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Oskarshamn site investigation

Single-hole injection tests in borehole KLX10

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Abstract

Borehole KLX10 is a deep core-drilled borehole within the site investigations in the Oskarshamn area. It is designed as a so called telescopic borehole, with an enlarged diameter in the upper approximately 100 m, enabling installation of certain bulky borehole equipment. The borehole is inclined c. 85 degrees from the horizontal plane, has a drilling length about 1,000 m and is cased to a depth of about 102 m. The borehole diameter is 76 mm in the interval 102.13–1,001.20 m.

This report presents injection tests performed using the pipe string system PSS in borehole KLX10 and the test results.

The main aim of the injection tests in KLX10 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.

The injection tests gave consistent results on the different measurement scales regarding transmissivity. During most of the tests, a certain time interval with pseudo-radial flow could be identified from the injection period, making a standard transient evaluation possible. However, the pressure recovery in KLX10 was often fast, especially in the borehole interval c. 100–450 m, and only displaying a pseudo-stationary flow. The pressure recovery was also in many tests strongly affected by wellbore storage effects, making an unambiguous transient evaluation of this period difficult.

The interval with the highest transmissivity in KLX10 is 318.2–338.2 m. Other intervals with a relatively high transmissivity are 105.2–262.5 m and 419.0–424.0 m.

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

Sammanfattning

Borrhål KLX10 är ett djupt kärnborrhål inom platsundersökningarna i Oskarshamnsområdet. Det är utfört som ett så kallat teleskopborrhål där de översta ca 100 metrarna har större diameter än resten av borrhålet. Detta gör det möjligt att installera viss skrymmande utrustning i borrhålet. Kärnborrhålet är ca 1 000 m långt, lutar ca 85 grader från horisontalplanet och är försett med foderrör till ca 102 m. Borrhålsdiametern är ca 76 mm i diameter i intervallet 102,13–1 001,20 m.

Denna rapport beskriver genomförda injektionstester med rörgångssystemet PSS i borrhål KLX10 samt resultaten från desamma.

Huvudsyftet med injektionstesterna var att karaktärisera de hydrauliska förhållandena hos berget i anslutning till borrhålet i olika mätskalor (100 m, 20 m och 5 m). Hydrauliska parametrar såsom transmissivitet och hydraulisk konduktivitet bestämdes med hjälp av analysmetoder för såväl stationära som transienta förhållanden tillsammans med dominerande flödesregim och eventuella yttre hydrauliska randvillkor. Injektionstesterna gav samstämmiga resultat för de olika mätskalorna beträffande transmissivitet. Under de flesta tester kunde ett visst tidsintervall med pseudoradiellt flöde identifieras från flödesperioden, vilket möjliggjorde en standardmässig transient utvärdering. Tryckåterhämtningen i KLX10 var däremot ofta snabb, speciellt i borrhålsintervallet c:a 100–450 m, och uppvisade bara ett pseudo-stationärt tillstånd. Tryckåterhämtningen var också i många tester starkt påverkad av brunnsmagasinseffekter, vilket gör en unik transient utvärdering av denna period svår.

Den mest transmissiva zonen är intervallet 318,2–338,2 m. Andra intervall med relativt stor transmissivitet är 105,2–262,5 m och 419,0–424,0 m.

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 in borehole KLX10, situated in the Laxemar subarea, at Oskarshamn, Sweden, were carried out from January to March 2006 by Geosigma AB. The borehole KLX10 is a deep cored borehole within the on-going site investigation in the Oskarshamn area. The borehole is a so called telescopic borehole and designed with an enlarged diameter in the upper approximately 100 m percussion drilled part, allowing installation of certain bulky borehole equipment. The borehole is inclined, c. 85 degrees from the horizontal plane, has a drilling length of about 1,000 m and is cased to about 102 m. The borehole diameter is about 76 mm in the interval 102.13–1,001.20 m. The location of the borehole is shown in Figure 1-1. There were three intervals with extensive fractures and an increased risk of fallouts from the borehole wall. These sections were reinforced with stainless steel plates, so called PLEX-plates, after drilling to stabilize the walls.

This document reports the results obtained from the injection tests in borehole KLX10. The activity is performed within the Oskarshamn 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.

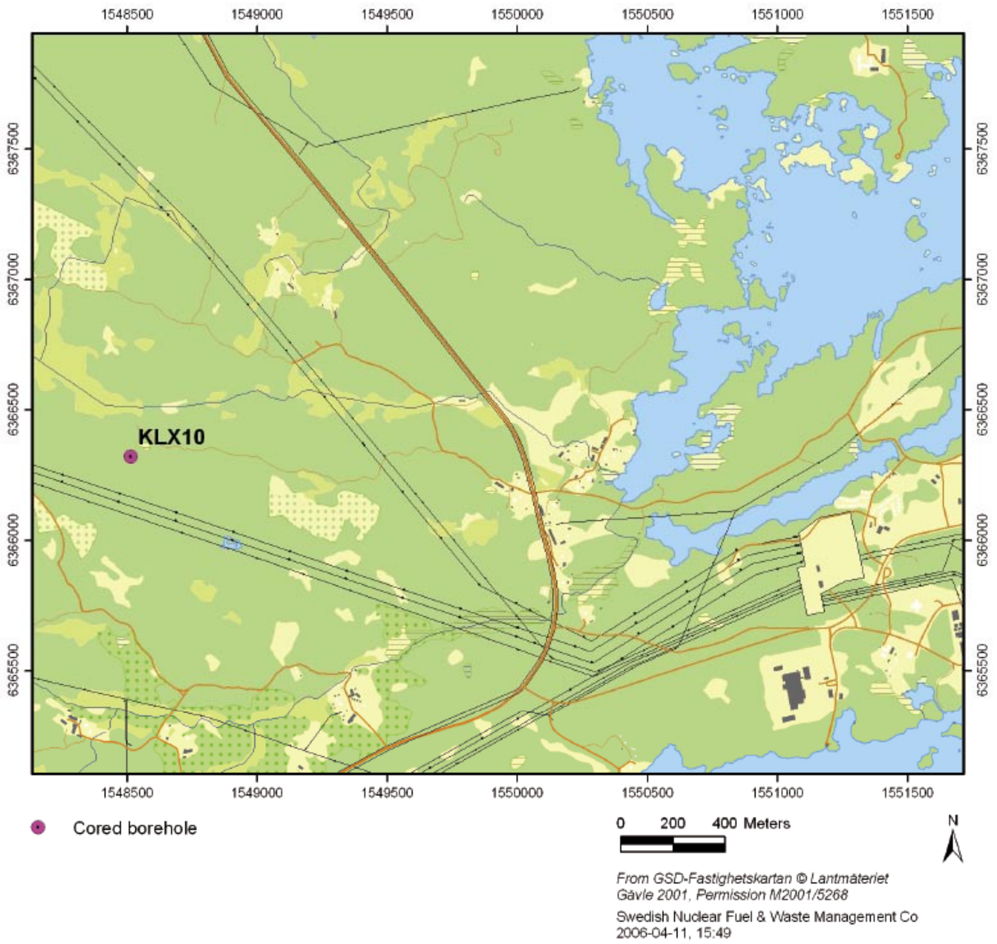


Figure 1-1. *The investigation area at Oskarshamn showing the position of borehole KLX10 in the Laxemar subarea.*

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

Activity Plan	**Number**	**Version**
Hydraulic injection tests in borehole KLX10	AP PS 400-05-090	1.0
Method descriptions	**Number**	**Version**
Mätsystembeskrivning (MSB) – Allmän del. Pipe String System	SKB MD 345.100	1.0
Mätsystembeskrivning för: Kalibrering	SKB MD 345.122	1.0
Mätsystembeskrivning för: Skötsel, service, serviceprotokoll	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 600.04	1.0

2 Objectives

The main aim of the injection tests in borehole KLX10 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 injection- and recovery periods.

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 borehole.

3.2 Tests performed

The injection tests in borehole KLX10, performed according to Activity Plan AP PS 400-05-090 (see Table 1-1), are listed in Table 3-2. The injection tests were carried out with the Pipe String System. 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).

Table 3-1. Technical data of borehole KLX10 (printout from SKB database, SICADA).

Borehole length (m):	1,001.200				
Drilling period(s):	**From date**	**To date**	**Secup (m)**	**Seclow (m)**	**Drilling type**
	2005-04-24	2005-06-01	0.000	100.600	Percussion drilling
	2005-06-18	2005-10-15	0.000	1,001.200	Core drilling
Starting point coordinate:	**Length (m)**	**Northing (m)**	**Easting (m)**	**Elevation**	**Coord system**
	0.000	6366319.384	1548515.230	18.276	RT90-RHB70
Angles:	**Length (m)**	**Bearing**	**Inclination (– = down)**		
	0.00	250.812	–85.185		
Borehole diameter:	**Secup (m)**	**Seclow (m)**	**Hole diam (m)**		
	0.00	9.200	0.343		
	9.2	12.100	0.248		
	12.100	100.500	0.197		
	100.500	100.600	0.163		
	100.500	101.130	0.086		
	101.130	1,001.200	0.076		
Core diameter:	**Secup (m)**	**Seclow (m)**	**Core diam (m)**		
	100.500	101.130	0.072		
	101.130	1,001.200	0.050		
Casing diameter:	**Secup (m)**	**Seclow (m)**	**Case in (m)**	**Case out (m)**	
	0.00	12.100	0.200	0.208	
	0.120	9.200	0.280	0.311	

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, only data from the last test in each section were used.

Table 3-2. Single-hole injection tests performed in borehole KLX10.

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
KLX10	105.20	205.20	100.0	3	6	2006-01-13 08:36	2006-01-13 10:56
KLX10	203.50	303.50	100.0	3	1	2006-01-16 14:41	2006-01-16 16:38
KLX10	301.00	401.00	100.0	3	1	2006-01-16 17:46	2006-01-16 19:29
KLX10	398.60	498.60	100.0	3	1	2006-01-17 10:06	2006-01-17 11:57
KLX10	497.50	597.50	100.0	3	1	2006-01-17 15:01	2006-01-17 16:57
KLX10	596.50	696.50	100.0	3	1	2006-01-17 18:19	2006-01-17 20:09
KLX10	696.50	796.50	100.0	3	1	2006-01-18 09:56	2006-01-18 11:50
KLX10	796.50	896.50	100.0	3	1	2006-01-18 14:19	2006-01-18 16:10
KLX10	892.50	992.50	100.0	3	1	2006-01-18 17:36	2006-01-18 19:25
KLX10	105.20	125.20	20.0	3	1	2006-02-16 17:28	2006-02-16 19:00
KLX10	120.20	140.20	20.0	3	1	2006-02-16 19:45	2006-02-16 21:01
KLX10	140.20	160.20	20.0	3	1	2006-02-17 08:22	2006-02-17 09:43
KLX10	149.60	169.60	20.0	3	1	2006-02-17 10:28	2006-02-17 11:50
KLX10	174.60	194.60	20.0	3	1	2006-02-20 08:59	2006-02-20 10:14
KLX10	191.30	211.30	20.0	3	1	2006-02-20 11:01	2006-02-20 12:15
KLX10	214.00	234.00	20.0	3	1	2006-02-20 13:19	2006-02-20 14:33
KLX10	222.50	242.50	20.0	3	1	2006-02-20 14:51	2006-02-20 16:05
KLX10	242.50	262.50	20.0	3	1	2006-02-20 16:25	2006-02-20 17:39
KLX10	262.50	282.50	20.0	3	1	2006-01-24 16:07	2006-01-24 17:29
KLX10	282.50	302.50	20.0	3	1	2006-01-24 17:54	2006-01-24 19:09
KLX10	297.50	317.50	20.0	3	1	2006-01-25 08:05	2006-01-25 09:32
KLX10	339.20	359.20	20.0	3	1	2006-01-25 11:44	2006-01-25 12:58
KLX10	359.20	379.20	20.0	3	1	2006-01-25 14:17	2006-01-25 15:44
KLX10	377.70	397.70	20.0	3	1	2006-01-25 16:21	2006-01-25 17:41
KLX10	398.60	418.60	20.0	3	1	2006-01-25 18:10	2006-01-25 19:30
KLX10	418.60	438.60	20.0	3	1	2006-01-26 07:45	2006-01-26 09:01
KLX10	432.50	452.50	20.0	3	1	2006-01-26 09:25	2006-01-26 10:40
KLX10	452.50	472.50	20.0	3	1	2006-01-26 13:55	2006-01-26 15:11
KLX10	472.50	492.50	20.0	3	1	2006-02-21 08:19	2006-02-21 09:35
KLX10	492.50	512.50	20.0	3	1	2006-02-21 10:05	2006-02-21 11:18
KLX10	512.50	532.50	20.0	3	1	2006-02-21 11:33	2006-02-21 13:23
KLX10	532.50	552.50	20.0	3	1	2006-02-21 13:43	2006-02-21 14:57
KLX10	552.50	572.50	20.0	3	1	2006-02-21 15:20	2006-02-21 16:35
KLX10	572.50	592.50	20.0	3	1	2006-02-21 17:03	2006-02-21 18:16
KLX10	592.50	612.50	20.0	3	1	2006-02-22 07:45	2006-02-22 08:59
KLX10	612.50	632.50	20.0	3	1	2006-02-22 09:22	2006-02-22 10:36
KLX10	632.50	652.50	20.0	3	1	2006-02-22 11:04	2006-02-22 12:19

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
KLX10	652.50	672.50	20.0	3	1	2006-02-22 13:09	2006-02-22 14:23
KLX10	672.50	692.50	20.0	3	1	2006-02-22 14:44	2006-02-22 15:37
KLX10	696.50	716.50	20.0	3	1	2006-02-22 16:10	2006-02-22 17:23
KLX10	716.50	736.50	20.0	3	1	2006-02-22 17:46	2006-02-22 19:00
KLX10	736.50	756.50	20.0	3	1	2006-02-22 19:21	2006-02-22 20:34
KLX10	756.50	776.50	20.0	3	1	2006-02-23 08:31	2006-02-23 09:34
KLX10	776.50	796.50	20.0	3	1	2006-02-23 09:58	2006-02-23 11:11
KLX10	796.50	816.50	20.0	3	1	2006-02-23 11:29	2006-02-23 12:42
KLX10	816.50	836.50	20.0	3	1	2006-02-23 13:18	2006-02-23 14:50
KLX10	836.50	856.50	20.0	3	1	2006-02-23 15:11	2006-02-23 16:26
KLX10	856.50	876.50	20.0	3	1	2006-02-23 16:45	2006-02-23 17:29
KLX10	876.50	896.50	20.0	3	1	2006-02-23 17:52	2006-02-23 19:06
KLX10	892.50	912.50	20.0	3	1	2006-02-24 07:44	2006-02-24 08:31
KLX10	912.50	932.50	20.0	3	1	2006-02-24 08:55	2006-02-24 09:44
KLX10	932.50	952.50	20.0	3	1	2006-02-27 09:21	2006-02-27 10:09
KLX10	952.50	972.50	20.0	3	1	2006-02-27 10:38	2006-02-27 11:57
KLX10	972.50	992.50	20.0	3	1	2006-02-27 13:18	2006-02-27 14:37
KLX10	120.20	125.20	5.0	3	1	2006-03-01 09:38	2006-03-01 11:17
KLX10	169.60	174.60	5.0	3	1	2006-03-01 12:43	2006-03-01 13:48
KLX10	297.50	302.50	5.0	3	1	2006-03-01 15:22	2006-03-01 16:44
KLX10	302.50	307.50	5.0	3	1	2006-03-01 17:02	2006-03-01 18:23
KLX10	307.00	312.00	5.0	3	1	2006-03-01 18:42	2006-03-01 19:58
KLX10	312.50	317.50	5.0	3	2	2006-03-09 08:12	2006-03-10 09:29
KLX10	341.20	346.20	5.0	3	1	2006-03-09 10:39	2006-03-09 11:55
KLX10	344.50	349.50	5.0	3	1	2006-03-09 12:59	2006-03-09 14:14
KLX10	348.30	353.30	5.0	3	1	2006-03-09 14:28	2006-03-09 15:45
KLX10	353.30	358.30	5.0	3	1	2006-03-09 15:59	2006-03-09 17:17
KLX10	358.30	363.30	5.0	3	1	2006-03-09 17:29	2006-03-09 18:43
KLX10	362.40	367.40	5.0	3	1	2006-03-10 07:15	2006-03-10 08:31
KLX10	367.40	372.40	5.0	3	1	2006-03-10 08:46	2006-03-10 10:03
KLX10	372.40	377.40	5.0	3	1	2006-03-10 10:18	2006-03-10 11:03
KLX10	377.40	382.40	5.0	3	1	2006-03-13 08:15	2006-03-13 08:55
KLX10	382.40	387.40	5.0	3	1	2006-03-13 09:16	2006-03-13 10:31
KLX10	387.40	392.40	5.0	3	1	2006-03-13 10:41	2006-03-13 12:02
KLX10	389.00	394.00	5.0	3	1	2006-03-13 12:28	2006-03-13 13:43
KLX10	392.70	397.70	5.0	3	1	2006-03-13 13:50	2006-03-13 15:06
KLX10	395.70	400.70	5.0	3	1	2006-03-13 15:22	2006-03-13 16:35
KLX10	406.00	411.00	5.0	3	1	2006-03-13 16:54	2006-03-13 18:08
KLX10	411.00	416.00	5.0	3	1	2006-03-14 07:31	2006-03-14 08:47
KLX10	414.00	419.00	5.0	3	1	2006-03-14 08:56	2006-03-14 10:15
KLX10	419.00	424.00	5.0	3	1	2006-03-14 10:46	2006-03-14 11:59
KLX10	424.00	429.00	5.0	3	1	2006-03-14 13:30	2006-03-14 14:43
KLX10	429.00	434.00	5.0	3	1	2006-03-14 14:56	2006-03-14 16:10
KLX10	434.00	439.00	5.0	3	1	2006-03-14 16:21	2006-03-14 17:34
KLX10	439.00	444.00	5.0	3	1	2006-03-14 17:46	2006-03-14 19:11

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
KLX10	442.50	447.50	5.0	3	1	2006-03-15 07:26	2006-03-15 08:47
KLX10	447.50	452.50	5.0	3	1	2006-03-15 09:03	2006-03-15 10:16
KLX10	452.50	457.50	5.0	3	1	2006-03-15 10:26	2006-03-15 11:40
KLX10	457.50	462.50	5.0	3	1	2006-03-15 12:27	2006-03-15 13:41
KLX10	462.50	467.50	5.0	3	1	2006-03-15 13:54	2006-03-15 14:33
KLX10	467.50	472.50	5.0	3	1	2006-03-15 14:51	2006-03-15 16:06
KLX10	472.50	477.50	5.0	3	1	2006-03-15 16:14	2006-03-15 17:28
KLX10	477.50	482.50	5.0	3	1	2006-03-15 17:38	2006-03-15 18:19
KLX10	482.50	487.50	5.0	3	1	2006-03-16 07:17	2006-03-16 08:31
KLX10	487.50	492.50	5.0	3	1	2006-03-16 08:41	2006-03-16 09:22
KLX10	492.50	497.50	5.0	3	1	2006-03-16 09:36	2006-03-16 10:16
KLX10	497.50	502.50	5.0	3	1	2006-03-16 10:25	2006-03-16 11:04
KLX10	502.50	507.50	5.0	3	1	2006-03-16 11:13	2006-03-16 12:32
KLX10	507.50	512.50	5.0	3	1	2006-03-16 12:45	2006-03-16 13:59
KLX10	512.50	517.50	5.0	3	1	2006-03-16 14:10	2006-03-16 14:50
KLX10	517.50	522.50	5.0	3	1	2006-03-16 14:58	2006-03-16 16:11
KLX10	522.50	527.50	5.0	3	1	2006-03-16 16:21	2006-03-16 17:35
KLX10	527.50	532.50	5.0	3	1	2006-03-17 07:45	2006-03-17 09:01
KLX10	532.50	537.50	5.0	3	1	2006-03-17 09:09	2006-03-17 10:24
KLX10	537.50	542.50	5.0	3	1	2006-03-17 10:36	2006-03-17 11:51
KLX10	542.50	547.50	5.0	3	1	2006-03-20 13:37	2006-03-20 14:54
KLX10	547.50	552.50	5.0	3	1	2006-03-20 15:19	2006-03-20 16:47
KLX10	552.50	557.50	5.0	3	1	2006-03-20 17:03	2006-03-20 18:22
KLX10	557.50	562.50	5.0	3	1	2006-03-21 08:25	2006-03-21 09:43
KLX10	562.50	567.50	5.0	3	1	2006-03-21 09:56	2006-03-21 10:39
KLX10	567.50	572.50	5.0	3	1	2006-03-21 10:58	2006-03-21 11:41
KLX10	572.50	577.50	5.0	3	1	2006-03-21 12:04	2006-03-21 13:42
KLX10	577.50	582.50	5.0	3	1	2006-03-21 13:58	2006-03-21 14:45
KLX10	582.50	587.50	5.0	3	1	2006-03-21 14:59	2006-03-21 16:18
KLX10	587.50	592.50	5.0	3	1	2006-03-21 16:30	2006-03-21 17:21
KLX10	592.50	597.50	5.0	3	1	2006-03-21 17:45	2006-03-21 18:39
KLX10	597.50	602.50	5.0	3	1	2006-03-21 18:54	2006-03-21 19:46
KLX10	602.50	607.50	5.0	3	1	2006-03-22 08:31	2006-03-22 09:32
KLX10	607.50	612.50	5.0	3	1	2006-03-22 09:46	2006-03-22 11:06
KLX10	612.50	617.50	5.0	3	1	2006-03-22 11:21	2006-03-22 13:53
KLX10	617.50	622.50	5.0	3	1	2006-03-22 14:14	2006-03-22 15:03
KLX10	622.50	627.50	5.0	3	1	2006-03-22 15:15	2006-03-22 16:10
KLX10	627.50	632.50	5.0	3	1	2006-03-22 16:28	2006-03-22 17:17
KLX10	632.50	637.50	5.0	3	1	2006-03-22 17:29	2006-03-22 18:12
KLX10	637.50	642.50	5.0	3	1	2006-03-22 18:29	2006-03-22 19:44
KLX10	642.50	647.50	5.0	3	1	2006-03-23 08:19	2006-03-23 09:02
KLX10	647.50	652.50	5.0	3	1	2006-03-23 11:07	2006-03-23 12:29
KLX10	652.50	657.50	5.0	3	1	2006-03-23 13:42	2006-03-23 15:00
KLX10	657.50	662.50	5.0	3	1	2006-03-23 16:59	2006-03-23 17:41
KLX10	662.50	667.50	5.0	3	1	2006-03-23 18:06	2006-03-23 18:58

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
KLX10	667.50	672.50	5.0	3	1	2006-03-24 07:27	2006-03-24 08:21
KLX10	691.50	696.50	5.0	3	1	2006-03-24 08:51	2006-03-24 10:09
KLX10	696.50	701.50	5.0	3	1	2006-03-24 10:28	2006-03-24 11:43
KLX10	701.50	706.50	5.0	3	1	2006-03-27 13:44	2006-03-27 15:06
KLX10	706.50	711.50	5.0	3	1	2006-03-27 15:29	2006-03-27 16:14
KLX10	711.50	716.50	5.0	3	1	2006-03-27 16:34	2006-03-27 17:20

[1] 3: Injection test.

3.3 Equipment checks

The PSS equipment was fully serviced, according to SKB internal controlling documents (SKB MD 345.124, service, and SKB MD 345.122, calibration), in December 2005.

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 both air and 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.

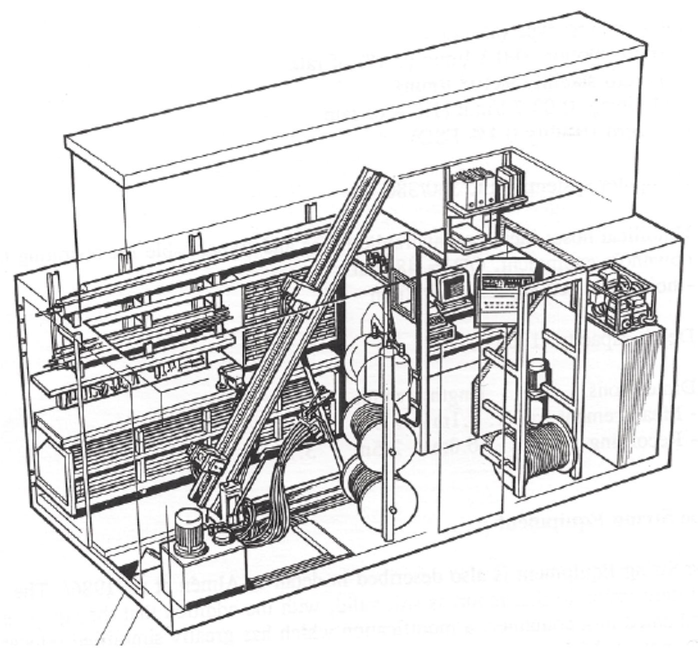


Figure 4-1. *Outline of the PSS container with equipment.*

At the lower end of the borehole equipment, a level indicator (caliper 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 m).

4.2 Measurement sensors

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

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).

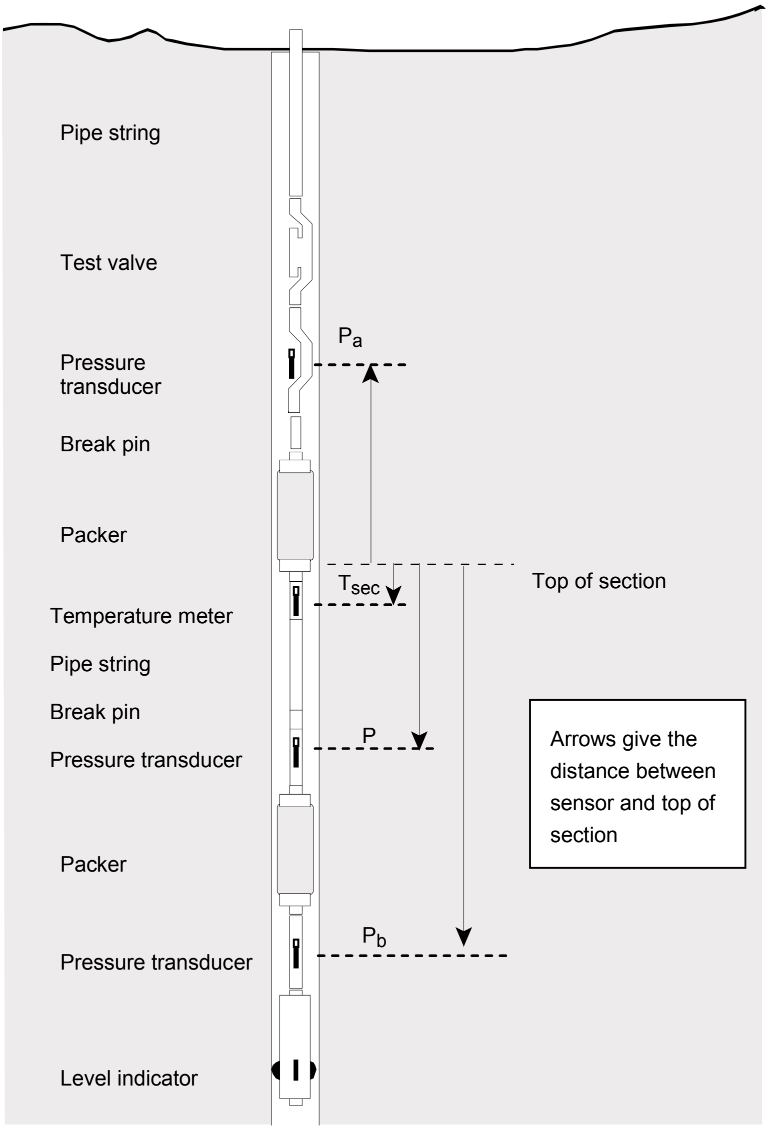


Figure 4-2. *Schematic drawing of the down-hole equipment in the PSS.*

Table 4-1. Technical data for sensors together with estimated data for the PSS (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	$1.67 \cdot 10^{-5}$–$1.67 \cdot 10^{-3}$		The specific accuracy is depending on actual flow
	Resolution	m^3/s	$6.7 \cdot 10^{-8}$		
	Accuracy[2)]	% O.R	0.15–0.3	< 1.5	
Flow Qsmall	Output signal	mA	4–20		
	Meas. range	m^3/s	$1.67 \cdot 10^{-8}$–$1.67 \cdot 10^{-5}$		The specific accuracy is depending on actual flow
	Resolution	m^3/s	$6.7 \cdot 10^{-10}$		
	Accuracy[3)]	% O.R	0.1–0.4	0.5–30	

[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.

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

Parameter	**Length of test section (m)**		
	5	**20**	**100**
Equipment displacement volume in test section [1)]	3.6	13	61
Total volume of test section [2)]	0.011281	0.045126	0.225628
Position for sensor P_a, pressure above test section, (m above secup) [3)]	1.86	1.86	1.87
Position for sensor P, pressure in test section, (m above secup) [3)]	–4.10	–19.10	–99.11
Position for sensor T_{sec}, temperature in test section, (m above secup) [3)]	–0.99,[4)] –0.97	–0.98	–0.97
Position for sensor P_b, pressure below test section, (m above secup) [3)]	–6.99	–21.99, [4)] –22.01	–102.01

[1)] Displacement volume in test section due to pipe string, signal cable, sensors and packer ends (in litre).
[2)] Total volume of test section [m^3] (V = section length*π*d^2/4).
[3)] Position of sensor relative top of test section. A negative value indicates a position below top of test section, (secup).
[4)] The section were taken up and rebuilt causing the sensor to be located in a different position, the first position is from the first setup of the test section.

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.

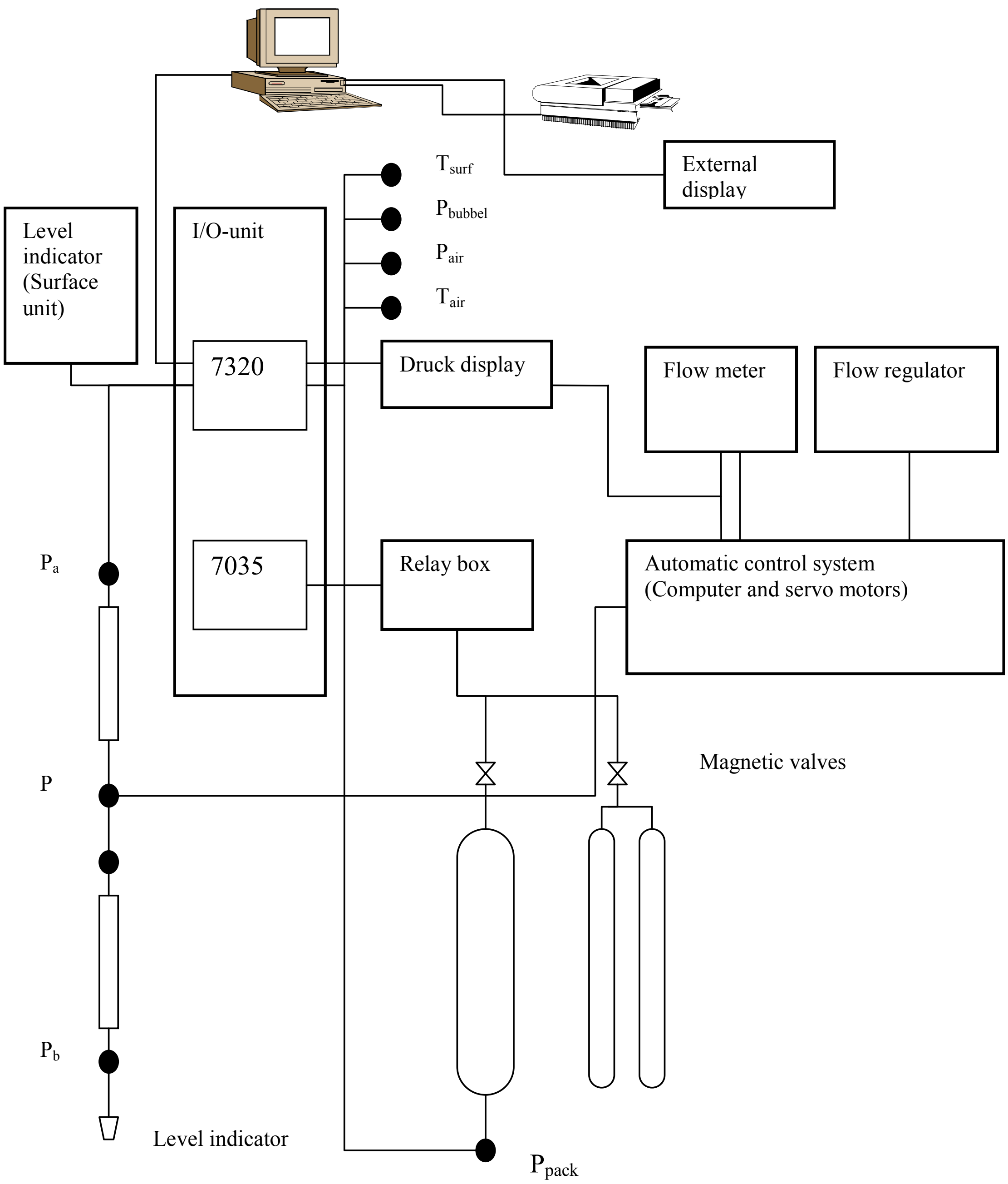


Figure 4-3. *Schematic drawing of the data acquisition system and the automatic control system in PSS.*

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 once 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 600.04, see Table 1-1), level 1

5.2 Test performance

5.2.1 Test principle

The injection tests in KLX10 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 with 20 m and 5 m section length, 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 PS 400-05-090. Exceptions to this are presented in Section 5.5.

A test cycle includes the following phases: 1) Transfer of down-hole equipment to the next section, 2) Packer inflation, 3) Pressure stabilisation, 4) Injection period, 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 PS 400-05-090. 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 KLX10.

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, injection tests in 100 m sections were performed in KLX10 within the interval 105.2–992.5 m. The delimitations of the test sections were, as far as possible, selected in order to minimize the overlap of sections in subsequent testing on different scales.

Secondly, injection tests in 20 m sections were carried out in the same interval, 105.2–992.5 m. Due to large fractures and fallouts in the borehole, the 100 m sections between 105.2 and 498.6 had to be measured with one or more overlapping 20 m sections. This strategy was necessary because of the risk of damaging the packers when they were inflated across a large fracture or PLEX plate. In all of the tested 100 m sections, five successive injection tests with 20 m section length were performed. Exceptions are the first two 100 m sections, 105.2–205.2 and 203.5–303.5 m, in which six 20 m tests were performed. The problems in placing the packers on safe positions led to that some borehole intervals were not covered by the 20 m test sections.

Finally, injection tests with 5 m section length were conducted in the interval 300–700 m in the previously measured 20 m sections with a flow above the detection limit. Four successive tests with 5 m section length were performed within the 20 m intervals. The total number of injection tests was, thus, dependent on the results of the previous tests. In a few 20 m sections, five tests with section length 5 m were performed within the 20 m interval instead of four tests. Two intervals, between 317.5–341.2 m and 400.7–406.0 m respectively, were not covered at all by the 5 m test sections depending on large fractures making it too risky to place the packers in these intervals.

The intervals between 211.3–214.0 m, 317.5–318.2 m and 338.2–339.2 were not covered by either 20 m or 5 m test sections. Large fractures in the vicinity of these intervals made it impossible to place the packers on safe locations without a major risk of damage and leakage. However, there were no visible fractures on the BIPS pictures in the two latter sections.

Since the results of the tests in 100 m sections will have a strong effect on the continued test program, it was considered important to ensure accurate results of these tests, particularly regarding test sections close to the lower measurement limit.

5.3 Data handling

With the PSS, 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 ___KLX10_0105.20_200601130836.ht2). The name differs slightly from the convention stated in Instructions 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 KLX10 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 ($1.7\cdot10^{-8}$ 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. For approximately 40% of the injection tests in KLX10, the actual lower measurement limit of the flow rate was estimated ranging from $2.7\cdot10^{-9}$ m^3/s to $7.6\cdot10^{-9}$ m^3/s.

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). However, for some test sections in KLX10, the actual injection pressure was considerably different. The highest injection pressure during the tests in KLX10 was 305 kPa and for twelve of the tests the injection pressure was below 100 kPa. A 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. The estimated test specific lower measurement limit for the specific flow rate in KLX10 ranged from $1.4\cdot10^{-10}$ m^2/s to $4.1\cdot10^{-10}$ m^2/s.

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 (since the actual pressure difference often was significantly less than 200 kPa, see above).

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 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 KLX10.

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)
0.0385	100	1.7E–08	100	1.6E–09	1.30	2.1E–09
0.0385	100	1.7E–08	200	8.2E–10	1.30	1.1E–09
0.0385	100	1.7E–08	300	5.5E–10	1.30	7.1E–10
0.0385	100	1.2E–08	100	1.1E–09	1.30	1.5E–09
0.0385	100	1.2E–08	200	5.7E–10	1.30	7.4E–10
0.0385	100	1.2E–08	300	3.8E–10	1.30	5.0E–10
0.0385	100	5.0E–09	100	4.9E–10	1.30	6.4E–10
0.0385	100	5.0E–09	200	2.5E–10	1.30	3.2E–10
0.0385	100	5.0E–09	300	1.6E–10	1.30	2.1E–10
0.0385	20	1.7E–08	100	1.6E–09	1.04	1.7E–09
0.0385	20	1.7E–08	200	8.2E–10	1.04	8.5E–10
0.0385	20	1.7E–08	300	5.5E–10	1.04	5.7E–10
0.0385	20	1.2E–08	100	1.1E–09	1.04	1.2E–09
0.0385	20	1.2E–08	200	5.7E–10	1.04	6.0E–10
0.0385	20	1.2E–08	300	3.8E–10	1.04	4.0E–10
0.0385	20	5.0E–09	100	4.9E–10	1.04	5.1E–10
0.0385	20	5.0E–09	200	2.5E–10	1.04	2.6E–10
0.0385	20	5.0E–09	300	1.6E–10	1.04	1.7E–10
0.0385	5	1.7E–08	100	1.6E–09	0.82	1.3E–09
0.0385	5	1.7E–08	200	8.2E–10	0.82	6.7E–10
0.0385	5	1.7E–08	300	5.5E–10	0.82	4.5E–10
0.0385	5	1.2E–08	100	1.1E–09	0.82	9.4E–10
0.0385	5	1.2E–08	200	5.7E–10	0.82	4.7E–10
0.0385	5	1.2E–08	300	3.8E–10	0.82	3.1E–10
0.0385	5	5.0E–09	100	4.9E–10	0.82	4.0E–10
0.0385	5	5.0E–09	200	2.5E–10	0.82	2.0E–10
0.0385	5	5.0E–09	300	1.6E–10	0.82	1.3E–10

5.4.3 Qualitative analysis

Initially, a qualitative evaluation of actual flow regimes, e.g. wellbore storage (WBS), 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 reflect the fracture properties close to the borehole which may possibly be characterized by turbulent head losses. These specific 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 sometimes 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.

5.4.4 Quantitative analysis

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 equation:

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

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

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) solution /1/ 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) /2/.

In borehole KLX10, the storativity was calculated using an empirical regression relationship between storativity and transmissivity, see Equation 5-3 (Rhén et al. (1997) /3/. Firstly, the transmissivity and skin factor was 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.

$$S = 0.007 \cdot T^{0.5} \tag{5-3}$$

S = storativity (–)

T = transmissivity (m^2/s)

For transient analysis of the recovery period, a model presented by Dougherty-Babu (1984) /4/ 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 is 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) /5/ based on the effective wellbore radius concept to account for non-zero (negative) skin factors. However, for tests in isolated test sections, the wellbore storage is 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 5-4.

$$C = V_w \cdot c_w = L_w \cdot \pi \cdot r_w^2 \cdot c_w \tag{5-4}$$

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})

The model by Dougherty-Babu (1984) was used to estimate the transmissivity and skin factor from the recovery period. 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) /6/ 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 5-5.

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

ζ = skin factor

r_w = borehole radius (m)

r_{wf} = effective borehole radius

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) /7/, was applied for evaluation of the recovery period for tests showing pseudo-spherical- or pseudo-stationary flow during this period. This model also allows calculation of the wellbore storage coefficient according to Equation 5-6.

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

Some tests showed fracture responses (a slope of 0.5 or less in a log-log plot). A model for single fractures was then used for the transient analysis as a complement to the standard models. The model by Ozkan-Raghavan (1991a) /8/ and (1991b) /9/ for a vertical fracture was employed. In this case, the test section length was used to convert K and S_s to T and S, respectively, after analysis by fracture models. The quotient K_x/K_y of the hydraulic conductivity in the x and the y-direction, respectively, was assumed to be 1.0 (one). Type curve matching provided values of K_x and L_f, where L_f is the theoretical fracture length.

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 assumed as the most representative for the hydraulic conditions in the rock close to the tested section. In most cases, the transient estimates of transmissivity from the injection period were considered more representative than those from the recovery period. The recovery responses were sometimes strongly affected by wellbore storage and, frequently, no pseudo-radial flow regime was reached. In addition, the pressure recovery was fast in many tests causing a pseudo-stationary state during the recovery period.

Finally, a representative value of transmissivity of the test section, T_R, was chosen from T_T and T_M. In general, the transmissivity from the transient evaluation, T_T, was considered as the best estimate. In 5 out of 97 tests with a definable final flow rate in KLX10 the steady-state transmissivity, T_M, was chosen as the most representative value of transmissivity of the test section. The latter transmissivity was chosen whenever a transient evaluation of the test data was not possible. Whenever the flow rate by the end of the injection period (Q_p) was too low to be defined, and thus neither T_T nor T_M could be estimated, the representative transmissivity for the test section was considered to be less than T_M based on the estimated lower measurement limit for Q/s (i.e. $T_R < T_M = Q/s\text{-measl-}L \cdot C_M$).

Estimated values of the borehole storage coefficient, C, based on actual borehole geometrical data and assumed fluid properties together with the estimated effective C_{eff} from laboratory experiments /10/ are shown in Table 5-3. 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) /11/.

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 /10/.

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	1.80E–10	1.87E–10
0.0379	20	0.090	0.013	0.077	3.55E–11	4.25E–11
0.0379	5	0.023	0.004	0.019	8.54E–12	1.55E–11

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 (C_{net}) based on geometry and the value of C_{eff} based on laboratory experiments (Table 5-3).

Furthermore, when using the model by Dougherty-Babu (1984) /4/, 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. (1986) /11/.

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.

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) /12/:

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 applied. The radius of influence can be used to deduce the length of the hydraulic feature(s) tested.

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

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)

Furthermore, a 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 period. 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 actual flow time t_p in Equation 5-7.

5.5 Nonconformities

The test program in KLX10 was carried out according to the Activity Plan AP PS 400-05-090 with the following exceptions:

- The temperature sensor, T_{sec}, measuring the temperature in the test section, broke down during the tests with 20 m section length. The 20 m-sections measured without a functioning T_{sec} was in the interval 696.5–992.5 m. The sensor was not replaced until the equipment was lifted to the surface to rebuild it for the 5 m sections. The replacement was not done earlier because of limited time for the field campaign. Hence, all tests in KLX10 performed between 16:10 on February 22, 2006 and 14:37 on February 27, 2006 have no (or unreliable) registration of temperature in the test section.
- During the tests in the 20 m sections 174.6–194.6 m, 191.3–211.3 m, 418.6–438.6 m, 836.5–856.5 m and in two 5 m tests in the interval 414–424 m the test valve could not close properly at stop of the injection. However, the evaluations of the injection periods of these tests gave sufficient information of the transmissivity and the tests did not need to be re-performed.
- A small leakage was discovered in the pipe string during tests performed in the 20 m sections 756.5–776.5 m, 856.5–896.5 m, 912.5–932.5 m and 952.5–972.5 m. The leakage had a magnitude of maximum 1.2 mL/min at 260 kPa pressure. Since the leakage was quantifiable it was possible to compensate for the leakage during the evaluation of the tests.
- Due to major fractures in the borehole, some of the positions of the 100-, 20- and 5 m test sections were shifted. This fact resulted in that some of the intervals measured with different section lengths are not identical. It also resulted in some partly overlapping and missing borehole intervals as follows:
  - The following intervals were not measured by either 20 m or 5 m sections: 211.3–214.0 m, 317.5–318.2 m and 338.2–339.2 m.
  - The following intervals were not tested with 20 m section length but subsequently covered by the 5 m test section length: 169.6–174.6 m, 397.7–398.6 m and 692.5–696.5 m.
  - Intervals not covered by the 5 m test section but measured with the 20 m test section were: 312.0–312.5 m, 318.2–338.2 m, 339.2–341.2 m and 400.7–406.0 m.
  - The following intervals were measured with overlapping 100 m sections: 203.5–205.2 m, 301–303.5 m, 398.6–401.0 m, 497.5–498.6 m, 596.5–597.5 m and 892.5–896.5 m.
  - The following intervals were measured with overlapping 20 m sections: 120.2–125.2 m, 149.6–160.2 m, 191.3–194.6 m, 222.5–234 m, 297.5–302.5 m, 377.7–379.2 m, 432.5–438.6 m and 892.5–896.5 m.
  - The following intervals were measured with overlapping 5 m sections: 307–307.5 m, 344.5–346.2 m, 348.3–349.5 m, 362.4–363.3 m, 389–392.4 m, 392.7–394.0 m, 395.7–397.7 m, 414.0–416.0 m and 442.5–444.0 m.

6 Results

6.1 Nomenclature and symbols

The nomenclature and symbols used for the results of the injection tests in KLX10 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.

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 KLX10, reference marks were milled into the borehole wall at every 50 m (with a few exceptions).

During the injection tests in KLX10 with the PSS, length reference marks were detected as presented in Table 6-1. As seen from Table 6-1, all but one of the reference marks were detected. At each mark, the length scale for the injection tests was adjusted according to the reported length to the reference mark. The tests with 20 m and 5 m section length above the first reference mark were adjusted according to the first detected reference mark by the tests in 100 m sections.

The largest difference between the reported and measured lengths at the reference marks during the injection tests was 0.53 m, at the 980 m reference mark. The difference between two consecutive measurements over a 100 m borehole interval was 0.07 m or less in all cases. A comparison of the measurements performed with different section lengths results in a maximum difference of 0.02 m.

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

6.2.3 General results

For the injection tests, transient evaluation was conducted, whenever possible, both on the injection and recovery periods (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. Transient evaluation was performed for all tests for which a significant flow rate, Q_p, could be identified, see Section 5.4.2. The quantitative analysis was conducted using the AQTESOLV software.

Table 6-1. Detected reference marks during the injection tests in KLX10.

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 [1)]
110	Yes	Yes	Yes
150	Yes	Yes	Yes
204	Yes	Yes	Yes
251	Yes	Yes	Yes
300	Yes	Yes	Yes
350	Yes	Yes	Yes
402	Yes	Yes	Yes
450	Yes	Yes	Yes
500	Yes	Yes	Yes
550	Yes	Yes	Yes
600	Yes	Yes	Yes
651	No	Yes	Yes
698	Yes	Yes	Yes
750	Yes	Yes	
799	Yes	Yes	
850	Yes	Yes	
900	Yes	Yes	
950	Yes	Yes	
980	Yes	Yes	

[1)] No tests of section length 5 m were performed below 711.5–716.5 m, hence no reference marks below 698 m was passed using this section length.

A summary of the results of the routine evaluation of the injection tests is presented, test by test, in Table 6-2. Selected test diagrams are presented in Appendix 3. In general, one linear diagram showing the entire test sequence together with log-log and lin-log diagrams from the injection and recovery periods, respectively, are presented. The quantitative analysis was performed from such diagrams using the AQTESOLV software. From 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 KLX10 are also compiled in appropriate tables in Appendix 5 to be stored in the SICADA database, where they will be traceable by the Activity Plan number.

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 are further commented on in Section 6.2.4. During the injection period, a certain time interval with pseudo-radial flow could, in most tests, be identified. Consequently, standard methods for single-hole tests with wellbore storage and skin effects were generally 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.

Table 6-2. Summary of the routine evaluation of the single-hole injection tests in borehole KLX10 (Nomenclature is given in Appendix 5).

Secup (m)	Seclow (m)	Test start YYYYMMDD 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 (–)
105.20	205.20	2006-01-13 08:36	100.00	PSF->PSS	PSF->PSS	1.27E–04	1.85E–04	1.88E–04	1.85E–04	1.85E–04	3.65						281.38	–1
203.50	303.50	2006-01-16 14:41	100.00	->PSF	PSF->PSS	2.80E–05	3.00E–05	2.42E–05	3.00E–05	3.00E–05	0.60						178.86	–1
301.00	401.00	2006-01-16 17:46	100.00	->PRF	PRF	3.74E–04	1.85E–04	3.98E–04	1.85E–04	1.85E–04	–4.98	700	1,800	100	1,000		280.34	0
398.60	498.60	2006-01-17 10:06	100.00	PRF->NFB?	PSF->PSS	8.21E–06	1.50E–05	1.13E–05	1.50E–05	1.50E–05	4.83	50	600				86.43	1
497.50	597.50	2006-01-17 15:01	100.00	(PRF1)->PRF2	WBS->PRF	1.43E–07	5.78E–08	5.68E–08	5.78E–08	5.78E–08	–3.88	200	1,200	30	500		30.46	0
596.50	696.50	2006-01-17 18:19	100.00	PRF	WBS->PRF	1.01E–07	5.35E–08	1.05E–07	5.35E–08	5.35E–08	–2.65	150	1,800	600	1,000		36.58	0
696.50	796.50	2006-01-18 09:56	100.00	NFB->	PLF	5.32E–07				5.32E–07							65.39	–
796.50	896.50	2006-01-18 14:19	100.00	PRF->NFB	PSF	1.82E–07	1.51E–07	8.84E–08	1.51E–07	1.51E–07	–0.69	200	700				29.57	1
892.50	992.50	2006-01-18 17:36	100.00	NFB	PLF/NFB	2.12E–09		1.40E–10	1.40E–10	1.40E–10							8.22	1
105.20	125.20	2006-02-16 17:28	20.00	PSF	PSF->PSS	2.45E–05	2.83E–05	2.57E–05	2.83E–05	2.83E–05	–0.03						144.94	–1
120.20	140.20	2006-02-16 19:45	20.00	PSF1->PSF2	PSS	7.59E–06	1.06E–05		1.06E–05	1.06E–05	1.57						112.49	–1
140.20	160.20	2006-02-17 08:22	20.00	PSF	PSS	8.53E–06	1.21E–05		1.21E–05	1.21E–05	1.60						116.98	–1
149.60	169.60	2006-02-17 10:28	20.00	PSF	PSS	5.28E–06	1.28E–05		1.28E–05	1.28E–05	8.36						118.57	–1
174.60	194.60	2006-02-20 08:59	20.00	(PRF)->PSF	PSS	2.27E–05	4.17E–05		4.17E–05	4.17E–05	3.92	200	500				101.87	–1
191.30	211.30	2006-02-20 11:01	20.00	PSF	PSF->PSS	5.82E–05	9.46E–05	1.60E–04	9.46E–05	9.46E–05	2.48						194.74	–1
214.00	234.00	2006-02-20 13:19	20.00	PRF	PSS	5.44E–06	1.20E–05		1.20E–05	1.20E–05	6.35	100	1,200				115.47	0
222.50	242.50	2006-02-20 14:51	20.00	PRF	PSS	5.73E–06	1.94E–05		1.94E–05	1.94E–05	14.1	100	1,200				130.32	0
242.50	262.50	2006-02-20 16:25	20.00	PSF	PSF	5.42E–06	8.45E–06	7.66E–06	8.45E–06	8.45E–06	2.78						106.51	–1
262.50	282.50	2006-01-24 16:07	20.00	PRF->NFB	PSS	7.42E–08	8.41E–08		8.41E–08	8.41E–08	0.17	50	300				16.72	1
282.50	302.50	2006-01-24 17:54	20.00	PRF	PSS	1.79E–07	1.68E–07		1.68E–07	1.68E–07	–0.89	100	1,200				39.75	0
297.50	317.50	2006-01-25 08:05	20.00	PRF	PSS	2.83E–08	3.52E–08	1.03E–08	3.52E–08	3.52E–08	1.51	50	1,200				26.90	0
318.20	338.20	2006-01-25 10:01	20.00	PRF	PRF	3.19E–04	2.82E–04	4.25E–04	2.82E–04	2.82E–04	–3.09	200	1,200	60	700		254.50	0
339.20	359.20	2006-01-25 11:44	20.00	PSF	PSS	1.55E–06	2.09E–06	2.07E–06	2.09E–06	2.09E–06	1.53						75.23	–1
359.20	379.20	2006-01-25 14:17	20.00	PRF	PSS	3.02E–07	2.58E–07		2.58E–07	2.58E–07	–1.56	20	1,220				44.61	0
377.70	397.70	2006-01-25 16:21	20.00	(PRF1)->PRF2	PSS	2.93E–07	6.38E–08		6.38E–08	6.38E–08	–5.73	500	1,200				31.22	0
398.60	418.60	2006-01-25 18:10	20.00	PRF	PSS	1.77E–06	1.75E–06	2.38E–06	1.75E–06	1.75E–06	–1.13	100	1,200				71.38	1

Secup (m)	Seclow (m)	Test start YYYYMMDD 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 (–)
418.60	438.60	2006-01-26 07:45	20.00	PRF->NFB	PSS	6.39E–06	1.20E–05		1.20E–05	1.20E–05	4.05	60	600				81.73	1
432.50	452.50	2006-01-26 09:25	20.00	PRF	PSS	9.75E–07	9.57E–07	8.40E–07	9.57E–07	9.57E–07	–1.05	40	1,200				61.43	0
452.50	472.50	2006-01-26 13:55	20.00	PSF	WBS->PSF	3.18E–08	5.28E–08	5.61E–08	5.28E–08	5.28E–08	4.09						30.09	–1
472.50	492.50	2006-02-21 08:19	20.00	PLF->(PRF)	WBS->	8.45E–10	2.28E–10		2.28E–10	2.28E–10	–3.74	100	1,200			5.94E–11	7.63	0
492.50	512.50	2006-02-21 10:05	20.00	(PRF)->NFB	WBS->	1.15E–09	3.53E–10		3.53E–10	3.53E–10	–3.50	100	1,200			5.06E–11	8.51	1
512.50	532.50	2006-02-21 11:33	20.00	PLF	PLF	8.89E–09	1.77E–09		1.77E–09	1.77E–09							12.84	0
532.50	552.50	2006-02-21 13:43	20.00	PSF	PSF	7.70E–08	5.91E–08	2.71E–08	5.91E–08	5.91E–08	–1.25	200	1,000				27.95	–1
552.50	572.50	2006-02-21 15:20	20.00	PLF	PLF	3.54E–08	7.88E–09	1.17E–08	7.88E–09	7.88E–09	–5.16	80	1,200				18.50	0
572.50	592.50	2006-02-21 17:03	20.00	PRF->NFB	WBS->	2.87E–09	1.49E–09		1.49E–09	1.49E–09	–2.56	70	1,200			5.45E–11	12.21	0
592.50	612.50	2006-02-22 07:45	20.00	PLF->	PLF	3.97E–09	4.98E–10		4.98E–10	4.98E–10							9.35	0
612.50	632.50	2006-02-22 09:22	20.00	PLF	PLF	6.86E–10		9.30E–11	9.30E–11	9.30E–11	–5.70						6.15	1
632.50	652.50	2006-02-22 11:04	20.00	PRF->NFB	WBS->PRF?	5.84E–09	1.32E–08		1.32E–08	1.32E–08	4.79	20	400			6.11E–11	12.15	1
652.50	672.50	2006-02-22 13:09	20.00	PRF	WBS->	1.04E–09	8.58E–10	7.82E–10	8.58E–10	8.58E–10	–0.13	100	1,200			4.46E–11	10.63	0
672.50	692.50	2006-02-22 14:44	20.00	–	–	<2.86E–10				<2.86E–10							–	–
696.50	716.50	2006-02-22 16:10	20.00	NFB	PLF	5.21E–07		2.79E–07	2.79E–07	2.79E–07							45.13	1
716.50	736.50	2006-02-22 17:46	20.00	PLF->(PRF)	WBS->PRF->NFB	6.42E–09	1.71E–09	3.59E–09	3.59E–09	3.59E–09	–3.26			60	300		7.60	1
736.50	756.50	2006-02-22 19:21	20.00	–	–	<2.86E–10				<2.86E–10							–	–
756.50	776.50	2006-02-23 08:31	20.00	–	–	<2.81E–10				<2.81E–10							–	–
776.50	796.50	2006-02-23 09:58	20.00	PLF	WBS->	5.31E–10	1.02E–10	1.96E–10	1.96E–10	5.31E–10	–4.35	300	1,200				9.51	1
796.50	816.50	2006-02-23 11:29	20.00	–	–	<3.34E–10				<3.34E–10							–	–
816.50	836.50	2006-02-23 13:18	20.00	PRF	WBS->PSF?	3.68E–09	3.90E–09	1.38E–09	3.90E–09	3.90E–09	1.28	20	1,200				15.52	0
836.50	856.50	2006-02-23 15:11	20.00	PRF1->PRF2	PSF	1.30E–07	1.56E–07		1.56E–07	1.56E–07	–0.04	60	200				15.94	1
856.50	876.50	2006-02-23 16:45	20.00	–	–	<2.09E–10				<2.09E–10							–	–
876.50	896.50	2006-02-23 17:52	20.00	(PSS)	WBS	3.41E–10		5.64E–11	5.64E–11	3.41E–10	–4.23					3.73E–11	8.56	1
892.50	912.50	2006-02-24 07:44	20.00	–	–	<2.06E–10				<2.06E–10							–	–
912.50	932.50	2006-02-24 08:55	20.00	–	–	<2.06E–10				<2.06E–10							–	–
932.50	952.50	2006-02-27 09:21	20.00	–	–	<2.06E–10				<2.06E–10							–	–
952.50	972.50	2006-02-27 10:38	20.00	PLF	WBS	8.39E–10	1.19E–10	1.08E–10	1.19E–10	1.19E–10						6.52E–11	6.53	0

Secup (m)	Seclow (m)	Test start YYYYMMDD 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 (–)
972.50	992.50	2006-02-27 13:18	20.00	NFB	PLF	1.10E–09		1.22E–10	1.22E–10	1.22E–10							6.48	1
120.20	125.20	2006-03-01 09:38	5.00	PRF	PSS	1.63E–06	1.11E–06		1.11E–06	1.11E–06	–4.00	150	1,200				63.78	0
169.60	174.60	2006-03-01 12:43	5.00	–	–	<1.24E–10				<1.24E–10							–	–
297.50	302.50	2006-03-01 15:22	5.00	(PRF)	WBS->PSS	3.45E–09	1.21E–09		1.21E–09	1.21E–09	–4.28	300	800			1.98E–11	9.46	0
302.50	307.50	2006-03-01 17:02	5.00	(PRF)	WBS->PSS	2.55E–09	1.07E–09		1.07E–09	1.07E–09	–3.78						11.33	1
307.00	312.00	2006-03-01 18:42	5.00	PRF	WBS->PSS	1.06E–08	1.39E–08	1.26E–08	1.39E–08	1.39E–08	0.41	100	1,200				21.32	0
312.50	317.50	2006-03-09 08:12	5.00	PRF	PSS	1.76E–08	4.56E–08		4.56E–08	4.56E–08	6.70	600	1,200				28.70	0
341.20	346.20	2006-03-09 10:39	5.00	PRF	PSS	1.34E–07	1.67E–07		1.67E–07	1.67E–07	–0.51	200	1,200				39.71	0
344.50	349.50	2006-03-09 12:59	5.00	PRF	PSS	4.22E–08	6.32E–08		6.32E–08	6.32E–08	0.81	200	1,200				31.13	0
348.30	353.30	2006-03-09 14:28	5.00	PRF?	WBS->	5.00E–10	4.62E–10		4.62E–10	4.62E–10	–2.98	100	1,800			9.79E–12	11.15	0
353.30	358.30	2006-03-09 15:59	5.00	PRF	PSS	1.02E–06	1.27E–06		1.27E–06	1.27E–06	–1.10	50	1,200				65.94	0
358.30	363.30	2006-03-09 17:29	5.00	PLF/PRF	PSS	2.31E–07	1.56E–07		1.56E–07	1.56E–07	–3.59	200	1,200				39.03	0
362.40	367.40	2006-03-10 07:15	5.00	PRF1->PRF2->CHB	PSS	2.24E–07	2.51E–07		2.51E–07	2.51E–07	–1.27	400	1,000				40.11	–1
367.40	372.40	2006-03-10 08:46	5.00	PLF->(PRF)	WBS->PSS	1.26E–09	4.75E–10	1.62E–09	4.75E–10	4.75E–10	–3.93	100	1,200			1.38E–11	9.17	0
372.40	377.40	2006-03-10 10:18	5.00	–	–	<2.99E–10				<2.99E–10							–	–
377.40	382.40	2006-03-13 08:15	5.00	–	–	<2.48E–10				<2.48E–10							–	–
382.40	387.40	2006-03-13 09:16	5.00	PRF->NFB	PSS	4.39E–08	6.94E–08		6.94E–08	6.94E–08	–1.00	20	200				13.01	1
387.40	392.40	2006-03-13 10:41	5.00	PRF->NFB	WBS->(PSS)	7.16E–10	1.08E–09		1.08E–09	1.08E–09	–0.70	20	200			1.41E–11	4.60	1
389.00	394.00	2006-03-13 12:28	5.00	PLF/PRF->NFB	WBS->(PRF)	5.41E–10	5.25E–10	1.01E–09	5.25E–10	5.25E–10	–2.08	20	200				3.84	1
392.70	397.70	2006-03-13 13:50	5.00	PRF->NFB	PSS	3.57E–07	6.20E–07		6.20E–07	6.20E–07	–0.07	20	200				22.49	1
395.70	400.70	2006-03-13 15:22	5.00	PRF->NFB	PSS	4.75E–07	1.32E–06		1.32E–06	1.32E–06	4.76	20	300				33.30	1
406.00	411.00	2006-03-13 16:54	5.00	PLF/PRF	PSS	1.24E–07	1.11E–07		1.11E–07	1.11E–07	–2.39	200	1,200				35.85	0
411.00	416.00	2006-03-14 07:31	5.00	PRF->NFB	PSS	3.29E–07	4.87E–07		4.87E–07	4.87E–07	–1.28	100	400				29.96	1
414.00	419.00	2006-03-14 08:56	5.00	PSF	PSS	2.45E–07	1.01E–07		1.01E–07	1.01E–07	–4.66						35.22	–1
419.00	424.00	2006-03-14 10:46	5.00	PRF?	PSS	2.30E–06	7.43E–06		7.43E–06	7.43E–06	8.80	70	1,200				102.53	0
424.00	429.00	2006-03-14 13:30	5.00	(PRF1)->PRF2	PSS	2.82E–07	2.57E–07		2.57E–07	2.57E–07	–2.44	600	1,200				44.21	0
429.00	434.00	2006-03-14 14:56	5.00	PSF	PSS	2.71E–06	2.06E–06		2.06E–06	2.06E–06	–2.66						74.87	–1
434.00	439.00	2006-03-14 16:21	5.00	PRF1->PRF2	PSS	7.74E–07	1.36E–06		1.36E–06	1.36E–06	0.73	30	200				27.37	1

Secup (m)	Seclow (m)	Test start YYYYMMDD 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 (–)
439.00	444.00	2006-03-14 17:46	5.00	PRF	WBS->	1.93E–09	2.51E–09		2.51E–09	2.51E–09	0.70	20	1,200			2.40E–11	13.90	0
442.50	447.50	2006-03-15 07:26	5.00	PRF	WBS->PSF	4.79E–09	4.24E–09	6.58E–09	4.24E–09	4.24E–09	–1.72	40	1,200				15.84	0
447.50	452.50	2006-03-15 09:03	5.00	PRF?	WBS->PSF	7.05E–09	2.00E–08	1.57E–08	2.00E–08	2.00E–08	8.49	100	1,200				23.37	0
452.50	457.50	2006-03-15 10:26	5.00	PSF	PSF	2.17E–08	3.42E–08	4.89E–08	3.42E–08	3.42E–08	2.18						26.90	–1
457.50	462.50	2006-03-15 12:27	5.00	PRF	WBS->PSF	2.96E–09	5.10E–09		5.10E–09	5.10E–09	3.10	20	1,200				16.60	0
462.50	467.50	2006-03-15 13:54	5.00	–	–	<3.14E–10				<3.14E–10							–	–
467.50	472.50	2006-03-15 14:51	5.00	(PRF)	WBS->	3.17E–10	7.95E–11	2.56E–10	2.56E–10	2.56E–10	–1.58	100	1,200				7.92	–1
472.50	477.50	2006-03-15 16:14	5.00	(PRF)	WBS->(PRF)	3.75E–10	2.81E–10	9.43E–11	2.81E–10	2.81E–10	–0.80	50	12,00	600	1,000		8.04	0
477.50	482.50	2006-03-15 17:38	5.00	–	–	<2.13E–10				<2.13E–10							–	–
482.50	487.50	2006-03-16 07:17	5.00	–	–	<2.63E–10				<2.63E–10							–	–
487.50	492.50	2006-03-16 08:41	5.00	–	–	<2.82E–10				<2.82E–10							–	–
492.50	497.50	2006-03-16 09:36	5.00	–	–	<2.82E–10				<2.82E–10							–	–
497.50	502.50	2006-03-16 10:25	5.00	–	–	<2.82E–10				<2.82E–10							–	–
502.50	507.50	2006-03-16 11:13	5.00	–	–	<2.31E–10				<2.31E–10							–	–
507.50	512.50	2006-03-16 12:45	5.00	PRF	WBS->(PRF)	1.16E–09	1.11E–09	1.79E–09	1.11E–09	1.11E–09	–0.55	20	1,200			1.67E–11	11.32	0
512.50	517.50	2006-03-16 14:10	5.00	–	–	<2.82E–10				<2.82E–10							–	–
517.50	522.50	2006-03-16 14:58	5.00	PLF->PRF?	PLF	4.99E–09	1.17E–09	3.10E–10	1.17E–09	1.17E–09		700	1,200				11.49	0
522.50	527.50	2006-03-16 16:21	5.00	PLF->(PRF)	PLF->NFB?	6.50E–10	1.89E–10		1.89E–10	1.89E–10		100	1,200				7.28	0
527.50	532.50	2006-03-17 07:45	5.00	PSF->PSS	WBS->(PSF)	2.90E–09	2.59E–09		2.59E–09	2.59E–09	0.19						14.06	–1
532.50	537.50	2006-03-17 09:09	5.00	PLF->PSF->(CHB)	PLF->PSF?	2.86E–09	8.21E–10		8.21E–10	8.21E–10	–3.86						10.59	–1
537.50	542.50	2006-03-17 10:36	5.00	PSF->PSS	PSF	5.06E–08	1.27E–07	2.44E–08	2.44E–08	2.44E–08	–2.51						24.60	–1
542.50	547.50	2006-03-20 13:37	5.00	PRF>PSF	PRF->PSF	1.62E–08	2.11E–08	2.40E–08	2.11E–08	2.11E–08	0.48						23.88	–1
547.50	552.50	2006-03-20 15:19	5.00	PRF>PSF	WBS->PRF->(NFB)	8.67E–10	3.15E–10	6.18E–10	3.15E–10	3.15E–10	–3.43			60	300	1.28E–11	8.37	–1
552.50	557.50	2006-03-20 17:03	5.00	PRF->PLF/NFB	WBS->PRF	5.25E–09	7.63E–09	1.64E–08	7.63E–09	7.63E–09	0.22	10	100				5.30	1
557.50	562.50	2006-03-21 08:25	5.00	(PLF)->(PRF)	(PLF)->(PRF)	2.83E–08	9.15E–09	1.50E–08	9.15E–09	9.15E–09	–4.90	100	1,200				19.21	0
562.50	567.50	2006-03-21 09:56	5.00	–	–	<1.63E–10				<1.63E–10							–	–
567.50	572.50	2006-03-21 10:58	5.00	–	–	<2.13E–10				<2.13E–10							–	–
572.50	577.50	2006-03-21 12:04	5.00	–	–	<1.12E–10				<1.12E–10							–	–

Secup (m)	Seclow (m)	Test start YYYYMMDD hh:mm	b (m)	Flow regime [1) Injection	recovery	T_M (m^2/s)	T_f (m^2/s)	T_s (m^2/s)	T_T (m^2/s)	T_R [2) (m^2/s)	ξ (–)	t_1 (s)	t_2 (s)	dte_1 (s)	dte_2 (s)	C (m^3/Pa)	r_i (m)	r_i-index (–)
577.50	582.50	2006-03-21 13:58	5.00	–	–	<2.13E–10				<2.13E–10							–	–
582.50	587.50	2006-03-21 14:59	5.00	PRF->PSF	WBS->PRF	2.81E–09	3.64E–09	5.51E–09	5.51E–09	5.51E–09	4.56			300	600	2.18E–11	11.96	0
587.50	592.50	2006-03-21 16:30	5.00	–	–	<2.13E–10				<2.13E–10							–	–
592.50	597.50	2006-03-21 17:45	5.00	–	–	<1.63E–10				<1.63E–10							–	–
597.50	602.50	2006-03-21 18:54	5.00	–	–	<1.63E–10				<1.63E–10							–	–
602.50	607.50	2006-03-22 08:31	5.00	–	–	<1.63E–10				<1.63E–10							–	–
607.50	612.50	2006-03-22 09:46	5.00	NFB/PLF	PLF	2.11E–09		6.58E–10	6.58E–10	6.58E–10							9.92	1
612.50	617.50	2006-03-22 11:21	5.00	NFB/PLF	NFB/PLF	4.01E–10				4.01E–10							11.68	–
617.50	622.50	2006-03-22 14:14	5.00	–	–	<1.63E–10				<1.63E–10							–	–
622.50	627.50	2006-03-22 15:15	5.00	–	–	<1.63E–10				<1.63E–10							–	–
627.50	632.50	2006-03-22 16:28	5.00	–	–	<1.63E–10				<1.63E–10							–	–
632.50	637.50	2006-03-22 17:29	5.00	–	–	<2.13E–10				<2.13E–10							–	–
637.50	642.50	2006-03-22 18:29	5.00	PSF	WBS->	6.39E–10				6.39E–10						1.82E–11	9.98	–
642.50	647.50	2006-03-23 08:19	5.00	–	–	<1.63E–10				<1.63E–10							–	–
647.50	652.50	2006-03-23 11:07	5.00	PRF	WBS->PRF->NFB	1.41E–08	1.84E–08	2.36E–08	1.84E–08	1.84E–08	0.27	20	1,200	30	100		22.86	0
652.50	657.50	2006-03-23 13:42	5.00	PRF->NFB?	WBS->(PRF)	8.00E–10	5.13E–10	6.07E–10	5.13E–10	5.13E–10	–2.45	30	1,200			2.94E–11	9.35	0
657.50	662.50	2006-03-23 16:59	5.00	–	–	<1.63E–10				<1.63E–10							–	–
662.50	667.50	2006-03-23 18:06	5.00	–	–	<3.14E–10				<3.14E–10							–	–
667.50	672.50	2006-03-24 07:27	5.00	–	–	<2.02E–10				<2.02E–10							–	–
691.50	696.50	2006-03-24 08:51	5.00	PRF->NFB	PSF->NFB	6.73E–08	1.58E–07		1.58E–07	1.58E–07	4.10	50	500				25.29	1
696.50	701.50	2006-03-24 10:28	5.00	NFB/PLF	PLF	4.58E–07		2.35E–07	2.35E–07	2.35E–07							43.27	1
701.50	706.50	2006-03-27 13:44	5.00	PRF/PSF->NFB	PRF->PSF->PSS	1.34E–07	2.81E–07	2.90E–07	2.81E–07	2.81E–07	2.98	80	400	50	150		26.12	1
706.50	711.50	2006-03-27 15:29	5.00	–	–	<2.13E–10				<2.13E–10							–	–
711.50	716.50	2006-03-27 16:34	5.00	–	–	<3.14E–10				<3.14E–10							–	–

1) The acronyms in the column “Flow regime” are as follow: 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.

Some of the responses during the recovery period were strongly influenced by wellbore storage effects. Thus, for these tests, pseudo-radial flow was not reached during this period. In addition, the pressure recovery was fast in many tests, particularly down to a borehole length of c. 450 m, causing a fast pseudosteady-state despite the fact that the injection period exhibited a pseudo-radial (or other) flow regime. In general, no unambiguous transient evaluation could be made on these tests. To investigate the possible consistency between the responses during the injection and recovery period, despite the different flow regimes, the pressure recovery was simulated by assuming the same transmissivity and storativity as obtained from the transient evaluation of the injection period for tests showing a fast recovery. In many cases the fast recovery could be satisfactorily simulated by assuming a higher value on the skin factor than obtained from the injection period.

For a few tests, a type curve fit is yet displayed in the diagrams in Appendix 3, despite that the estimated parameters from the fit are judged as non-representative or ambiguous and not included in the result tables in SICADA. For these tests, the type curve fit is presented, for example, to illustrate that an assumption of pseudo-radial flow regime is not justified for the test and some other flow regime is likely to dominate or to show one possible fit in case of ambiguous evaluation. For example, for test responses showing only wellbore storage and tests approaching a pseudo-stationary state, no unambiguous transient evaluation may be possible, cf. tests with fast recovery as discussed above.

The transmissivity judged as the most reliable from the transient evaluation of the flow- and recovery periods of the tests was selected as T_T. The associated value of the skin factor is listed in Table 6-2. Since a fairly well-defined time interval with pseudo-radial flow in most cases could be identified from the injection period, the transmissivity calculated from this period is generally considered as the most reliable transmissivity, T_T, from the transient analysis of the injection tests in KLX10. Furthermore, the transient evaluation of transmissivity from the injection period was for most of the tests also judged as the most representative estimate of transmissivity, T_R.

For those tests where transient evaluation was not possible or not considered representative, T_M was chosen as the representative transmissivity value, T_R. If Q_p fell below the actual test-specific measurement limit during the test, the representative transmissivity value was assumed to be less than the estimated T_M, based on Q/s-measl-L, see Section 5.4.2 and 5.4.4.

The results of the routine evaluation of the injection tests in borehole KLX10 are also compiled in appropriate tables in Appendix 5 to be stored in the SICADA database.

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 in general considered as good. The lower standard measurement limit of transmissivity in 5 m sections based on a flow rate of 1 mL/min and an injection pressure of 200 kPa is indicated in the figure.

The wellbore storage coefficient, C, was calculated from the straight line with a unit slope in the log-log diagrams from the recovery period in KLX10, 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 be compared with the net values of C_{net} (based on geometry) and the value of C obtained from laboratory experiments, C_{eff} /10/, both found in Table 5-3.

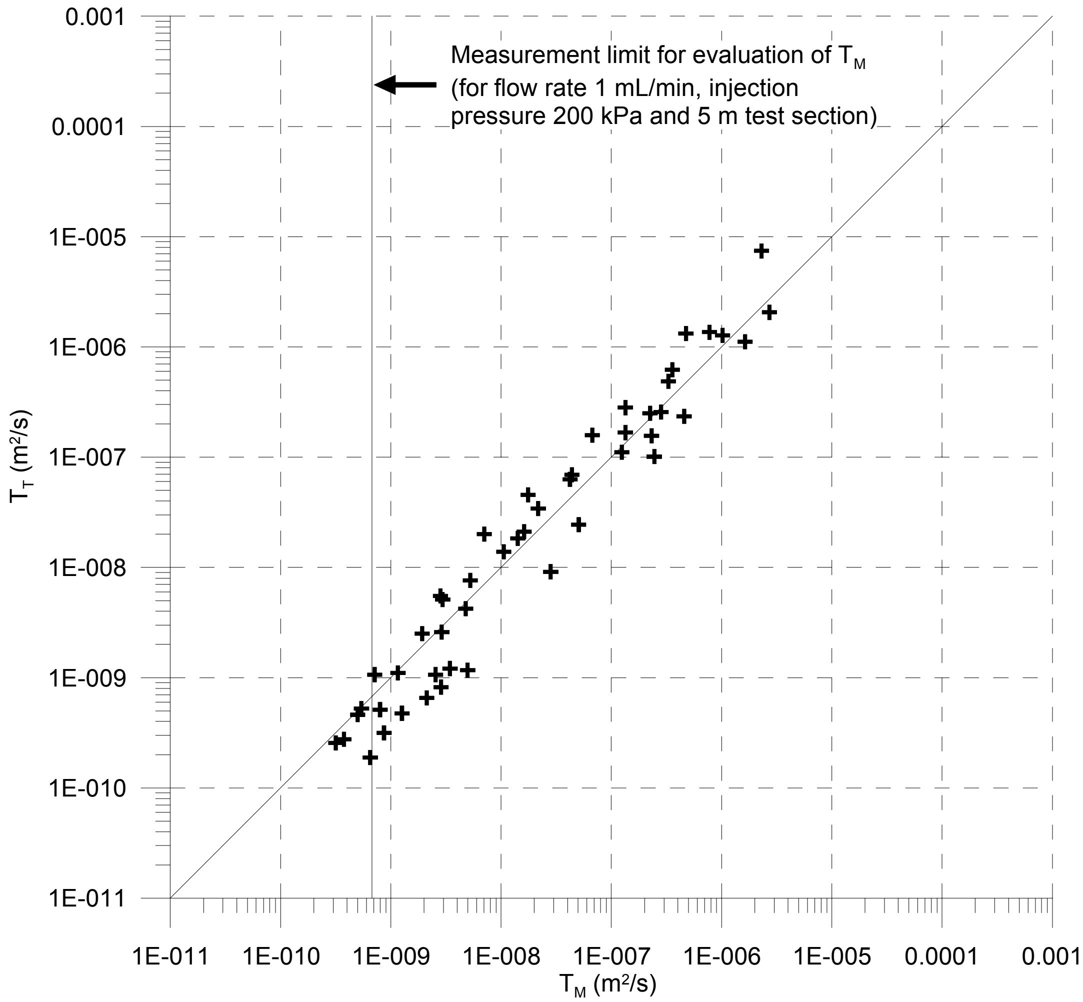


Figure 6-1. *Estimated transmissivities in 5 m sections from steady-state (T_M) and transient (T_T) evaluation in KLX10.*

The number of tests with a well-defined line of unit slope for which it was possible to calculate C was as follows: 7 out of 46 with the 20 m test section and 10 out of 79 with the 5 m test section resulted in a well-defined 1:1 straight line. For 100 m test section no well-defined 1:1 straight line could be observed. Table 6-2 shows that the calculated values from the tests tend to be slightly higher than C_{net} presented in Table 5-3. However, when the calculated values are compared with the value C_{eff} obtained from laboratory experiments, the agreement is better for the 20 m and the 5 m test sections although the calculated values still tend to be slightly higher. When constructing 95% confidence intervals (using a t-distribution) from calculated values of C from the tests, the values of C_{net} listed in Table 5-3 are slightly lower than the confidence interval for the 5 m sections and 20 m sections. When the same comparison is made with C_{eff}, the values fall within the confidence interval for section length 5 m, but for the 20 m sections the value falls just below the confidence interval.

6.2.4 Comments on the tests

Short comments on each test follow below. Tests were performed within the interval 105.2–992.5 m in KLX10. 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

105.20–205.20 m

A limited injection head (c. 7 m) was achieved in this section. The injection starts with a transition to slightly leaky flow (PSF) approaching PSS at the end of the period. The recovery period also shows a PSF that turns into a PSS by the end. The pressure in the section below the test section increased by c. 3.9 kPa during the injection period. Though transmissivity in the section below is of same magnitude as in the section 105.2–205.2 m, this relatively small pressure interference should not have a major impact of the test performed in the section. Evaluation using the Hantush model on the injection period results in similar transmissivities as from the recovery period and also similar to the stationary transmissivity TM.

203.50–303.50 m

The pressure in the section above the test section increased by c. 2.9 kPa during the injection period and the pressure in the section below increased by c. 3.5 kPa. Since transmissivity in the sections above and below are of the same magnitude as in the section 203.5–303.5, this relatively small pressure interference may have resulted in an overestimation of the transmissivity in this section. During the injection period a transition to a PSF occurs, lasting to the end of the period. Due to rather long time for achieving stable pressure in the test section, flow regime interpretation is not possible before c. 350 s. The recovery period is dominated by PSS from c. 150 s, preceded by an apparent PSF during the initial 150 s of the period. The flow regime of the tested section is of higher dimension than two. Hence, transient evaluation is made with a model assuming a leaky aquifer. The transient evaluations of the injection- and recovery periods are in good agreement and also with the steady-state solution. The transient evaluation from the injection period is considered to be the most representative.

301.00–401.00 m

The achieved injection pressure was only c. 15 kPa, i.e. less than one tenth of the standard injection pressure. As a result, the resolution of the registered pressure is c. 5% of the total pressure making the sensitivity of the pressure regulation rather poor. The pressure in the section above the test section increased by c. 1.5 kPa during the injection period and the pressure in the section below increased by c. 5 kPa. Though transmissivity in the sections above and below are higher than in the section 203.5–303.5, this relatively small pressure interference should not have a major impact of the test performed in the section. The first part of the injection period was disturbed by regulation and a phase of apparent PSS is indicated. However, it is uncertain weather this fact is a real property of the rock formation or just effects of the regulation. From c. 700 s a PRF is indicated. During the recovery period a PRF is indicated from c. 100 s to the end of the period. Since the flow was clearly still decreasing at the end of the injection period the steady-state evaluation may overestimate the transmissivity. Hence the transient evaluation of the injection period is considered to be the most representative for the section.

398.60–498.60 m

The pressure in the section above the test section increased by c. 2.5 kPa during the injection period. Since transmissivity in the section above is higher than the transmissivity in the section 398.6–498.6, this relatively high pressure interference may have resulted in an overestimation of the transmissivity in this section. Flow during injection turn into a PRF after about 50 s and lasts until 600s. Then it makes a transition into another, apparent PRF with lower transmissivity after c. 900 s and continues for the rest of the period. Alternatively, the latter period may be interpreted as an apparent NFB in combination with leakage flow to the borehole interval above the test section by the end. Recovery begins with a PSF that makes a transition into a PSS after about 400 s. The responses during the injection and recovery period are not consistent. The pressure below the test section is continuously dropping during the time the packers are inflated. This is probably caused by a different formation pressure in the deeper parts of the bedrock. No unambiguous transient evaluation can be made on the recovery period. The transmissivity estimated from the first part of the injection period is chosen as the most representative.

497.50–597.50 m

The injection period starts with a possible PRF after c. 30 s and continues until about 200 s. Then the flow makes a transition to a dominating PRF which continues for the remainder of the injection period. The recovery period is dominated by a PRF after a short period of WBS. At the end of the recovery, after about 5–600 s, the flow makes a transition into a possible PSF. Since the second PRF during the injection period lasts longer and is more evident the evaluation from the later part of the injection period is chosen as the most representative for the section.

596.50–696.50 m

The pressure in the section below the test section increased by c. 8.4 kPa during the injection period. Since the transmissivity in the section below is higher than the transmissivity in the section 596.5–696.5, this relatively high pressure interference may have resulted in an overestimation of the transmissivity in this section. The injection period is dominated by a PRF from c. 150 s until the end of the period. After initial WBS, a rather long transition phase is indicated from c. 10 to c. 600 s during the recovery period. A PRF is interpreted from c. 600 s of the recovery throughout the period. The transient evaluation based on the injection period is chosen to best represent the rock formation parameters.

696.50–796.50 m

The flow rate during the injection period is rapidly decreasing and the period is dominated by an apparent NFB, possibly a fracture of decreasing aperture away from the borehole. However, after c. 1,000 s the derivative flattens out which could imply a transition to some other flow regime. The recovery period only indicates a PLF during the entire period. Only a limited recovery (c. 10 m) was achieved during the recovery period. No reliable transient evaluation is possible on either period. As a result, TM was considered to be the most representative transmissivity value for this section. For demonstration purposes, examples of ambiguous transient evaluations on the injection- and recovery period are presented.

796.50–896.50 m

The high injection pressure was caused by a malfunction of the servos controlling the regulation valves. This fact also caused the disturbance of the injection pressure at c. 200 s. However, a PRF seems to dominate the injection period between c. 200 and 700 s. It is followed by a period of increasing derivative suggesting an apparent NFB. The recovery is fast and seemingly dominated by a PSF but no unambiguous transient evaluation of the recovery period is possible. The responses during the injection and recovery period are not consistent. The pressure in the section recovered very fast, after c. 100 s only c. 1.5 m of the applied head change of 45 m water column remains. An example of an unambiguous transient evaluation of the recovery period is presented.

892.50–992.50 m

The injection pressure was rather unstable during the first half of the test due to difficulties with the pressure regulation. No other flow regimes than an apparent NFB could not be interpreted from this period. The section has a low transmissivity. The recovery indicates a PLF or possibly an apparent NFB. No unambiguous transient evaluation on the flow period was possible.
An approximate transient evaluation was made on the recovery. The latter evaluation was considered to be the most representative transmissivity value for this section. A demonstrating example of a non-unambiguous transient evaluation on the injection period is shown. The flow rate measurement noise during periods of zero flow is centered around c. –8e–9 m^3/s, as visible in the overview plot. An offset value of 8.e–9 m^3/s is therefore added to the flow rate during the evaluation of this test.

105.20–125.20 m

Both the injection and recovery period are dominated by a PSF. By the end of the recovery period a PSS is developed. Thus, a leaky-aquifer model is employed for the transient evaluation of both periods. The transient evaluations from the injection and recovery period show consistent results and are also supported by the steady-state evaluation. The transient evaluation of the injection period is considered to be the best representative for the tested section. The pressure in the section below the test section increased by c. 1.9 kPa during the injection period. Since the transmissivity in the section below is higher than the transmissivity in the section 105.2–120.5 m, this relatively small pressure interference may have resulted in an overestimation of the transmissivity in this section.

120.20–140.20 m

The injection period indicates two separate periods of PSF of which the first has a slightly lower transmissivity. This behaviour may be due to the observed pressure interference with the surrounding sections, particularly the section above the test section. In this section some pressure interference was observed (2.5 kPa) during injection, the pressure initially increased but then decreased. The recovery may be affected by that fact that the test valve did not close properly. The pressure recovery was fast and the only identifiable flow regime is PSS. Hence, no unambiguous transient evaluation could be made on the recovery period. The transient evaluation presented for the recovery period only constitutes an example. The transient evaluation on the second part of the injection period is considered to be the most representative.

140.20–160.20 m

The injection period clearly shows a PSF from c. 60 s throughout the period. Some interference was observed both above (1.5 kPa) and below (1 kPa) the test section. The recovery may be affected by the fact that the test valve did not close properly. The pressure recovery was fast and the only identifiable flow regime is PSS. Hence, no unambiguous transient evaluation could be made on the recovery period. In the transient evaluation on the recovery period, presented as an example, the transmissivity was assumed to be the same as for the injection period. A very high positive skin factor is needed to simulate the recovery response with this transmissivity value.

149.60–169.60 m

After c. 800 s of the injection period the flow rate suddenly increases slightly. No reasonable explanation, related to the equipment, was found for this behavior. Hence, it may be an effect of the rock formation or pressure interference with the surrounding sections in the borehole. The rather flat derivative between c. 100 s and 800 s of the injection period may suggest an apparent PRF. However, a fit to this period using a PRF-model result in a large positive skin factor which may suggests a flow regime of higher dimension, i.e. a PSF. Some pressure interference was observed in the interval above (1 kPa) the test section. The recovery may be affected by that fact that the test valve did not close properly. The pressure recovery was fast and the only identifiable flow regime is PSS. Hence, no unambiguous transient evaluation could be made on the recovery period.

174.60–194.60 m

The pressure in the section below the test section increased by c. 3.4 kPa during the injection period. Since the transmissivity in the section below is higher than the transmissivity in the section 105.2–120.5 m, this pressure interference may have resulted in an overestimation of the transmissivity in this section. During the injection period an apparent PRF is indicated between c. 200–500 s transitioning to a PSF which lasts throughout the period. The recovery may be affected by the fact that the test valve did not close properly. The pressure recovery was fast and the only identifiable flow regime is PSS. Hence, no unambiguous transient evaluation could be made on the recovery period.

191.30–211.30 m

The pressure in the section below the test section increased by c. 1.9 kPa during the injection period. Though transmissivity in the section below is higher than the transmissivity in the section 191.3–211.3 m, this relatively small pressure interference should not have a major impact on the transmissivity in this section. A PSF is indicated during both the injection and recovery period. The PSF during the recovery is possibly followed by a transition to PSS. The recovery may be affected by the fact that the test valve did not close properly. However, the transient evaluation of both periods gives similar results.

214.00–234.00 m

The pressure in the section above the test section increased by c. 1.7 kPa during the injection period. Since the transmissivity in the section above is higher than the transmissivity in the section 214.0–234.0 m, this pressure interference may have resulted in an overestimation of the transmissivity in this section. A PRF dominates the injection period from c. 100 s and throughout the period. A rather high positive skin factor was determined from the injection period. The recovery is entirely dominated by a PSS and no unambiguous transient evaluation could be made on the period. An example of a transient evaluation assuming the same transmissivity as obtained from the injection period is presented. A very high positive skin factor is needed to simulate the recovery response with this transmissivity value. The transient evaluation on the injection period was considered to be the most representative for this section. The response and results of this test is very similar to the partly overlapping next test section below, 222.5.0–242.5 m.

222.50–242.50 m

The pressure in the section above the test section increased by c. 1.5 kPa during the injection period. Though transmissivity in the section above is higher than the transmissivity in the section 222.5–242.5 m, this relatively small pressure interference should not have a major impact on the transmissivity in this section. A PRF dominates the injection period from c. 100 s and throughout the period. Transient evaluation using a PRF model results in a high positive skin factor. The recovery is entirely dominated by a PSS and no unambiguous transient evaluation could be made on this period. An example of a transient evaluation assuming the same transmissivity as obtained from the injection period is presented. A very high positive skin factor is needed to simulate the recovery response with this transmissivity value. The transient evaluation on the injection period was considered to be the most representative transmissivity value for this section. The response and results of this test is very similar to the partly overlapping previous test section, 214.0–234.0 m.

242.50–262.50 m

The pressure in the sections above and below the test section increased by c. 1.6 kPa during the injection period. Since transmissivity in the sections above and below are higher than the section 242.5–262.5, this relatively small pressure interference may have resulted in an overestimation of the transmissivity. Both the injection and recovery period indicate a PSF. Unambiguous transient evaluation was possible on both the injection and recovery period.

262.50–282.50 m

The injection period indicates an early PRF between 50 and 300 s followed by a transition to an apparent NFB. The decrease in the derivative towards the end of the injection period may be an effect of the performance of the pressure regulation system and the sampling time and not a true characteristic of the bedrock. The recovery in the section is fast and the only visible flow regime is PSS towards the end of the period. No unambiguous transient evaluation could be made on this period. An example of transient evaluation on the recovery period is presented.

282.50–302.50 m

The injection is clearly dominated by a PRF from c. 100 s and throughout the period. The recovery in the section is fast and the only visible flow regime is PSS towards the end of the period. Hence, no unambiguous transient evaluation could be made on this period. An example of a transient evaluation on the recovery period assuming the same transmissivity as obtained from the injection period is presented. A very high positive skin factor is needed to simulate the recovery response with this transmissivity value.

297.50–317.50 m

A PRF is dominating the injection period and an unambiguous transient evaluation was possible. The recovery is rather fast and indicates a leaky flow and a possible PSS at the end of the period. Still, a fair transient evaluation of the recovery using the Hantush model was possible. It supports the transmissivity evaluated from the injection. The disturbance during this test at c. 08:40 as visible in the overview plot was the first attempt of the injection in the test section. This test was not successful due to an error in the pressure regulation system (earlier power loss). The injection was restarted later when it was assumed that the section was fully recovered.

318.20–338.20 m

The pressure in the section below the test section increased by c. 4.5 kPa during the injection period. Since the transmissivity in the section below is of much lesser magnitude than the transmissivity in the section 318.2–338.2 m, this relatively low pressure interference should not have a major impact of the test performed in this section. Due to the high transmissivity of this section and the limited flow capacity of the equipment, the injection head was only 1.71 m. The pressure regulation is therefore somewhat unstable which is best seen on the derivative during the injection period. Still, a PRF dominates both the injection and recovery period. Transient evaluation of the injection and recovery produce similar results.

339.20–359.20 m

During the injection period a slightly leaky flow (PSF) is the dominating flow regime in this section starting after about 70 s and continues for the rest of the injection period. The recovery is very fast with a transition into a PSS as clearly seen from the lin-log diagram in which the derivative is virtually zero. A manual fit using the Hantush model provides a T-value similar to the one obtained from the injection period, but the evaluation is regarded uncertain. The sections above and below the test section are both influenced by the injection indicating hydraulic connection with these sections.

359.20–379.20 m

The injection period in this section is dominated by a well-defined PRF during the entire period. The recovery is very fast with a transition into a PSS as clearly seen from the lin-log diagram in which the derivative is virtually zero. A manual fit using the Hantush model provides a T-value similar to the one obtained from the injection period, but the evaluation is regarded as uncertain.

377.70–397.70 m

Although the derivative, especially during the first c. 100 s, is quite scattered, two separate periods of PRF may possibly be identified. However, the first one between c. 30 and 150 s is considered as very uncertain. The second PRF period, which starts at c. 500 s and lasts to the end of the injection period, is regarded as more dominating. The recovery period is very fast and completely dominated by a PSS. The pressure almost completely recovered after c. 30 seconds. No unambiguous transient evaluation can be made on the recovery period. An example is presented. The transient evaluation on the late PRF is considered to be the most representative for the test section.

398.60–418.60 m

The pressure in the section below the test section increased by c. 2.2 kPa during the injection period. Since the transmissivity in the section below is higher than the transmissivity in the section 398.6–418.6 m, this relatively small pressure interference may have resulted in an overestimation of the transmissivity in this section. A PRF is the dominating flow regime in this section. It starts after about 100 s and lasts to the end of the injection period. The recovery is very fast with a transition into a PSS, this is evident when looking at the curve in lin-log where the derivative is zero. No unambiguous transient evaluation is possible from this period. An example is presented.

418.60–438.60 m

The pressure in the section above the test section increased by c. 1.6 kPa during the injection period. Since the transmissivity in the section above is of higher magnitude than in the section 418.6–438.6 m, this pressure interference may have resulted in an overestimation of the transmissivity in this section. The injection period exhibits a PRF from c. 60 to 600 s transitioning to an apparent NFB by the end. The recovery is fast and only a PSS is present, it may be affected by that fact that the test valve did not close properly. No unambiguous transient evaluation is possible on the recovery period. The pressure below the test section is affected by the packer expansion and then slowly decreases for the duration of the test. The transient evaluation on the first part of the injection period is regarded as the most representative for the test.

432.50–452.50 m

The injection starts with a PRF that begins after about 40 s and lasts throughout the period. The recovery starts with a transition into a PSS, this is clearly seen when looking at the curve in lin-log were the derivative is zero. No unambiguous transient evaluation can be made on the recovery period. An example is presented.

452.50–472.50 m

During the injection period a PSF is dominating. The recovery starts with WBS transitioning to a PSF. The transient evaluation on the injection period is regarded as the most representative.

472.50–492.50 m

The flow rate data and derivative is rather scattered due to the low flow rate during the test. However, the injection period indicates a PLF transitioning to an approximate PRF after c. 100 s. The recovery is affected by WBS and a short transition period, hence no unambiguous transient evaluation is possible on the period. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit as well as the flow data was manually elevated by the offset 4e–9 m^3/s.

492.50–512.50 m

The injection period indicates an approximate PRF transitioning to an apparent NFB by the end. The flow rate is low, close to the measurement limit and hence the data, especially the flow derivative, is quite scattered during the injection period but a transient evaluation can be accomplished. The recovery period shows WBS and a transition period. No unambiguous transient evaluation can be made from the recovery period. An example is presented.

512.50–532.50 m

The entire injection and recovery periods are dominated by a PLF. Transient evaluation was made by a single fracture model for both the injection and recovery period. The transmissivity from the injection period is considered as the most representative for this section. The scattered derivative during the end of the injection period probably reflects the pressure disturbance in the end of this period as seen on the overview plot. The pressure below the test section (Pb) increases when the packers expand and decreases then slowly. This fact indicates that in sections of such a low transmissivity, packer expansion affects the pressure throughout the period.

532.50–552.50 m

Both the injection- and recovery period is dominated by a PSF. Unambiguous transient evaluations were made on both the injection and recovery period.

552.50–572.50 m

A PLF transitioning towards an assumed PRF dominate the injection period. Accordingly, a transient evaluation using a PRF model results in a rather low negative skin factor. The single fracture model by Ozkan-Raghavan supports the estimated T-value from the PRF model. During the recovery period a PLF seems to dominate the recovery period from c. 100 s. The Dougherty-Babu model for pseudo-radial flow provides an estimate of transmissivity in accordance with the evaluation from the injection period.

572.50–592.50 m

The injection period is dominated by a PRF from c. 70 s to c. 500 s followed by an apparent NFB. Since the flow rate is low and close to the measurement limit the flow derivate is very scattered during the injection period. The recovery period shows WBS and a transition period. No unambiguous transient evaluation can be made on the recovery period. An example is presented.

592.50–612.50 m

An apparent PLF (or possibly a NFB) seems to dominate the injection period from c. 100 s and throughout the period. The flow rate is low, close to the measurement limit and hence the data, especially the flow derivative, is quite scattered during the injection period. Models for pseudo-radial and pseudo-linear flow, respectively provide similar estimates of transmissivity. During the recovery period a possible PLF seems to dominate the recovery period. No unambiguous transient evaluation can be made on the recovery period. An example is presented.

612.50–632.50 m

A PLF seems to dominate the injection period. The flow rate is low, close to the measurement limit and hence the data, especially the flow derivative, is quite scattered during the injection period. No unambiguous transient evaluation can be made on the injection period. The recovery period is dominated by PLF from c. 100 seconds and throughout the recovery period. A transient evaluation of the recovery period is considered as the most representative transmissivity value.

632.50–652.50 m

The flow rate suddenly drops after c. 400 s of the injection period. This may be an effect of the rock formation since no equipment-related explanation is found. Due to the flow rate drop, the derivative is rather scattered. However, it is assumed that a PRF period dominates the injection period transitioning to an apparent NFB by the end. The recovery is larger than the applied injection pressure which may suggest that the true formation pressure in the section is lower than the initial pressure (pi). The period displays WBS and a transition period to a possible PRF by the end. No unambiguous transient evaluation can be made on the recovery period. An example is presented.

652.50–672.50 m

The flow rate data are quite scattered since the flow rate is low. However, a PRF is assumed to dominate during the injection period. Since the measurement noise with a zero flow was centred slightly above zero, the flow rate measurement limit as well as the flow data was manually lowered by an offset 5e–9 m^3/s. The recovery period is dominated by WBS and a transition period.

672.50–692.50 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. 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 above zero, the flow rate measurement limit was manually lowered 5e–9 m^3/s.

696.50–716.50 m

An apparent NFB is dominating the entire injection period. No unambiguous transient evaluation can be made on the injection period, hence the recovery period is regarded to give the most representative estimate of transmissivity. The recovery period only indicates a PLF. Transient evaluation with a single fracture model gives satisfying results. Only a limited recovery (c. 8 m) of the injection head was achieved in the section which may indicate flow in a fracture with geometrical restrictions.

716.50–736.50 m

The injection period displays a PLF transitioning towards an approximate PRF by the end. Transient evaluation using a PLF and a PRF model, respectively give similar results. The recovery displays WBS followed by a PRF. After 300 s of the recovery the derivative increases which indicates an apparent NFB. Since the recovery displays a clear intermediate PRF, a transient evaluation of the period was considered to give the most representative transmissivity value for this section. Since the measurement noise with a zero flow was centred slightly above zero, the flow data was manually elevated by an offset of 2e–9 m^3/s.

736.50–756.50 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 PS 400-05-90, 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 above zero due to a leakage in the pipe string, the flow rate measurement limit was manually lowered 1.8e–8 m^3/s.

756.50–776.50 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 PS 400-05-90, 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 above zero due to a leakage in the pipe string, the flow rate measurement limit was manually lowered 1.2e–8 m^3/s.

776.50–796.50 m

The flow rate during this test is low, close to the measurement limit and hence the data, especially the flow derivative, is quite scattered. A small temporary leakage was suspected during the early part of the injection. Hence, the earliest part of this test should not be used for transient evaluation. However, the later part of the injection period may be interpreted as a PLF transitioning towards a possible PRF. Transient evaluation using PLF and PRF-models give similar results. However, the transient evaluations are considered uncertain and below the practical measurement limit, hence Tm is chosen as the representative estimate of transmissivity in this case. The recovery only displays WBS and a transition to some other flow regime but no unambiguous transient evaluation could be made. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit as well as the flow data was manually elevated by an offset value of 1e–9 m^3/s.

796.50–816.50 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.

816.50–836.50 m

The injection period is clearly dominated by a PRF from 20 s and throughout the period. The recovery only displays WBS and a transition to some other period, possibly a PSF. In the overview plot a first unsuccessful attempt to start the injection is visible. This injection test is assumed to not have disturbed the evaluation of the actual injection test.

836.50–856.50 m

The injection indicates two separate periods of PRF. The recovery is dominated by a period of apparently flat derivative, possibly indicating a PRF. However, a fit with the Dougherty-Babu model results in a very high skin factor which may indicate a higher flow dimension. The recovery is rather fast but do not reach a true PSS and it may be affected by the fact that the test valve did not close properly. Hence, the most probable flow regime would be a PSF. No unambiguous transient evaluation of the recovery period is possible.

856.50–876.50 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 400-05-090, the injection time was shortened. As a result Tmoye, 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 c 2.5e–09 m^3/s. A recurrent leak, probably somewhere in the pipe string, appears shortly before the start of injection. This results in a fictitious flow into the rock formation. Since the flow rate during the injection period was very similar to the flow rate prior to the start of injection it could still be determined as a low transmissive 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. The pressure below the test section is affected by the packer expansion, indicating a low transmissivity below the test section.

876.50–896.50 m

The flow rate is low, close to the measurement limit and hence the data, especially the flow derivative, is quite scattered. Only an apparent PSS is present during the injection period which only may represent the noise in the flow rate. During the recovery period only WBS can be observed if the actual injection time is used to calculate the Agarwal equivalent time. If the multi-rate assumption is used to calculate the Agarwal time a transient evaluation is possible but this estimate is below the practical measurement limit for transmissivity. Hence Tm is considered to be the most representative value of transmissivity 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 was manually elevated 3.7e–09 m^3/s. Furthermore, a recurrent minor leak, probably somewhere in the pipe string, is believed to affect the flow rate during the injection test, resulting in a falsely high flow rate. Adjustments have been made in the flow data to compensate for this leak.

892.50–912.50 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 400-05-090, the injection time was shortened. As a result Tmoye, 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 1.2e–09 m^3/s. A recurrent leak, probably somewhere in the pipe string, is present during part of the injection period. When the leak disappears it is evident that the section is very low transmissive and the injection time is therefore shortened. 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. The pressure below the test section is affected by the packer expansion, indicating a low transmissivity below the test section.

912.50–932.50 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 400-05-090, the injection time was shortened. As a result Tmoye, 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 1.2e–09 m^3/s. A recurrent leak, probably somewhere in the pipe string, appears shortly before the start of injection. This results in a fictitious flow into the rock formation. Since the flow rate during the injection period was very similar to the flow rate prior to the start of injection it could still be determined as a low transmissive 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. The pressure below the test section is affected by the packer expansion, indicating a low transmissivity below the test section.

932.50–952.50 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 400-05-090, the injection time was shortened. As a result Tmoye, 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 3.7e–09 m^3/s. A recurrent leak, probably somewhere in the pipe string, appears shortly before the start of injection. This results in a fictitious flow into the rock formation. Since the flow rate during the injection period was very similar to the flow rate prior to the start of injection it could still be determined as low transmissive section. Furthermore, the flow rate makes a sudden drop during the injection period, implicating a temporary interruption of the leakage. 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. The pressure below the test section is affected by the packer expansion, indicating a low transmissivity below the test section.

952.50–972.50 m

During the injection period only an apparent PLF is identified and a linear flow fracture model was used for the transient evaluation. Using a model for radial flow results in a low negative skin factor which is consistent with the interpretation of a linear flow. Only WBS is observed during the recovery period if the actual injection time is used by the calculation of the Agarwal equivalent time. However, a transient evaluation is possible from the recovery period by using the multi-rate assumption by the calculation of the Agarwal equivalent time. Both the estimated transmissivity from the injection and the recovery period are below the practical measurement limit for transmissivity. The pressure below the test section is affected by the packer expansion, indicating a low transmissivity below the test section.

972.50–992.50 m

The injection period only displays an apparent NFB. The recovery period shows an apparent PLF during the entire period. A limited recovery (c. 8 m) was observed. No unambiguous transient evaluation is possible on the flow period. An approximate transient evaluation was made on the recovery period. The latter evaluation is considered to be the most representative value of transmissivity 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 was manually lowered 1.2e–09 m^3/s. A recurrent minor leak, probably somewhere in the pipe string, appears shortly before the start of injection. At the end of the injection period, however, there are no signs of a leak and it is considered that there was no leak during the injection period. Hence no additional correction of the flow data, apart from the already mentioned correction, has been made. The pressure below the test section increases for the duration of the test. This indicates that the section below the test section is of such low transmissivity that packer expansion affects the pressure throughout the entire test.

120.20–125.20 m

A PRF is dominating the injection period from c. 150–1,200 s. The transient evaluation using the Hurst-Clark-Bauer model for 2D is considered to give the most representative value of transmissivity. The recovery period is dominated by a PSS with a fast recovery. No unambiguous transient evaluation can be made on the recovery period. An example of analysis is shown assuming the same transmissivity as estimated from injection period. The pressure above the test section is influenced by the injection, probably due to flow around the packers. This fact indicates that the calculated transmissivity and skin factor may be slightly overestimated.

169.60–174.60 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 PS 400-05-090, 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 3.7e–09 m^3/s.

297.50–302.50 m

During the injection period from c. 60 s the flow suddenly decreased from c. 4.3e–07 m^3/s to c. 2.4e–07 m3/s in one second. No obvious explanation is found for this behaviour. After c. 300 s of the injection period, an approximate PRF is developed. After initial WBS effects, the recovery period is dominated by a PSS lasting from c. 30 s throughout the recovery period. No unambiguous transient evaluation can be made on the recovery period. An example of analysis is shown assuming the same transmissivity as estimated from injection period.

302.50–307.50 m

An approximate PRF is dominating the injection period from c. 200–1,800 s. The recovery period is dominated by initial WBS transitioning to a PSS. No unambiguous transient evaluation can be made on the recovery period. An example of analysis is shown assuming the same transmissivity as estimated from injection period. The transient evaluation from the injection period using the Hurst-Clark-Bauer model is considered to give the most representative value of transmissivity.

307.00–312.00 m

During the injection period a PRF starts after c. 100 s and dominates the remainder of the period. The recovery period begins with a WBS during the first c. 10 s followed by a transition into a PSS. The injection and recovery period give similar T-values but the evaluation of the recovery period is considered as uncertain. The transient evaluation of the injection period is chosen as the most representative for this section.

312.50–317.50 m

The injection period is dominated by a PRF throughout the period. The entire recovery period is dominated by a PSS. No unambiguous transient evaluation is possible on the recovery period. An example of transient evaluation of the recovery period is shown. The transient evaluation of the injection period is chosen as the most representative for this section.

341.20–346.20 m

The flow rate derivative is somewhat scattered during the injection period. However, the period is assumed to be dominated by a PRF from c. 200 s and throughout the period. The recovery is very fast and only displays a PSS that dominates the period. Hence, no unambiguous transient evaluation of the recovery is possible. An example of analysis of the recovery period is shown assuming the same transmissivity as was estimated from injection period. The transient evaluation from the injection period using the Hurst-Clark-Bauer model is considered to give the most representative value of transmissivity.

344.50–349.50 m

The flow rate derivative is rather scattered during the injection. Still, a PRF is assumed to dominate the injection from c. 200 s and throughout the period. The recovery is very fast and only displays a PSS that dominates the period. Hence, no unambiguous transient evaluation of the recovery period is possible. An example of analysis of the recovery period is shown assuming the same transmissivity as was estimated from injection period. The transient evaluation from the injection period using the Hurst-Clark-Bauer model is considered to give the most representative value of transmissivity.

348.30–353.30 m

The injection period is assumed to be dominated by an apparent PRF, however, the flow rate is low, close to the measurement limit. Hence the data, especially the flow derivative, is quite scattered. The recovery period indicates WBS followed by a transition period and no unambiguous transient evaluation of the recovery period is possible. An example of analysis of the recovery period is shown assuming the same transmissivity as estimated from injection period. The transient evaluation from the injection period using the Hurst-Clark-Bauer model is considered to give the most representative value of transmissivity. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit as well as the flow data was manually elevated 5e–09 m^3/s.

353.30–358.30 m

A well-defined PRF is clearly dominating the injection period. The recovery is very fast and only displays a PSS. Hence, no unambiguous transient evaluation is possible of the recovery. An example of analysis of the recovery period is shown assuming the same transmissivity as was estimated from injection period. The transient evaluation from the injection period using the Hurst-Clark-Bauer model is considered to give the most representative value of transmissivity.

358.30–363.30 m

The pressure in the test section was rather unstable during the first 200 s due to an over-compensating pressure regulation system. From c. 200 s the injection pressure is however stable and an approximate PRF/PLF is developed. The recovery is very fast and only displays a PSS. Hence, no unambiguous transient evaluation is possible of the recovery. An example of analysis of the recovery period is shown assuming the same transmissivity as was estimated from injection period. The transient evaluation from the injection period using the Hurst-Clark-Bauer model is considered to give the most representative value of transmissivity.

362.40–367.40 m

The injection period indicates an early, short period of PRF. After c. 150 s the flow rate decreases suddenly. After c. 400 s a second PRF appears. The first PRF-period has a higher transmissivity than the second. At the end of the injection period an apparent CHB is indicated and the flow rate reaches a steady level. The recovery is very fast and only displays a PSS. Hence, no unambiguous transient evaluation is possible of the recovery period. An example of analysis of the recovery period is shown assuming the same transmissivity as was estimated from the second PRF during the injection period. The transient evaluation from the second PRF during the injection period using the Hurst-Clark-Bauer model is considered to give the most representative value of transmissivity due to its longer duration.

367.40–372.40 m

The injection period indicates a possible PLF transitioning towards an approximate PRF. The recovery shows WBS transitioning to a PSS. Unambiguous transient evaluation is possible on the injection period. Similar results are obtained with models for PRF and a single fracture, respectively. The transient evaluation on the recovery period is uncertain. The transient evaluation of the injection period is regarded as the most reliable. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate data was manually elevated 5e–9 m^3/s.

372.40–377.40 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 PS 400-05-090, 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 3e–9 m^3/s.

377.40–382.40 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 PS 400-05-090, 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 3e–9 m^3/s.

382.40–387.40 m

The injection period displays a rather short and early PRF followed by an apparent NFB. The recovery is very fast and only displays a PSS. Hence, no unambiguous transient evaluation is possible of the recovery period. An example of analysis of the recovery period is shown assuming the same transmissivity as was estimated from injection period. The transient evaluation from the injection period using the Hurst-Clark-Bauer model is considered to give the most representative value of transmissivity.

387.40–392.40 m

The flow rate is low, close to the measurement limit and hence the data, especially the flow derivative, is quite scattered. Still, the injection displays a short and early PRF which is followed by an apparent NFB. The recovery only displays WBS and a transition to an assumed PSS. Hence, no unambiguous transient evaluation is possible on the recovery period. An example of analysis of the recovery period is shown assuming the same transmissivity and storativity as was estimated from injection period. The transient evaluation from the injection period using the Hurst-Clark-Bauer model is considered to give the most representative value of transmissivity. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit as well as the flow data was manually elevated 2e–9 m^3/s.

389.00–394.00 m

The flow rate is low, close to the measurement limit and hence the data, especially the flow derivative, is quite scattered. Still, the injection period is assumed to display a short and early PLF/PRF followed by a period that may be interpreted as an apparent NFB. The recovery period displays initial WBS and a transition towards a possible PRF at the end of the period. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit as well as the flow data was manually elevated 2e–9 m^3/s.

392.70–397.70 m

The injection period indicates two periods of possible PRF, where the first has a higher transmissivity. Alternatively, the second period may be interpreted as an apparent NFB. The recovery is very fast and only displays a PSS. Hence, no unambiguous transient evaluation is possible of the recovery period. An example of analysis of the recovery period is shown assuming the same transmissivity and storativity as estimated from the injection period. The transient evaluation from the injection period using the Hurst-Clark-Bauer model is considered to give the most representative value of transmissivity.

395.70–400.70 m

The injection period indicates two periods of possible PRF, where the first has a higher transmissivity. Alternatively, the second period may be interpreted as an apparent NFB. The recovery is very fast and only displays a PSS. Hence, no unambiguous transient evaluation is possible of the recovery period. An example of analysis of the recovery period is shown assuming the same transmissivity and storativity as estimated from the injection period. The transient evaluation from the injection period using the Hurst-Clark-Bauer model is considered to give the most representative value of transmissivity. A rather small but clear pressure increase is visible in the section below during the injection, indicating a shortcut around the lower packer.

406.00–411.00 m

An intermediate between a PLF and PRF is indicated during the injection period. The recovery is very fast and only displays a PSS. Hence, no unambiguous transient evaluation is possible of the recovery period. An example of analysis of the recovery period is shown assuming the same transmissivity and storativity as estimated from the injection period. The transient evaluation from the injection period using the Hurst-Clark-Bauer model is considered to give the most representative value of transmissivity.

411.00–416.00 m

The injection period shows a period of PRF between c. 100–400 s followed by a strong apparent NFB. The recovery is very fast and only displays a PSS. Hence, no unambiguous transient evaluation is possible of the recovery period. An example of analysis of the recovery period is shown assuming the same transmissivity and storativity as estimated from the injection period. The transient evaluation from the injection period using the Hurst-Clark-Bauer model is considered to give the most representative value of transmissivity. A rather small but clear pressure increase is visible in the section below during the injection, indicating a short-cut around the lower packer.

414.00–419.00 m

The injection period is clearly dominated by a PSF whilst the recovery period is very fast and only displays PSS, recovery may be affected by the fact that the test valve did not close properly. Hence, no unambiguous transient evaluation is possible of the recovery period. An example of analysis of the recovery period is shown assuming the same transmissivity and storativity as estimated from the injection period. The transient evaluation from the injection period is considered to give the most representative value of transmissivity.

419.00–424.00 m

The pressure in the section below the test section increased by c. 4 kPa during the injection period. Though transmissivity in the section below is of same magnitude as in the section 419.0–424.0 m, this relatively small pressure interference should not have a major impact of the test performed in this section. The injection period has a flat derivative throughout the period which suggests a dominating PRF. However, evaluation using a PRF-model results in a rather high positive skin factor which possibly might suggest a flow regime of higher dimension. The recovery is fast and only displays a PSS throughout the major part of the period, and it may be affected by the fact that the test valve did not close properly. Hence, no unambiguous transient evaluation is possible of this period. An example of analysis of the recovery period is shown assuming the same transmissivity and storativity as estimated from the injection period. Despite the uncertainty of the transient evaluation of the injection period it is assumed to be the most representative for this section.

424.00–429.00 m

The pressure in the section below the test section increased by c. 1.5 kPa during the injection period. Since the transmissivity in the section below is higher than the transmissivity in the section 424.0–429.0 m, this pressure interference may have resulted in an overestimation of the transmissivity in this section. The later half of the injection period is dominated by a PRF. It is preceded by a possible earlier PRF with a slightly higher transmissivity. The recovery is very fast and only displays PSS. Hence, no unambiguous transient evaluation is possible of this period. An example of analysis of the recovery period is shown assuming the same transmissivity and storativity as was estimated from the injection period. Since the first PRF during the injection period is rather weak the second PRF is considered to give the most representative transmissivity value for this section.

429.00–434.00 m

The injection period displays leakage flow, i.e. a PSF, throughout the period. A fit with the Hantush model results in a good fit. The recovery is fast and only displays a PSS. Hence, no unambiguous transient evaluation is possible of this period. An example of analysis of the recovery period is shown assuming the same transmissivity and storativity as estimated from the injection period. The pressure in the section below the test section increased by c. 9.9 kPa during the injection period. Since the transmissivity in the section below is of same magnitude as in the section 429.–434.0 m, this relatively small pressure interference may have resulted in an overestimation of the transmissivity. Also the dominating flow regime, PSF, and the comparison with other tests with longer test sections support this conclusion.

434.00–439.00 m

The injection period indicates two separate periods of PRF, the first has a slightly higher transmissivity. The recovery is fast and only displays a PSS. Hence, no unambiguous transient evaluation is possible of this period. An example of analysis of the recovery period is shown assuming the same transmissivity and storativity as estimated from the injection period.

439.00–444.00 m

The flow rate is rather low, hence the data, especially the flow derivative, is quite scattered. Still, a PRF is clearly dominating the injection period from 20 s and throughout the period. The recovery displays WBS and a transition period. No unambiguous transient evaluation of the recovery is possible. An example evaluation of the recovery period is shown. The first pressure disturbance in the test section, as seen at 18:20 in the overview plot, was the result of a first unsuccessful injection start. The pressure in the section was allowed to recover to the initial pressure before the second injection test.

442.50–447.50 m

The flow rate is rather low, hence the data, especially the flow derivative, is quite scattered. Still, a dominating PRF is indicated during the injection from 30 s and throughout the period. The recovery indicates an initial WBS transitioning to an assumed PSF that lasts throughout the period. Unambiguous transient evaluations are possible of both periods in this case.

447.50–452.50 m

The flow rate is rather low, hence the data, especially the flow derivative, is quite scattered. However, a dominating PRF or possibly, an intermediate between PRF and PSF is indicated. The recovery period exhibits an initial WBS transitioning to a possible PSF that lasts the rest of the period. Unambiguous transient evaluations are possible of both periods in this case. Transient evaluation using the Hurst-Clark-Brauer model for PRF from the injection period was considered to give the most representative transmissivity value although it corresponds to a rather high positive skin factor which might possibly suggest a flow dimension of higher dimension. However, the estimated transmissivity using the Hantush' model is similar to that from the Hurst et al. model.

452.50–457.50 m

The flow rate is rather low, hence the data, especially the flow derivative, is quite scattered. A PSF is dominating the injection period from c. 100 s and throughout the period. The recovery period also indicates a PSF. No unambiguous transient evaluation can be made on the recovery period. An example evaluation on this period is shown. The transient evaluation of the injection period using the Hantush model is considered as the representative evaluation.

457.50–462.50 m

The flow rate is rather low, hence the data, especially the flow derivative, is quite scattered. Still, a PRF is assumed to dominate the injection period from 20 s and throughout the period. The recovery period indicates an initial WBS transitioning to a possible PSF. No unambiguous transient evaluation of the recovery period is possible. An example of analysis of the recovery period is shown assuming the same transmissivity and storativity as was estimated from the injection period. The transient evaluation from the injection period is considered as representative for the test section.

462.50–467.50 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 PS 400-05-090, 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.

467.50–472.50 m

The injection period is assumed to be dominated by a PRF. However, the flow rate is very low, close to the measurement limit. Hence the data, especially the flow derivative, is quite scattered. The assumption of a PRF is therefore uncertain. The recovery only indicates WBS and a transition period. The transient evaluation on the recovery period was considered to be the most representative transmissivity value for this section.

472.50–477.50 m

The flow rate is very low, close to the measurement limit and hence the data, especially the flow derivative, is quite scattered. A PRF is assumed to dominate the injection period. The recovery period displays WBS and a transition to an approximate PRF. Transient evaluations of both periods gave similar results. The transient evaluation on the injection period was considered to be the most representative transmissivity value for this section.

477.50–482.50 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 PS 400-05-090, 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.

482.50–487.50 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 400-05-090, 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.

487.50–492.50 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 PS 400-05-090, 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 above zero, the flow rate measurement limit was manually lowered 2e–9 m^3/s.

492.50–497.50 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 PS 400-05-090, 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 above zero, the flow rate measurement limit was manually lowered 2e–9 m^3/s.

497.50–502.50 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 PS 400-05-090, 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 above zero, the flow rate measurement limit was manually lowered 2e–9 m^3/s.

502.50–507.50 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 PS 400-05-090, 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 packer inflation time was prolonged due to lunch break. Still, 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 above zero, the flow rate measurement limit was manually lowered 2e–9 m^3/s.

507.50–512.50 m

The flow rate is low, hence the data, especially the flow derivative, is quite scattered. Still, the injection period seems to be dominated by a PRF. The recovery displays WBS and a transition to some other flow regime, possibly a PRF. Transient evaluations of both period gave similar results. The transient evaluation on the injection period was considered to be the most representative transmissivity value for this section.

512.50–517.50 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 PS 400-05-090, 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 above zero, the flow rate measurement limit was manually lowered 2e–9 m^3/s.

517.50–522.50 m

The beginning of the injection period shows an increasing flow derivative which may be interpret as a possible PLF which is transitioning to possible PRF. However, the latter interpretation is uncertain. The recovery period only indicates a PLF. Transient evaluation using the Raghavan-Ozkan model on the injection period was considered to be the most representative transmissivity value for this section.

522.50–527.50 m

The flow rate is low, hence the data, especially the flow derivative, is quite scattered. Still, the injection period indicates an early PLF transitioning towards a possible PRF. Transient evaluation using both Hurst-Clark-Brauer and Raghavan-Ozkan model results in consistent parameters. The recovery period only indicates a PLF, possibly transitioning to an apparent NFB by the end. No unambiguous transient evaluation of the recovery is possible. An example of analysis of the recovery period is shown assuming the same transmissivity and storativity as estimated from the injection period. The transient evaluation from the injection period is considered to give the most representative value of transmissivity. Since the measurement noise with a zero flow was centred slightly above zero, the flow rate measurement limit as well as the flow data was manually lowered 2e–9 m^3/s.

527.50–532.50 m

The flow rate is low, hence the data, especially the flow derivative, is quite scattered. Still, the injection period seems to be dominated by a PSF transitioning to PSS by the end. The recovery period shows WBS and a transition to some other flow regime, possibly a PSF. No unambiguous transient evaluation of the recovery is possible. An example of analysis of the recovery period is shown. The transient evaluation from the injection period is considered to give the most representative value of transmissivity for the test section.

532.50–537.50 m

A short PLF is indicated in the beginning of the injection period, transitioning to a dominating PSF, which is most clear from c. 100 s to 800 s. After 800 s the derivative drops rapidly which could imply an apparent CHB. The recovery period indicates a PLF transitioning to a possible PSF by the end. No unambiguous transient evaluation of the recovery period is possible. An example of transient analysis of the recovery period is shown assuming the same transmissivity and storativity as estimated from the injection period. The transient evaluation from the injection period is considered to give the most representative value of transmissivity.

537.50–542.50 m

The injection period is dominated by a PSF transitioning to a PSS by the end. The recovery period is also dominated by a PSF from c. 40–700 s. Transient evaluation from the recovery period is considered to provide the best estimate of transmissivity for the section.

542.50–547.50 m

The injection period indicates a PRF from c. 100–1,200 s transitioning to a PSF by the end. During the recovery period a PRF is indicated between c. 50 and 200 s. It then transitions into a PSF lasting throughout the recovery period. Transient evaluation from both periods gives similar results. The transient evaluation from the injection period is considered to give the most representative value of transmissivity for the test section.

547.50–552.50 m

The injection period is dominated by an apparent PRF between c. 100–800 transitioning to a PSF by the end. The flow rate is low, close to the measurement limit and hence the data, especially the flow derivative, is quite scattered during the injection period. The recovery period starts with WBS followed by a PRF transitioning to an apparent NFB after c. 300 s. The transient evaluation from the recovery period is considered to give the most representative value of transmissivity for the test section.

552.50–557.50 m

During the injection period a PRF is dominating from 10 s until c. 100 s, then transitioning to a PLF or apparent NFB. The recovery period is dominated by initial WBS followed by a transition period and then transitioning to an apparent PRF. Transient evaluation of recovery with a model assuming two-dimensional (radial) flow gives a high positive value of the skin factor which may indicate a higher flow dimension. However, the recovery response is not consistent with a model for pseudo-spherical flow. The transient evaluation on the PRF during the injection period is chosen as representative for the test.

557.50–562.50 m

The beginning of the injection period indicates a possible PLF transitioning towards a possible PRF. Transient evaluation with the PRF-model by Hurst et al as well as with the Ozkan-Raghavan model for a single fracture gives consistent results. The same flow regimes are identified during the recovery period and transient evaluation was made with both the Dougherty-Babu PRF-model and the model by Ozkan-Raghavan for a single fracture. The transient evaluation on the injection period is chosen as representative for the test.

562.50–567.50 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 PS 400-05-090, 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.

567.50–572.50 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 PS 400-05-090, 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 1.2e–09 m^3/s.

572.50–577.50 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 PS 400-05-090, 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.

577.50–582.50 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 PS 400-05-090, 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.

582.50–587.50 m

The injection period demonstrates a short PRF transitioning to a PSF by the end. The recovery exhibits WBS in the beginning. After a transition period a PRF is developed. The transient evaluation on the recovery period is regarded to provide the best estimate of transmissivity for this section.

587.50–592.50 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 PS 400-05-090, 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. Pb decreases from packer expansion throughout the entire test, probably due to lower formation pressure from a fracture in the section below the test section.

592.50–597.50 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 PS 400-05-090, 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. Pb decreases from packer expansion throughout the entire test, probably due to lower formation pressure from a fracture in the section below the test section.

597.50–602.50 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 PS 400-05-090, 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. Pb decreases from packer expansion throughout the entire test, probably due to lower formation pressure from a fracture in the section below the test section.

602.50–607.50 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 PS 400-05-090, 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. Pb decreases from packer expansion throughout the entire test, probably due to lower formation pressure from a fracture in the section below the test section.

607.50–612.50 m

The injection pressure increases (c. 3 kPa) during the injection period due to a drift in the gas pressure regulator. This fact may affect the transient evaluation of the injection period. Nevertheless, the injection period indicates an apparent NFB, possibly transitioning to an apparent PLF by the end. A PLF is assumed to dominate the recovery period from c. 500 s throughout the period. No unambiguous transient evaluation is possible from the injection period. An example is shown. The transient evaluation from the recovery period using the single-fracture model by Ozkan-Raghavan is considered as the most representative evaluation for the section.

612.50–617.50 m

The injection period for this test was 15 minutes longer than normal (35 minutes instead of 20 minutes). During the injection period the pressure decreased c. 4 kPa. Both the injection- and recovery periods are dominated by an apparent NFB/PLF. The transient evaluations on both the injection and recovery period are very uncertain and only shown for demonstration purposes. Therefore, TM is considered most representative for this section.

617.50–622.50 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 PS 400-05-090, 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. Pb decreases from packer expansion throughout the entire test, probably due to lower formation pressure from a fracture in the section below the test section.

622.50–627.50 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 PS 400-05-090, 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. Pb decreases from packer expansion throughout the entire test, probably due to lower formation pressure from a fracture in the section below the test section. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit was manually elevated 1.2e–9 m^3/s.

627.50–632.50 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 PS 400-05-090, 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. Pb decreases from packer expansion throughout the entire test, probably due to lower formation pressure from a fracture in the section below the test section. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit was manually elevated 1.2e–9 m^3/s.

632.50–637.50 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 PS 400-05-090, 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. Pb decreases from packer expansion throughout the entire test, probably due to lower formation pressure from a fracture in the section below the test section. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit was manually elevated 1.2e–9 m^3/s.

637.50–642.50 m

As a result of low transmissivity, flow data are scattered causing the derivative data to be difficult to interpret with respect to flow regime. Nevertheless, a PSF is assumed to dominate the injection period. During the recovery period, WBS is dominating the first c. 65 s followed by a transition period. No unambiguous transient evaluations could be made of neither the injection nor the recovery period. Thus, only examples of transient evaluations are shown. The steady-state transmissivity TM is considered to be the most representative for the test section. The pressure below the test section, Pb, decreases from the moment of packer expansion throughout the entire test sequence, probably due to lower formation pressure below the test section.

642.50–647.50 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 PS 400-05-090, 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 3.7e–9 m^3/s. Pb decreases from packer expansion throughout the entire test, probably due to lower formation pressure from a fracture in the section below the test section.

647.50–652.50 m

A PRF is indicated after c. 30 s throughout the injection period. After initial WBS during the recovery period, a possible PRF is indicated from c. 30–100 s transitioning to an apparent NFB. Estimated T-values from the injection period are similar to the T-values derived from the recovery period from transient evaluation. The estimated T-value from the injection period was chosen as representative for the test. The pressure below the test section, Pb, decreases from the moment of packer expansion throughout the entire test sequence, probably due to lower formation pressure in the interval below the test section.

652.50–657.50 m

As a result of low transmissivity, flow data is scattered causing the derivative data to be difficult to interpret with respect to flow regime during the injection period. Nevertheless, a PRF is interpreted between c. 30 and 1,800 s, possibly transitioning to an apparent NFB by the end. During the recovery period, WBS is dominating the first c. 60 s followed by a transition period towards an approximate PRF. Consistent results are obtained from transient evaluation of the recovery period using a model by Dougherty-Babu with similar parameters as for the injection period. The transient evaluation of the injection period is considered to be the most representative for the test section. The pressure below the test section, Pb, decreases throughout the entire test sequence, probably due to lower formation pressure in the interval below the test section.

657.50–662.50 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 PS 400-05-090, 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. Pb decreases from packer expansion throughout the entire test, probably due to lower formation pressure from a fracture in the section below the test section.

662.50–667.50 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 PS 400-05-090, 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. Pb decreases from packer expansion throughout the entire test, probably due to lower formation pressure from a fracture in the section below the test section.

667.50–672.50 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 PS 400-05-090, 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 1.22e–9 m^3/s. Pb decreases from packer expansion throughout the entire test, probably due to lower formation pressure from a fracture in the section below the test section.

691.50–696.50 m

The derivative is rather scattered from c. 0–100 s. during the injection period, a PRF is still indicated between c. 50 and 500 s. It is followed by an apparent NFB. The recovery period exhibits a possible PSF transitioning to an apparent NFB. The pressure in the section below the test section increased by c. 11.6 kPa during the injection period. Since the transmissivity in the section below is higher than the transmissivity in the section 691.5–696.5 m, this pressure interference may have resulted in an overestimation of the transmissivity in this section. The transient evaluation for the recovery period is regarded as uncertain and presented as an example only. The transient evaluation from the injection period is considered to be the most representative for this section.

696.50–701.50 m

A strong apparent NFB/PLF is indicated during the entire injection period. A diagnostic transient evaluation was made on the injection period for demonstration purposes only. The recovery period is dominated entirely by a PLF. Transient evaluation of the recovery period is possible using the Ozkan-Raghavan model for a single fracture. The pressure in the section below the test section increased by c. 167.7 kPa during the injection period. The transmissivity in the section below is in the same order of magnitude as the transmissivity in the section 696.5–701.5 m, this relatively large pressure interference has probably resulted in an overestimation of the transmissivity in this section. The transient evaluation from the recovery period is selected as the most representative but it is uncertain which section the estimated hydraulic parameters represent in this case due to the observed direct hydraulic connection with the section below the tested section. Furthermore, it should be observed that the total recovery in the rather transmissive test section was only c. 9 m of the applied injection head of c. 22 m, possibly indicating a hydraulic feature of varying properties (e.g. a fracture with decreasing aperture).

701.50–706.50 m

The injection period indicates an intermediate between PRF and PSF transitioning to an apparent NFB after c. 400 s. Both the Hurst-Clark-Brauer model as well as the Hantush model gives consistent results for the injection period. The recovery period exhibits a PRF at intermediate times, transitioning to a PSF and PSS by the end. An almost complete recovery was observed for this test. Also for the recovery period, a PSF-model as well as a PRF-model gives consistent results. The estimated transmissivity in this section is similar to the one for the section above which possibly may indicate that the sections are hydraulically connected, cf. comments for the previous test. However, no pressure increase was observed above the section during injection.

706.50–711.50 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 PS 400-05-090, 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 3.7e–9 m^3/s.

711.50–716.50 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 PS 400-05-090, 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 5.16e–9 m^3/s.

6.2.5 Flow regimes

A ceratin time interval with pseudo-radial flow could, in most tests, be identified from the injection period. As discussed in Section 5.4.4, the recovery periods were sometimes dominated by wellbore storage effects and no pseudo-radial flow period was reached. In addition, during many tests, the pressure recovery was fast causing a fast pseudo-stationary state during the recovery period. A summary of the frequency of identified flow regimes on the different test scales is presented in Table 6-3, which shows all identified flow regimes during the test periods. 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.

It should be noted that the interpretation of flow regimes is only tentative and only 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. Interpreted flow regimes during the injection tests in KLX10.

Borehole	Section length (m)	Number of tests	Number of tests with definable Q_p	Injection period					Recovery period					
				PLF	PRF	PSF	PSS	NFB	WBS	PLF	PRF	PSF	PSS	NFB
KLX10	5	79	50	12(0)	40(21)	11(4)	2(0)	13(0)	21(4)	7(3)	11(0)	10(2)	23(17)	5(0)
KLX10	20	46	38	8(6)	20(12)	10(9)	1(1)	7(2)	11(7)	6(6)	3(1)	7(3)	17(15)	1(0)
KLX10	100	9	9	0(0)	5(3)	2(1)	1(0)	4(2)	2(0)	2(1)	3(1)	4(1)	3(0)	1(0)

Table 6-3 shows that, during the injection period, the most common interpreted flow regime was pseudo-radial flow (PRF). A certain period of pseudo-radial flow could be identified from the injection period in 67 % of all the tests with a definable final flow rate for KLX10. The percentage is higher for the tests in 5 m sections compared to the tests with 100 m and 20 m sections. During the recovery period pseudo-stationary flow (PSS) dominated due to several tests with fast recovery. For the recovery period, a certain period of pseudo-radial flow could be identified for only 18 % of all the tests with a definable final flow rate.

For both the injection and recovery period more than one flow regime could be identified in 63 % of all tests. The most common transition in KLX10 during the injection period was from pseudo-radial flow to an apparent no-flow boundary. During the recovery period in KLX10 the most common transition was from wellbore storage to pseudo-radial flow. Also transitions from pseudo-spherical flow to pseudo-stationary flow, from wellbore storage to pseudo-spherical flow or pseudo-stationary flow were fairly common.

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 KLX10 in the tested sections of 100 m, 20 m and 5 m length, respectively, are shown in Figure 6-2. This figure demonstrates a good agreement between results obtained from tests on different scales in KLX10. 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).

In Table 6-4, estimated transmissivity values in 100 m and 20 m test sections in KLX10 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 for KLX10. In addition, summations of transmissivities from the tests with 20 m and 5 m sections in the intervals 105.2–992.5 m and 297.5–716.5 m are also displayed in Table 6-4. The summation of the tests in 20 m sections is considerably higher than the corresponding summation for 5 m sections in the interval 297.5–716.5 m due to the fact that the interval with the highest transmissivity is not measured in the tests with 5 m section length. This fact is also visible in Figure 6-2.

In Table 6-4, 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, which gives overestimated values of the summed transmissivities for intervals with low transmissivity.

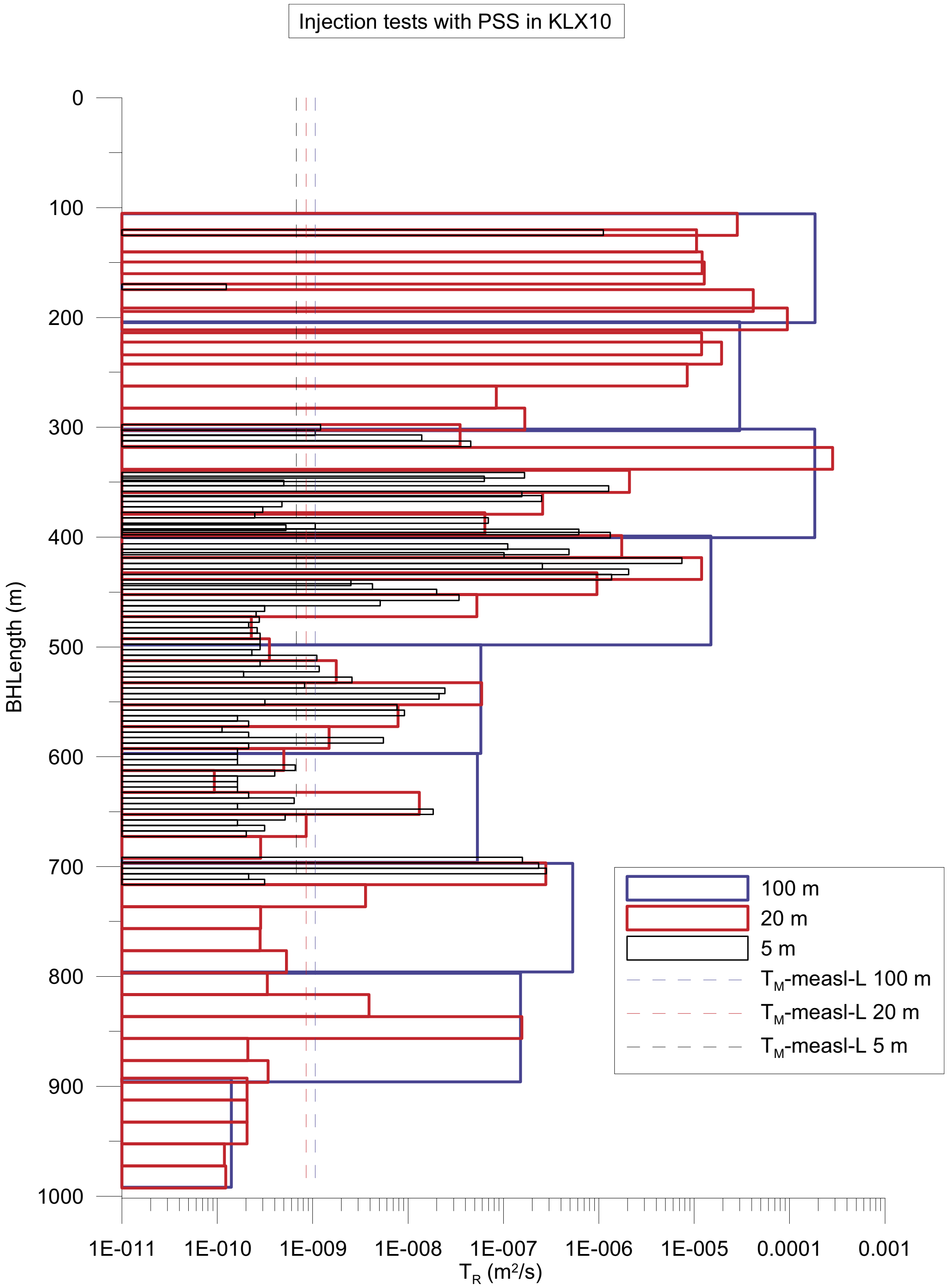


Figure 6-2. *Estimated best representative transmissivity values (T_R) for sections of 100 m, 20 m and 5 m length in borehole KLX10. Estimated transmissivity values for the lower standard measurement limit from stationary evaluation (T_M-measl-L) for different test section lengths are also shown.*

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 KLX10.

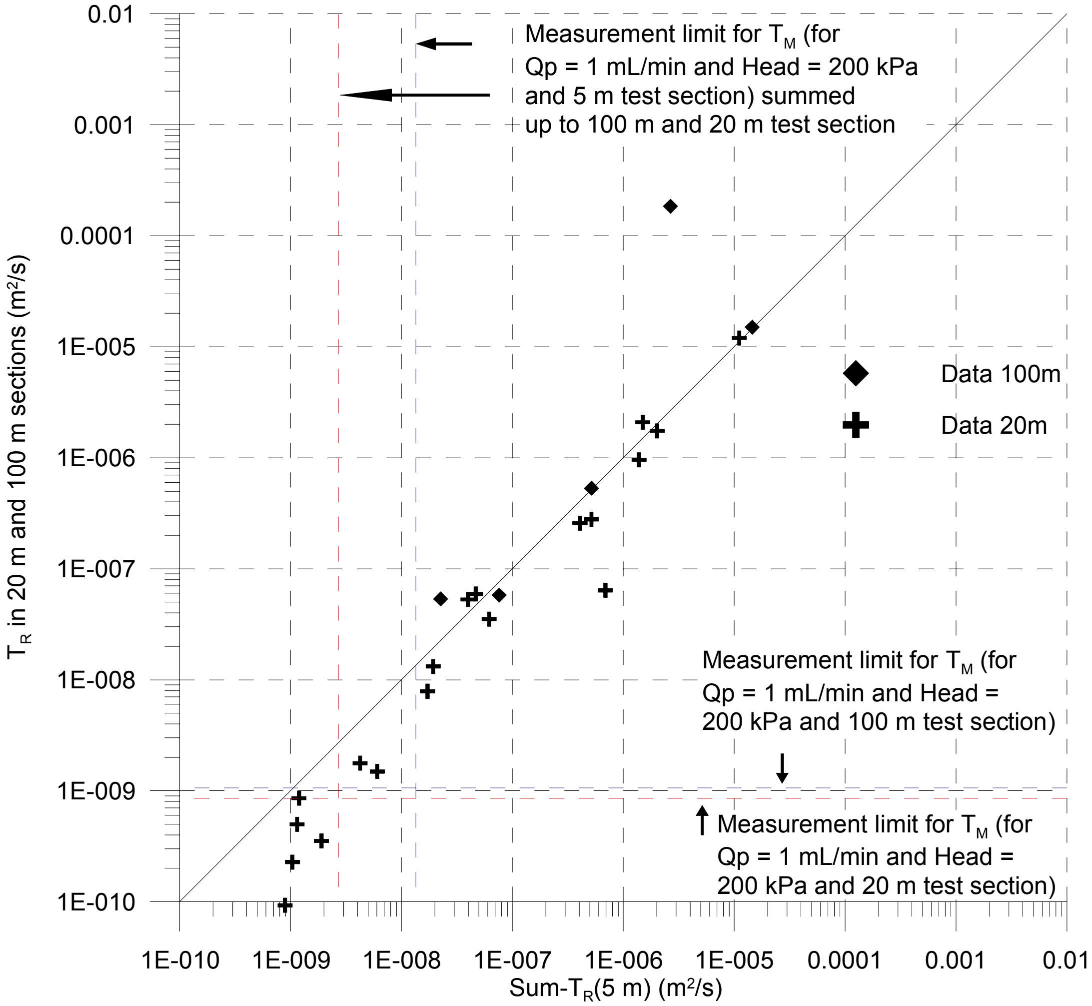
Borehole Idcode	Secup inj.test (m)	Seclow inj.test (m)	L_w (m)	T_M inj. tests (m^2/ s)	T_R inj. tests (m^2/s)	SUM T_M (20 m) inj. tests (m^2/s)	SUM T_R (20 m) inj. tests (m^2/s)	SUM T_M (5 m) inj. tests (m^2/s)	SUM T_R (5 m) inj. tests (m^2/s)
KLX10	105.20	205.20	100.00	1.27E–04	1.85E–04	1.25E–04 [1)]	1.99E–04 [1)]	n.m. 5 m	n.m. 5 m
KLX10	203.50	303.50	100.00	2.80E–05	3.00E–05	1.68E–05	4.00E–05	n.m. 5 m	n.m. 5 m
KLX10	301.00	401.00	100.00	3.74E–04	1.85E–04	3.21E–04	2.84E–04	2.09E–06	2.66E–06
KLX10	398.60	498.60	100.00	8.21E–06	1.50E–05	9.17E–06	1.48E–05	8.05E–06	1.46E–05
KLX10	497.50	597.50	100.00	1.43E–07	5.78E–08	1.25E–07	7.06E–08	1.19E–07	7.60E–08
KLX10	596.50	696.50	100.00	1.01E–07	5.35E–08	7.91E–08 [2)]	1.73E–07 [2)]	8.74E–08	1.81E–07
KLX10	696.50	796.50	100.00	5.32E–07	5.32E–07	5.28E–07	2.83E–07	5.92E–07 [3)]	5.16E–07 [3)]
KLX10	796.50	896.50	100.00	1.82E–07	1.51E–07	1.34E–07	1.61E–07	n.m. 5 m	n.m. 5 m
KLX10	892.50	992.50	100.00	2.12E–09	1.40E–10	2.56E–09	8.60E–10	n.m. 5 m	n.m. 5 m
KLX10	105.20	125.20	20.00	2.45E–05	2.83E–05			n.m. 5 m	n.m. 5 m
KLX10	120.20	140.20	20.00	7.59E–06	1.06E–05			n.m. 5 m	n.m. 5 m
KLX10	140.20	160.20	20.00	8.53E–06	1.21E–05			n.m. 5 m	n.m. 5 m
KLX10	149.60	169.60	20.00	5.28E–06	1.28E–05			n.m. 5 m	n.m. 5 m
KLX10	174.60	194.60	20.00	2.27E–05	4.17E–05			n.m. 5 m	n.m. 5 m
KLX10	191.30	211.30	20.00	5.82E–05	9.46E–05			n.m. 5 m	n.m. 5 m
KLX10	214.00	234.00	20.00	5.44E–06	1.20E–05			n.m. 5 m	n.m. 5 m
KLX10	222.50	242.50	20.00	5.73E–06	1.94E–05			n.m. 5 m	n.m. 5 m
KLX10	242.50	262.50	20.00	5.42E–06	8.45E–06			n.m. 5 m	n.m. 5 m
KLX10	262.50	282.50	20.00	7.42E–08	8.41E–08			n.m. 5 m	n.m. 5 m
KLX10	282.50	302.50	20.00	1.79E–07	1.68E–07			n.m. 5 m	n.m. 5 m
KLX10	297.50	317.50	20.00	2.83E–08	3.52E–08			3.42E–08	6.18E–08
KLX10	318.20	338.20	20.00	3.19E–04	2.82E–04			n.m. 5 m	n.m. 5 m
KLX10	339.20	359.20	20.00	1.55E–06	2.09E–06			1.19E–06	1.50E–06
KLX10	359.20	379.20	20.00	3.02E–07	2.58E–07			4.57E–07	4.07E–07
KLX10	377.70	397.70	20.00	2.93E–07	6.38E–08			4.03E–07	6.91E–07
KLX10	398.60	418.60	20.00	1.77E–06	1.75E–06			1.17E–06	2.02E–06
KLX10	418.60	438.60	20.00	6.39E–06	1.20E–05			6.07E–06	1.11E–05
KLX10	432.50	452.50	20.00	9.75E–07	9.57E–07			7.88E–07	1.38E–06
KLX10	452.50	472.50	20.00	3.18E–08	5.28E–08			2.53E–08	3.99E–08
KLX10	472.50	492.50	20.00	8.45E–10	2.28E–10			1.13E–09	1.03E–09
KLX10	492.50	512.50	20.00	1.15E–09	3.53E–10			1.96E–09	1.90E–09
KLX10	512.50	532.50	20.00	8.89E–09	1.77E–09			8.82E–09	4.23E–09
KLX10	532.50	552.50	20.00	7.70E–08	5.91E–08			7.05E–08	4.66E–08
KLX10	552.50	572.50	20.00	3.54E–08	7.88E–09			3.39E–08	1.72E–08
KLX10	572.50	592.50	20.00	2.87E–09	1.49E–09			3.35E–09	6.05E–09
KLX10	592.50	612.50	20.00	3.97E–09	4.98E–10			2.60E–09	1.15E–09
KLX10	612.50	632.50	20.00	6.86E–10	9.30E–11			8.89E–10	8.89E–10
KLX10	632.50	652.50	20.00	5.84E–09	1.32E–08			1.52E–08	1.94E–08
KLX10	652.50	672.50	20.00	1.04E–09	8.58E–10			1.48E–09	1.19E–09
KLX10	672.50	692.50	20.00	<2.86E–10	<2.86E–10			n.m. 5 m	n.m. 5 m

Borehole Idcode	Secup inj.test (m)	Seclow inj.test (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)
KLX10	696.50	716.50	20.00	5.21E–07	2.79E–07			5.92E–07	5.16E–07
KLX10	716.50	736.50	20.00	6.42E–09	3.59E–09			n.m. 5 m	n.m. 5 m
KLX10	736.50	756.50	20.00	<2.86E–10	<2.86E–10			n.m. 5 m	n.m. 5 m
KLX10	756.50	776.50	20.00	<2.81E–10	<2.81E–10			n.m. 5 m	n.m. 5 m
KLX10	776.50	796.50	20.00	5.31E–10	5.31E–10			n.m. 5 m	n.m. 5 m
KLX10	796.50	816.50	20.00	<3.34E–10	<3.34E–10			n.m. 5 m	n.m. 5 m
KLX10	816.50	836.50	20.00	3.68E–09	3.90E–09			n.m. 5 m	n.m. 5 m
KLX10	836.50	856.50	20.00	1.30E–07	1.56E–07			n.m. 5 m	n.m. 5 m
KLX10	856.50	876.50	20.00	<2.09E–10	<2.09E–10			n.m. 5 m	n.m. 5 m
KLX10	876.50	896.50	20.00	3.41E–10	3.41E–10			n.m. 5 m	n.m. 5 m
KLX10	892.50	912.50	20.00	<2.06E–10	<2.06E–10			n.m. 5 m	n.m. 5 m
KLX10	912.50	932.50	20.00	<2.06E–10	<2.06E–10			n.m. 5 m	n.m. 5 m
KLX10	932.50	952.50	20.00	<2.06E–10	<2.06E–10			n.m. 5 m	n.m. 5 m
KLX10	952.50	972.50	20.00	8.39E–10	1.19E–10			n.m. 5 m	n.m. 5 m
KLX10	972.50	992.50	20.00	1.10E–09	1.22E–10			n.m. 5 m	n.m. 5 m
Sum of T in 105.20–992.50 m				5.38E–04	4.15E–04	4.73E–04	5.39E–04	n.m. 5 m	n.m. 5 m
Sum of T in 297.50–716.50 m				n.m	n.m	3.31E–04	3.00E–04	1.02E–05	1.66E–05

1) Section 120.0–125.0 was overlapping, later measured in a 5 m-section and subtracted from this sum. Section 169.6–174.6 m was not measured with a 20 m-section but later measured with a 5 m-section and added to this sum.
2) Section 691.5–696.5 m was not measured with a 20 m-section, but later measured with a 5 m-section and added to this sum.
3) Interval only partly measured.
n.m. = not measured.

In Figure 6-3, estimated 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 KLX10 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 6-3 indicates a relatively good agreement between estimated transmissivity values in longer sections and summed transmissivity values in corresponding 5 m sections for the injection tests. However, a majority of the data points are located below the straight line, indicating that the sum of transmissivity from the shorter sections is generally higher than the estimated transmissivity in longer sections. Some of the sections are partly overlapping, resulting in an overestimation when summing the sections together. Also interference between adjacent sections can contribute to an overestimation of the sum of transmissivity when summing the transmissivity from several sections together. Since the measurement limit values are summed up, the sum of T 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. The outlier in Figure 6-3 represents the sum of transmissivities in the 100 m section 301.0–401.0 m and the corresponding sum of 5 m tests, respectively. However, the section with the highest transmissivity in this section was not measured with 5 m sections, making this comparision not justified.



Figur 6-3. *Transmissivity values considered most representative (TR) for 100 m and 20 m sections versus the sum of most representative transmissivity values (TR) in 5 m sections in the corresponding borehole intervals from the injection tests in KLX10 together with the standard lower measurement limit at different scales.*

6.4 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 KLX10. The hydraulic conductivity is obtained by dividing the transmissivity by the section length; in this case T_M/L_w. Results from tests where Q_p was below the estimated test-specific measurement limit were not included in the statistical analyses of K_M. 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 6-6. It should be noted that the statistics for the different section lengths is based on different borehole intervals.

Table 6-5. Basic statistical parameters for steady-state hydraulic conductivity (K_M) and hydraulic conductivity considered most representative (K_R) in borehole KLX10. L_w = section length, m = arithmetic mean, s = standard deviation.

Parameter	Unit	KLX10 L_w=100 m	KLX10 L_w=20 m	KLX10 L_w=20 m	KLX10 L_w=5 m
Measured borehole interval	m	105.2–992.5 [1)]	105.2–992.5 [1), 3)]	297.5–716.5 [1), 3)]	297.5–716.5 [1), 2), 3) 4)]
Number of tests	–	9	46	21	79
N:o of tests below E.L.M.L.[5)]	–	0	8	1	29
m ($Log_{10}(K_M)$)	Log_{10}(m/s)	–7.83	–8.24	–8.53	–8.49
s ($Log_{10}(K_M)$)	–	1.70	1.69	1.52	1.17
m ($Log_{10}(K_R)$)	Log_{10}(m/s)	–8.03	–8.79	–8.86	–9.20
s ($Log_{10}(K_R)$)	–	2.02	2.03	1.75	1.36

[1)] Some sections partly overlapping, see Section 5.5 point 4 in nonconformatives.
[2)] Sections with very low or non-detectable flow (20 m section length) are not measured with 5 m section length.
[3)] Whithin the measured intervals, three sections are not measured with 20 and 5 m sections, see Section 5.5 point 5 in nonconformatives.
[4)] Three sections were measured as complements to the 20 m sections. These were 120.2–125.2, 169.6–174.6 and 691.5–696.5 m
[.5)] Number of tests where Qp could not be defined (E.L.M.L. = estimated test-specific lower measurement limit)

7 References

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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	Paramete rs in file	Comments
idcode	(m)	(m)	(1-6)[1]		YYYYMMDD hh:mm	YYYYMMDD hh:mm	__Borehole id_secup_date and time of test start		
KLX10	105.20	205.20	3	1	2006-01-09 14:55	2006-01-09 19:09	___KLX10_0105.20_200601091455.ht2	P, Q, Te	Interrupted [2]
KLX10	105.20	205.20	3	2	2006-01-10 10:19	2006-01-10 11:04	___KLX10_0105.20_200601101019.ht2	P, Q, Te	Reperformed, interrupted [2]
KLX10	105.20	205.20	3	3	2006-01-10 11:17	2006-01-10 18:58	___KLX10_0105.20_200601101117.ht2	P, Q, Te	Reperformed, interrupted [2], couldn´t be converted in IP-plot, values estimated.
KLX10	105.20	205.20	3	4	2006-01-12 17:38	2006-01-12 18:35	___KLX10_0105.20_200601121738.ht2	P, Q, Te	Reperformed, interrupted [2]
KLX10	105.20	205.20	3	5	2006-01-12 18:43	2006-01-12 19:39	___KLX10_0105.20_200601121843.ht2	P, Q, Te	Reperformed, interrupted [2]
KLX10	105.20	205.20	3	6	2006-01-13 08:36	2006-01-13 10:56	___KLX10_0105.20_200601130836.ht2	P, Q, Te	Reperformed
KLX10	203.50	303.50	3	1	2006-01-16 14:41	2006-01-16 16:38	___KLX10_0203.50_200601161441.ht2	P, Q, Te	
KLX10	301.00	401.00	3	1	2006-01-16 17:46	2006-01-16 19:29	___KLX10_0301.00_200601161746.ht2	P, Q, Te	
KLX10	404.50	504.50	3	1	2005-10-03 09:27	2005-10-03 10:32	___KLX10_0398.60_200601171006.ht2	P, Q, Te	
KLX10	497.50	597.50	3	1	2006-01-17 15:01	2006-01-17 16:57	___KLX10_0497.50_200601171501.ht2	P, Q, Te	
KLX10	596.50	696.50	3	1	2006-01-17 18:19	2006-01-17 20:09	___KLX10_0596.50_200601171819.ht2	P, Q, Te	
KLX10	696.50	796.50	3	1	2006-01-18 09:56	2006-01-18 11:50	___KLX10_0696.50_200601180956.ht2	P, Q, Te	
KLX10	796.50	896.50	3	1	2006-01-18 14:19	2006-01-18 16:10	___KLX10_0796.50_200601181419.ht2	P, Q, Te	
KLX10	892.50	992.50	3	1	2006-01-18 17:36	2006-01-18 19:25	___KLX10_0892.50_200601181736.ht2	P, Q, Te	
KLX10	105.20	125.20	3	1	2006-02-16 17:28	2006-02-16 19:00	___KLX10_0105.20_200602161728.ht2	P, Q, Te	
KLX10	120.20	140.20	3	1	2006-02-16 19:45	2006-02-16 21:01	___KLX10_0120.20_200602161945.ht2	P, Q, Te	
KLX10	140.20	160.20	3	1	2006-02-17 08:22	2006-02-17 09:43	___KLX10_0140.20_200602170822.ht2	P, Q, Te	
KLX10	149.60	169.60	3	1	2006-02-17 10:28	2006-02-17 11:50	___KLX10_0149.60_200602171028.ht2	P, Q, Te	
KLX10	174.60	194.60	3	1	2006-02-20 08:59	2006-02-20 10:14	___KLX10_0174.60_200602200859.ht2	P, Q, Te	
KLX10	191.30	211.30	3	1	2006-02-20 11:01	2006-02-20 12:15	___KLX10_0191.30_200602201101.ht2	P, Q, Te	
KLX10	214.00	234.00	3	1	2006-02-20 13:19	2006-02-20 14:33	___KLX10_0214.00_200602201319.ht2	P, Q, Te	
KLX10	222.50	242.50	3	1	2006-02-20 14:51	2006-02-20 16:05	___KLX10_0222.50_200602201451.ht2	P, Q, Te	
KLX10	242.50	262.50	3	1	2006-02-20 16:25	2006-02-20 17:39	___KLX10_0242.50_200602201625.ht2	P, Q, Te	
KLX10	262.50	282.50	3	1	2006-01-24 16:07	2006-01-24 17:29	___KLX10_0262.50_200601241607.ht2	P, Q, Te	Test performed during the first test round with the 20 m-section
KLX10	282.50	302.50	3	1	2006-01-24 17:54	2006-01-24 19:09	___KLX10_0282.50_200601241754.ht2	P, Q, Te	d:o
KLX10	297.50	317.50	3	1	2006-01-25 08:05	2006-01-25 09:32	___KLX10_0297.50_200601250805.ht2	P, Q, Te	d:o
KLX10	318.20	338.20	3	1	2006-01-25 10:01	2006-01-25 11:16	___KLX10_0318.20_200601251001.ht2	P, Q, Te	d:o
KLX10	339.20	359.20	3	1	2006-01-25 11:44	2006-01-25 12:58	___KLX10_0339.20_200601251144.ht2	P, Q, Te	d:o
KLX10	359.20	379.20	3	1	2006-01-25 14:17	2006-01-25 15:44	___KLX10_0359.20_200601251417.ht2	P, Q, Te	d:o
KLX10	377.70	397.70	3	1	2006-01-25 16:21	2006-01-25 17:41	___KLX10_0377.70_200601251621.ht2	P, Q, Te	d:o
KLX10	398.60	418.60	3	1	2006-01-25 18:10	2006-01-25 19:30	___KLX10_0398.60_200601251810.ht2	P, Q, Te	d:o
KLX10	418.60	438.60	3	1	2006-01-26 07:45	2006-01-26 09:01	___KLX10_0418.60_200601260745.ht2	P, Q, Te	d:o

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		
KLX10	432.50	452.50	3	1	2006-01-26 09:25	2006-01-26 10:40	___KLX10_0432.50_200601260925.ht2	P, Q, Te	d:o
KLX10	472.50	492.50	3	1	2006-02-21 08:19	2006-02-21 09:35	___KLX10_0472.50_200602210819.ht2	P, Q, Te	
KLX10	492.50	512.50	3	1	2006-02-21 10:05	2006-02-21 11:18	___KLX10_0492.50_200602211005.ht2	P, Q, Te	
KLX10	512.50	532.50	3	1	2006-02-21 11:33	2006-02-21 13:23	___KLX10_0512.50_200602211133.ht2	P, Q, Te	
KLX10	532.50	552.50	3	1	2006-02-21 13:43	2006-02-21 14:57	___KLX10_0532.50_200602211343.ht2	P, Q, Te	
KLX10	552.50	572.50	3	1	2006-02-21 15:20	2006-02-21 16:35	___KLX10_0552.50_200602211520.ht2	P, Q, Te	
KLX10	572.50	592.50	3	1	2006-02-21 17:03	2006-02-21 18:16	___KLX10_0572.50_200602211703.ht2	P, Q, Te	
KLX10	592.50	612.50	3	1	2006-02-22 07:45	2006-02-22 08:59	___KLX10_0592.50_200602220745.ht2	P, Q, Te	
KLX10	612.50	632.50	3	1	2006-02-22 09:22	2006-02-22 10:36	___KLX10_0612.50_200602220922.ht2	P, Q, Te	
KLX10	632.50	652.50	3	1	2006-02-22 11:04	2006-02-22 12:19	___KLX10_0632.50_200602221104.ht2	P, Q, Te	
KLX10	652.50	672.50	3	1	2006-02-22 13:09	2006-02-22 14:23	___KLX10_0652.50_200602221309.ht2	P, Q, Te	
KLX10	672.50	692.50	3	1	2006-02-22 14:44	2006-02-22 15:37	___KLX10_0672.50_200602221444.ht2	P, Q, Te	
KLX10	696.50	716.50	3	1	2006-02-22 16:10	2006-02-22 17:23	___KLX10_0696.50_200602221610.ht2	P, Q, Te	
KLX10	716.50	736.50	3	1	2006-02-22 17:46	2006-02-22 19:00	___KLX10_0716.50_200602221746.ht2	P, Q, Te	
KLX10	736.50	756.50	3	1	2006-02-22 19:21	2006-02-22 20:34	___KLX10_0736.50_200602221921.ht2	P, Q, Te	
KLX10	756.50	776.50	3	1	2006-02-23 08:31	2006-02-23 09:34	___KLX10_0756.50_200602230831.ht2	P, Q, Te	
KLX10	776.50	796.50	3	1	2006-02-23 09:58	2006-02-23 11:11	___KLX10_0776.50_200602230958.ht2	P, Q, Te	
KLX10	796.50	816.50	3	1	2006-02-23 11:29	2006-02-23 12:42	___KLX10_0796.50_200602231129.ht2	P, Q, Te	
KLX10	816.50	836.50	3	1	2006-02-23 13:18	2006-02-23 14:50	___KLX10_0816.50_200602231318.ht2	P, Q, Te	
KLX10	836.50	856.50	3	1	2006-02-23 15:11	2006-02-23 16:26	___KLX10_0836.50_200602231511.ht2	P, Q, Te	
KLX10	856.50	876.50	3	1	2006-02-23 16:45	2006-02-23 17:29	___KLX10_0856.50_200602231645.ht2	P, Q, Te	
KLX10	876.50	896.50	3	1	2006-02-23 17:52	2006-02-23 19:06	___KLX10_0876.50_200602231752.ht2	P, Q, Te	
KLX10	892.50	912.50	3	1	2006-02-24 07:44	2006-02-24 08:31	___KLX10_0892.50_200602240744.ht2	P, Q, Te	
KLX10	912.50	932.50	3	1	2006-02-24 08:55	2006-02-24 09:44	___KLX10_0912.50_200602240855.ht2	P, Q, Te	
KLX10	932.50	952.50	3	1	2006-02-27 09:21	2006-02-27 10:09	___KLX10_0932.50_200602270921.ht2	P, Q, Te	
KLX10	952.50	972.50	3	1	2006-02-27 10:38	2006-02-27 11:57	___KLX10_0952.50_200602271038.ht2	P, Q, Te	
KLX10	972.50	992.50	3	1	2006-02-27 13:18	2006-02-27 14:37	___KLX10_0972.50_200602271318.ht2	P, Q, Te	
KLX10	120.20	125.20	3	1	2006-03-01 09:38	2006-03-01 11:17	___KLX10_0120.20_200603010938.ht2	P, Q, Te	
KLX10	169.60	174.60	3	1	2006-03-01 12:43	2006-03-01 13:48	___KLX10_0169.60_200603011243.ht2	P, Q, Te	
KLX10	297.50	302.50	3	1	2006-03-01 15:22	2006-03-01 16:44	___KLX10_0297.50_200603011522.ht2	P, Q, Te	
KLX10	302.50	307.50	3	1	2006-03-01 17:02	2006-03-01 18:23	___KLX10_0302.50_200603011702.ht2	P, Q, Te	
KLX10	307.00	312.00	3	1	2006-03-01 18:42	2006-03-01 19:58	___KLX10_0307.00_200603011842.ht2	P, Q, Te	
KLX10	312.50	317.50	3	1	2006-03-02 08:24	2006-03-02 09:15	___KLX10_0312.50_200603020824.ht2	P, Q, Te	Interrupted [2)]
KLX10	312.50	317.50	3	2	2006-03-09 08:12	2006-03-10 09:29	___KLX10_0312.50_200603090812.ht2	P, Q, Te	Re-performed
KLX10	341.20	346.20	3	1	2006-03-09 10:39	2006-03-09 11:55	___KLX10_0341.20_200603091039.ht2	P, Q, Te	
KLX10	344.50	349.50	3	1	2006-03-09 12:59	2006-03-09 14:14	___KLX10_0344.50_200603091259.ht2	P, Q, Te	
KLX10	348.30	353.30	3	1	2006-03-09 14:28	2006-03-09 15:45	___KLX10_0348.30_200603091428.ht2	P, Q, Te	
KLX10	353.30	358.30	3	1	2006-03-09 15:59	2006-03-09 17:17	___KLX10_0353.30_200603091559.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		
KLX10	358.30	363.30	3	1	2006-03-09 17:29	2006-03-09 18:43	___KLX10_0358.30_200603091729.ht2	P, Q, Te	
KLX10	362.40	367.40	3	1	2006-03-10 07:15	2006-03-10 08:31	___KLX10_0362.40_200603100715.ht2	P, Q, Te	
KLX10	367.40	372.40	3	1	2006-03-10 08:46	2006-03-10 10:03	___KLX10_0367.40_200603100846.ht2	P, Q, Te	
KLX10	372.40	377.40	3	1	2006-03-10 10:18	2006-03-10 11:03	___KLX10_0372.40_200603101018.ht2	P, Q, Te	
KLX10	377.40	382.40	3	1	2006-03-13 08:15	2006-03-13 08:55	___KLX10_0377.40_200603130815.ht2	P, Q, Te	
KLX10	382.40	387.40	3	1	2006-03-13 09:16	2006-03-13 10:31	___KLX10_0382.40_200603130916.ht2	P, Q, Te	
KLX10	387.40	392.40	3	1	2006-03-13 10:41	2006-03-13 12:02	___KLX10_0387.40_200603131041.ht2	P, Q, Te	
KLX10	389.00	394.00	3	1	2006-03-13 12:28	2006-03-13 13:43	___KLX10_0389.00_200603131228.ht2	P, Q, Te	
KLX10	392.70	397.70	3	1	2006-03-13 13:50	2006-03-13 15:06	___KLX10_0392.70_200603131350.ht2	P, Q, Te	
KLX10	395.70	400.70	3	1	2006-03-13 15:22	2006-03-13 16:35	___KLX10_0395.70_200603131522.ht2	P, Q, Te	
KLX10	406.00	411.00	3	1	2006-03-13 16:54	2006-03-13 18:08	___KLX10_0406.00_200603131654.ht2	P, Q, Te	
KLX10	411.00	416.00	3	1	2006-03-14 07:31	2006-03-14 08:47	___KLX10_0411.00_200603140731.ht2	P, Q, Te	
KLX10	414.00	419.00	3	1	2006-03-14 08:56	2006-03-14 10:15	___KLX10_0414.00_200603140856.ht2	P, Q, Te	
KLX10	419.00	424.00	3	1	2006-03-14 10:46	2006-03-14 11:59	___KLX10_0419.00_200603141046.ht2	P, Q, Te	
KLX10	424.00	429.00	3	1	2006-03-14 13:30	2006-03-14 14:43	___KLX10_0424.00_200603141330.ht2	P, Q, Te	
KLX10	429.00	434.00	3	1	2006-03-14 14:56	2006-03-14 16:10	___KLX10_0429.00_200603141456.ht2	P, Q, Te	
KLX10	434.00	439.00	3	1	2006-03-14 16:21	2006-03-14 17:34	___KLX10_0434.00_200603141621.ht2	P, Q, Te	
KLX10	439.00	444.00	3	1	2006-03-14 17:46	2006-03-14 19:11	___KLX10_0439.00_200603141746.ht2	P, Q, Te	
KLX10	442.50	447.50	3	1	2006-03-15 07:26	2006-03-15 08:47	___KLX10_0442.50_200603150726.ht2	P, Q, Te	
KLX10	447.50	452.50	3	1	2006-03-15 09:03	2006-03-15 10:16	___KLX10_0447.50_200603150903.ht2	P, Q, Te	
KLX10	452.50	457.50	3	1	2006-03-15 10:26	2006-03-15 11:40	___KLX10_0452.50_200603151026.ht2	P, Q, Te	
KLX10	457.50	462.50	3	1	2006-03-15 12:27	2006-03-15 13:41	___KLX10_0457.50_200603151227.ht2	P, Q, Te	
KLX10	462.50	467.50	3	1	2006-03-15 13:54	2006-03-15 14:33	___KLX10_0462.50_200603151354.ht2	P, Q, Te	
KLX10	467.50	472.50	3	1	2006-03-15 14:51	2006-03-15 16:06	___KLX10_0467.50_200603151451.ht2	P, Q, Te	
KLX10	472.50	477.50	3	1	2006-03-15 16:14	2006-03-15 17:28	___KLX10_0472.50_200603151614.ht2	P, Q, Te	
KLX10	477.50	482.50	3	1	2006-03-15 17:38	2006-03-15 18:19	___KLX10_0477.50_200603151738.ht2	P, Q, Te	
KLX10	482.50	487.50	3	1	2006-03-16 07:17	2006-03-16 08:31	___KLX10_0482.50_200603160717.ht2	P, Q, Te	
KLX10	487.50	492.50	3	1	2006-03-16 08:41	2006-03-16 09:22	___KLX10_0487.50_200603160841.ht2	P, Q, Te	
KLX10	492.50	497.50	3	1	2006-03-16 09:36	2006-03-16 10:16	___KLX10_0492.50_200603160936.ht2	P, Q, Te	
KLX10	497.50	502.50	3	1	2006-03-16 10:25	2006-03-16 11:04	___KLX10_0497.50_200603161025.ht2	P, Q, Te	
KLX10	502.50	507.50	3	1	2006-03-16 11:13	2006-03-16 12:32	___KLX10_0502.50_200603161113.ht2	P, Q, Te	
KLX10	507.50	512.50	3	1	2006-03-16 12:45	2006-03-16 13:59	___KLX10_0507.50_200603161245.ht2	P, Q, Te	
KLX10	512.50	517.50	3	1	2006-03-16 14:10	2006-03-16 14:50	___KLX10_0512.50_200603161410.ht2	P, Q, Te	
KLX10	517.50	522.50	3	1	2006-03-16 14:58	2006-03-16 16:11	___KLX10_0517.50_200603161458.ht2	P, Q, Te	
KLX10	522.50	527.50	3	1	2006-03-16 16:21	2006-03-16 17:35	___KLX10_0522.50_200603161621.ht2	P, Q, Te	
KLX10	527.50	532.50	3	1	2006-03-17 07:45	2006-03-17 09:01	___KLX10_0527.50_200603170745.ht2	P, Q, Te	
KLX10	532.50	537.50	3	1	2006-03-17 09:09	2006-03-17 10:24	___KLX10_0532.50_200603170909.ht2	P, Q, Te	
KLX10	537.50	542.50	3	1	2006-03-17 10:36	2006-03-17 11:51	___KLX10_0537.50_200603171036.ht2	P, Q, Te	
KLX10	542.50	547.50	3	1	2006-03-20 13:37	2006-03-20 14:54	___KLX10_0542.50_200603201337.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		
KLX10	547.50	552.50	3	1	2006-03-20 15:19	2006-03-20 16:47	___KLX10_0547.50_200603201519.ht2	P, Q, Te	
KLX10	552.50	557.50	3	1	2006-03-20 17:03	2006-03-20 18:22	___KLX10_0552.50_200603201703.ht2	P, Q, Te	
KLX10	557.50	562.50	3	1	2006-03-21 08:25	2006-03-21 09:43	___KLX10_0557.50_200603210825.ht2	P, Q, Te	
KLX10	562.50	567.50	3	1	2006-03-21 09:56	2006-03-21 10:39	___KLX10_0562.50_200603210956.ht2	P, Q, Te	
KLX10	567.50	572.50	3	1	2006-03-21 10:58	2006-03-21 11:41	___KLX10_0567.50_200603211058.ht2	P, Q, Te	
KLX10	572.50	577.50	3	1	2006-03-21 12:04	2006-03-21 13:42	___KLX10_0572.50_200603211204.ht2	P, Q, Te	
KLX10	577.50	582.50	3	1	2006-03-21 13:58	2006-03-21 14:45	___KLX10_0577.50_200603211358.ht2	P, Q, Te	
KLX10	582.50	587.50	3	1	2006-03-21 14:59	2006-03-21 16:18	___KLX10_0582.50_200603211459.ht2	P, Q, Te	
KLX10	587.50	592.50	3	1	2006-03-21 16:30	2006-03-21 17:21	___KLX10_0587.50_200603211630.ht2	P, Q, Te	
KLX10	592.50	597.50	3	1	2006-03-21 17:45	2006-03-21 18:39	___KLX10_0592.50_200603211745.ht2	P, Q, Te	
KLX10	597.50	602.50	3	1	2006-03-21 18:54	2006-03-21 19:46	___KLX10_0597.50_200603211854.ht2	P, Q, Te	
KLX10	602.50	607.50	3	1	2006-03-22 08:31	2006-03-22 09:32	___KLX10_0602.50_200603220831.ht2	P, Q, Te	Interrupted[2]
KLX10	607.50	612.50	3	1	2006-03-22 09:46	2006-03-22 11:06	___KLX10_0607.50_200603220946.ht2	P, Q, Te	
KLX10	612.50	617.50	3	1	2006-03-22 11:21	2006-03-22 13:53	___KLX10_0612.50_200603221121.ht2	P, Q, Te	
KLX10	617.50	622.50	3	1	2006-03-22 14:14	2006-03-22 15:03	___KLX10_0617.50_200603221414.ht2	P, Q, Te	
KLX10	622.50	627.50	3	1	2006-03-22 15:15	2006-03-22 16:10	___KLX10_0622.50_200603221515.ht2	P, Q, Te	
KLX10	627.50	632.50	3	1	2006-03-22 16:28	2006-03-22 17:17	___KLX10_0627.50_200603221628.ht2	P, Q, Te	
KLX10	632.50	637.50	3	1	2006-03-22 17:29	2006-03-22 18:12	___KLX10_0632.50_200603221729.ht2	P, Q, Te	
KLX10	637.50	642.50	3	1	2006-03-22 18:29	2006-03-22 19:44	___KLX10_0637.50_200603221829.ht2	P, Q, Te	
KLX10	642.50	647.50	3	1	2006-03-23 08:19	2006-03-23 09:02	___KLX10_0642.50_200603230819.ht2	P, Q, Te	
KLX10	647.50	652.50	3	1	2006-03-23 11:07	2006-03-23 12:29	___KLX10_0647.50_200603231107.ht2	P, Q, Te	
KLX10	652.50	657.50	3	1	2006-03-23 13:42	2006-03-23 15:00	___KLX10_0652.50_200603231342.ht2	P, Q, Te	
KLX10	657.50	662.50	3	1	2006-03-23 16:59	2006-03-23 17:41	___KLX10_0657.50_200603231522.ht2	P, Q, Te	
KLX10	662.50	667.50	3	1	2006-03-23 18:06	2006-03-23 18:58	___KLX10_0662.50_200603231806.ht2	P, Q, Te	
KLX10	667.50	672.50	3	1	2006-03-24 07:27	2006-03-24 08:21	___KLX10_0667.50_200603240727.ht2	P, Q, Te	
KLX10	691.50	696.50	3	1	2006-03-24 08:51	2006-03-24 10:09	___KLX10_0691.50_200603240851.ht2	P, Q, Te	
KLX10	696.50	701.50	3	1	2006-03-24 10:28	2006-03-24 11:43	___KLX10_0696.50_200603241028.ht2	P, Q, Te	
KLX10	701.50	706.50	3	1	2006-03-27 13:44	2006-03-27 15:06	___KLX10_0701.50_200603271344.ht2	P, Q, Te	
KLX10	706.50	711.50	3	1	2006-03-27 15:29	2006-03-27 16:14	___KLX10_0706.50_200603271529.ht2	P, Q, Te	
KLX10	711.50	716.50	3	1	2006-03-27 16:34	2006-03-27 17:20	___KLX10_0711.50_200603271634.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:	KLX10
Testtype:	CHir (Constant Head injection and recovery)
Field crew:	K. Gokall-Norman, E. Gustavsson, J. Harrström, C. Hjerne, J. Jönsson, A. Lindquist, T. Svensson, E. Wallger.
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)
105.20	205.20	2006-01-13 08:36:45	2006-01-13 09:54:00	2006-01-13 10:24:11	2006-01-13 10:56:27	30	30
203.50	303.50	2006-01-16 14:41:28	2006-01-16 15:36:31	2006-01-16 16:06:47	2006-01-16 16:38:58	30	30
301.00	401.00	2006-01-16 17:46:50	2006-01-16 18:26:53	2006-01-16 18:57:03	2006-01-16 19:29:12	30	30
398.60	498.60	2006-01-17 10:06:18	2006-01-17 10:55:00	2006-01-17 11:25:19	2006-01-17 11:57:28	30	30
497.50	597.50	2006-01-17 15:01:27	2006-01-17 15:55:30	2006-01-17 16:26:03	2006-01-17 16:57:57	31	30
596.50	696.50	2006-01-17 18:19:29	2006-01-17 19:06:59	2006-01-17 19:37:25	2006-01-17 20:09:27	30	30
696.50	796.50	2006-01-18 09:56:14	2006-01-18 10:48:03	2006-01-18 11:18:27	2006-01-18 11:50:30	30	30
796.50	896.50	2006-01-18 14:19:08	2006-01-18 15:08:03	2006-01-18 15:38:21	2006-01-18 16:10:30	30	30
892.50	992.50	2006-01-18 17:36:12	2006-01-18 18:22:53	2006-01-18 18:53:22	2006-01-18 19:25:20	30	30
105.20	125.20	2006-02-16 17:28:42	2006-02-16 18:17:38	2006-02-16 18:38:06	2006-02-16 19:00:06	20	20
120.20	140.20	2006-02-16 19:45:12	2006-02-16 20:18:56	2006-02-16 20:39:07	2006-02-16 21:01:24	20	20
140.20	160.20	2006-02-17 08:22:31	2006-02-17 09:00:36	2006-02-17 09:21:00	2006-02-17 09:43:05	20	20
149.60	169.60	2006-02-17 10:28:43	2006-02-17 11:08:17	2006-02-17 11:28:41	2006-02-17 11:50:46	20	20
174.60	194.60	2006-02-20 08:59:22	2006-02-20 09:32:06	2006-02-20 09:52:29	2006-02-20 10:14:35	20	20
191.30	211.30	2006-02-20 11:01:07	2006-02-20 11:33:23	2006-02-20 11:53:36	2006-02-20 12:15:53	20	20
214.00	234.00	2006-02-20 13:19:46	2006-02-20 13:50:47	2006-02-20 14:11:03	2006-02-20 14:33:17	20	20
222.50	242.50	2006-02-20 14:51:47	2006-02-20 15:22:48	2006-02-20 15:43:03	2006-02-20 16:05:18	20	20
242.50	262.50	2006-02-20 16:25:45	2006-02-20 16:57:11	2006-02-20 17:17:25	2006-02-20 17:39:40	20	20
262.50	282.50	2006-01-24 16:07:47	2006-01-24 16:47:26	2006-01-24 17:07:46	2006-01-24 17:29:54	20	20
282.50	302.50	2006-01-24 17:54:04	2006-01-24 18:26:36	2006-01-24 18:46:56	2006-01-24 19:09:04	20	20
297.50	317.50	2006-01-25 08:05:43	2006-01-25 08:49:44	2006-01-25 09:10:07	2006-01-25 09:32:13	20	20
318.20	338.20	2006-01-25 10:01:58	2006-01-25 10:34:13	2006-01-25 10:54:23	2006-01-25 11:16:37	20	20
339.20	359.20	2006-01-25 11:44:15	2006-01-25 12:16:25	2006-01-25 12:36:43	2006-01-25 12:58:54	20	20
359.20	379.20	2006-01-25 14:17:21	2006-01-25 15:02:12	2006-01-25 15:22:33	2006-01-25 15:44:41	20	20
377.70	397.70	2006-01-25 16:21:29	2006-01-25 16:59:02	2006-01-25 17:19:22	2006-01-25 17:41:31	20	20
398.60	418.60	2006-01-25 18:10:04	2006-01-25 18:48:26	2006-01-25 19:08:46	2006-01-25 19:30:55	20	20
418.60	438.60	2006-01-26 07:45:45	2006-01-26 08:18:51	2006-01-26 08:38:49	2006-01-26 09:01:20	20	20
432.50	452.50	2006-01-26 09:25:04	2006-01-26 09:57:41	2006-01-26 10:18:01	2006-01-26 10:40:10	20	20
452.50	472.50	2006-01-26 13:55:17	2006-01-26 14:28:56	2006-01-26 14:49:22	2006-01-26 15:11:25	20	20
472.50	492.50	2006-02-21 08:19:43	2006-02-21 08:53:01	2006-02-21 09:13:22	2006-02-21 09:35:28	20	20
492.50	512.50	2006-02-21 10:05:14	2006-02-21 10:36:26	2006-02-21 10:56:49	2006-02-21 11:18:54	20	20
512.50	532.50	2006-02-21 11:33:49	2006-02-21 12:41:24	2006-02-21 13:01:43	2006-02-21 13:23:51	20	20
532.50	552.50	2006-02-21 13:43:49	2006-02-21 14:14:49	2006-02-21 14:35:09	2006-02-21 14:57:17	20	20
552.50	572.50	2006-02-21 15:20:54	2006-02-21 15:52:44	2006-02-21 16:13:03	2006-02-21 16:35:11	20	20
572.50	592.50	2006-02-21 17:03:17	2006-02-21 17:34:27	2006-02-21 17:54:47	2006-02-21 18:16:55	20	20
592.50	612.50	2006-02-22 07:45:19	2006-02-22 08:16:58	2006-02-22 08:37:17	2006-02-22 08:59:25	20	20
612.50	632.50	2006-02-22 09:22:54	2006-02-22 09:54:22	2006-02-22 10:14:46	2006-02-22 10:36:49	20	20
632.50	652.50	2006-02-22 11:04:17	2006-02-22 11:36:52	2006-02-22 11:57:23	2006-02-22 12:19:19	21	20
652.50	672.50	2006-02-22 13:09:31	2006-02-22 13:41:28	2006-02-22 14:01:50	2006-02-22 14:23:55	20	20
672.50	692.50	2006-02-22 14:44:22	2006-02-22 15:16:34	2006-02-22 15:29:52	2006-02-22 15:37:22	13	5
696.50	716.50	2006-02-22 16:10:21	2006-02-22 16:41:30	2006-02-22 17:01:46	2006-02-22 17:23:57	20	20
716.50	736.50	2006-02-22 17:46:28	2006-02-22 18:18:00	2006-02-22 18:38:19	2006-02-22 19:00:27	20	20
736.50	756.50	2006-02-22 19:21:13	2006-02-22 19:52:16	2006-02-22 20:12:52	2006-02-22 20:34:43	21	20
756.50	776.50	2006-02-23 08:31:19	2006-02-23 09:03:08	2006-02-23 09:23:04	2006-02-23 09:34:15	20	9
776.50	796.50	2006-02-23 09:58:05	2006-02-23 10:29:17	2006-02-23 10:49:39	2006-02-23 11:11:44	20	20
796.50	816.50	2006-02-23 11:29:17	2006-02-23 12:00:15	2006-02-23 12:20:11	2006-02-23 12:42:41	20	20
816.50	836.50	2006-02-23 13:18:05	2006-02-23 14:07:50	2006-02-23 14:28:12	2006-02-23 14:50:17	20	20
836.50	856.50	2006-02-23 15:11:43	2006-02-23 15:43:37	2006-02-23 16:03:53	2006-02-23 16:26:04	20	20
856.50	876.50	2006-02-23 16:45:11	2006-02-23 17:20:47	2006-02-23 17:21:43	2006-02-23 17:29:13	1	5
876.50	896.50	2006-02-23 17:52:43	2006-02-23 18:23:42	2006-02-23 18:44:15	2006-02-23 19:06:09	21	20
892.50	912.50	2006-02-24 07:44:56	2006-02-24 08:19:22	2006-02-24 08:24:08	2006-02-24 08:31:39	5	5
912.50	932.50	2006-02-24 08:55:12	2006-02-24 09:30:09	2006-02-24 09:36:52	2006-02-24 09:44:12	7	5
932.50	952.50	2006-02-27 09:21:54	2006-02-27 09:58:13	2006-02-27 10:01:50	2006-02-27 10:09:20	4	5
952.50	972.50	2006-02-27 10:38:08	2006-02-27 11:15:19	2006-02-27 11:35:36	2006-02-27 11:57:44	20	20
972.50	992.50	2006-02-27 13:18:05	2006-02-27 13:54:49	2006-02-27 14:15:23	2006-02-27 14:37:17	21	20
120.20	125.20	2006-03-01 09:38:04	2006-03-01 10:35:28	2006-03-01 10:55:31	2006-03-01 11:17:36	20	20
169.60	174.60	2006-03-01 12:43:09	2006-03-01 13:35:57	2006-03-01 13:41:26	2006-03-01 13:48:56	5	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)
297.50	302.50	2006-03-01 15:22:48	2006-03-01 16:02:33	2006-03-01 16:22:54	2006-03-01 16:44:45	20	20
302.50	307.50	2006-03-01 17:02:08	2006-03-01 17:41:43	2006-03-01 18:02:05	2006-03-01 18:23:59	20	20
307.00	312.00	2006-03-01 18:42:40	2006-03-01 19:16:08	2006-03-01 19:36:30	2006-03-01 19:58:24	20	20
312.50	317.50	2006-03-09 08:12:08	2006-03-09 09:08:38	2006-03-09 09:29:11	2006-03-10 09:29:12	21	20
341.20	346.20	2006-03-09 10:39:20	2006-03-09 11:12:55	2006-03-09 11:33:11	2006-03-09 11:55:22	20	20
344.50	349.50	2006-03-09 12:59:49	2006-03-09 13:31:50	2006-03-09 13:52:15	2006-03-09 14:14:17	20	20
348.30	353.30	2006-03-09 14:28:17	2006-03-09 15:02:59	2006-03-09 15:23:33	2006-03-09 15:45:26	21	20
353.30	358.30	2006-03-09 15:59:19	2006-03-09 16:34:54	2006-03-09 16:55:06	2006-03-09 17:17:21	20	20
358.30	363.30	2006-03-09 17:29:16	2006-03-09 18:00:52	2006-03-09 18:21:08	2006-03-09 18:43:19	20	20
362.40	367.40	2006-03-10 07:15:46	2006-03-10 07:48:35	2006-03-10 08:09:04	2006-03-10 08:31:02	20	20
367.40	372.40	2006-03-10 08:46:21	2006-03-10 09:20:57	2006-03-10 09:41:31	2006-03-10 10:03:24	21	20
372.40	377.40	2006-03-10 10:18:24	2006-03-10 10:54:40	2006-03-10 10:55:52	2006-03-10 11:03:22	1	5
377.40	382.40	2006-03-13 08:15:07	2006-03-13 08:46:48	2006-03-13 08:48:17	2006-03-13 08:55:47	1	5
382.40	387.40	2006-03-13 09:16:34	2006-03-13 09:50:48	2006-03-13 10:11:05	2006-03-13 10:31:54	20	20
387.40	392.40	2006-03-13 10:41:43	2006-03-13 11:20:08	2006-03-13 11:40:35	2006-03-13 12:02:37	20	20
389.00	394.00	2006-03-13 12:28:02	2006-03-13 13:00:57	2006-03-13 13:21:25	2006-03-13 13:43:13	20	20
392.70	397.70	2006-03-13 13:50:20	2006-03-13 14:23:42	2006-03-13 14:44:06	2006-03-13 15:06:11	20	20
395.70	400.70	2006-03-13 15:22:01	2006-03-13 15:53:20	2006-03-13 16:13:38	2006-03-13 16:35:49	20	20
406.00	411.00	2006-03-13 16:54:24	2006-03-13 17:26:24	2006-03-13 17:46:42	2006-03-13 18:08:53	20	20
411.00	416.00	2006-03-14 07:31:30	2006-03-14 08:04:51	2006-03-14 08:25:12	2006-03-14 08:47:20	20	20
414.00	419.00	2006-03-14 08:56:50	2006-03-14 09:32:36	2006-03-14 09:52:50	2006-03-14 10:15:04	20	20
419.00	424.00	2006-03-14 10:46:25	2006-03-14 11:17:30	2006-03-14 11:37:45	2006-03-14 11:59:59	20	20
424.00	429.00	2006-03-14 13:30:10	2006-03-14 14:01:27	2006-03-14 14:21:45	2006-03-14 14:43:56	20	20
429.00	434.00	2006-03-14 14:56:16	2006-03-14 15:28:09	2006-03-14 15:48:24	2006-03-14 16:10:38	20	20
434.00	439.00	2006-03-14 16:21:04	2006-03-14 16:51:49	2006-03-14 17:12:03	2006-03-14 17:34:18	20	20
439.00	444.00	2006-03-14 17:46:55	2006-03-14 18:28:58	2006-03-14 18:49:14	2006-03-14 19:11:28	20	20
442.50	447.50	2006-03-15 07:26:43	2006-03-15 08:04:46	2006-03-15 08:25:04	2006-03-15 08:47:15	20	20
447.50	452.50	2006-03-15 09:03:25	2006-03-15 09:34:25	2006-03-15 09:54:40	2006-03-15 10:16:54	20	20
452.50	457.50	2006-03-15 10:26:03	2006-03-15 10:57:33	2006-03-15 11:17:50	2006-03-15 11:40:01	20	20
457.50	462.50	2006-03-15 12:27:55	2006-03-15 12:59:08	2006-03-15 13:19:25	2006-03-15 13:41:37	20	20
462.50	467.50	2006-03-15 13:54:38	2006-03-15 14:26:13	2006-03-15 14:27:14	2006-03-15 14:33:28	1	5
467.50	472.50	2006-03-15 14:51:35	2006-03-15 15:23:32	2006-03-15 15:43:52	2006-03-15 16:06:00	20	20
472.50	477.50	2006-03-15 16:14:13	2006-03-15 16:46:19	2006-03-15 17:06:36	2006-03-15 17:28:47	20	20
477.50	482.50	2006-03-15 17:38:38	2006-03-15 18:10:41	2006-03-15 18:11:43	2006-03-15 18:19:13	1	5
482.50	487.50	2006-03-16 07:17:57	2006-03-16 07:49:00	2006-03-16 08:08:58	2006-03-16 08:31:28	20	20
487.50	492.50	2006-03-16 08:41:25	2006-03-16 09:13:06	2006-03-16 09:14:30	2006-03-16 09:22:00	1	5
492.50	497.50	2006-03-16 09:36:26	2006-03-16 10:07:26	2006-03-16 10:08:31	2006-03-16 10:16:01	1	5
497.50	502.50	2006-03-16 10:25:05	2006-03-16 10:56:04	2006-03-16 10:57:04	2006-03-16 11:04:34	1	5
502.50	507.50	2006-03-16 11:13:27	2006-03-16 12:23:27	2006-03-16 12:24:32	2006-03-16 12:32:02	1	5
507.50	512.50	2006-03-16 12:45:32	2006-03-16 13:16:35	2006-03-16 13:36:55	2006-03-16 13:59:04	20	20
512.50	517.50	2006-03-16 14:10:50	2006-03-16 14:41:59	2006-03-16 14:43:00	2006-03-16 14:50:30	1	5
517.50	522.50	2006-03-16 14:58:40	2006-03-16 15:29:23	2006-03-16 15:49:42	2006-03-16 16:11:51	20	20
522.50	527.50	2006-03-16 16:21:50	2006-03-16 16:53:02	2006-03-16 17:13:19	2006-03-16 17:35:30	20	20
527.50	532.50	2006-03-17 07:45:20	2006-03-17 08:18:38	2006-03-17 08:38:45	2006-03-17 09:01:00	20	20
532.50	537.50	2006-03-17 09:09:44	2006-03-17 09:41:40	2006-03-17 10:01:57	2006-03-17 10:24:08	20	20
537.50	542.50	2006-03-17 10:36:31	2006-03-17 11:08:48	2006-03-17 11:29:01	2006-03-17 11:51:16	20	20
542.50	547.50	2006-03-20 13:37:53	2006-03-20 14:12:13	2006-03-20 14:32:34	2006-03-20 14:54:40	20	20
547.50	552.50	2006-03-20 15:19:05	2006-03-20 16:04:50	2006-03-20 16:25:18	2006-03-20 16:47:21	20	20
552.50	557.50	2006-03-20 17:03:52	2006-03-20 17:40:27	2006-03-20 18:00:50	2006-03-20 18:22:55	20	20
557.50	562.50	2006-03-21 08:25:01	2006-03-21 09:00:51	2006-03-21 09:21:12	2006-03-21 09:43:18	20	20
562.50	567.50	2006-03-21 09:56:28	2006-03-21 10:30:15	2006-03-21 10:32:10	2006-03-21 10:39:40	2	5
567.50	572.50	2006-03-21 10:58:12	2006-03-21 11:31:29	2006-03-21 11:33:30	2006-03-21 11:41:00	2	5
572.50	577.50	2006-03-21 12:04:43	2006-03-21 13:30:11	2006-03-21 13:35:07	2006-03-21 13:42:38	5	5
577.50	582.50	2006-03-21 13:58:34	2006-03-21 14:35:44	2006-03-21 14:37:37	2006-03-21 14:45:07	2	5
582.50	587.50	2006-03-21 14:59:31	2006-03-21 15:36:24	2006-03-21 15:56:40	2006-03-21 16:18:50	20	20
587.50	592.50	2006-03-21 16:30:46	2006-03-21 17:11:26	2006-03-21 17:13:51	2006-03-21 17:21:22	2	5
592.50	597.50	2006-03-21 17:45:25	2006-03-21 18:21:00	2006-03-21 18:31:48	2006-03-21 18:39:19	11	5
597.50	602.50	2006-03-21 18:54:51	2006-03-21 19:28:37	2006-03-21 19:38:34	2006-03-21 19:46:04	10	5
602.50	607.50	2006-03-22 08:31:31	2006-03-22 09:13:37	2006-03-22 09:25:20	2006-03-22 09:32:51	12	5
607.50	612.50	2006-03-22 09:46:52	2006-03-22 10:23:57	2006-03-22 10:44:24	2006-03-22 11:06:29	20	20
612.50[1)]	617.50	2006-03-22 11:21:02	2006-03-22 12:56:16	2006-03-22 13:31:37	2006-03-22 13:53:35	35	20
617.50	622.50	2006-03-22 14:14:14	2006-03-22 14:49:46	2006-03-22 14:56:01	2006-03-22 15:03:32	6	5
622.50	627.50	2006-03-22 15:15:07	2006-03-22 15:56:24	2006-03-22 16:02:59	2006-03-22 16:10:29	7	5
627.50	632.50	2006-03-22 16:28:38	2006-03-22 17:01:15	2006-03-22 17:10:00	2006-03-22 17:17:31	9	5
632.50	637.50	2006-03-22 17:29:43	2006-03-22 18:03:12	2006-03-22 18:05:14	2006-03-22 18:12:44	2	5
637.50	642.50	2006-03-22 18:29:31	2006-03-22 19:02:05	2006-03-22 19:22:30	2006-03-22 19:44:32	20	20
642.50	647.50	2006-03-23 08:19:55	2006-03-23 08:53:19	2006-03-23 08:54:43	2006-03-23 09:02:13	1	5
647.50	652.50	2006-03-23 11:07:00	2006-03-23 11:47:00	2006-03-23 12:07:30	2006-03-23 12:29:32	21	20
652.50	657.50	2006-03-23 13:42:36	2006-03-23 14:18:26	2006-03-23 14:38:54	2006-03-23 15:00:56	20	20

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)
657.50	662.50	2006-03-23 16:59:44	2006-03-23 17:32:47	2006-03-23 17:34:22	2006-03-23 17:41:52	2	5
662.50	667.50	2006-03-23 18:06:37	2006-03-23 18:40:24	2006-03-23 18:51:02	2006-03-23 18:58:33	11	5
667.50	672.50	2006-03-24 07:27:42	2006-03-24 08:12:09	2006-03-24 08:13:58	2006-03-24 08:21:28	2	5
691.50	696.50	2006-03-24 08:51:32	2006-03-24 09:26:45	2006-03-24 09:47:04	2006-03-24 10:09:12	20	20
696.50	701.50	2006-03-24 10:28:43	2006-03-24 11:01:09	2006-03-24 11:21:22	2006-03-24 11:43:36	20	20
701.50	706.50	2006-03-27 13:44:14	2006-03-27 14:23:37	2006-03-27 14:44:01	2006-03-27 15:06:04	20	20
706.50	711.50	2006-03-27 15:29:08	2006-03-27 16:04:09	2006-03-27 16:07:13	2006-03-27 16:14:44	3	5
711.50	716.50	2006-03-27 16:34:09	2006-03-27 17:09:16	2006-03-27 17:12:45	2006-03-27 17:20:57	3	6
105.20[2]	205.20	2006-01-09 14:55:52	2006-01-09 19:05:58	2006-01-09 19:07:10	2006-01-09 19:09:42	1	0
105.20[2]	205.20	2006-01-10 10:19:03	2006-01-10 10:58:02	2006-01-10 10:59:43	2006-01-10 11:04:09	2	2
105.20[2]	205.20	2006-01-10 11:17:00	2006-01-10 18:55:35	2006-01-10 18:55:46	2006-01-10 18:58:38	0	0
105.20[2]	205.20	2006-01-12 17:38:34	2006-01-12 18:23:45	2006-01-12 18:25:33	2006-01-12 18:35:20	2	8
105.20[2]	205.20	2006-01-12 18:43:26	2006-01-12 19:22:14	2006-01-12 19:36:32	2006-01-12 19:39:07	14	0
312.50[2]	317.50	2006-03-02 08:24:06	2006-03-02 09:04:38	2006-03-02 09:13:21	2006-03-02 09:15:31	9	0

[1)] The injection period is longer than usual.
[2)]The tests were interrupted for various reasons or did not provide satisfying data for the evaluation and were hence re-performed later.

Appendix 2.2 Pressure and flow data

Summary of pressure and flow data for all tests in KLX10

Test section		Pressure			Flow		
secup	seclow	p_i	p_p	p_F	Q_p 1)	Q_m 2)	V_p 2)
(m)	(m)	(kPa)	(kPa)	(kPa)	(m^3/s)	(m^3/s)	(m^3)
105.20	205.20	1076.25	1144.73	1076.53	0.000683	0.000693	1.25E+00
203.50	303.50	2034	2188	2035.96	0.000338	0.000349	6.34E-01
301.00	401.00	2988.95	3003.63	2991.55	0.000429	0.000471	8.54E-01
398.60	498.60	3948.25	4150.51	3950.45	0.00013	0.000148	2.69E-01
497.50	597.50	4912.34	5117.08	4934.02	2.29E-06	2.81E-06	5.14E-03
596.50	696.50	5867.66	6072.54	5868.76	1.62E-06	1.86E-06	3.40E-03
696.50	796.50	6858.39	7096.6	7006.59	9.91E-06	2.67E-05	4.87E-02
796.50	896.50	7802.87	8244.8	7808.50	6.3E-06	7.07E-06	1.29E-02
892.50	992.50	8784.95	8989.7	8913.39	3.4E-08	8.53E-08	1.57E-04
105.20	125.20	1085.32	1269.33	1086.70	0.000439	0.000449	5.51E-01
120.20	140.20	1233.24	1434.13	1233.24	0.000149	0.000153	1.86E-01
140.20	160.20	1424.25	1627.3	1424.81	0.000169	0.000174	2.13E-01
149.60	169.60	1514.819	1716.25	1515.36	0.000104	0.000104	1.26E-01
174.60	194.60	1760.711	1917.56	1761.81	0.000347	0.000352	4.32E-01
191.30	211.30	1922.63	1998.24	1923.19	0.000428	0.000434	5.27E-01
214.00	234.00	2143.28	2343.62	2143.28	0.000106	0.000109	1.33E-01
222.50	242.50	2226.71	2429.93	2226.71	0.000113	0.000115	1.40E-01
242.50	262.50	2421.97	2640.55	2423.21	0.000115	0.000118	1.44E-01
262.50	282.50	2613.25	2814	2614.21	1.45E-06	1.62E-06	1.99E-03
282.50	302.50	2809.2	3010.8	2810.17	3.52E-06	3.85E-06	4.72E-03
297.50	317.50	2957.81	3157.6	2957.81	5.5E-07	5.91E-07	7.25E-04
318.20	338.20	3160.35	3177.09	3162.55	0.00052	0.000559	6.76E-01
339.20	359.20	3367.55	3543.74	3368.37	2.65E-05	2.75E-05	3.36E-02
359.20	379.20	3563.91	3764.66	3564.33	5.9E-06	6.52E-06	7.96E-03
377.70	397.70	3744.35	3946.89	3744.90	5.78E-06	8E-06	9.77E-03
398.60	418.60	3950.18	4089.74	3950.73	2.41E-05	2.57E-05	3.14E-02
418.60	438.60	4148.6	4353.61	4149.43	0.000128	0.000134	1.61E-01
432.50	452.50	4283.07	4484.1	4282.79	1.91E-05	2.07E-05	2.53E-02
452.50	472.50	4480.39	4681.01	4480.39	6.21E-07	6.73E-07	8.25E-04
472.50	492.50	4711.75	4930.48	4791.06	1.8E-08	2.19E-08	2.62E-05
492.50	512.50	4883.82	5095.14	4907.43	2.36E-08	3.23E-08	3.95E-05
512.50	532.50	5070.71	5270.78	5127.52	1.73E-07	2.79E-07	3.40E-04
532.50	552.50	5259.253	5460.8	5262.55	1.51E-06	1.61E-06	1.97E-03
552.50	572.50	5462.883	5664.33	5517.77	6.94E-07	9.85E-07	1.20E-03
572.50	592.50	5665.97	5899.65	5672.00	6.53E-08	9.17E-08	1.12E-04
592.50	612.50	5860.82	6072	5962.91	8.15E-08	1.58E-07	1.93E-04
612.50	632.50	6066.93	6254.8	6178.62	1.26E-08	3.8E-08	4.55E-05
632.50	652.50	6243.8	6472.54	6230.76	1.3E-07	1.65E-07	2.04E-04
652.50	672.50	6454.29	6680.84	6477.20	2.3E-08	4.22E-08	5.15E-05
672.50	692.50	6673.16	6876.65	6883.93			
696.50	716.50	6870	7086.73	7010.72	1.1E-05	3.2E-05	3.89E-02
716.50	736.50	7080.29	7285.29	7129.82	1.28E-07	1.85E-07	2.26E-04
736.50	756.50	7297.23	7482.2	7522.27			
756.50	776.50	7490.44	7698.46	7708.89			
776.50	796.50	7677.32	7890.01	7773.11	1.1E-08	3.47E-08	4.14E-05
796.50	816.50	7880.69	8085.42	7952.04			
816.50	836.50	8011.18	8242.94	8010.77	8.3E-08	1E-07	1.23E-04
836.50	856.50	8202.73	8423.53	8203.97	2.79E-06	3.19E-06	3.89E-03
856.50	876.50	8491.86	8657.9	8665.58			
876.50	896.50	8668.88	8852.48	8736.38	6.1E-09	2.95E-08	3.53E-05
892.50	912.50	8823.52	9011.37	9016.31			
912.50	932.50	9020.56	9207.88	9211.17			
932.50	952.50	9207.04	9450.34	9452.12			
952.50	972.50	9381.2	9642.2	9516.34	2.13E-08	4.02E-08	4.83E-05
972.50	992.50	9581.11	9835.8	9755.65	2.74E-08	9.47E-08	1.17E-04
120.20	125.20	1081.21	1281.13	1081.76	4.03E-05	4.55E-05	5.47E-02
169.60	174.60	1588.37	1825.49	1805.73			
297.50	302.50	2812.22	3078.6	2813.46	1.13E-07	1.64E-07	2.00E-04
302.50	307.50	2863.13	3168.03	2863.96	9.59E-08	1.27E-07	1.55E-04
307.00	312.00	2909.1	3120.55	2908.96	2.75E-07	2.96E-07	3.62E-04
312.50	317.50	2962.76	3250.91	2963.30	6.26E-07	6.53E-07	8.06E-04
341.20	346.20	3242.13	3517.2	3243.23	4.54E-06	4.9E-06	5.95E-03
344.50	349.50	3276.44	3518.9	3276.71	1.26E-06	1.39E-06	1.70E-03

Test section		Pressure			Flow		
secup	**seclow**	**p_i**	**p_p**	**p_F**	**Q_p 1)**	**Q_m 2)**	**V_p 2)**
(m)	(m)	(kPa)	(kPa)	(kPa)	(m^3/s)	(m^3/s)	(m^3)
348.30	353.30	3314.72	3533.6	3324.46	1.35E-08	3.79E-08	4.66E-05
353.30	358.30	3366.04	3560.62	3366.18	2.45E-05	2.63E-05	3.20E-02
358.30	363.30	3413.24	3630.7	3413.37	6.2E-06	7.05E-06	8.58E-03
362.40	367.40	3451.66	3651.59	3451.80	5.54E-06	6.28E-06	7.74E-03
367.40	372.40	3503.81	3792.6	3510.54	4.5E-08	5.95E-08	7.35E-05
372.40	377.40	3687.27	3841.78	3879.38			
377.40	382.40	3700.17	3847.54	3902.98			
382.40	387.40	3647.75	3848.6	3648.30	1.09E-06	1.43E-06	1.74E-03
387.40	392.40	3700.85	3951.97	3700.45	2.22E-08	3.45E-08	4.13E-05
389.00	394.00	3730.22	3970.76	3744.35	1.61E-08	2.32E-08	2.78E-05
392.70	397.70	3750.94	3951.97	3751.48	8.86E-06	1.06E-05	1.29E-02
395.70	400.70	3780.45	3981.88	3780.59	1.18E-05	1.34E-05	1.64E-02
406.00	411.00	3881.58	4101.67	3881.02	3.38E-06	3.84E-06	4.68E-03
411.00	416.00	3928.8	4129.67	3929.32	8.15E-06	1.07E-05	1.31E-02
414.00	419.00	3958.69	4158.75	3959.51	6.04E-06	7.12E-06	8.66E-03
419.00	424.00	4009.18	4201.5	4009.45	5.46E-05	5.6E-05	6.72E-02
424.00	429.00	4058.86	4259.75	4059.42	6.99E-06	7.88E-06	9.61E-03
429.00	434.00	4107.72	4266.74	4108.26	5.32E-05	5.39E-05	6.56E-02
434.00	439.00	4157.11	4360.2	4157.66	1.94E-05	2.14E-05	2.60E-02
439.00	444.00	4208.29	4439.78	4207.05	5.5E-08	6.26E-08	7.64E-05
442.50	447.50	4238.61	4470.5	4239.44	1.37E-07	1.67E-07	2.04E-04
447.50	452.50	4289.25	4519.78	4287.74	2E-07	2.1E-07	2.55E-04
452.50	457.50	4338.65	4561.35	4338.25	5.97E-07	6.13E-07	7.48E-04
457.50	462.50	4391.48	4602.8	4391.48	7.72E-08	8.2E-08	1.00E-04
462.50	467.50	4510.58	4652.2	4700.50			
467.50	472.50	4520.6	4699.54	4522.11	6.99E-09	1.16E-08	1.39E-05
472.50	477.50	4586.33	4750.44	4589.07	7.6E-09	9E-09	1.08E-05
477.50	482.50	4618.58	4799.84	4811.37			
482.50	487.50	4652.06	4844.85	4737.82			
487.50	492.50	4716.14	4893.15	4876.68			
492.50	497.50	4884.64	4941.87	5060.56			
497.50	502.50	4890.82	4987.56	5042.45			
502.50	507.50	4847.32	5037.51	5042.99			
507.50	512.50	4892.33	5086.4	4876.68	3E-08	3.51E-08	4.29E-05
512.50	517.50	5048.21	5133.97	5202.18			
517.50	522.50	4975.62	5191.33	5056.71	1.33E-07	2.19E-07	2.67E-04
522.50	527.50	5076.47	5241.70	5109.96	1.33E-08	1.70E-08	2.04E-05
527.50	532.50	5085.26	5288.90	5071.54	7.72E-08	7.70E-08	9.31E-05
532.50	537.50	5120.00	5364.09	5130.26	8.6E-08	1.04E-07	1.27E-04
537.50	542.50	5158.12	5361.80	5158.26	1.27E-06	1.30E-06	1.57E-03
542.50	547.50	5214.11	5472.76	5212.05	5.16E-07	5.48E-07	6.70E-04
547.50	552.50	5293.01	5515.17	5340.49	2.38E-08	3.02E-08	3.70E-05
552.50	557.50	5312.90	5561.27	5318.53	1.61E-07	1.87E-07	2.29E-04
557.50	562.50	5361.48	5582.68	5410.74	7.71E-07	1.05E-06	1.28E-03
562.50	567.50	5549.61	5647.86	5691.22			
567.50	572.50	5655.27	5699.31	5862.47			
572.50	577.50	5536.85	5750.64	5756.54			
577.50	582.50	5702.33	5800.99	5781.23			
582.50	587.50	5616.99	5849.02	5616.57	8.05E-08	7.96E-08	9.68E-05
587.50	592.50	5802.78	5898.14	5910.77			
592.50	597.50	5783.57	5945.35	5872.34			
597.50	602.50	5768.20	5995.29	5955.78			
602.50	607.50	5853.00	6032.48	5950.83			
607.50	612.50	5871.66	6090.39	5992.55	5.7E-08	1.26E-07	1.55E-04
612.50	617.50	5920.64	6135.90	6035.92	1.07E-08	1.88E-08	3.91E-05
617.50	622.50	6013.68	6183.01	6163.25			
622.50	627.50	6041.13	6230.08	6201.13			
627.50	632.50	6152.14	6279.06	6267.53			
632.50	637.50	6284.42	6329.15	6464.04			
637.50	642.50	6170.39	6378.97	6156.66	1.65E-08	1.63E-08	1.94E-05
642.50	647.50	6236.12	6418.75	6411.35			
647.50	652.50	6231.31	6469.20	6244.48	4.15E-07	4.49E-07	5.51E-04
652.50	657.50	6316.67	6523.50	6329.01	2.04E-08	2.96E-08	3.63E-05
657.50	662.50	6436.32	6573.67	6642.43			
662.50	667.50	6480.78	6623.21	6638.58			
667.50	672.50	6510.96	6663.83	6760.97			
691.50	696.50	6668.90	6868.43	6670.41	1.66E-06	1.85E-06	2.26E-03
696.50	701.50	6720.77	6940.74	6855.93	1.24E-05	3.22E-05	3.91E-02
701.50	706.50	6781.01	6983.41	6781.84	3.34E-06	3.73E-06	4.56E-03
706.50	711.50	6862.66	7082.62	7104.57			
711.50	716.50	6929.62	7133.66	7125.44			

Test section		Pressure			Flow		
secup	seclow	p_i	p_p	p_F	Q_p [1)]	Q_m [2)]	V_p [2)]
(m)	(m)	(kPa)	(kPa)	(kPa)	(m^3/s)	(m^3/s)	(m^3)
105.20[3)]	205.20	1074.88	1075.02	1074.88			
105.20[3)]	205.20	1073.78	1073.92	1073.78	5.54E-08	5.08E-07	5.13E-05
105.20[3)]	205.20	1075.70	1075.70	1075.7	-	-	-
105.20[3)]	205.20	1074.33	1074.88	1073.24	7.8E-09		
105.20[3)]	205.20	1075.29	1076.12	1075.98	8.72E-09		
312.50[3)]	317.50	2962.76	3436.16	0	7.46E-07	8.60E-07	4.50E-04

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) No value indicates that the parameter could not be calculated due to low and uncertain flow rates during a major part of flow period
3) 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 Tests

In the following pages diagrams are presented for all test sections. A linear diagram of pressure and flow rate is presented for each test. For most tests are log-log and lin-log diagrams presented, from injection and recovery period respectively.

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 (-)

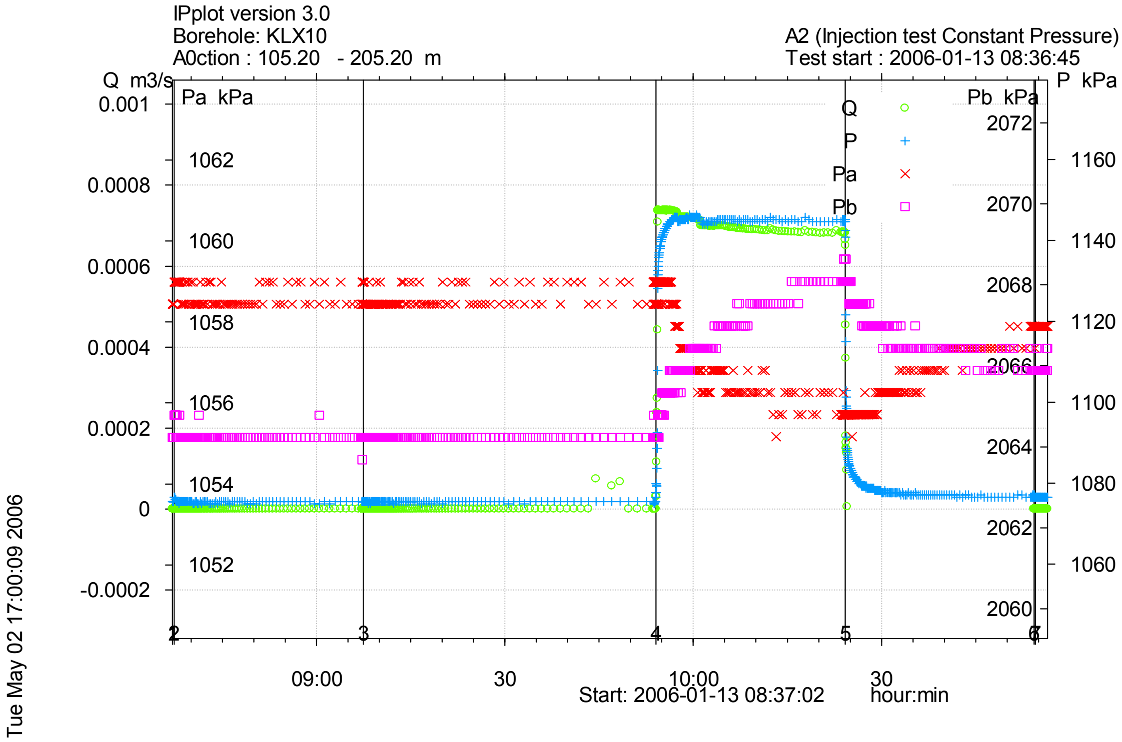


__Figure A3-1.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 105.2-205.2 m in borehole KLX10.

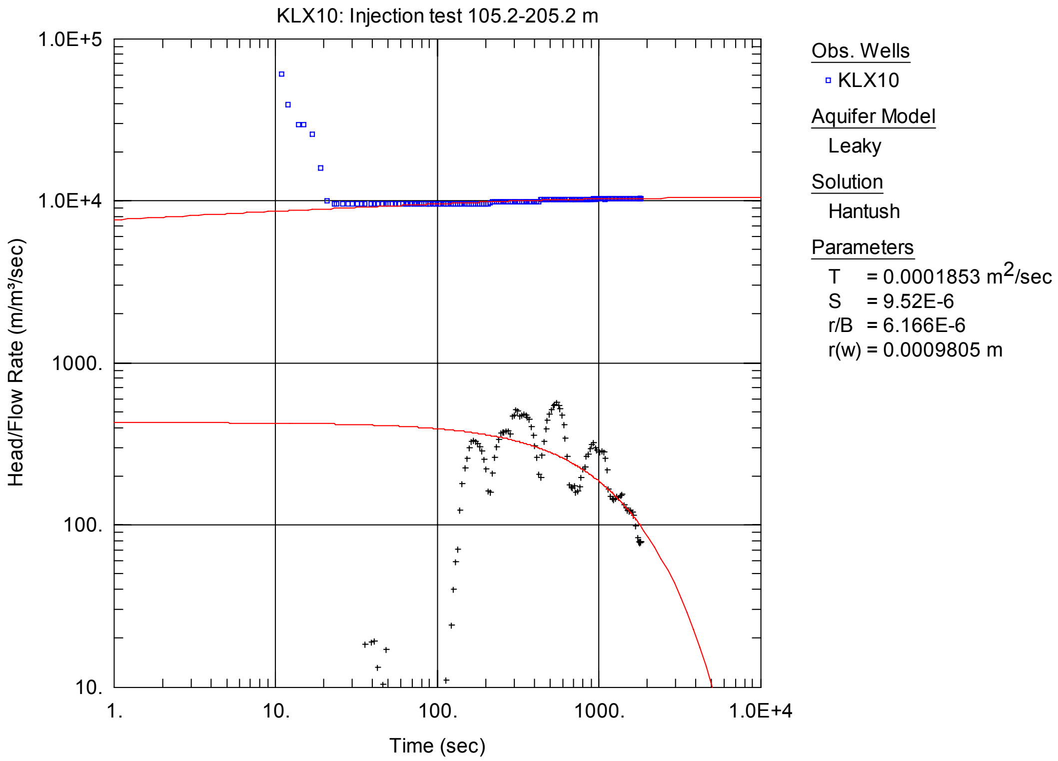


__Figure A3-2.__ Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 105.2-205.2 m in KLX10.

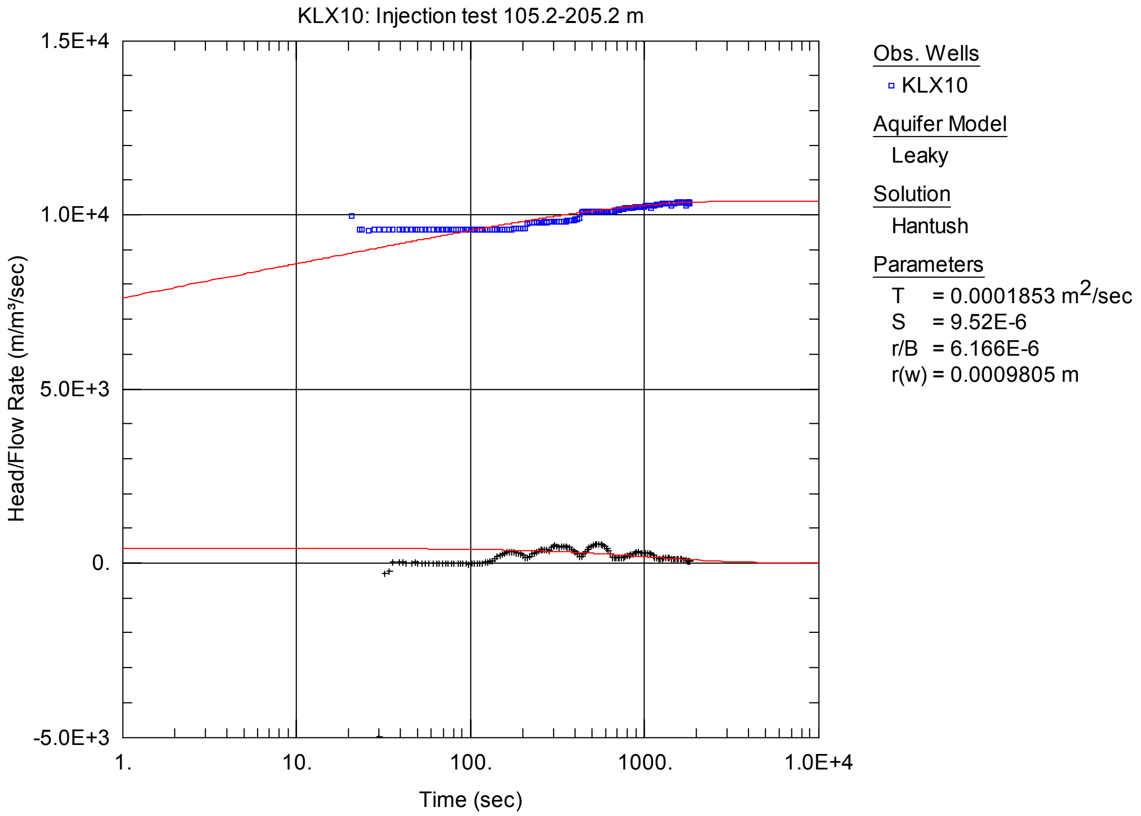


Figure A3-3. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 105.2-205.2 m in KLX10.*

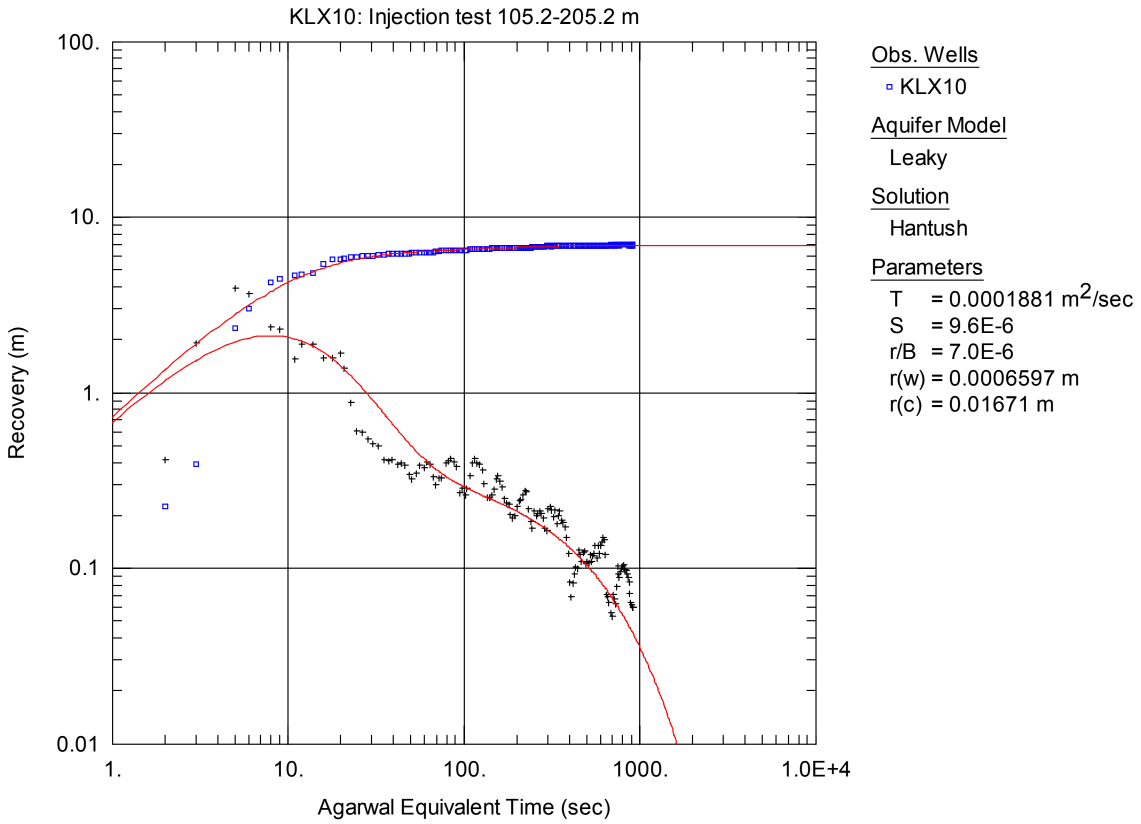


Figure A3-4. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 105.2-205.2 m in KLX10.*

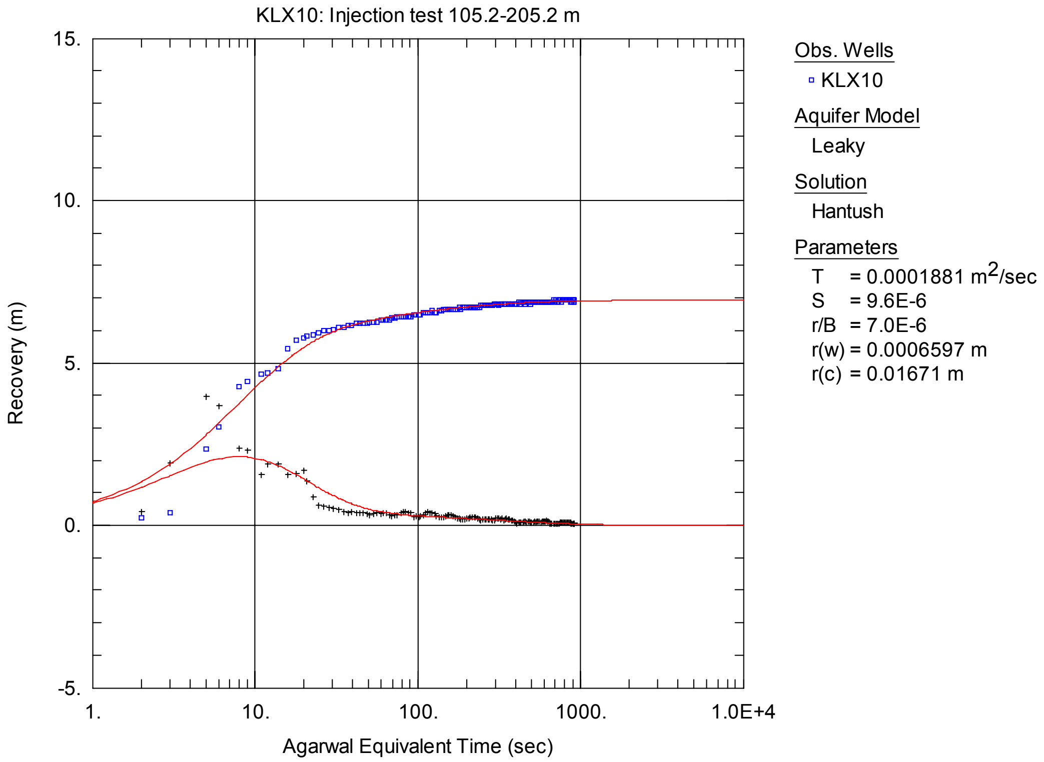


Figure A3-5. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 105.2-205.2 m in KLX10.*

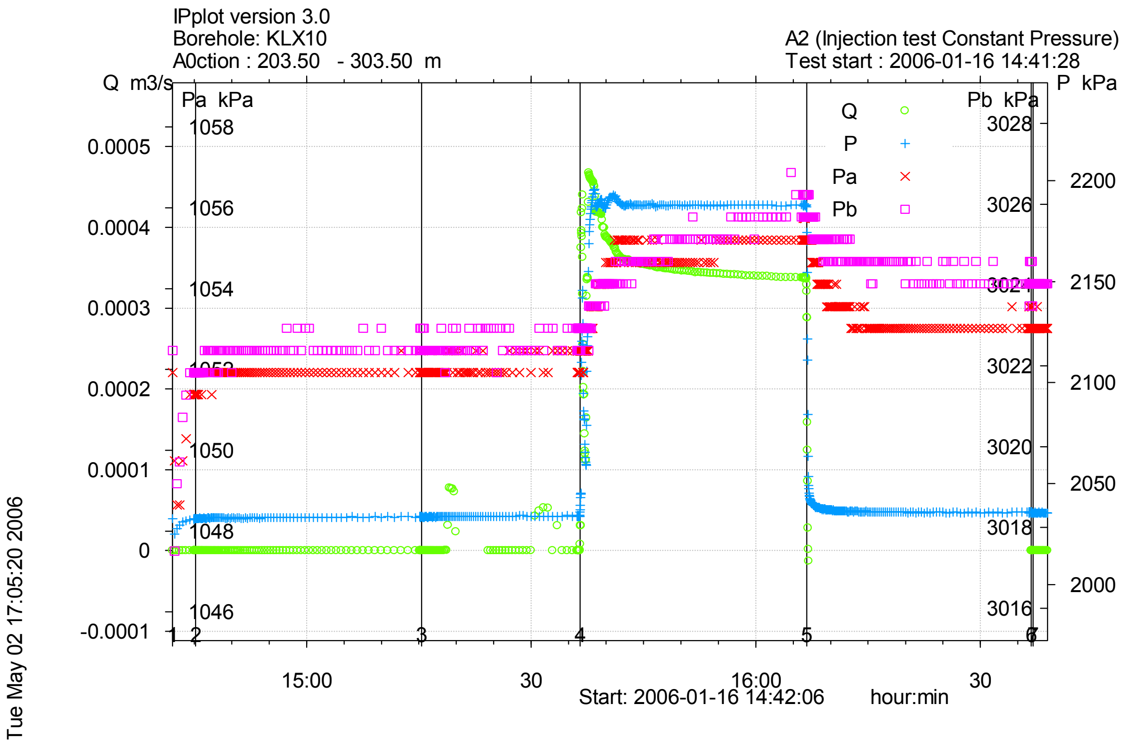


Figure A3-6. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 203.5-303.5 m in borehole KLX10.*

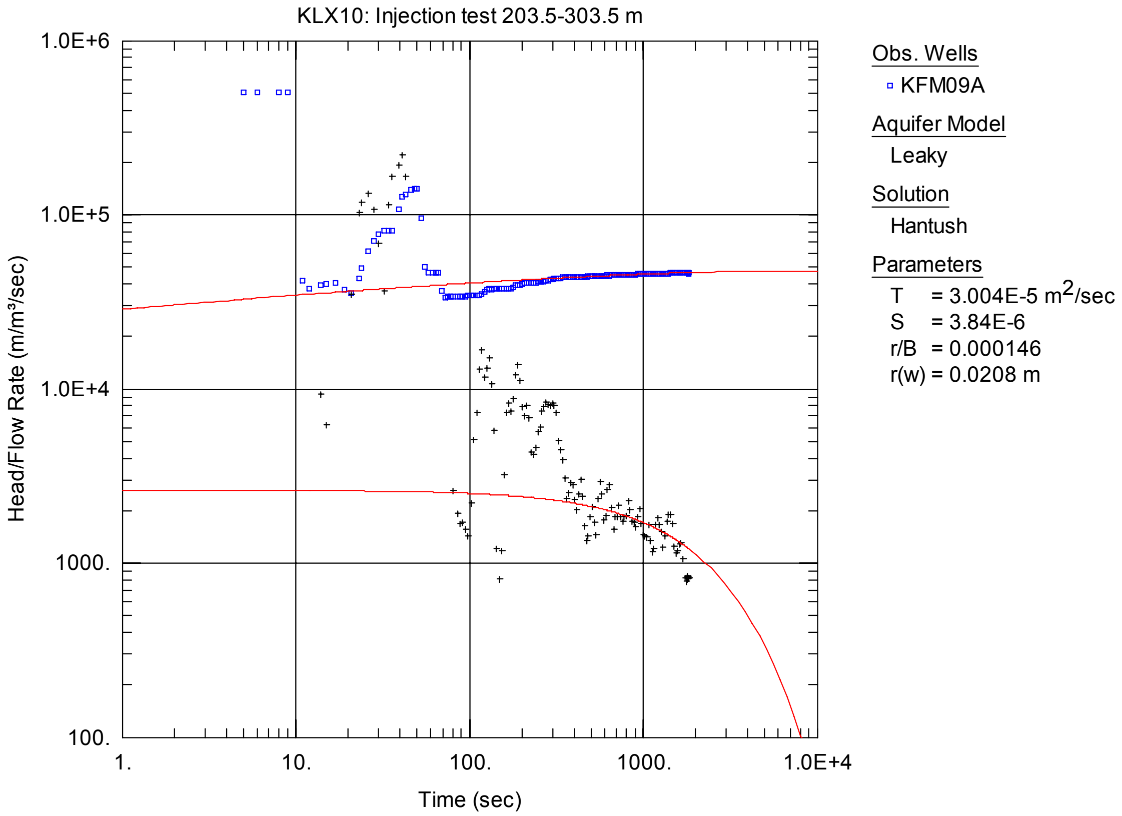


Figure A3-7. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 203.5-303.5 m in KLX10.*

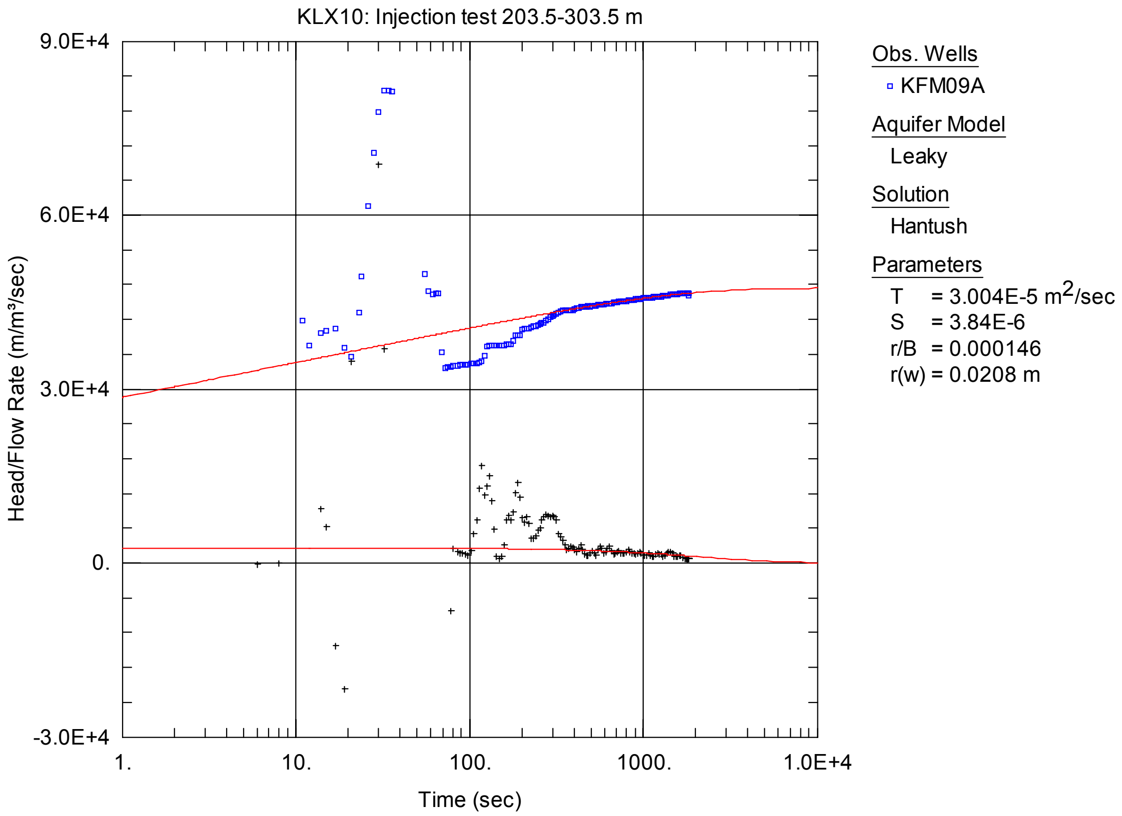


Figure A3-8. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 203.5-303.5 m in KLX10.*

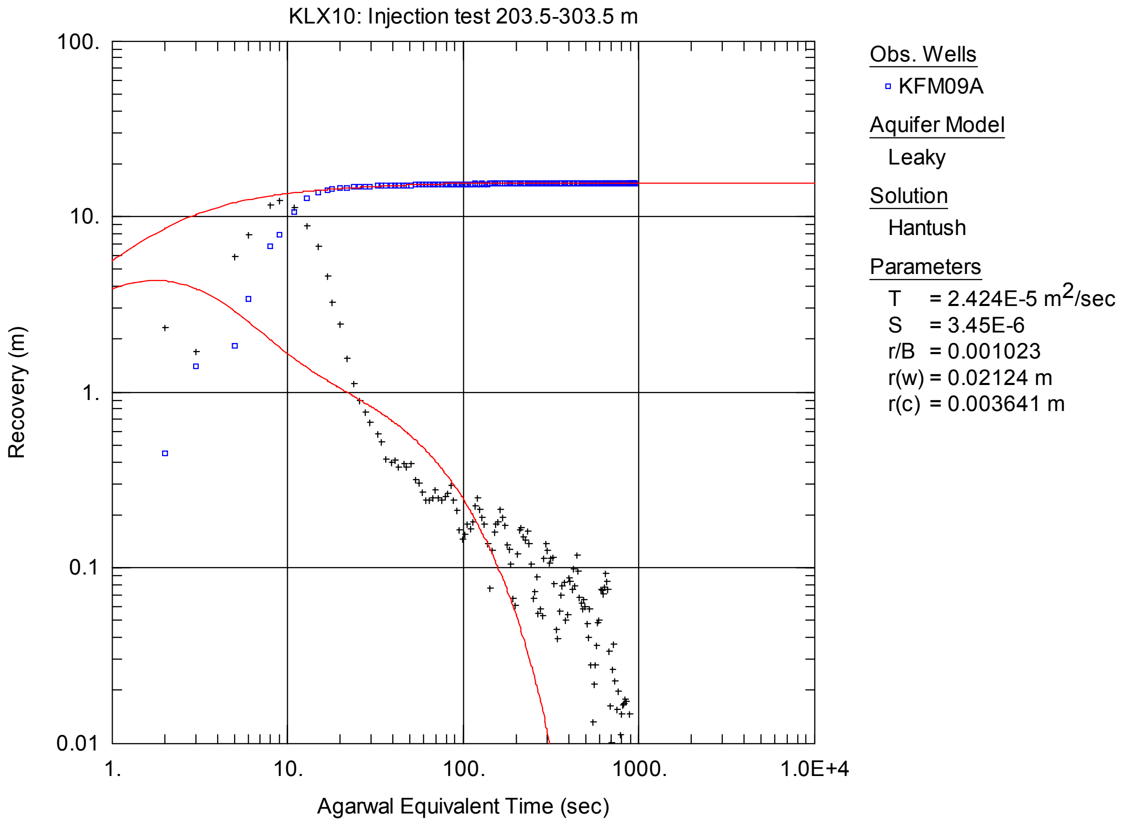


Figure A3-9. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 203.5-303.5 m in KLX10.*

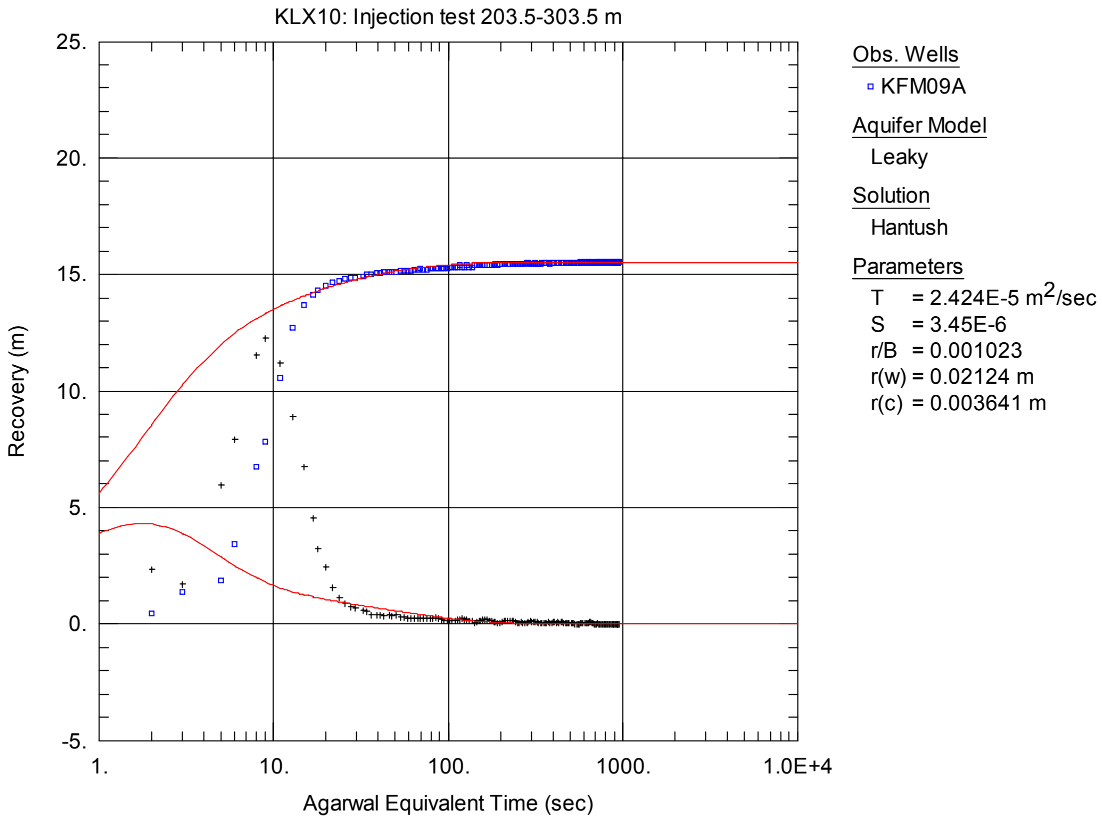


Figure A3-10. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 203.5-303.5 m in KLX10.*

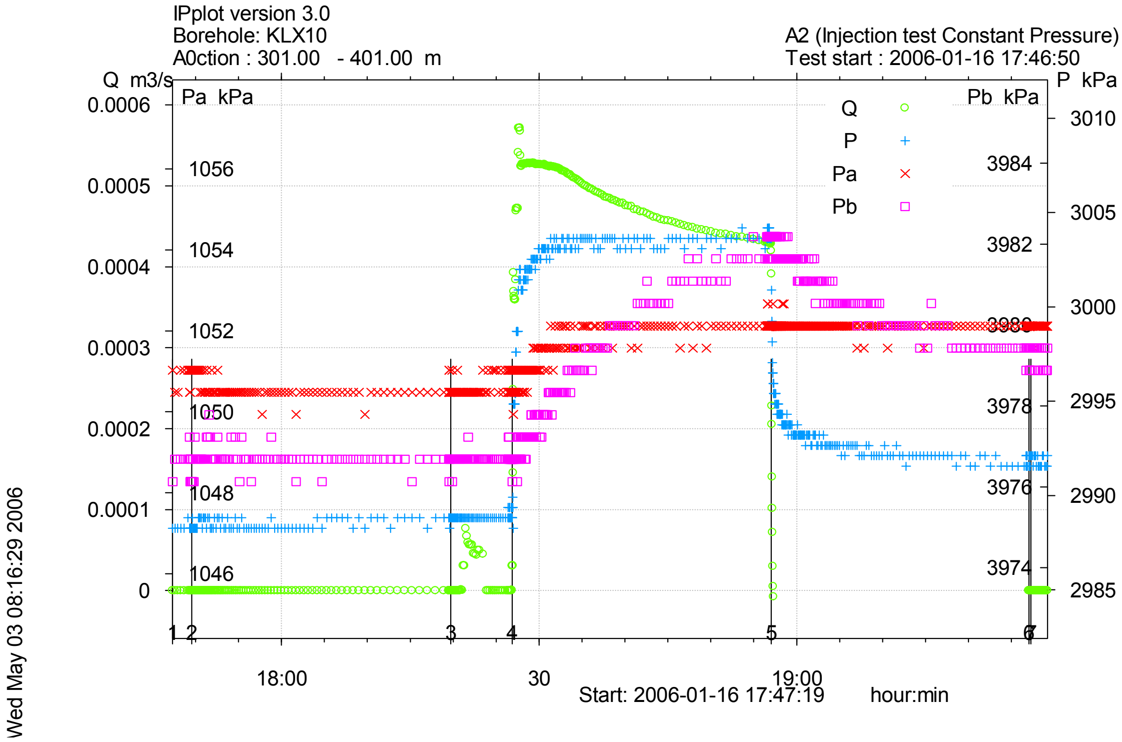


Figure A3-11. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 301.0-401.0 m in borehole KLX10.*

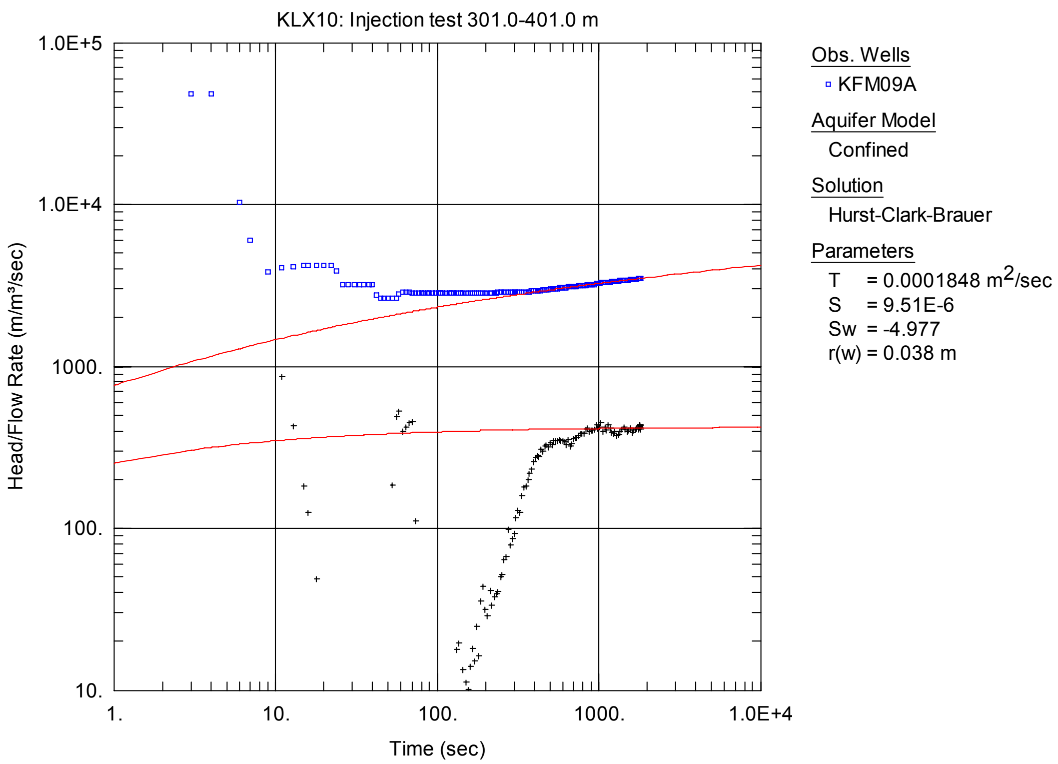


Figure A3-12. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 301.0-401.0 m in KLX10.*

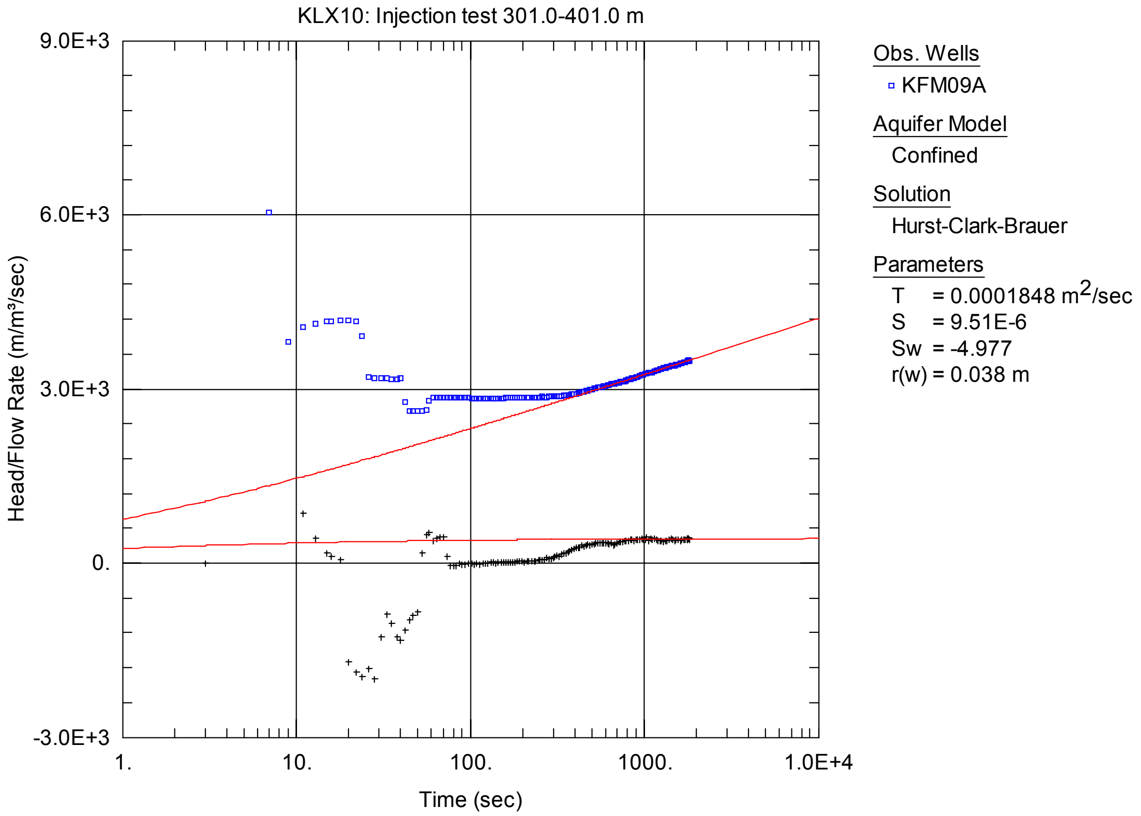


Figure A3-13. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 301.0-401.0 m in KLX10.*

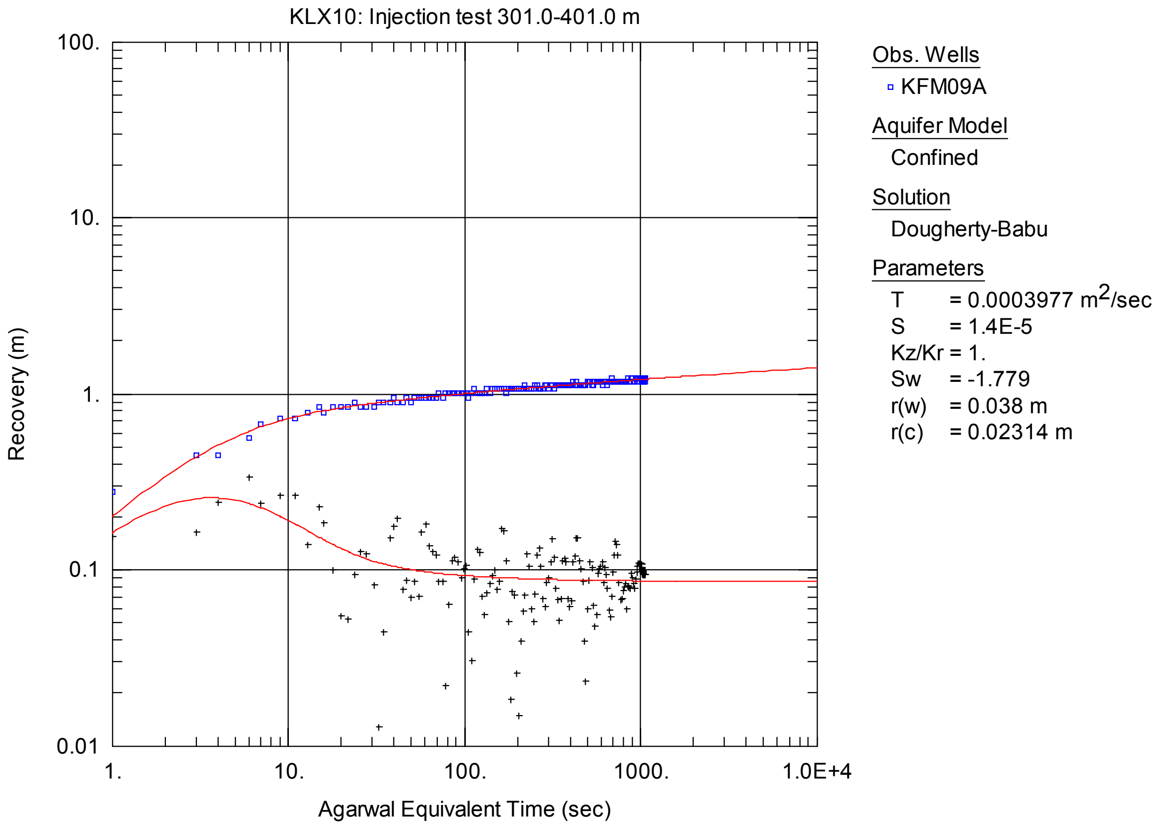


Figure A3-14. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 301.0-401.0 m in KLX10.*

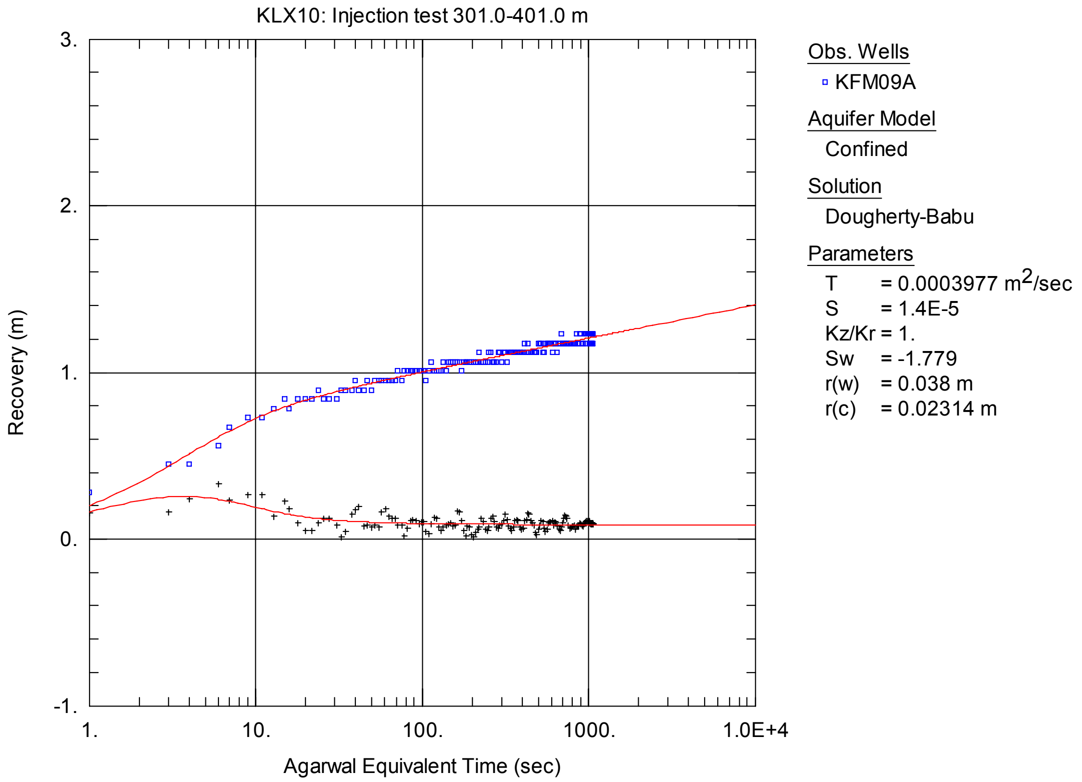


Figure A3-15. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 301.0-401.0 m in KLX10.*

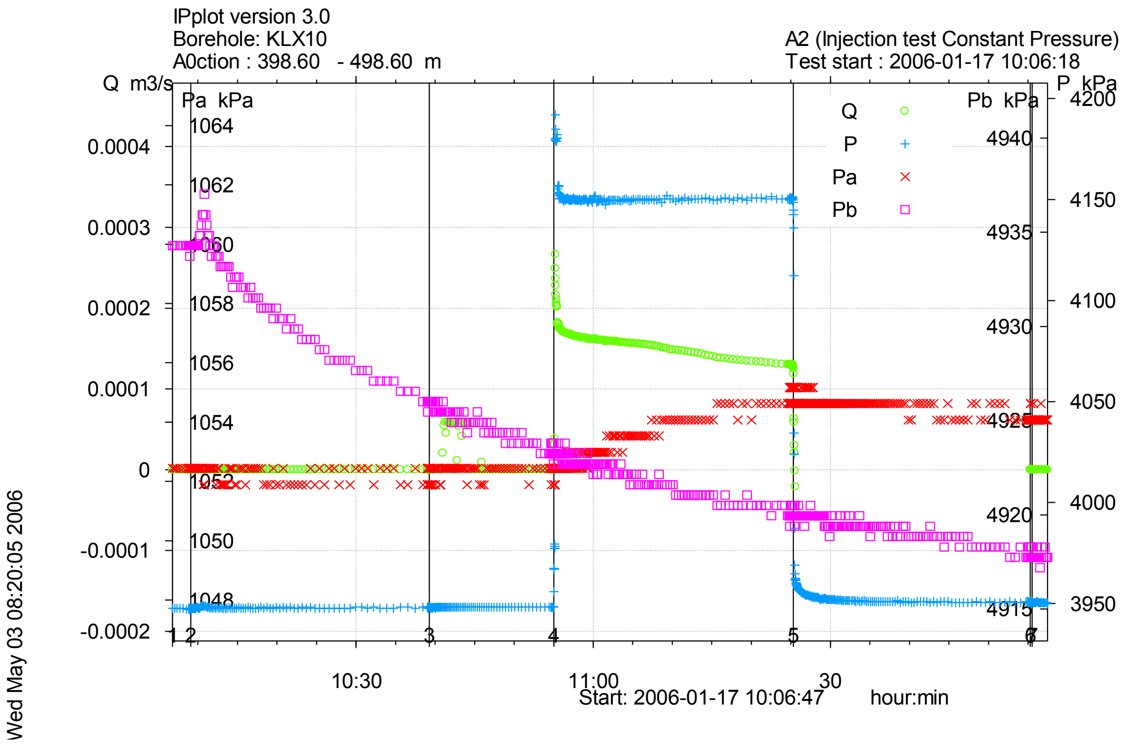


Figure A3-16. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 398.6-498.6 m in borehole KLX10.*

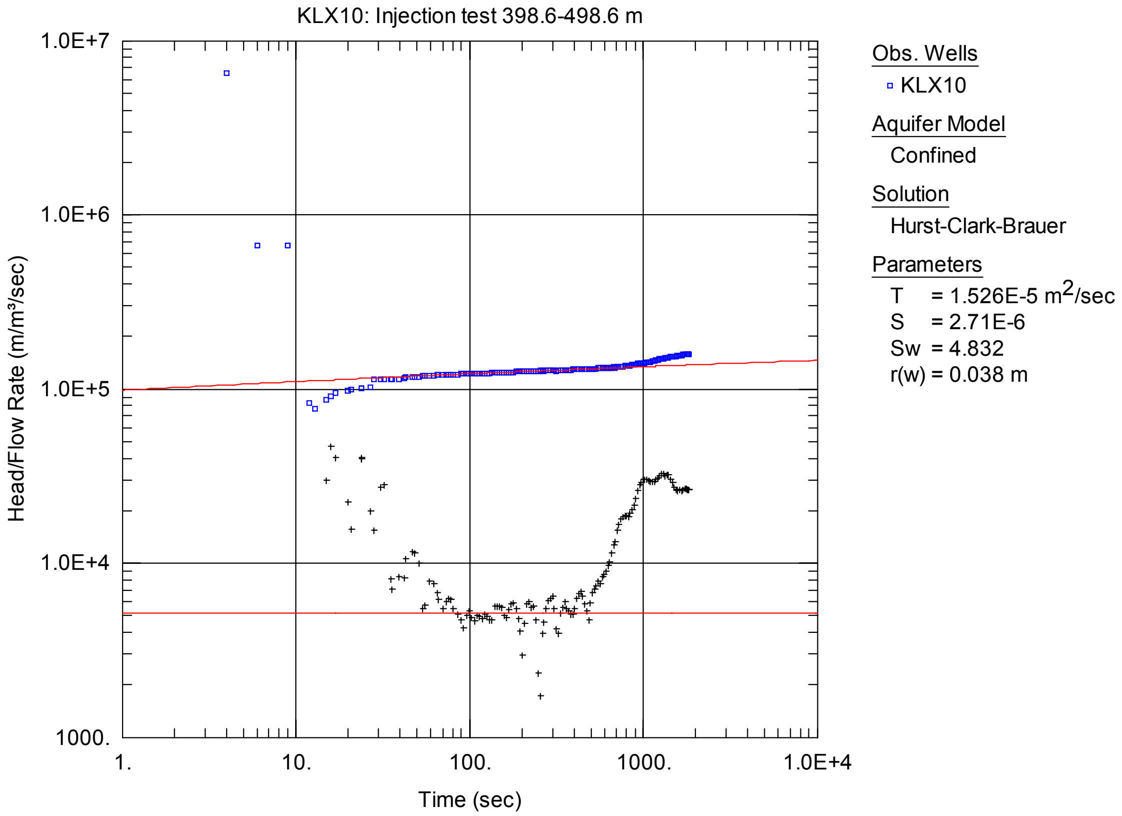


Figure A3-17. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 398.6-498.6 m in KLX10.*

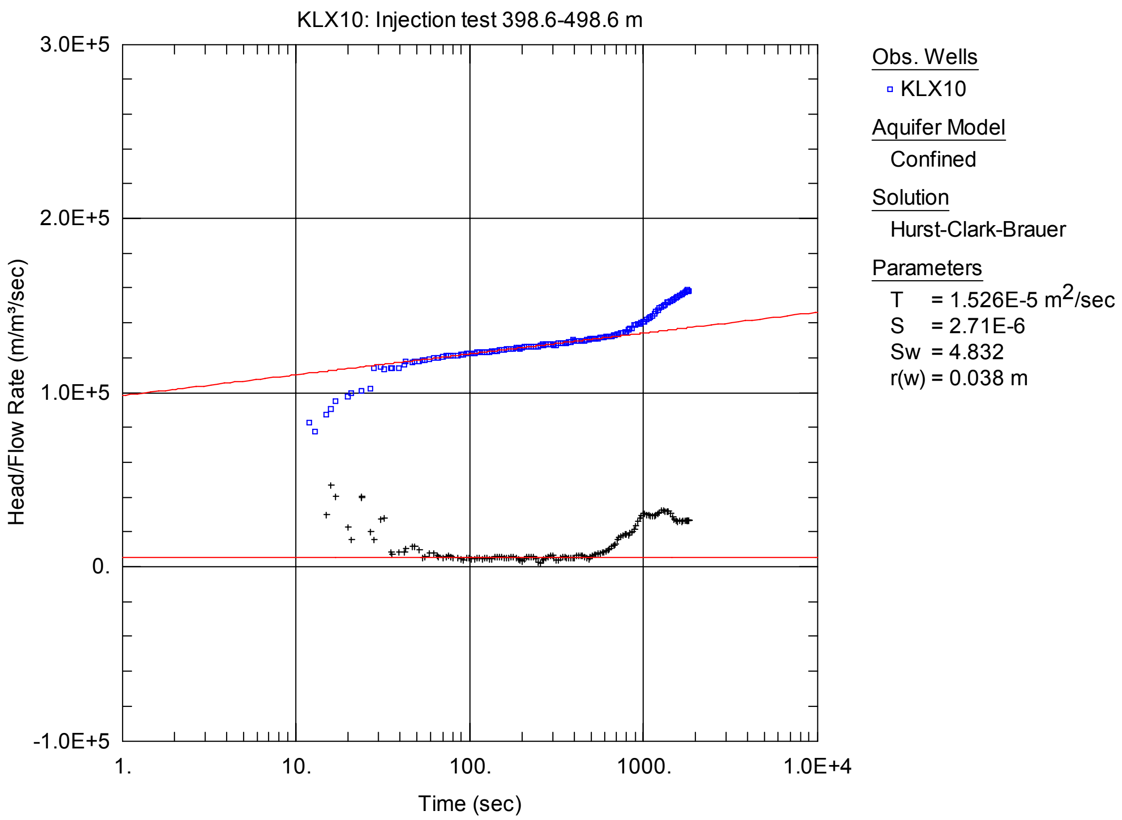


Figure A3-18. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 398.6-498.6 m in KLX10.*

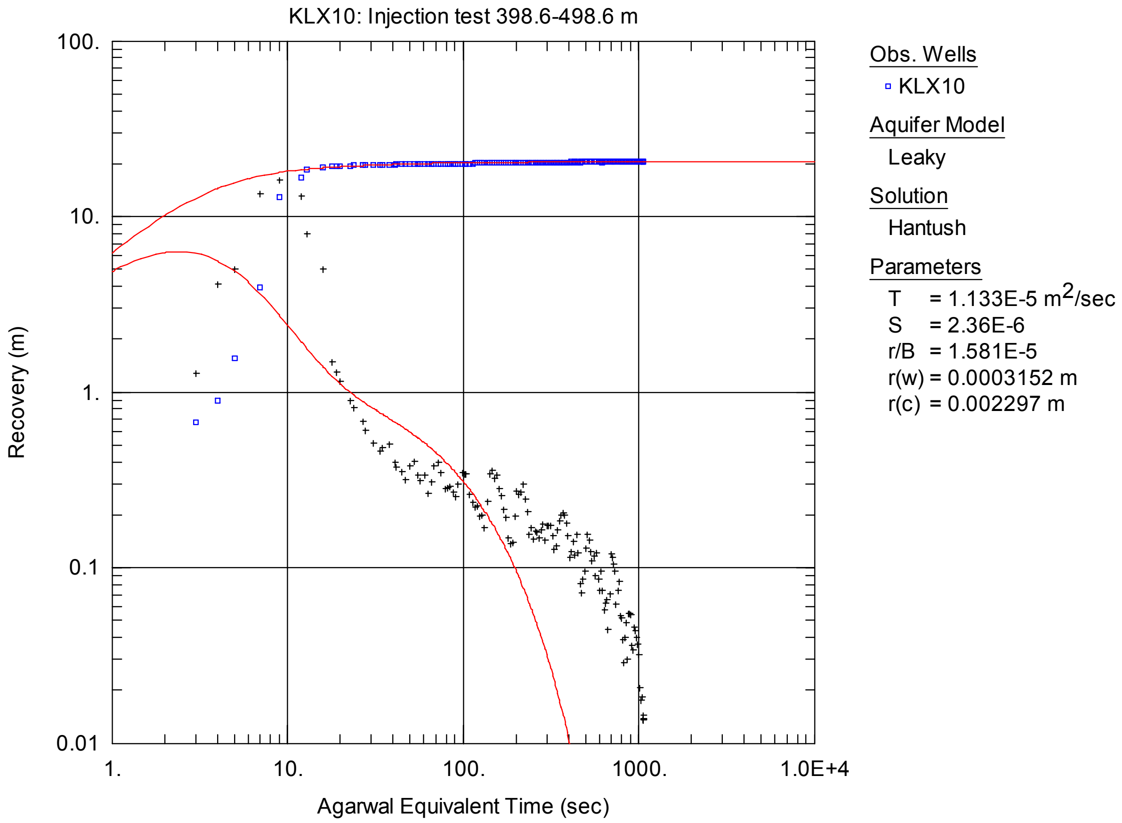


Figure A3-19. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 398.6-498.6 m in KLX10.*

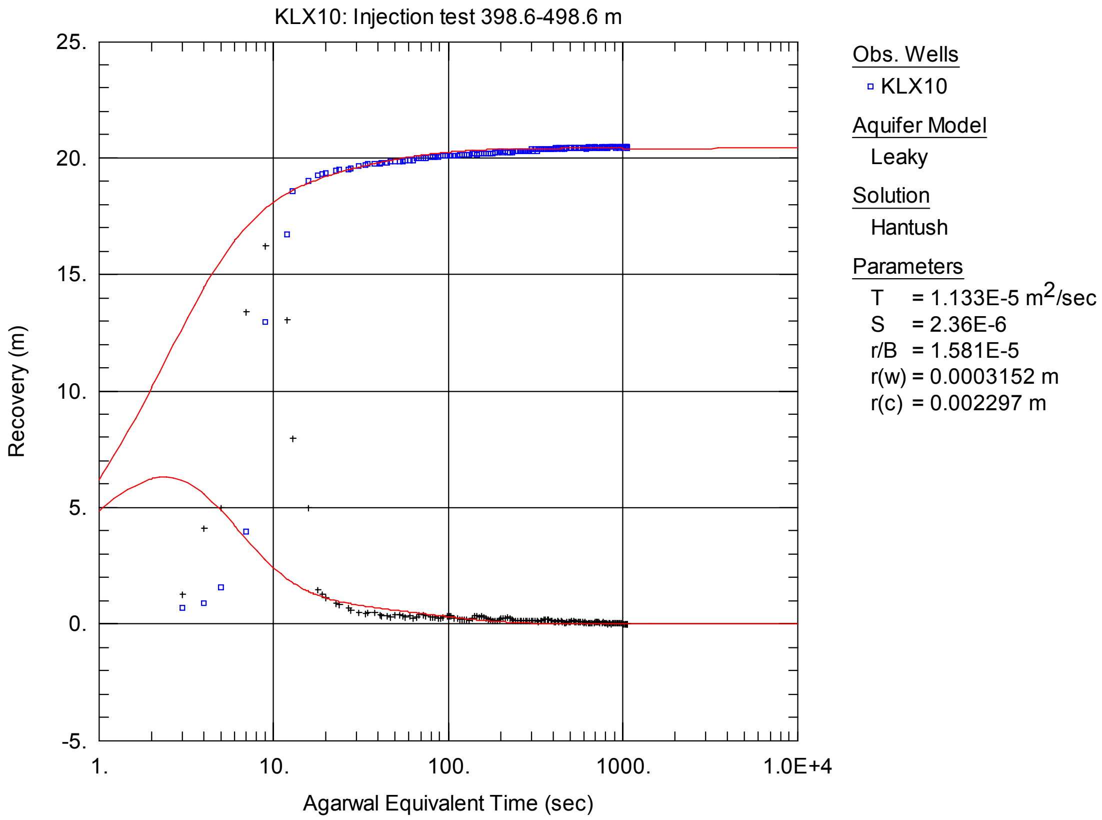


Figure A3-20. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 398.6-498.6 m in KLX10.*

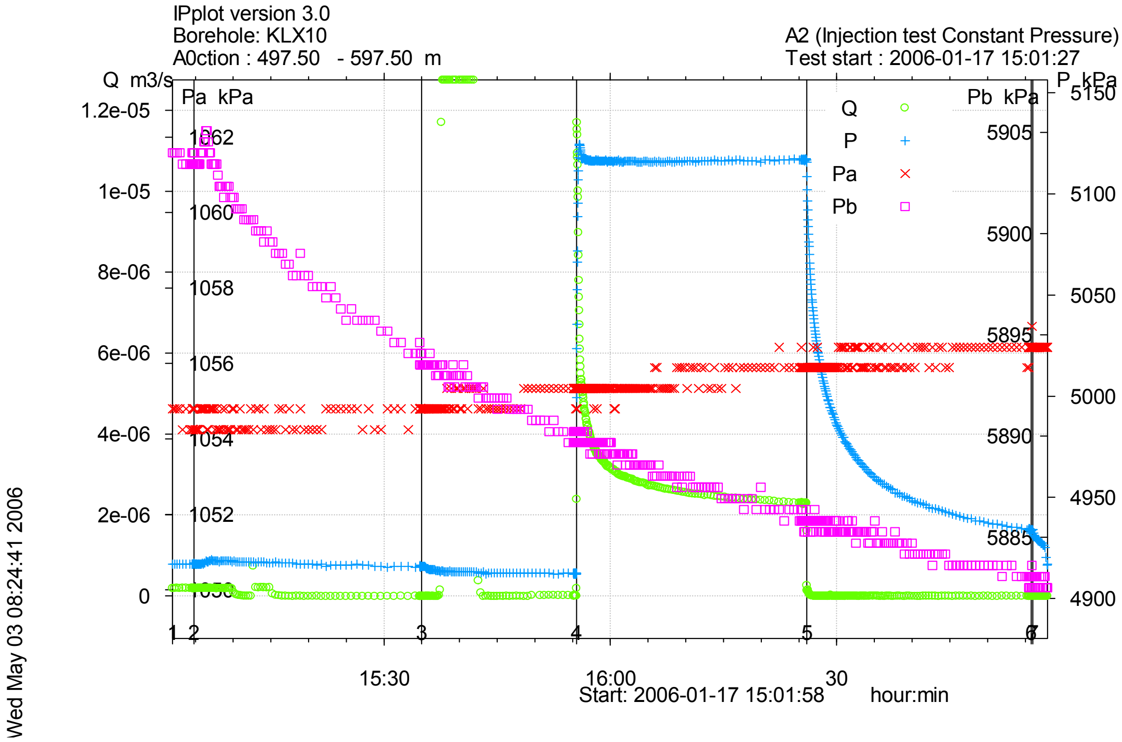


Figure A3-21. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 497.5-597.5 m in borehole KLX10.*

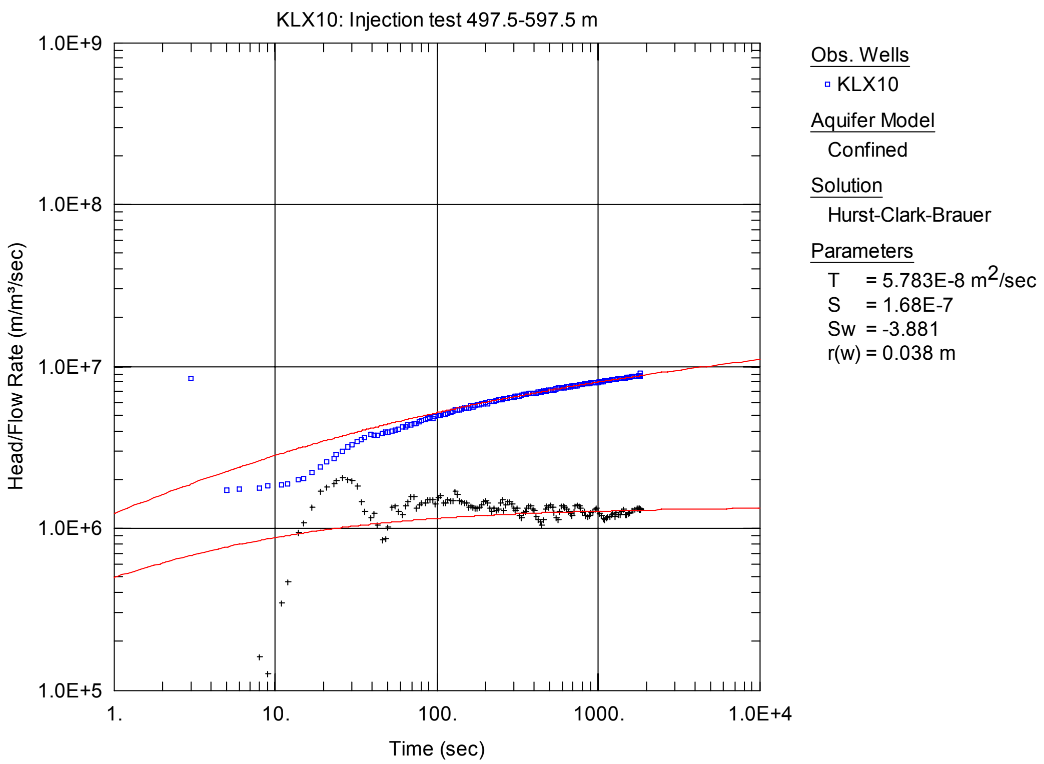


Figure A3-22. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 497.5-597.5 m in KLX10.*

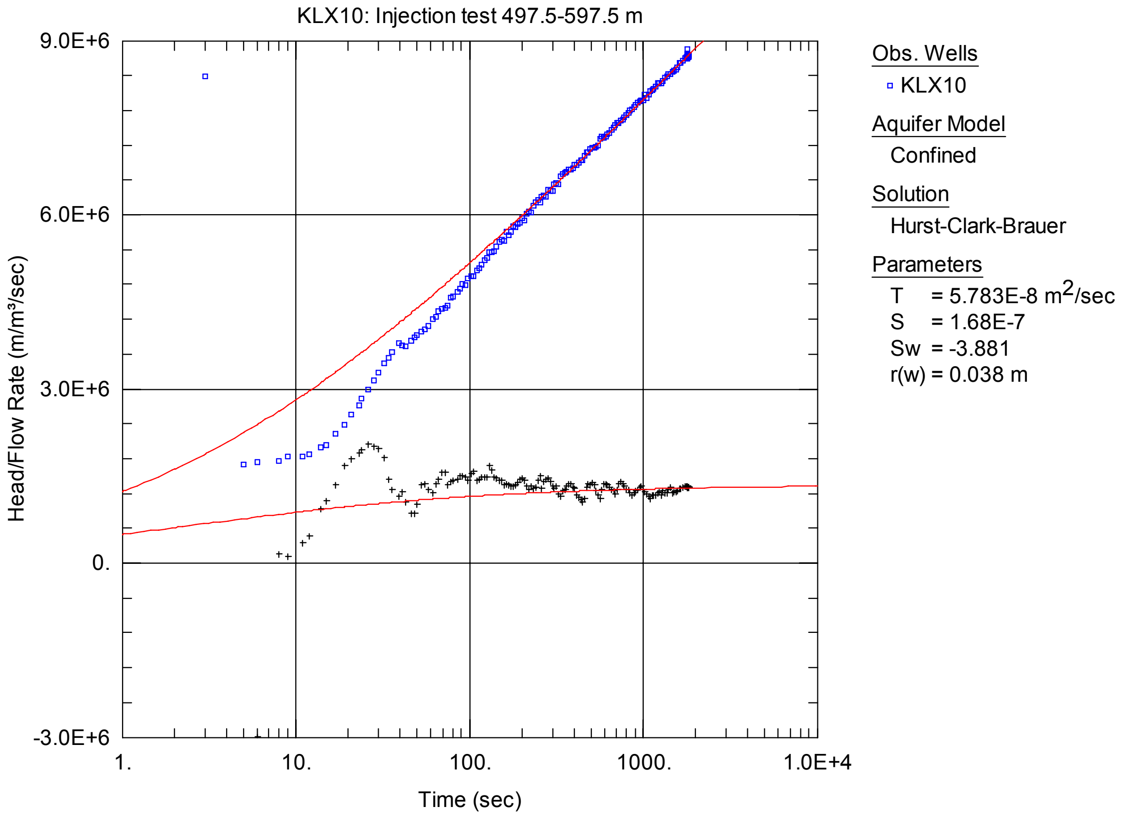


Figure A3-23. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 497.5-597.5 m in KLX10.*

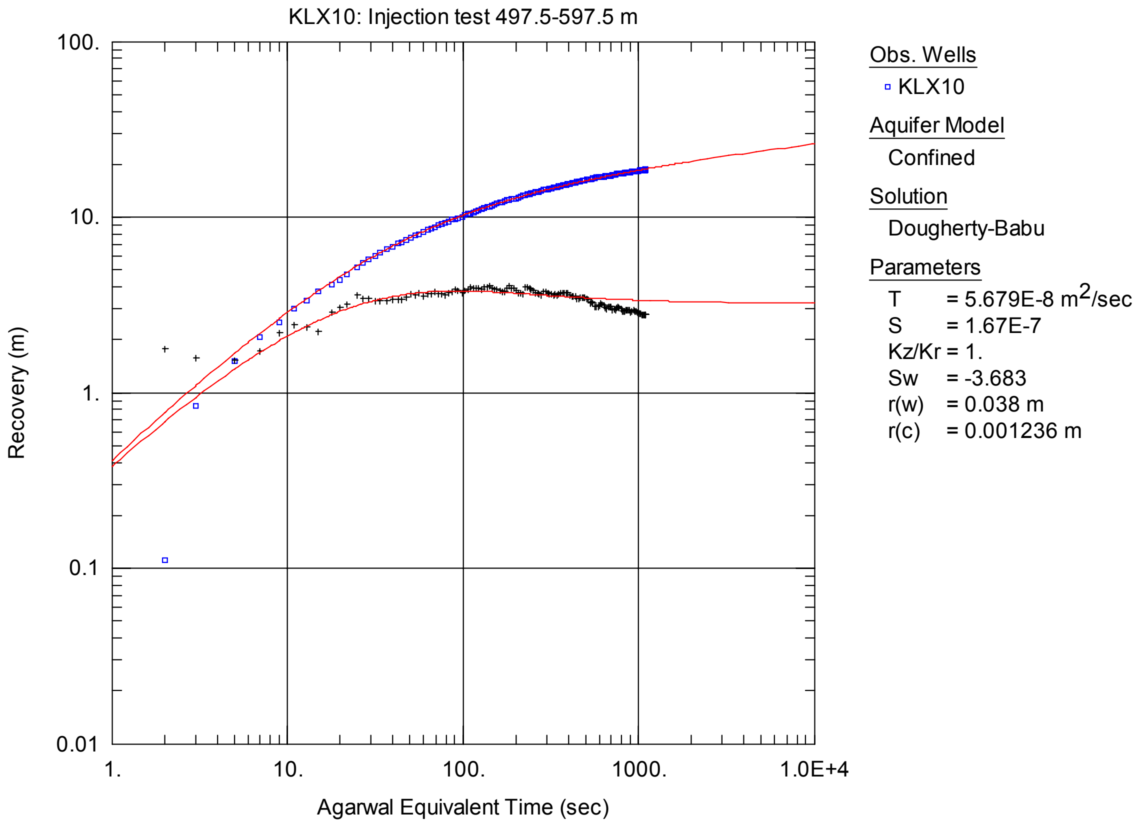


Figure A3-24. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 497.5-597.5 m in KLX10.*

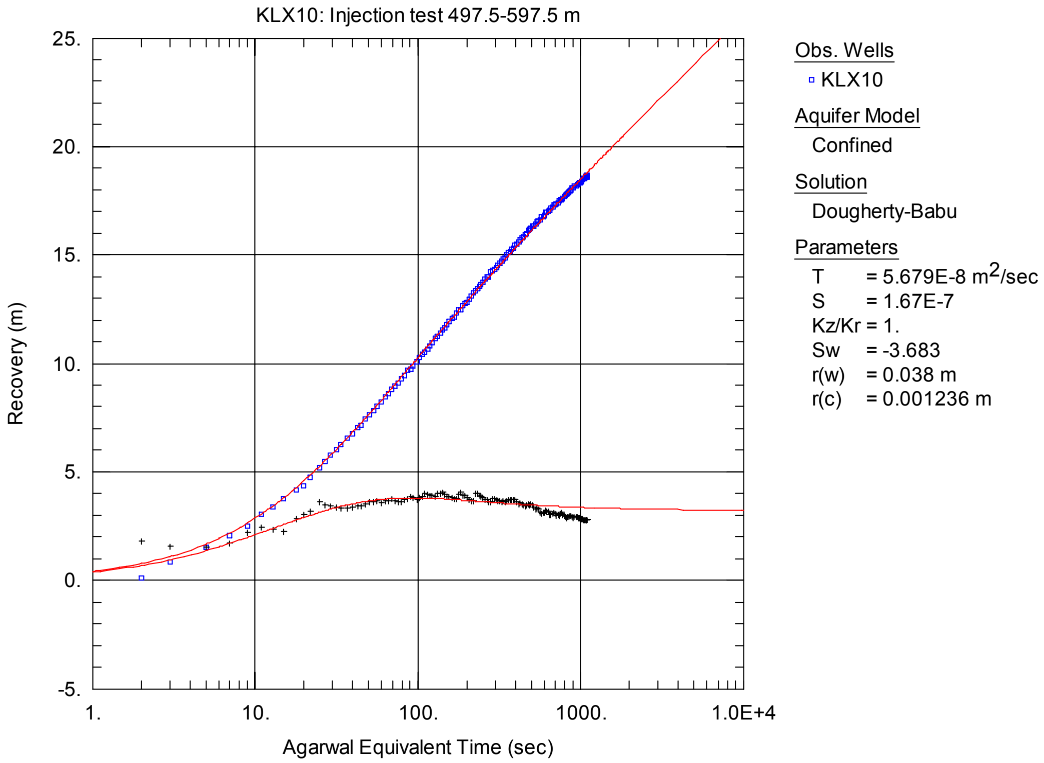


Figure A3-25. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 497.5-597.5 m in KLX10.*

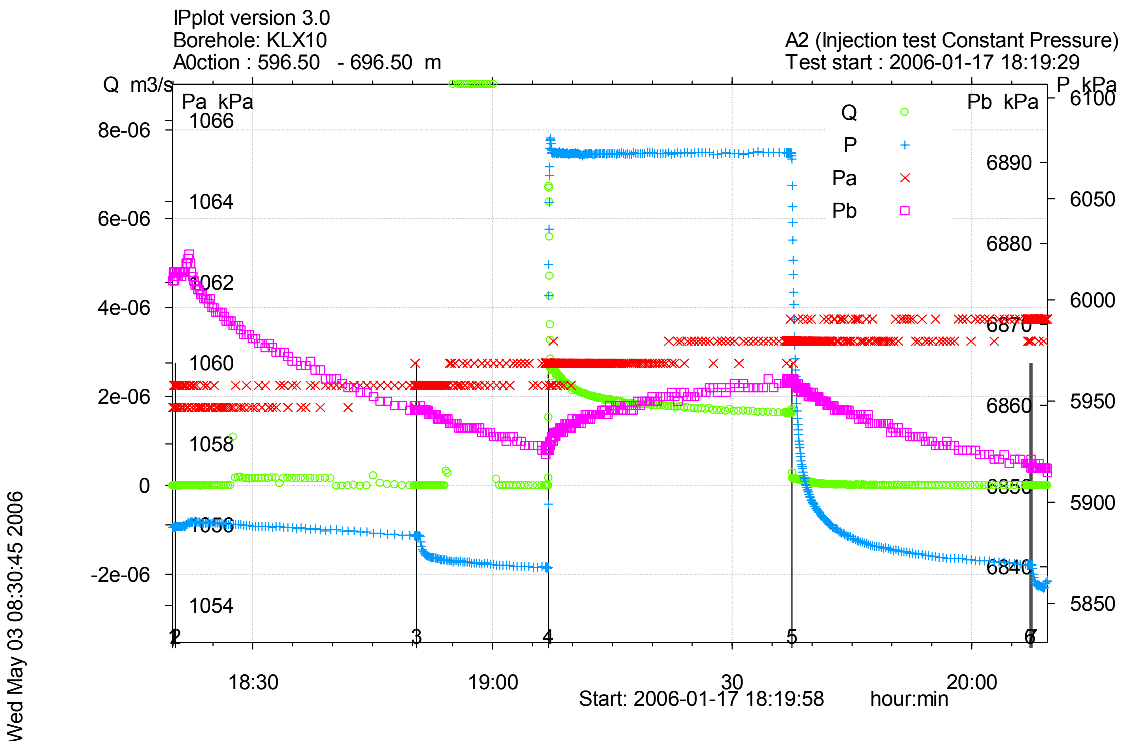


Figure A3-26. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 596.5-696.5 m in borehole KLX10.*

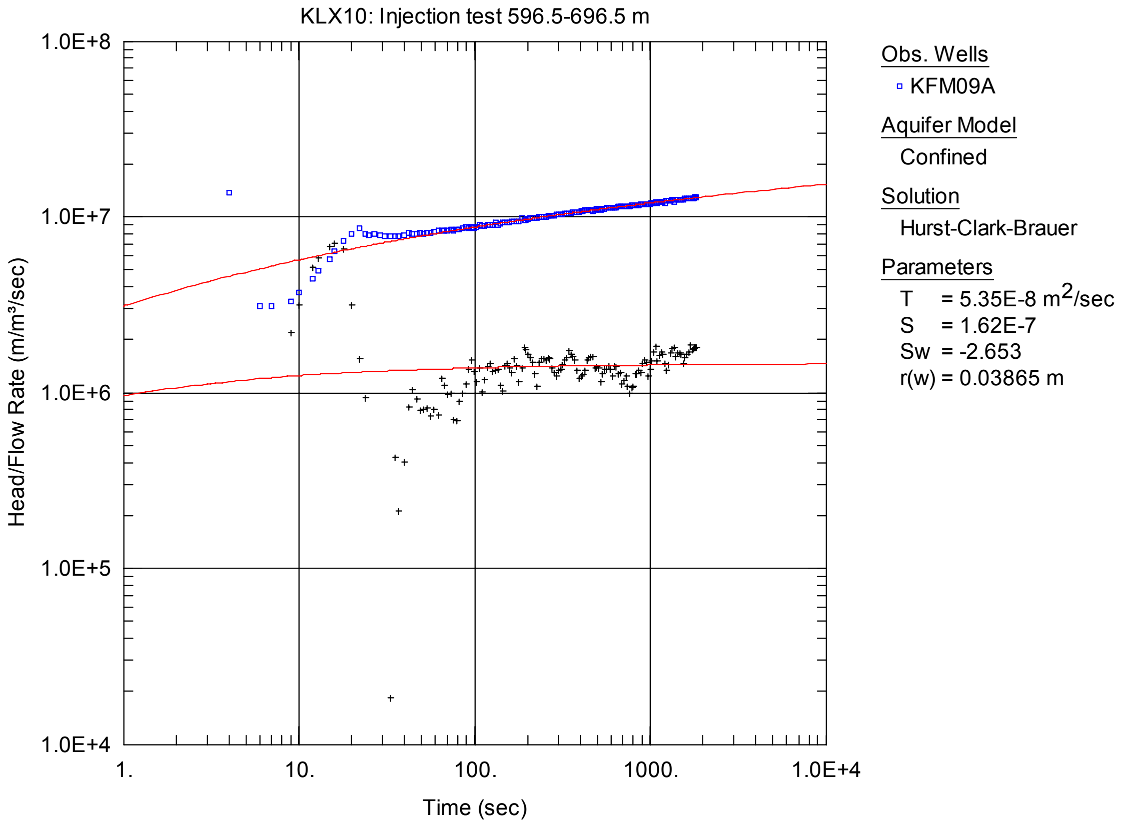


Figure A3-27. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 596.5-696.5 m in KLX10.*

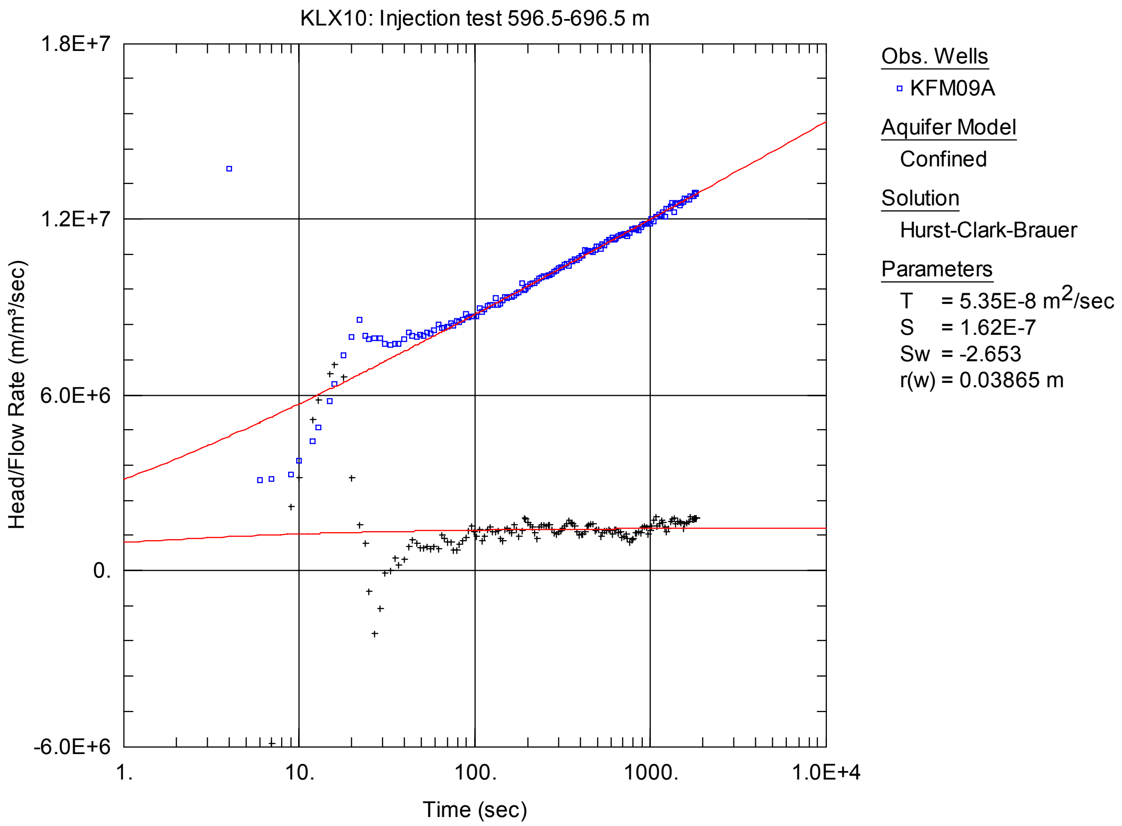


Figure A3-28. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 596.5-696.5 m in KLX10.*

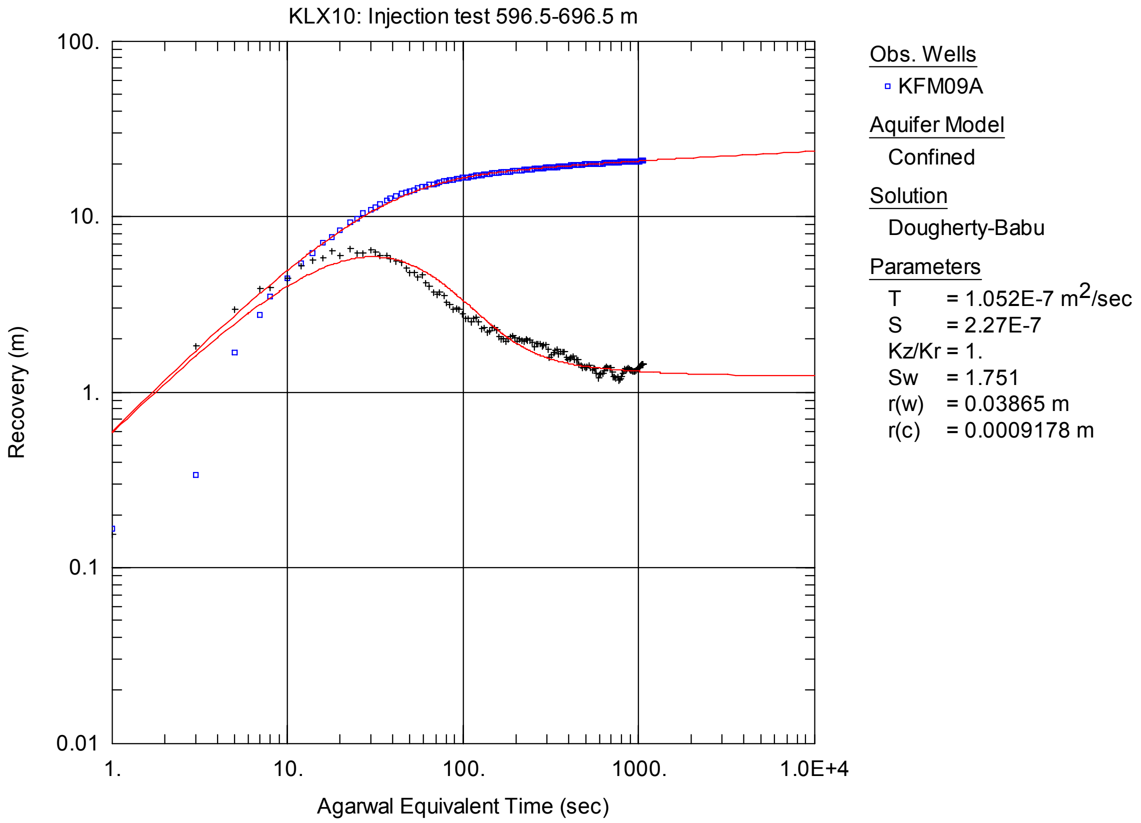


Figure A3-29. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 596.5-696.5 m in KLX10.*

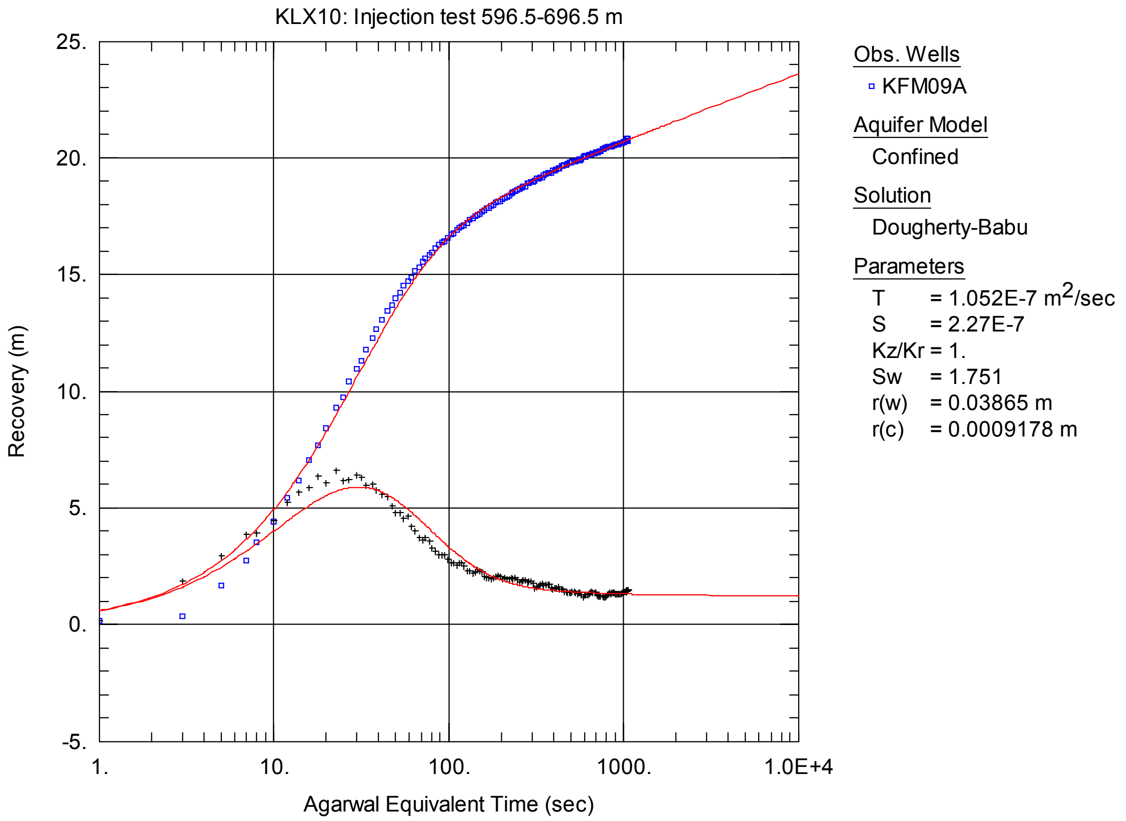


Figure A3-30. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 596.5-696.5 m in KLX10.*

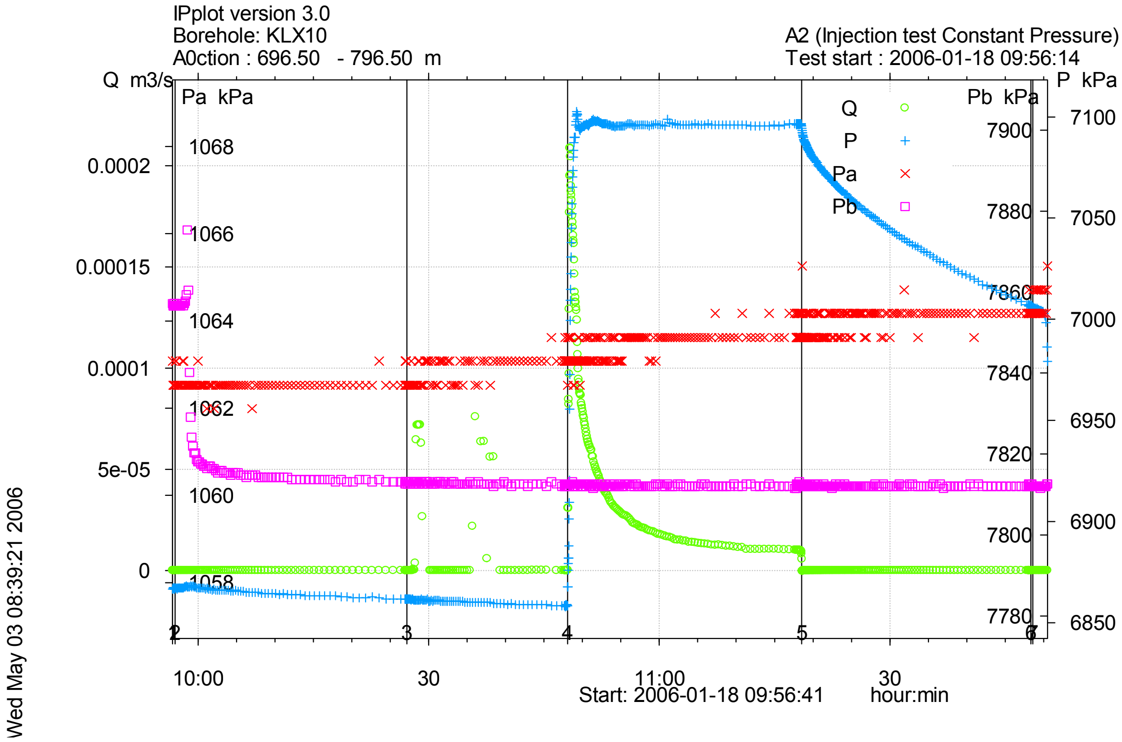


Figure A3-31. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 696.5-796.5 m in borehole KLX10.*

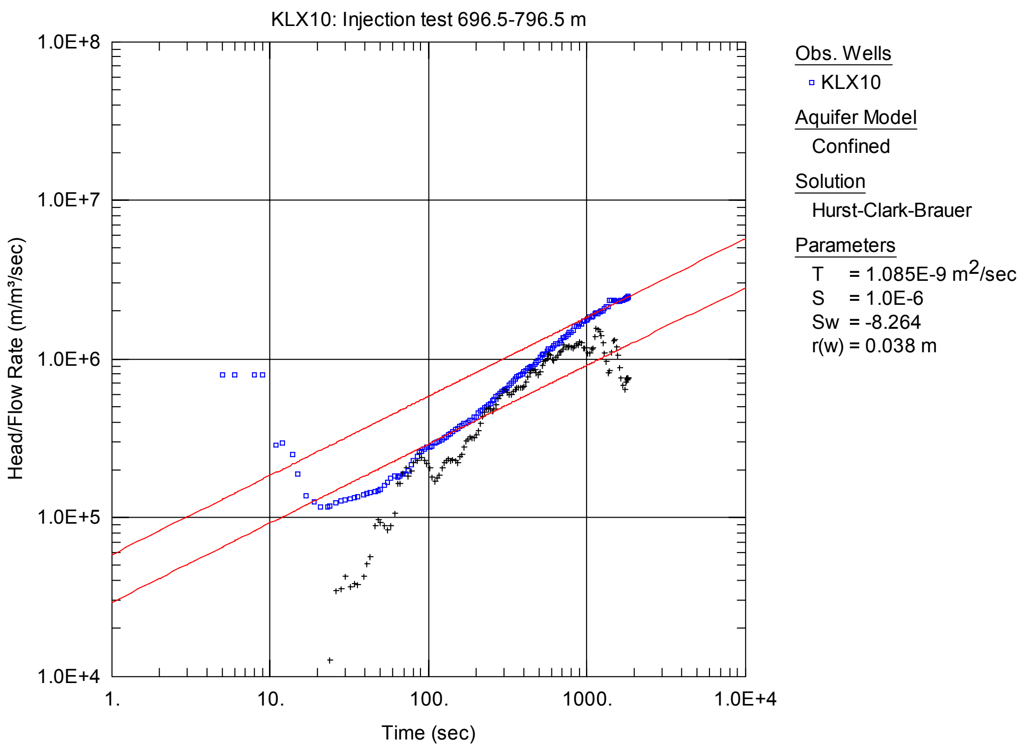


Figure A3-32. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 696.5-796.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

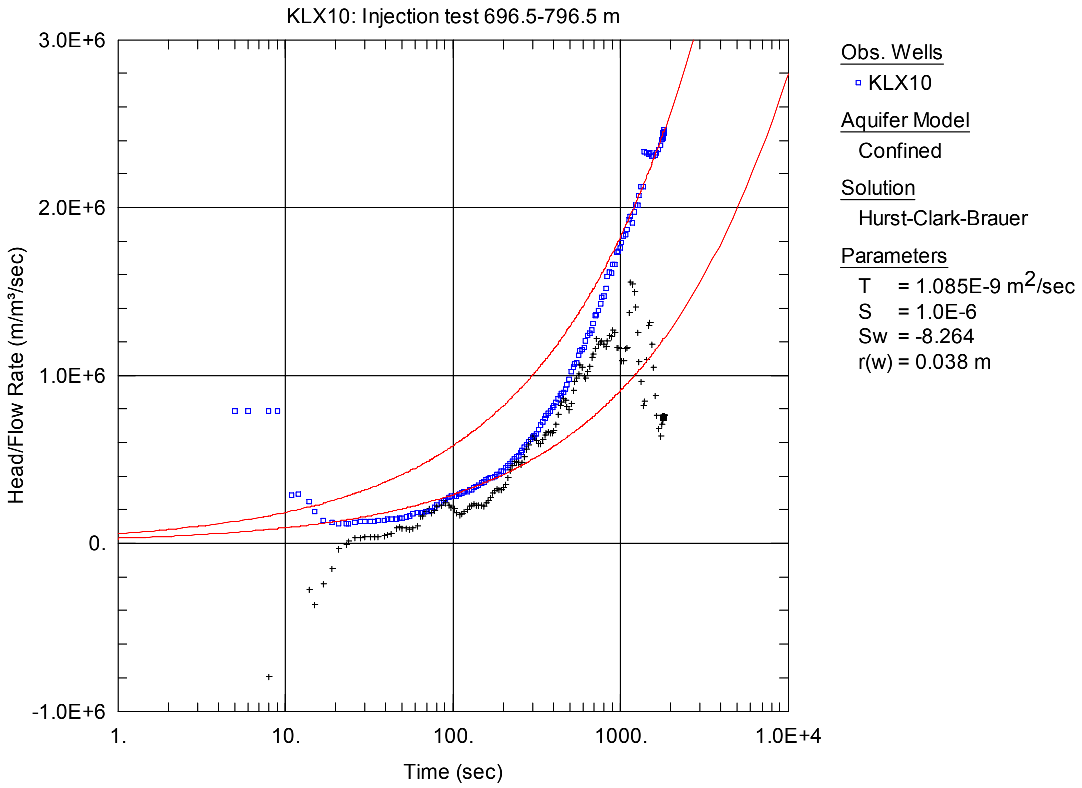


Figure A3-33. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 696.5-796.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

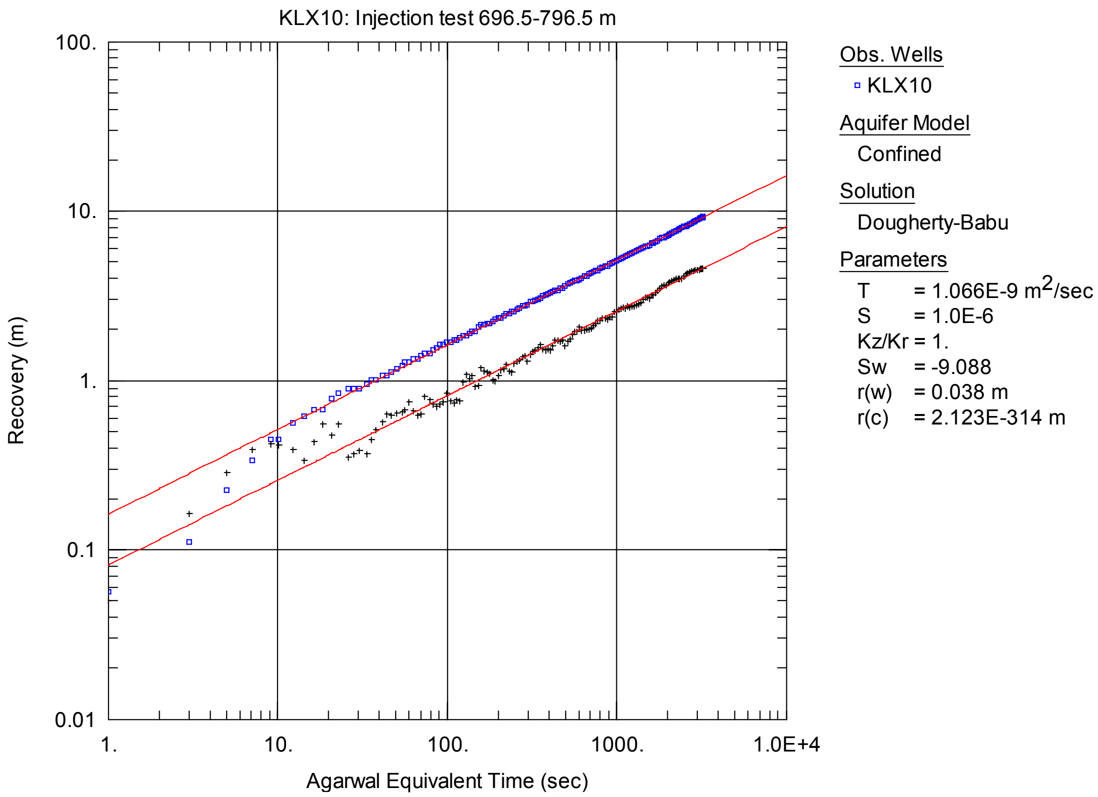


Figure A3-34. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 696.5-796.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

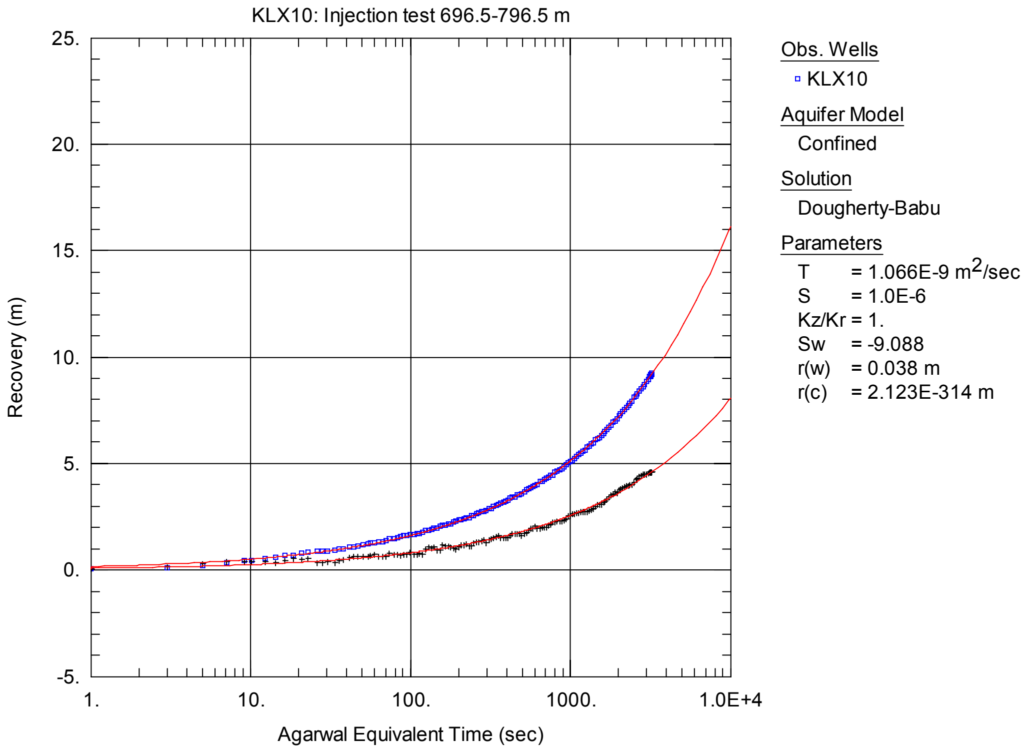


Figure A3-35. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 696.5-796.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

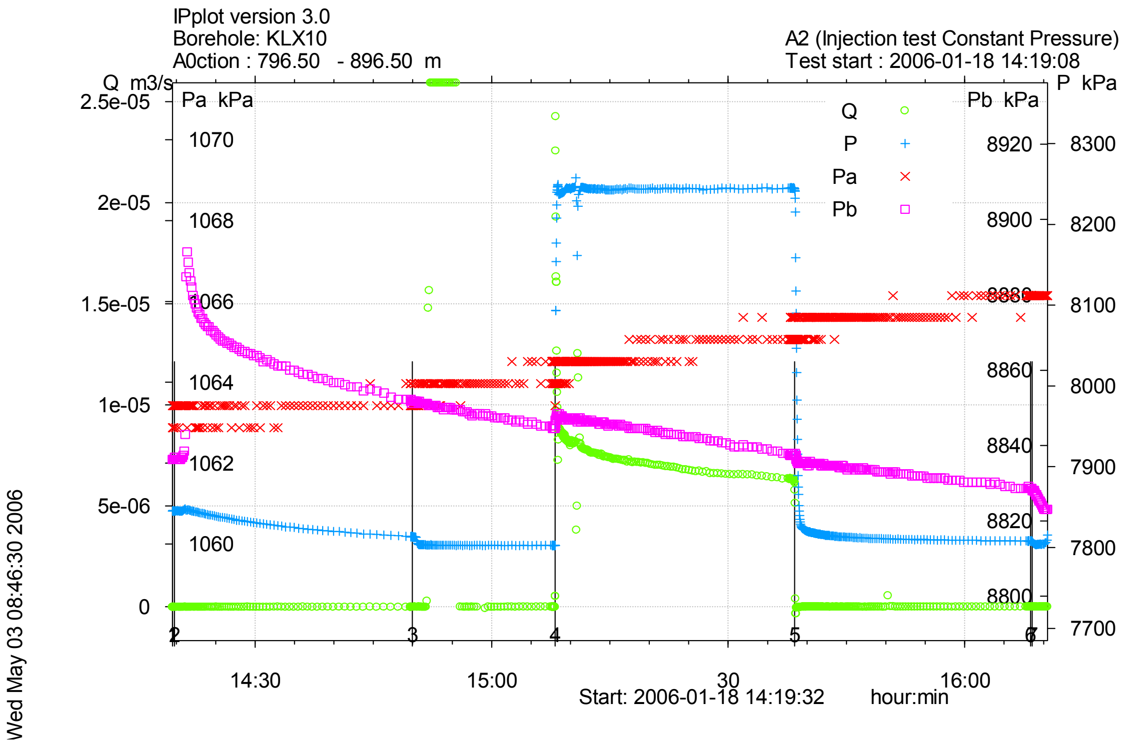


Figure A3-36. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 796.5-896.5 m in borehole KLX10.*

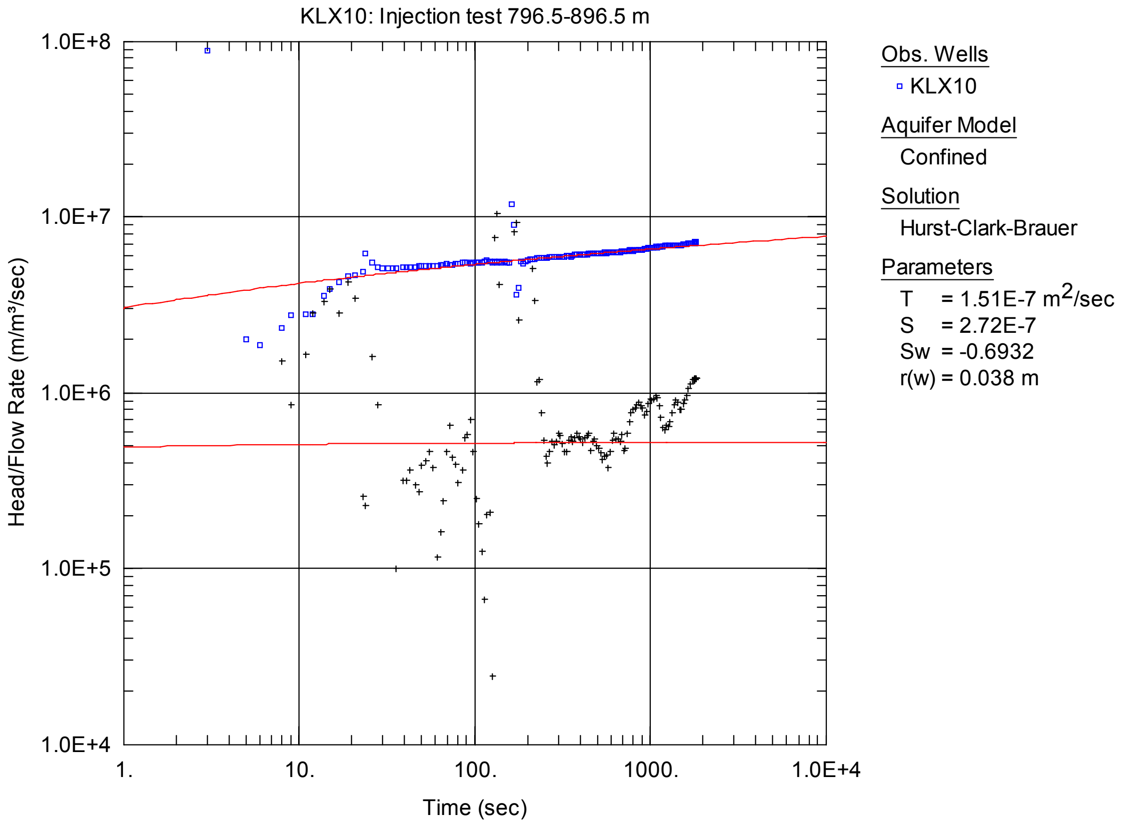


Figure A3-37. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 796.5-896.5 m in KLX10.*

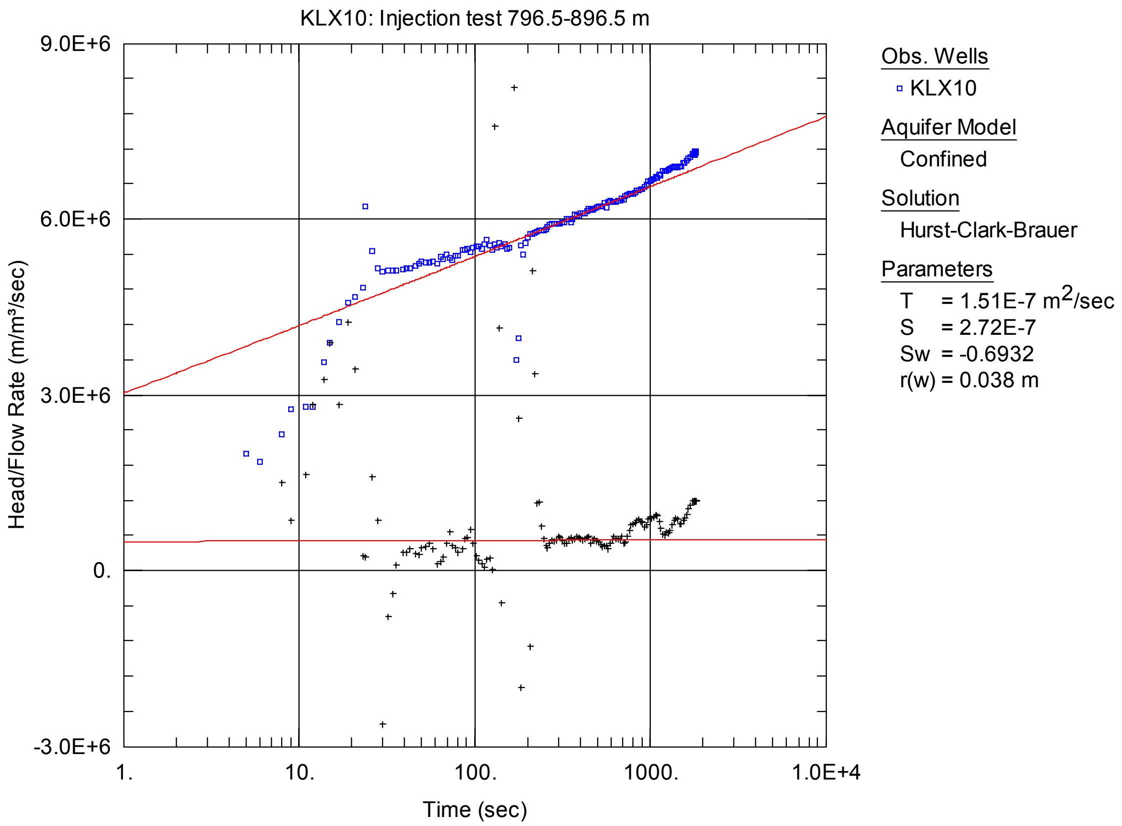


Figure A3-38. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 796.5-896.5 m in KLX10.*

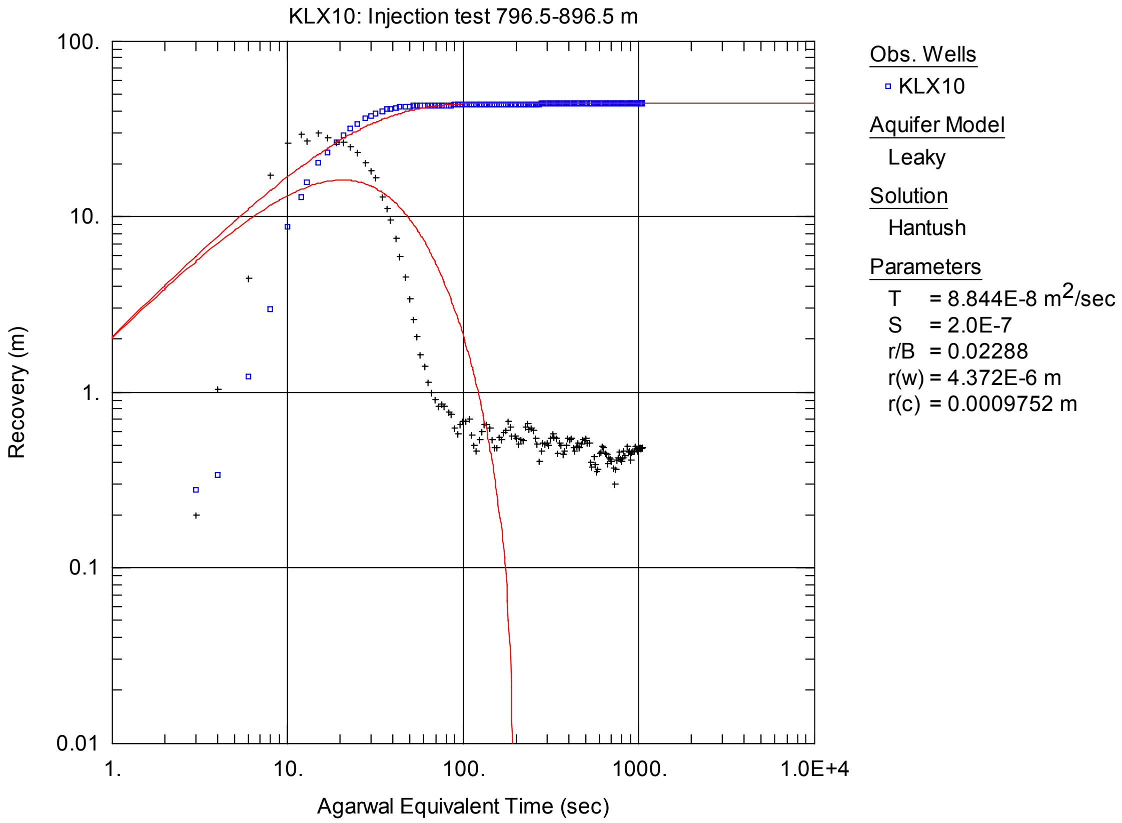


Figure A3-39. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 796.5-896.5 m in KLX10.*

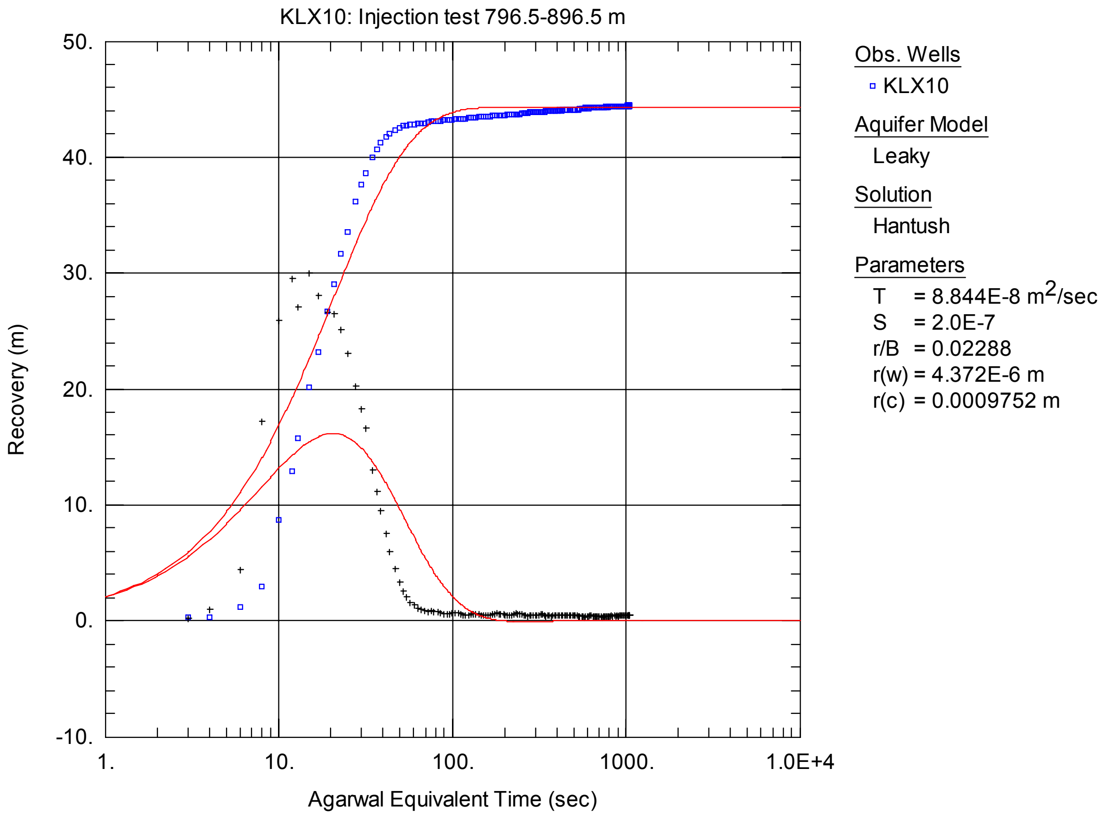


Figure A3-40. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 796.5-896.5 m in KLX10.*

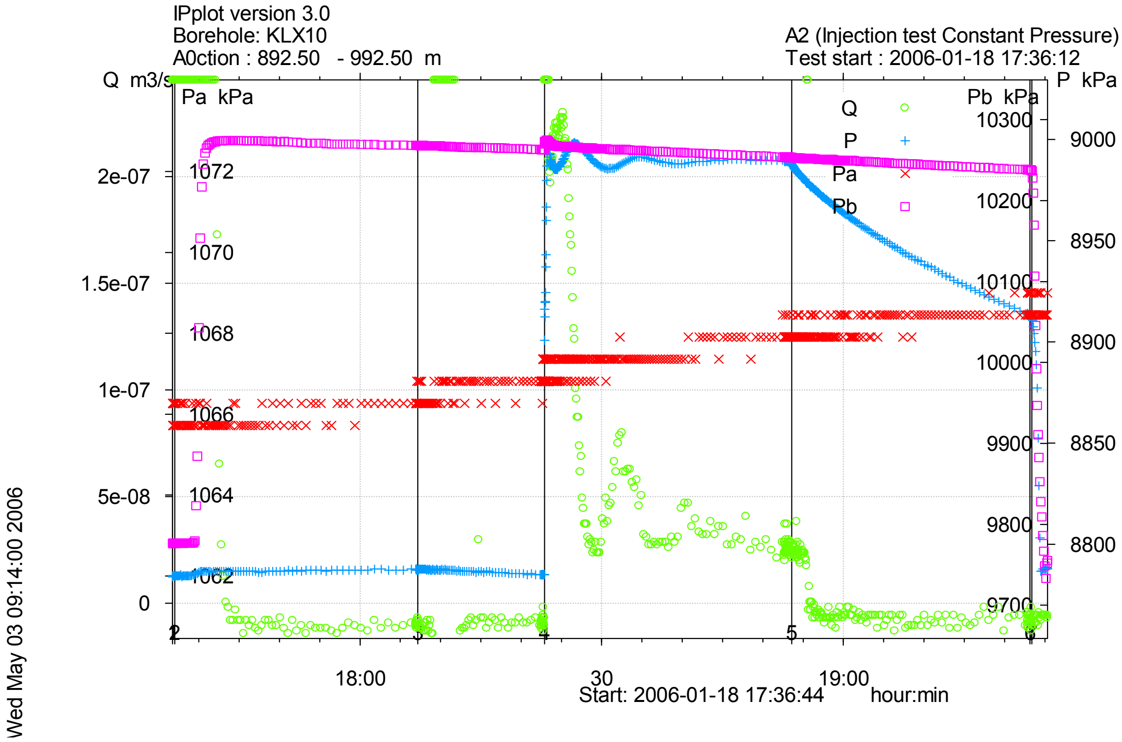


Figure A3-41. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 892.5-992.5 m in borehole KLX10.*

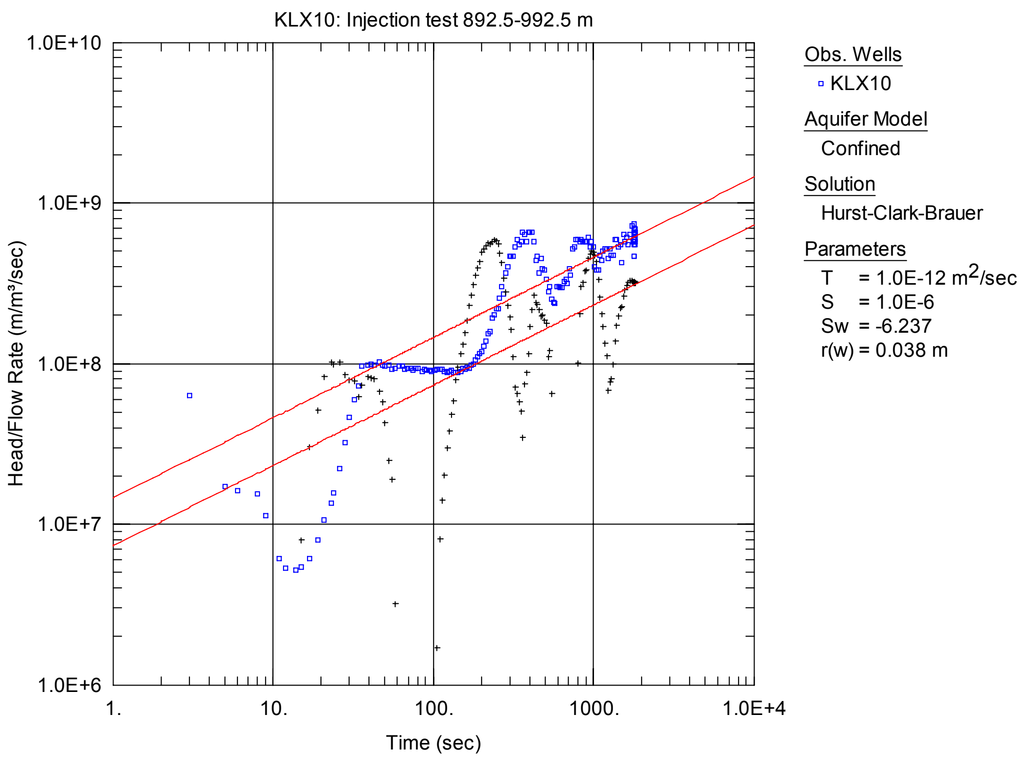


Figure A3-42. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 892.5-992.5 m in KLX10. The type curve fit is only to show that an assumption of PRF is not valid.*

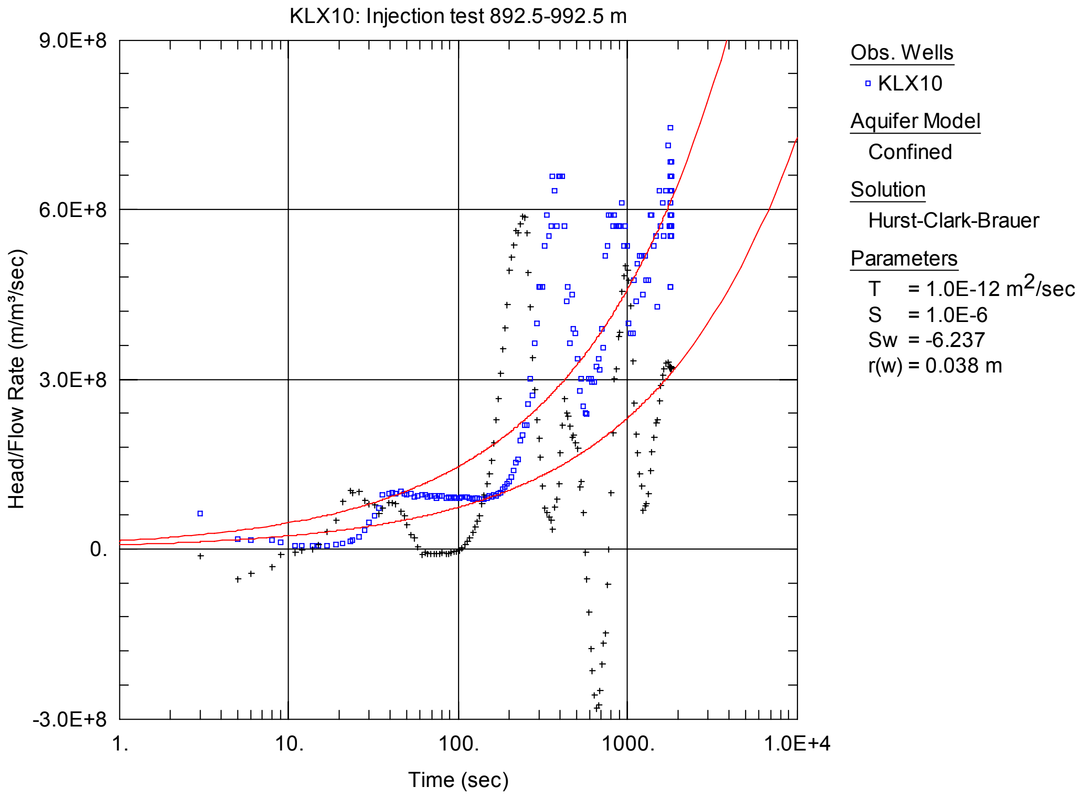


Figure A3-43. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 892.5-992.5 m in KLX10. The type curve fit is only to show that an assumption of PRF is not valid.*

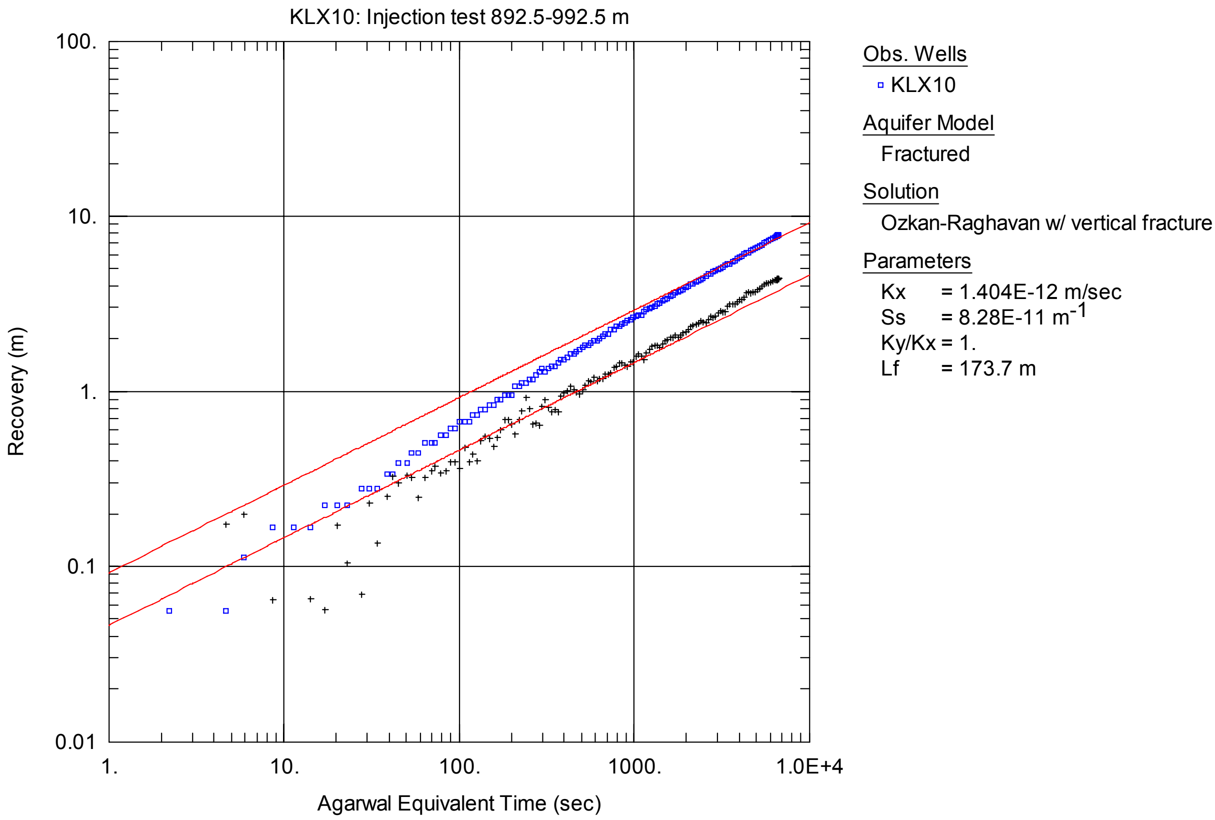


Figure A3-44. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 892.5-992.5 m in KLX10.*

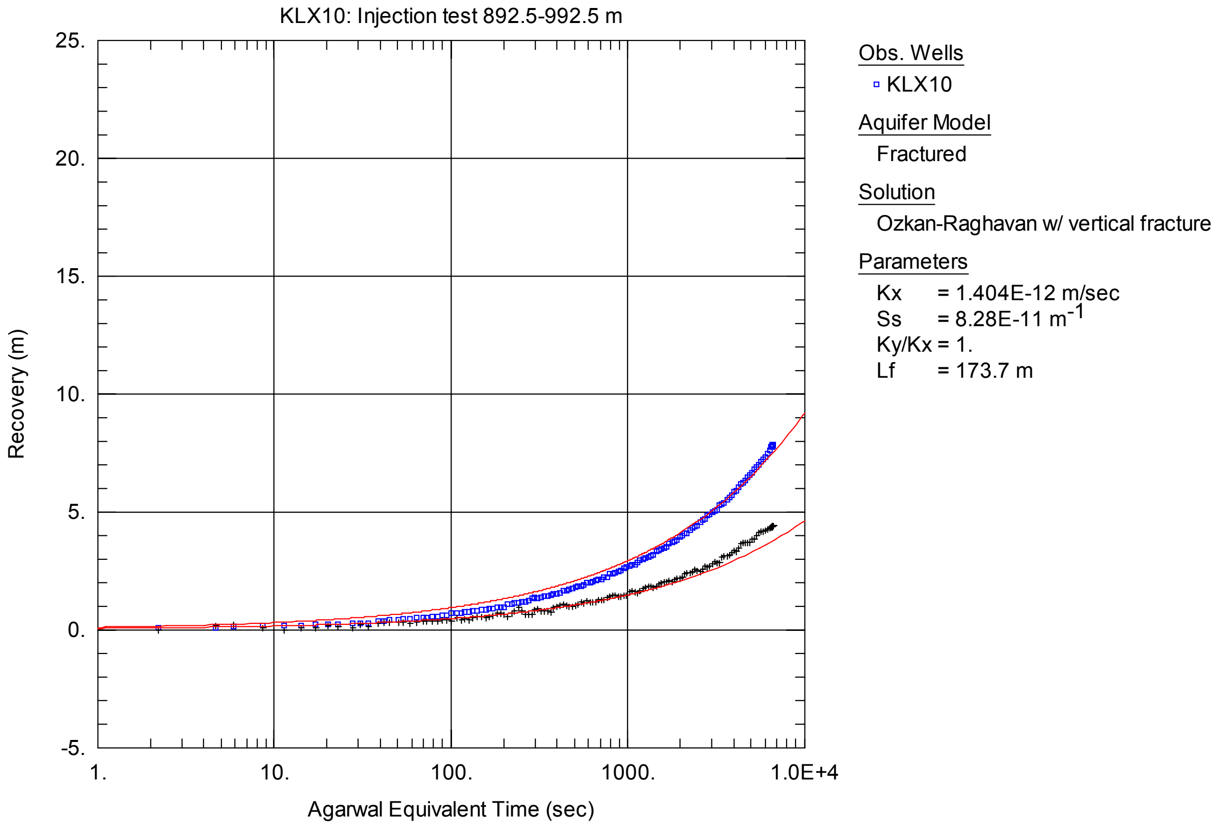


Figure A3-45. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 892.5-992.5 m in KLX10.*

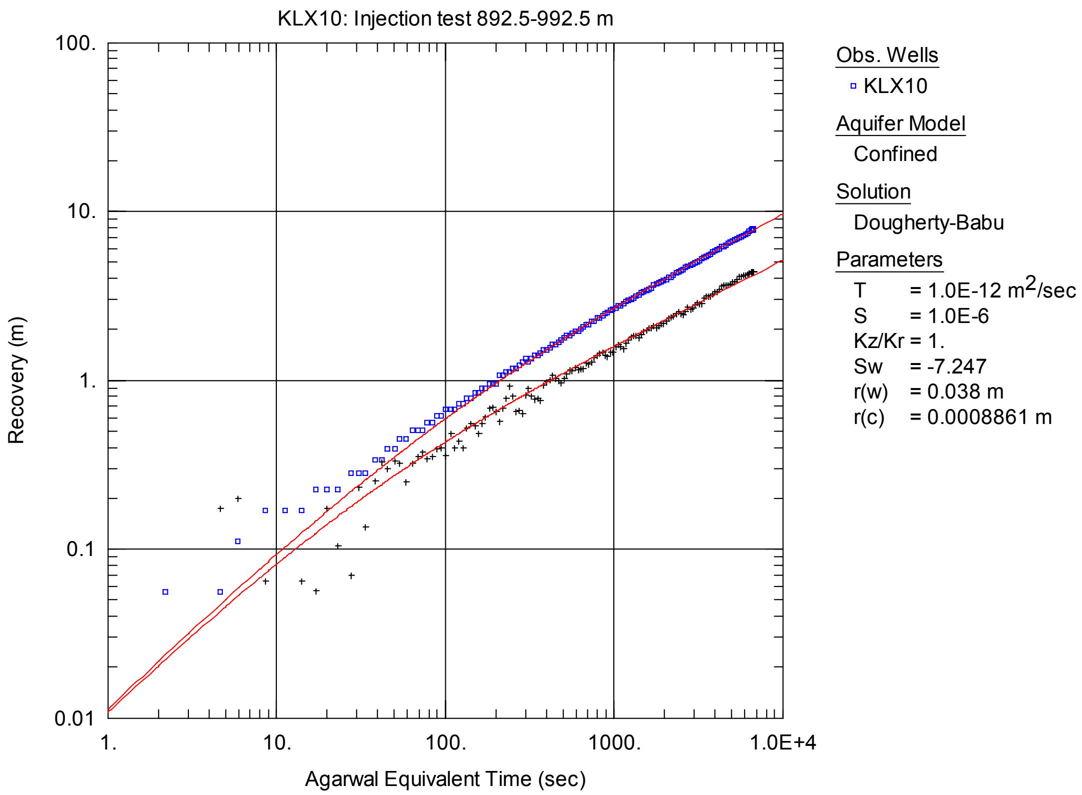


Figure A3-46. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 892.5-992.5 m in KLX10. The type curve fit is only to show that an assumption of PRF is not valid.*

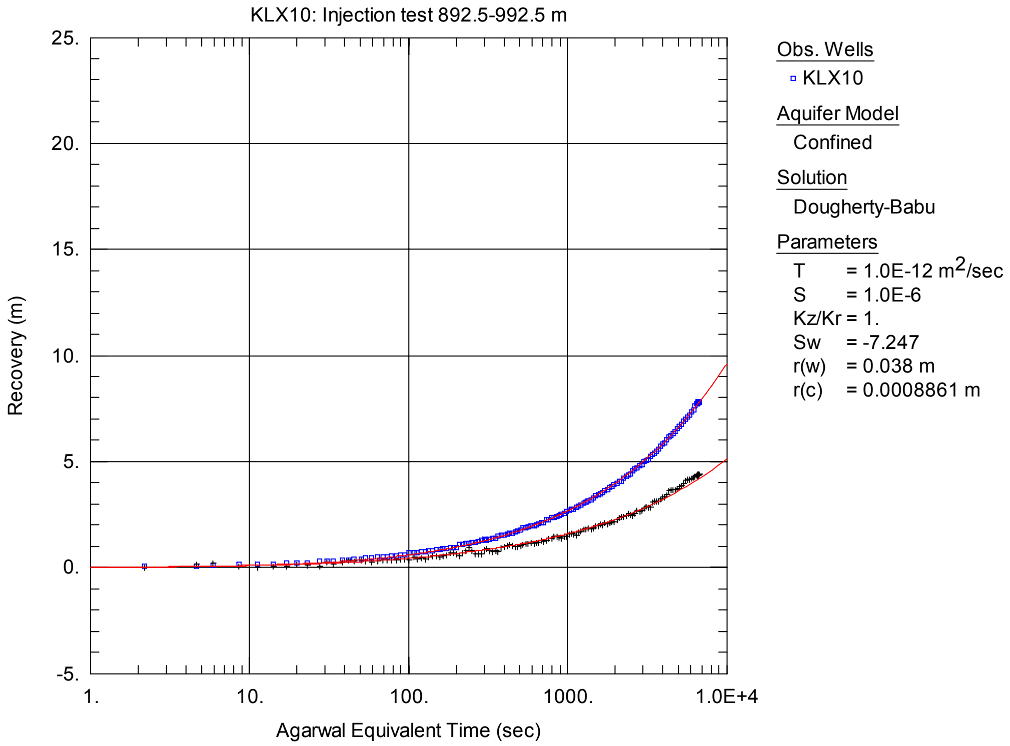


Figure A3-47. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 892.5-992.5 m in KLX10. The type curve fit is only to show that an assumption of PRF is not valid.*

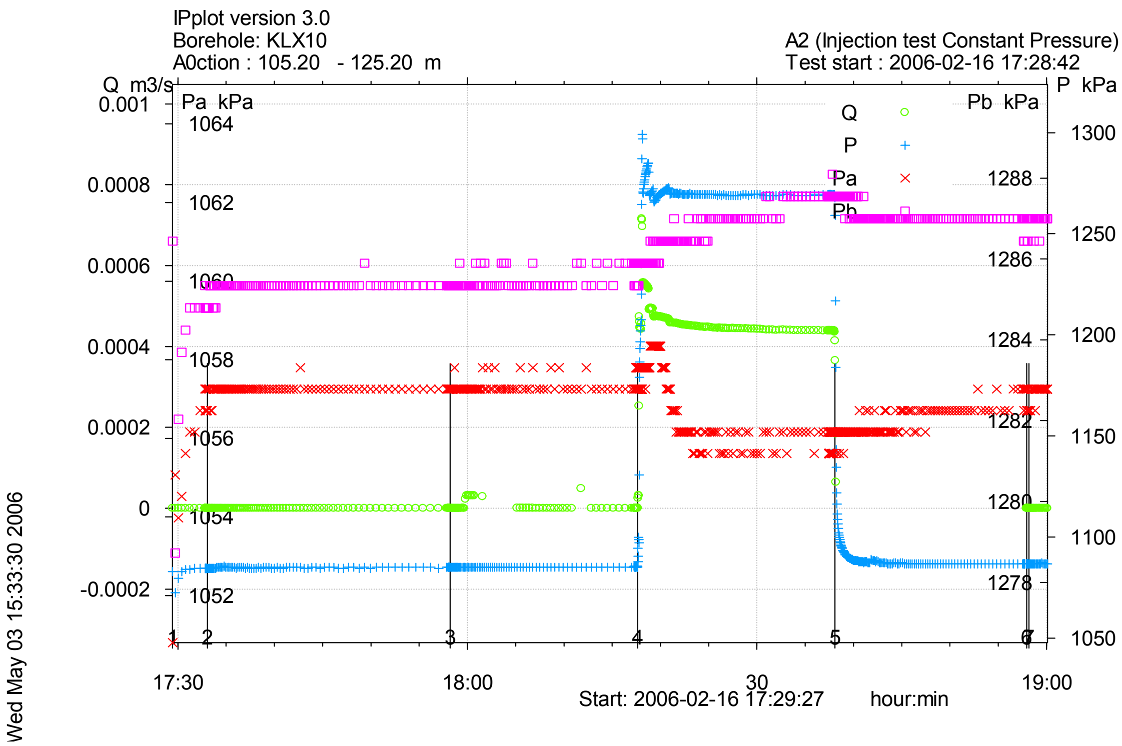


Figure A3-48. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 105.2-125.2 m in borehole KLX10.*

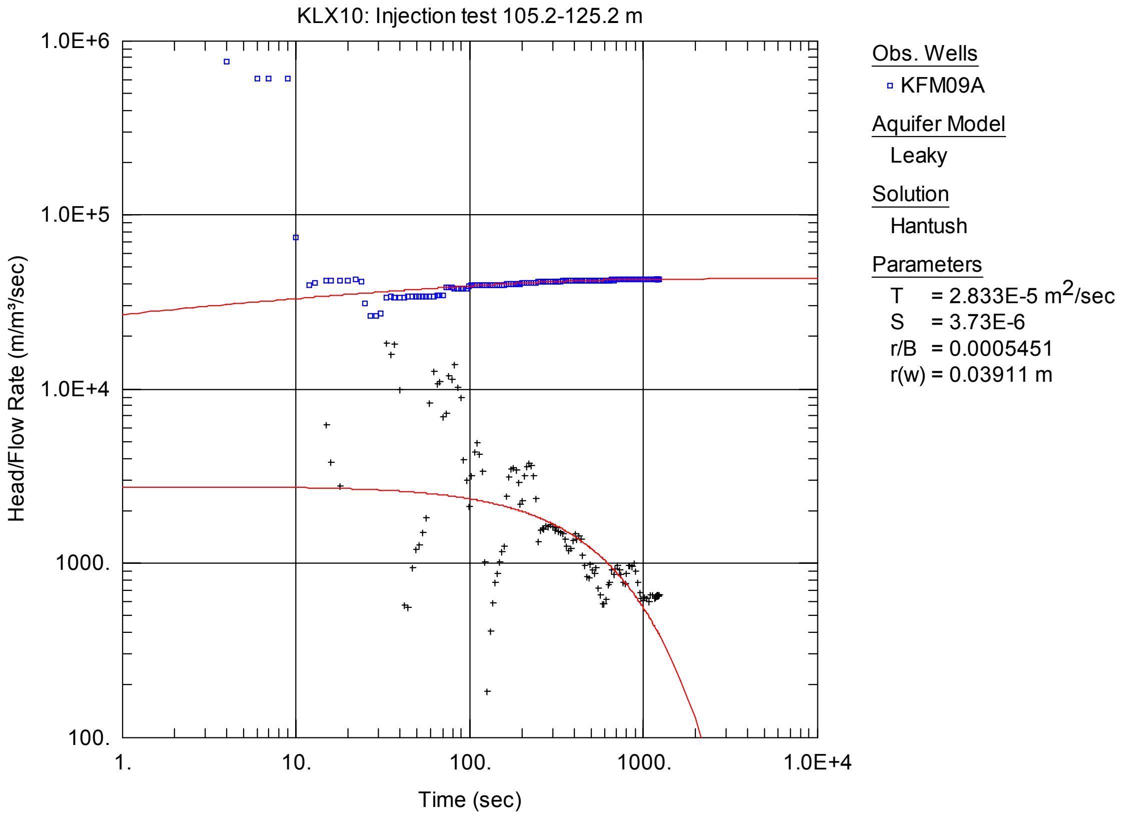


Figure A3-49. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 105.2-125.2 m in KLX10.*

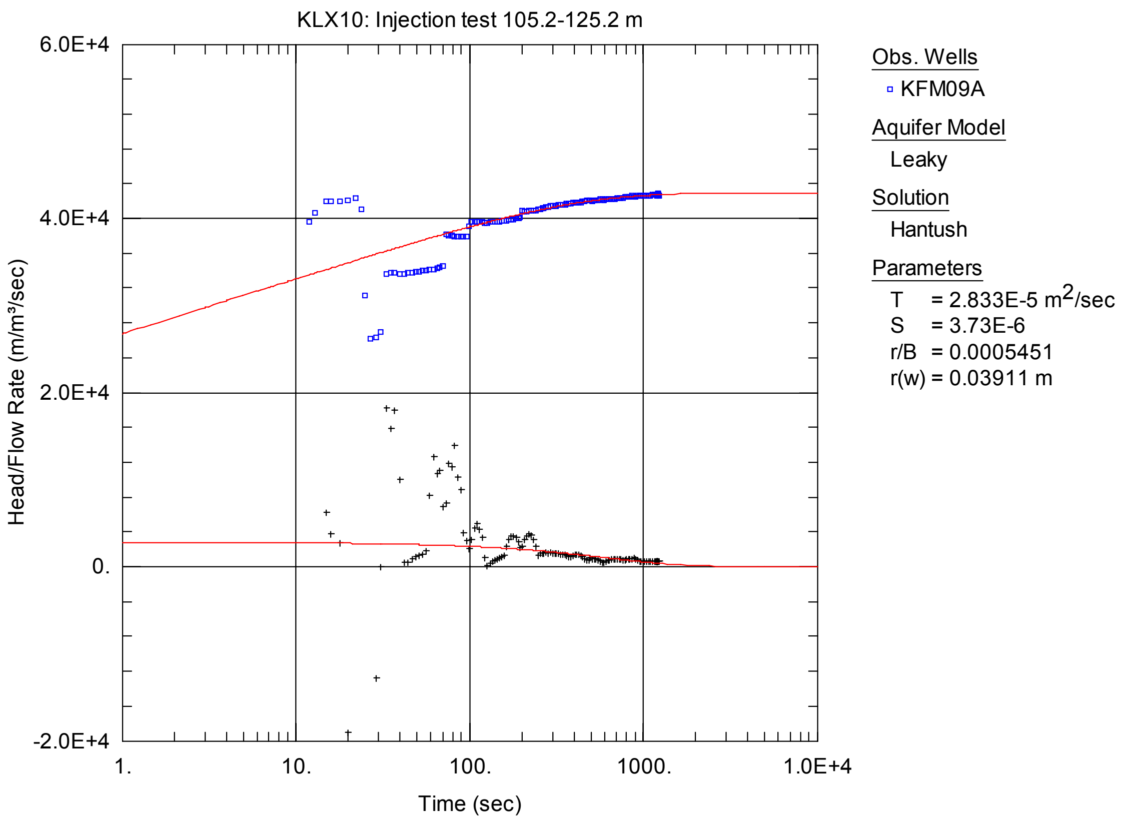


Figure A3-50. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 105.2-125.2 m in KLX10.*

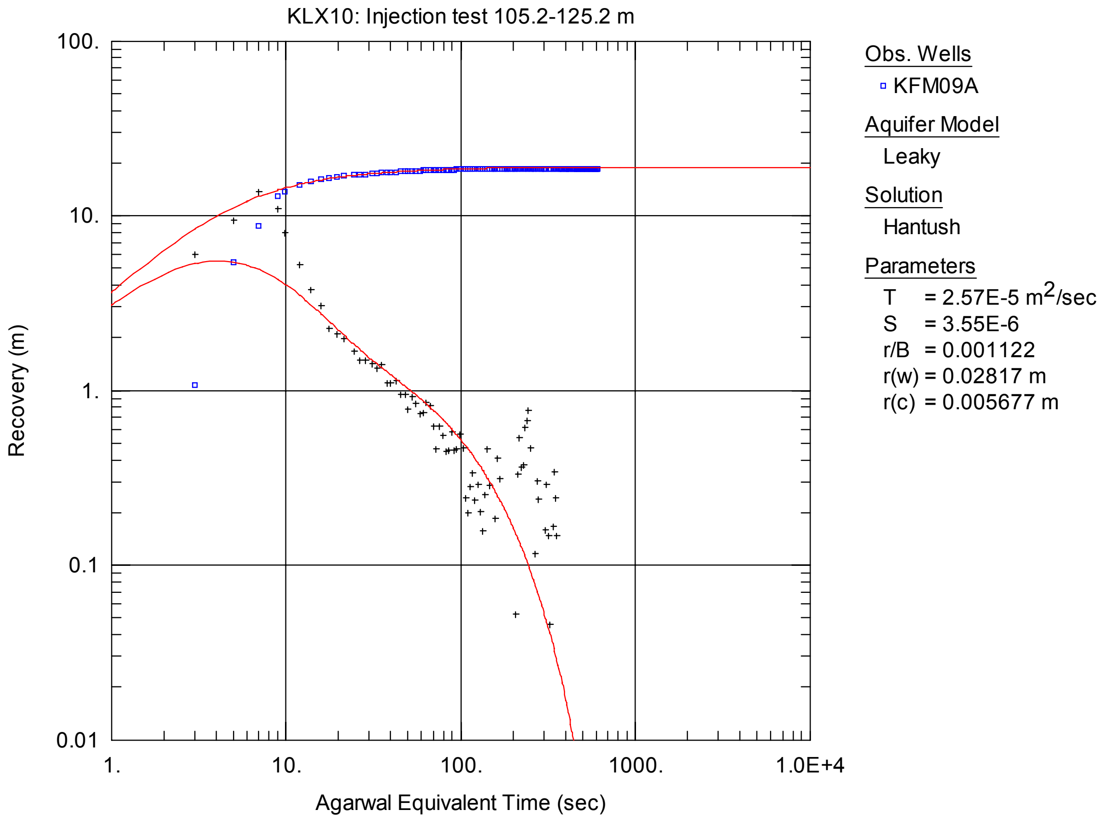


Figure A3-51. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 105.2-125.2 m in KLX10.*

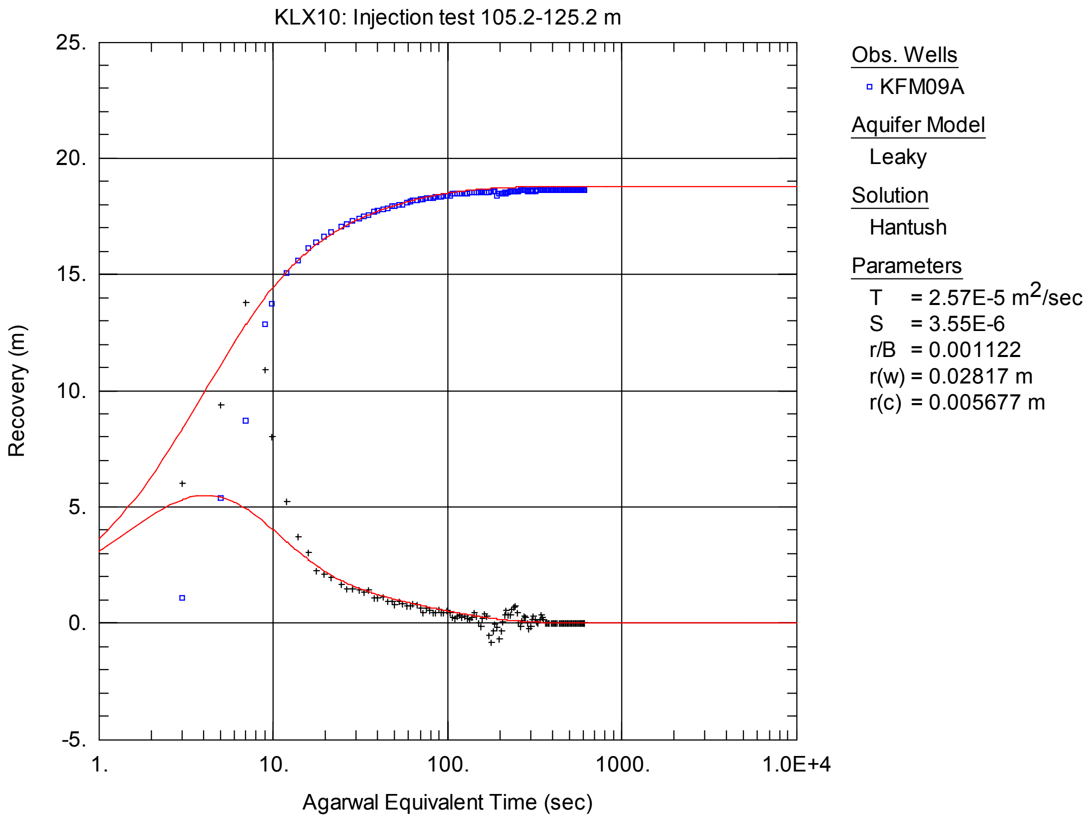


Figure A3-52. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 105.2-125.2 m in KLX10.*

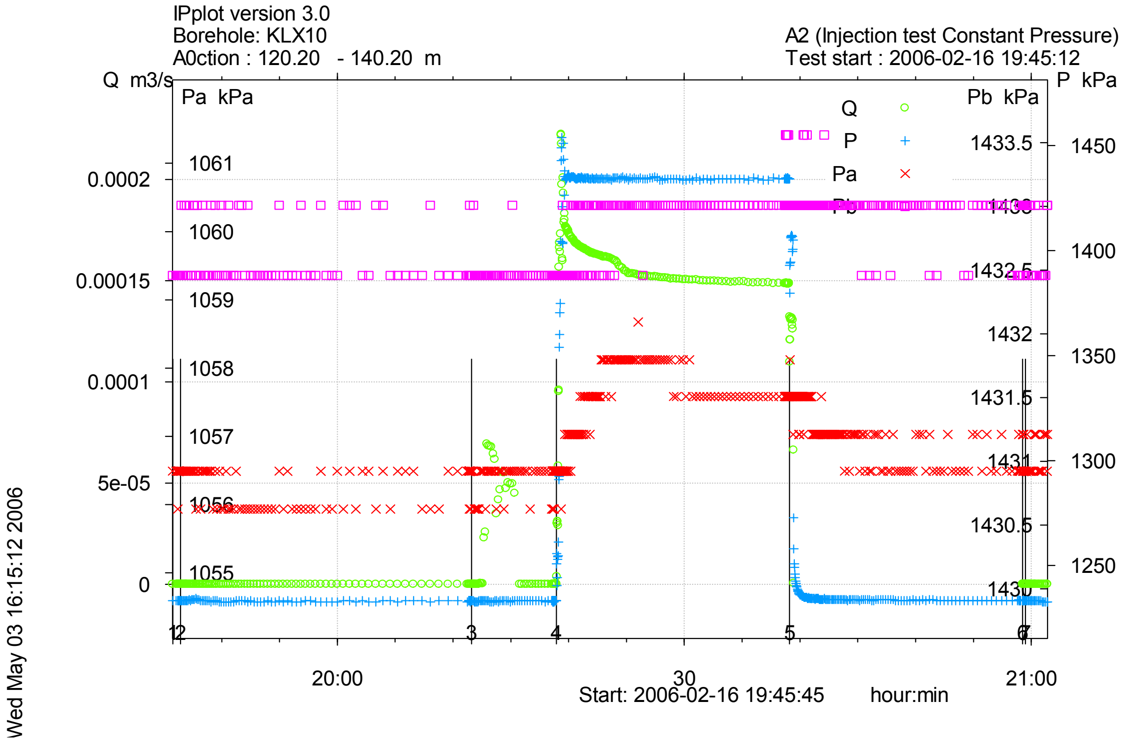


Figure A3-53. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 120.2-140.2 m in borehole KLX10.

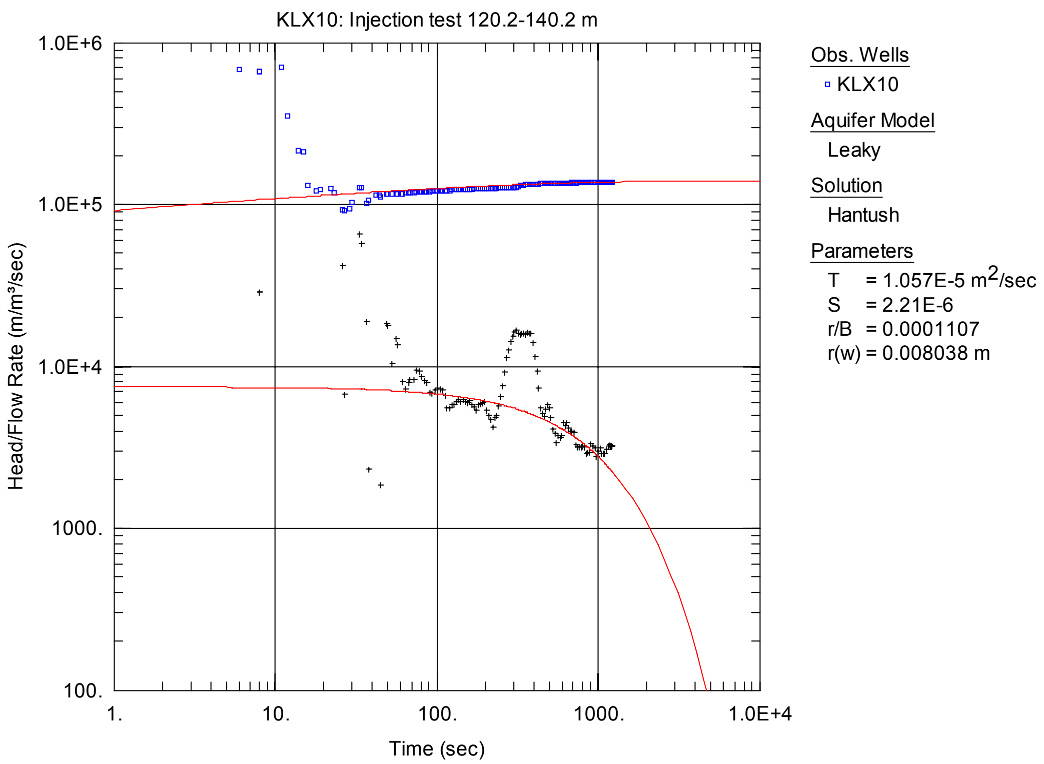


Figure A3-54. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 120.2-140.2 m in KLX10.

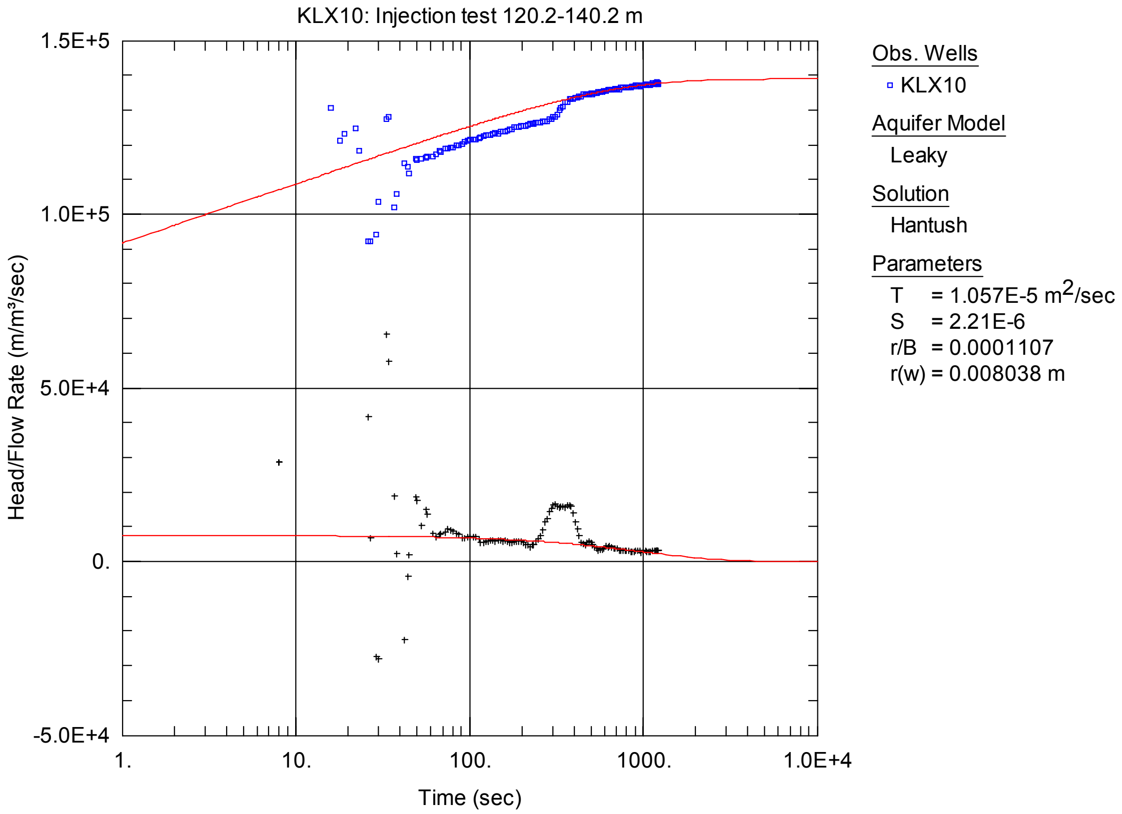


Figure A3-55. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 120.2-140.2 m in KLX10.*

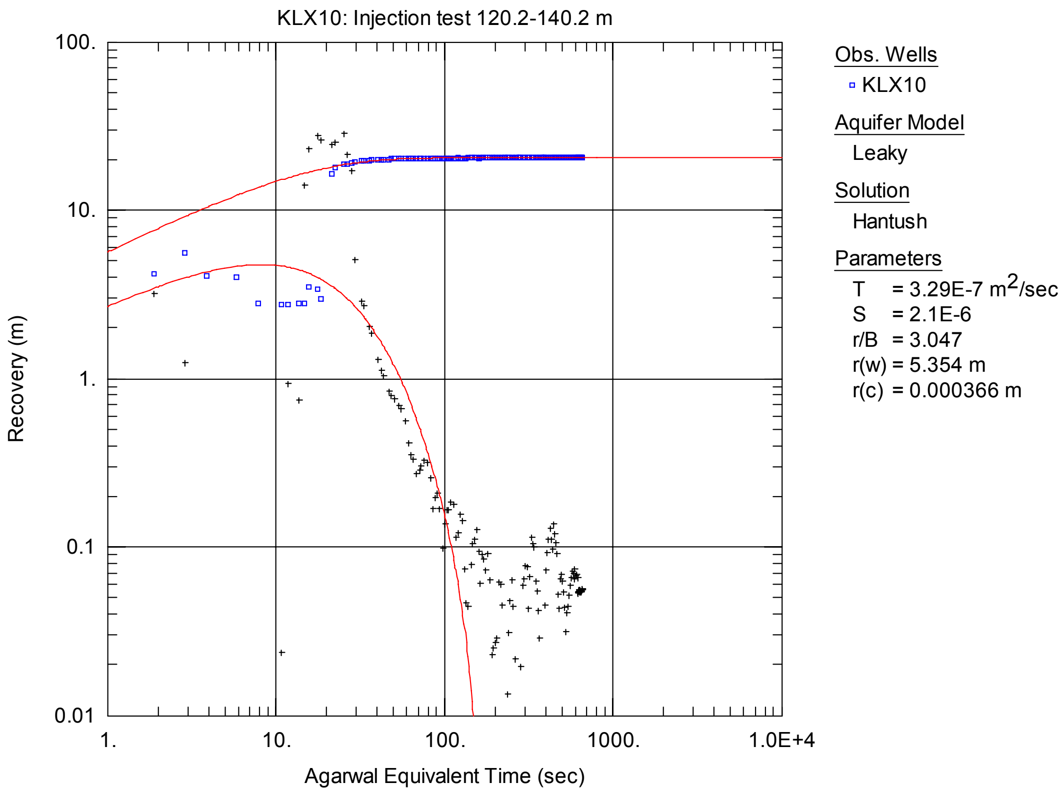


Figure A3-56. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 120.2-140.2 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

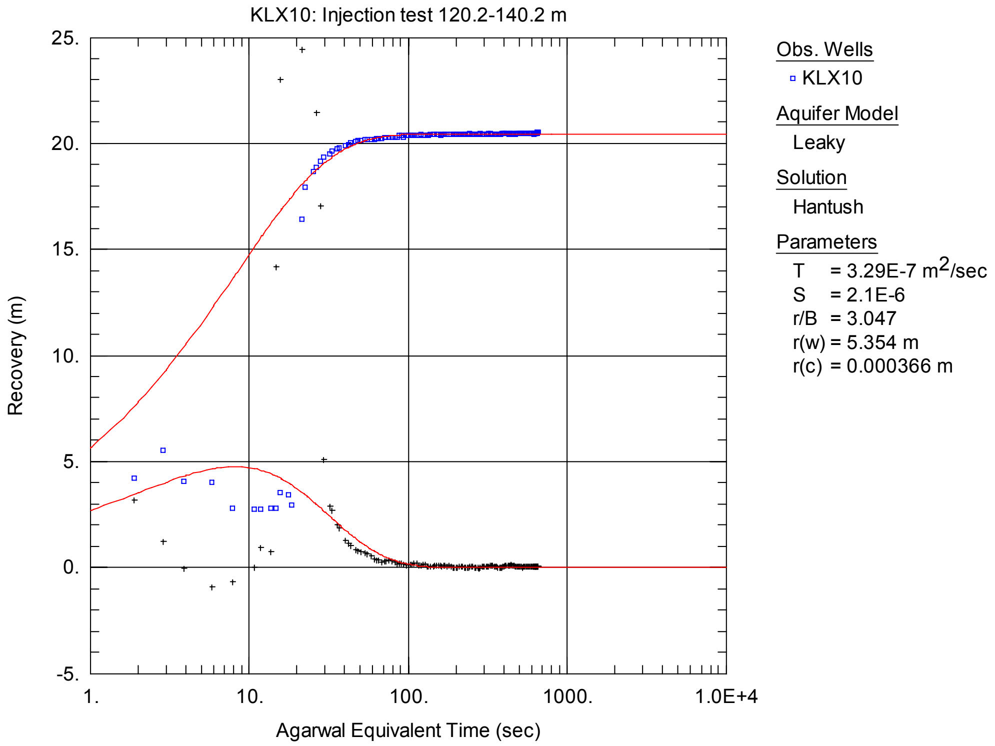


Figure A3-57. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 120.2-140.2 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

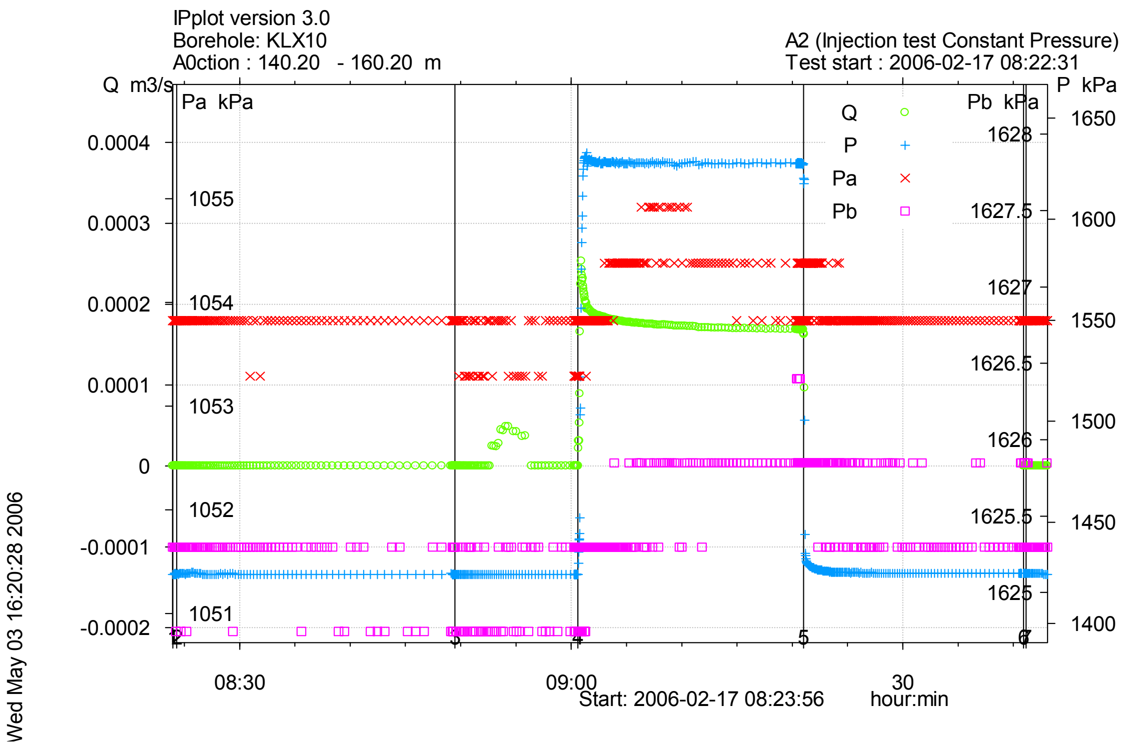


Figure A3-58. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 140.2-160.2 m in borehole KLX10.*

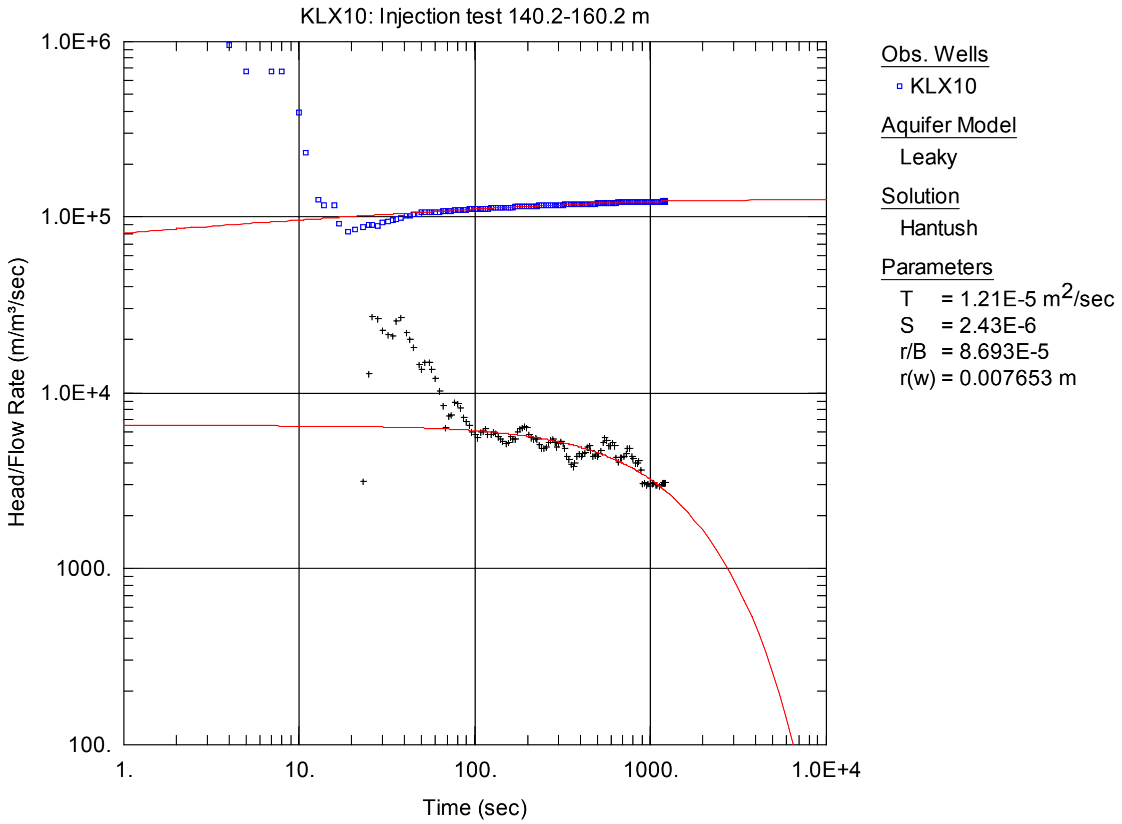


Figure A3-59. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 140.2-160.2 m in KLX10.*

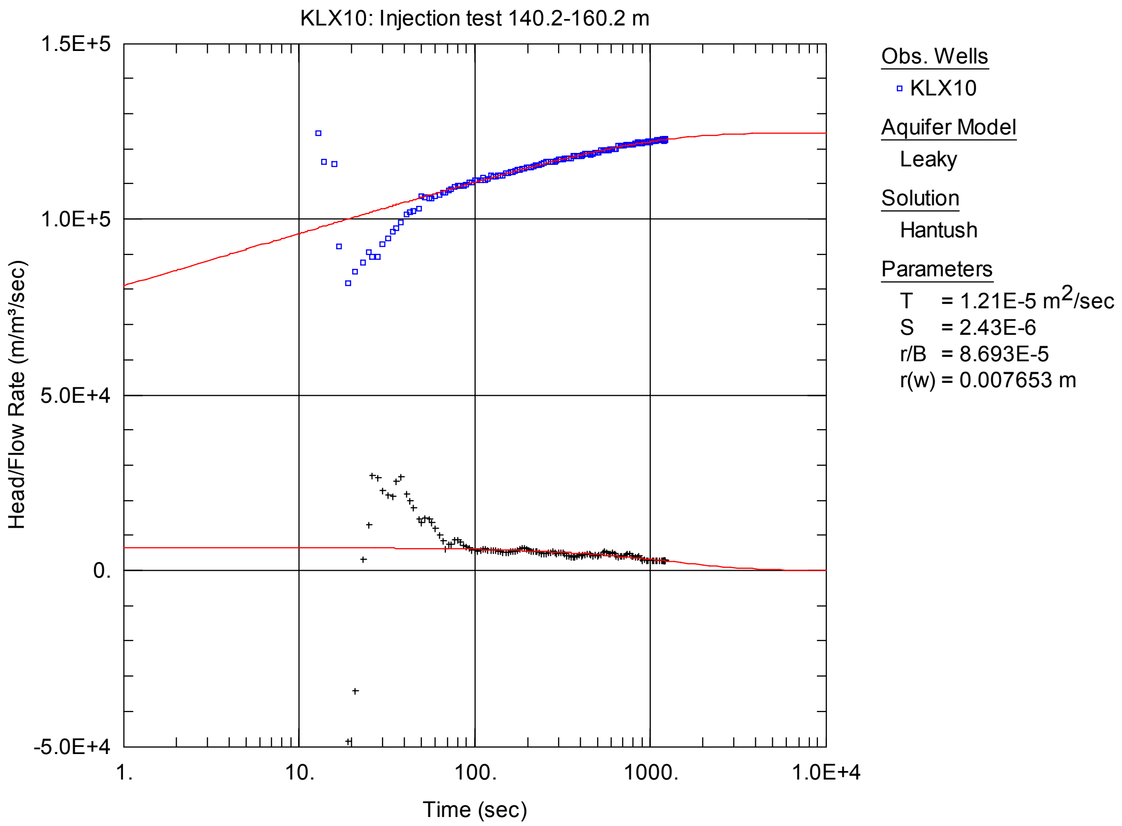


Figure A3-60. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 140.2-160.2 m in KLX10.*

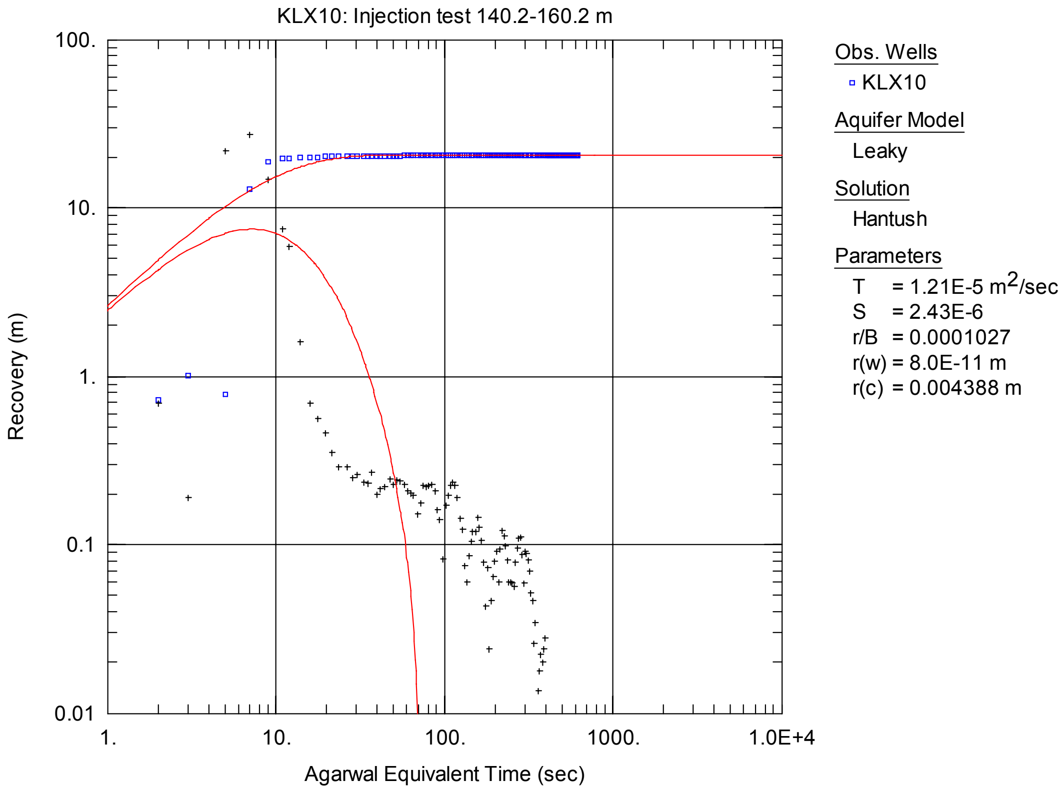


Figure A3-61. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 140.2-160.2 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

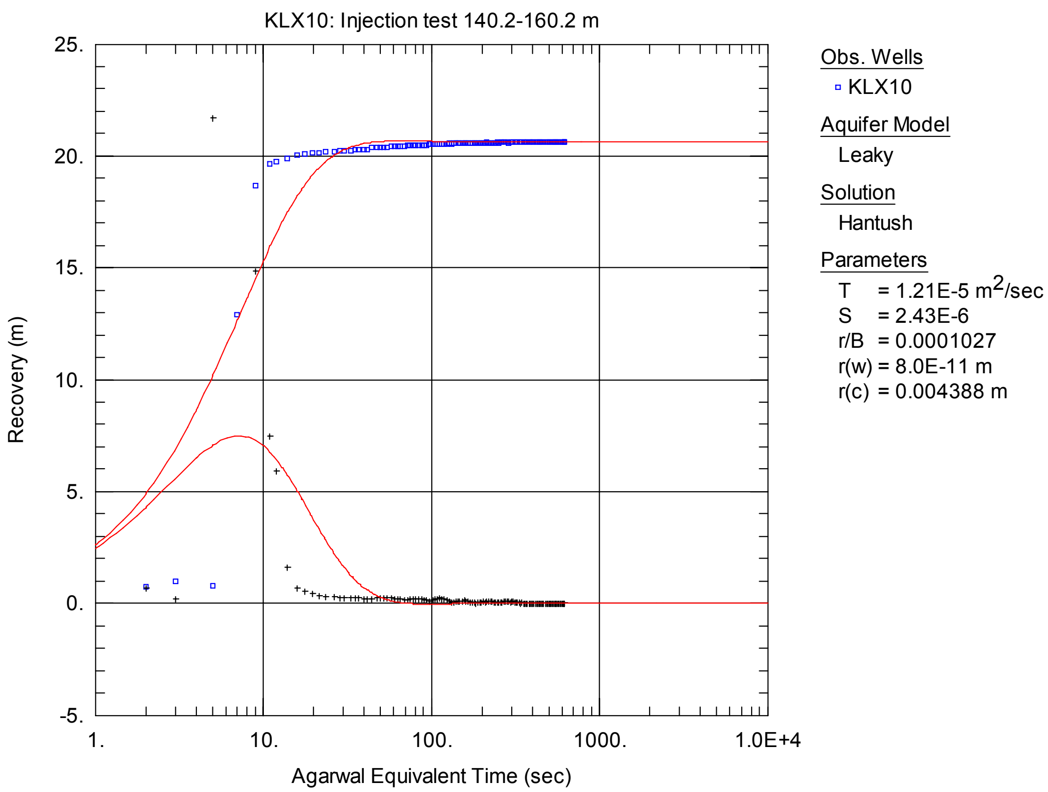


Figure A3-62. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 140.2-160.2 m in KLX10 The type curve fit is showing a possible, however not unambiguous, evaluation.*

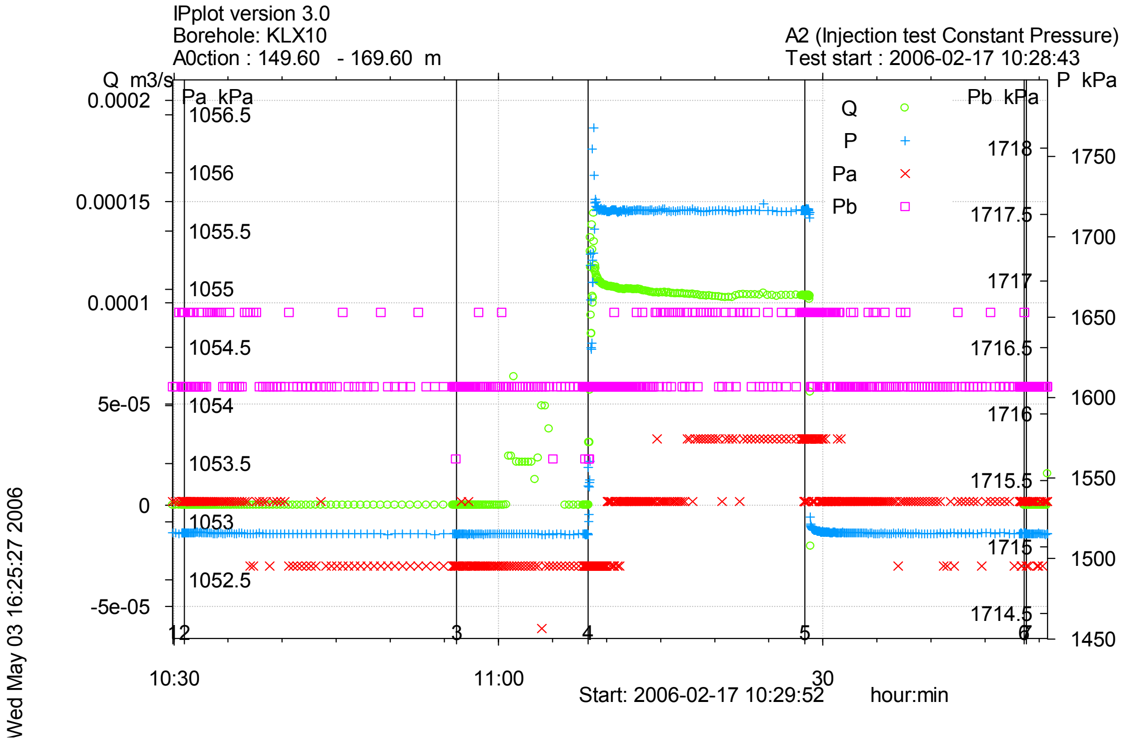


Figure A3-63. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 149.6-169.6 m in borehole KLX10.*

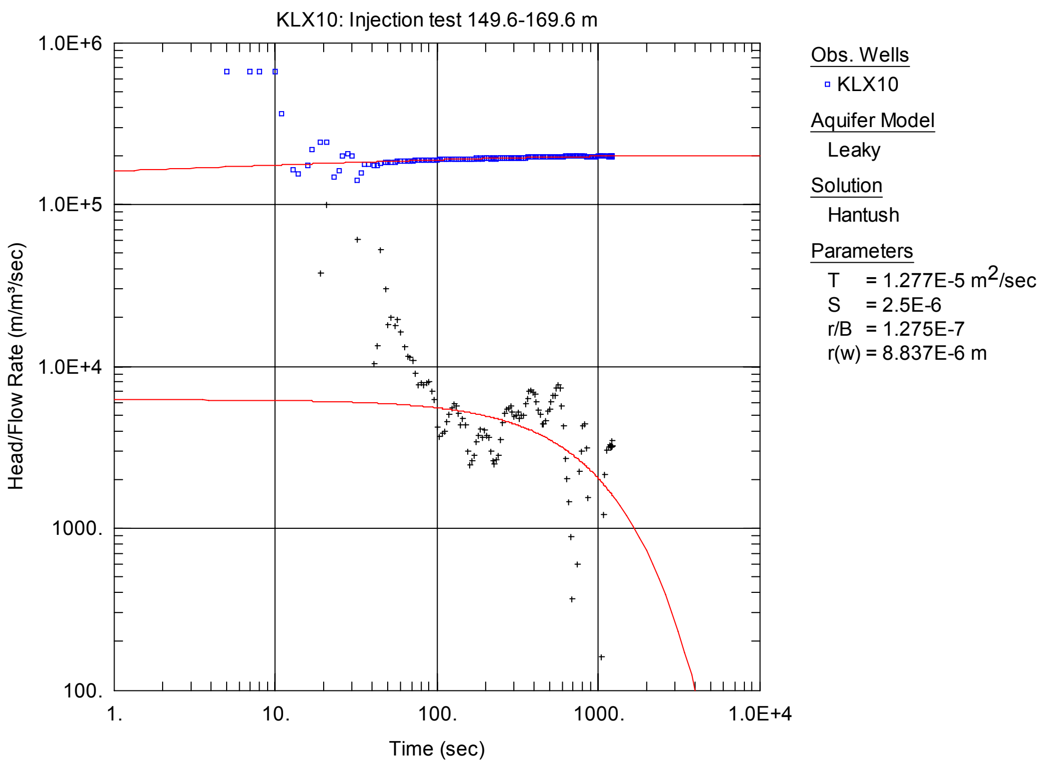


Figure A3-64. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 149.6-169.6 m in KLX10.*

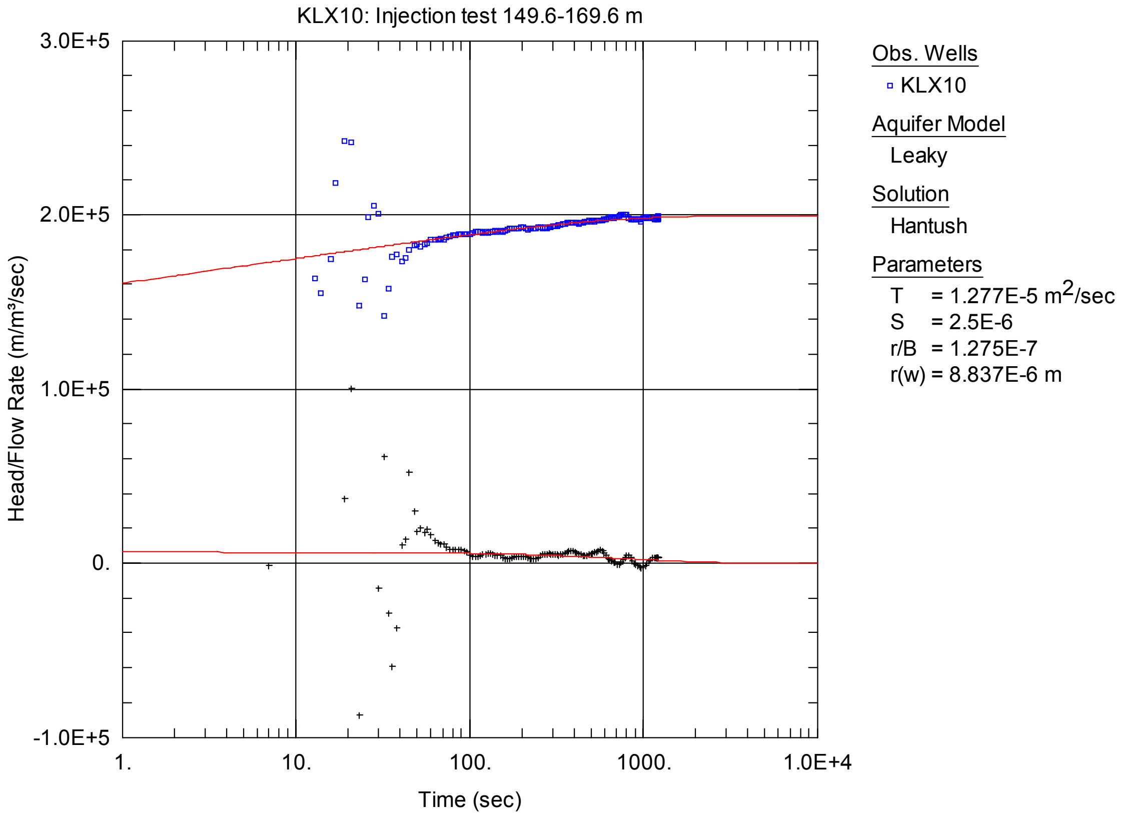


Figure A3-65. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 149.6-169.6 m in KLX10.*

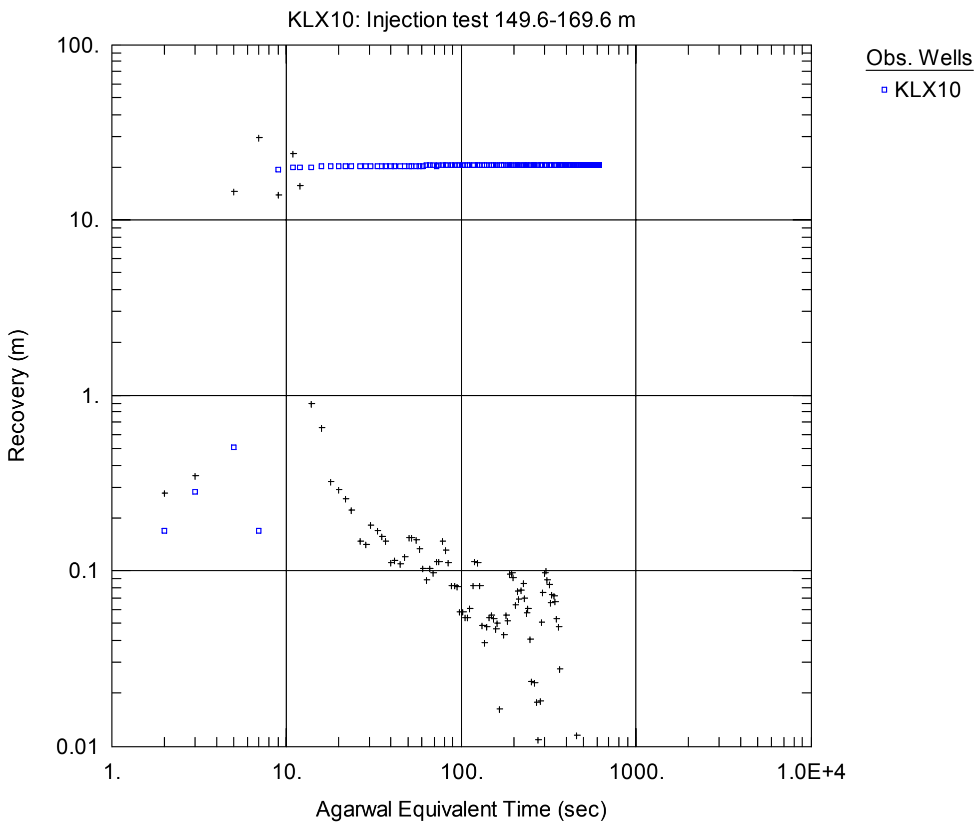


Figure A3-66. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 149.6-169.6 m in KLX10.*

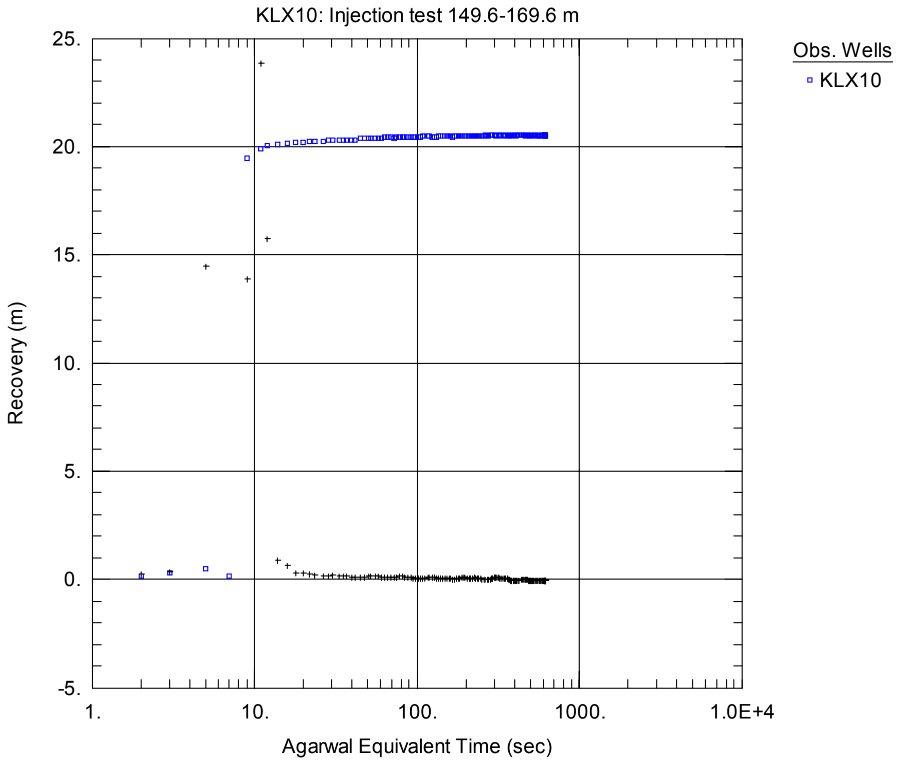


Figure A3-67. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 149.6-169.6 m in KLX10.*

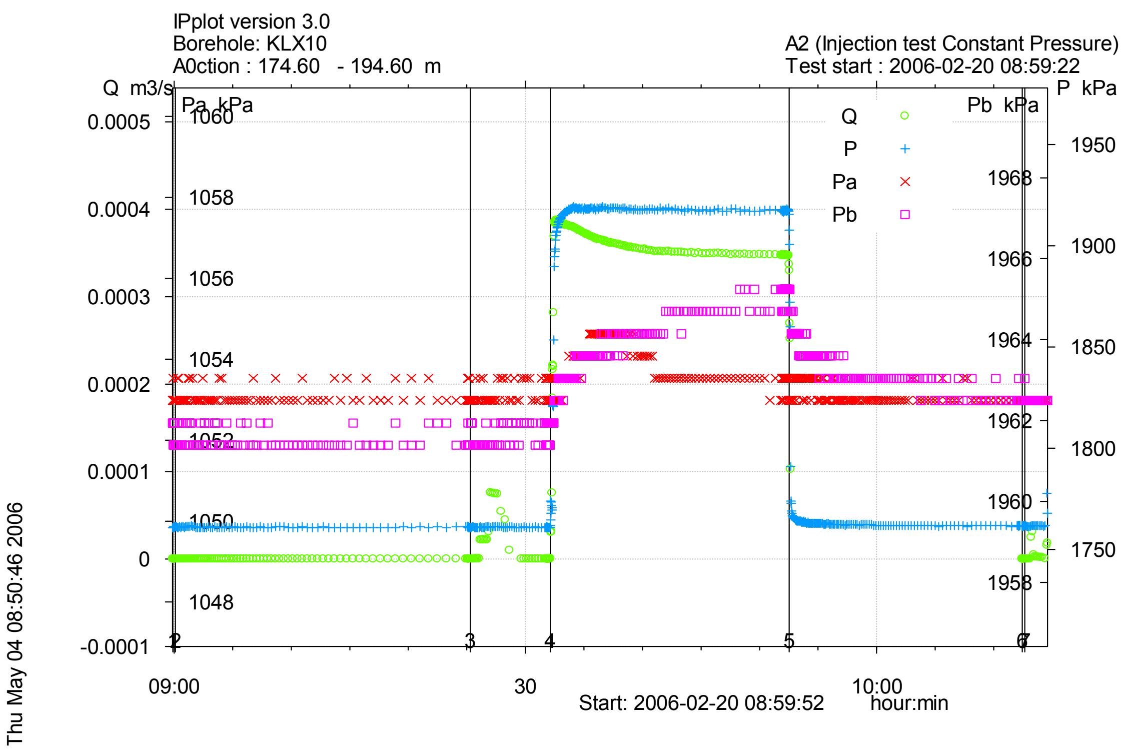


Figure A3-68. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 174.6-194.6 m in borehole KLX10.*

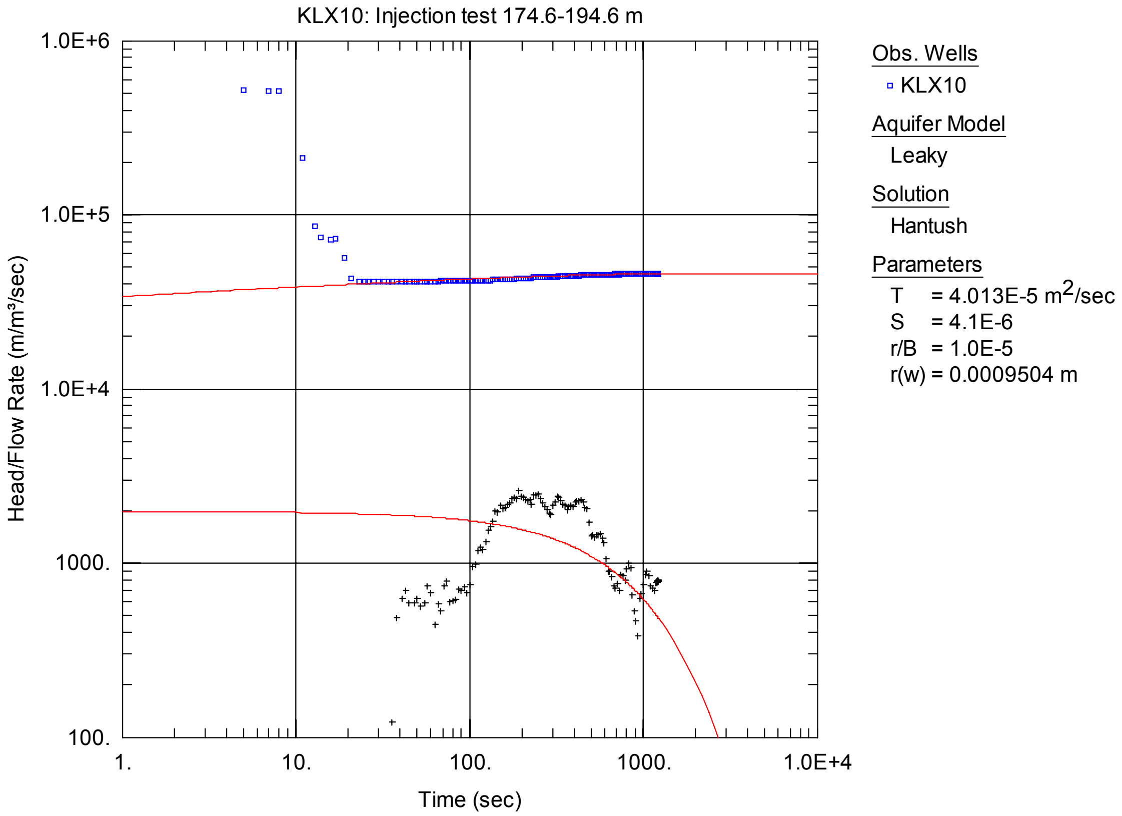


Figure A3-69. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 174.6-194.6 m in KLX10.*

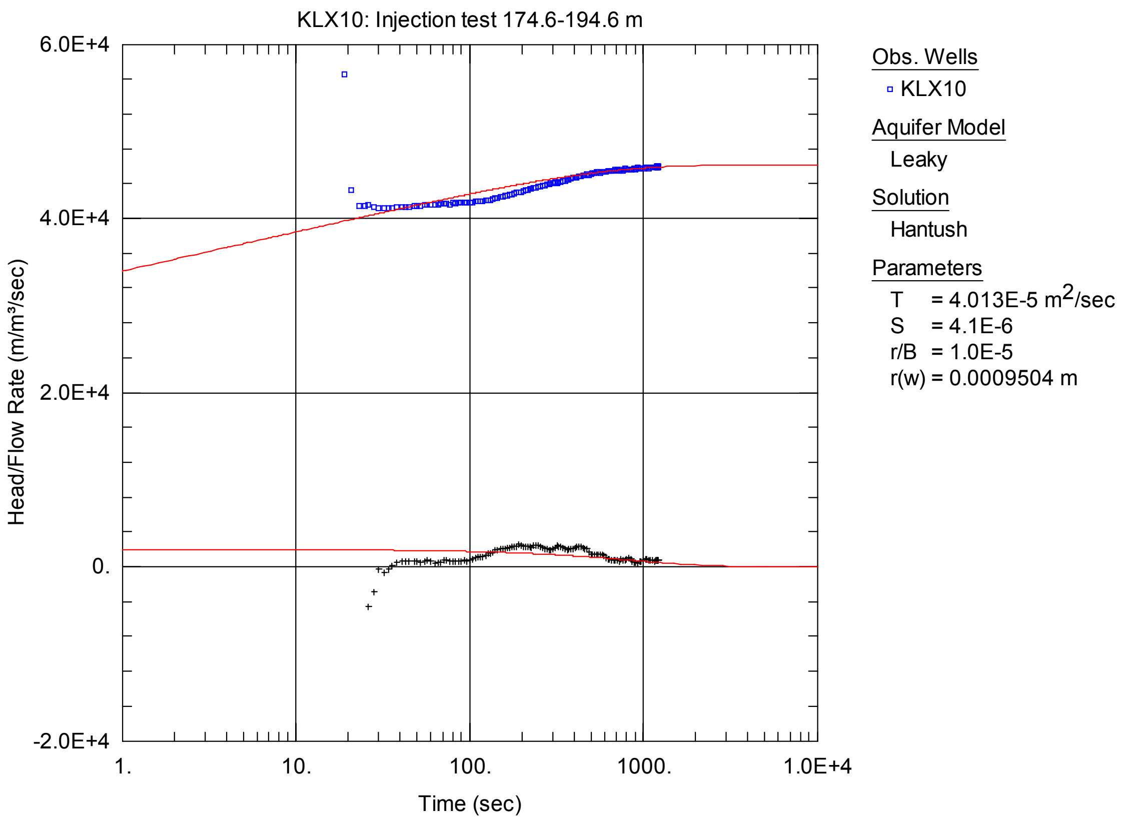


Figure A3-70. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 174.6-194.6 m in KLX10.*

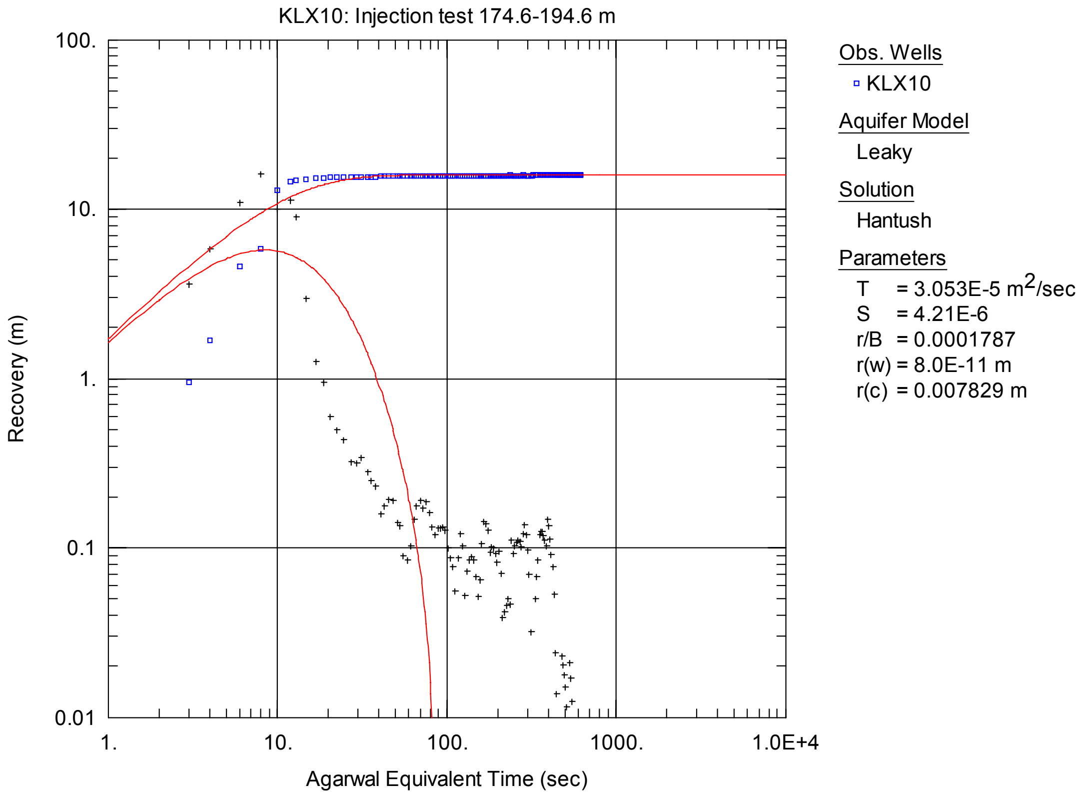


Figure A3-71. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 174.6-194.6 m in KLX10. The type curve fit is only to show that an assumption of PSF is not valid.*

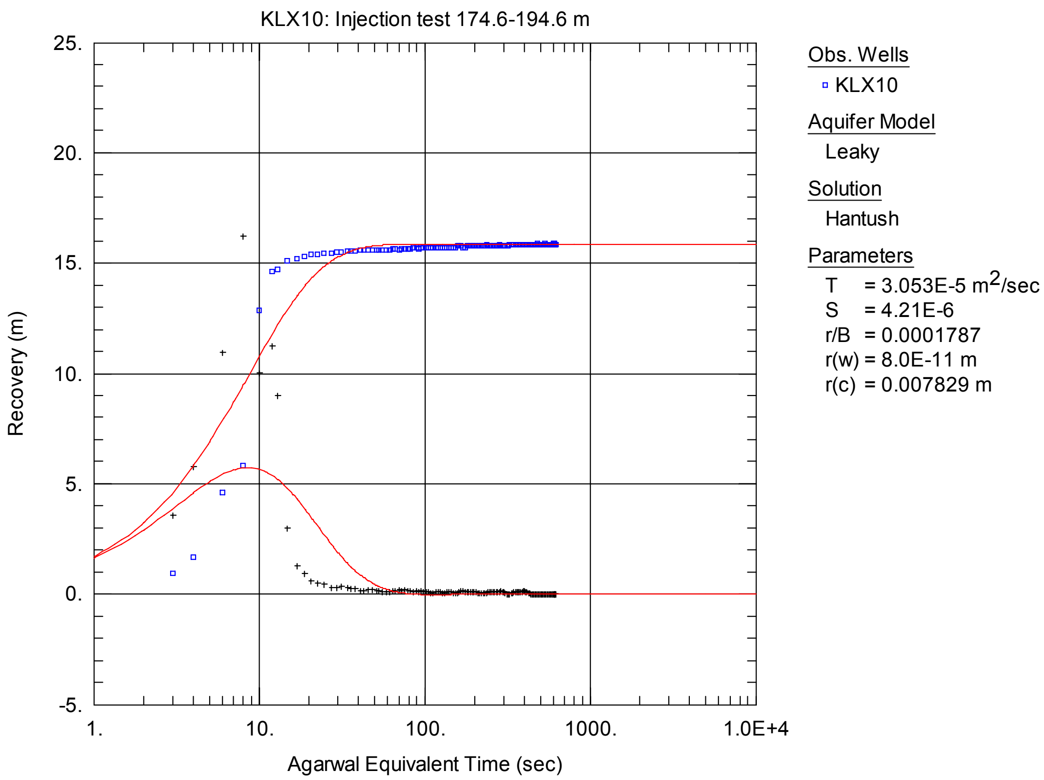


Figure A3-72. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section xxx.x-73xx.x m in KLX10. The type curve fit is only to show that an assumption of PSF is not valid.*

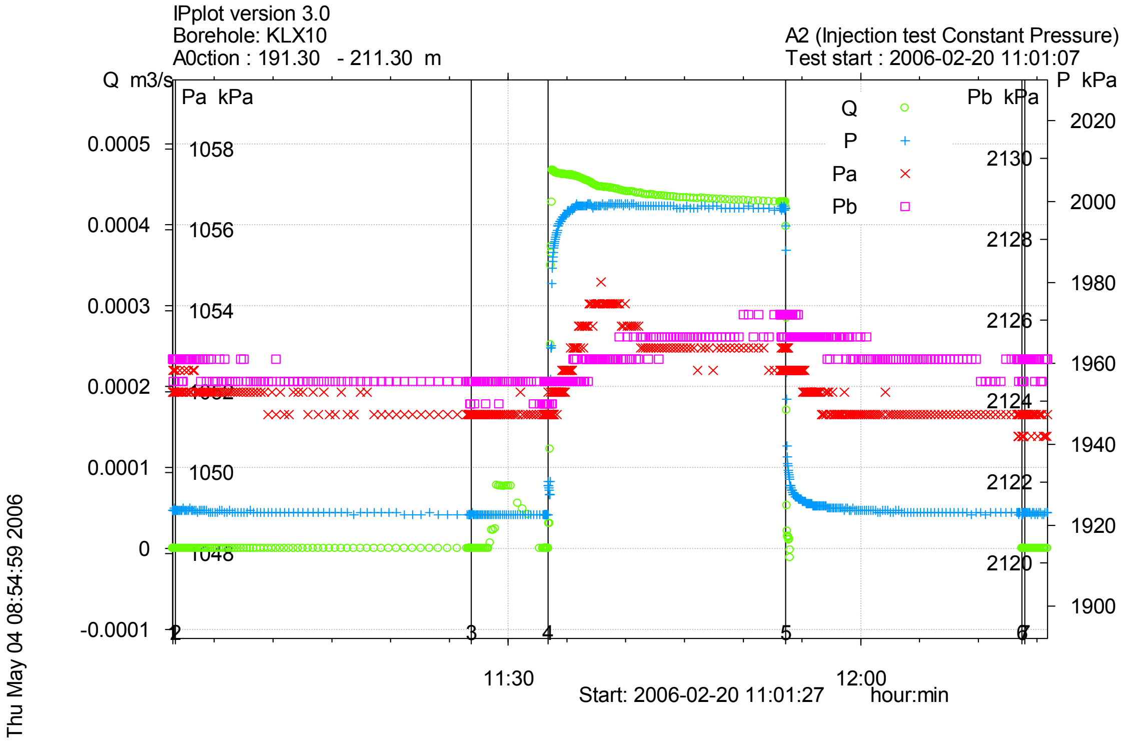


Figure A3-74. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 191.3-211.3 m in borehole KLX10.*

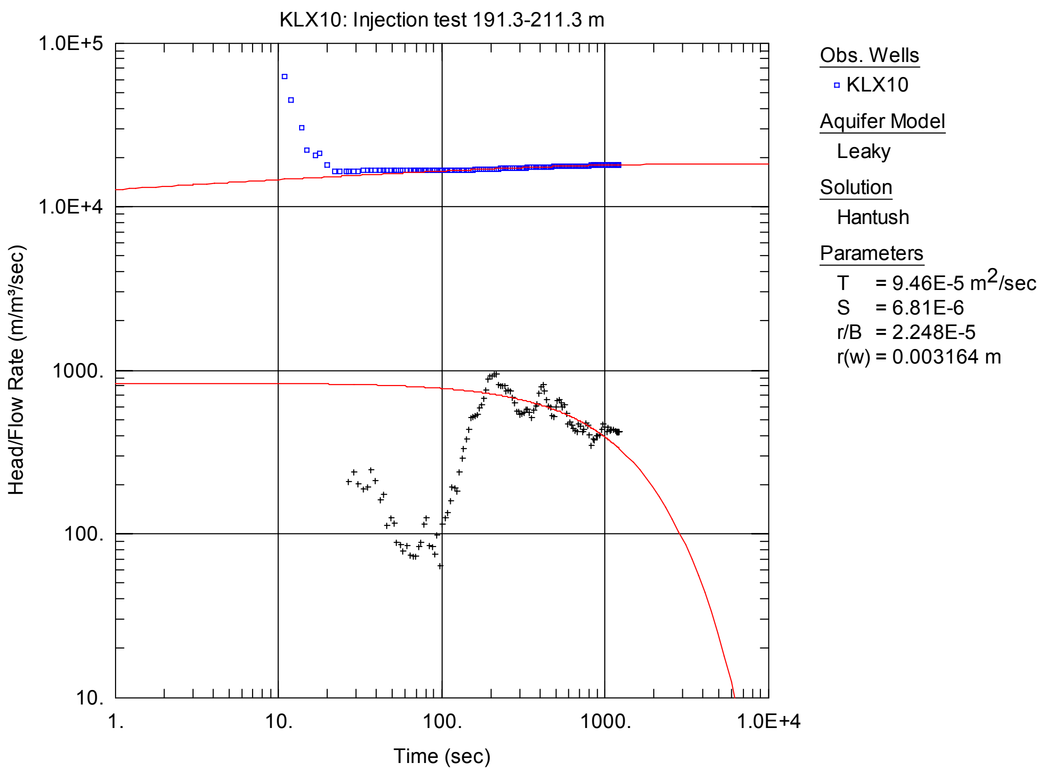


Figure A3-75. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 191.3-211.3 m in KLX10.*

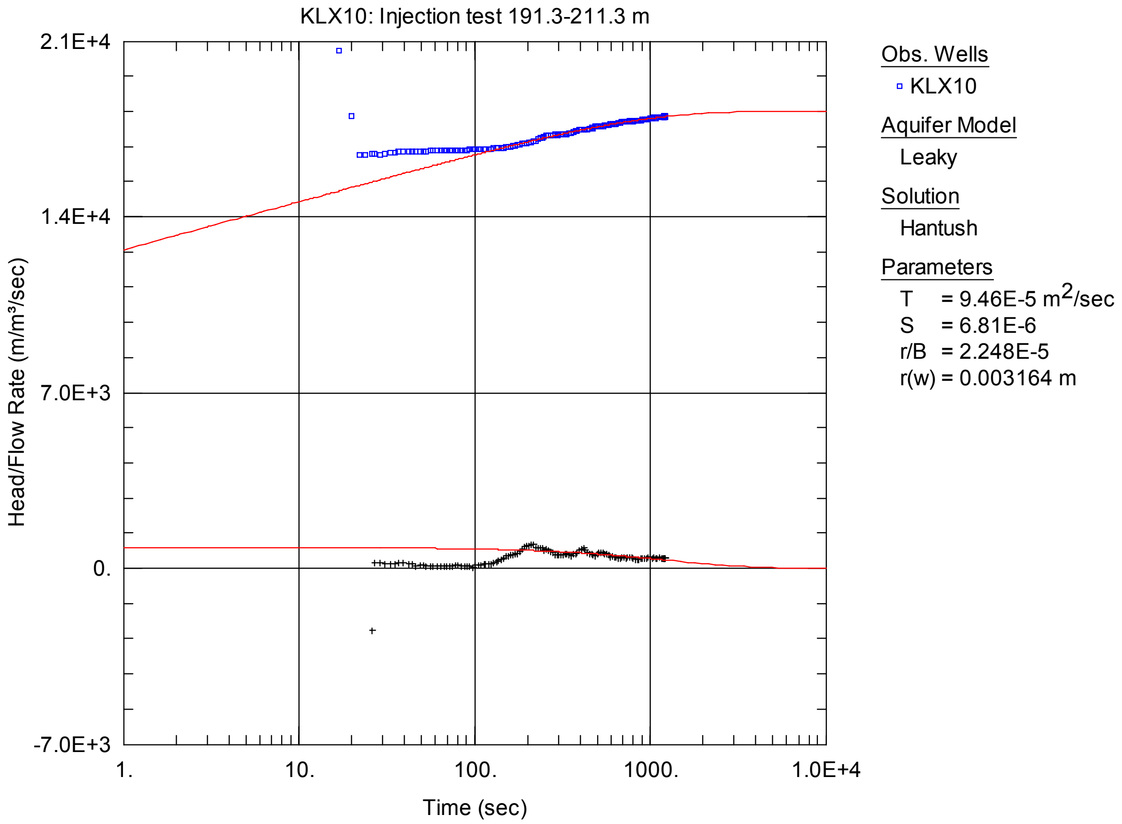


Figure A3-76. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 191.3-211.3 m in KLX10.*

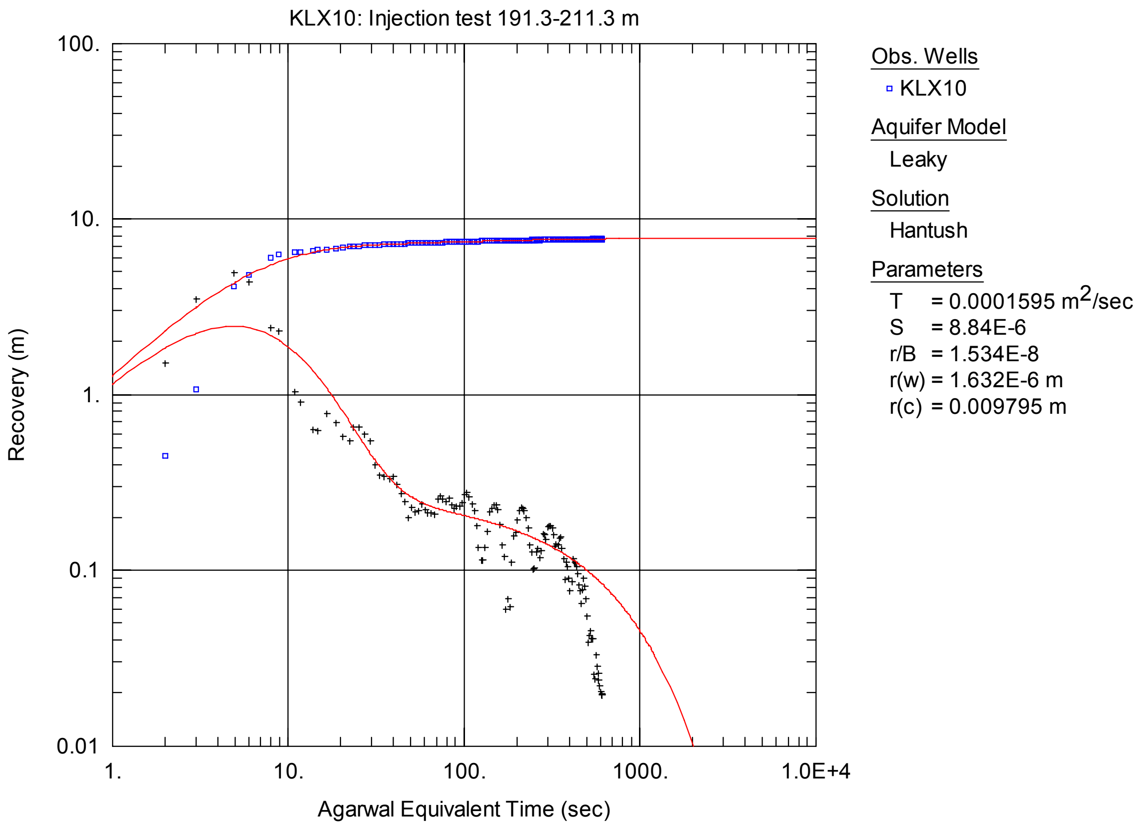


Figure A3-77. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 191.3-211.3 m in KLX10.*

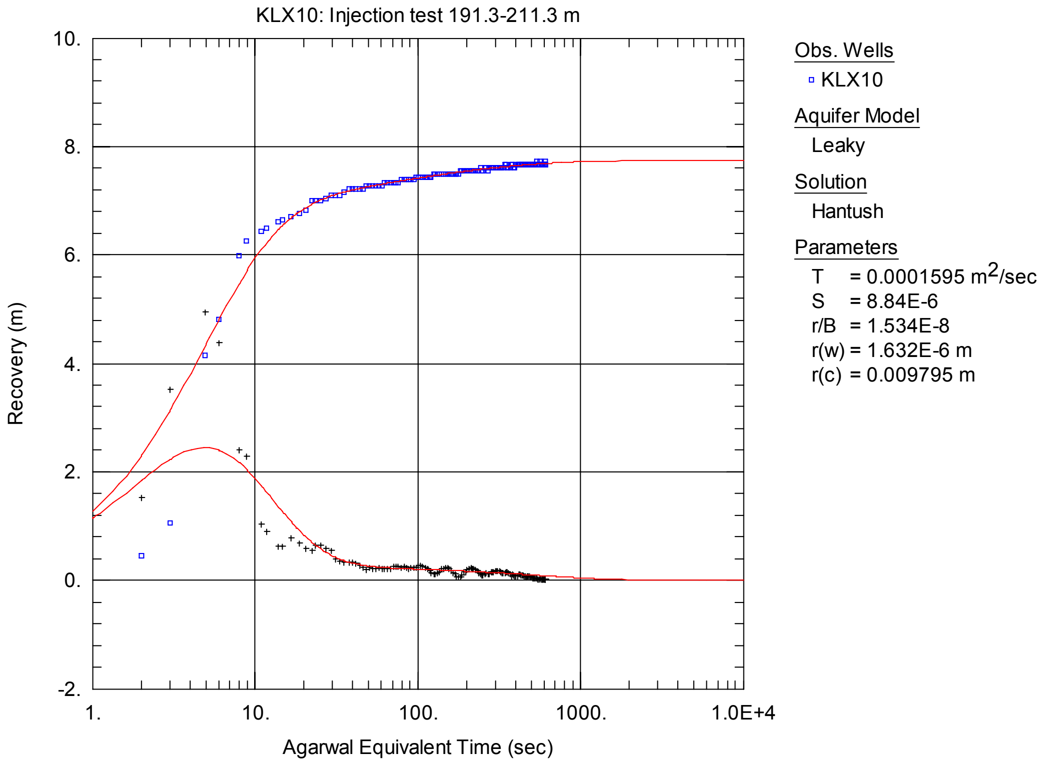


Figure A3-78. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 191.3-211.3 m in KLX10.*

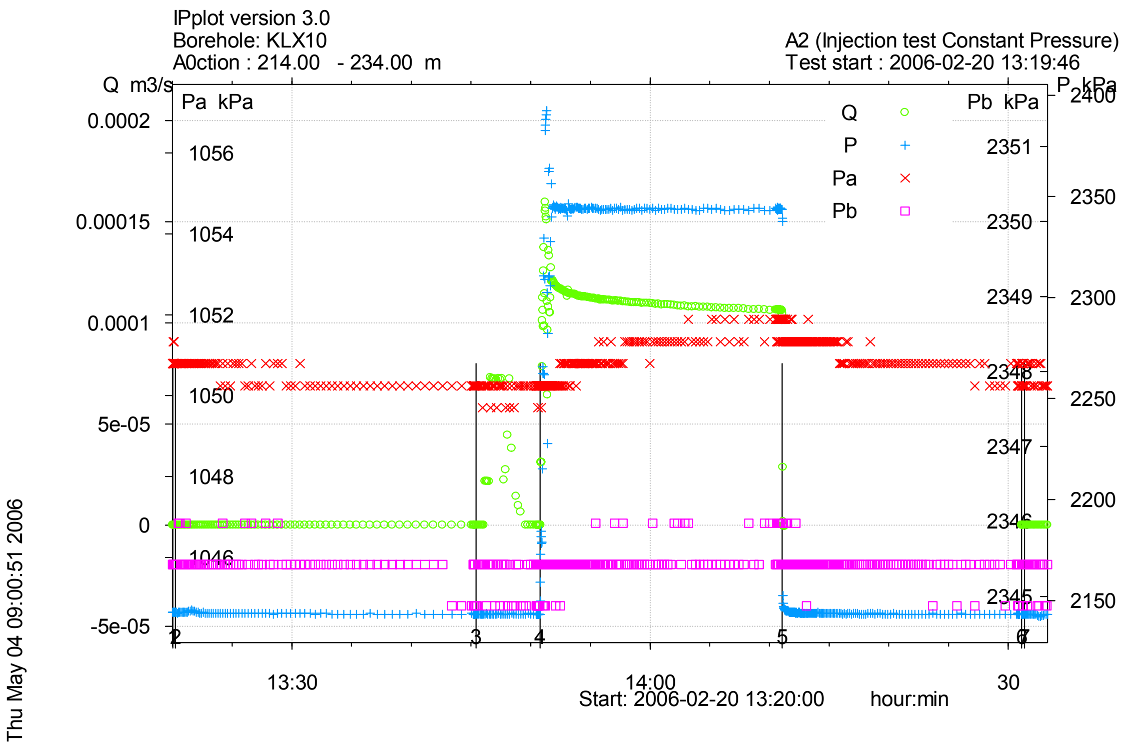


Figure A3-79. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 214.0-234.0 m in borehole KLX10.*

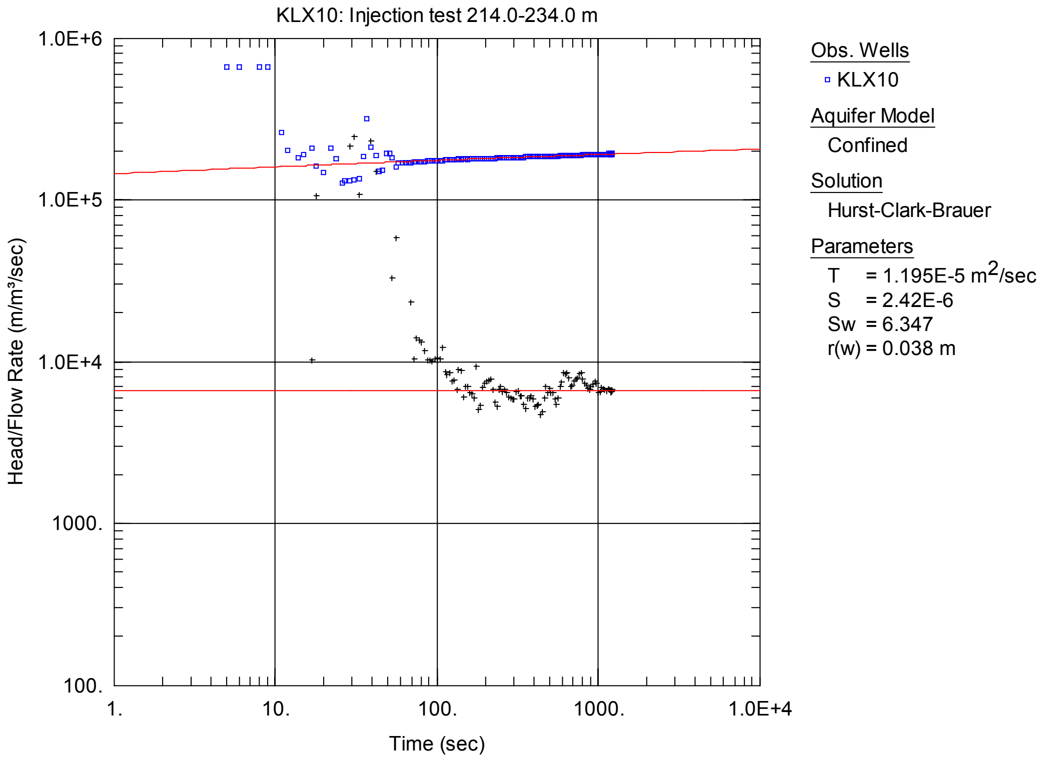


Figure A3-80. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 214.0-234.0 m in KLX10.*

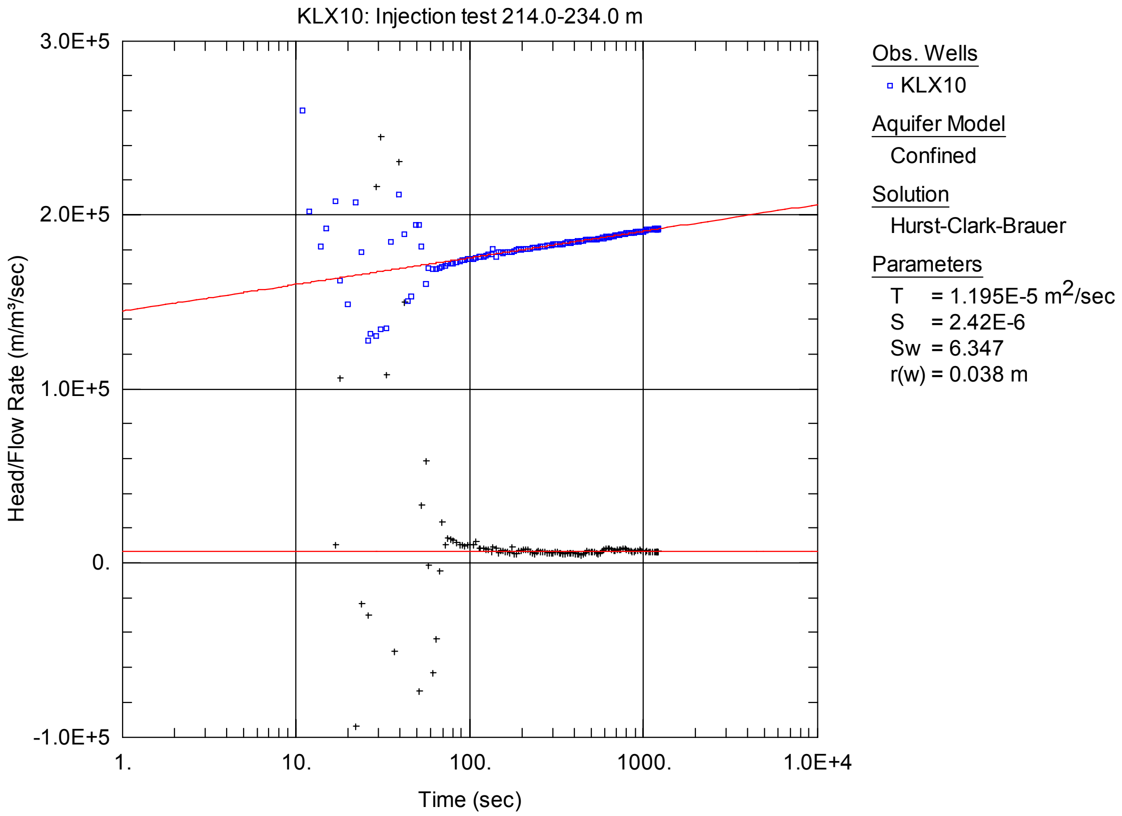


Figure A3-81. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 214.0-234.0 m in KLX10.*

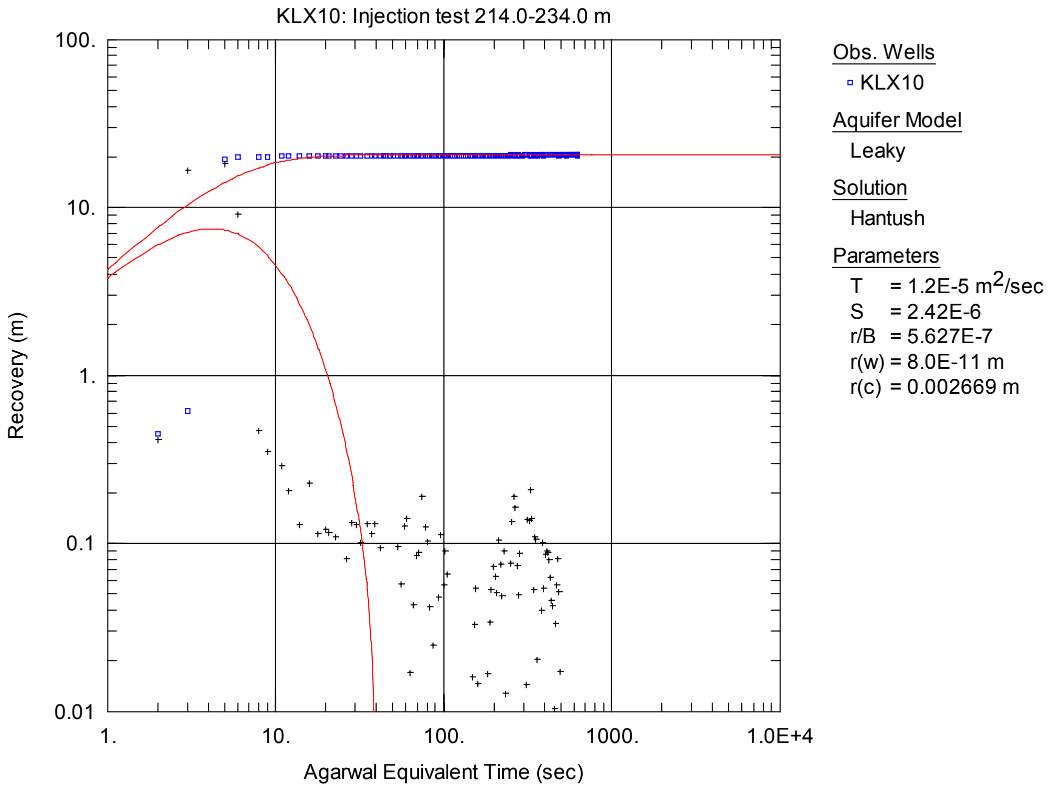


Figure A3-82. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 214.0-234.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

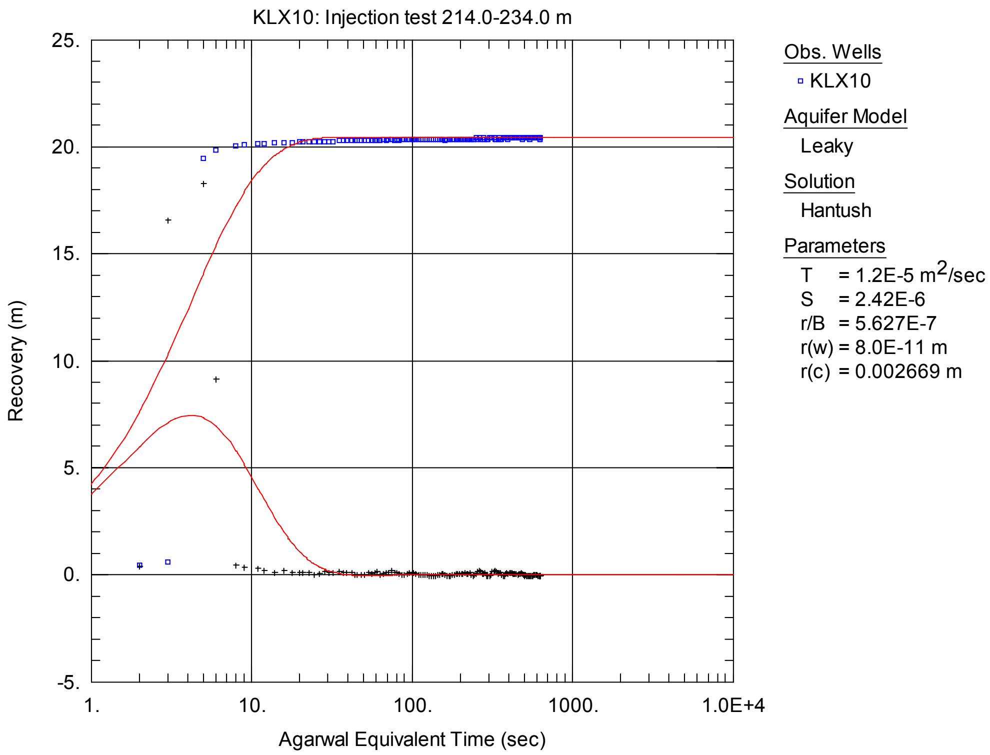


Figure A3-83. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 214.0-234.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

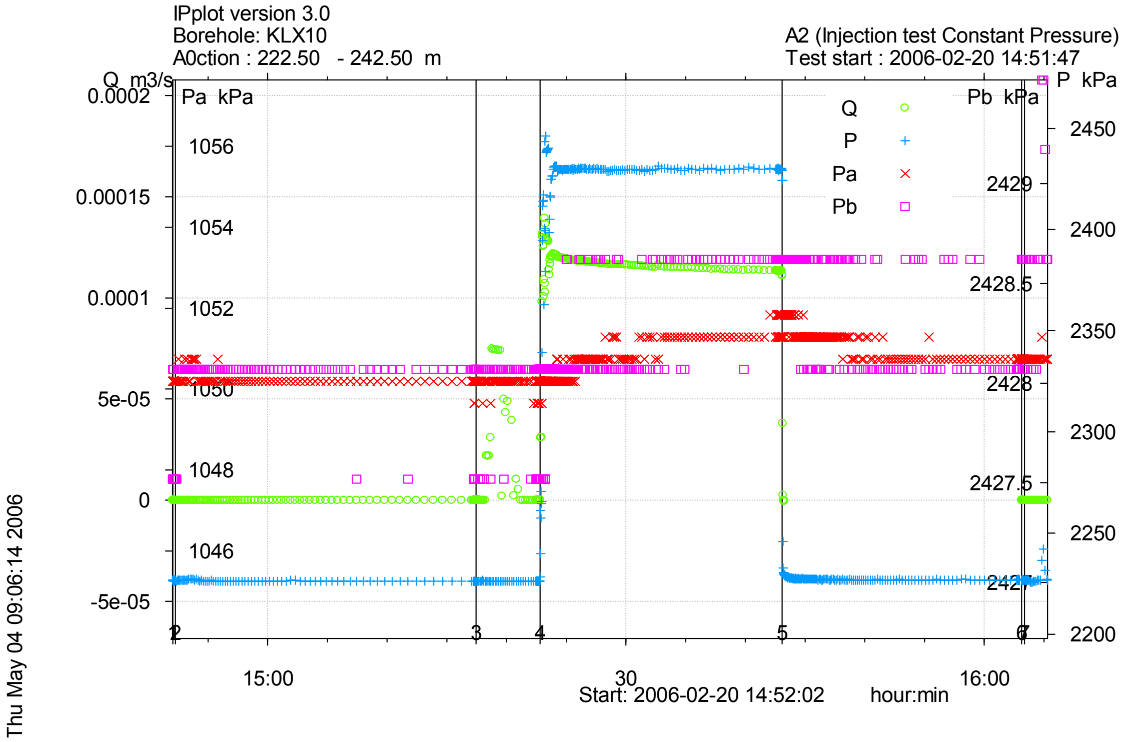


Figure A3-84. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 222.5-242.5 m in borehole KLX10.*

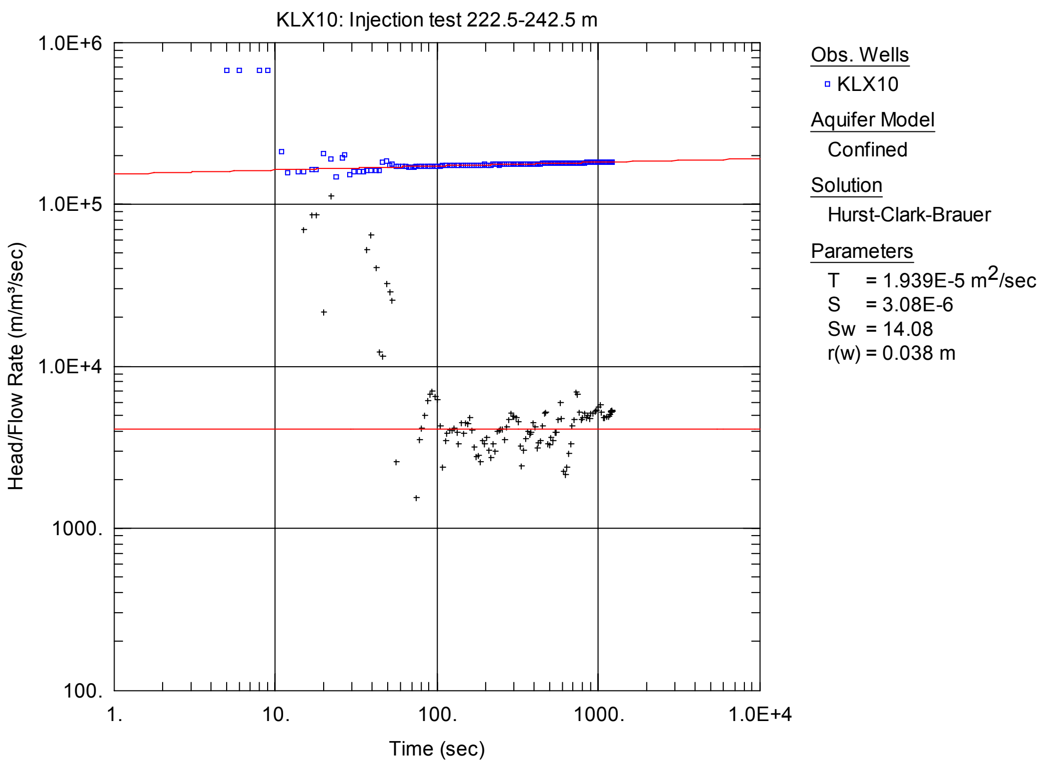


Figure A3-85. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 222.5-242.5 m in KLX10.*

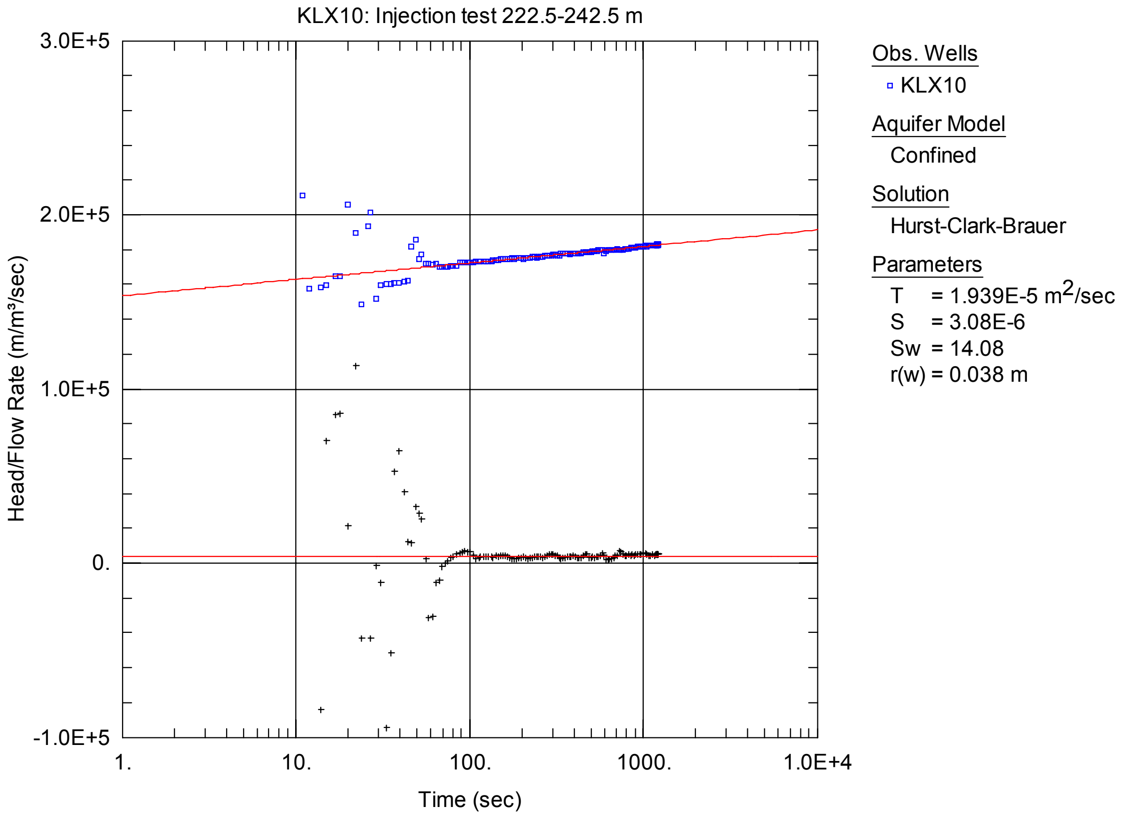


Figure A3-86. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 222.5-242.5 m in KLX10.*

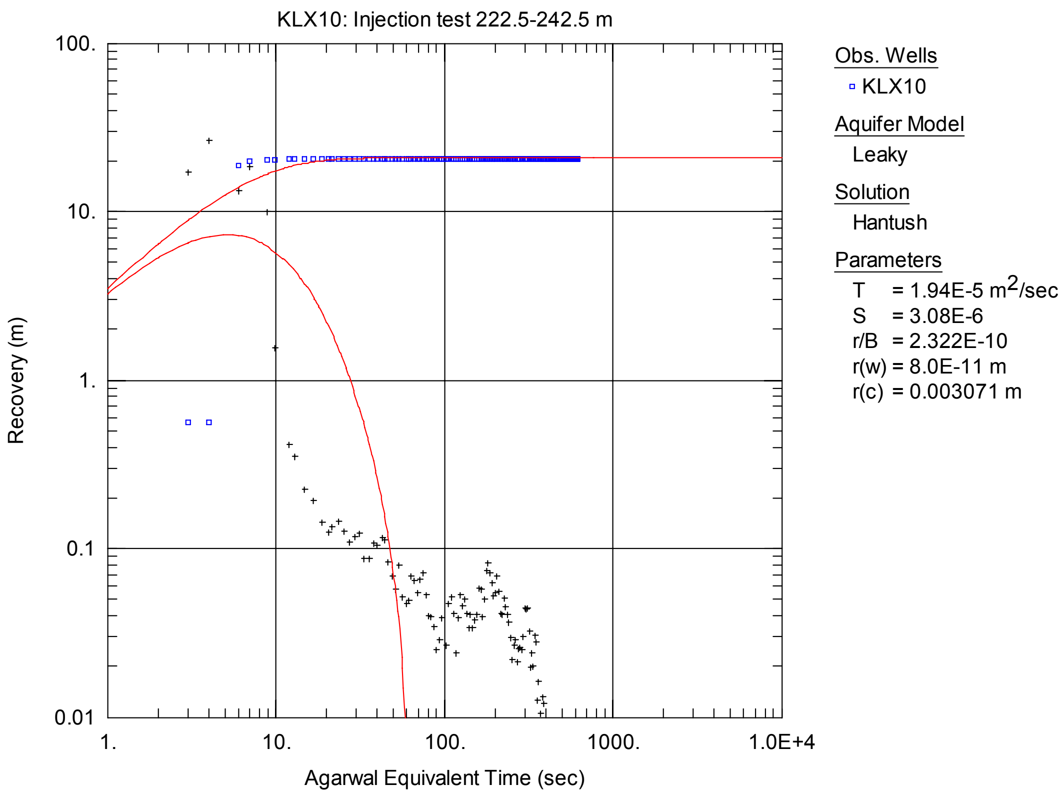


Figure A3-87. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 222.5-242.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

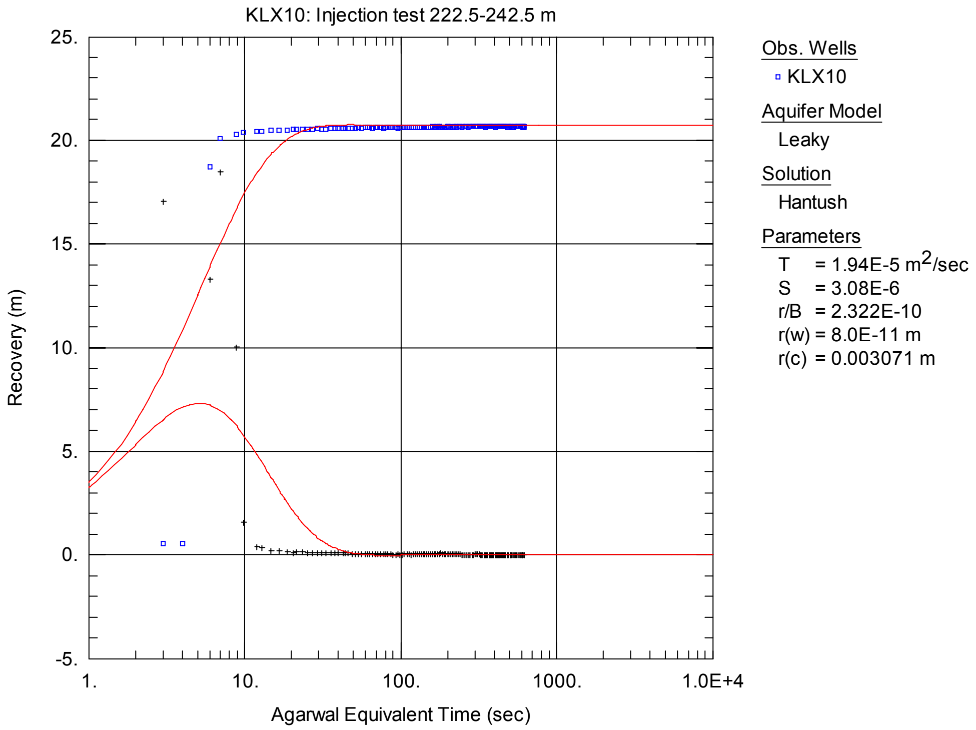


Figure A3-88. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 222.5-242.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

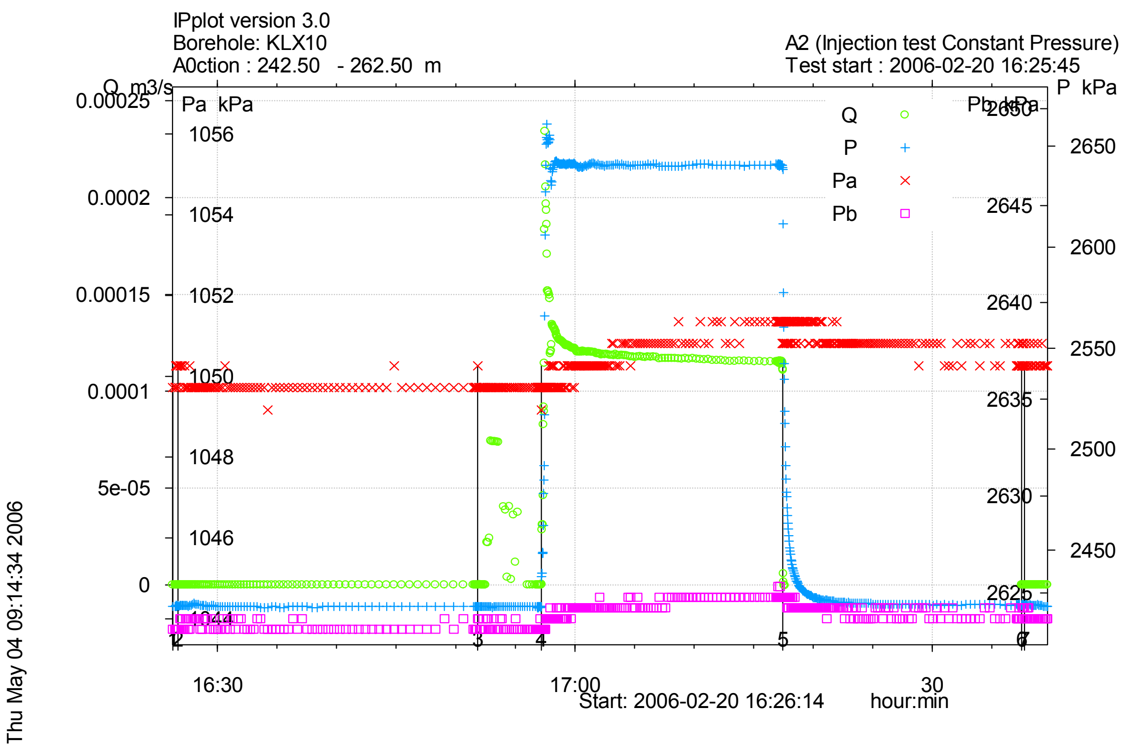


Figure A3-89. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 242.5-262.5 m in borehole KLX10.*

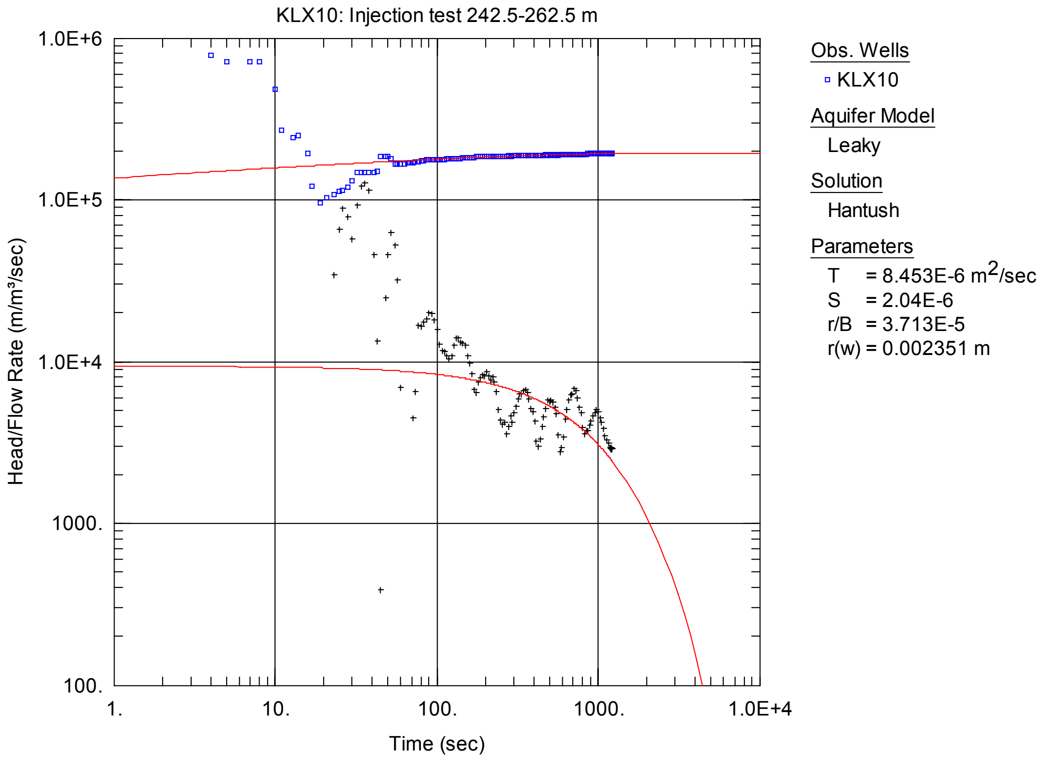


Figure A3-90. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 242.5-262.5 m in KLX10.*

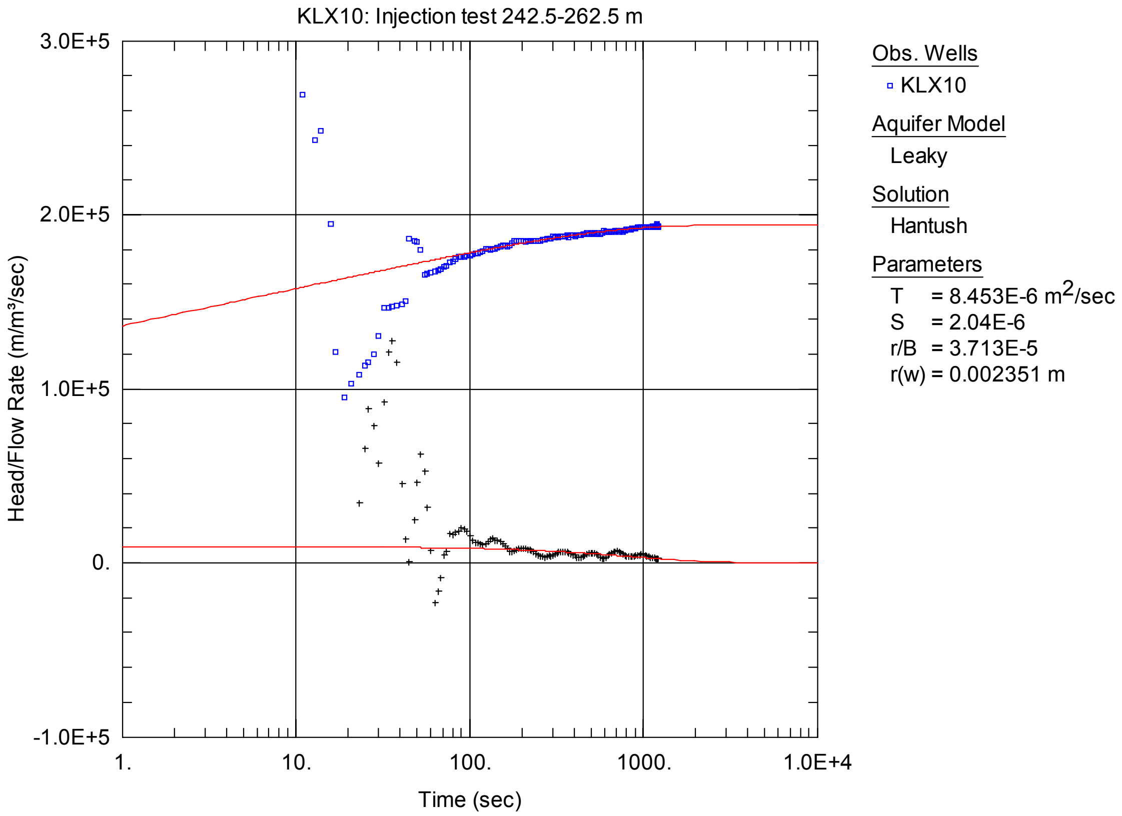


Figure A3-91. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 242.5-262.5 m in KLX10.*

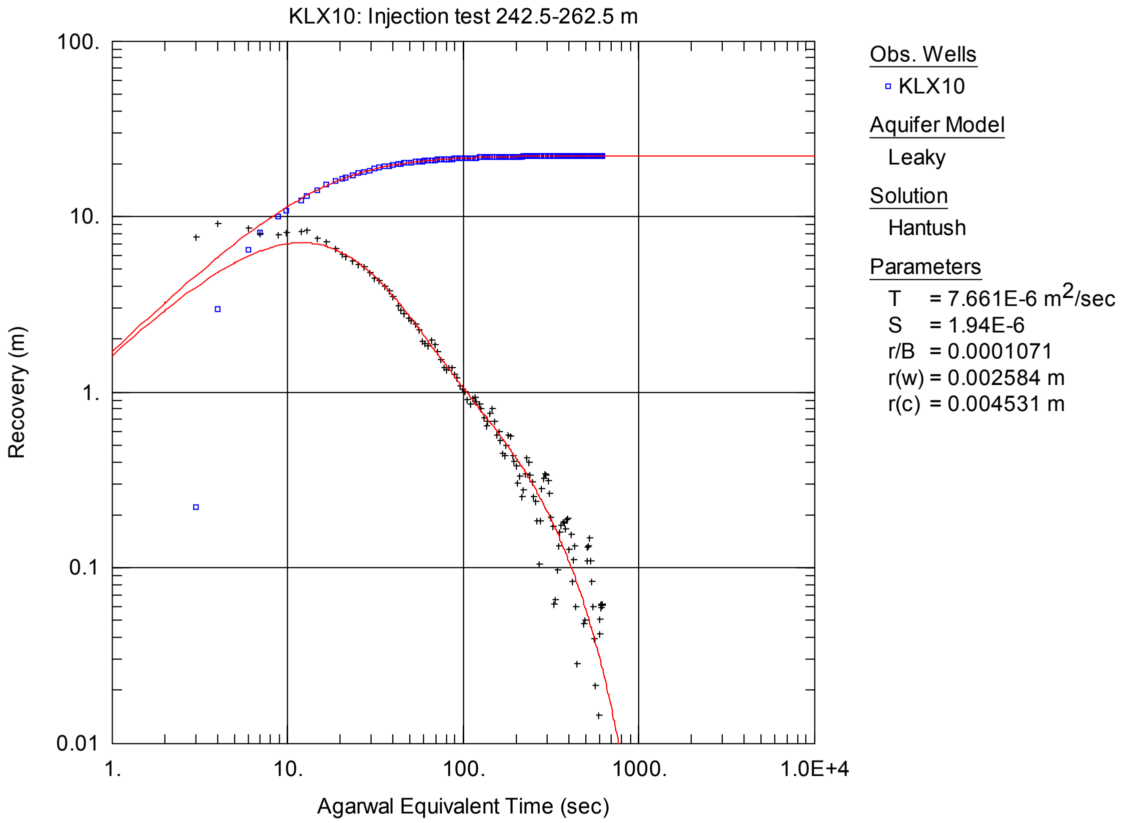


Figure A3-92. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 242.5-262.5 m in KLX10.*

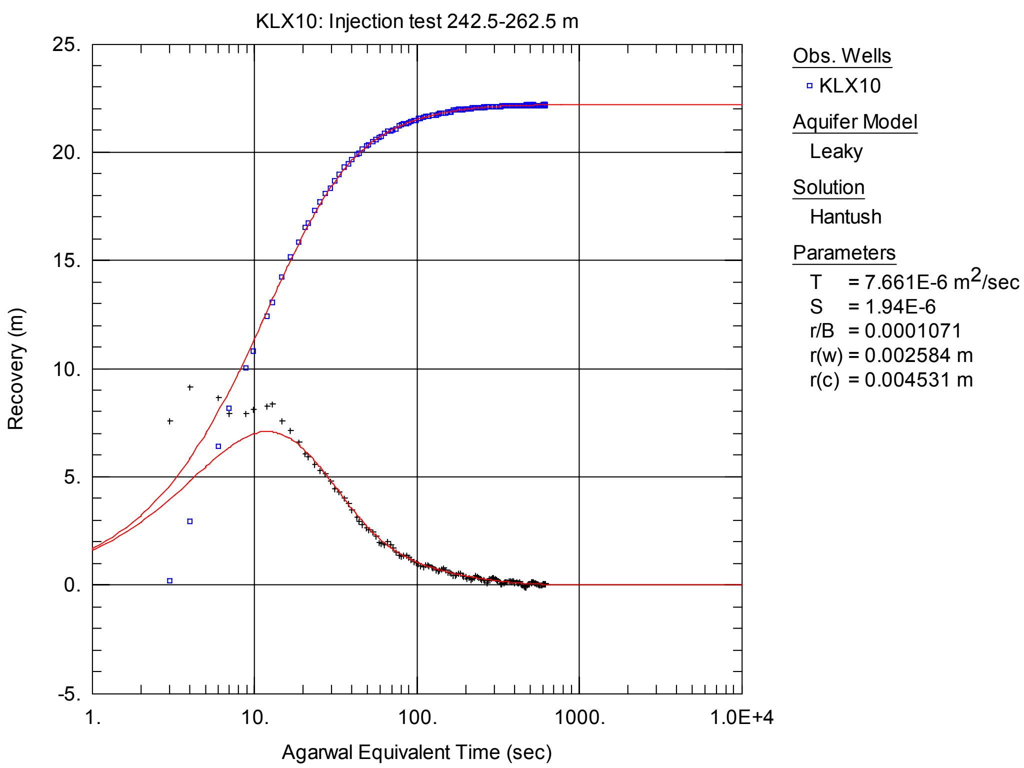


Figure A3-93. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 242.5-262.5 m in KLX10.*

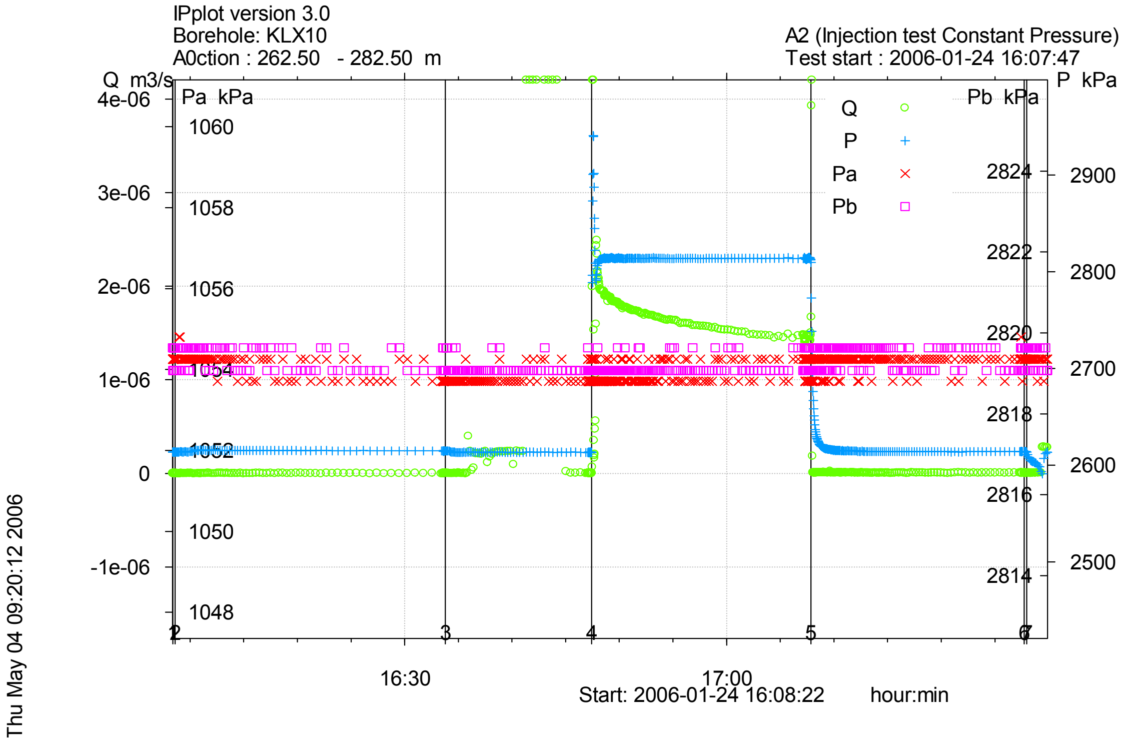


Figure A3-94. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 262.5-282.5 m in borehole KLX10.

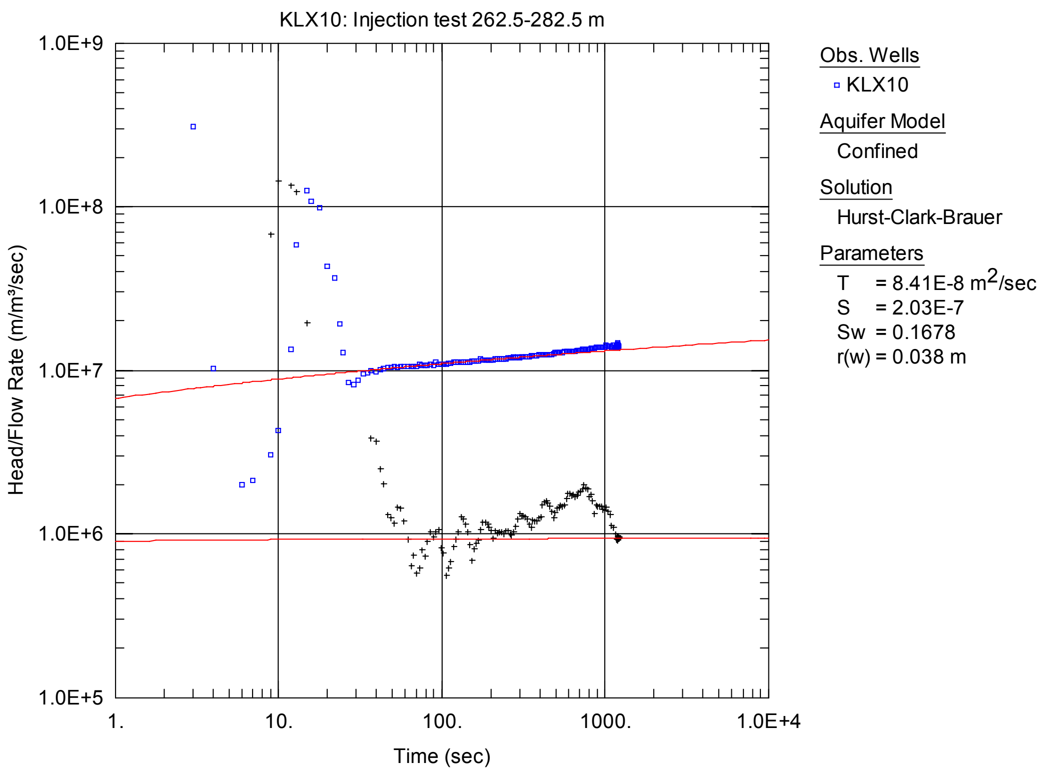


Figure A3-95. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 262.5-282.5 m in KLX10.

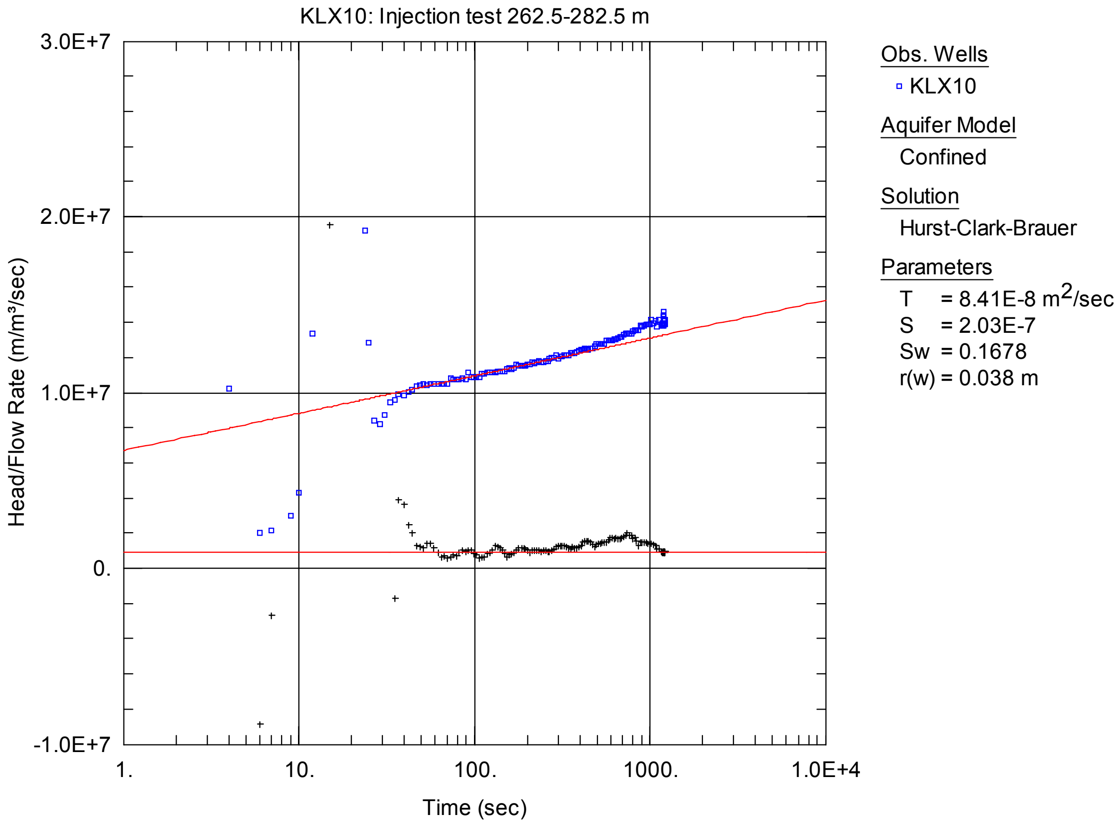


Figure A3-96. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 262.5-282.5 x m in KLX10.*

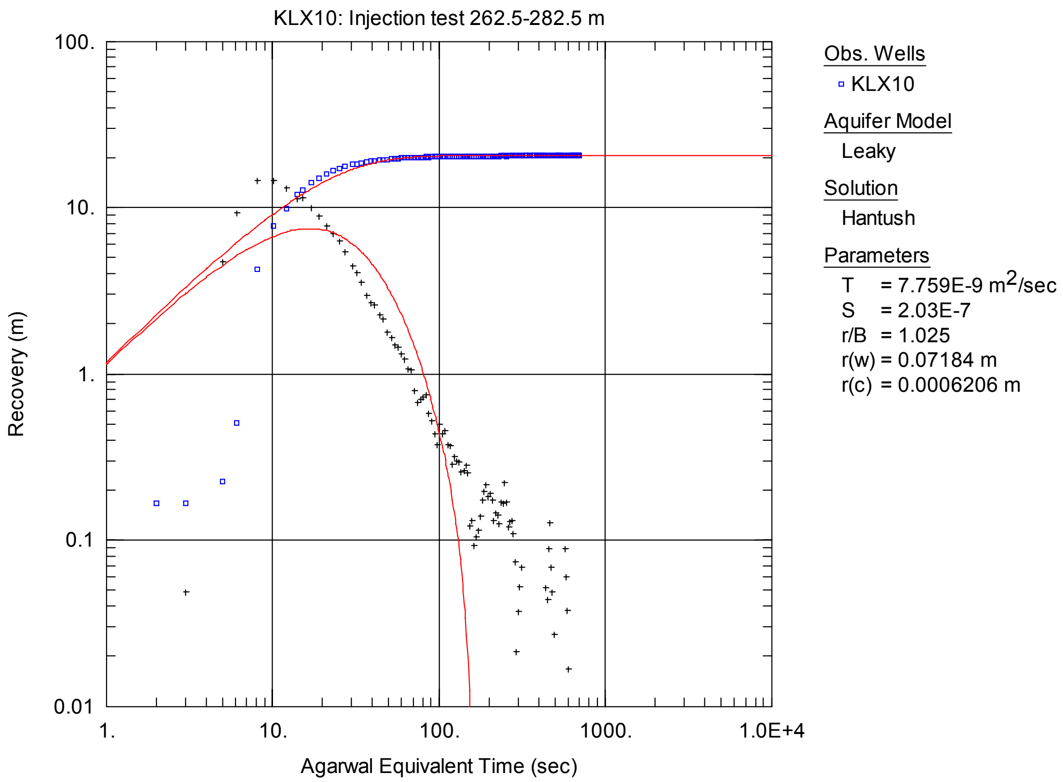


Figure A3-97. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 262.5-282.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

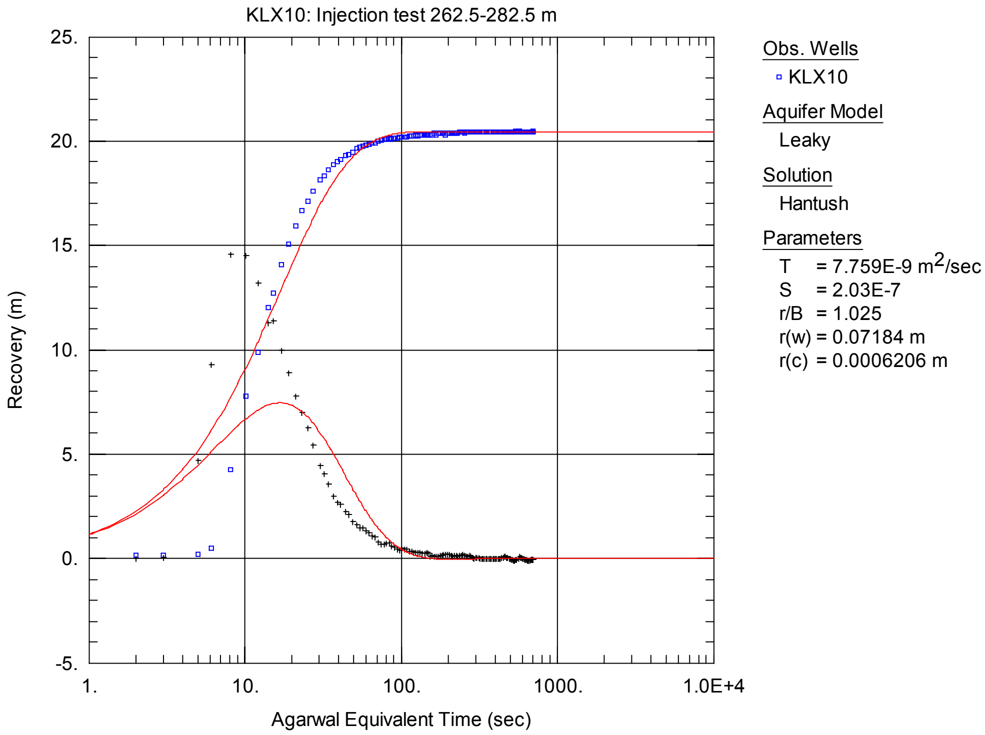


Figure A3-98. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 262.5-282.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

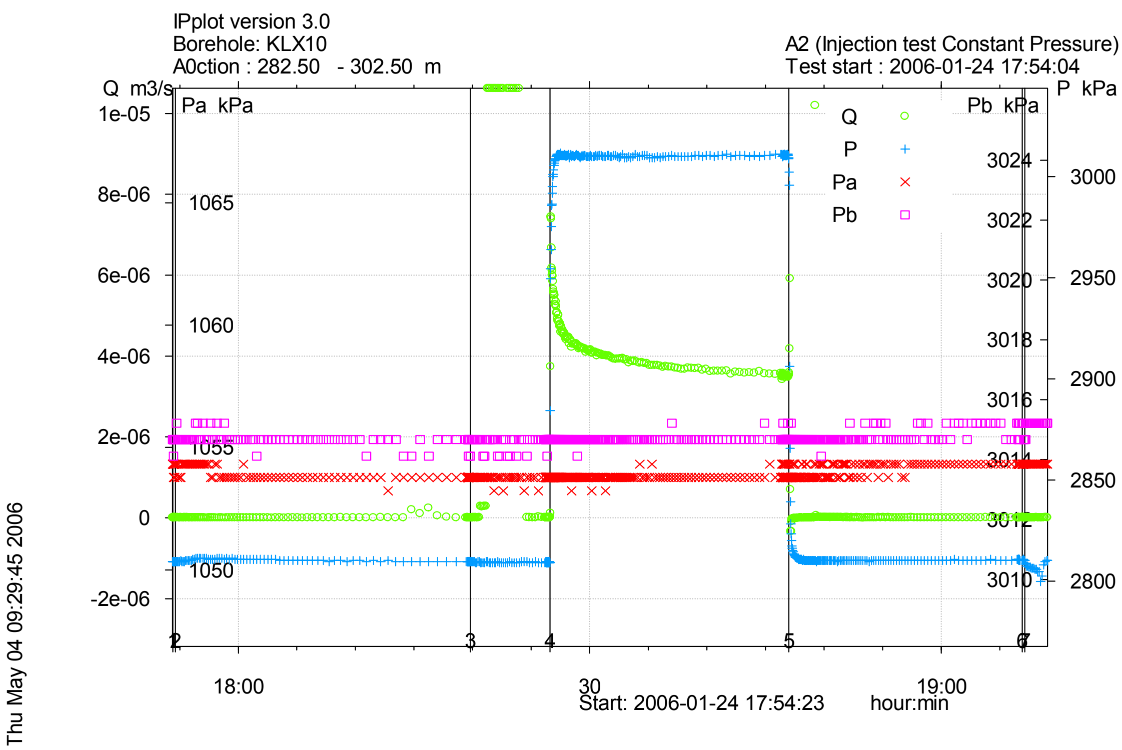


Figure A3-99. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 282.5-302.5 m in borehole KLX10.*

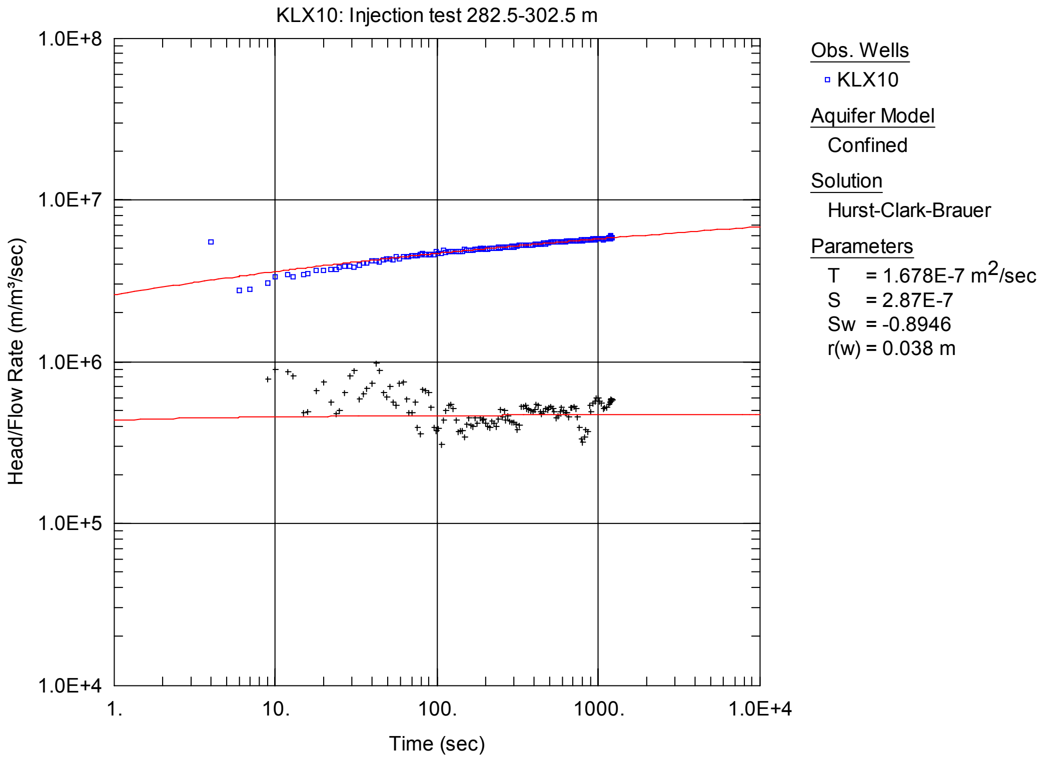


Figure A3-100. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 282.5-302.5 m in KLX10.*

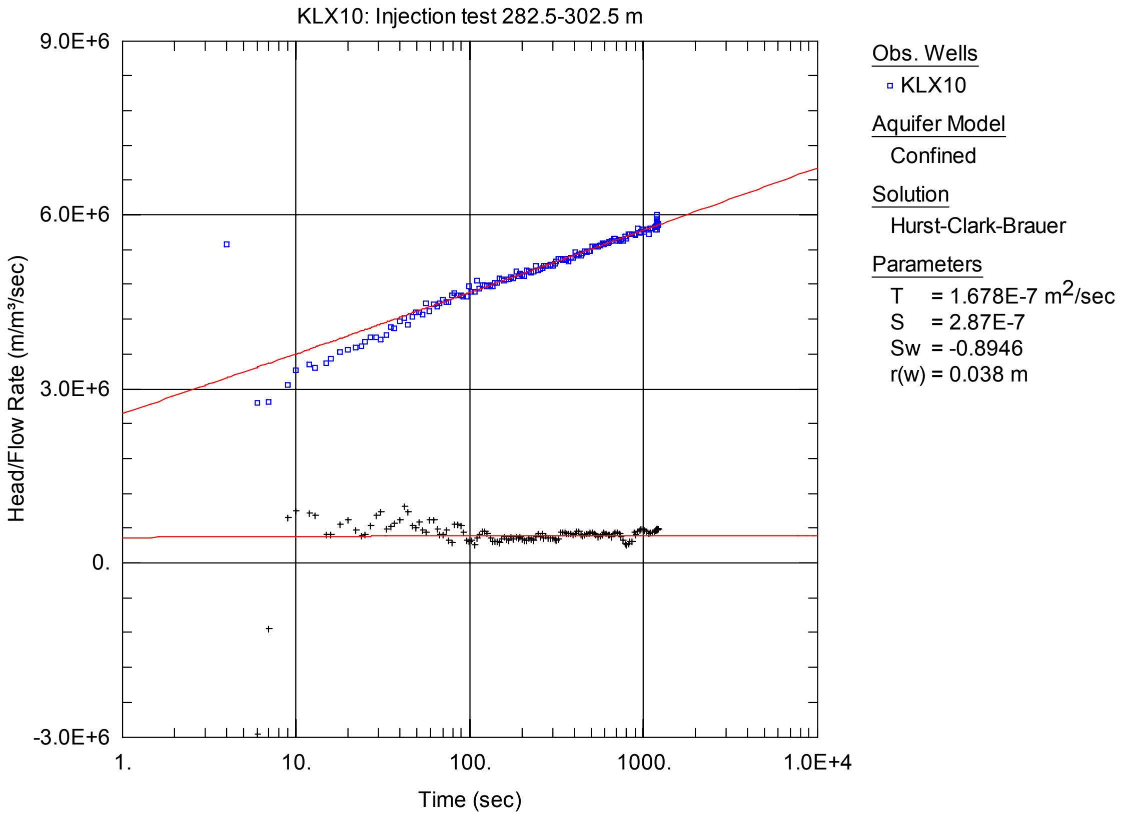


Figure A3-101. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 282.5-302.5 m in KLX10.*

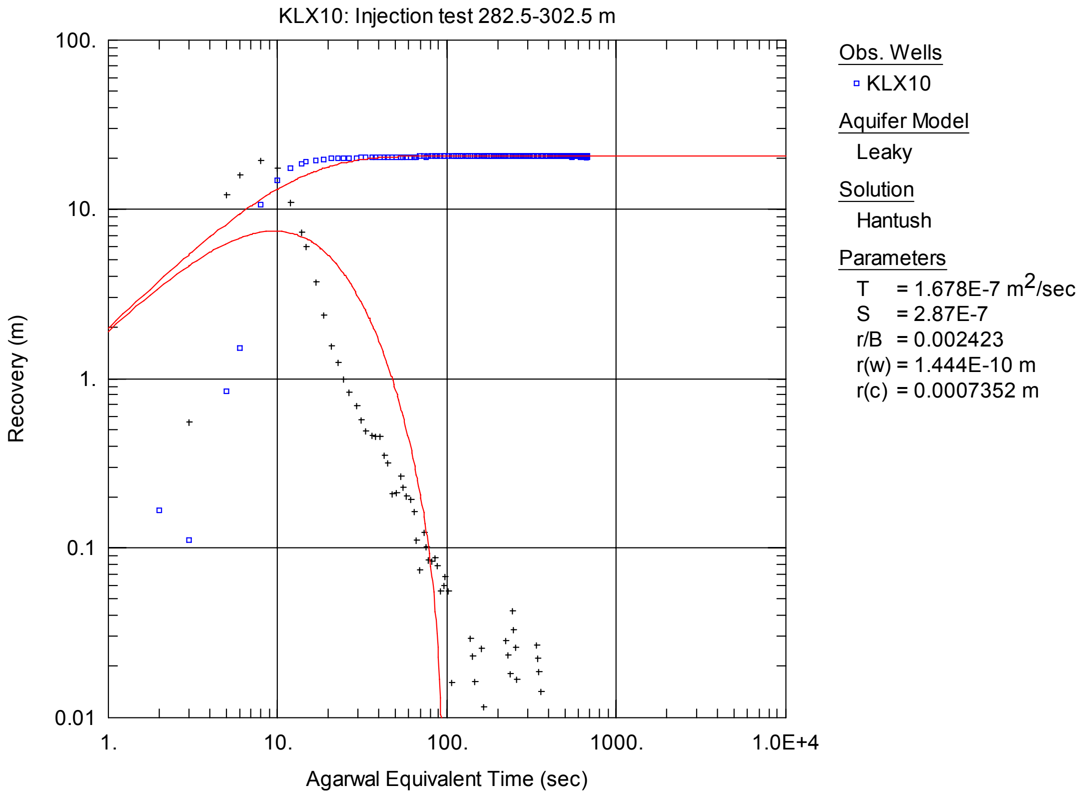


Figure A3-102. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 282.5-302.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

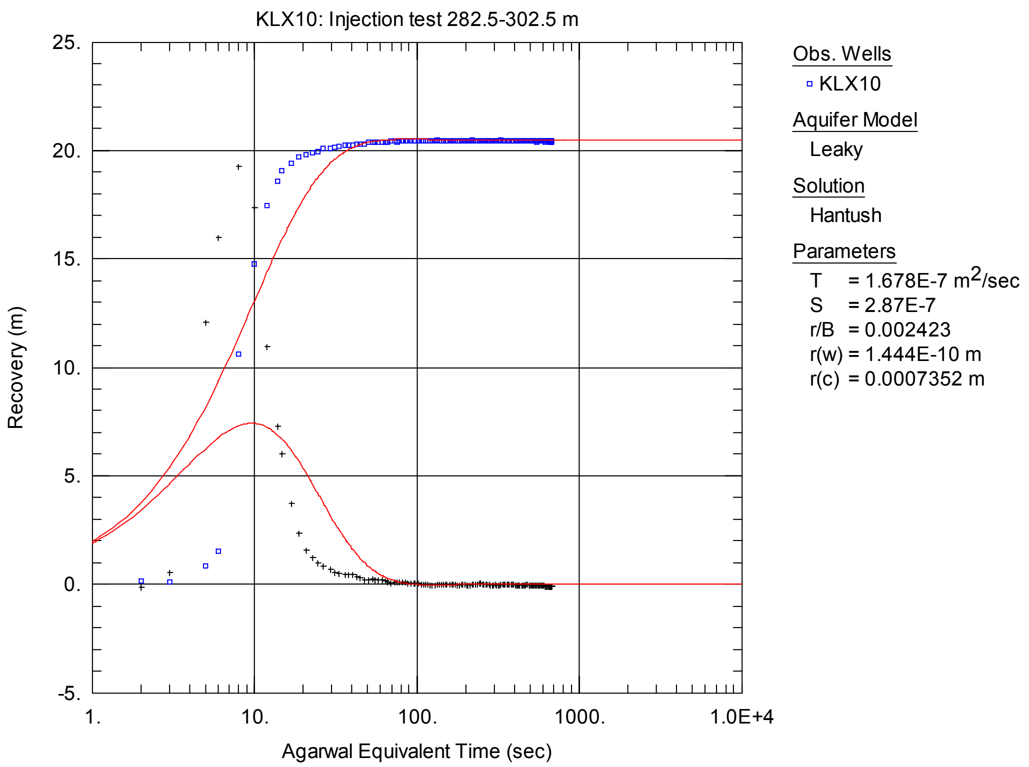


Figure A3-103. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 282.5-302.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

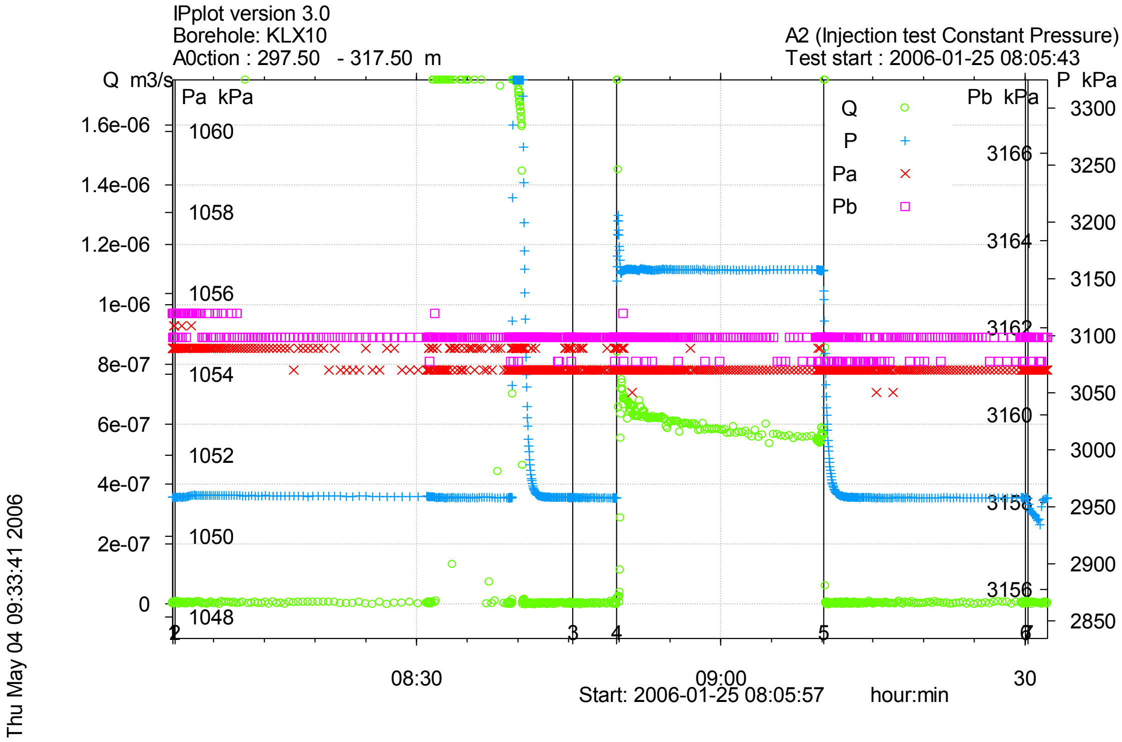


Figure A3-104. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 297.5-317.5 m in borehole KLX10.

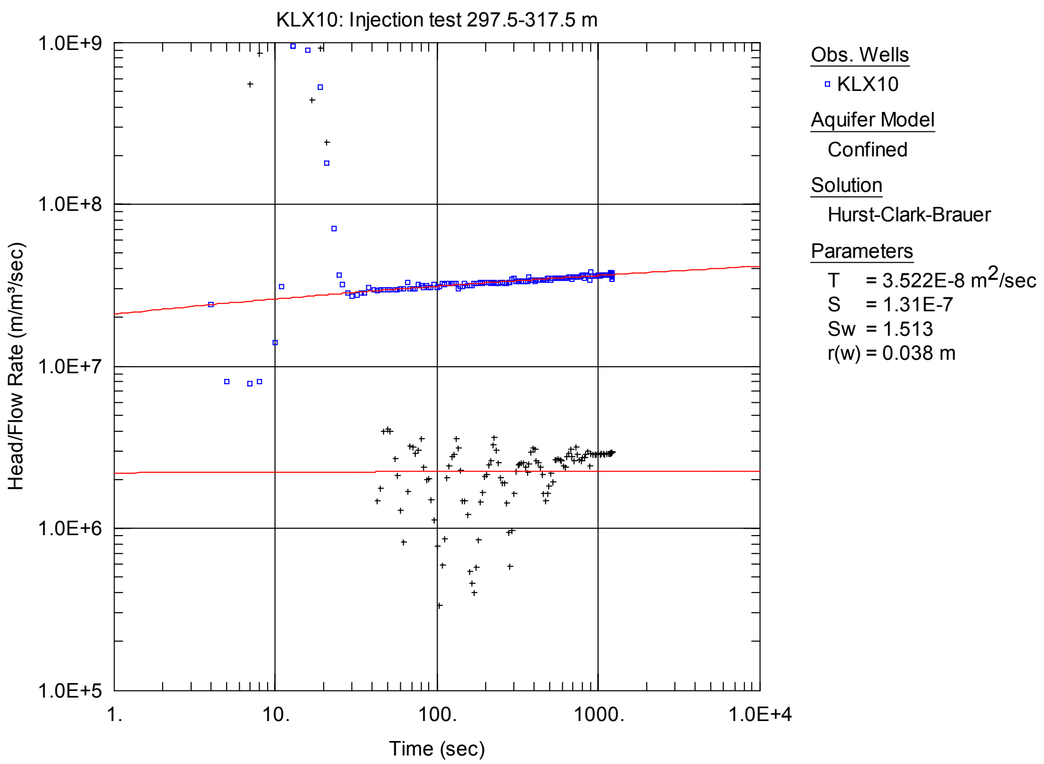


Figure A3-105. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 297.5-317.5 m in KLX10.

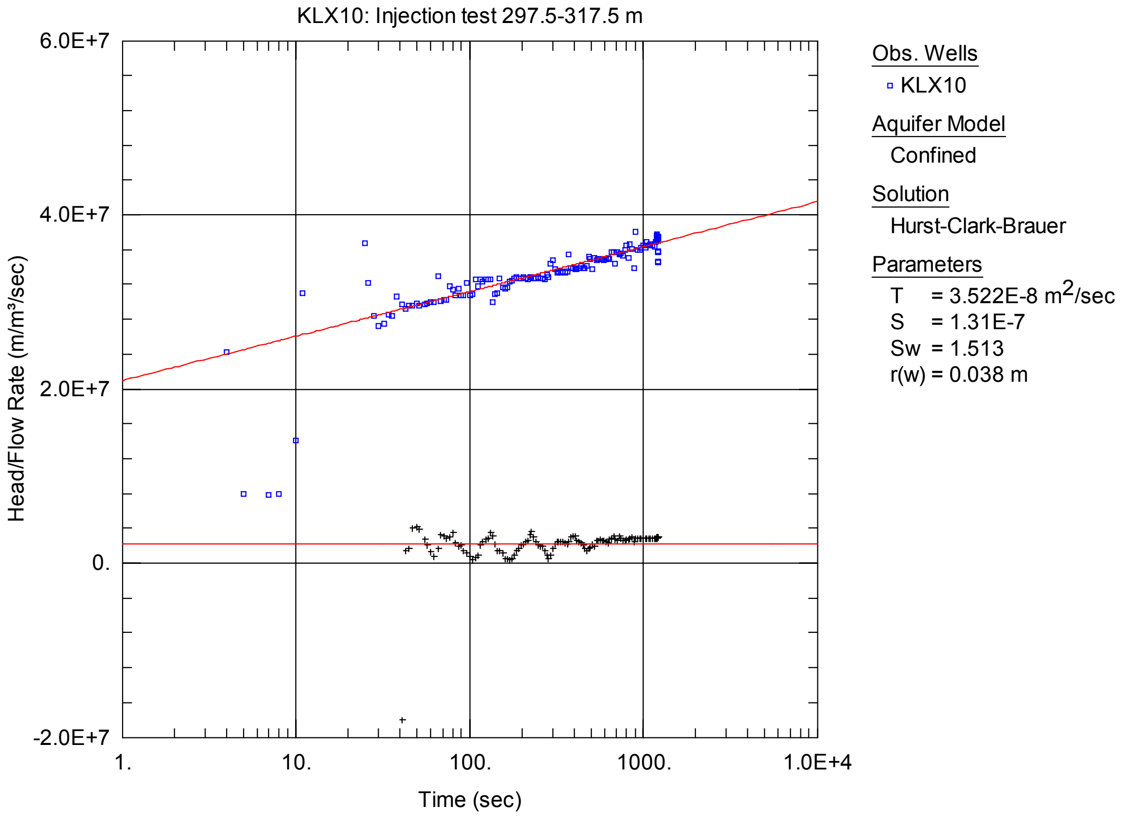


Figure A3-106. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 297.5-317.5 m in KLX10.*

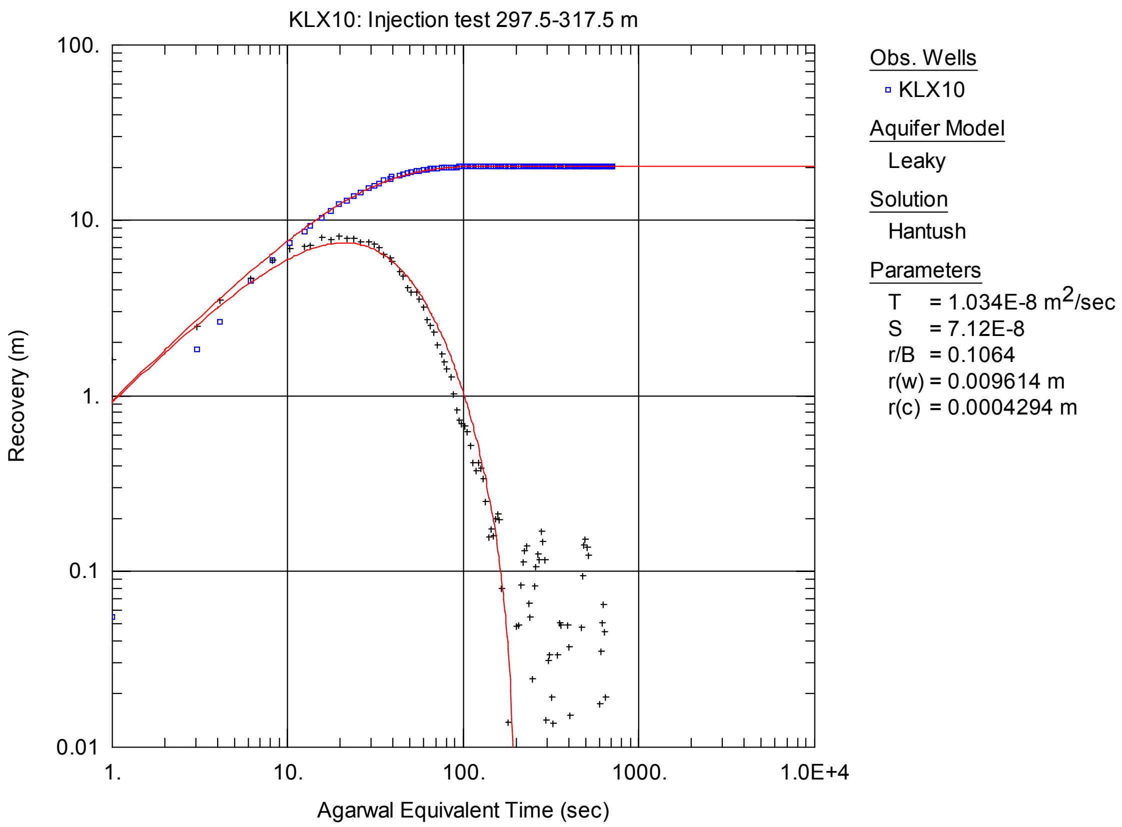


Figure A3-107. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 297.5-317.5 m in KLX10.*

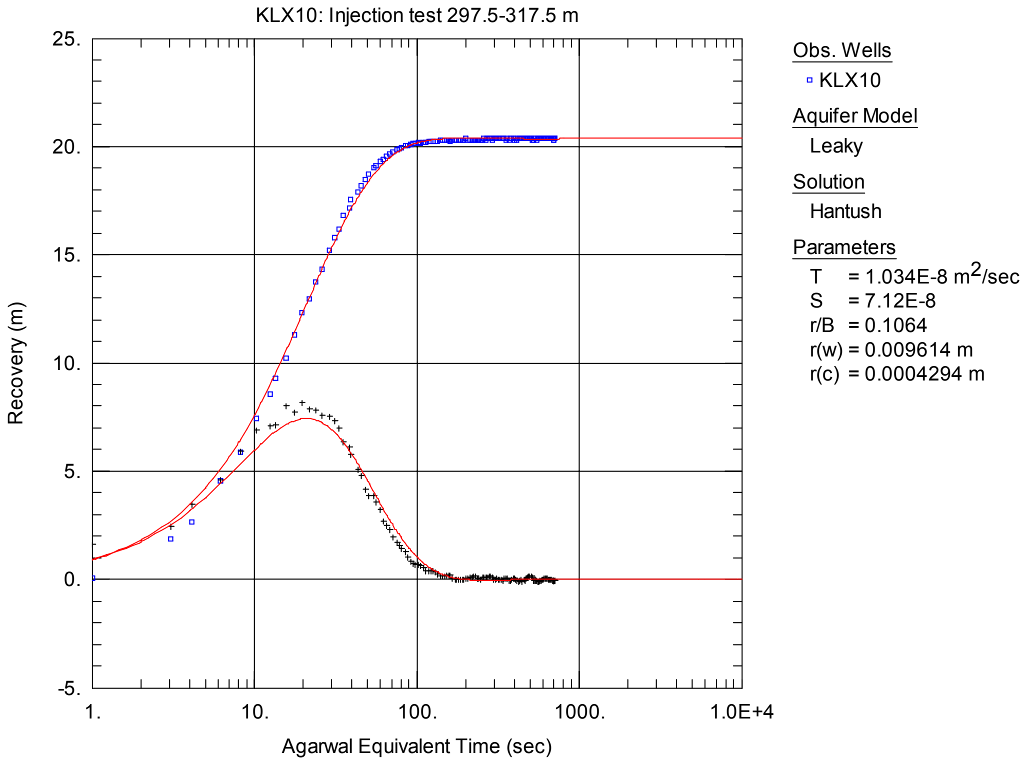


***Figure A3-108.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 297.5-317.5 m in KLX10.*

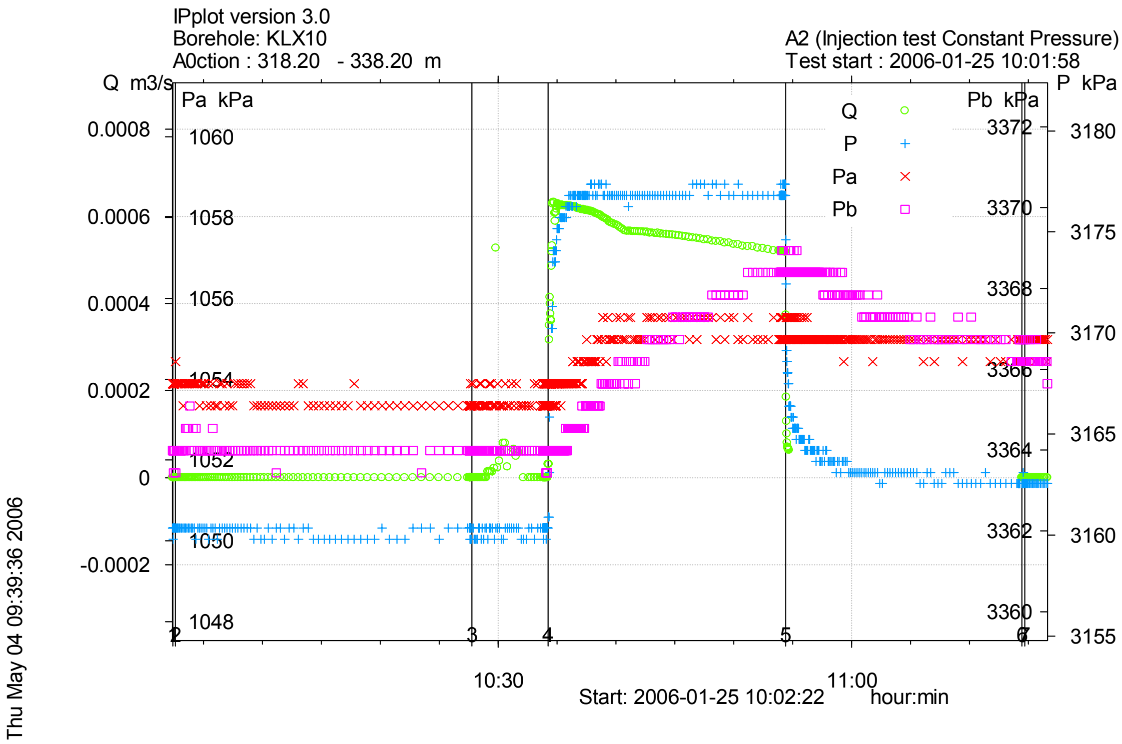


***Figure A3-109.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 318.2-338.2 m in borehole KLX10.*

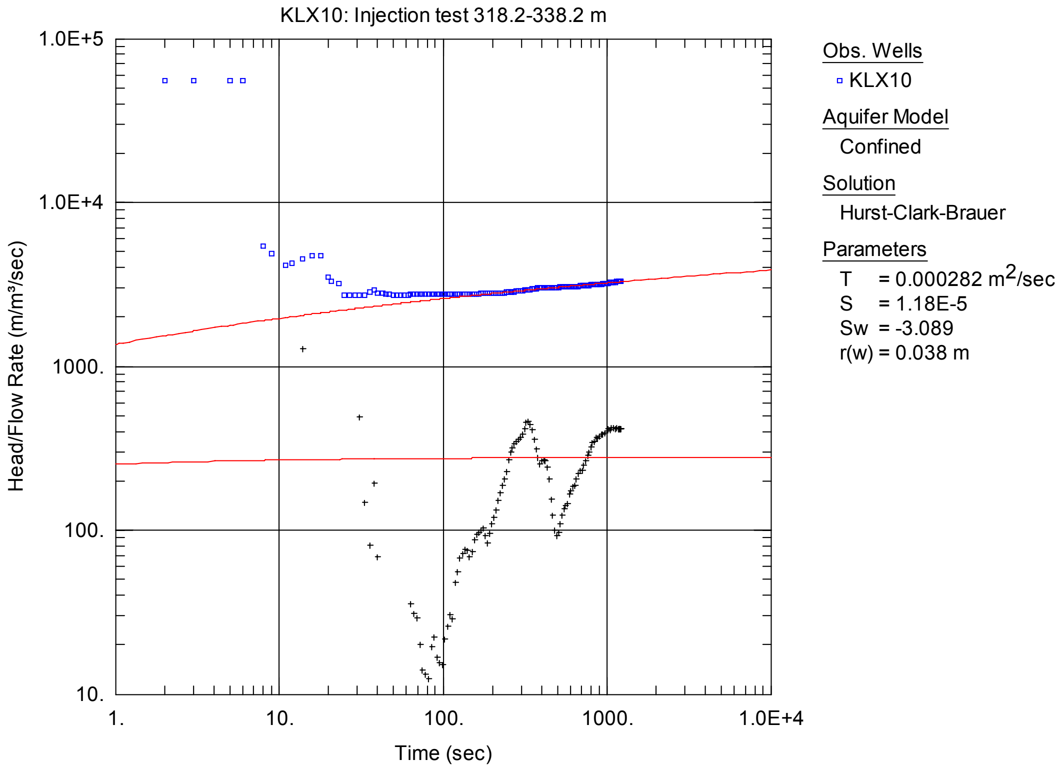


Figure A3-110. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 318.2-338.2 m in KLX10.*

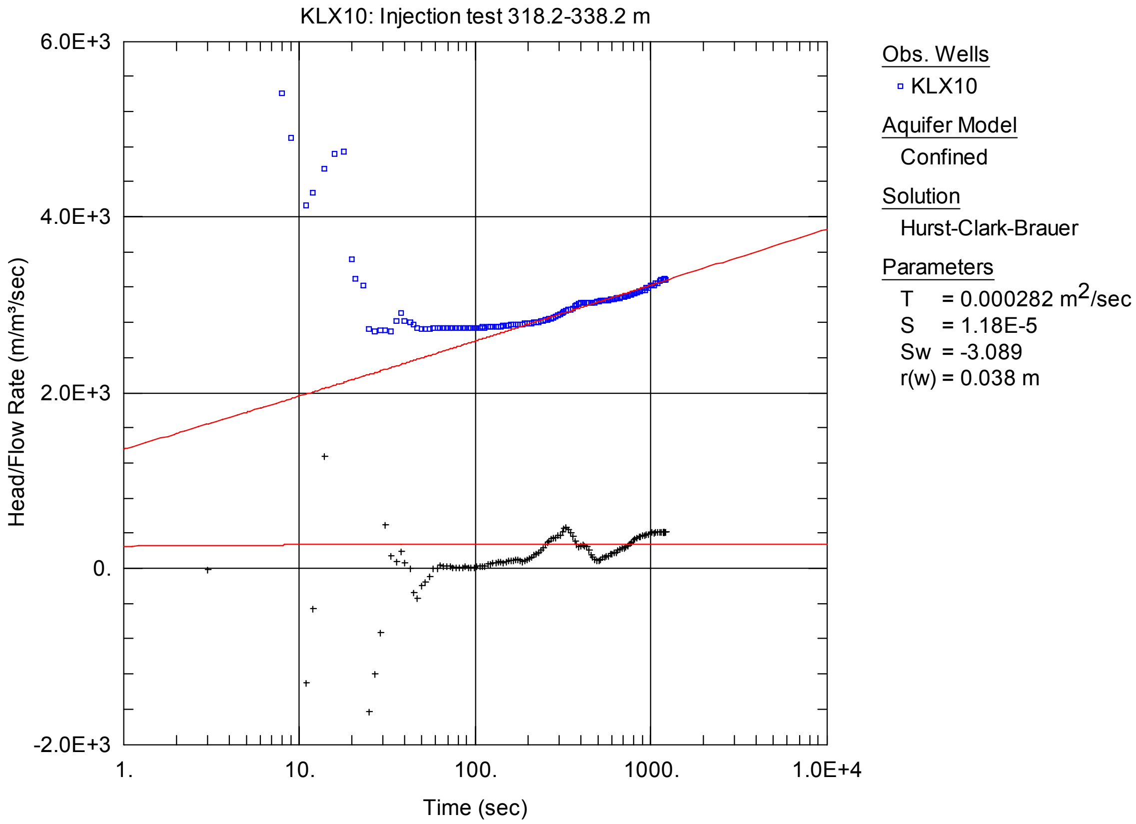


Figure A3-111. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 318.2-338.2 m in KLX10.*

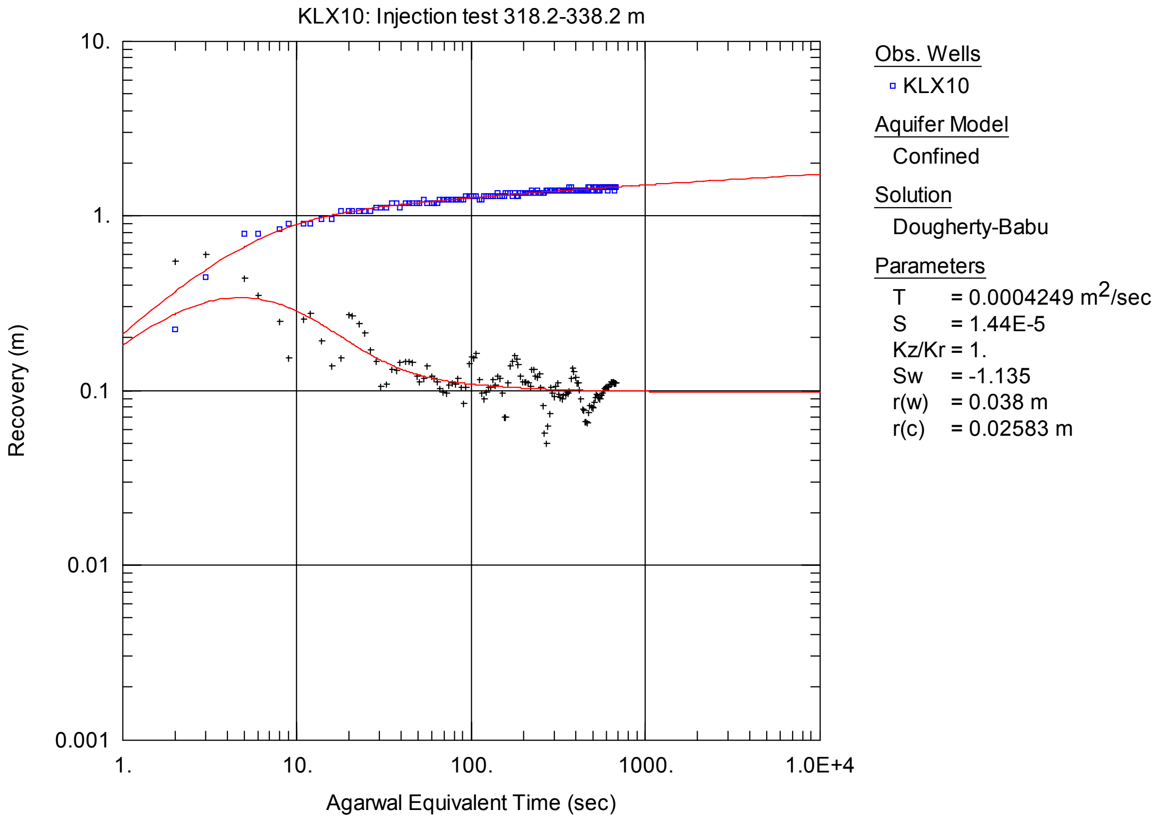


Figure A3-112. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 318.2-338.2 m in KLX10.*

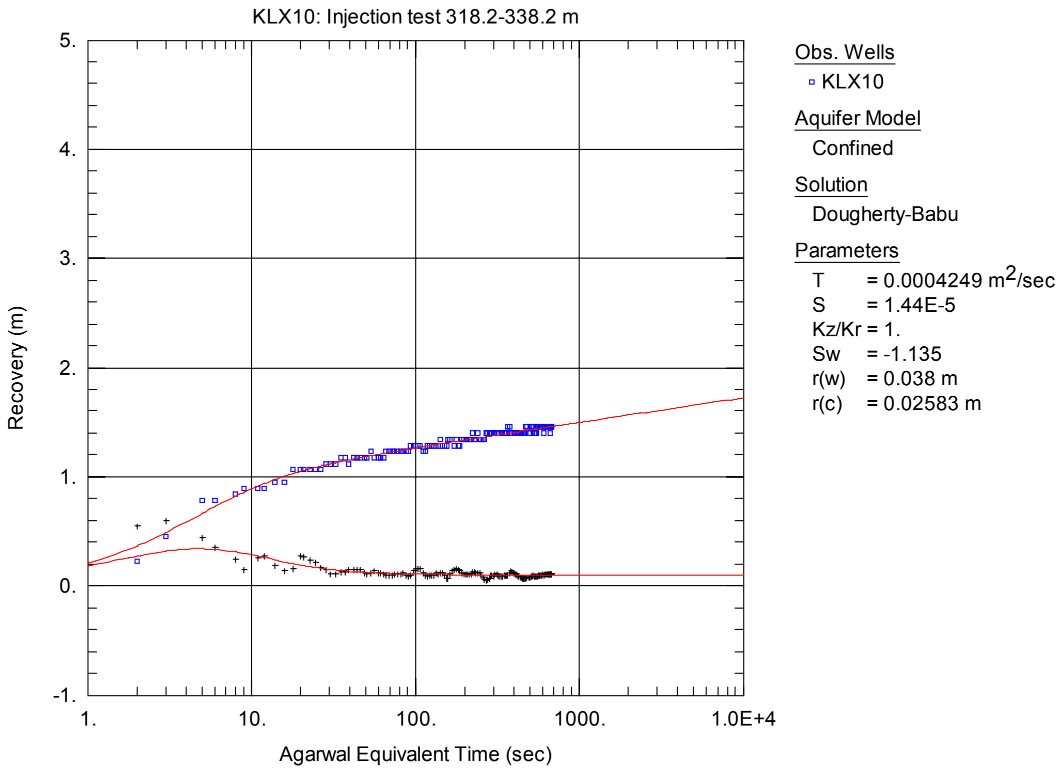


Figure A3-113. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 318.2-338.2 m in KLX10.*

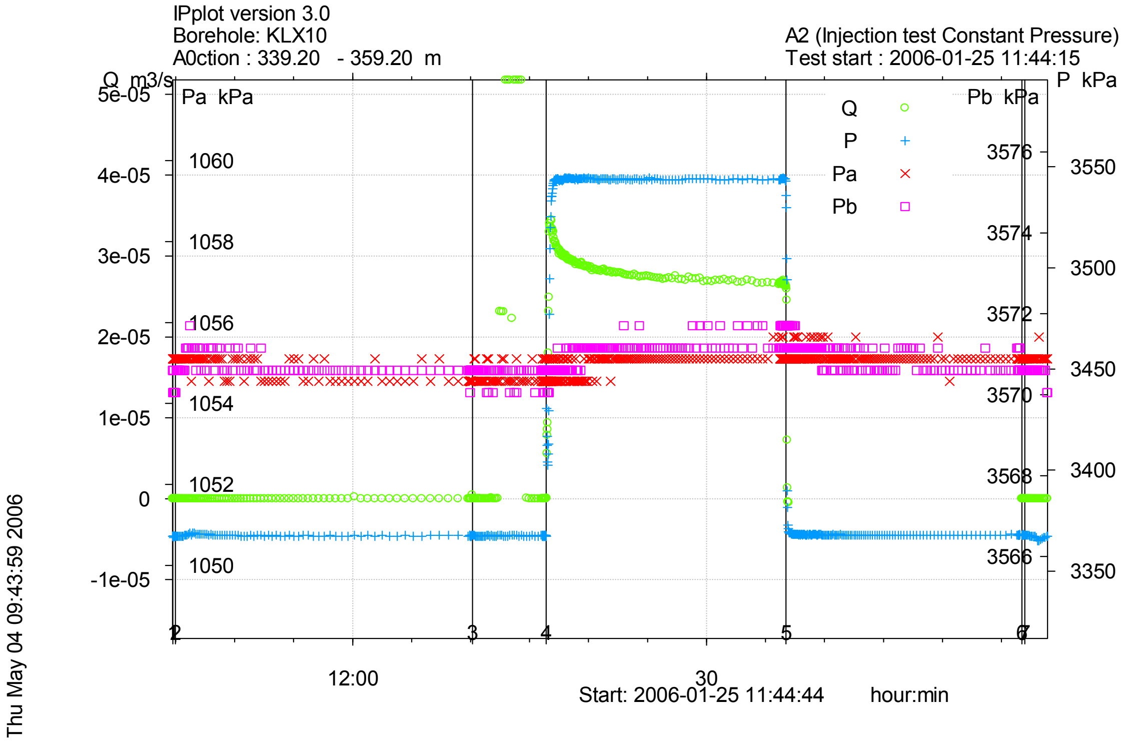


__Figure A3-114.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 339.2-359.2 m in borehole KLX10.

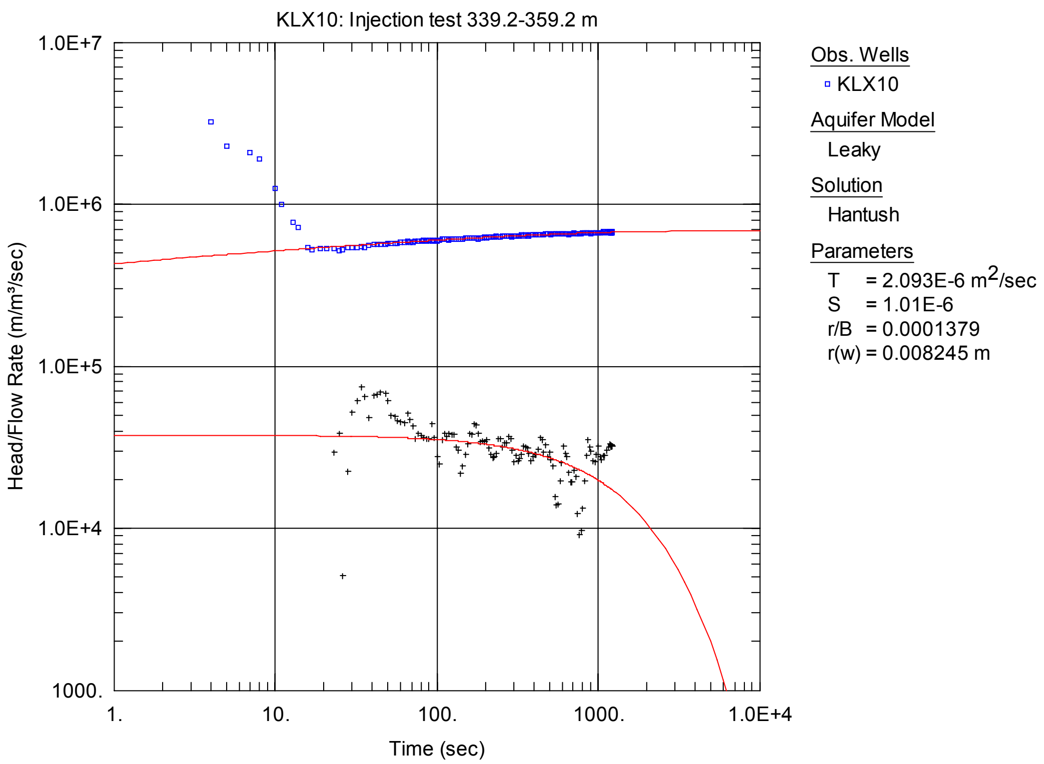


__Figure A3-115.__ Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 339.2-359.2 m in KLX10.

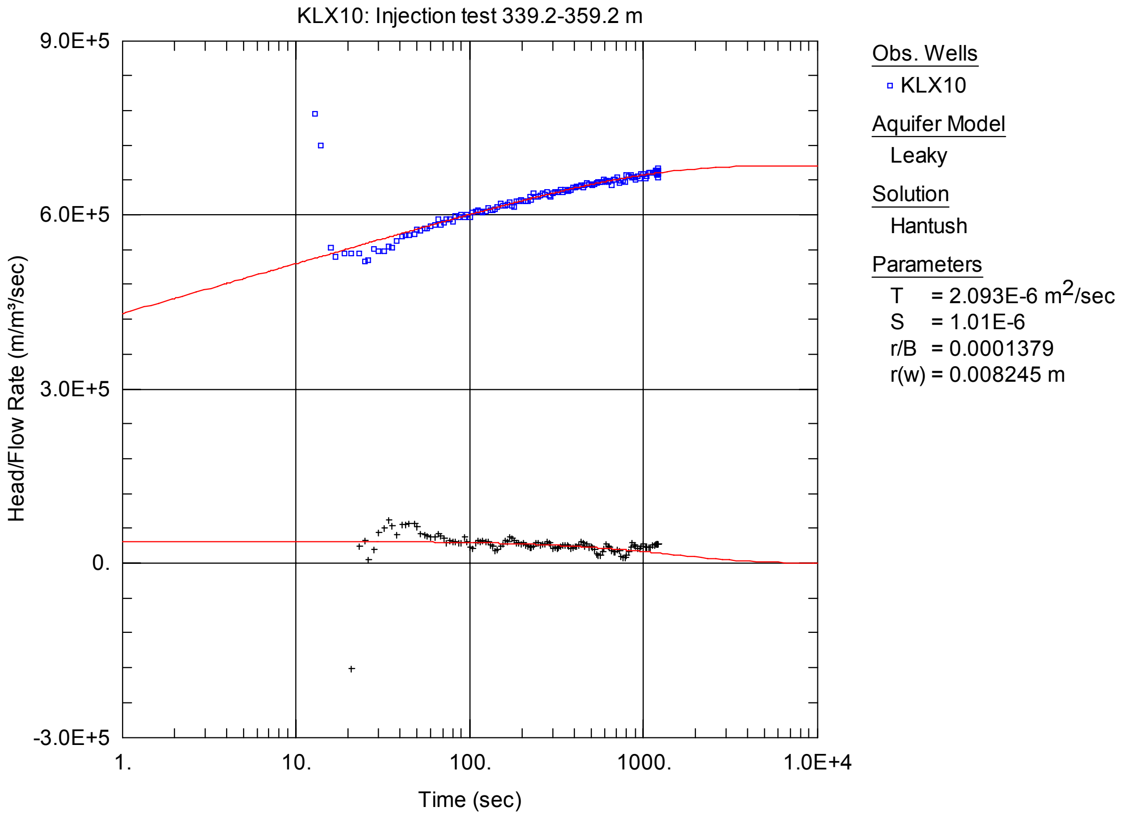


Figure A3-116. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 339.2-359.2 x m in KLX10.*

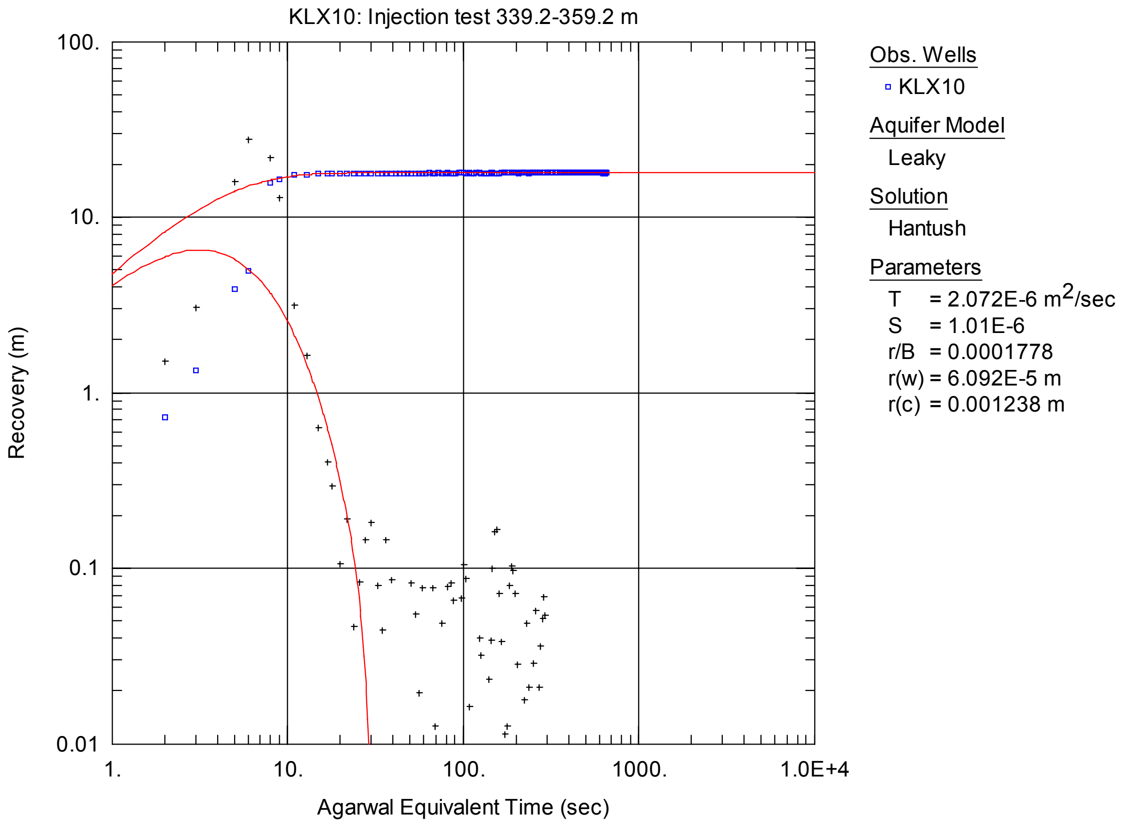


Figure A3-117. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 339.2-359.2 m in KLX10.*

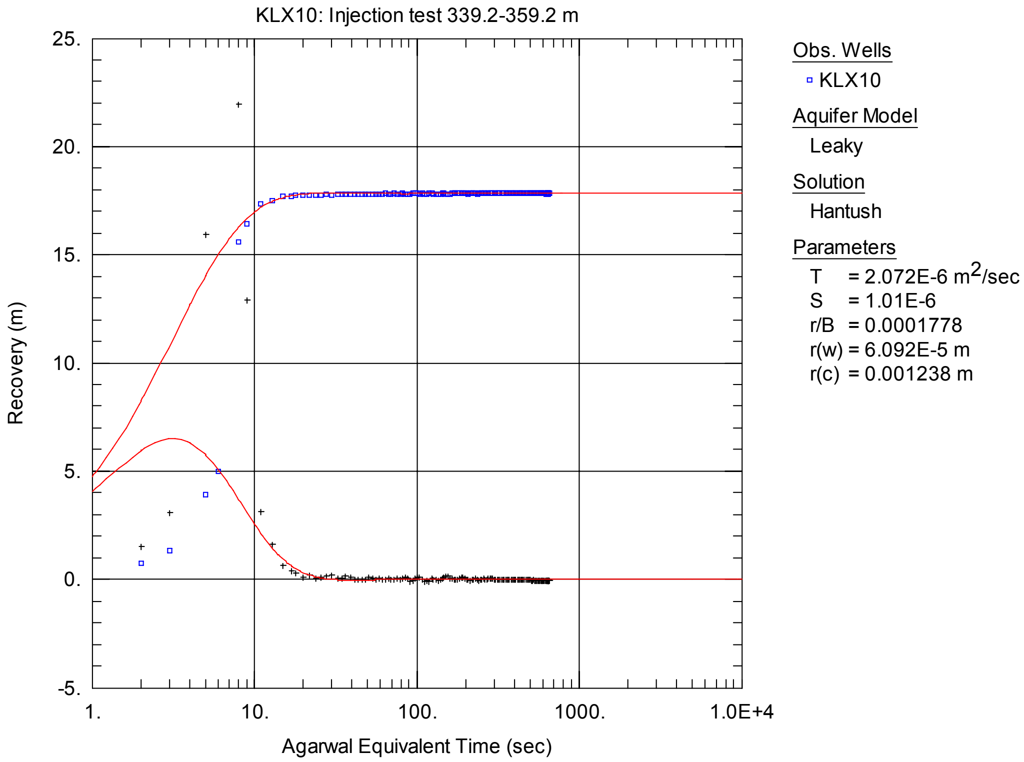


__Figure A3-118.__ Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 339.2-359.2 m in KLX10.

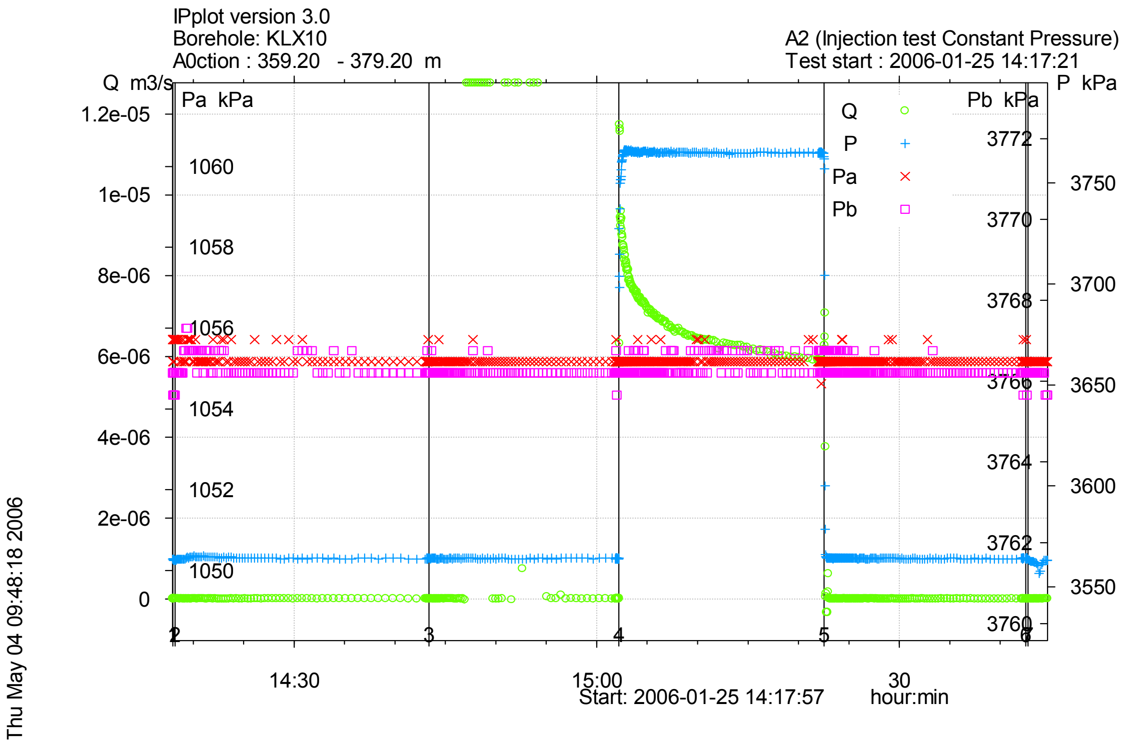


__Figure A3-119.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 359.2-379.2 m in borehole KLX10.

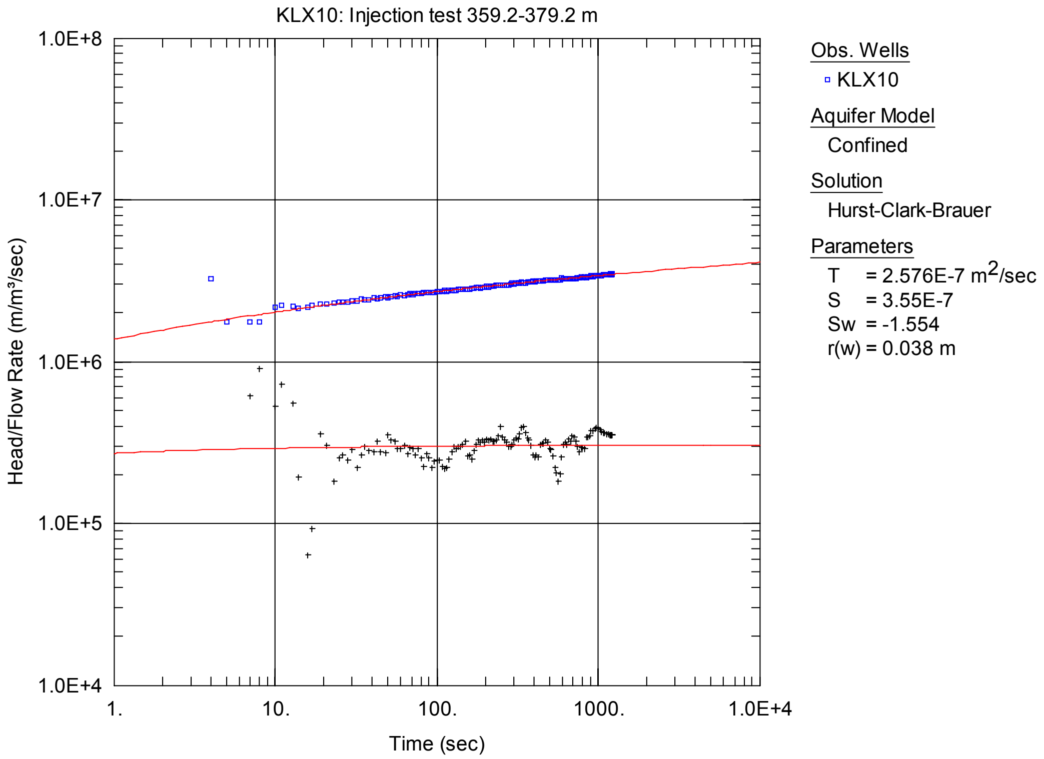


Figure A3-120. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 359.2-379.2 m in KLX10.*

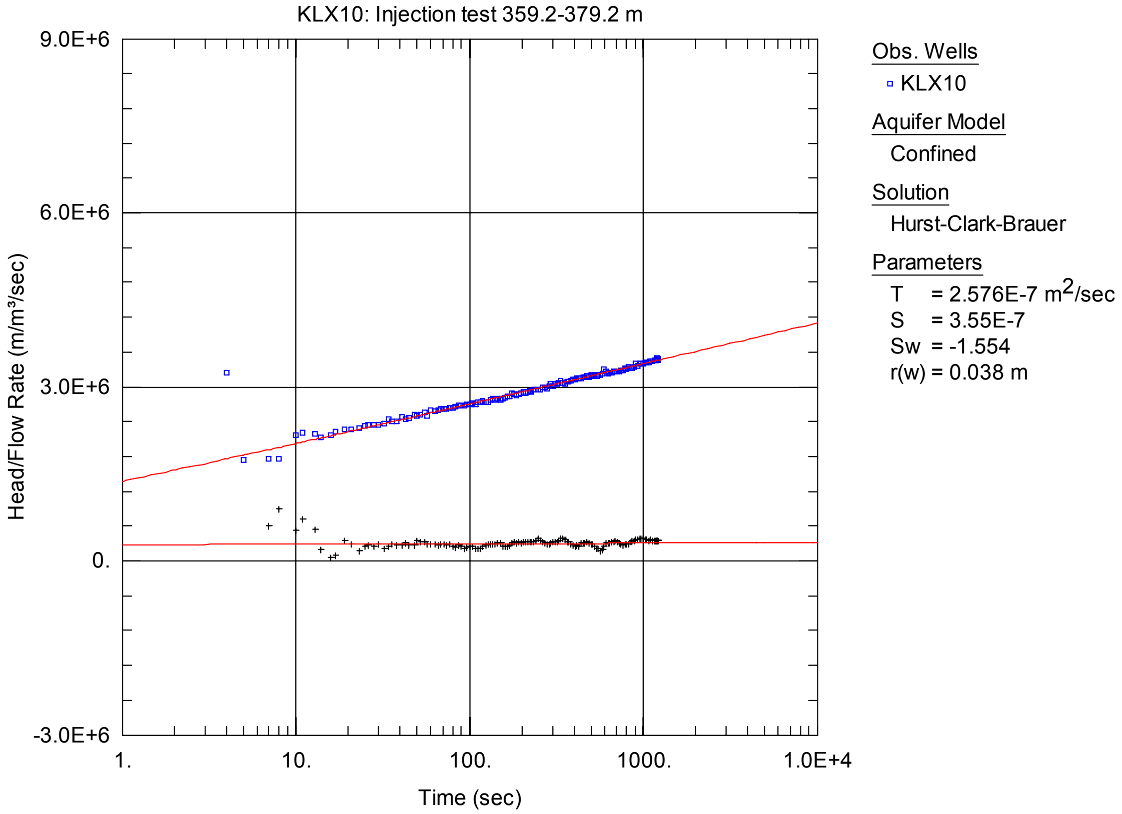


Figure A3-121. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 359.2-379.2 m in KLX10.*

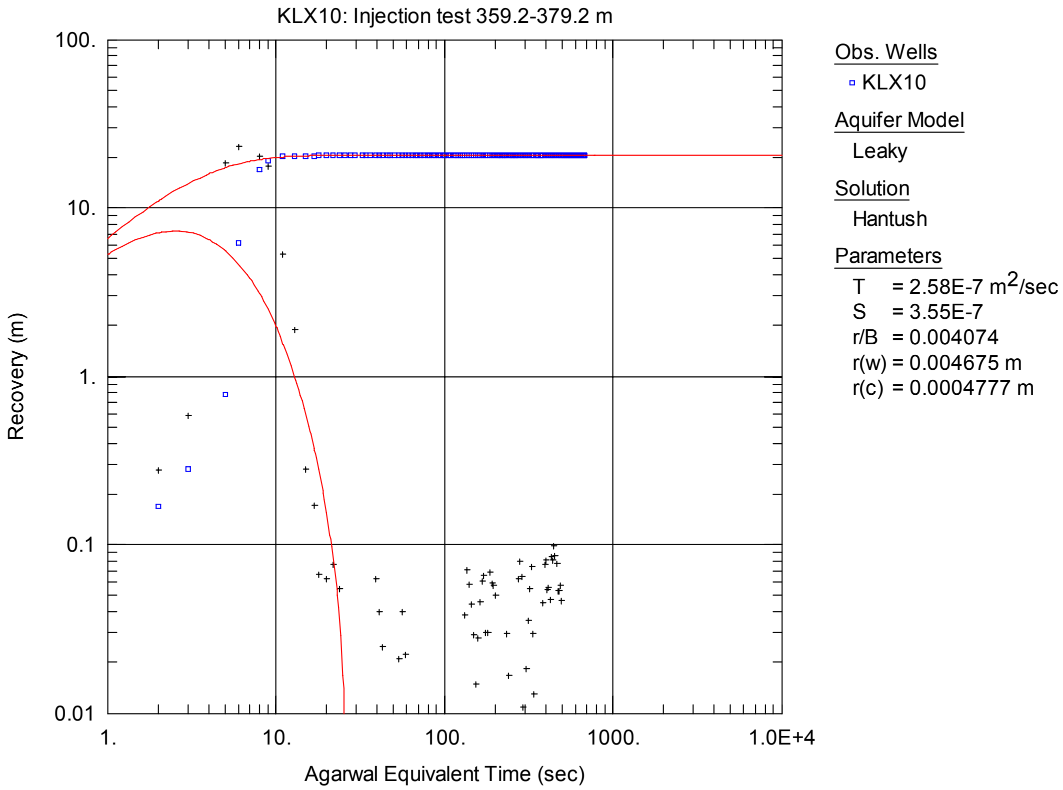


***Figure A3-122.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 359.2-379.2 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

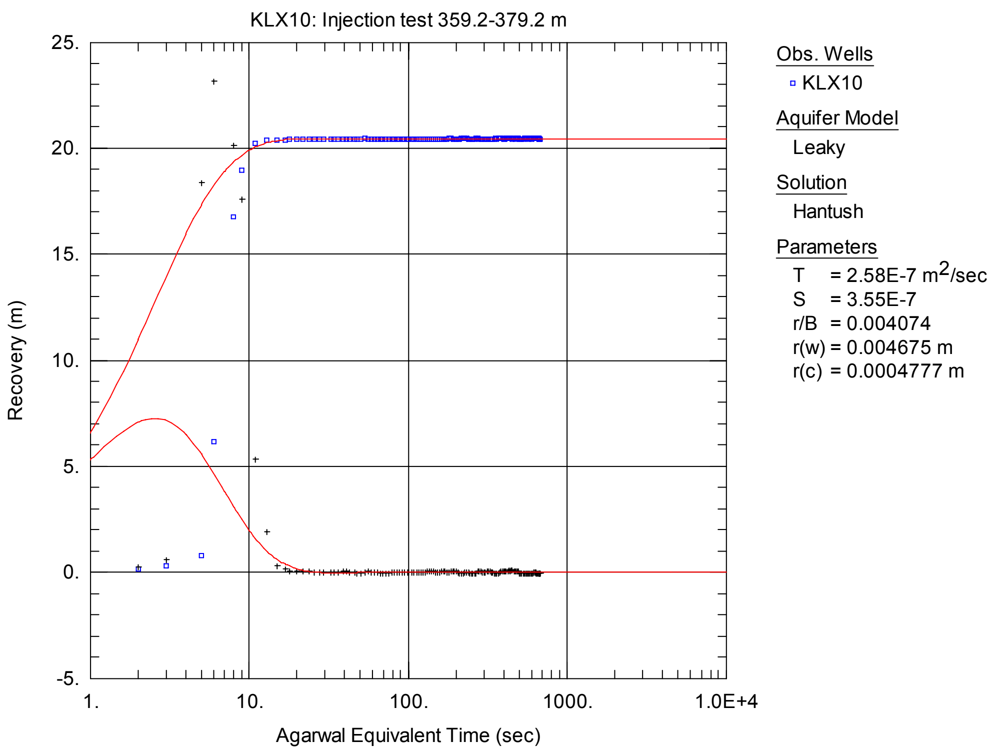


***Figure A3-123.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 359.2-379.2 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

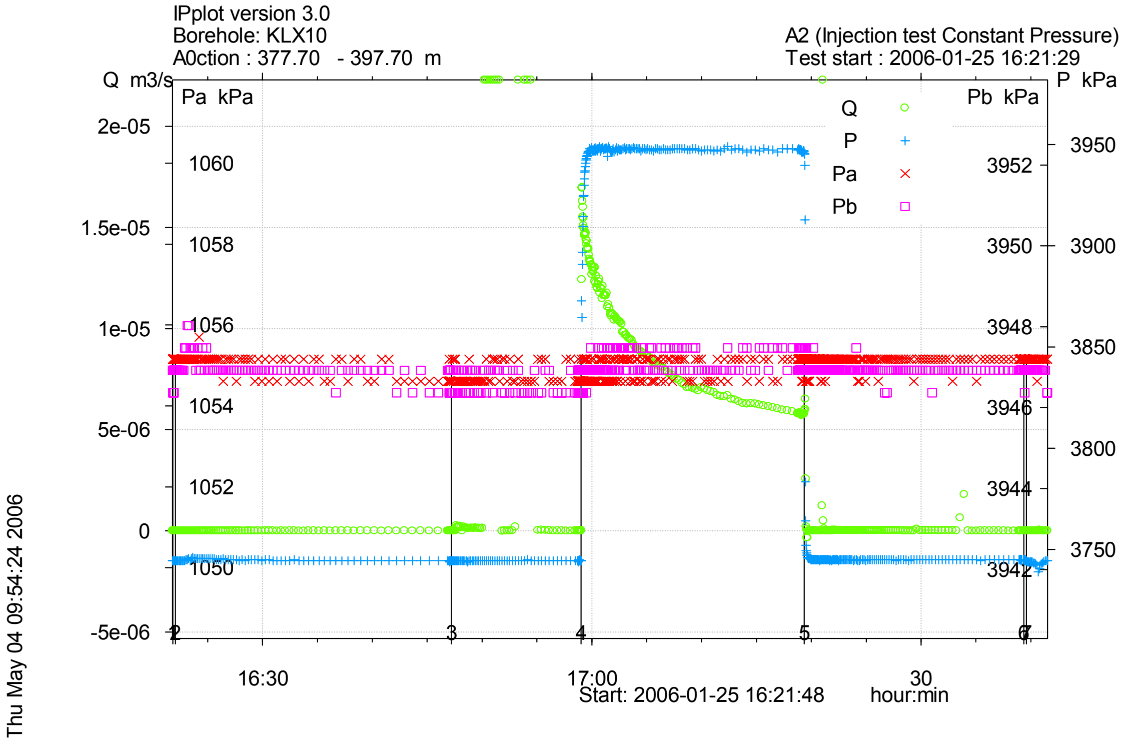


Figure A3-124. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 377.7-397.7 m in borehole KLX10.*

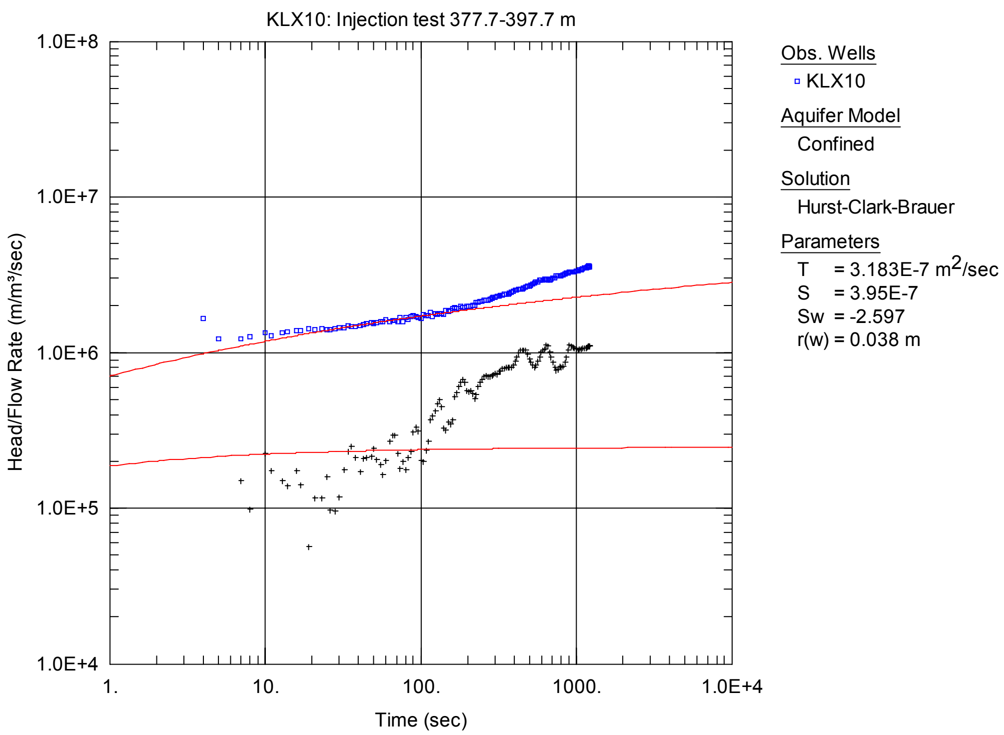


Figure A3-125. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution on the first PRF period, from the injection test in section 377.7-397.7 m in KLX10.*

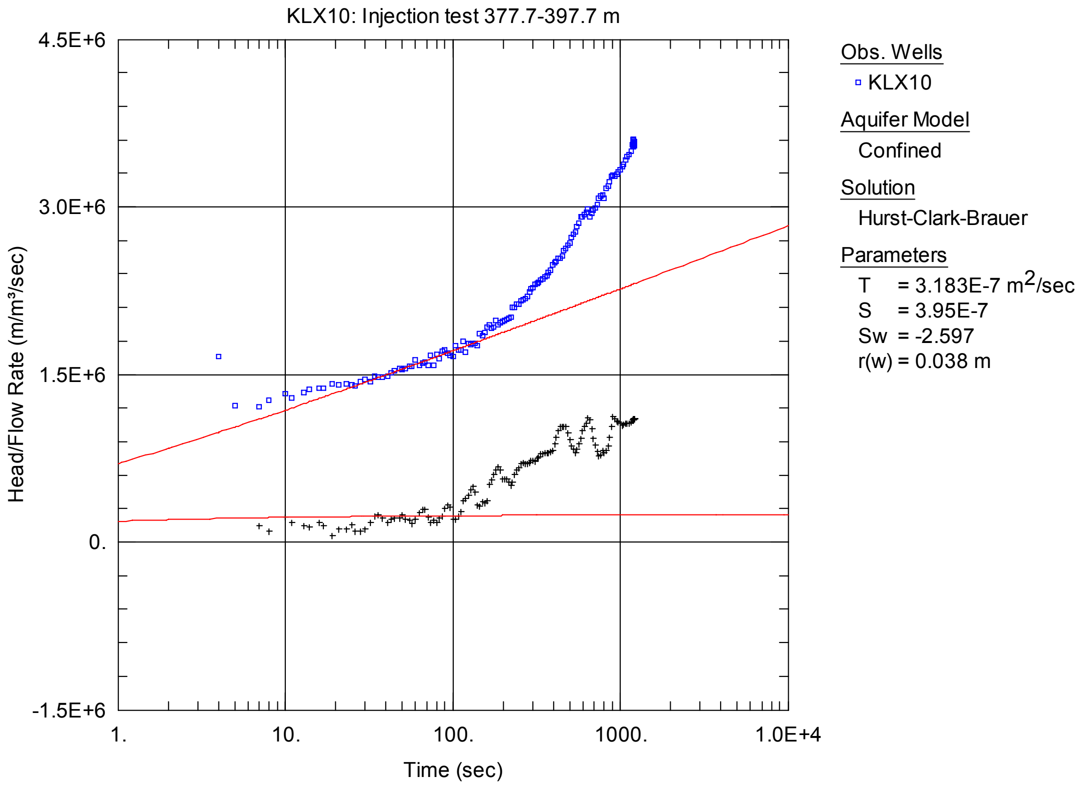


Figure A3-126. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution on the first PRF period, from the injection test in section 377.7-397.7 m in KLX10.*

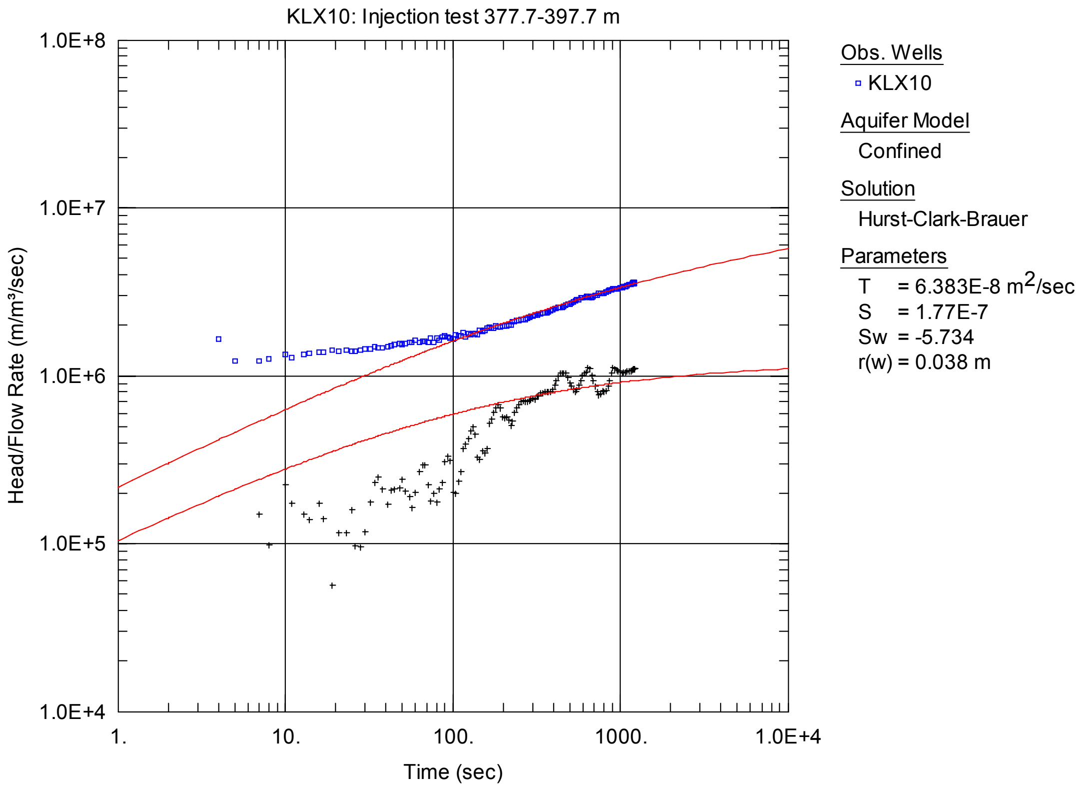


Figure A3-127. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution on the second PRF period, from the injection test in section 377.7-397.7 m in KLX10.*

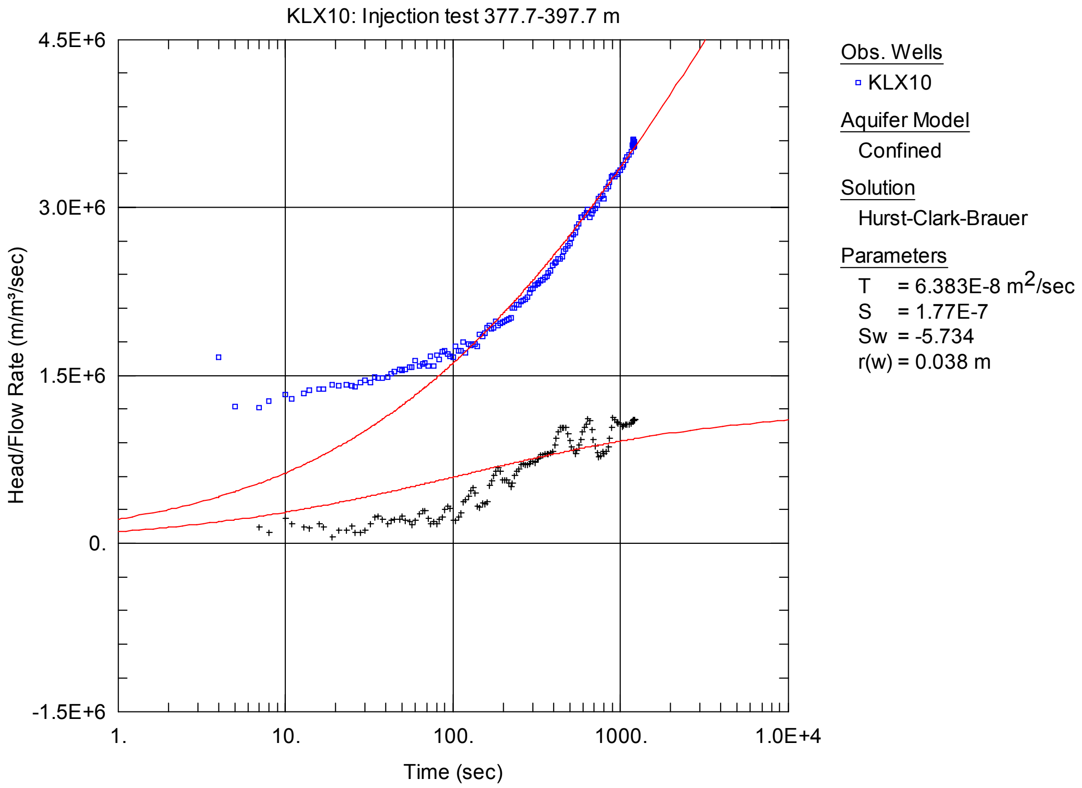


Figure A3-128. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution on the second PRF period, from the injection test in section 377.7-397.7 m in KLX10.*

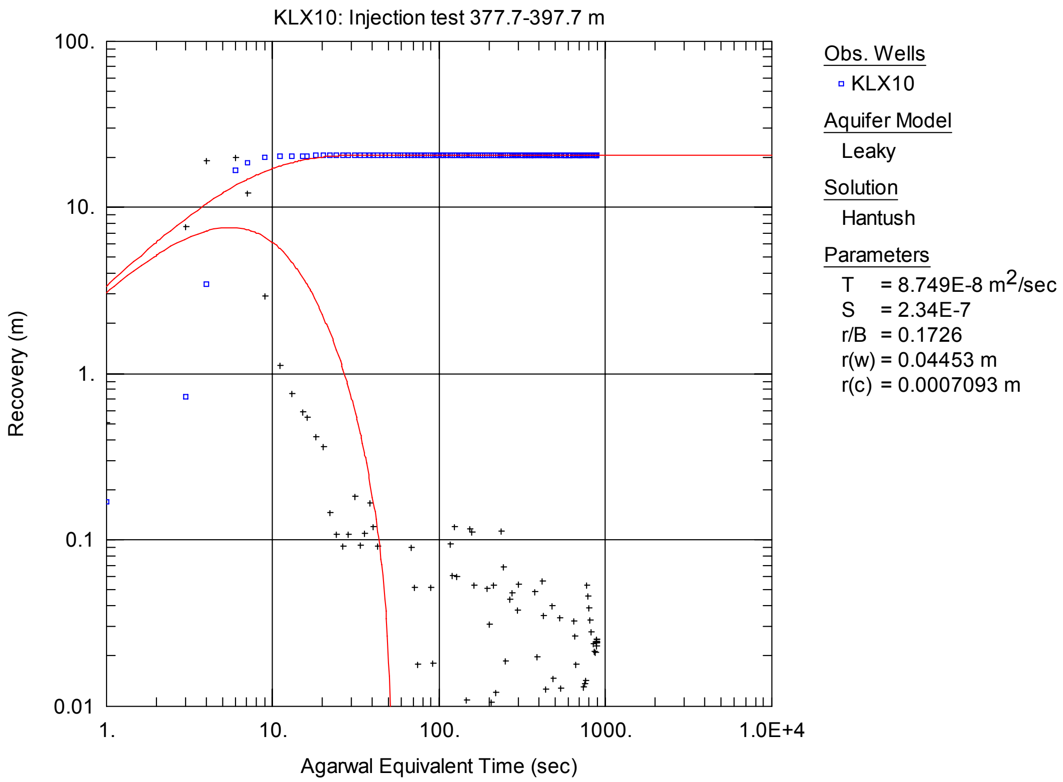


Figure A3-129. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 377.7-397.7 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

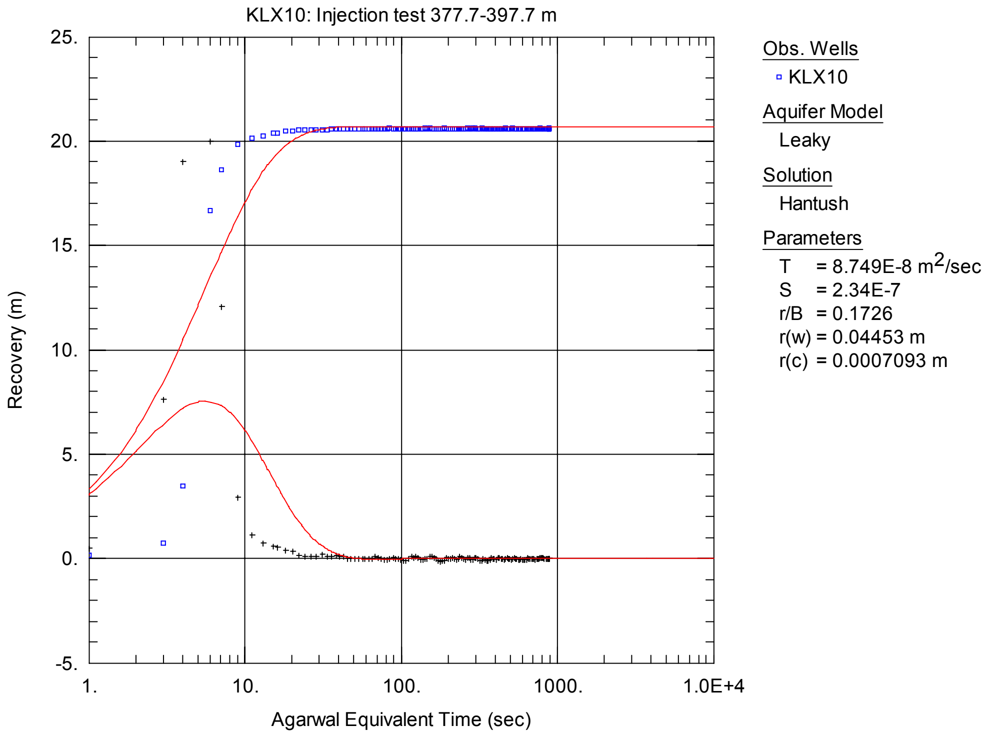


Figure A3-130. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 377.7-397.7 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

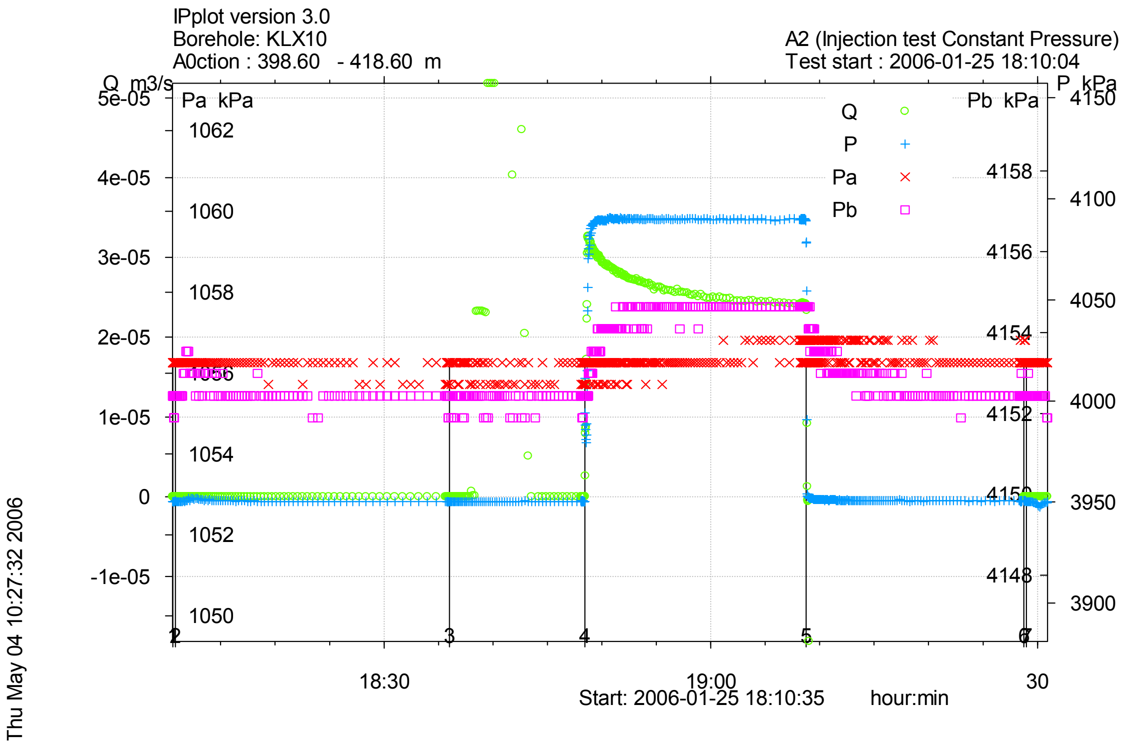


Figure A3-131. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 398.6-418.6 m in borehole KLX10.*

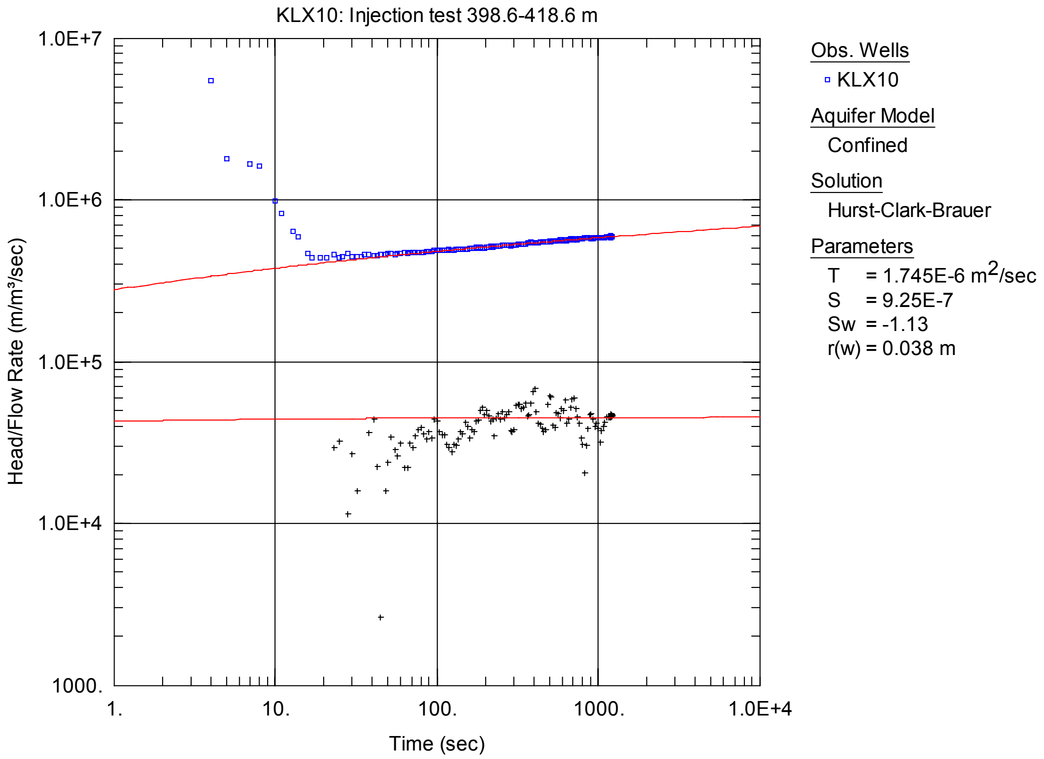


Figure A3-132. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 398.6-418.6 m in KLX10.*

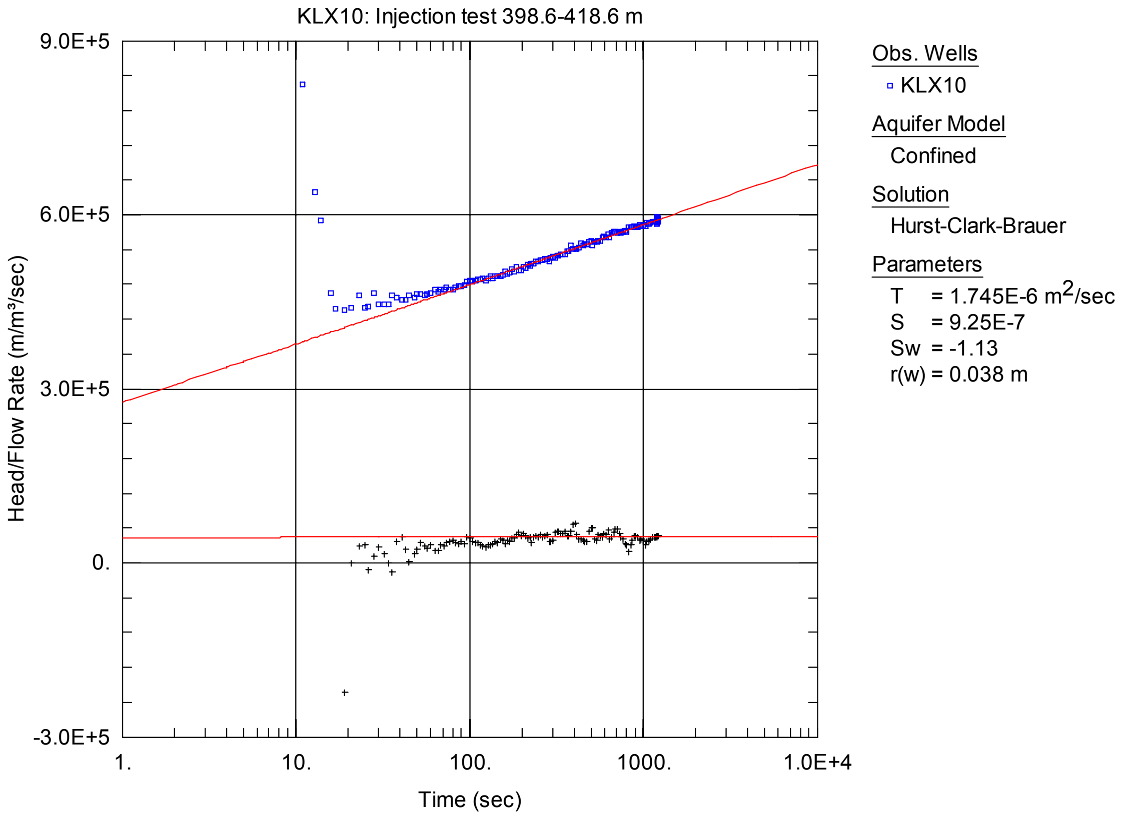


Figure A3-133. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 398.6-418.6 m in KLX10.*

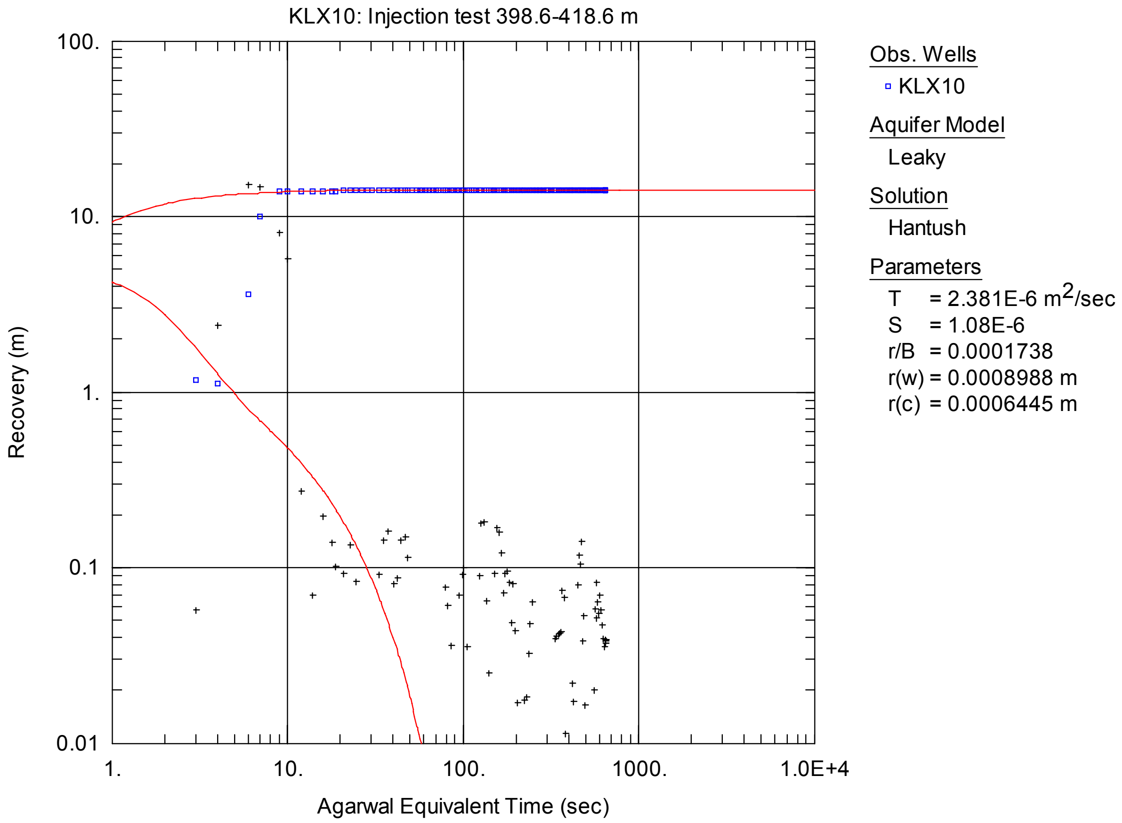


Figure A3-134. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 398.6-418.6 m in KLX10.*

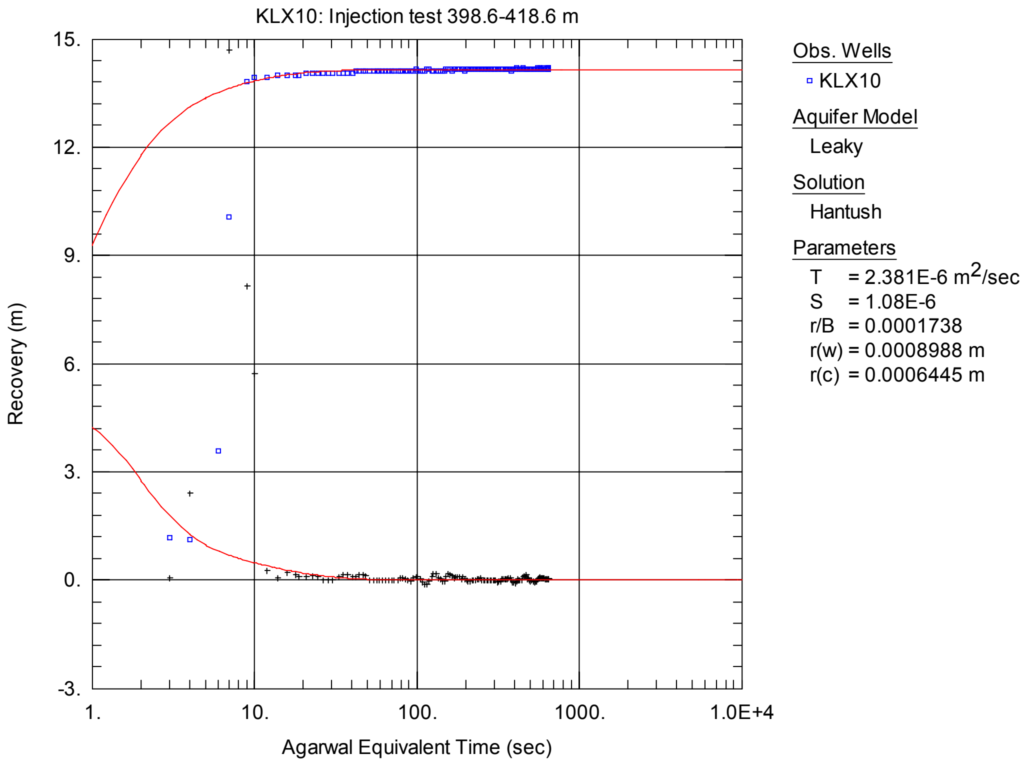


Figure A3-135. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 398.6-418.6 m in KLX10.*

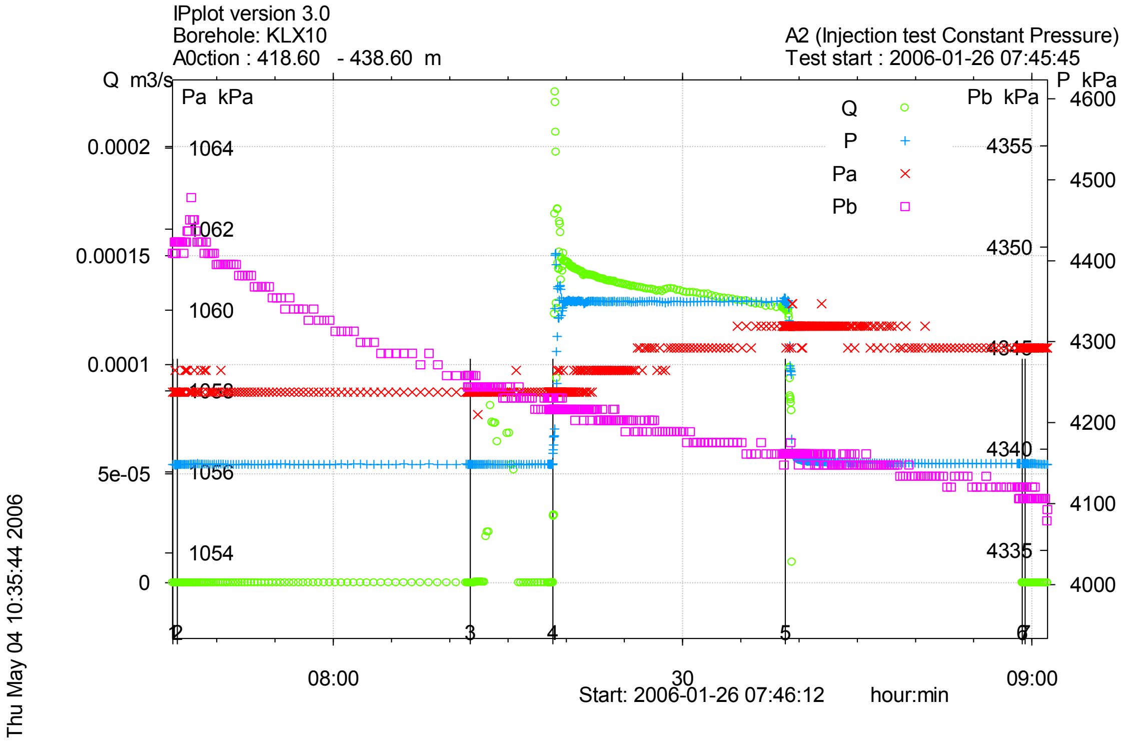


Figure A3-136. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 418.6-438.6 m in borehole KLX10.*

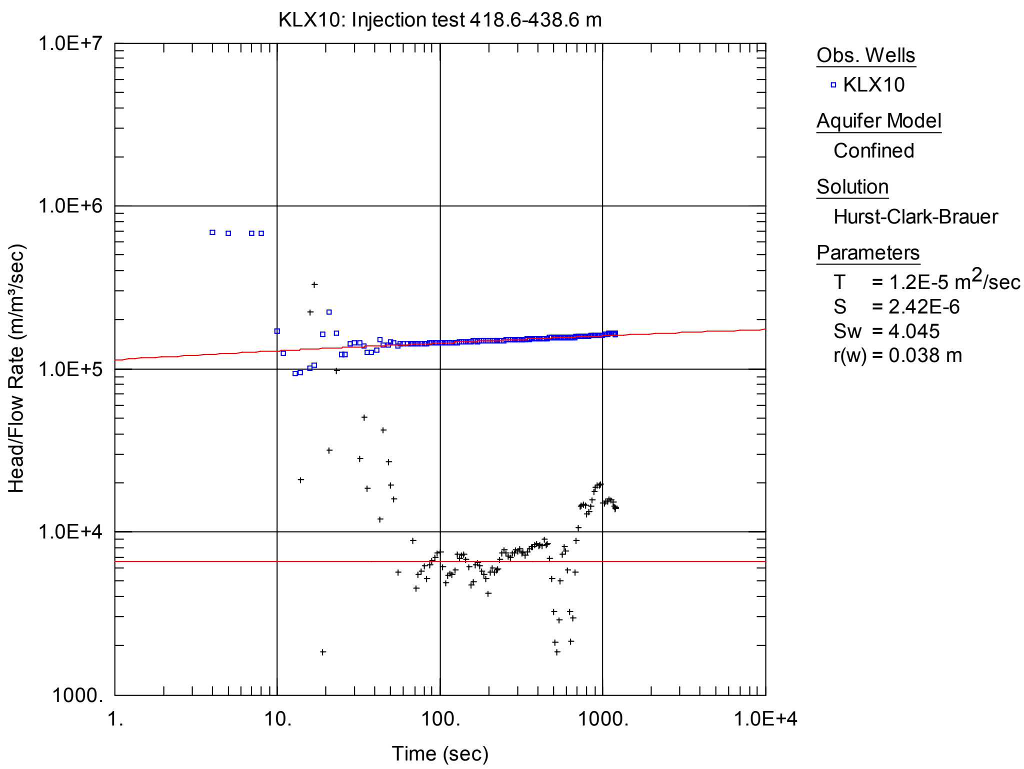


Figure A3-137. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 418.6-438.6 m in KLX10.*

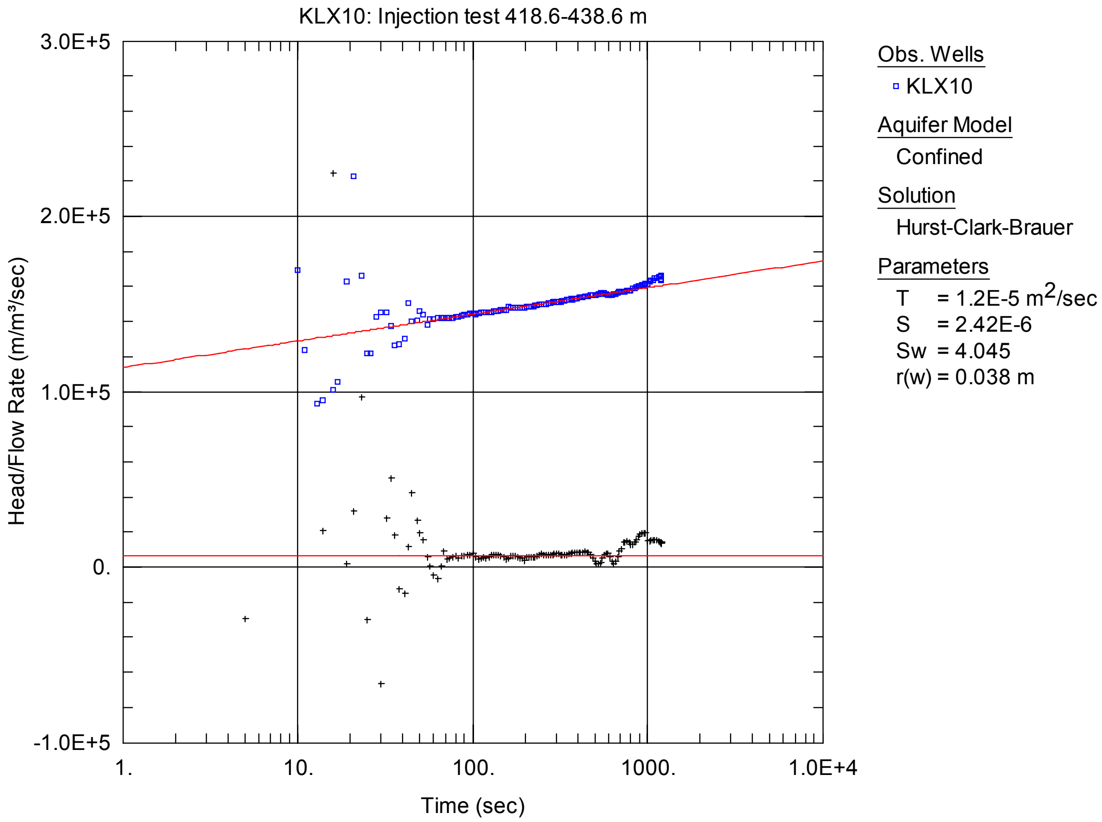


***Figure A3-138.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 418.6-438.6 m in KLX10.*

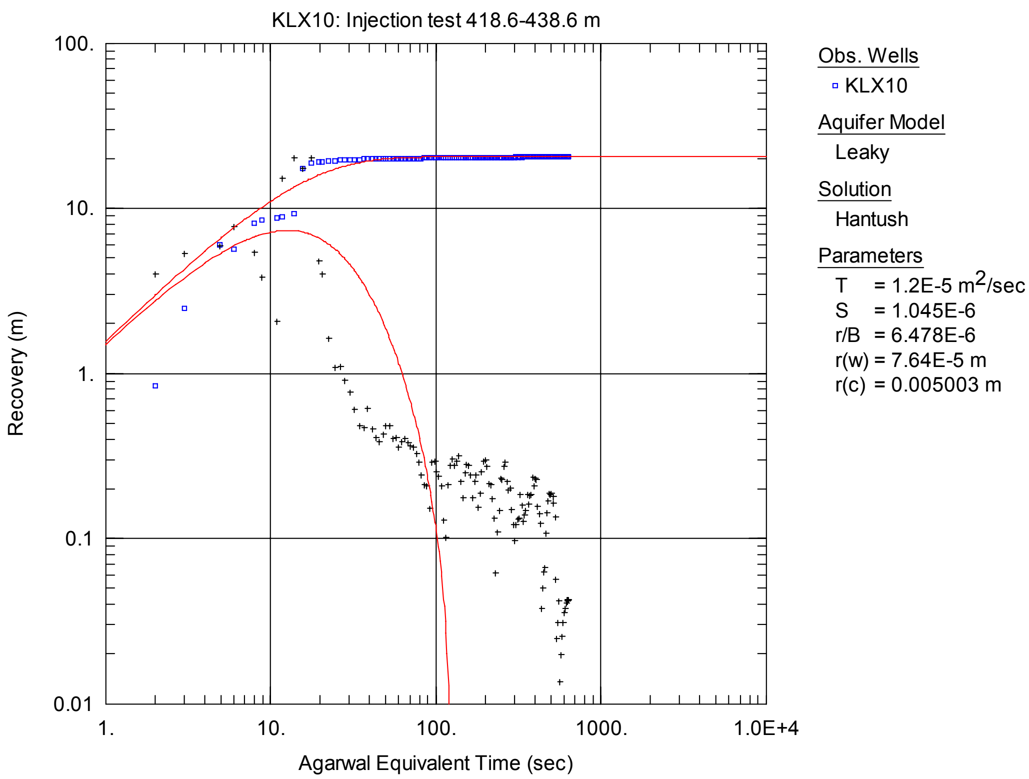


***Figure A3-139.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 418.6-438.6 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

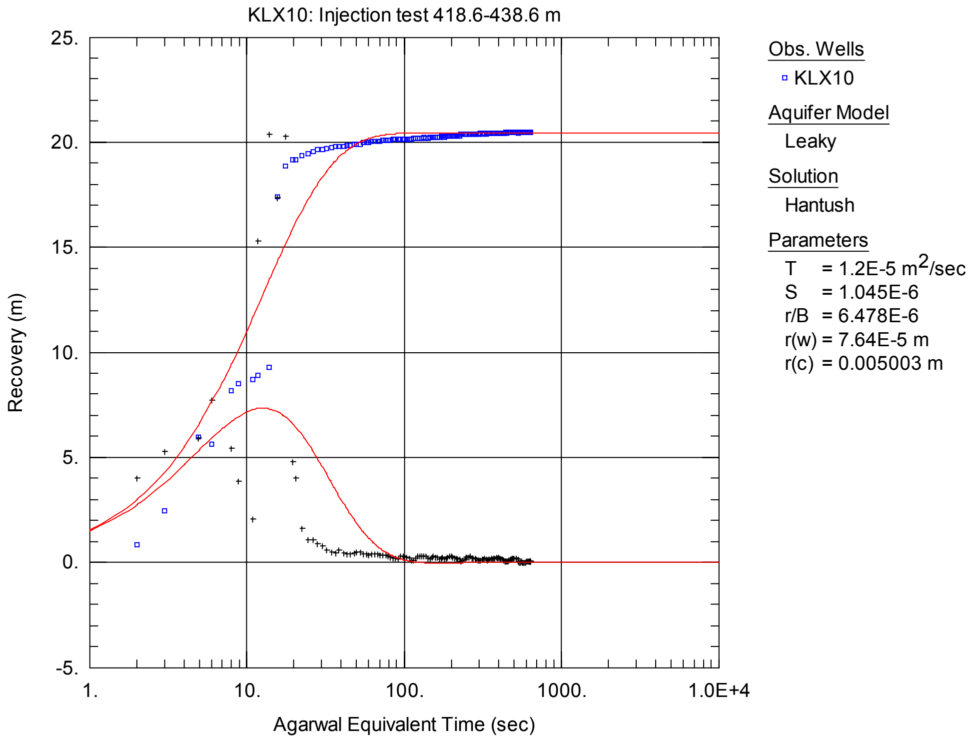


Figure A3-140. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 418.6-438.6 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

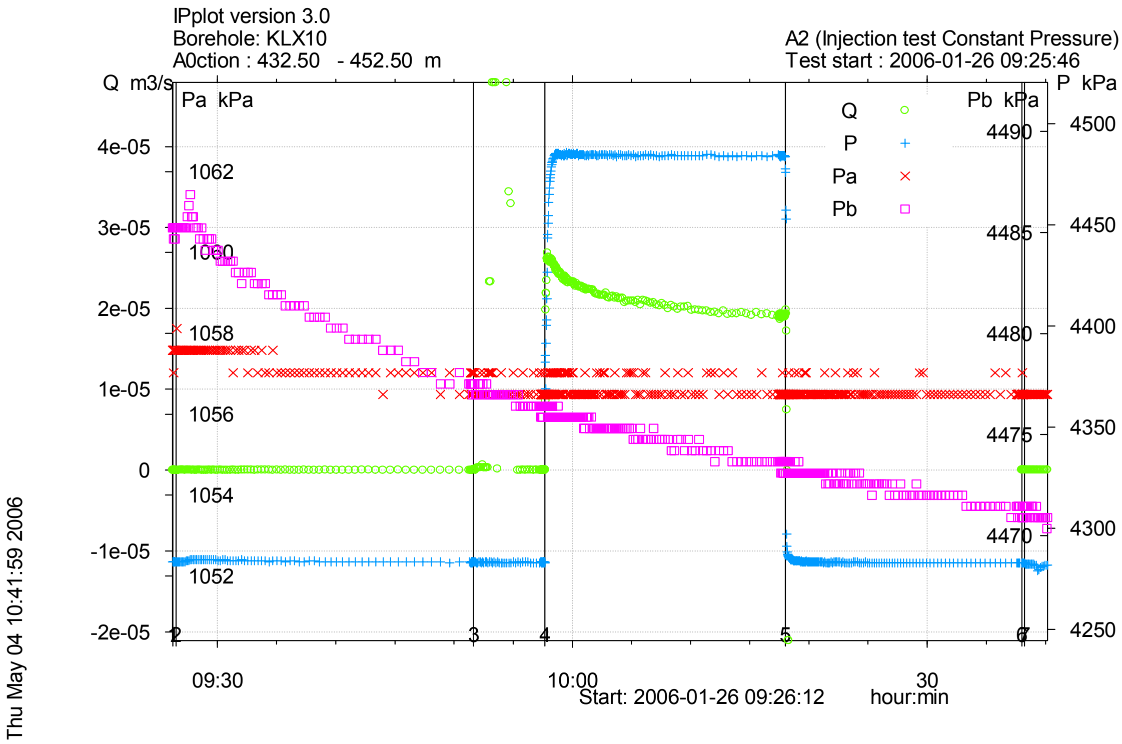


Figure A3-141. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 432.5-452.5 m in borehole KLX10.*

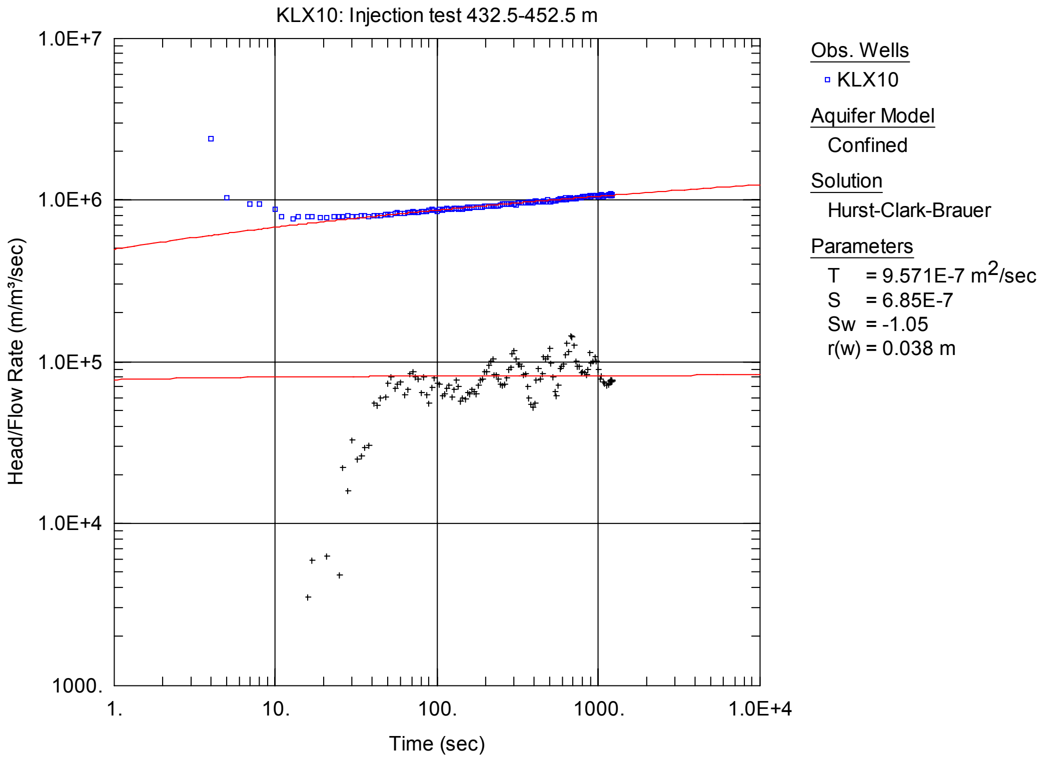


Figure A3-142. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 432.5-452.5 m in KLX10.*

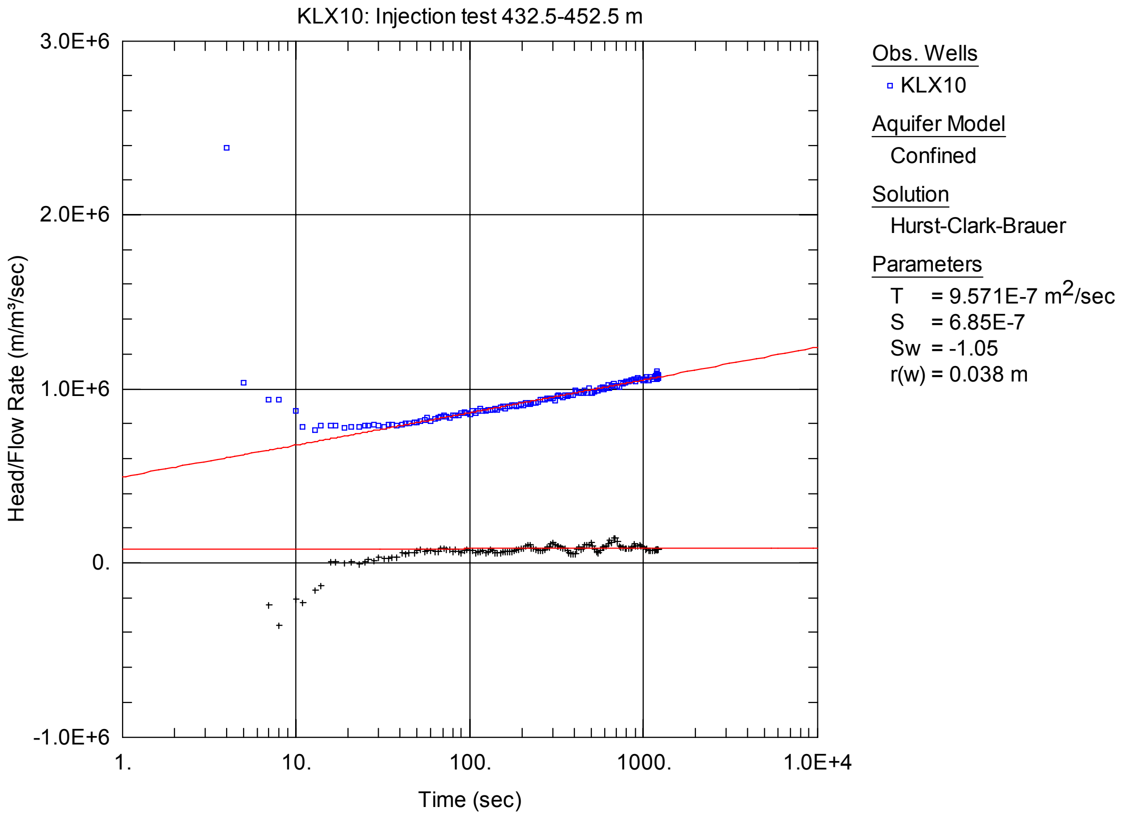


Figure A3-143. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 432.5-452.5 m in KLX10.*

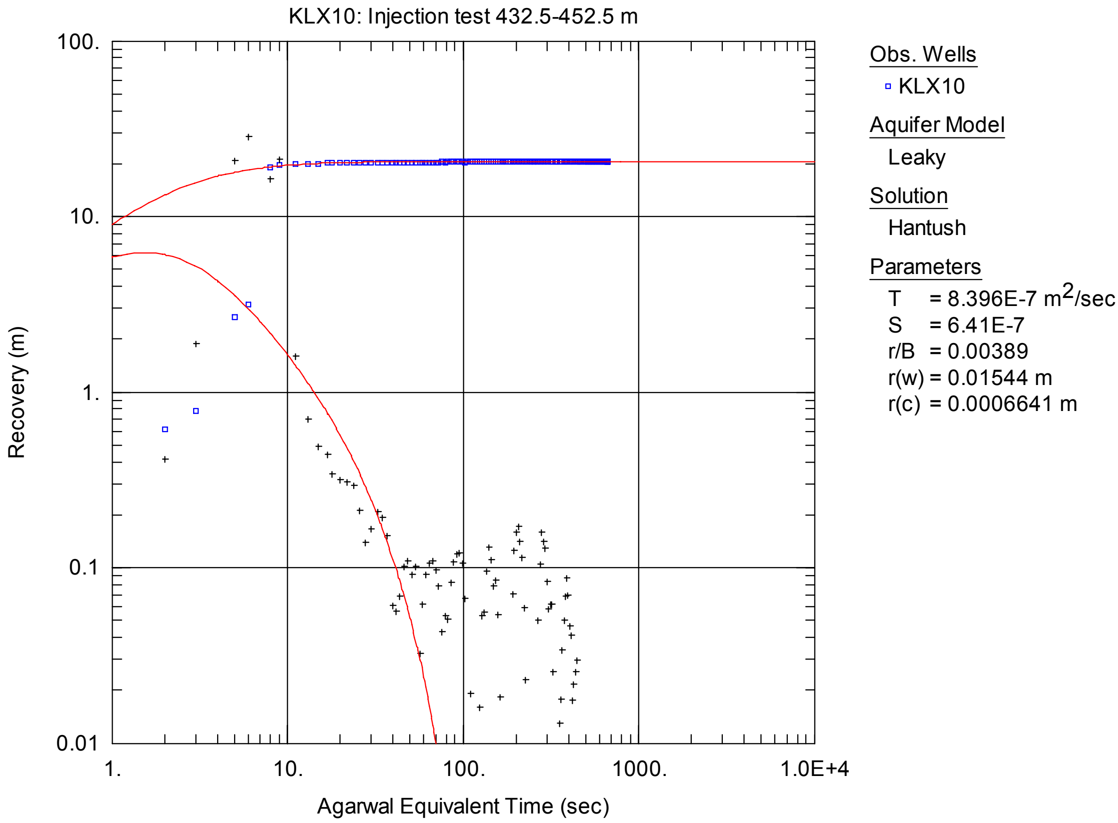


***Figure A3-144.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 432.5-452.5 m in KLX10.*

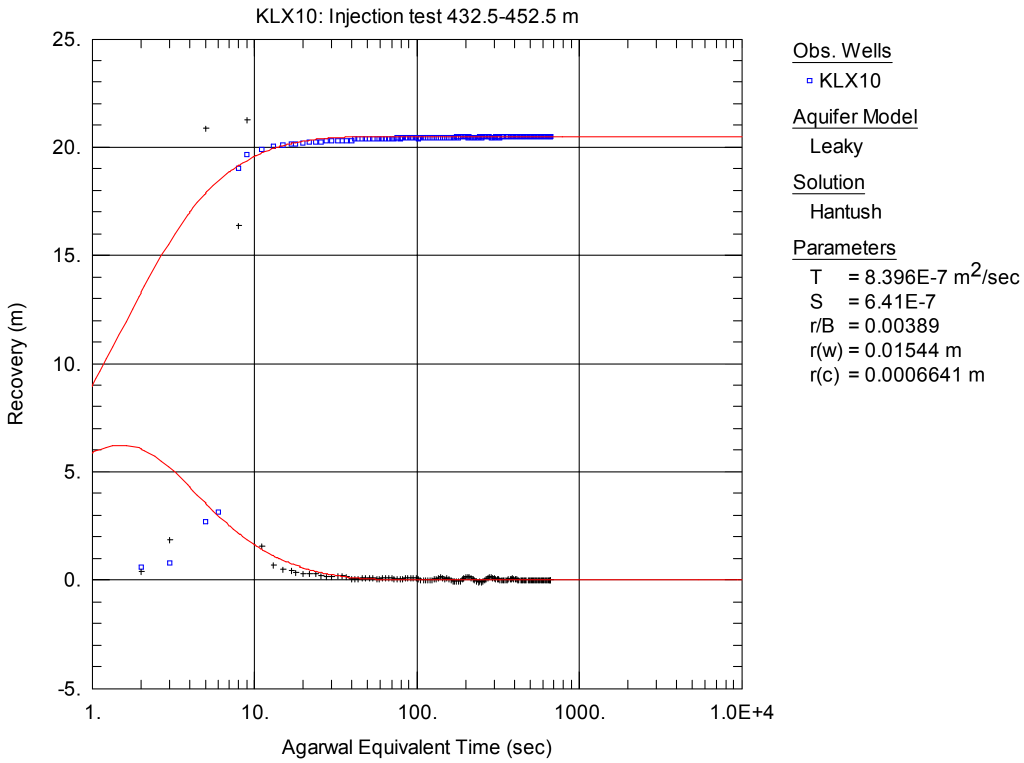


***Figure A3-145.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 432.5-452.5 m in KLX10.*

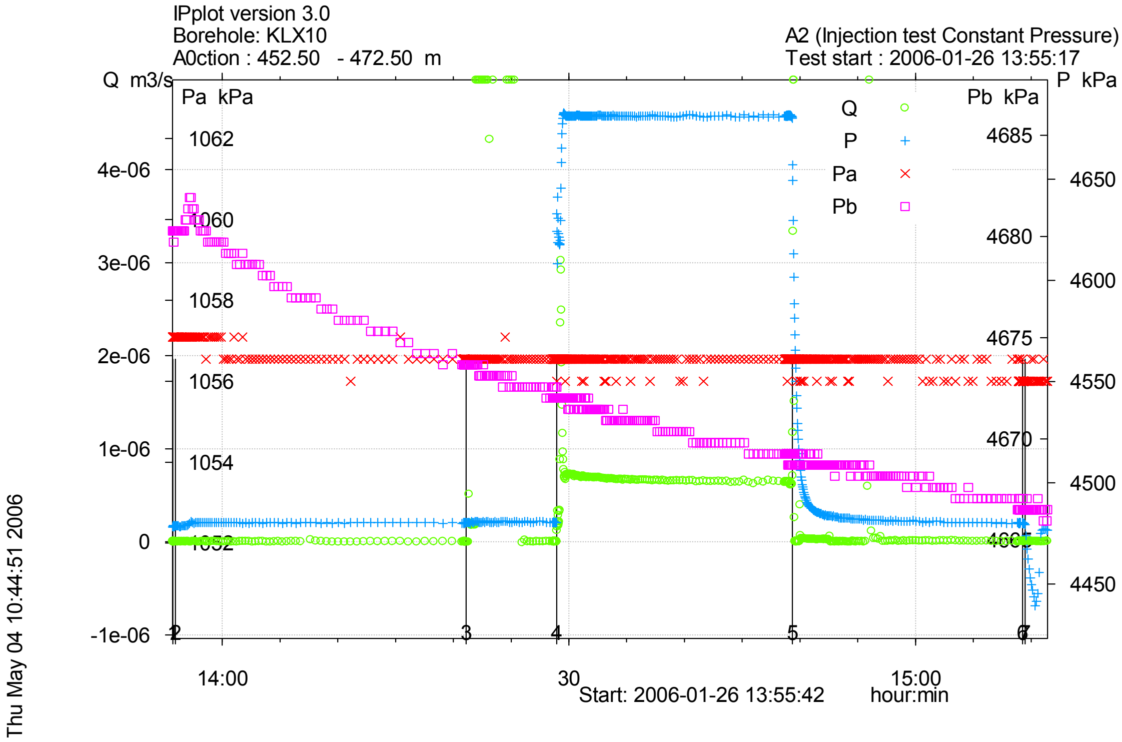


Figure A3-146. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 452.5-472.5 m in borehole KLX10.

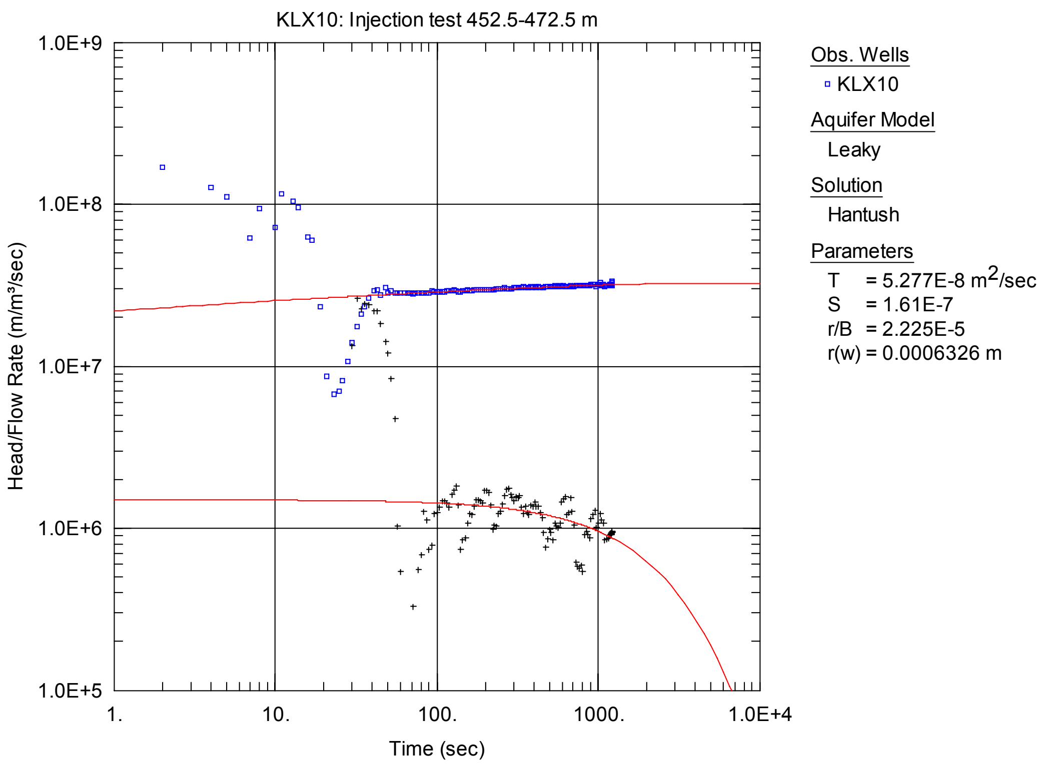


Figure A3-147. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 452.5-472.5 m in KLX10.

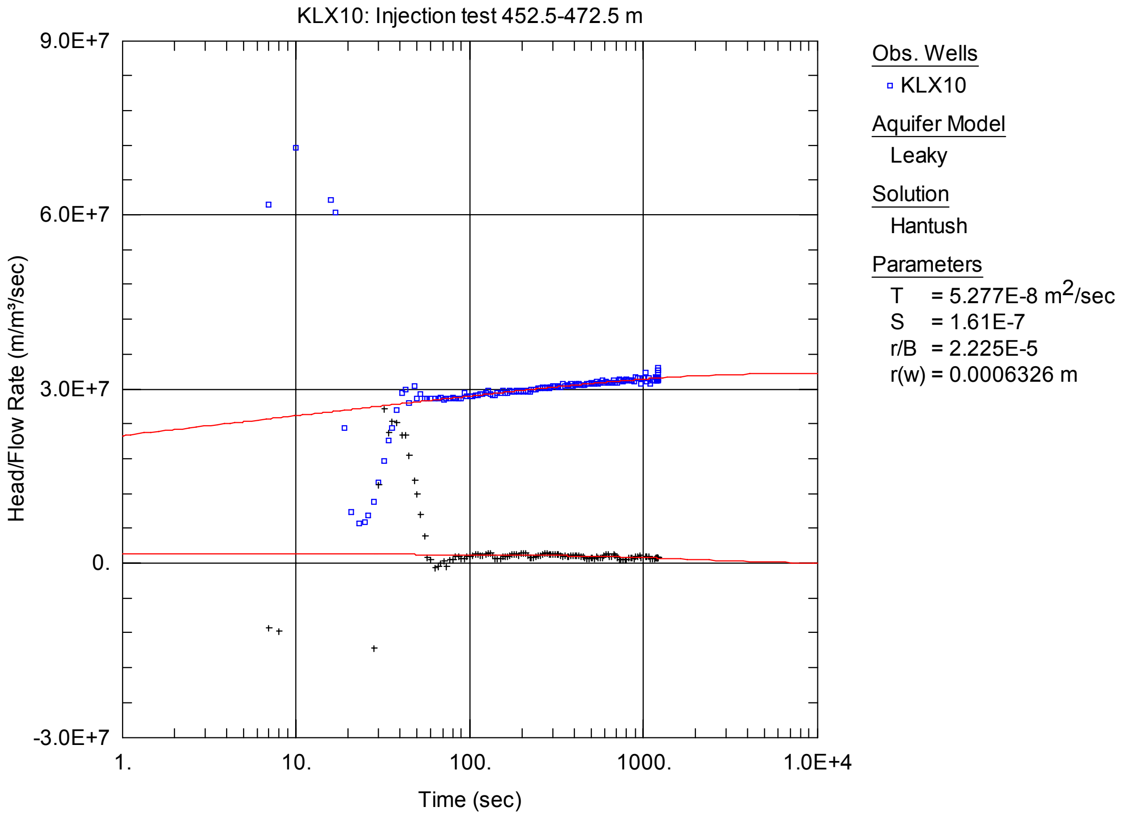


***Figure A3-148.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 452.5-472.5 m in KLX10.*

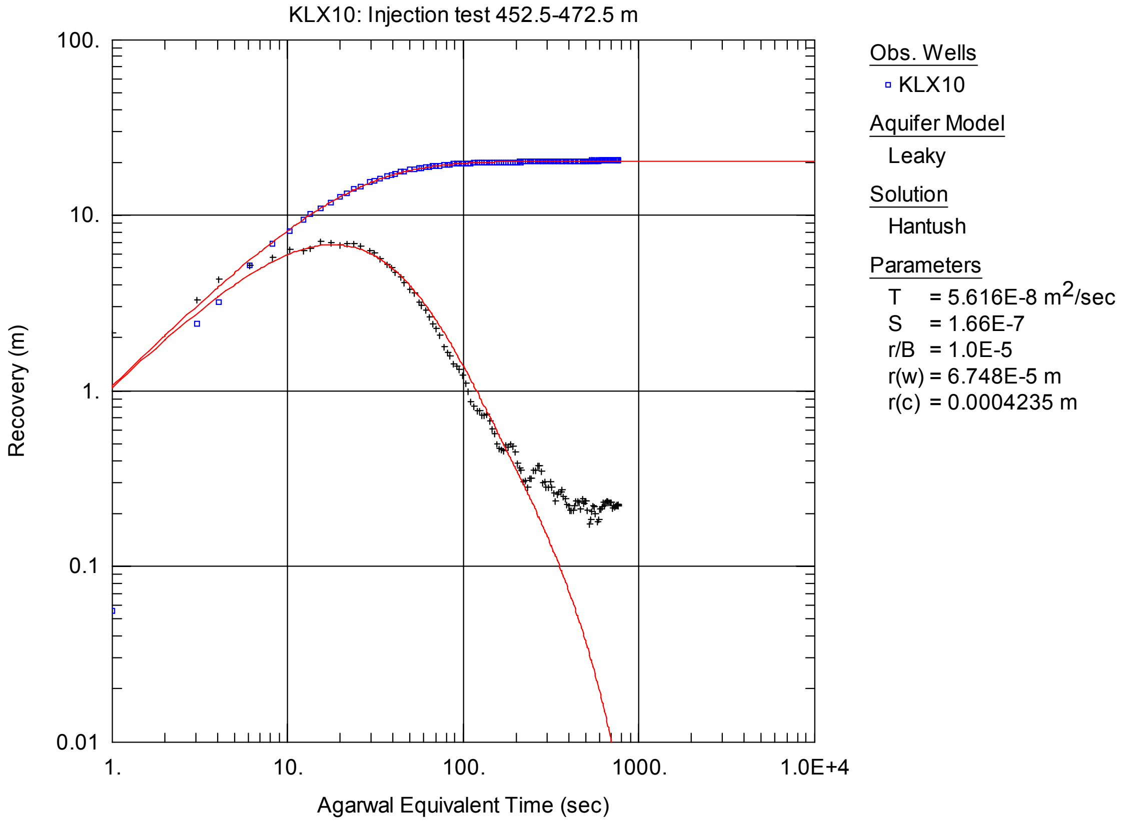


***Figure A3-149.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 452.5-472.5 m in KLX10.*

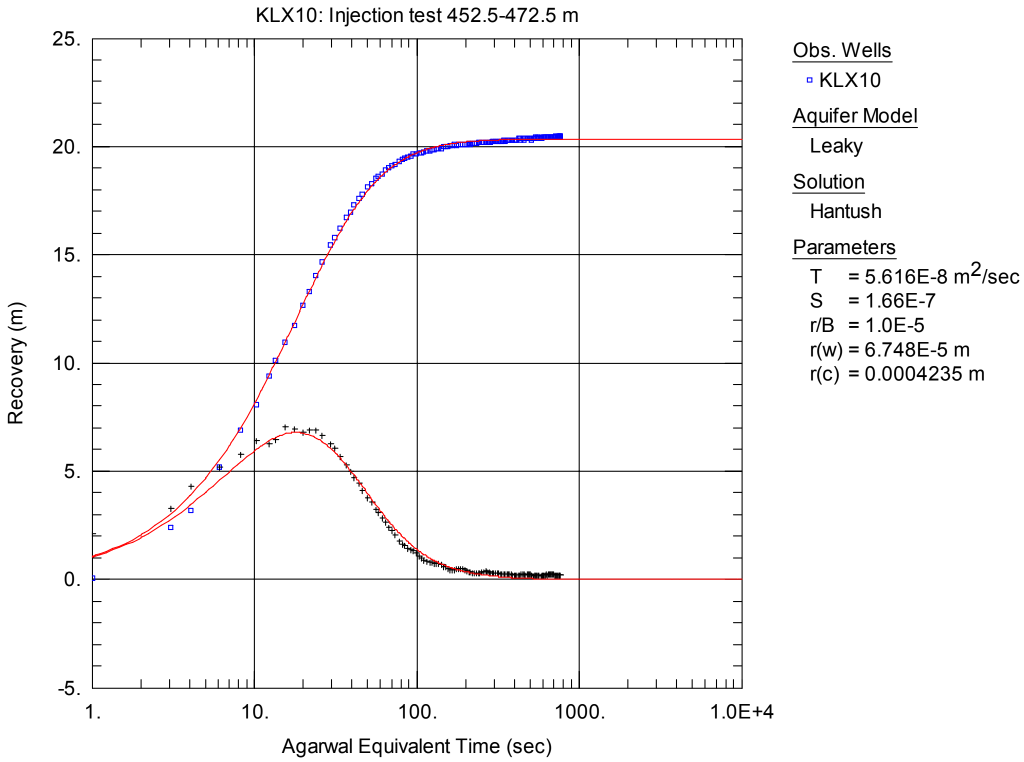


***Figure A3-150.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 452.5-472.5 m in KLX10.*

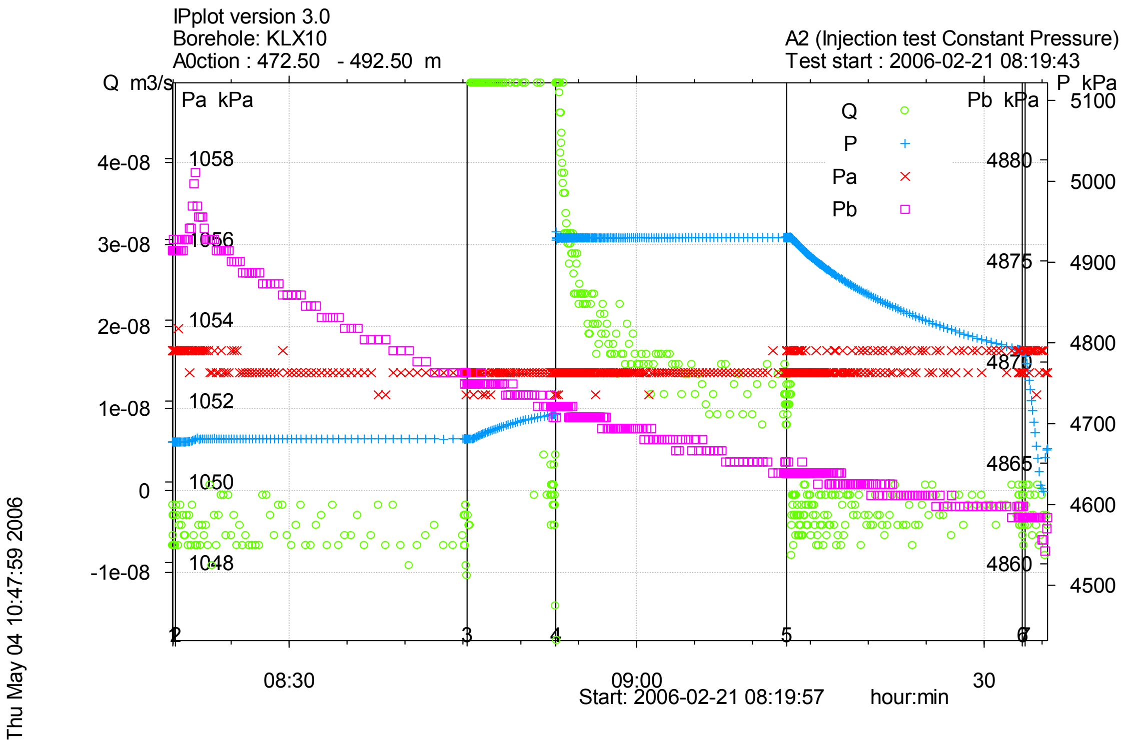


***Figure A3-151.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 472.5-492.5 m in borehole KLX10.*

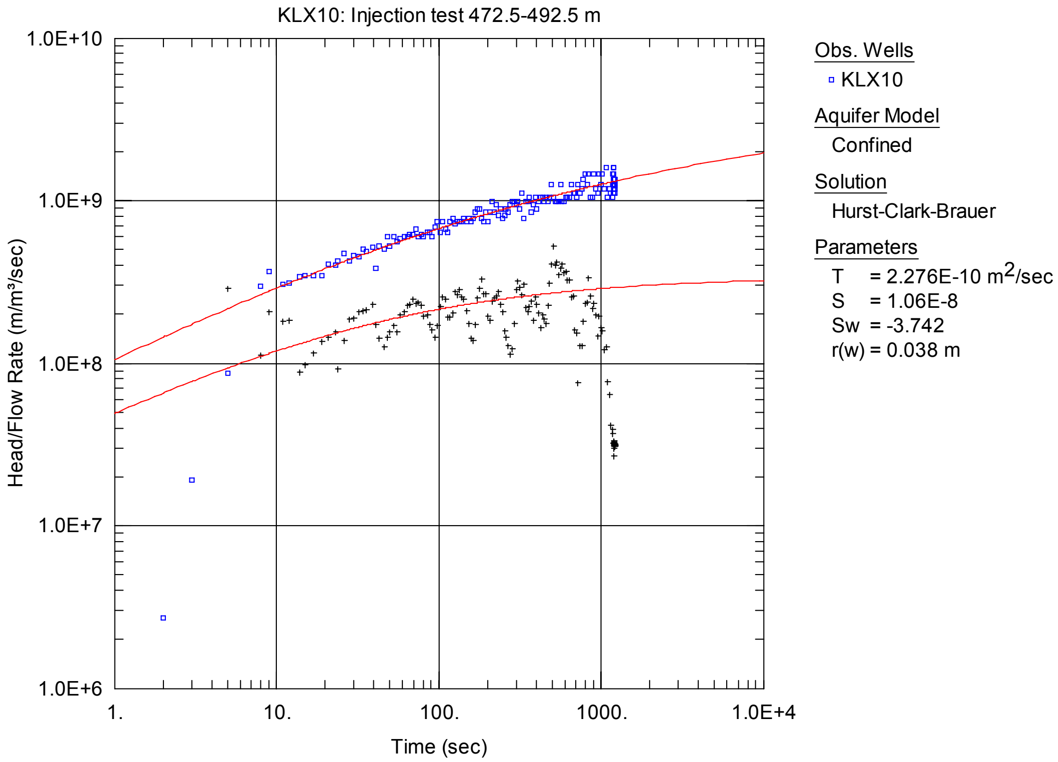


Figure A3-152. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution, from the injection test in section 472.5-492.5 m in KLX10.*

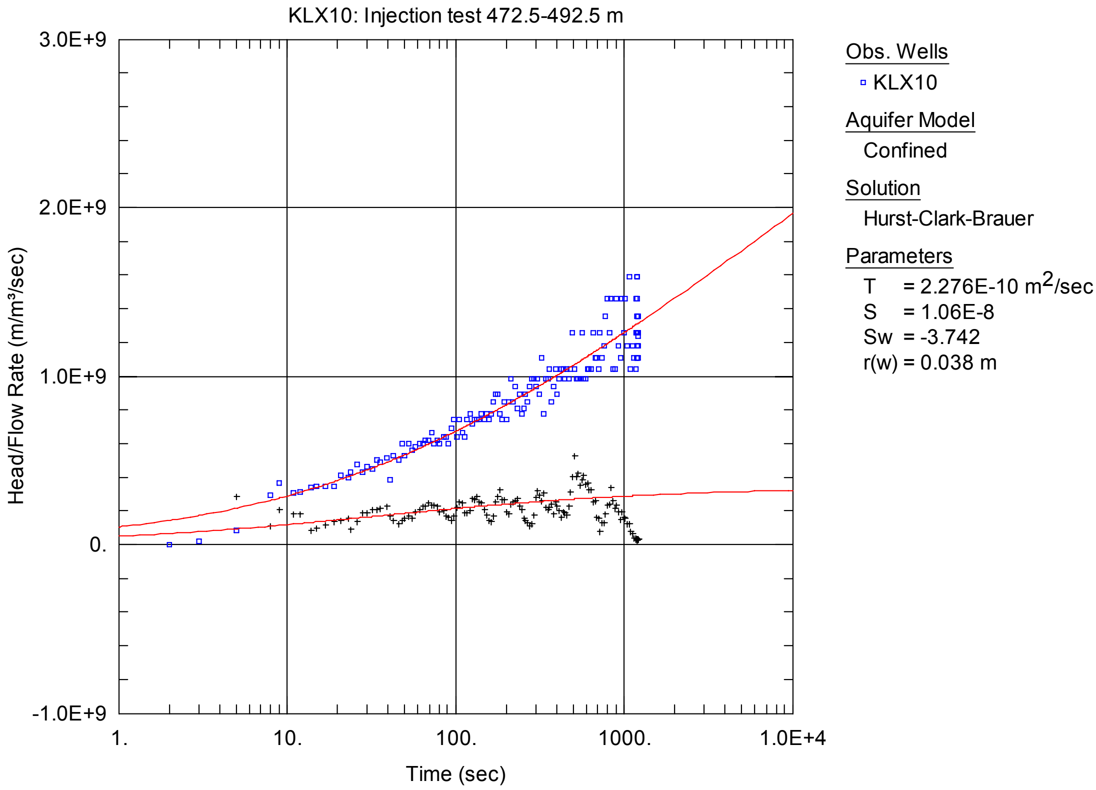


Figure A3-153. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution, from the injection test in section 472.5-492.5 m in KLX10.*

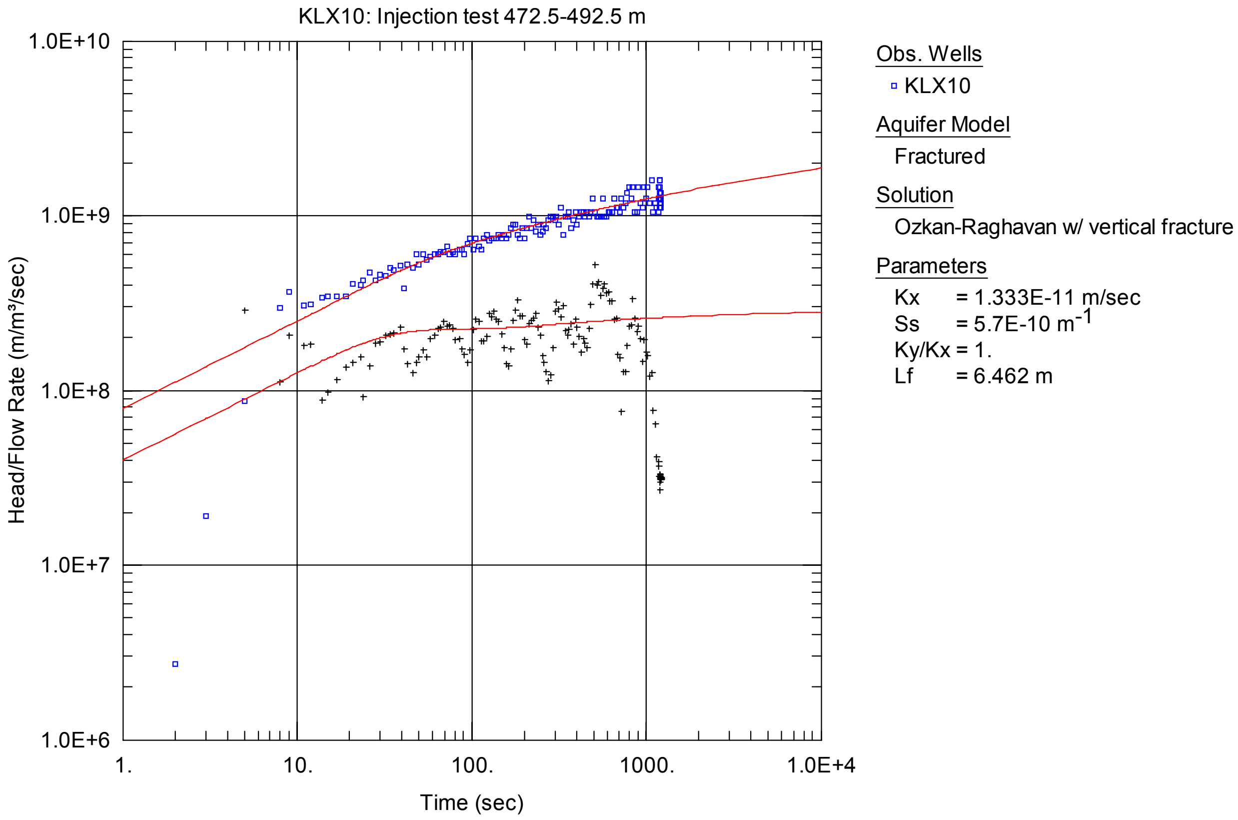


Figure A3-154. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan solution, from the injection test in section 472.5-492.5 m in KLX10.*

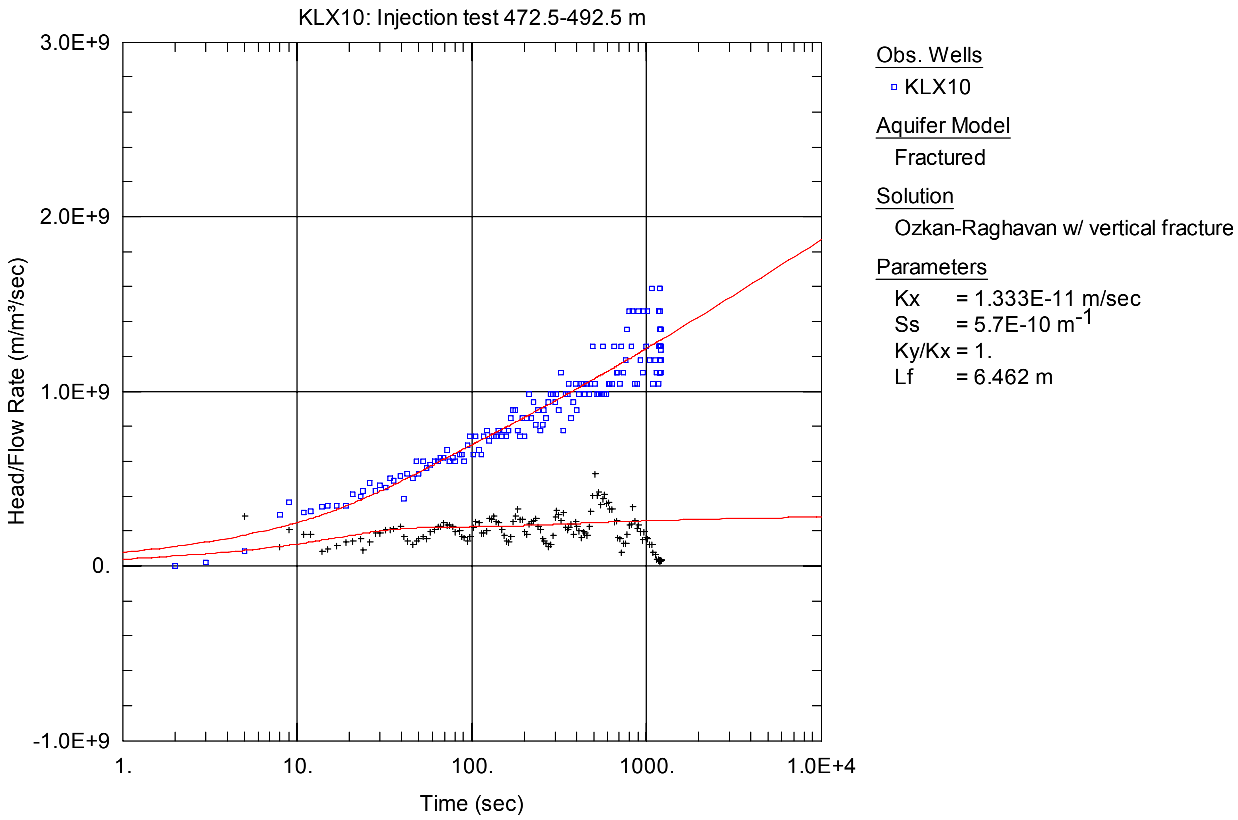


Figure A3-155. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan solution, from the injection test in section 472.5-492.5 m in KLX10.*

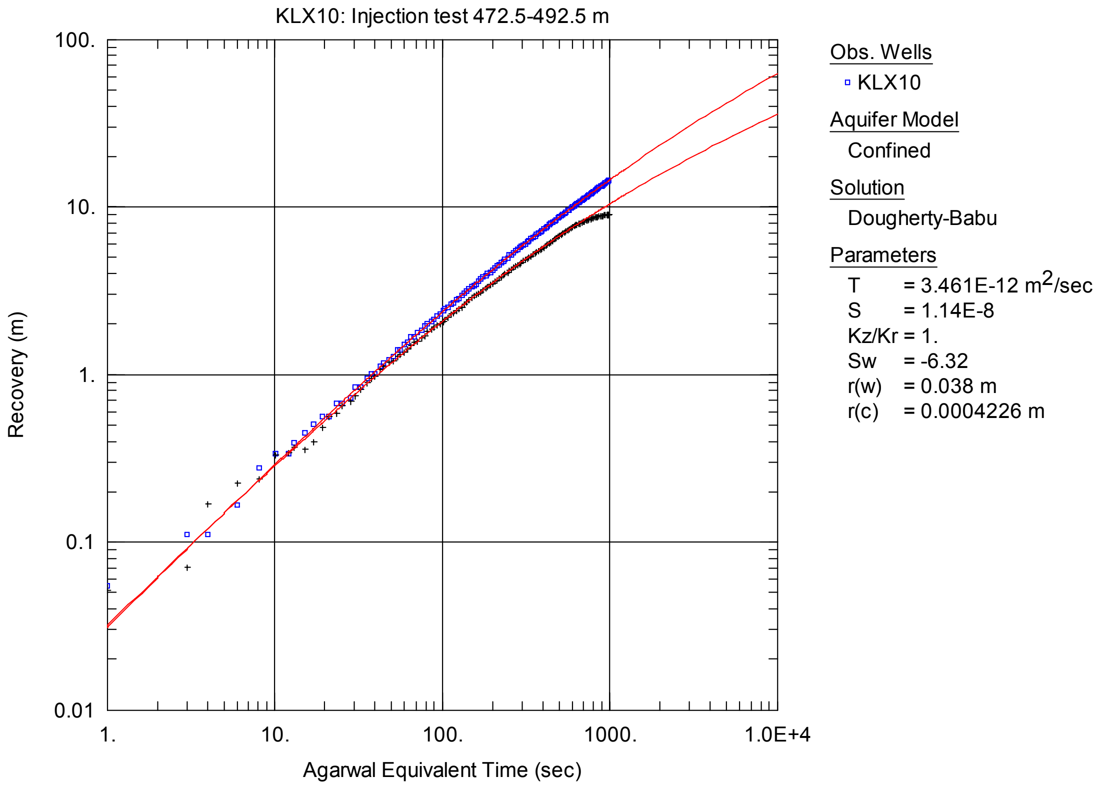


Figure A3-156. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 472.5-492.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

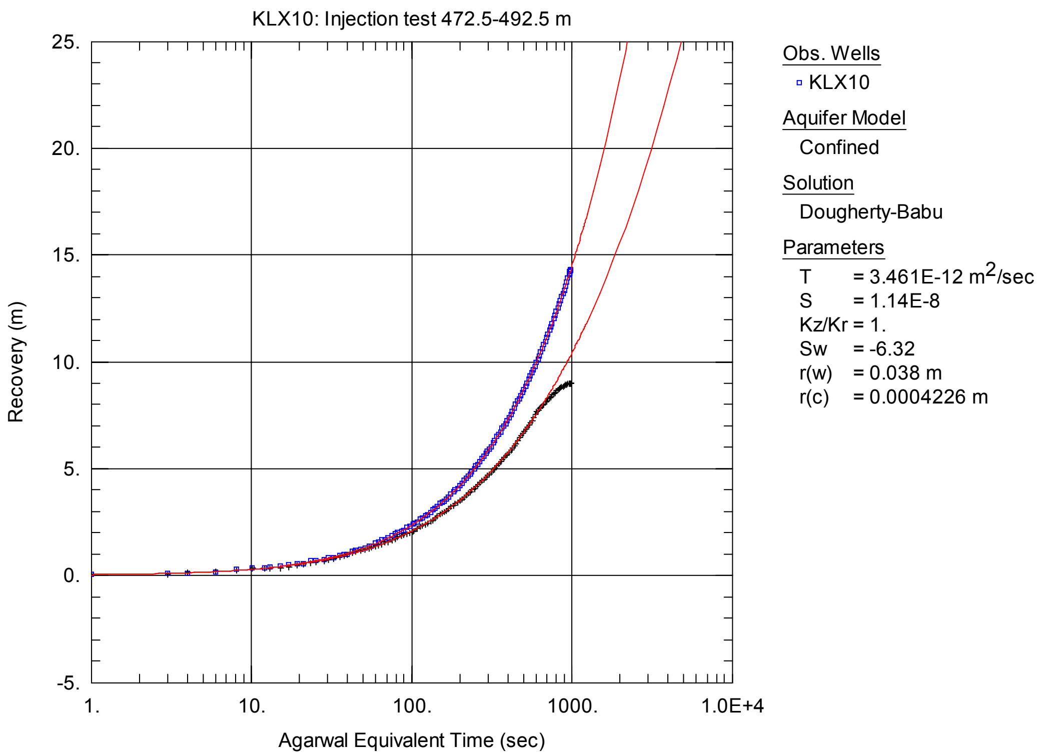


Figure A3-157. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 472.5-492.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

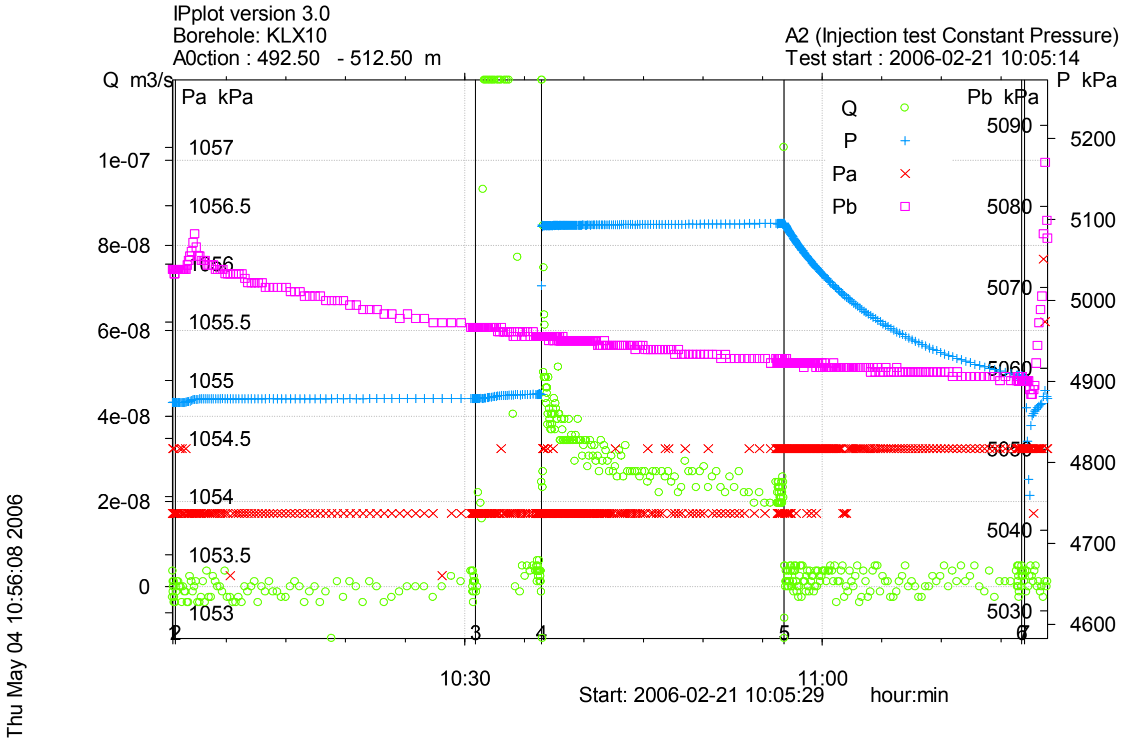


Figure A3-158. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 492.5-512.5 m in borehole KLX10.

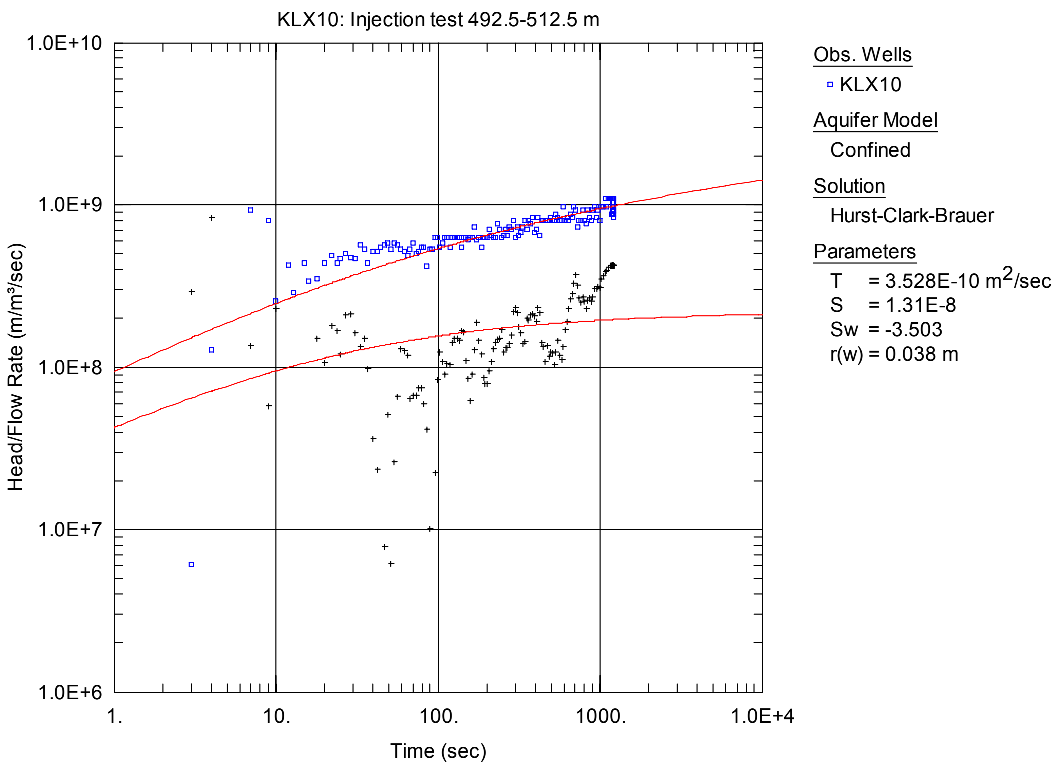


Figure A3-159. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 492.5-512.5 m in KLX10.

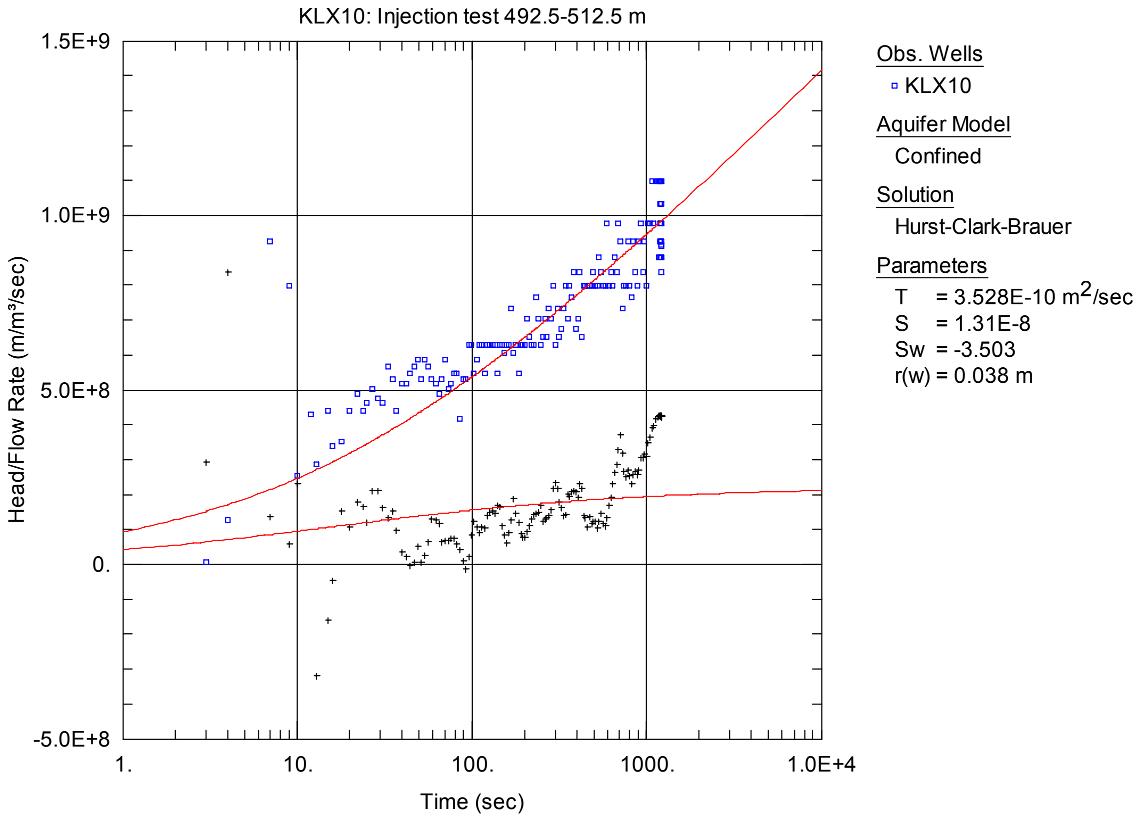


Figure A3-160. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 492.5-512.5 m in KLX10.*

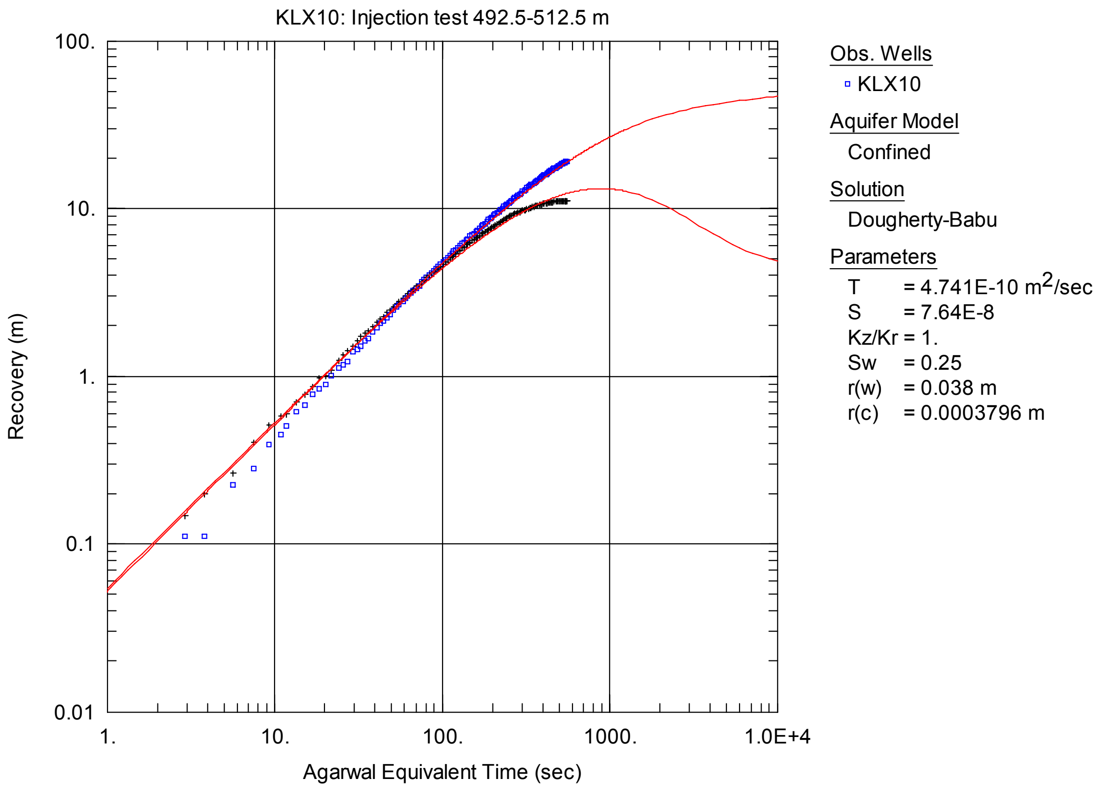


Figure A3-161. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 492.5-512.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

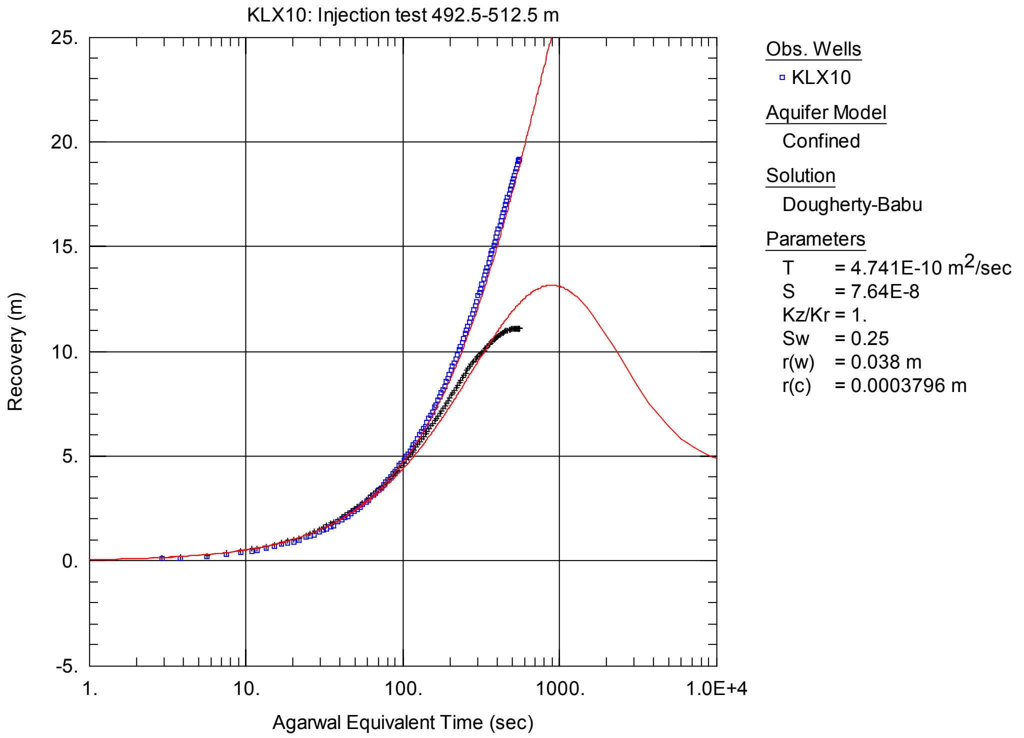


Figure A3-162. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 492.5-512.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

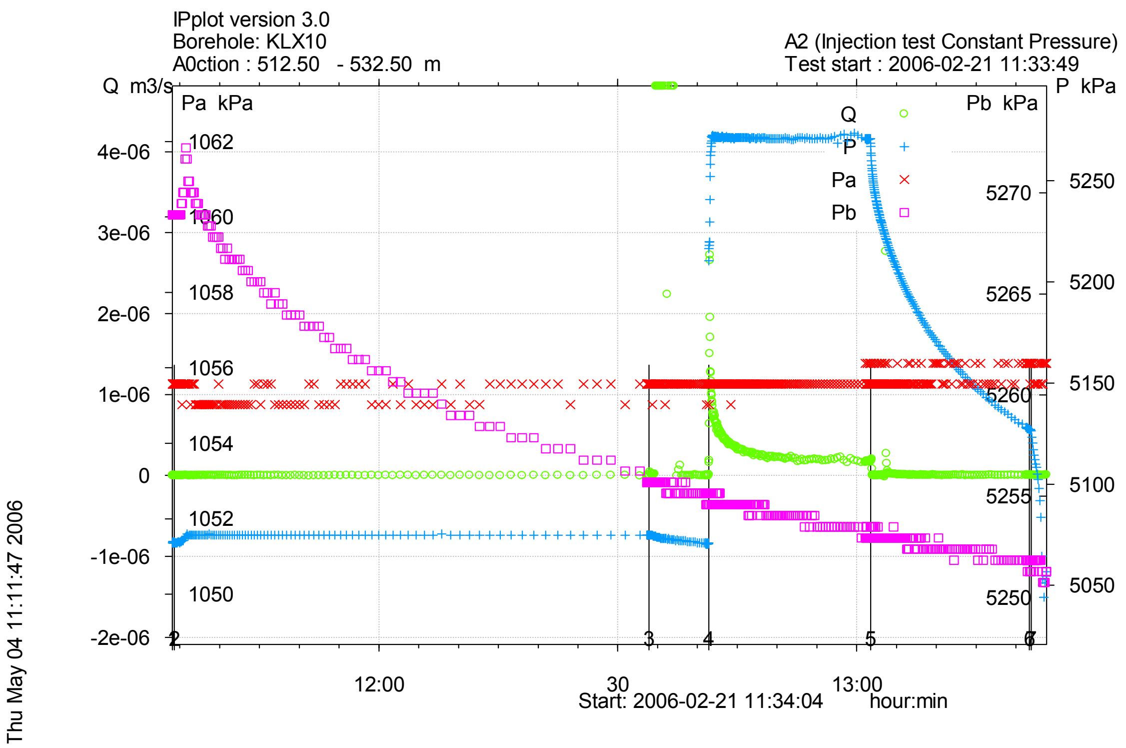


Figure A3-163. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 512.5-532.5 m in borehole KLX10.*

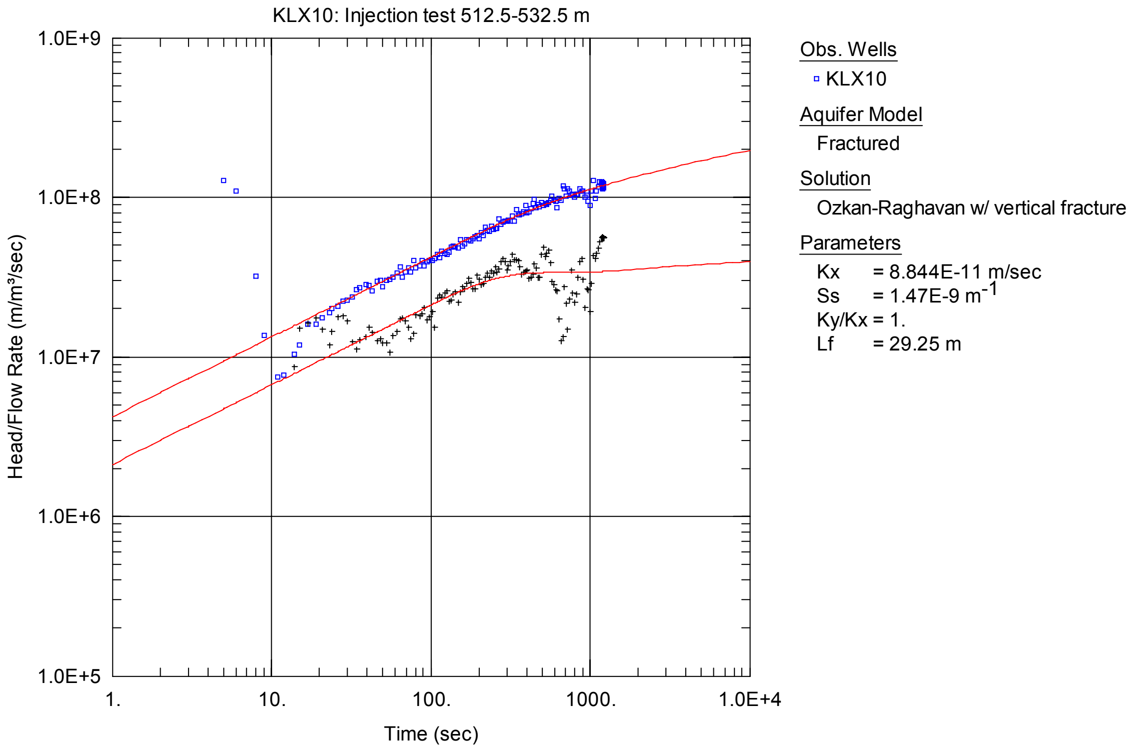


Figure A3-164. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan solution, from the injection test in section 512.5-532.5 m in KLX10.*

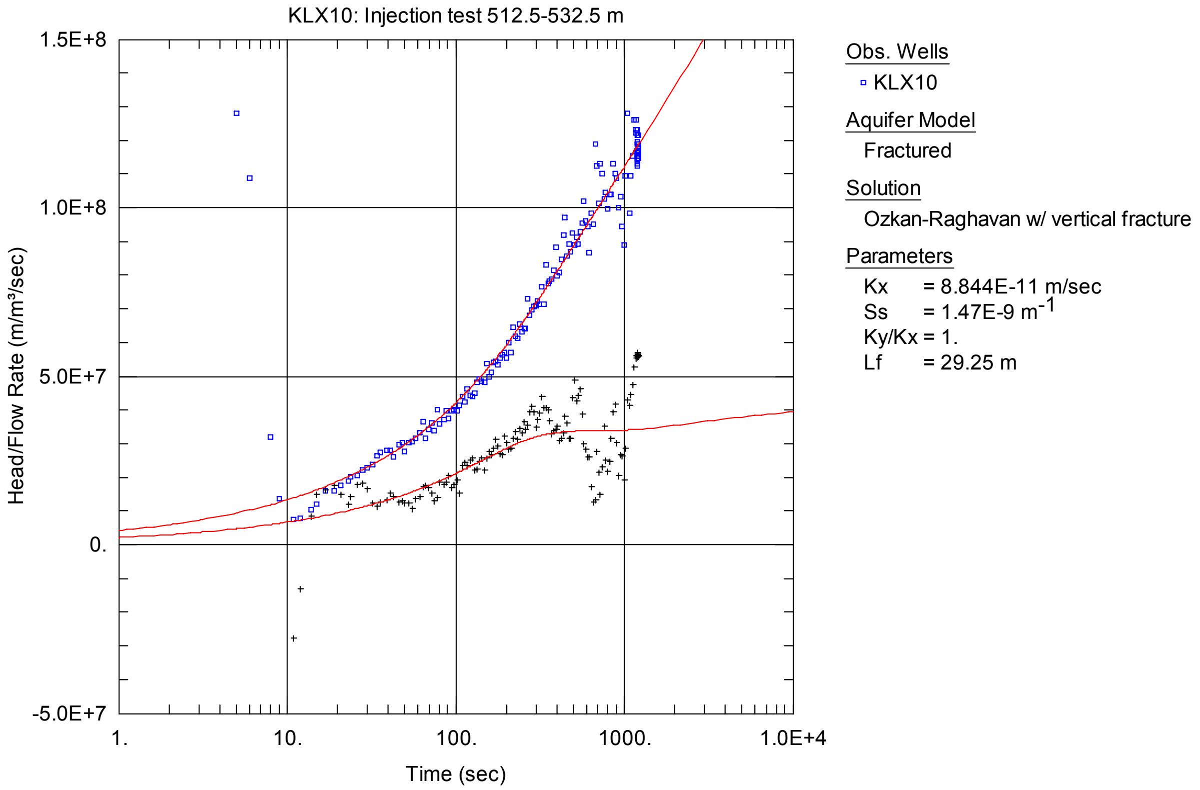


Figure A3-165. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan solution, from the injection test in section 512.5-532.5 x m in KLX10.*

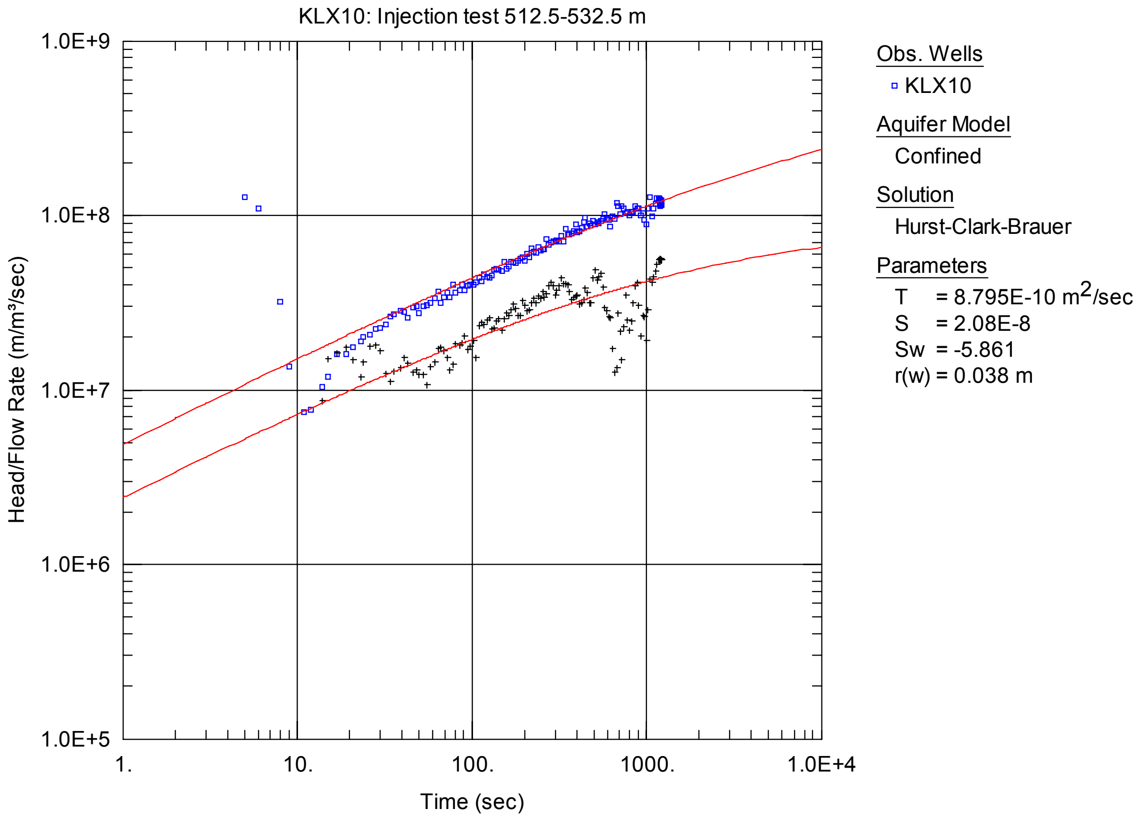


Figure A3-166. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution, from the injection test in section 512.5-532.5 m in KLX10.*

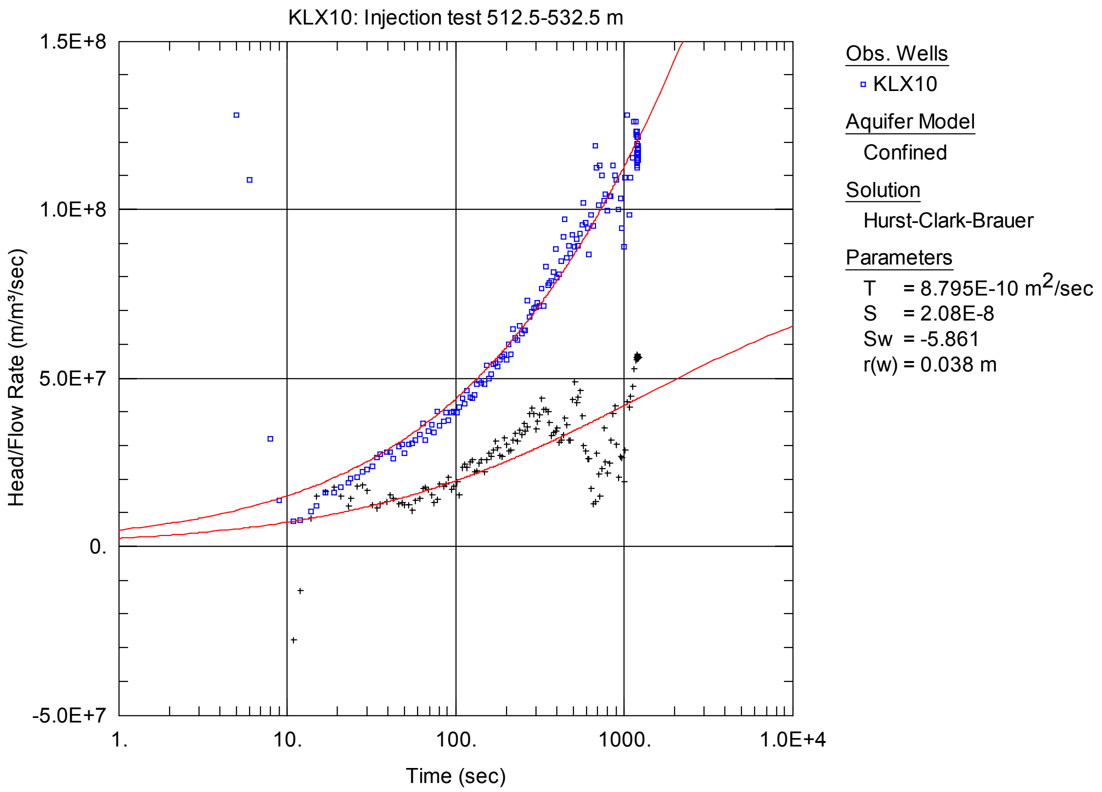


Figure A3-167. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan solution, from the injection test in section 512.5-532.5 m in KLX10.*

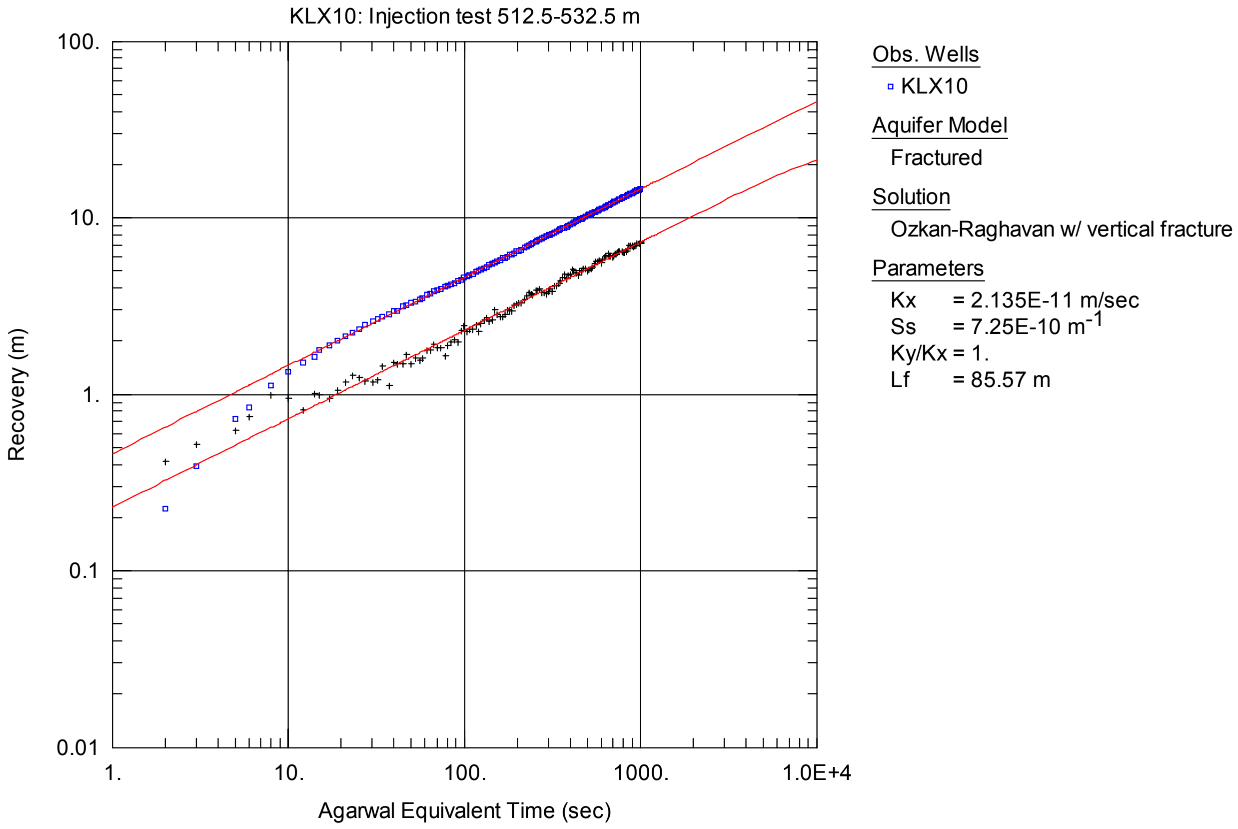


Figure A3-168. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 512.5-532.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

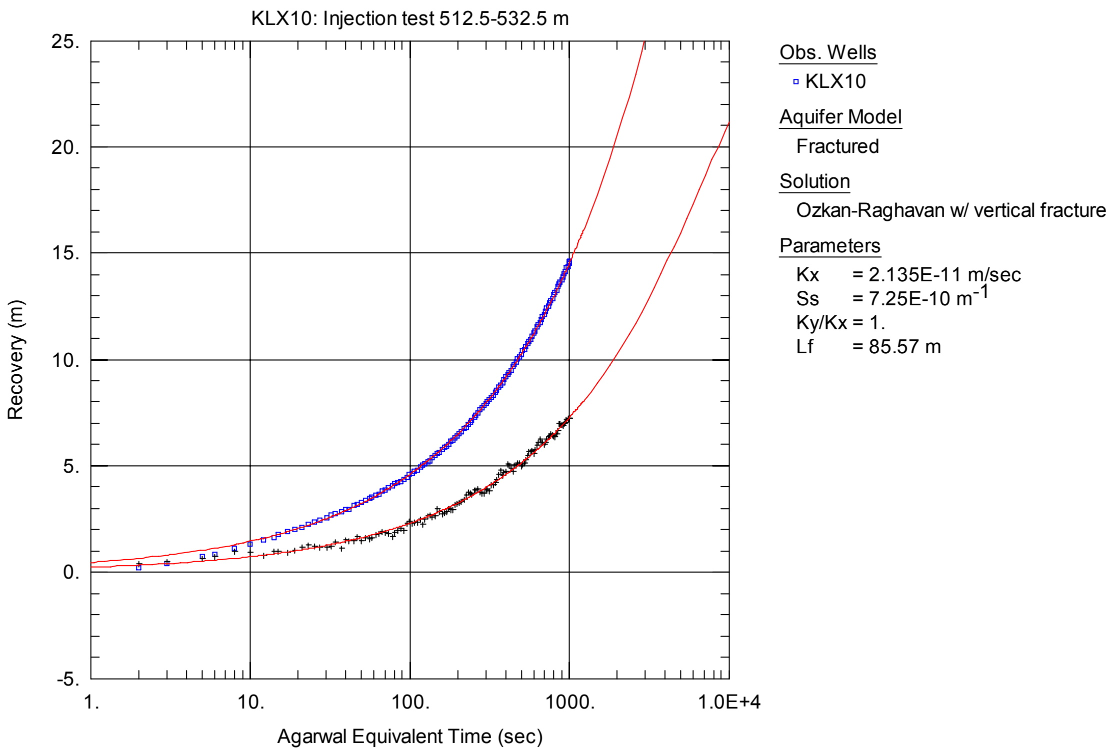


Figure A3-169. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 512.5-532.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

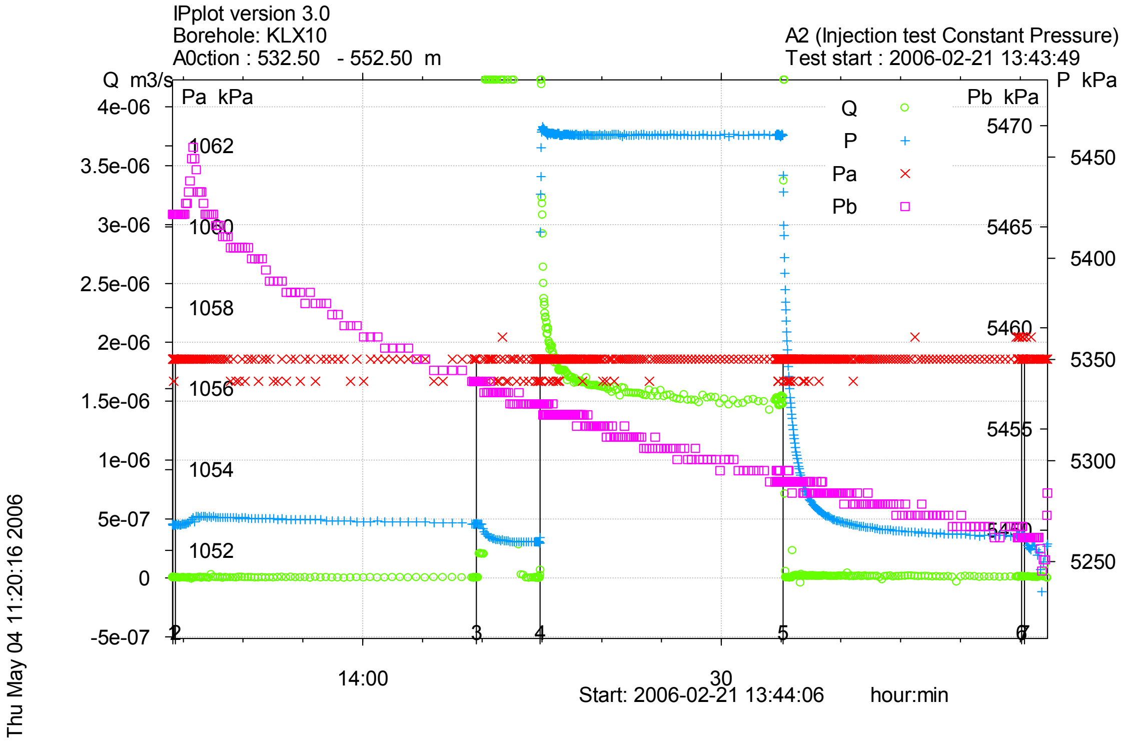


Figure A3-170. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 532.5-552.5 m in borehole KLX10.*

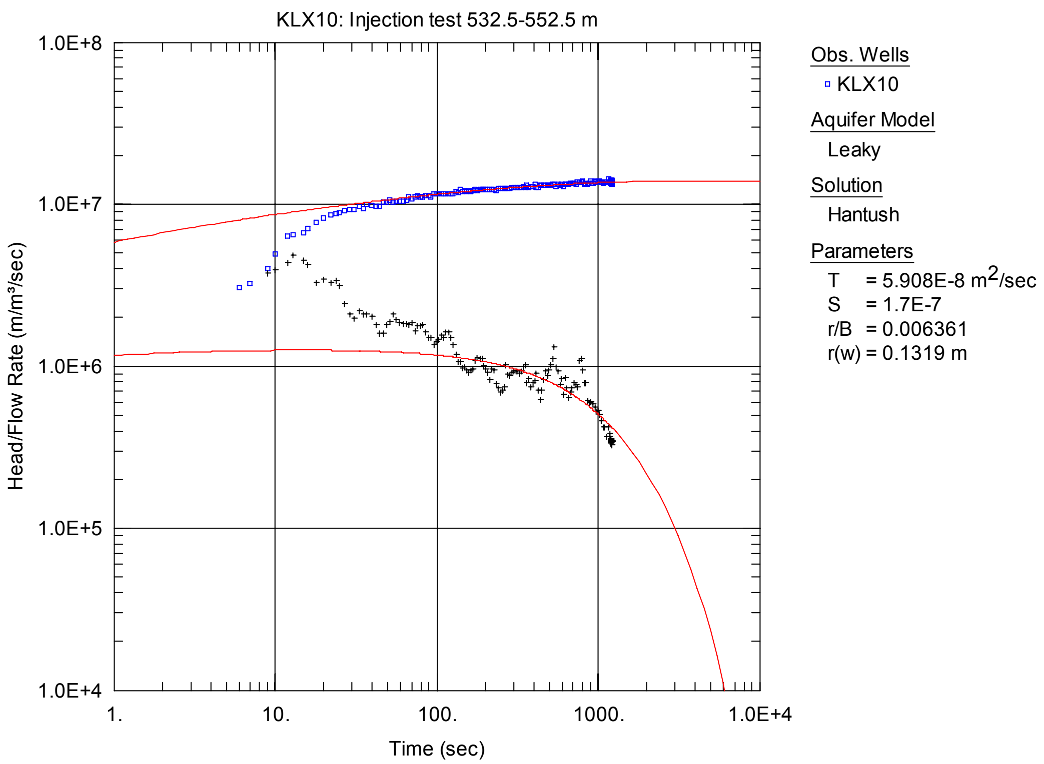


Figure A3-171. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 532.5-552.5 m in KLX10.*

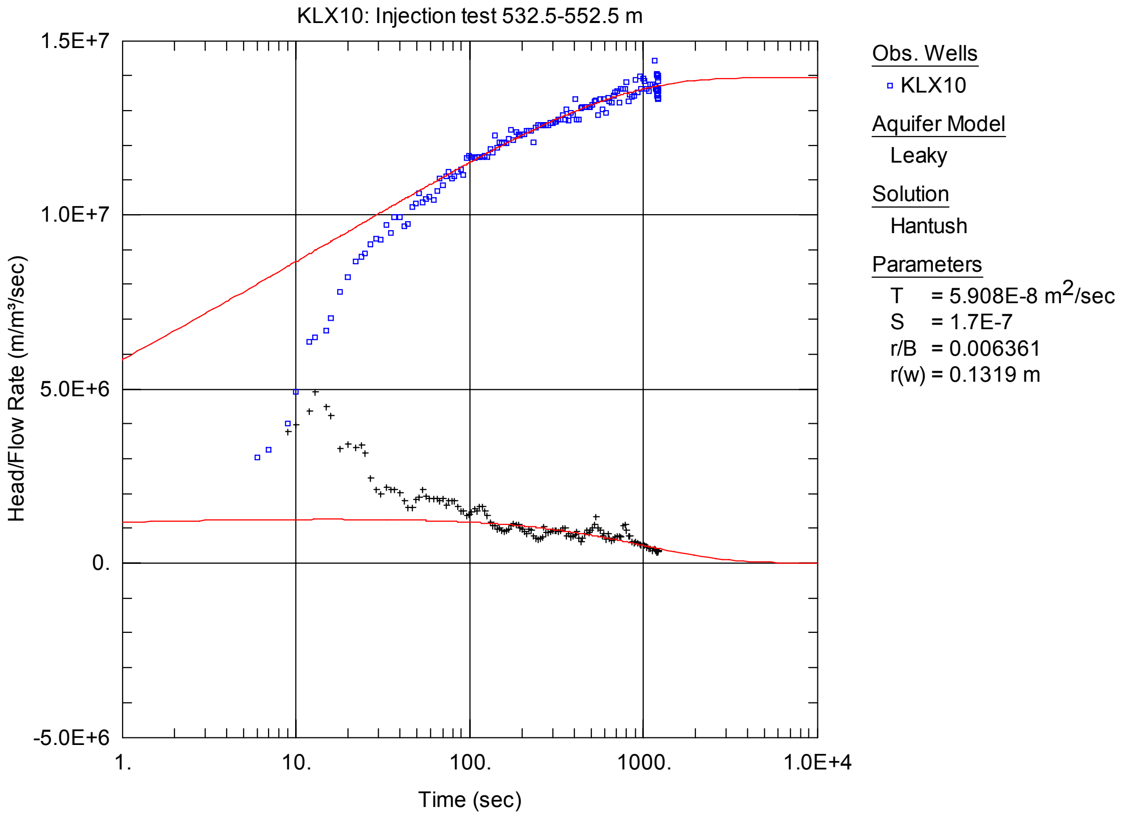


Figure A3-172. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 532.5-552.5 m in KLX10.*

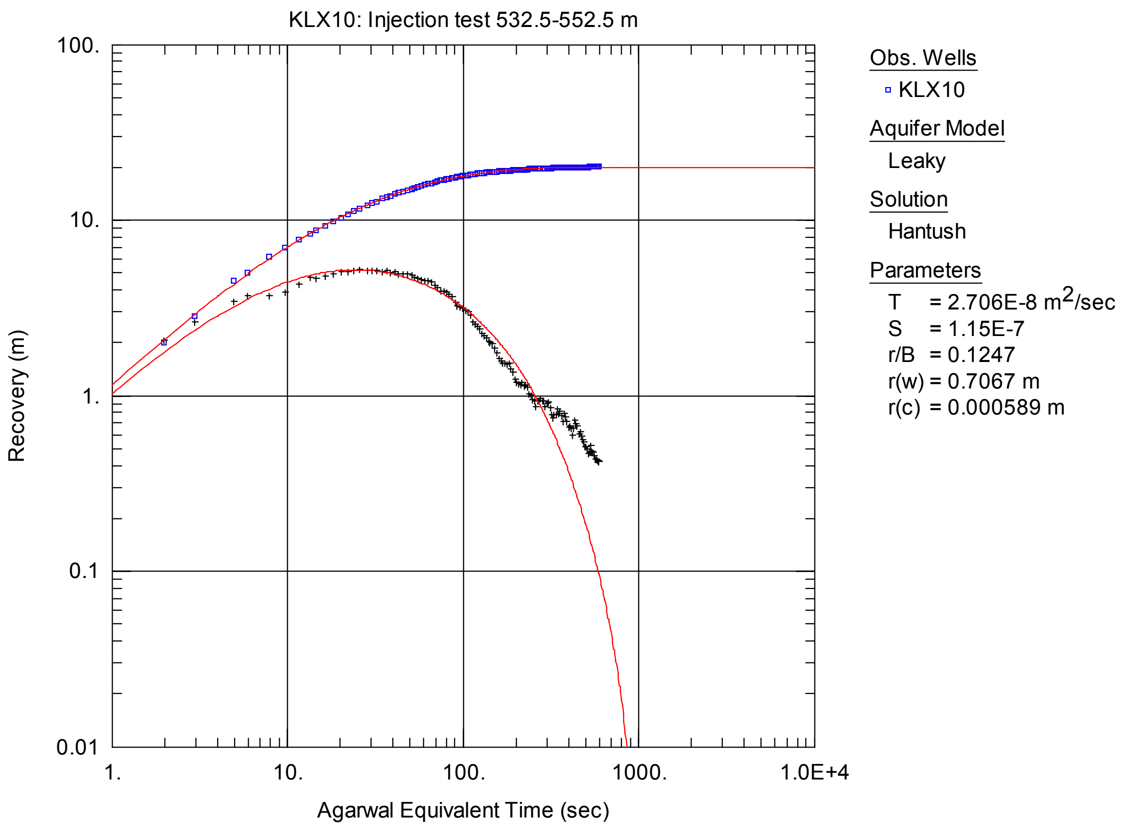


Figure A3-173. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 532.5-552.5 m in KLX10.*

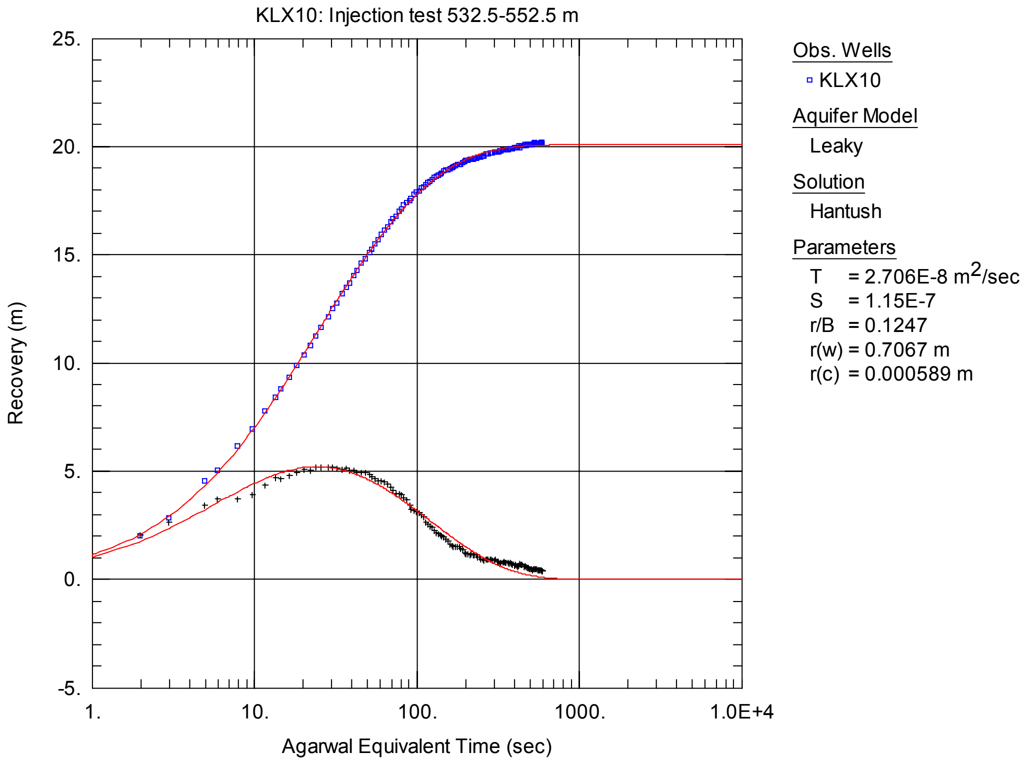


Figure A3-174. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 532.5-552.5 m in KLX10.*

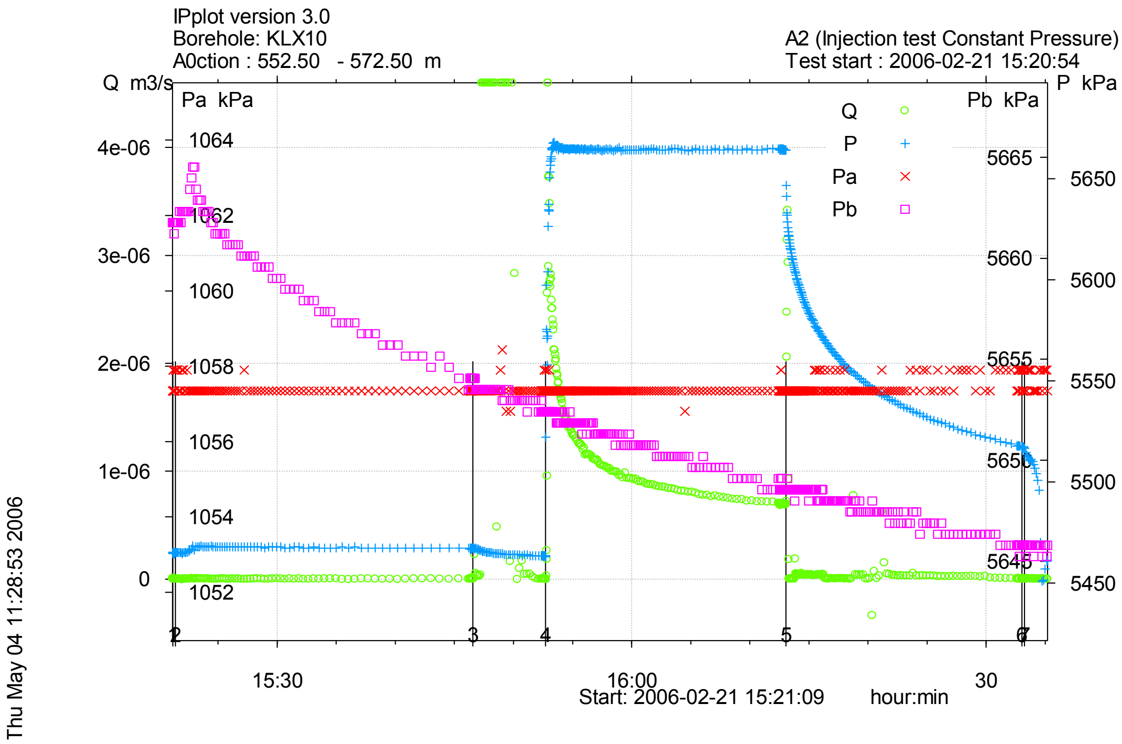


Figure A3-175. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 552.5-572.5 m in borehole KLX10.*

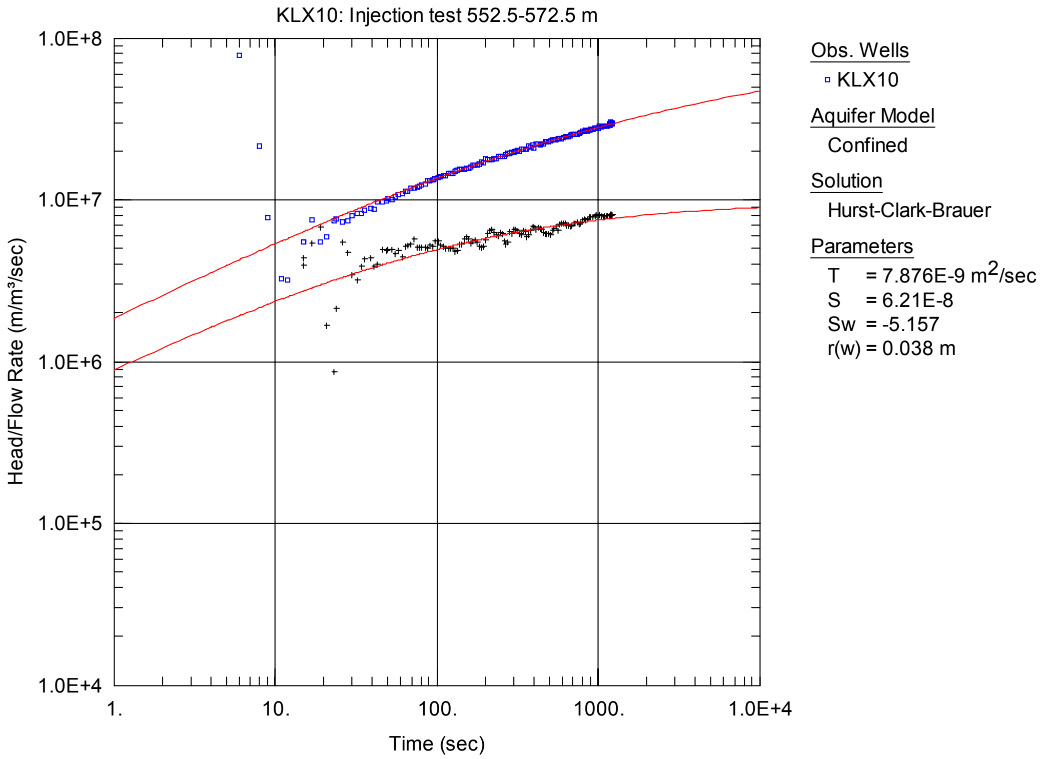


Figure A3-176. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 552.5-572.5 m in KLX10.*

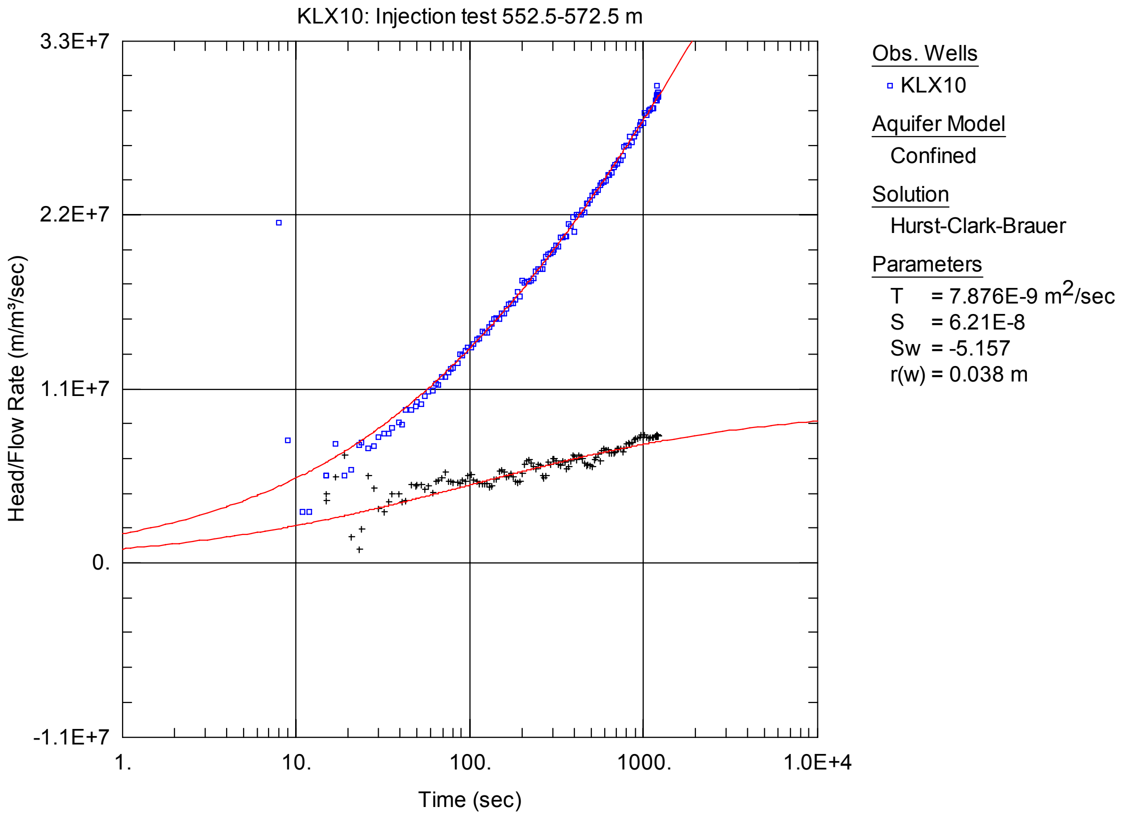


Figure A3-177. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 552.5-572.5 m in KLX10.*

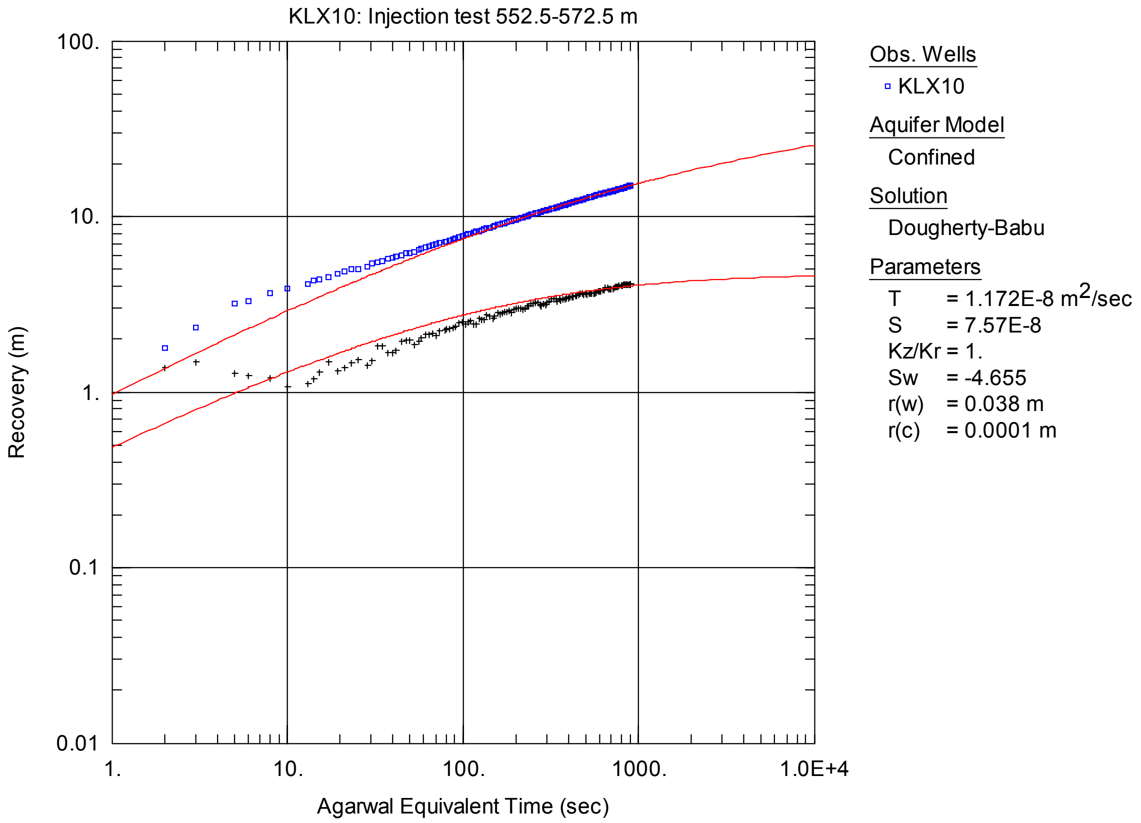


Figure A3-178. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 552.5-572.5 m in KLX10.*

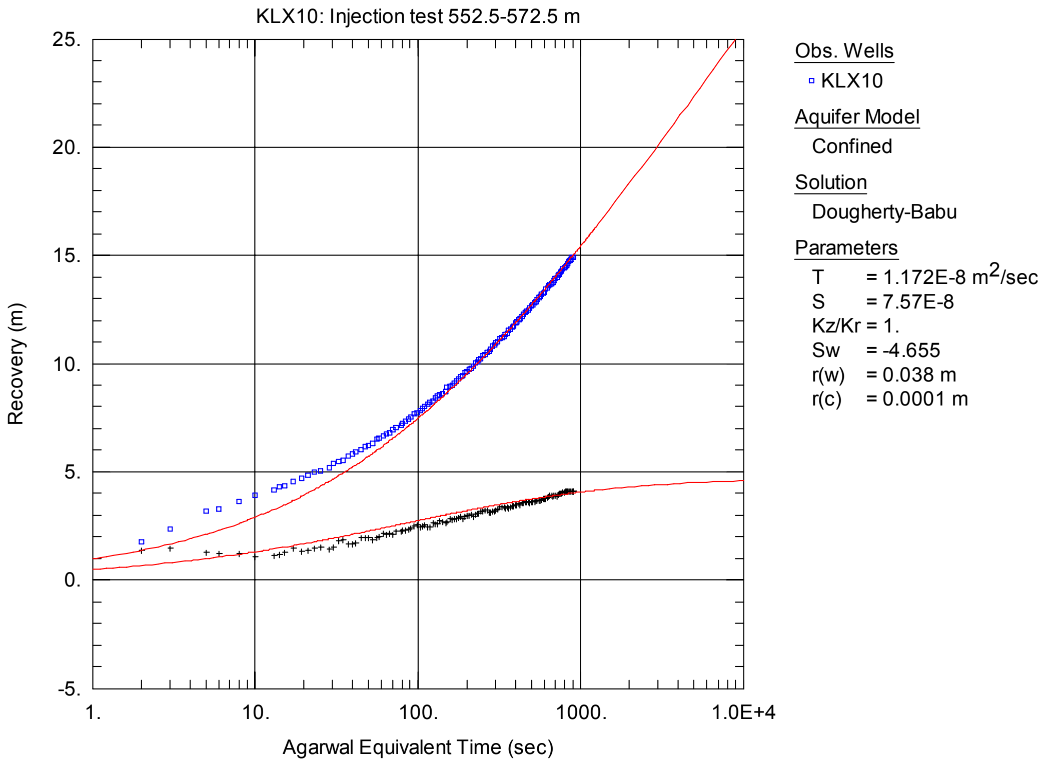


Figure A3-179. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 552.5-572.5 m in KLX10.*

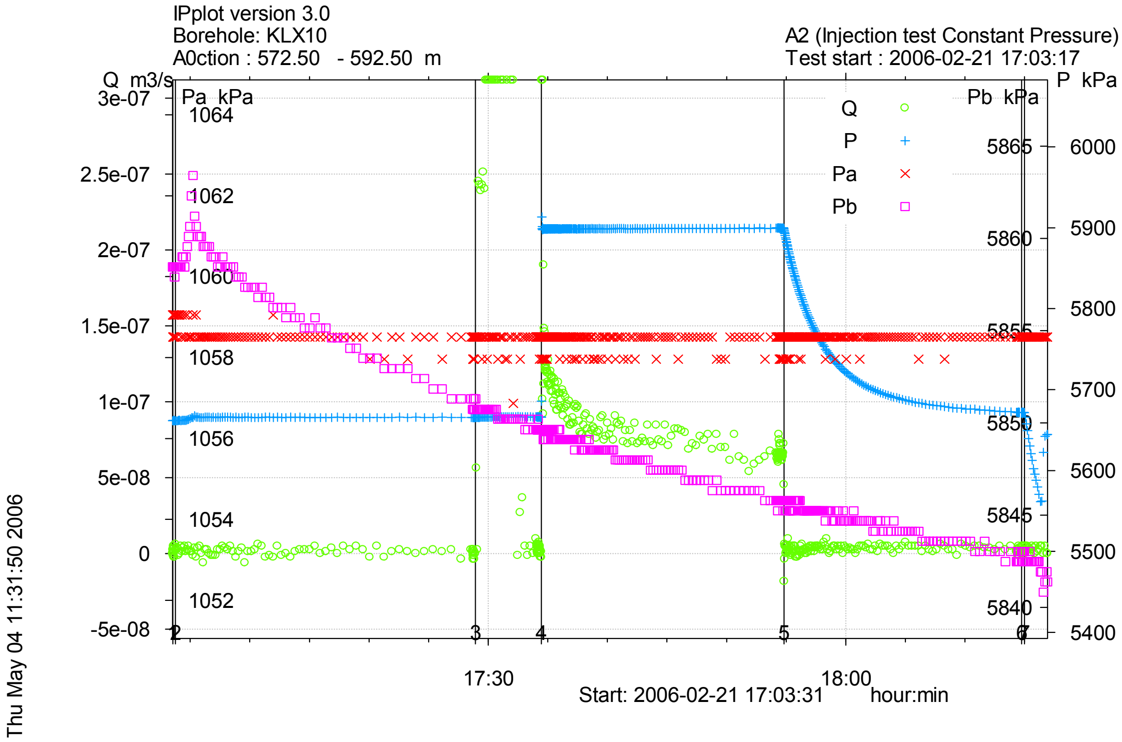


Figure A3-180. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 572.5-592.5 m in borehole KLX10.

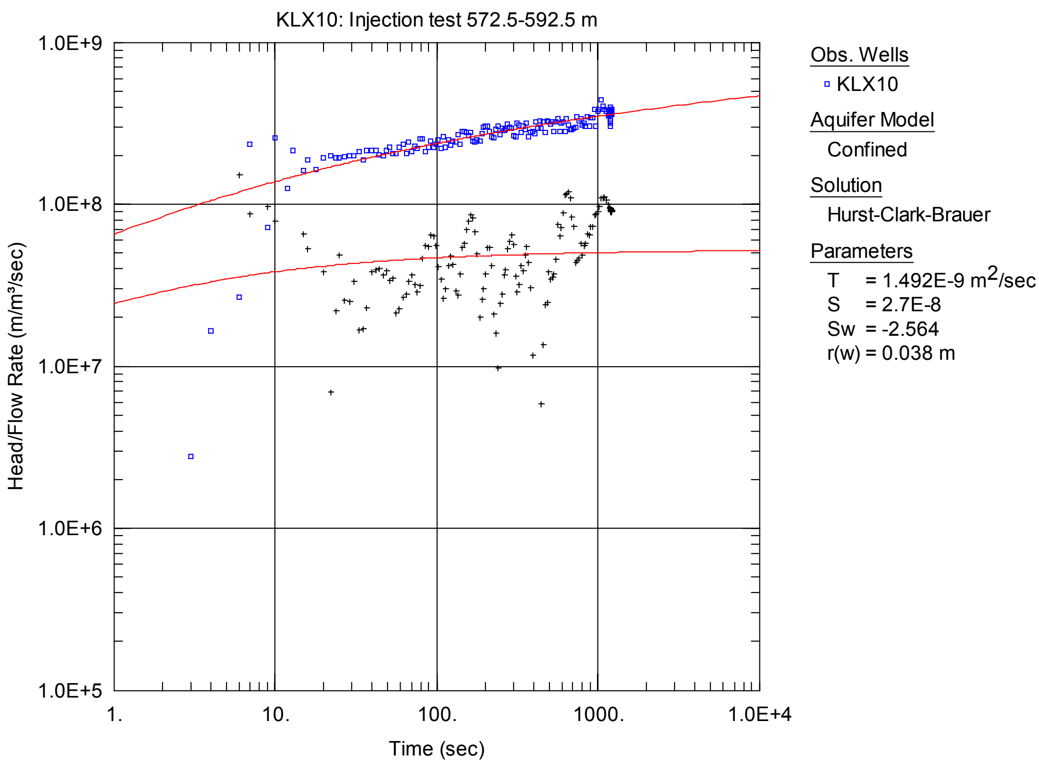


Figure A3-181. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 572.5-592.5 m in KLX10.

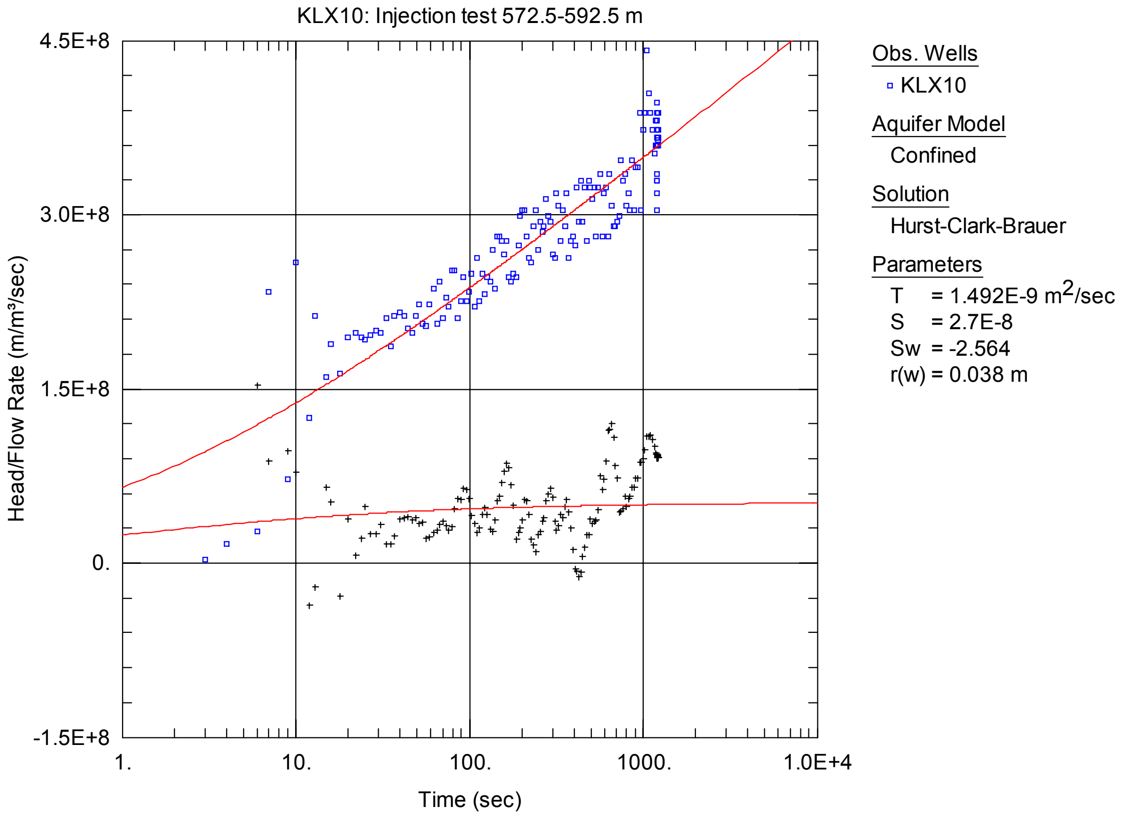


Figure A3-182. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 572.5-592.5 m in KLX10.*

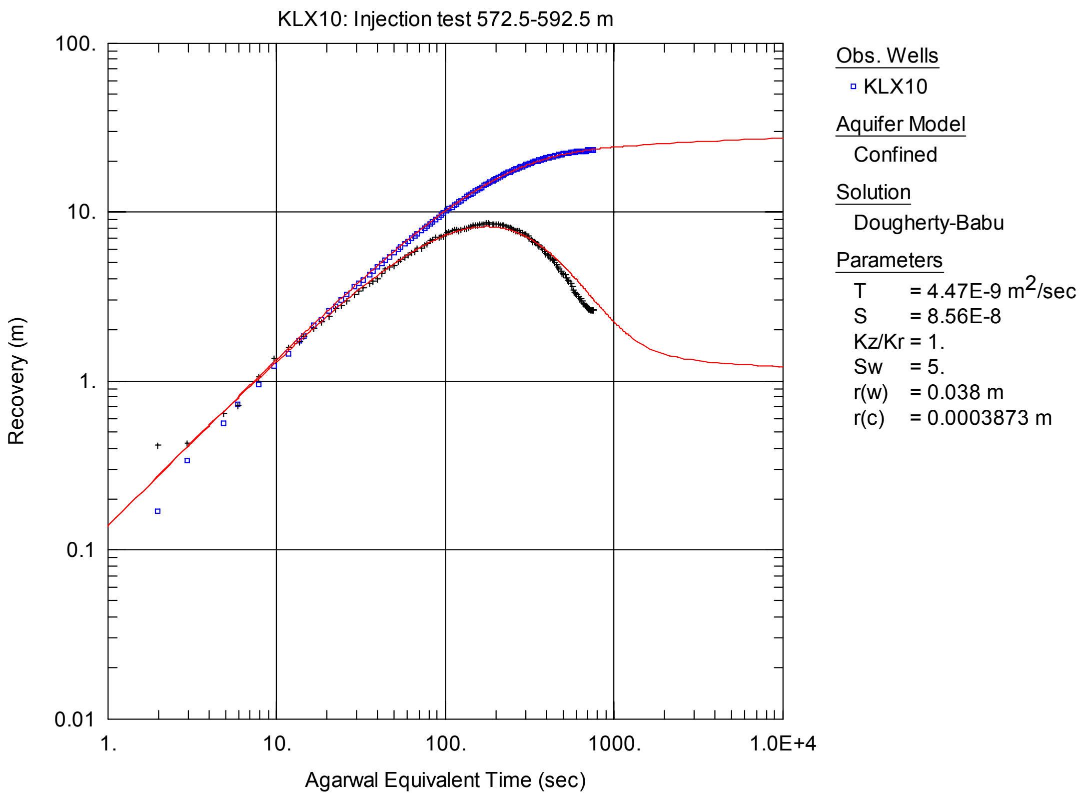


Figure A3-183. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 572.5-592.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

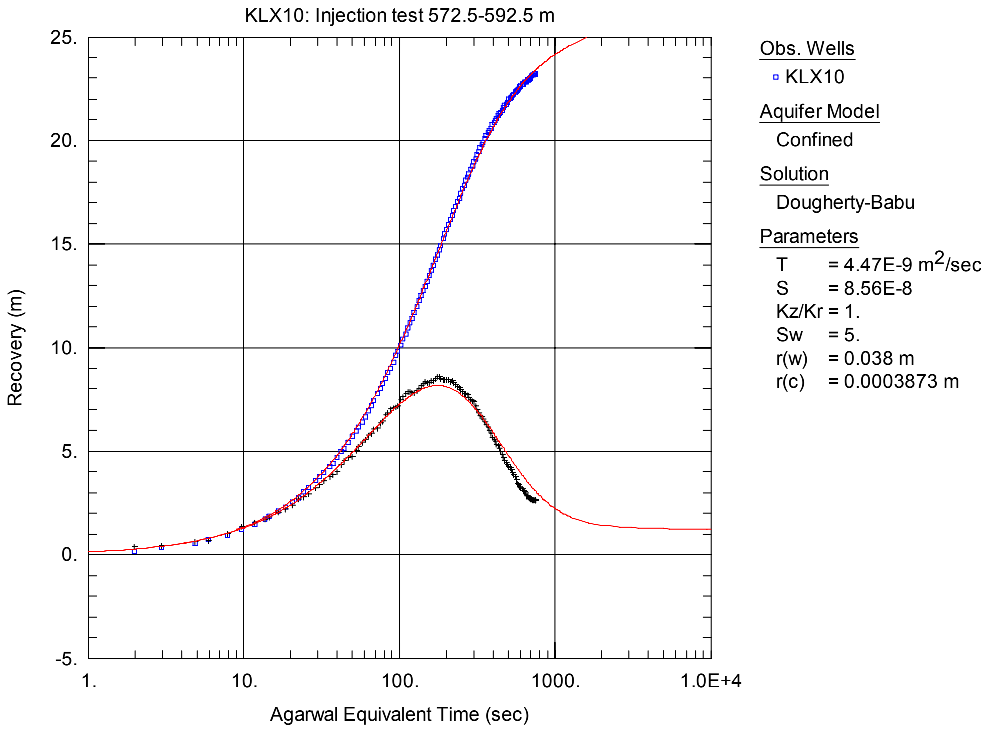


Figure A3-184. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 572.5-592.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

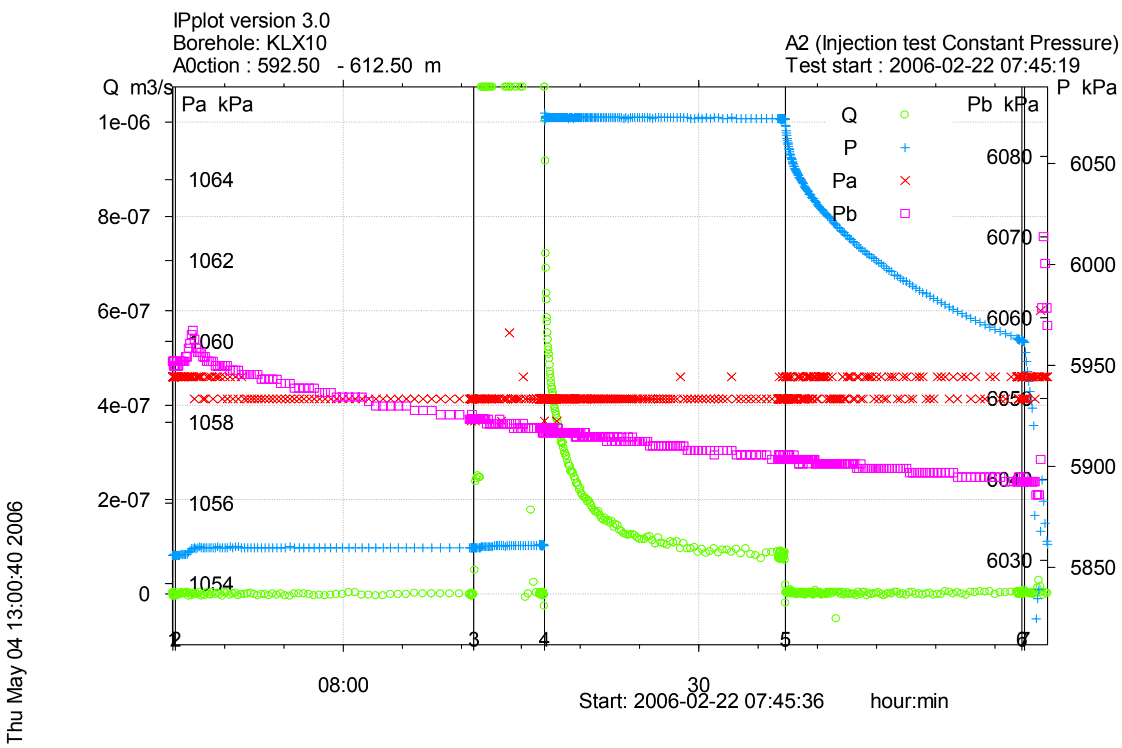


Figure A3-185. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 592.5-612.5 m in borehole KLX10.*

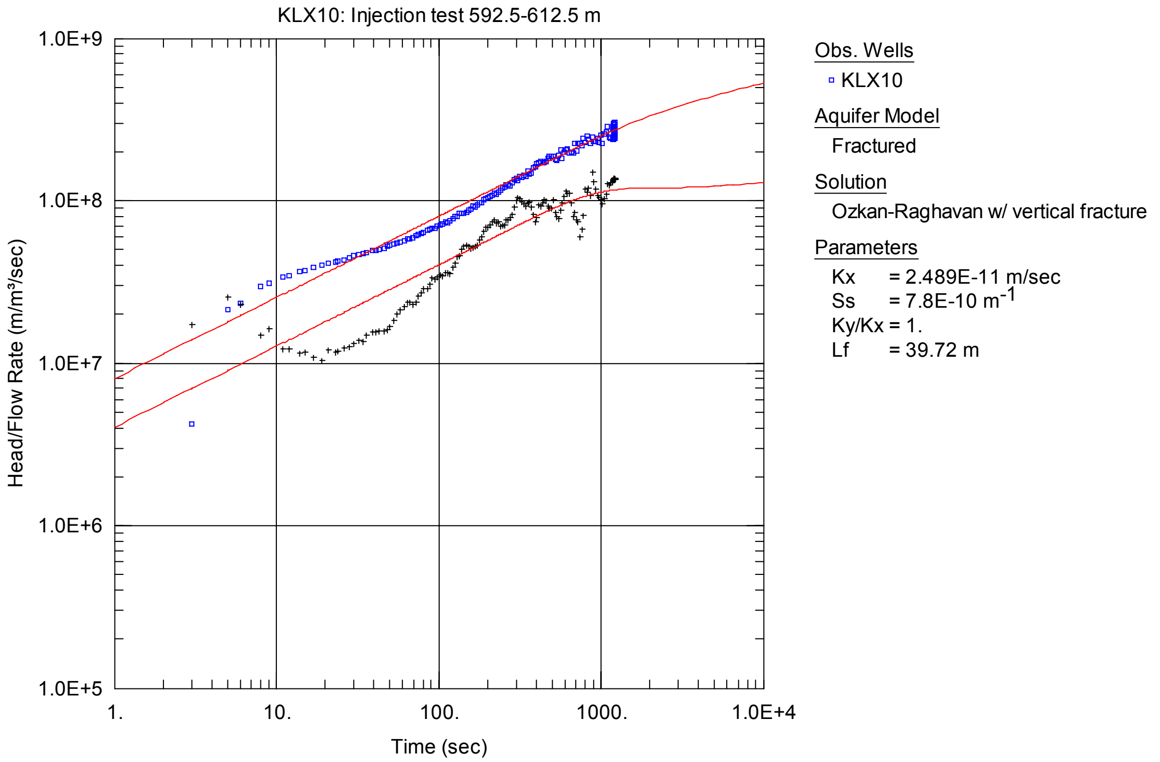


***Figure A3-186.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 592.5-612.5 m in KLX10.*

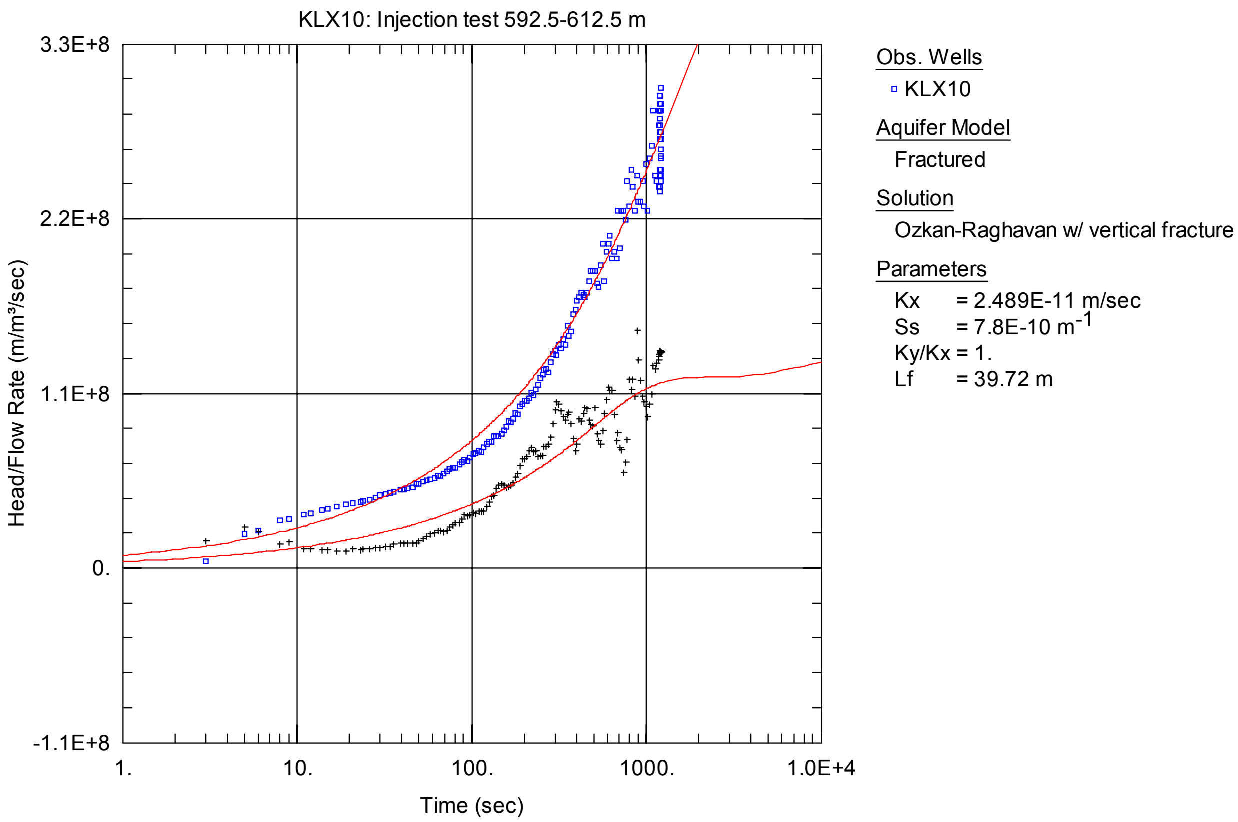


***Figure A3-187.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 592.5-612.5 m in KLX10.*

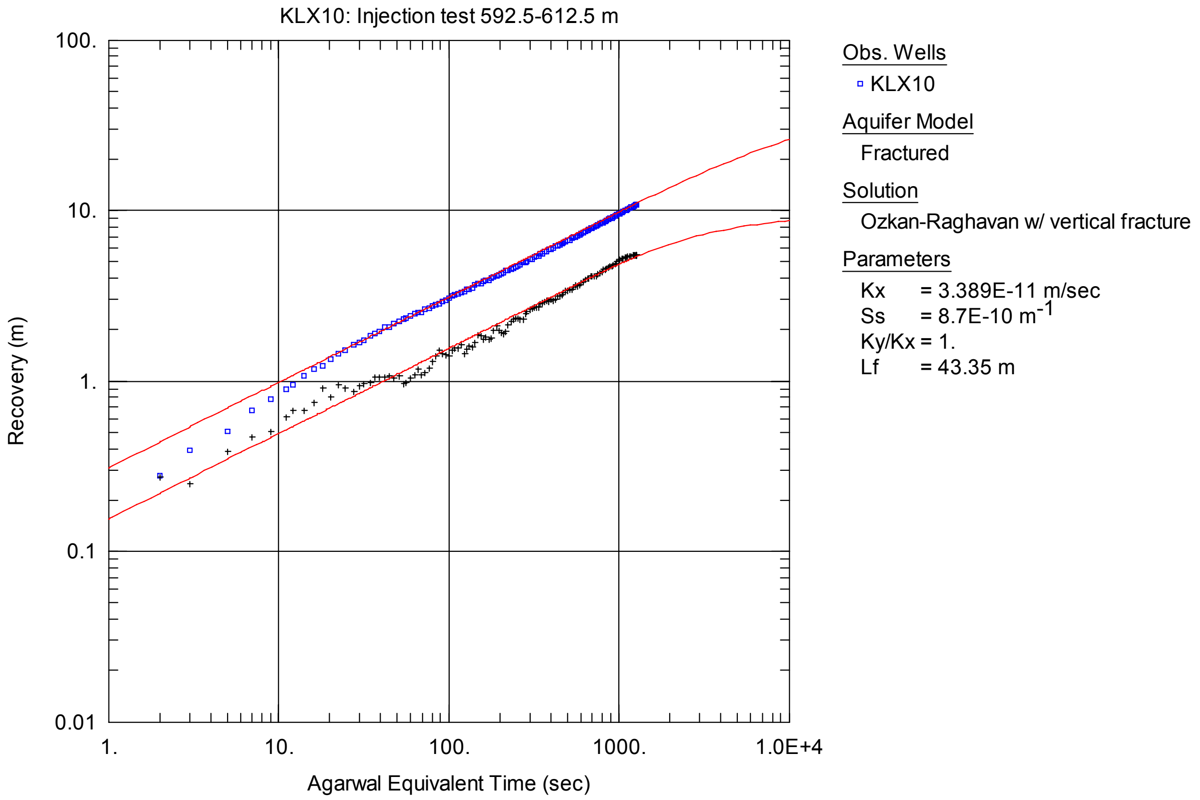


Figure A3-188. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 592.5-612.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

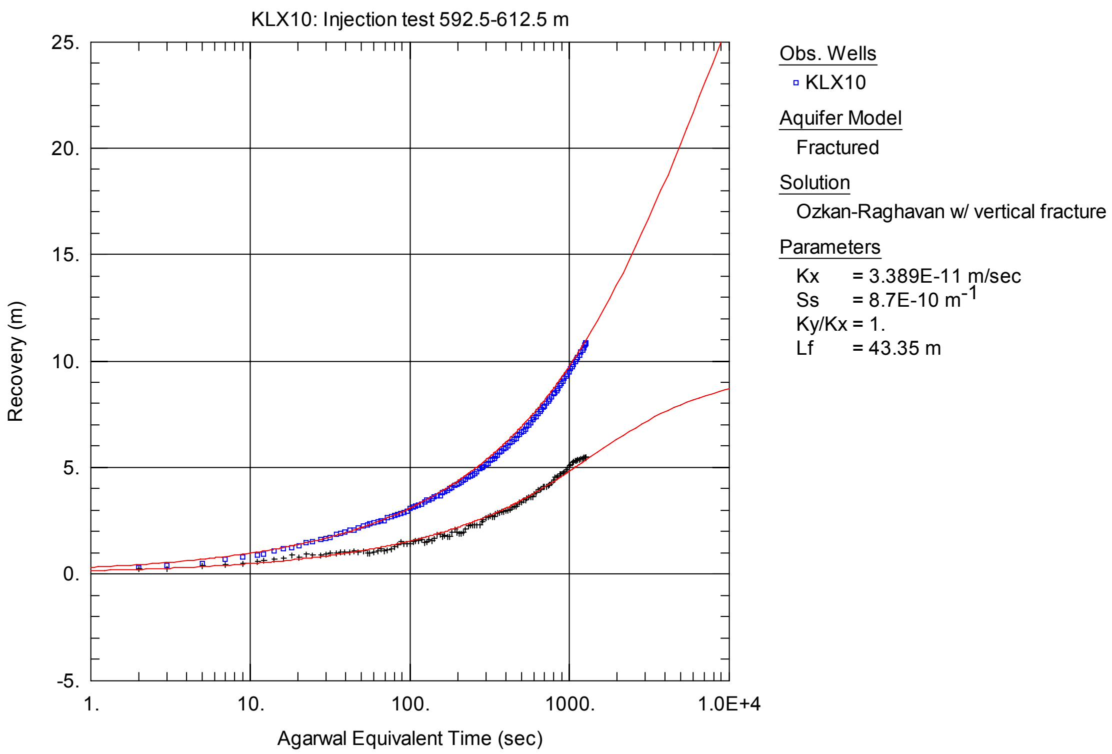


Figure A3-189. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 592.5-612.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

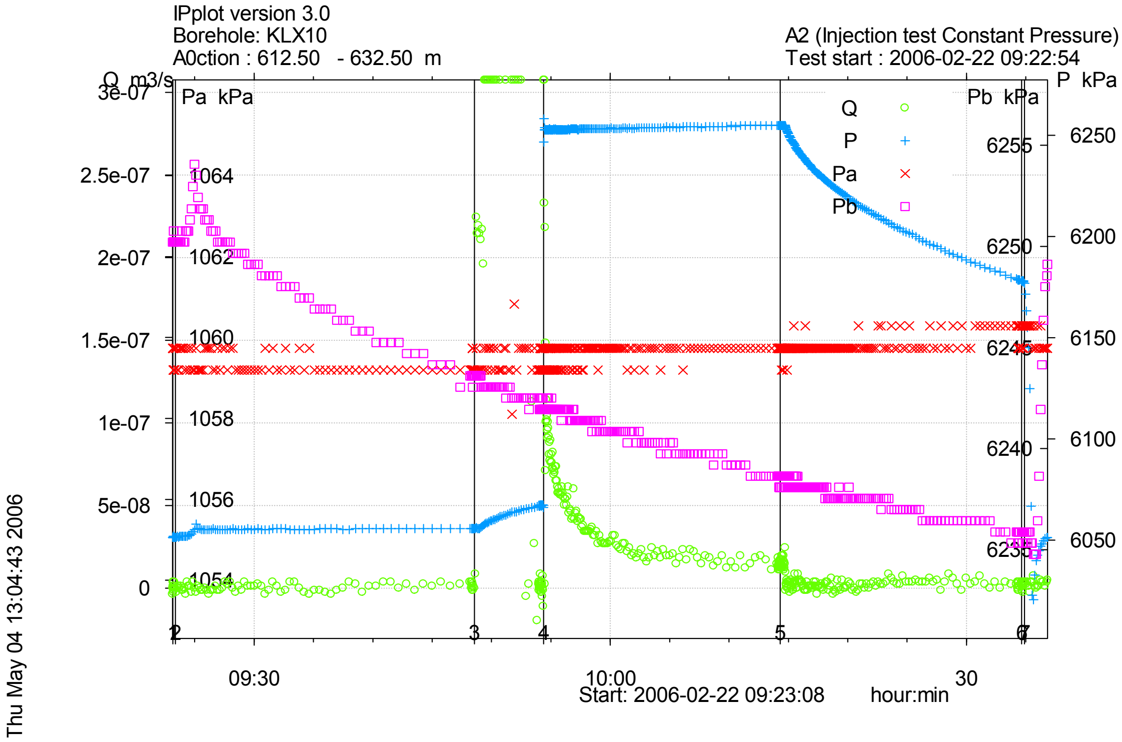


Figure A3-190. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 612.5-632.5 m in borehole KLX10.*

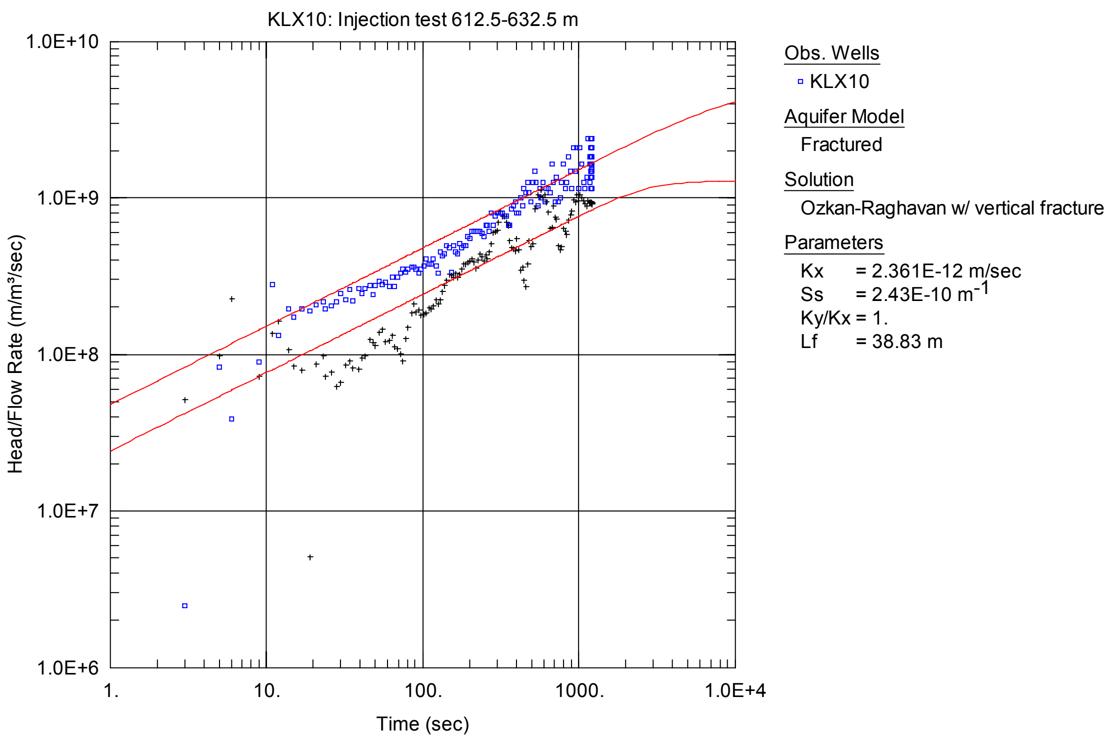


Figure A3-191. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 612.5-632.5 m in KLX10. The type curve fit is only to show that an assumption of PLF is not valid.*

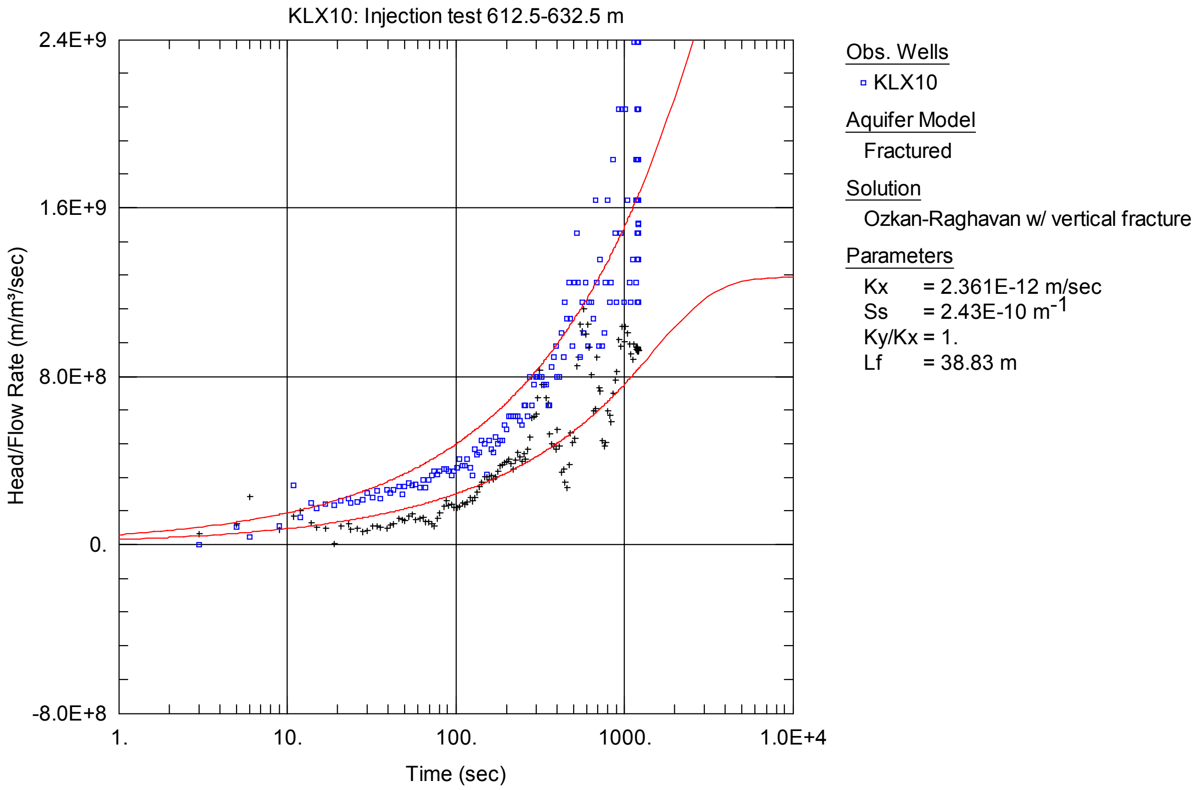


Figure A3-192. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 612.5-632.5 m in KLX10. The type curve fit is only to show that an assumption of PLF is not valid.*

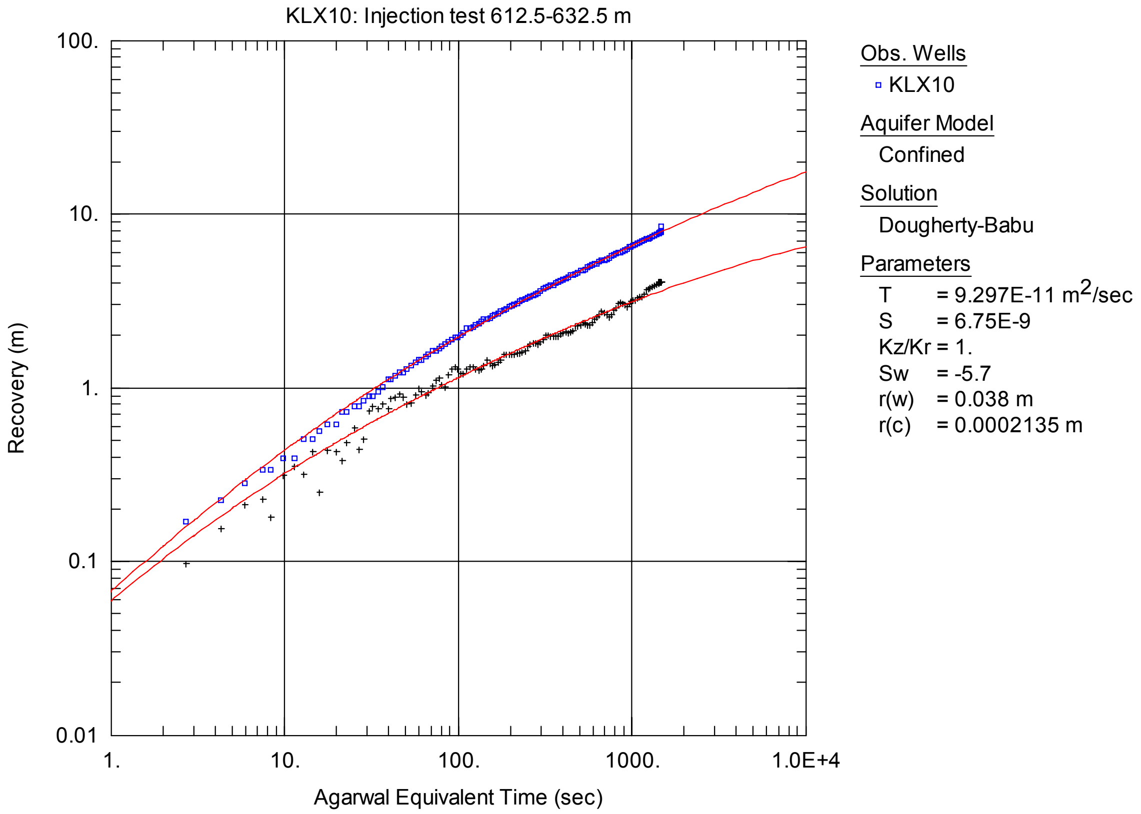


Figure A3-193. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Babu solution, from the injection test in section 612.5-632.5 m in KLX10.*

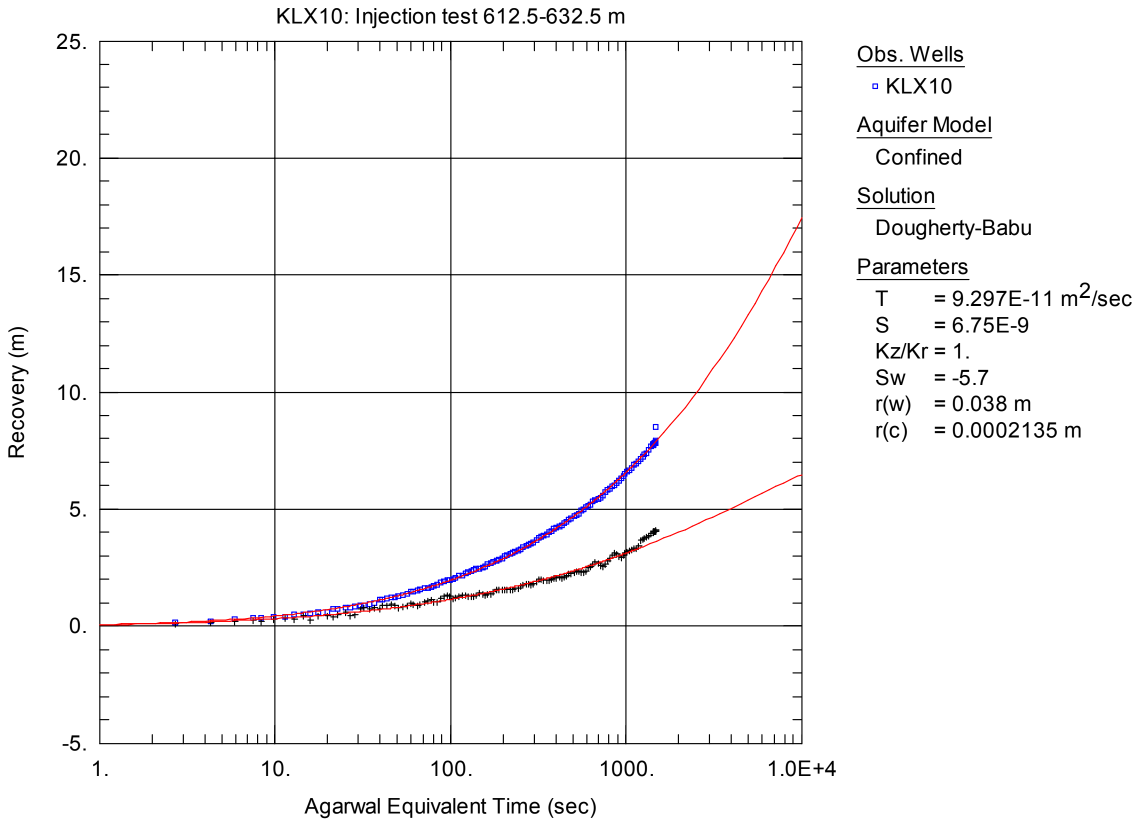


Figure A3-194. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Babu solution, from the injection test in section 612.5-632.5 m in KLX10.*

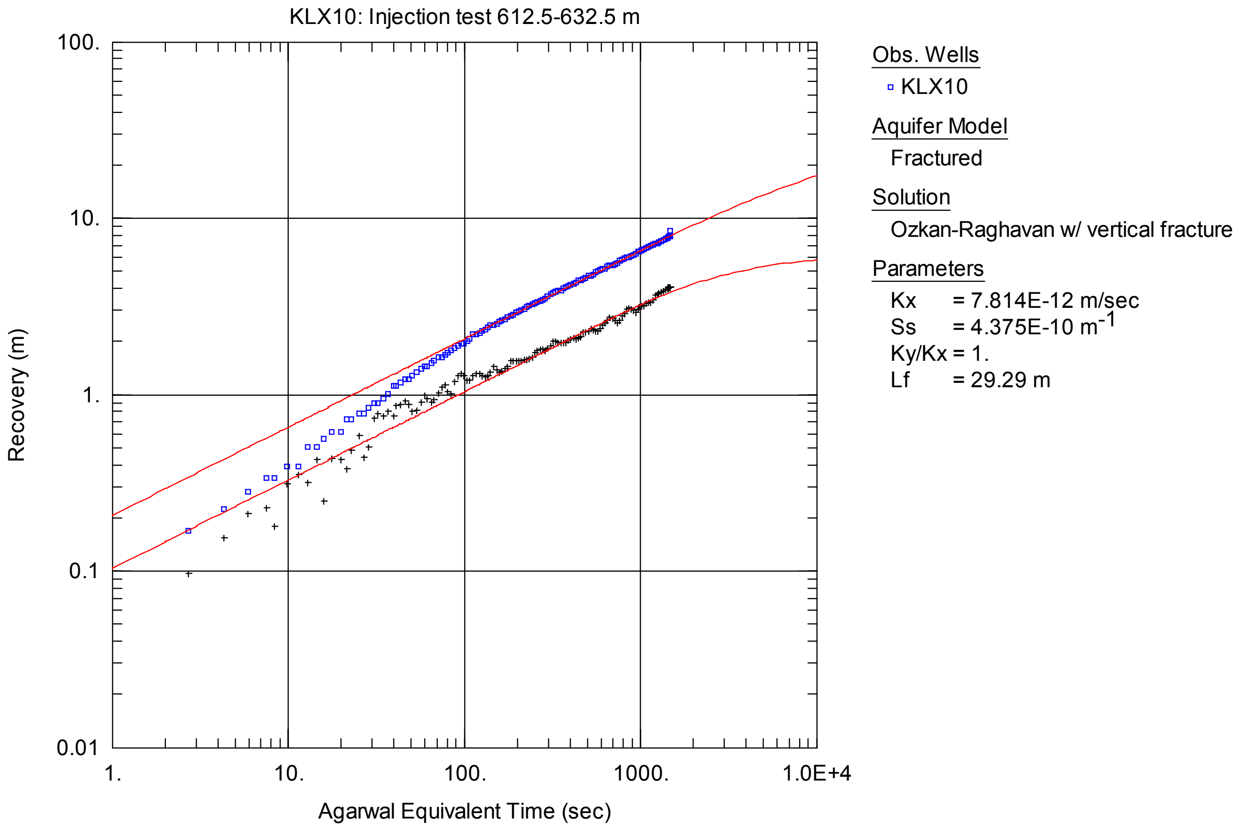


Figure A3-195. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan solution, from the injection test in section 612.5-632.5 m in KLX10.*

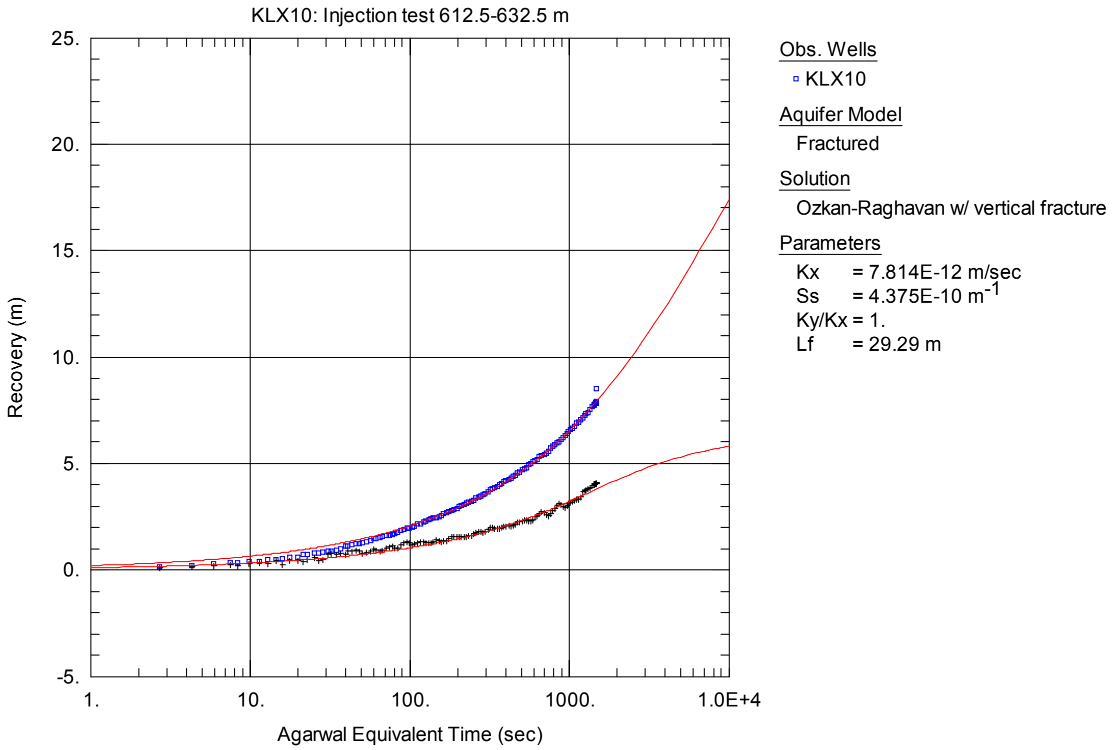


Figure A3-196. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan solution, from the injection test in section 612.5-632.5 m in KLX10.*

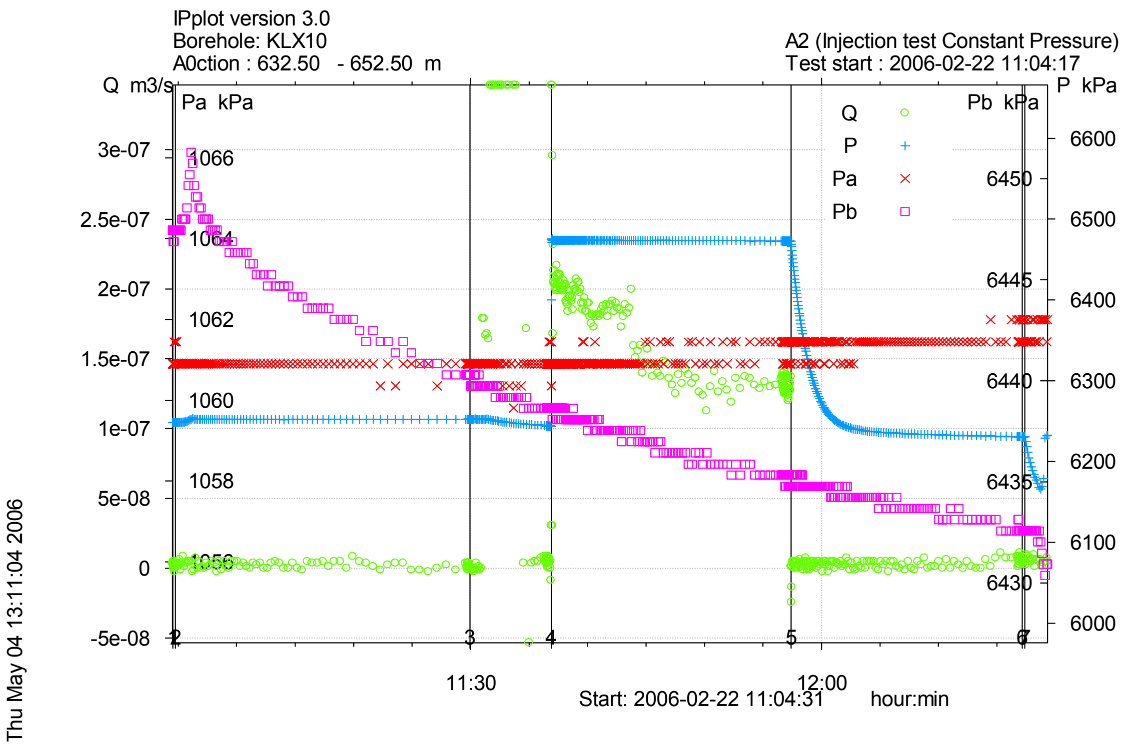


Figure A3-197. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 632.5-652.5 m in borehole KLX10.*

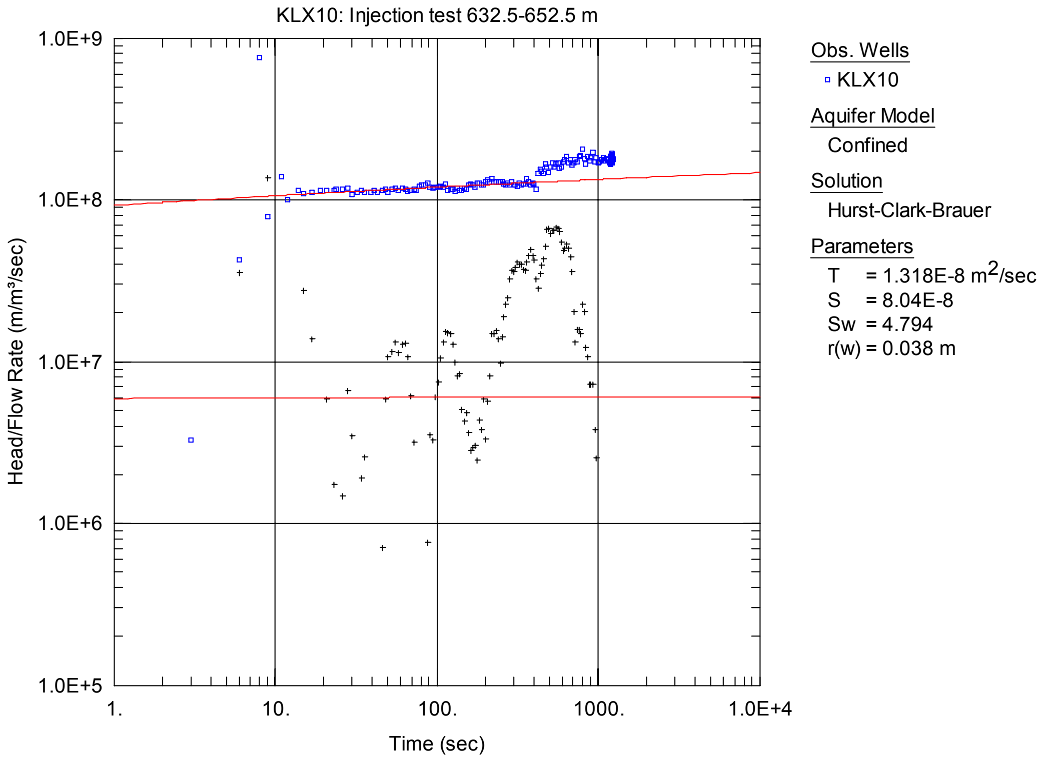


Figure A3-198. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 632.5-652.5 m in KLX10.*

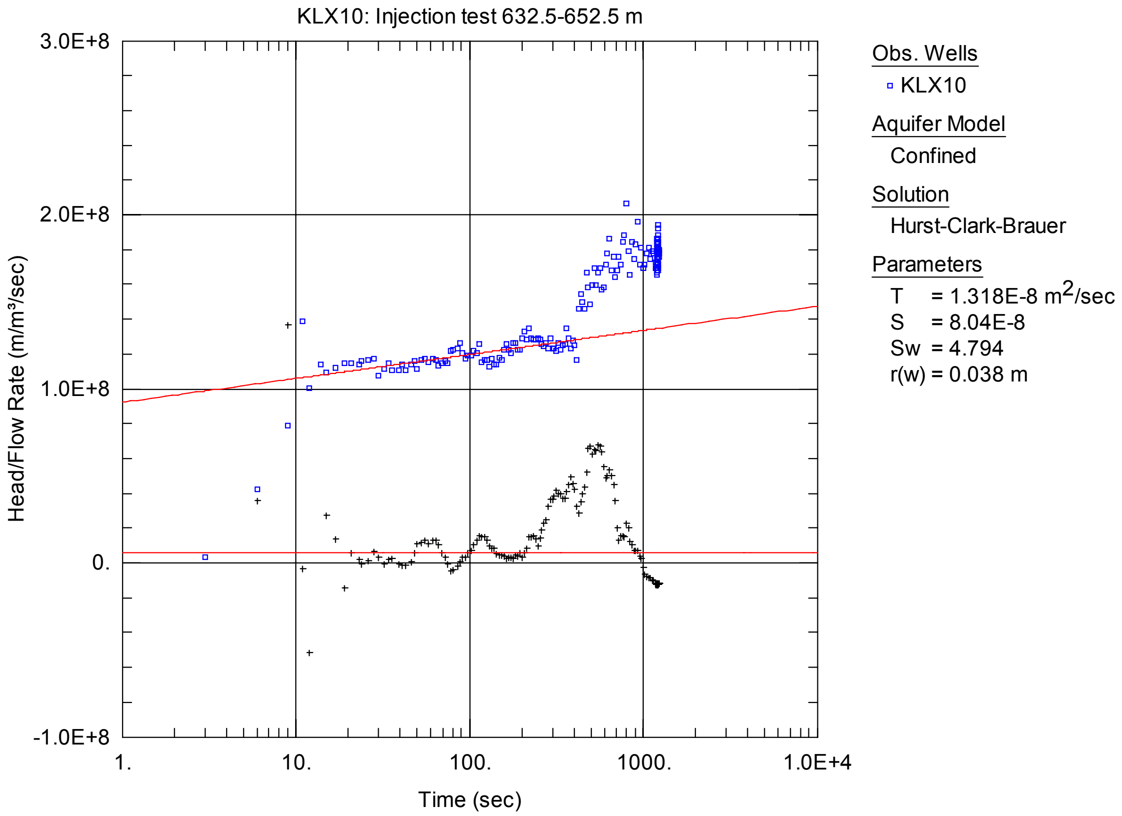


Figure A3-199. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 632.5-652.5 m in KLX10.*

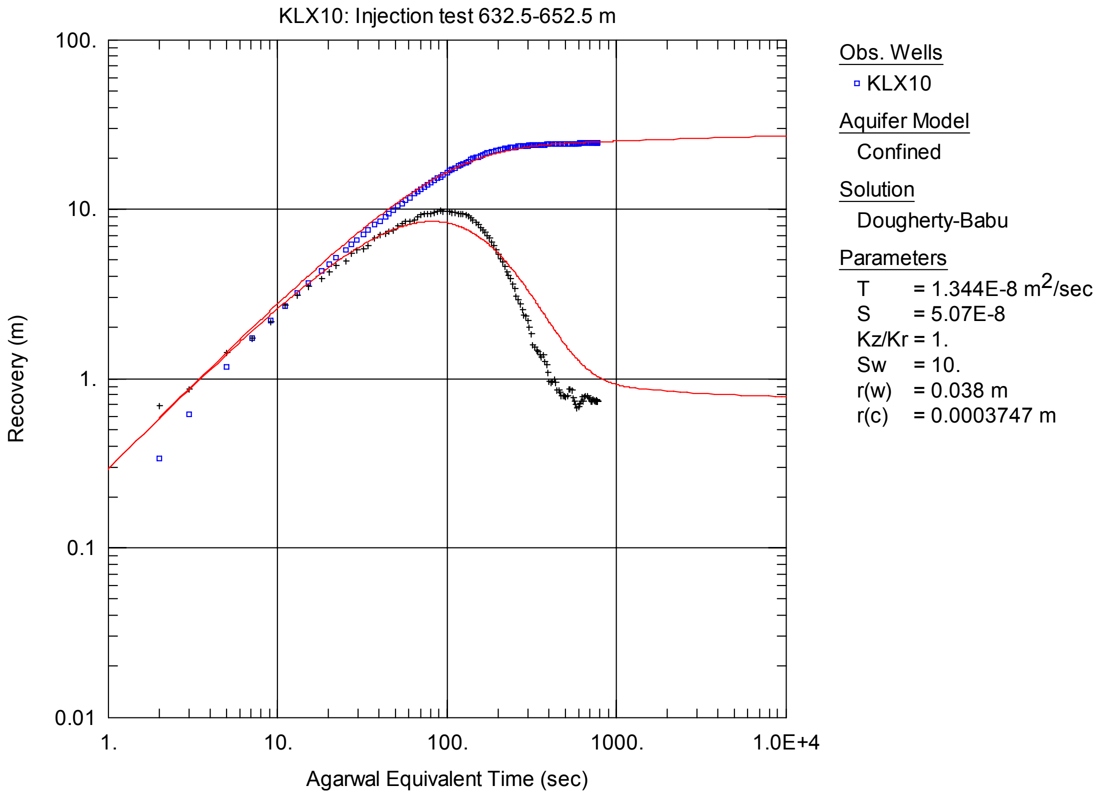


Figure A3-200. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 632.5-652.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

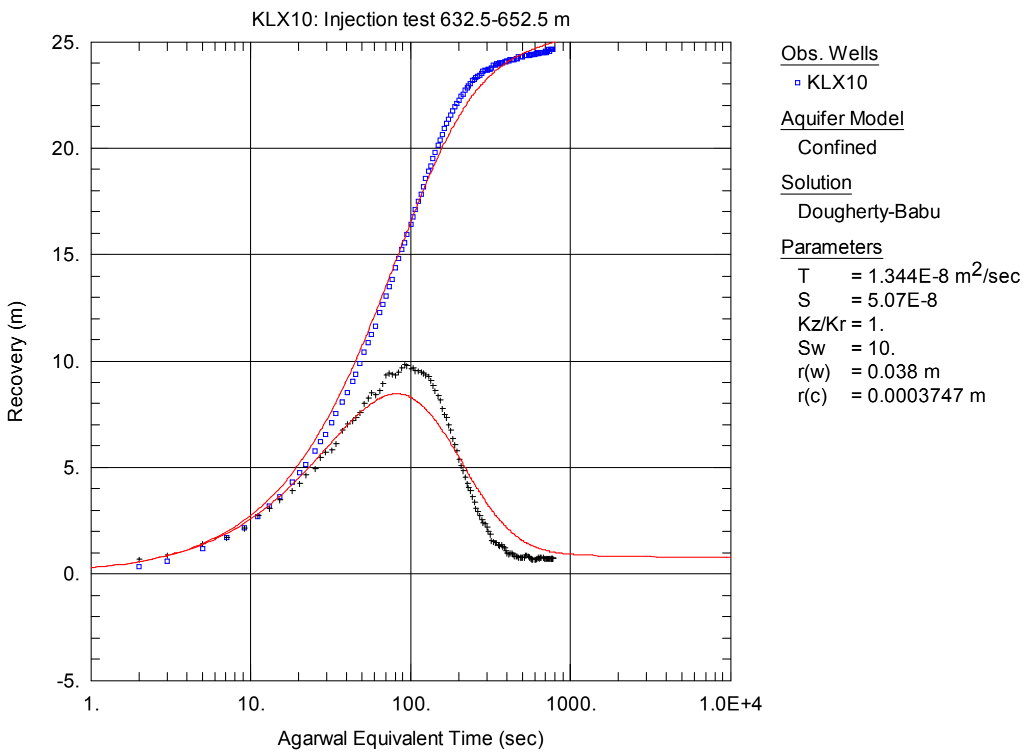


Figure A3-201. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 632.5-652.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

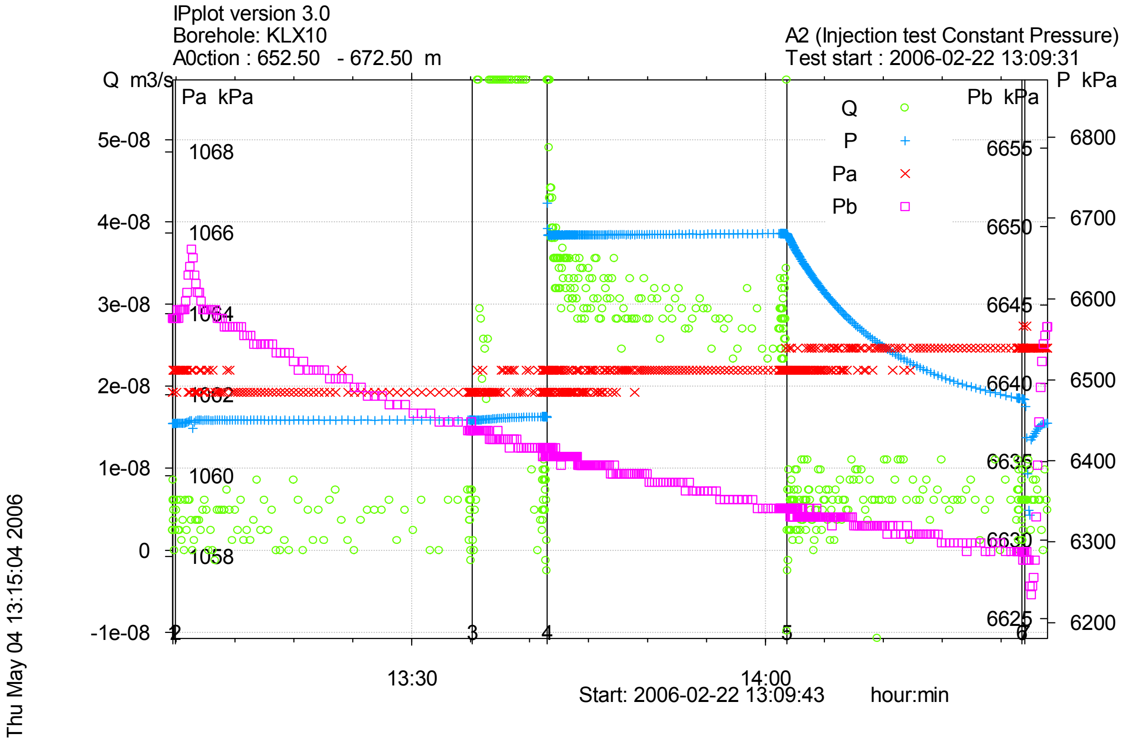


__Figure A3-202.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 652.5-672.5 m in borehole KLX10.

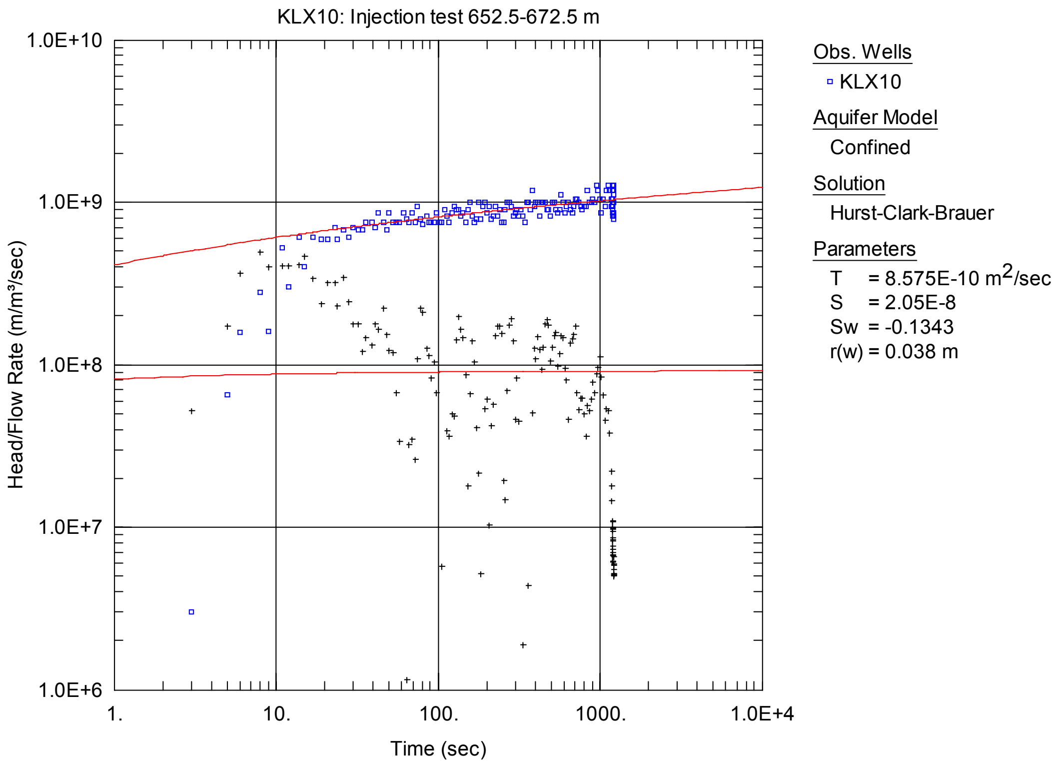


__Figure A3-203.__ Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 652.5-672.5 m in KLX10.

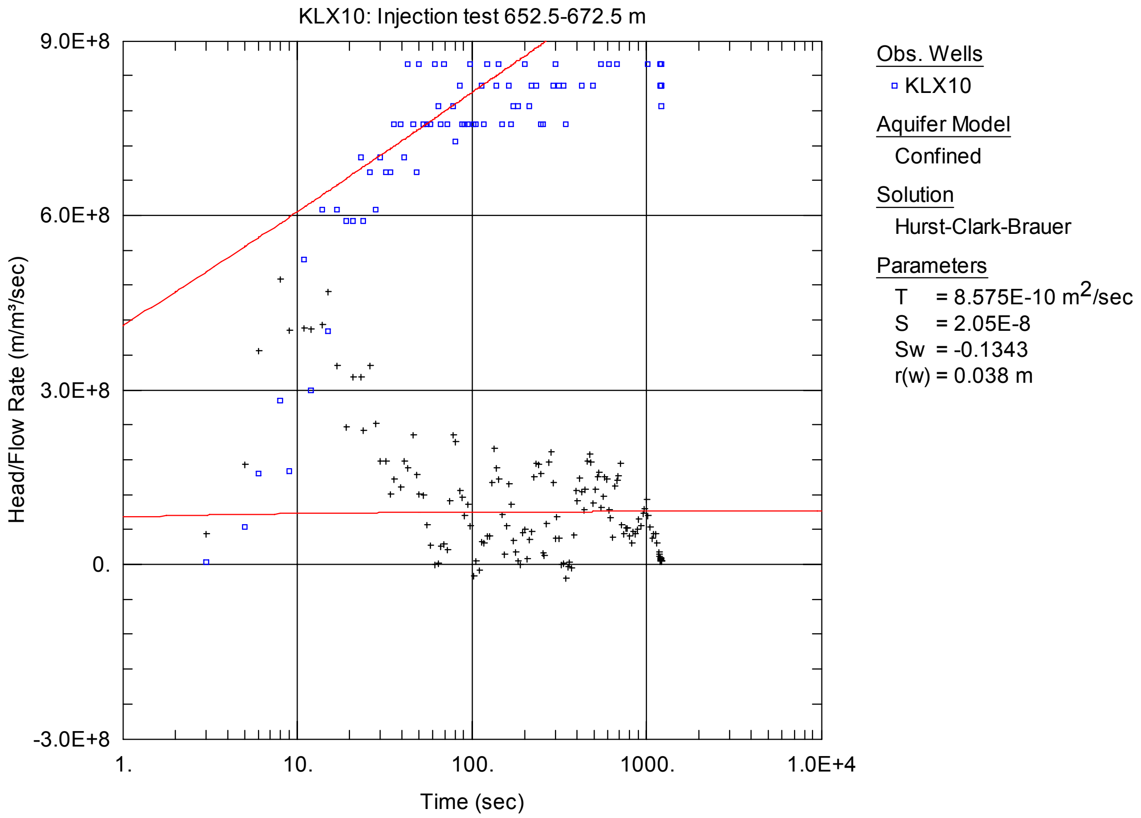


Figure A3-204. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 652.5-672.5 m in KLX10.*

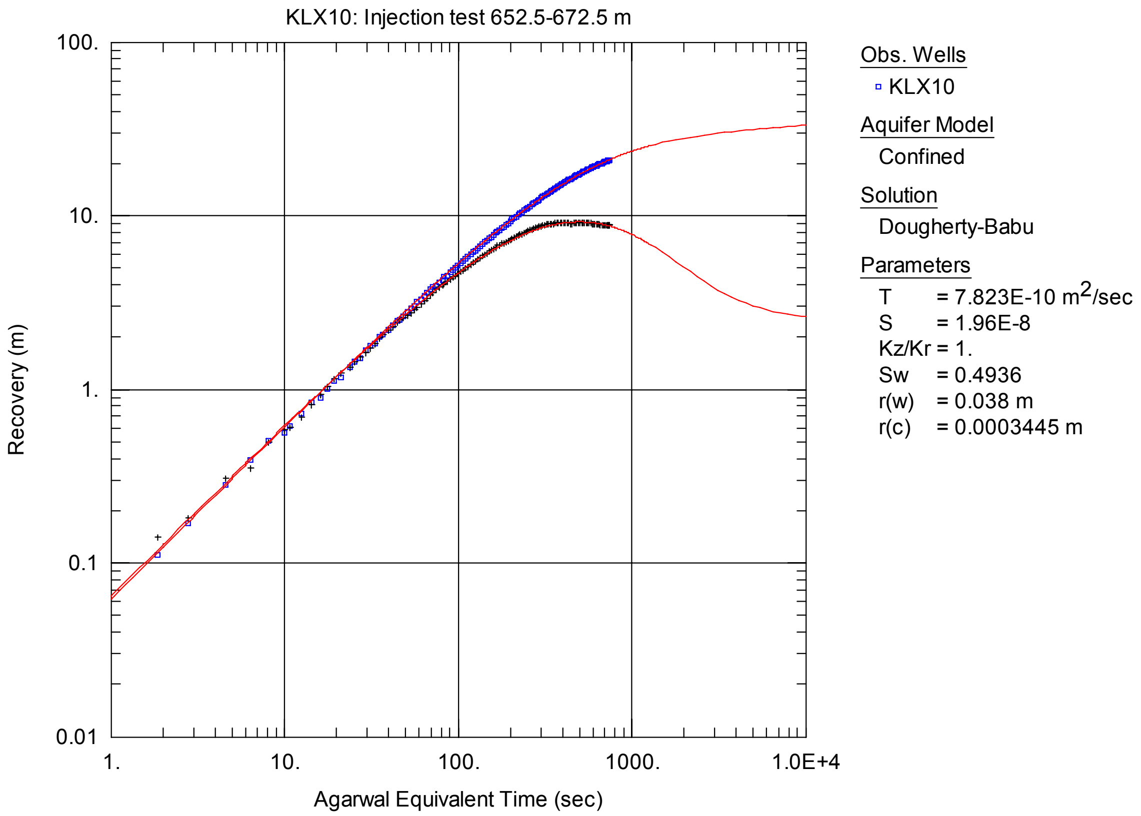


Figure A3-205. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 652.5-672.5 m in KLX10.*

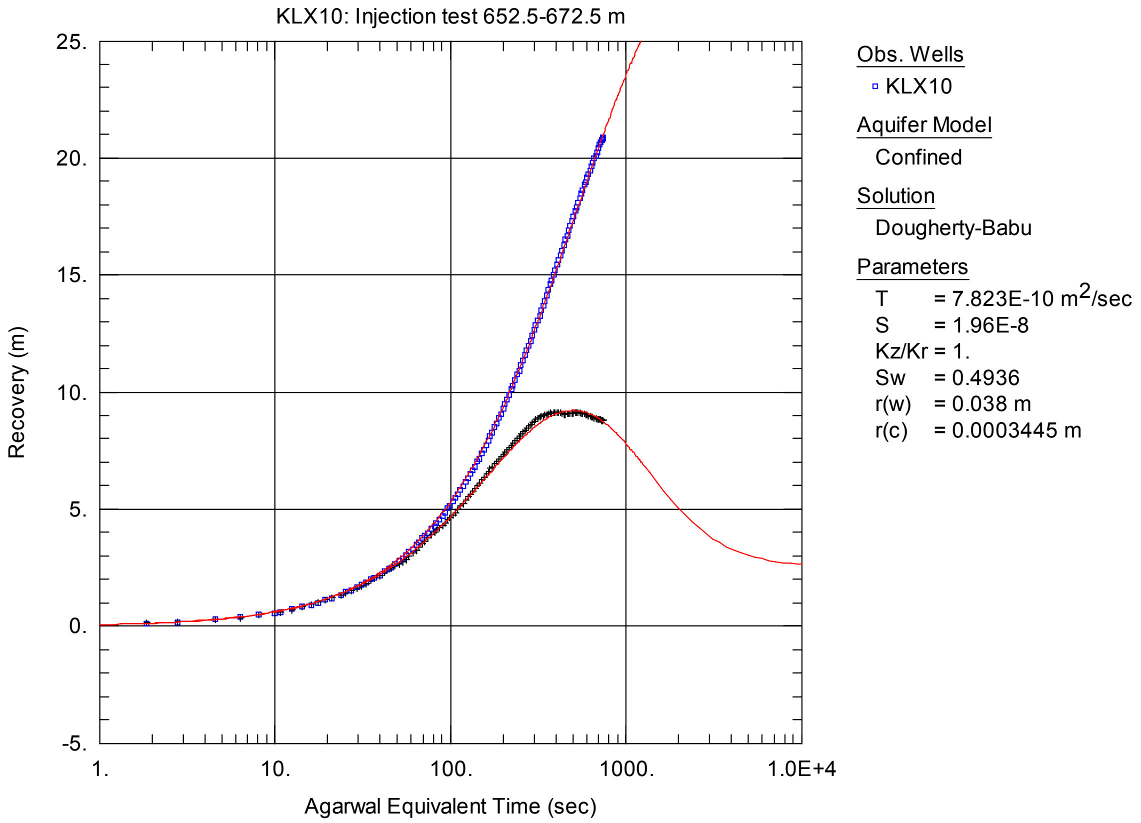


***Figure A3-206.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 652.5-672.5 m in KLX10.*

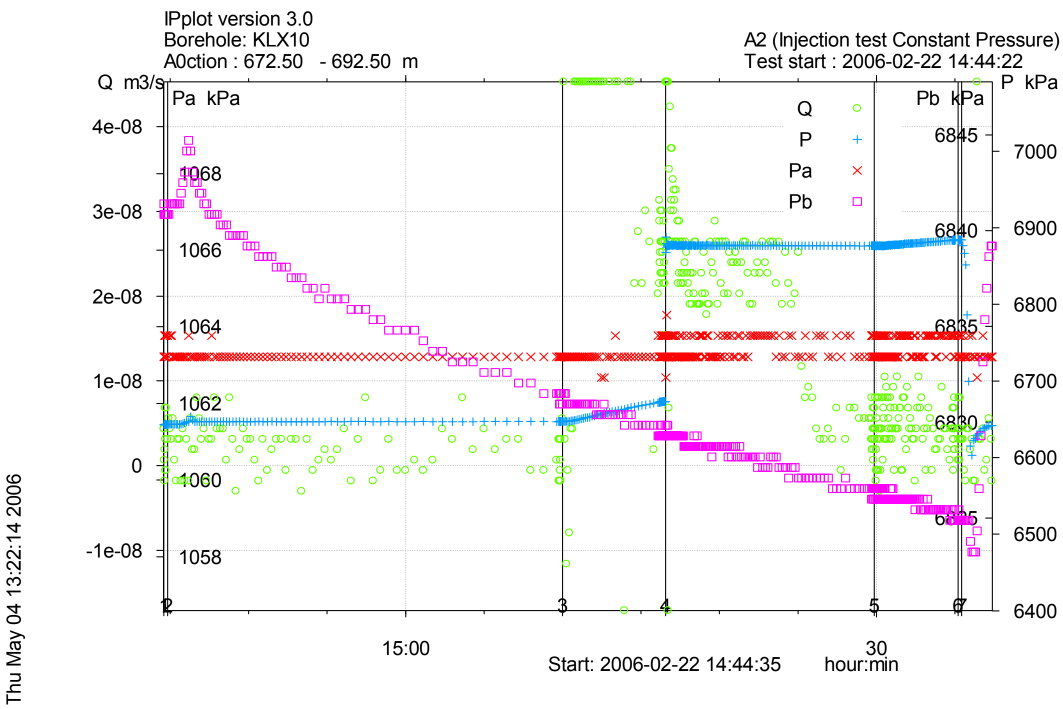


***Figure A3-207.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 672.5-692.5 m in borehole KLX10.*

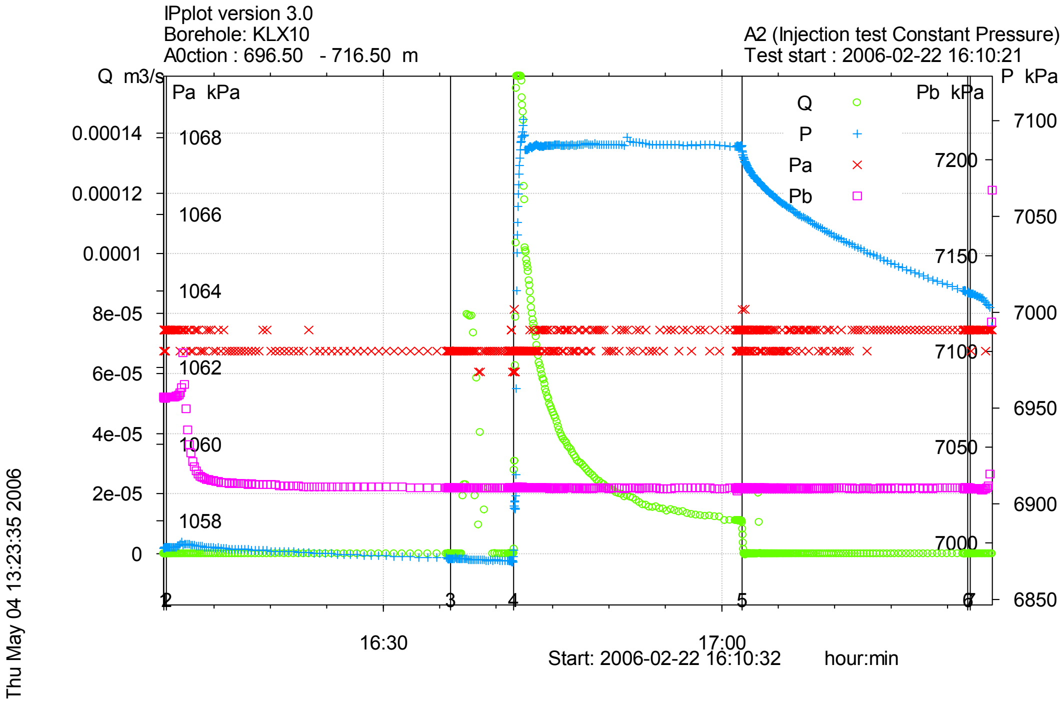


Figure A3-208. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 696.5-716.5 m in borehole KLX10.*

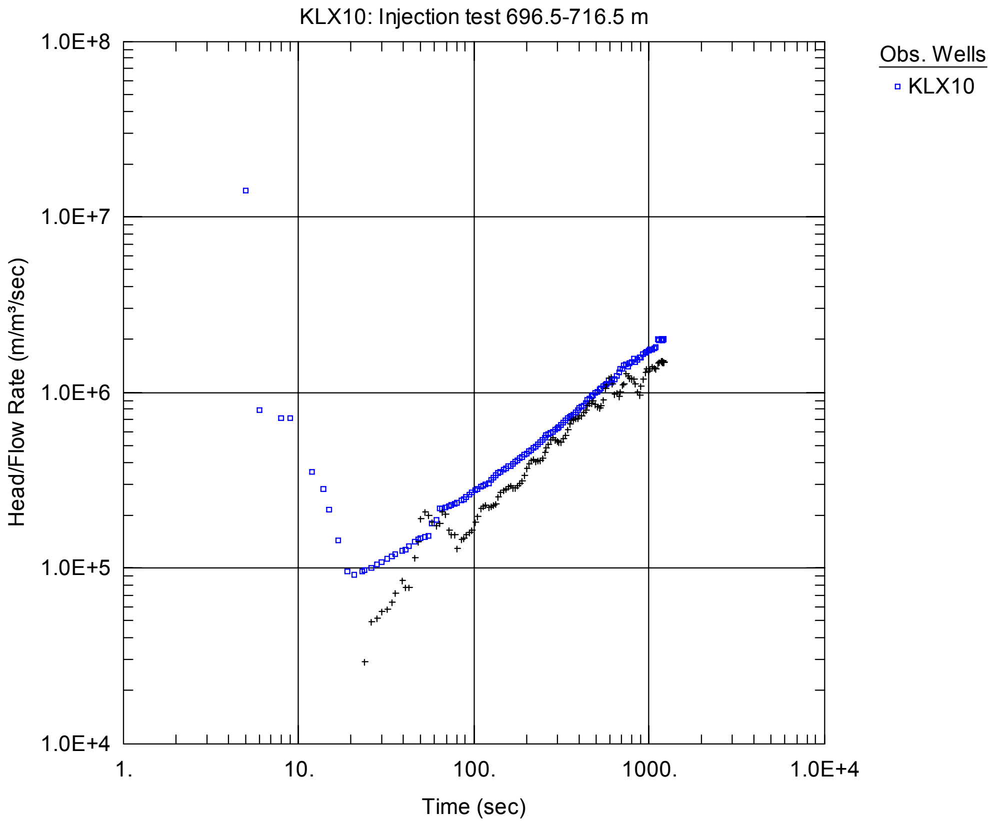


Figure A3-209. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 696.5-716.5 m in KLX10.*

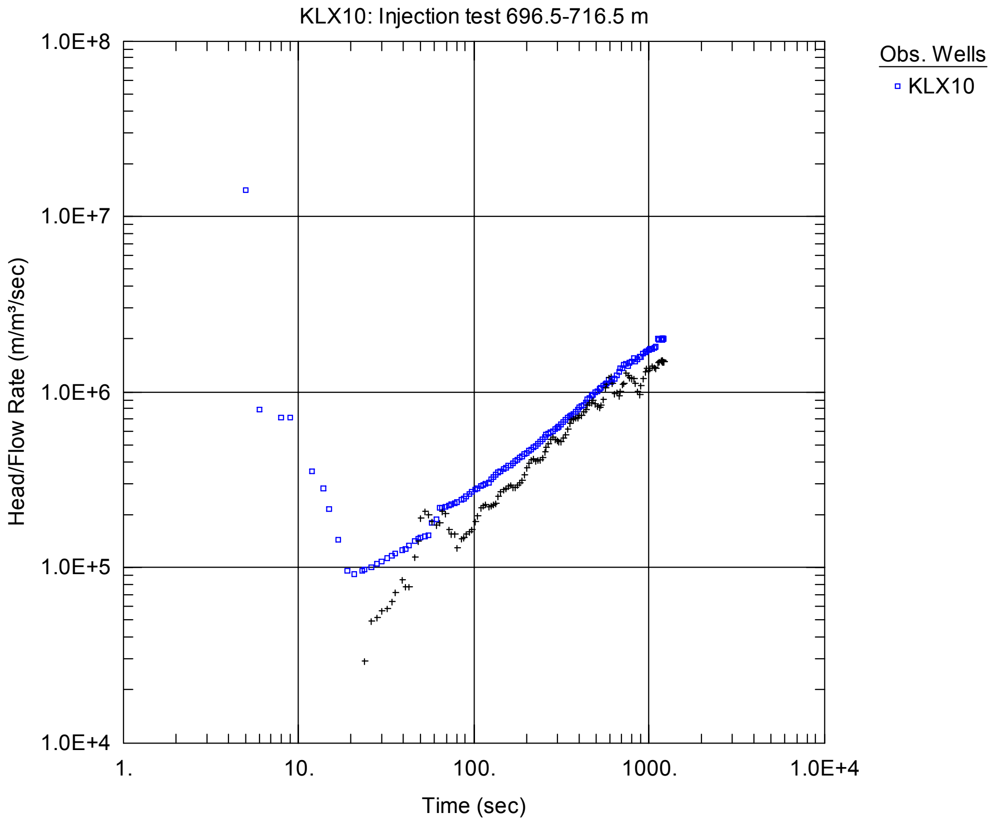


Figure A3-210. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 696.5-716.5 m in KLX10.*

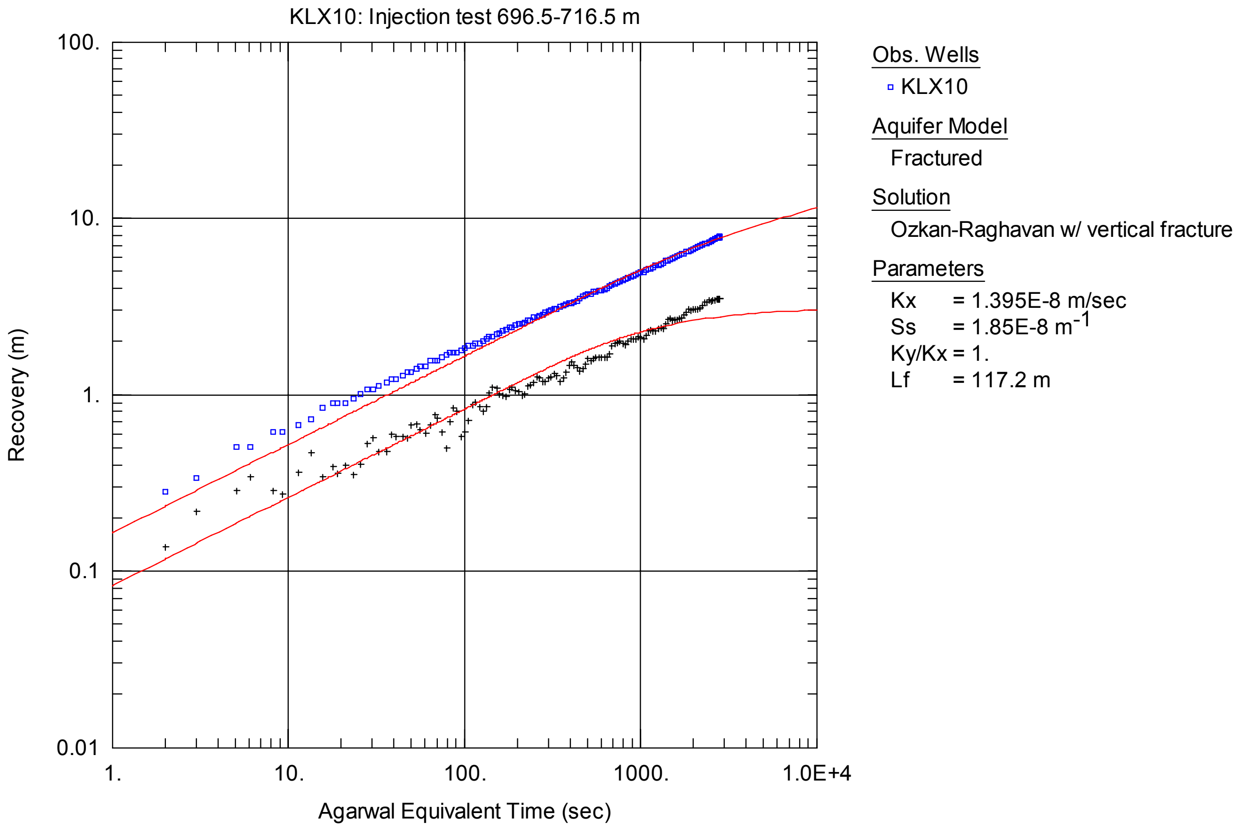


Figure A3-211. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 696.5-716.5 m in KLX10.*

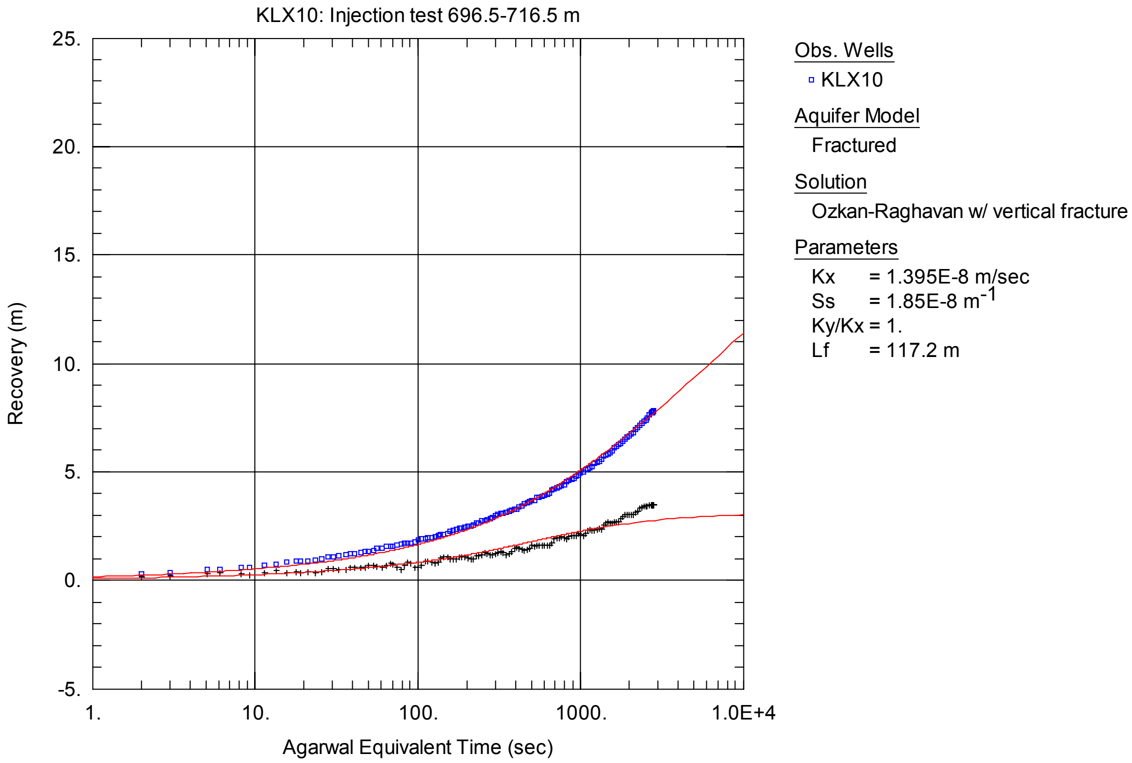


Figure A3-212. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 696.5-716.5 m in KLX10.*

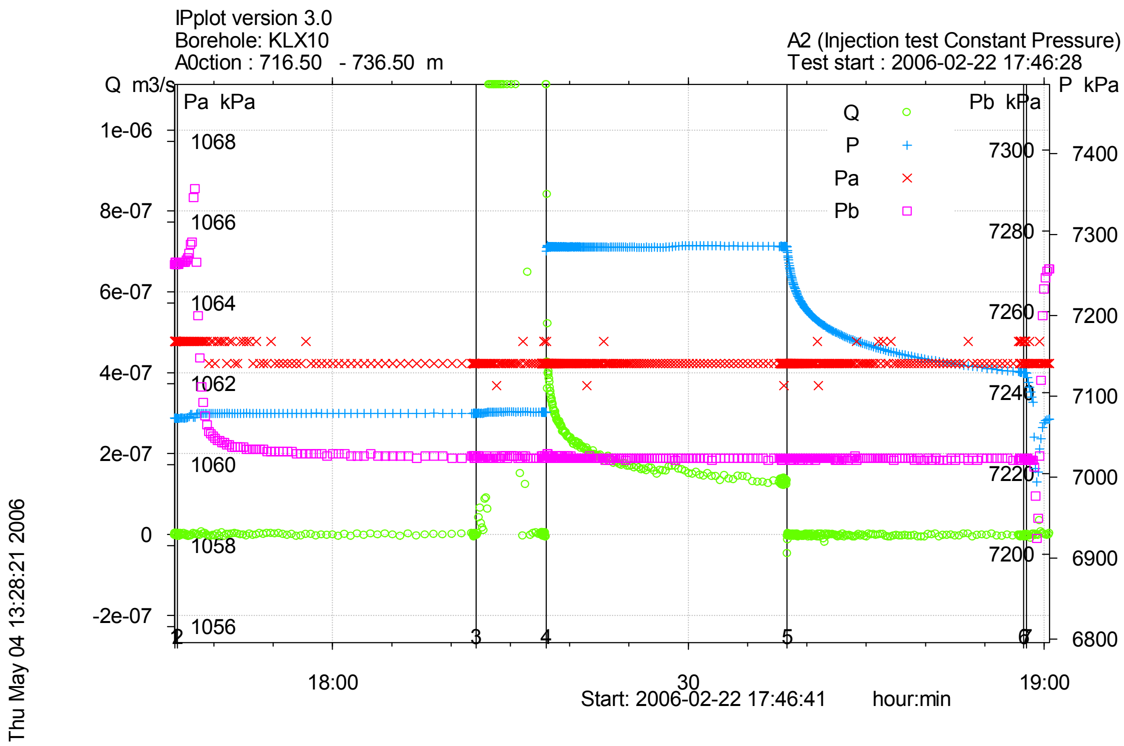


Figure A3-213. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 716.5-736.5 m in borehole KLX10.*

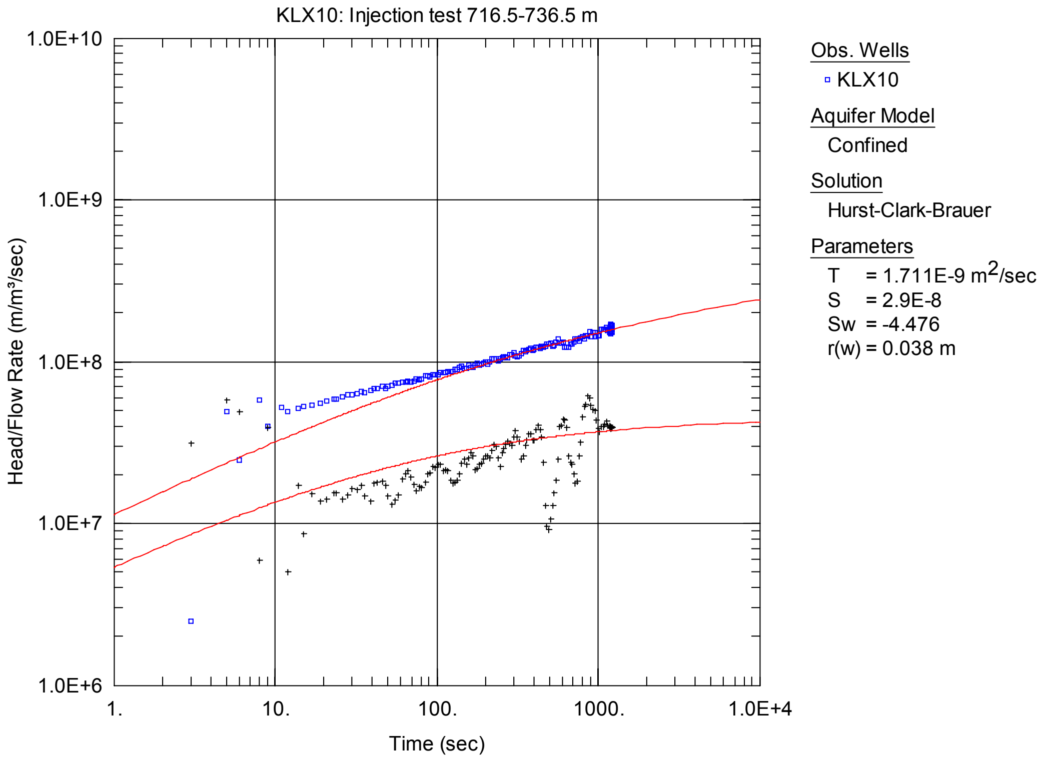


***Figure A3-214.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 716.5-736.5 m in KLX10.*

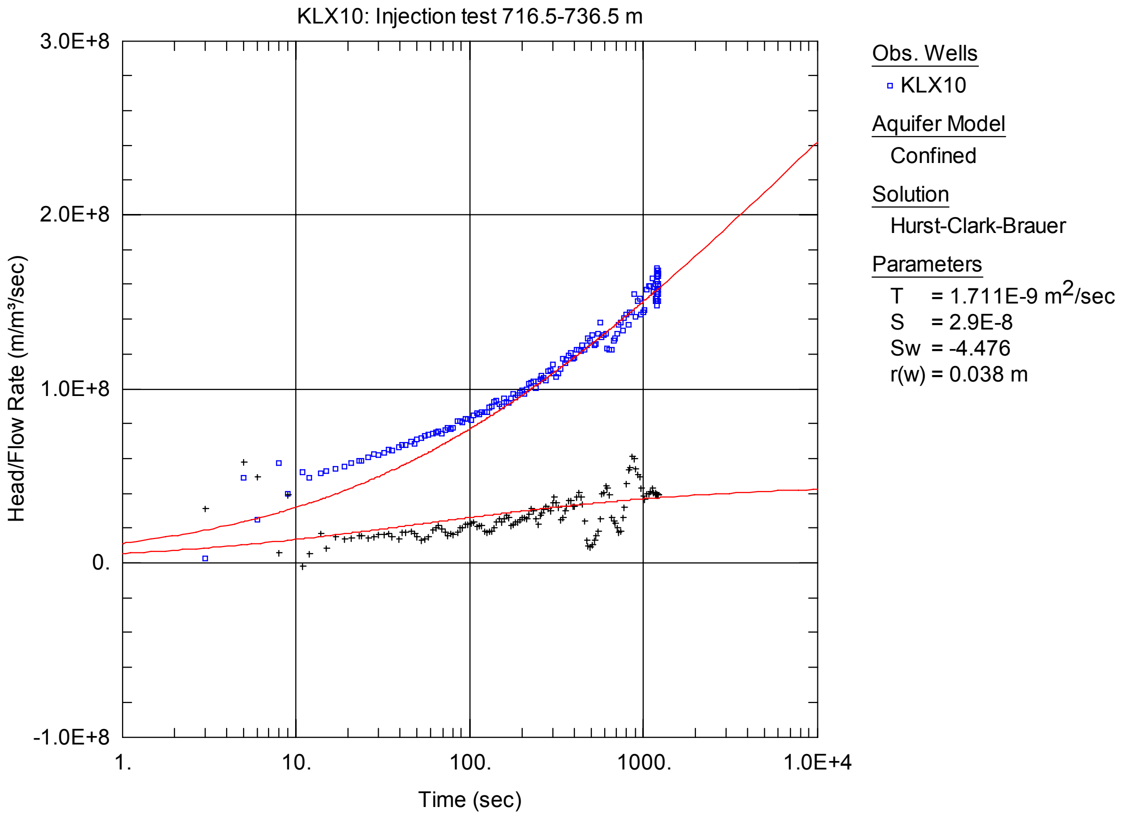


***Figure A3-215.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 716.5-736.5 m in KLX10.*

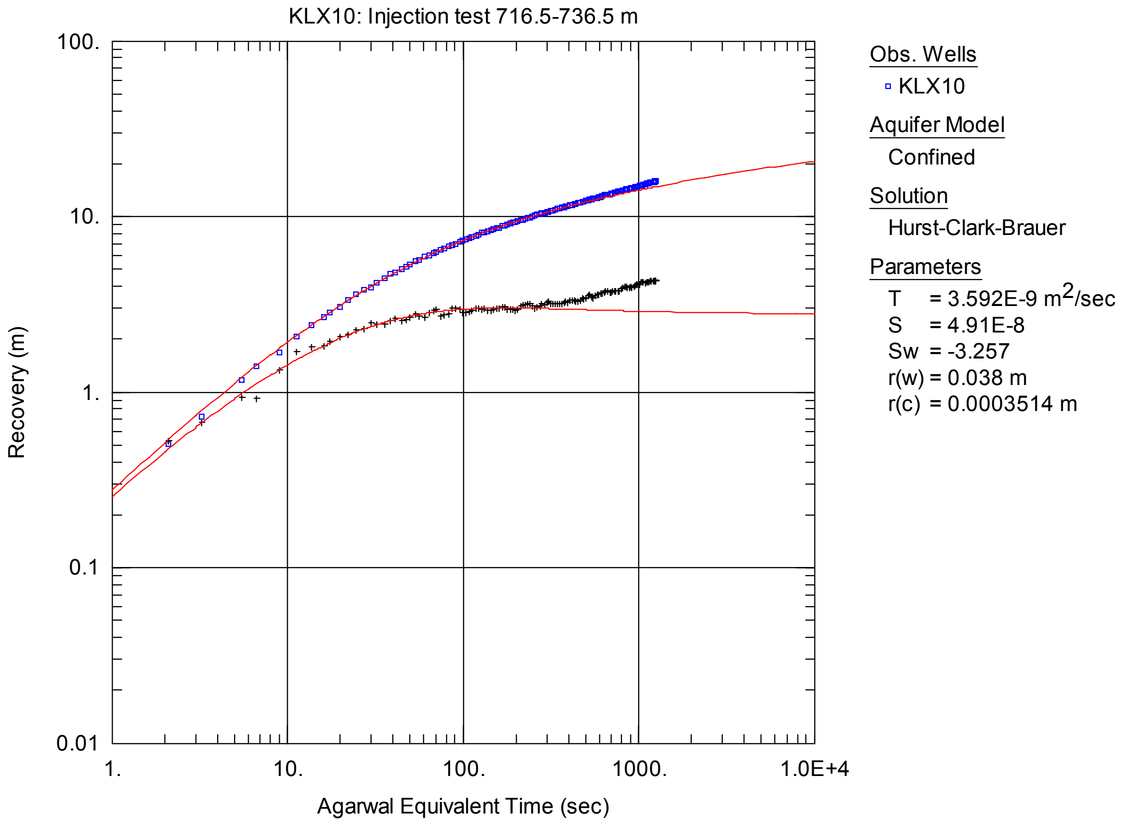


Figure A3-216. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 716.5-736.5 m in KLX10.*

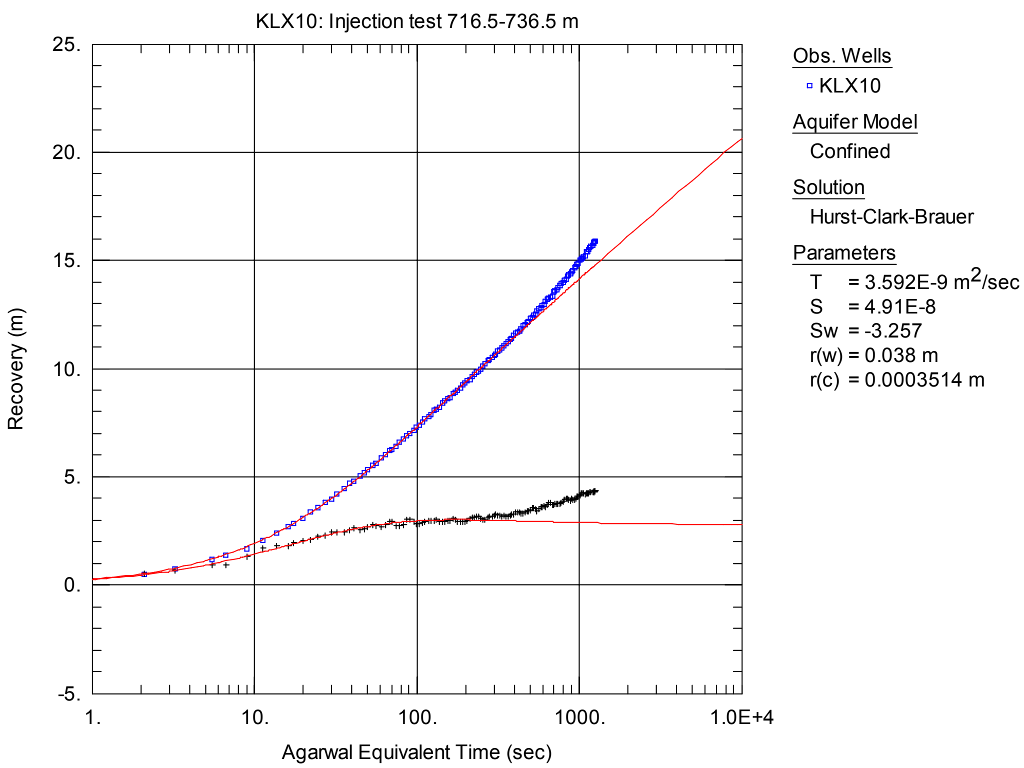


Figure A3-217. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 716.5-736.5 m in KLX10.*

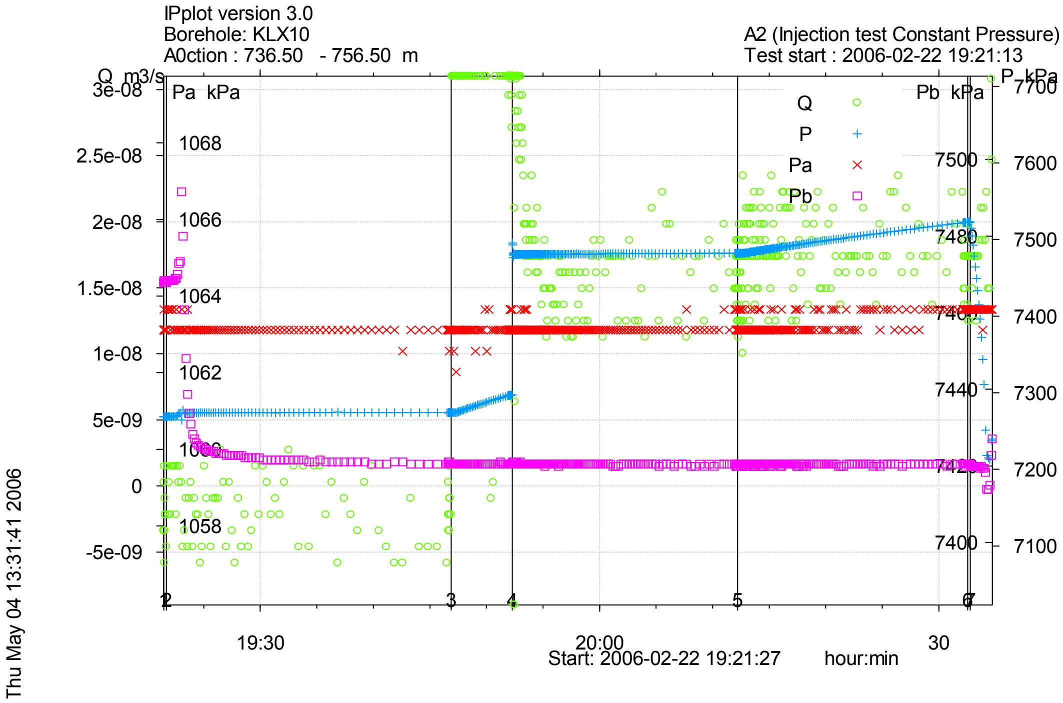


Figure A3-218. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 736.5-756.5 m in borehole KLX10.*

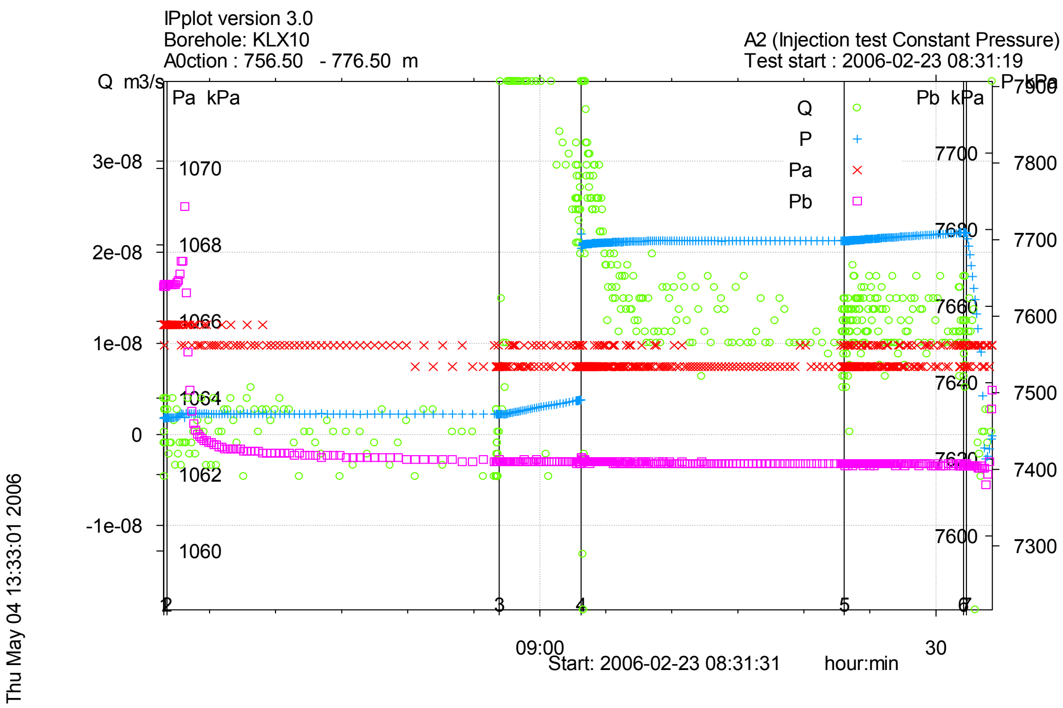


Figure A3-219. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 756.5-776.5 m in borehole KLX10.*

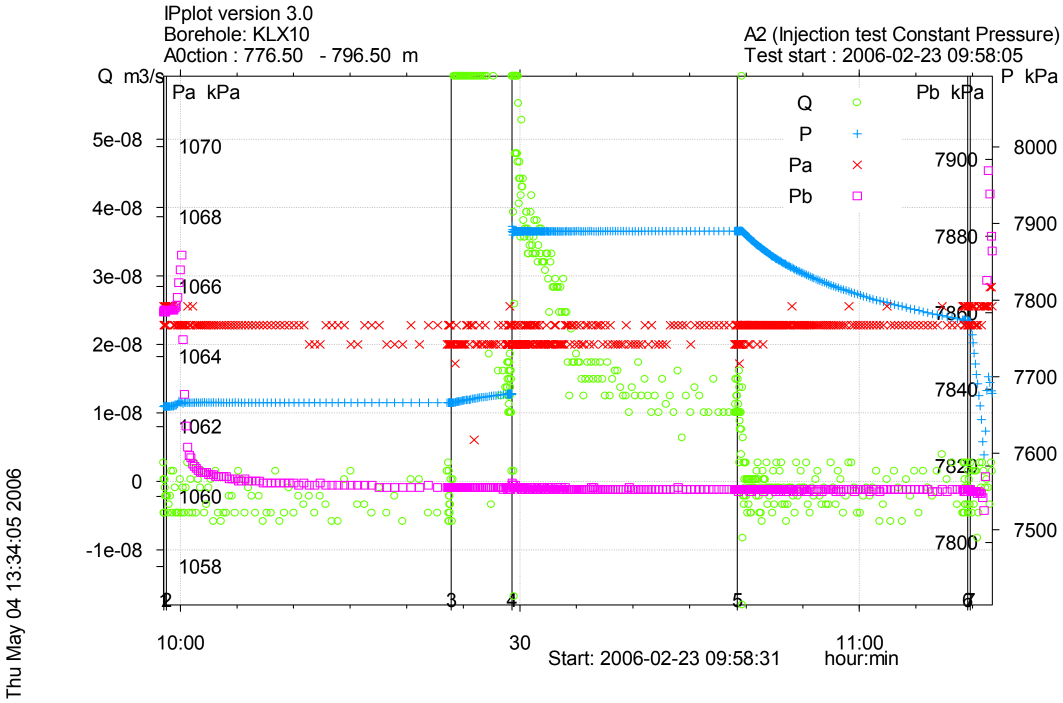


Figure A3-220. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 776.5-796.5 m in borehole KLX10.*

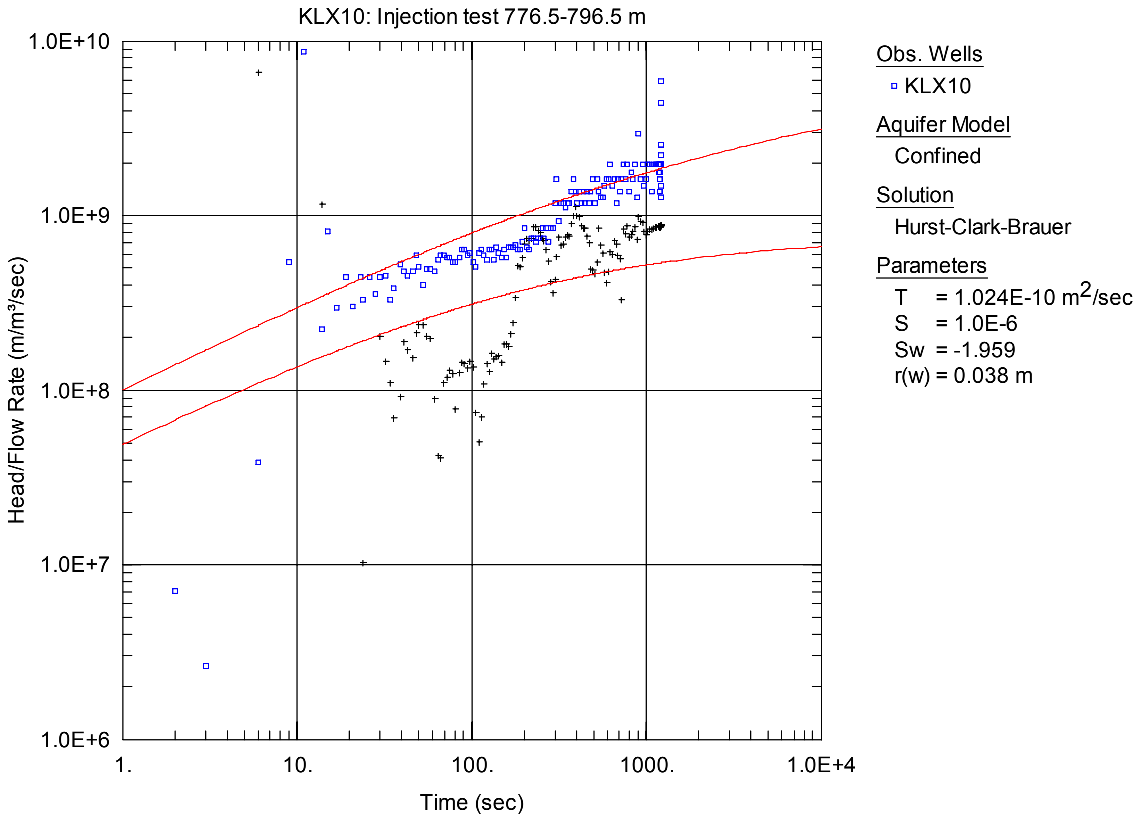


Figure A3-221. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 776.5-796.5 m in KLX10.*

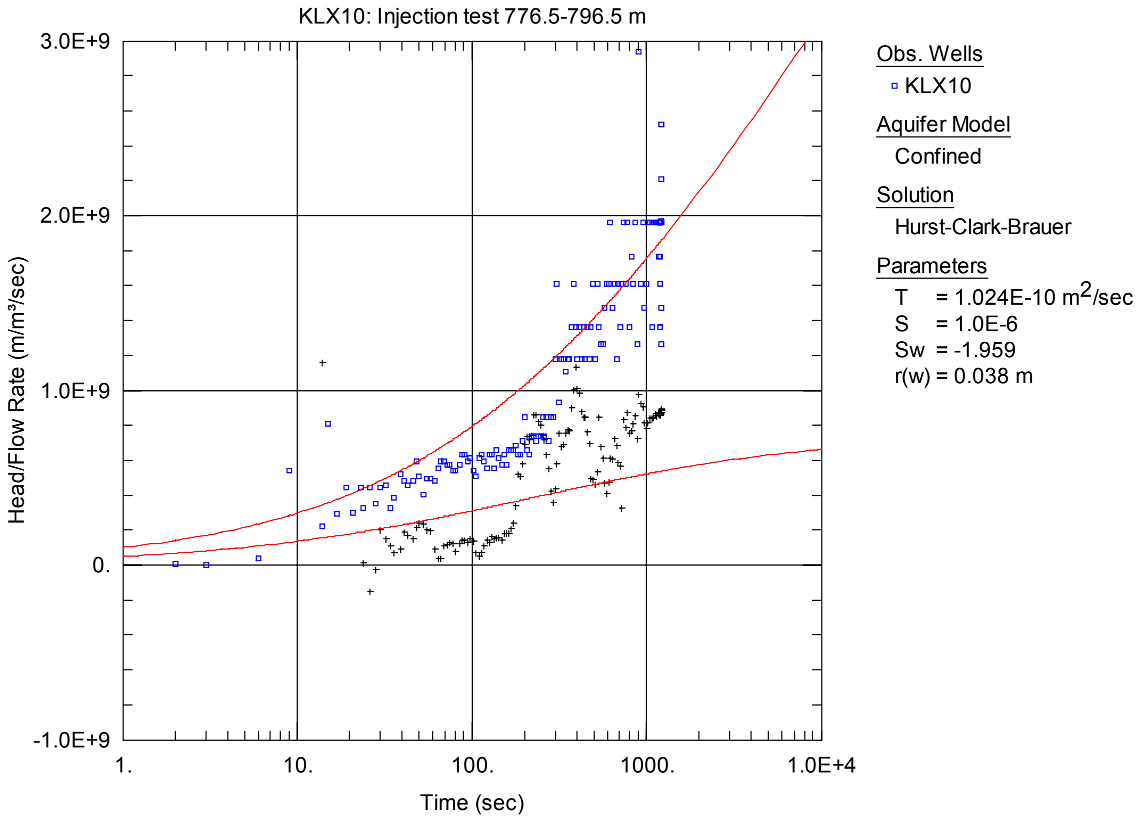


Figure A3-222. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 776.5-796.5 m in KLX10.*

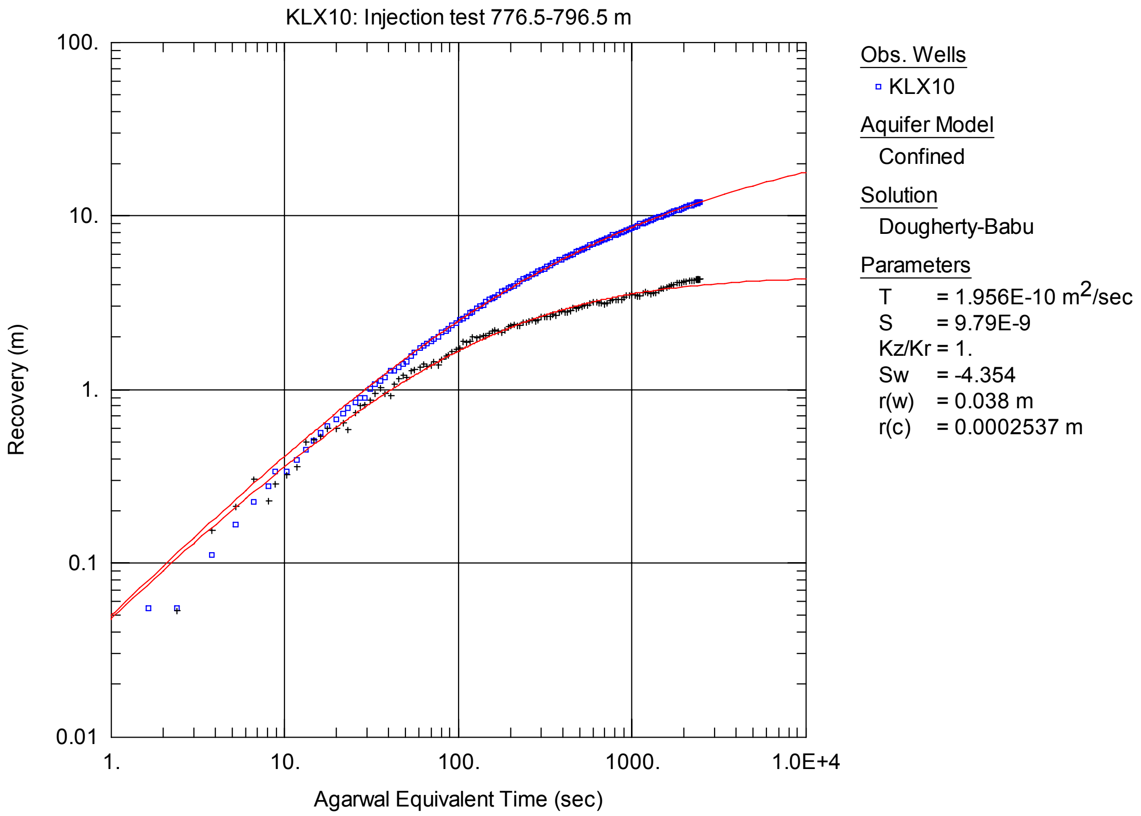


Figure A3-223. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 776.5-796.5 m in KLX10.*

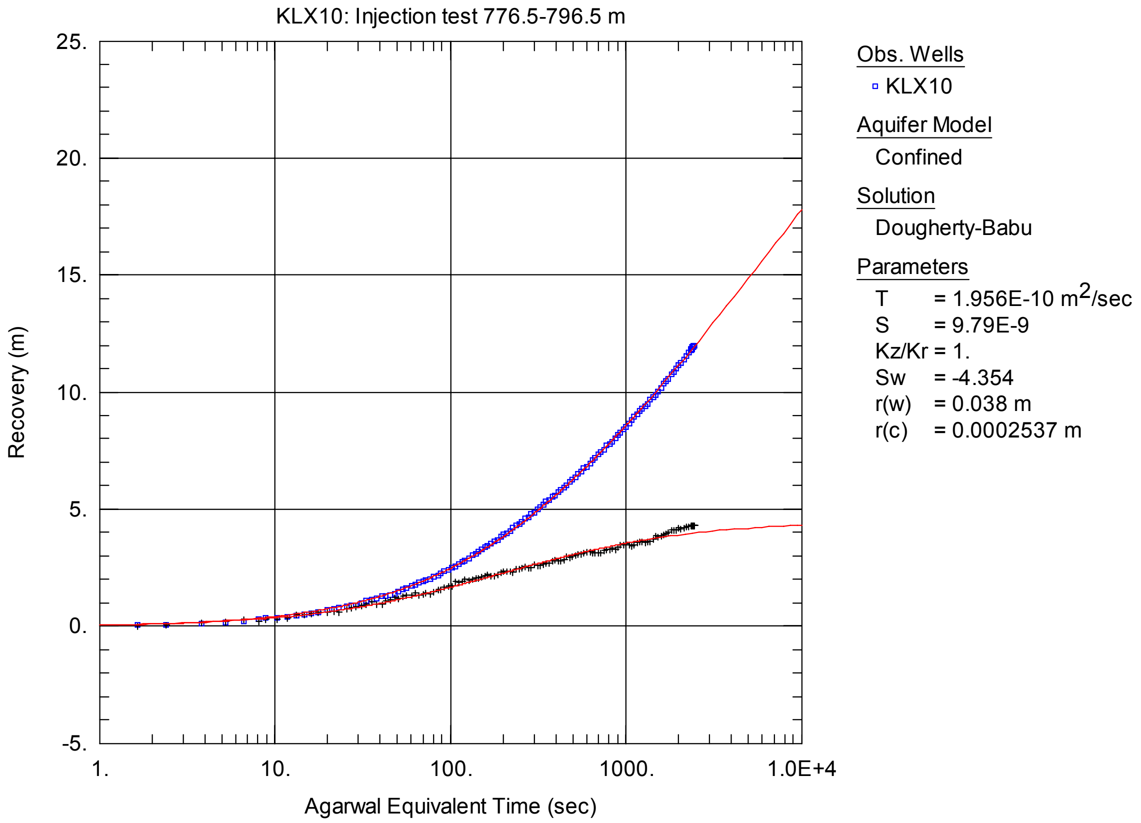


Figure A3-224. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 776.5-796.5 m in KLX10.*

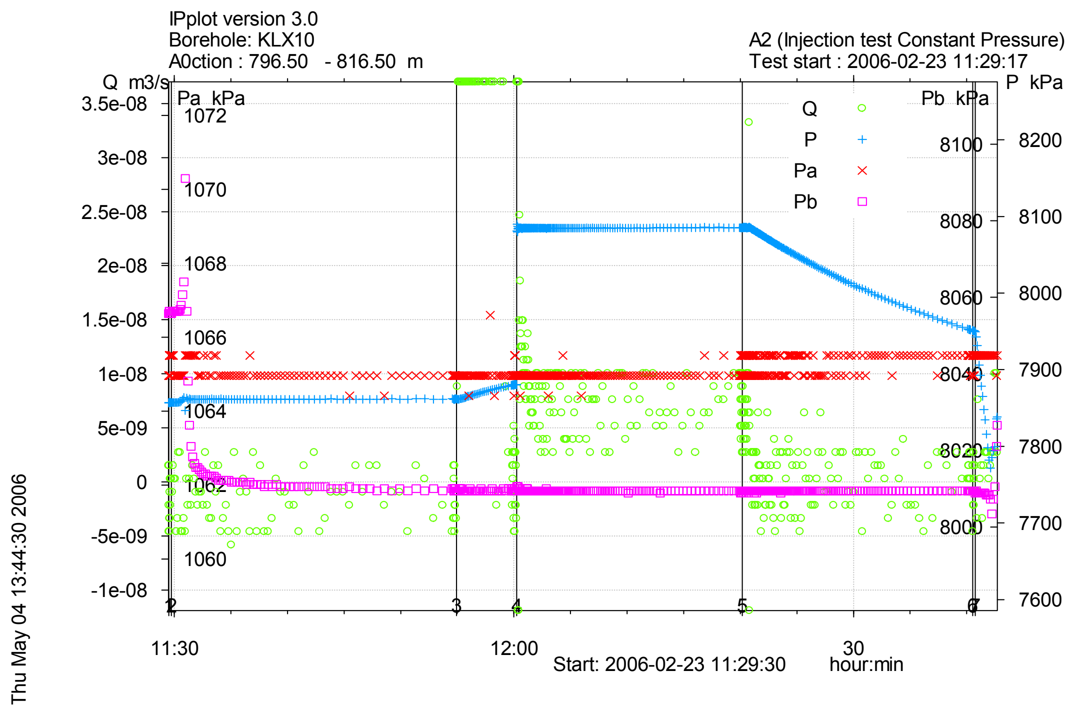


Figure A3-225. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 796.5-816.5 m in borehole KLX10.*

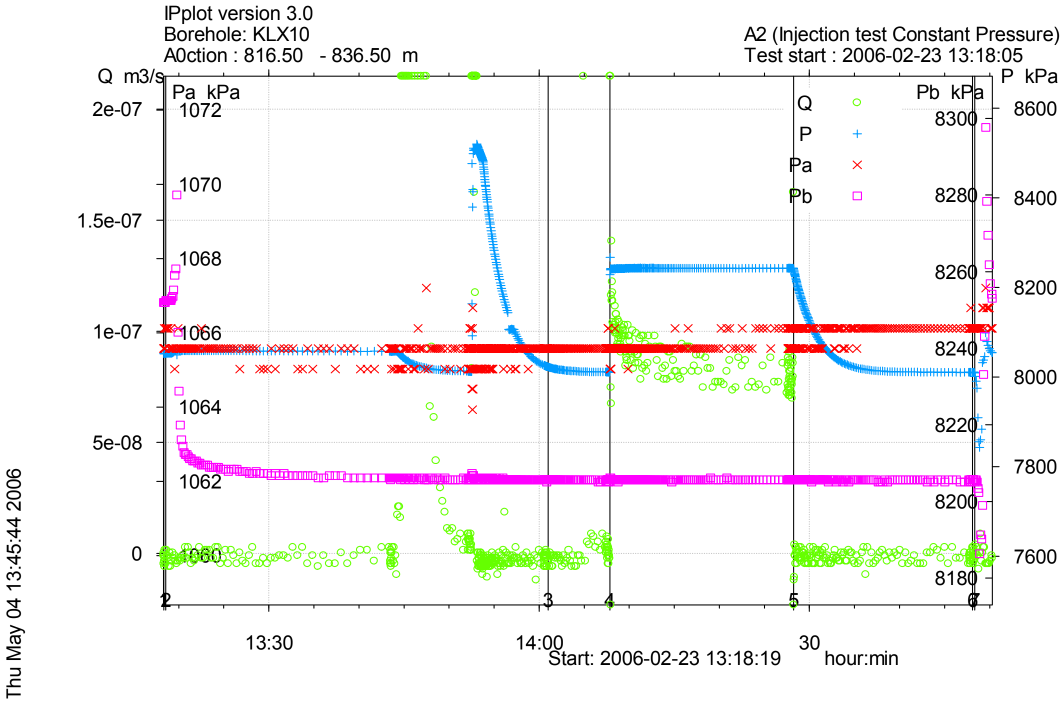


Figure A3-226. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 816.5-836.5 m in borehole KLX10.

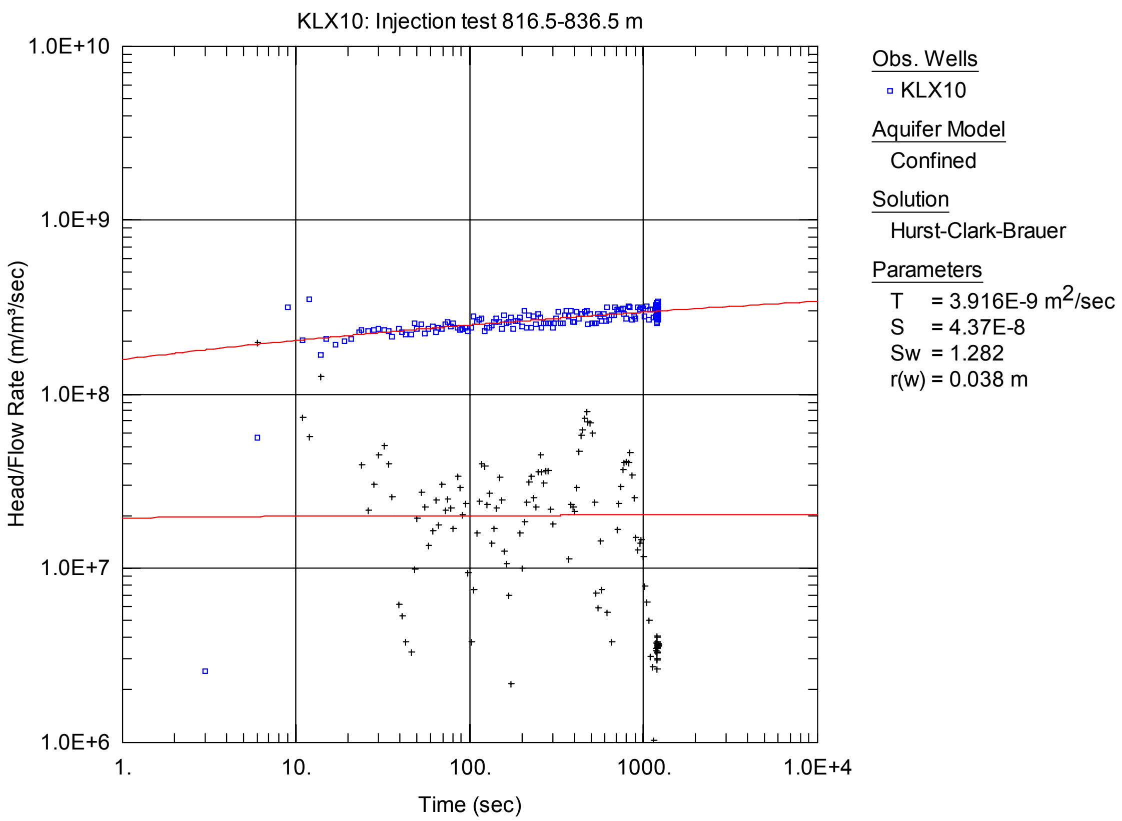


Figure A3-227. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 816.5-836.5 m in KLX10.

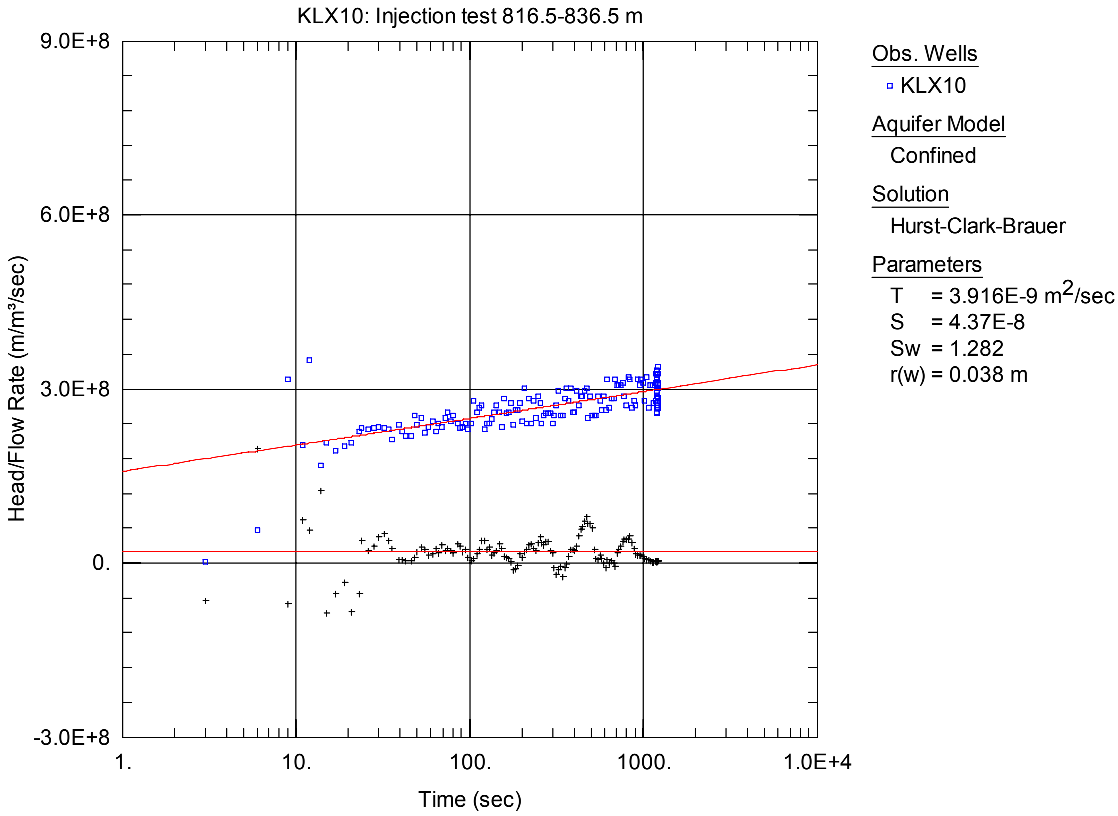


Figure A3-228. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 816.5-836.5 m in KLX10.*

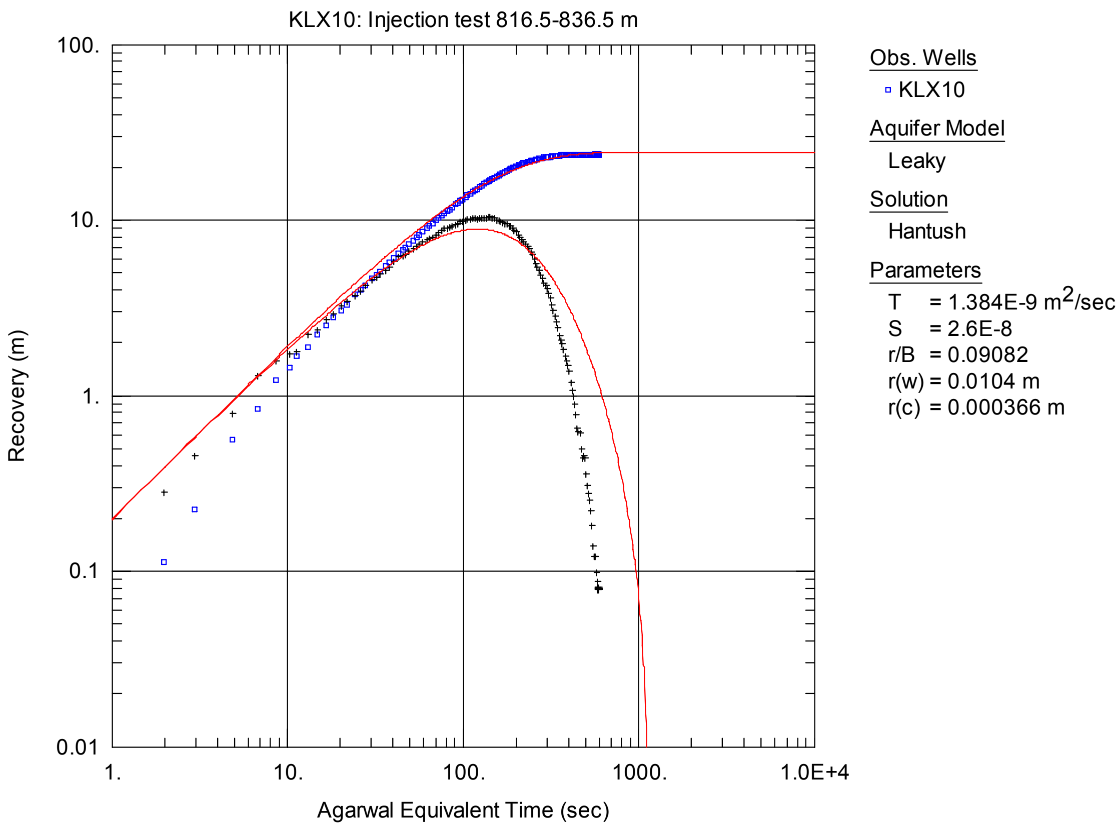


Figure A3-229. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 816.5-836.5 m in KLX10.*

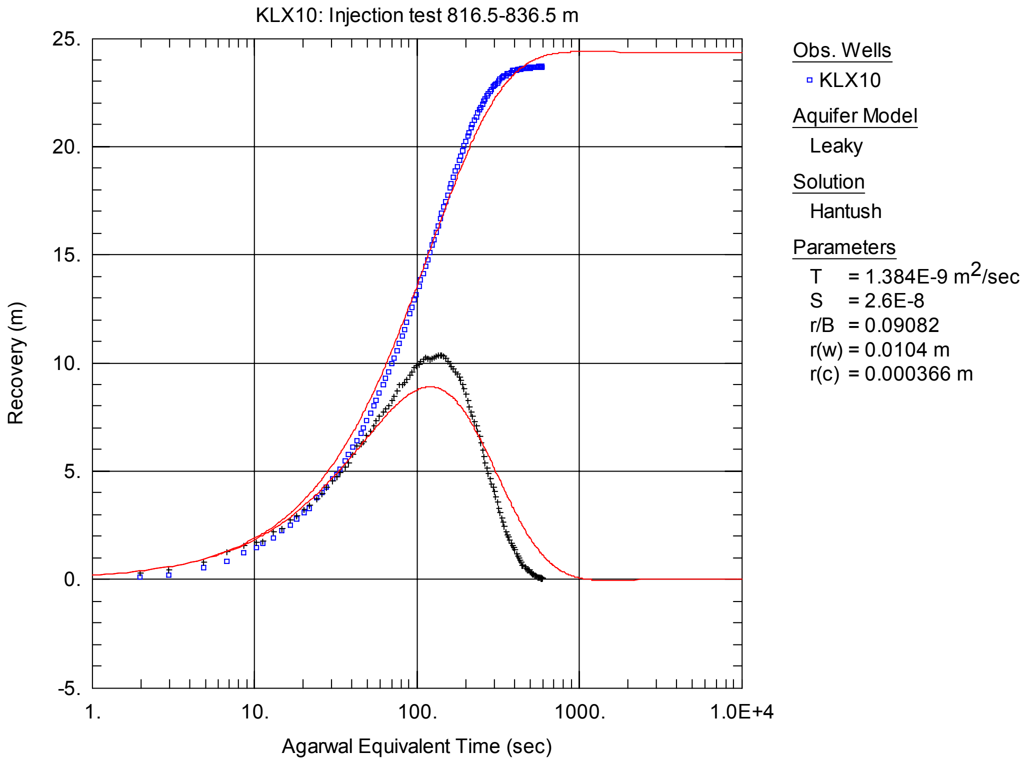


Figure A3-230. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 816.5-836.5 m in KLX10.*

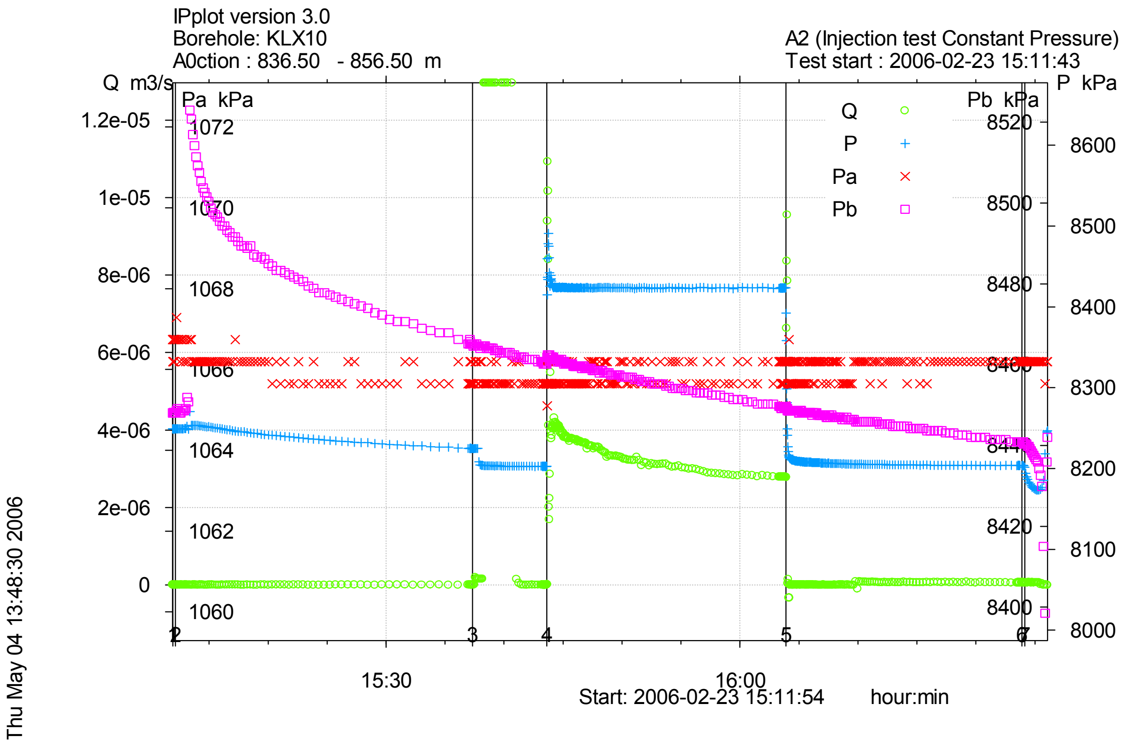


Figure A3-231. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 836.5-856.5 m in borehole KLX10.*

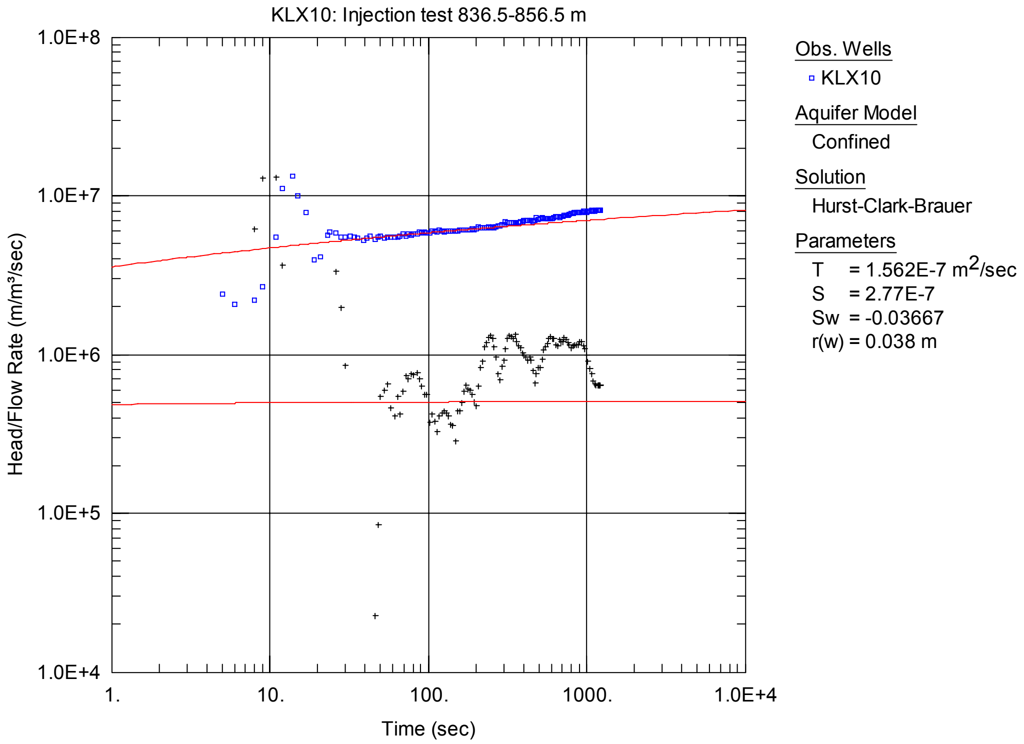


Figure A3-232. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Babu solution on the first PRF, from the injection test in section 836.5-856.5 m in KLX10.*

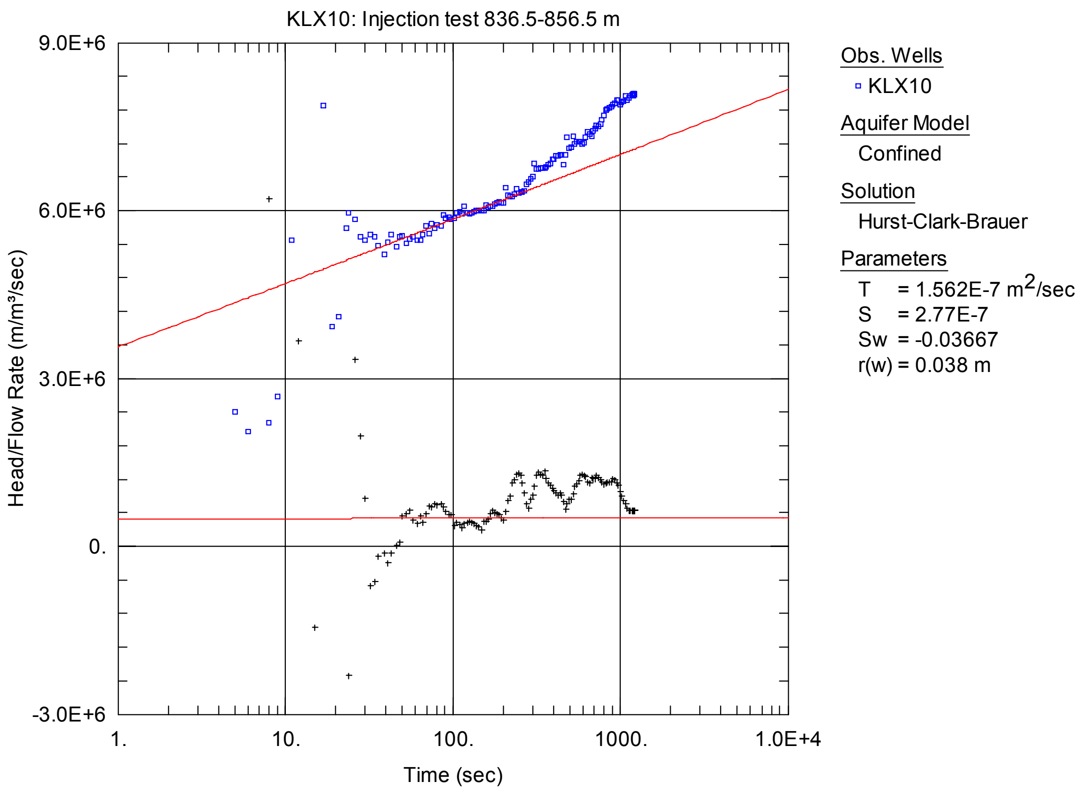


Figure A3-233. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Babu solution on the first PRF, from the injection test in section 836.5-856.5 m in KLX10.*

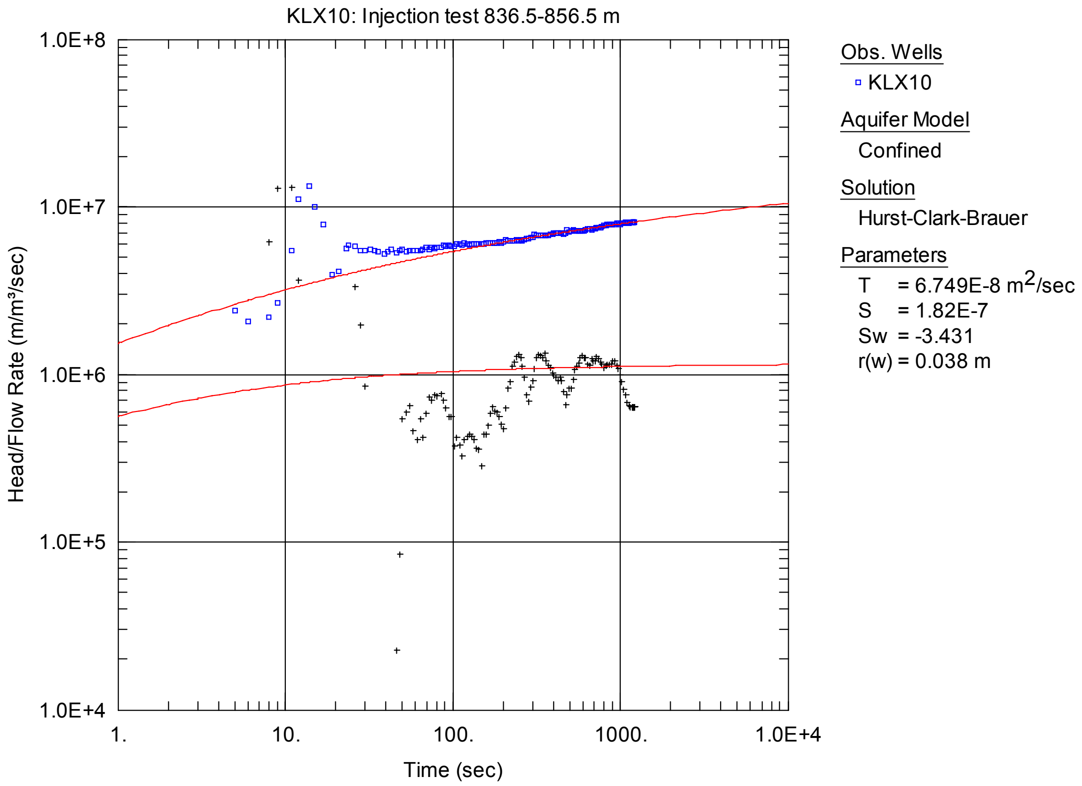


Figure A3-234. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Babu solution on the second PRF, from the injection test in section 836.5-856.5 m in KLX10. PRF2*

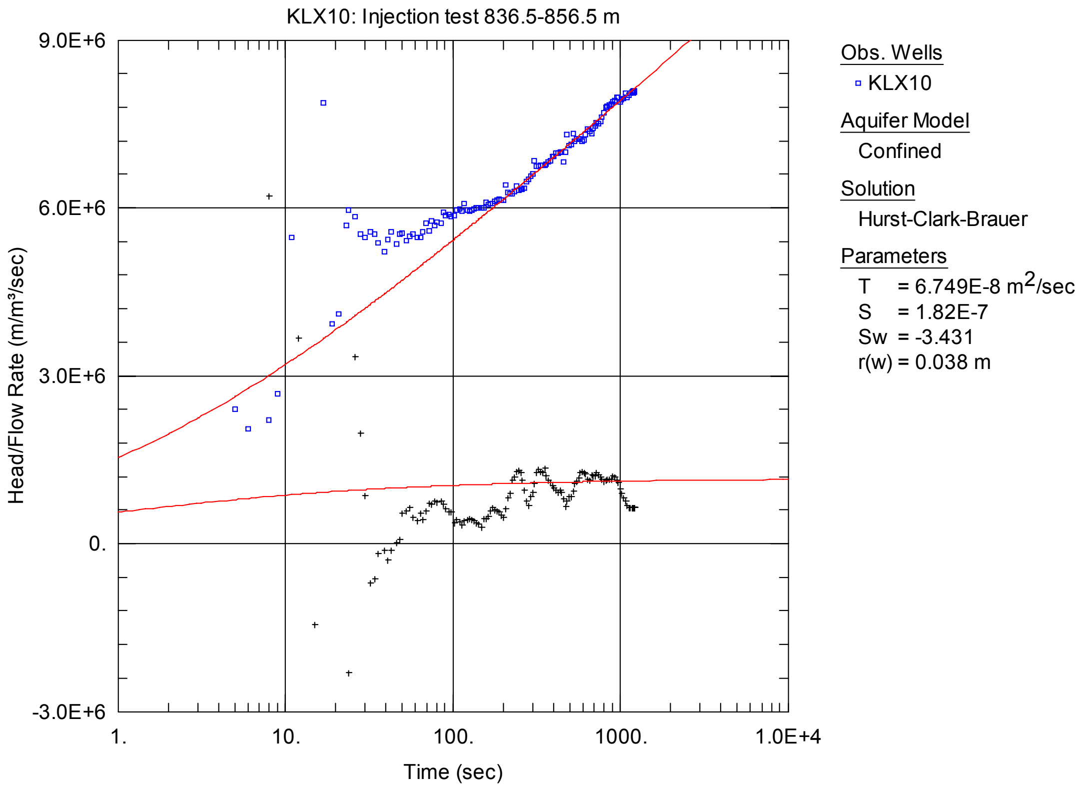


Figure A3-235. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Babu solution on the second PRF, from the injection test in section 836.5-856.5 m in KLX10.*

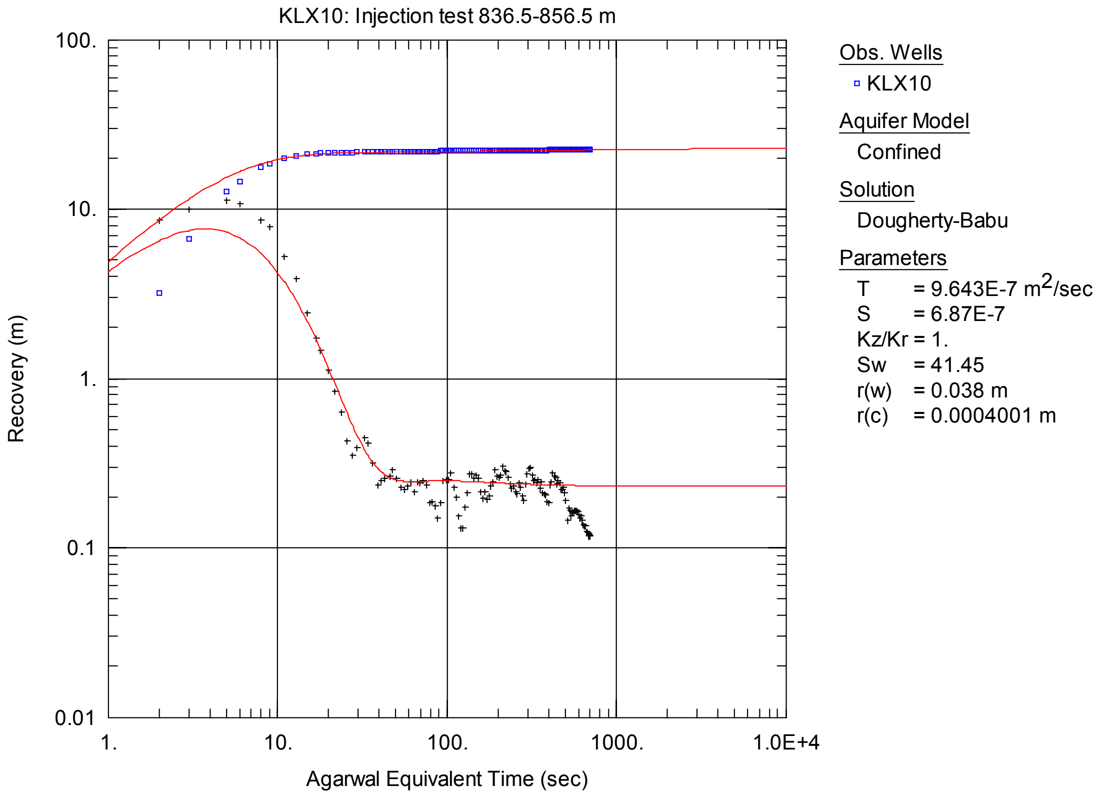


Figure A3-236. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 836.5-856.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

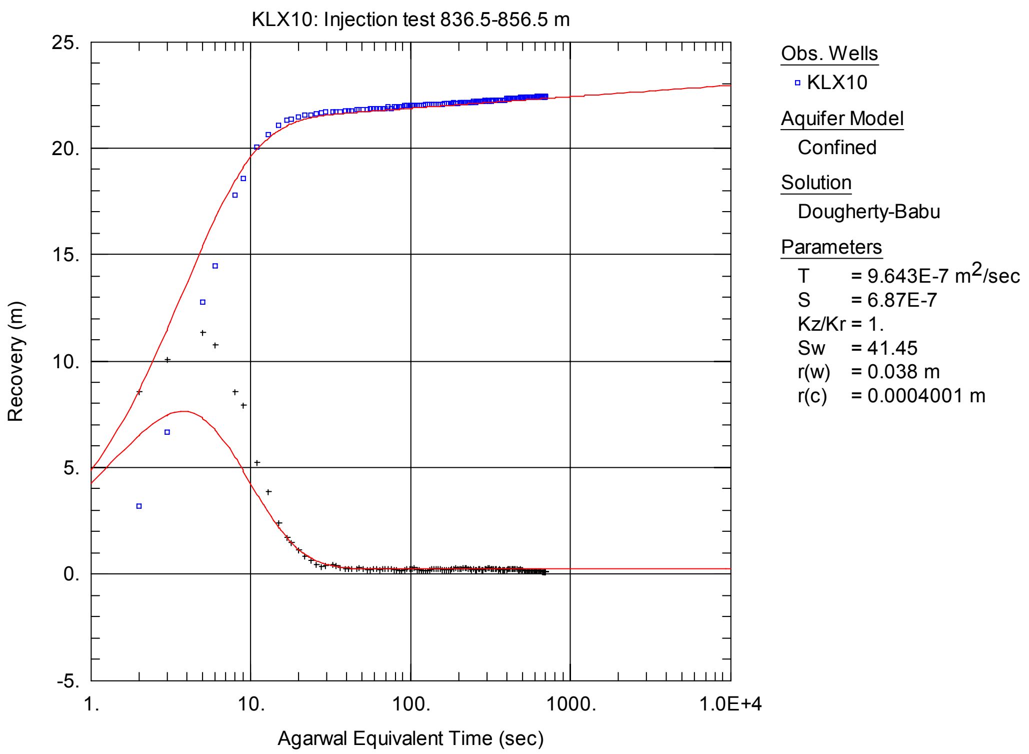


Figure A3-237. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 836.5-856.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

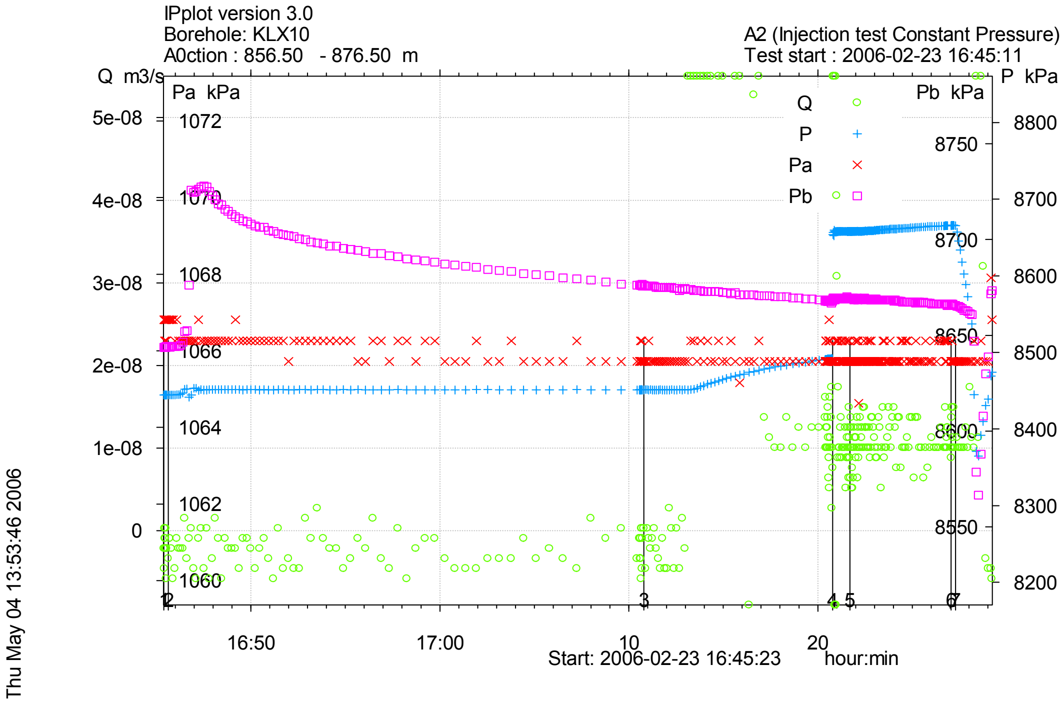


__Figure A3-238.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 856.5-876.5 m in borehole KLX10.

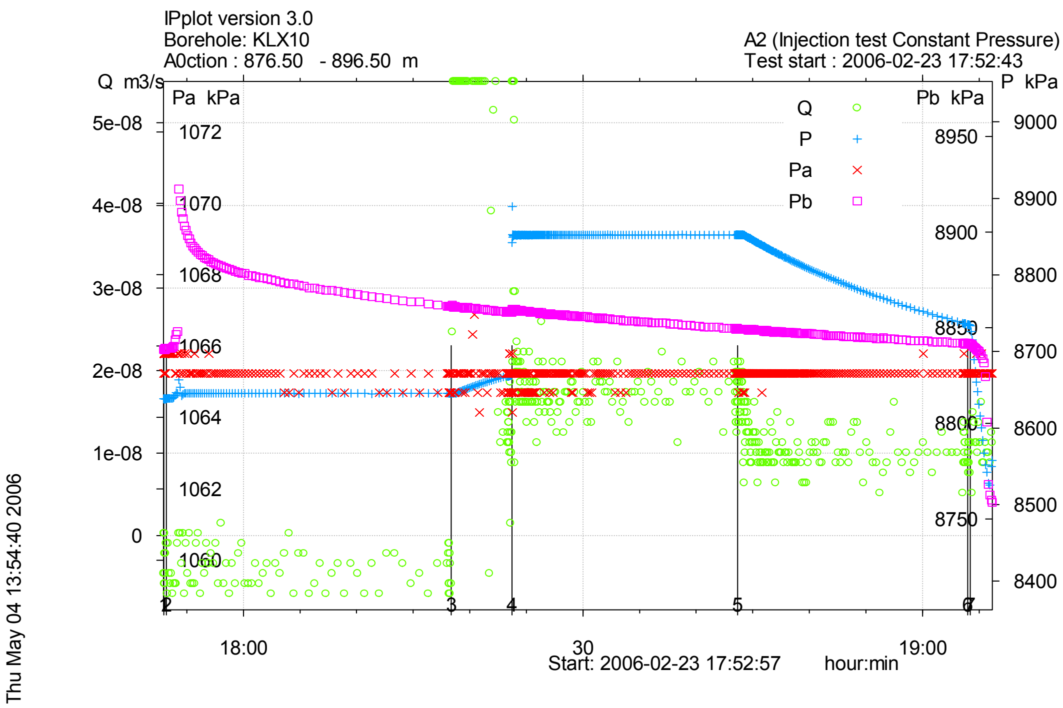


__Figure A3-239.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 876.5-896.5 m in borehole KLX10.

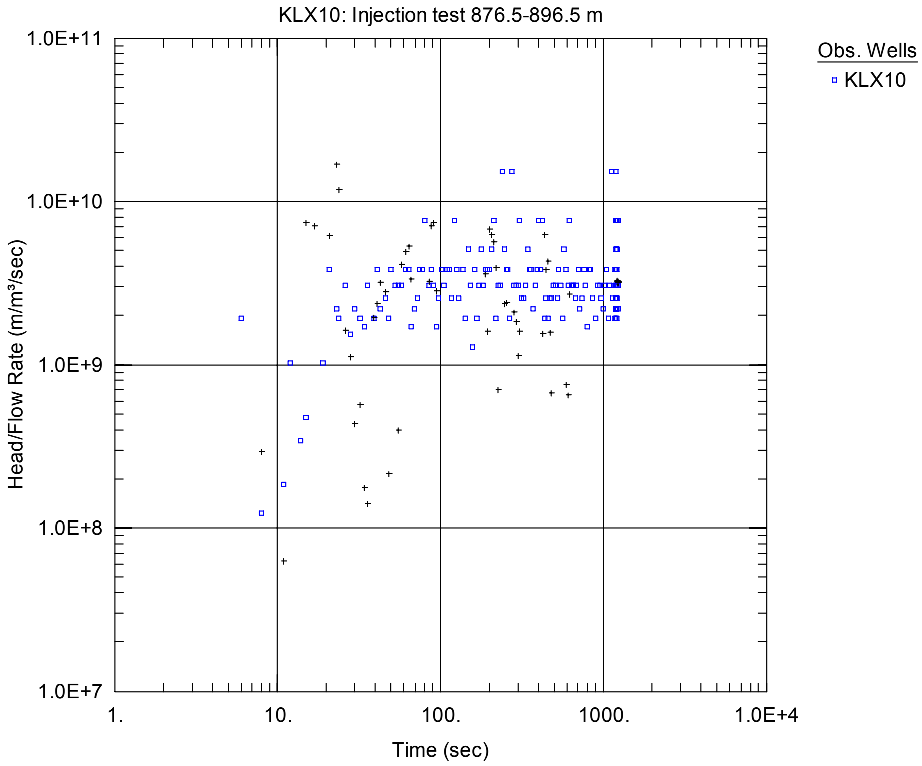


Figure A3-240. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 876.5-896.5 m in KLX10.*

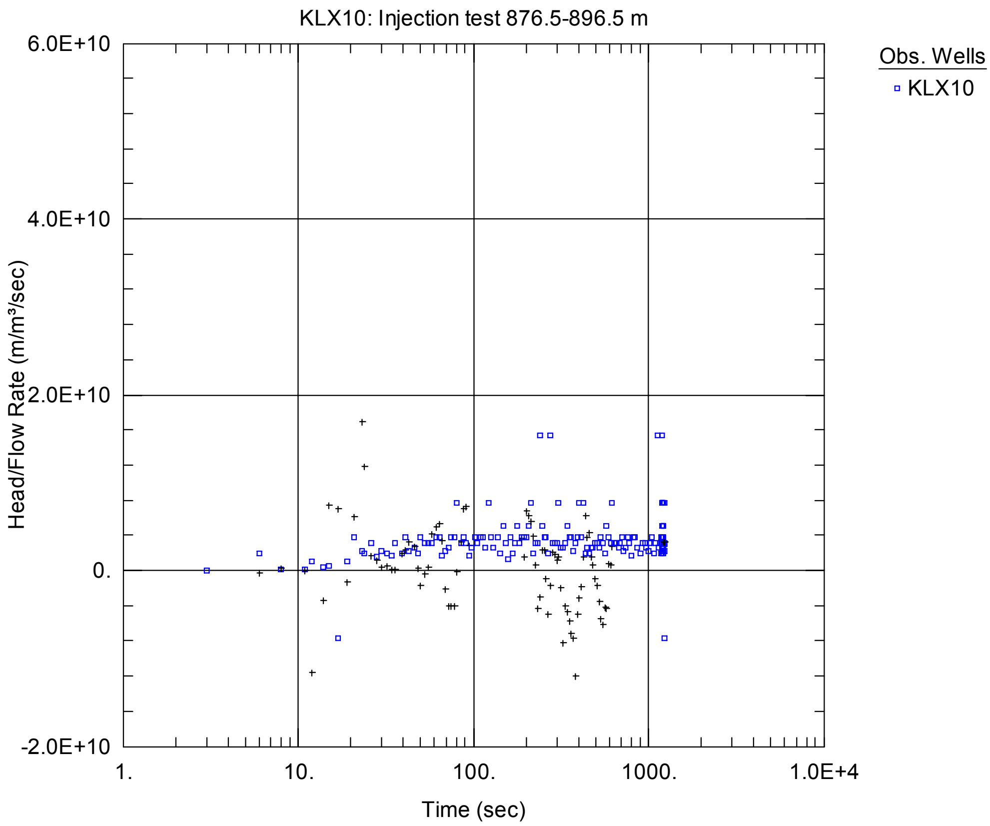


Figure A3-241. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 876.5-896.5 m in KLX10.*

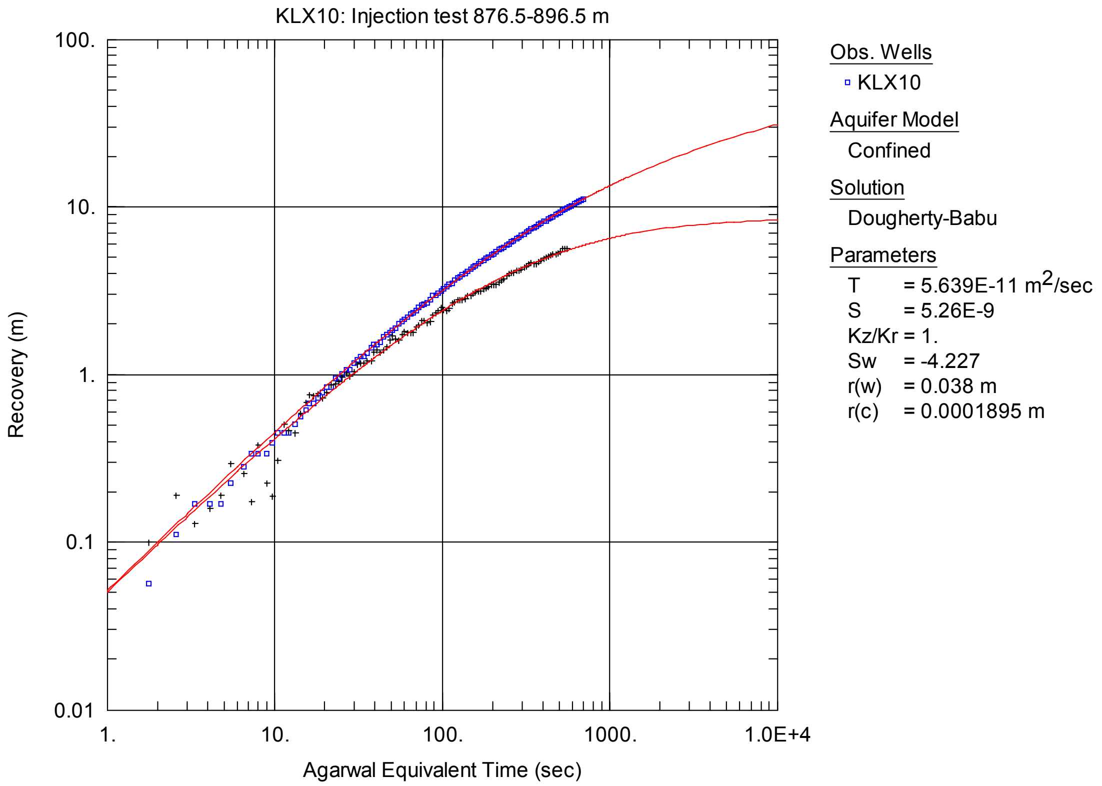


Figure A3-242. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 876.5-896.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

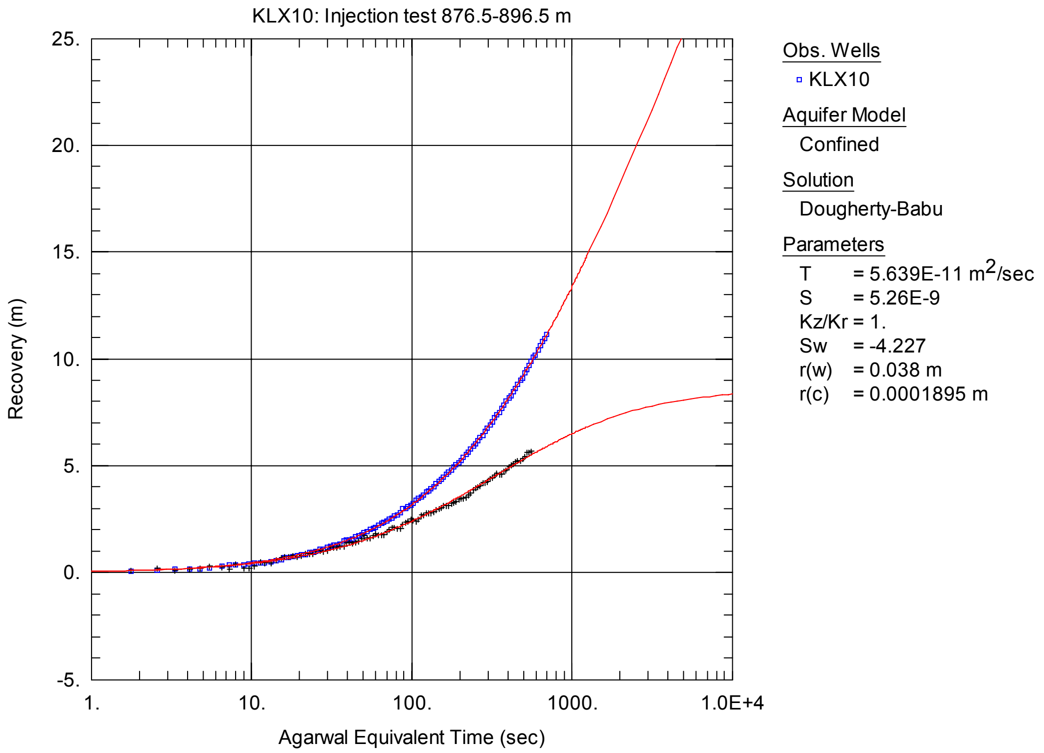


Figure A3-243. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 876.5-896.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

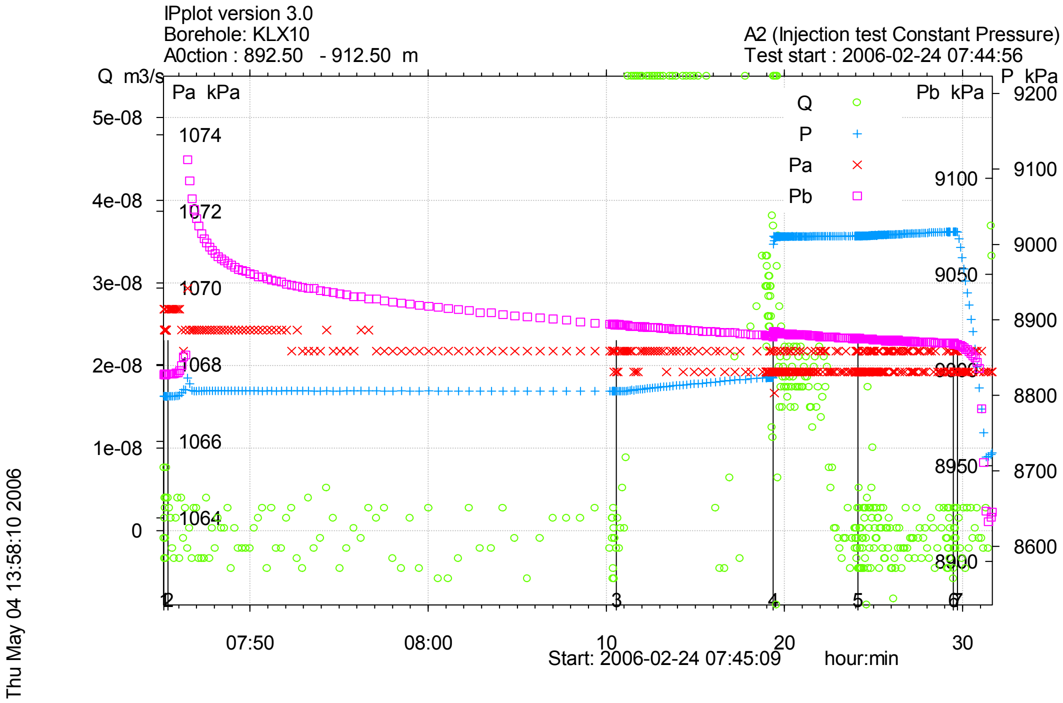


Figure A3-244. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 892.5-912.5 m in borehole KLX10.

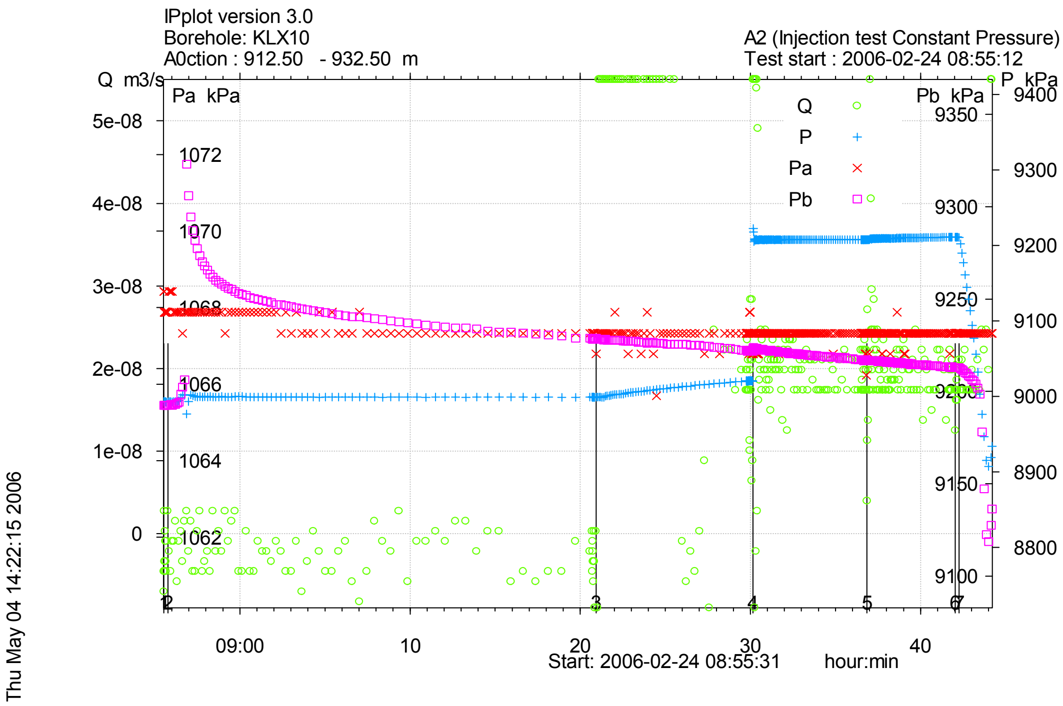


Figure A3-245. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 912.5-932.5 m in borehole KLX10.

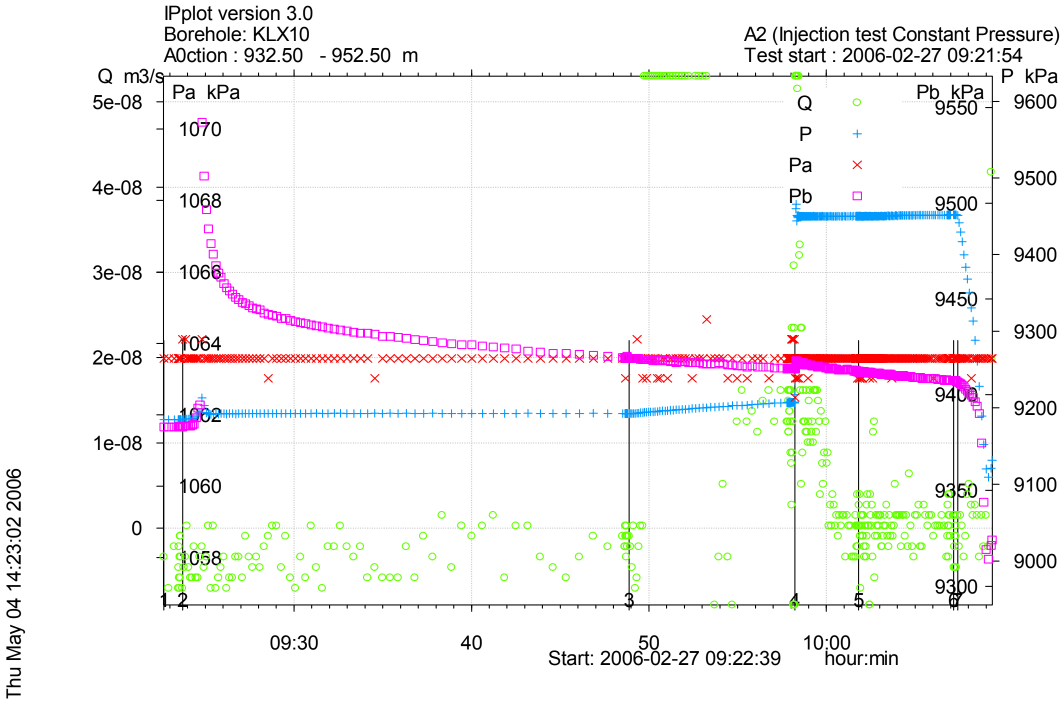


Figure A3-246. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 932.5-952.5 m in borehole KLX10.*

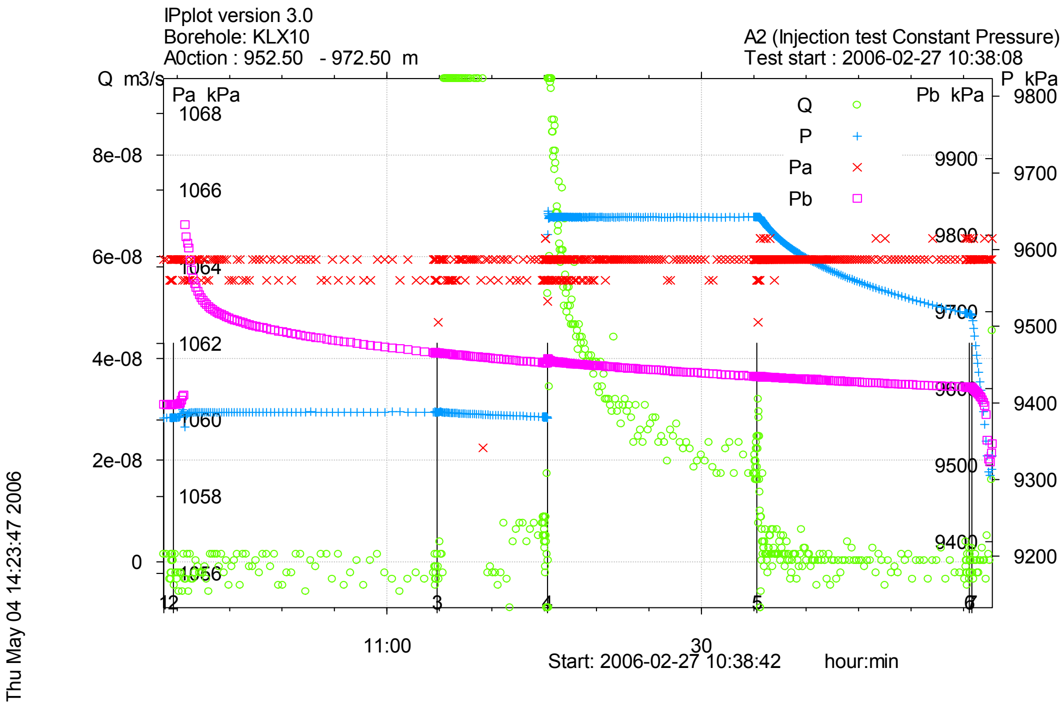


Figure A3-247. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 952.5-972.5 m in borehole KLX10.*

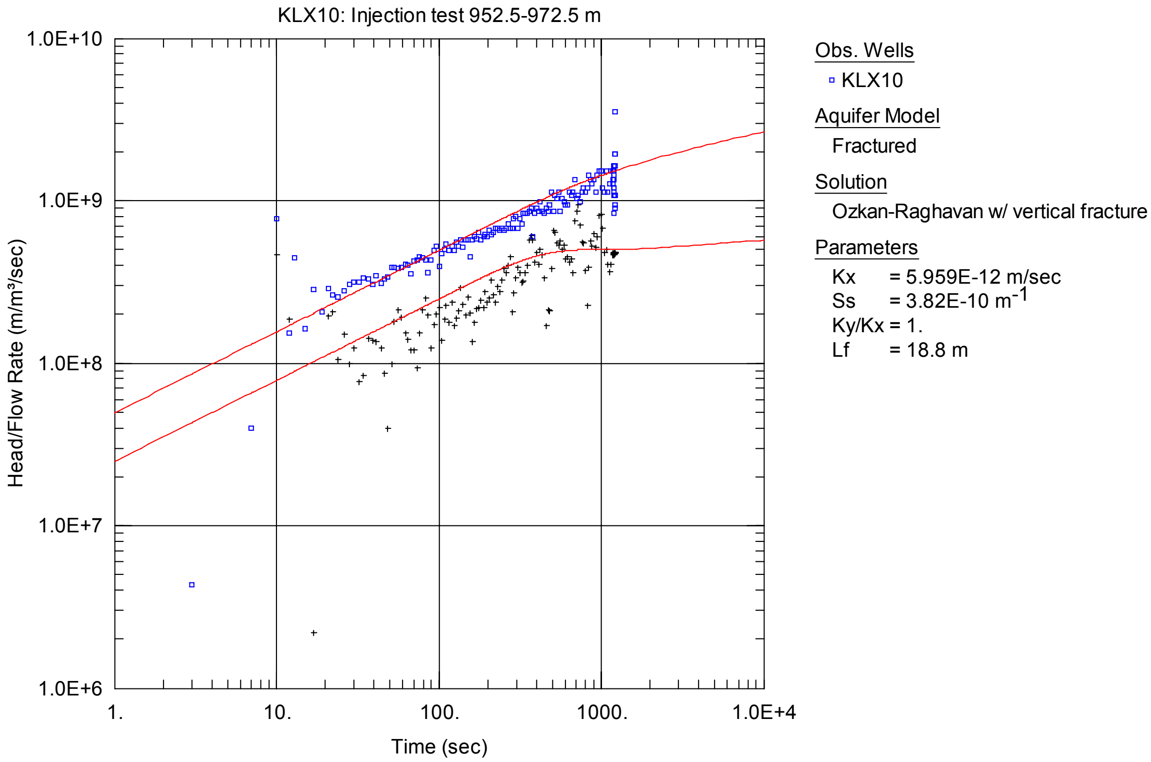


Figure A3-248. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 952.5-972.5 m in KLX10.*

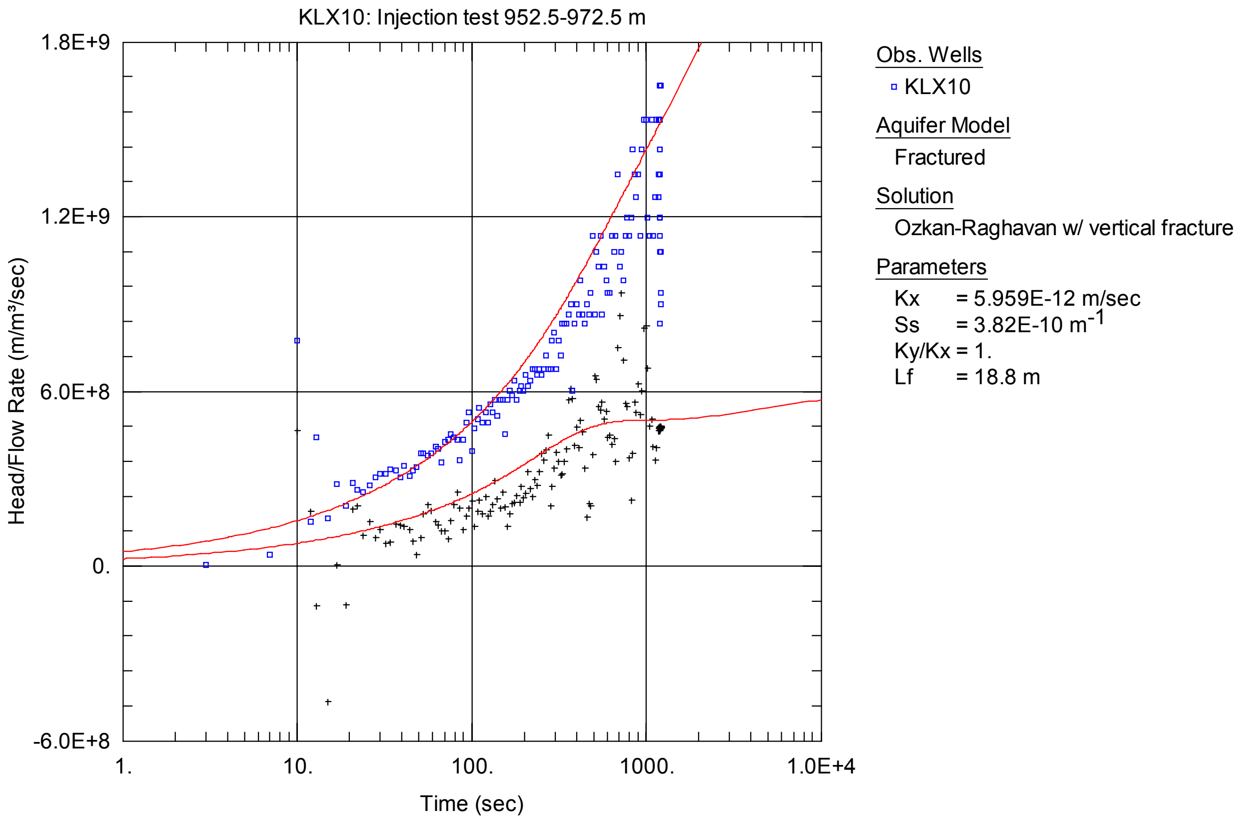


Figure A3-249. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 952.5-972.5 m in KLX10.*

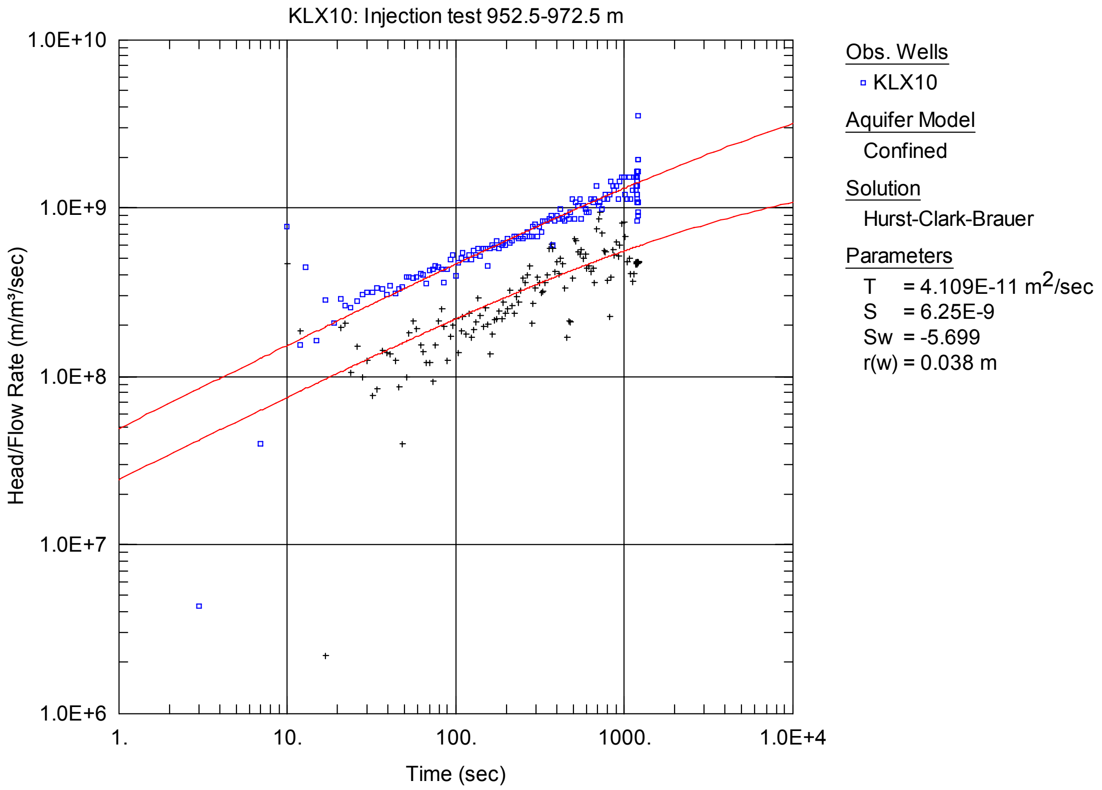


Figure A3-250. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 952.5-972.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

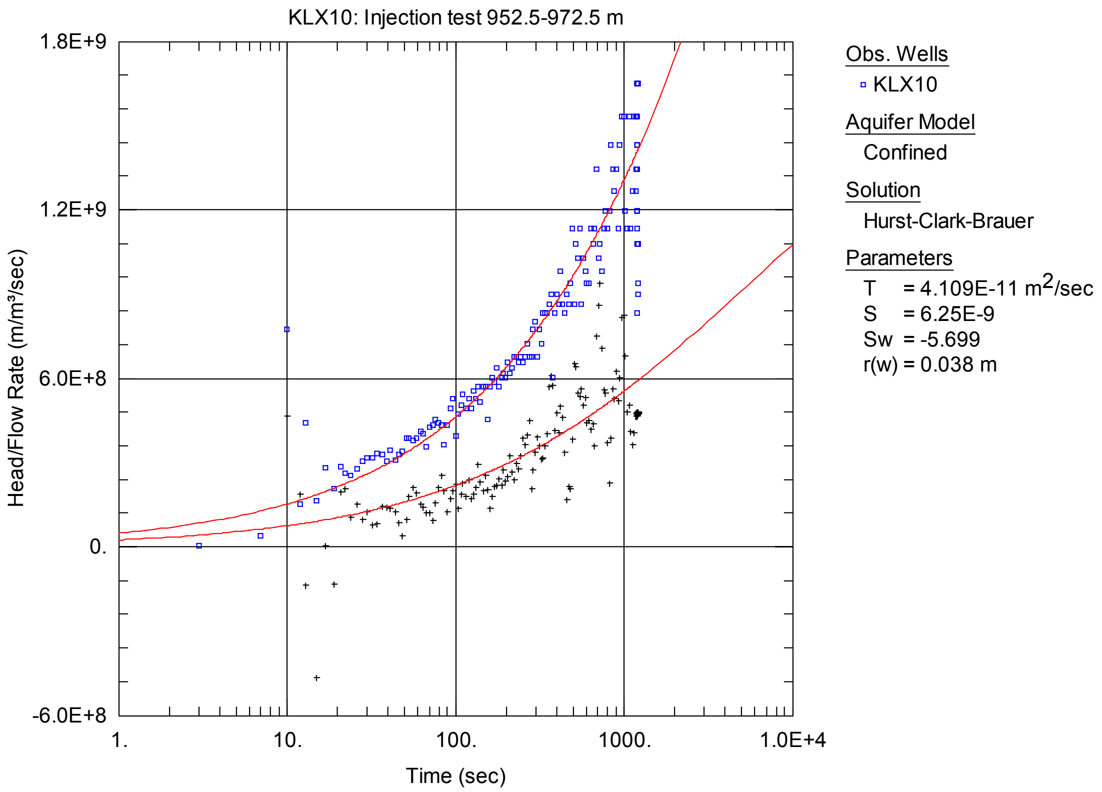


Figure A3-251. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 952.5-972.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

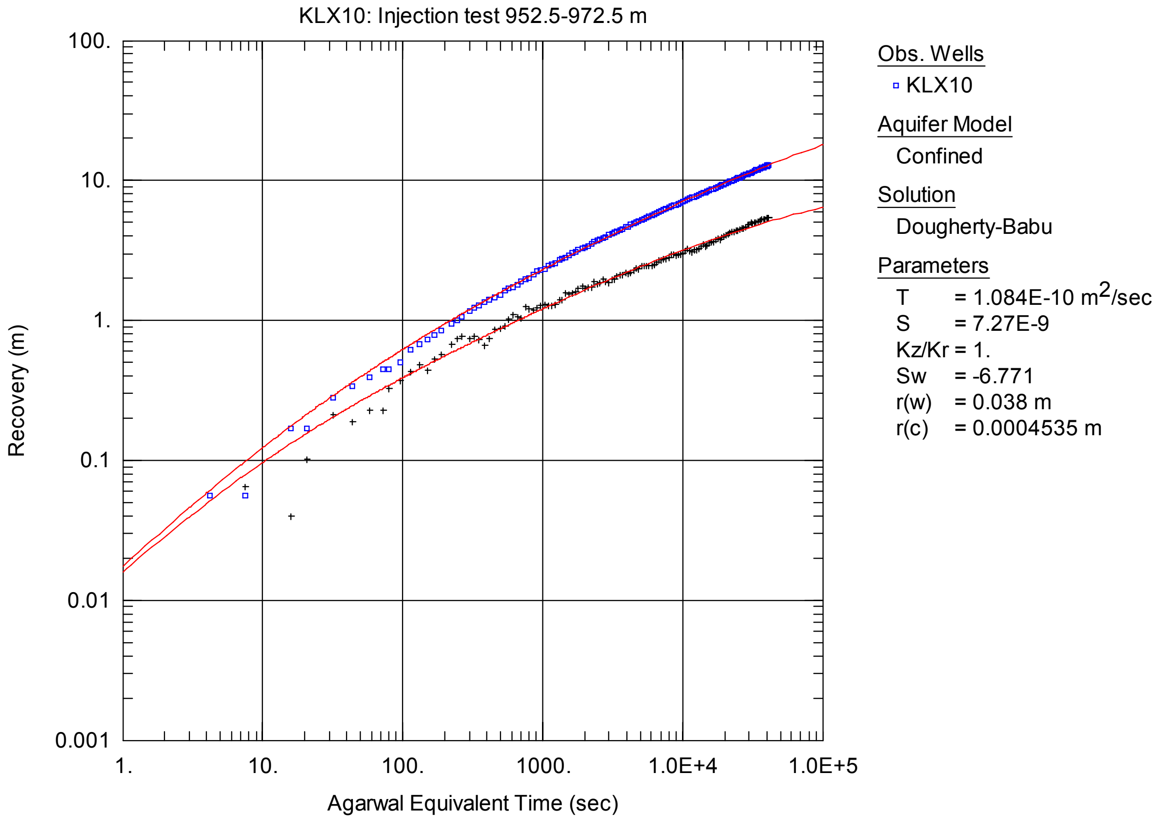


Figure A3-252. Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 952.5-972.5 m in KLX10.

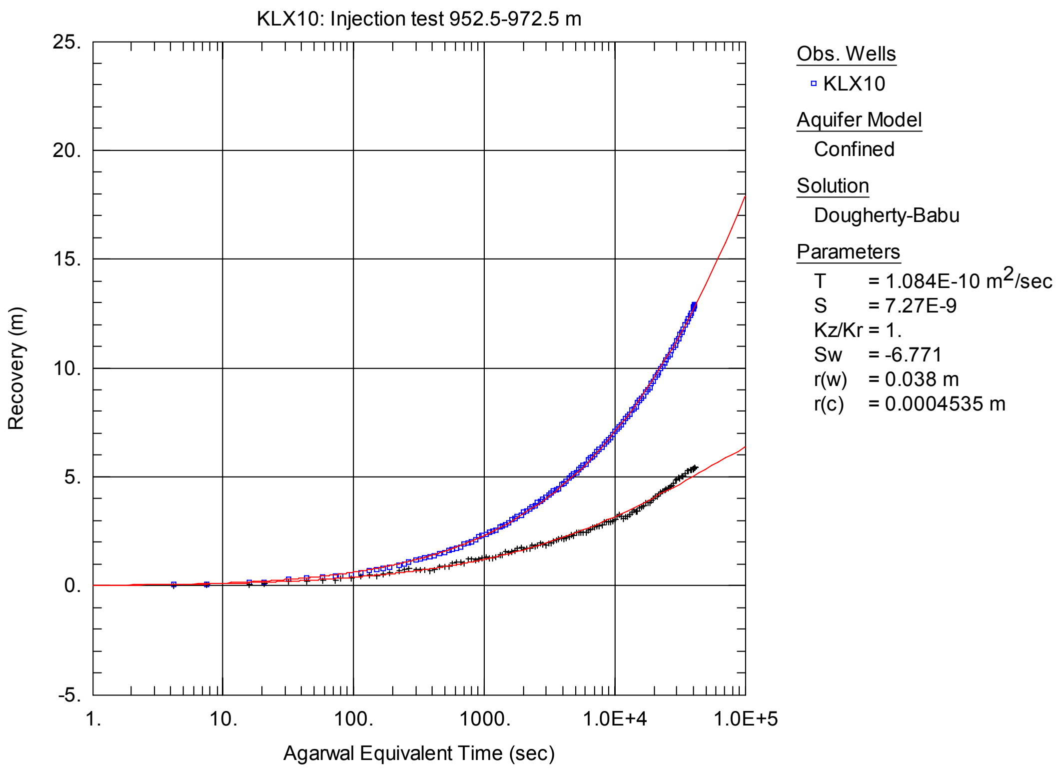


Figure A3-253. Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 952.5-972.5 m in KLX10.

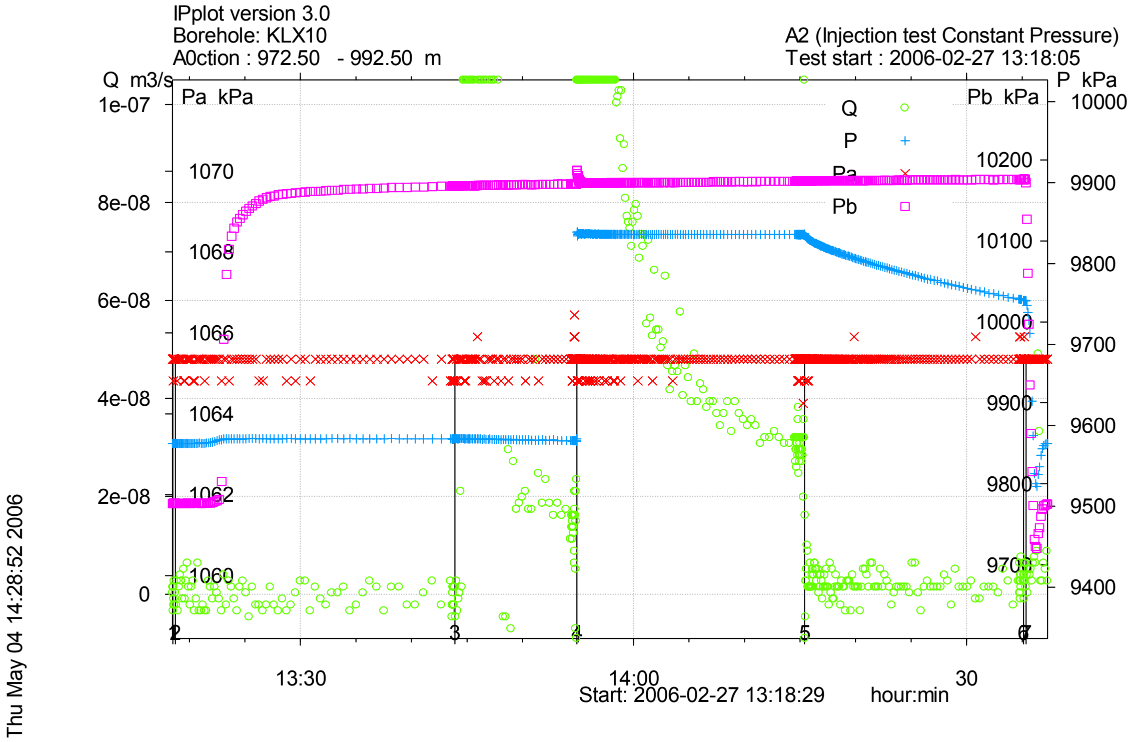


Figure A3-254. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 972.5-992.5 m in borehole KLX10.

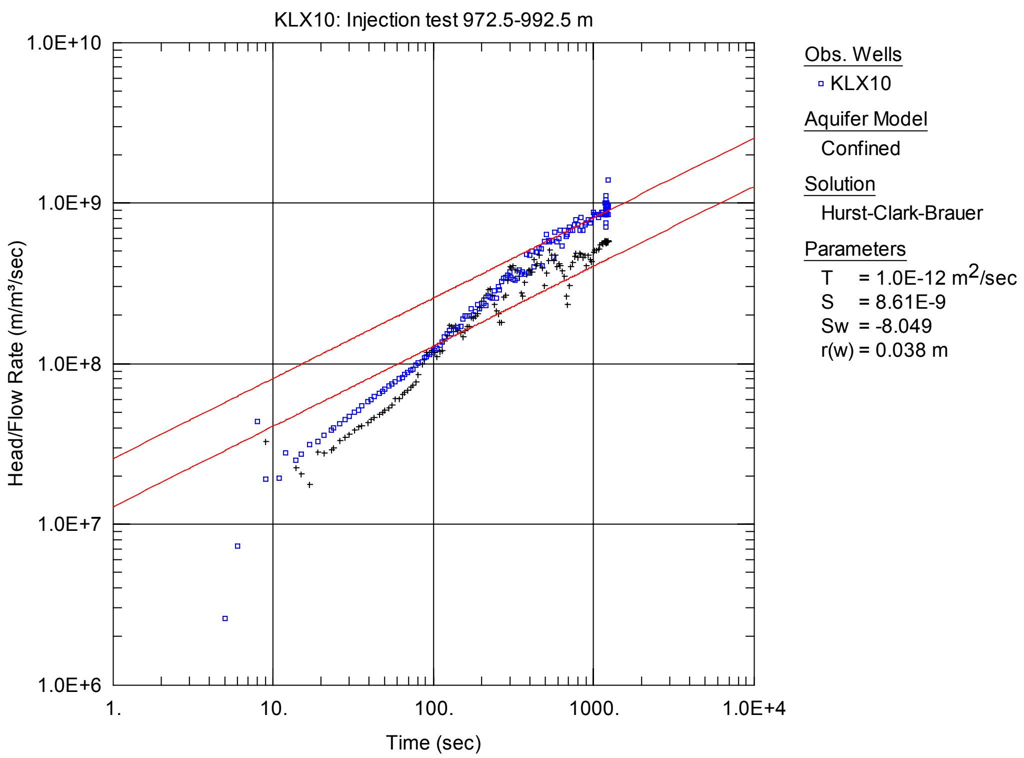


Figure A3-255. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 972.5-992.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.

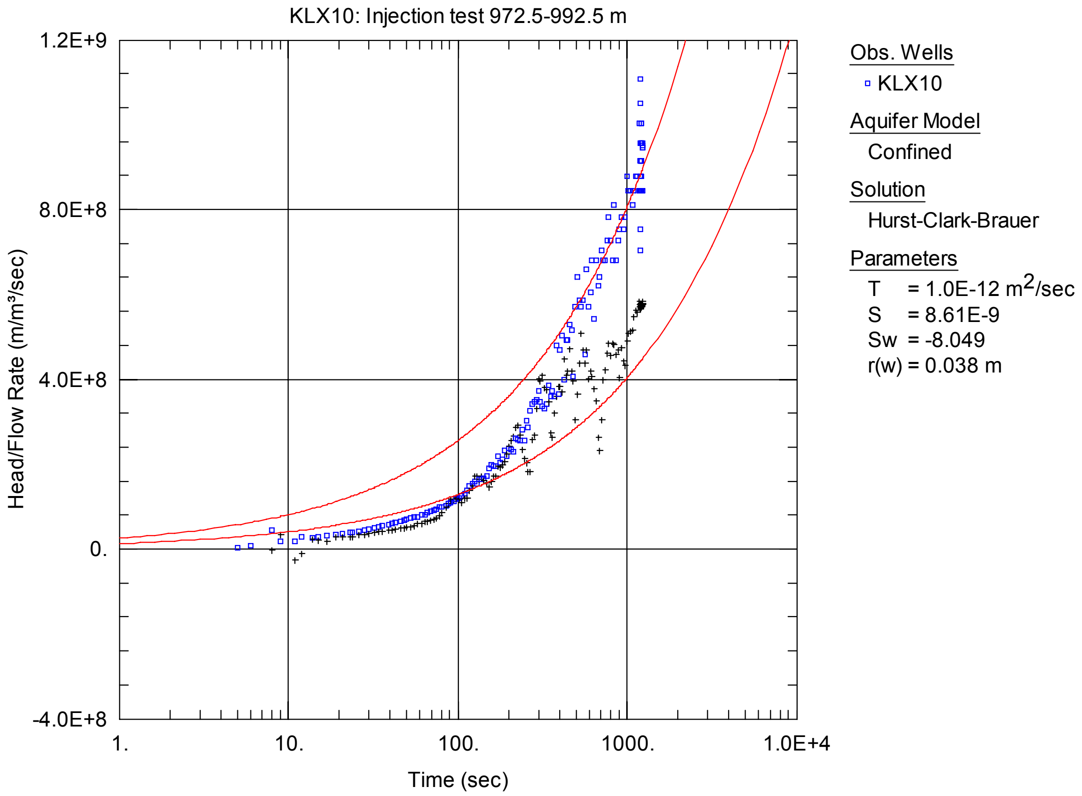


__Figure A3-256.__ Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 972.5-992.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.

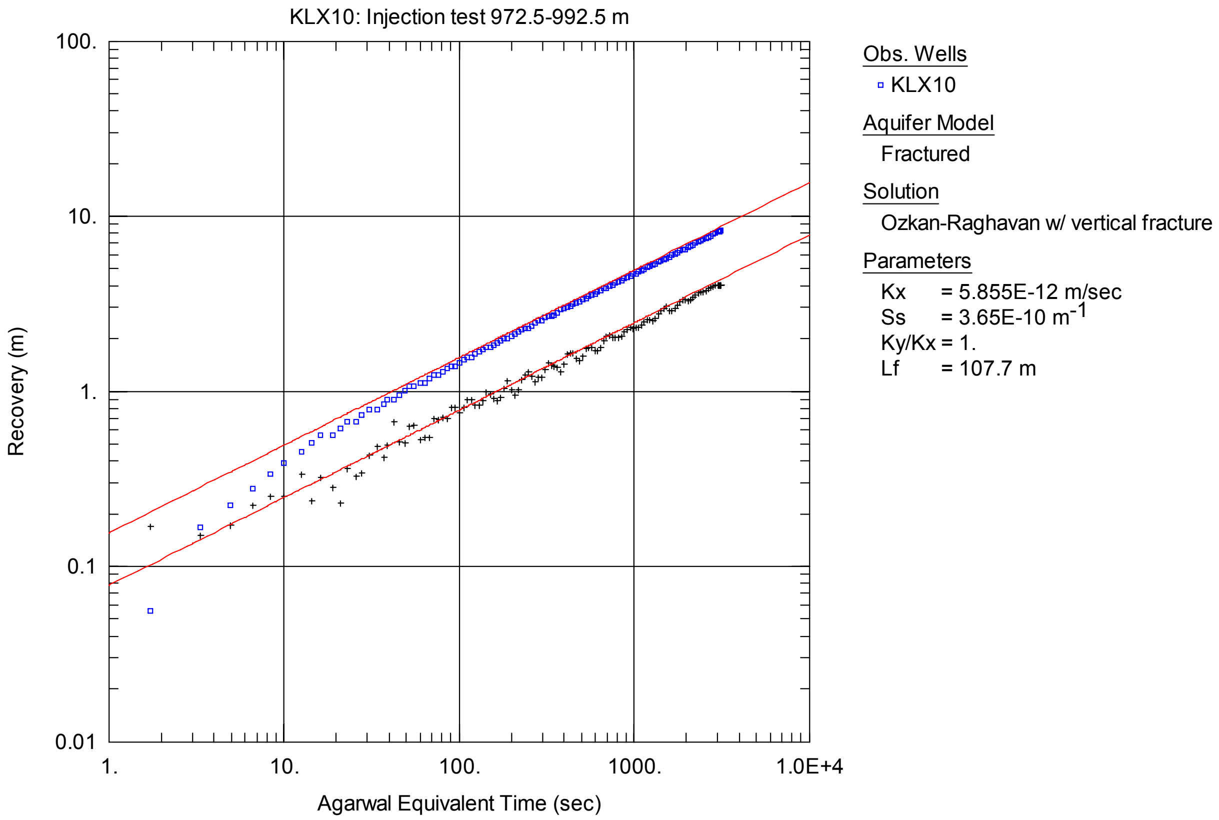


__Figure A3-257.__ Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 972.5-992.5 m in KLX10.

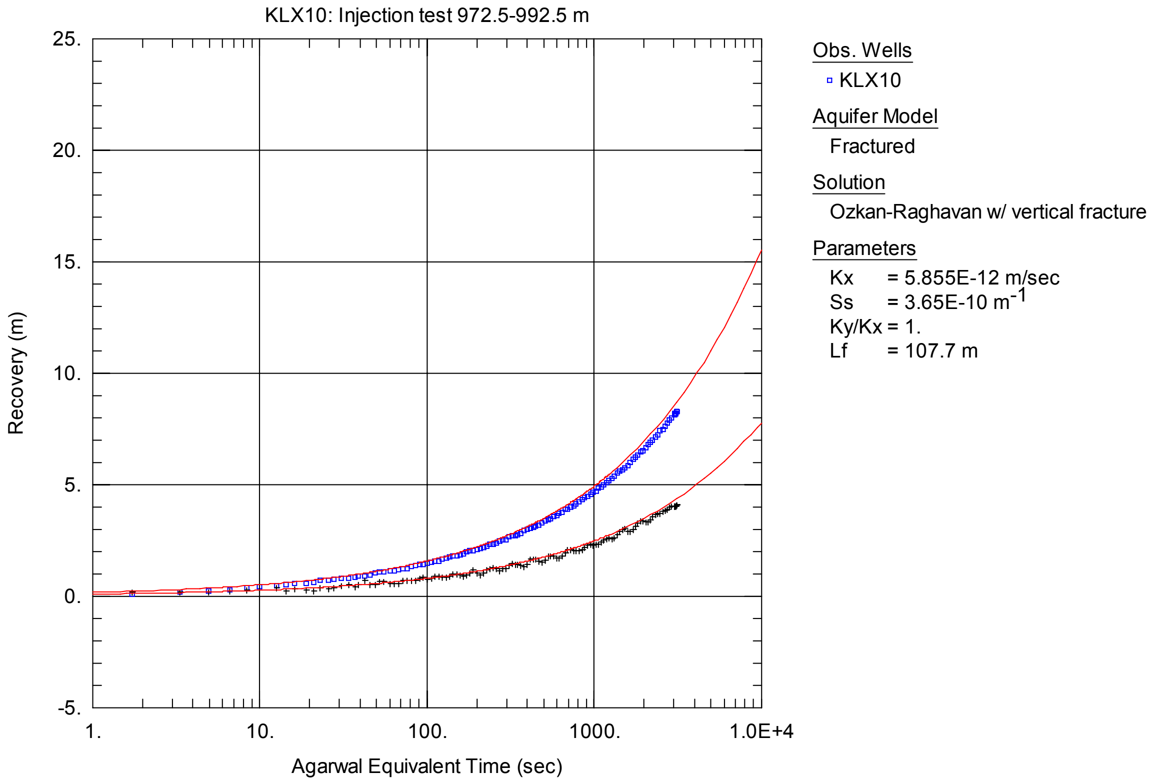


Figure A3-258. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 972.5-992.5 m in KLX10.*

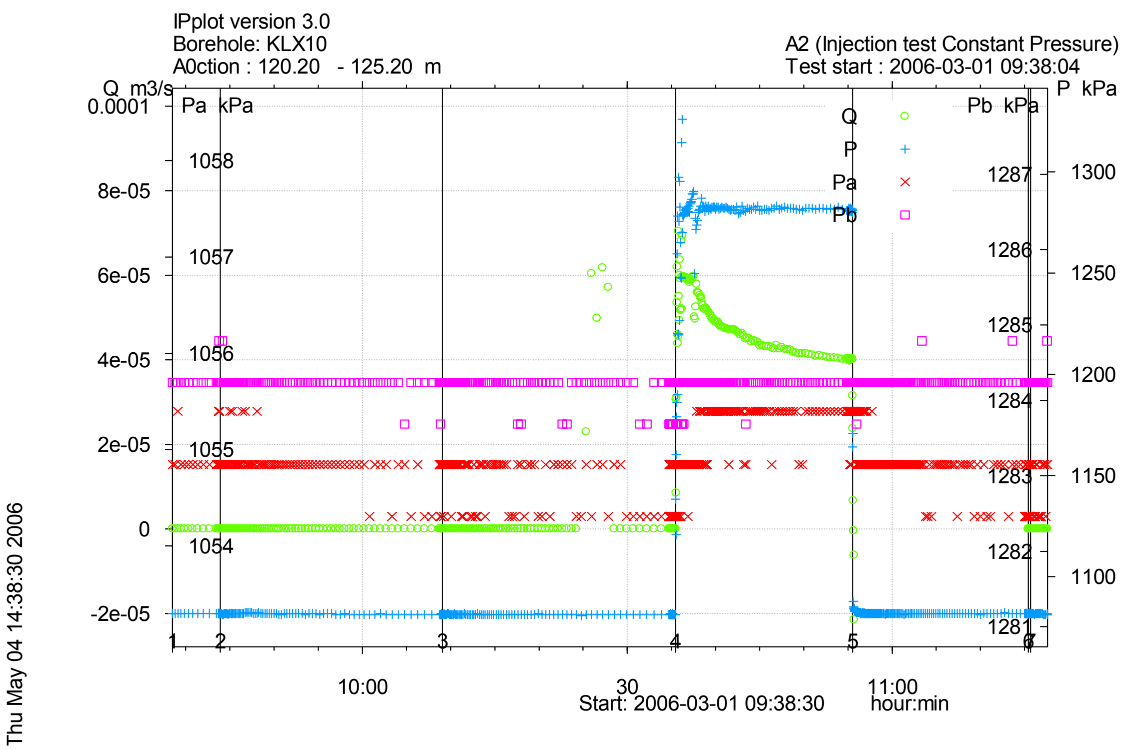


Figure A3-259. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 120.2-125.2 m in borehole KLX10.*

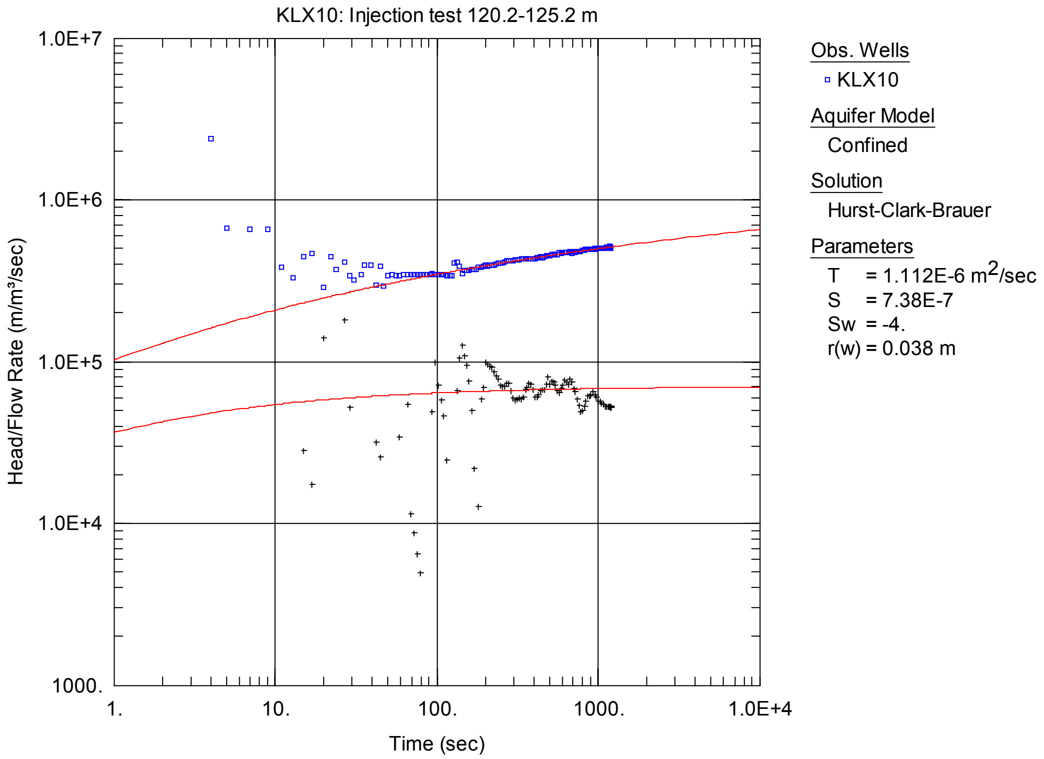


Figure A3-260. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 120.2-125.2 m in KLX10.*

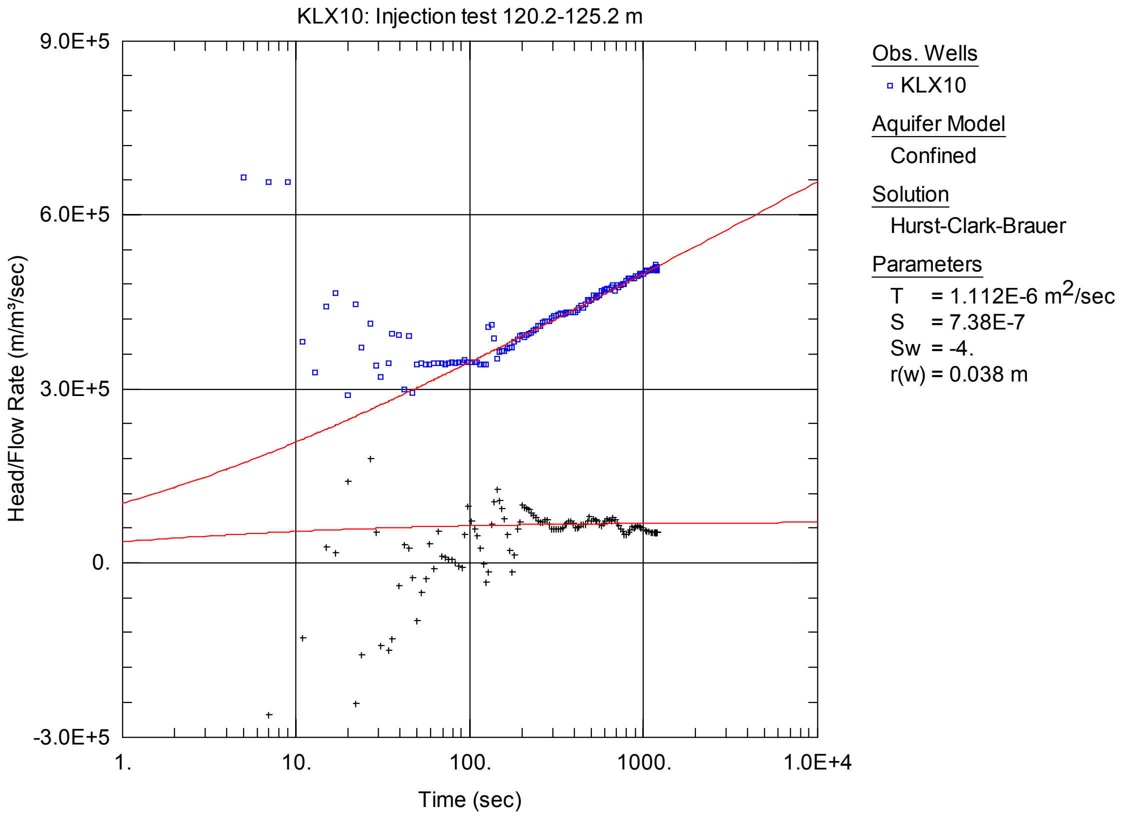


Figure A3-261. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 120.2-125.2 m in KLX10.*

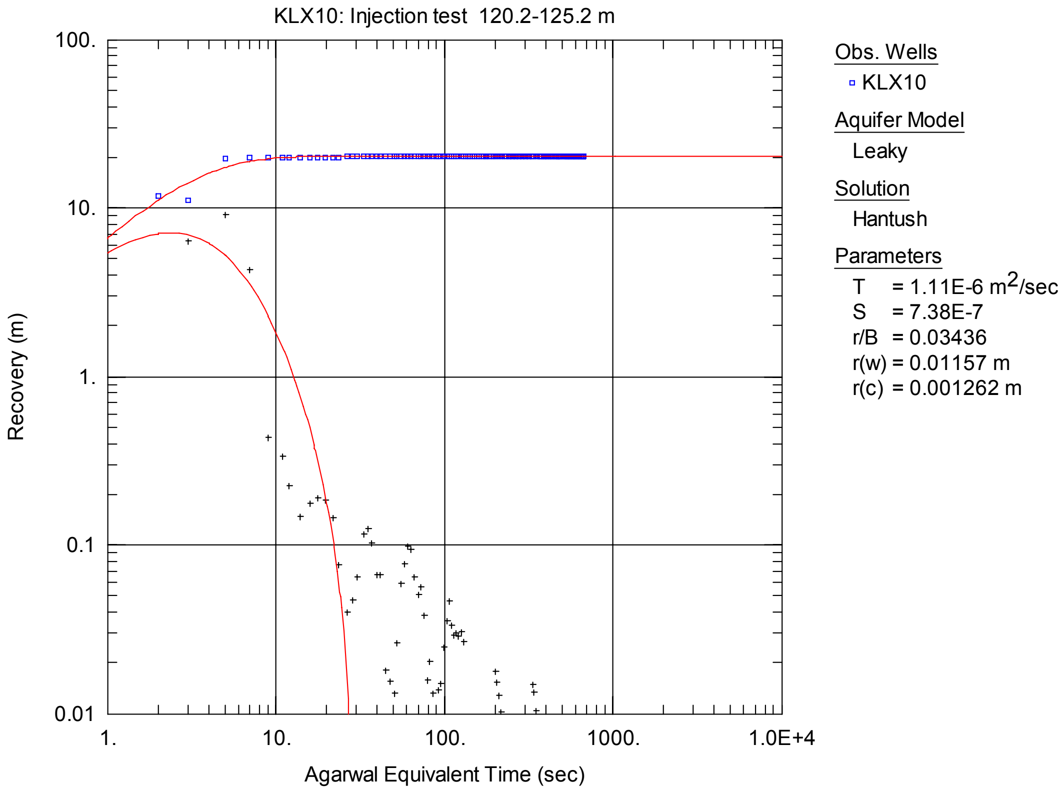


Figure A3-262. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 120.2-125.2 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

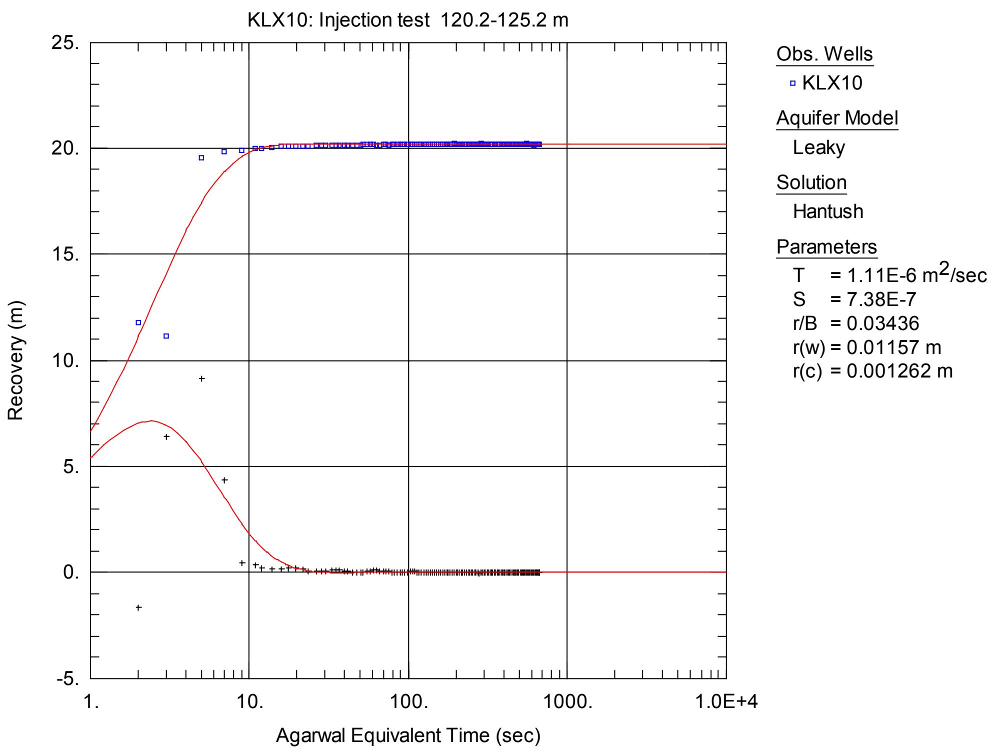


Figure A3-263. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 120.2-125.2 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

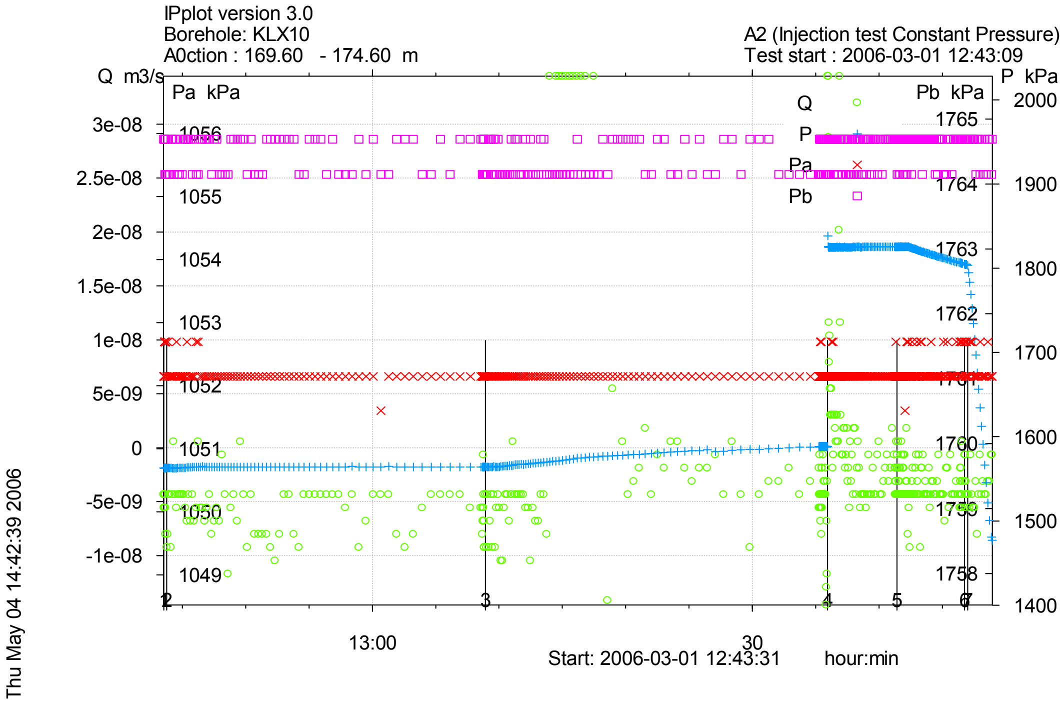


Figure A3-264. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 169.6-174.6 m in borehole KLX10.*

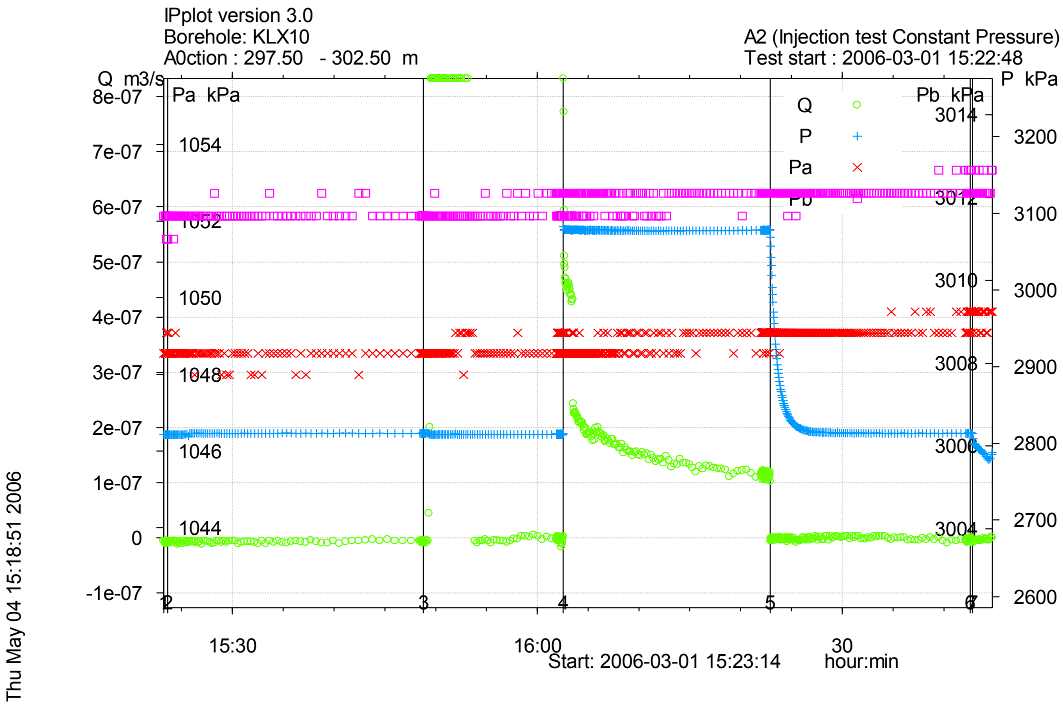


Figure A3-265. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 297.5-302.5 m in borehole KLX10.*

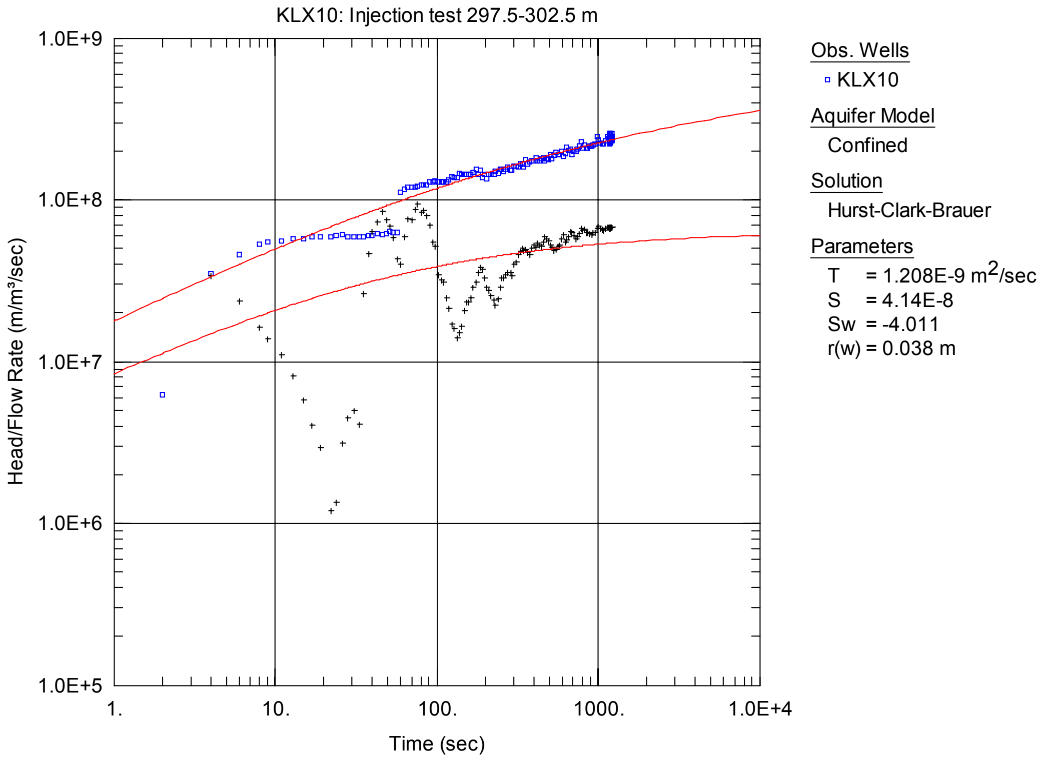


Figure A3-266. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 297.5-302.5 m in KLX10.*

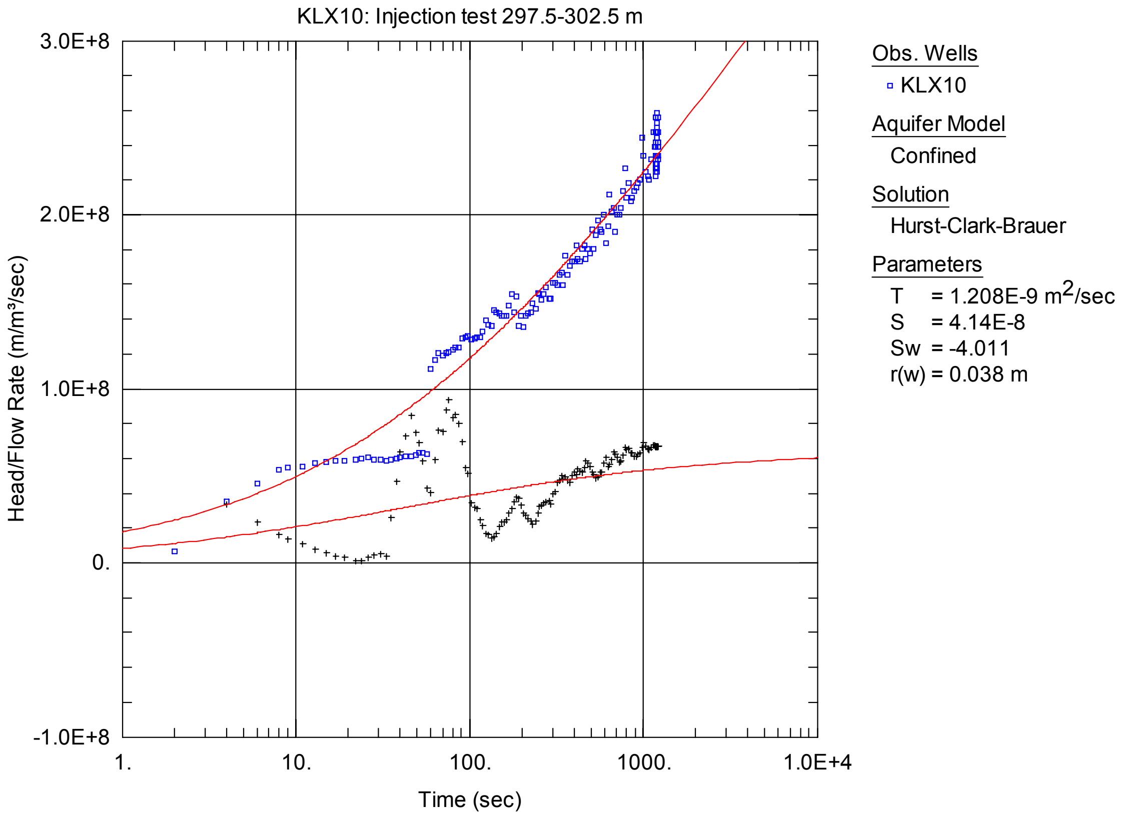


Figure A3-267. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 297.5-302.5 m in KLX10.*

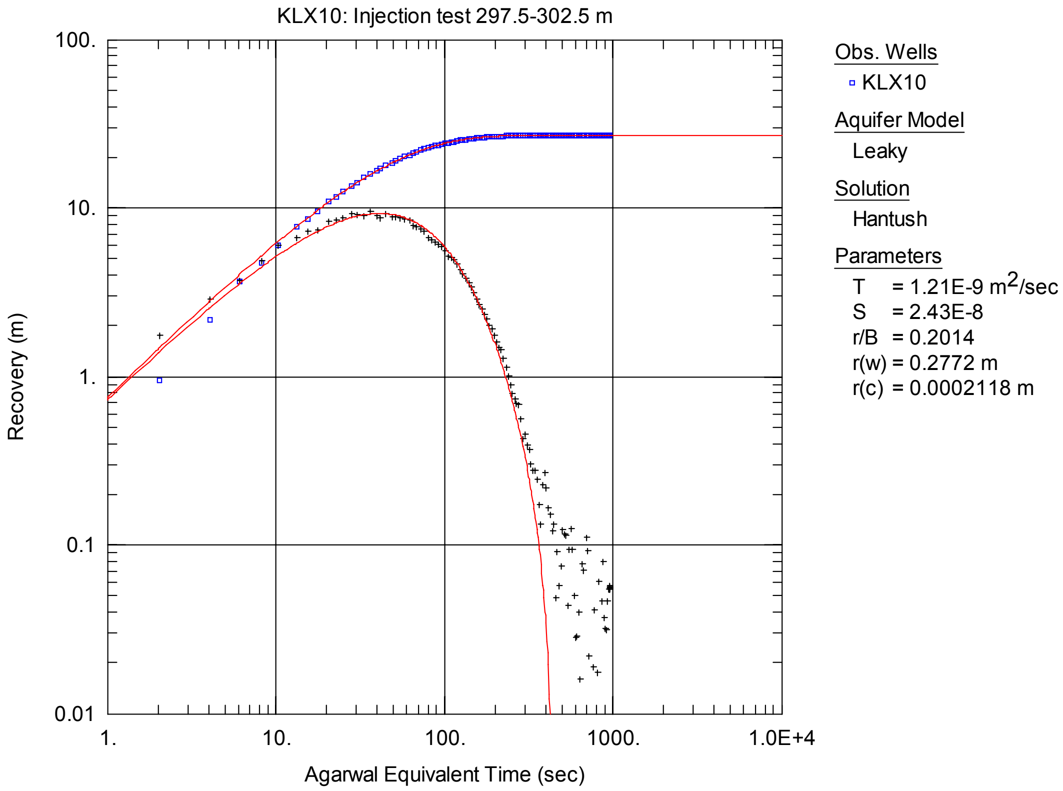


Figure A3-268. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 297.5-302.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

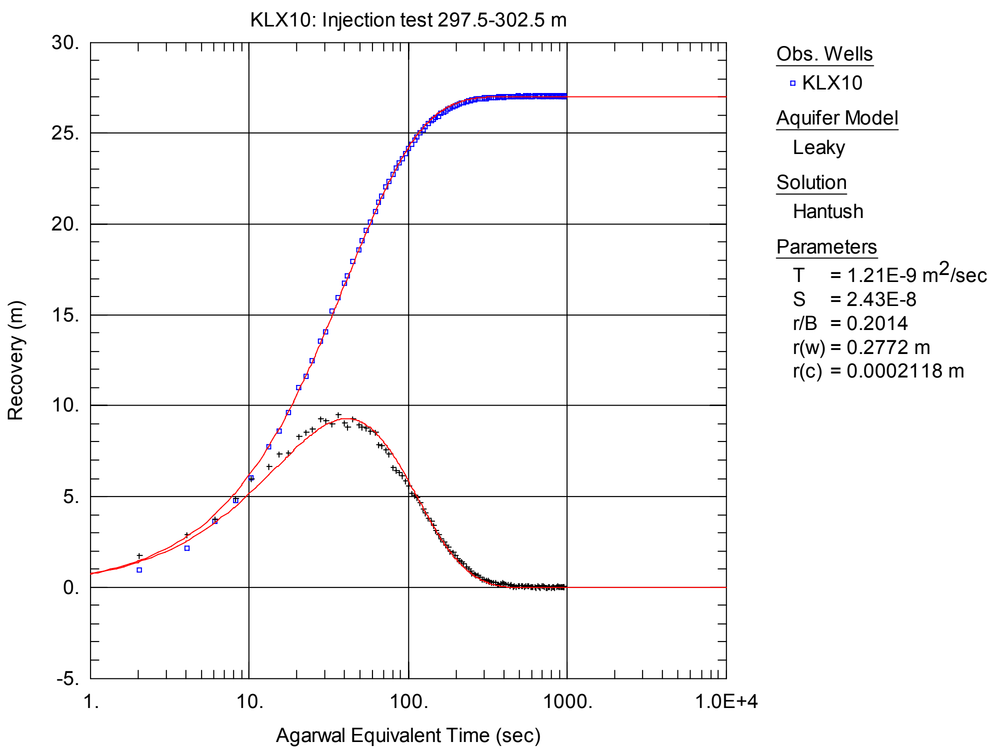


Figure A3-269. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 297.5-302.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

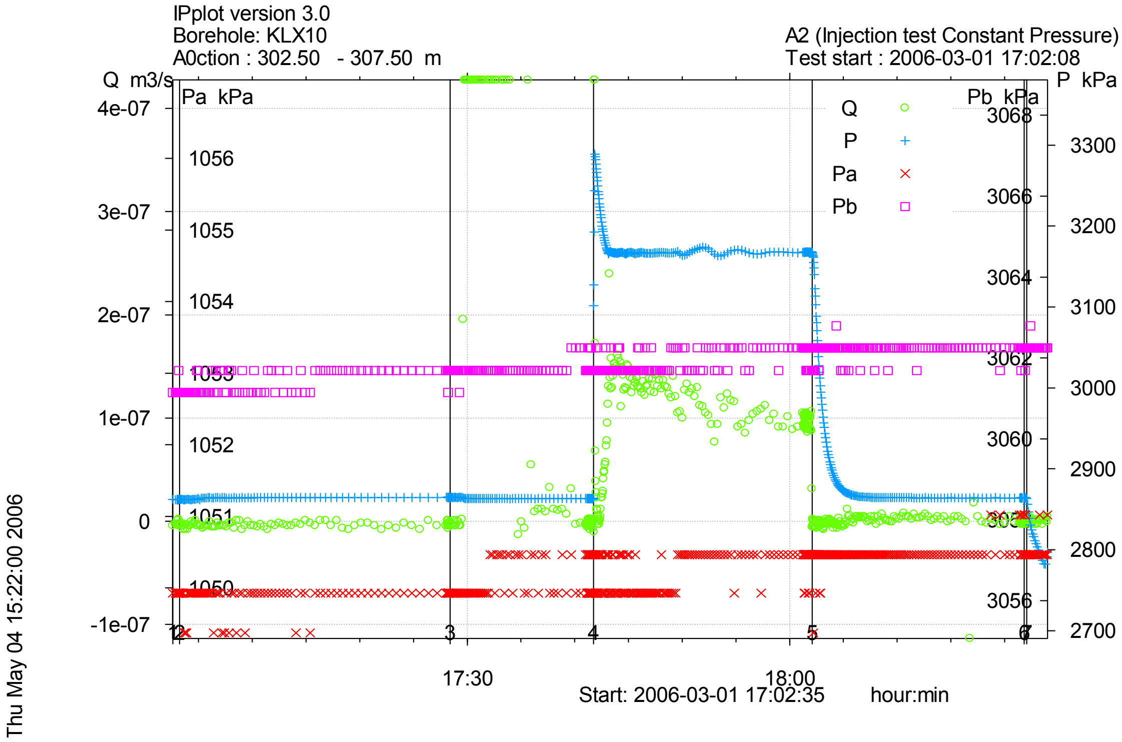


Figure A3-270. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 302.5-307.5 m in borehole KLX10.

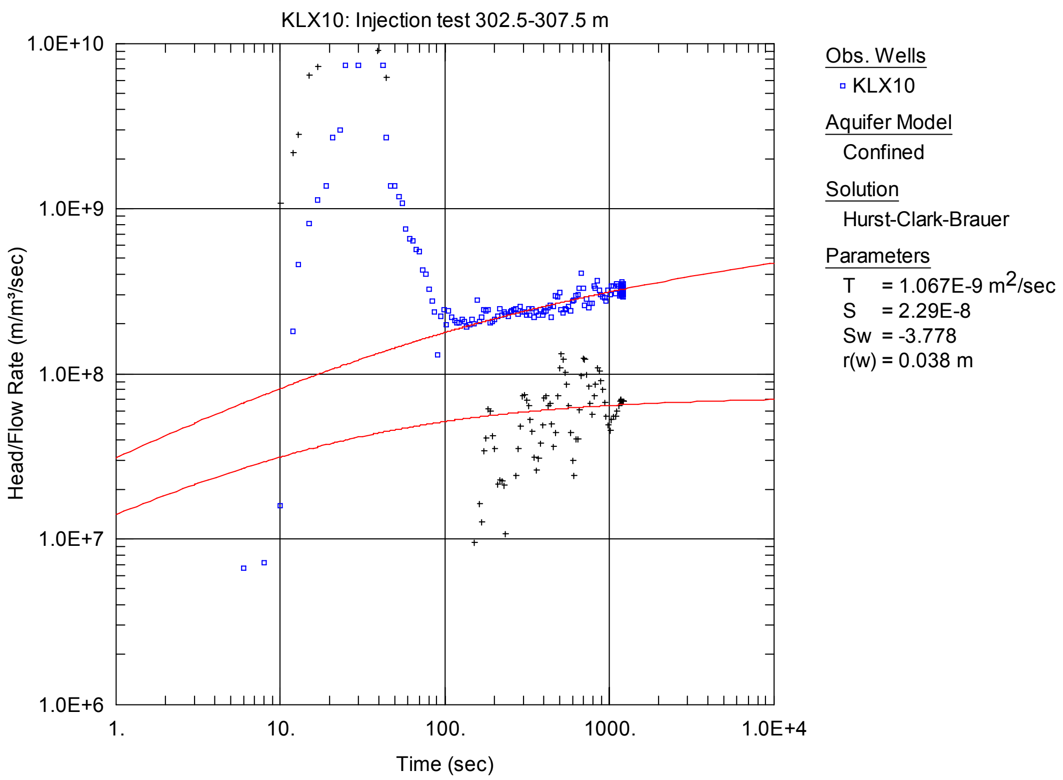


Figure A3-271. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 302.5-307.5 m in KLX10.

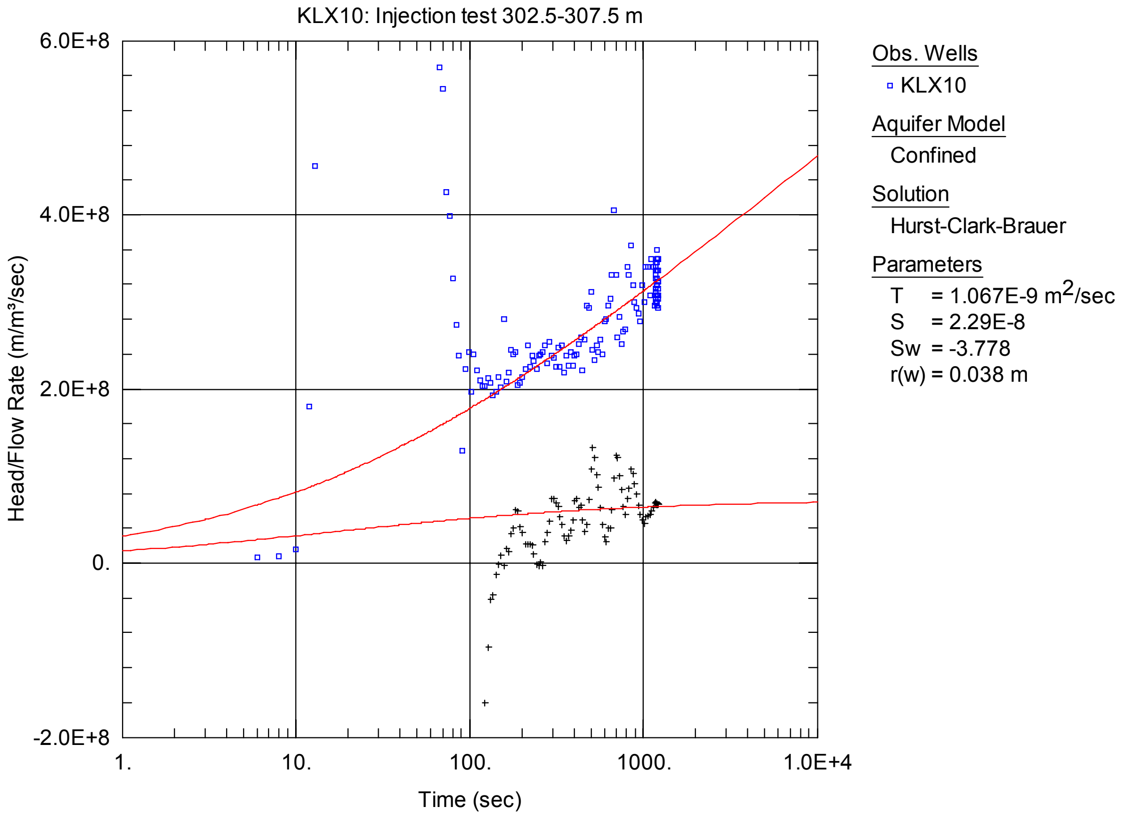


Figure A3-272. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 302.5-307.5 m in KLX10.*

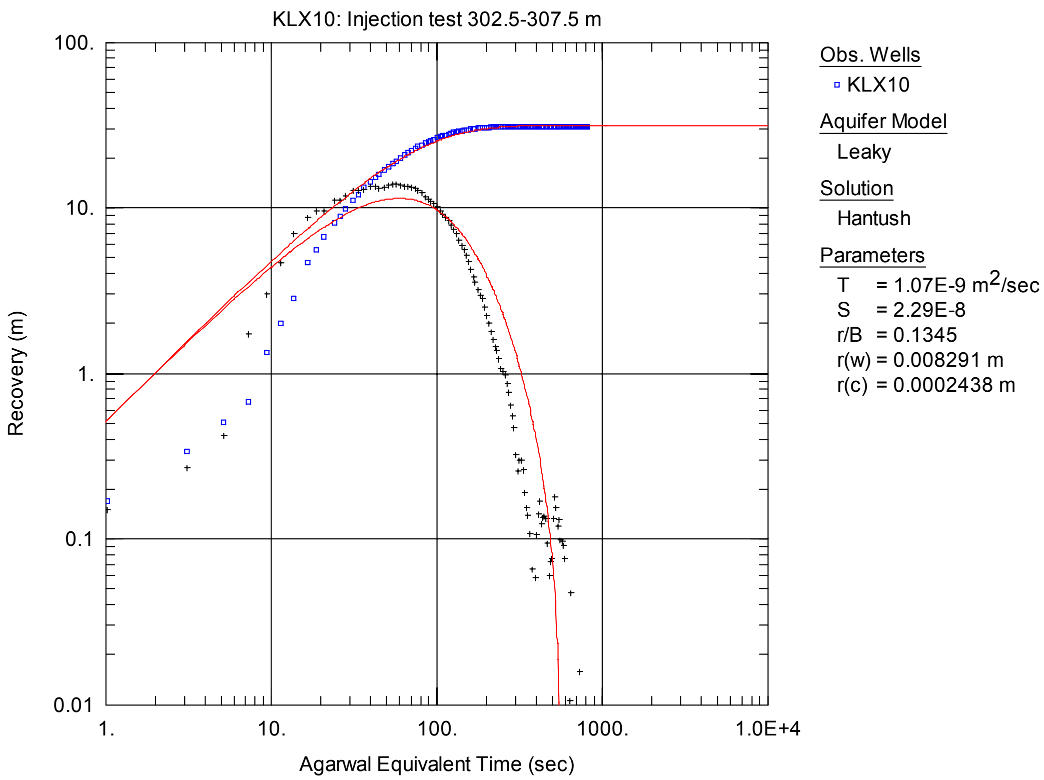


Figure A3-273. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 302.5-307.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

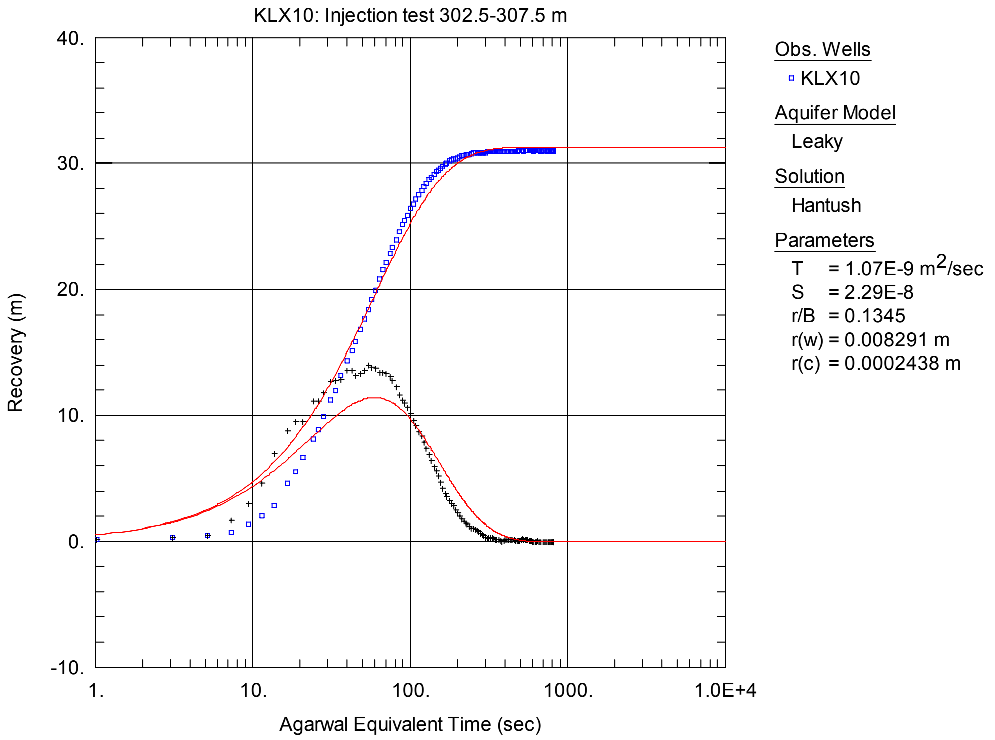


Figure A3-274. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 302.5-307.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

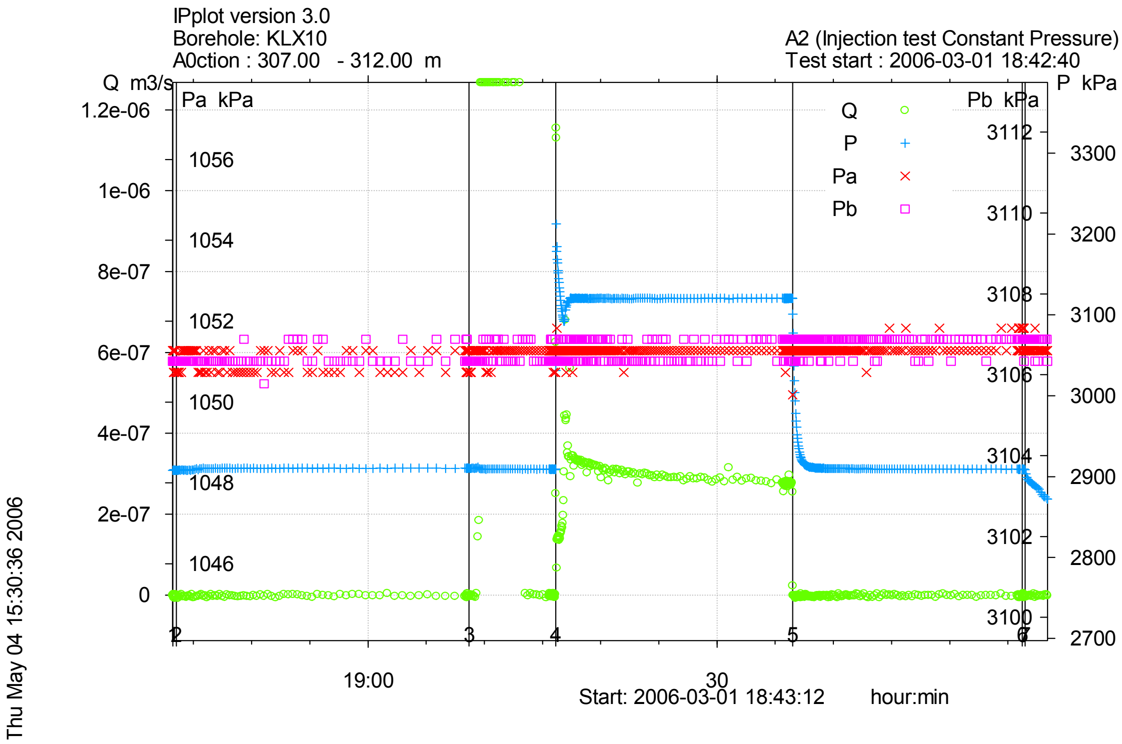


Figure A3-275. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 307.0-312.0 m in borehole KLX10.*

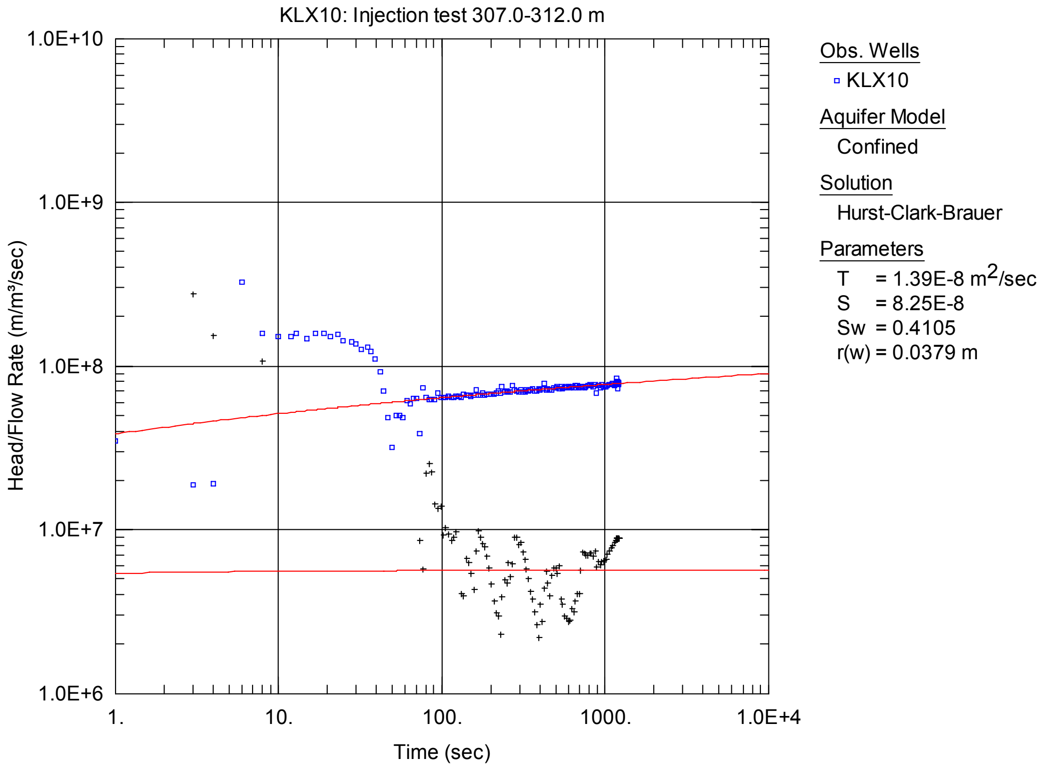


Figure A3-276. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 307.0-312.0 m in KLX10.*

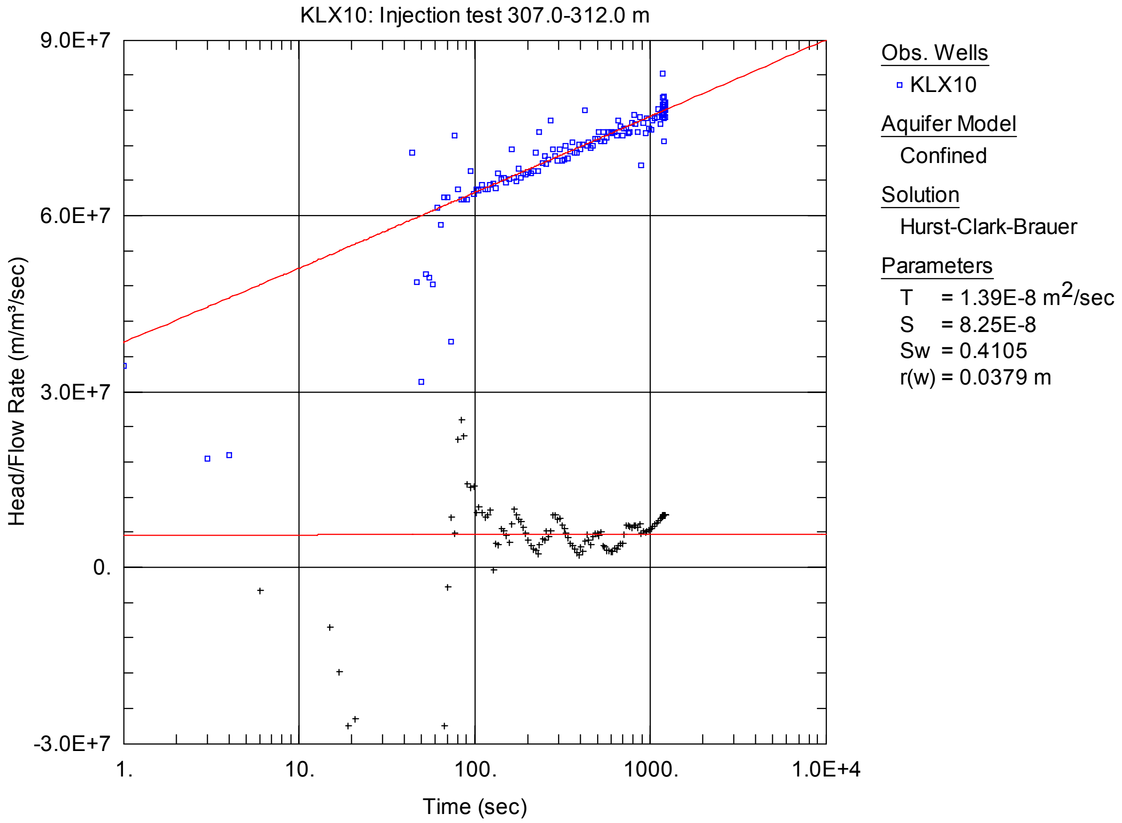


Figure A3-277. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 307.0-312.0 m in KLX10.*

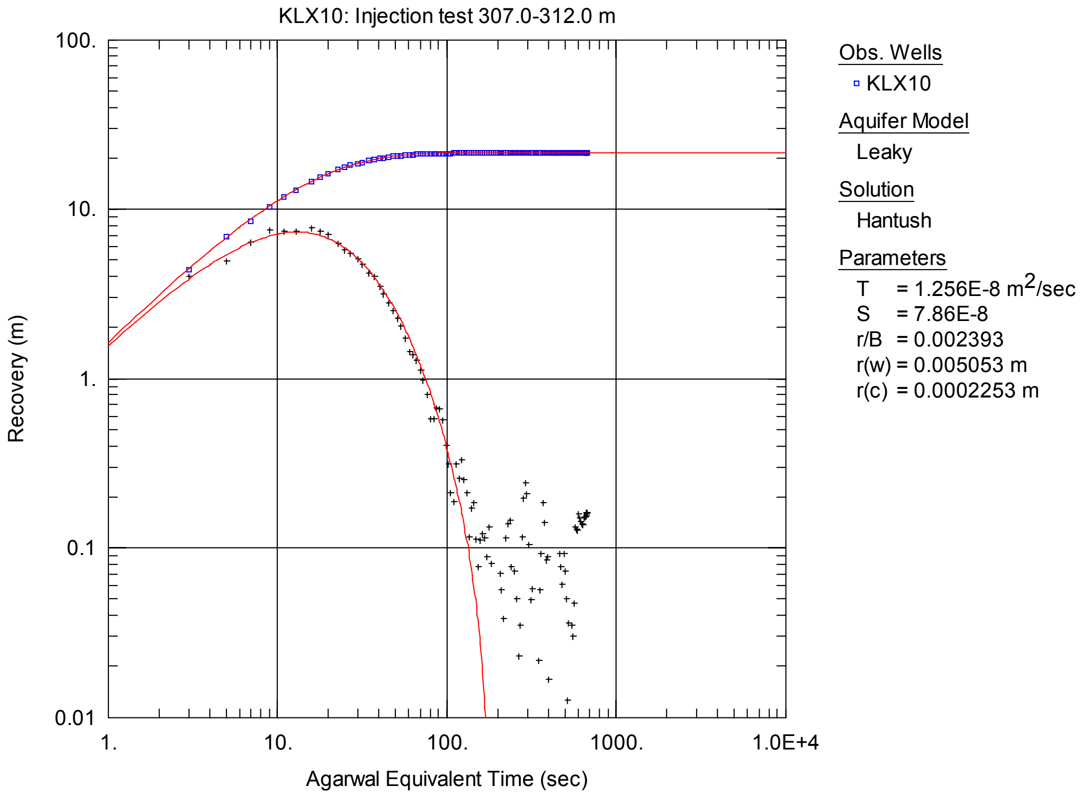


Figure A3-278. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 307.0-312.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

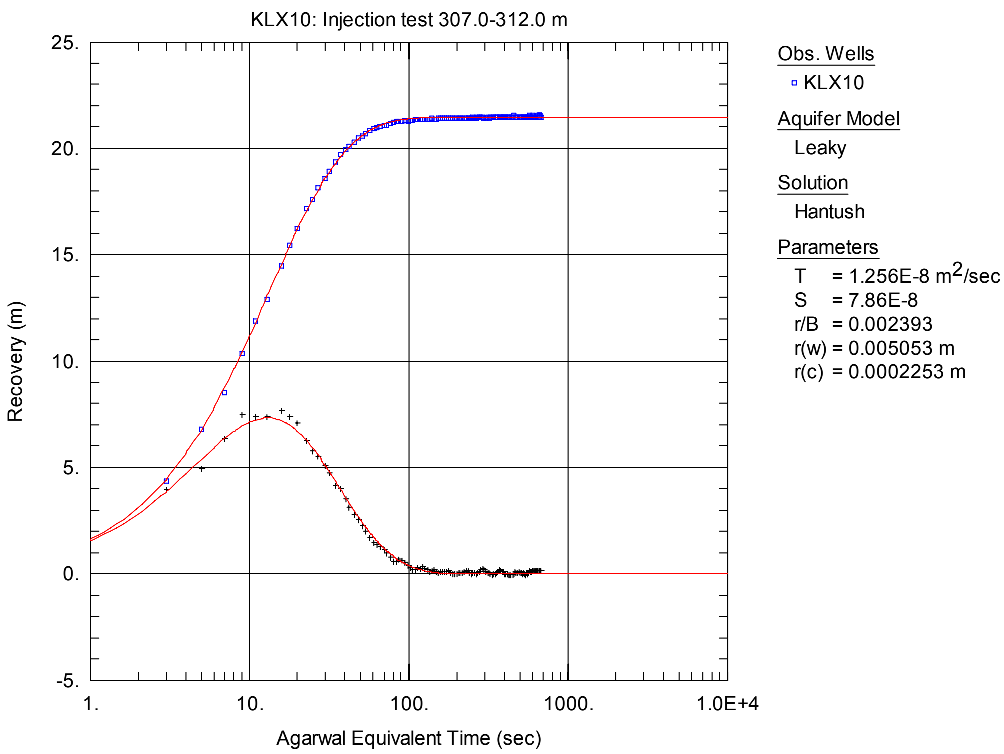


Figure A3-279. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 307.0-312.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

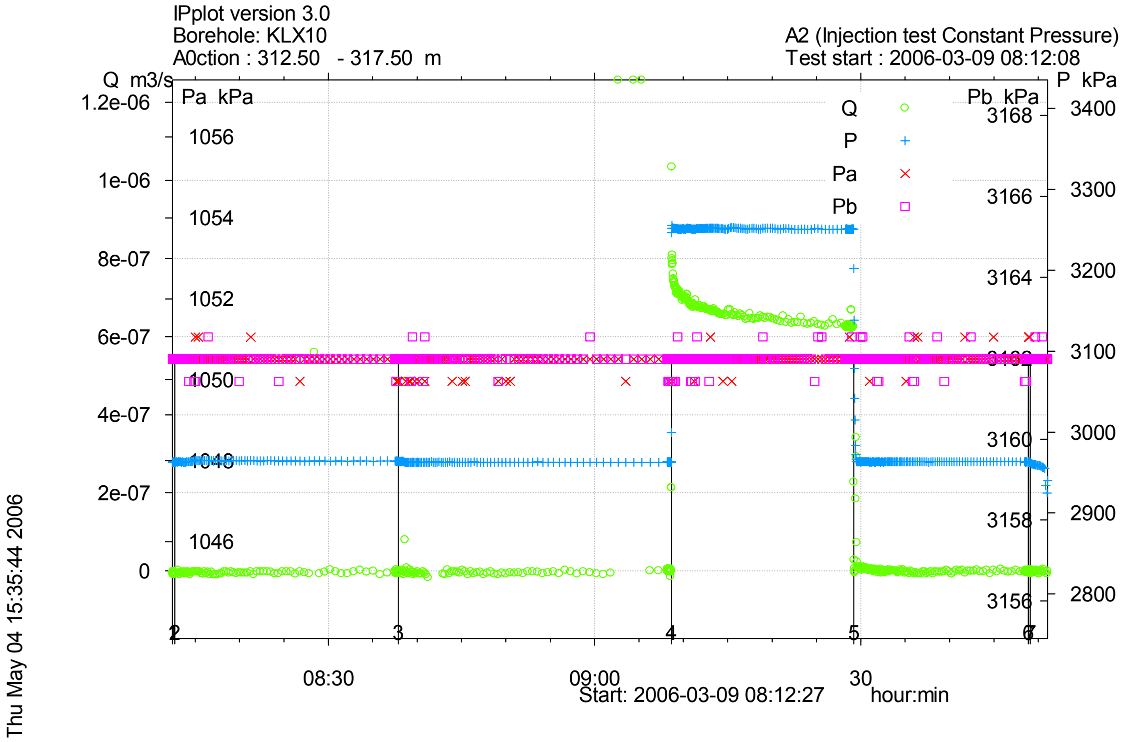


Figure A3-280. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 312.5-317.5 m in borehole KLX10.*

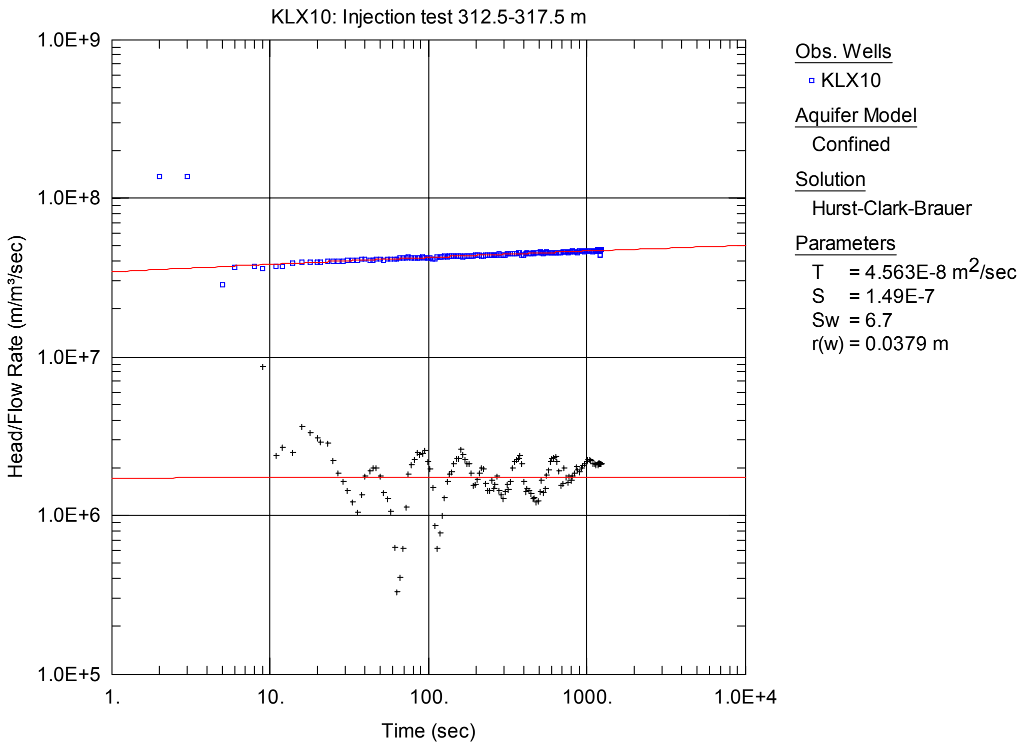


Figure A3-281. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 312.5-317.5 m in KLX10.*

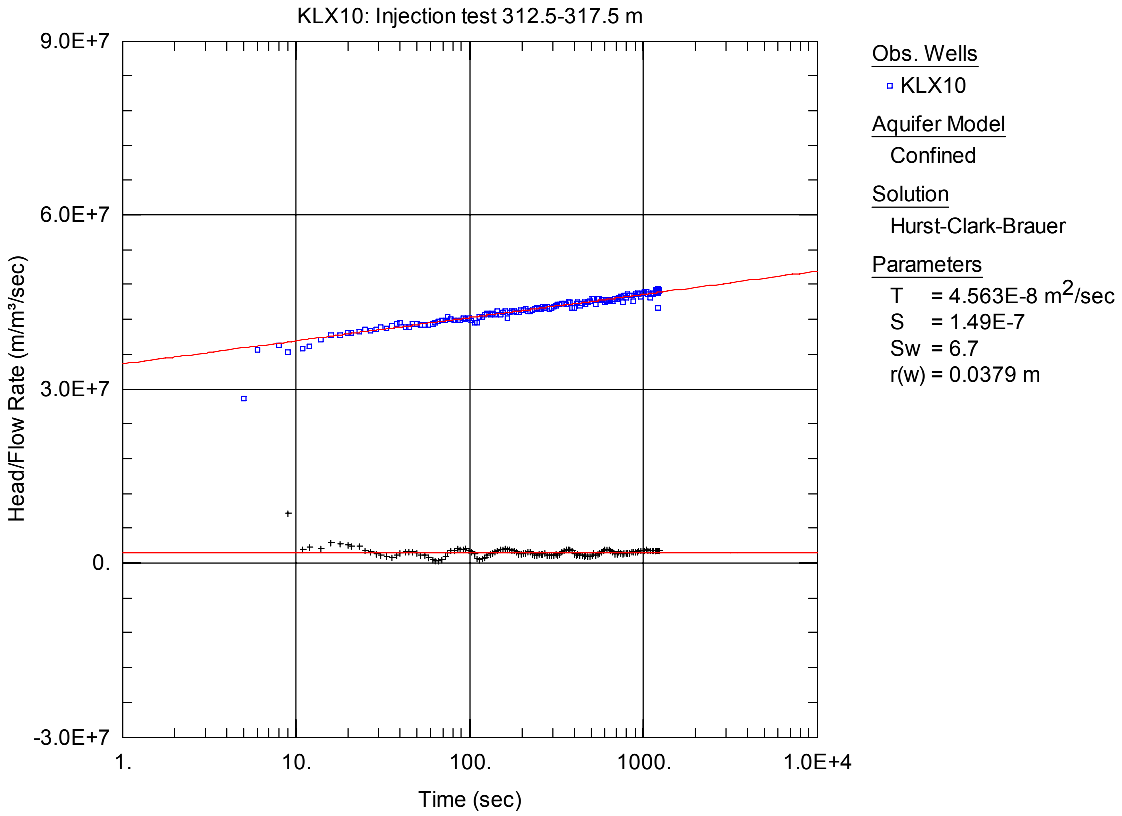


Figure A3-282. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 312.5-317.5 m in KLX10.*

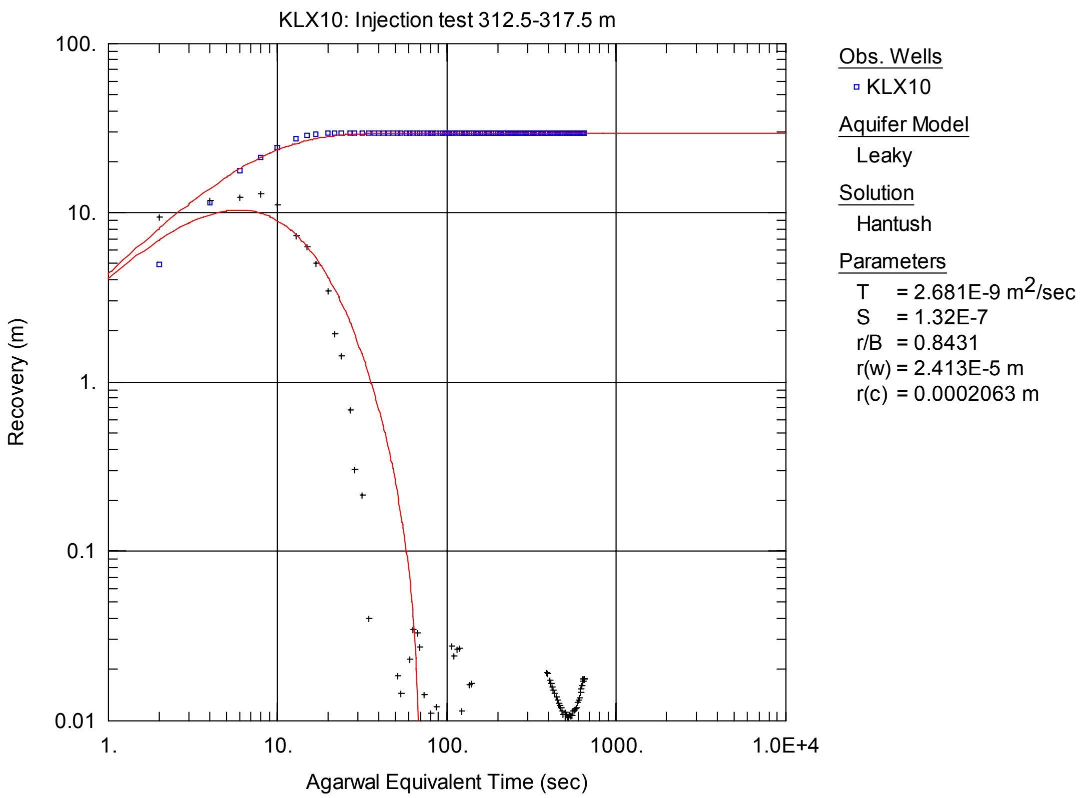


Figure A3-283. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 312.5-317.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

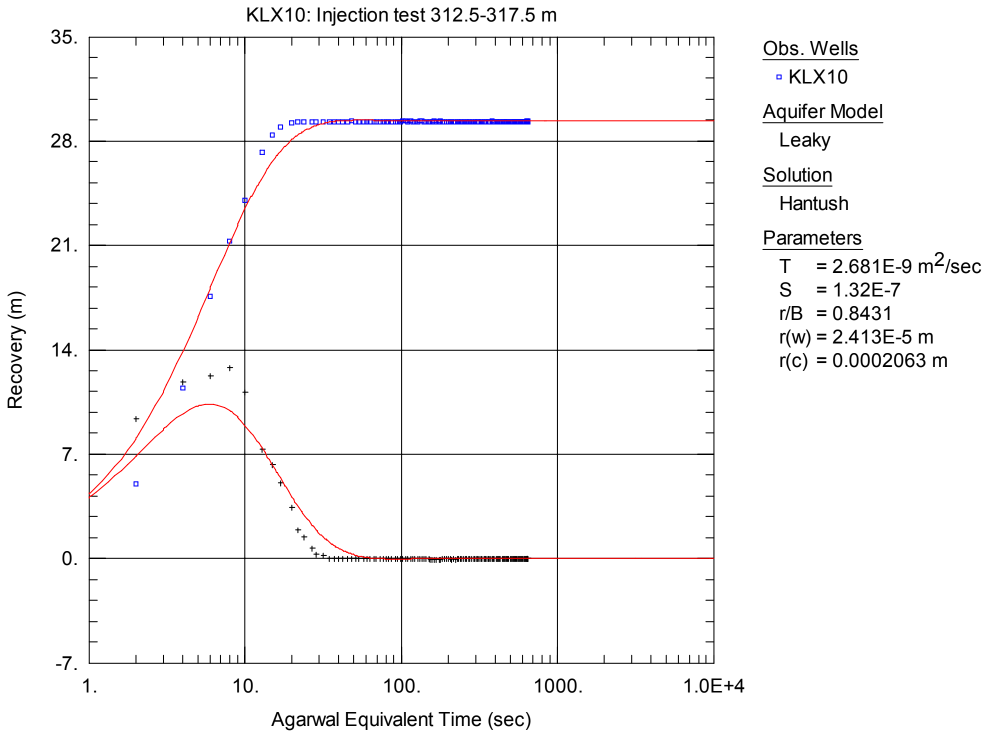


***Figure A3-284.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 312.5-317.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

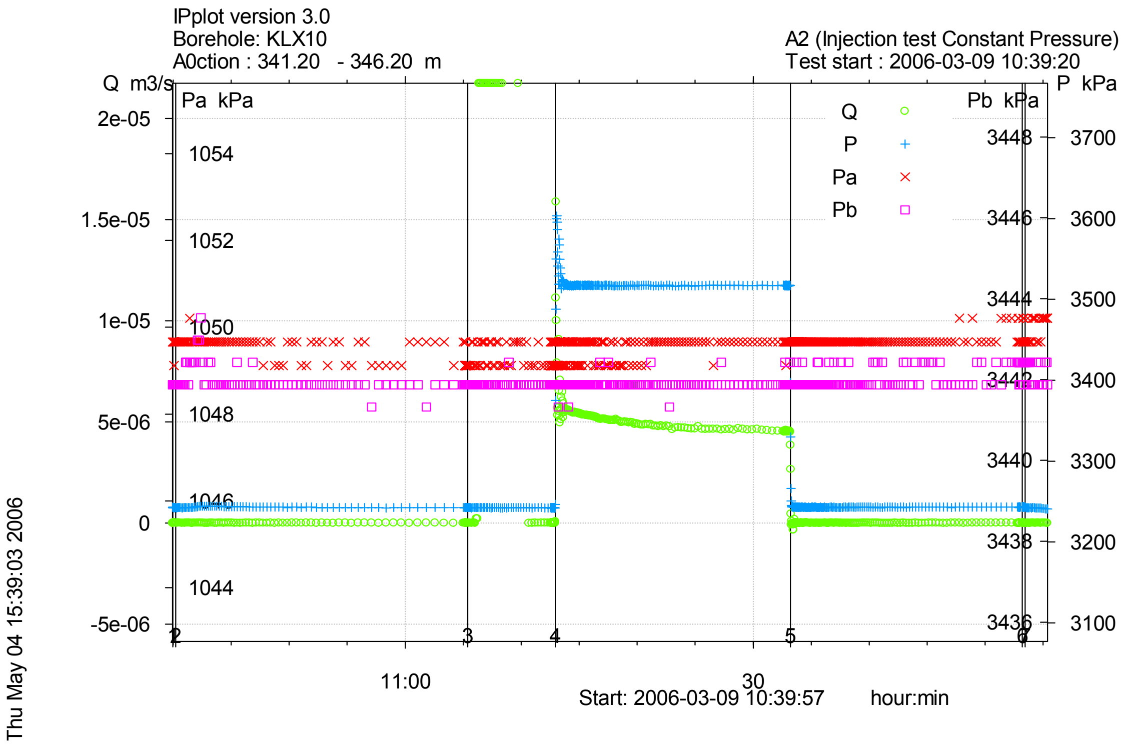


***Figure A3-285.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 341.2-346.2 m in borehole KLX10.*

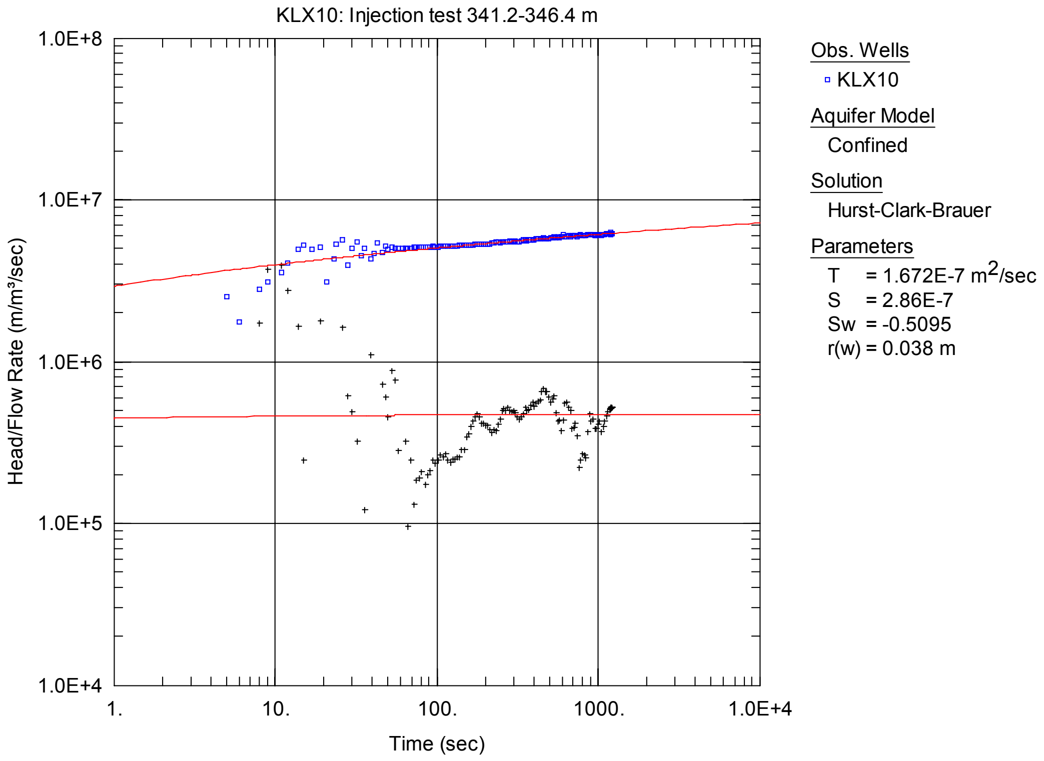


***Figure A3-286.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 341.2-346.2 m in KLX10.*

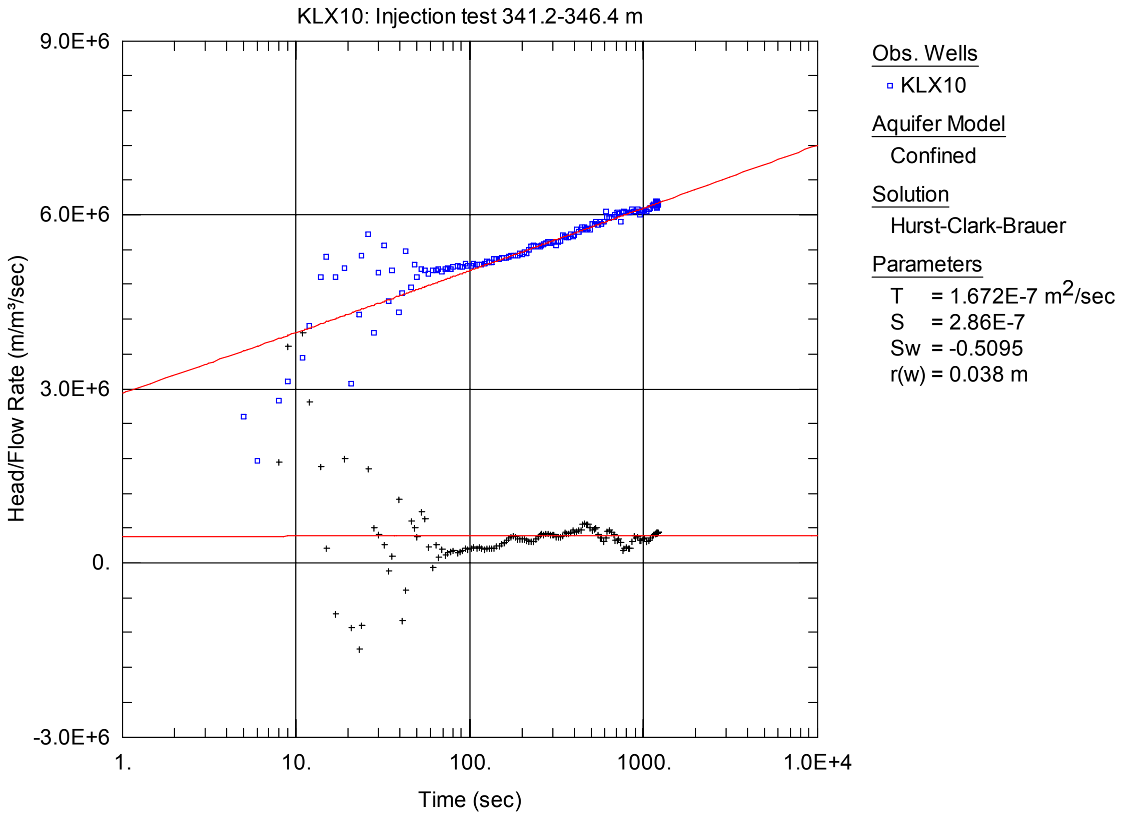


***Figure A3-287.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 341.2-346.2 m in KLX10.*

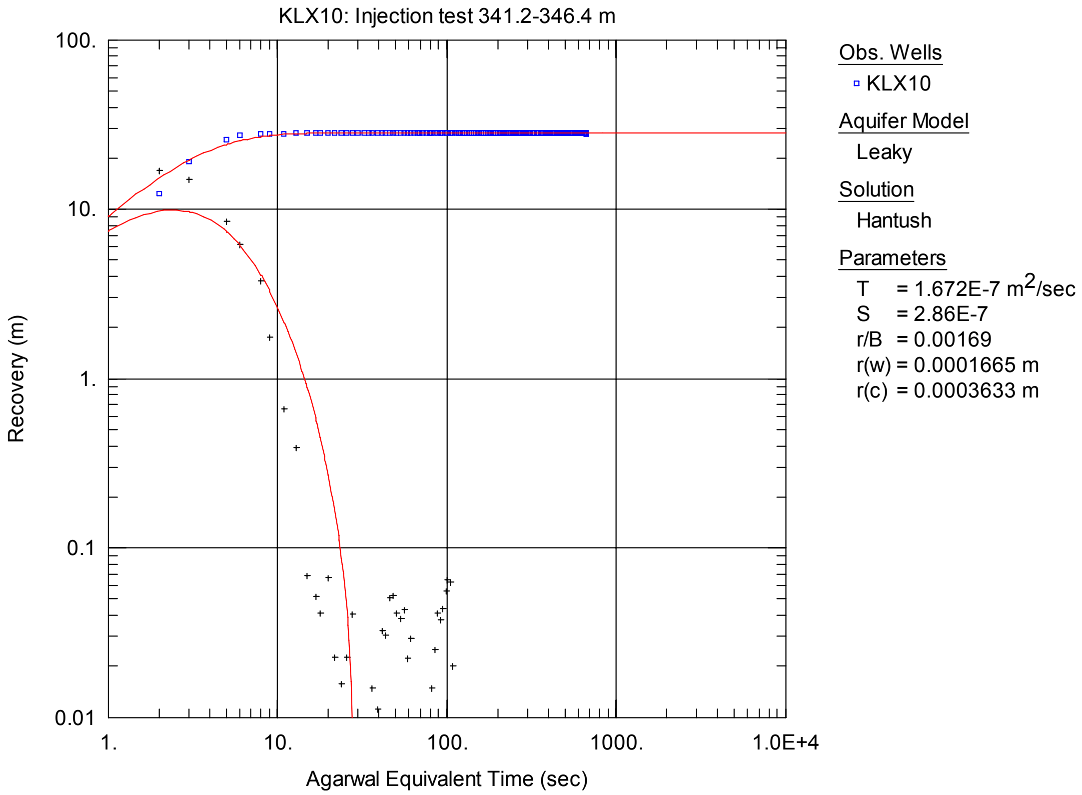


***Figure A3-288.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 341.2-346.2 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

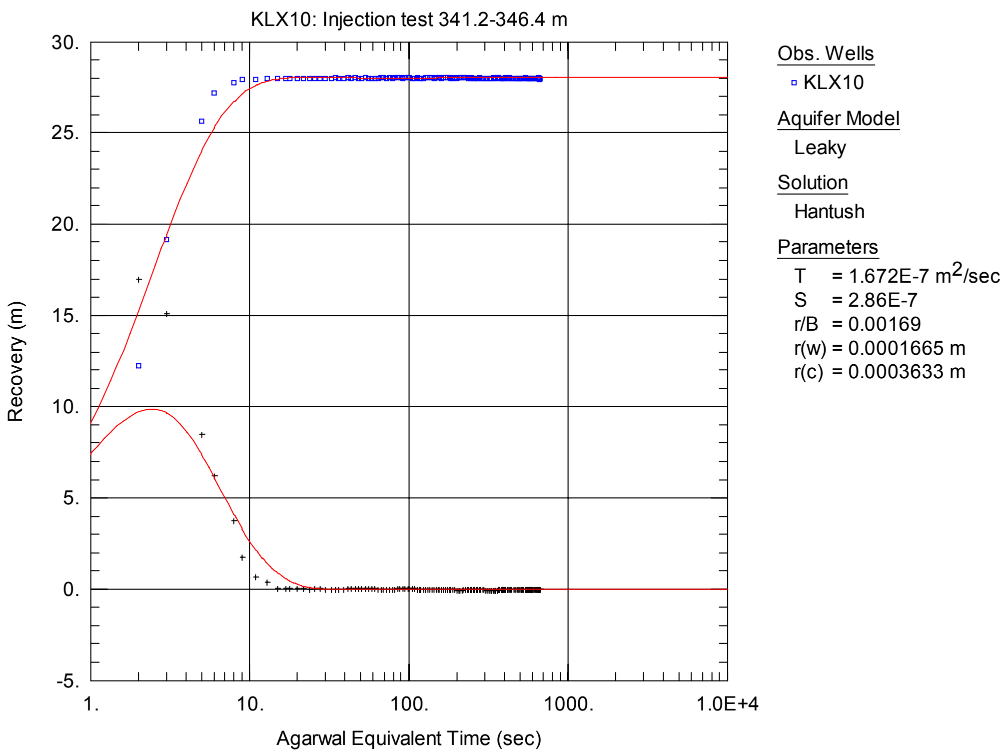


***Figure A3-289.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 341.2-346.2 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

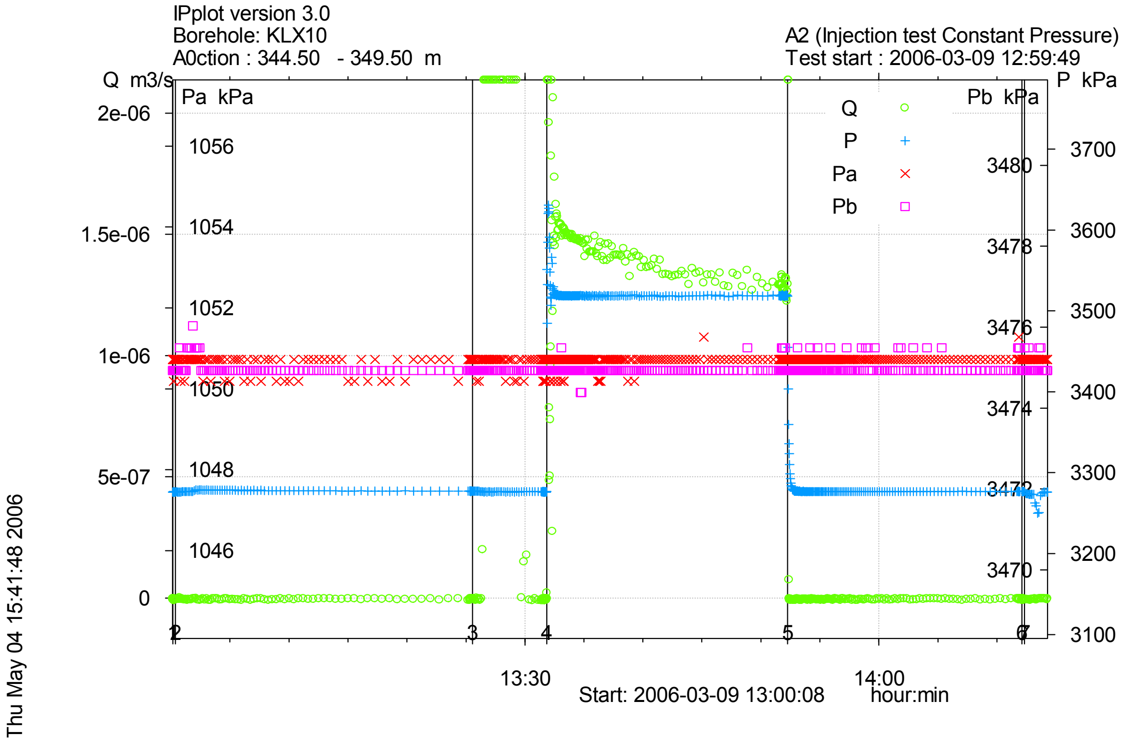


Figure A3-290. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 344.5-349.5 m in borehole KLX10.

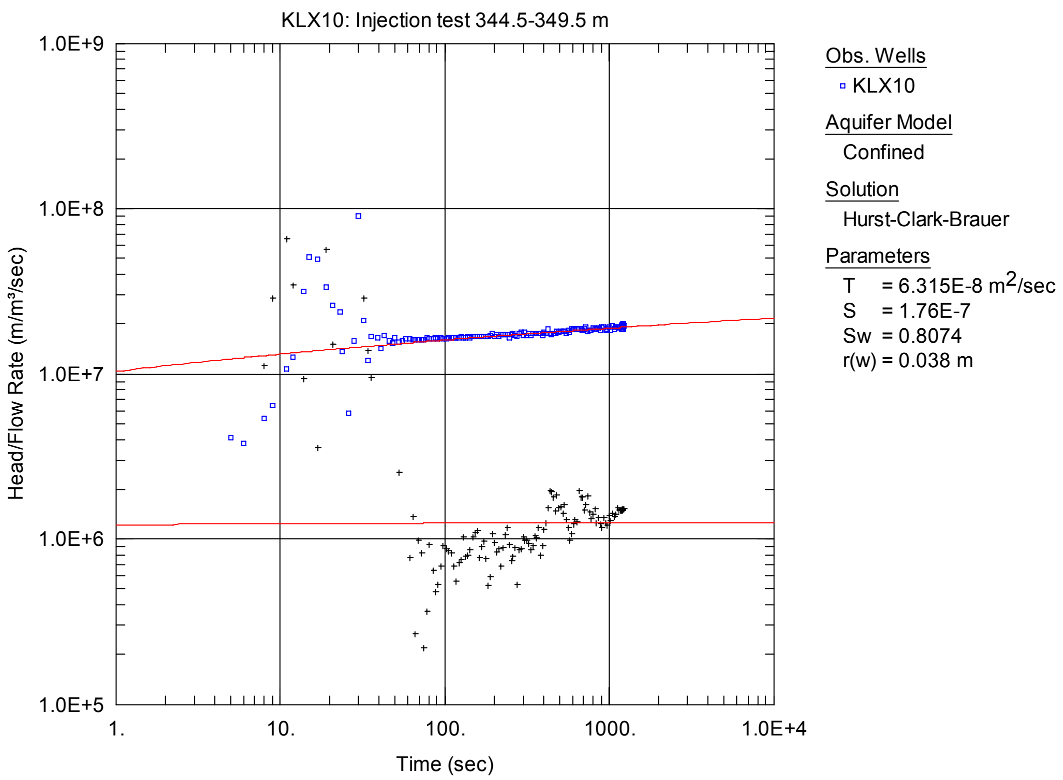


Figure A3-291. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 344.5-349.5 m in KLX10.

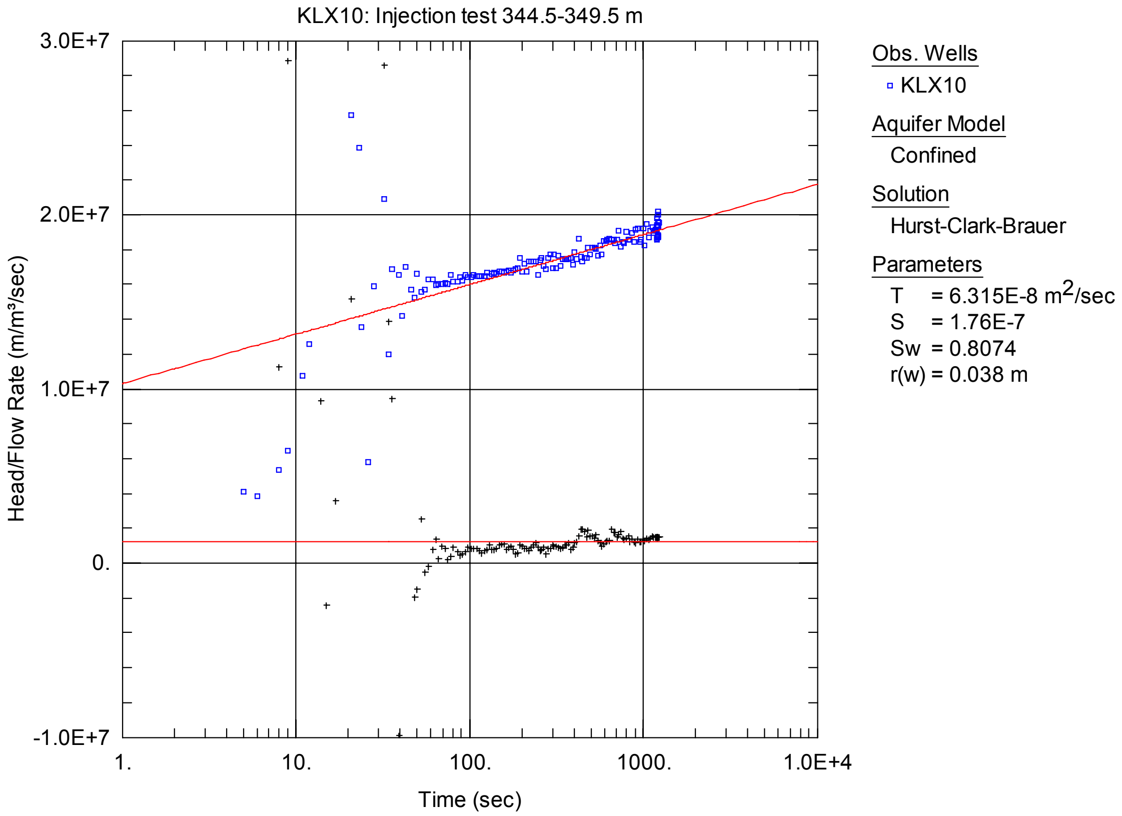


***Figure A3-292.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 344.5-349.5 m in KLX10.*

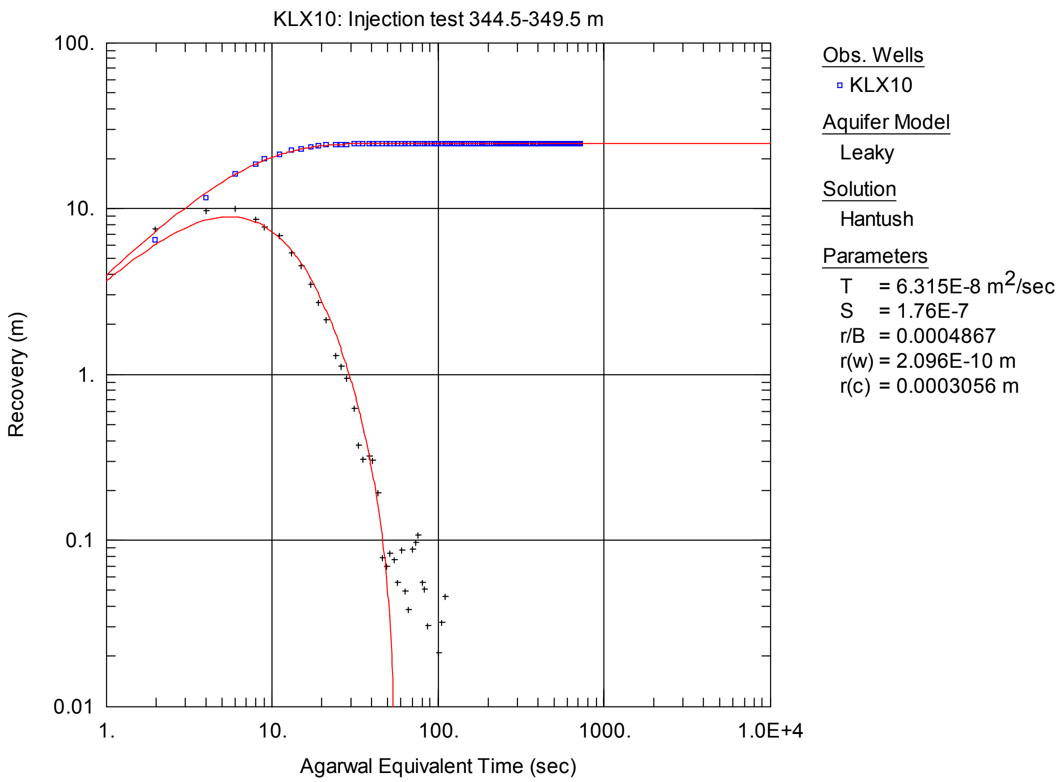


***Figure A3-293.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 344.5-349.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

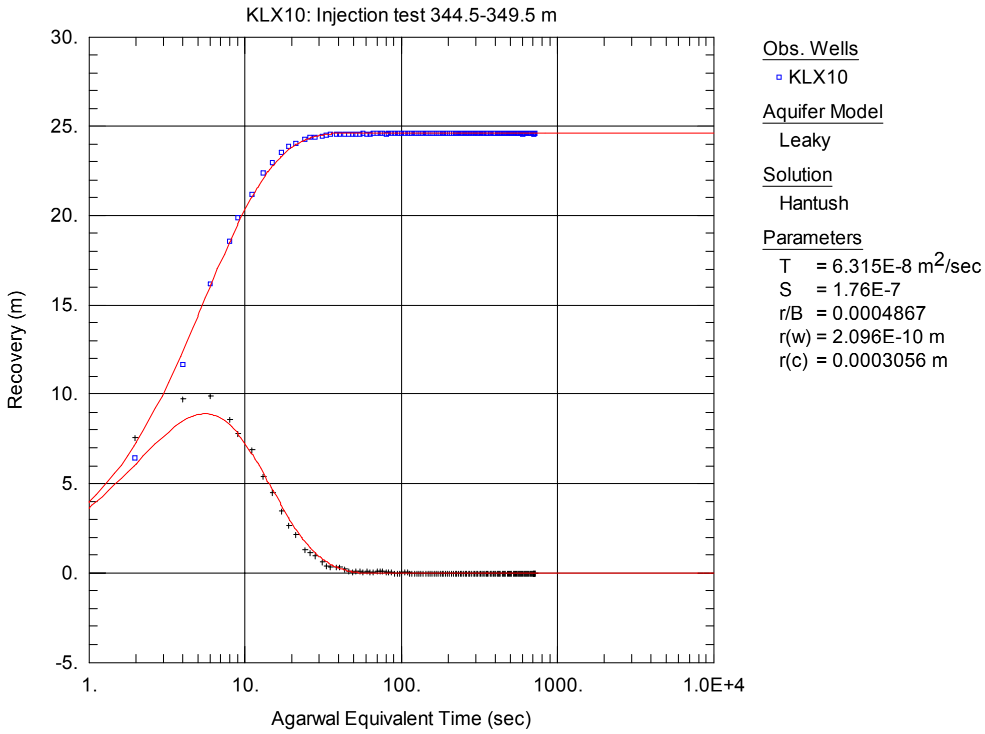


Figure A3-294. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 344.5-349.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

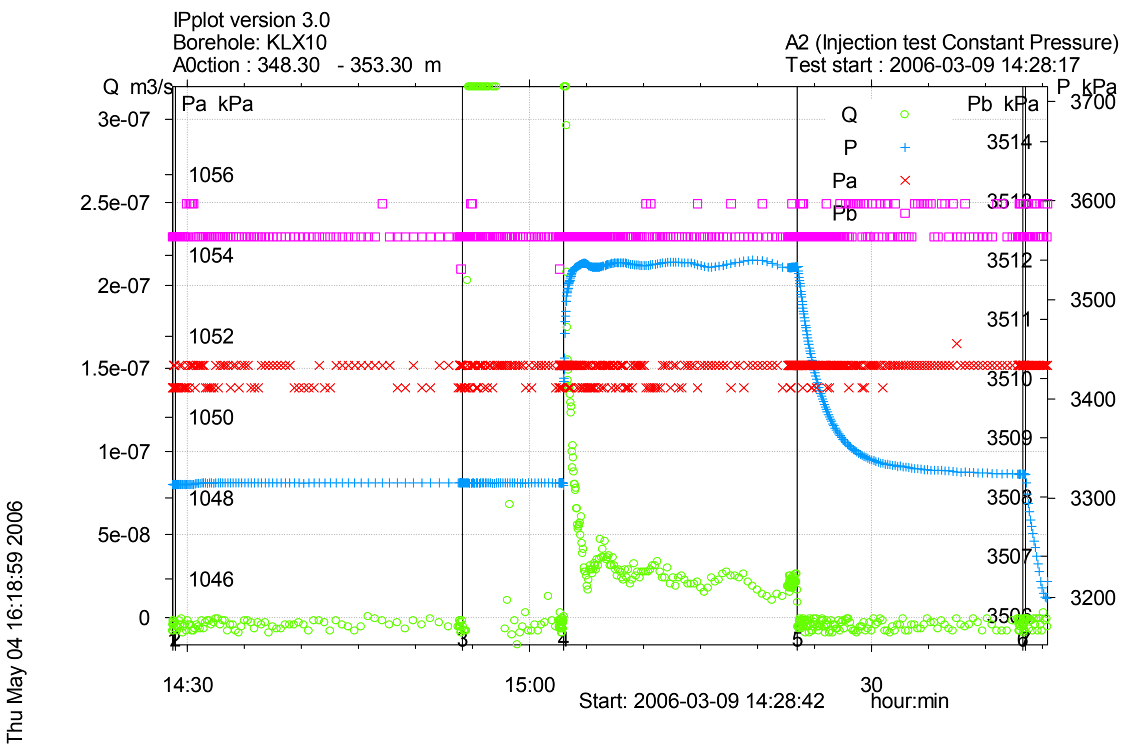


Figure A3-295. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 348.3-353.3 m in borehole KLX10.*

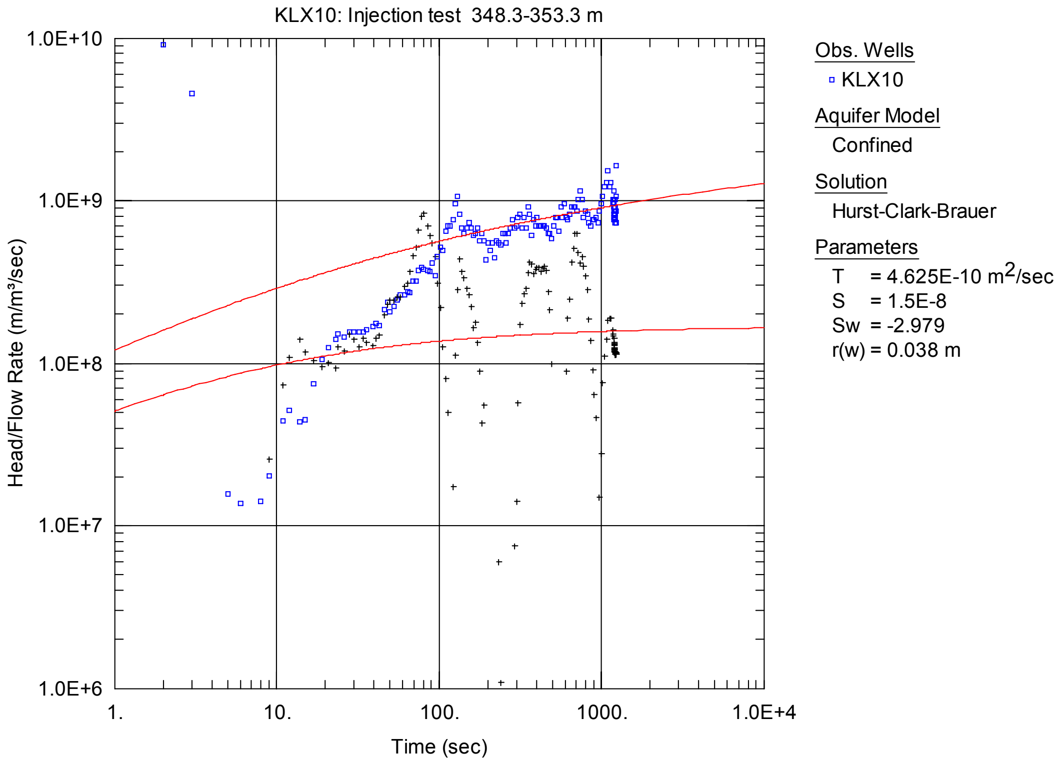


Figure A3-296. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 348.3-353.3 m in KLX10.*

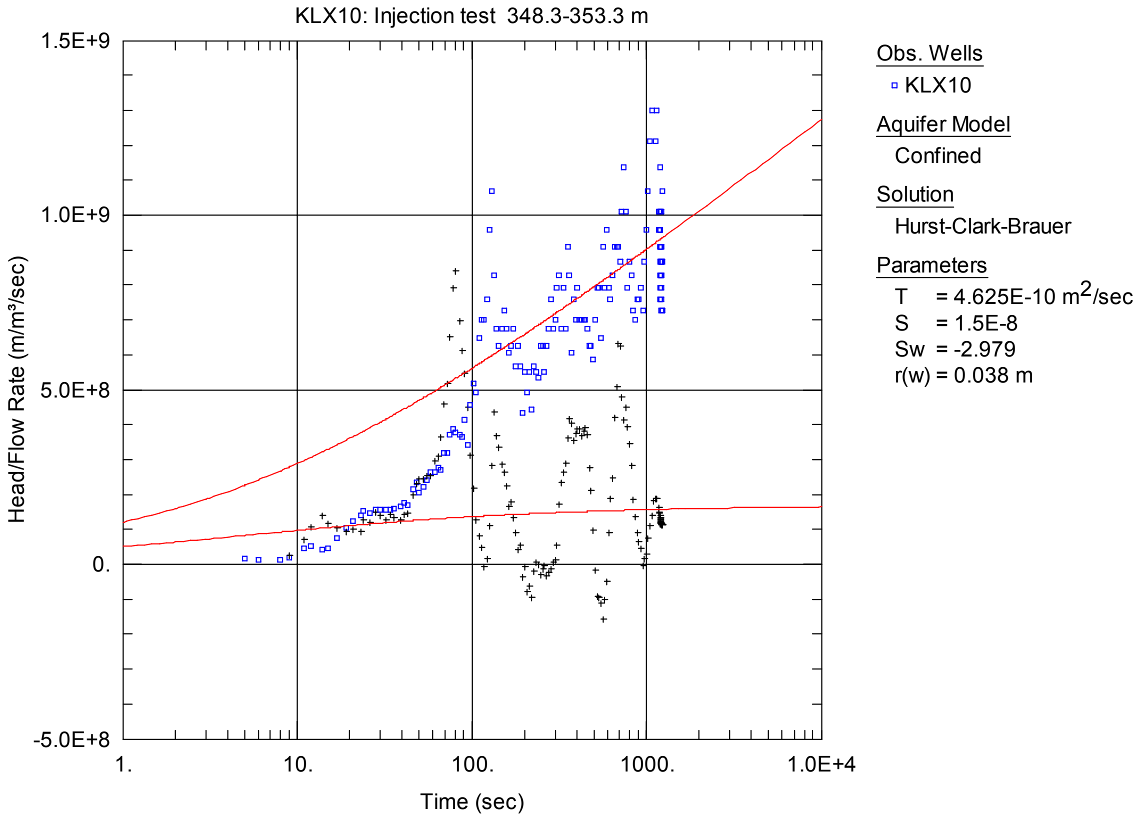


Figure A3-297. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 348.3-353.3 m in KLX10.*

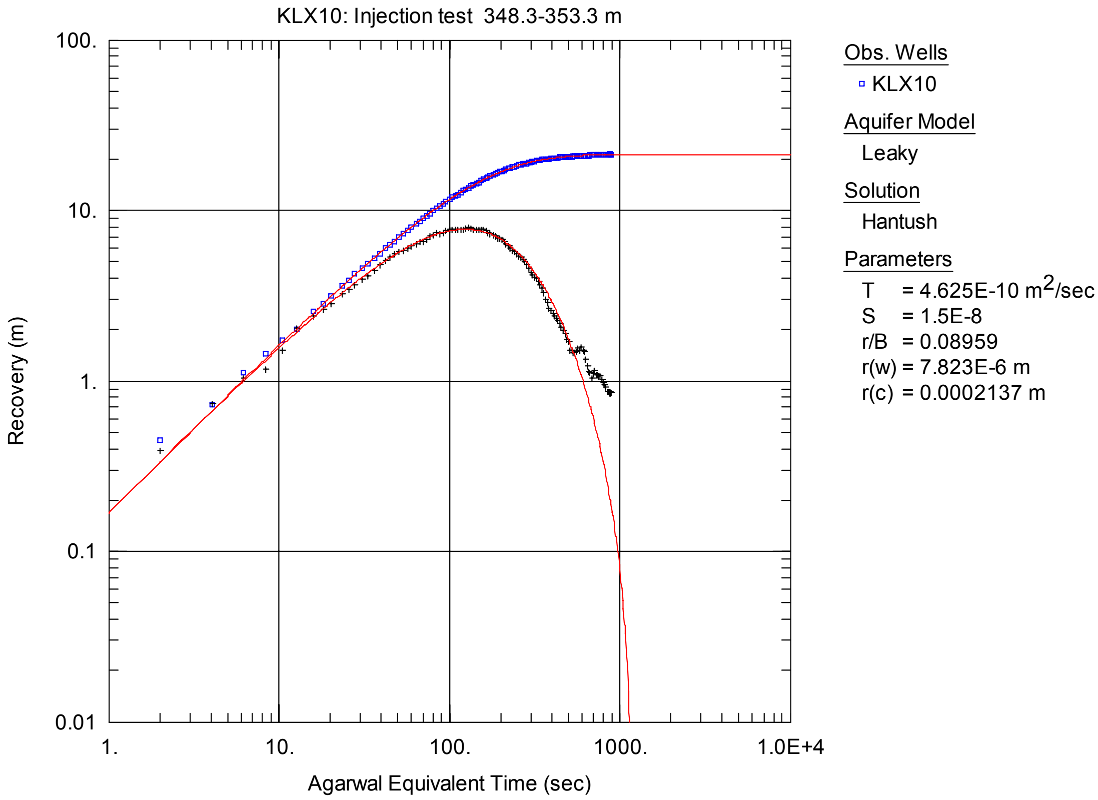


Figure A3-298. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 348.3-353.3 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

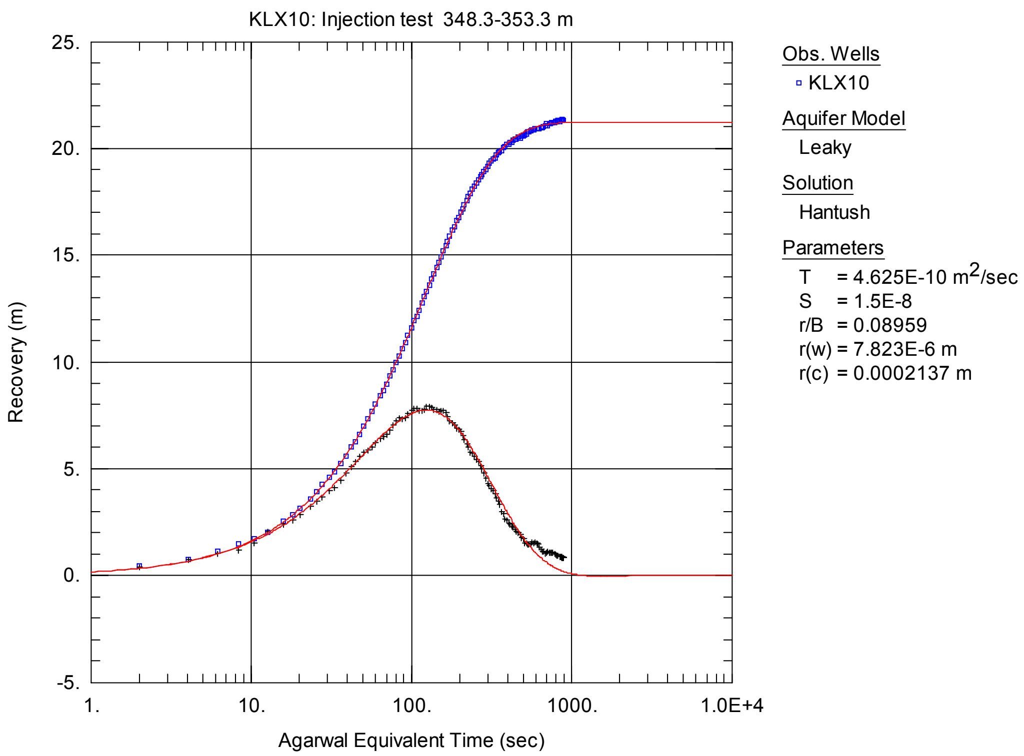


Figure A3-299. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 348.3-353.3 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

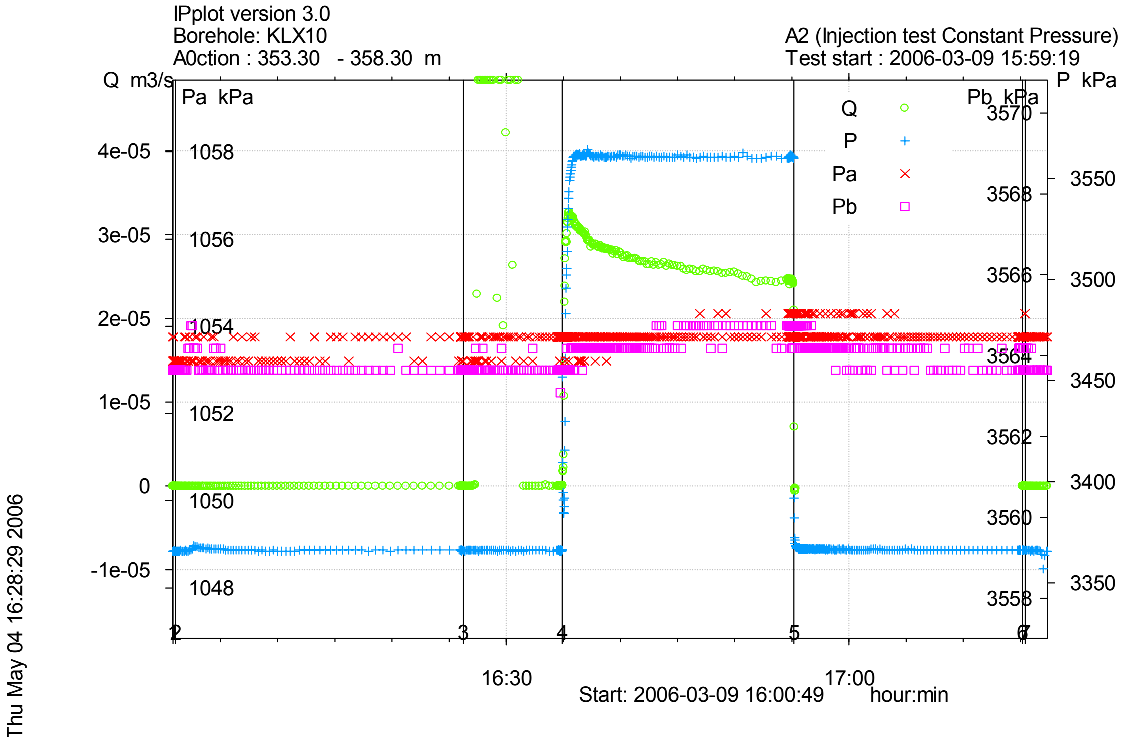


__Figure A3-300.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 353.3-358.3 m in borehole KLX10.

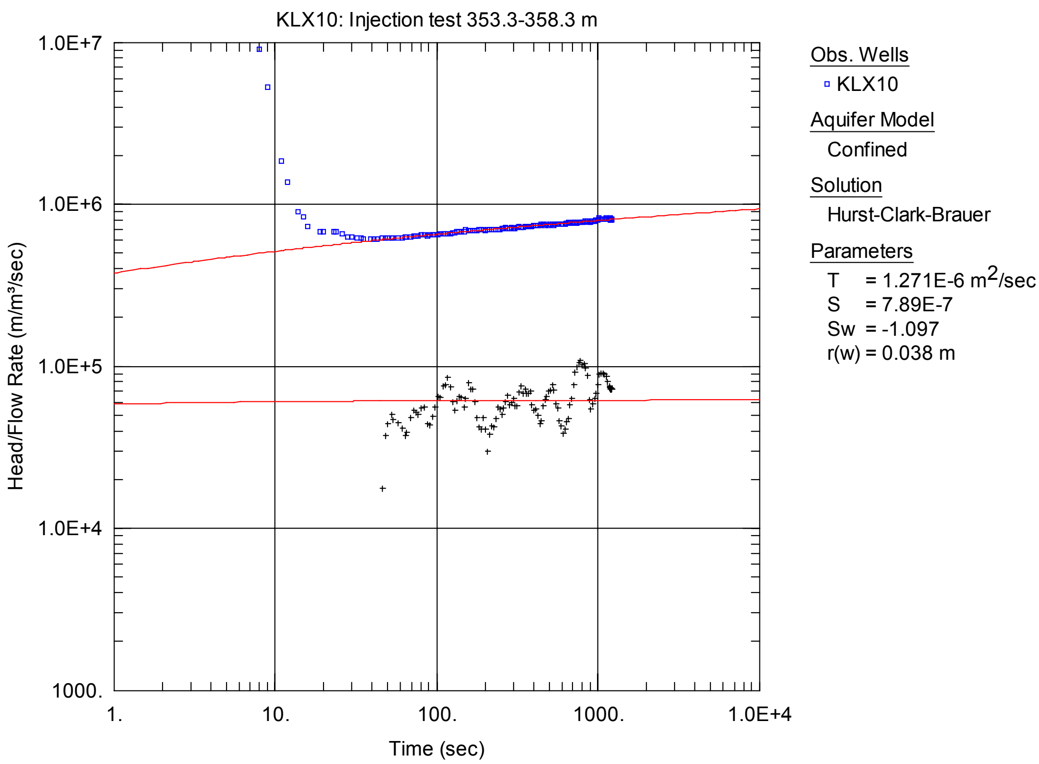


__Figure A3-301.__ Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 353.3-358.3 m in KLX10.

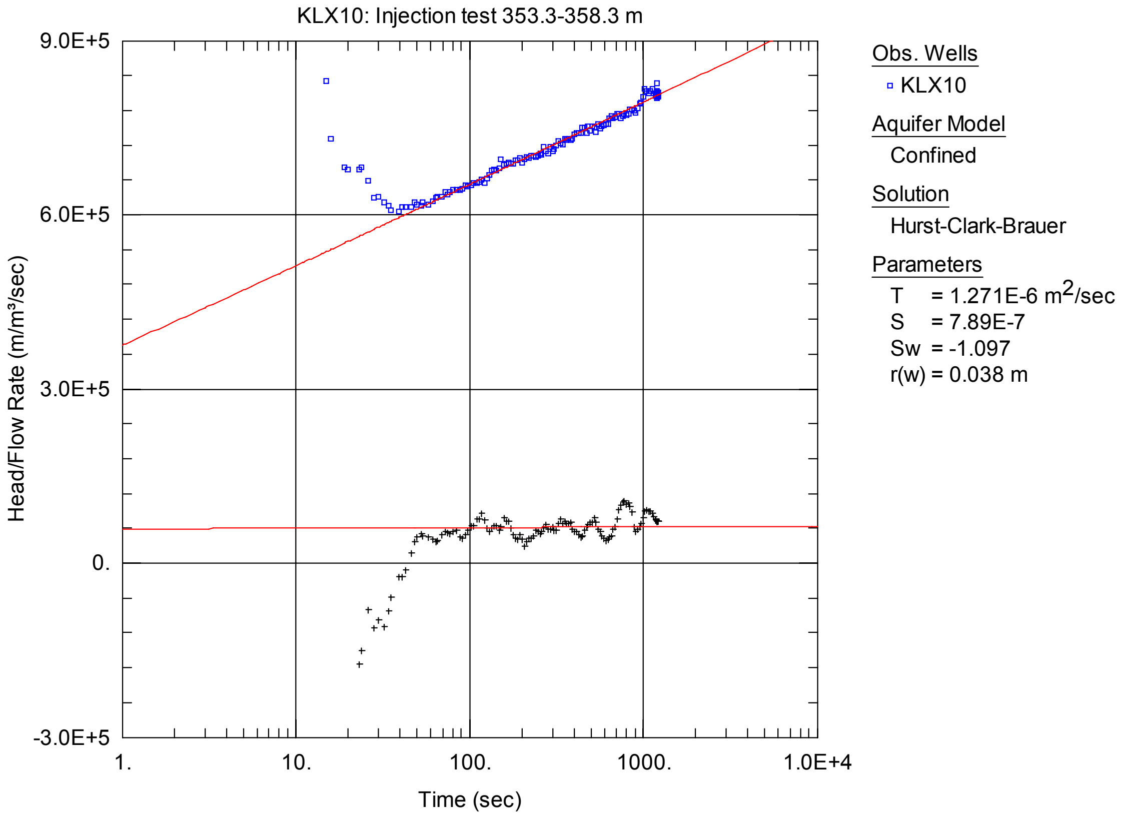


Figure A3-302. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 353.3-358.3 m in KLX10.*

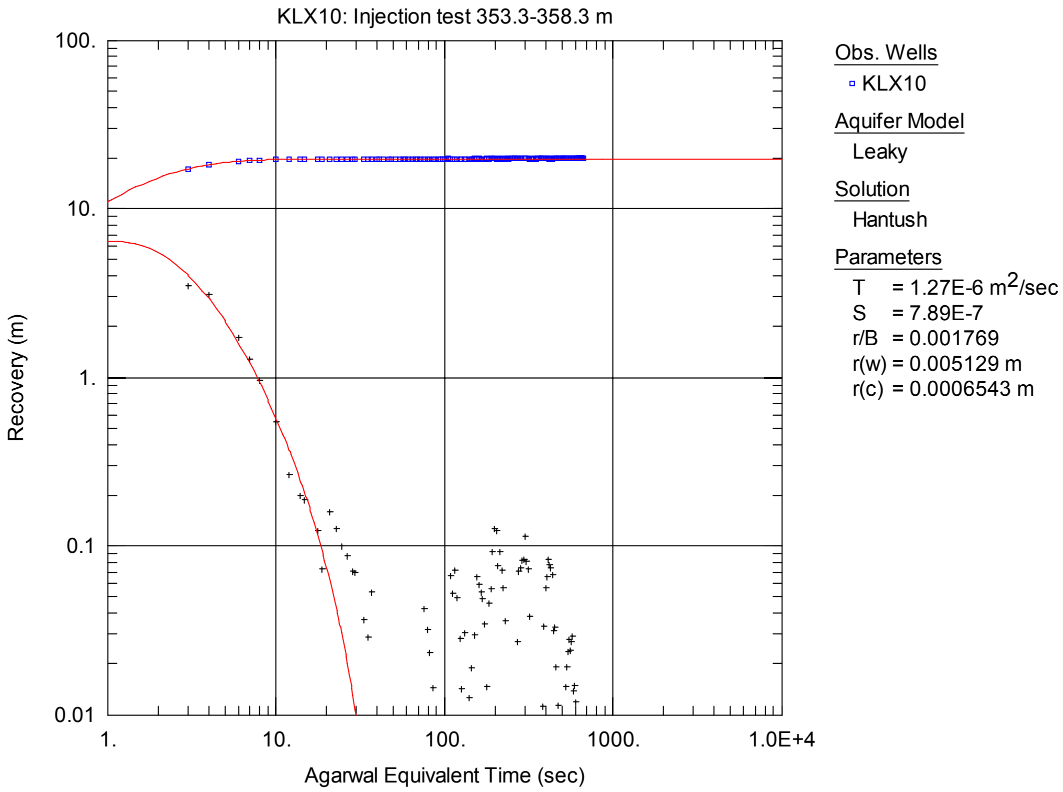


Figure A3-303. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 353.3-358.3 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

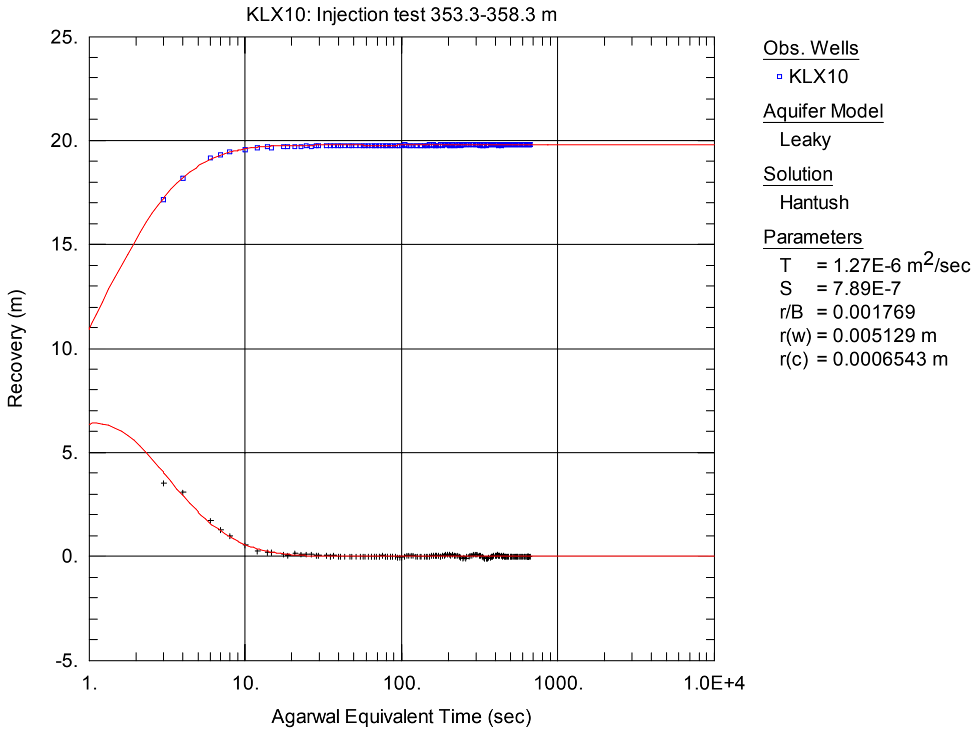


Figure A3-304. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 353.3-358.3 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

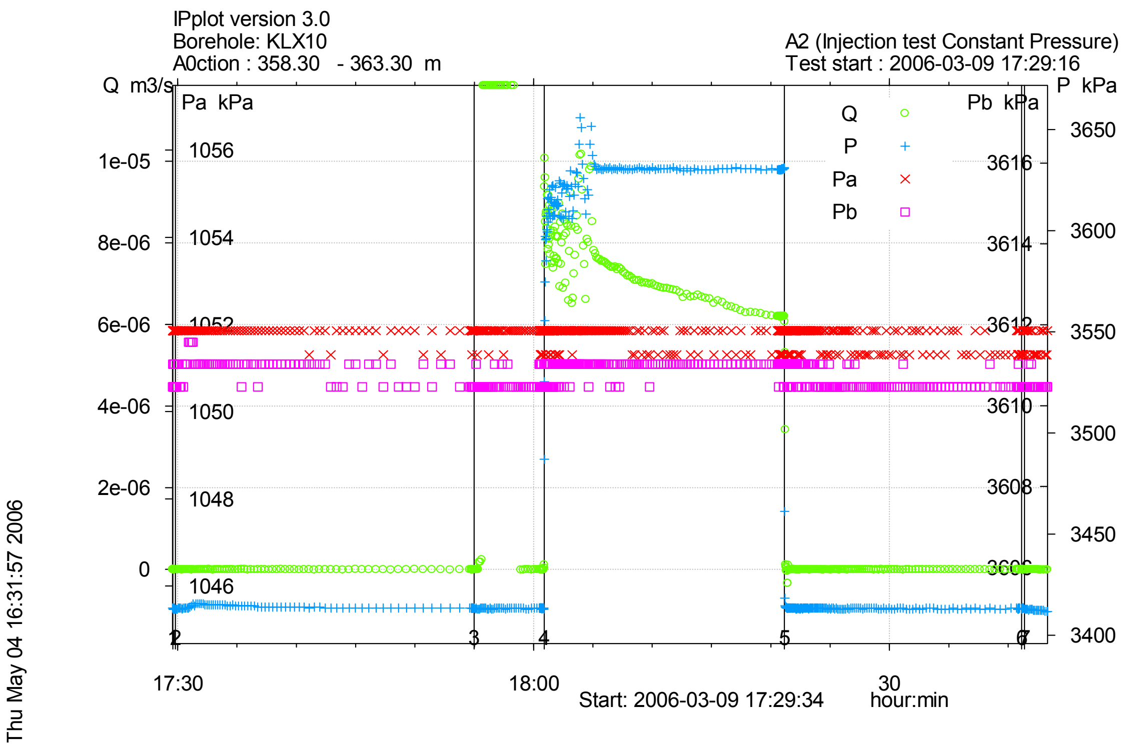


Figure A3-305. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 358.3-363.3 m in borehole KLX10.*

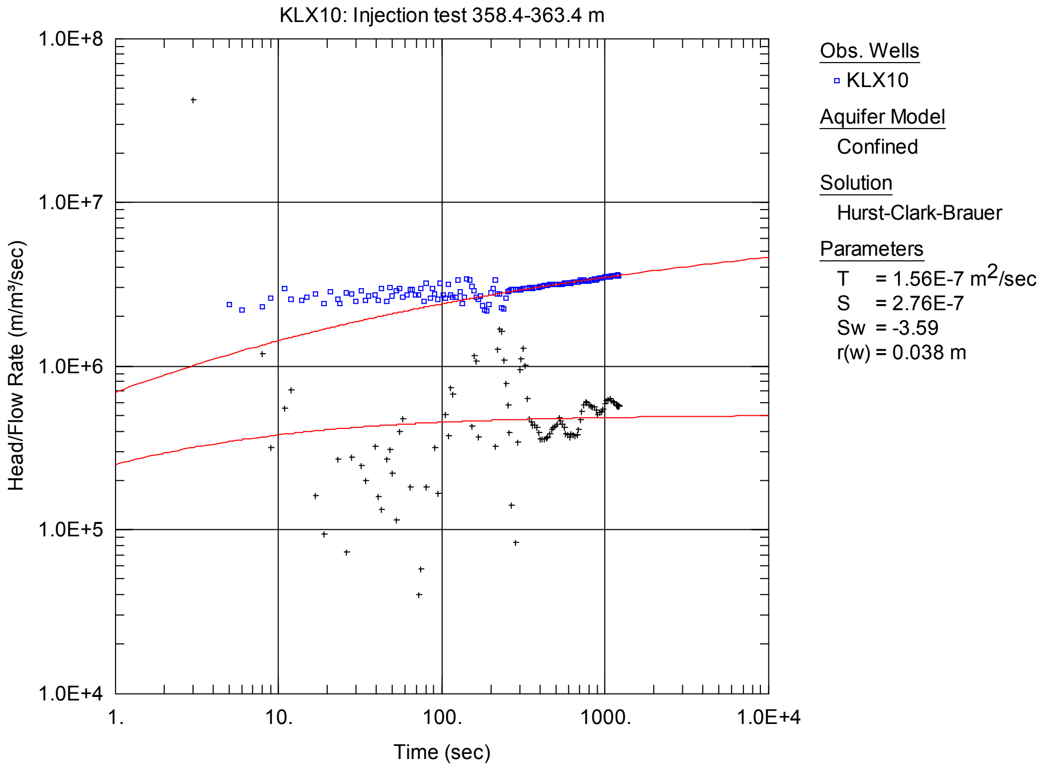


Figure A3-306. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 358.3-363.3 m in KLX10.*

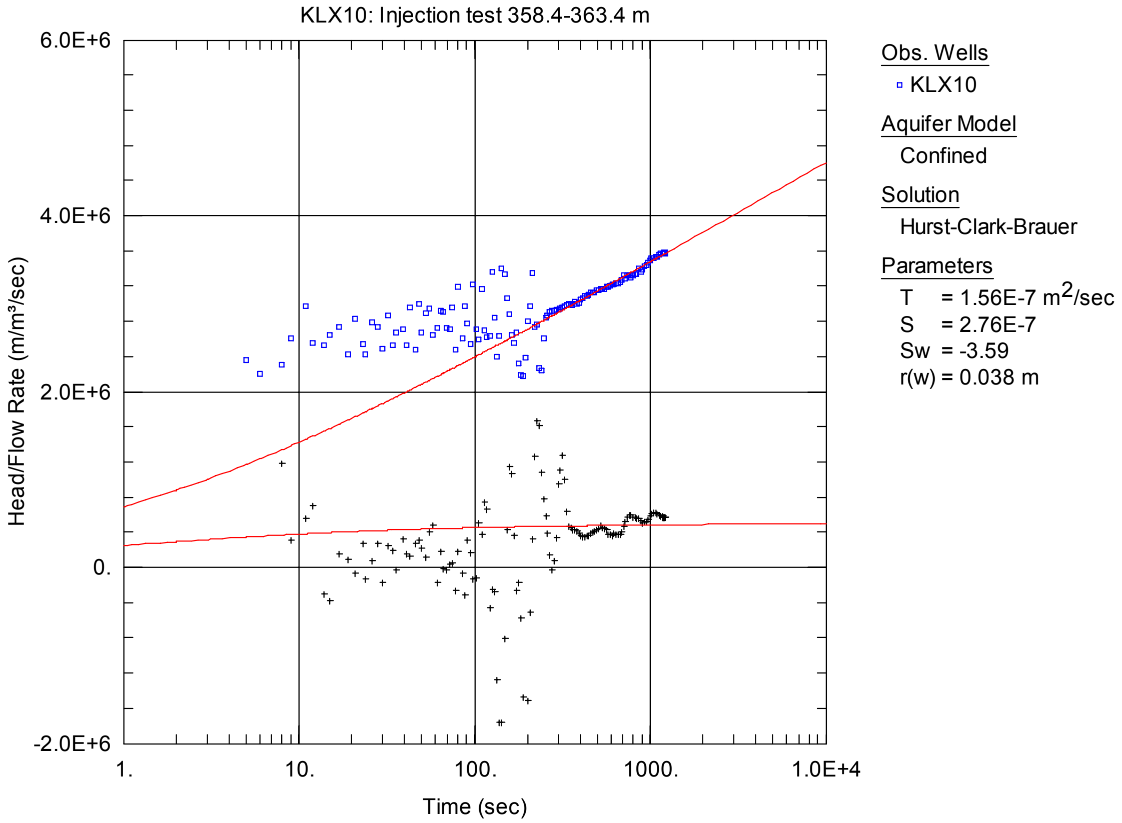


Figure A3-307. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 358.3-363.3 m in KLX10.*

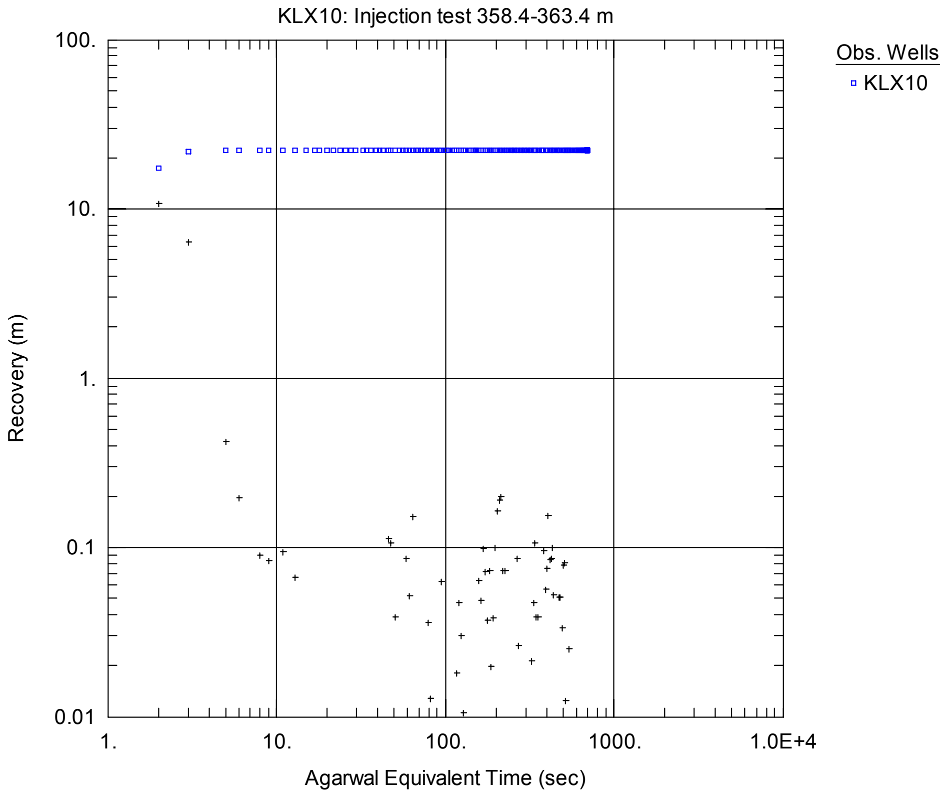


Figure A3-308. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 358.3-363.3 m in KLX10.*

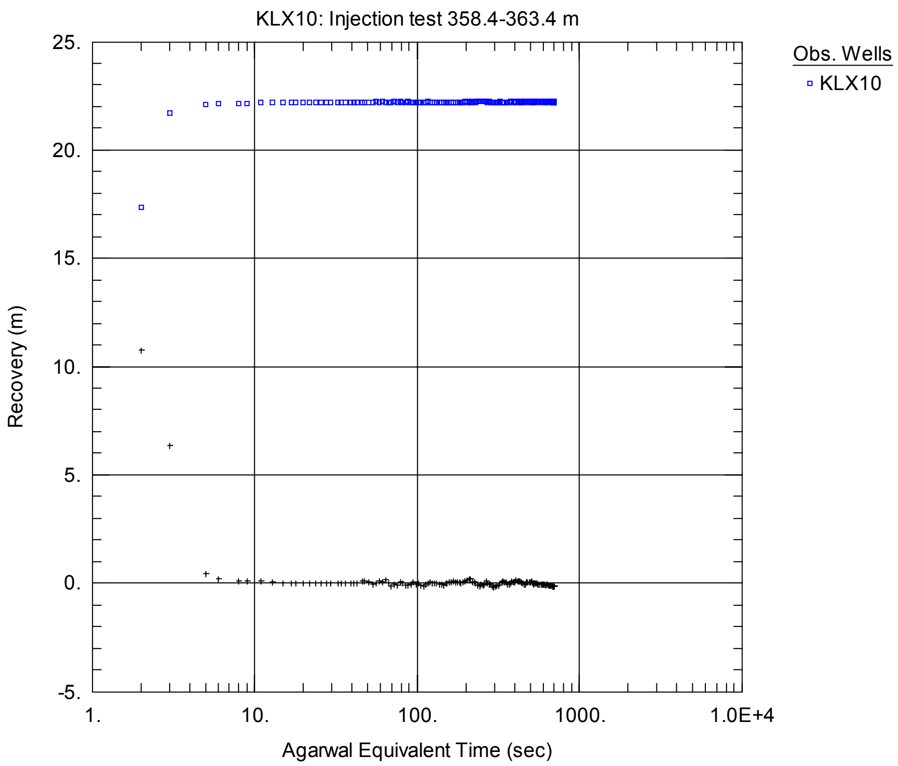


Figure A3-309. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 358.3-363.3 m in KLX10.*

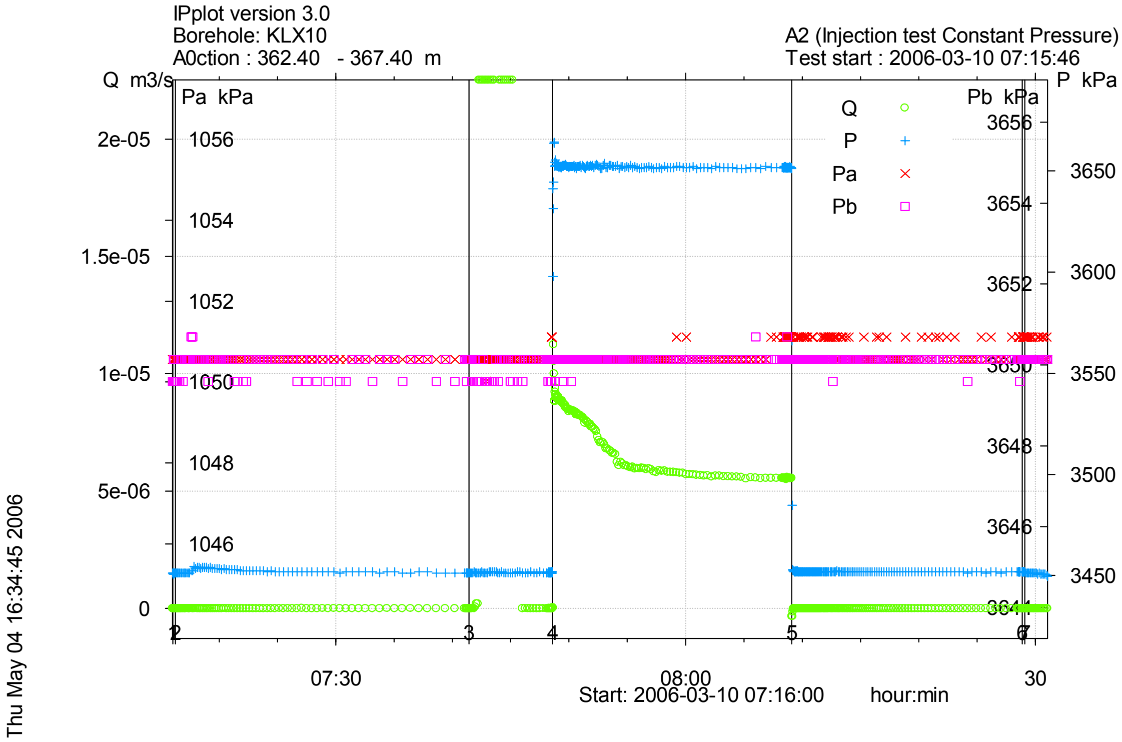


Figure A3-310. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 362.4-367.4 m in borehole KLX10.

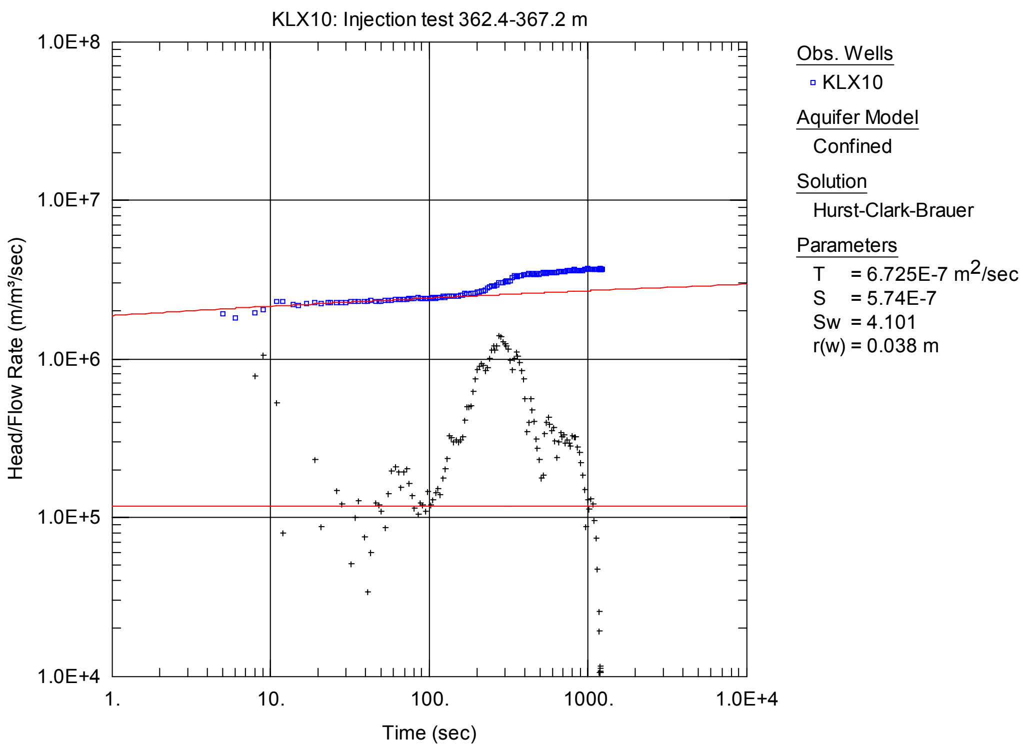


Figure A3-311. Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution for the first PRF, from the injection test in section 362.4-367.4 m in KLX10.

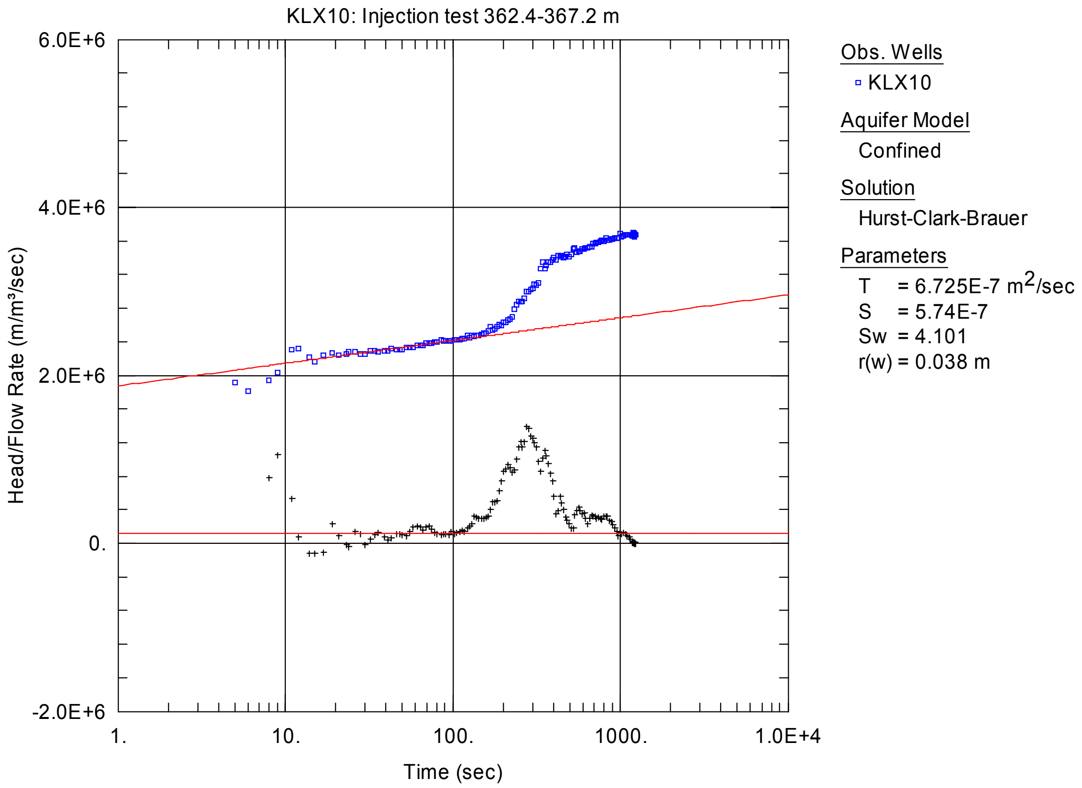


Figure A3-312. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution for the first PRF, from the injection test in section 362.4-367.4 m in KLX10.*

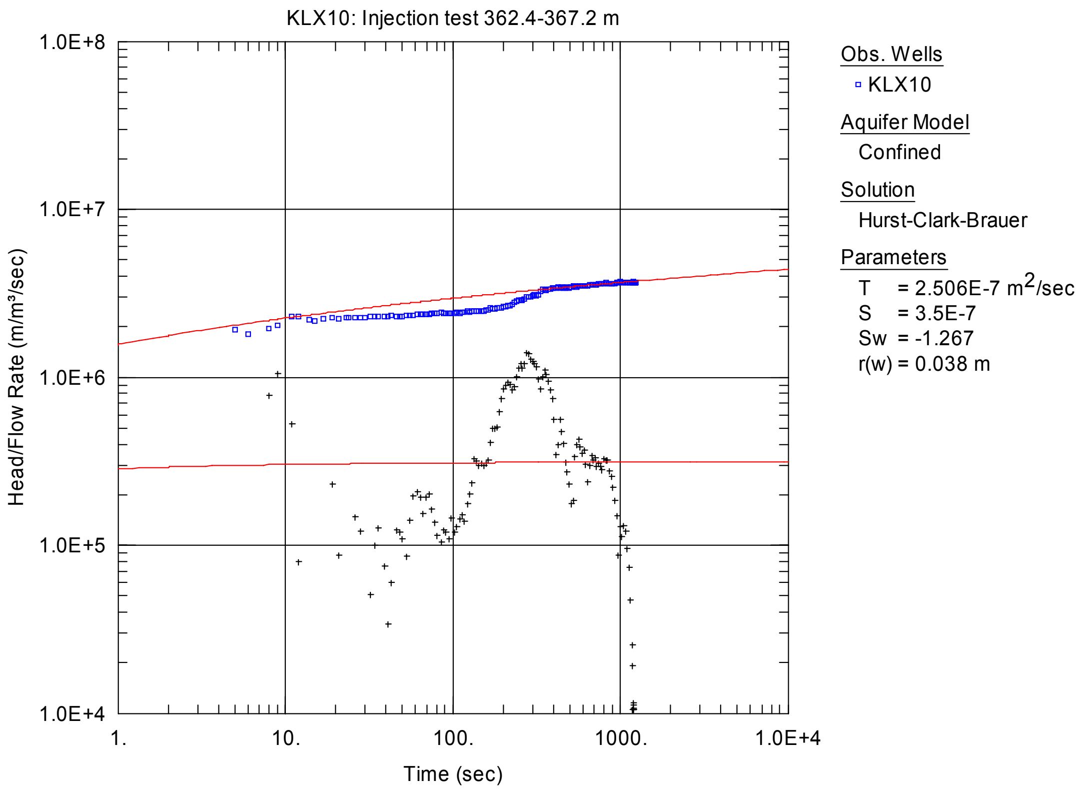


Figure A3-313. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution for the second PRF, from the injection test in section 362.4-367.4 m in KLX10.*

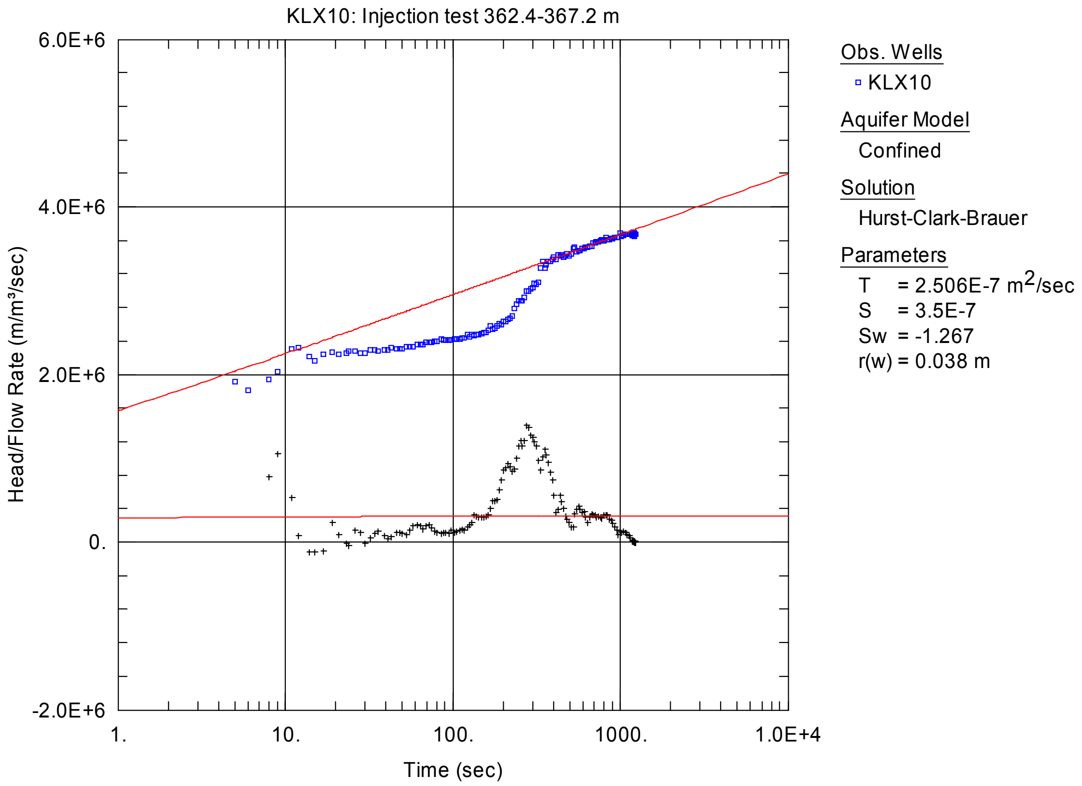


__Figure A3-314.__ Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution for the second PRF, from the injection test in section 362.4-367.4 m in KLX10.

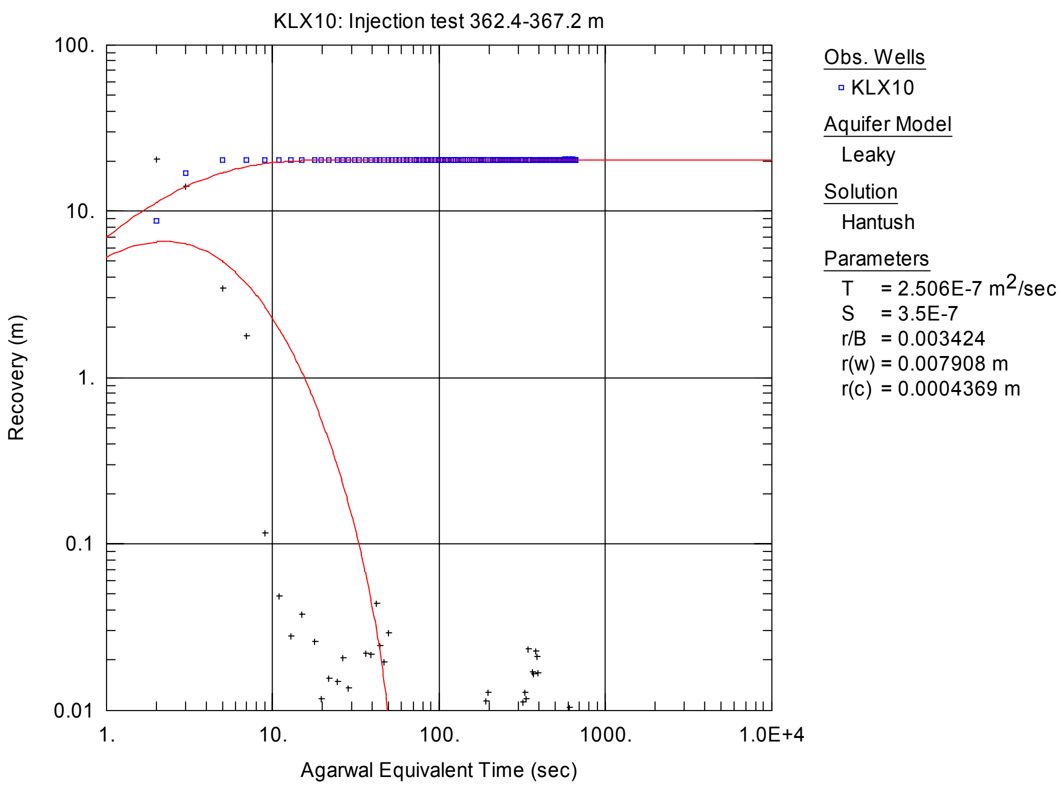


__Figure A3-315.__ Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 362.4-367.4 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.

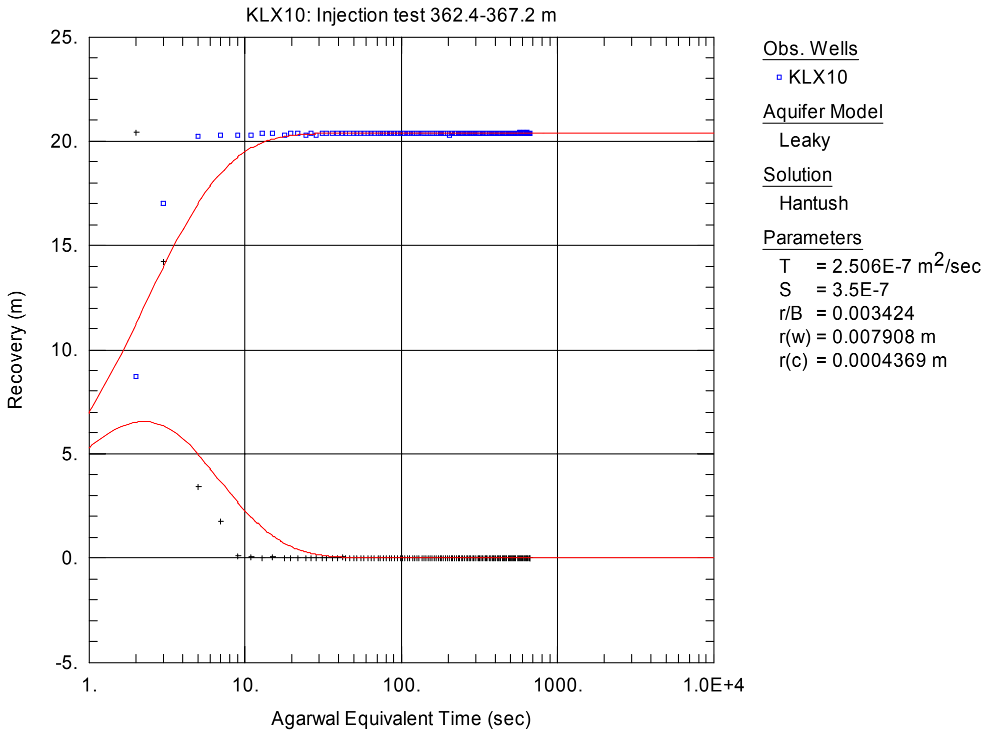


Figure A3-316. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 362.4-367.4 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

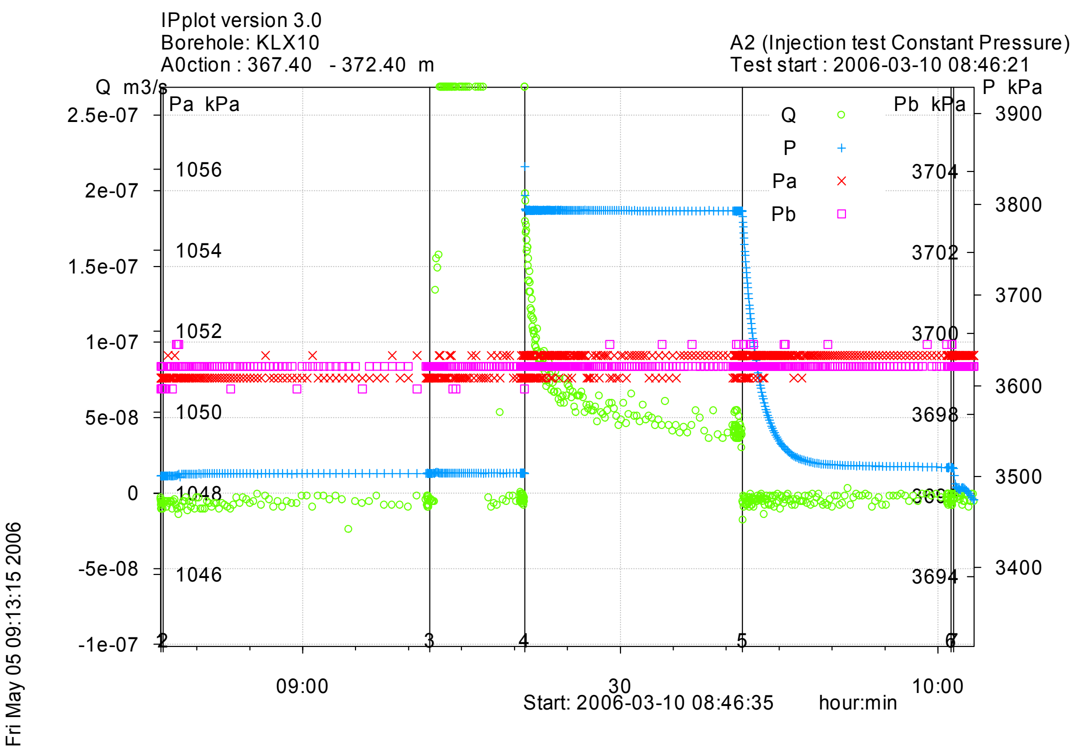


Figure A3-317. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 367.4-372.4 m in borehole KLX10.*

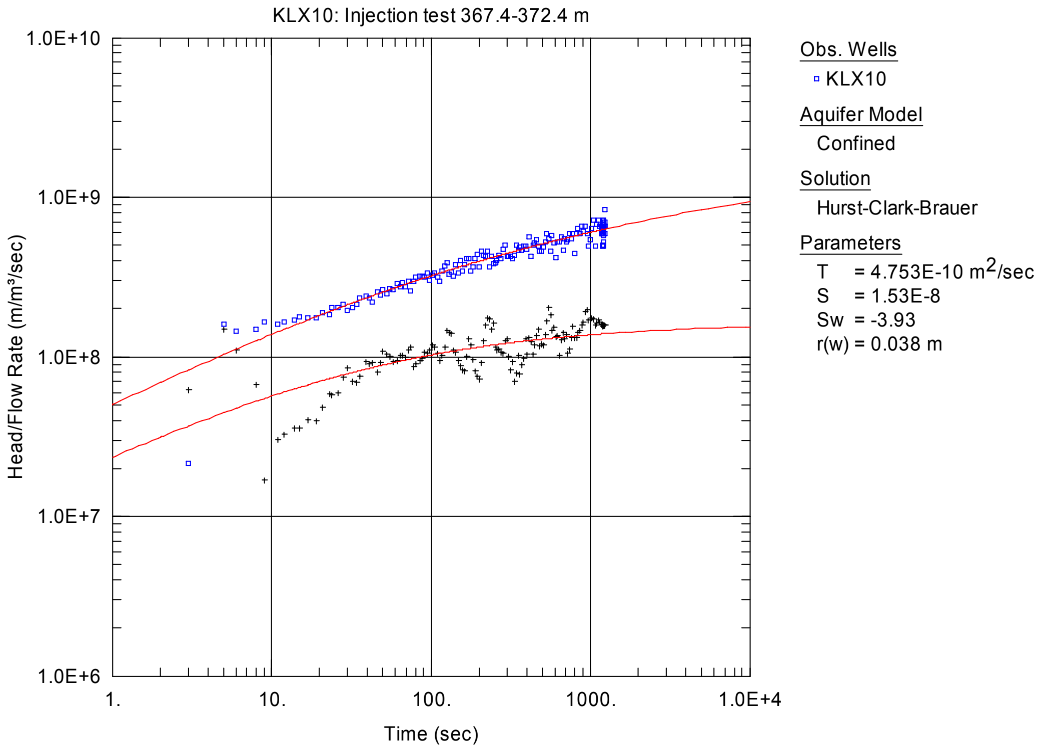


Figure A3-318. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution, from the injection test in section 367.4-372.4 m in KLX10.*

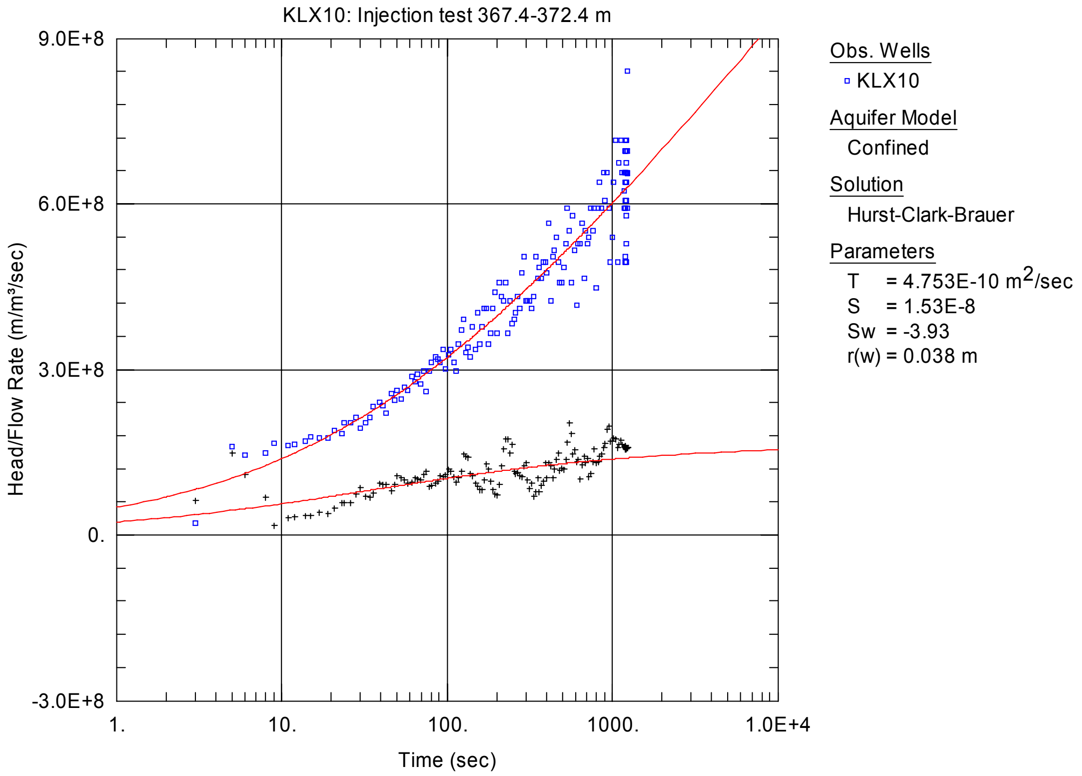


Figure A3-319. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution, from the injection test in section 367.4-372.4 m in KLX10.*

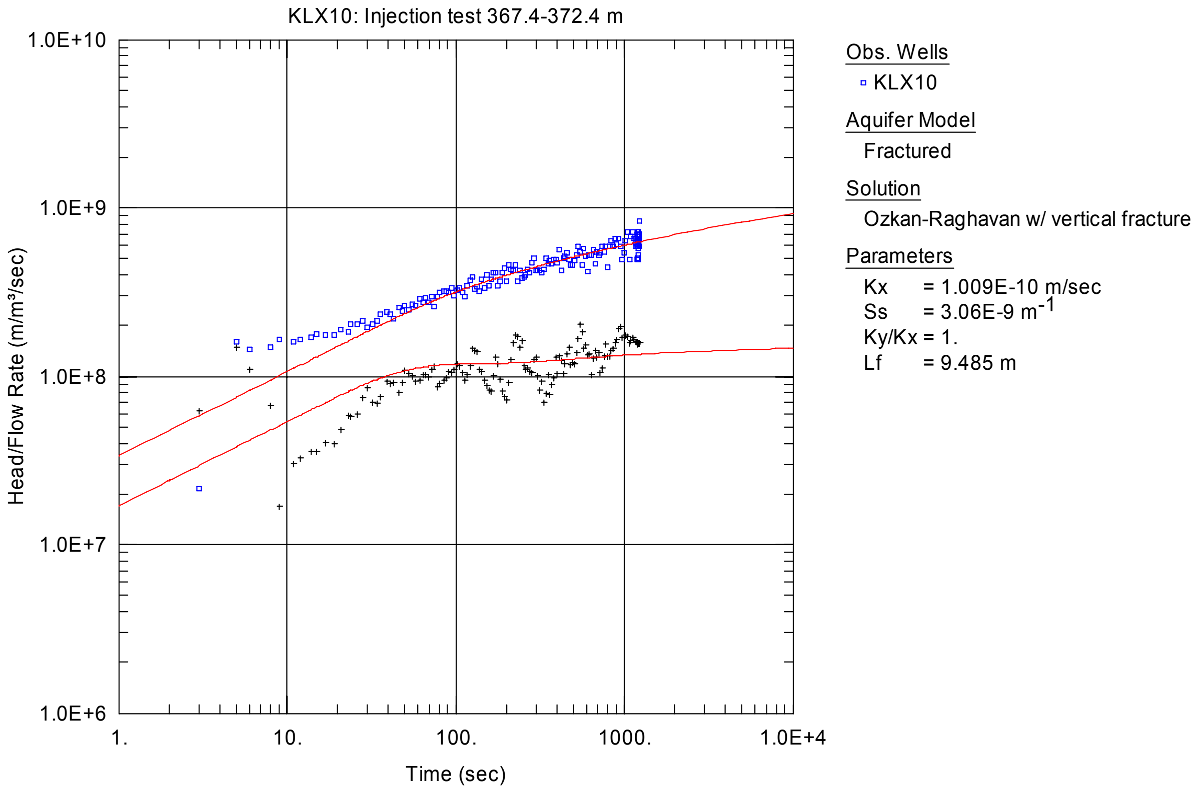


Figure A3-320. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan solution, from the injection test in section 367.4-372.4 m in KLX10.*

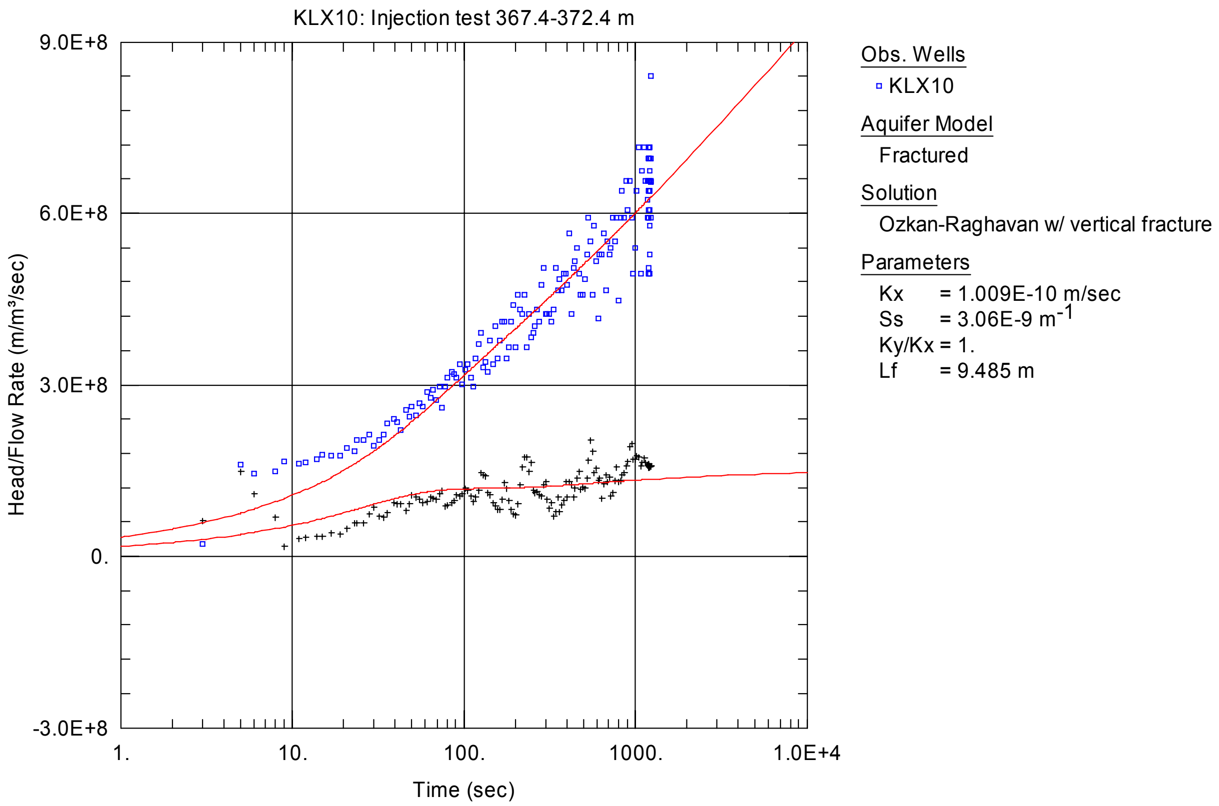


Figure A3-321. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan solution, from the injection test in section 367.4-372.4 m in KLX10.*

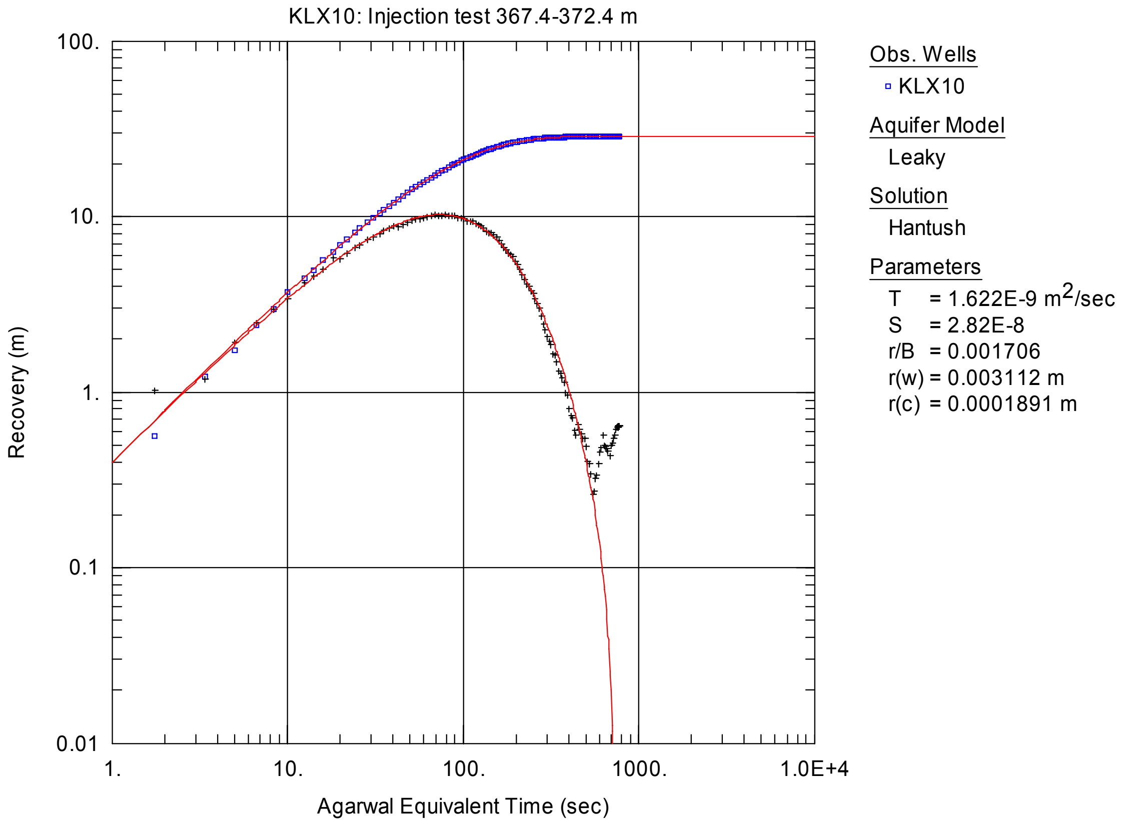


Figure A3-322. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 367.4-372.4 m in KLX10.*

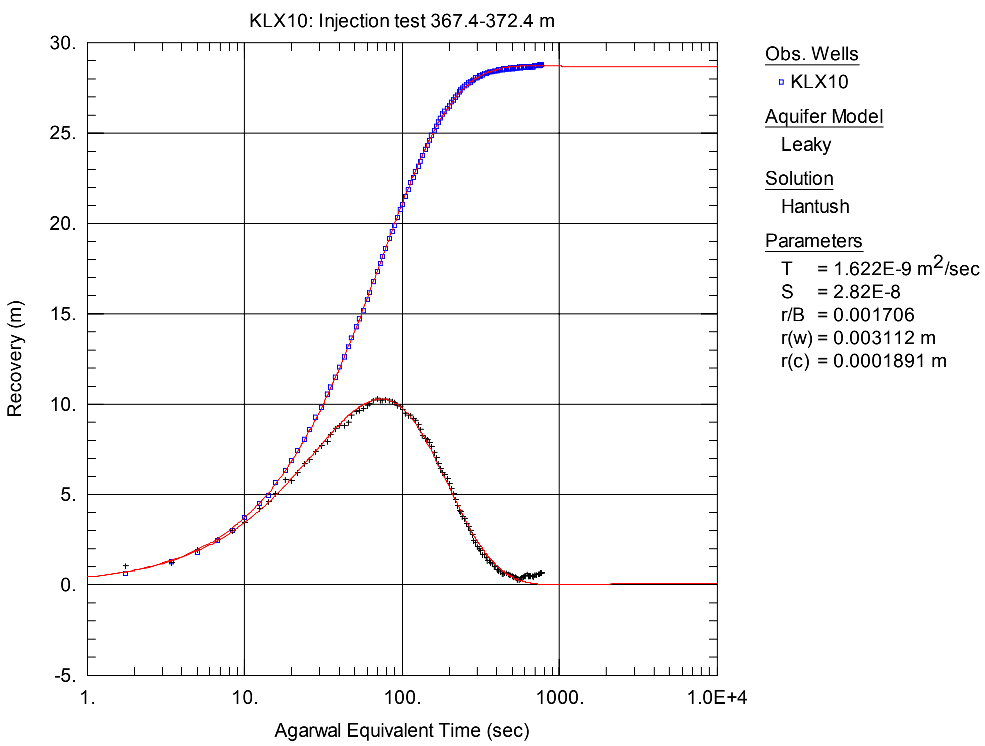


Figure A3-323. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 367.4-372.4 m in KLX10.*

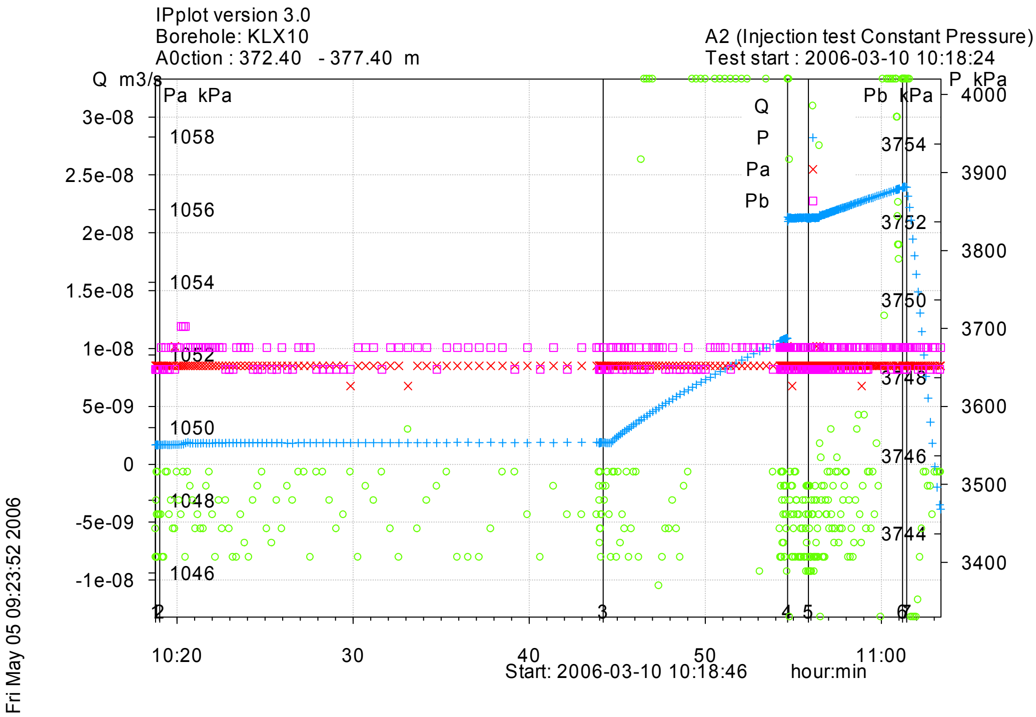


Figure A3-324. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 372.4-377.4 m in borehole KLX10.*

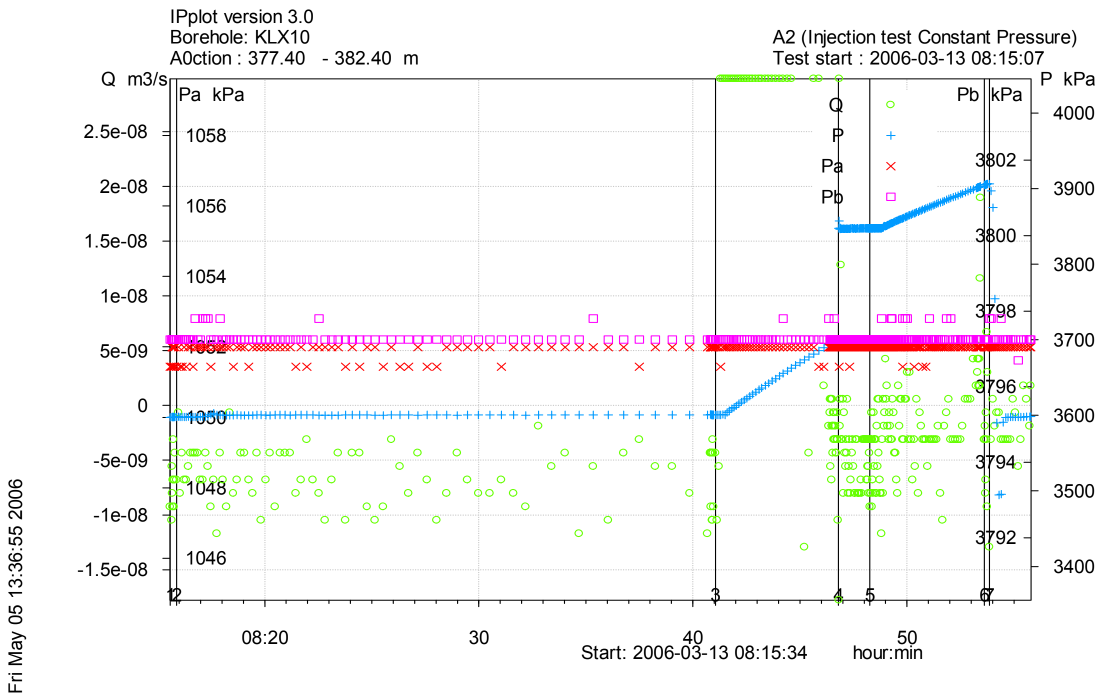


Figure A3-325. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 377.4-382.4 m in borehole KLX10.*

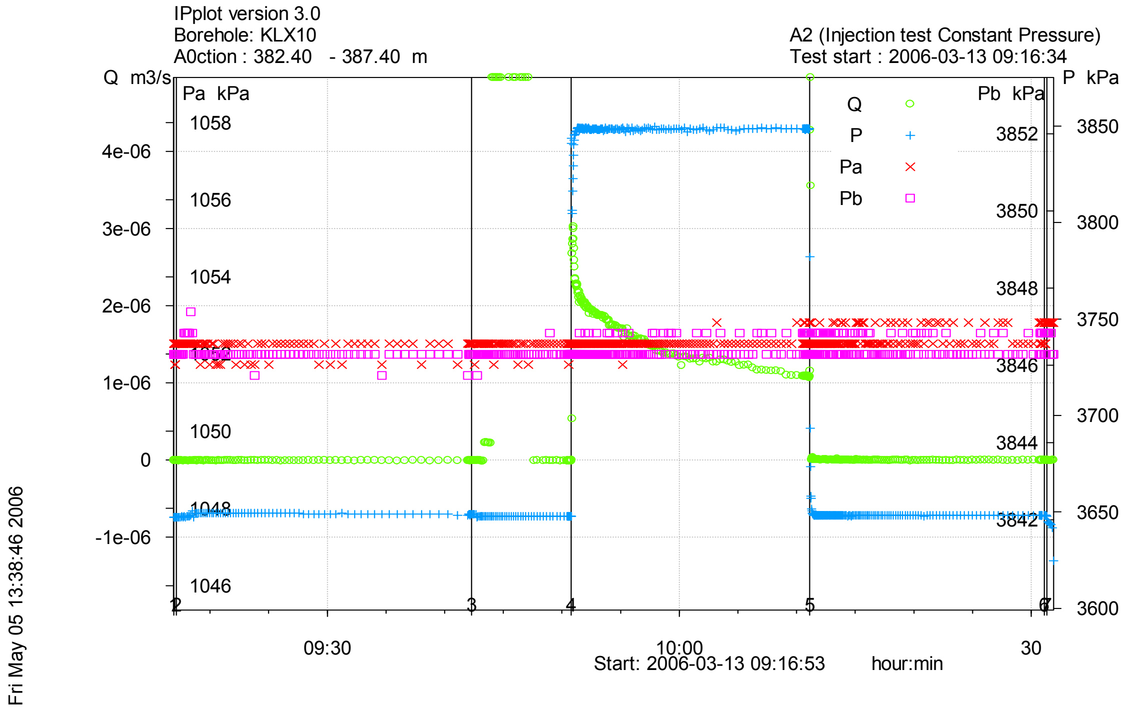


Figure A3-326. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 382.4-387.4 m in borehole KLX10.*

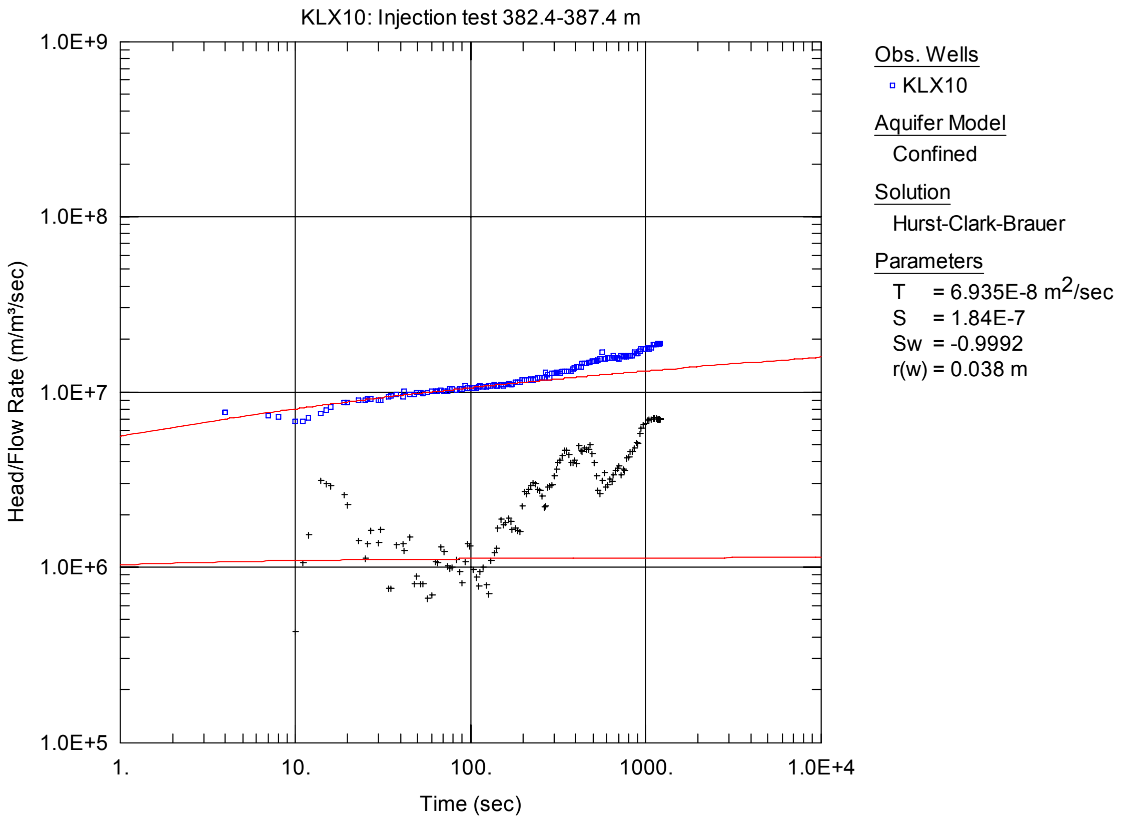


Figure A3-327. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 382.4-387.4 m in KLX10.*

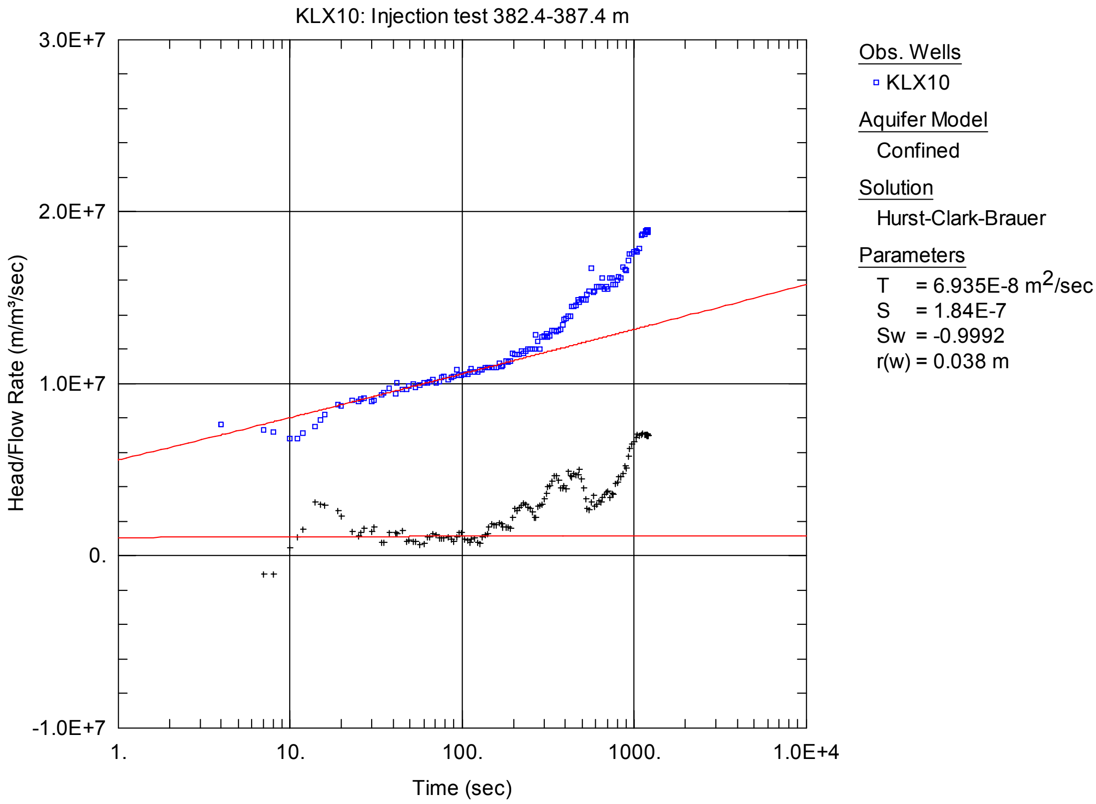


Figure A3-328. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 382.4-387.4 m in KLX10.*

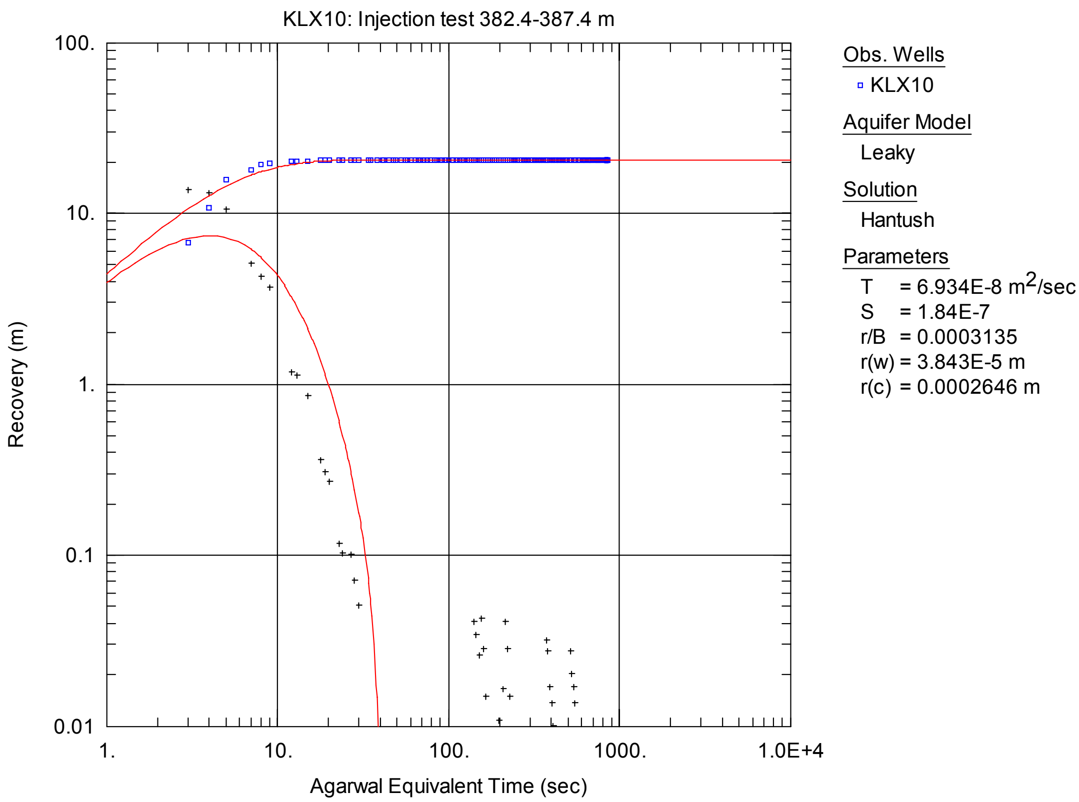


Figure A3-329. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 382.4-387.4 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

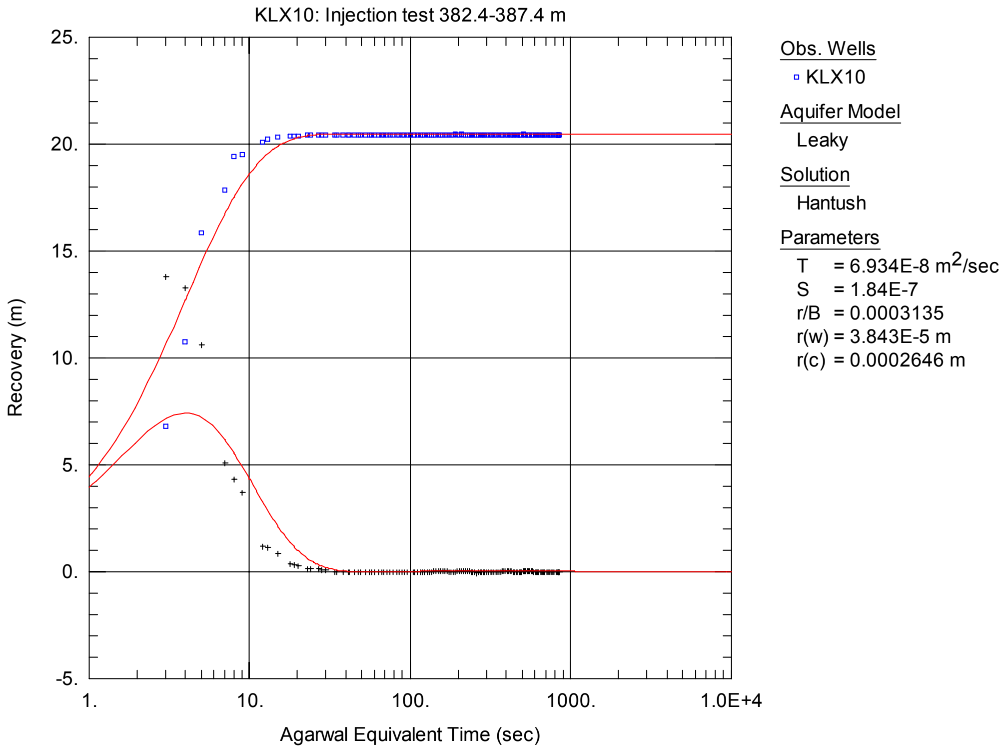


Figure A3-330. Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 382.4-387.4 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.

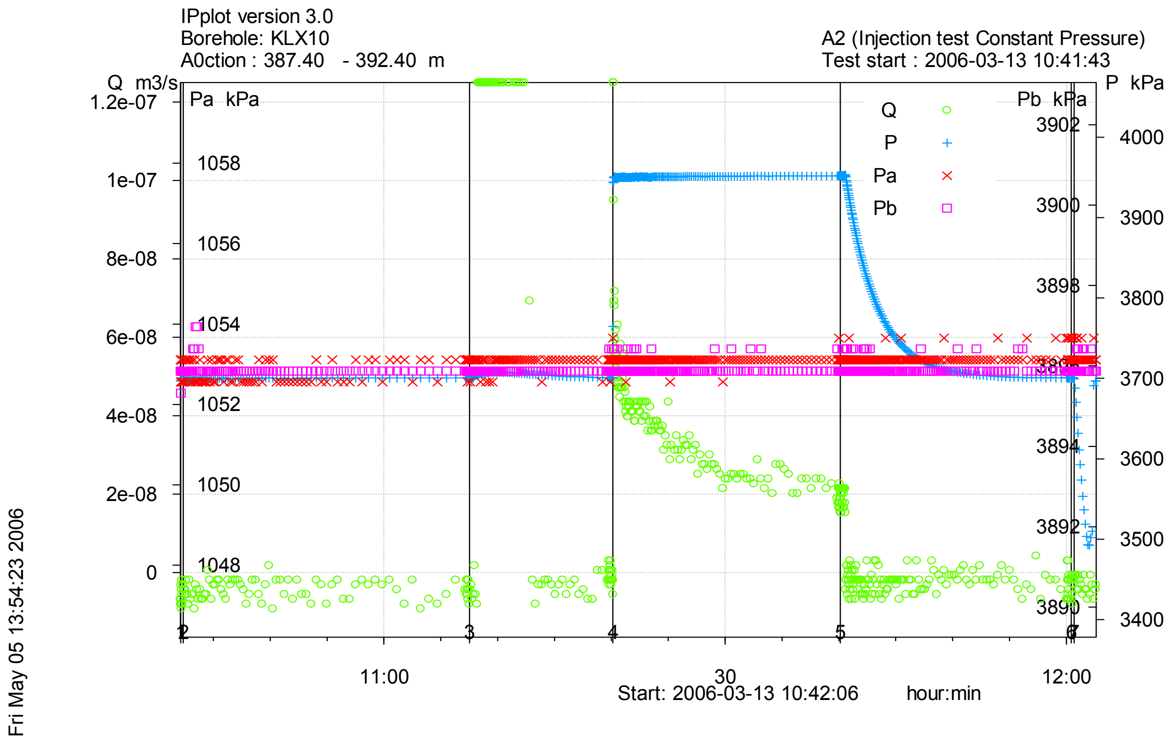


Figure A3-331. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 387.4-392.4 m in borehole KLX10.

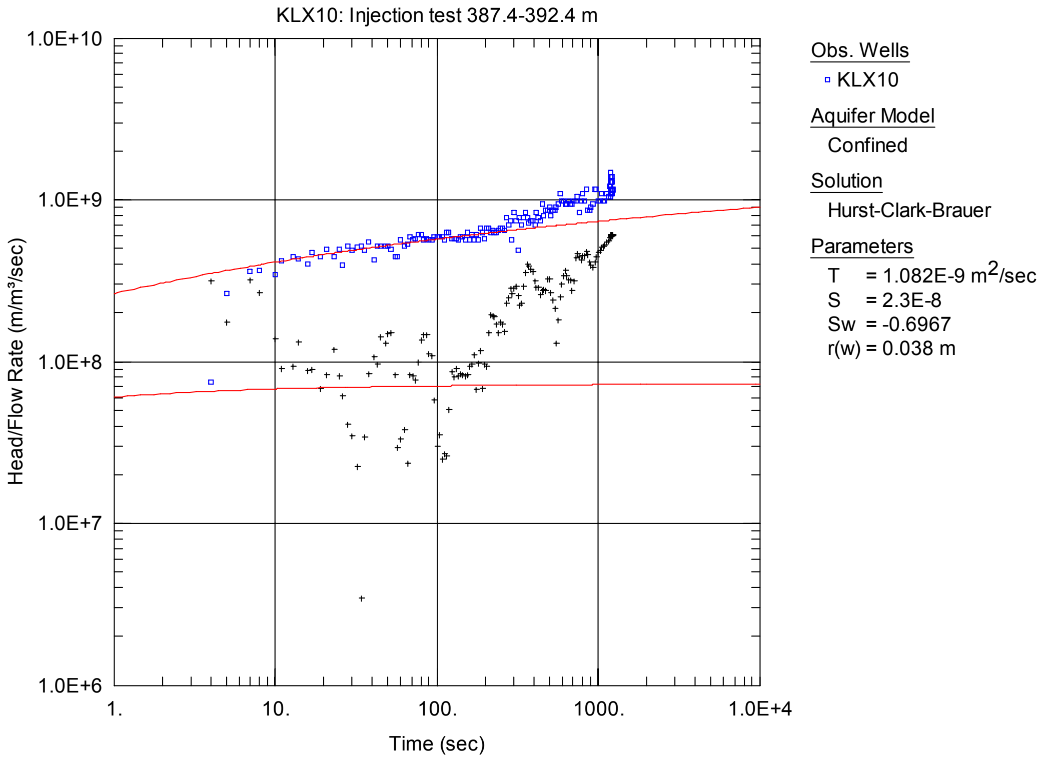


***Figure A3-332.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 387.4-392.4 m in KLX10.*

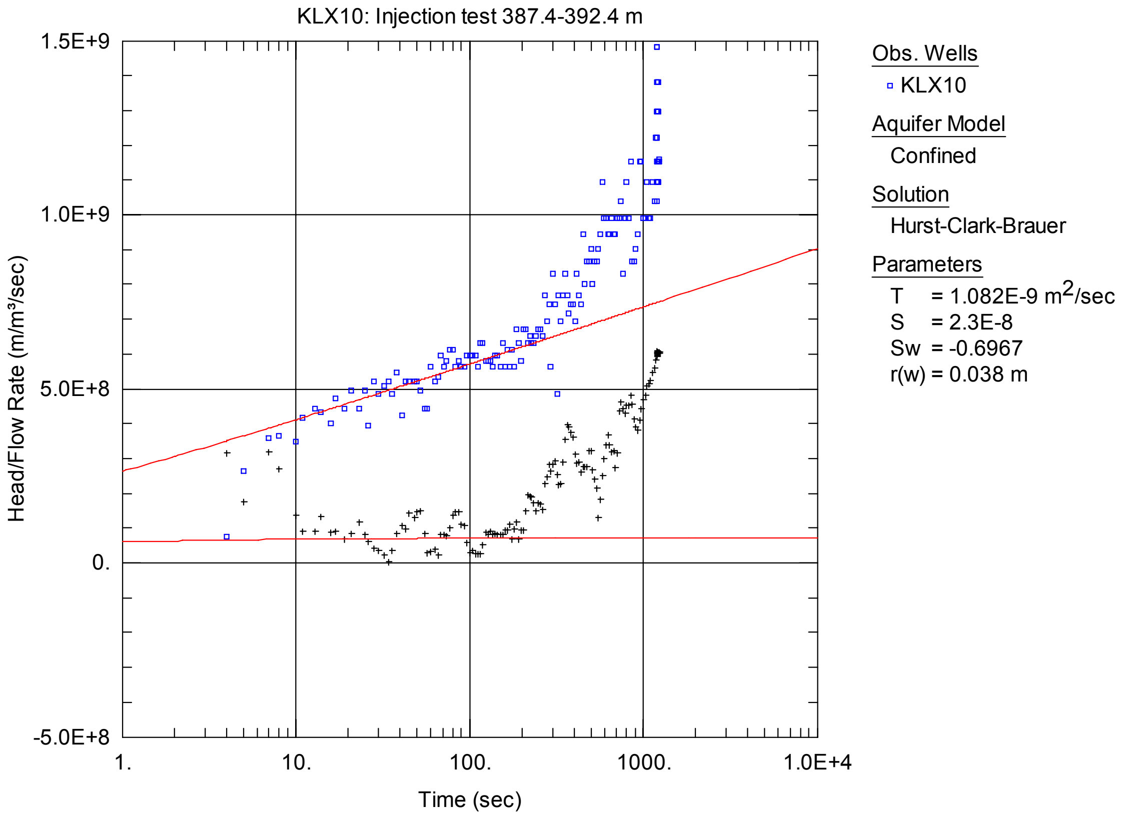


***Figure A3-333.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 387.4-392.4 m in KLX10.*

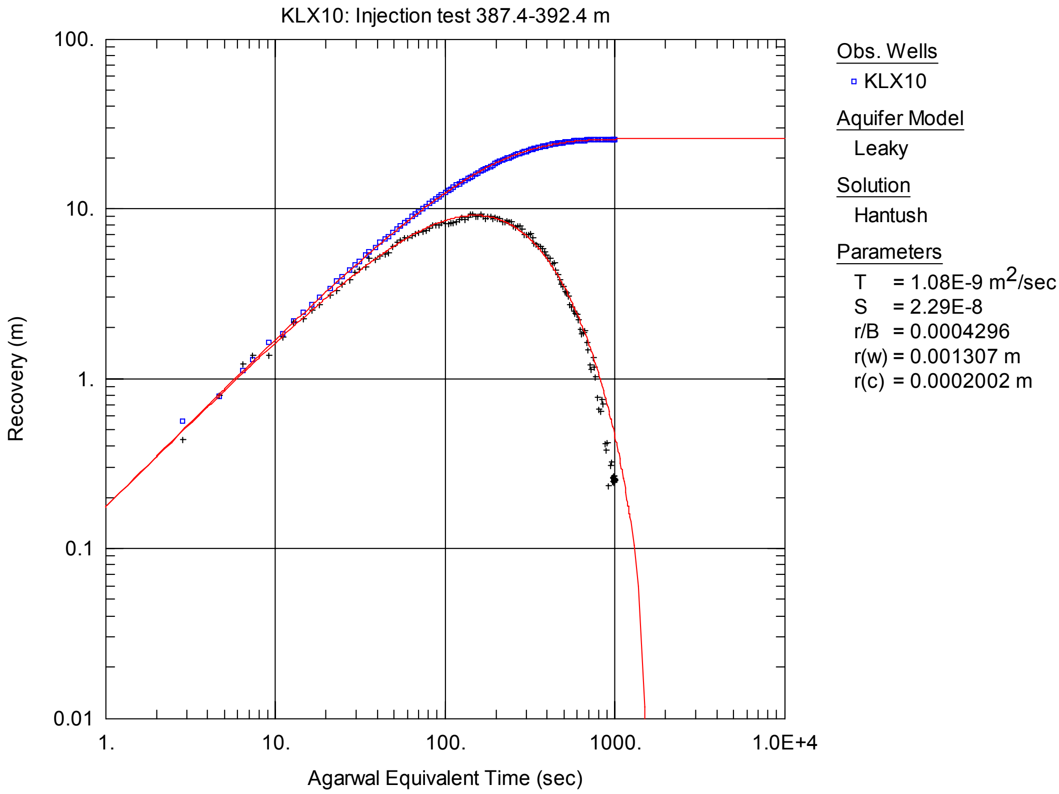


Figure A3-334. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 387.4-392.4 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

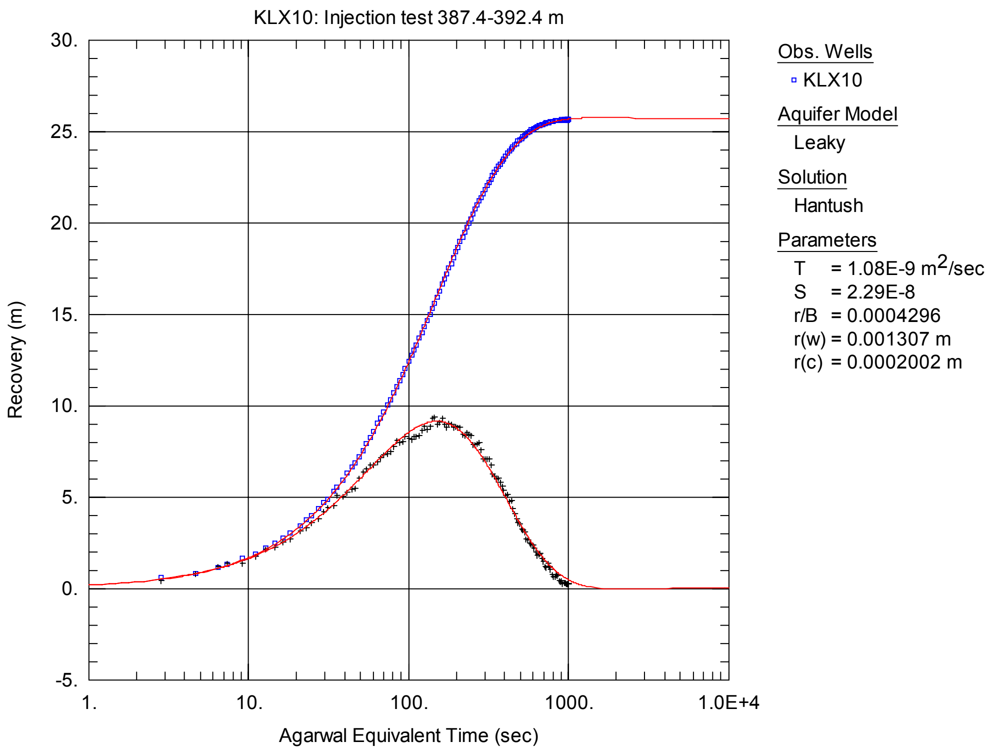


Figure A3-335. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 387.4-392.4 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

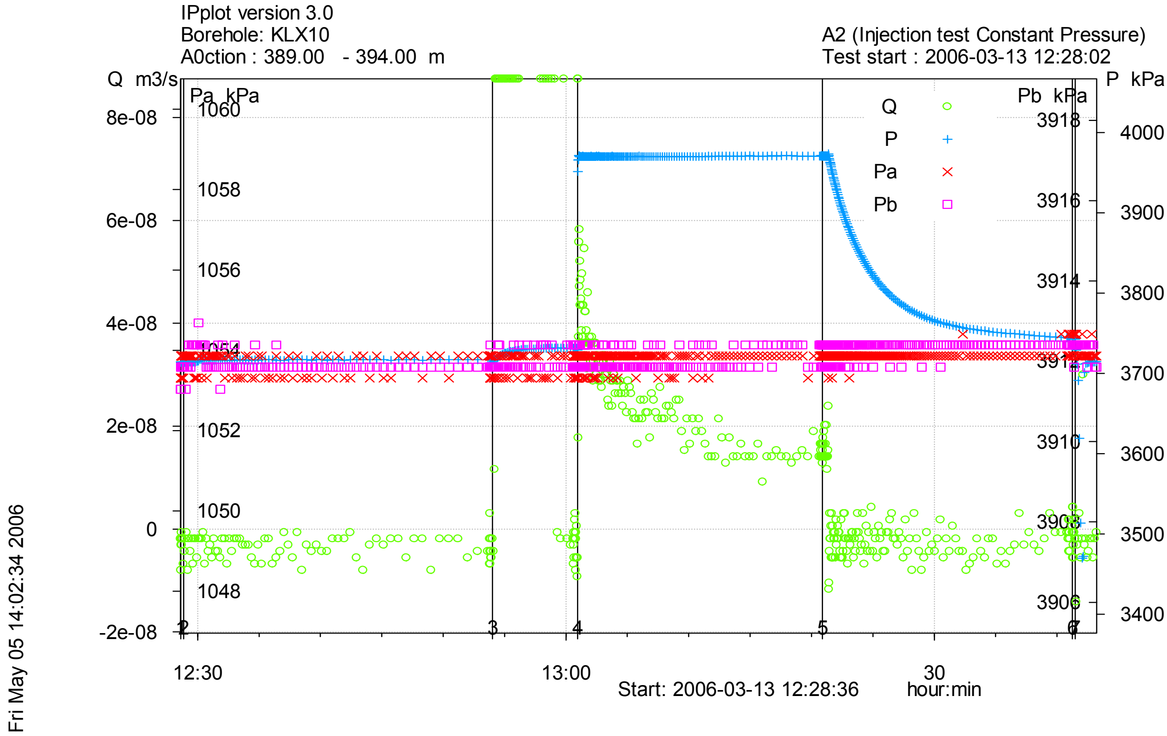


Figure A3-336. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 389.0-394.0 m in borehole KLX10.

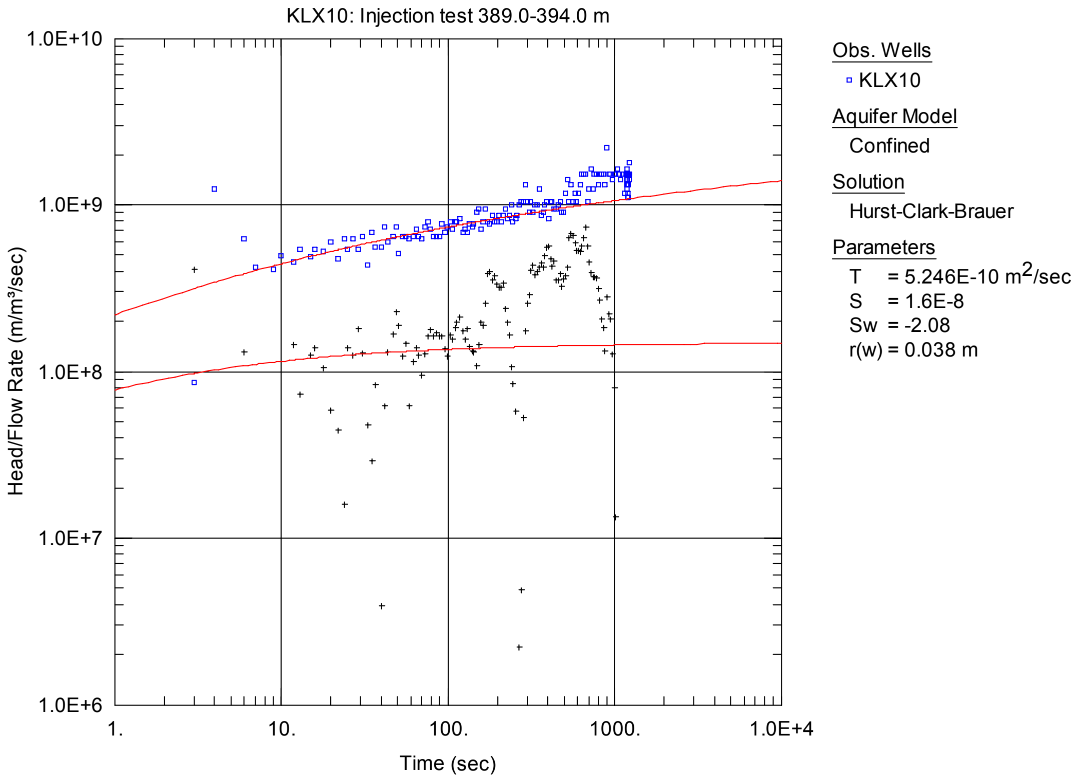


Figure A3-337. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 389.0-394.0 m in KLX10.

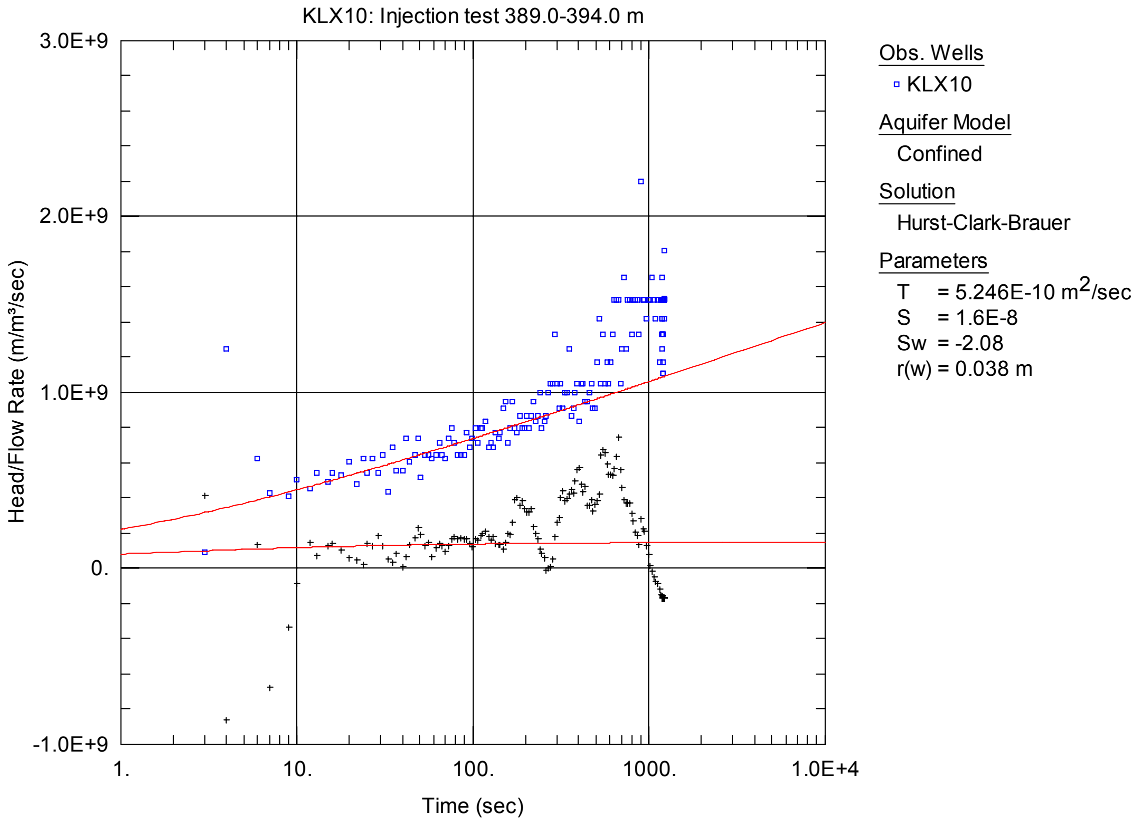


Figure A3-338. Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 389.0-394.0 m in KLX10.

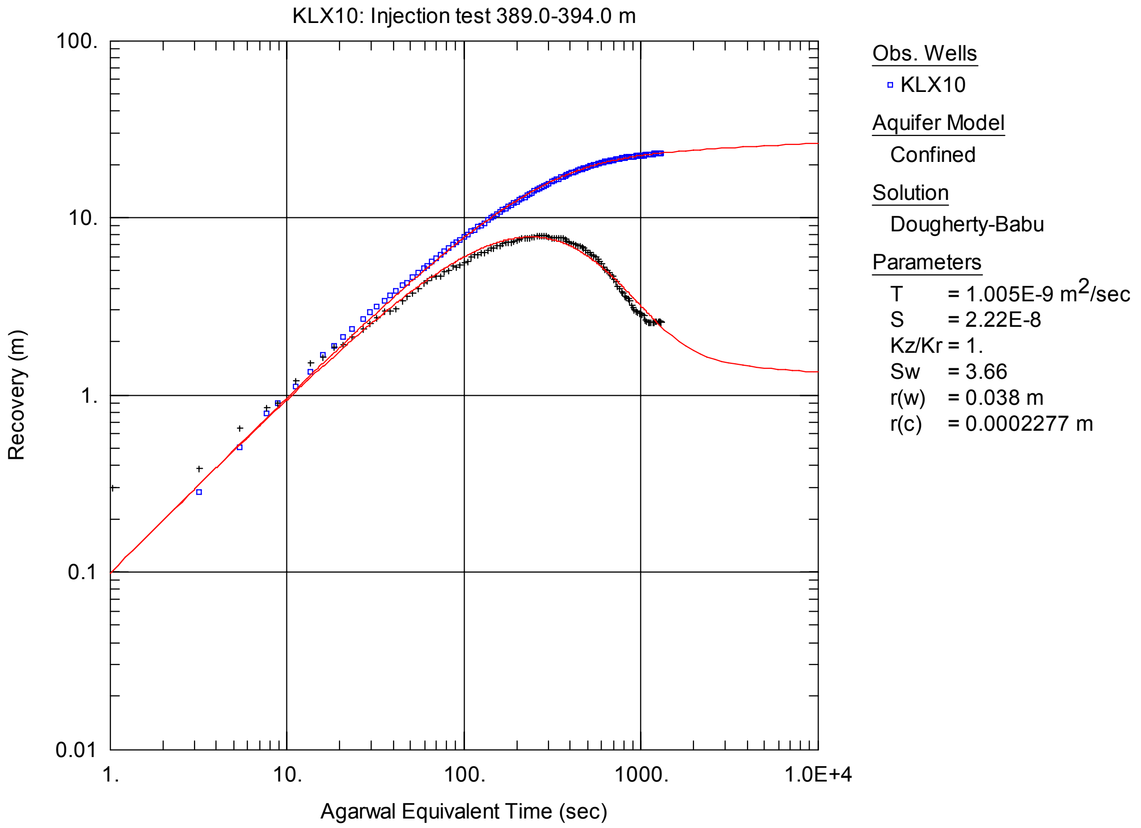


Figure A3-339. Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 389.0-394.0 m in KLX10.

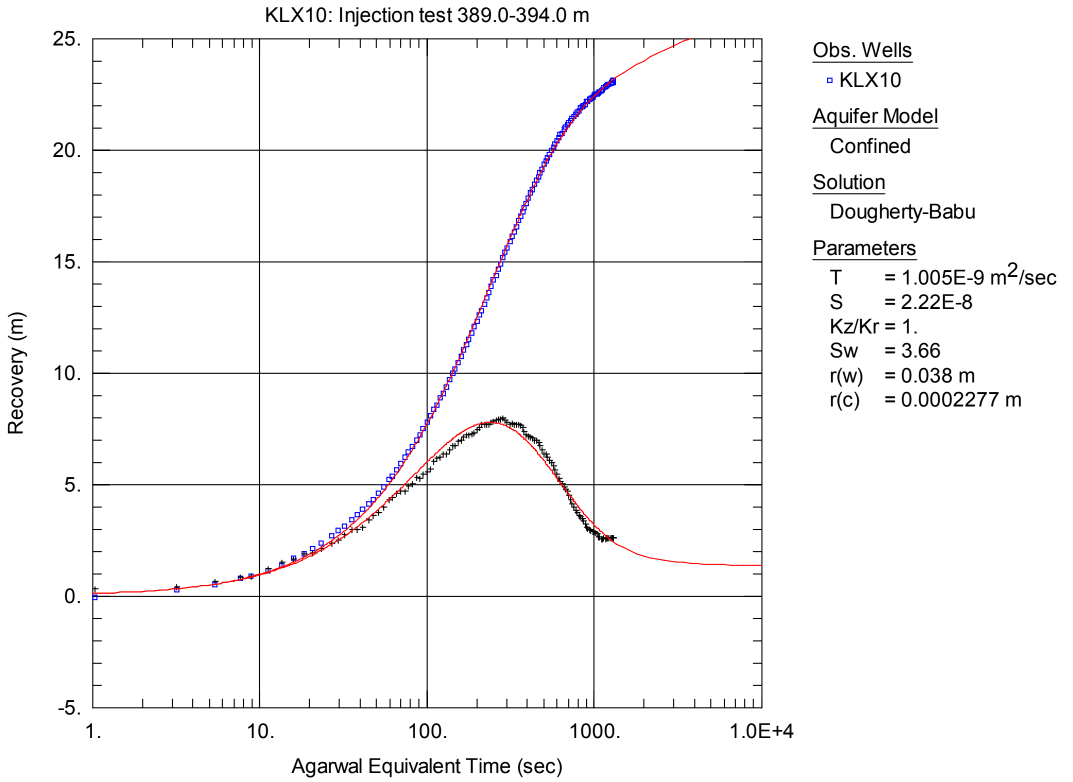


***Figure A3-340.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 389.0-394.0 m in KLX10.*

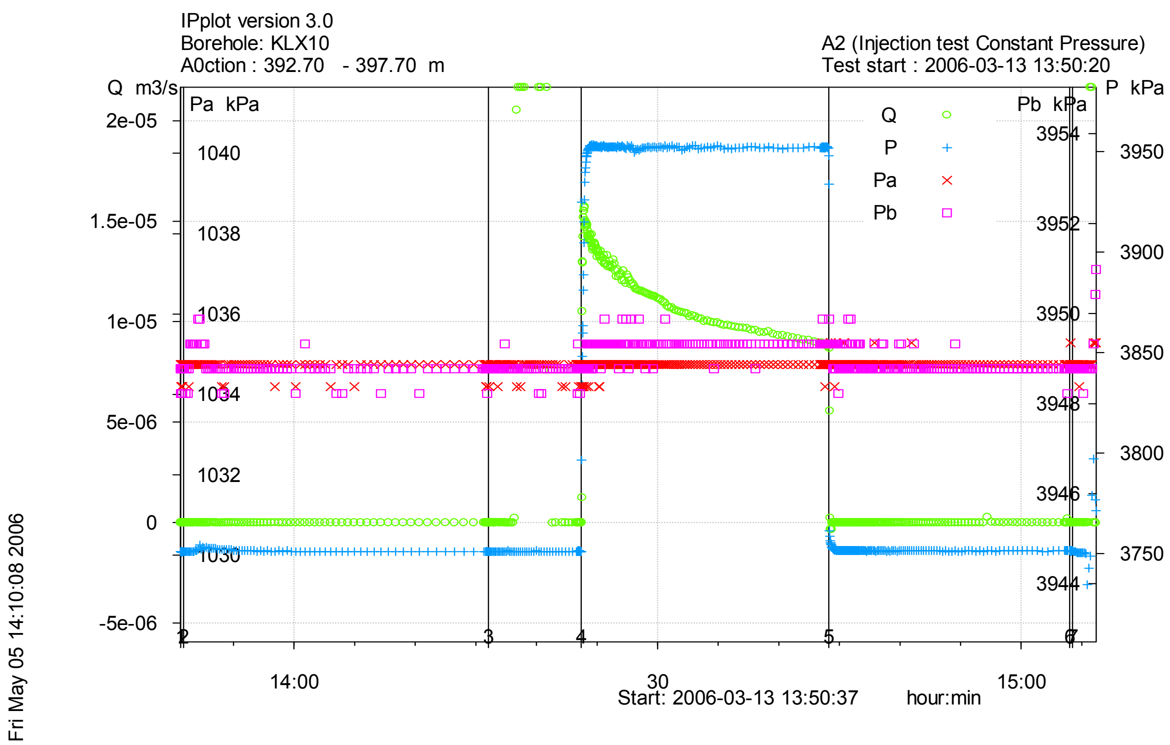


***Figure A3-341.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 392.7-397.7 m in borehole KLX10.*

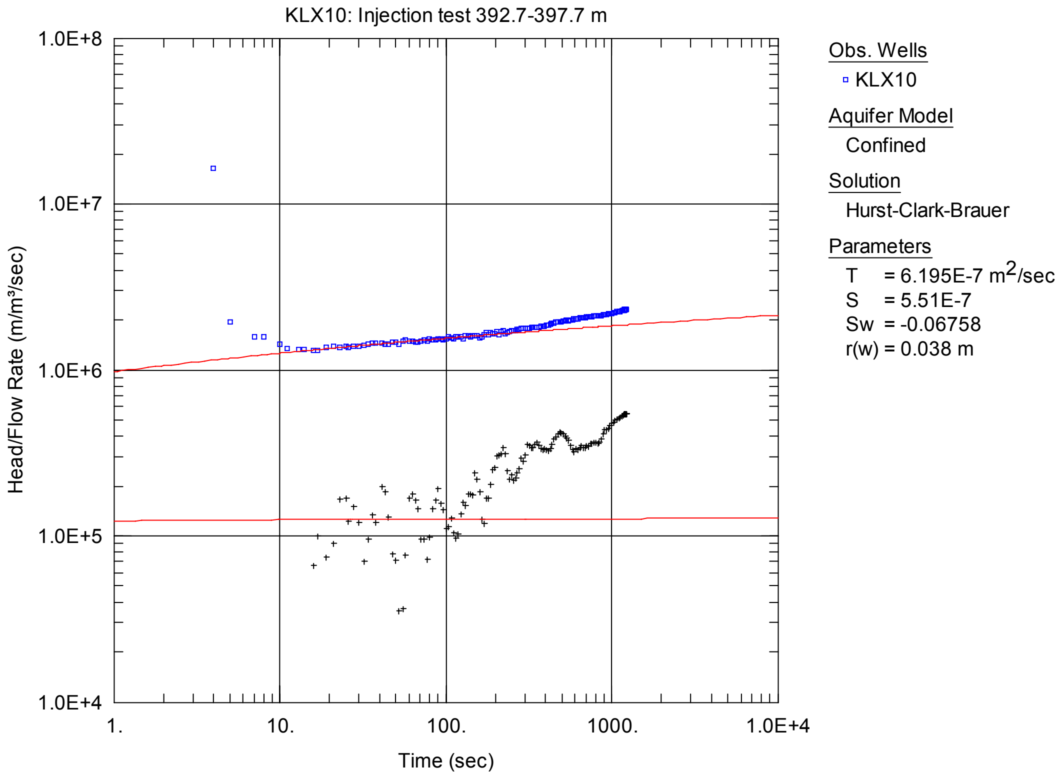


***Figure A3-342.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 392.7-397.7 m in KLX10.*

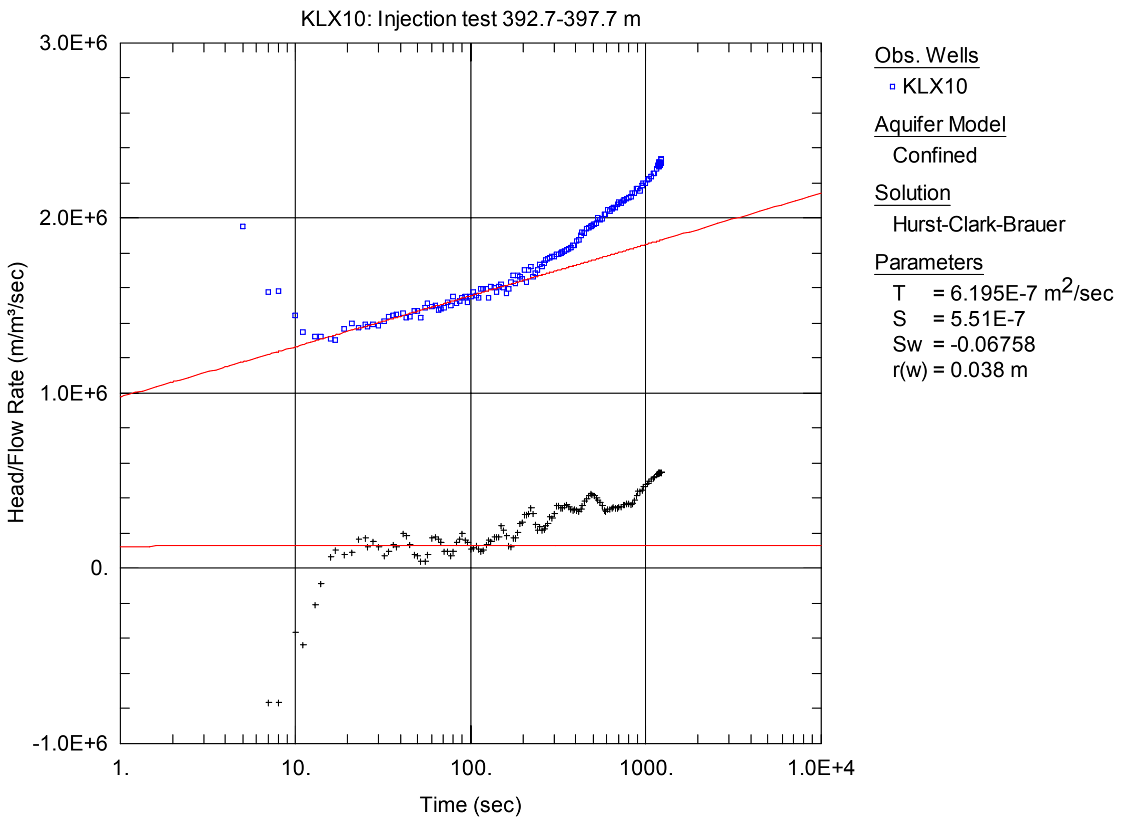


***Figure A3-343.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 392.7-397.7 m in KLX10.*

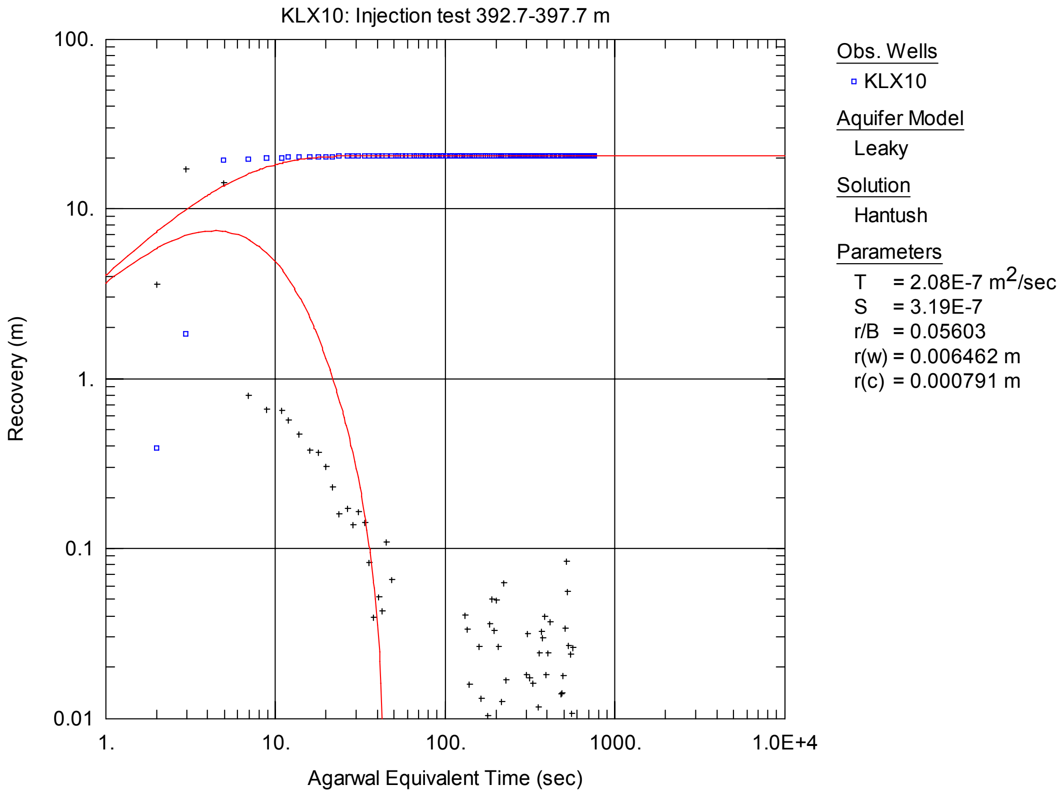


Figure A3-344. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 392.7-397.7 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

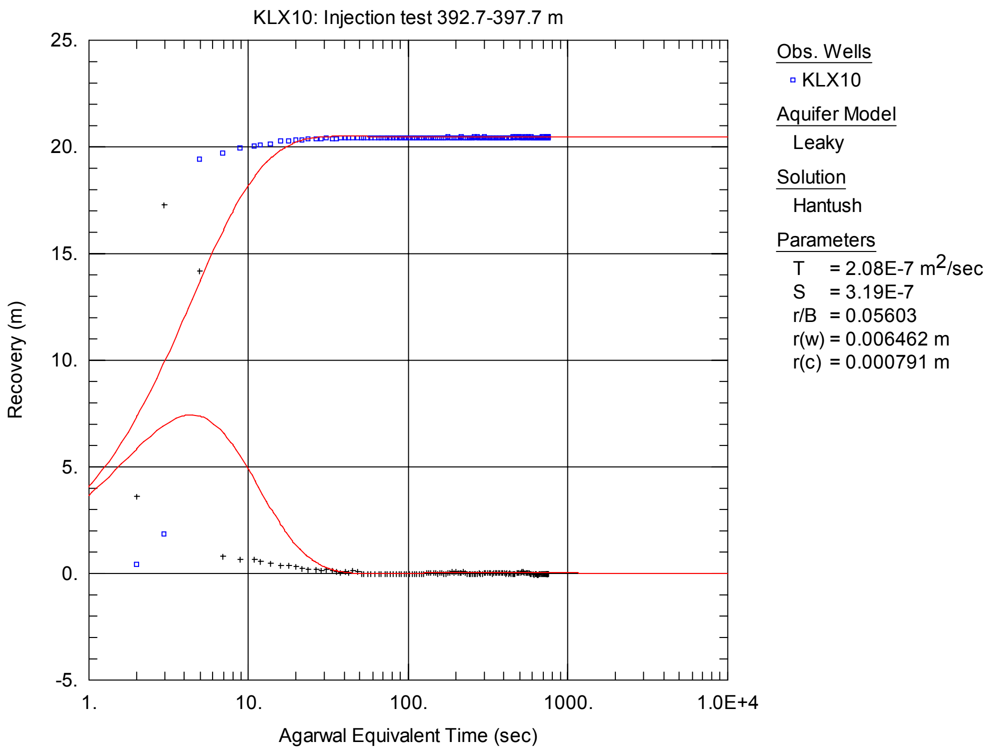


Figure A3-345. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 392.7-397.7 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

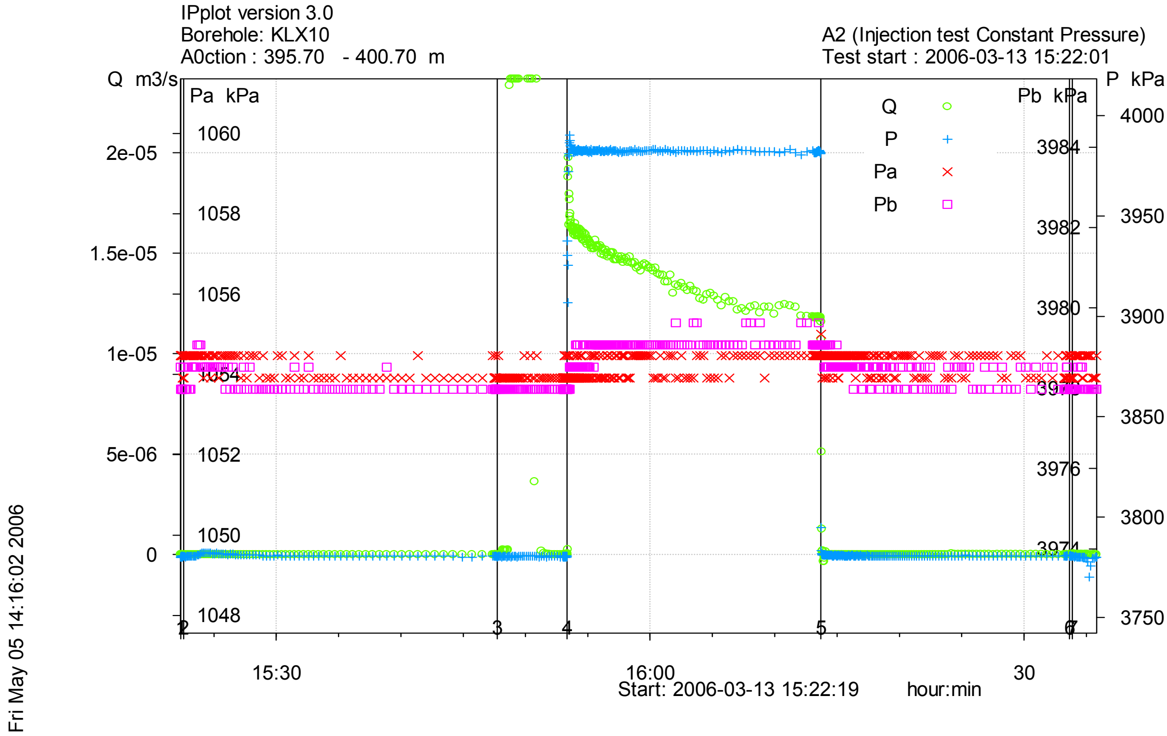


Figure A3-346. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 395.7-400.7 m in borehole KLX10.*

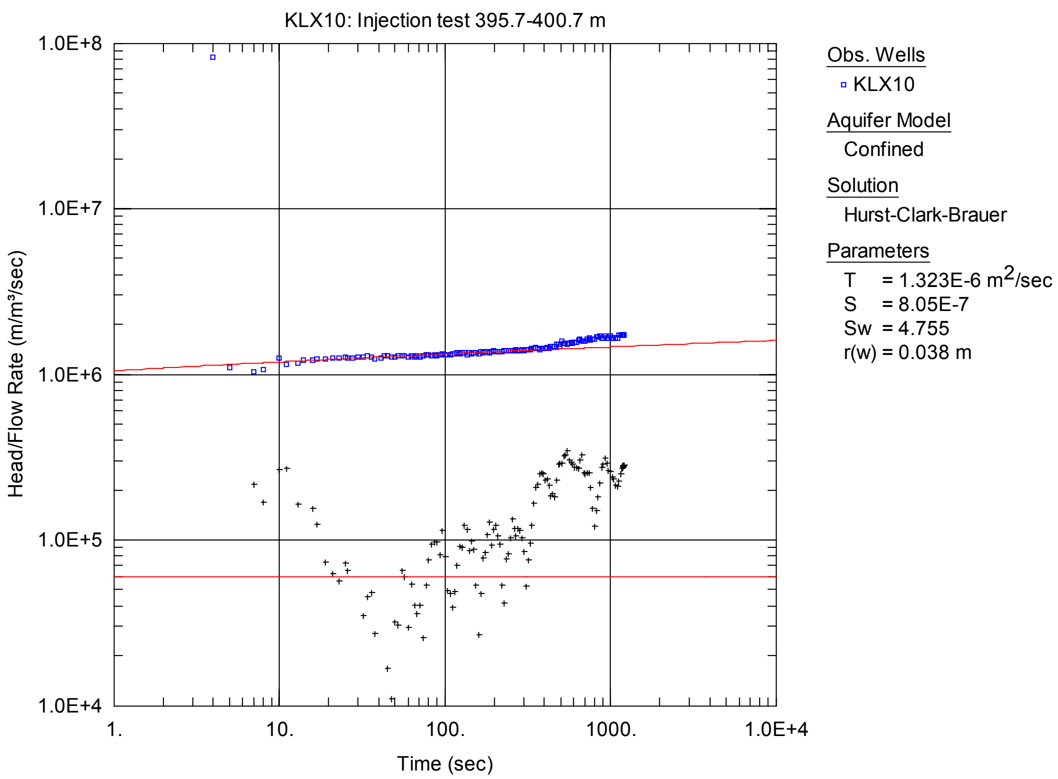


Figure A3-347. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 395.7-400.7 m in KLX10.*

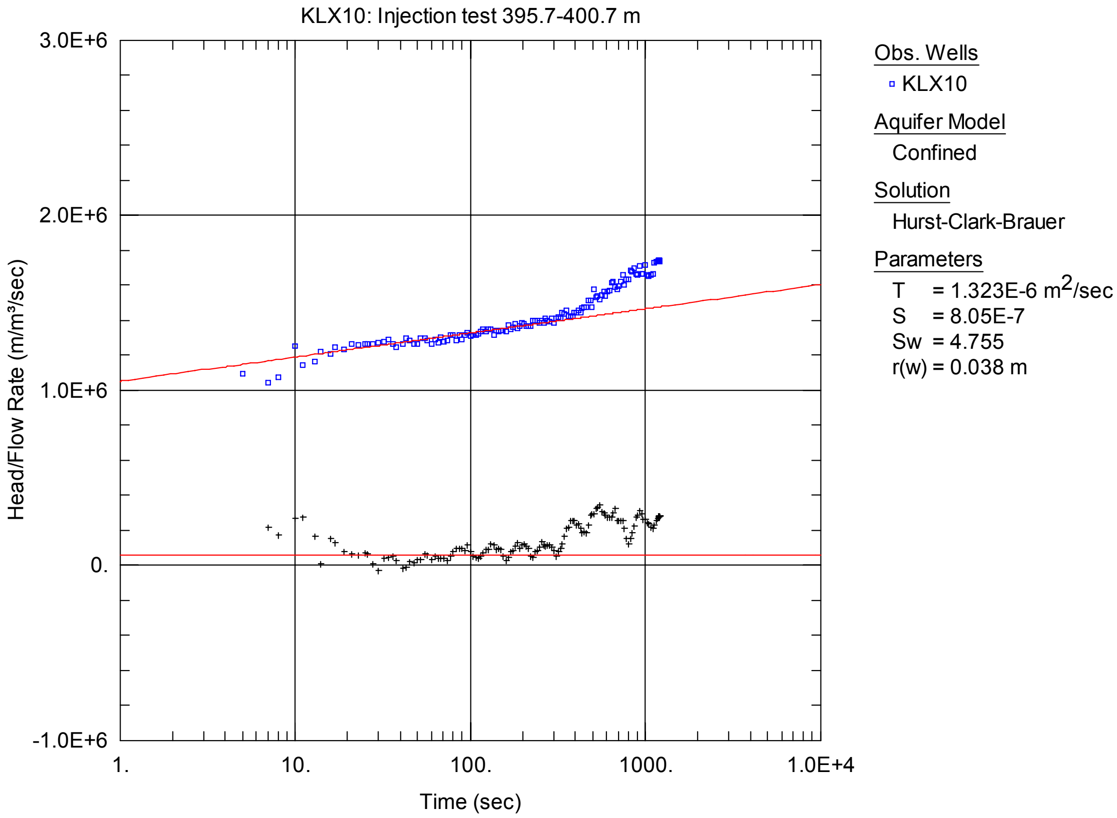


Figure A3-348. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 395.7-400.7 m in KLX10.*

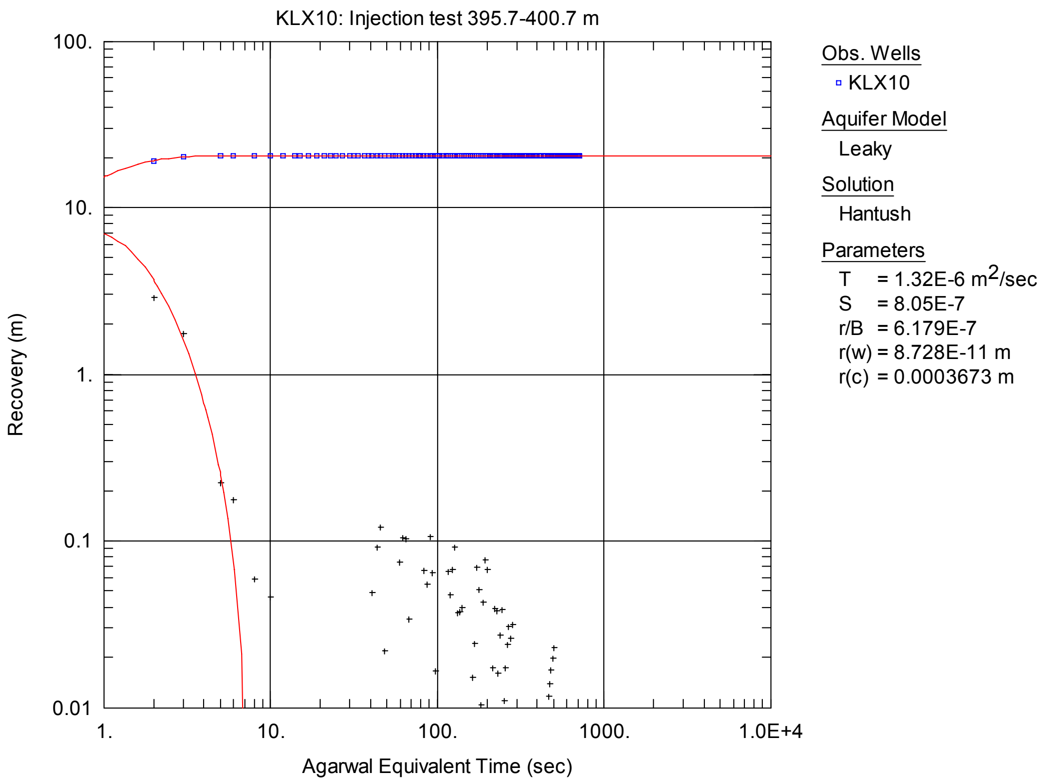


Figure A3-349. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 395.7-400.7 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

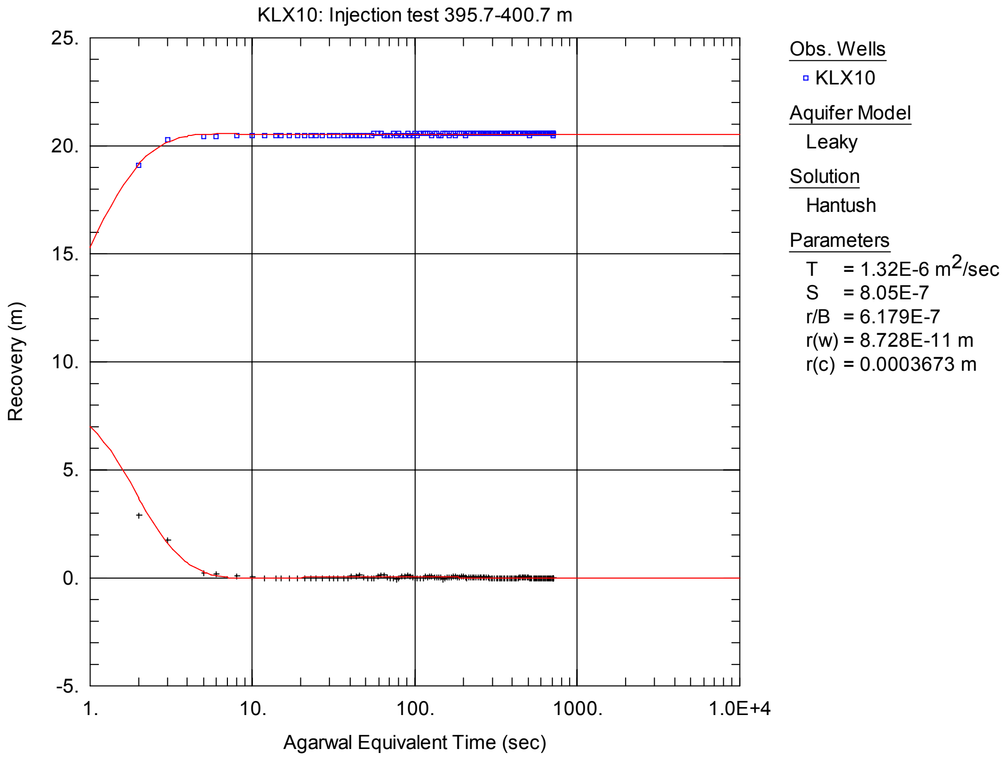


Figure A3-350. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 395.7-400.7 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

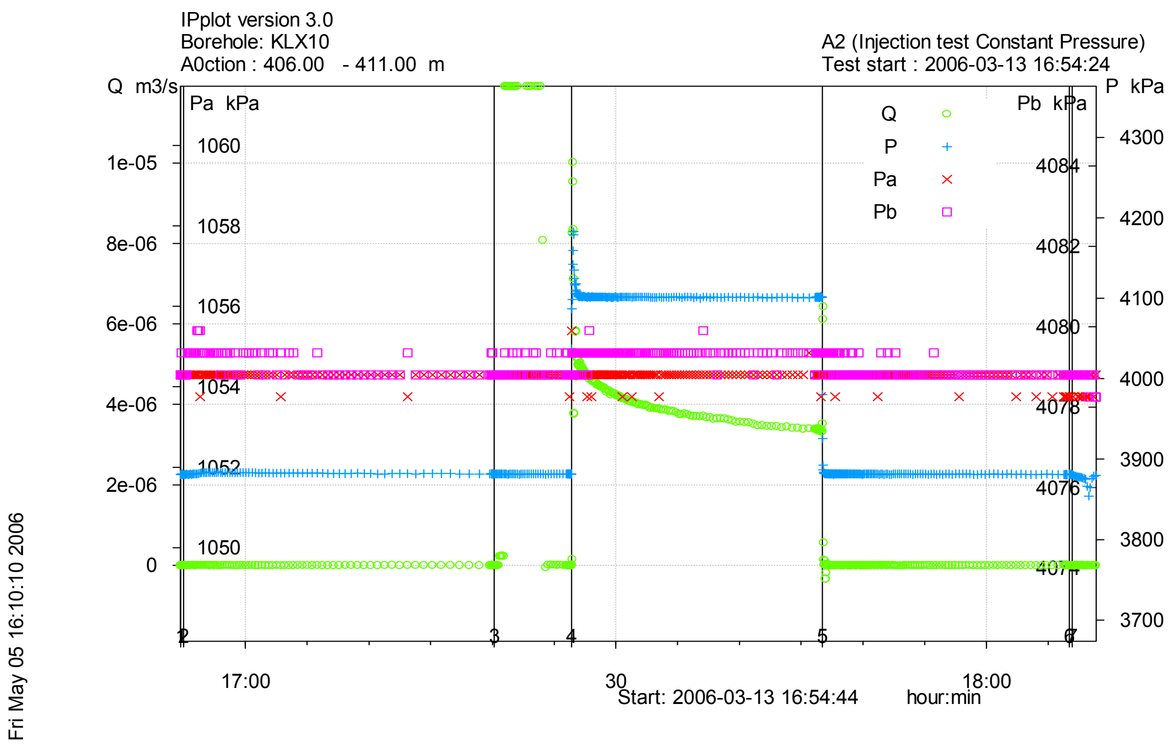


Figure A3-351. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 406.0-411.0 m in borehole KLX10.*

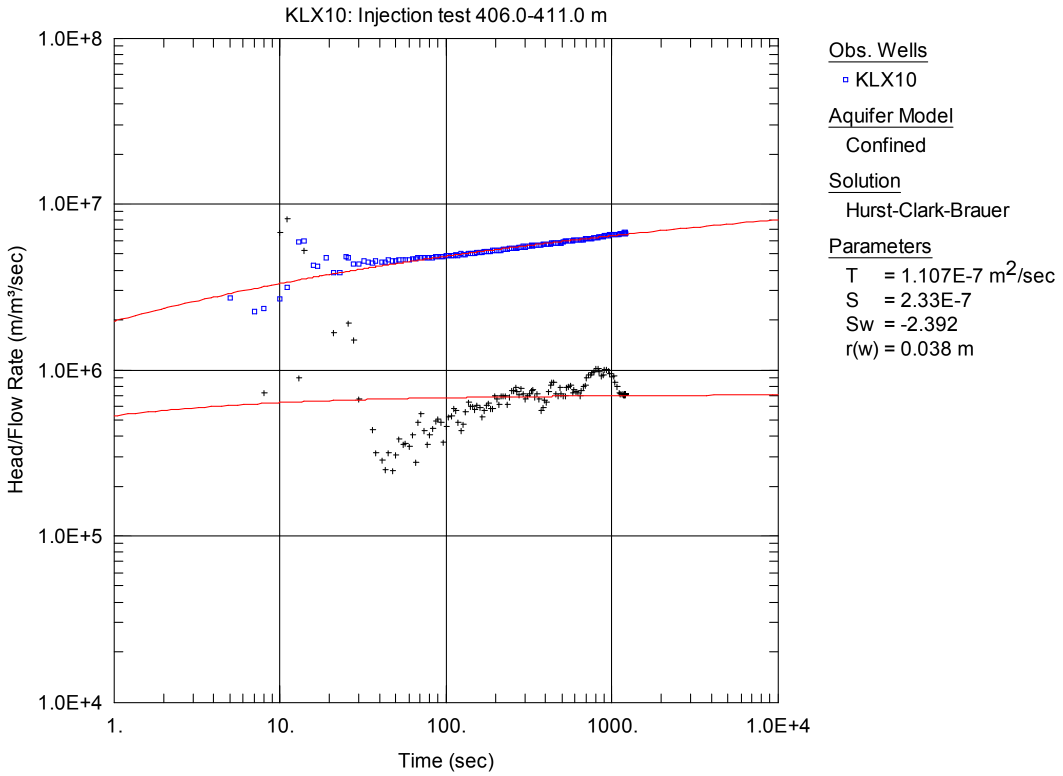


Figure A3-352. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 406.0-411.0 m in KLX10.*

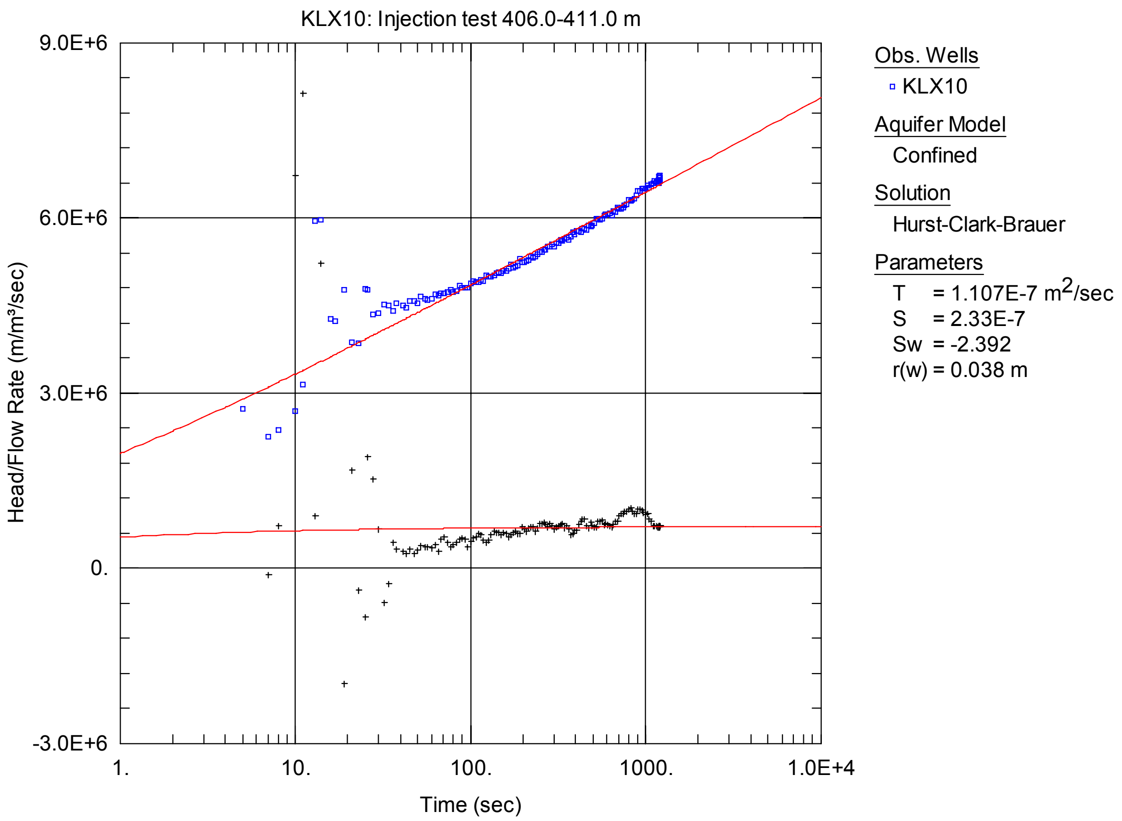


Figure A3-353. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 406.0-411.0 m in KLX10.*

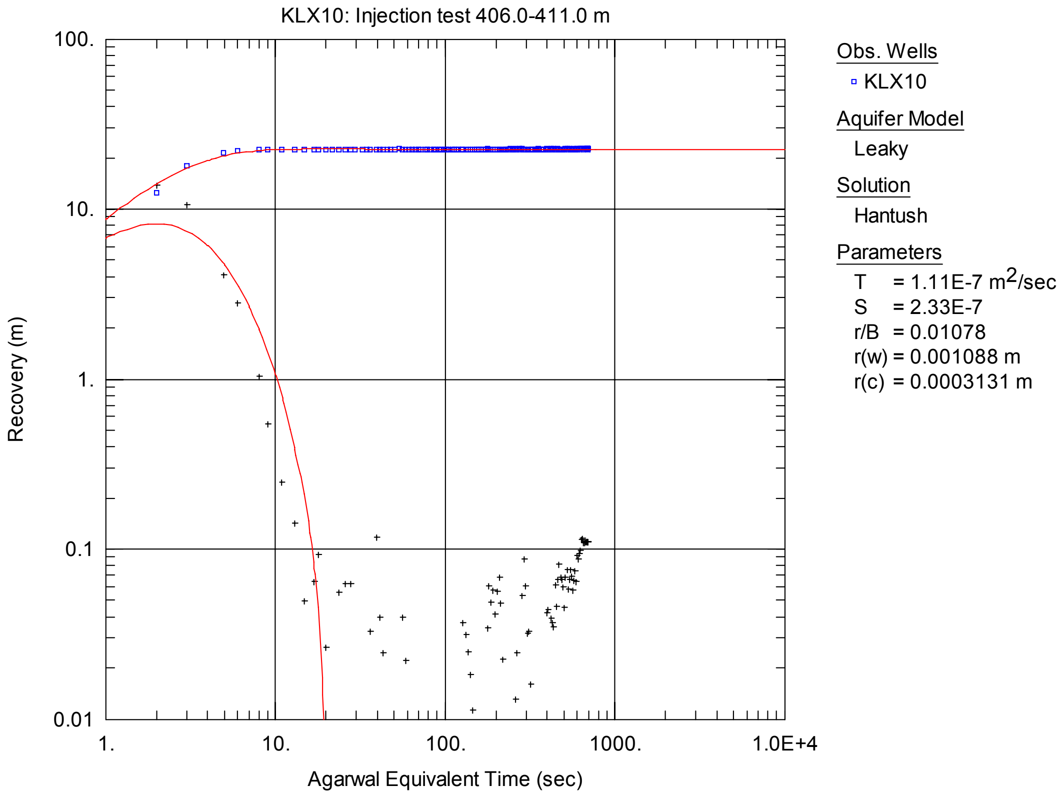


Figure A3-354. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 406.0-411.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

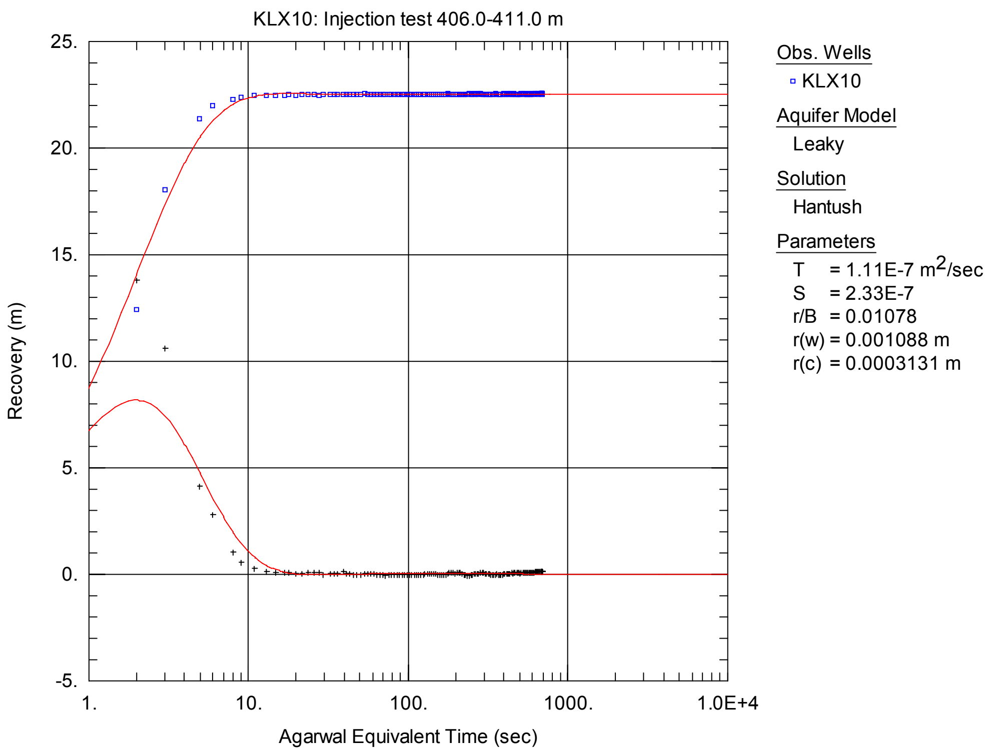


Figure A3-355. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 406.0-411.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

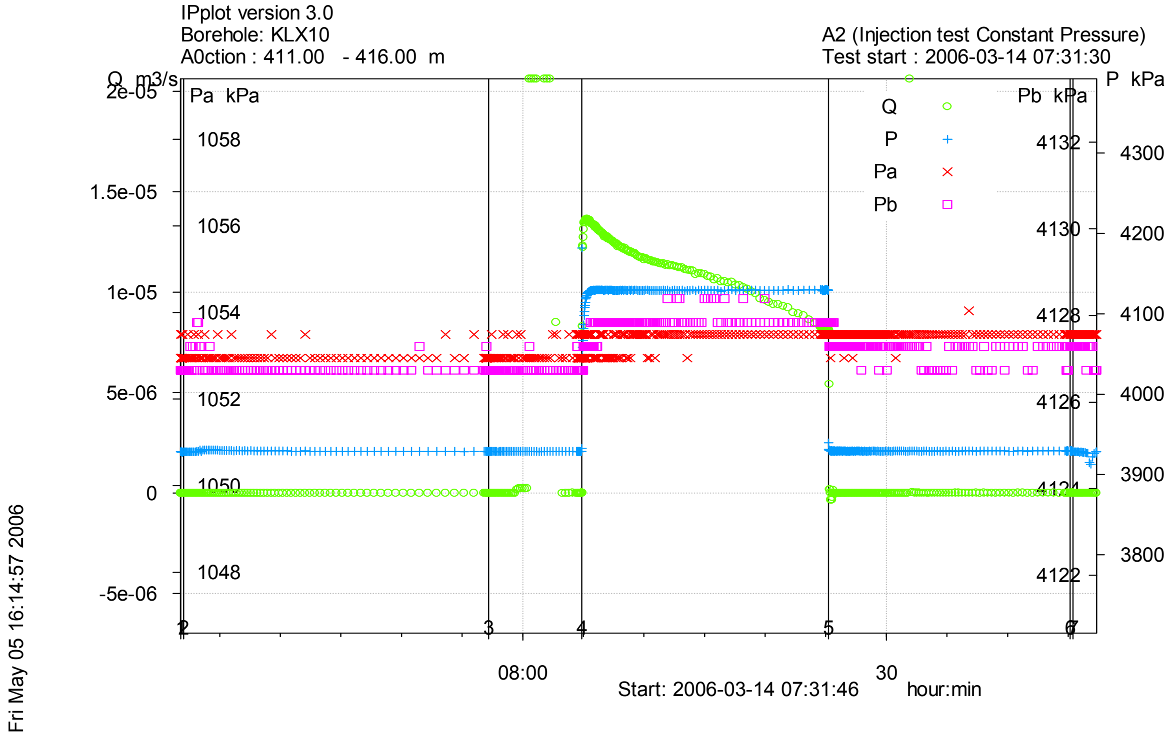


Figure A3-356. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 411.0-416.0 m in borehole KLX10.*

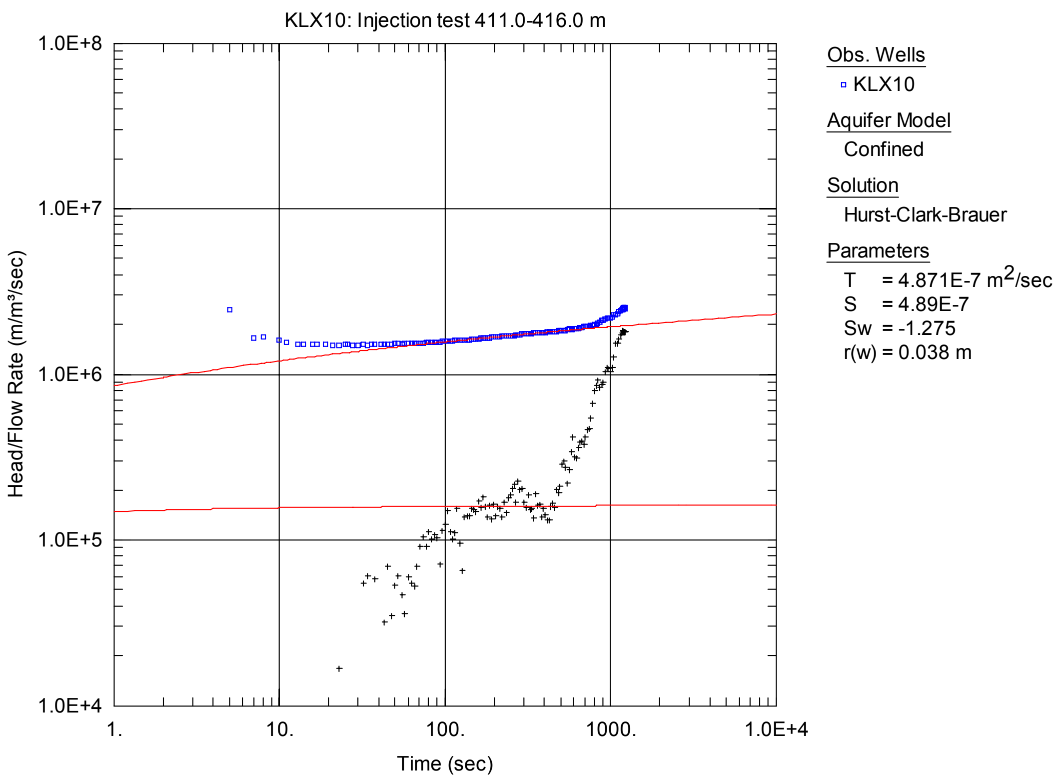


Figure A3-357. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 411.0-416.0 m in KLX10.*

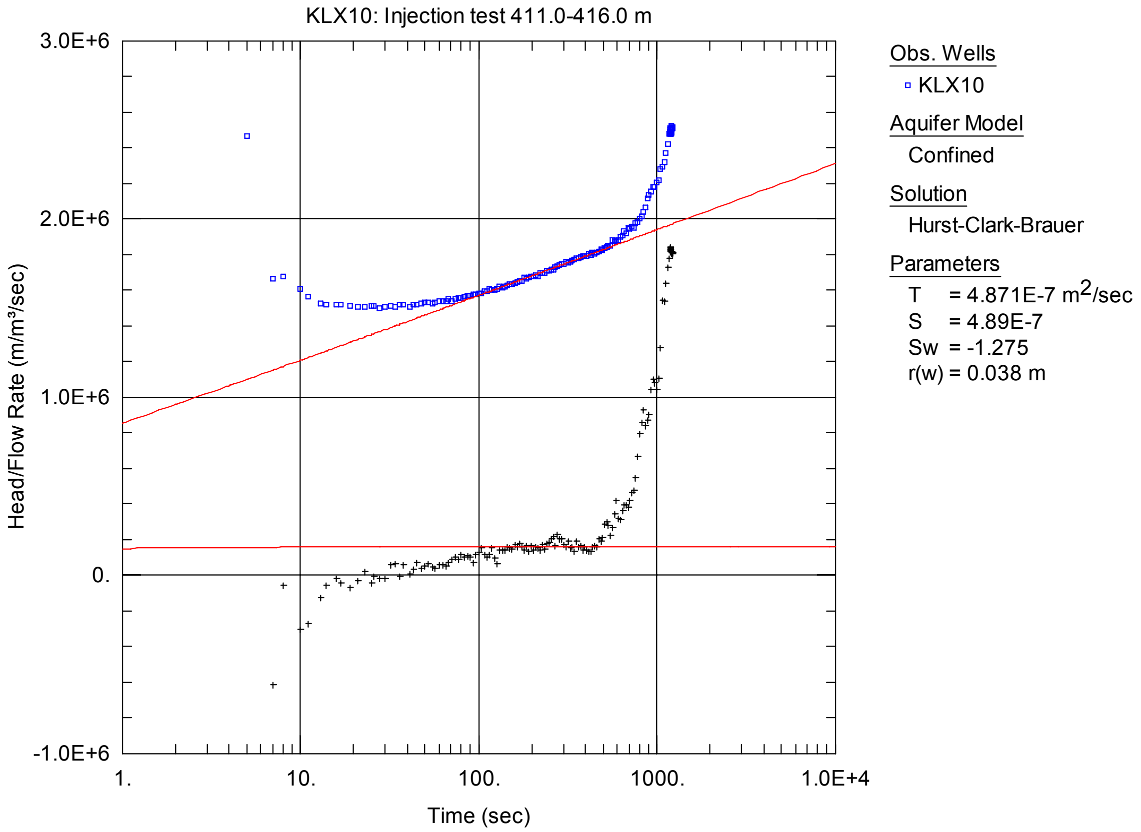


***Figure A3-358.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 411.0-416.0 m in KLX10.*

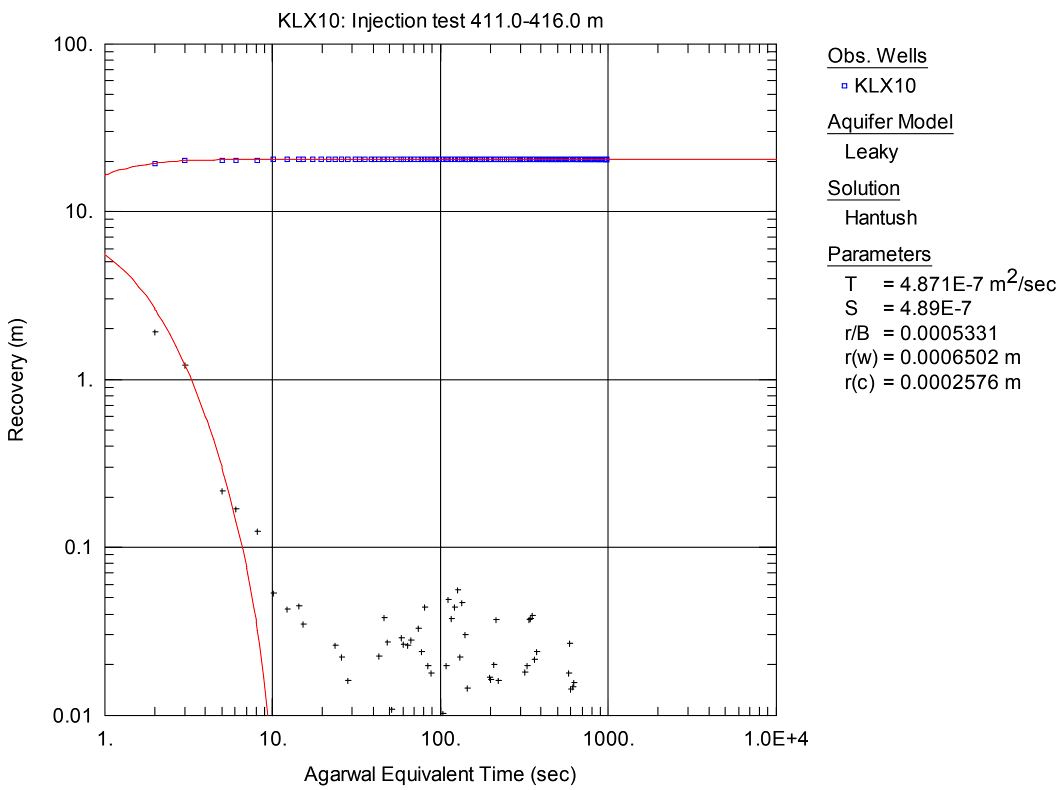


***Figure A3-359.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 411.0-416.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

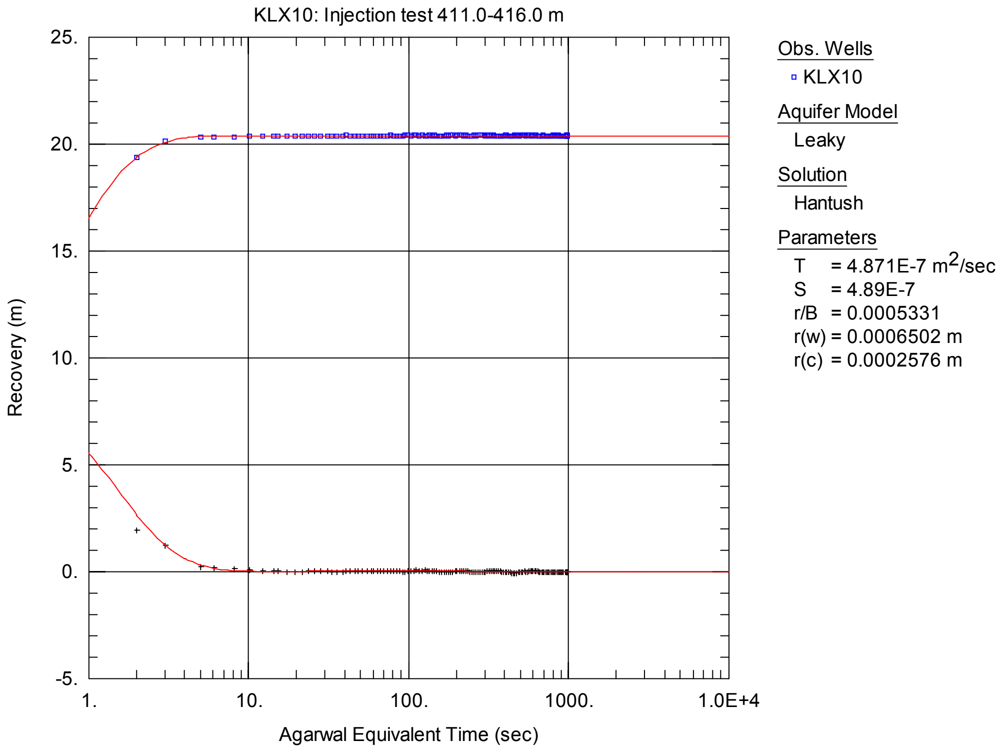


Figure A3-360. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 411.0-416.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

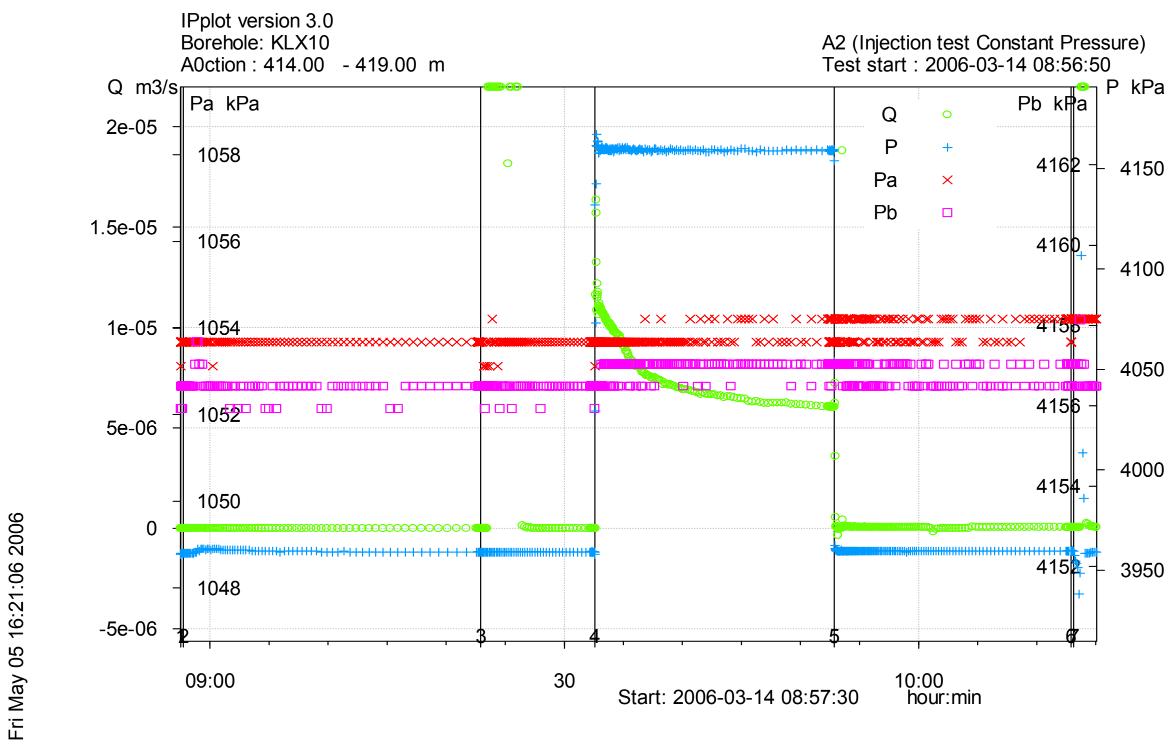


Figure A3-361. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 414.0-419.0 m in borehole KLX10.*

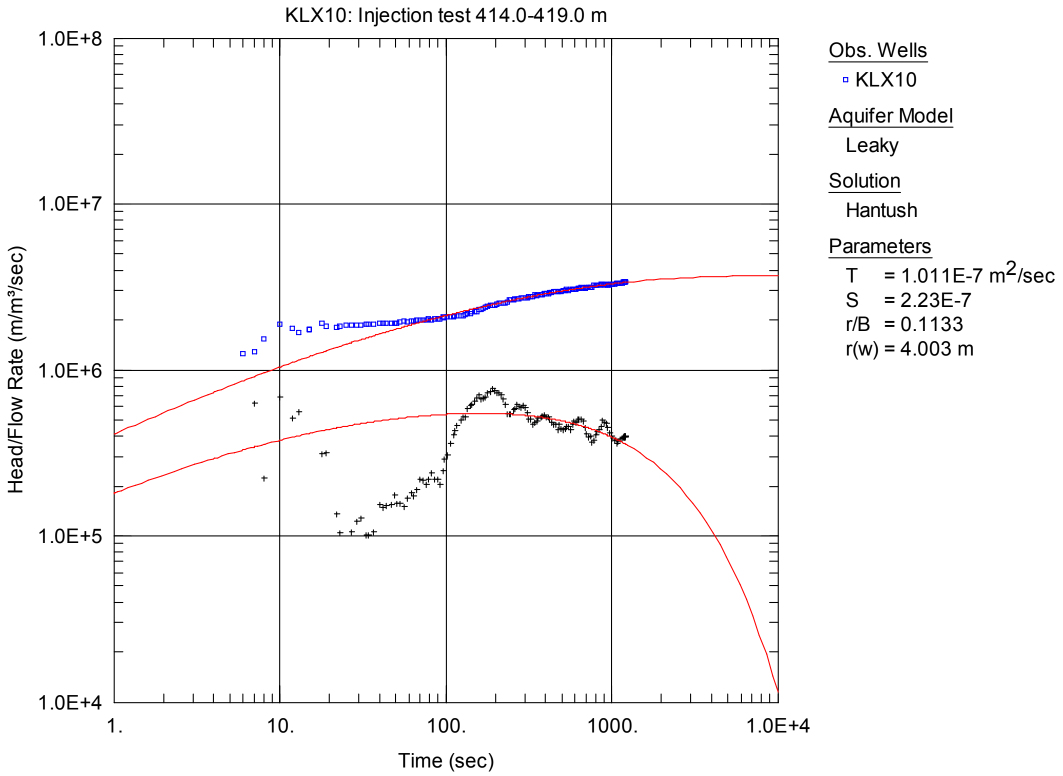


Figure A3-362. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 414.0-419.0 m in KLX10.*

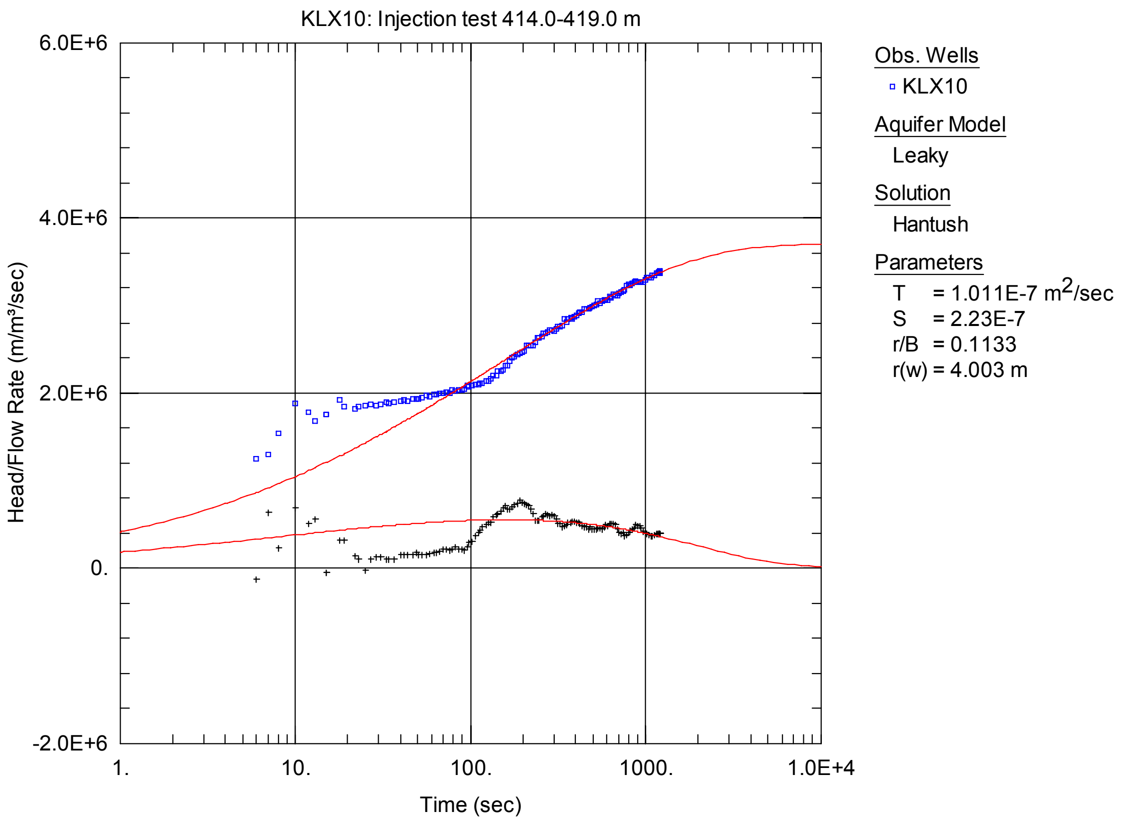


Figure A3-363. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 414.0-419.0 m in KLX10.*

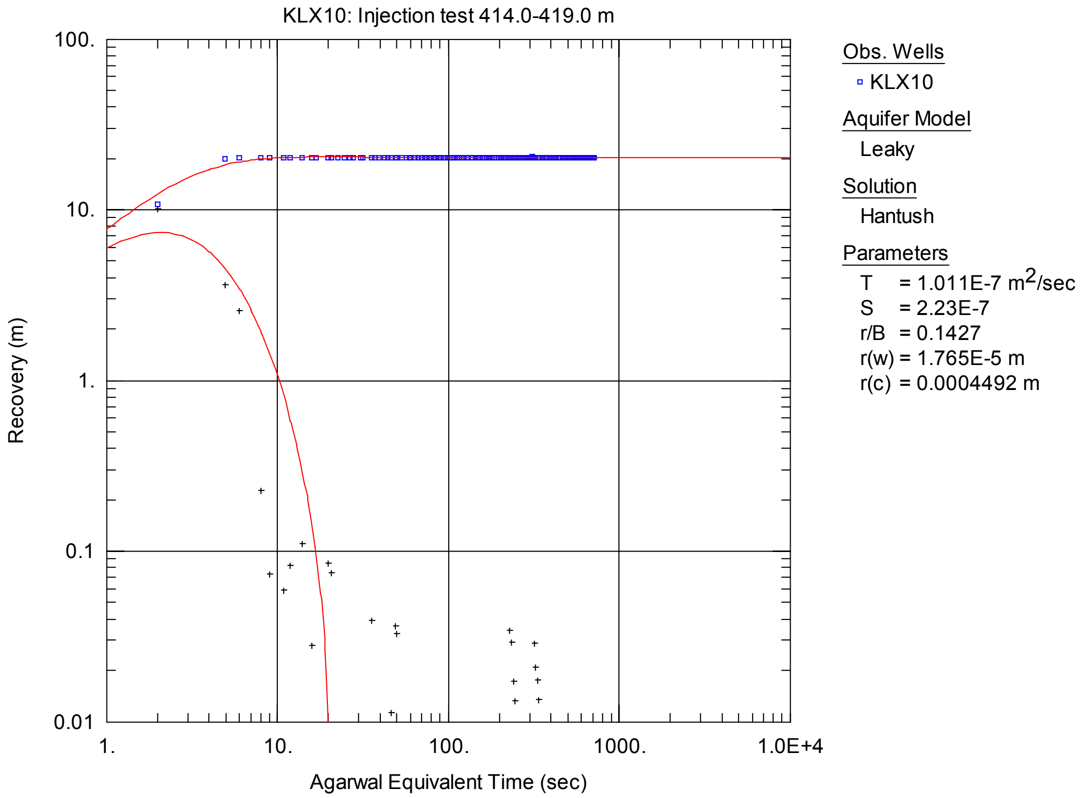


Figure A3-364. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 414.0-419.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

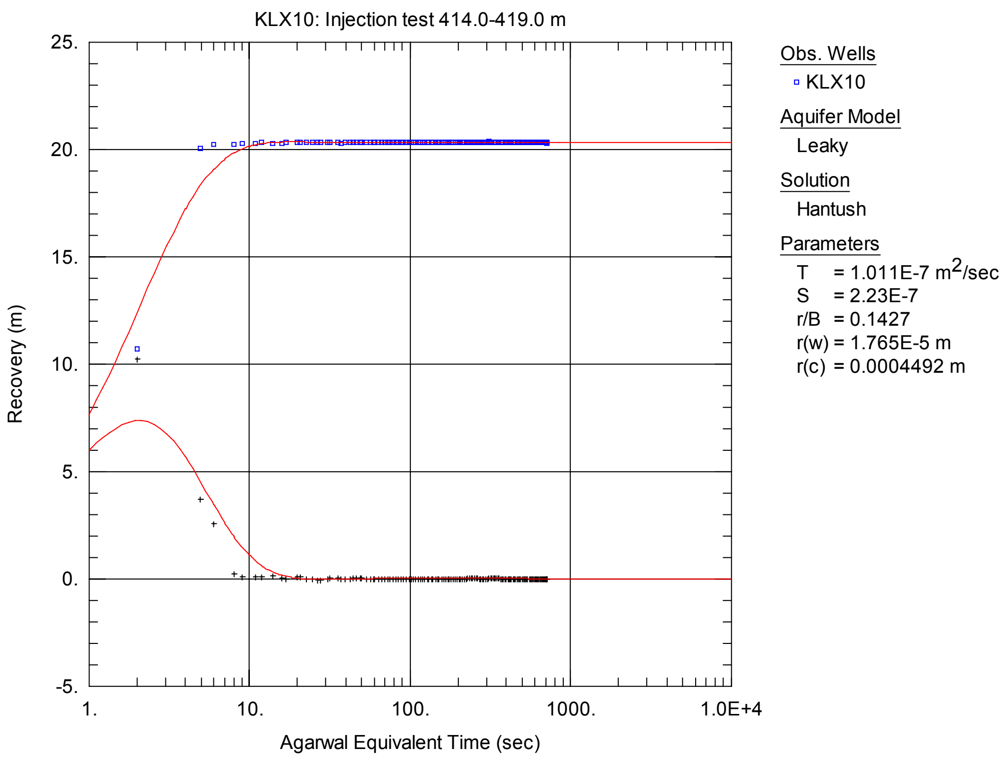


Figure A3-365. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 414.0-419.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

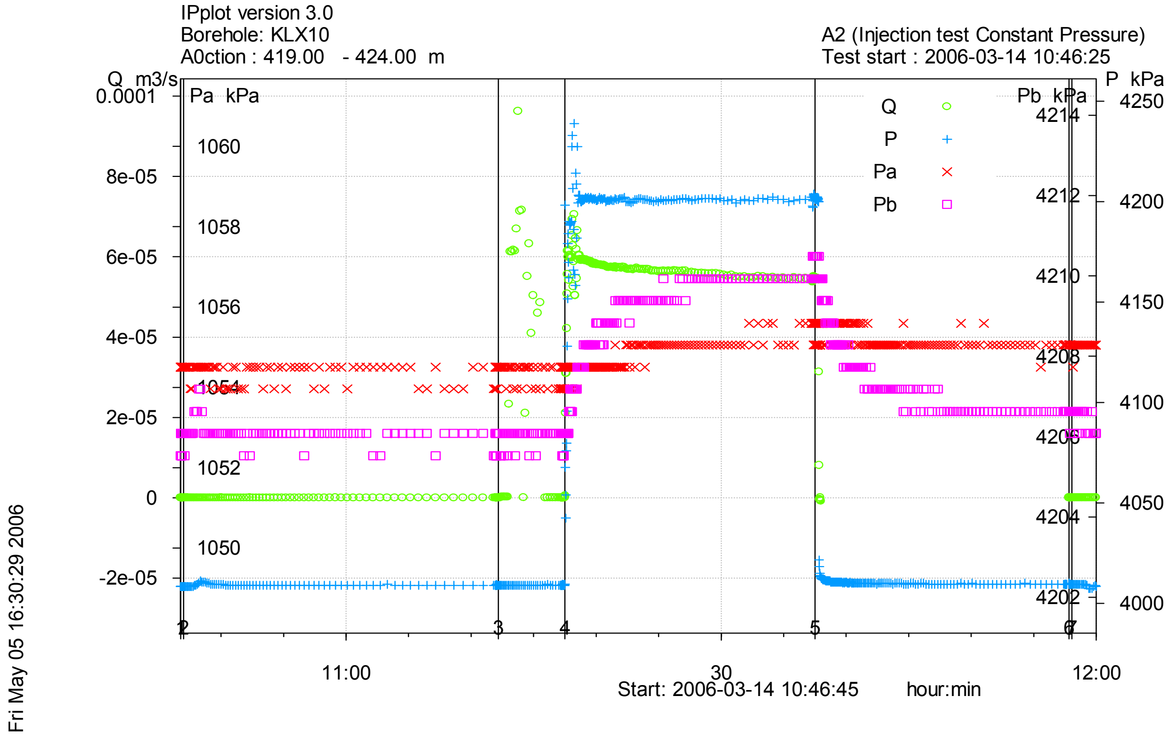


Figure A3-366. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 419.0-424.0 m in borehole KLX10.*

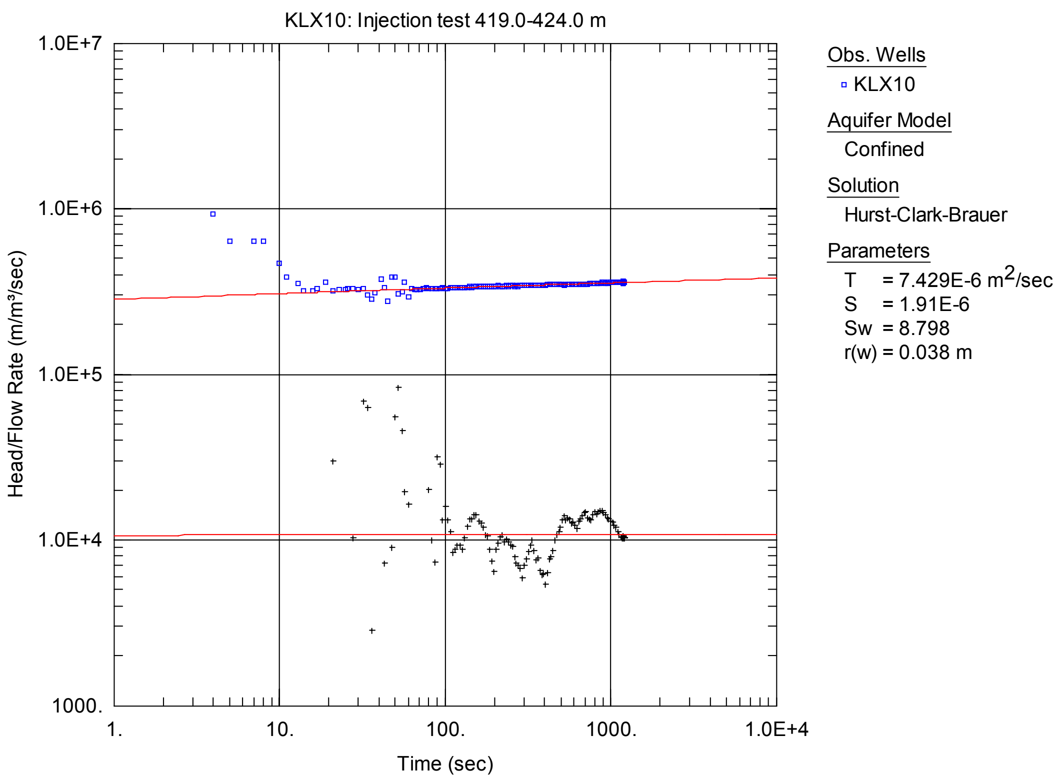


Figure A3-367. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 419.0-424.0 m in KLX10.*

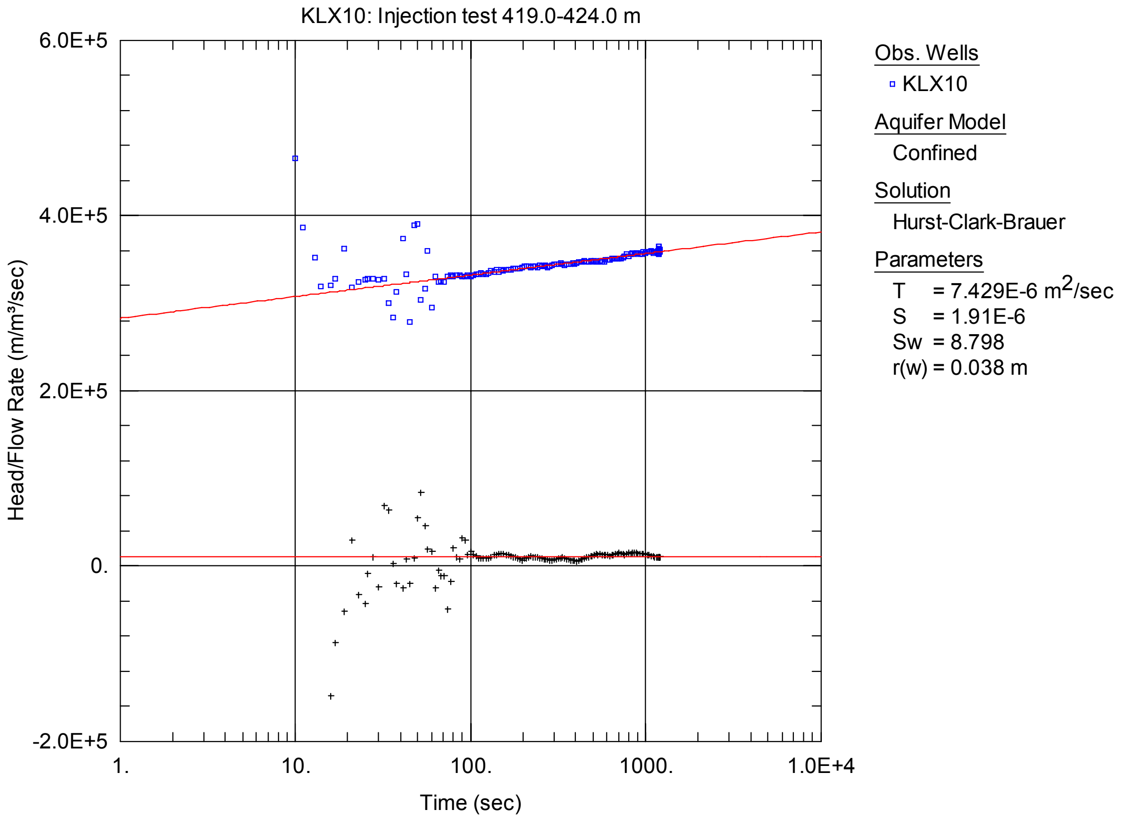


Figure A3-368. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 419.0-424.0 m in KLX10.*

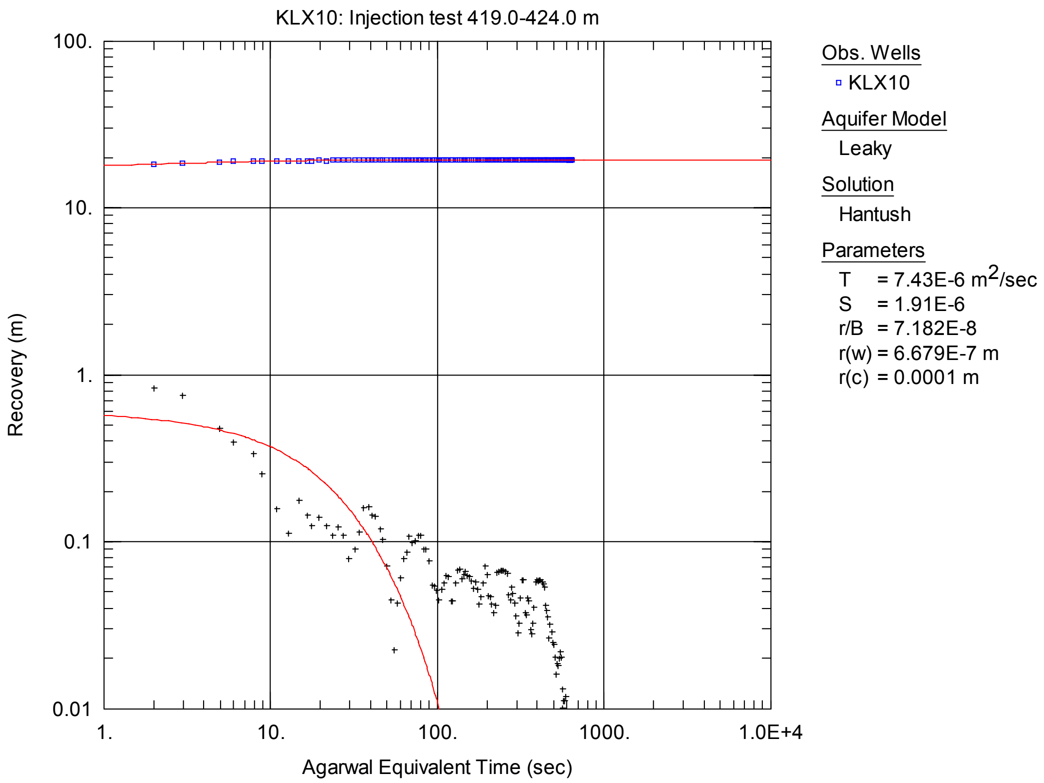


Figure A3-369. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 419.0-424.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

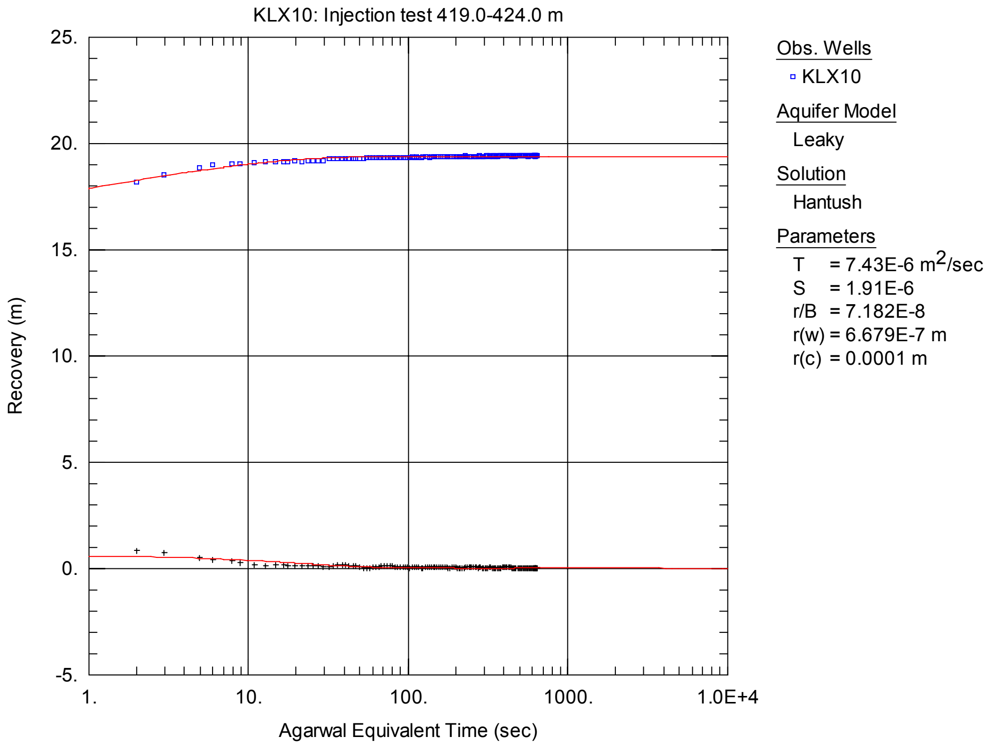


***Figure A3-370.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 419.0-424.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

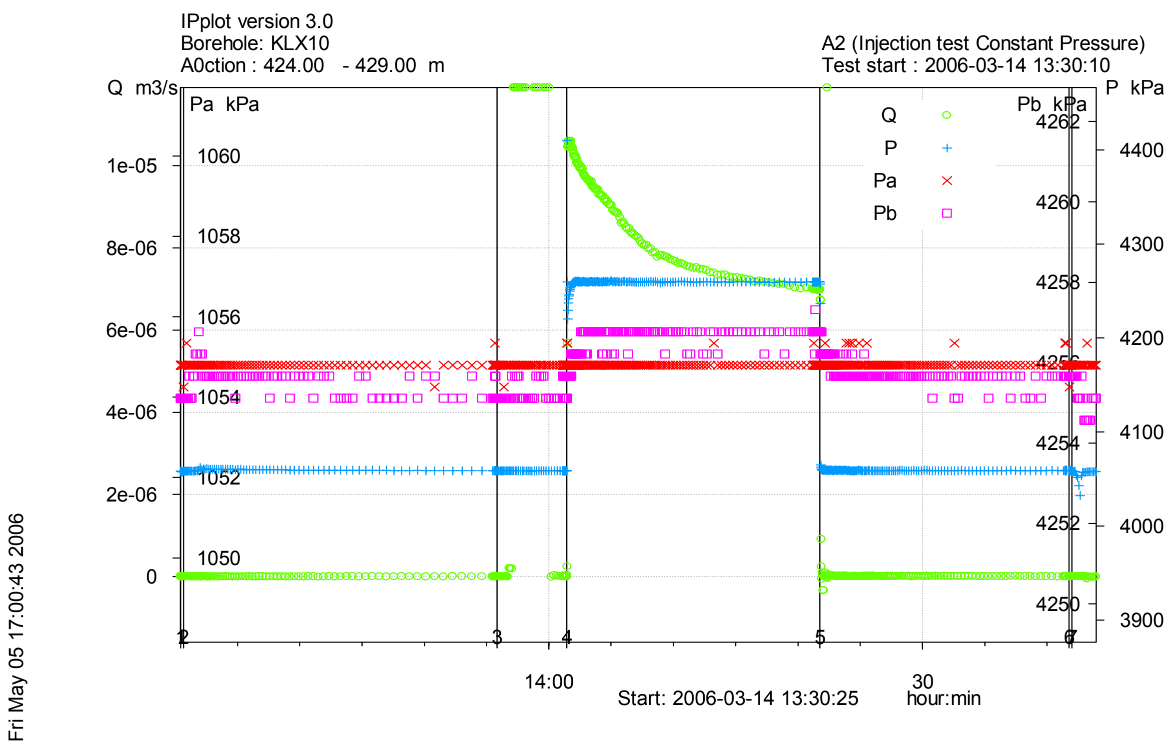


***Figure A3-371.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 424.0-429.0 m in borehole KLX10.*

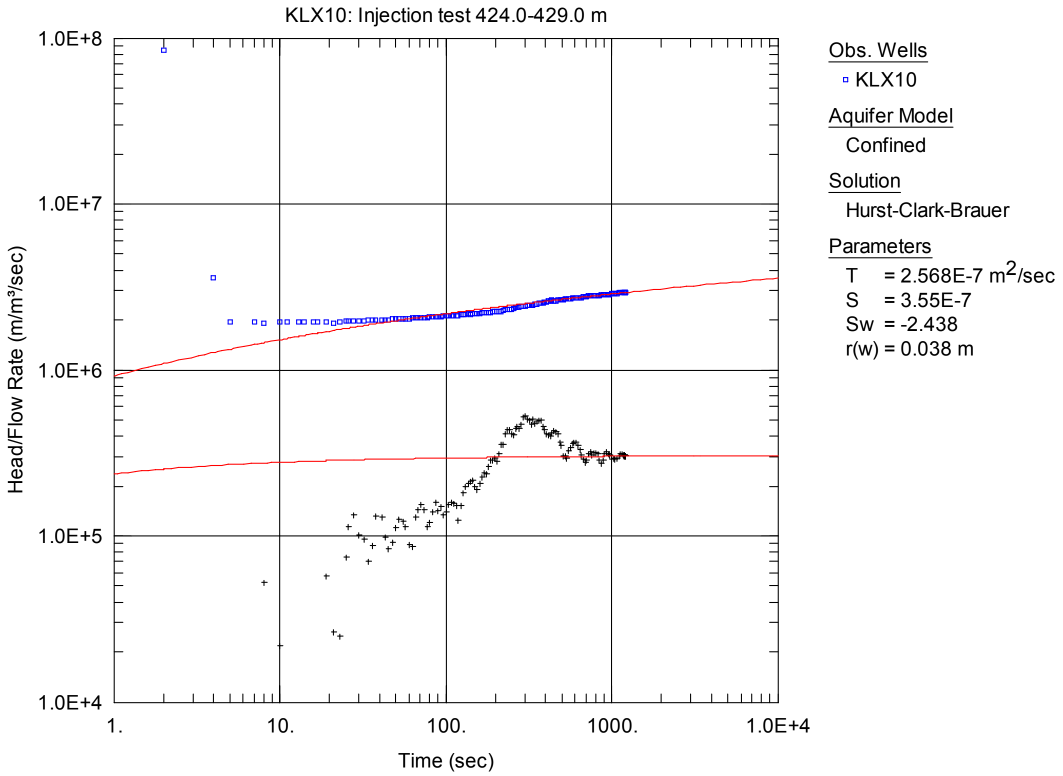


***Figure A3-372.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 424.0-429.0 m in KLX10.*

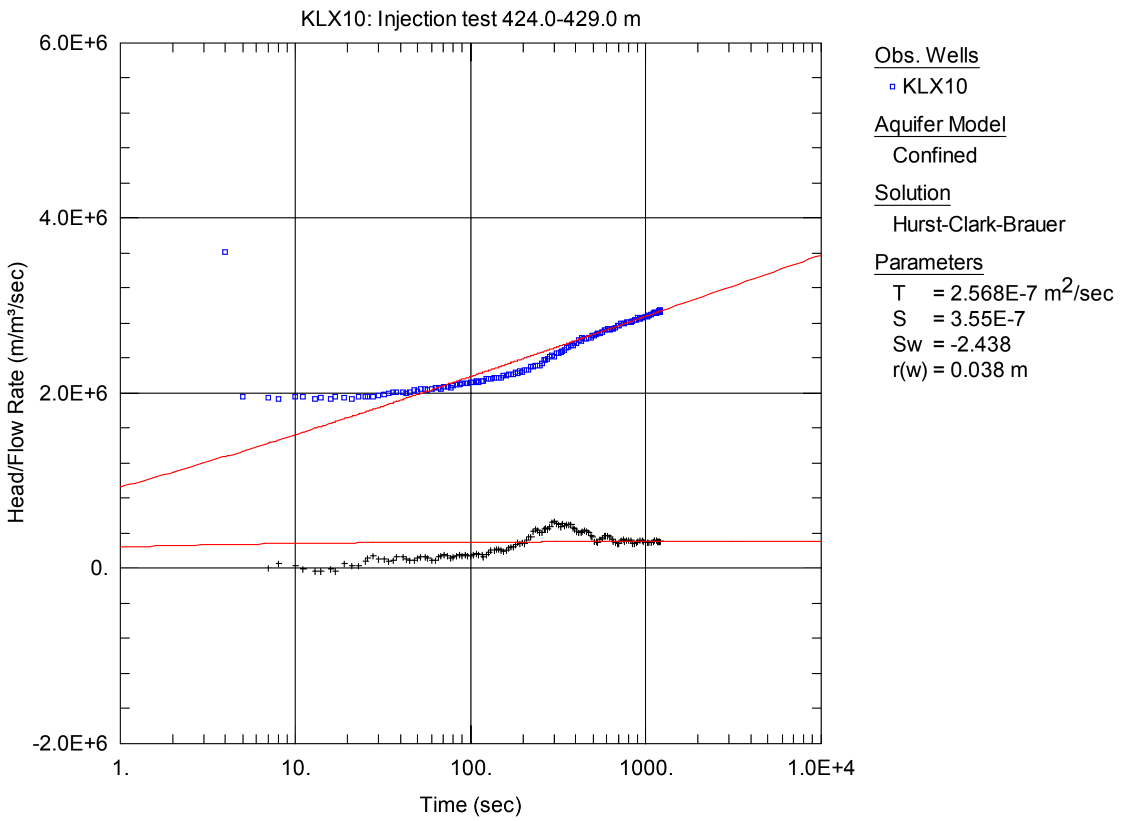


***Figure A3-373.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 424.0-429.0 m in KLX10.*

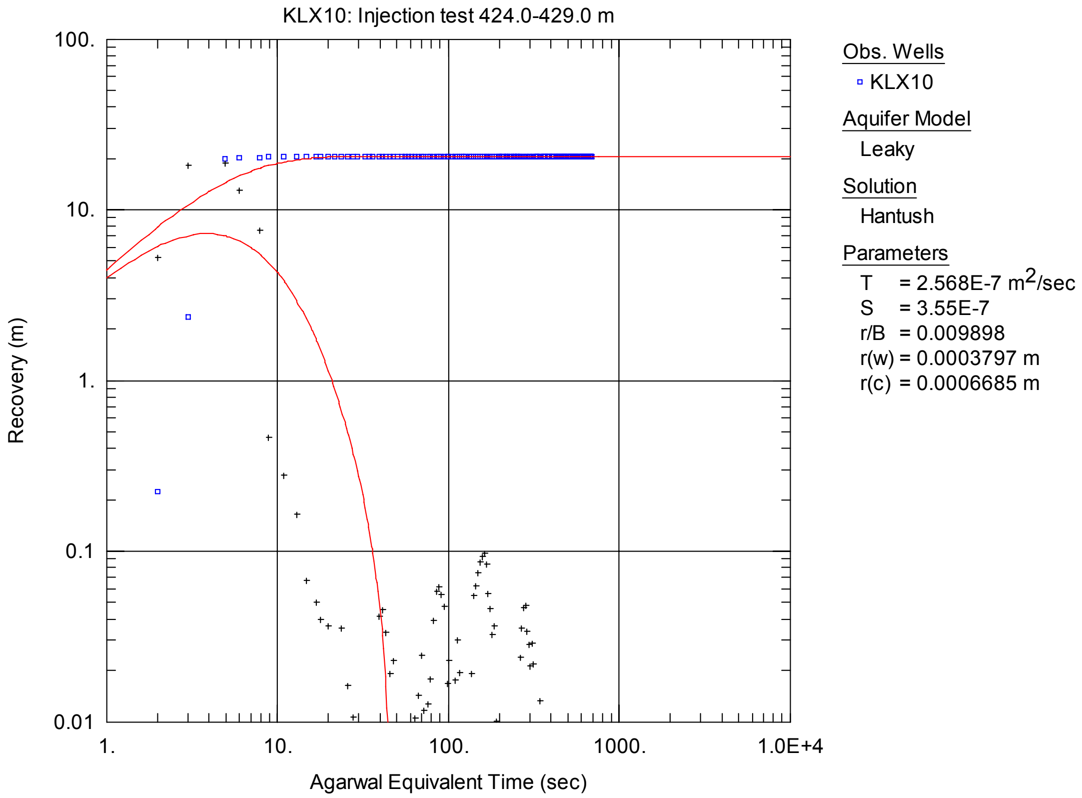


***Figure A3-374.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 424.0-429.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

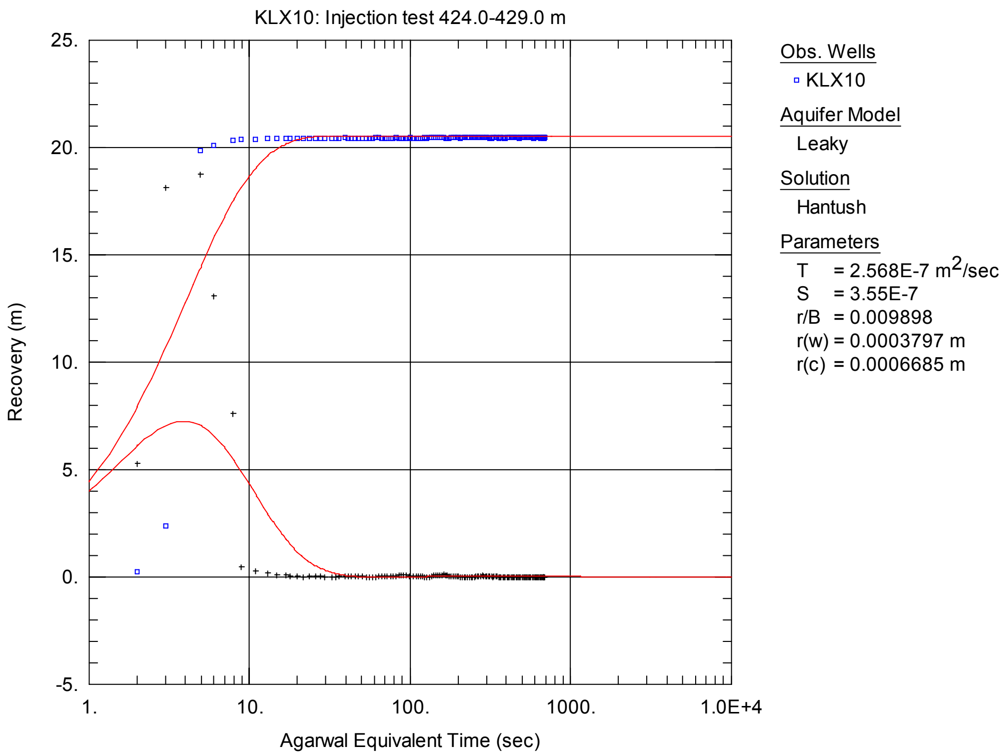


***Figure A3-375.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 424.0-429.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

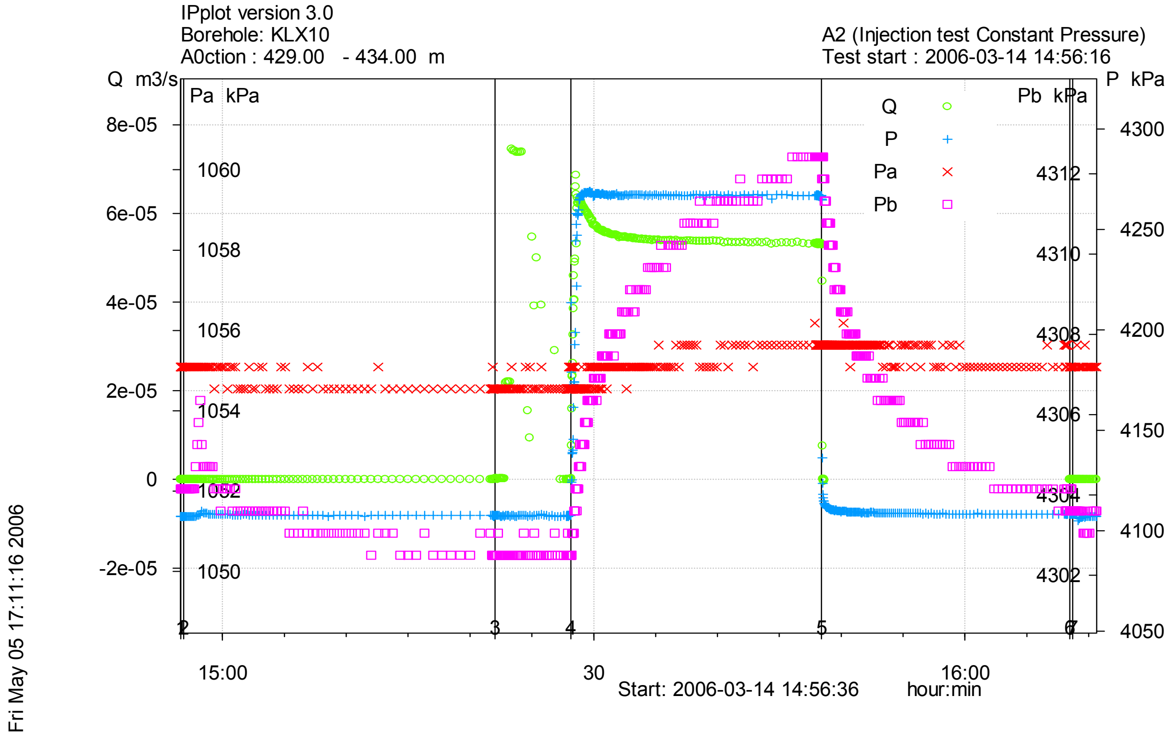


Figure A3-376. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 429.0-434.0 m in borehole KLX10.

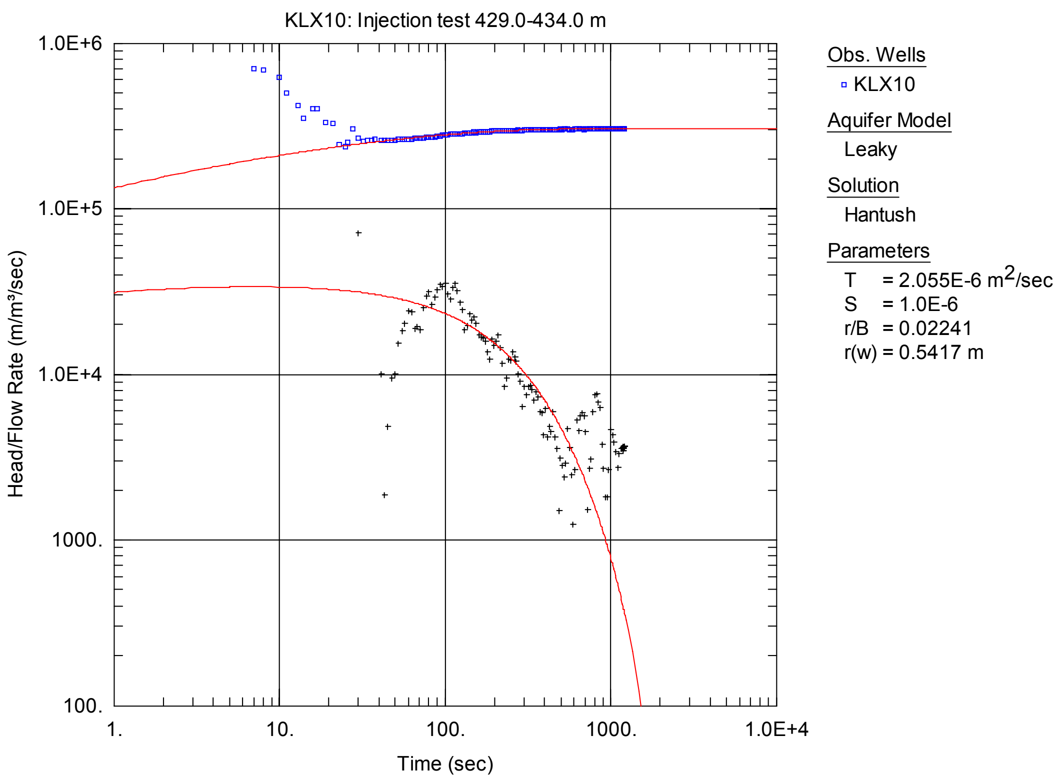


Figure A3-377. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 429.0-434.0 m in KLX10.

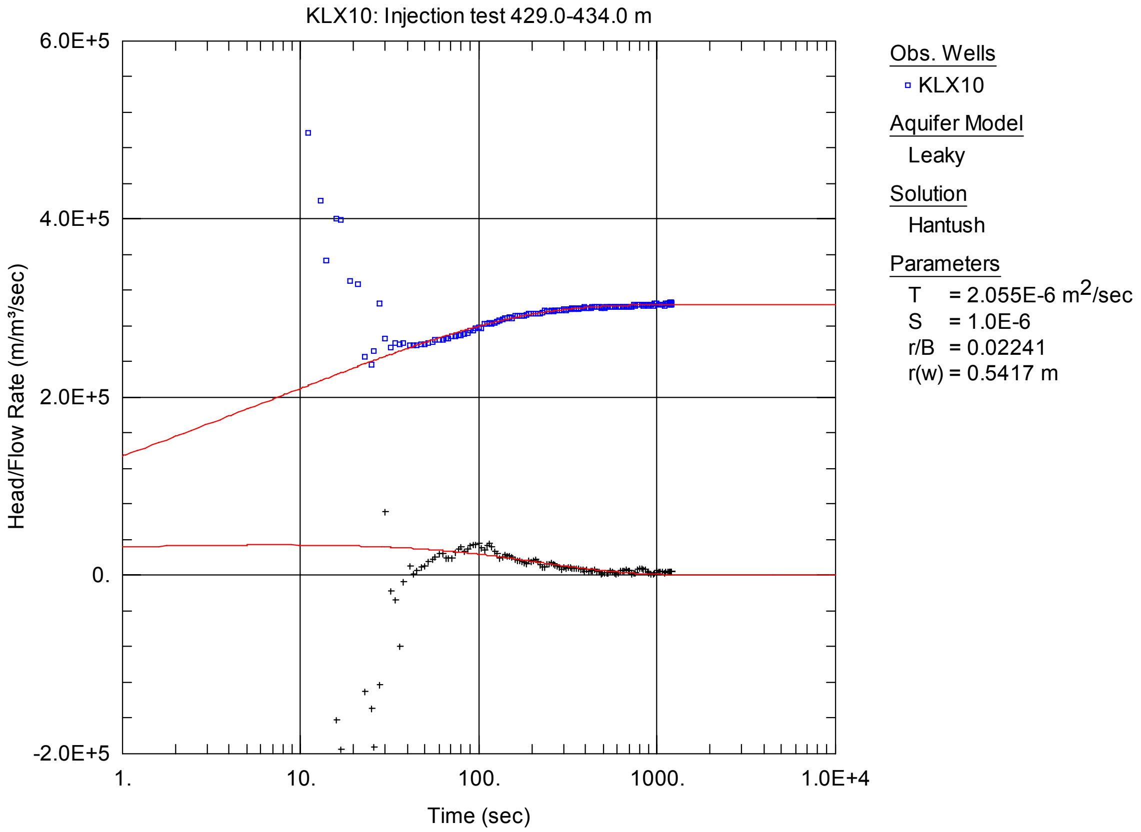


Figure A3-378. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 429.0-434.0 m in KLX10.*

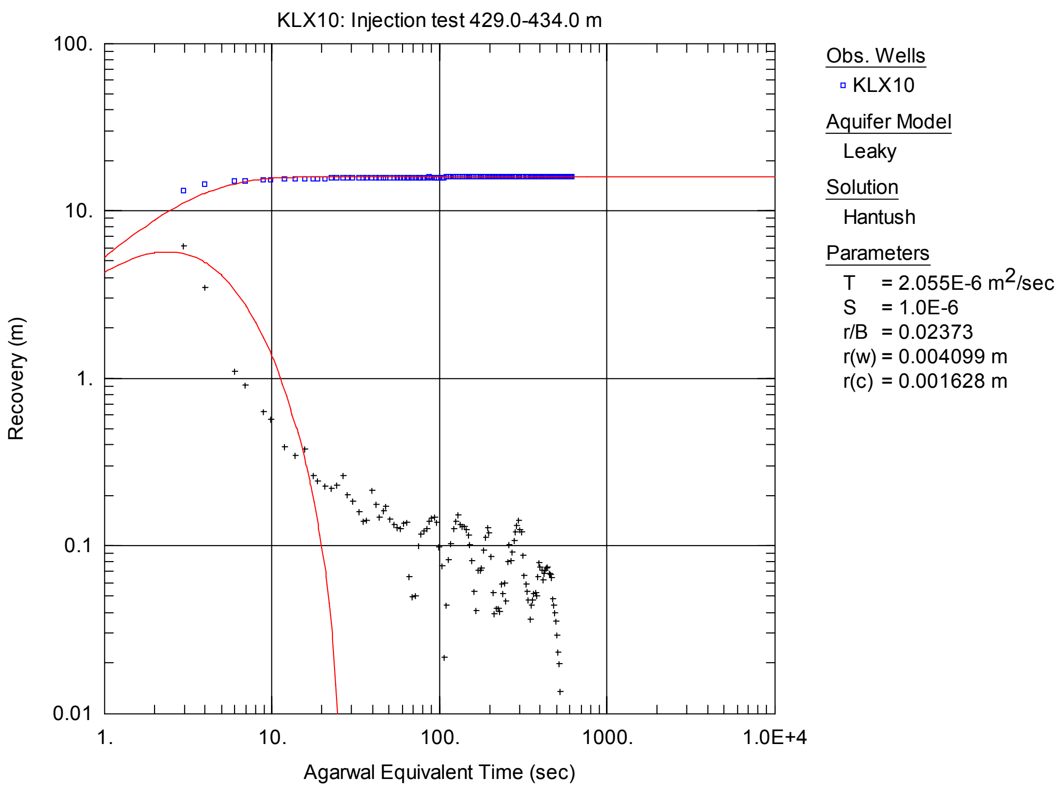


Figure A3-379. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 429.0-434.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

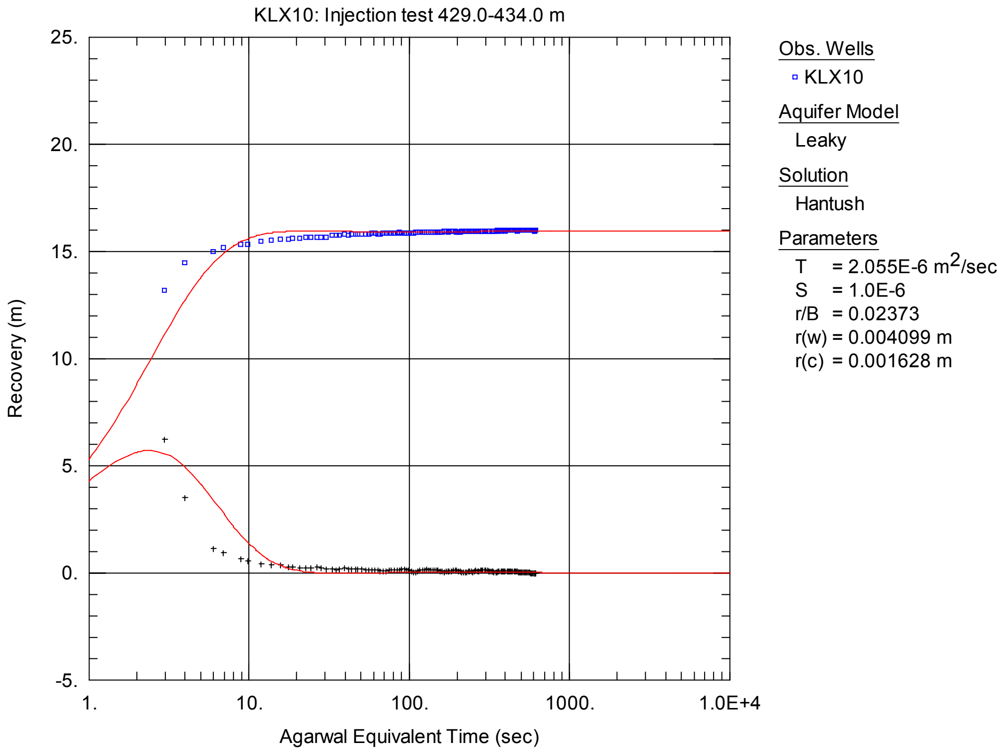


Figure A3-380. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 429.0-434.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

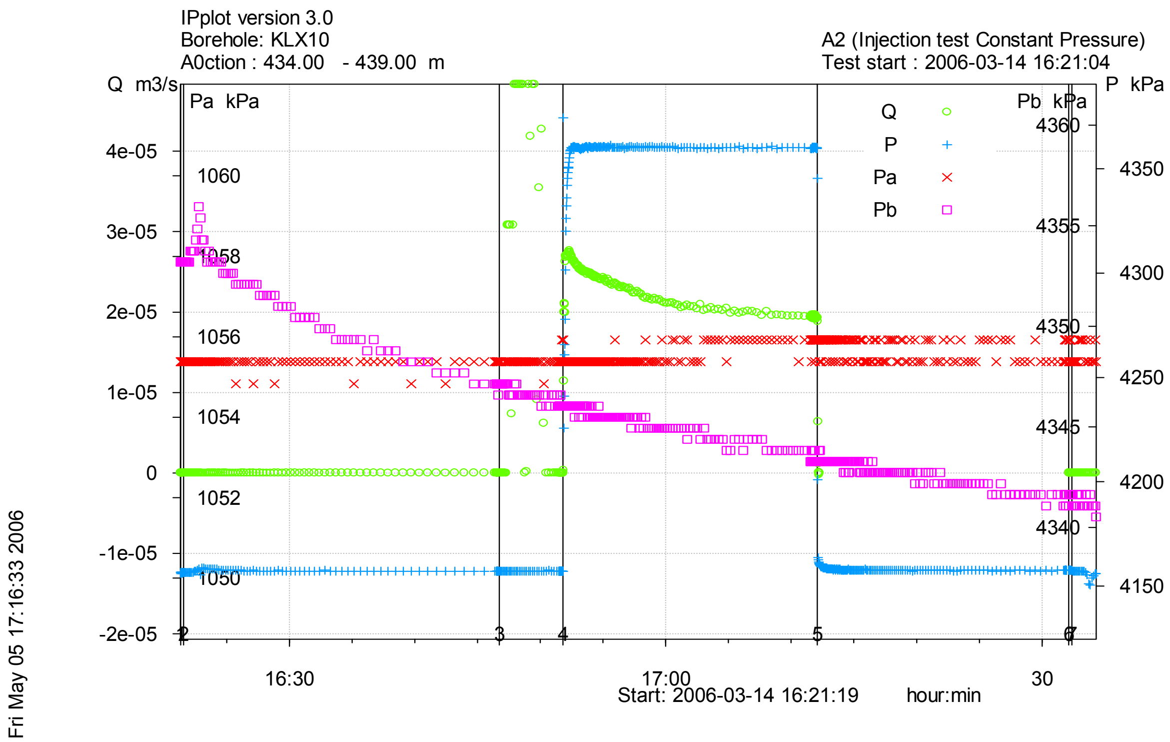


Figure A3-381. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 434.0-439.0 m in borehole KLX10.*

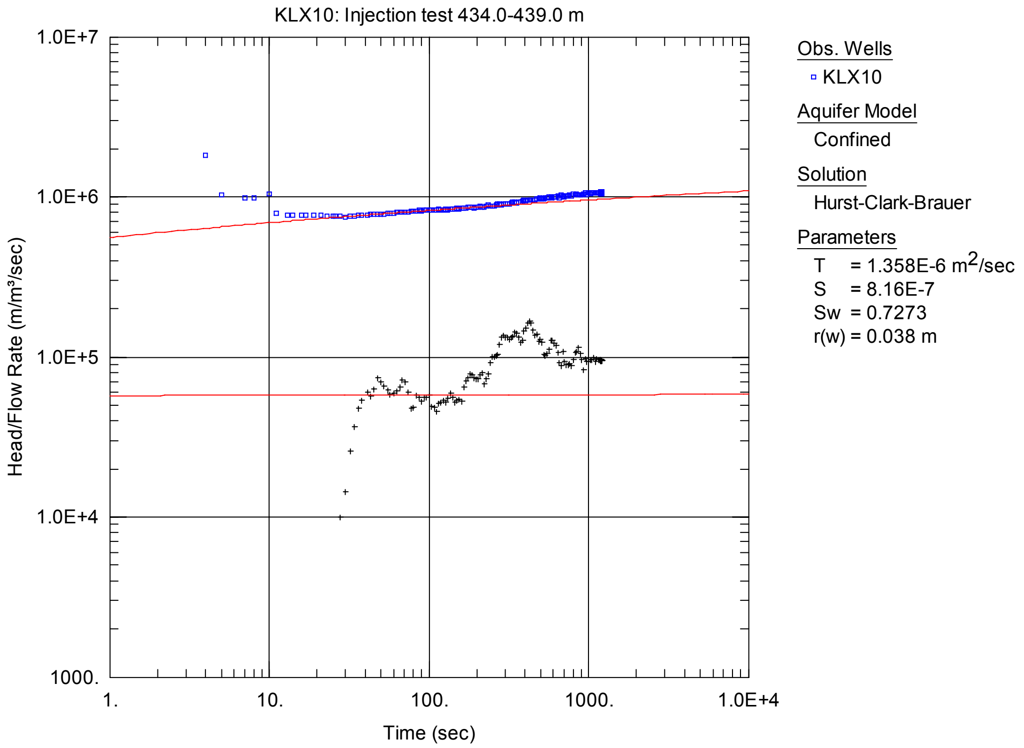


***Figure A3-382.** Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution for the first PRF, from the injection test in section 434.0-439.0 m in KLX10.*

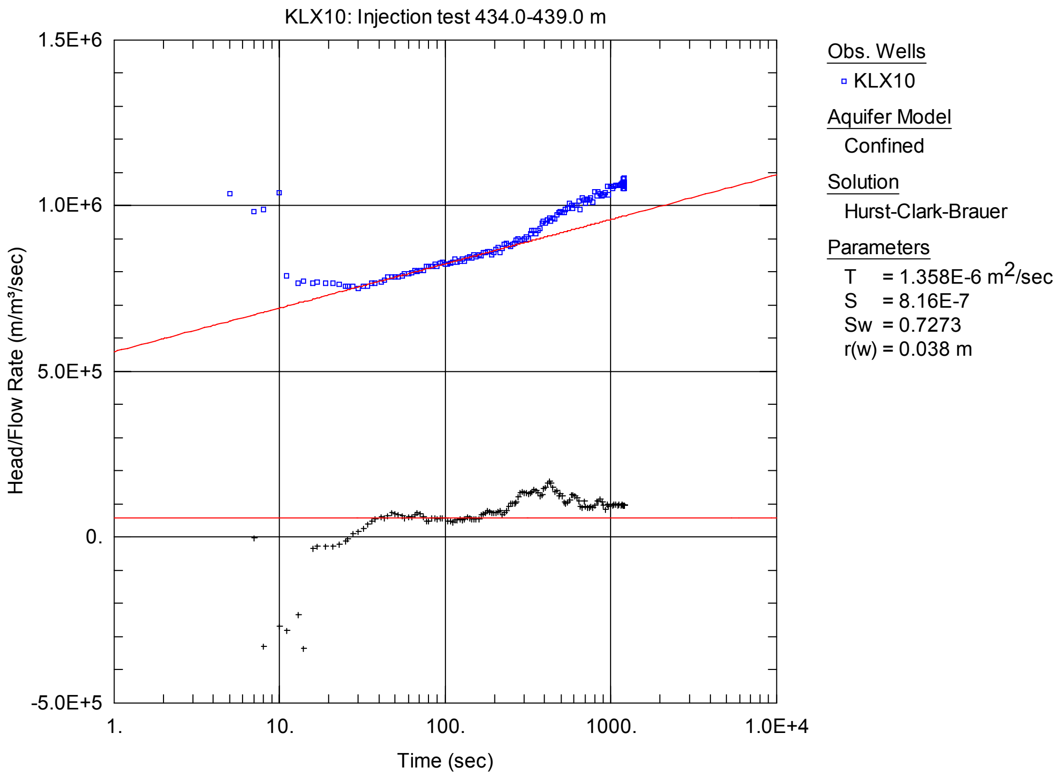


***Figure A3-383.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution for the first PRF, from the injection test in section 434.0-439.0 m in KLX10.*

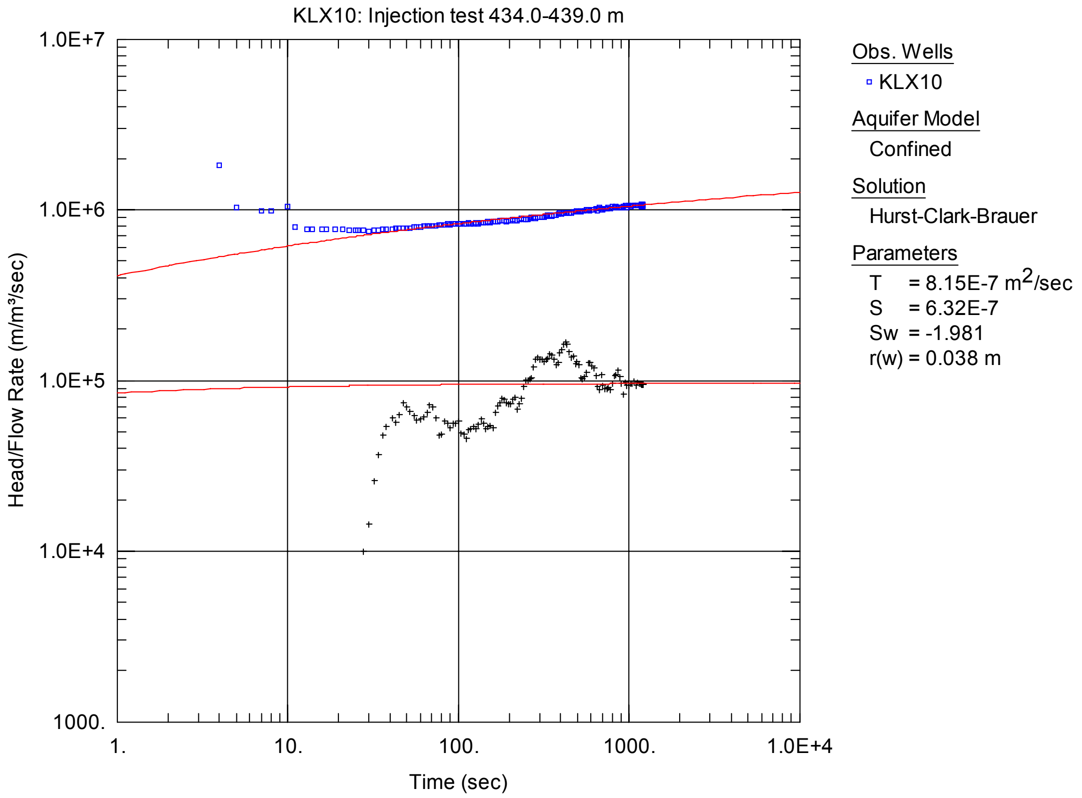


Figure A3-384. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution for the second PRF, from the injection test in section 434.0-439.0 m in KLX10.*

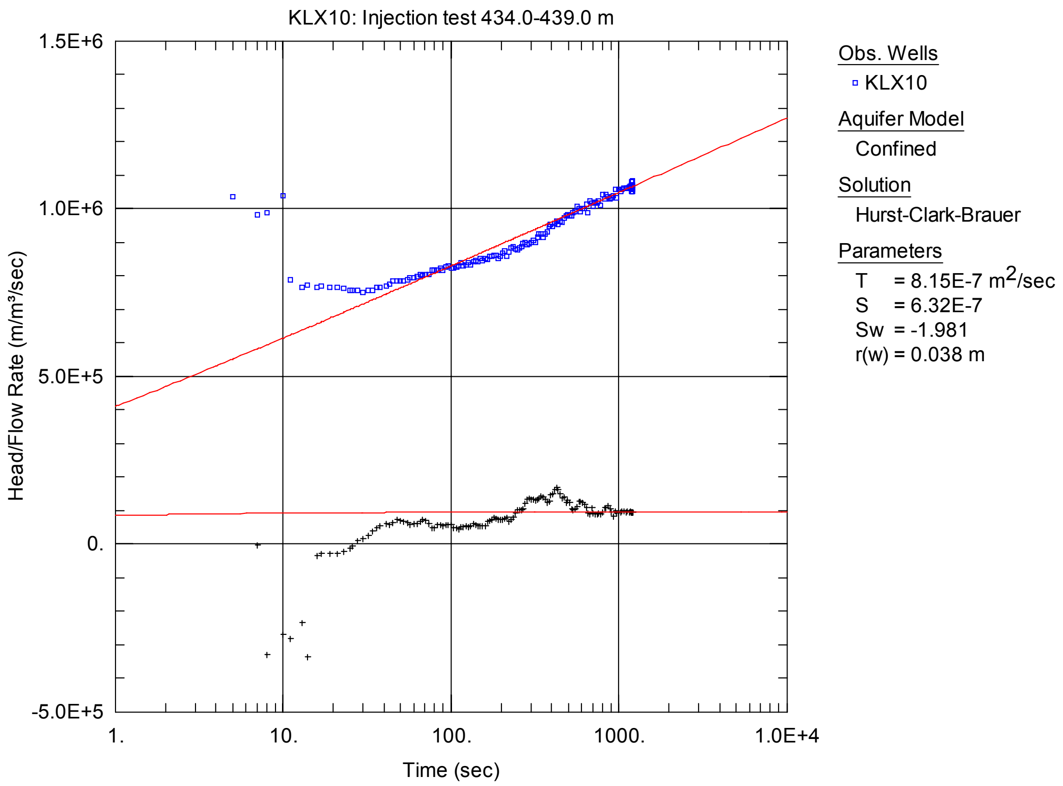


Figure A3-385. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution for the second PRF, from the injection test in section 434.0-439.0 m in KLX10.*

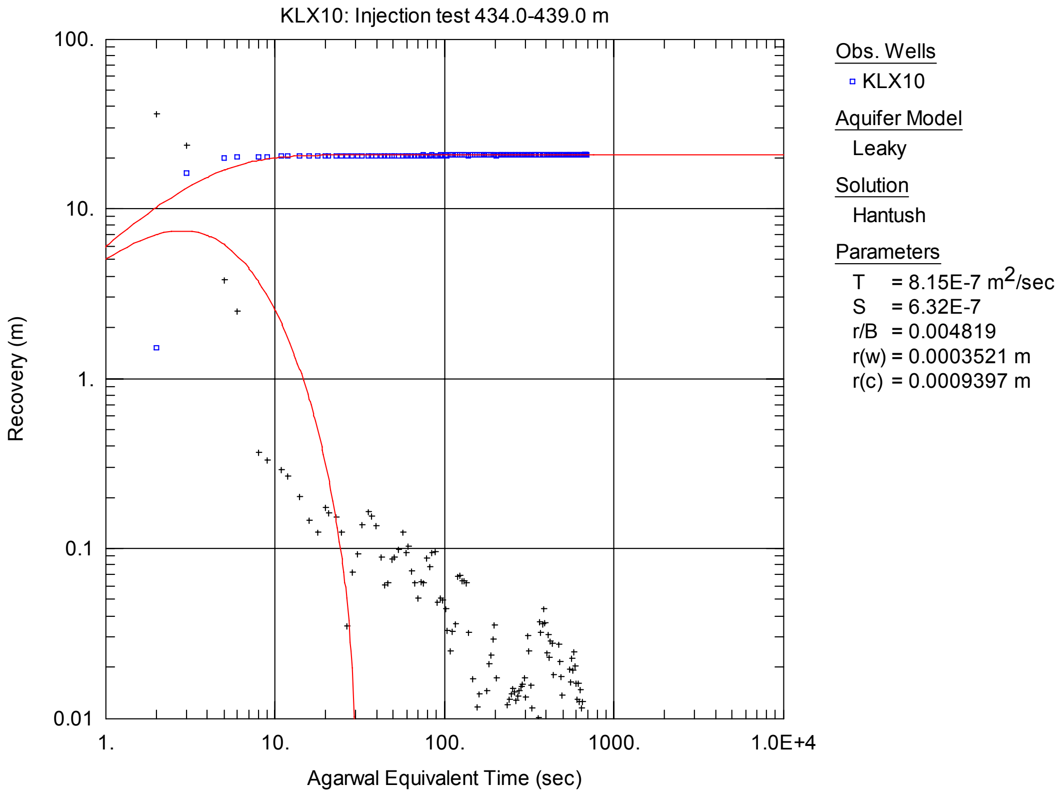


Figure A3-386. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 434.0-439.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

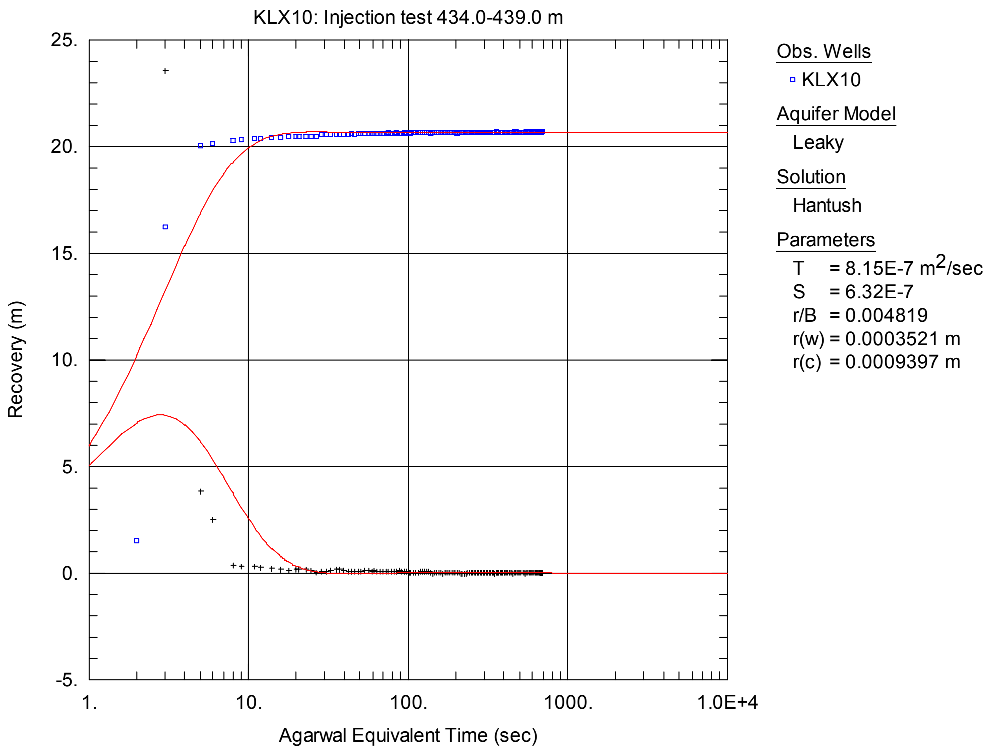


Figure A3-387. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 434.0-439.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

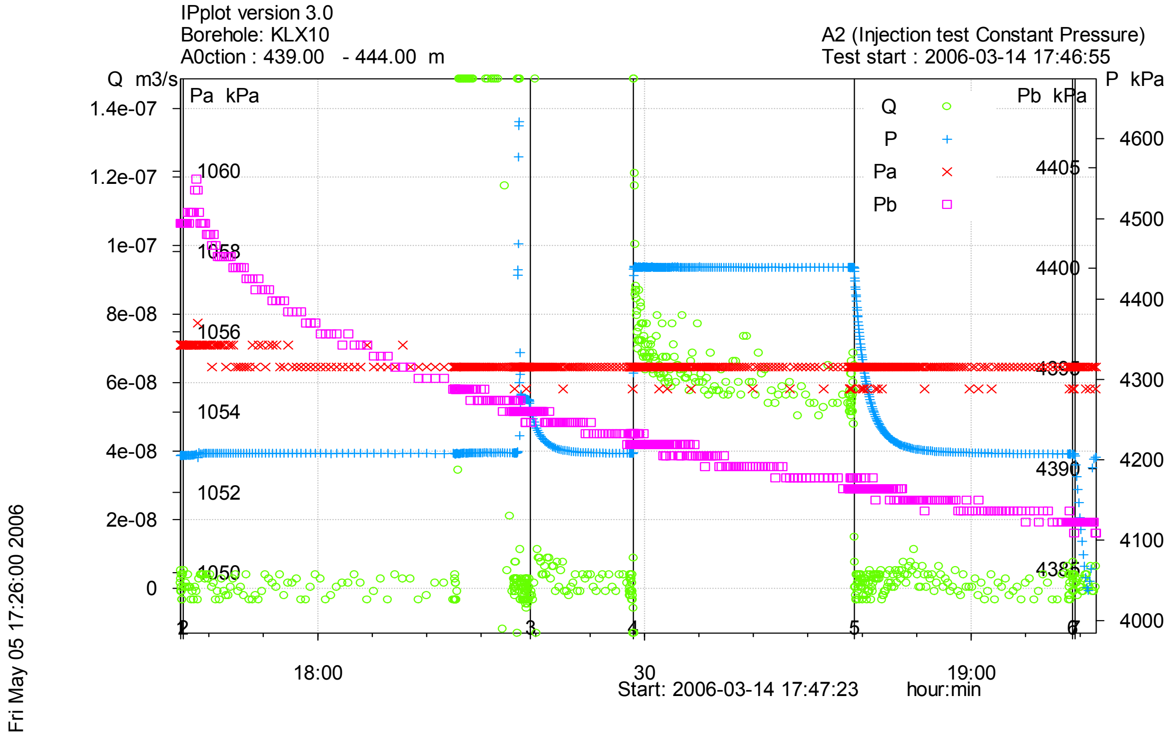


Figure A3-388. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 439.0-444.0 m in borehole KLX10.*

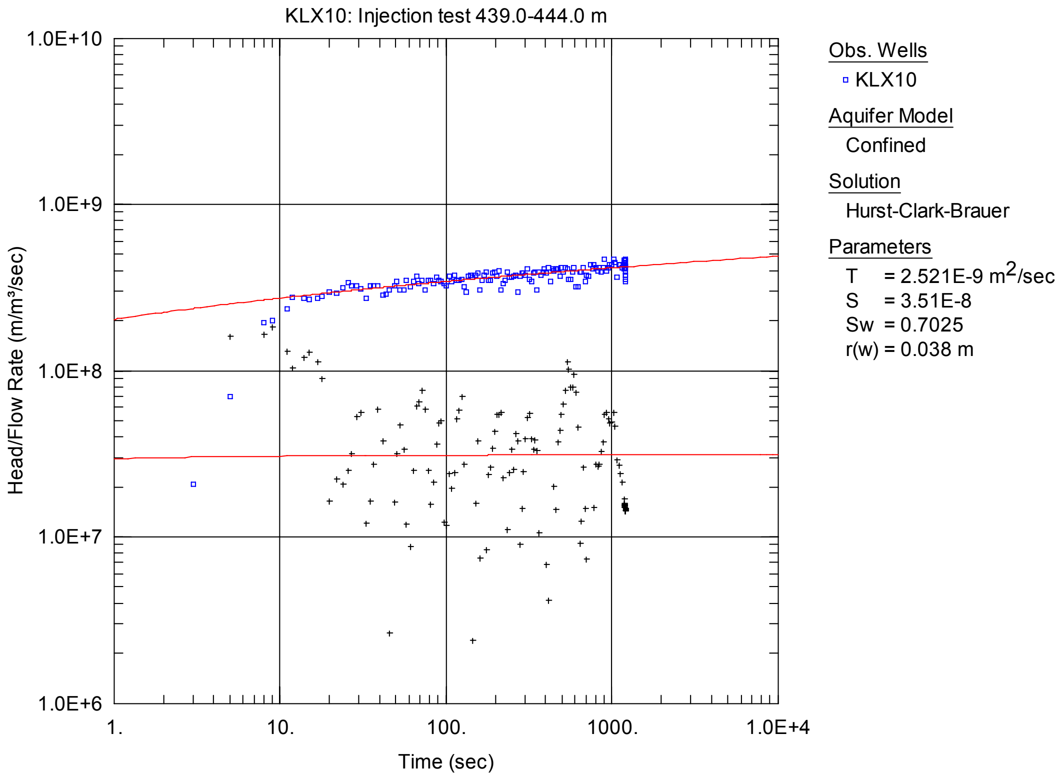


Figure A3-389. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 439.0-444.0 m in KLX10.*

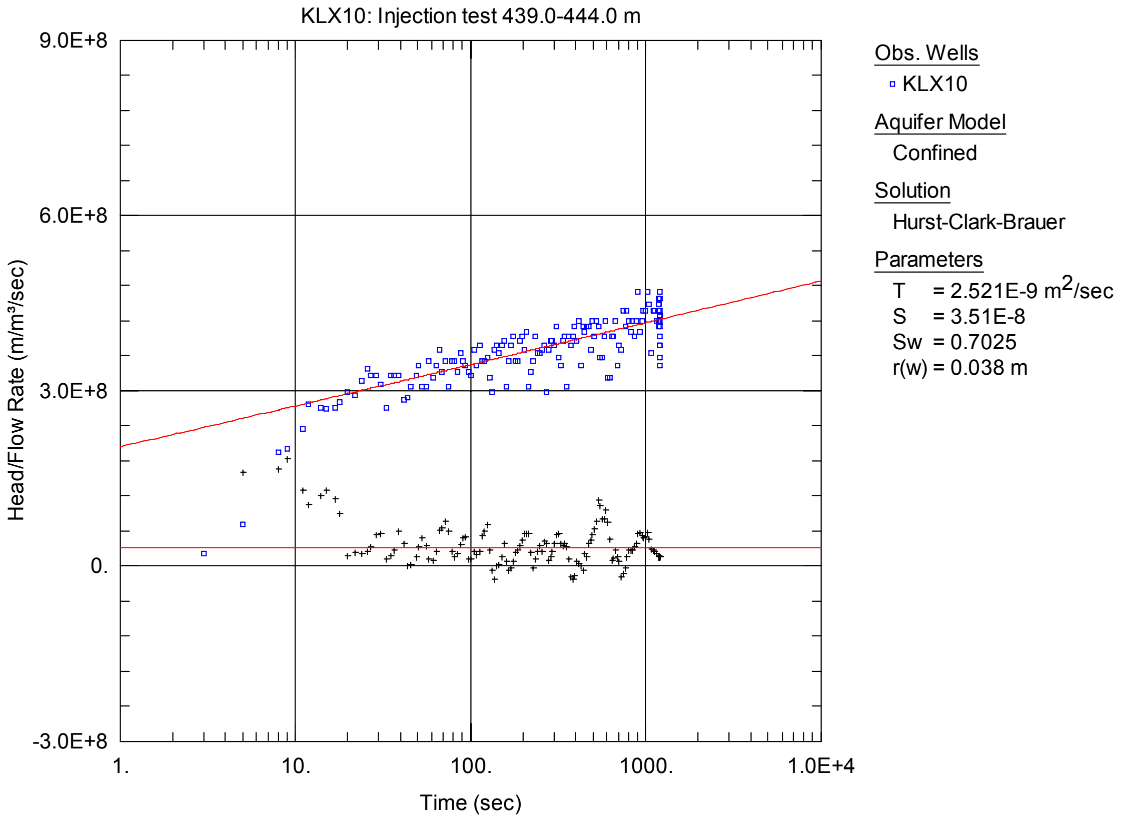


***Figure A3-390.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 439.0-444.0 m in KLX10.*

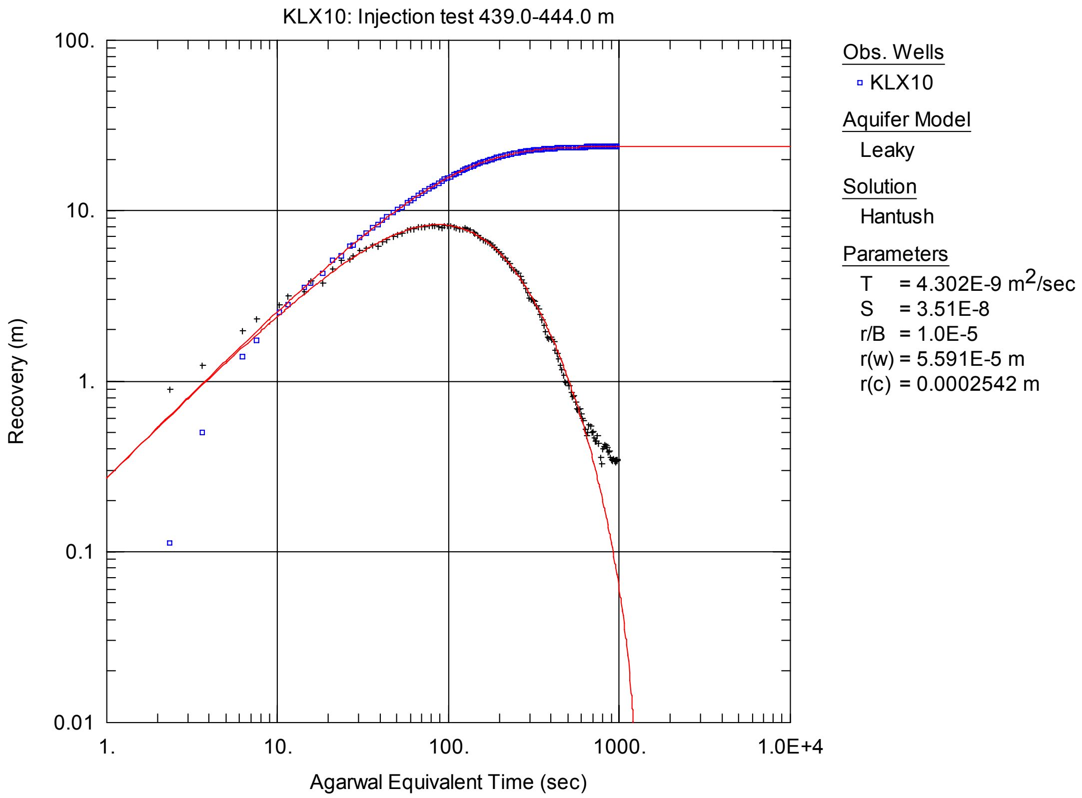


***Figure A3-391.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 439.0-444.0 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

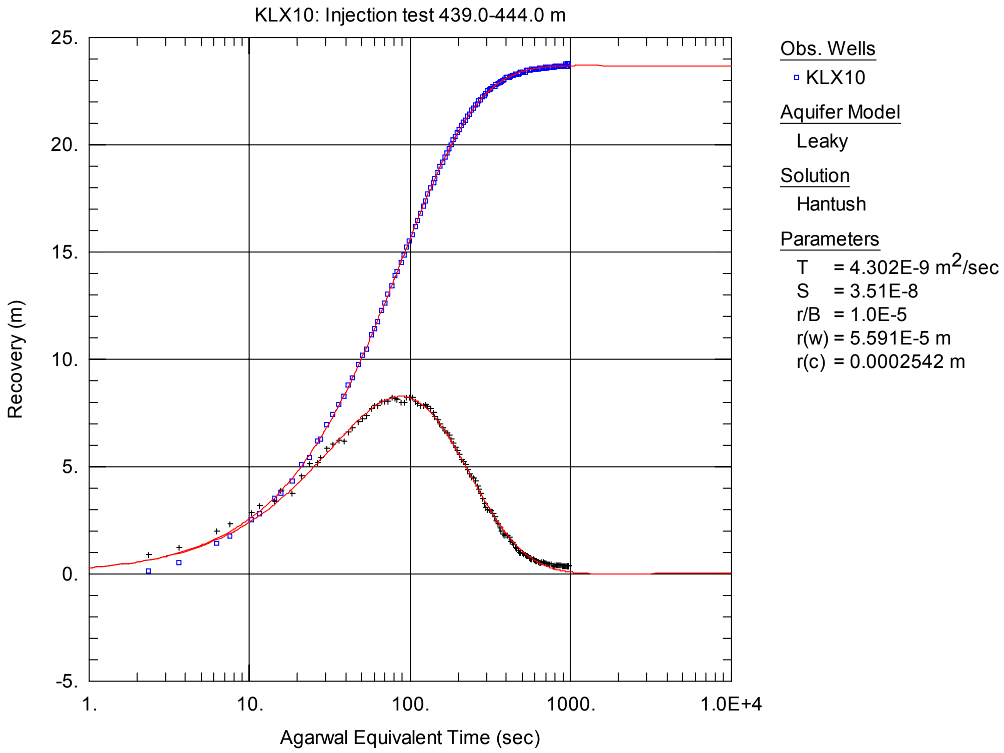


***Figure A3-392.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 439.0-444.0 m in KLX10 The type curve fit is showing a possible, however not unambiguous, evaluation.*

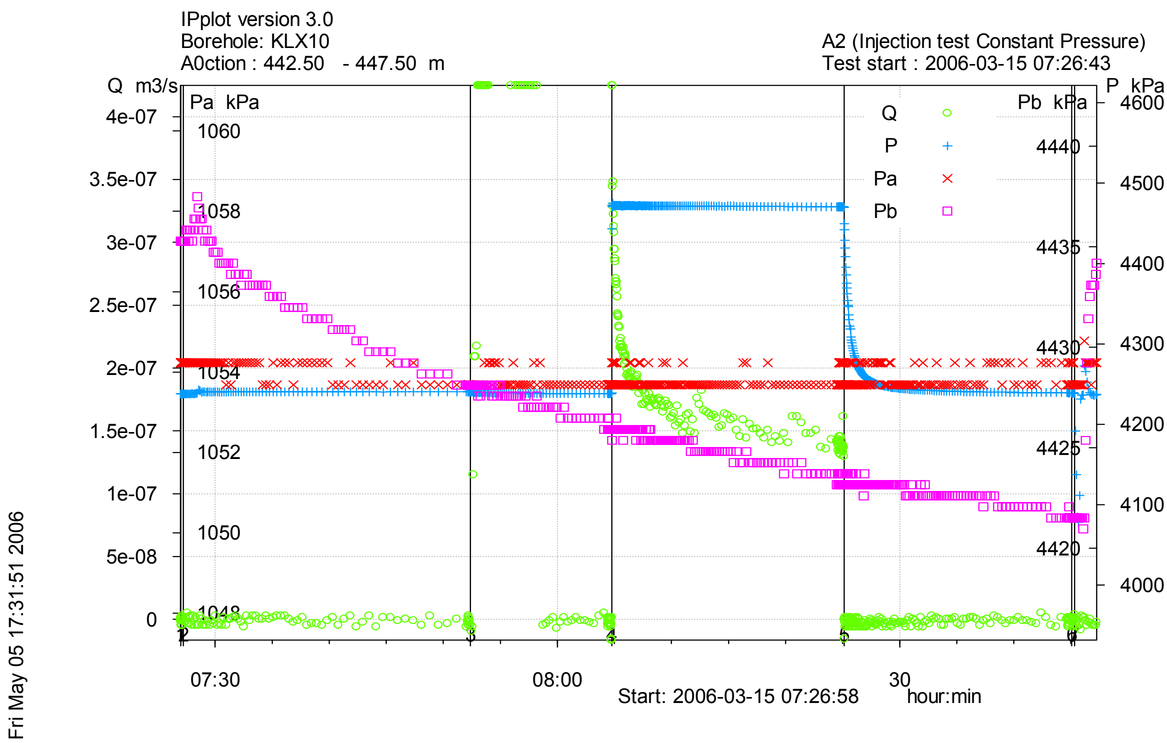


***Figure A3-393.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 442.5-447.5 m in borehole KLX10.*

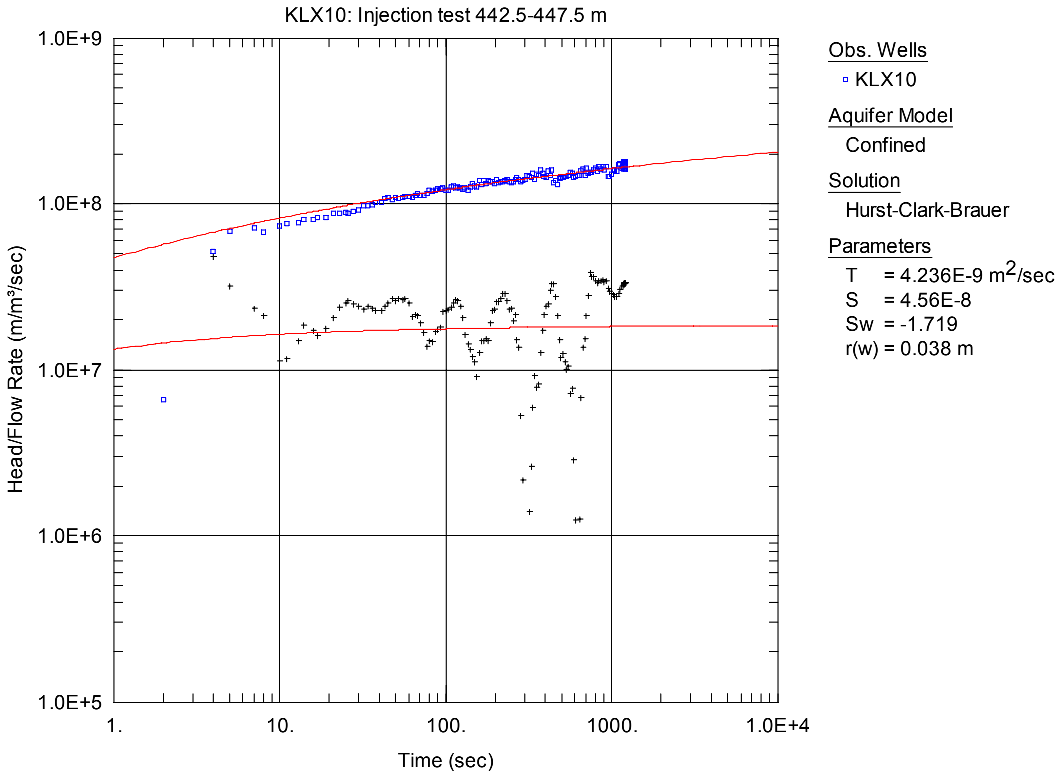


Figure A3-394. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 442.5-447.5 m in KLX10.*

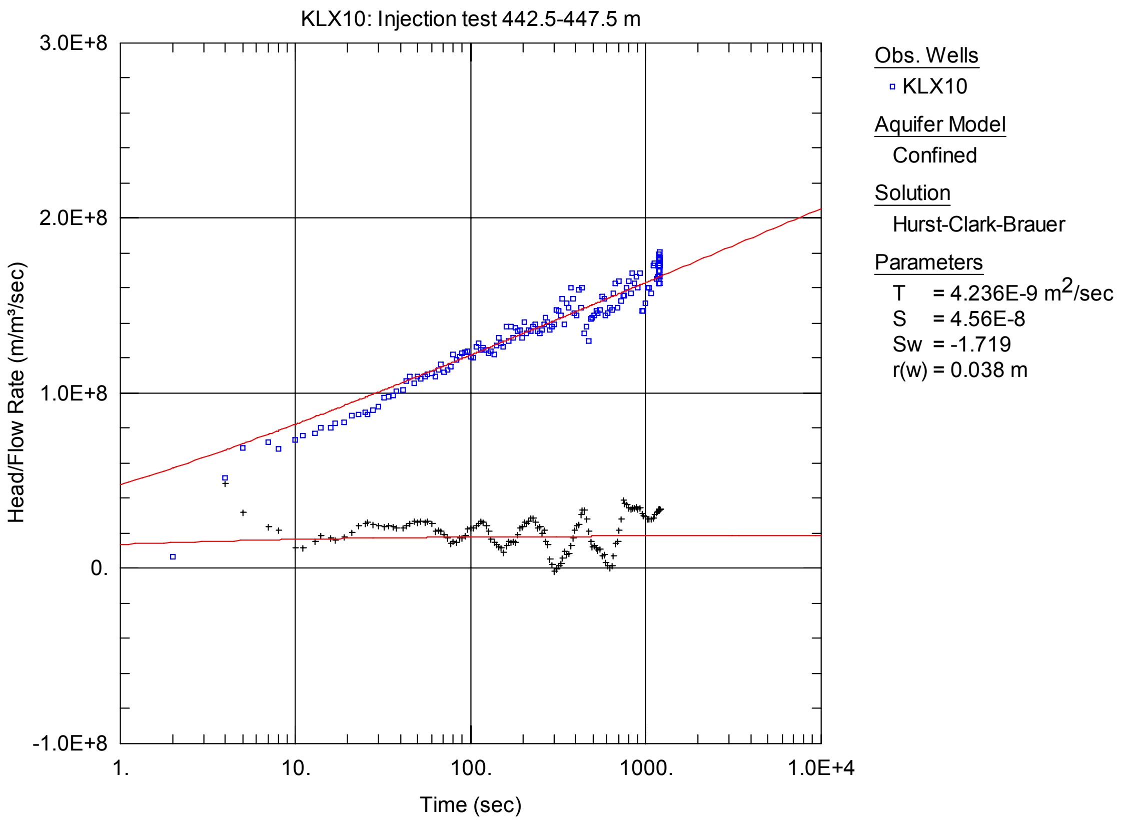


Figure A3-395. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 442.5-447.5 m in KLX10.*

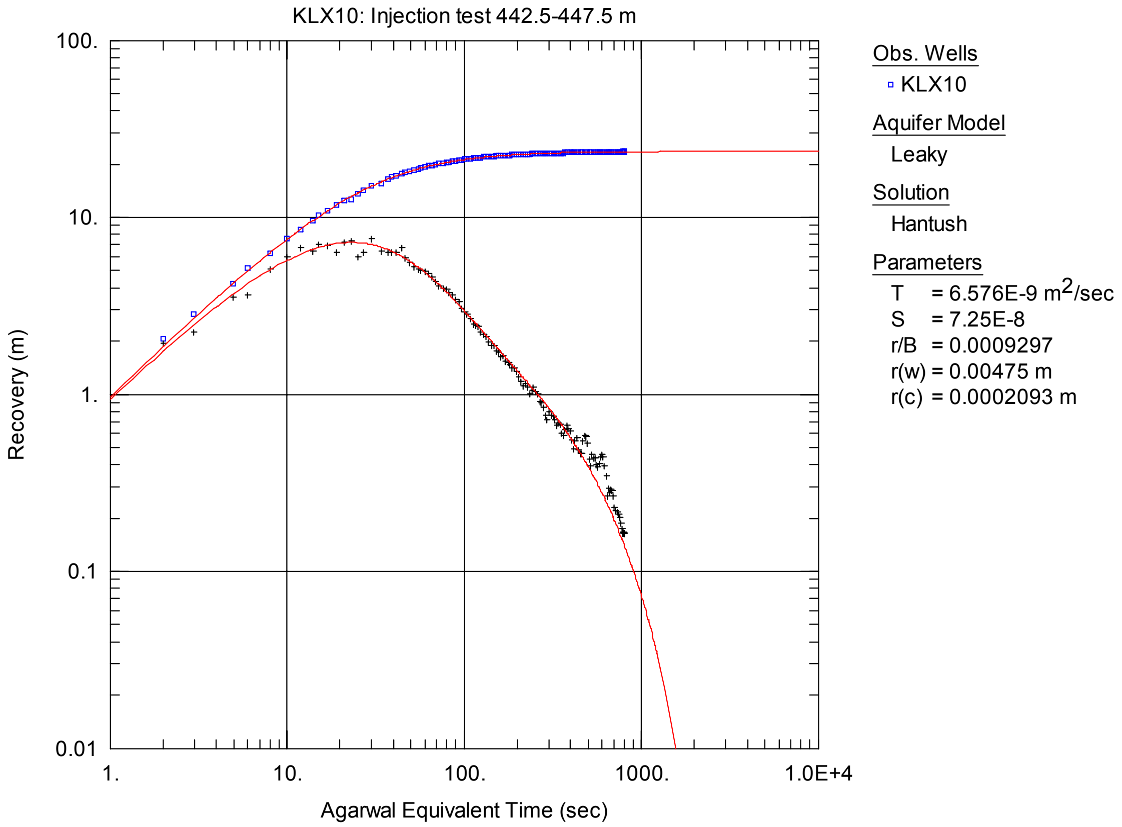


Figure A3-396. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 442.5-447.5 m in KLX10.*

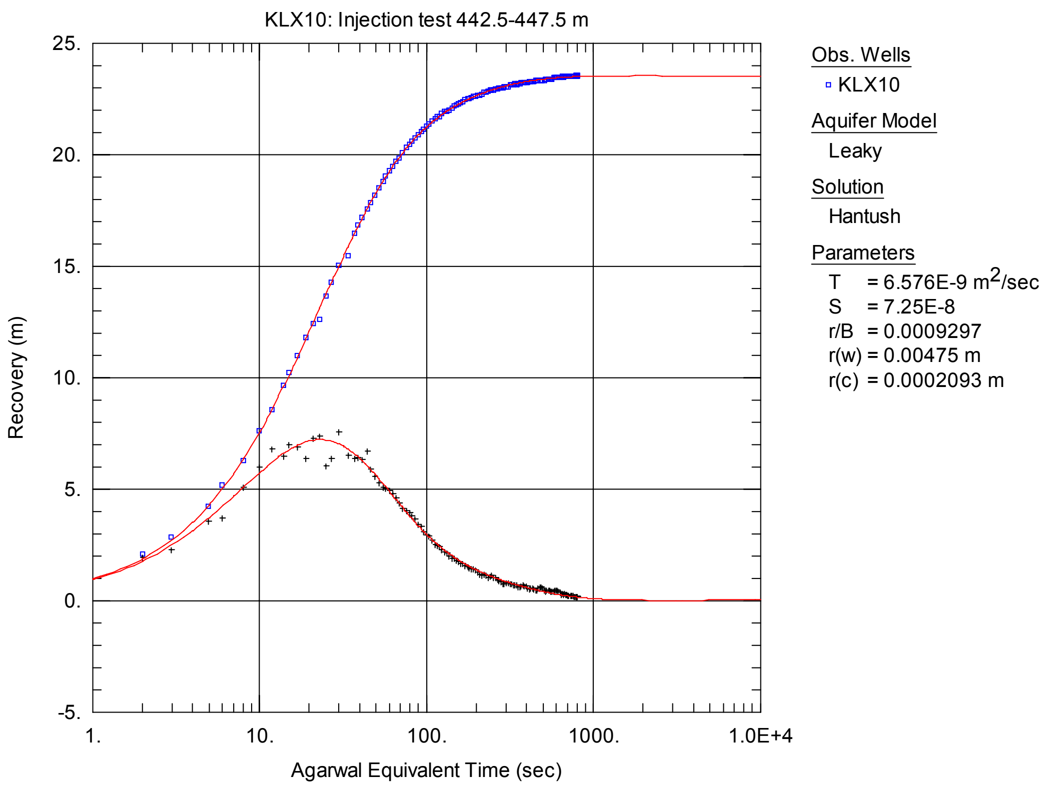


Figure A3-397. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 442.5-447.5 m in KLX10.*

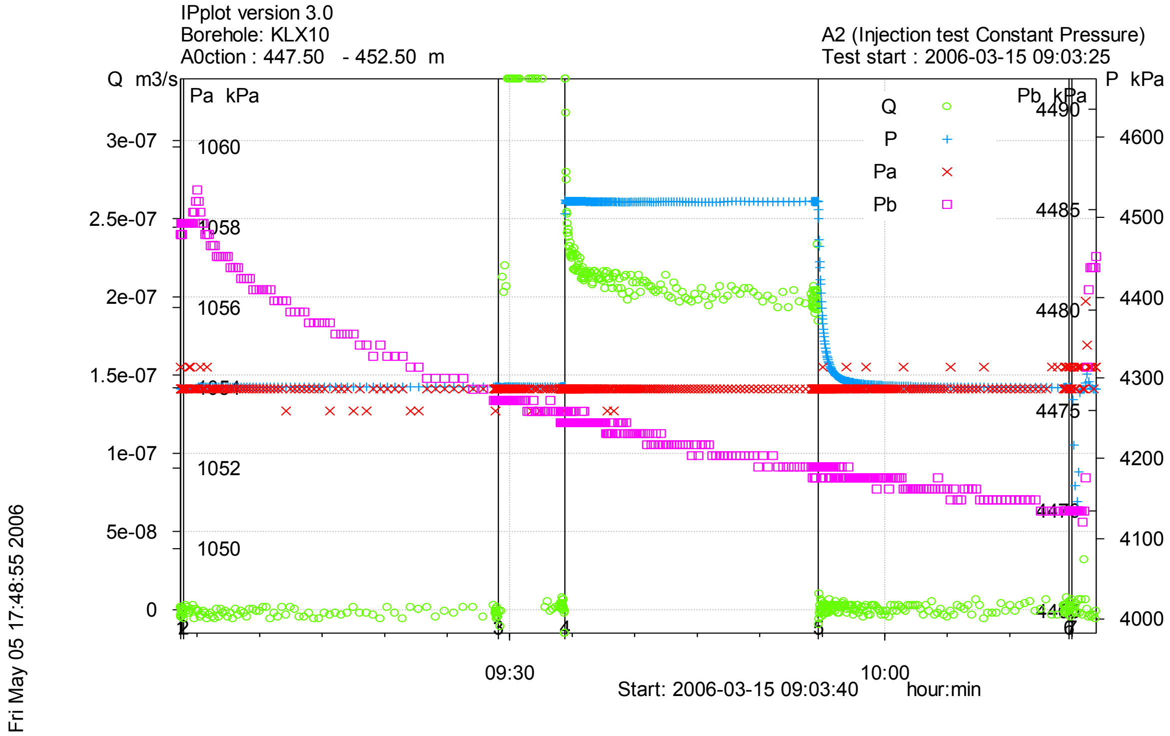


Figure A3-398. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 447.5-452.5 m in borehole KLX10.

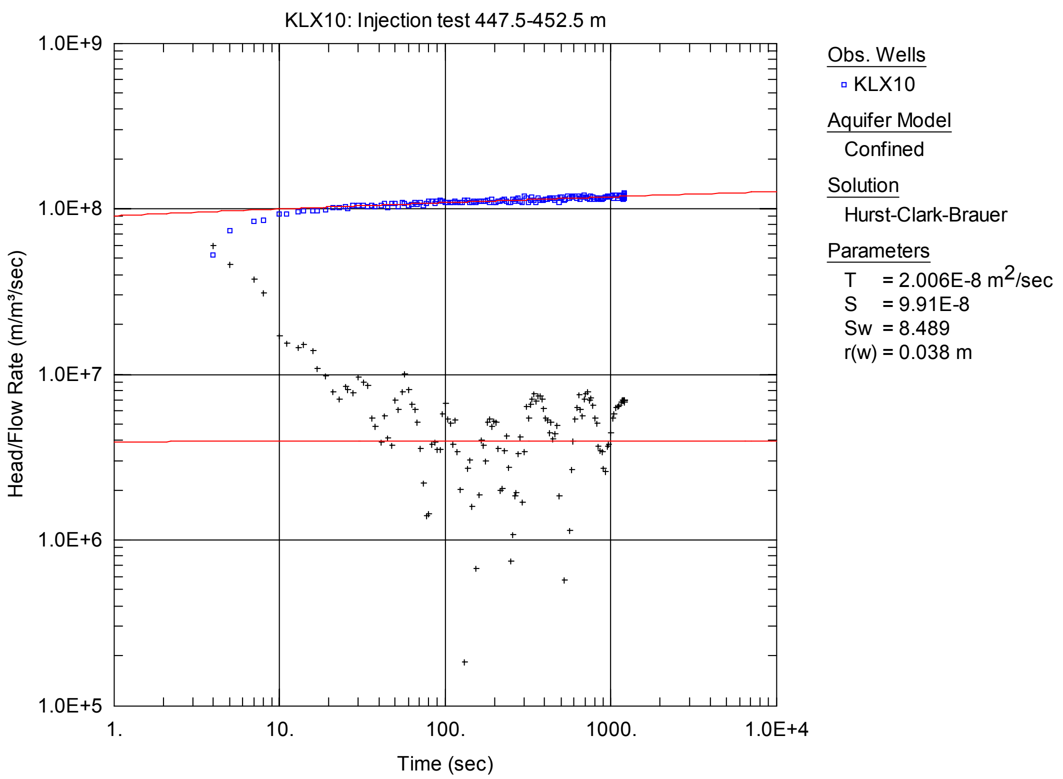


Figure A3-399. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 447.5-452.5 m in KLX10.

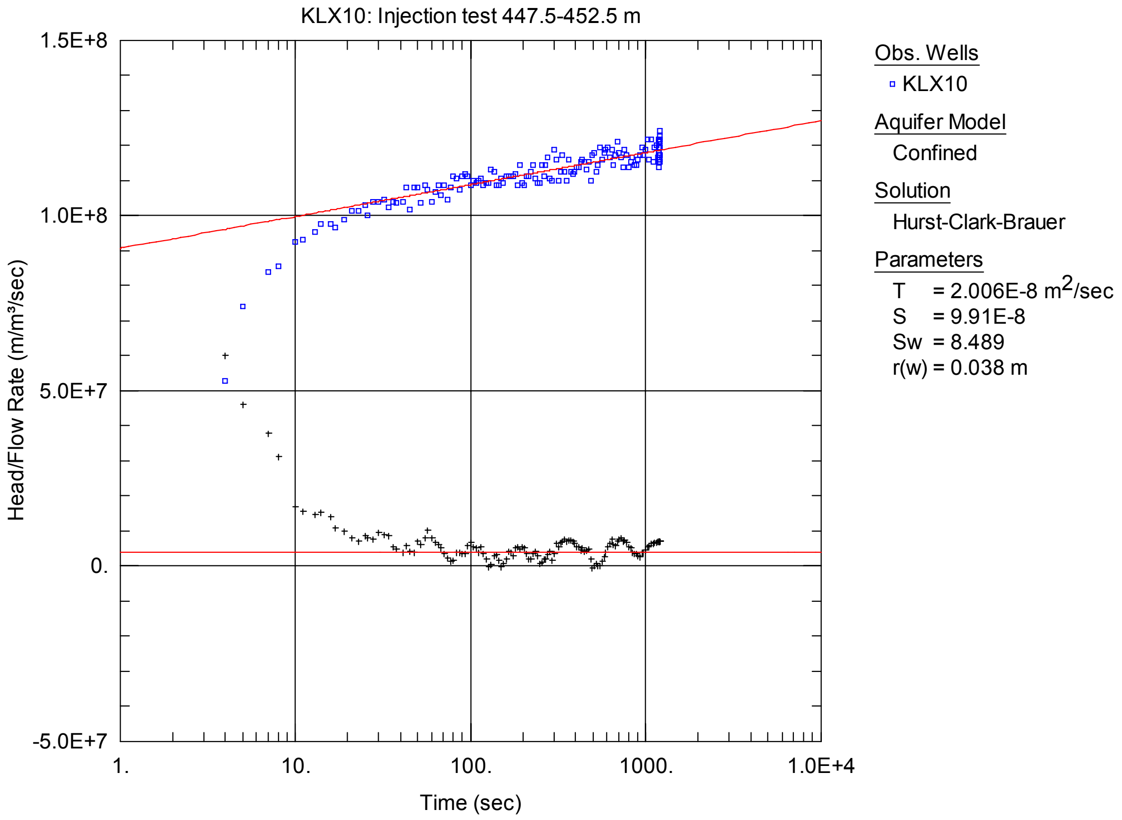


Figure A3-400. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 447.5-452.5 m in KLX10.*

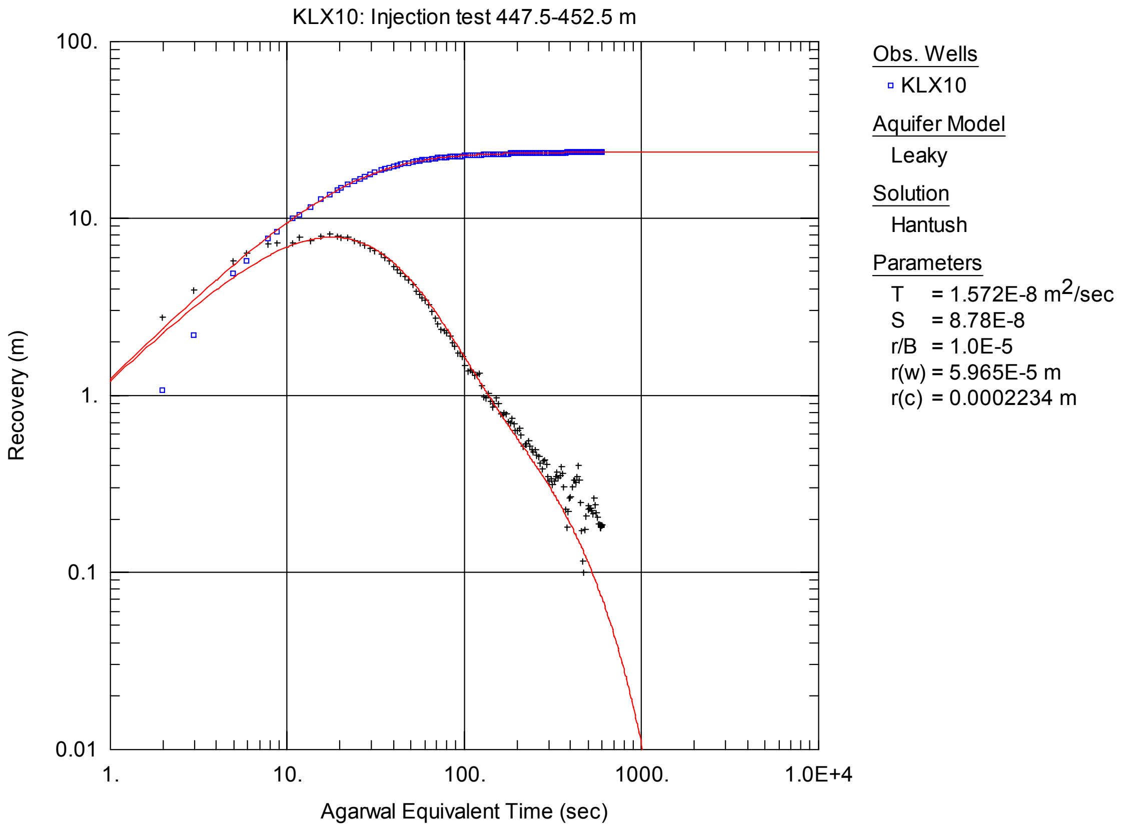


Figure A3-401. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 447.5-452.5 m in KLX10.*

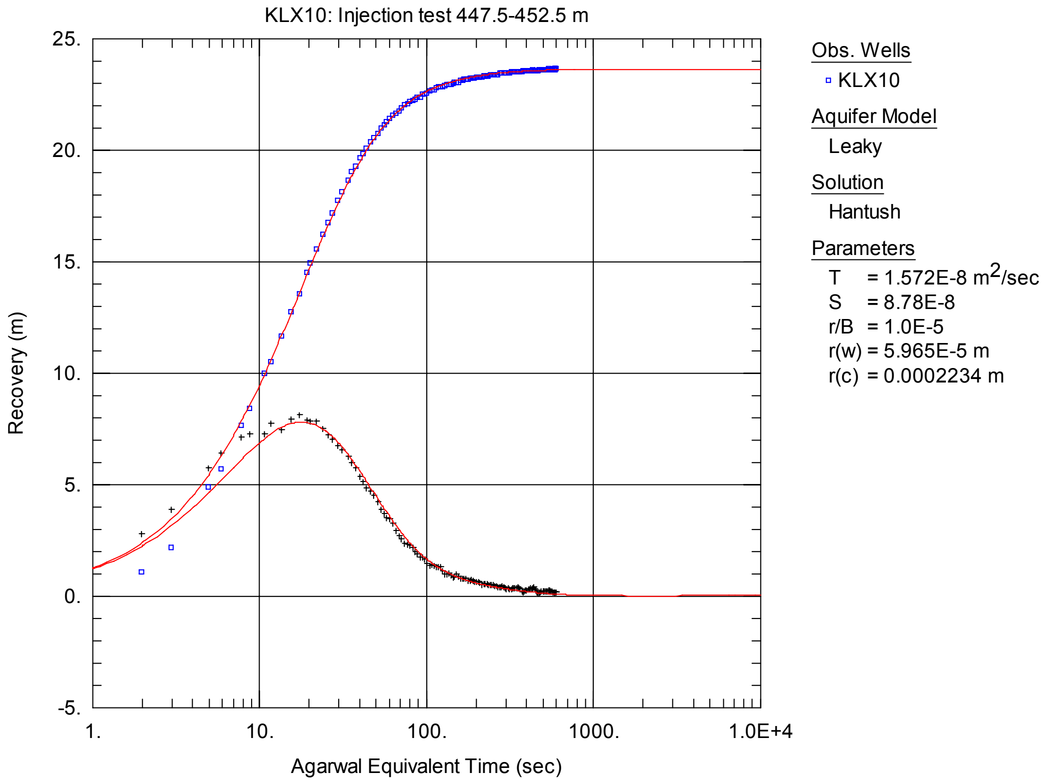


***Figure A3-402.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 447.5-452.5 m in KLX10.*

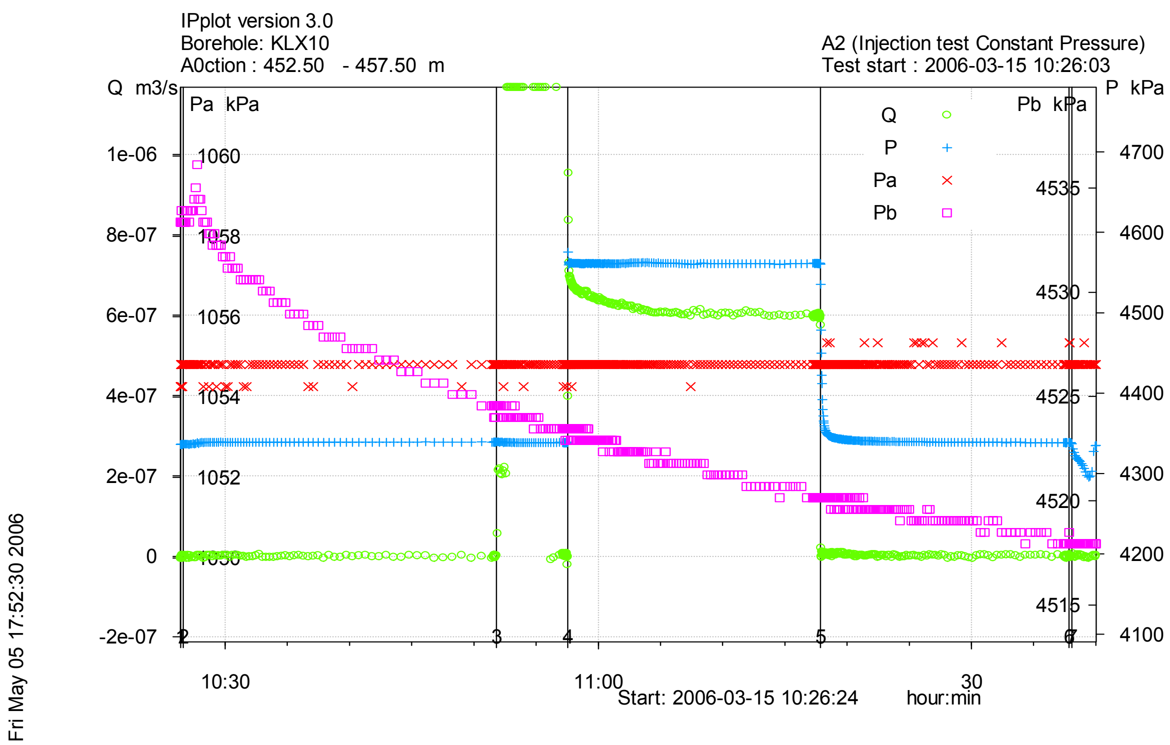


***Figure A3-403.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 452.5-457.5 m in borehole KLX10.*

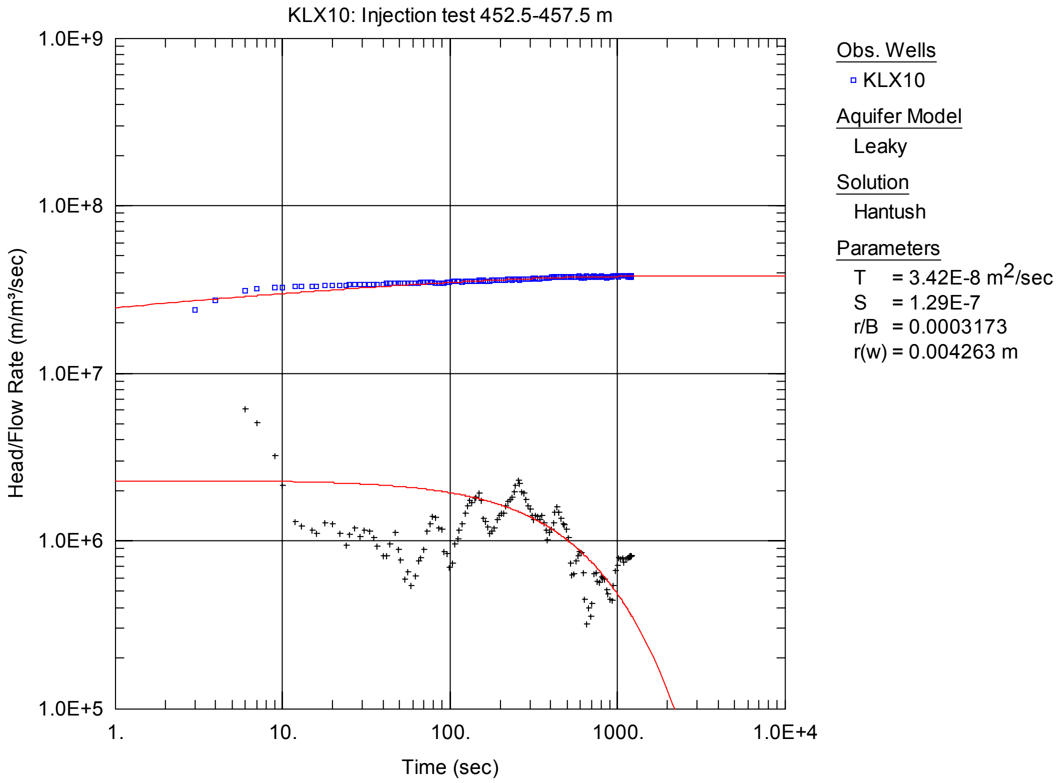


Figure A3-404. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 452.5-457.5 m in KLX10.*

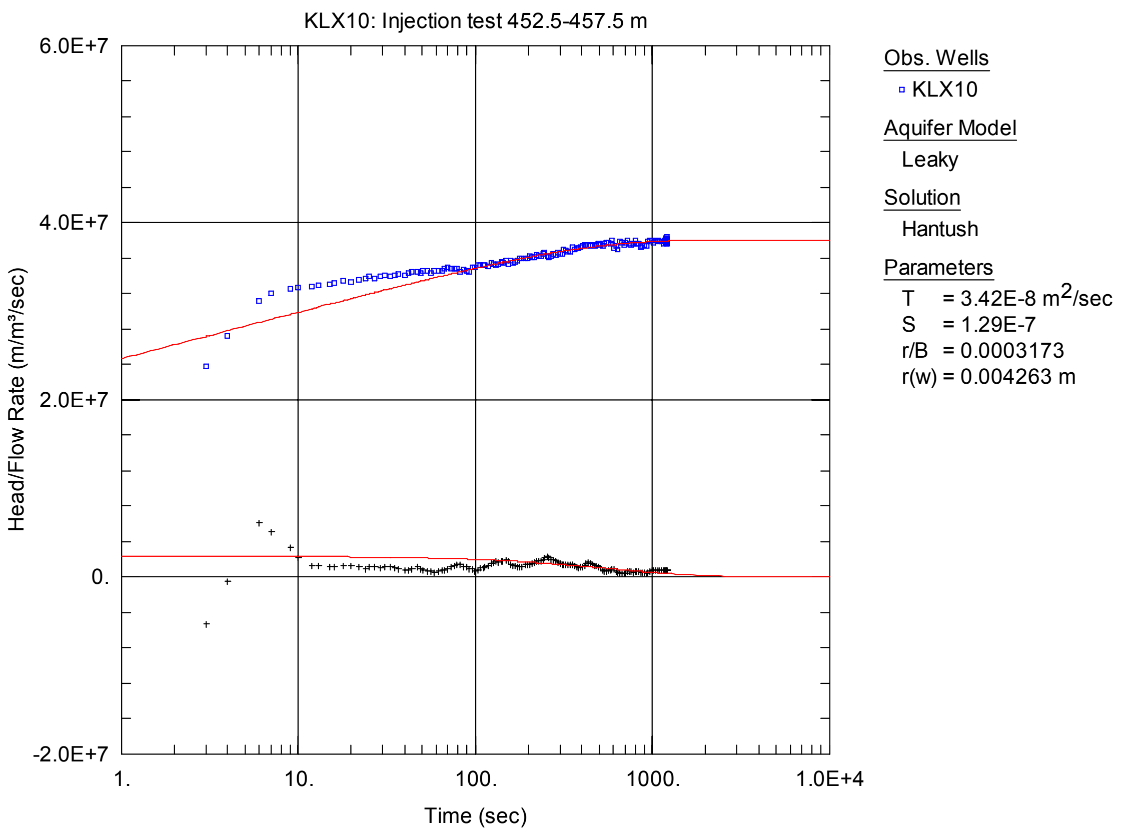


Figure A3-405. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 452.5-457.5 m in KLX10.*

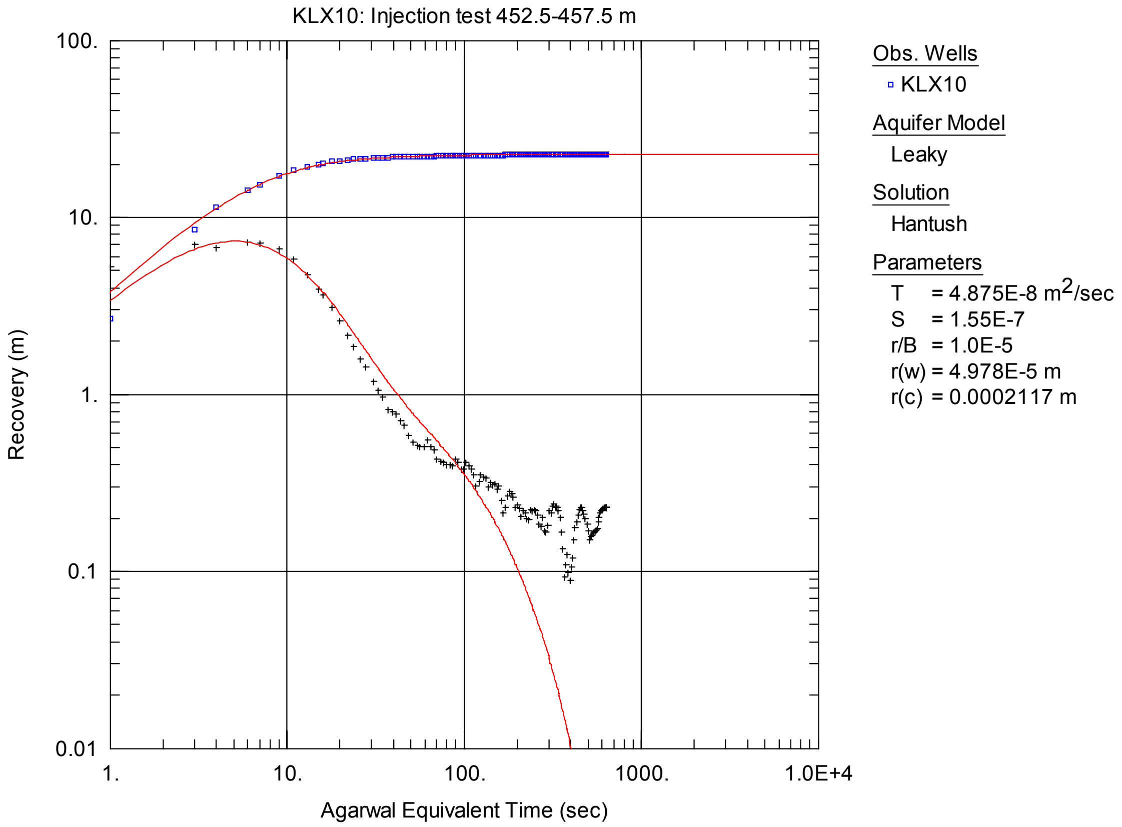


***Figure A3-406.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 452.5-457.5 m in KLX10.*

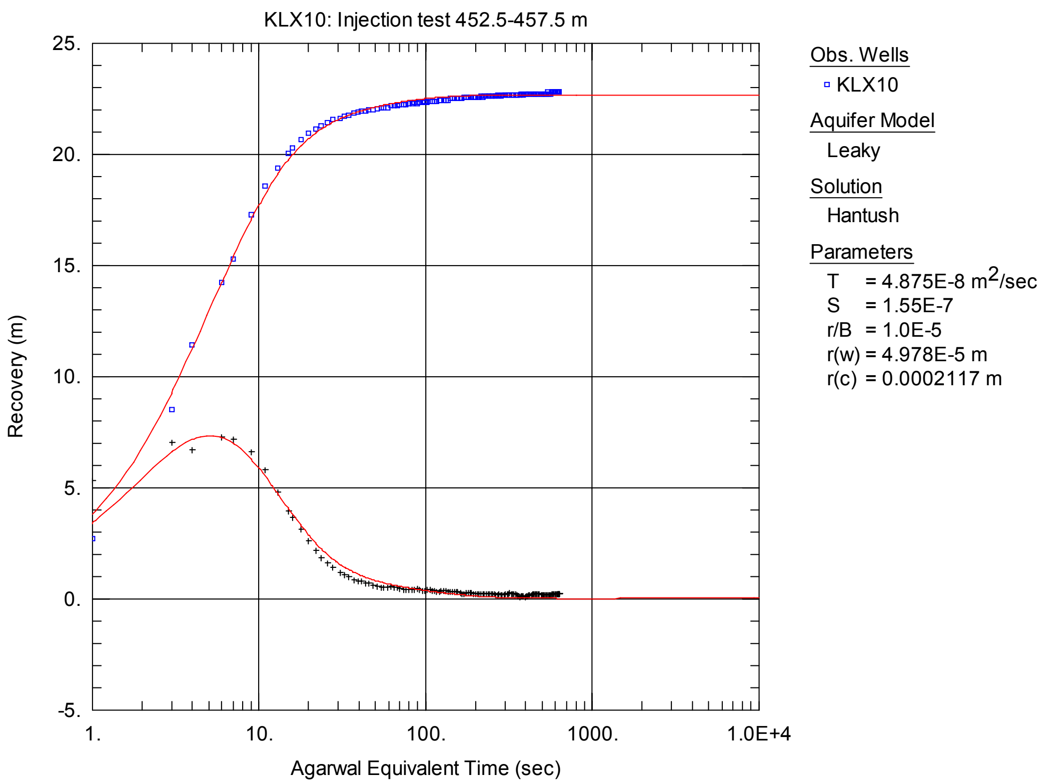


***Figure A3-407.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 452.5-457.5 m in KLX10.*

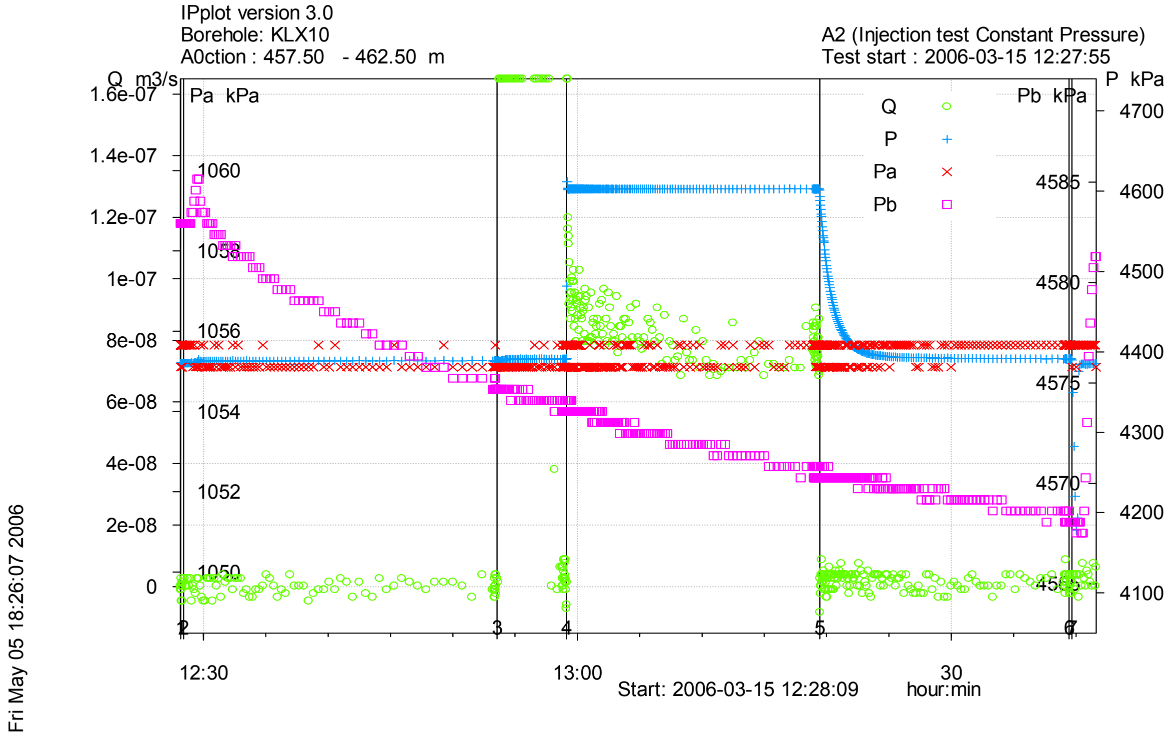


***Figure A3-408.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 457.5-462.5 m in borehole KLX10.*

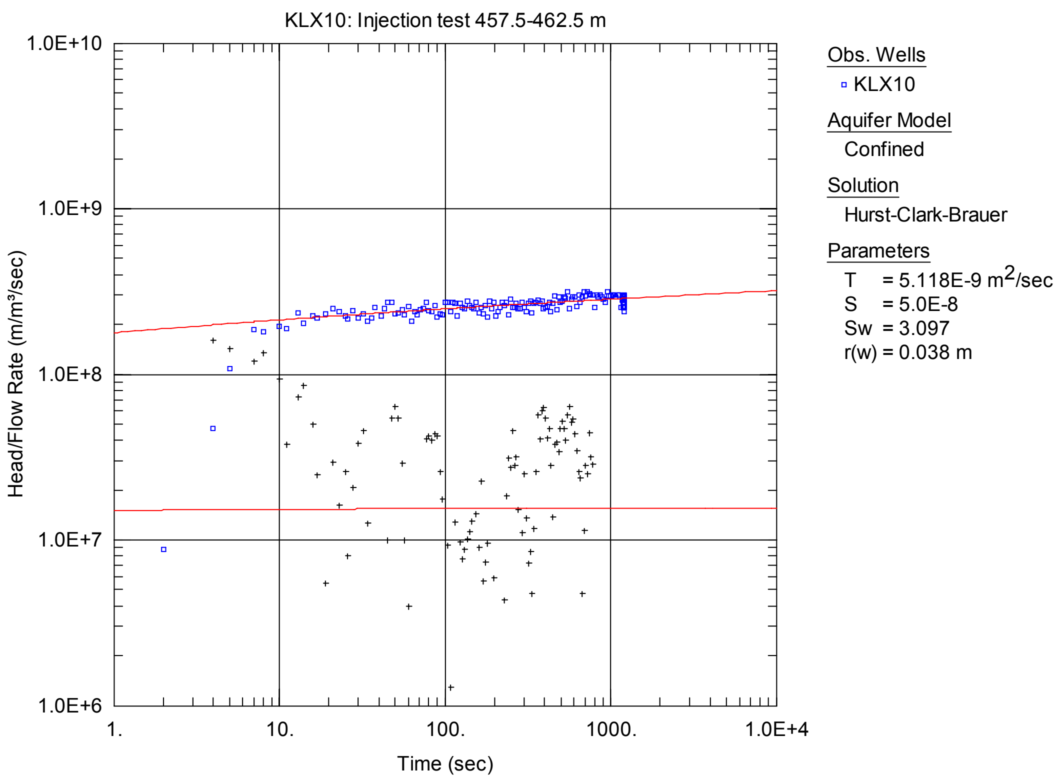


***Figure A3-409.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 457.5-462.5 m in KLX10.*

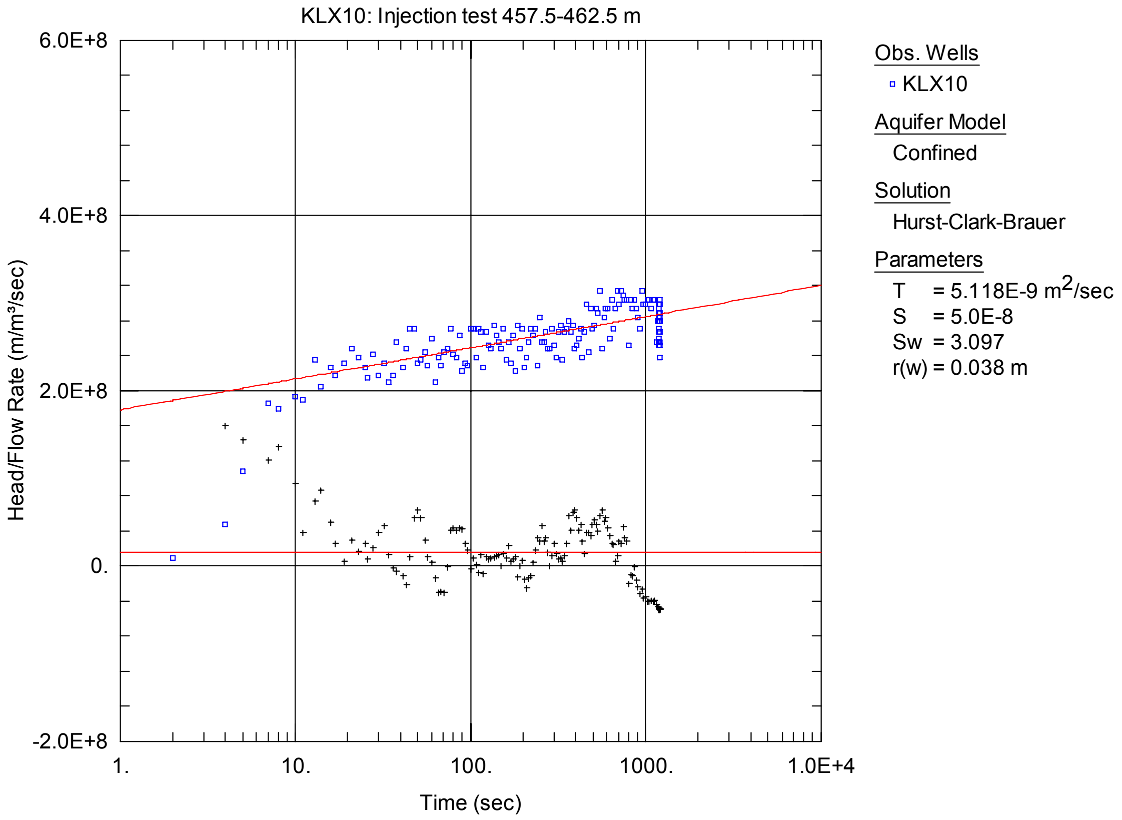


Figure A3-410. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 457.5-462.5 m in KLX10.*

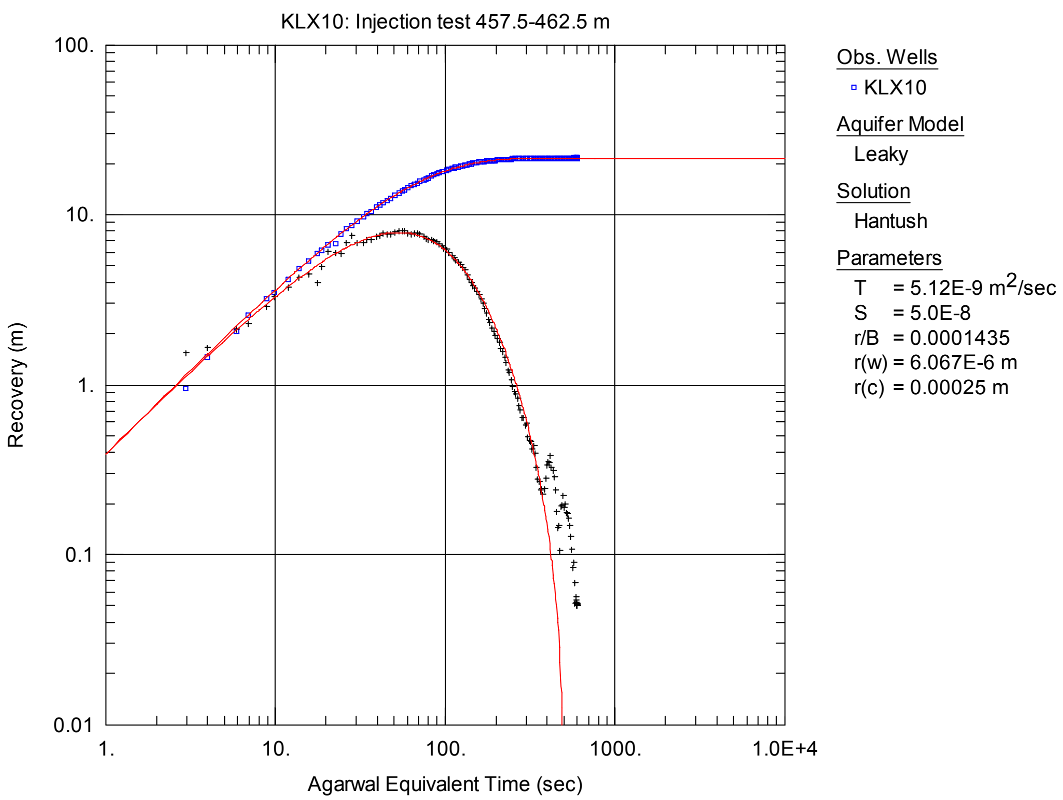


Figure A3-411. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 457.5-462.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

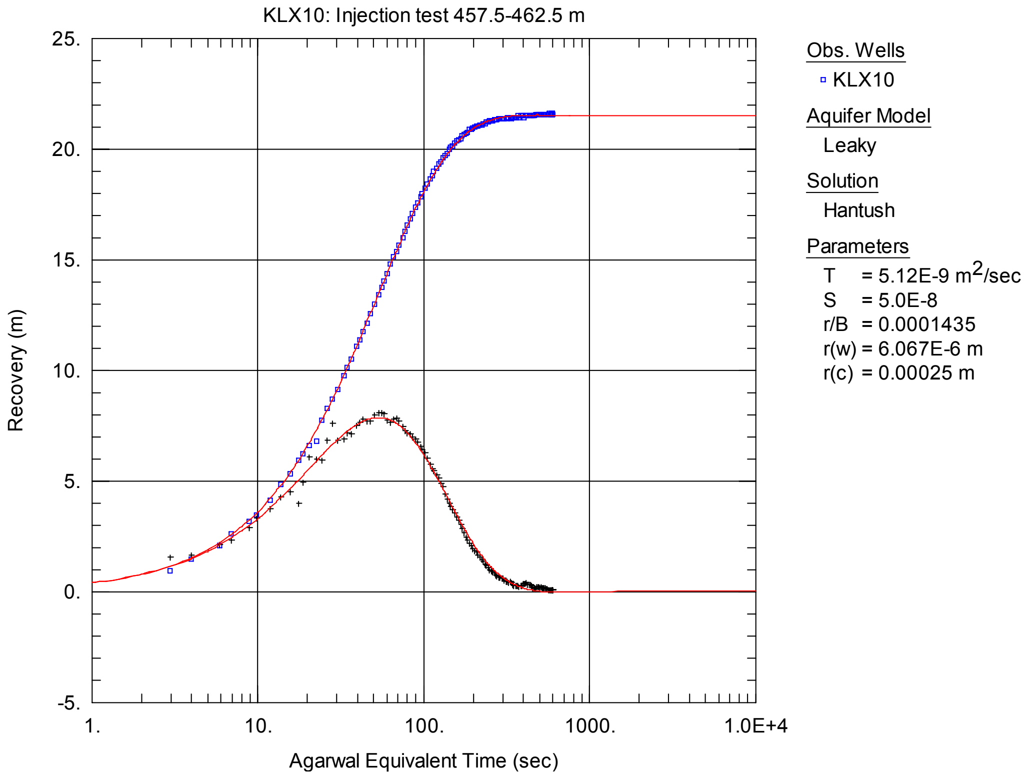


***Figure A3-412.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 457.5-462.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

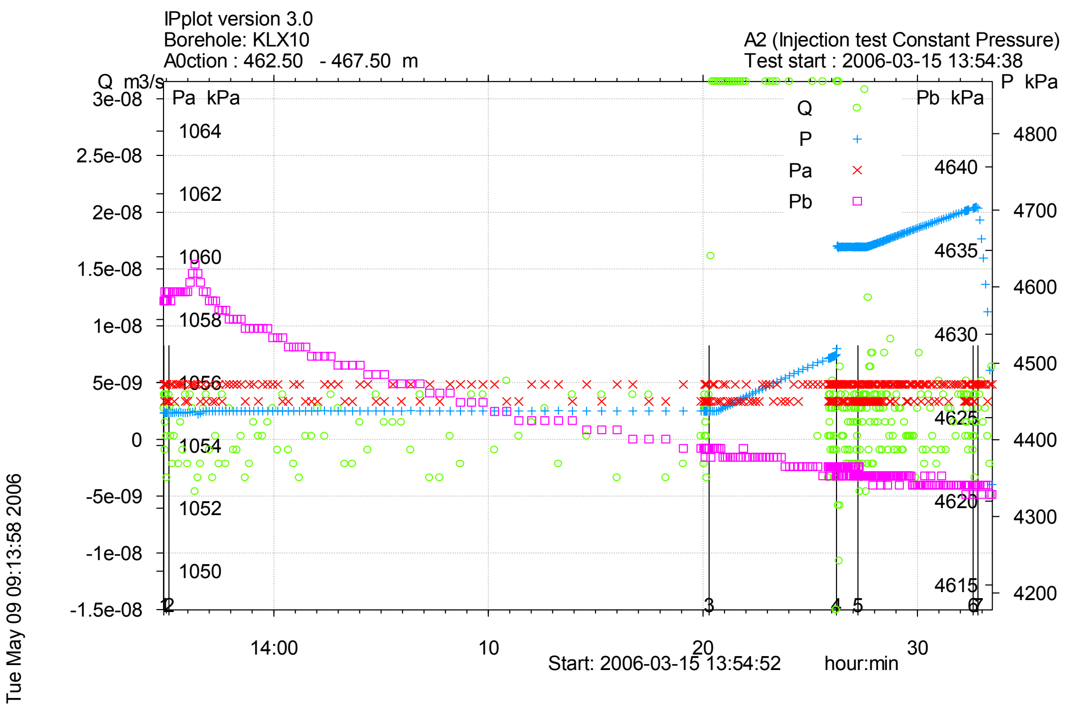


***Figure A3-413.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 462.5-467.5 m in borehole KLX10.*

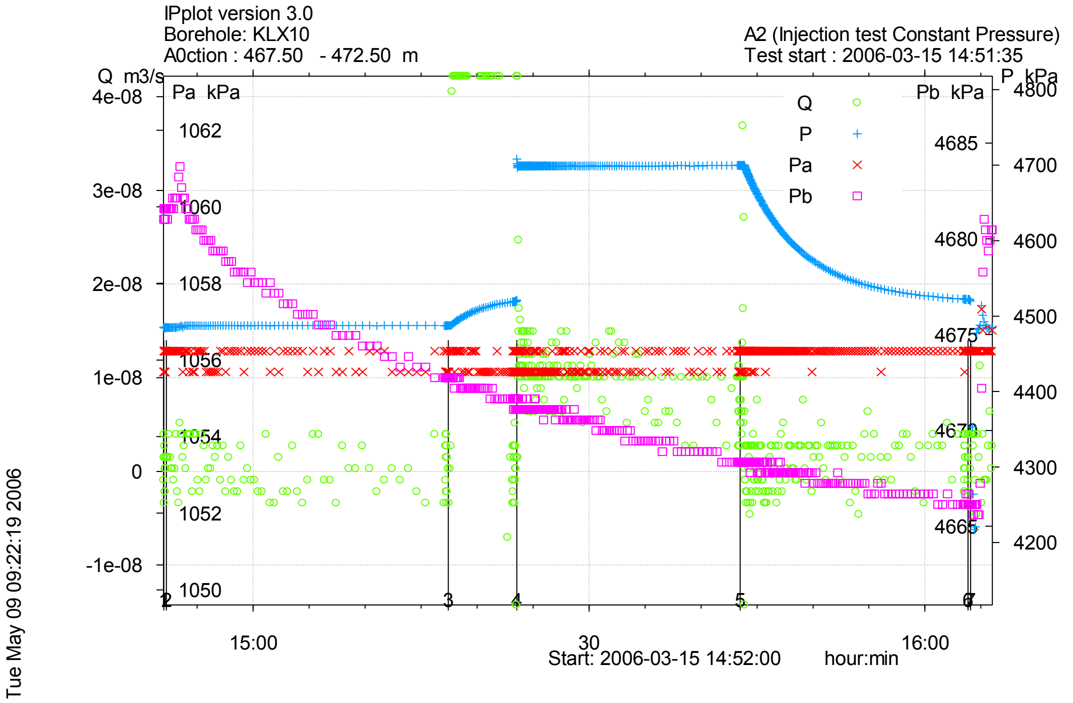


Figure A3-414. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 467.5-472.5 m in borehole KLX10.

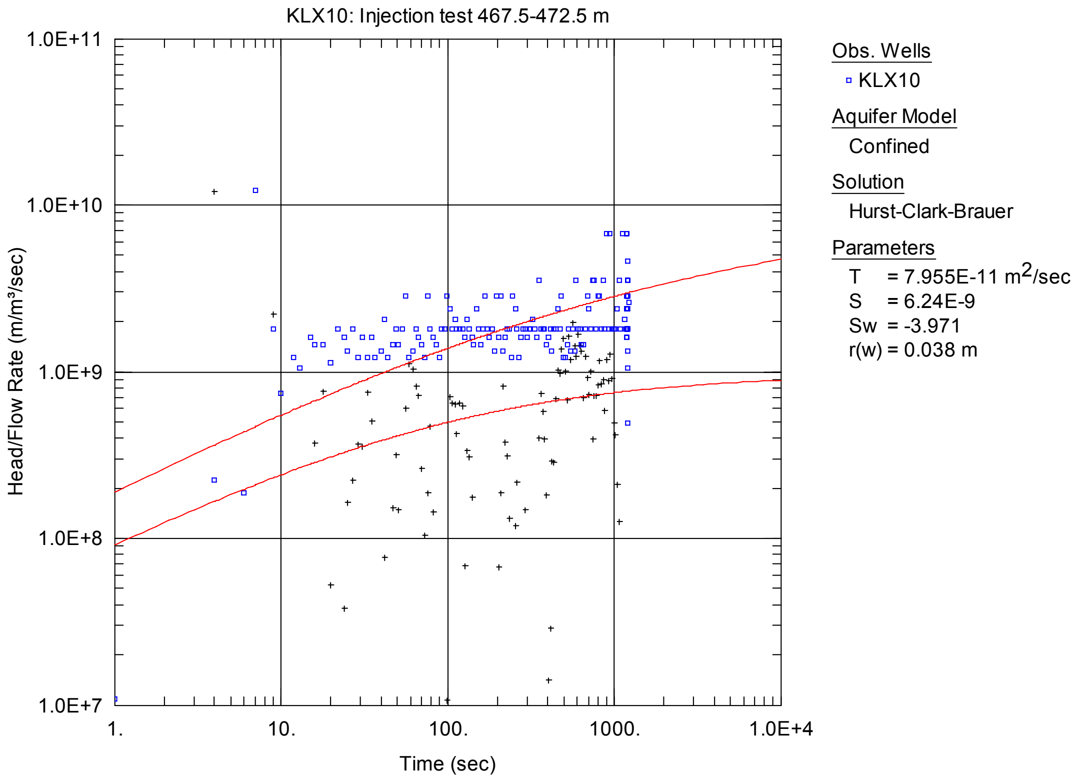


Figure A3-415. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 467.5-472.5 m in KLX10.

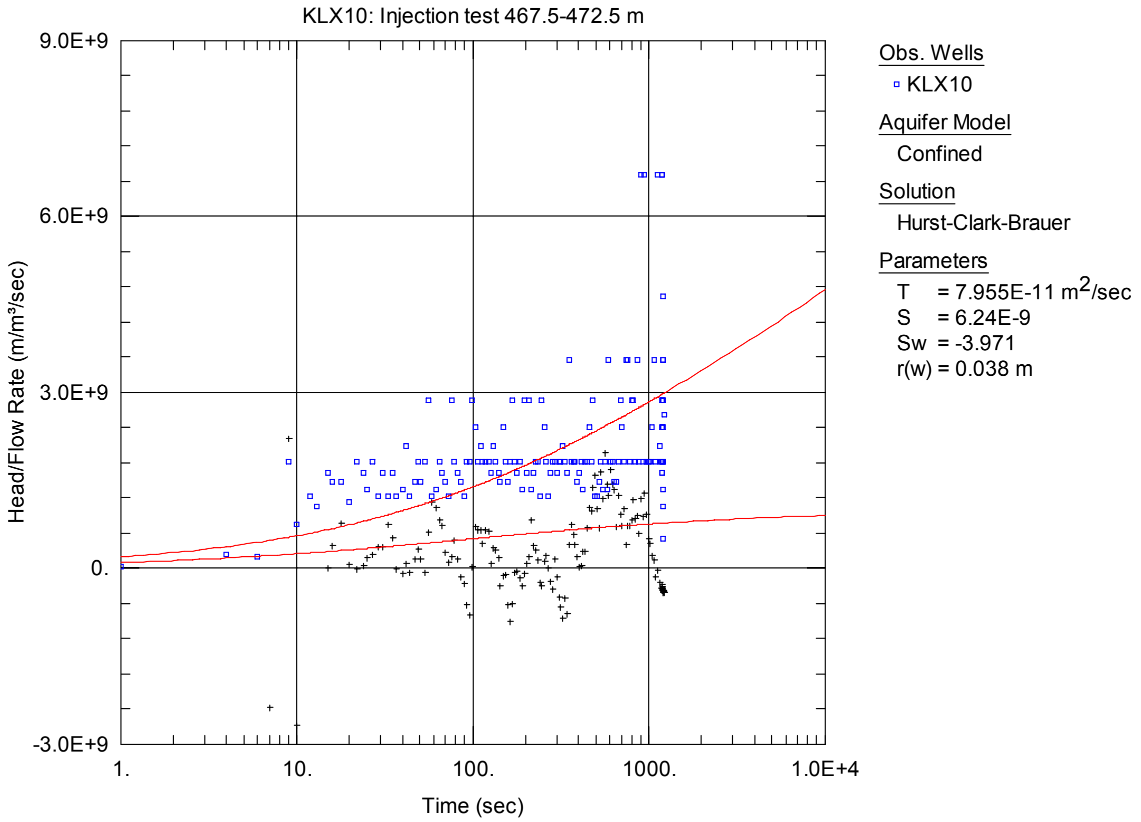


Figure A3-416. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 467.5-472.5 m in KLX10.*

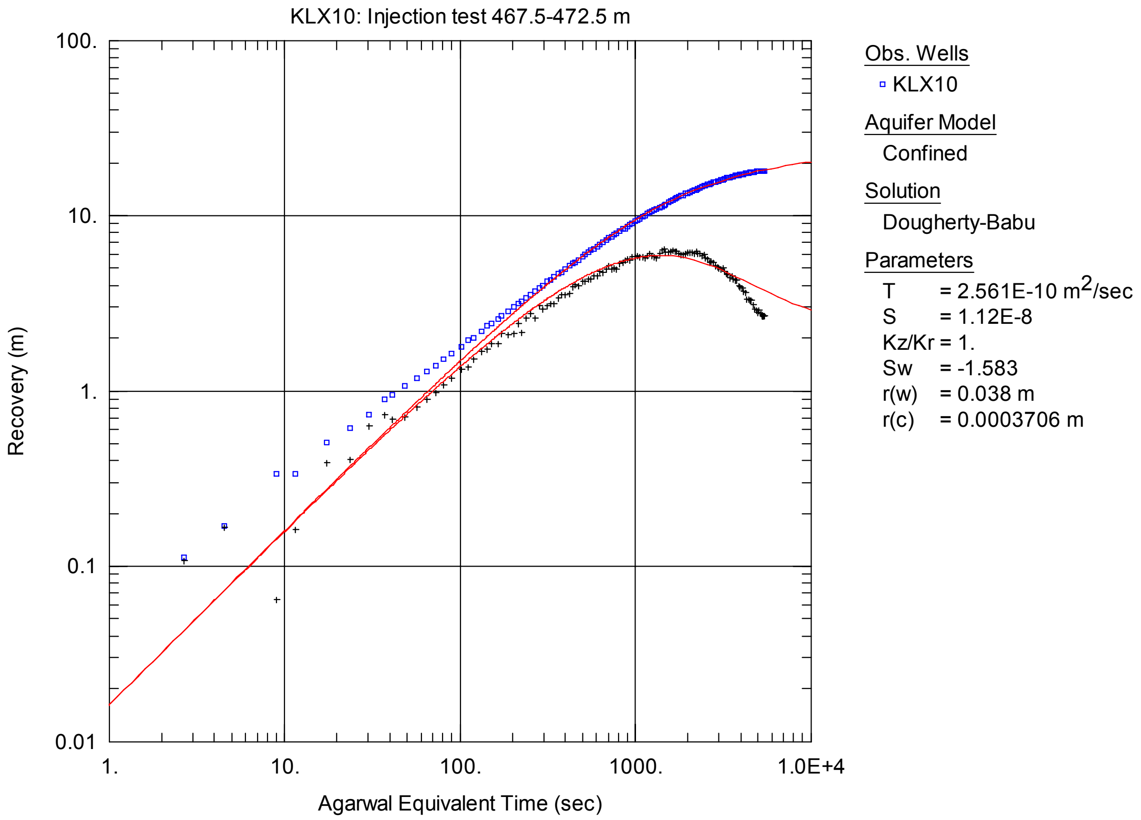


Figure A3-417. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 467.5-472.5 m in KLX10.*

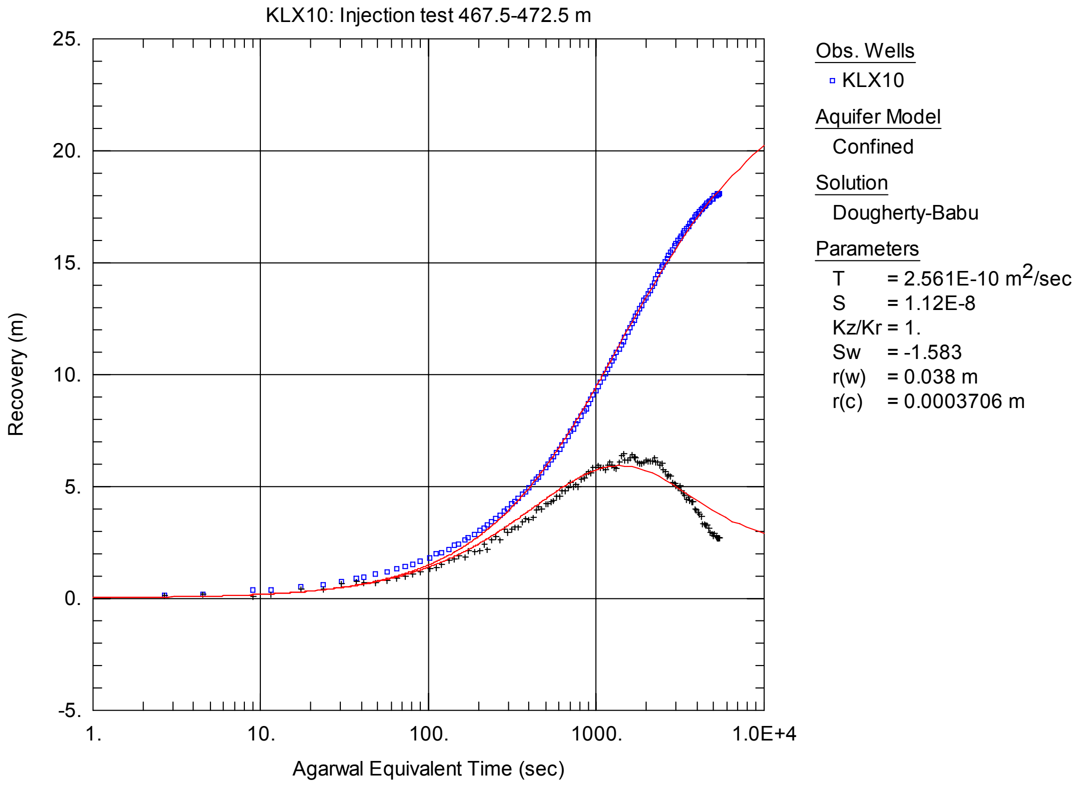


__Figure A3-418.__ Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 467.5-472.5 m in KLX10.

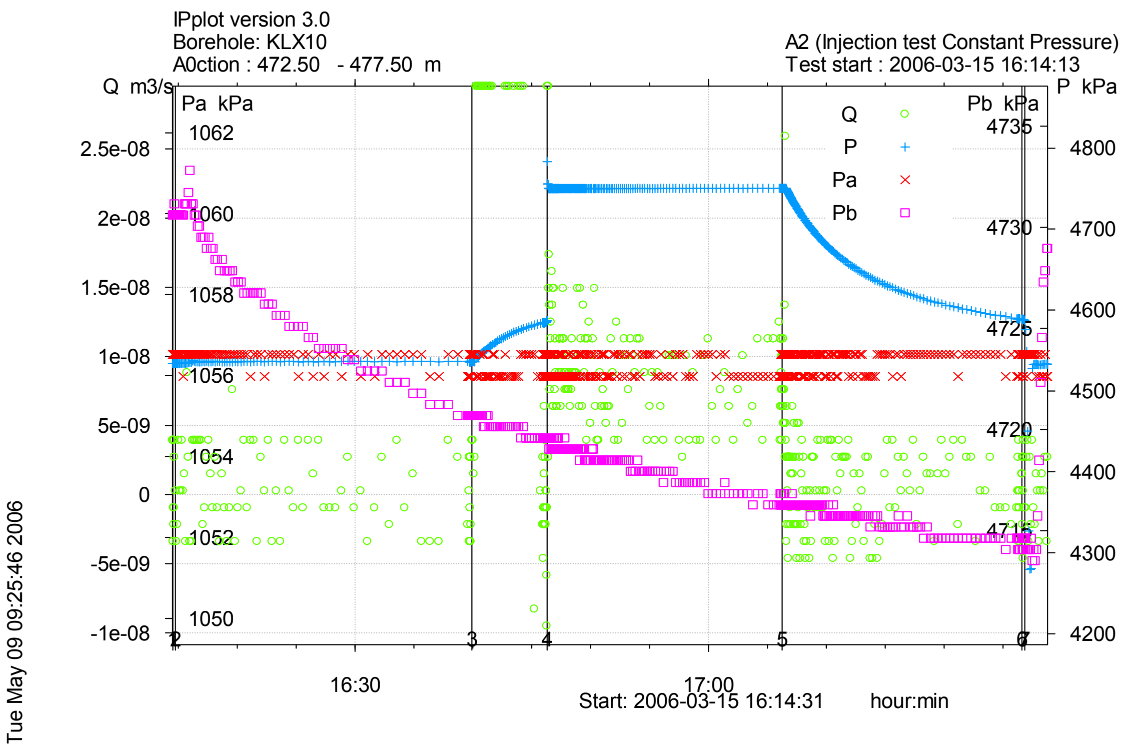


__Figure A3-419.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 472.5-477.5 m in borehole KLX10.

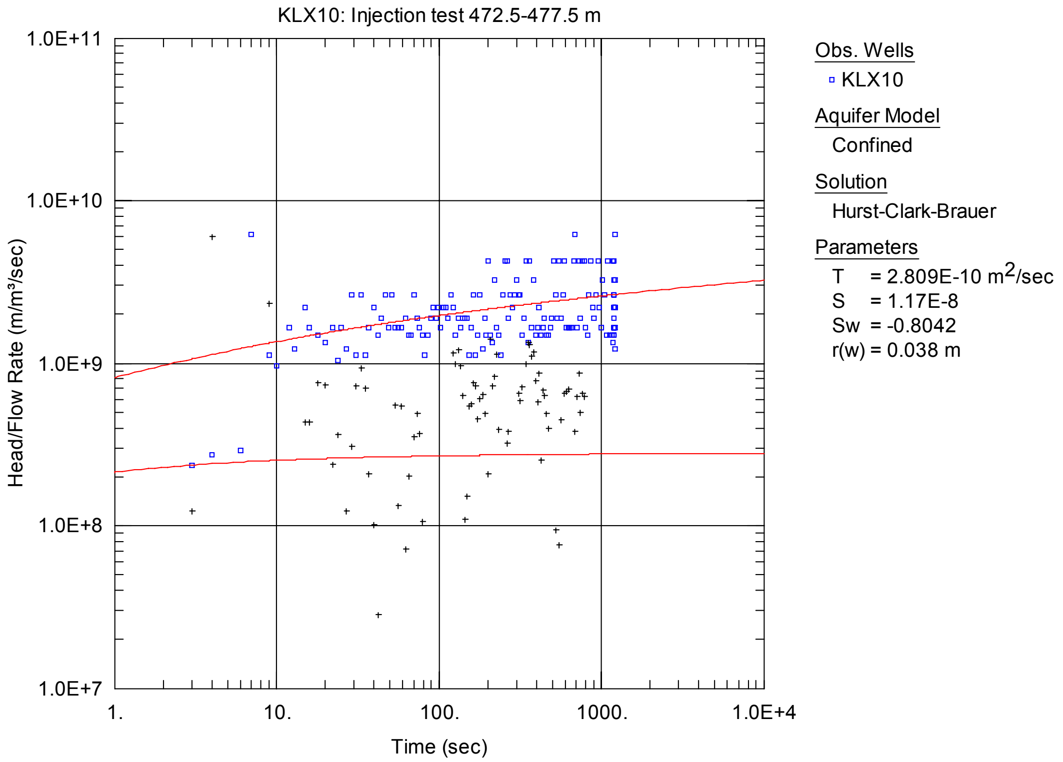


Figure A3-420. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 472.5-477.5 m in KLX10.

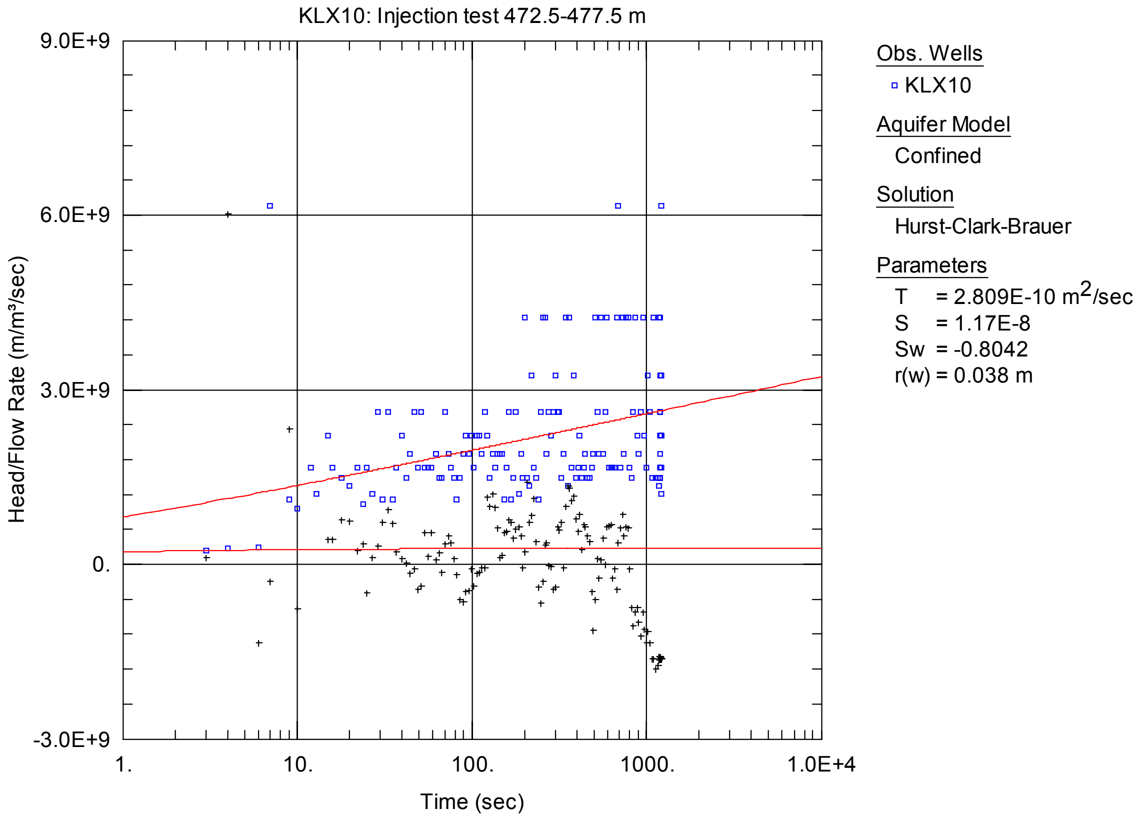


Figure A3-421. Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 472.5-477.5 m in KLX10.

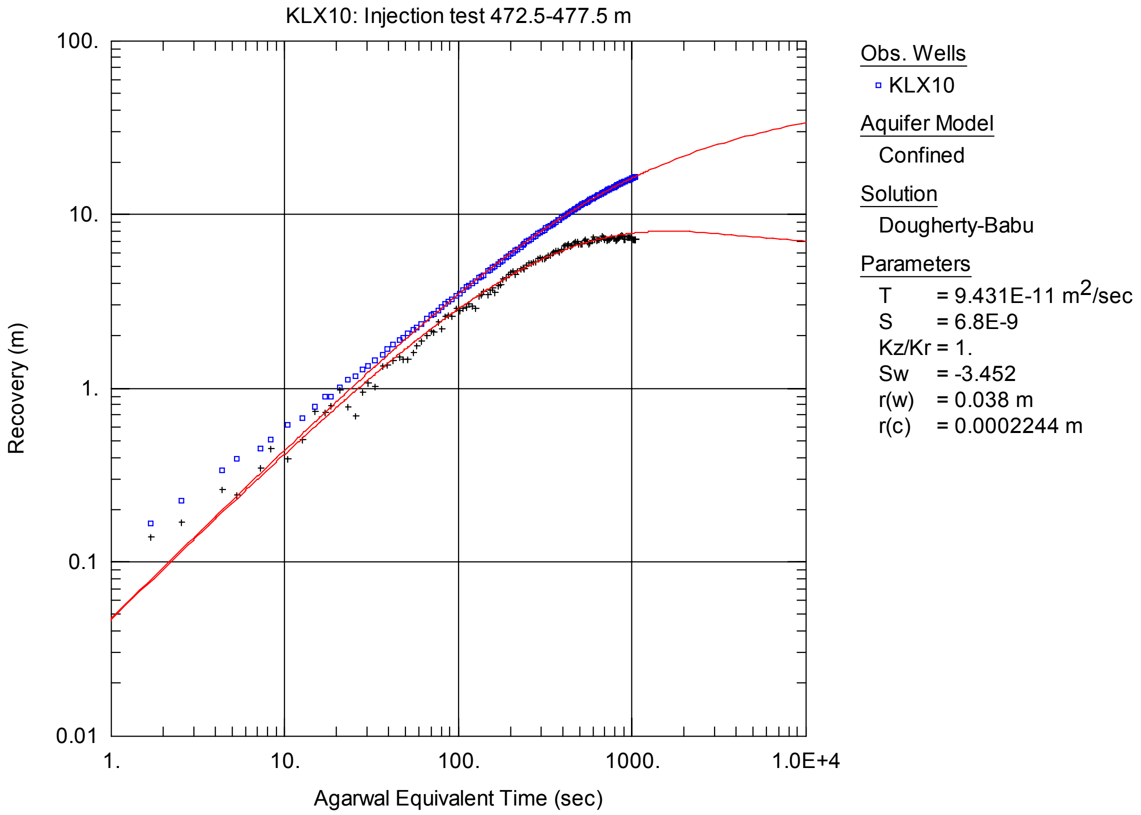


Figure A3-422. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 472.5-477.5 m in KLX10.*

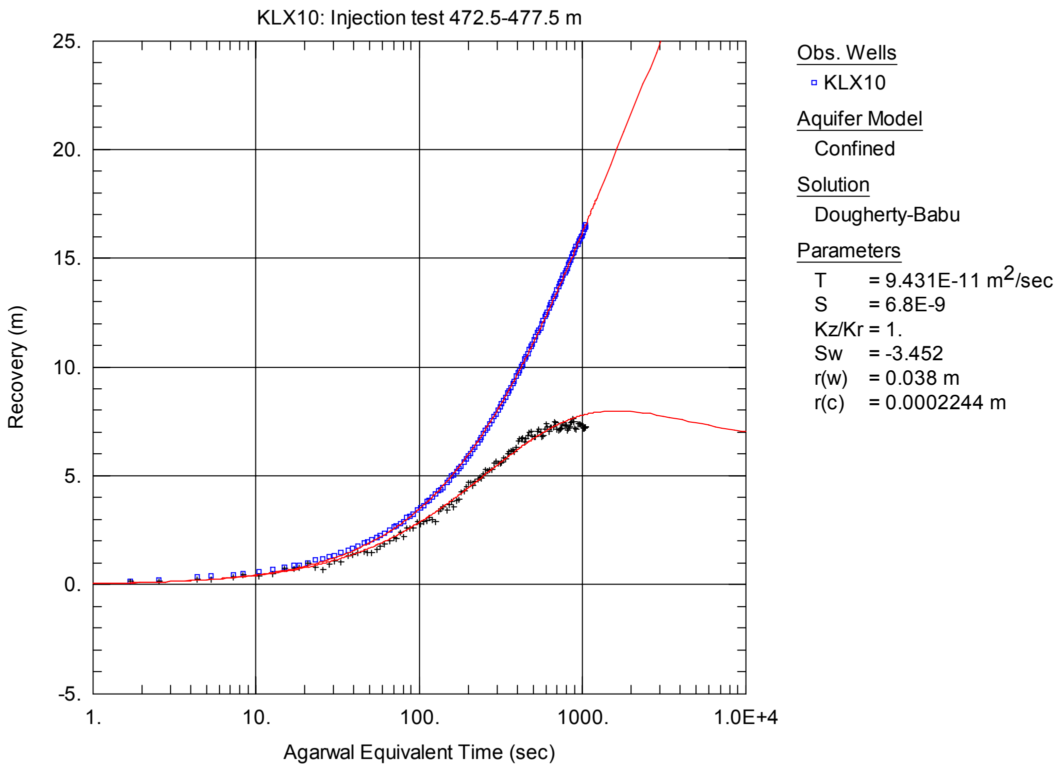


Figure A3-423. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 472.5-477.5 m in KLX10.*

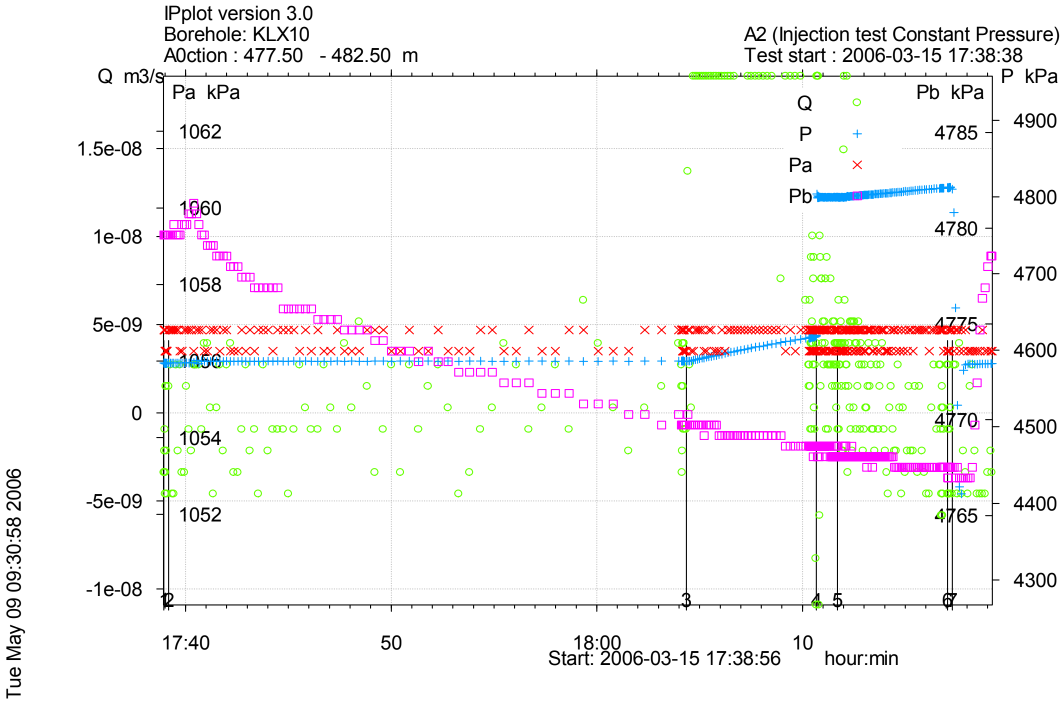


Figure A3-424. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 477.5-482.5 m in borehole KLX10.*

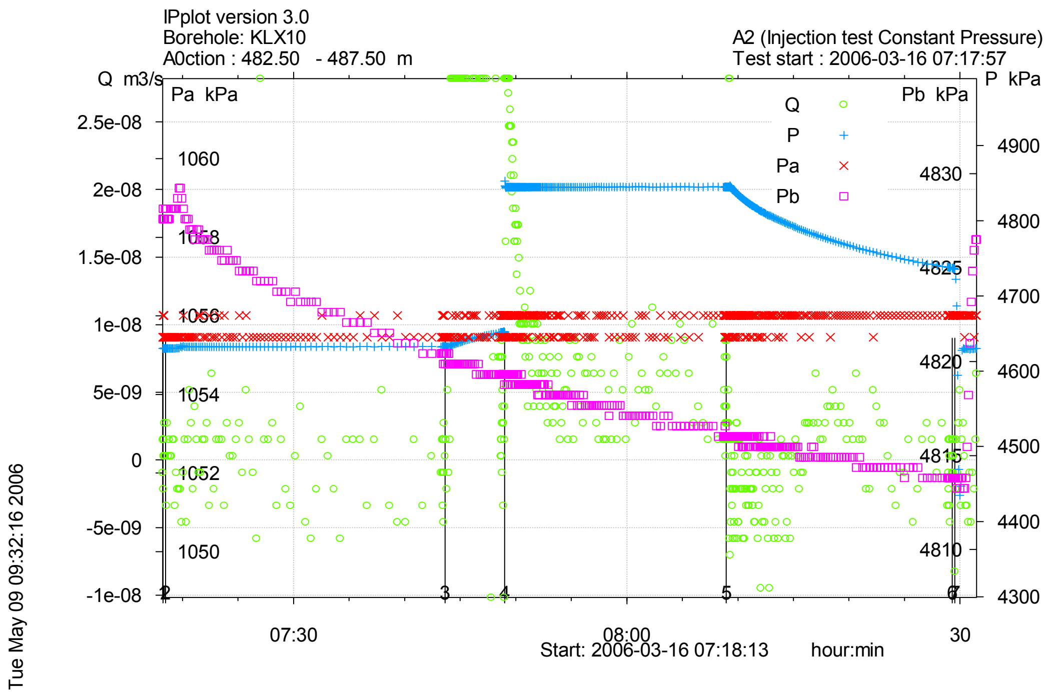


Figure A3-425. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 482.5-487.5 m in borehole KLX10.*

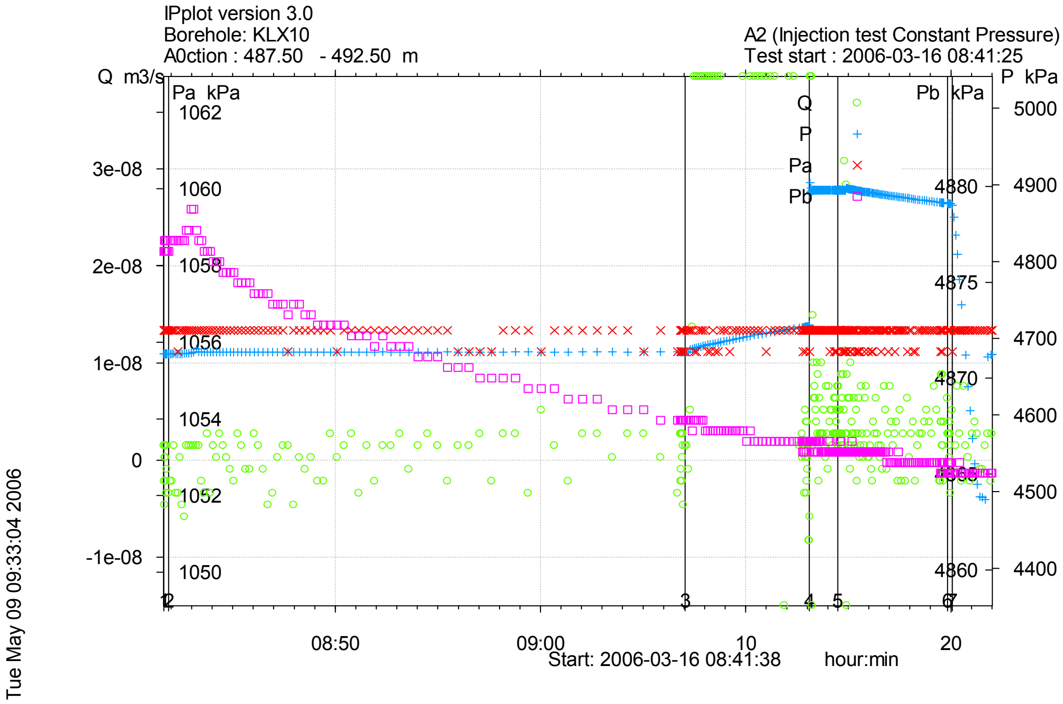


Figure A3-426. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 487.5-492.5 m in borehole KLX10.*

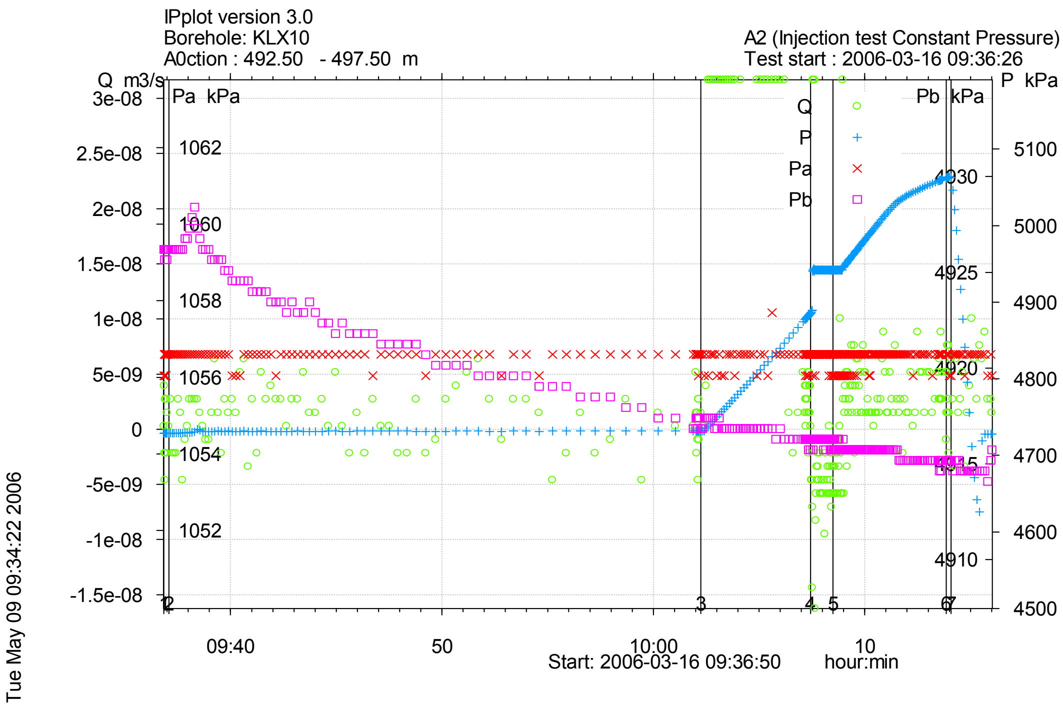


Figure A3-427. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 492.5-497.5 m in borehole KLX10.*

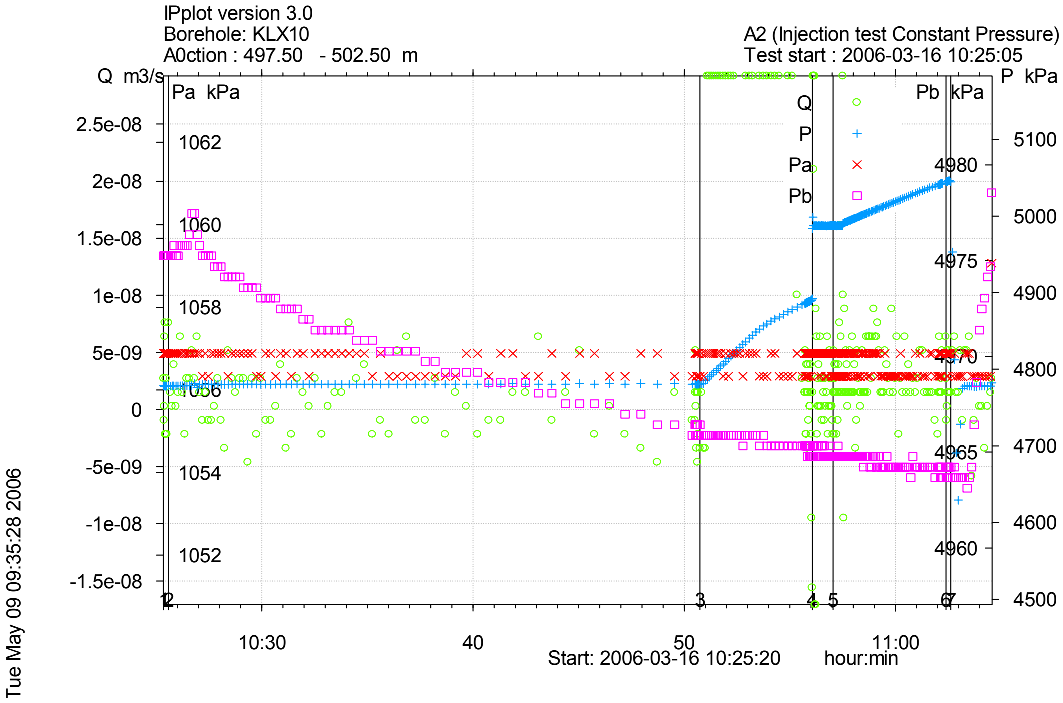


Figure A3-428. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 497.5-502.5 m in borehole KLX10.

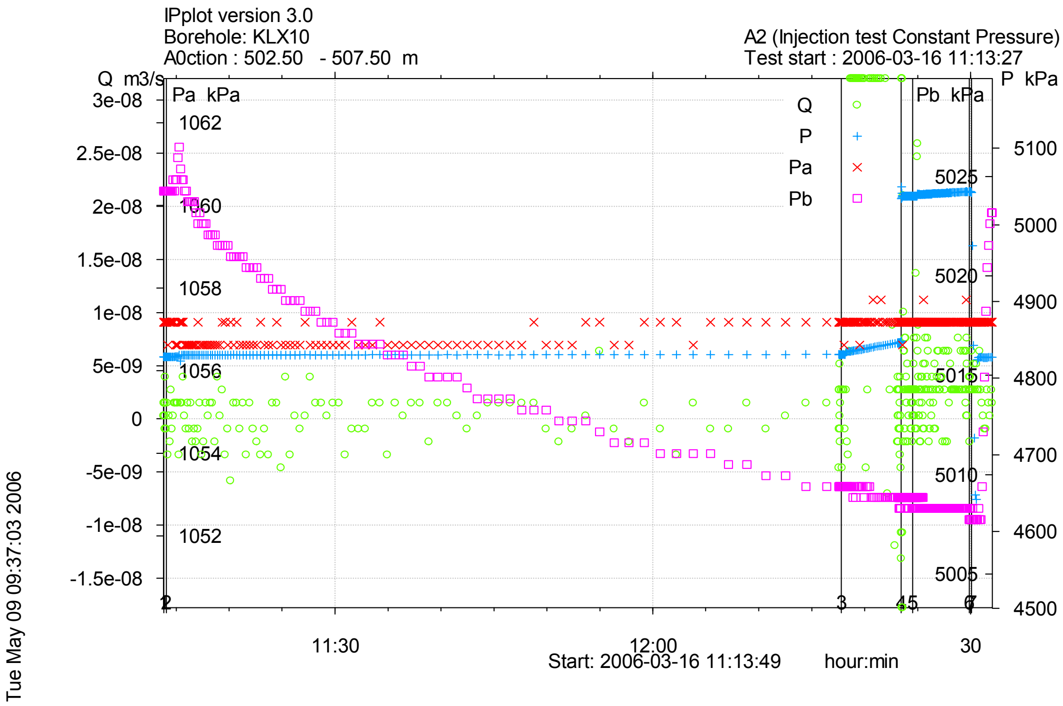


Figure A3-429. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 502.5-507.5 m in borehole KLX10.

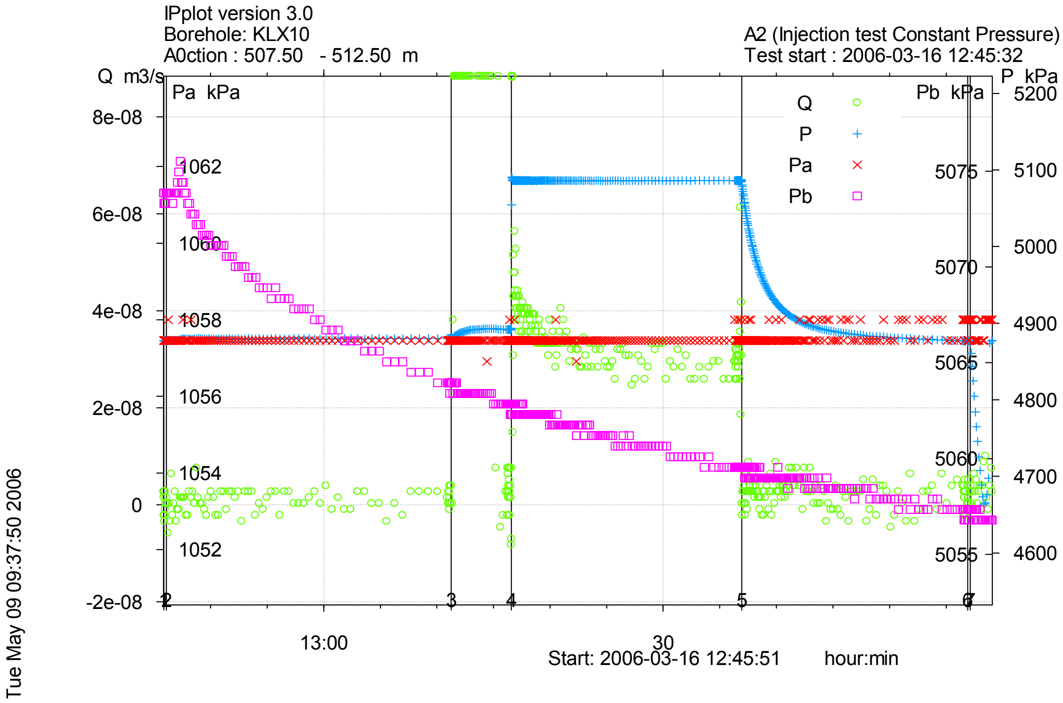


__Figure A3-430.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 507.5-512.5 m in borehole KLX10.

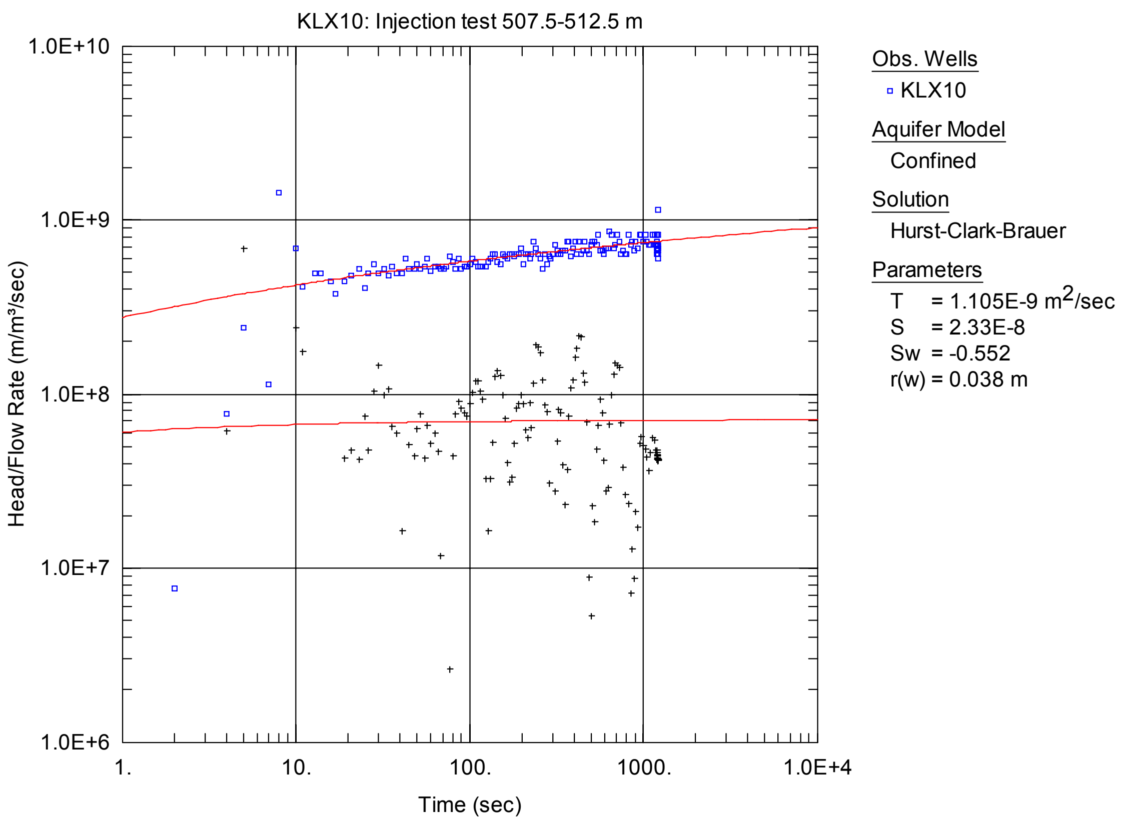


__Figure A3-431.__ Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 507.5-512.5 m in KLX10.

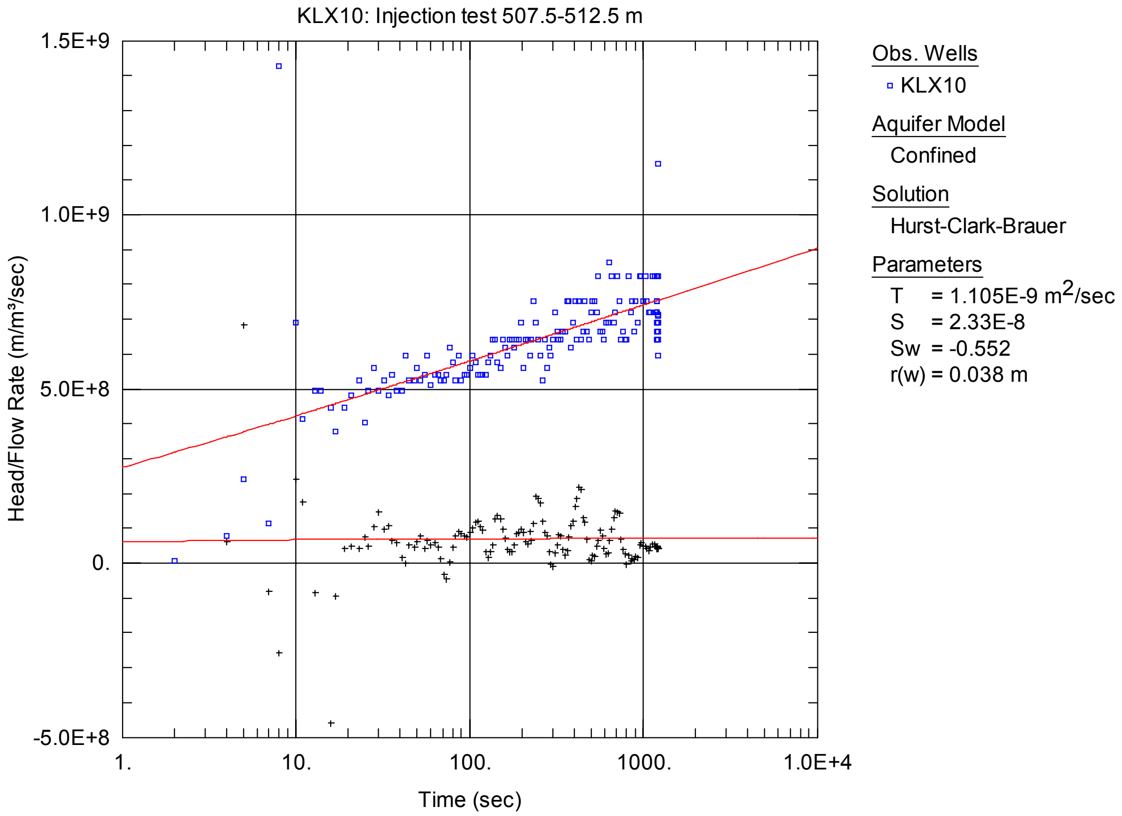


Figure A3-432. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 507.5-512.5 m in KLX10.*

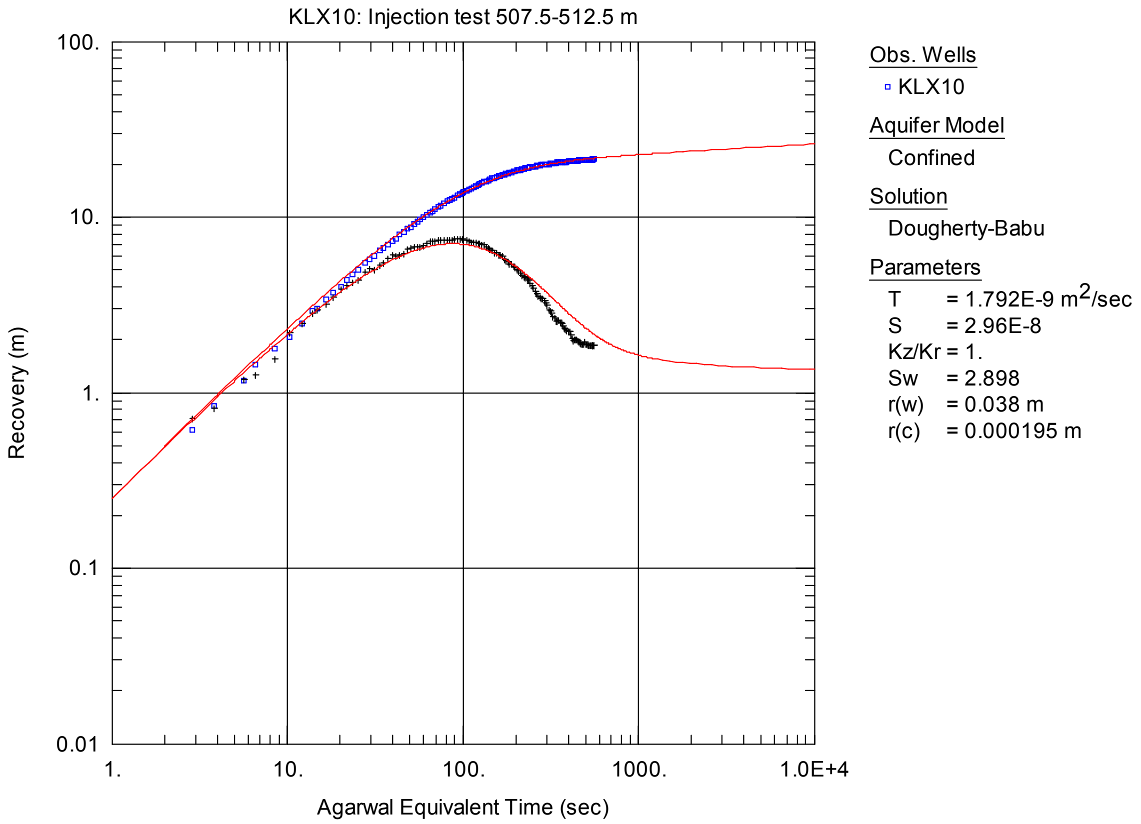


Figure A3-433. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 507.5-512.5 m in KLX10.*

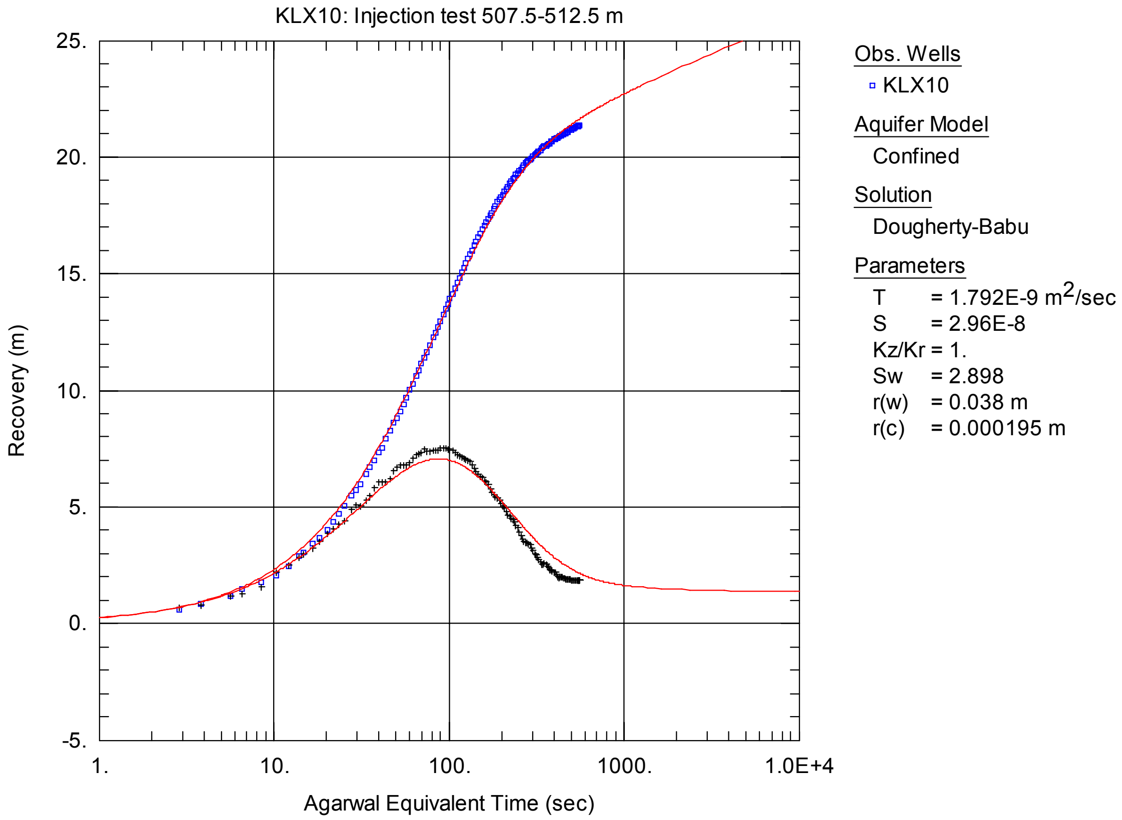


Figure A3-434. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 507.5-512.5 m in KLX10.*

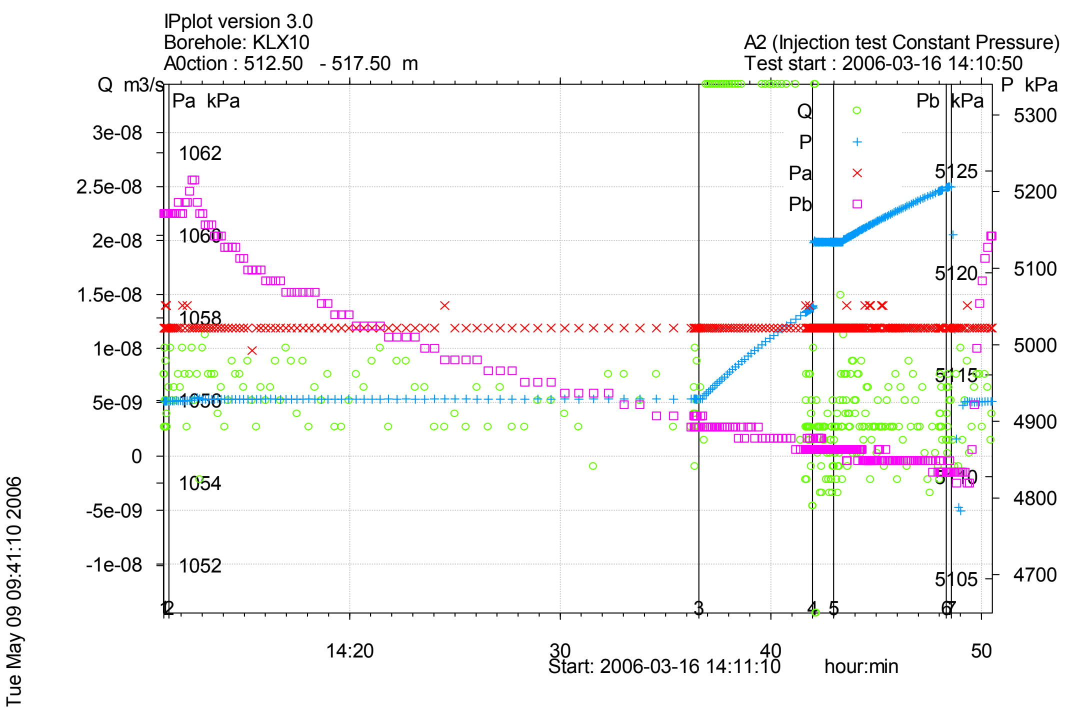


Figure A3-435. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 512.5-517.5 m in borehole KLX10.*

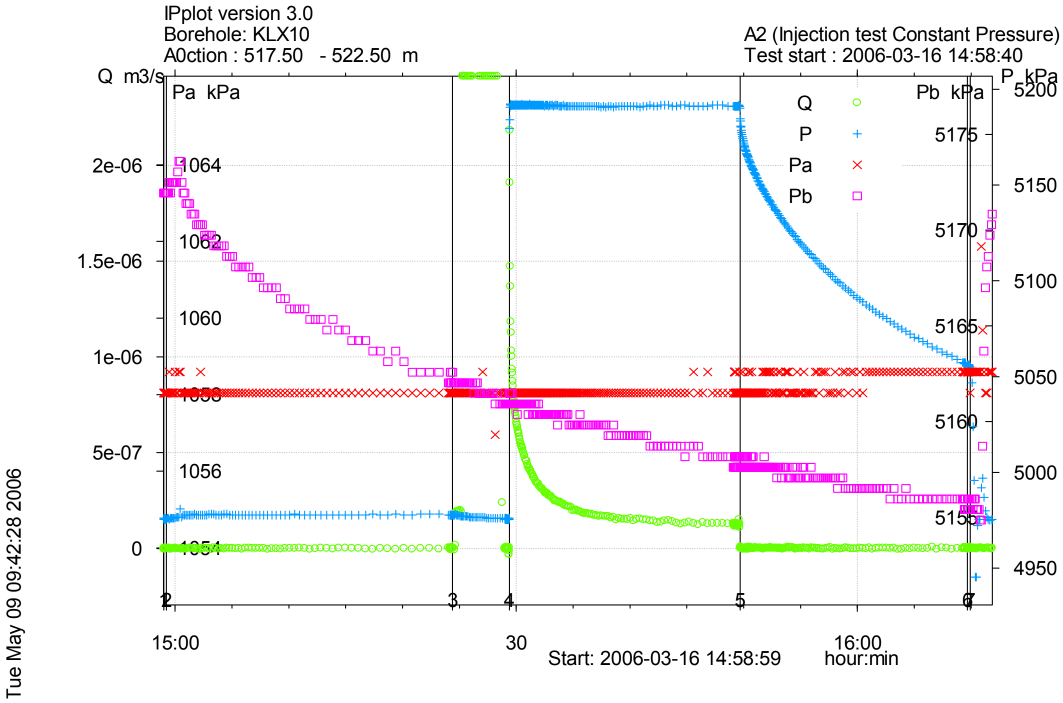


Figure A3-436. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 517.5-522.5 m in borehole KLX10.*

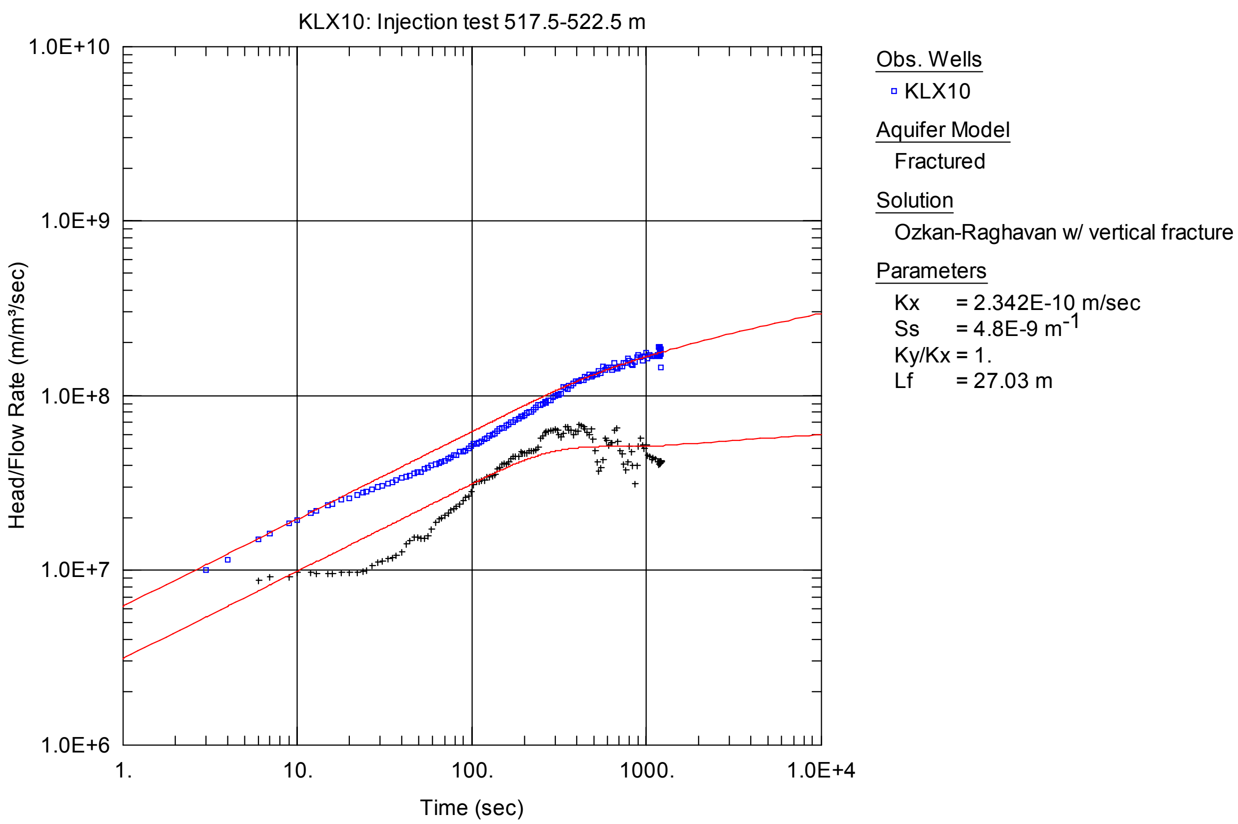


Figure A3-437. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 517.5-522.5 m in KLX10.*

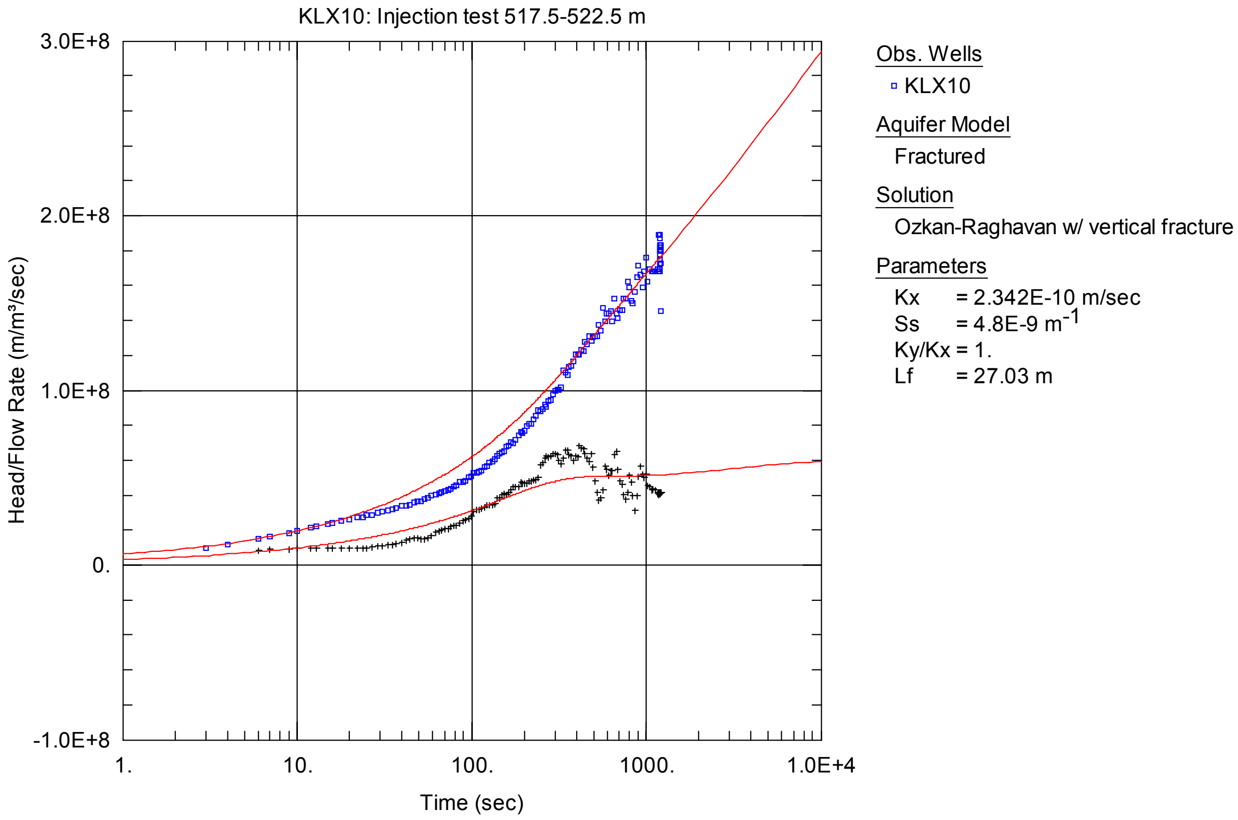


Figure A3-438. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 517.5-522.5 m in KLX10.*

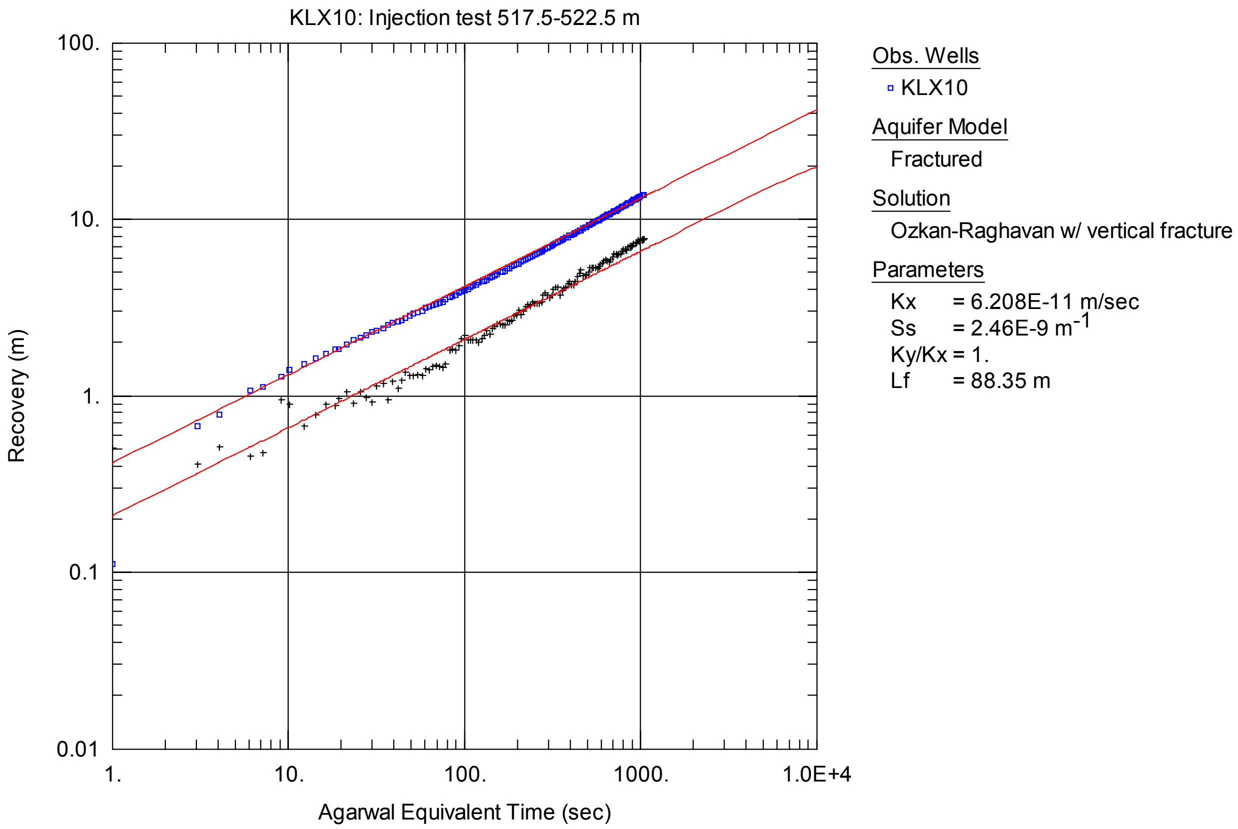


Figure A3-439. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 517.5-522.5 m in KLX10.*

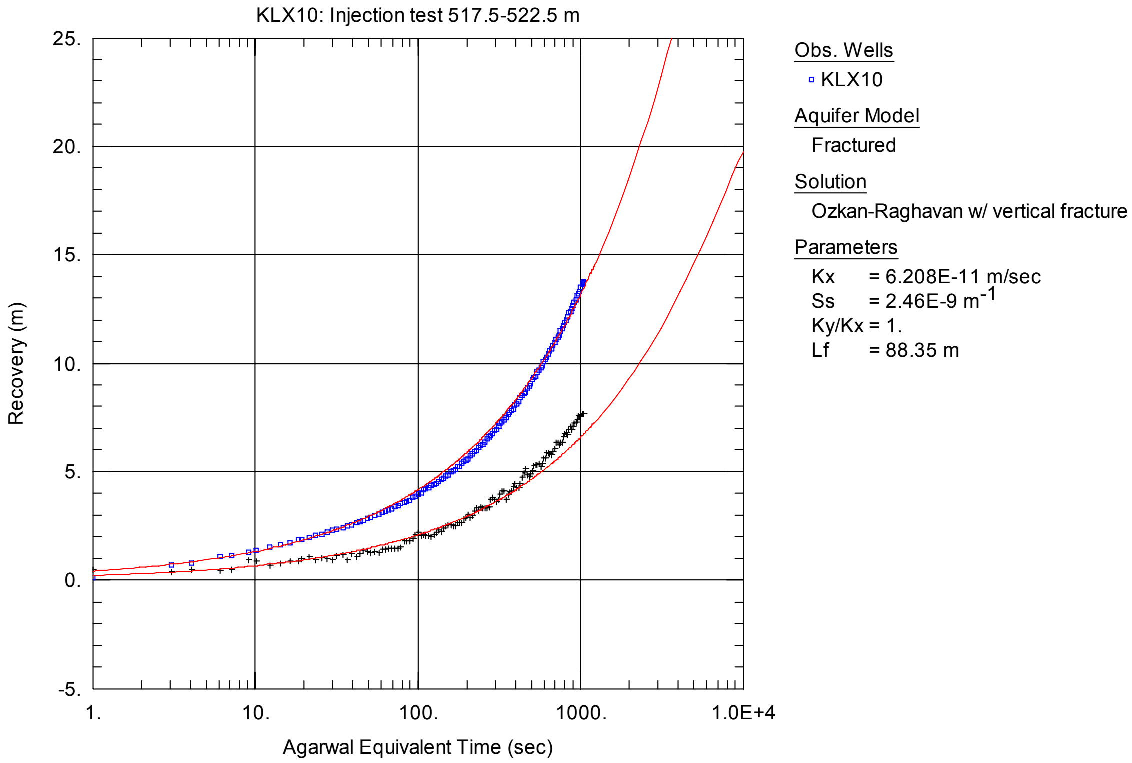


Figure A3-440. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 517.5-522.5 m in KLX10.*

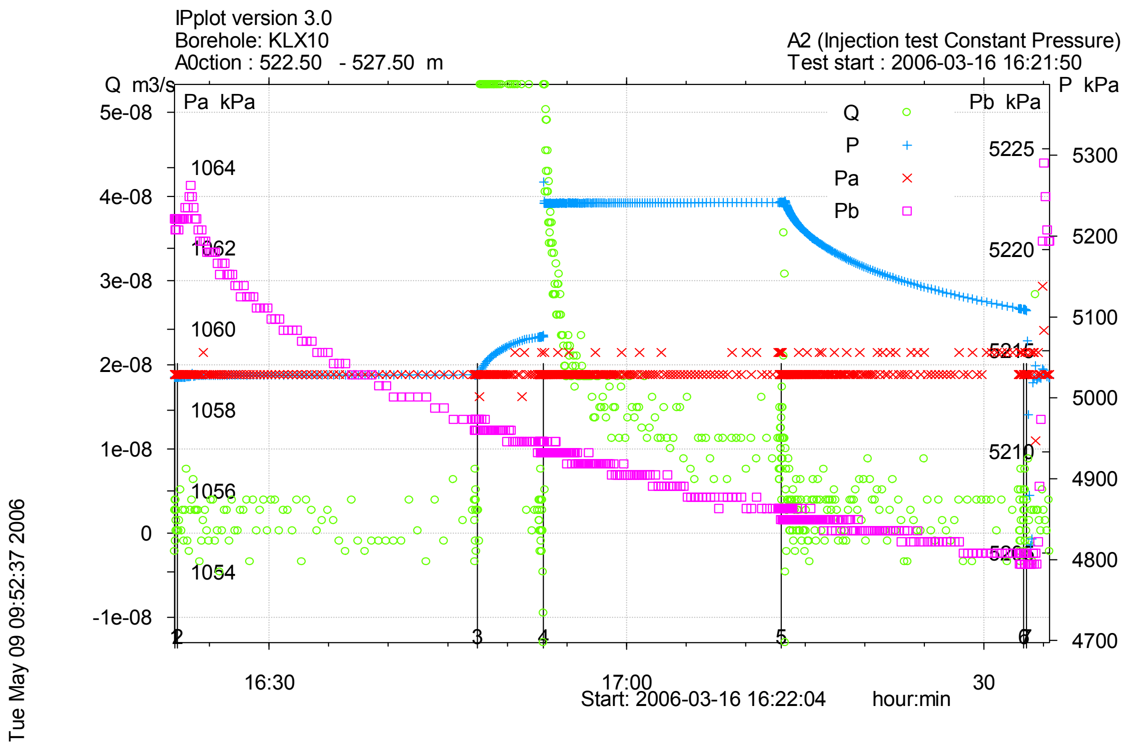


Figure A3-441. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 522.5-527.5 m in borehole KLX10.*

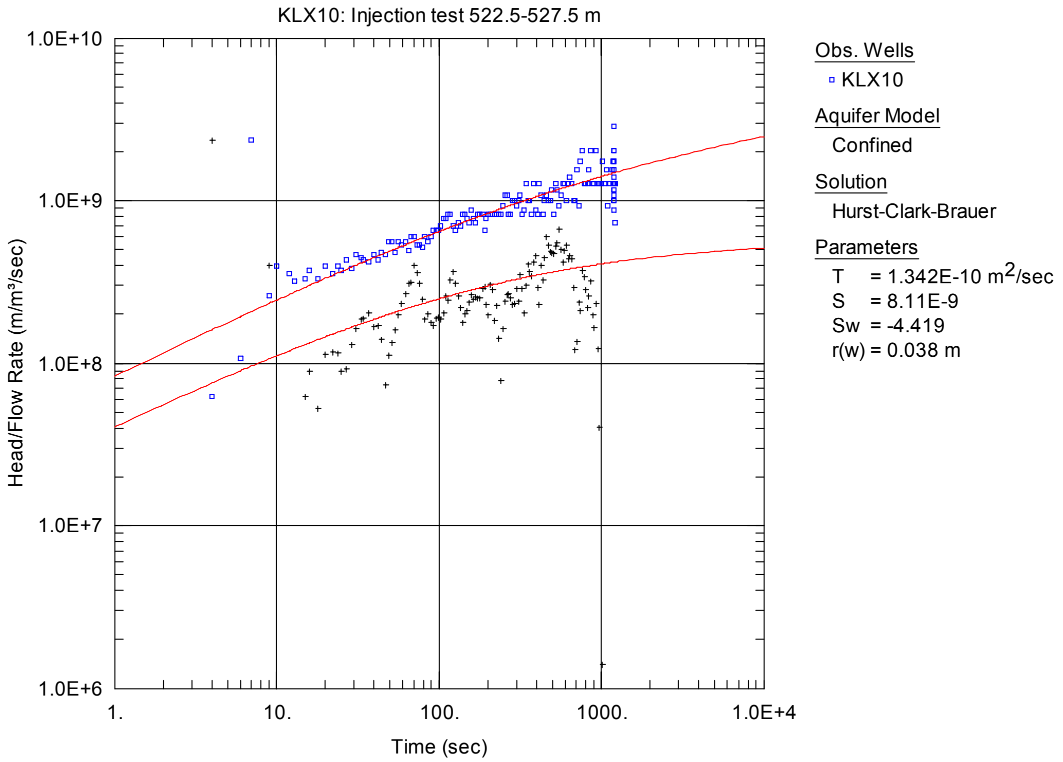


***Figure A3-442.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 522.5-527.5 m in KLX10.*

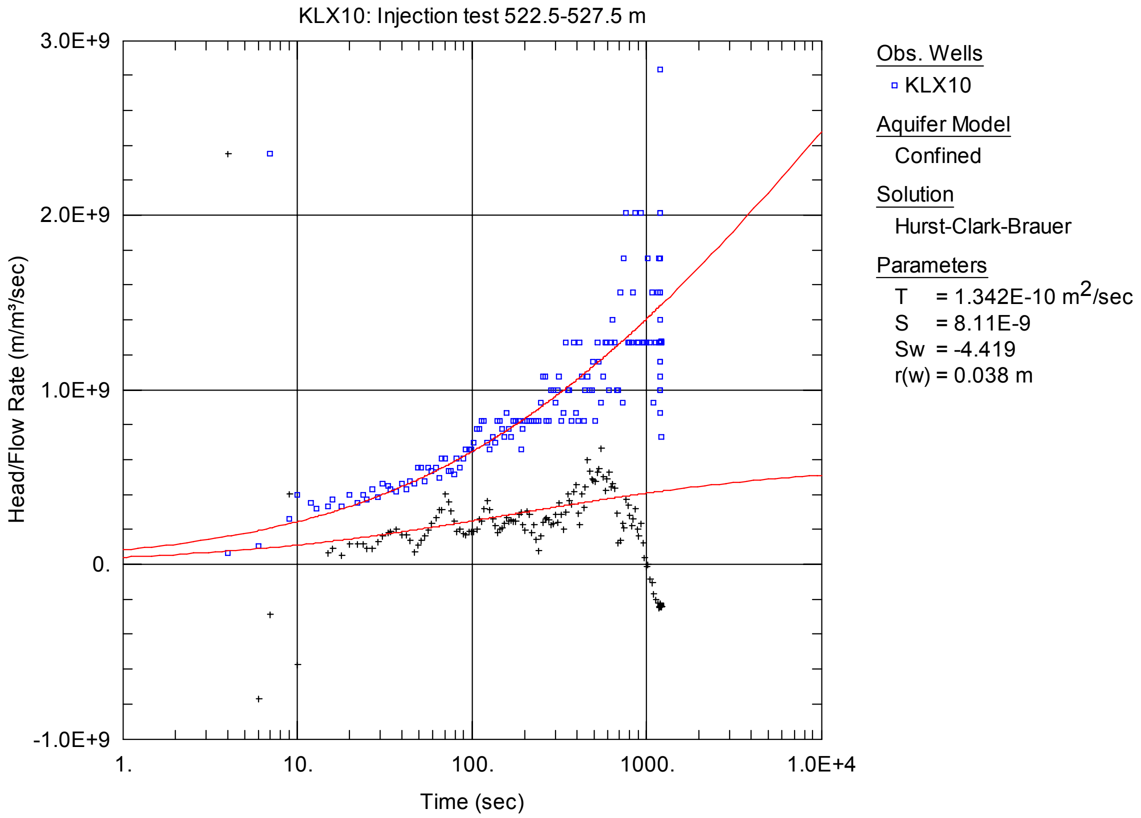


***Figure A3-443.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 522.5-527.5 m in KLX10.*

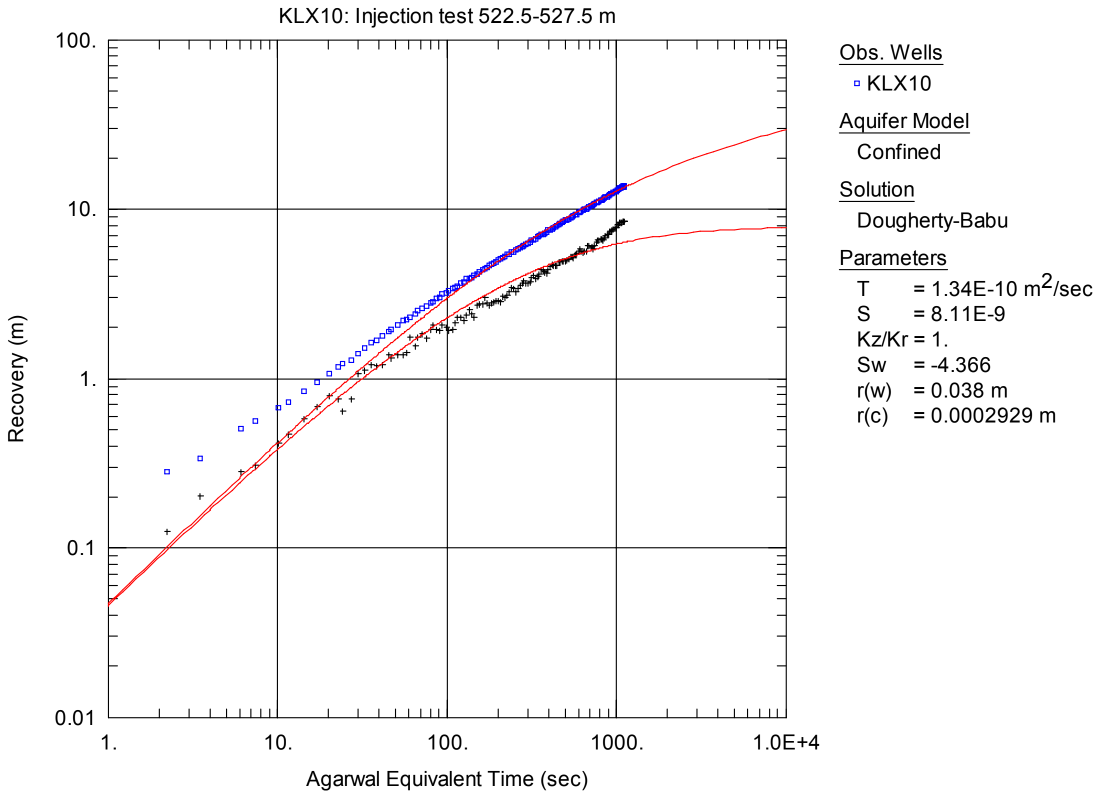


Figure A3-444. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 522.5-527.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

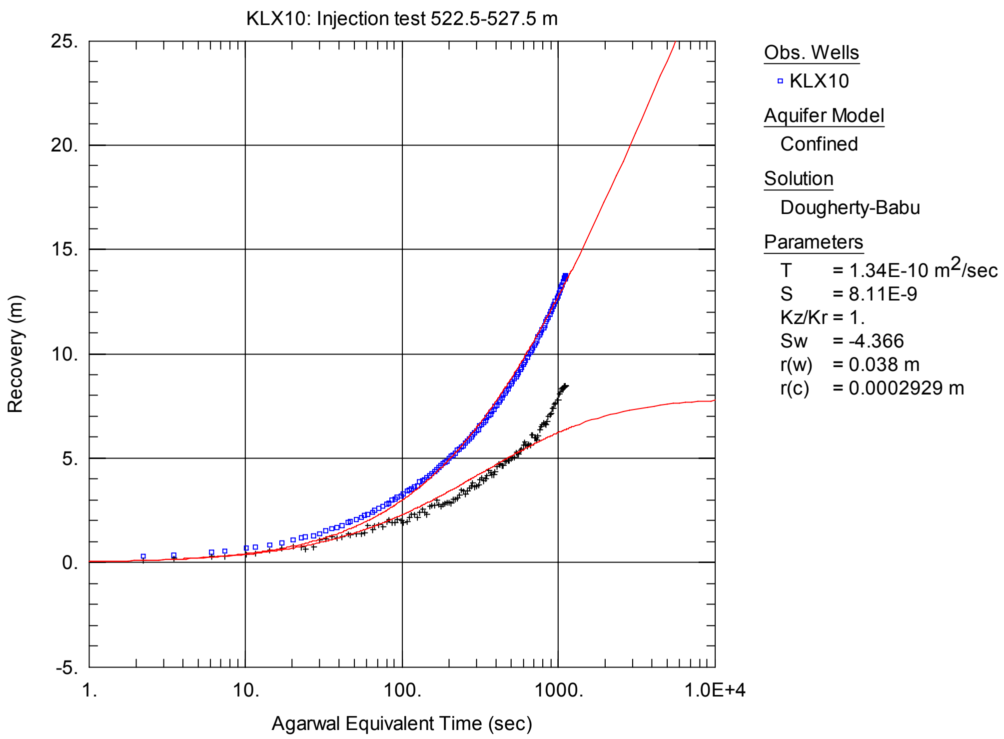


Figure A3-445. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 522.5-527.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

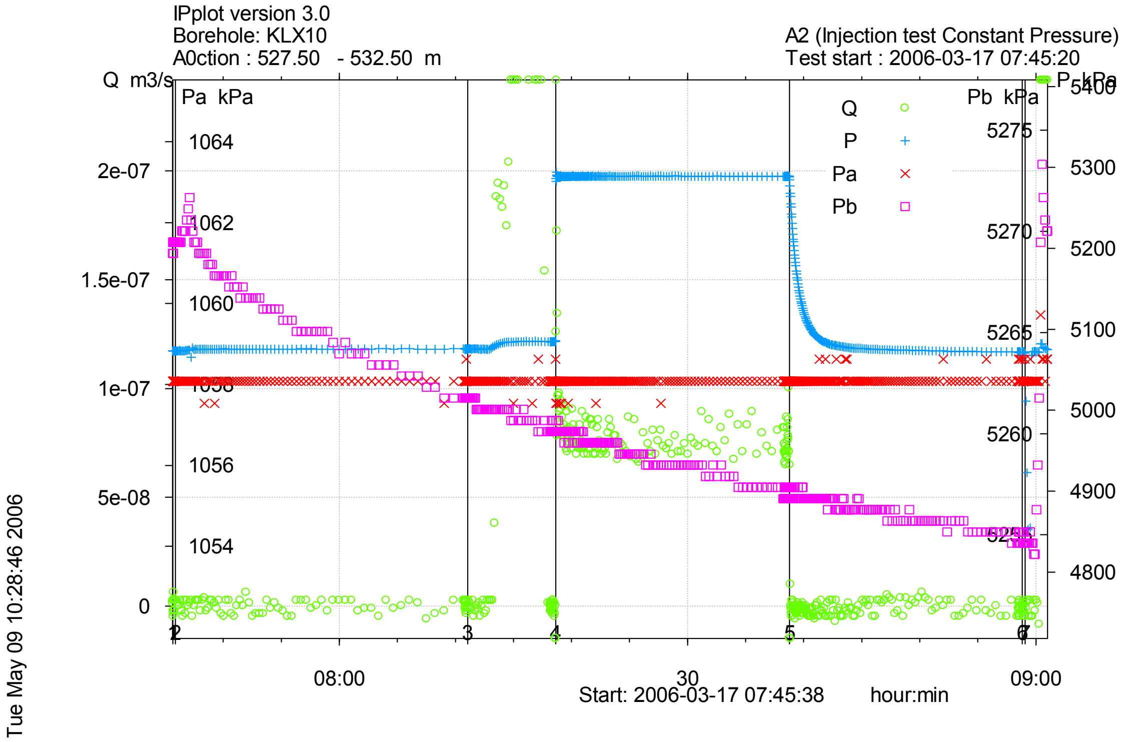


Figure A3-446. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 527.5-532.5 m in borehole KLX10.*

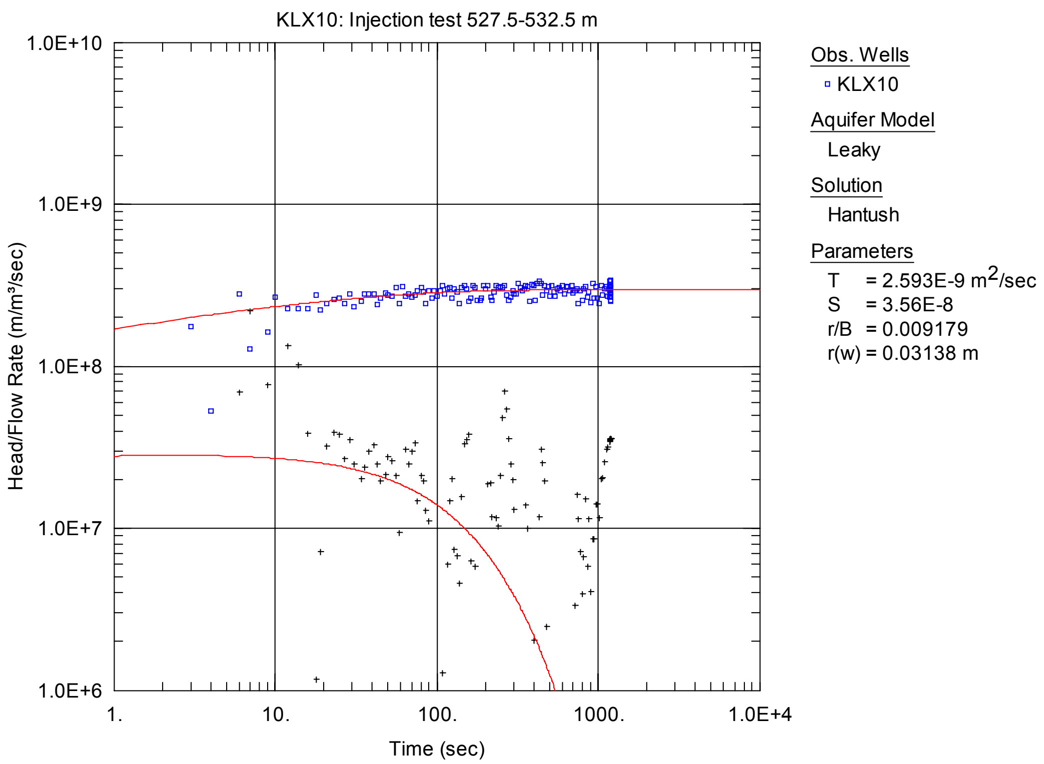


Figure A3-447. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 527.5-532.5 m in KLX10.*

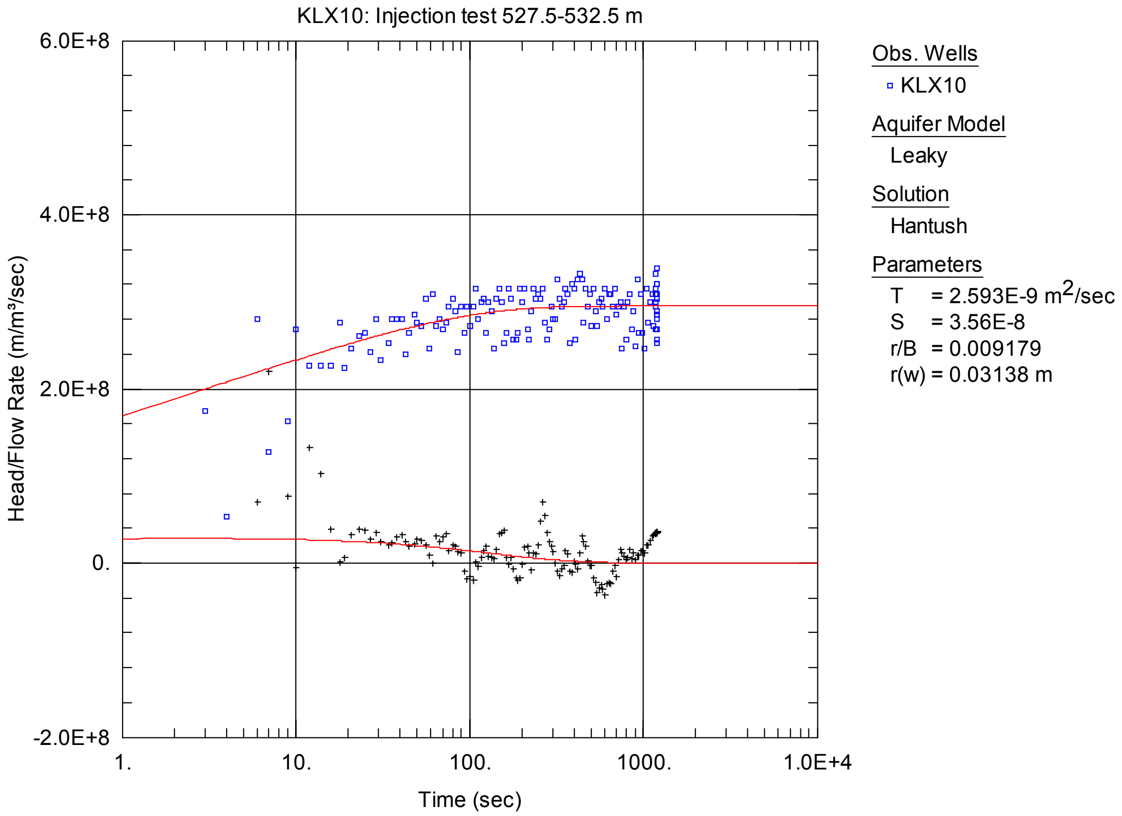


Figure A3-448. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 527.5-532.5 m in KLX10.*

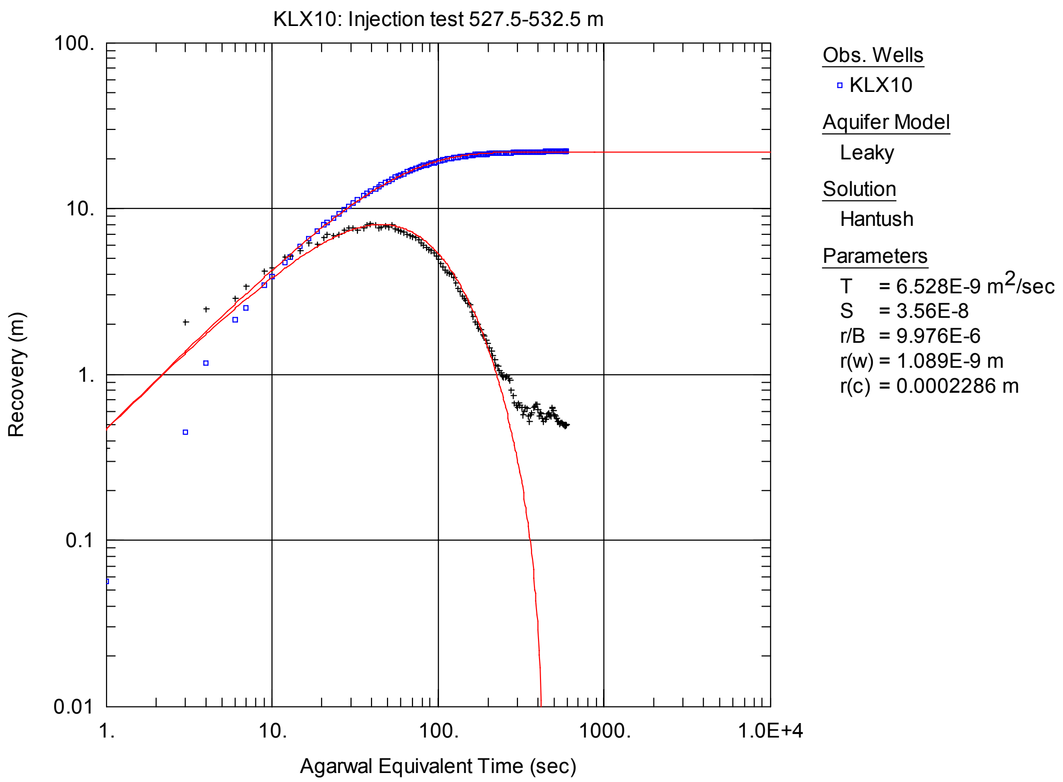


Figure A3-449. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 527.5-532.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

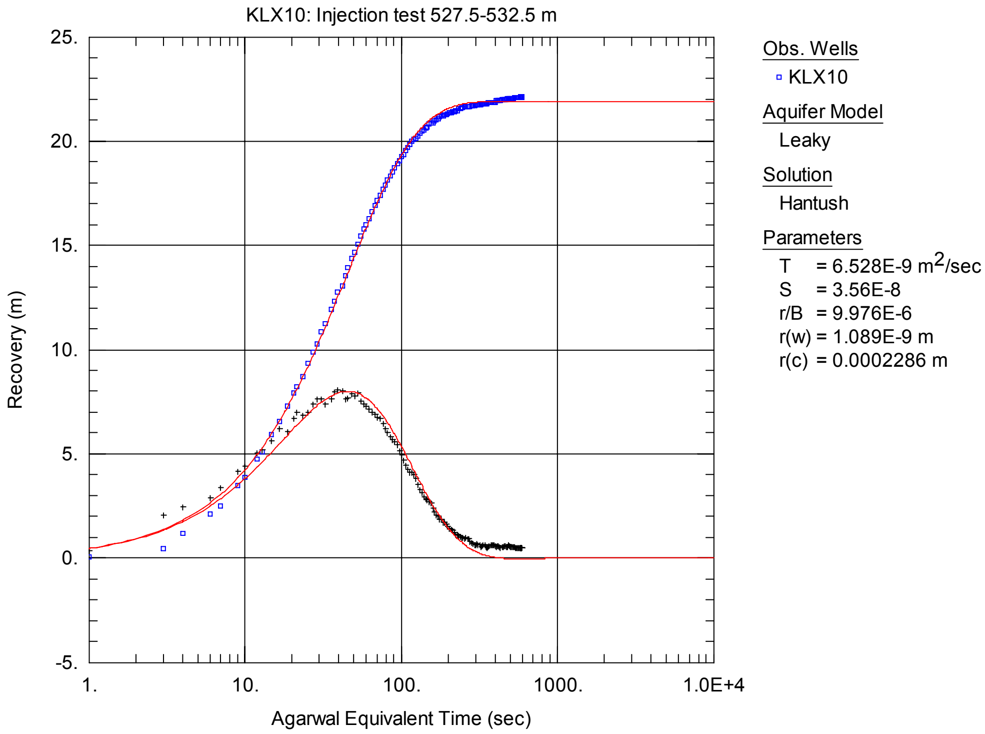


Figure A3-450. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 527.5-532.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

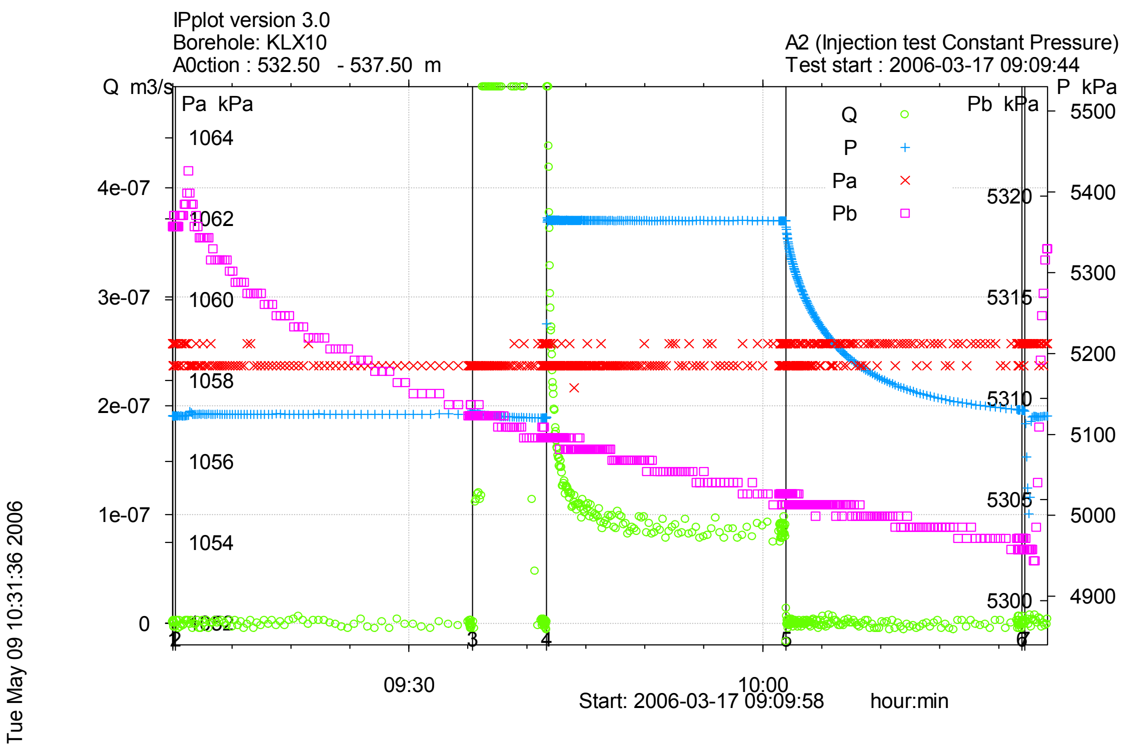


Figure A3-451. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 532.5-537.5 m in borehole KLX10.*

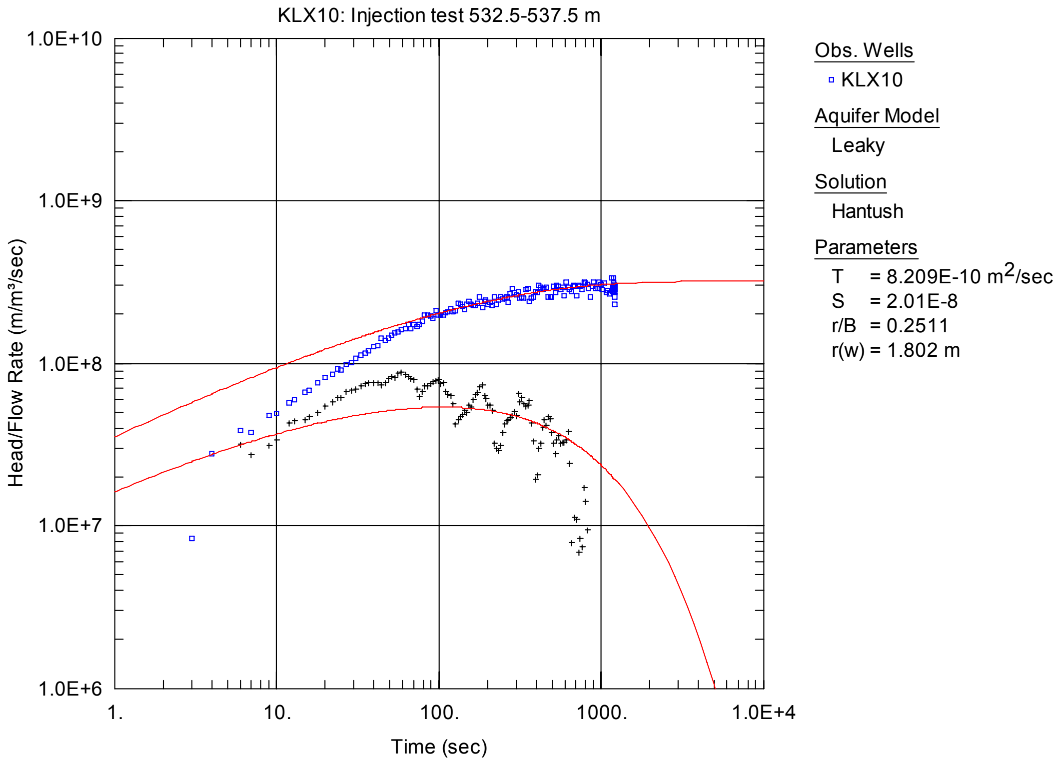


Figure A3-452. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 532.5-537.5 m in KLX10.*

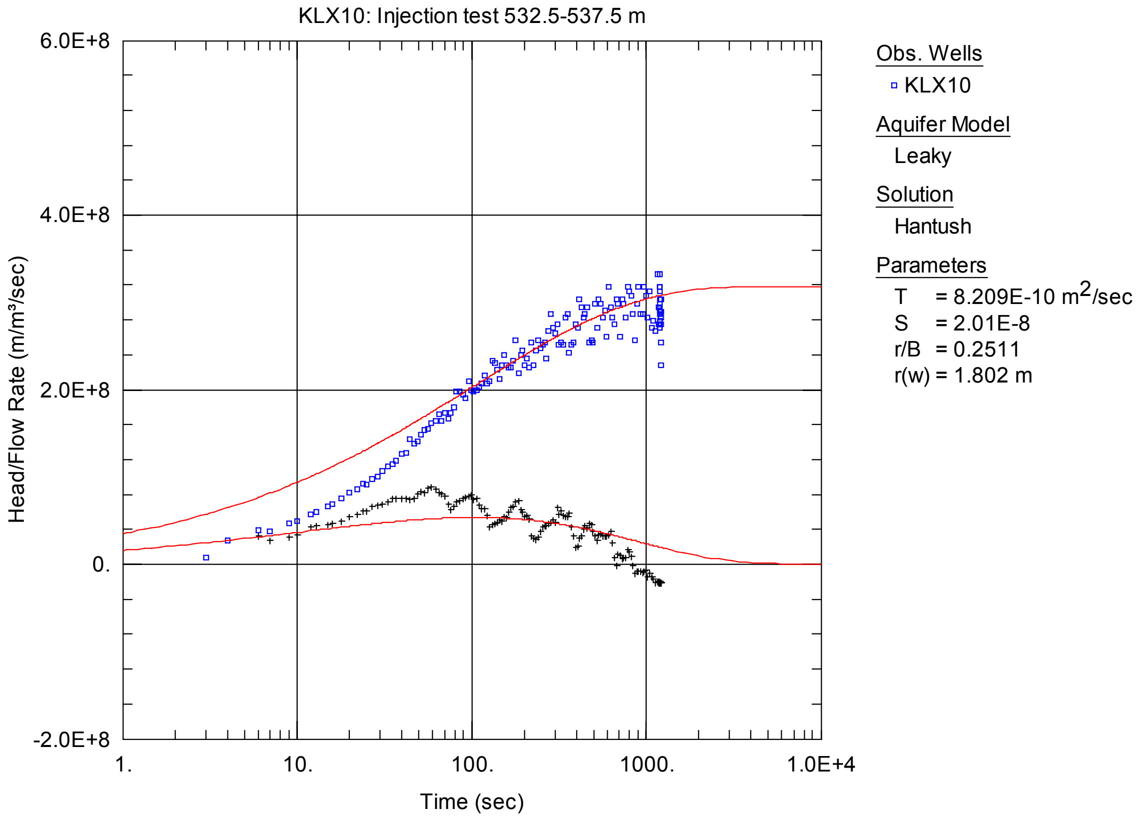


Figure A3-453. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 532.5-537.5 m in KLX10.*

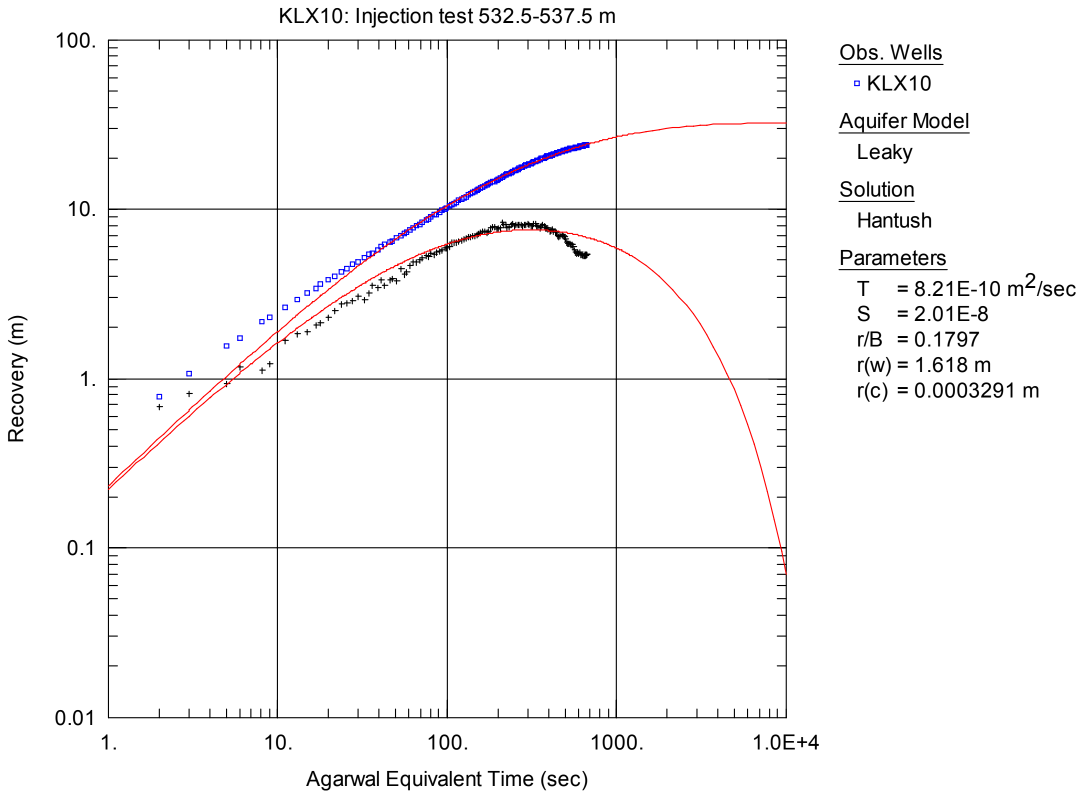


***Figure A3-454.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 532.5-537.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

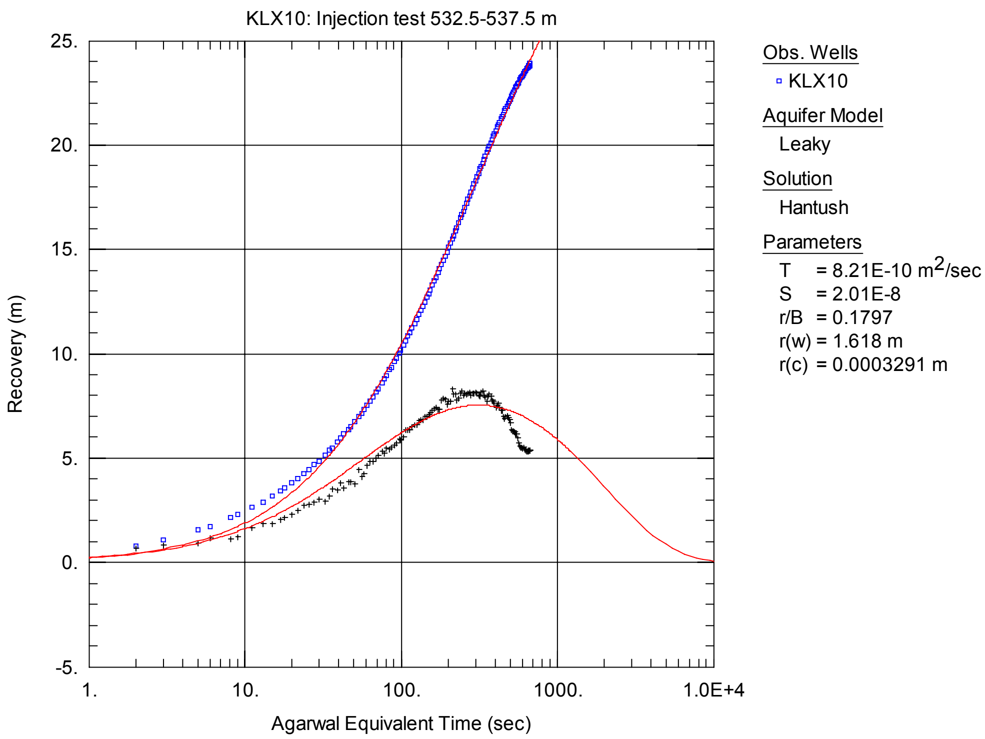


***Figure A3-455.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 532.5-537.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation*

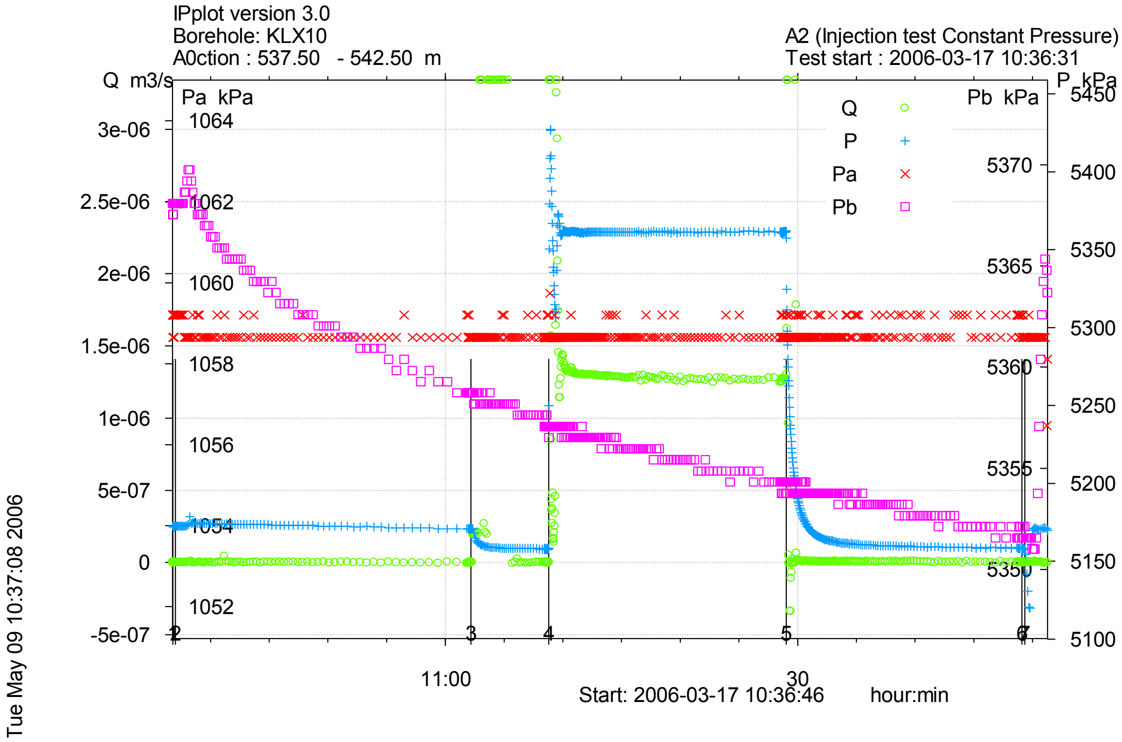


Figure A3-456. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 537.5-542.5 m in borehole KLX10.

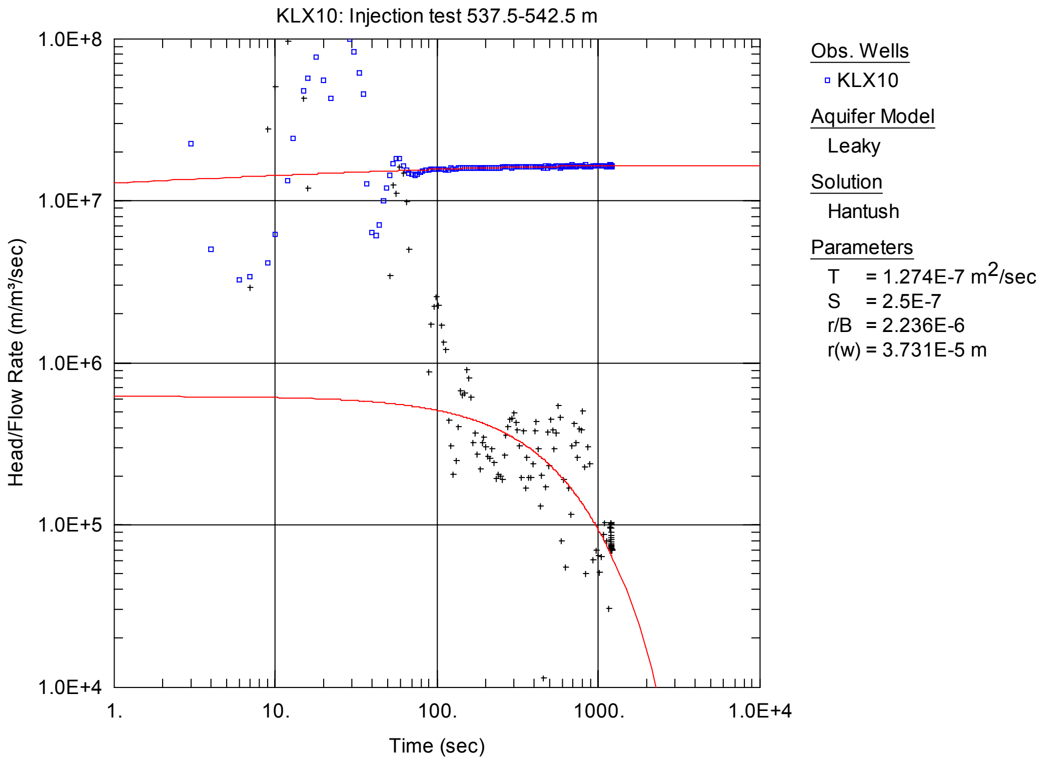


Figure A3-457. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 537.5-542.5 m in KLX10.

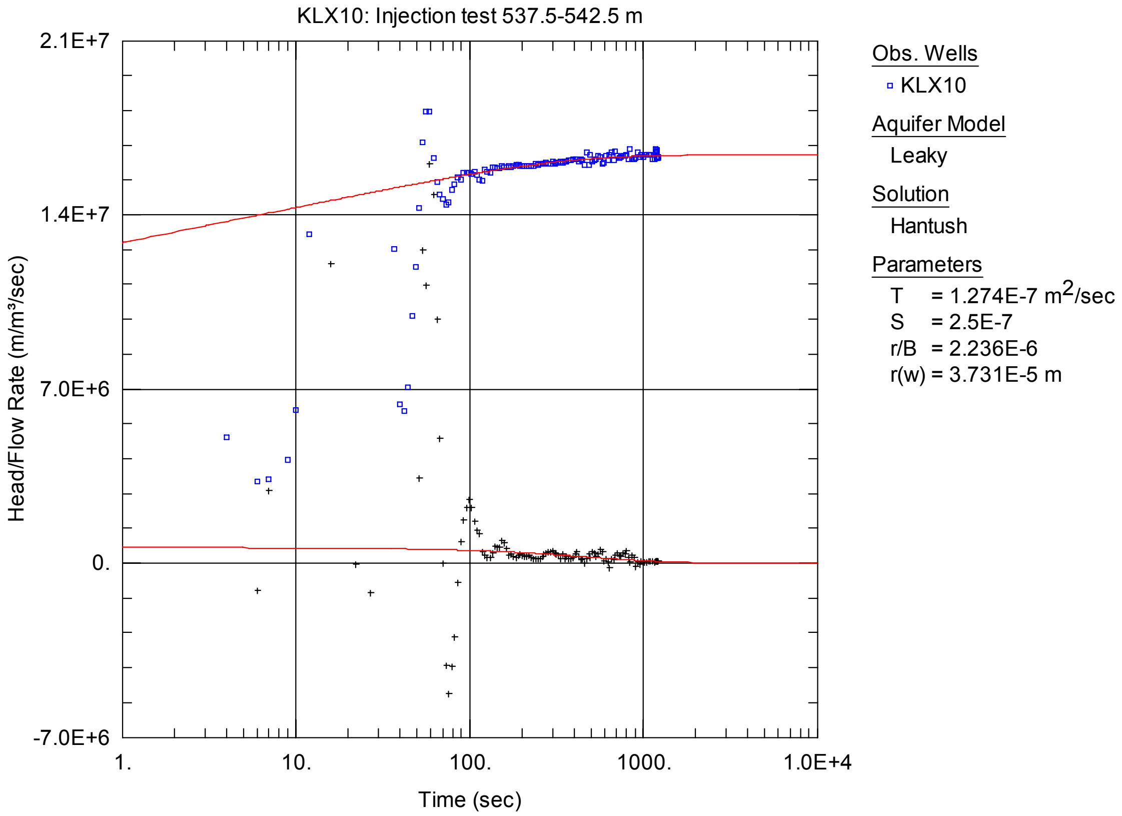


Figure A3-458. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 537.5-542.5 m in KLX10.*

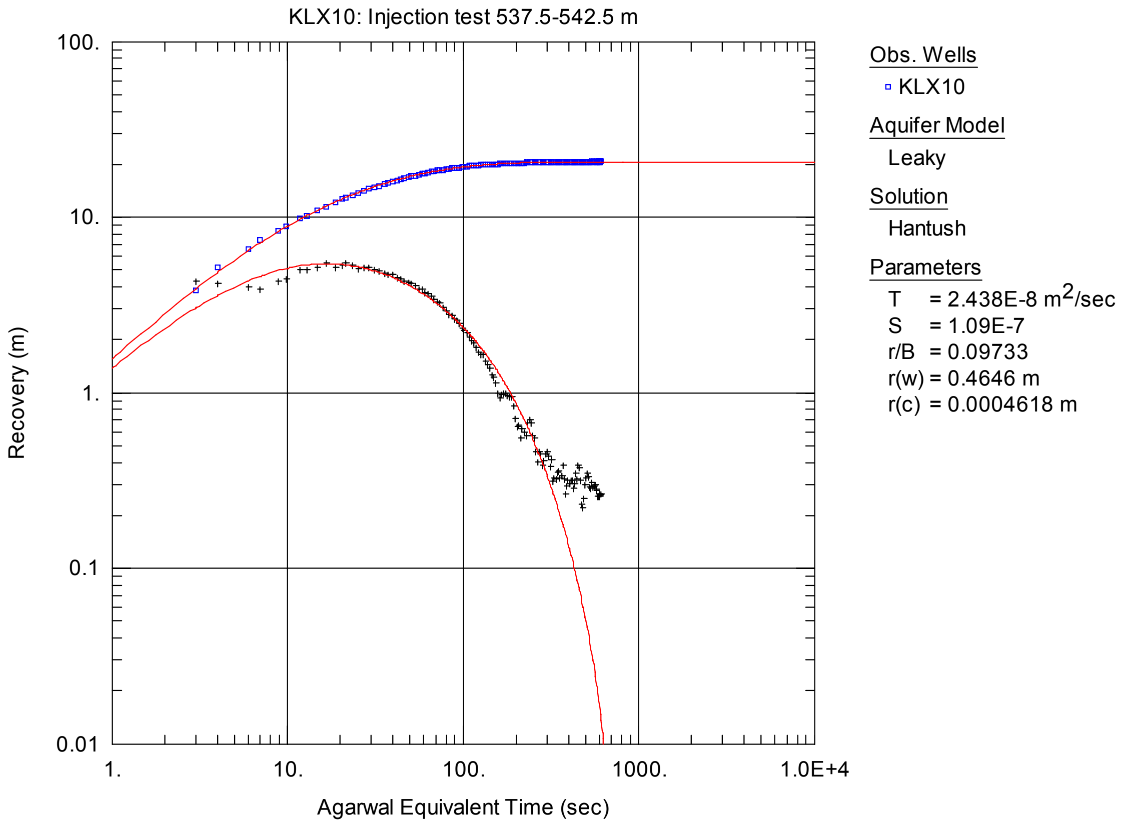


Figure A3-459. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 537.5-542.5 m in KLX10.*

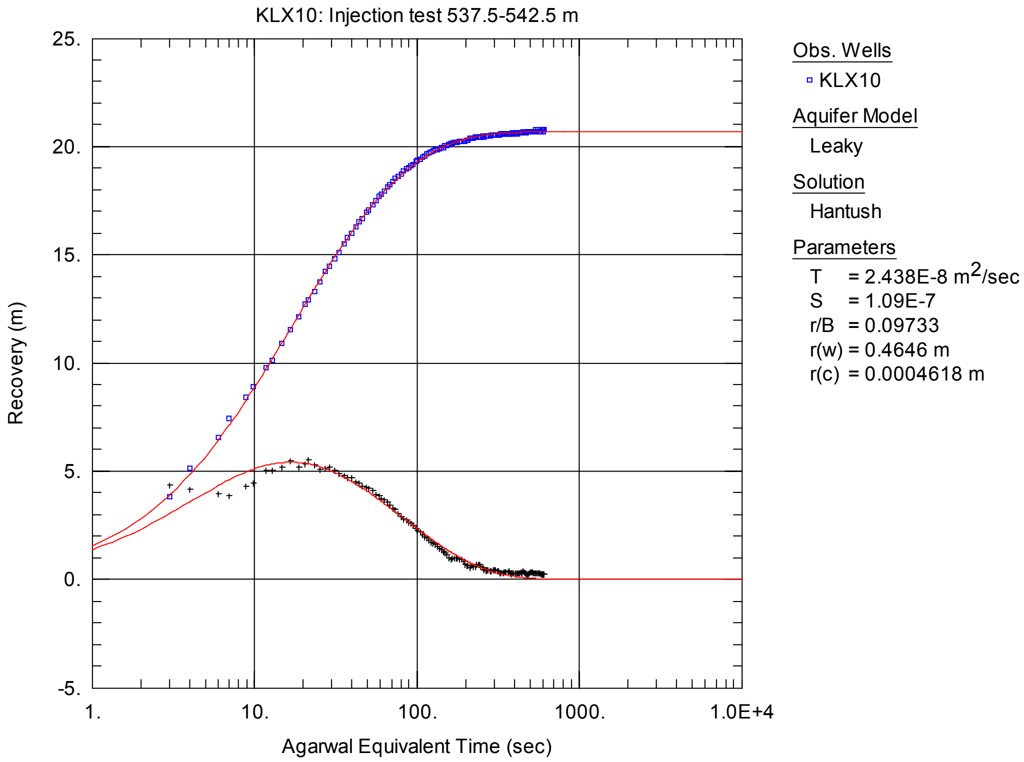


Figure A3-460. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 537.5-542.5 m in KLX10.*

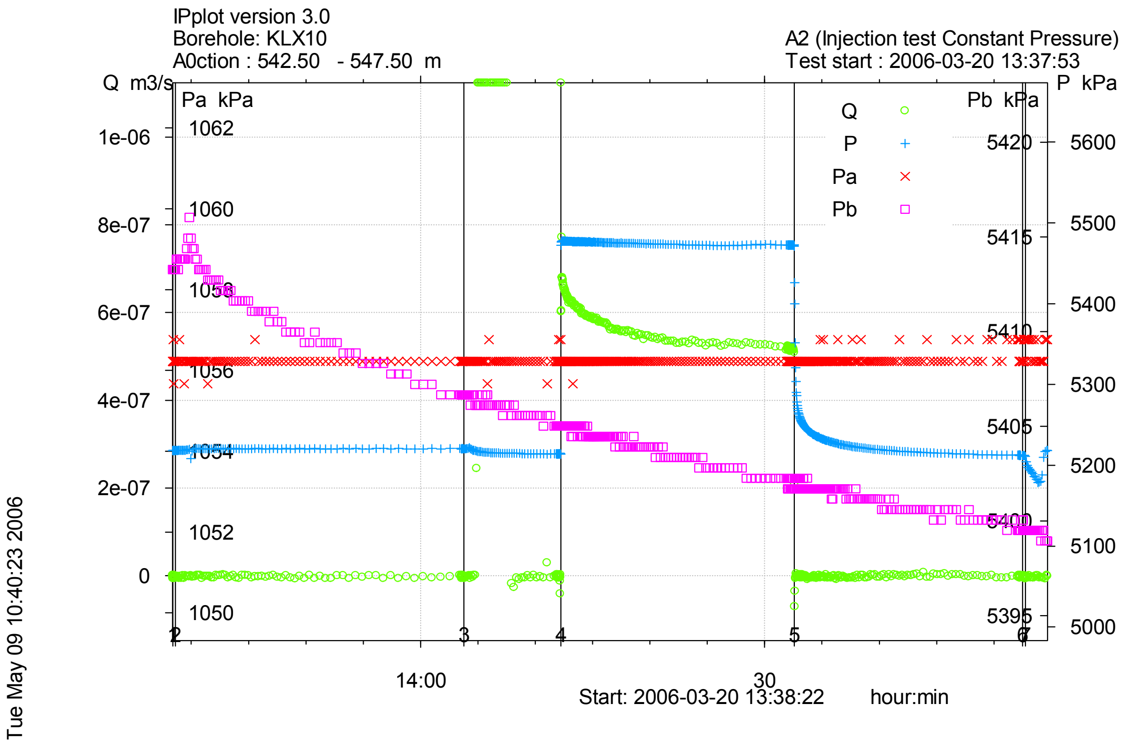


Figure A3-461. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 542.5-547.5 m in borehole KLX10.*

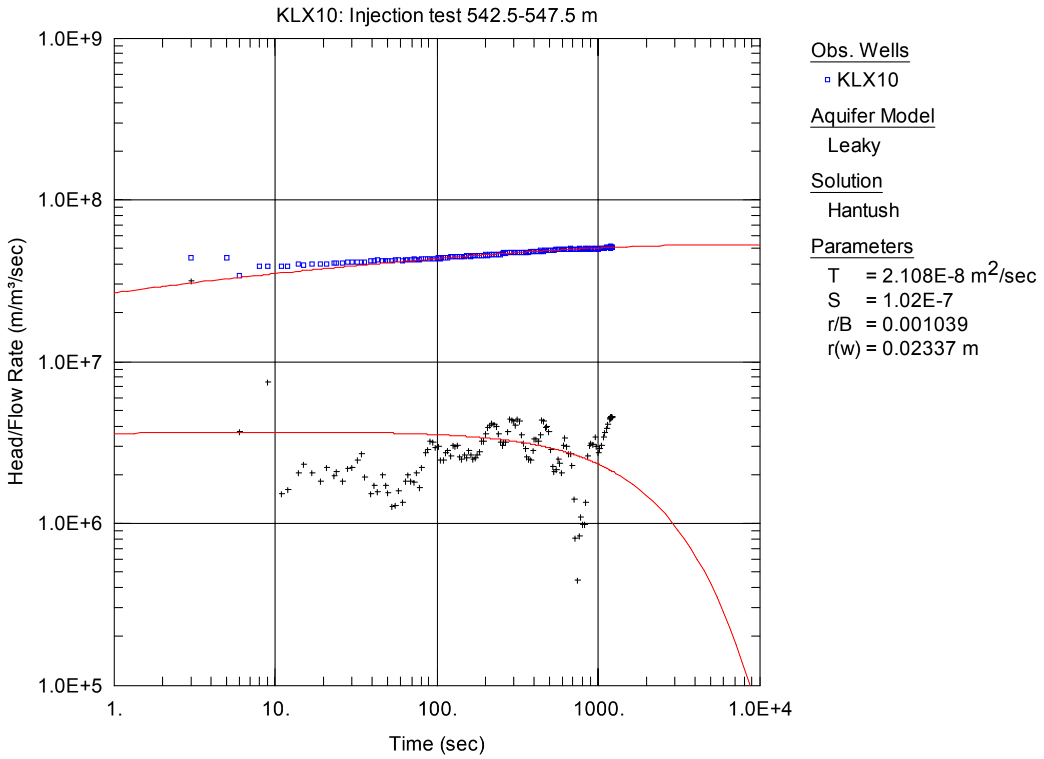


***Figure A3-462.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 542.5-547.5 m in KLX10.*

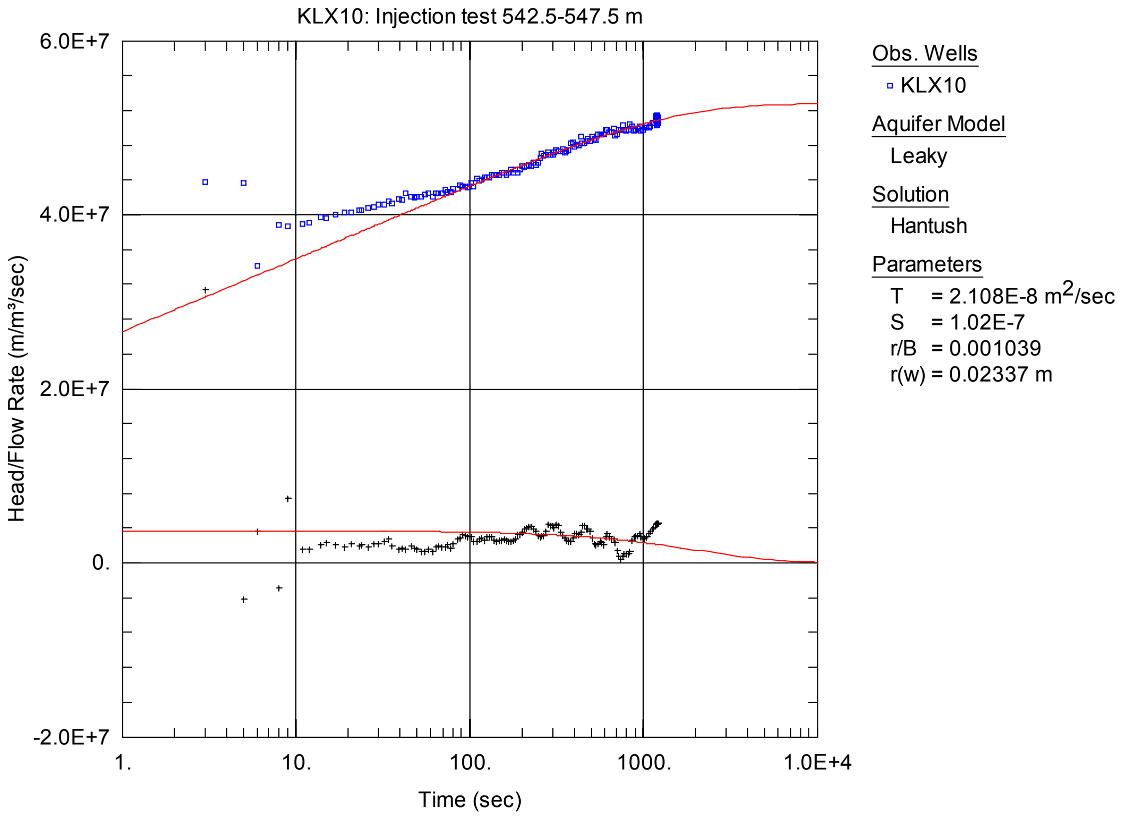


***Figure A3-463.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 542.5-547.5 m in KLX10.*

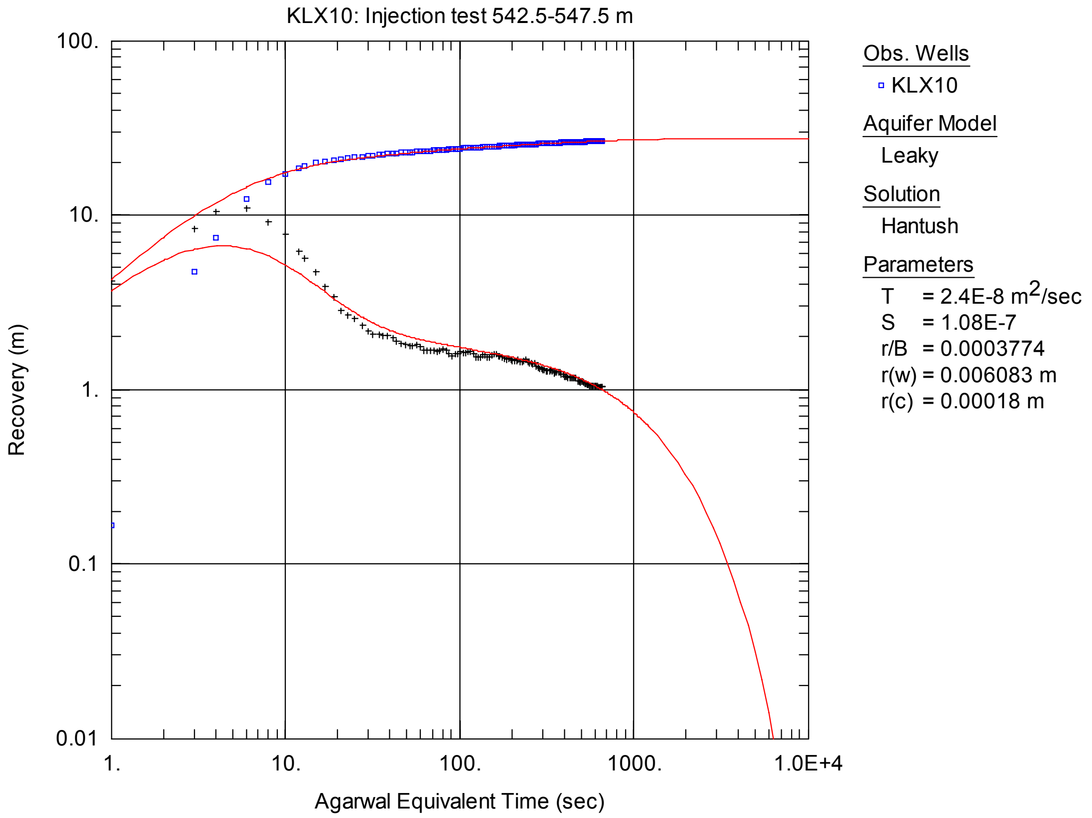


Figure A3-464. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 542.5-547.5 m in KLX10.*

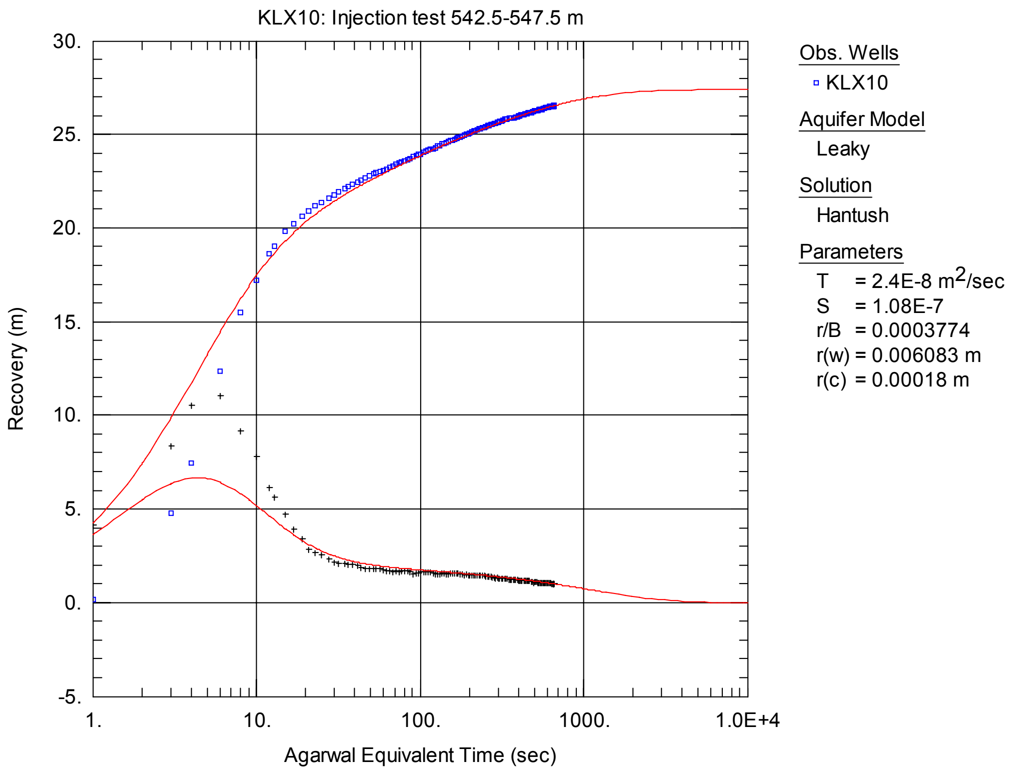


Figure A3-465. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 542.5-547.5 m in KLX10.*

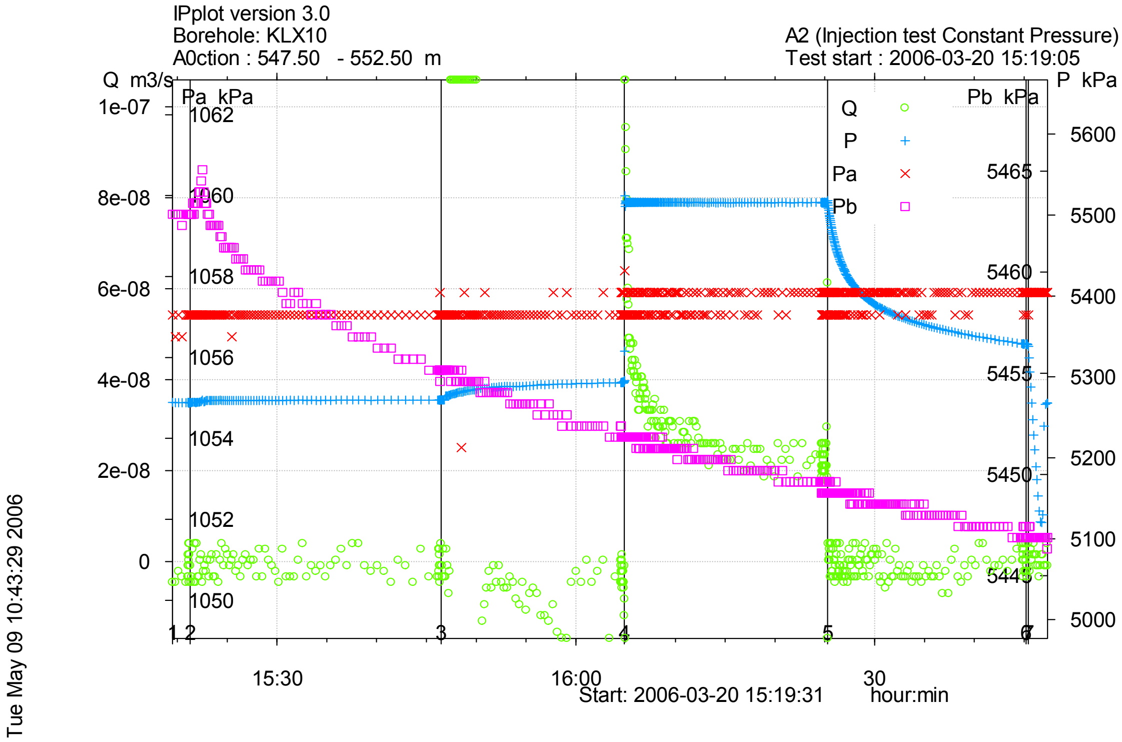


Figure A3-466. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 547.5-552.5 m in borehole KLX10.*

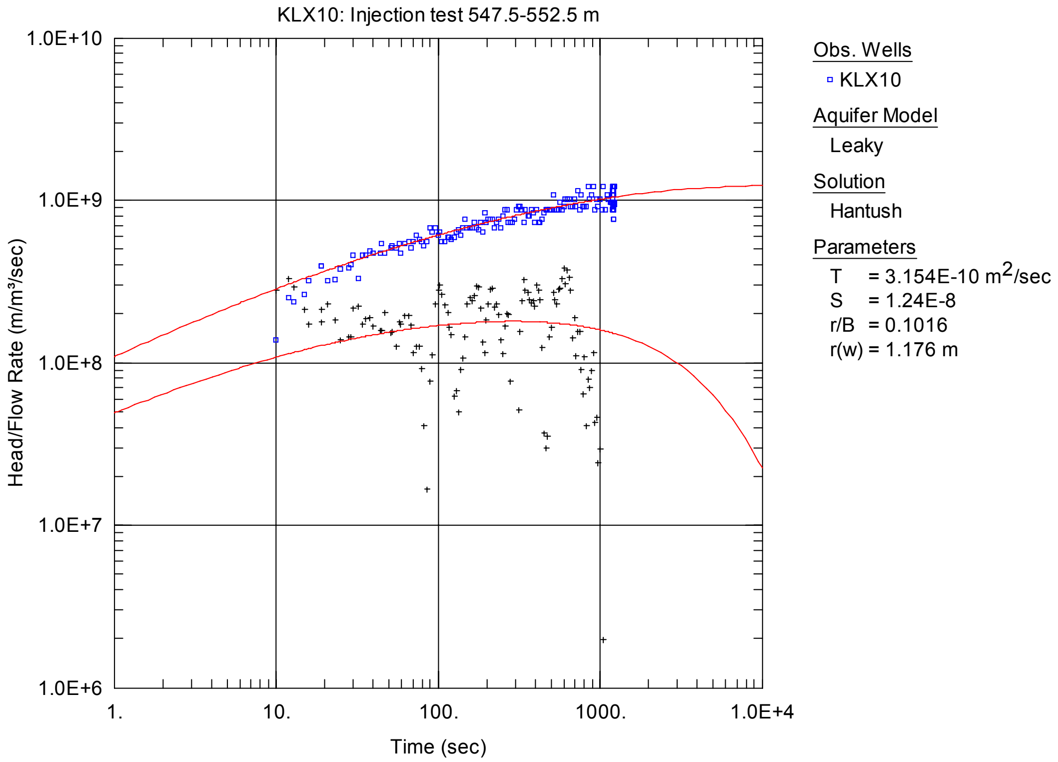


Figure A3-467. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 547.5-552.5 m in KLX10.*

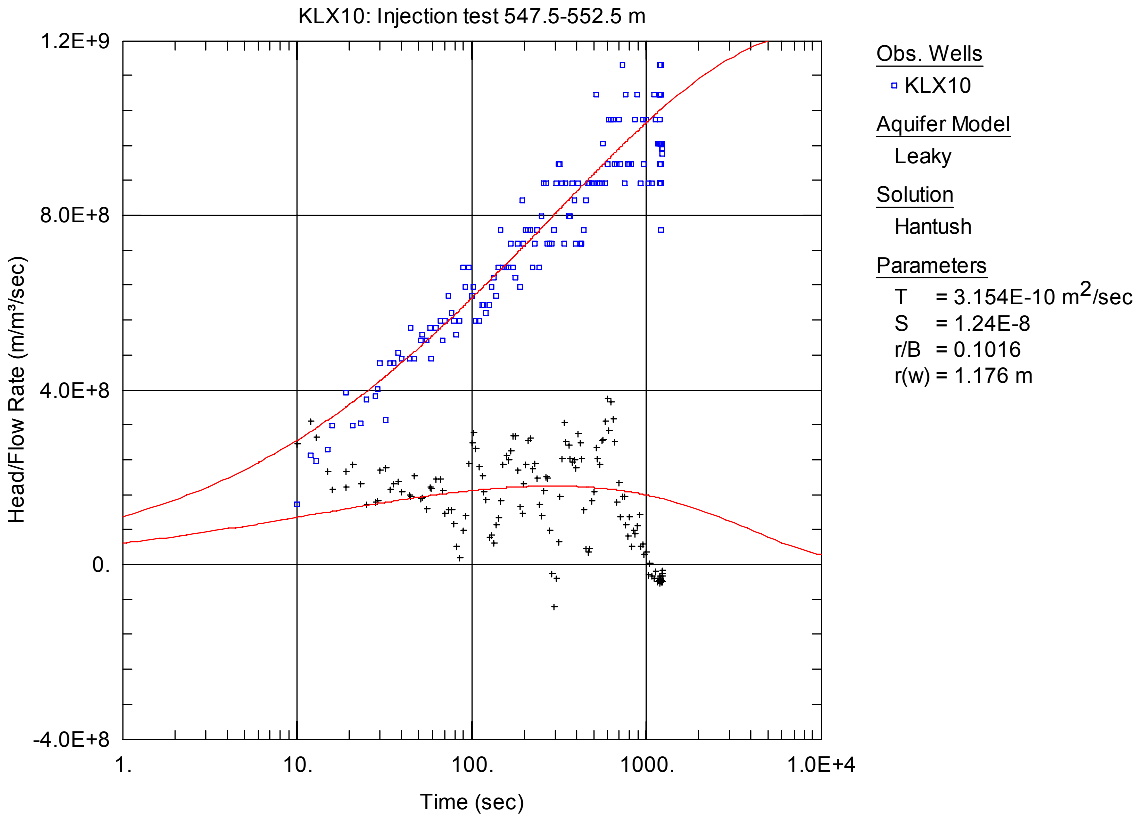


***Figure A3-468.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 547.5-552.5 m in KLX10.*

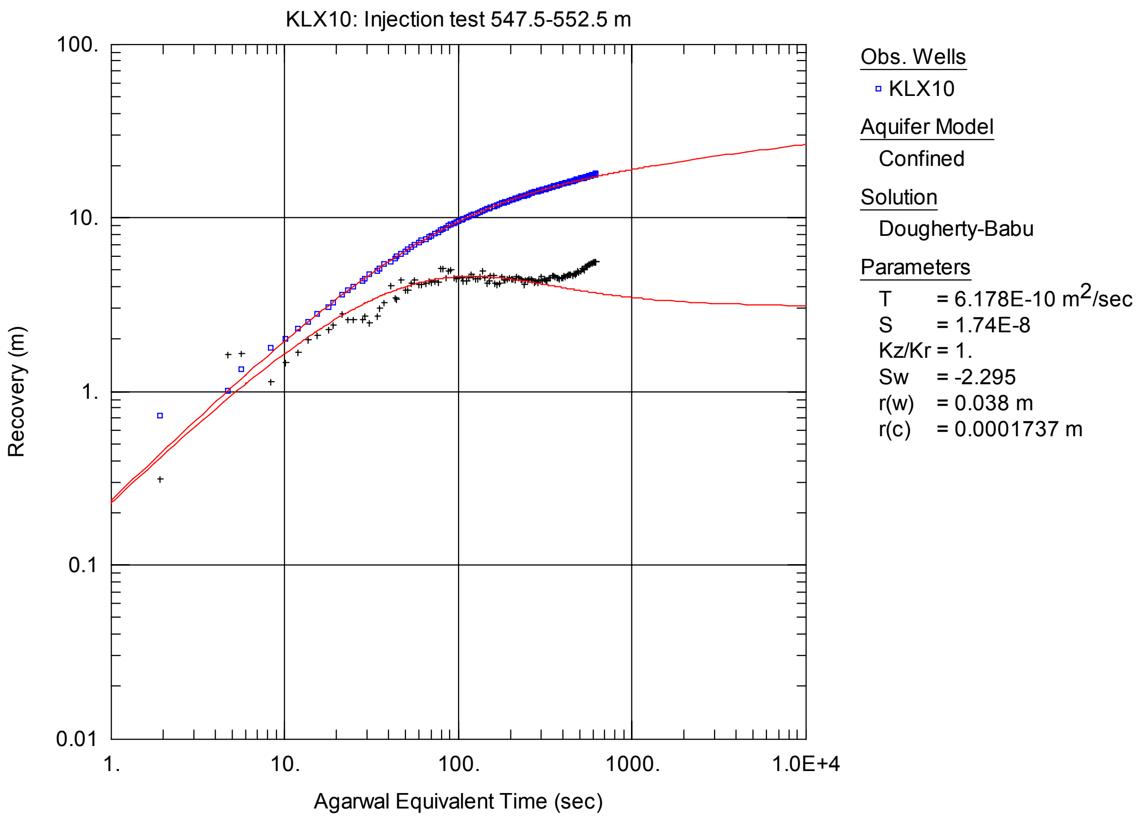


***Figure A3-469.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 547.5-552.5 m in KLX10.*

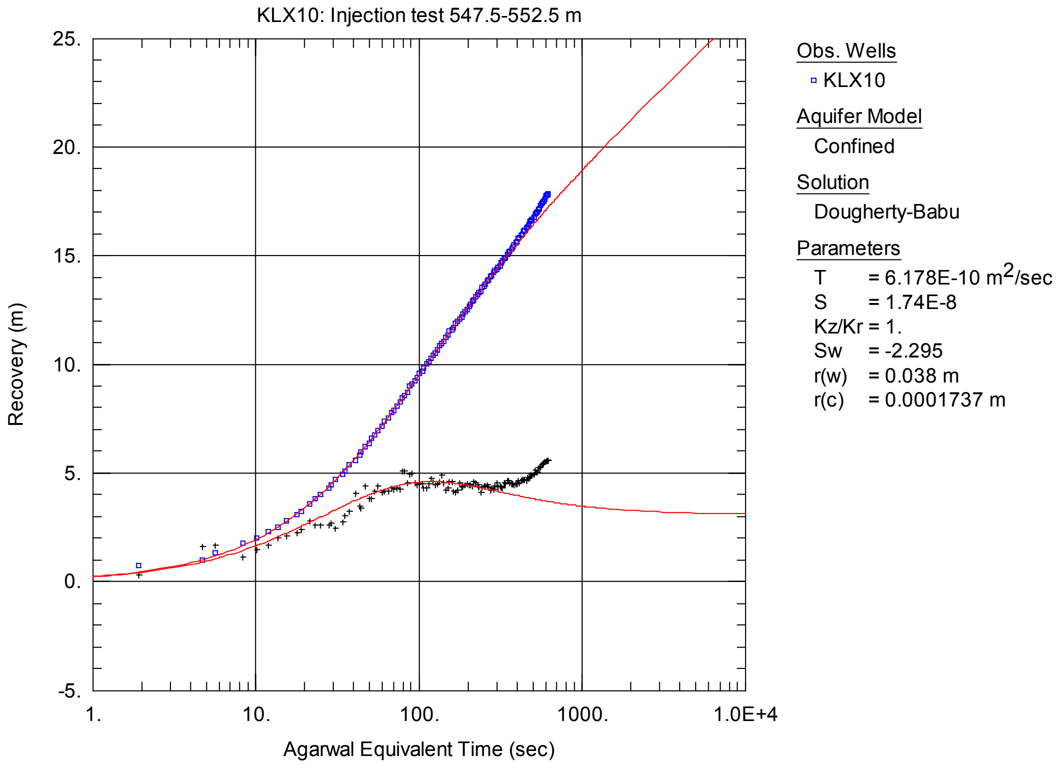


Figure A3-470. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 547.5-552.5 m in KLX10.*

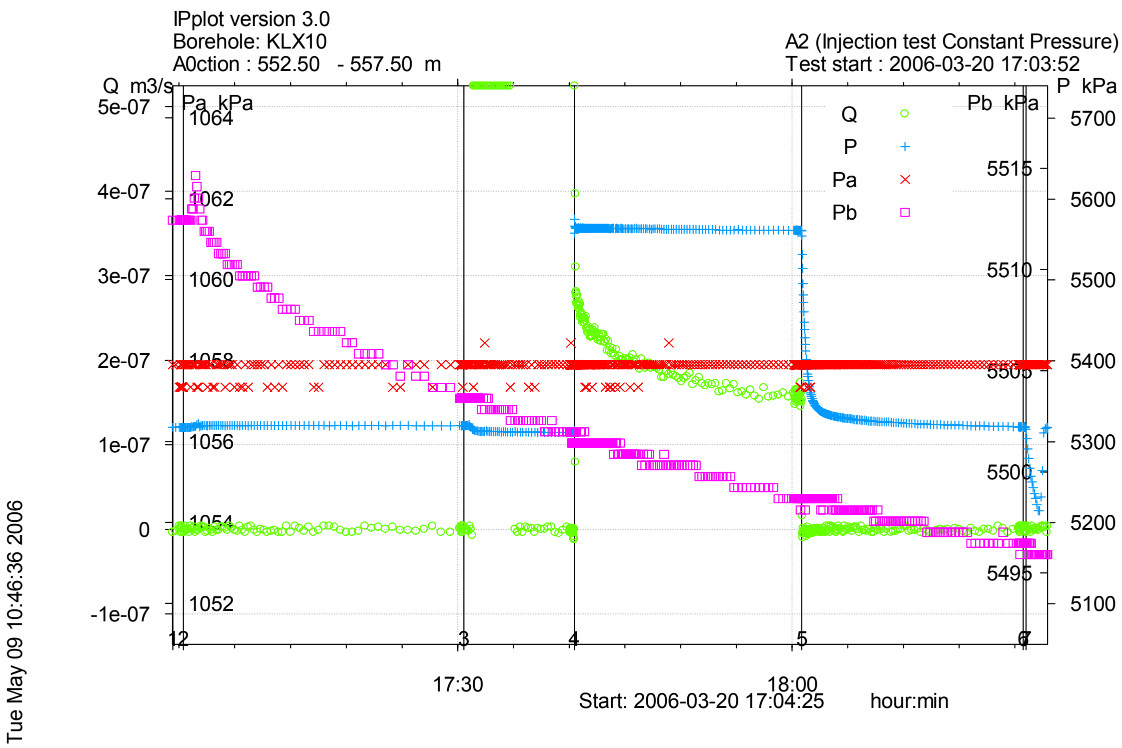


Figure A3-471. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 552.5-557.5 m in borehole KLX10.*

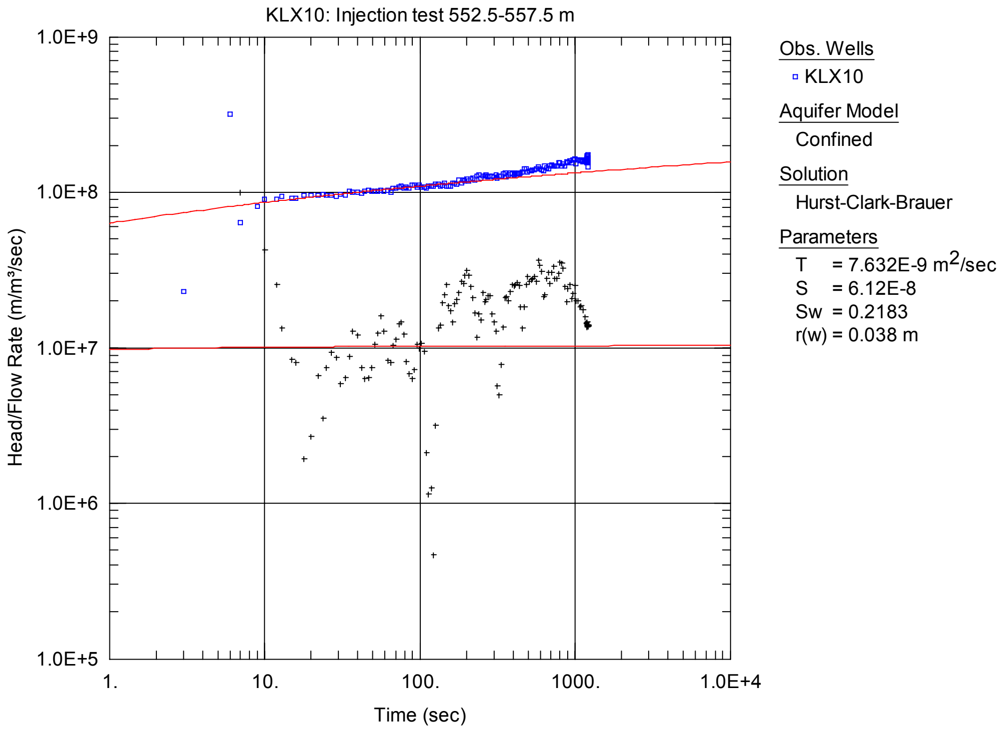


__Figure A3-472.__ Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution for the first PRF, from the injection test in section 552.5-557.5 m in KLX10.

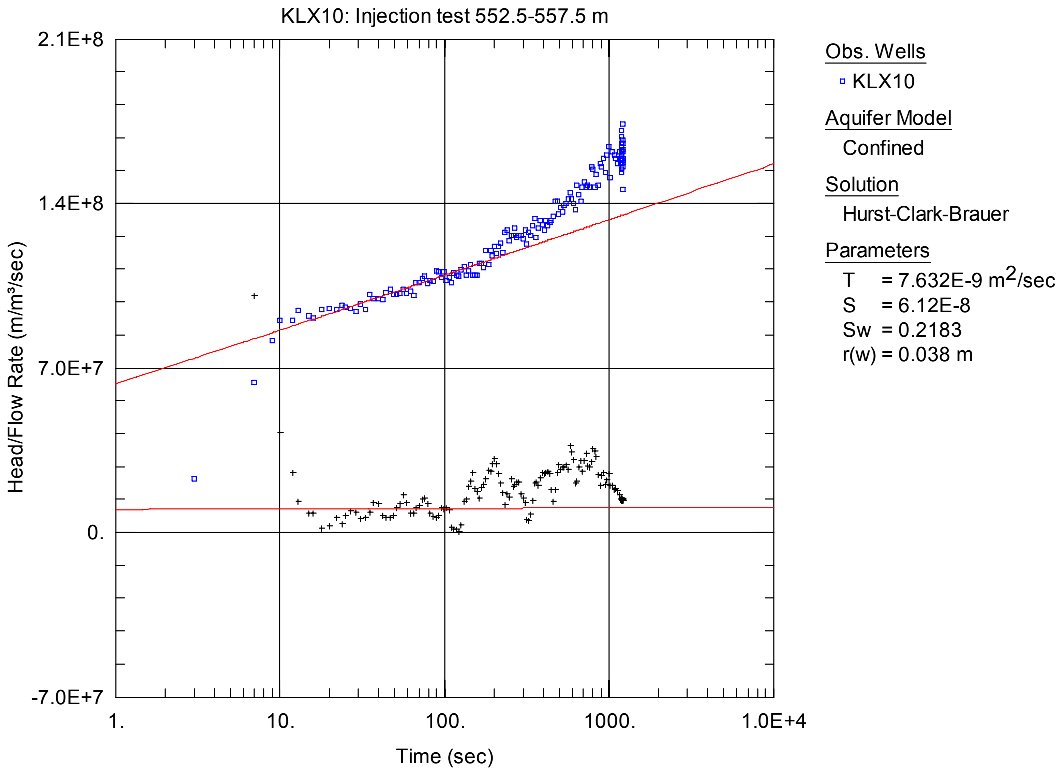


__Figure A3-473.__ Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution for the first PRF, from the injection test in section 552.5-557.5 m in KLX10.

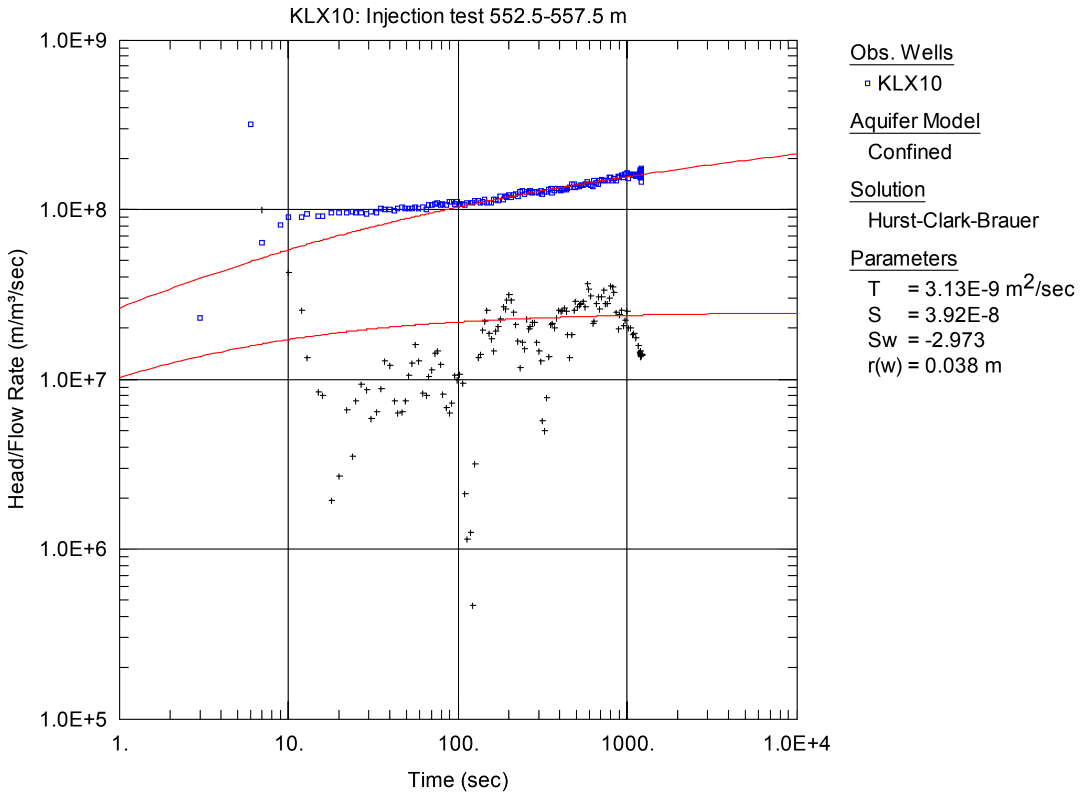


Figure A3-474. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution for the second PRF, from the injection test in section 552.5-557.5 m in KLX10.*

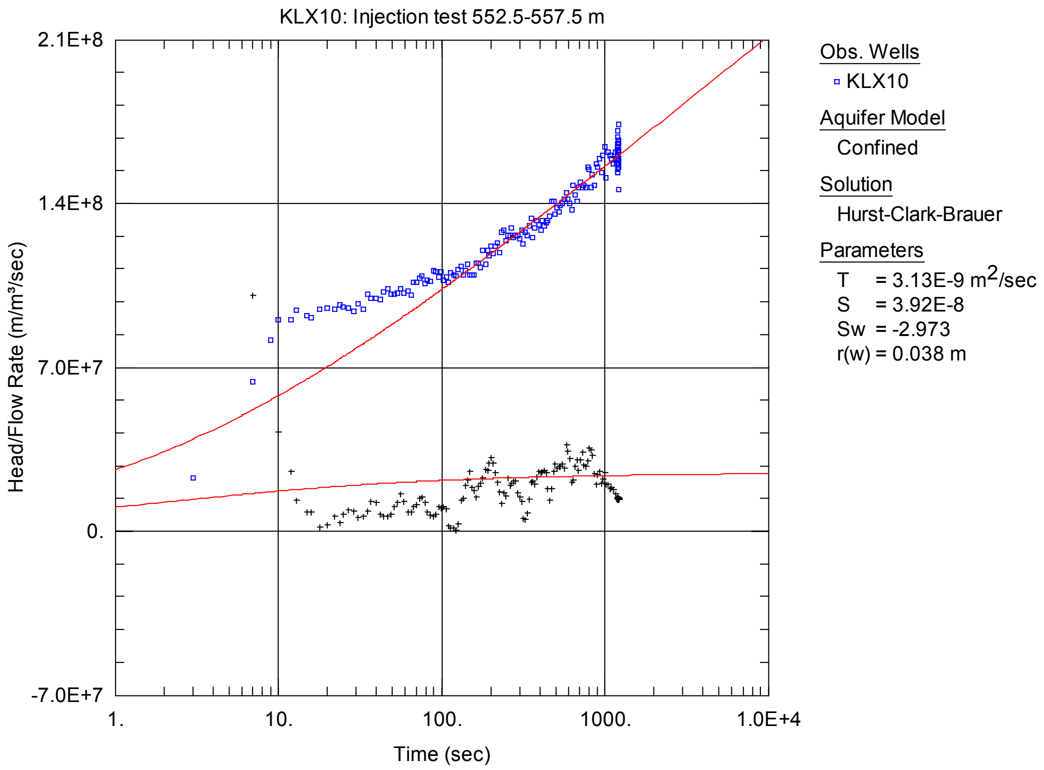


Figure A3-475. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst solution for the second PRF, from the injection test in section 552.5-557.5 m in KLX10.*

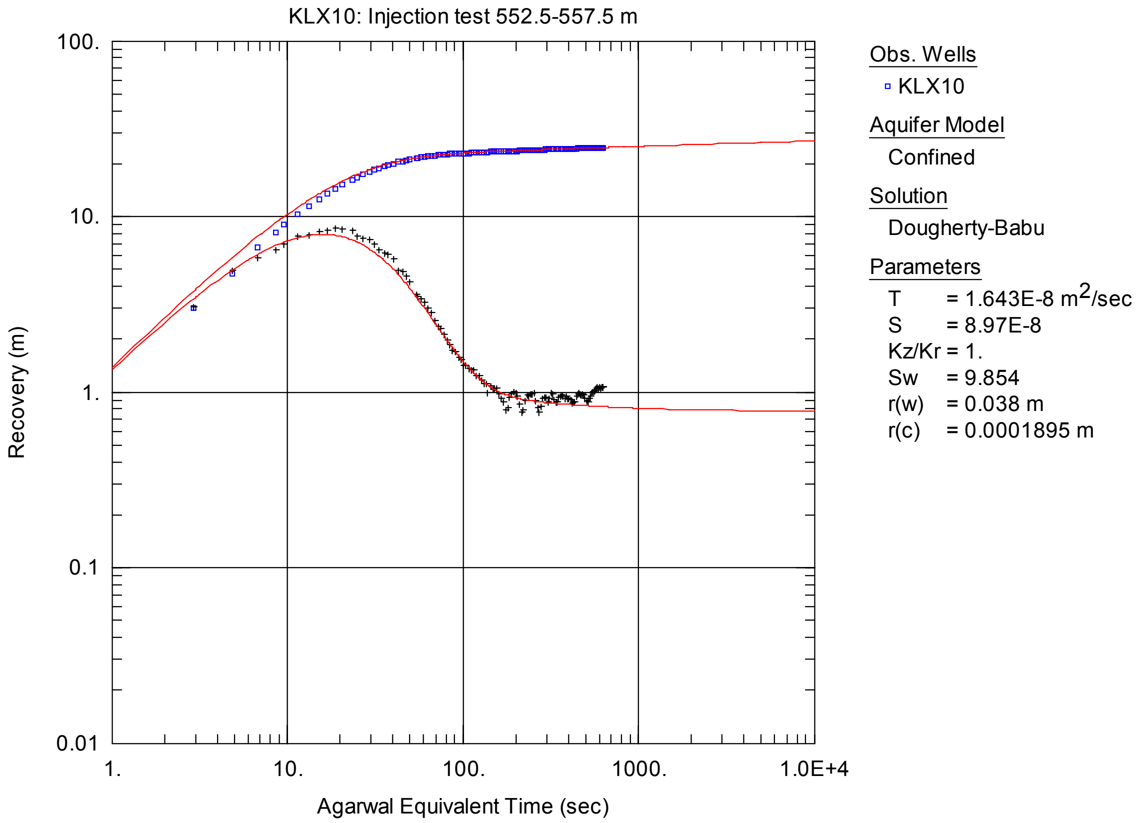


Figure A3-476. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 552.5-557.5 m in KLX10.*

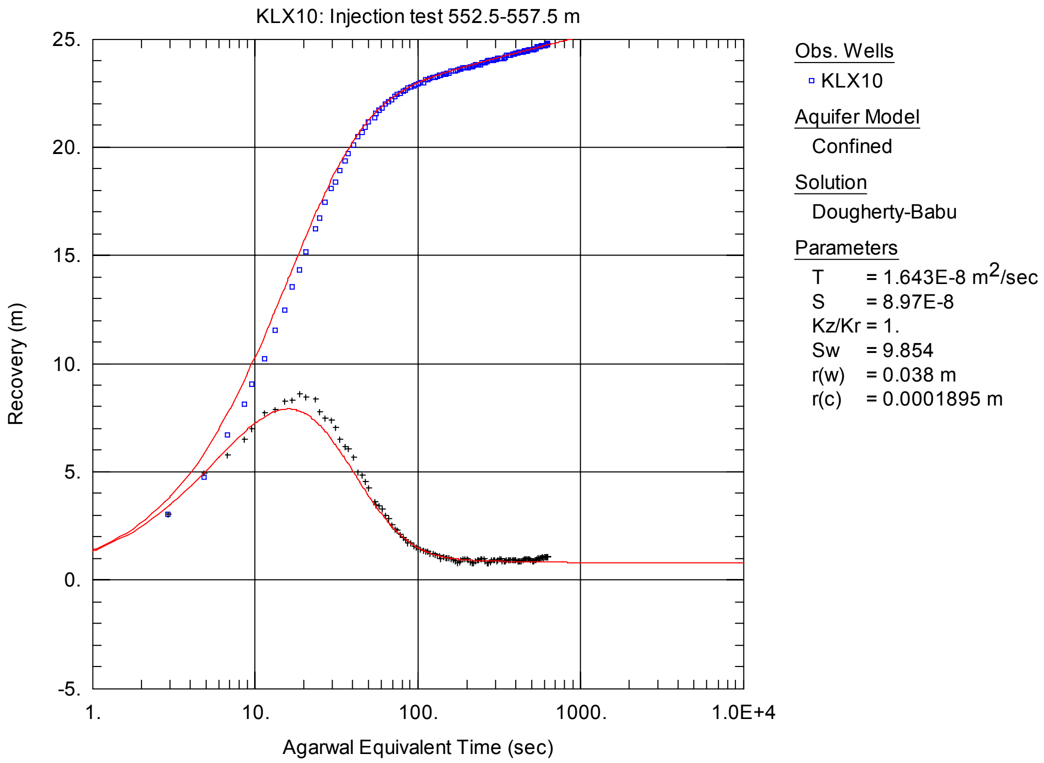


Figure A3-477. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 552.5-557.5 m in KLX10.*

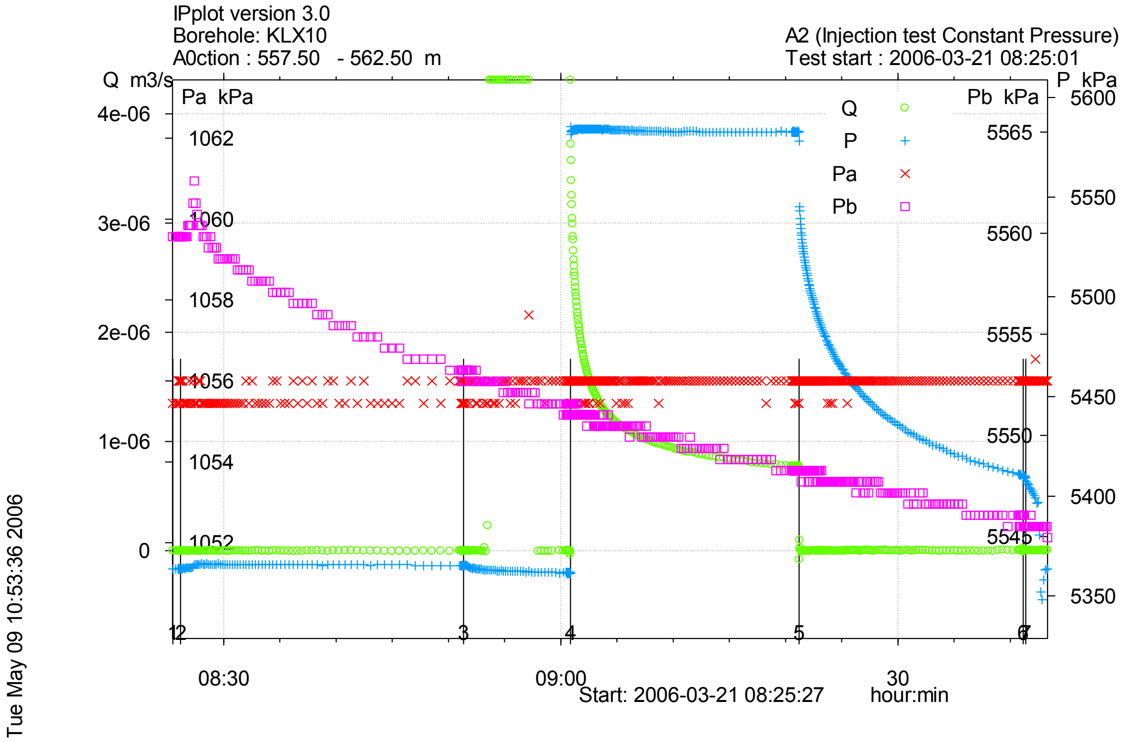


***Figure A3-478.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 557.5-562.5 x m in borehole KLX10.*

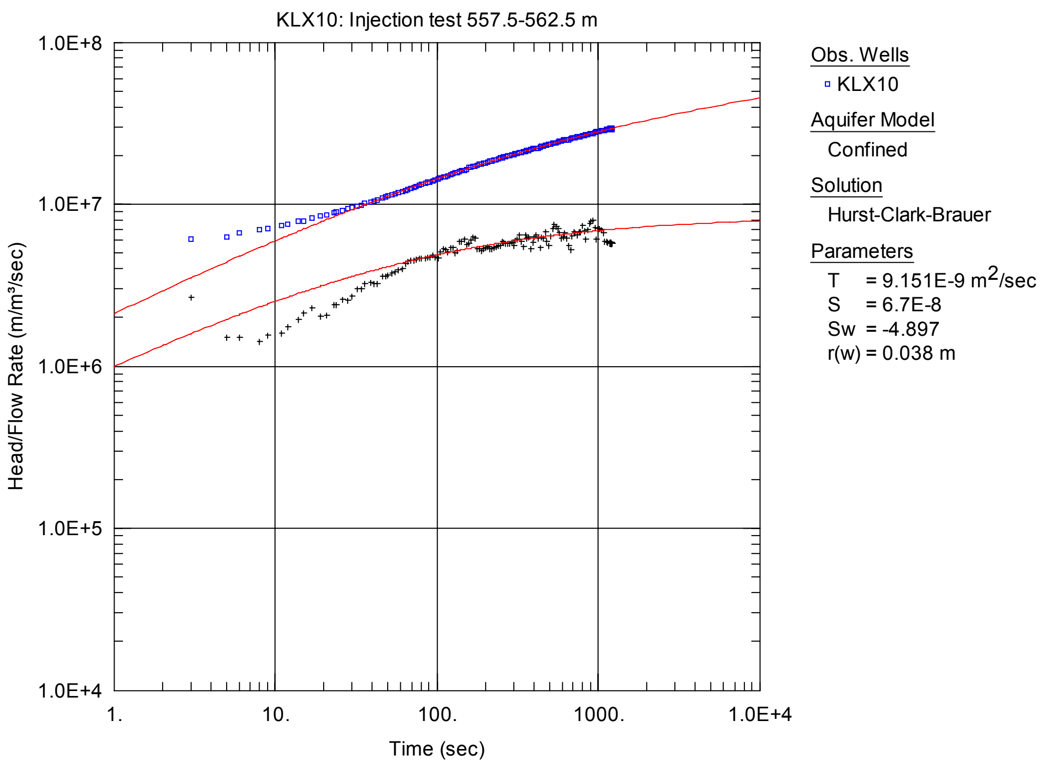


***Figure A3-479.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 557.5-562.5 m in KLX10.*

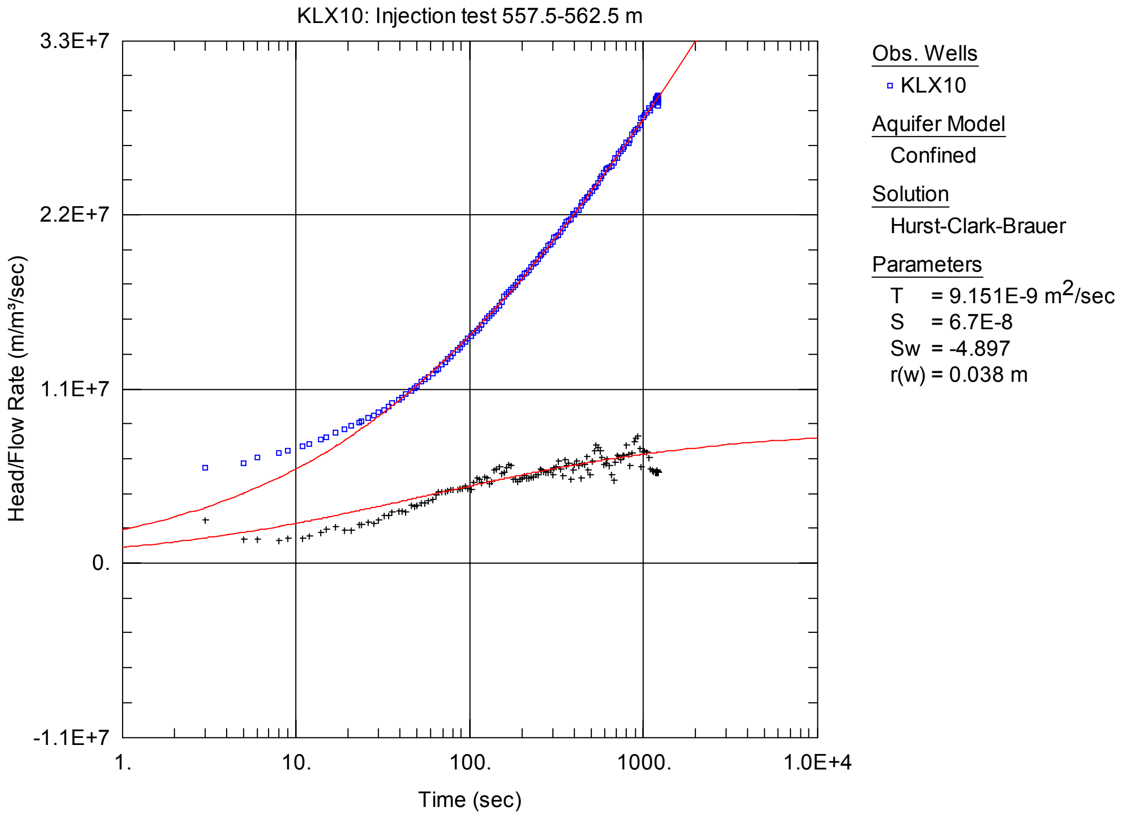


Figure A3-480. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 557.5-562.5 m in KLX10.*

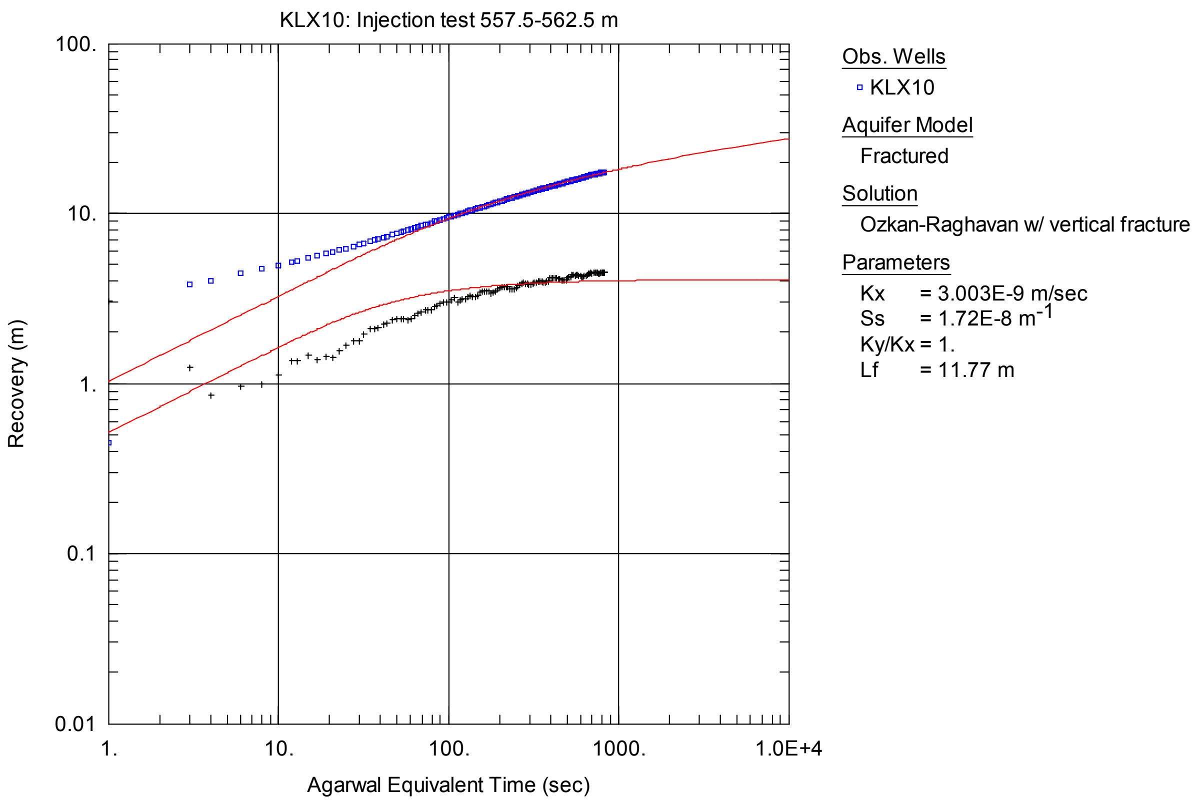


Figure A3-481. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan solution, from the injection test in section 557.5-562.5 m in KLX10.*

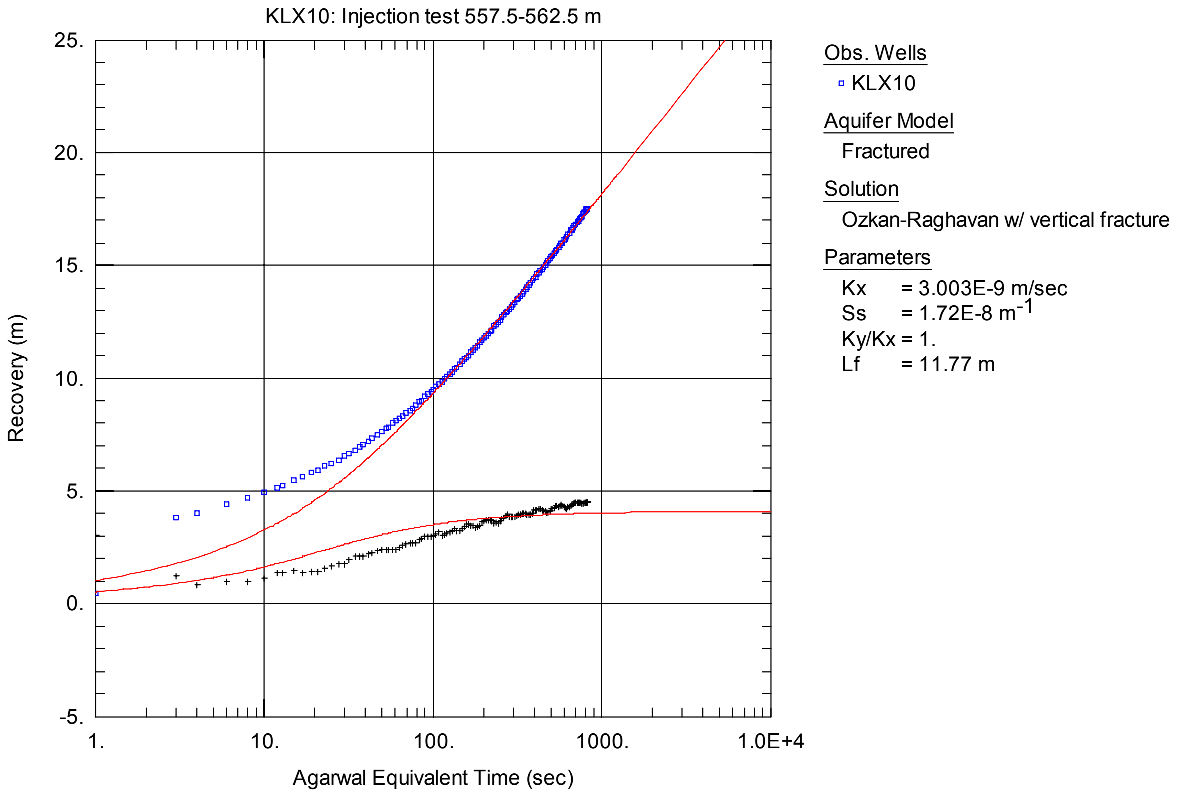


Figure A3-482. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan solution, from the injection test in section 557.5-562.5 m in KLX10.*

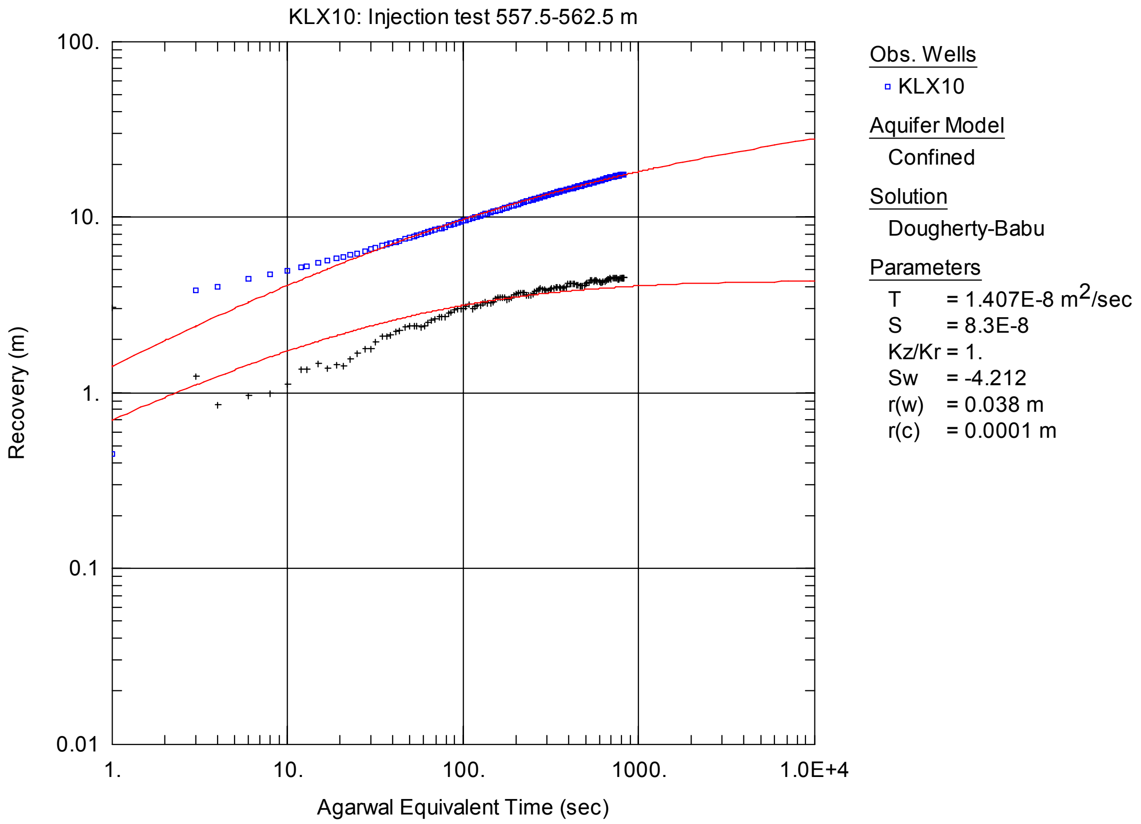


Figure A3-483. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Babu solution, from the injection test in section 557.5-562.5 m in KLX10.*

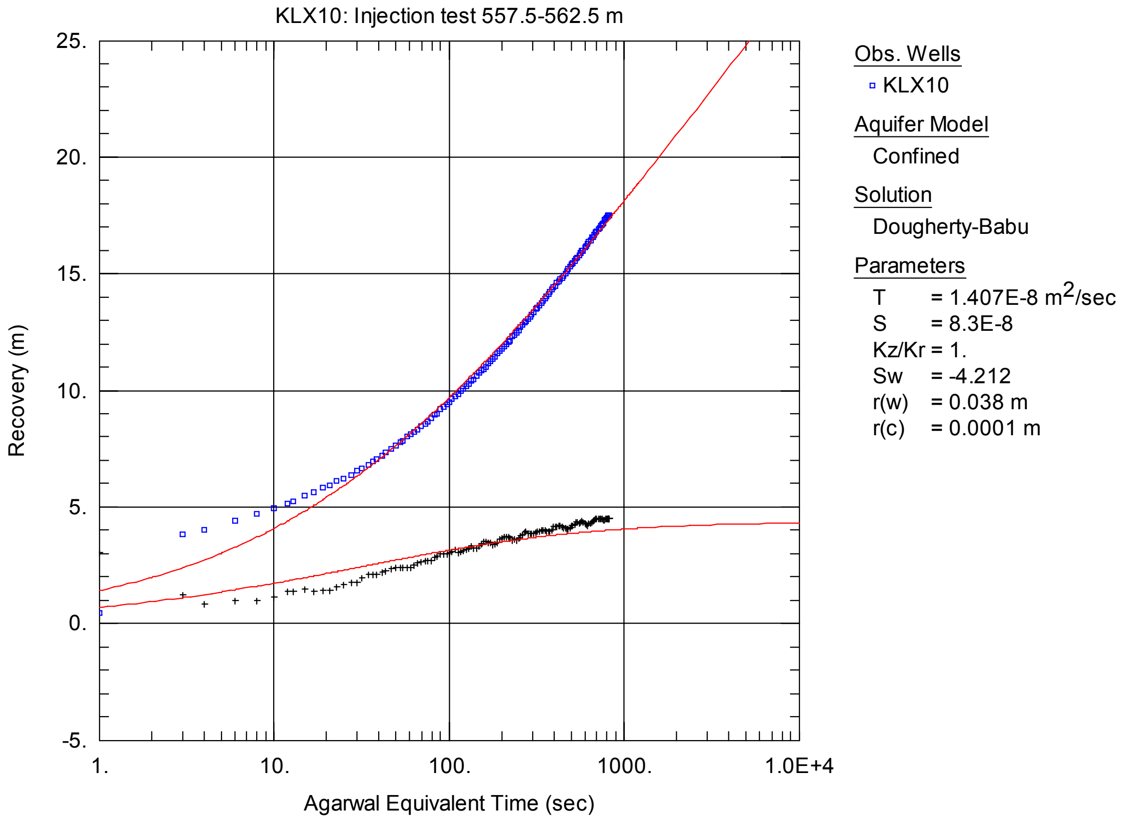


Figure A3-484. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Babu solution, from the injection test in section 557.5-562.5 m in KLX10.*

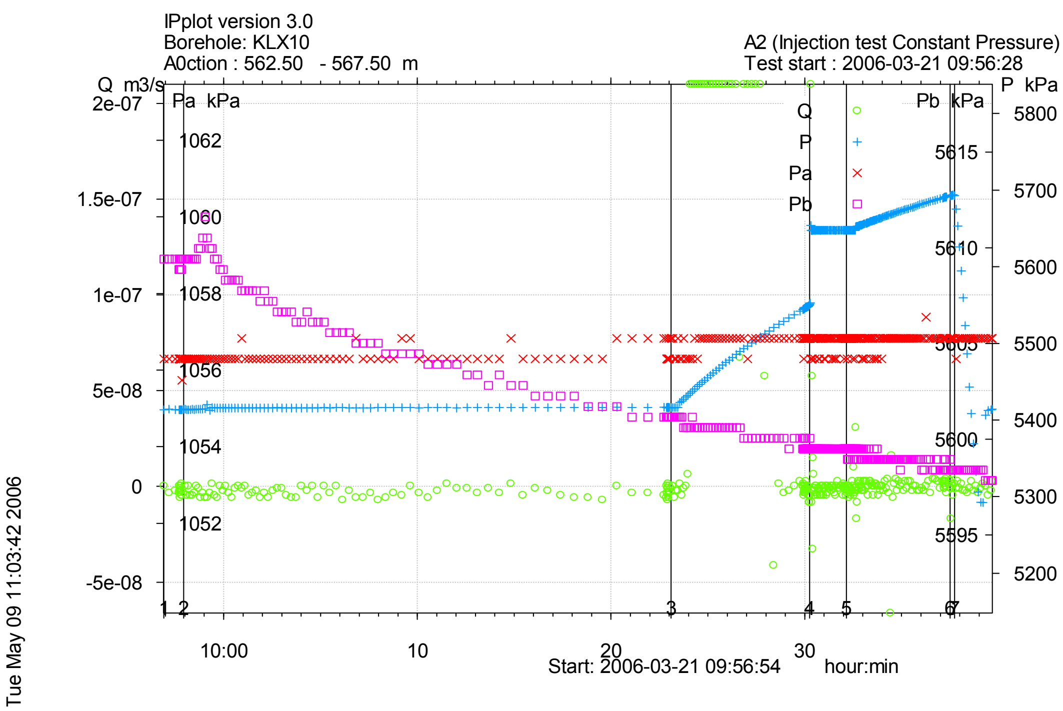


Figure A3-485. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 562.5-567.5 m in borehole KLX10.*

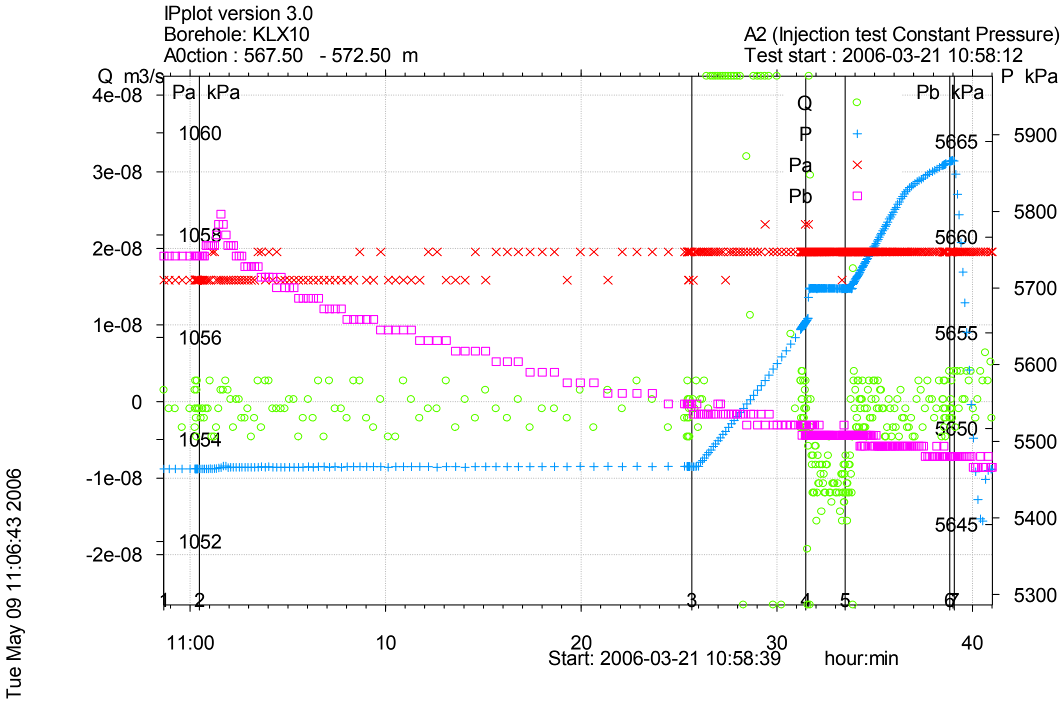


__Figure A3-486.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 567.5-572.5 m in borehole KLX10.

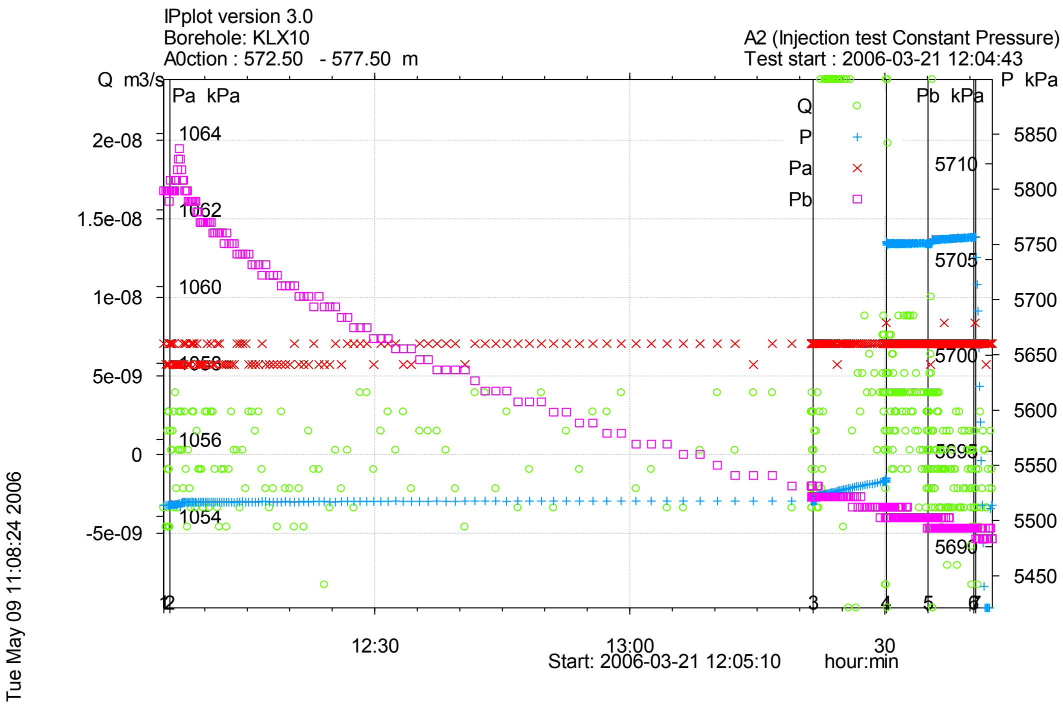


__Figure A3-487.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 572.5-577.5 m in borehole KLX10.

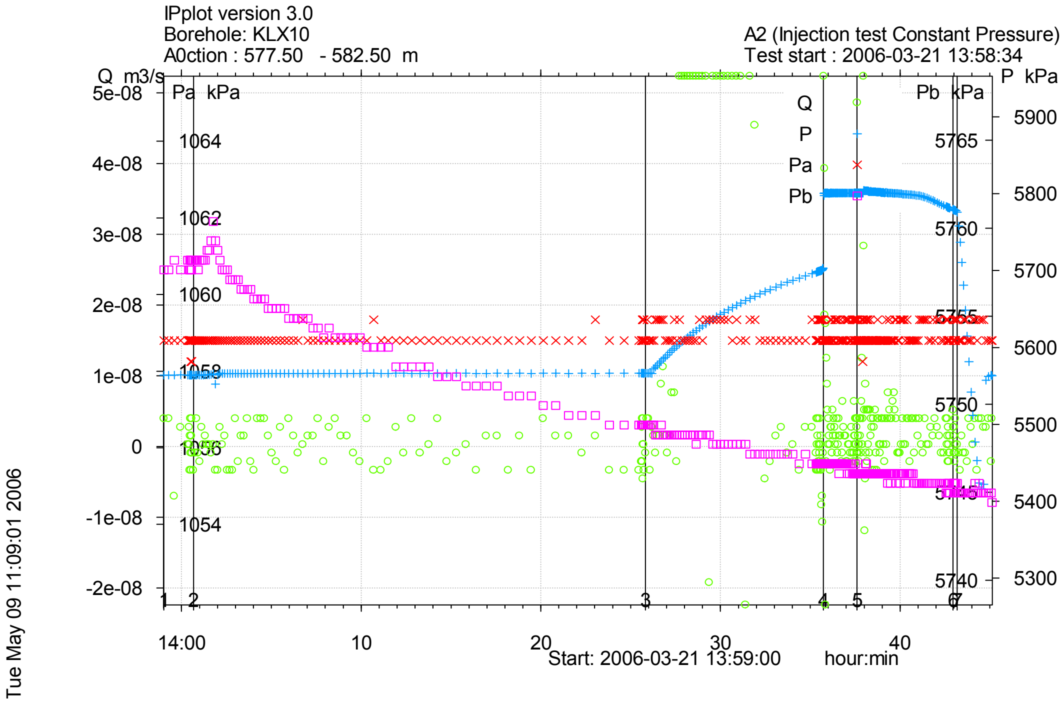


Figure A3-488. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 577.5-582.5 m in borehole KLX10.

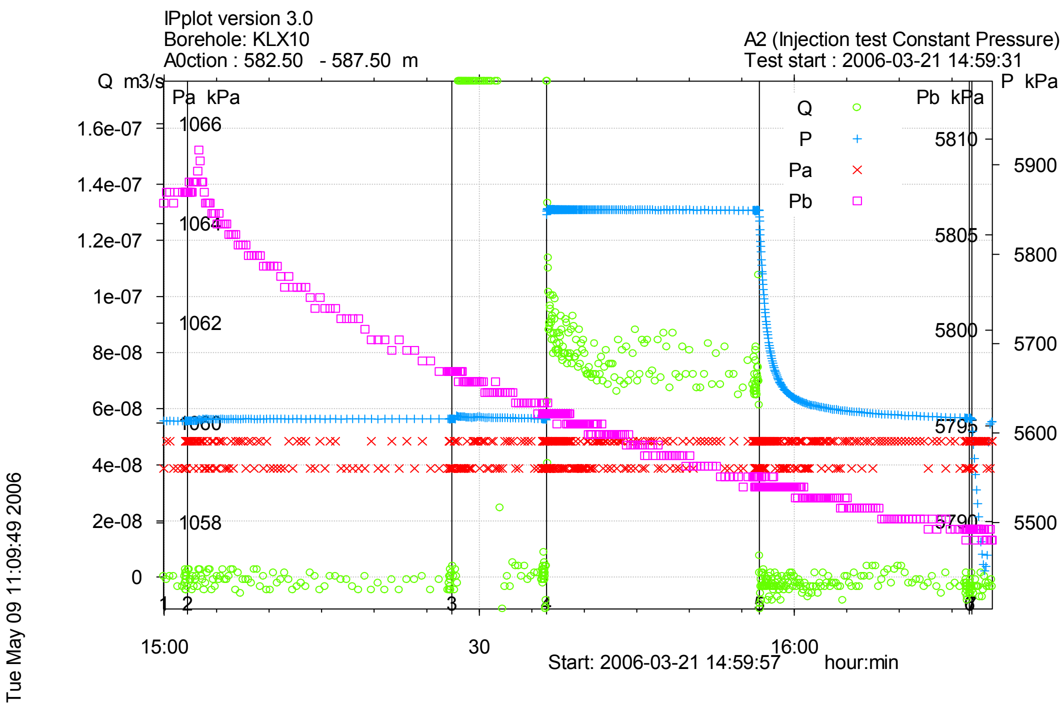


Figure A3-489. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 582.5-587.5 m in borehole KLX10.

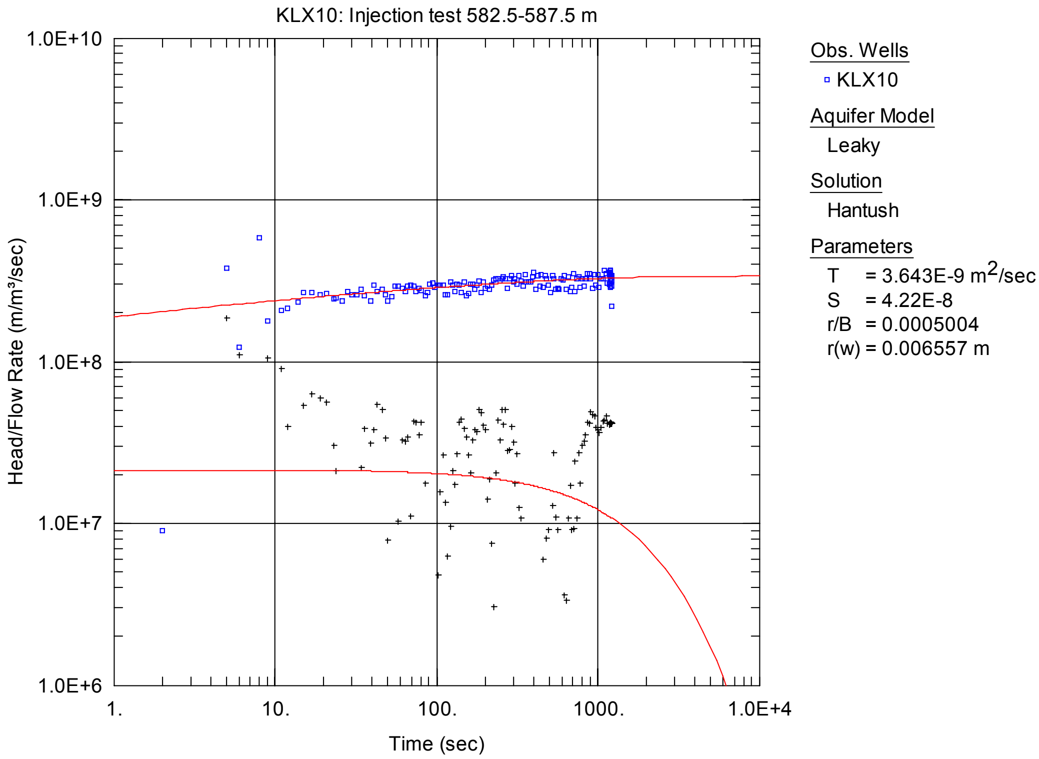


***Figure A3-490.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 582.5-587.5 m in KLX10.*

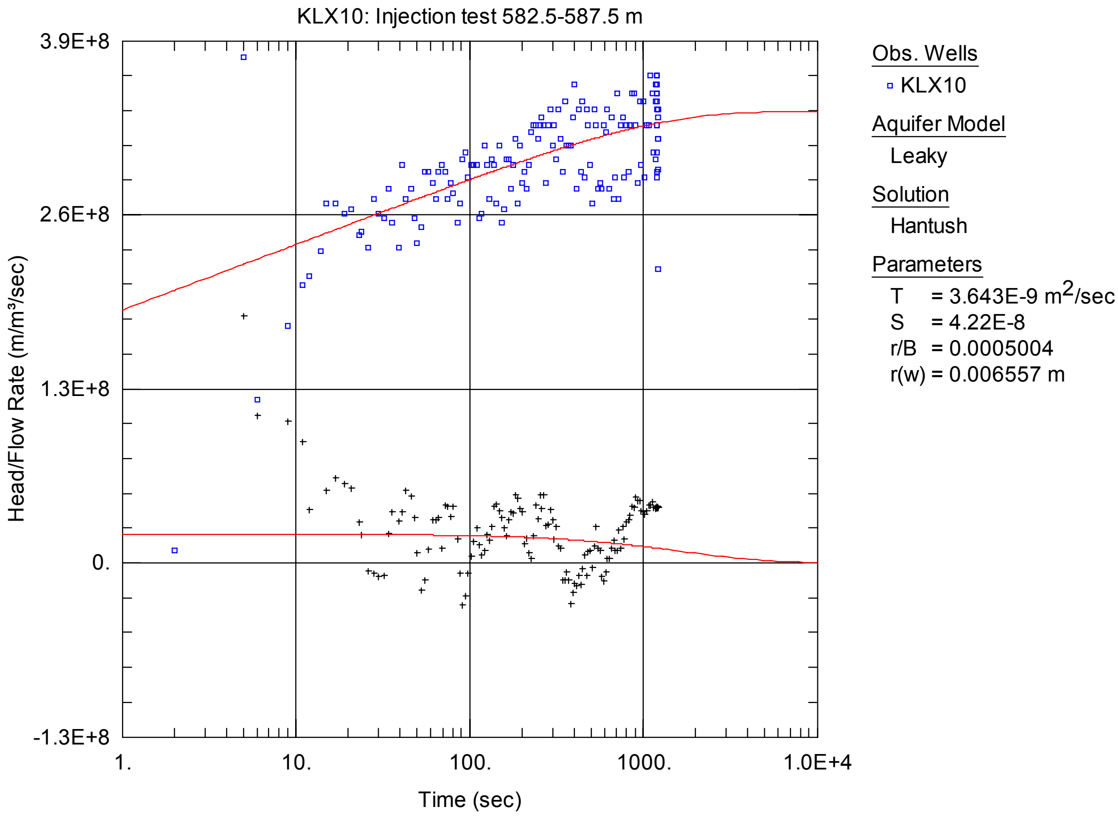


***Figure A3-491.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 582.5-587.5 m in KLX10.*

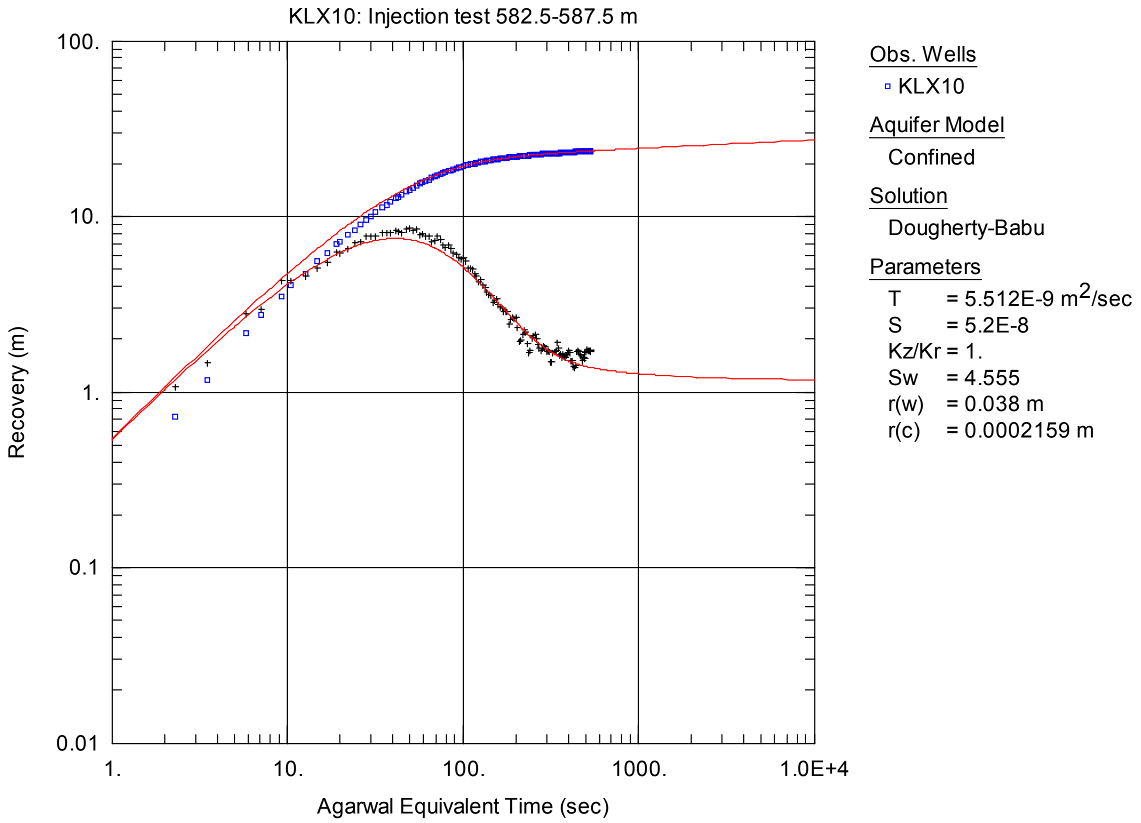


Figure A3-492. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 582.5-587.5 m in KLX10.*

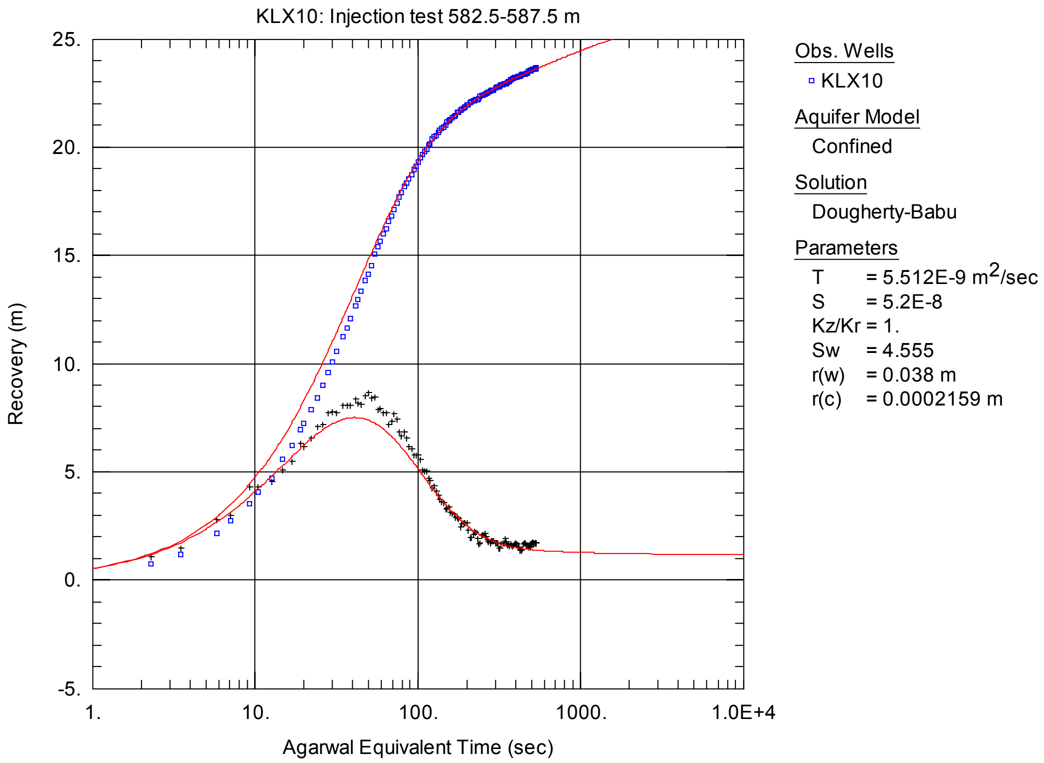


Figure A3-493. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 582.5-587.5 m in KLX10.*

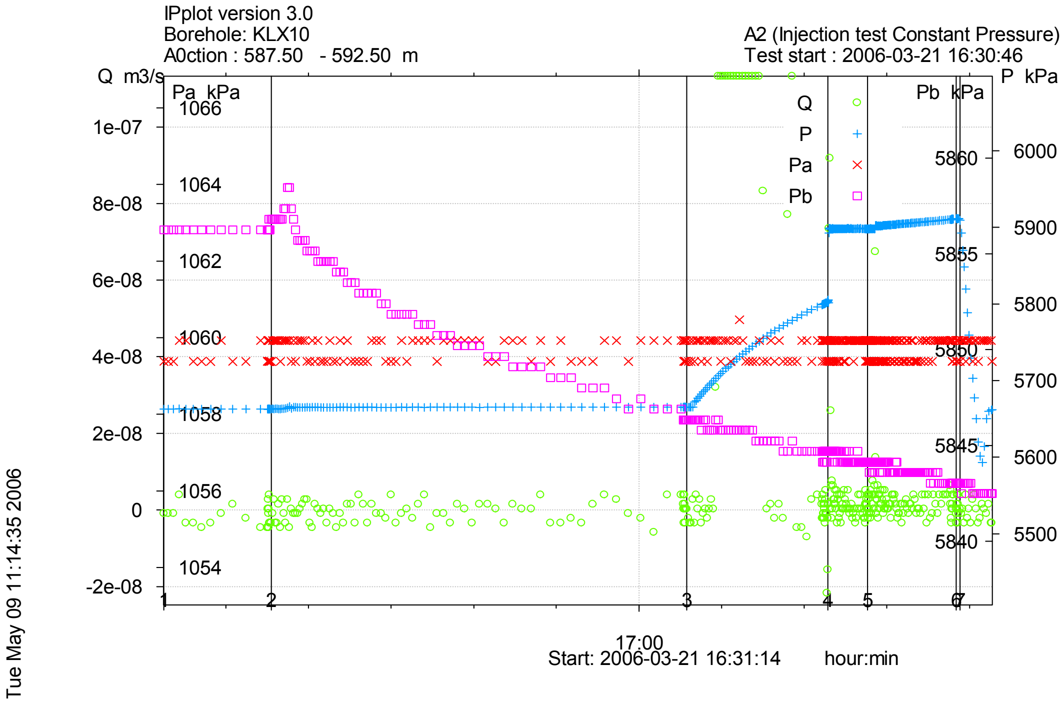


Figure A3-494. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 587.5-592.5 m in borehole KLX10.

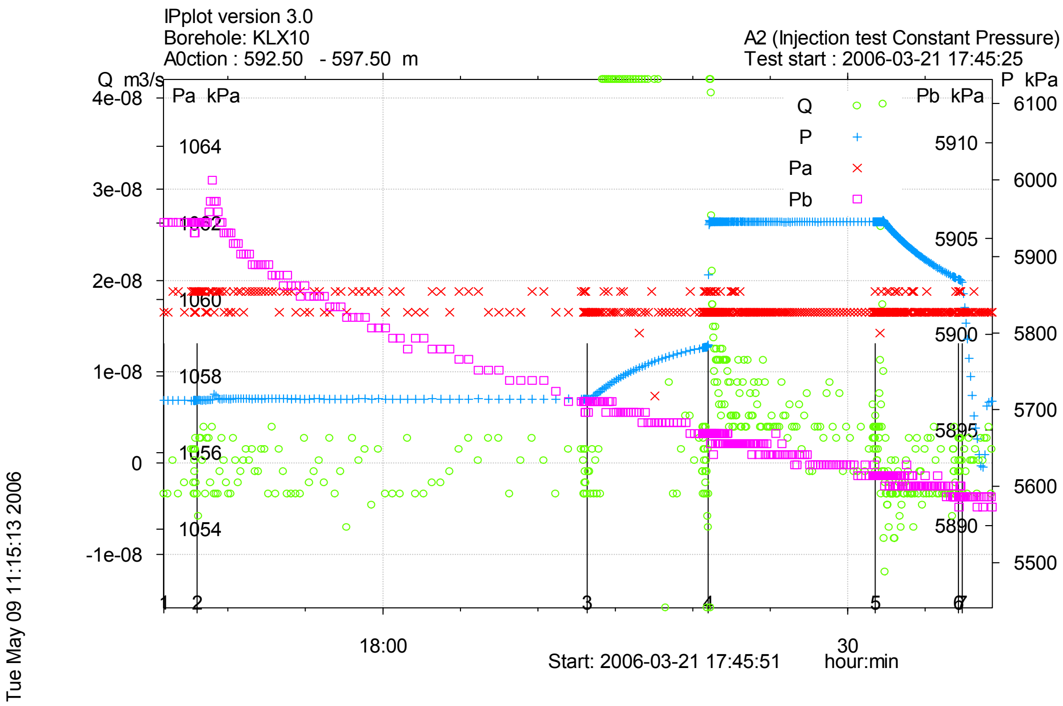


Figure A3-495. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 592.5-597.5 m in borehole KLX10.

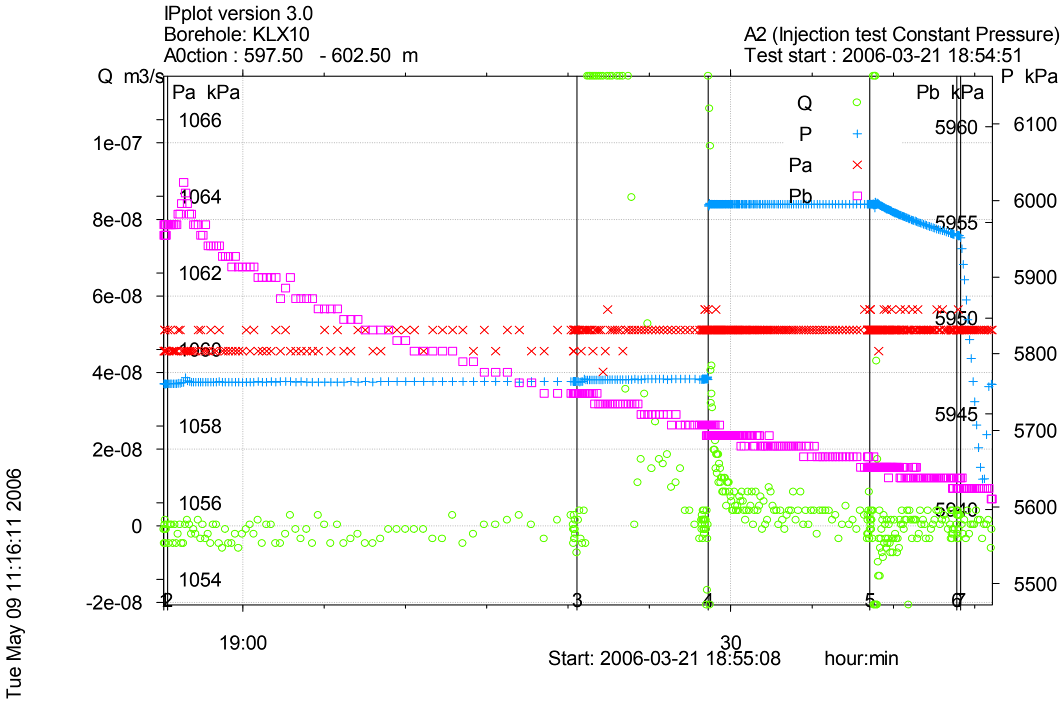


Figure A3-496. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 597.5-602.5 m in borehole KLX10.*

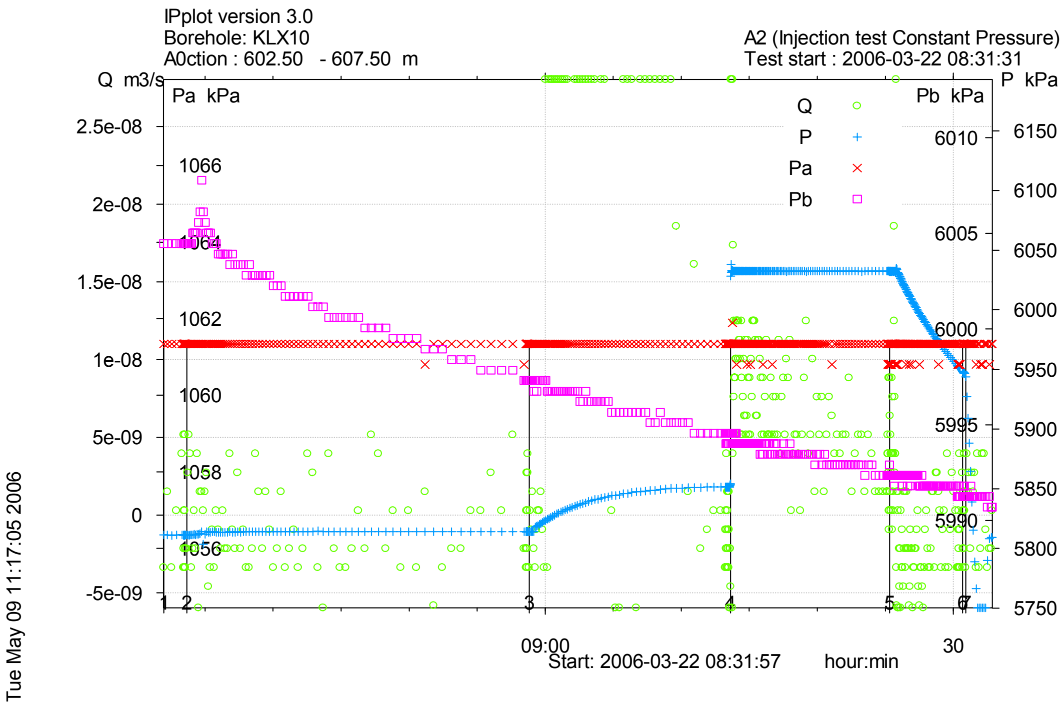


Figure A3-497. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 602.5-607.5 m in borehole KLX10.*

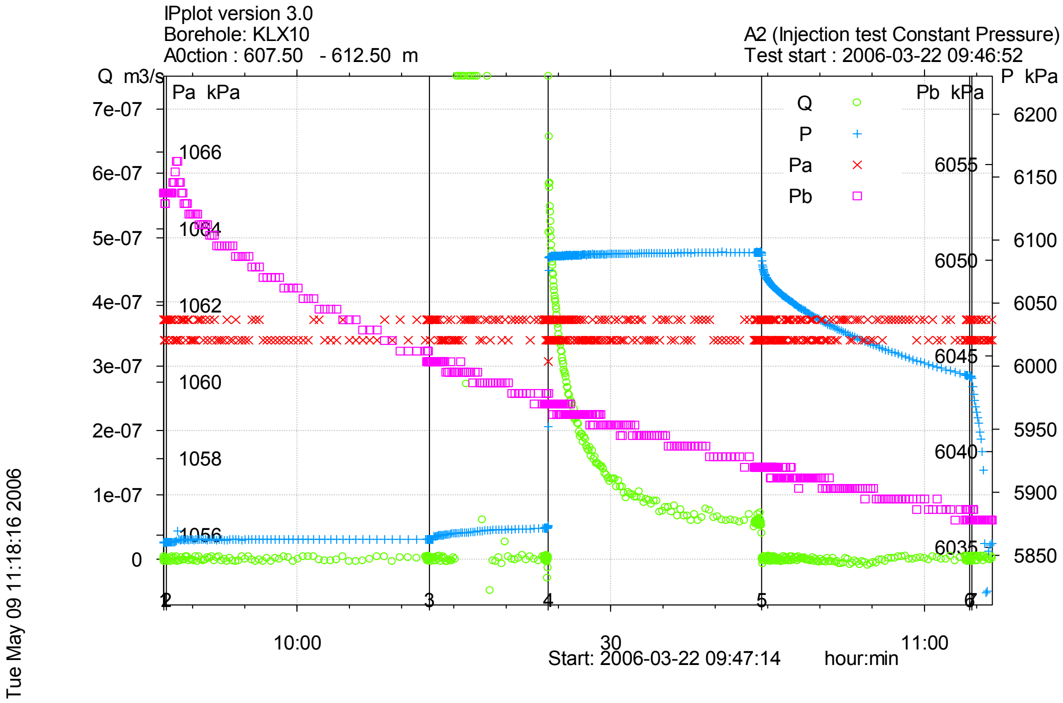


Figure A3-498. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 607.5-612.5 m in borehole KLX10.

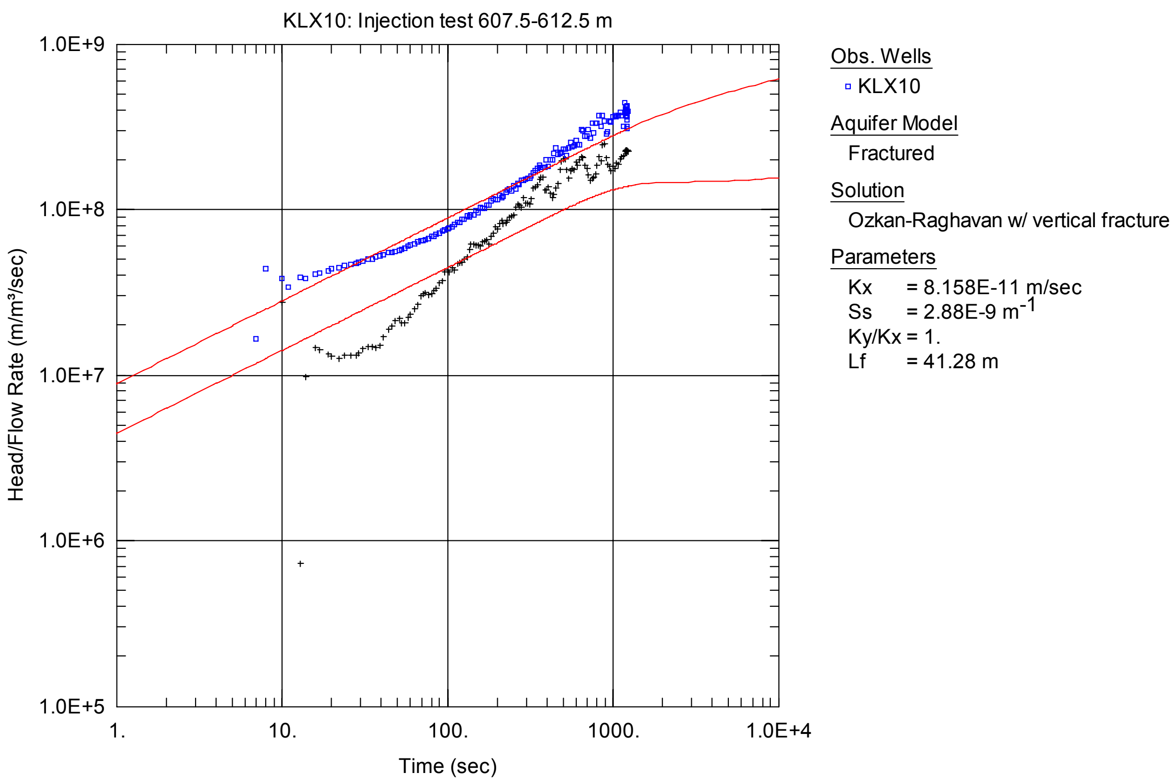


Figure A3-499. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 607.5-612.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.

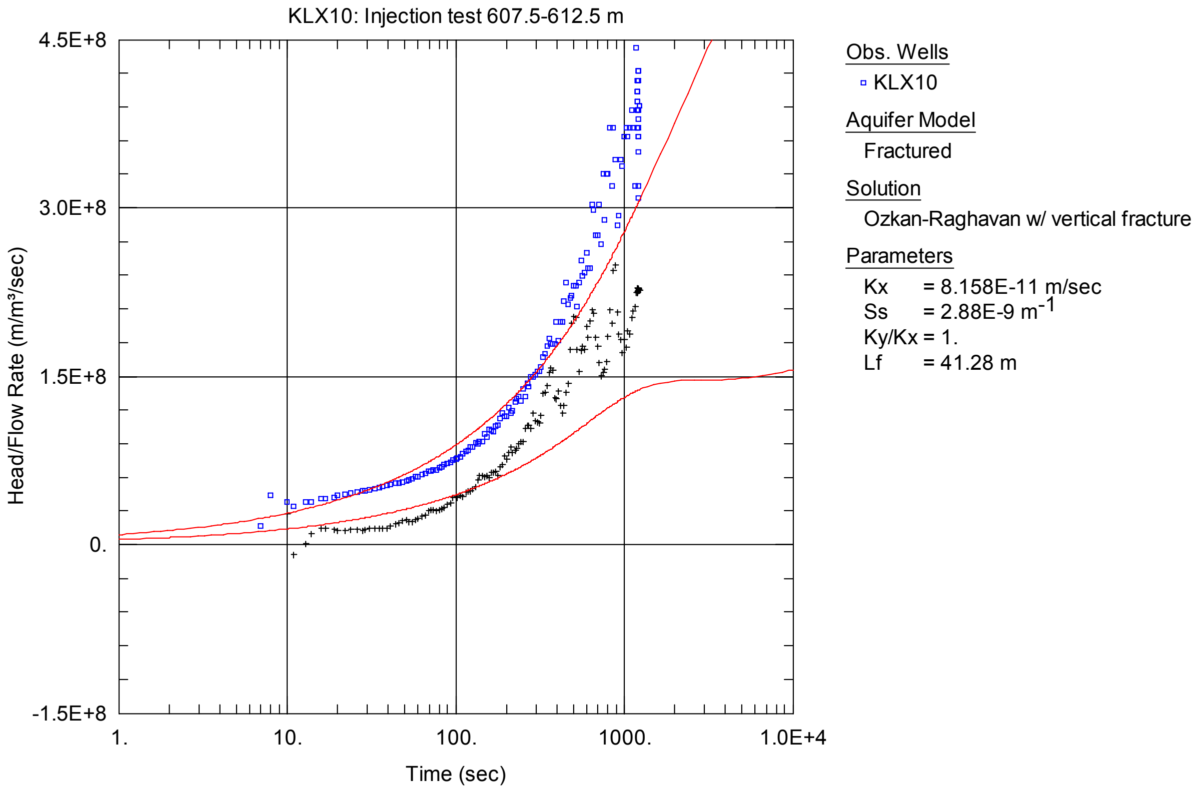


Figure A3-500. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 607.5-612.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

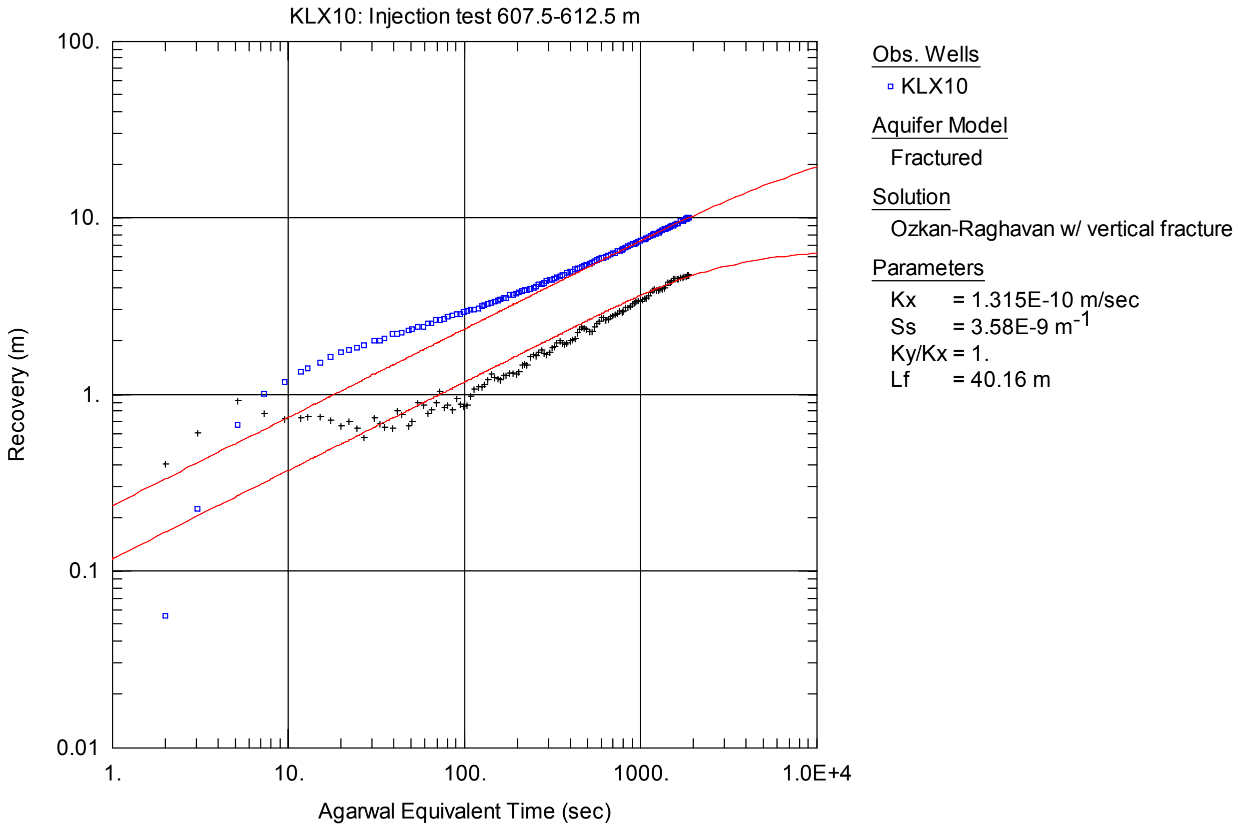


Figure A3-501. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 607.5-612.5 m in KLX10.*

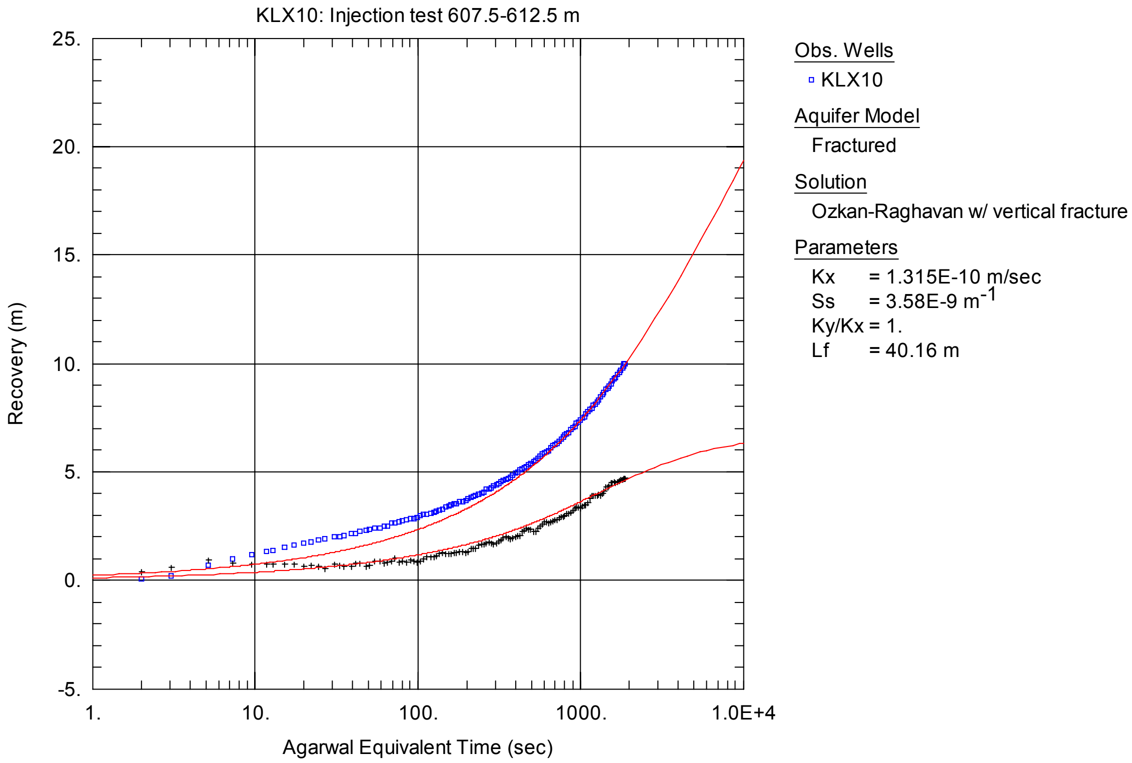


Figure A3-502. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 607.5-612.5 m in KLX10.*

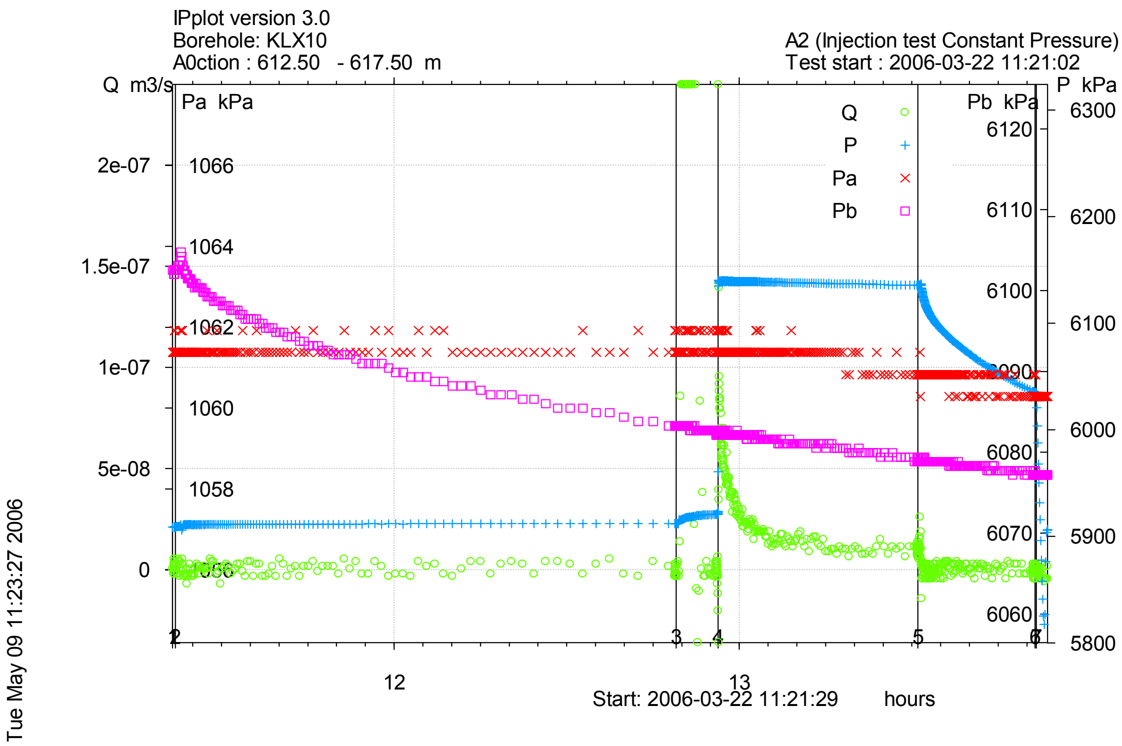


Figure A3-503. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 612.5-617.5 m in borehole KLX10.*

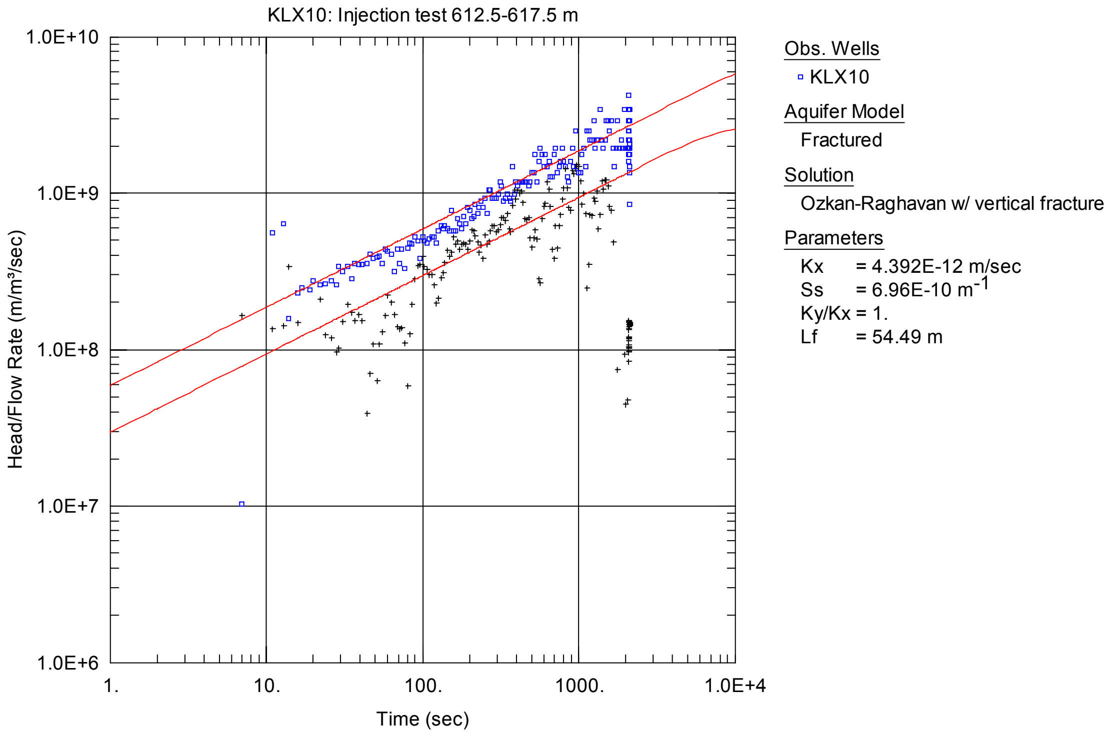


Figure A3-504. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 612.5-617.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

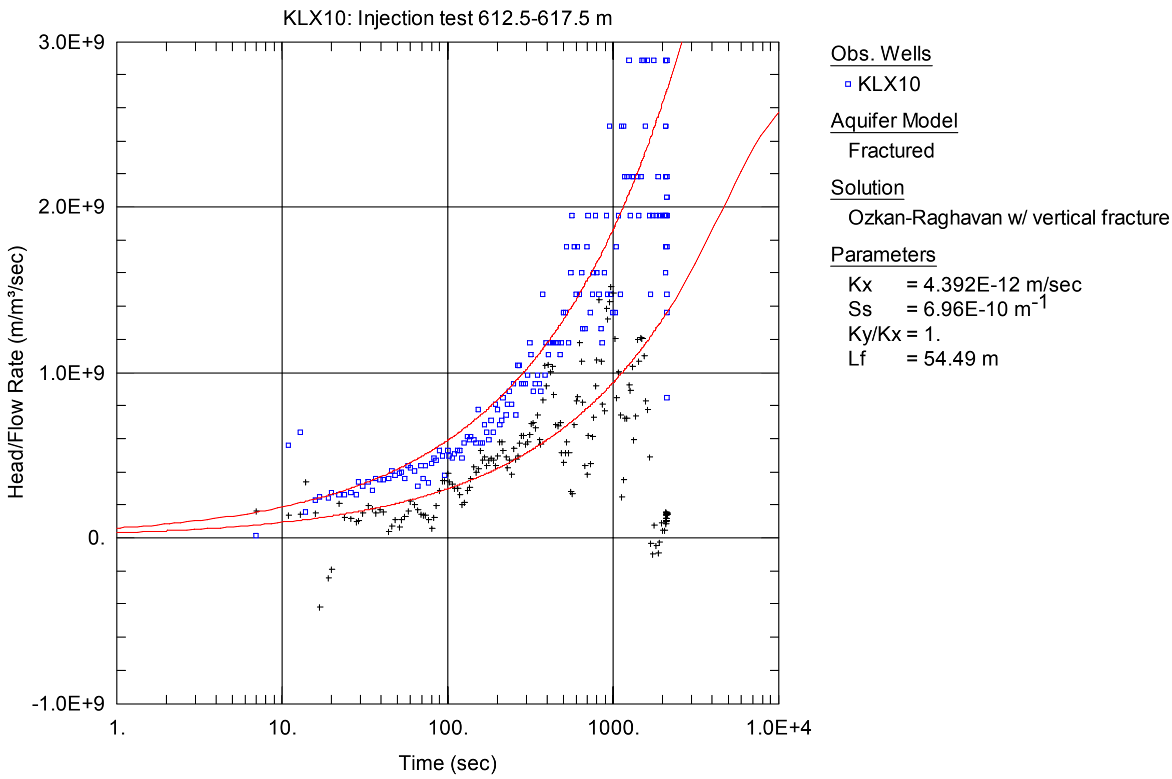


Figure A3-505. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 612.5-617.5 m in KLX10 The type curve fit is showing a possible, however not unambiguous, evaluation.*

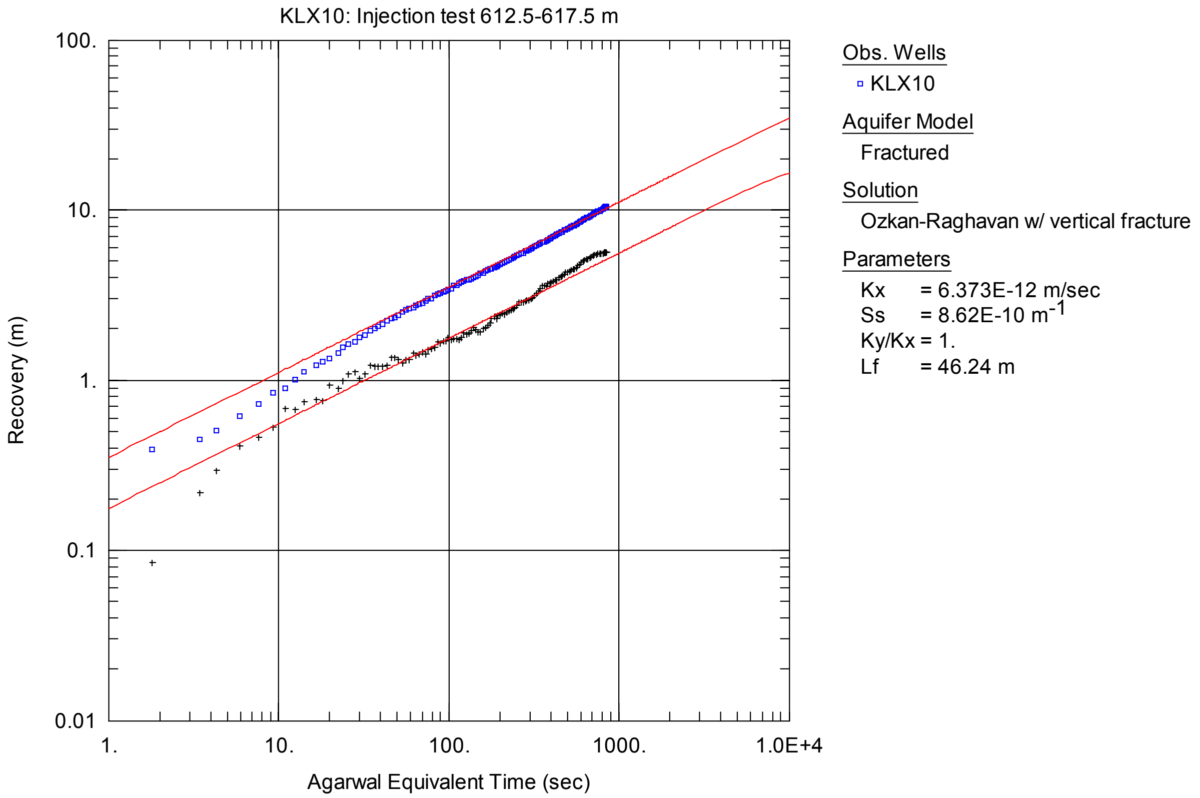


Figure A3-506. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 612.5-617.5 m in KLX10 The type curve fit is showing a possible, however not unambiguous, evaluation.*

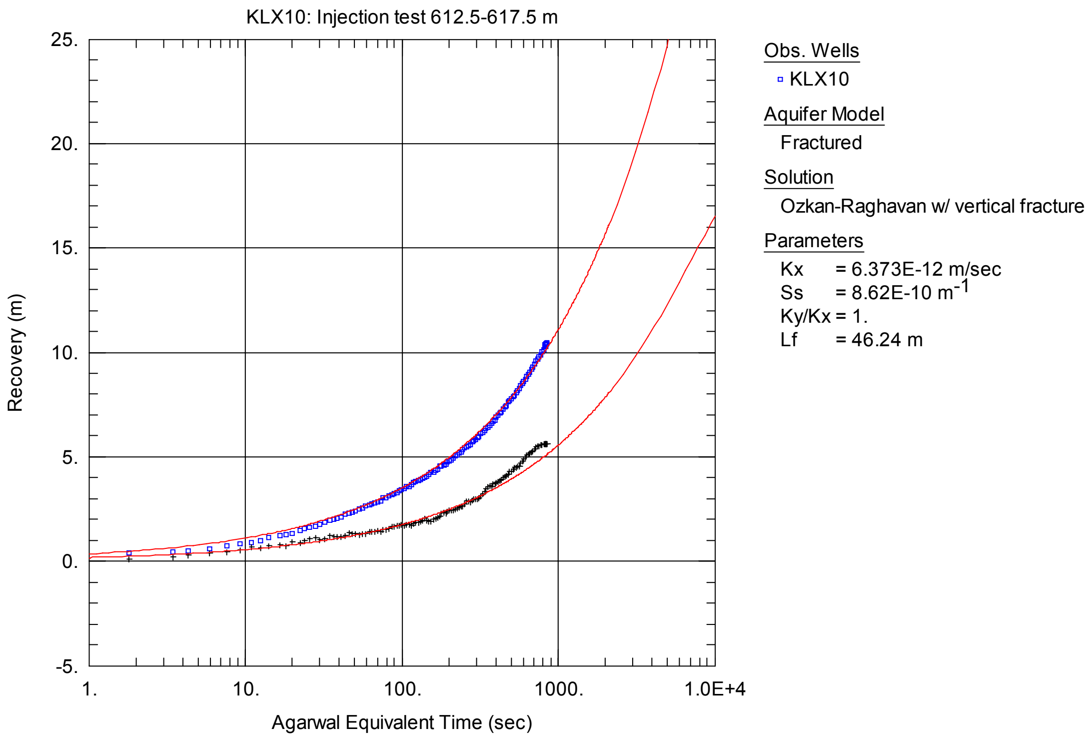


Figure A3-507. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 612.5-617.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

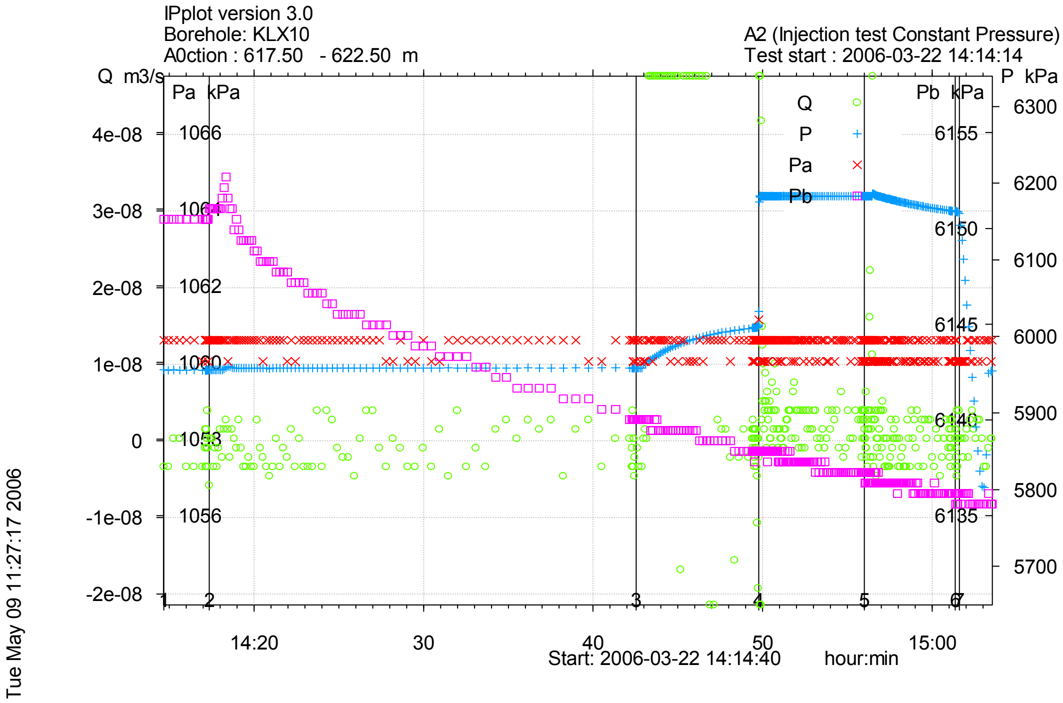


__Figure A3-508.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 617.5-622.5 m in borehole KLX10.

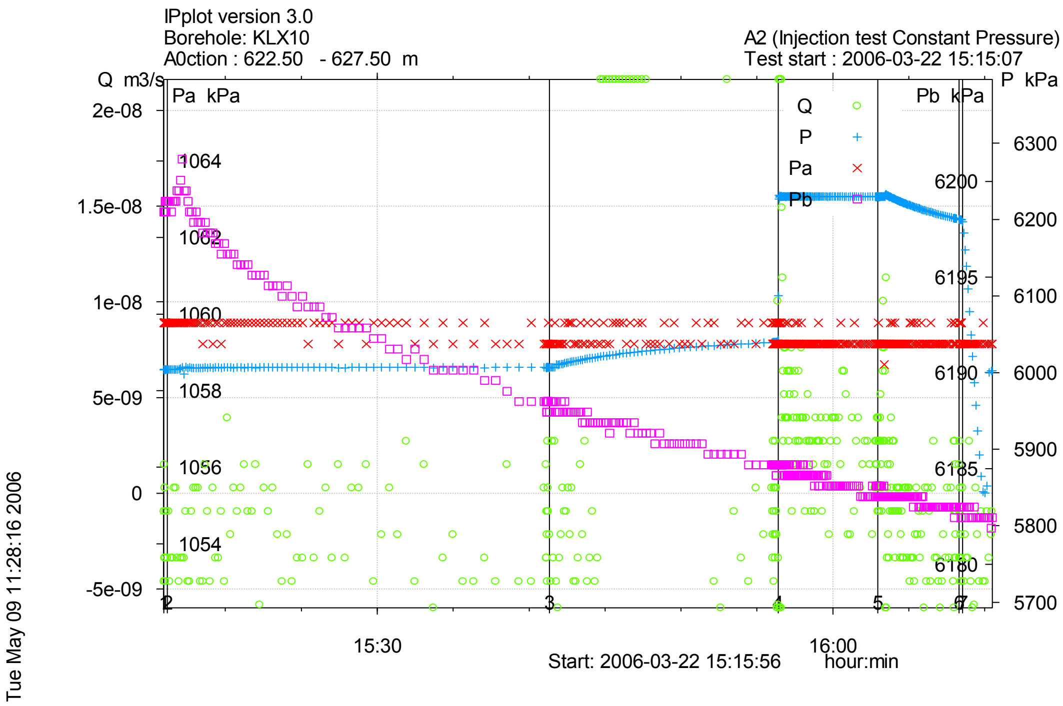


__Figure A3-509.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 622.5-627.5 m in borehole KLX10.

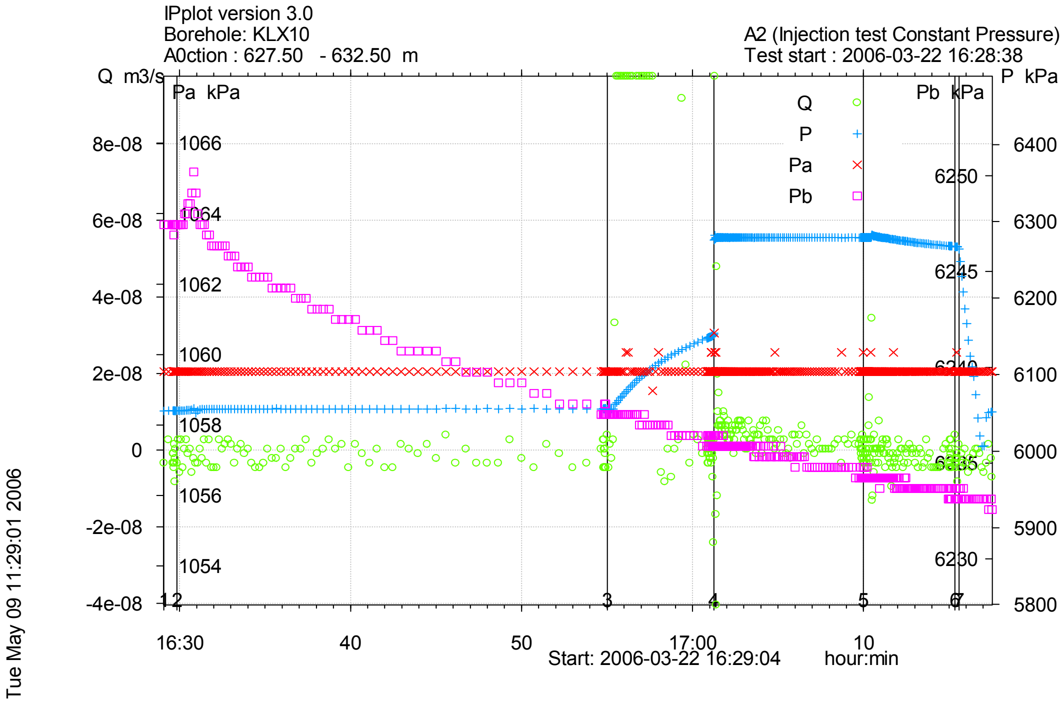


Figure A3-510. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 627.5-632.5 m in borehole KLX10.*

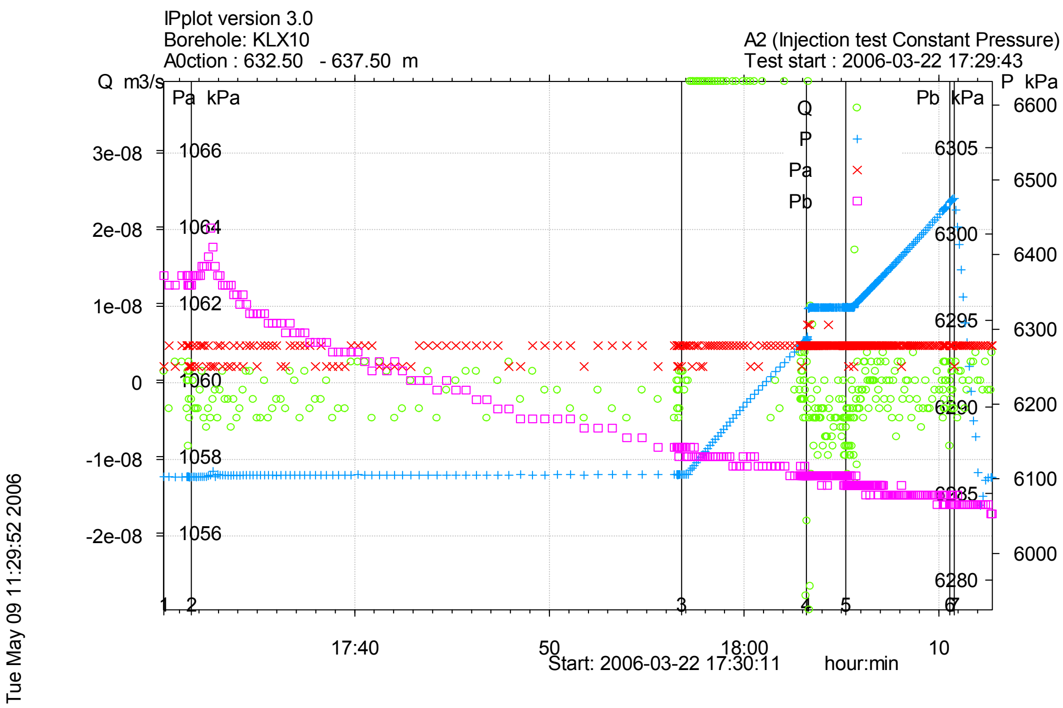


Figure A3-511. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 632.5-637.5 m in borehole KLX10.*

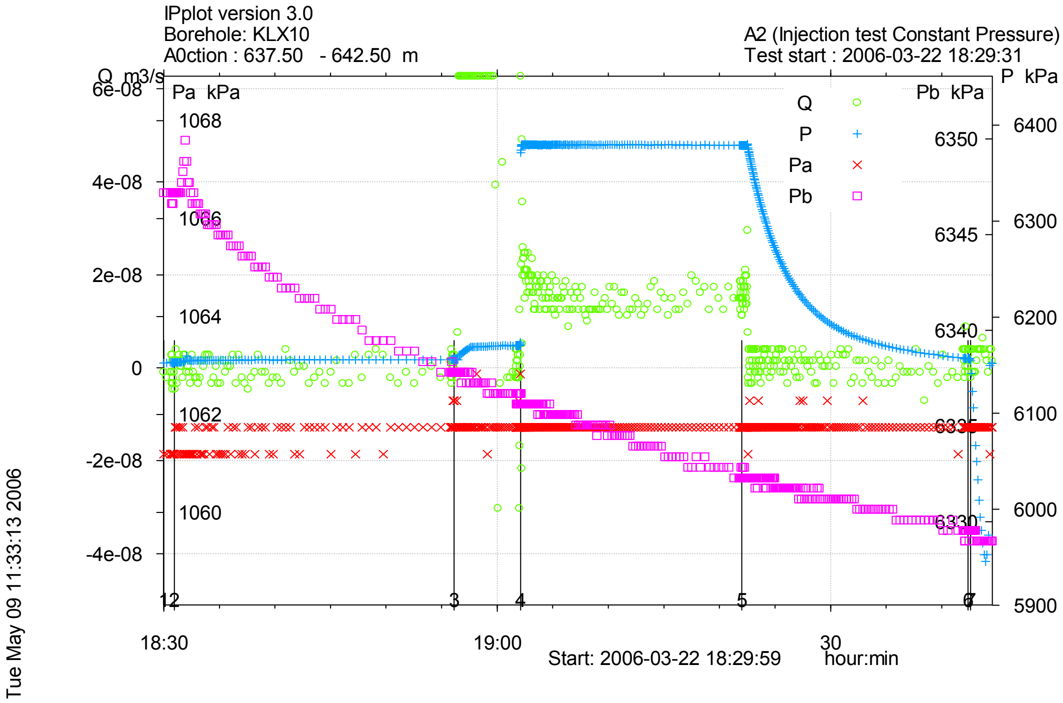


Figure A3-512. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 637.5-642.5 m in borehole KLX10.*

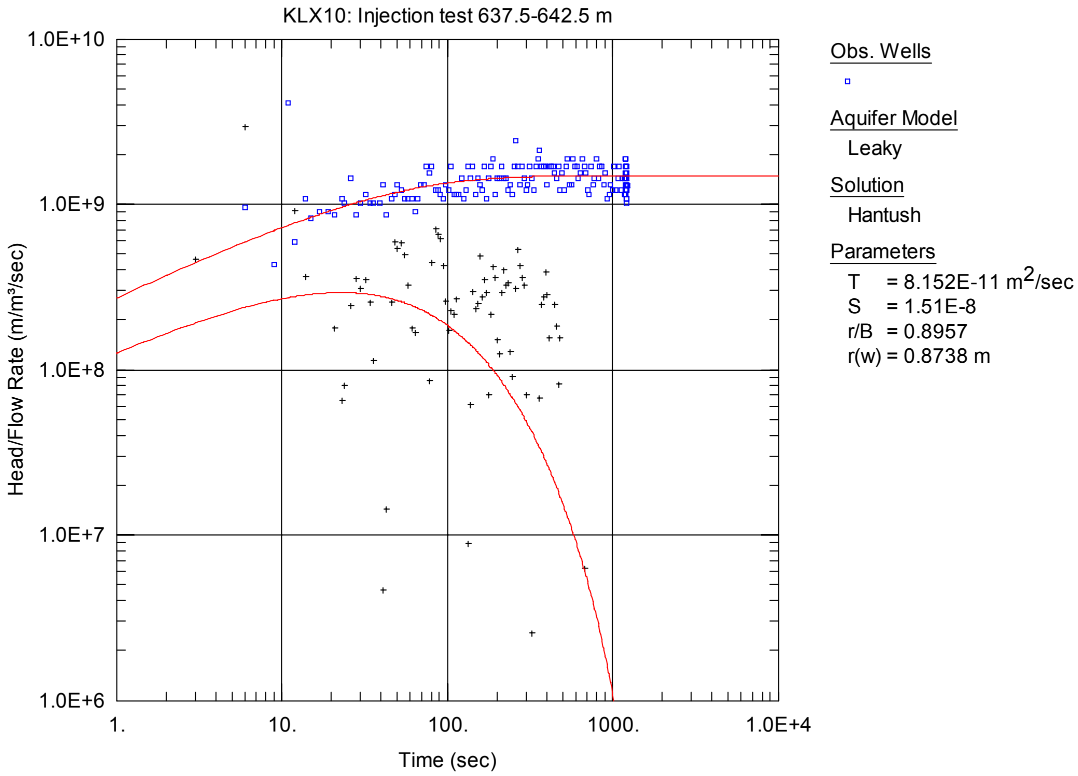


Figure A3-513. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 637.5-642.5 m in KLX10 The type curve fit is showing a possible, however not unambiguous, evaluation.*

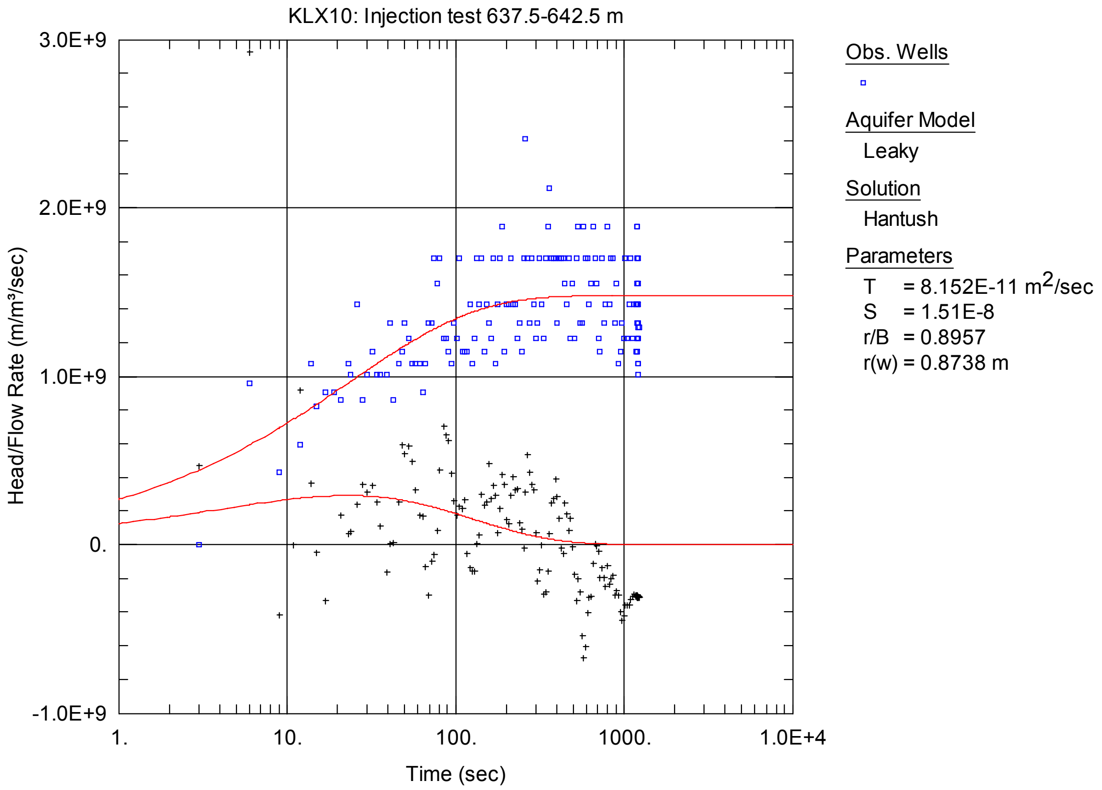


Figure A3-514. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 637.5-642.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

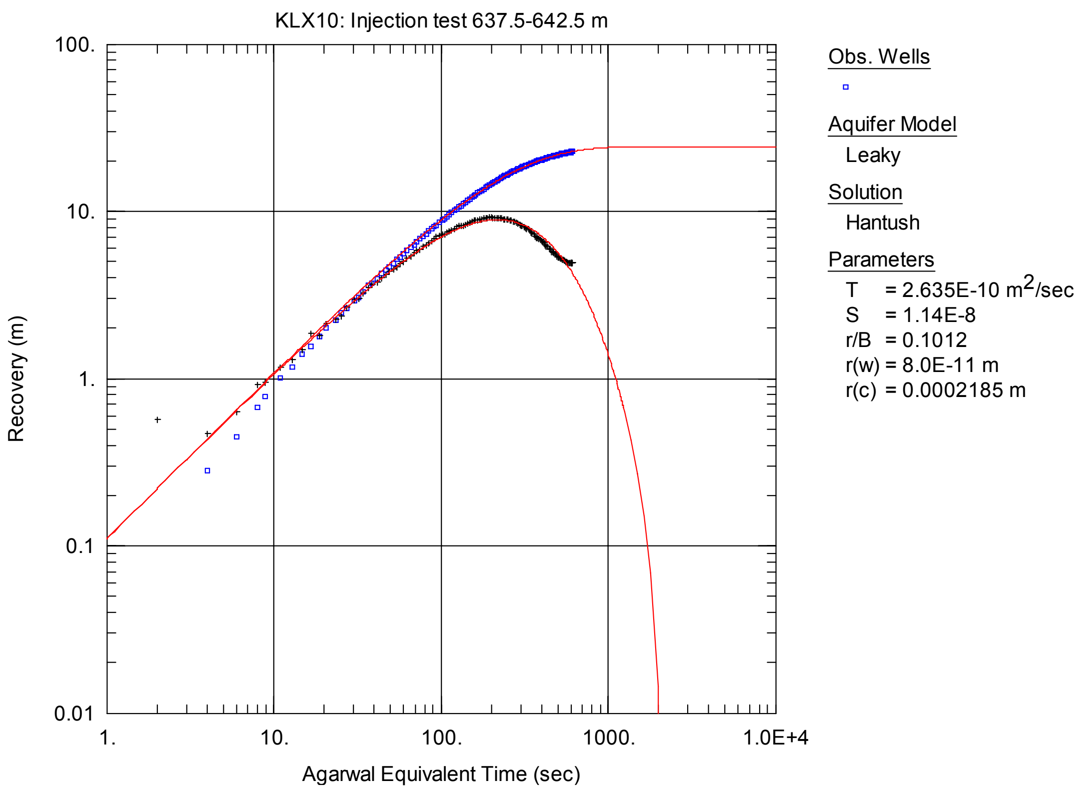


Figure A3-515. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 637.5-642.5 m in KLX10 The type curve fit is showing a possible, however not unambiguous, evaluation.*

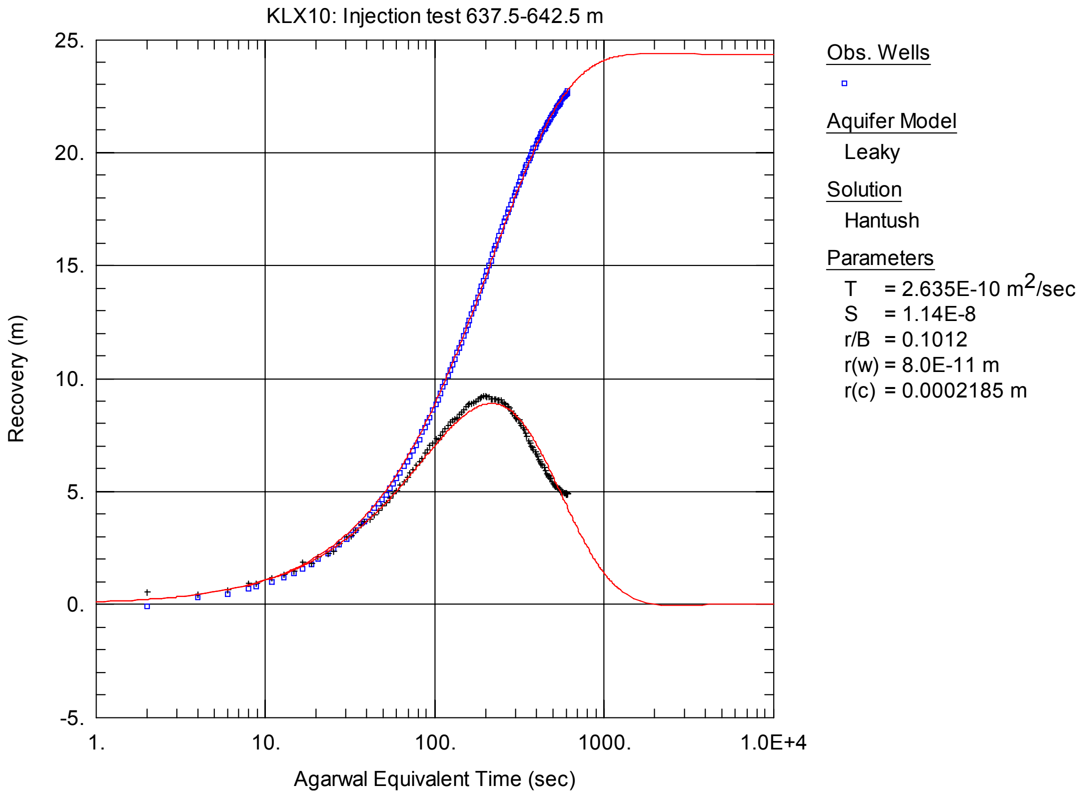


Figure A3-516. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 637.5-642.5 m in KLX10 The type curve fit is showing a possible, however not unambiguous, evaluation.*

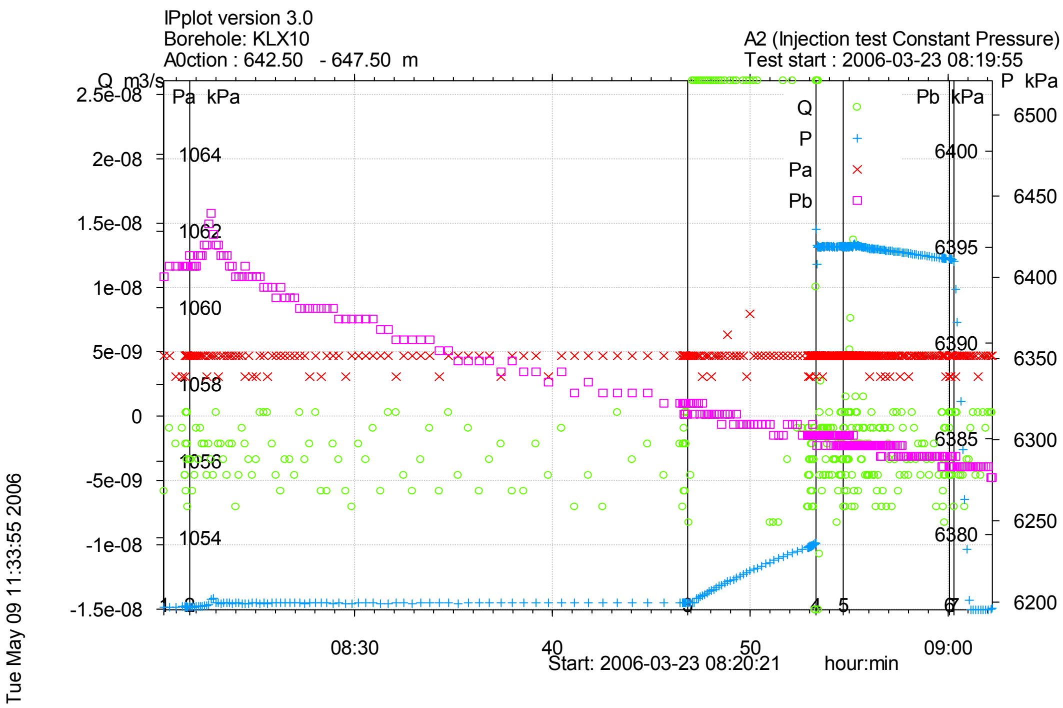


Figure A3-517. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 642.5-647.5 m in borehole KLX10.*

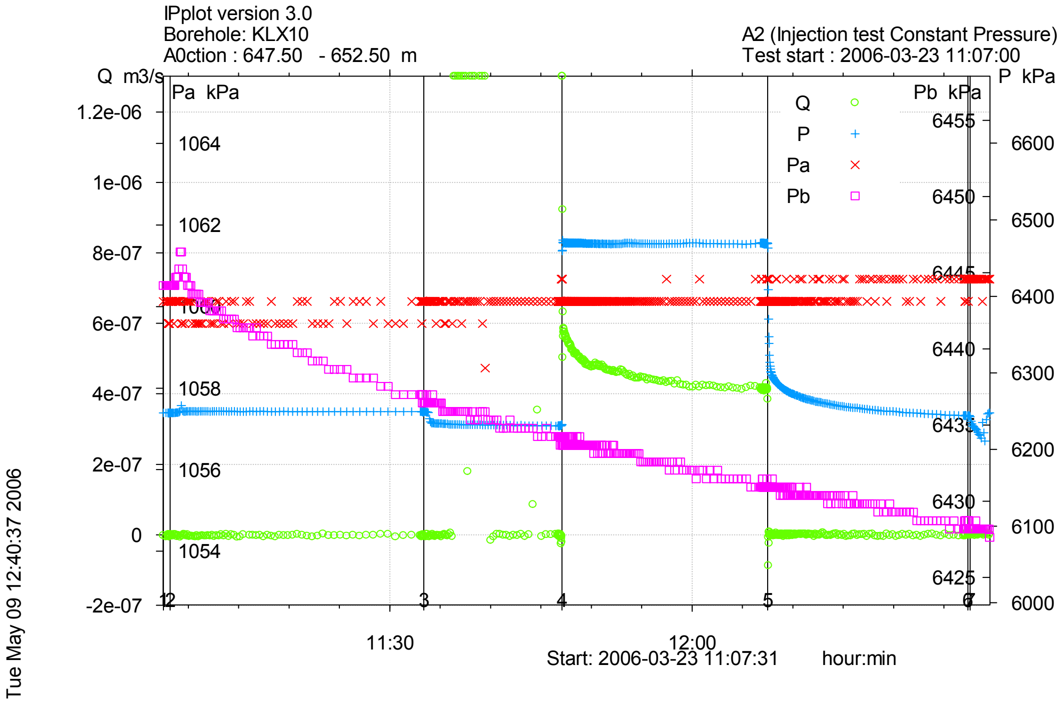


Figure A3-518. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 647.5-652.5m in borehole KLX10.

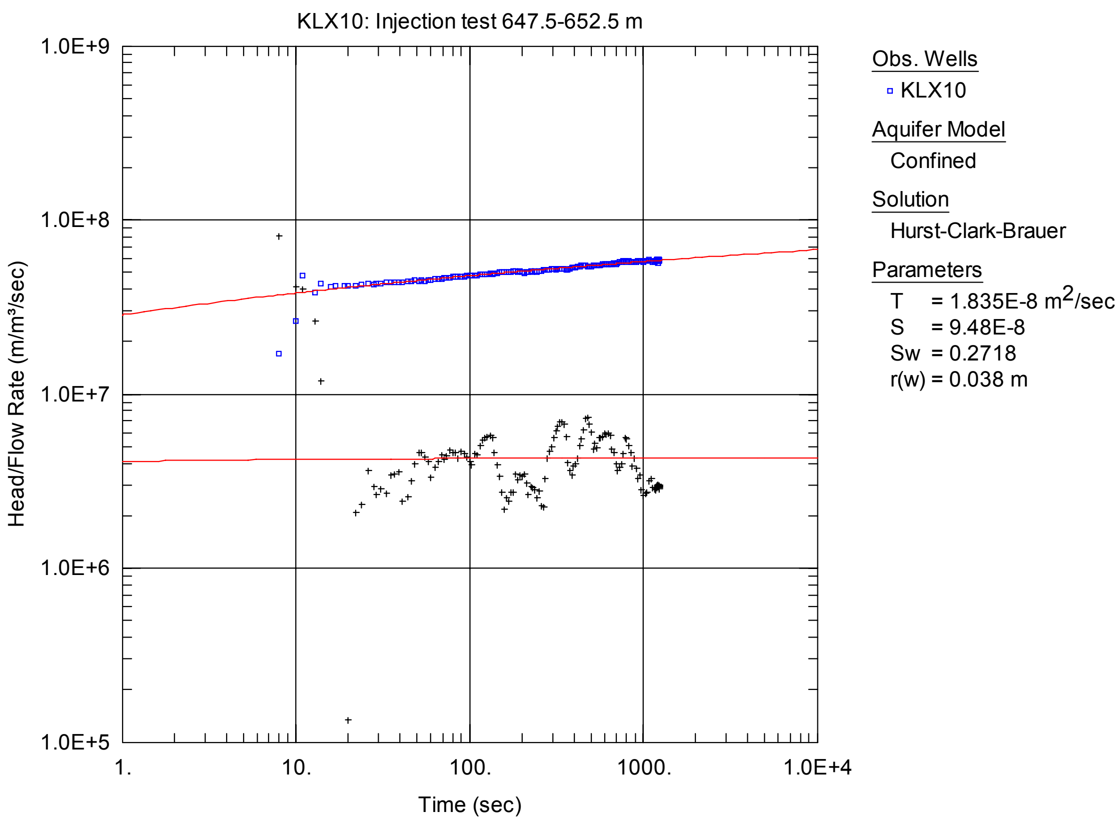


Figure A3-519. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 647.5-652.5 m in KLX10.

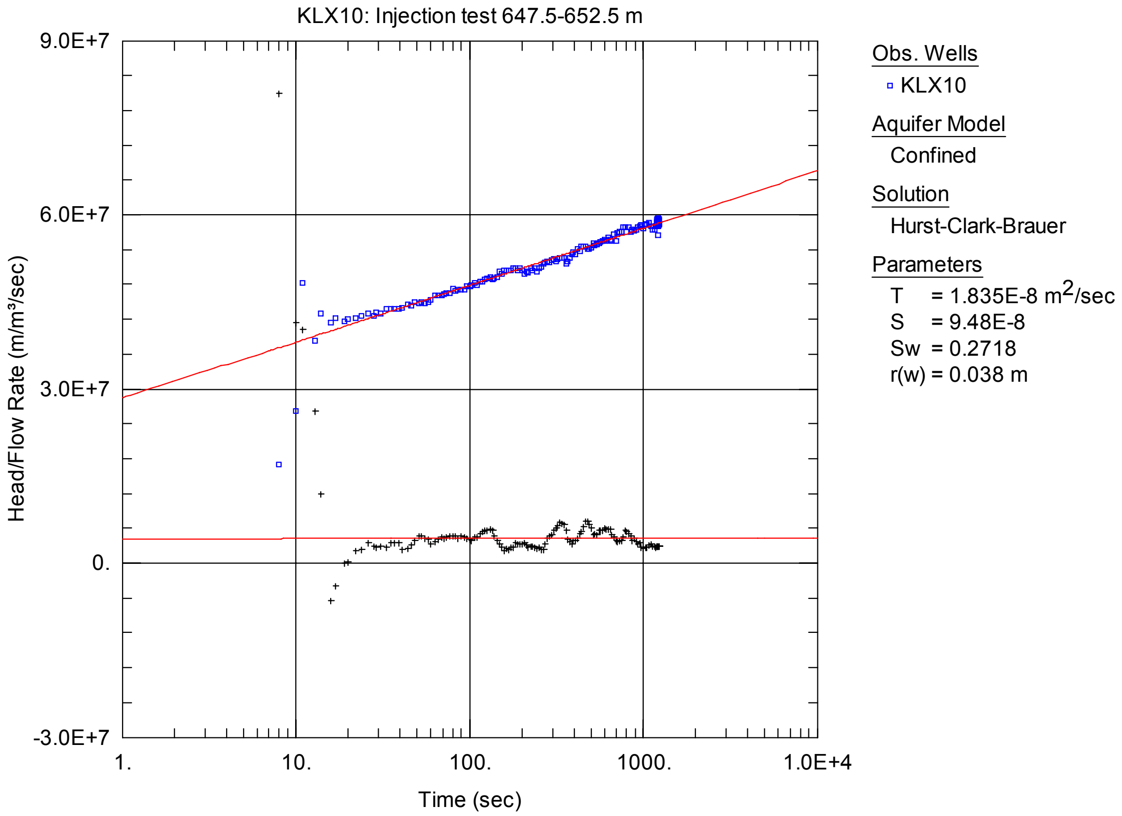


Figure A3-520. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 647.5-652.5 m in KLX10.*

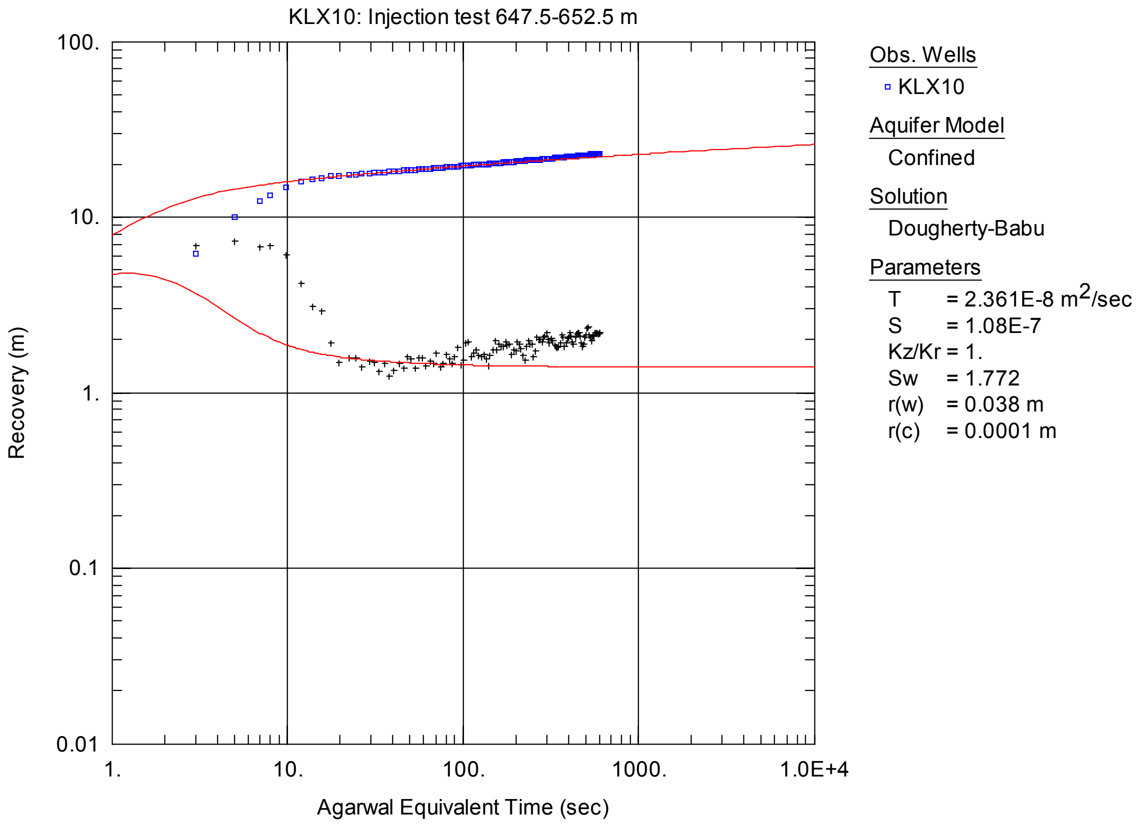


Figure A3-521. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 647.5-652.5 m in KLX10.*

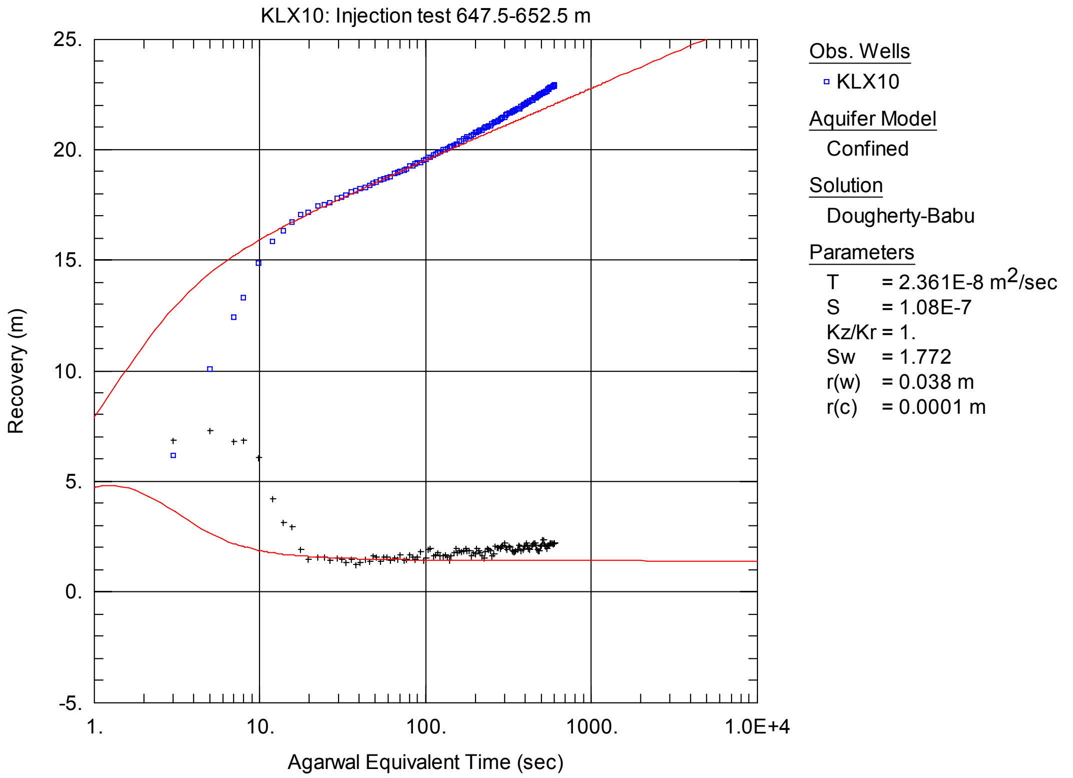


***Figure A3-522.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 647.5-652.5 m in KLX10.*

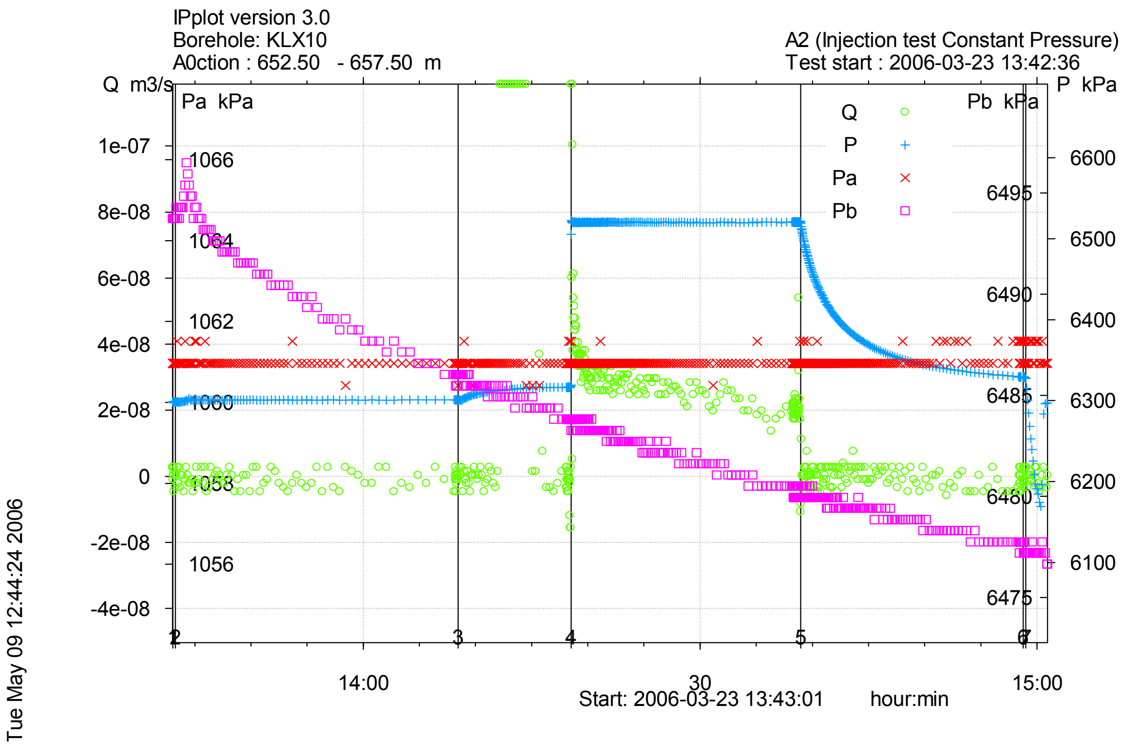


***Figure A3-523.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 652.5-657.5 m in borehole KLX10.*

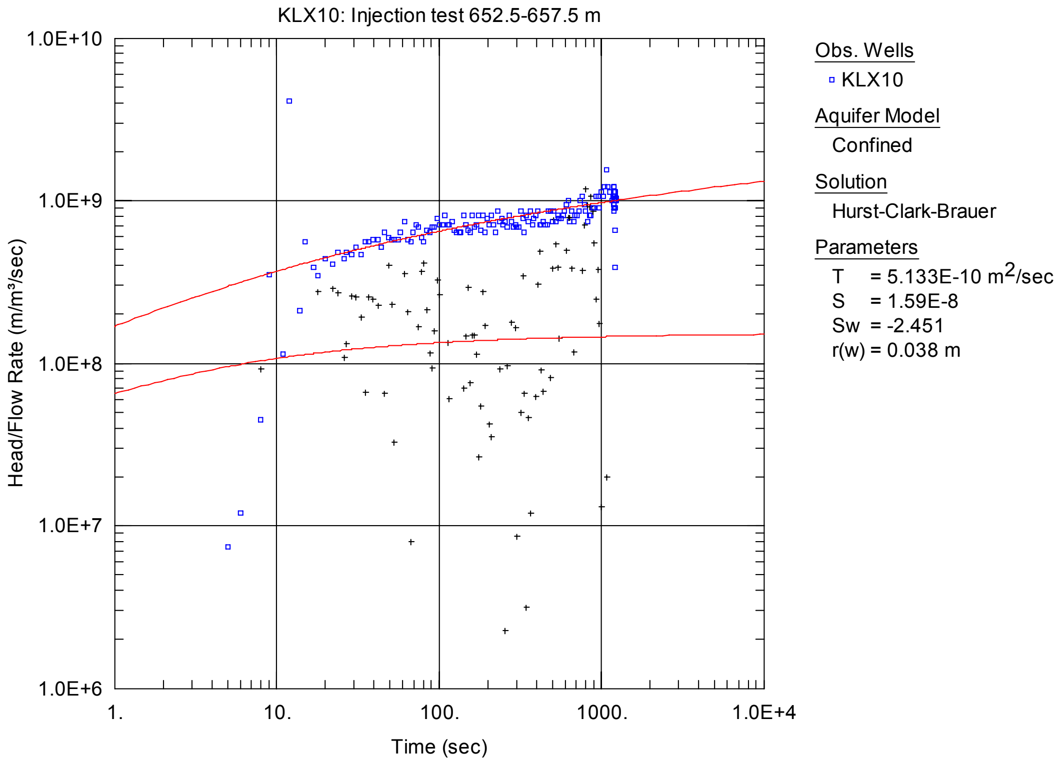


Figure A3-524. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 652.5-657.5 m in KLX10.*

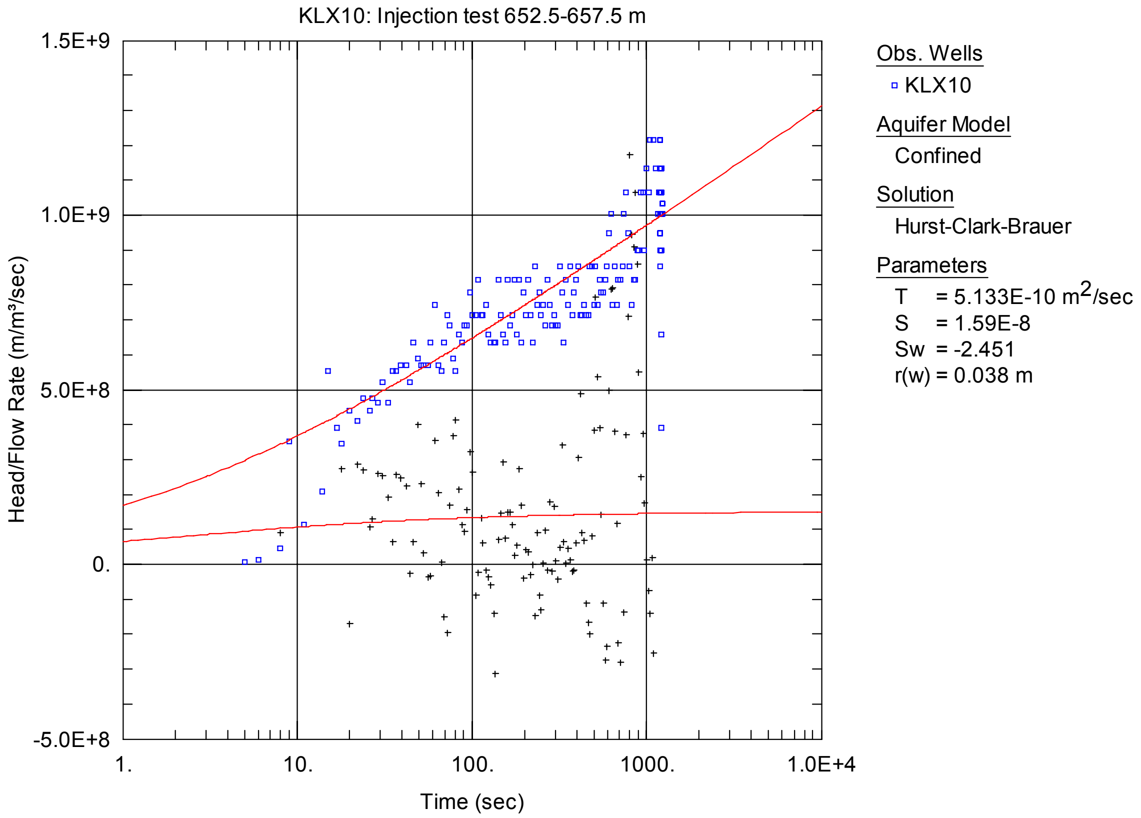


Figure A3-525. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 652.5-657.5 m in KLX10.*

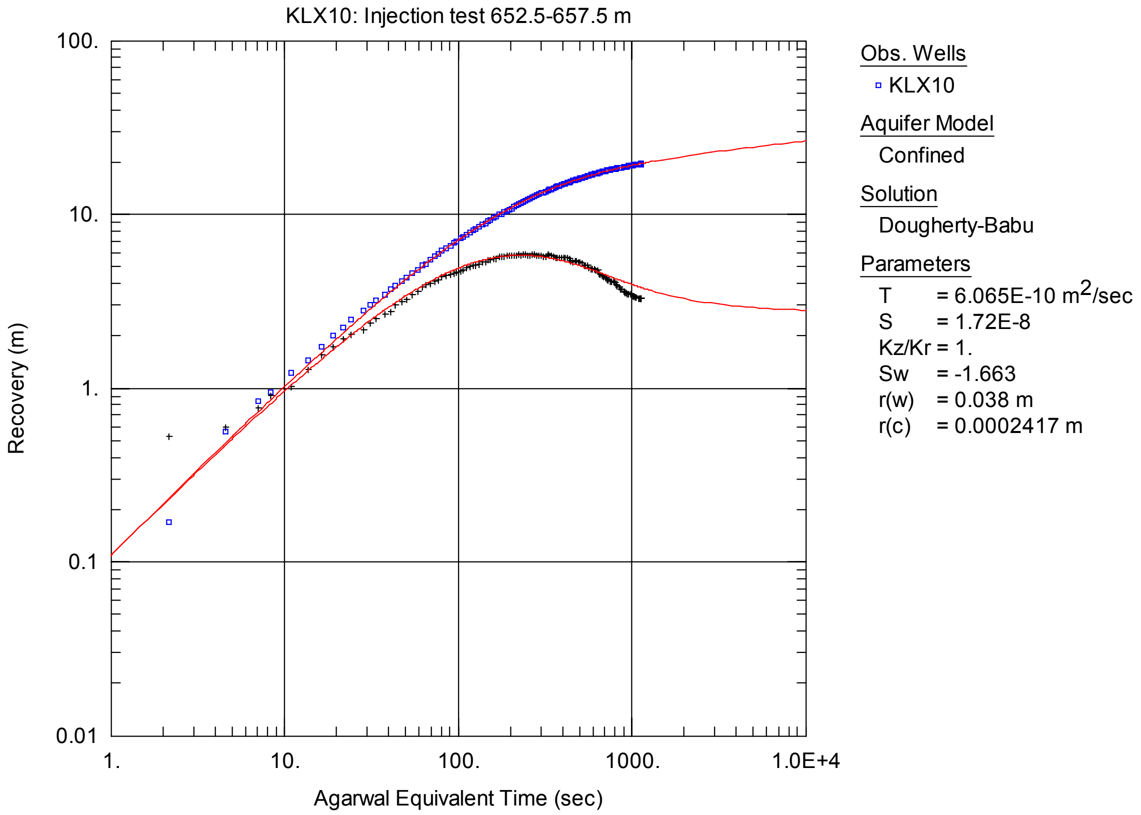


Figure A3-526. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 652.5-657.5 m in KLX10.*

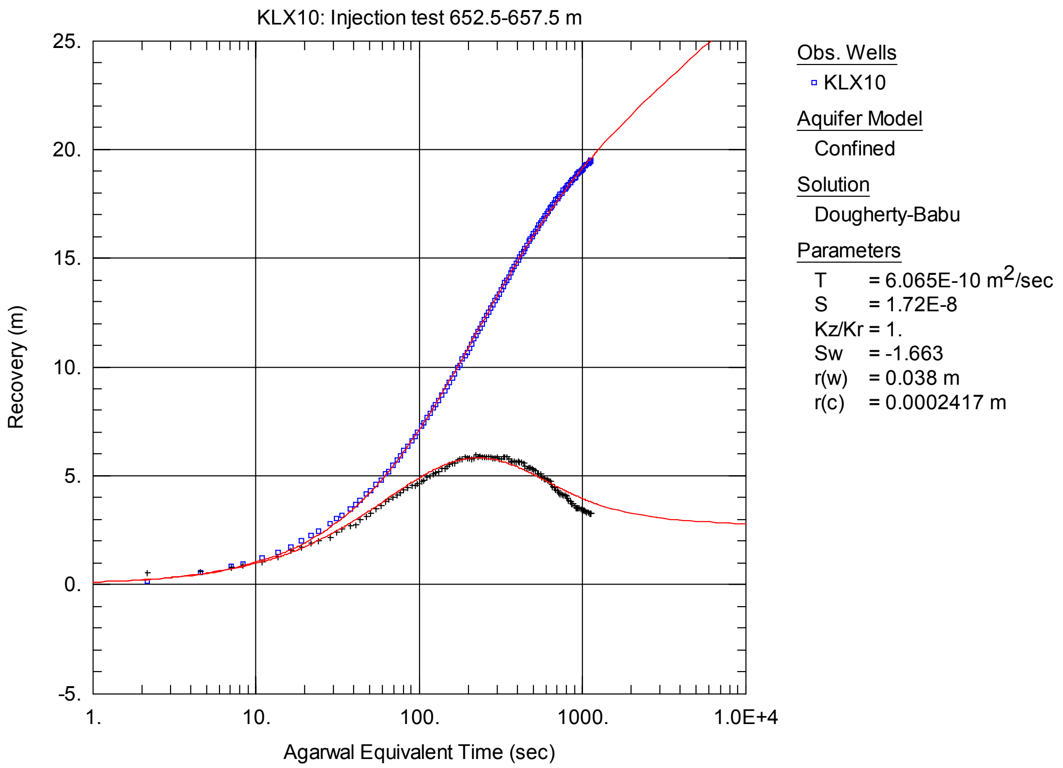


Figure A3-527. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 652.5-657.5 m in KLX10.*

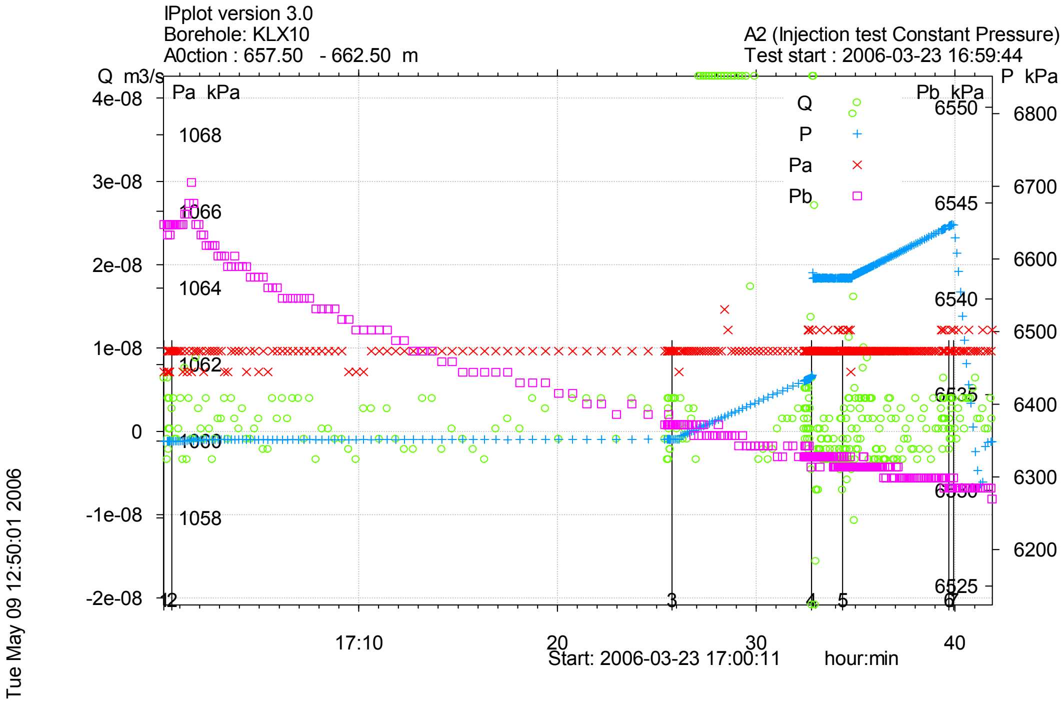


__Figure A3-528.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 657.5-662.5 m in borehole KLX10.

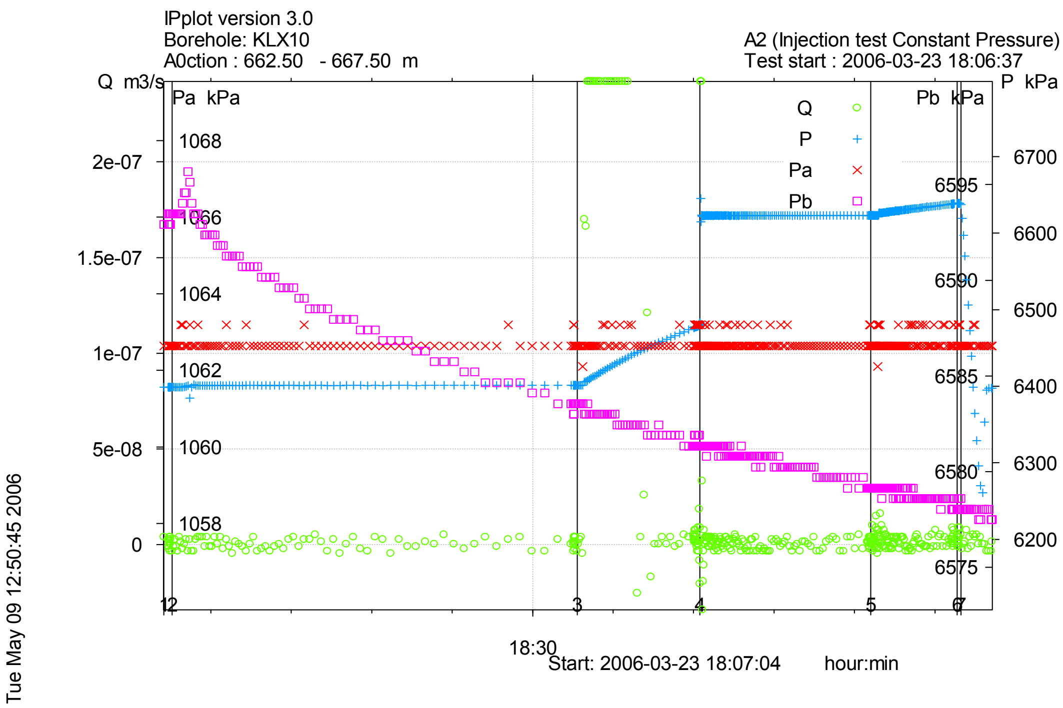


__Figure A3-529.__ Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 662.5-667.5 m in borehole KLX10.

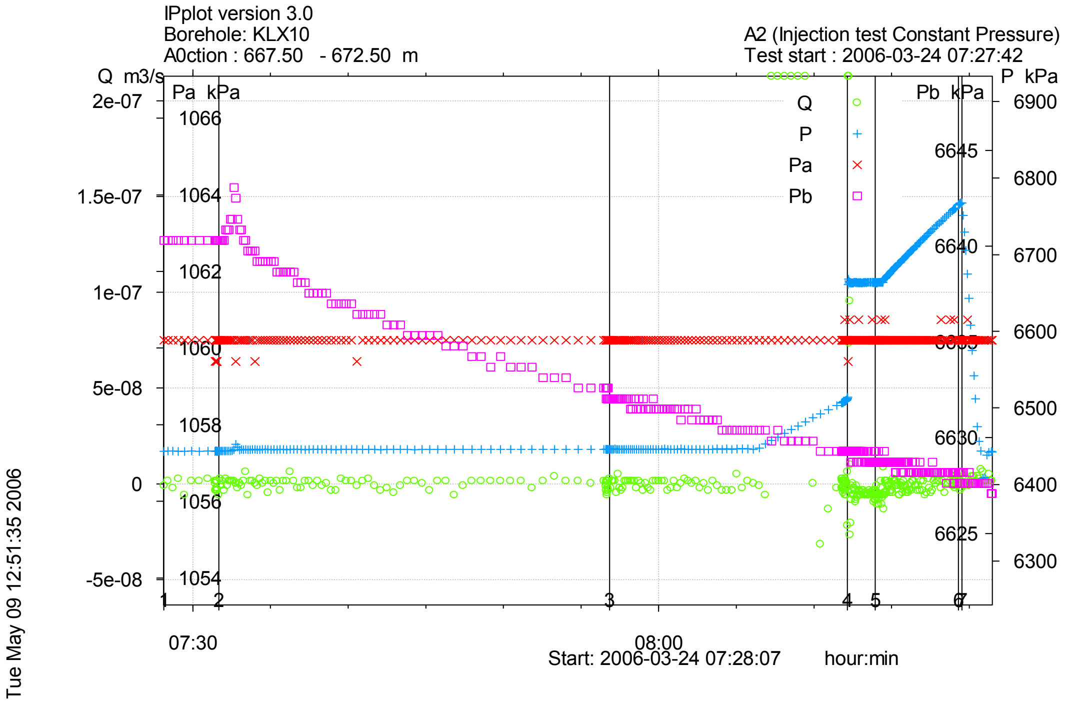


Figure A3-530. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 667.5-672.5 m in borehole KLX10.*

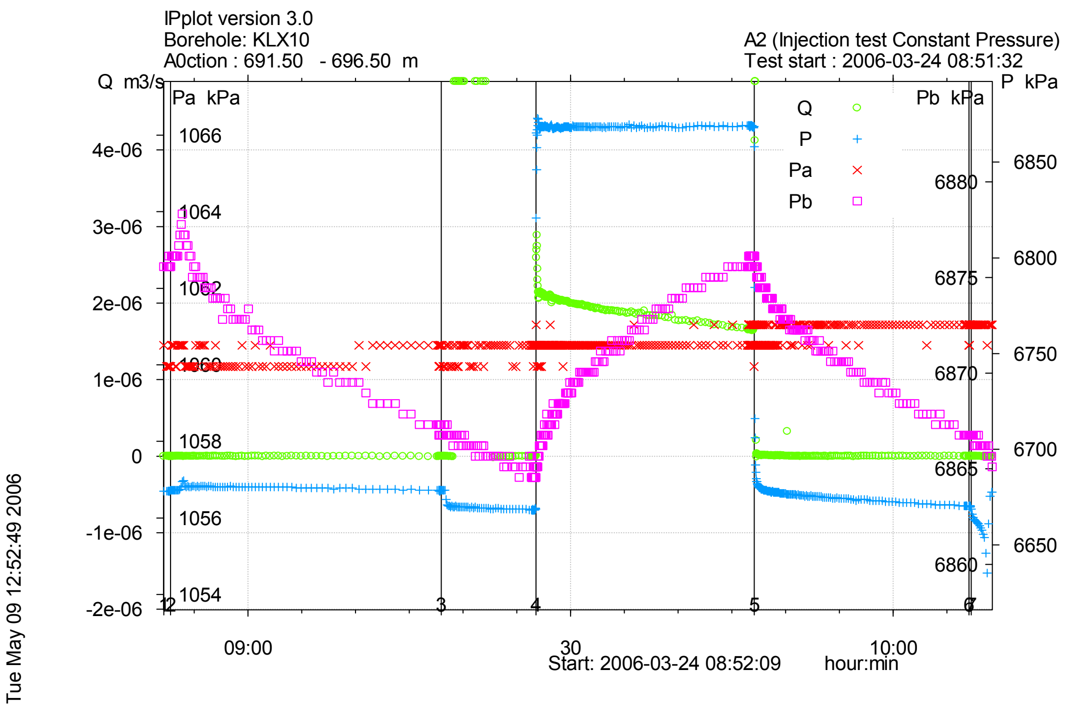


Figure A3-531. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 691.5-696.5 m in borehole KLX10.*

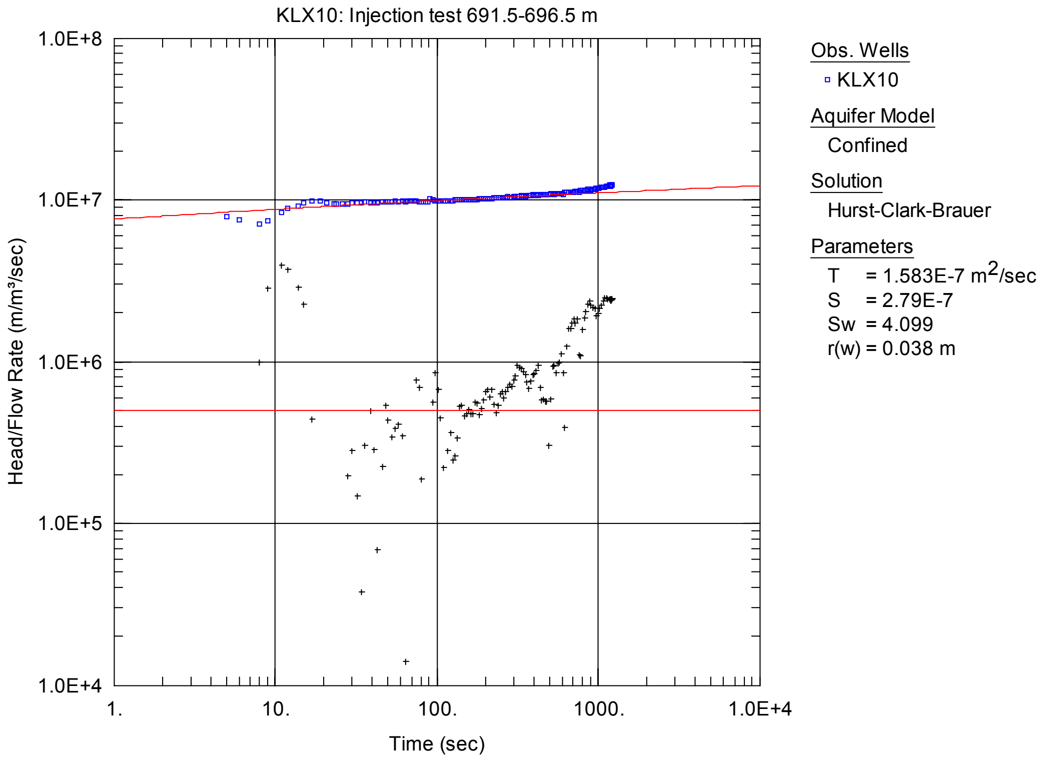


Figure A3-532. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 691.5-696.5 m in KLX10.*

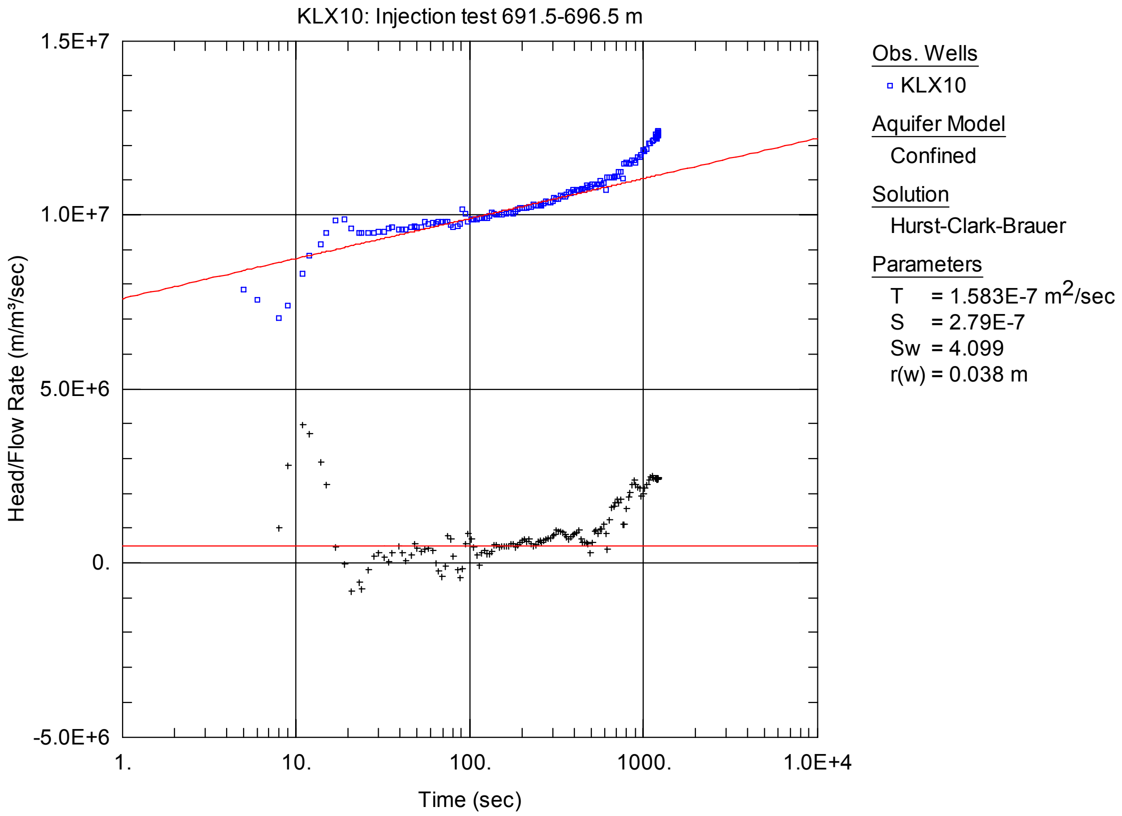


Figure A3-533. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 691.5-696.5 m in KLX10.*

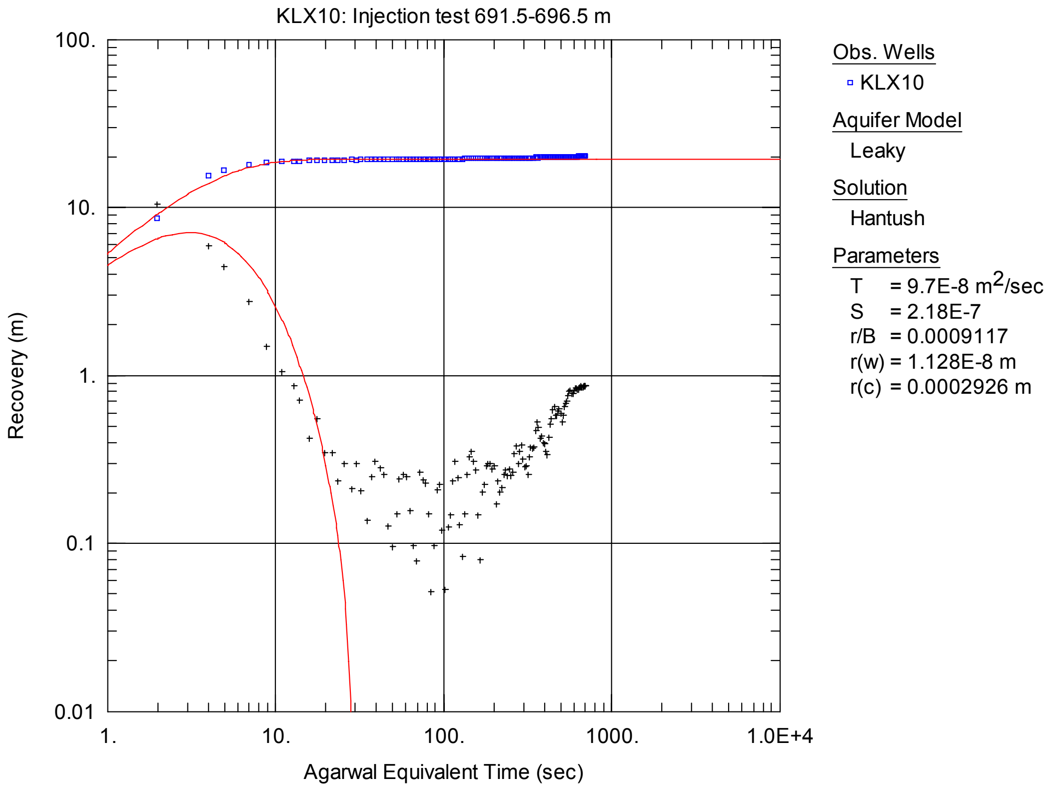


Figure A3-534. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 691.5-696.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

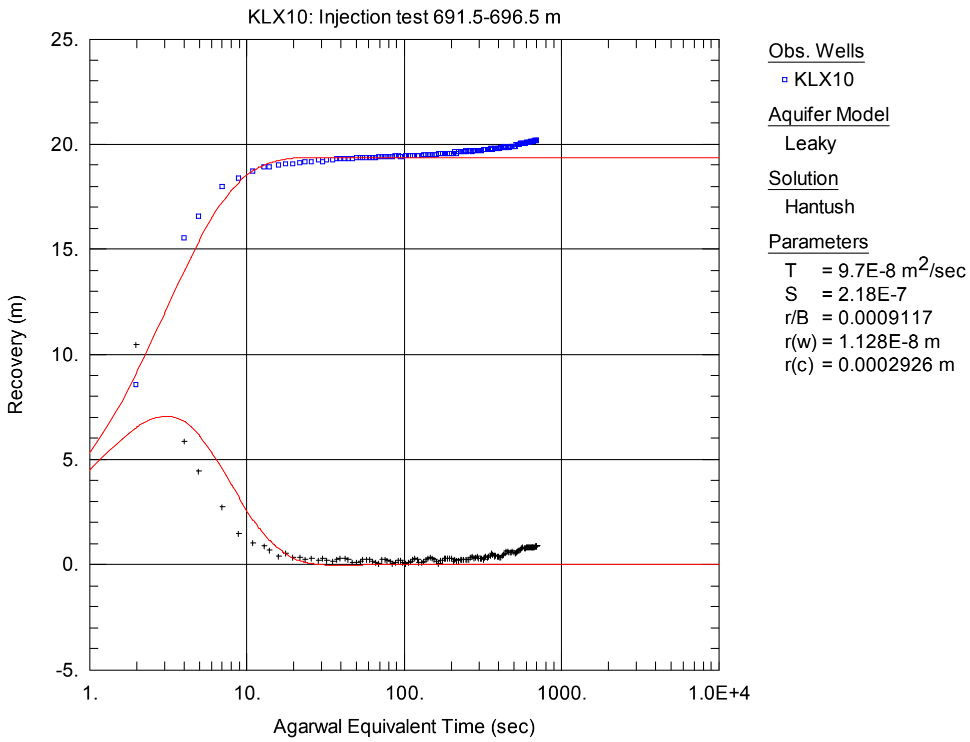


Figure A3-535. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 691.5-696.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

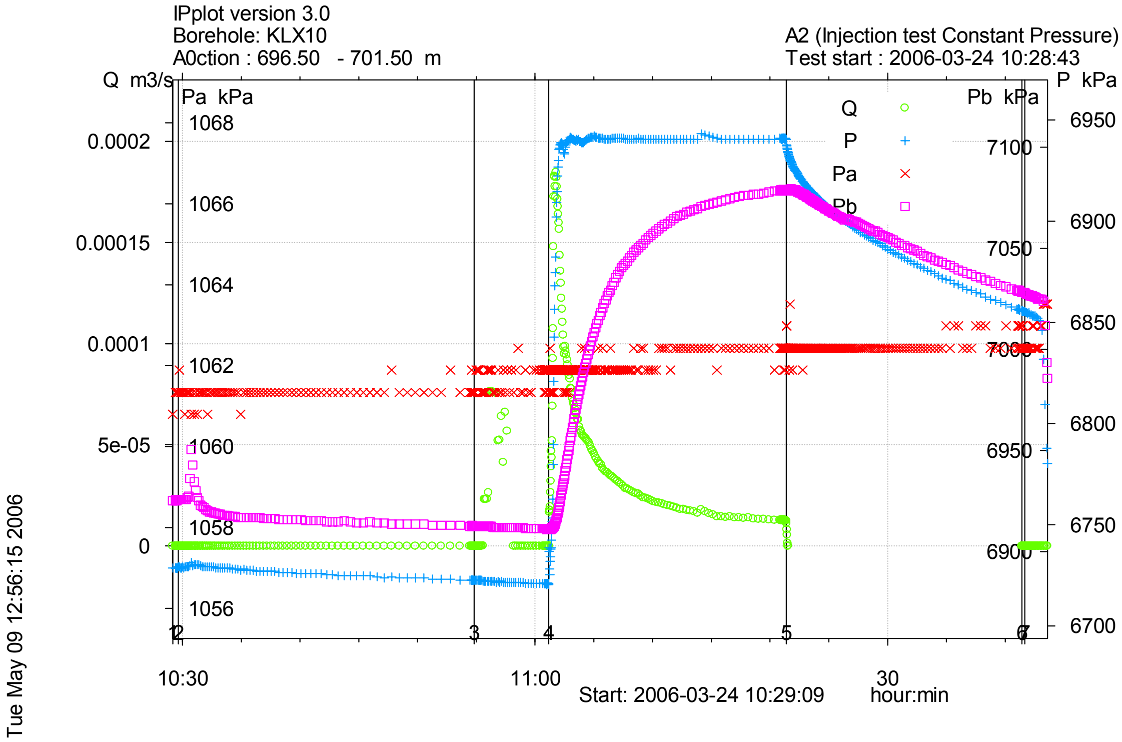


Figure A3-536. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 696.5-701.5 m in borehole KLX10.*

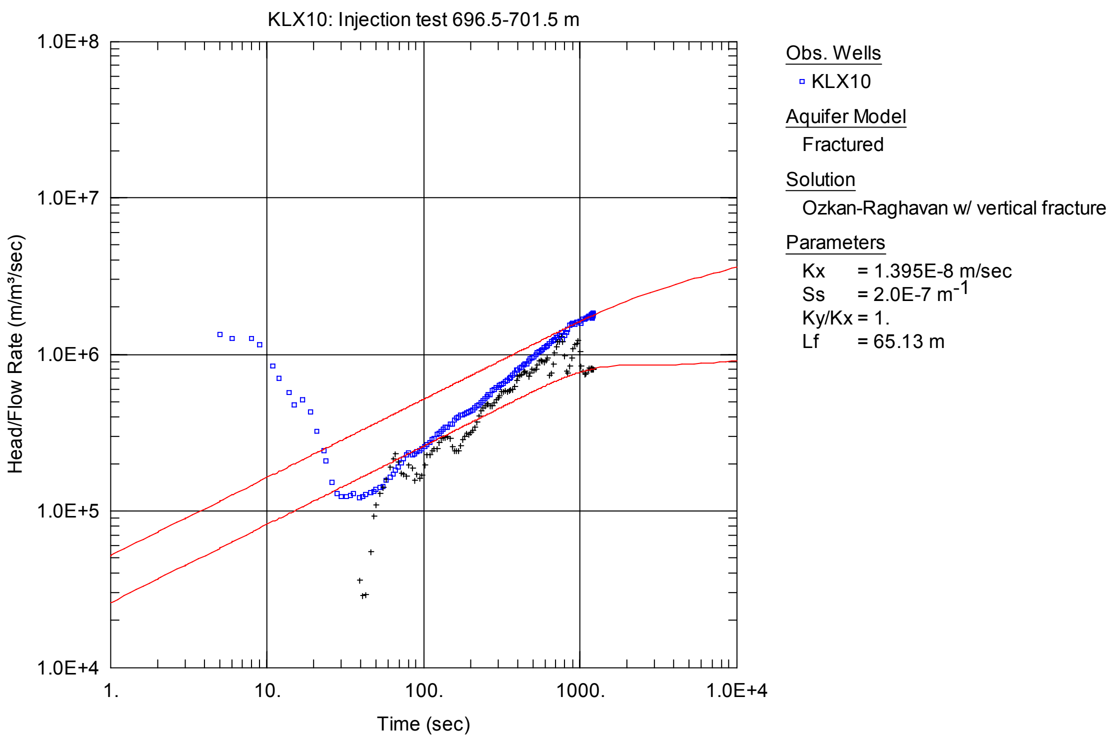


Figure A3-537. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 696.5-701.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

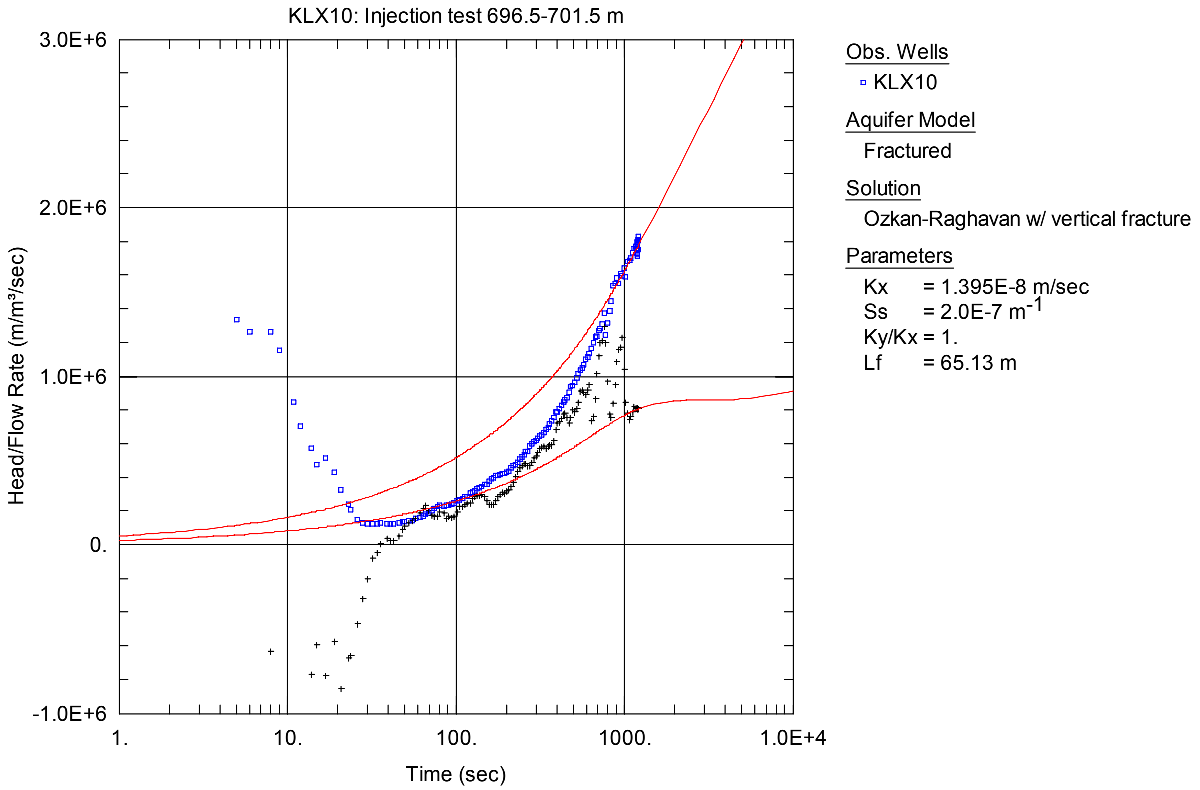


Figure A3-538. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 696.5-701.5 m in KLX10. The type curve fit is showing a possible, however not unambiguous, evaluation.*

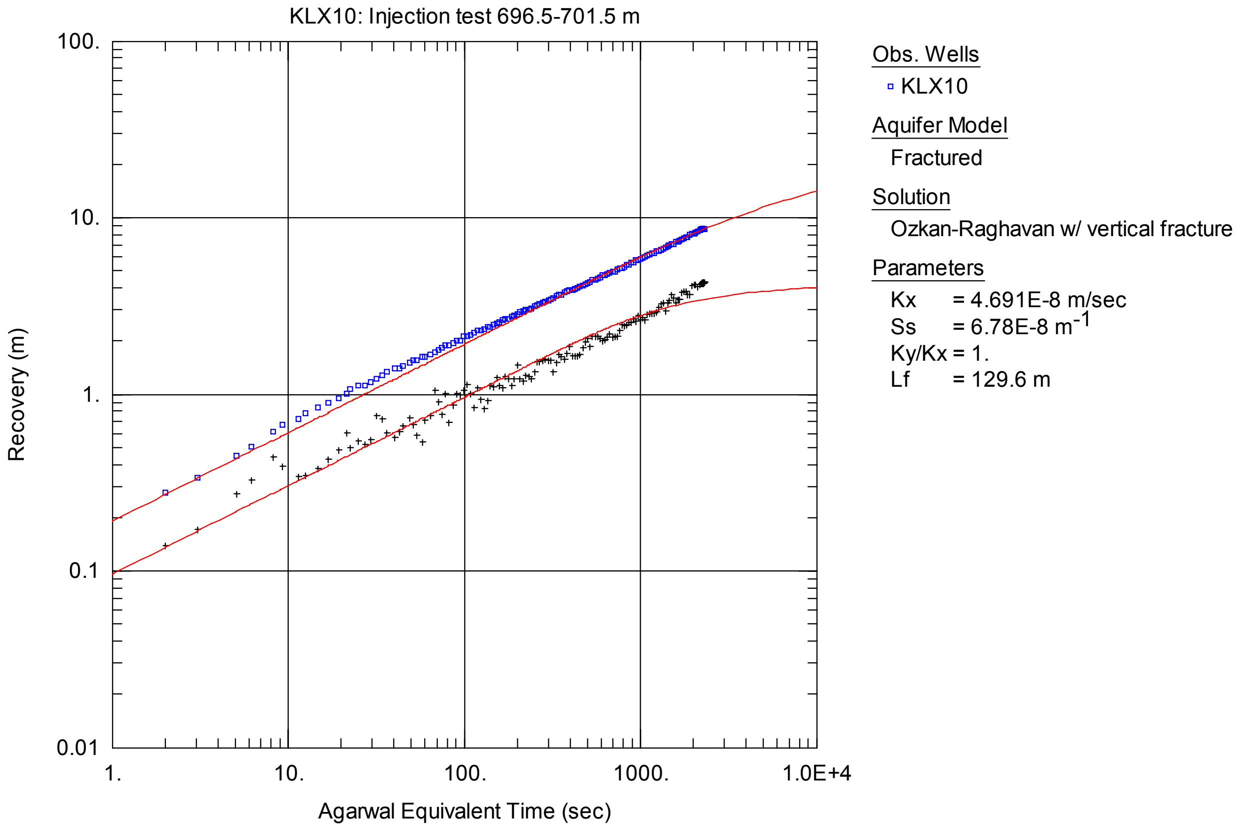


Figure A3-539. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 696.5-701.5 m in KLX10.*

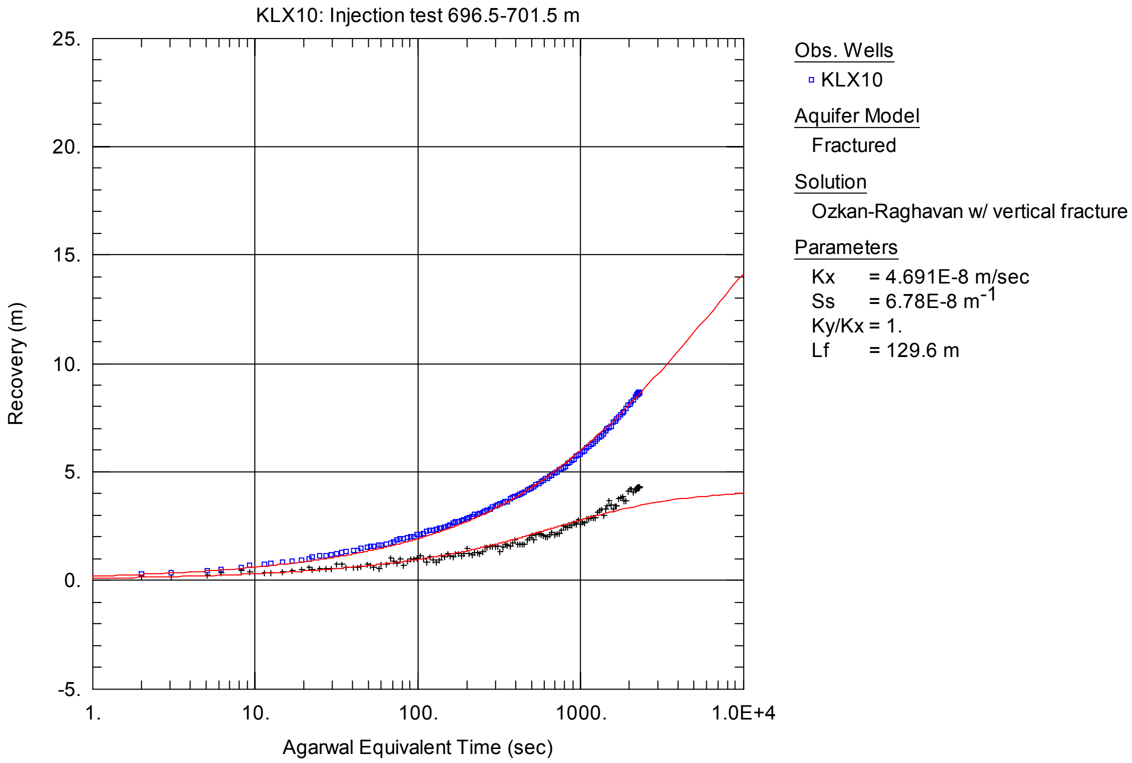


Figure A3-540. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 696.5-701.5 m in KLX10.*

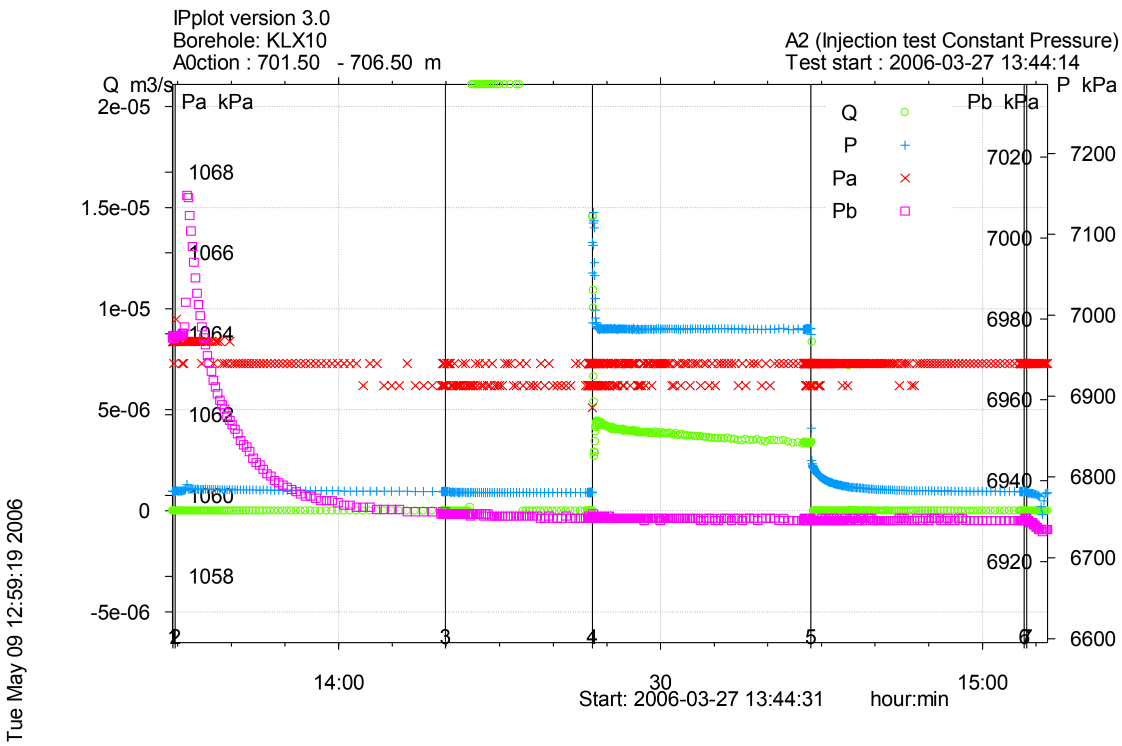


Figure A3-541. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 701.5-706.5 m in borehole KLX10.*

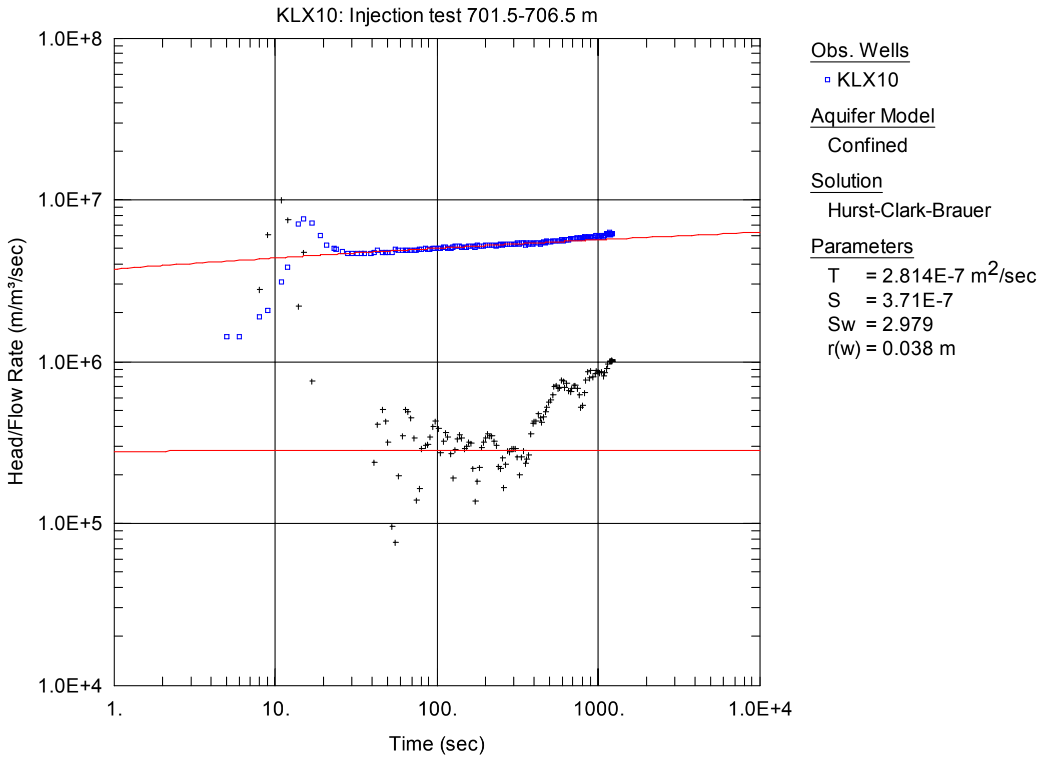


Figure A3-542. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 701.5-706.5 m in KLX10.*

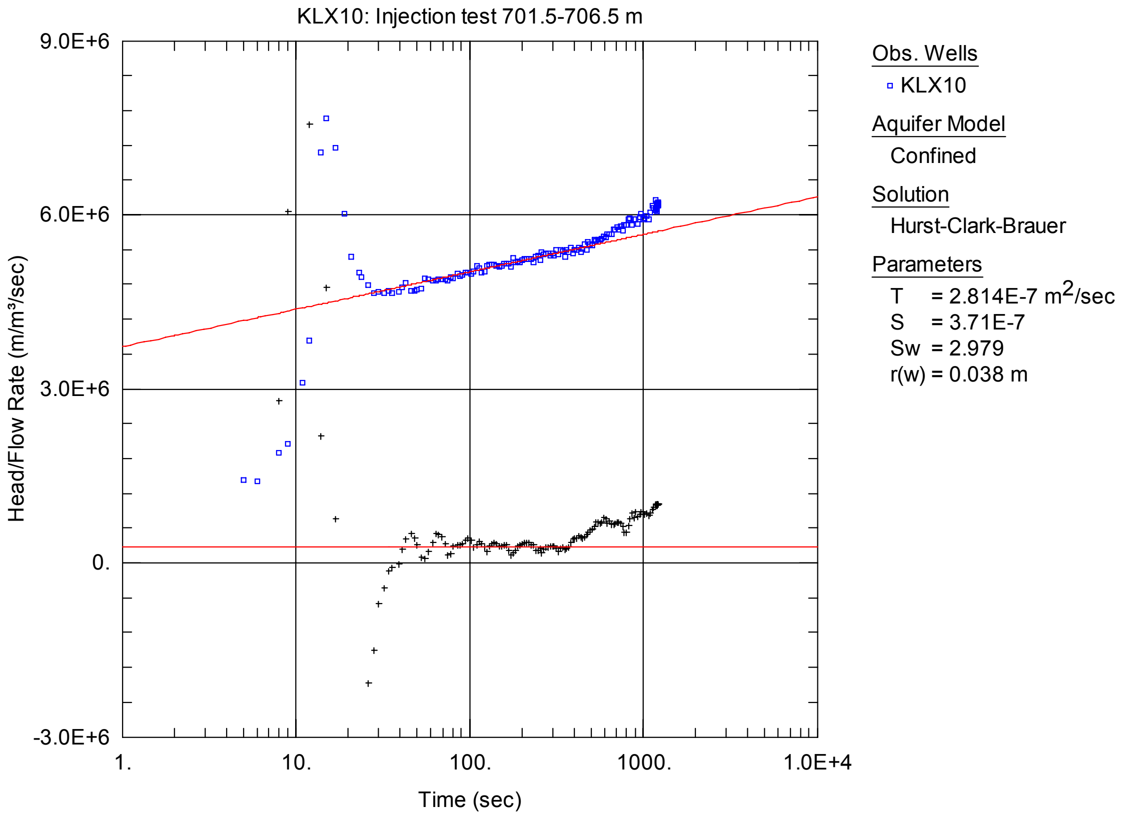


Figure A3-543. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 701.5-706.5 m in KLX10.*

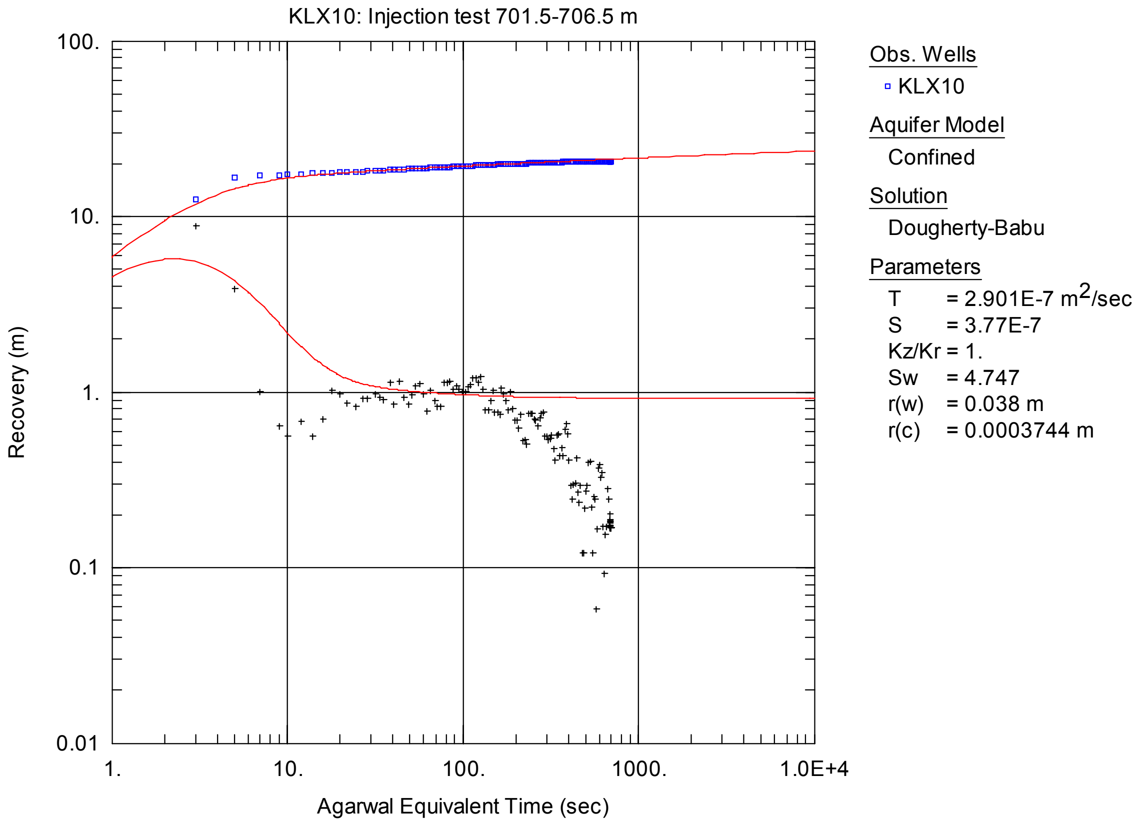


Figure A3-544. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 701.5-706.5 m in KLX10.*

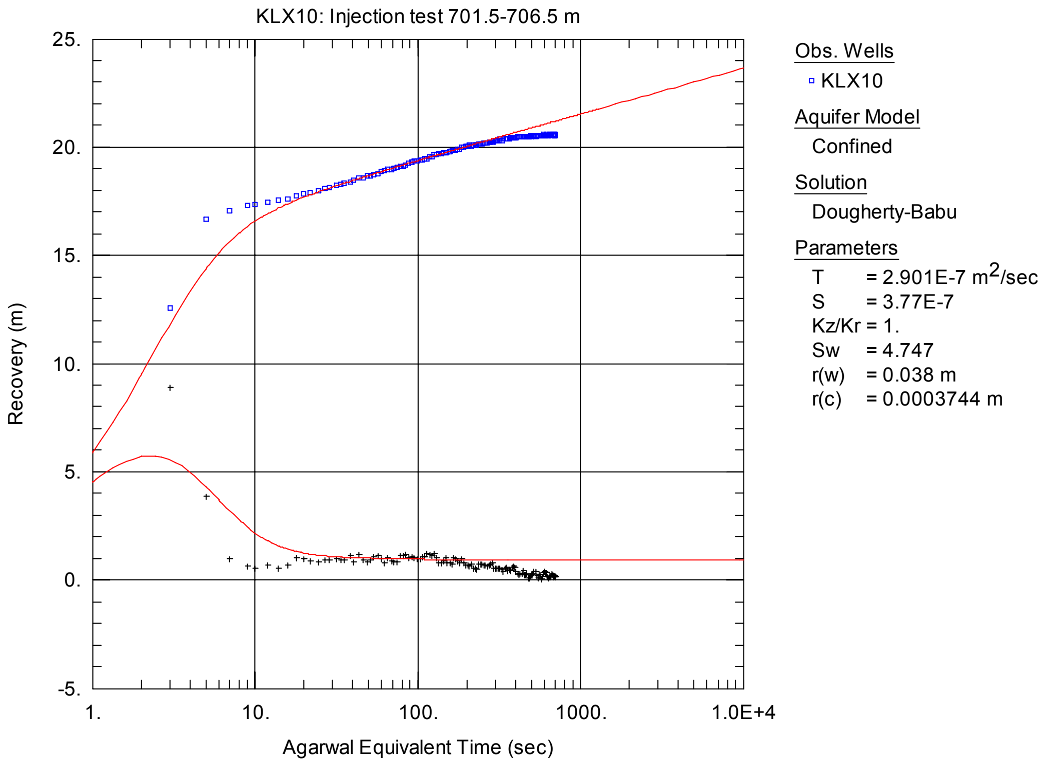


Figure A3-545. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 701.5-706.5 m in KLX10.*

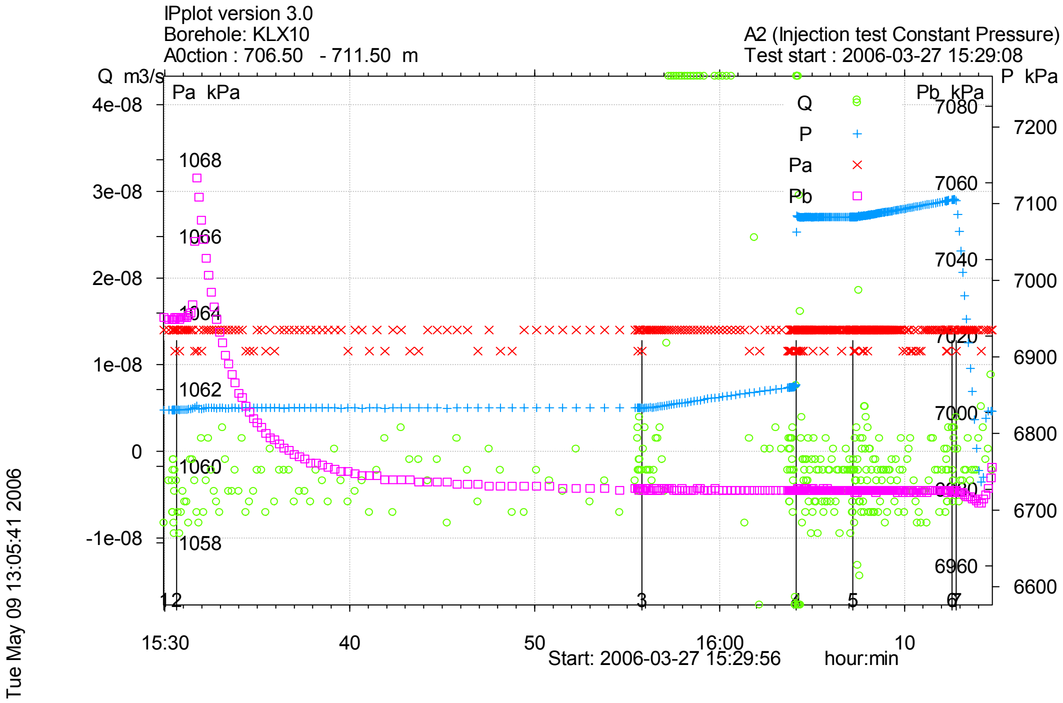


Figure A3-546. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 706.5-711.5 m in borehole KLX10.*

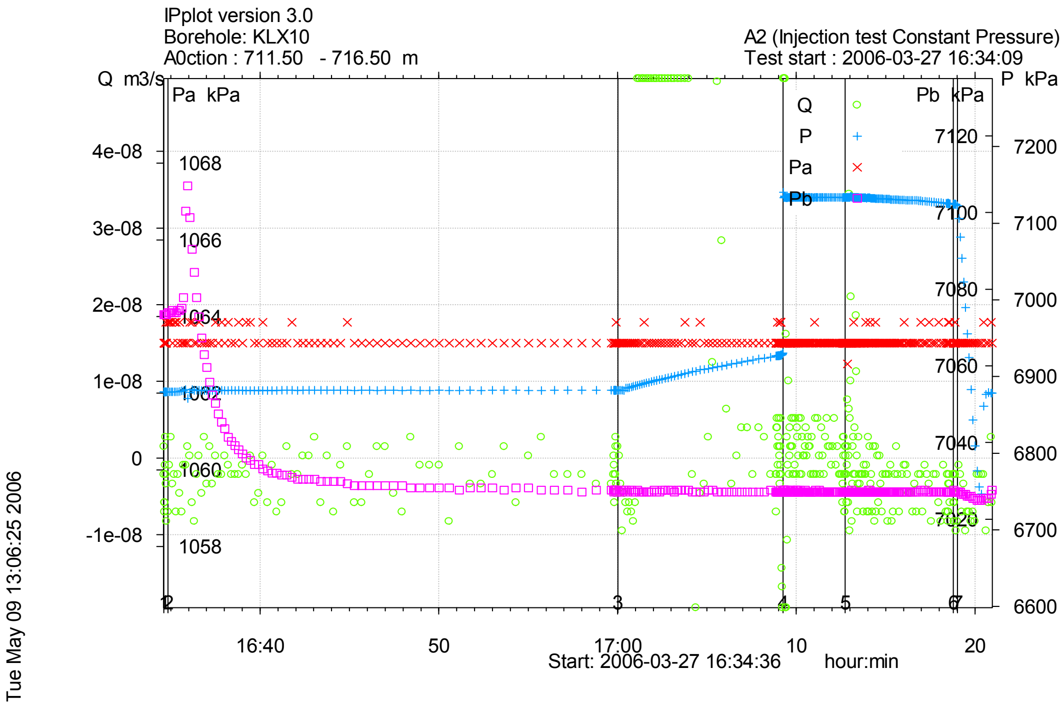


Figure A3-547. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 711.5-716.5 m in borehole KLX10.*

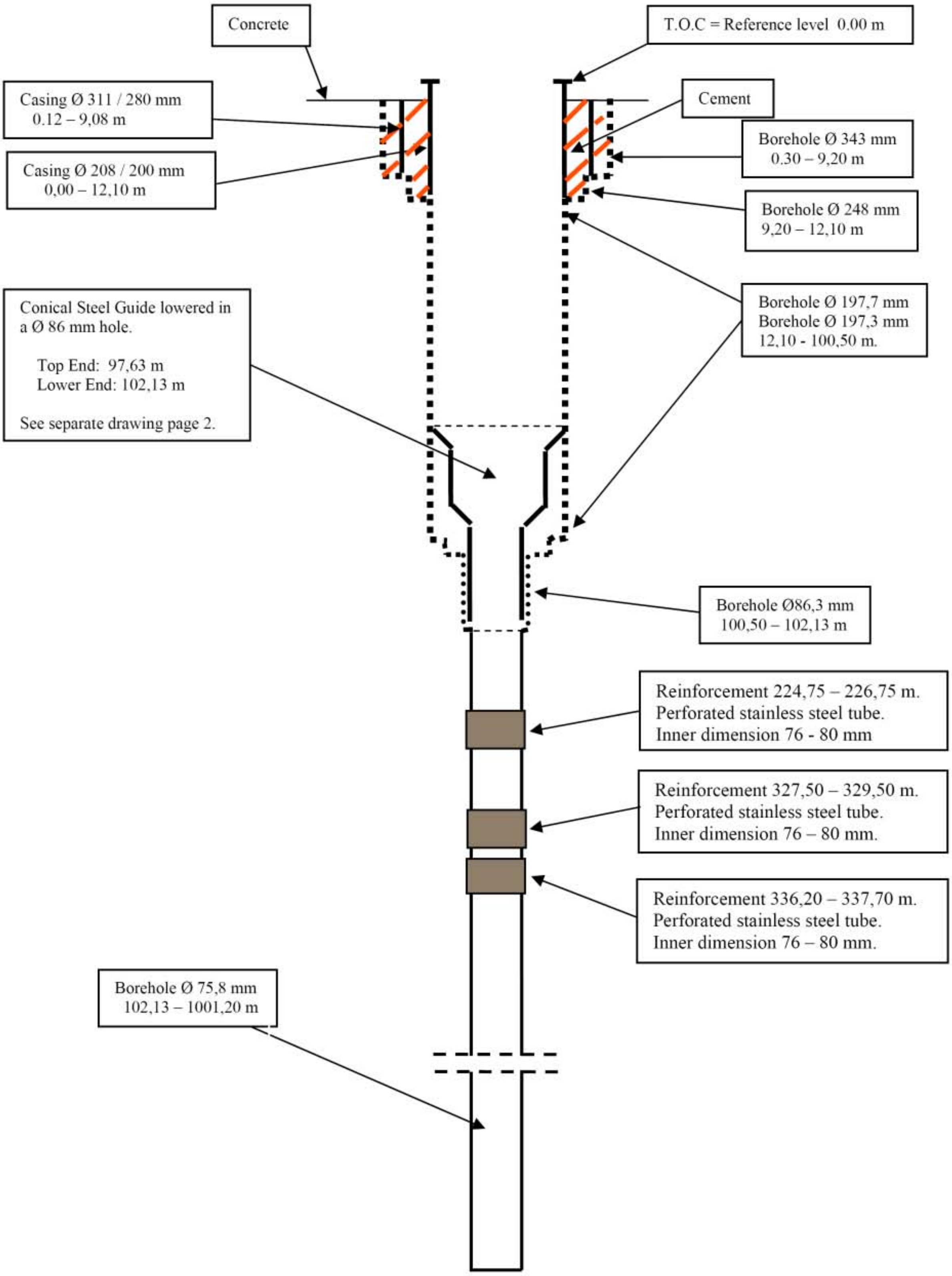
Appendix 4. Borehole technical data

Tabel 1-1 SICADA - Information about KLX10

Title	Value
	Information about cored borehole KLX10 (2005-12-14).
Comment:	No comment exists.
Borehole length (m):	1001.200
Reference level:	TOC
Drilling Period(s):	From Date To Date Secup(m) Seclow(m) Drilling Type 2005-05-24 2005-06-01 0.000 100.600 Percussion drilling 2005-06-18 2005-10-15 0.000 1001.200 Core drilling
Starting point coordinate:	Length(m) Northing(m) Easting(m) Elevation Coord System 0.000 6366319.384 1548515.230 18.276 RT90-RHB70
Angles:	Length(m) Bearing Inclination (- = down) Coord System 0.000 250.812 -85.185 RT90-RHB70
Borehole diameter:	Secup(m) Seclow(m) Hole Diam(m) 0.000 9.200 0.343 9.200 12.100 0.248 12.100 100.500 0.197 100.500 100.600 0.163 100.500 101.130 0.086 101.130 1001.200 0.076
Core diameter:	Secup(m) Seclow(m) Core Diam(m) 100.500 101.130 0.072 101.130 1001.200 0.050
Casing diameter:	Secup(m) Seclow(m) Case In(m) Case Out(m) Comment 0.000 12.100 0.200 0.208 0.120 9.200 0.280 0.311
Cone dimensions:	Secup(m) Seclow(m) Cone In(m) Cone Out(m) 97.480
Grove milling:	Length(m) Trace detectable 110.000 Yes 150.000 Yes 204.000 Yes 251.000 Yes 300.000 Yes 350.000 Yes 402.000 Yes 450.000 Yes 500.000 Yes 550.000 Yes 600.000 Yes 651.000 Yes 698.000 Yes 750.000 Yes 799.000 Yes 850.000 Yes 900.000 Yes 950.000 Yes 980.000 Yes
Installed sections:	Section no Start Date Secup(m) Seclow(m)
Section status:	Packers are released.
	End of additional information.

Number of rows: 61.
Printout from SICADA 2005-12-14 08:47:42.

TECHNICAL DATA BOREHOLE KLX10.(Not on scale).NHa 051028.



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	

Column	Datatype	Unit	Column Description	Alt. Symbol
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		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..	

Column	Datatype	Unit	Column Description	Alt. Symbol
value_type_t_nlr	CHAR		0:true value,-1:T_NLR<lower meas.limit,1:>upper meas.limit	
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)

KLX10 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
KLX10	20060113 08:36	20060113 10:56	105.20	205.20	3	1	20060113 09:54:00	20060113 10:24:11	6.83E-04	0	6.93E-04
KLX10	20060116 14:41	20060116 16:38	203.50	303.50	3	1	20060116 15:36:31	20060116 16:06:47	3.38E-04	0	3.49E-04
KLX10	20060116 17:46	20060116 19:29	301.00	401.00	3	1	20060116 18:26:53	20060116 18:57:03	4.29E-04	0	4.71E-04
KLX10	20060117 10:06	20060117 11:57	398.60	498.60	3	1	20060117 10:55:00	20060117 11:25:19	1.30E-04	0	1.48E-04
KLX10	20060117 15:01	20060117 16:57	497.50	597.50	3	1	20060117 15:55:30	20060117 16:26:03	2.29E-06	0	2.81E-06
KLX10	20060117 18:19	20060117 20:09	596.50	696.50	3	1	20060117 19:06:59	20060117 19:37:25	1.62E-06	0	1.86E-06
KLX10	20060118 09:56	20060118 11:50	696.50	796.50	3	1	20060118 10:48:03	20060118 11:18:27	9.91E-06	0	2.67E-05
KLX10	20060118 14:19	20060118 16:10	796.50	896.50	3	1	20060118 15:08:03	20060118 15:38:21	6.30E-06	0	7.07E-06
KLX10	20060118 17:36	20060118 19:25	892.50	992.50	3	1	20060118 18:22:53	20060118 18:53:22	3.40E-08	0	8.53E-08
KLX10	20060216 17:28	20060216 19:00	105.20	125.20	3	1	20060216 18:17:38	20060216 18:38:06	4.39E-04	0	4.49E-04
KLX10	20060216 19:45	20060216 21:01	120.20	140.20	3	1	20060216 20:18:56	20060216 20:39:07	1.49E-04	0	1.53E-04
KLX10	20060217 08:22	20060217 09:43	140.20	160.20	3	1	20060217 09:00:36	20060217 09:21:00	1.69E-04	0	1.74E-04
KLX10	20060217 10:28	20060217 11:50	149.60	169.60	3	1	20060217 11:08:17	20060217 11:28:41	1.04E-04	0	1.04E-04
KLX10	20060220 08:59	20060220 10:14	174.60	194.60	3	1	20060220 09:32:06	20060220 09:52:29	3.47E-04	0	3.52E-04
KLX10	20060220 11:01	20060220 12:15	191.30	211.30	3	1	20060220 11:33:23	20060220 11:53:36	4.28E-04	0	4.34E-04
KLX10	20060220 13:19	20060220 14:33	214.00	234.00	3	1	20060220 13:50:47	20060220 14:11:03	1.06E-04	0	1.09E-04
KLX10	20060220 14:51	20060220 16:05	222.50	242.50	3	1	20060220 15:22:48	20060220 15:43:03	1.13E-04	0	1.15E-04
KLX10	20060220 16:25	20060220 17:39	242.50	262.50	3	1	20060220 16:57:11	20060220 17:17:25	1.15E-04	0	1.18E-04
KLX10	20060124 16:07	20060124 17:29	262.50	282.50	3	1	20060124 16:47:26	20060124 17:07:46	1.45E-06	0	1.62E-06
KLX10	20060124 17:54	20060124 19:09	282.50	302.50	3	1	20060124 18:26:36	20060124 18:46:56	3.52E-06	0	3.85E-06
KLX10	20060125 08:05	20060125 09:32	297.50	317.50	3	1	20060125 08:49:44	20060125 09:10:07	5.50E-07	0	5.91E-07
KLX10	20060125 10:01	20060125 11:16	318.20	338.20	3	1	20060125 10:34:13	20060125 10:54:23	5.20E-04	0	5.59E-04
KLX10	20060125 11:44	20060125 12:58	339.20	359.20	3	1	20060125 12:16:25	20060125 12:36:43	2.65E-05	0	2.75E-05
KLX10	20060125 14:17	20060125 15:44	359.20	379.20	3	1	20060125 15:02:12	20060125 15:22:33	5.90E-06	0	6.52E-06
KLX10	20060125 16:21	20060125 17:41	377.70	397.70	3	1	20060125 16:59:02	20060125 17:19:22	5.78E-06	0	8.00E-06
KLX10	20060125 18:10	20060125 19:30	398.60	418.60	3	1	20060125 18:48:26	20060125 19:08:46	2.41E-05	0	2.57E-05
KLX10	20060126 07:45	20060126 09:01	418.60	438.60	3	1	20060126 08:18:51	20060126 08:38:49	1.28E-04	0	1.34E-04

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
KLX10	20060126 09:25	20060126 10:40	432.50	452.50	3	1	20060126 09:57:41	20060126 10:18:01	1.91E-05	0	2.07E-05
KLX10	20060126 13:55	20060126 15:11	452.50	472.50	3	1	20060126 14:28:56	20060126 14:49:22	6.21E-07	0	6.73E-07
KLX10	20060221 08:19	20060221 09:35	472.50	492.50	3	1	20060221 08:53:01	20060221 09:13:22	1.80E-08	0	2.19E-08
KLX10	20060221 10:05	20060221 11:18	492.50	512.50	3	1	20060221 10:36:26	20060221 10:56:49	2.36E-08	0	3.23E-08
KLX10	20060221 11:33	20060221 13:23	512.50	532.50	3	1	20060221 12:41:24	20060221 13:01:43	1.73E-07	0	2.79E-07
KLX10	20060221 13:43	20060221 14:57	532.50	552.50	3	1	20060221 14:14:49	20060221 14:35:09	1.51E-06	0	1.61E-06
KLX10	20060221 15:20	20060221 16:35	552.50	572.50	3	1	20060221 15:52:44	20060221 16:13:03	6.94E-07	0	9.85E-07
KLX10	20060221 17:03	20060221 18:16	572.50	592.50	3	1	20060221 17:34:27	20060221 17:54:47	6.53E-08	0	9.17E-08
KLX10	20060222 07:45	20060222 08:59	592.50	612.50	3	1	20060222 08:16:58	20060222 08:37:17	8.15E-08	0	1.58E-07
KLX10	20060222 09:22	20060222 10:36	612.50	632.50	3	1	20060222 09:54:22	20060222 10:14:46	1.26E-08	0	3.80E-08
KLX10	20060222 11:04	20060222 12:19	632.50	652.50	3	1	20060222 11:36:52	20060222 11:57:23	1.30E-07	0	1.65E-07
KLX10	20060222 13:09	20060222 14:23	652.50	672.50	3	1	20060222 13:41:28	20060222 14:01:50	2.30E-08	0	4.22E-08
KLX10	20060222 14:44	20060222 15:37	672.50	692.50	3	1	20060222 15:16:34	20060222 15:29:52		-1	
KLX10	20060222 16:10	20060222 17:23	696.50	716.50	3	1	20060222 16:41:30	20060222 17:01:46	1.10E-05	0	3.20E-05
KLX10	20060222 17:46	20060222 19:00	716.50	736.50	3	1	20060222 18:18:00	20060222 18:38:19	1.28E-07	0	1.85E-07
KLX10	20060222 19:21	20060222 20:34	736.50	756.50	3	1	20060222 19:52:16	20060222 20:12:52		-1	
KLX10	20060223 08:31	20060223 09:34	756.50	776.50	3	1	20060223 09:03:08	20060223 09:23:04		-1	
KLX10	20060223 09:58	20060223 11:11	776.50	796.50	3	1	20060223 10:29:17	20060223 10:49:39	1.10E-08	0	3.47E-08
KLX10	20060223 11:29	20060223 12:42	796.50	816.50	3	1	20060223 12:00:15	20060223 12:20:11		-1	
KLX10	20060223 13:18	20060223 14:50	816.50	836.50	3	1	20060223 14:07:50	20060223 14:28:12	8.30E-08	0	1.00E-07
KLX10	20060223 15:11	20060223 16:26	836.50	856.50	3	1	20060223 15:43:37	20060223 16:03:53	2.79E-06	0	3.19E-06
KLX10	20060223 16:45	20060223 17:29	856.50	876.50	3	1	20060223 17:20:47	20060223 17:21:43		-1	
KLX10	20060223 17:52	20060223 19:06	876.50	896.50	3	1	20060223 18:23:42	20060223 18:44:15	6.10E-09	0	2.95E-08
KLX10	20060224 07:44	20060224 08:31	892.50	912.50	3	1	20060224 08:19:22	20060224 08:24:08		-1	
KLX10	20060224 08:55	20060224 09:44	912.50	932.50	3	1	20060224 09:30:09	20060224 09:36:52		-1	
KLX10	20060227 09:21	20060227 10:09	932.50	952.50	3	1	20060227 09:58:13	20060227 10:01:50		-1	
KLX10	20060227 10:38	20060227 11:57	952.50	972.50	3	1	20060227 11:15:19	20060227 11:35:36	2.13E-08	0	4.02E-08
KLX10	20060227 13:18	20060227 14:37	972.50	992.50	3	1	20060227 13:54:49	20060227 14:15:23	2.74E-08	0	9.47E-08
KLX10	20060301 09:38	20060301 11:17	120.20	125.20	3	1	20060301 10:35:28	20060301 10:55:31	4.03E-05	0	4.55E-05
KLX10	20060301 12:43	20060301 13:48	169.60	174.60	3	1	20060301 13:35:57	20060301 13:41:26		-1	
KLX10	20060301 15:22	20060301 16:44	297.50	302.50	3	1	20060301 16:02:33	20060301 16:22:54	1.13E-07	0	1.64E-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
KLX10	20060301 17:02	20060301 18:23	302.50	307.50	3	1	20060301 17:41:43	20060301 18:02:05	9.59E-08	0	1.27E-07
KLX10	20060301 18:42	20060301 19:58	307.00	312.00	3	1	20060301 19:16:08	20060301 19:36:30	2.75E-07	0	2.96E-07
KLX10	20060309 08:12	20060310 09:29	312.50	317.50	3	1	20060309 09:08:38	20060309 09:29:11	6.26E-07	0	6.53E-07
KLX10	20060309 10:39	20060309 11:55	341.20	346.20	3	1	20060309 11:12:55	20060309 11:33:11	4.54E-06	0	4.90E-06
KLX10	20060309 12:59	20060309 14:14	344.50	349.50	3	1	20060309 13:31:50	20060309 13:52:15	1.26E-06	0	1.39E-06
KLX10	20060309 14:28	20060309 15:45	348.30	353.30	3	1	20060309 15:02:59	20060309 15:23:33	1.35E-08	0	3.79E-08
KLX10	20060309 15:59	20060309 17:17	353.30	358.30	3	1	20060309 16:34:54	20060309 16:55:06	2.45E-05	0	2.63E-05
KLX10	20060309 17:29	20060309 18:43	358.30	363.30	3	1	20060309 18:00:52	20060309 18:21:08	6.20E-06	0	7.05E-06
KLX10	20060310 07:15	20060310 08:31	362.40	367.40	3	1	20060310 07:48:35	20060310 08:09:04	5.54E-06	0	6.28E-06
KLX10	20060310 08:46	20060310 10:03	367.40	372.40	3	1	20060310 09:20:57	20060310 09:41:31	4.50E-08	0	5.95E-08
KLX10	20060310 10:18	20060310 11:03	372.40	377.40	3	1	20060310 10:54:40	20060310 10:55:52		-1	
KLX10	20060313 08:15	20060313 08:55	377.40	382.40	3	1	20060313 08:46:48	20060313 08:48:17		-1	
KLX10	20060313 09:16	20060313 10:31	382.40	387.40	3	1	20060313 09:50:48	20060313 10:11:05	1.09E-06	0	1.43E-06
KLX10	20060313 10:41	20060313 12:02	387.40	392.40	3	1	20060313 11:20:08	20060313 11:40:35	2.22E-08	0	3.45E-08
KLX10	20060313 12:28	20060313 13:43	389.00	394.00	3	1	20060313 13:00:57	20060313 13:21:25	1.61E-08	0	2.32E-08
KLX10	20060313 13:50	20060313 15:06	392.70	397.70	3	1	20060313 14:23:42	20060313 14:44:06	8.86E-06	0	1.06E-05
KLX10	20060313 15:22	20060313 16:35	395.70	400.70	3	1	20060313 15:53:20	20060313 16:13:38	1.18E-05	0	1.34E-05
KLX10	20060313 16:54	20060313 18:08	406.00	411.00	3	1	20060313 17:26:24	20060313 17:46:42	3.38E-06	0	3.84E-06
KLX10	20060314 07:31	20060314 08:47	411.00	416.00	3	1	20060314 08:04:51	20060314 08:25:12	8.15E-06	0	1.07E-05
KLX10	20060314 08:56	20060314 10:15	414.00	419.00	3	1	20060314 09:32:36	20060314 09:52:50	6.04E-06	0	7.12E-06
KLX10	20060314 10:46	20060314 11:59	419.00	424.00	3	1	20060314 11:17:30	20060314 11:37:45	5.46E-05	0	5.60E-05
KLX10	20060314 13:30	20060314 14:43	424.00	429.00	3	1	20060314 14:01:27	20060314 14:21:45	6.99E-06	0	7.88E-06
KLX10	20060314 14:56	20060314 16:10	429.00	434.00	3	1	20060314 15:28:09	20060314 15:48:24	5.32E-05	0	5.39E-05
KLX10	20060314 16:21	20060314 17:34	434.00	439.00	3	1	20060314 16:51:49	20060314 17:12:03	1.94E-05	0	2.14E-05
KLX10	20060314 17:46	20060314 19:11	439.00	444.00	3	1	20060314 18:28:58	20060314 18:49:14	5.50E-08	0	6.26E-08
KLX10	20060315 07:26	20060315 08:47	442.50	447.50	3	1	20060315 08:04:46	20060315 08:25:04	1.37E-07	0	1.67E-07
KLX10	20060315 09:03	20060315 10:16	447.50	452.50	3	1	20060315 09:34:25	20060315 09:54:40	2.00E-07	0	2.10E-07
KLX10	20060315 10:26	20060315 11:40	452.50	457.50	3	1	20060315 10:57:33	20060315 11:17:50	5.97E-07	0	6.13E-07
KLX10	20060315 12:27	20060315 13:41	457.50	462.50	3	1	20060315 12:59:08	20060315 13:19:25	7.72E-08	0	8.20E-08
KLX10	20060315 13:54	20060315 14:33	462.50	467.50	3	1	20060315 14:26:13	20060315 14:27:14		-1	
KLX10	20060315 14:51	20060315 16:06	467.50	472.50	3	1	20060315 15:23:32	20060315 15:43:52	6.99E-09	0	1.16E-08
KLX10	20060315 16:14	20060315 17:28	472.50	477.50	3	1	20060315 16:46:19	20060315 17:06:36	7.60E-09	0	9.00E-09

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
KLX10	20060315 17:38	20060315 18:19	477.50	482.50	3	1	20060315 18:10:41	20060315 18:11:43		-1	
KLX10	20060316 07:17	20060316 08:31	482.50	487.50	3	1	20060316 07:49:00	20060316 08:08:58		-1	
KLX10	20060316 08:41	20060316 09:22	487.50	492.50	3	1	20060316 09:13:06	20060316 09:14:30		-1	
KLX10	20060316 09:36	20060316 10:16	492.50	497.50	3	1	20060316 10:07:26	20060316 10:08:31		-1	
KLX10	20060316 10:25	20060316 11:04	497.50	502.50	3	1	20060316 10:56:04	20060316 10:57:04		-1	
KLX10	20060316 11:13	20060316 12:32	502.50	507.50	3	1	20060316 12:23:27	20060316 12:24:32		-1	
KLX10	20060316 12:45	20060316 13:59	507.50	512.50	3	1	20060316 13:16:35	20060316 13:36:55	3.00E-08	0	3.51E-08
KLX10	20060316 14:10	20060316 14:50	512.50	517.50	3	1	20060316 14:41:59	20060316 14:43:00		-1	
KLX10	20060316 14:58	20060316 16:11	517.50	522.50	3	1	20060316 15:29:23	20060316 15:49:42	1.33E-07	0	2.19E-07
KLX10	20060316 16:21	20060316 17:35	522.50	527.50	3	1	20060316 16:53:02	20060316 17:13:19	1.33E-08	0	1.70E-08
KLX10	20060317 07:45	20060317 09:01	527.50	532.50	3	1	20060317 08:18:38	20060317 08:38:45	7.72E-08	0	7.70E-08
KLX10	20060317 09:09	20060317 10:24	532.50	537.50	3	1	20060317 09:41:40	20060317 10:01:57	8.60E-08	0	1.04E-07
KLX10	20060317 10:36	20060317 11:51	537.50	542.50	3	1	20060317 11:08:48	20060317 11:29:01	1.27E-06	0	1.30E-06
KLX10	20060320 13:37	20060320 14:54	542.50	547.50	3	1	20060320 14:12:13	20060320 14:32:34	5.16E-07	0	5.48E-07
KLX10	20060320 15:19	20060320 16:47	547.50	552.50	3	1	20060320 16:04:50	20060320 16:25:18	2.38E-08	0	3.02E-08
KLX10	20060320 17:03	20060320 18:22	552.50	557.50	3	1	20060320 17:40:27	20060320 18:00:50	1.61E-07	0	1.87E-07
KLX10	20060321 08:25	20060321 09:43	557.50	562.50	3	1	20060321 09:00:51	20060321 09:21:12	7.71E-07	0	1.05E-06
KLX10	20060321 09:56	20060321 10:39	562.50	567.50	3	1	20060321 10:30:15	20060321 10:32:10		-1	
KLX10	20060321 10:58	20060321 11:41	567.50	572.50	3	1	20060321 11:31:29	20060321 11:33:30		-1	
KLX10	20060321 12:04	20060321 13:42	572.50	577.50	3	1	20060321 13:30:11	20060321 13:35:07		-1	
KLX10	20060321 13:58	20060321 14:45	577.50	582.50	3	1	20060321 14:35:44	20060321 14:37:37		-1	
KLX10	20060321 14:59	20060321 16:18	582.50	587.50	3	1	20060321 15:36:24	20060321 15:56:40	8.05E-08	0	7.96E-08
KLX10	20060321 16:30	20060321 17:21	587.50	592.50	3	1	20060321 17:11:26	20060321 17:13:51		-1	
KLX10	20060321 17:45	20060321 18:39	592.50	597.50	3	1	20060321 18:21:00	20060321 18:31:48		-1	
KLX10	20060321 18:54	20060321 19:46	597.50	602.50	3	1	20060321 19:28:37	20060321 19:38:34		-1	
KLX10	20060322 08:31	20060322 09:32	602.50	607.50	3	1	20060322 09:13:37	20060322 09:25:20		-1	
KLX10	20060322 09:46	20060322 11:06	607.50	612.50	3	1	20060322 10:23:57	20060322 10:44:24	5.70E-08	0	1.26E-07
KLX10[1)]	20060322 11:21	20060322 13:53	612.50	617.50	3	1	20060322 12:56:16	20060322 13:31:37	1.07E-08	0	1.88E-08
KLX10	20060322 14:14	20060322 15:03	617.50	622.50	3	1	20060322 14:49:46	20060322 14:56:01		-1	
KLX10	20060322 15:15	20060322 16:10	622.50	627.50	3	1	20060322 15:56:24	20060322 16:02:59		-1	
KLX10	20060322 16:28	20060322 17:17	627.50	632.50	3	1	20060322 17:01:15	20060322 17:10:00		-1	
KLX10	20060322 17:29	20060322 18:12	632.50	637.50	3	1	20060322 18:03:12	20060322 18:05:14		-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
KLX10	20060322 18:29	20060322 19:44	637.50	642.50	3	1	20060322 19:02:05	20060322 19:22:30	1.65E-08	0	1.63E-08
KLX10	20060323 08:19	20060323 09:02	642.50	647.50	3	1	20060323 08:53:19	20060323 08:54:43		-1	
KLX10	20060323 11:07	20060323 12:29	647.50	652.50	3	1	20060323 11:47:00	20060323 12:07:30	4.15E-07	0	4.49E-07
KLX10	20060323 13:42	20060323 15:00	652.50	657.50	3	1	20060323 14:18:26	20060323 14:38:54	2.04E-08	0	2.96E-08
KLX10	20060323 16:59	20060323 17:41	657.50	662.50	3	1	20060323 17:32:47	20060323 17:34:22		-1	
KLX10	20060323 18:06	20060323 18:58	662.50	667.50	3	1	20060323 18:40:24	20060323 18:51:02		-1	
KLX10	20060324 07:27	20060324 08:21	667.50	672.50	3	1	20060324 08:12:09	20060324 08:13:58		-1	
KLX10	20060324 08:51	20060324 10:09	691.50	696.50	3	1	20060324 09:26:45	20060324 09:47:04	1.66E-06	0	1.85E-06
KLX10	20060324 10:28	20060324 11:43	696.50	701.50	3	1	20060324 11:01:09	20060324 11:21:22	1.24E-05	0	3.22E-05
KLX10	20060327 13:44	20060327 15:06	701.50	706.50	3	1	20060327 14:23:37	20060327 14:44:01	3.34E-06	0	3.73E-06
KLX10	20060327 15:29	20060327 16:14	706.50	711.50	3	1	20060327 16:04:09	20060327 16:07:13		-1	
KLX10	20060327 16:34	20060327 17:20	711.50	716.50	3	1	20060327 17:09:16	20060327 17:12:45		-1	
KLX10[2)]	20060109 14:55	20060109 19:09	105.20	205.20	3	1	20060109 19:05:58	20060109 19:07:10		-1	
KLX10[2)]	20060110 10:19	20060110 11:04	105.20	205.20	3	1	20060110 10:58:02	20060110 10:59:43	5.54E-08	0	5.08E-07
KLX10[2)]	20060110 11:17	20060110 18:58	105.20	205.20	3	1	20060110 18:55:35	20060110 18:55:46		-1	
KLX10[2)]	20060112 17:38	20060112 18:35	105.20	205.20	3	1	20060112 18:23:45	20060112 18:25:33	7.80E-09	-1	
KLX10[2)]	20060112 18:43	20060112 19:39	105.20	205.20	3	1	20060112 19:22:14	20060112 19:36:32	8.72E-09	-1	
KLX10[2)]	20060302 08:24	20060302 09:15	312.50	317.50	3	1	20060302 09:04:38	20060302 09:13:21	7.46E-07	0	8.60E-07

[1)] The injection period is longer than usual.
[2)] The tests were interrupted for various reasons or did not provide satisfying data for the evaluation and were hence re-performed later.

KLX10 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
KLX10	105.20	205.20	1.7E-08	1.0E-03	1.25E+00	1811	1803	1076.25	1144.73	1076.53	15.24
KLX10	203.50	303.50	1.7E-08	1.0E-03	6.34E-01	1816	1800	2034.00	2188.00	2035.96	11.23
KLX10	301.00	401.00	1.7E-08	1.0E-03	8.54E-01	1810	1799	2988.95	3003.63	2991.55	11.76
KLX10	398.60	498.60	1.7E-08	1.0E-03	2.69E-01	1819	1799	3948.25	4150.51	3950.45	11.66
KLX10	497.50	597.50	1.7E-08	1.0E-03	5.14E-03	1833	1784	4912.34	5117.08	4934.02	14.37
KLX10	596.50	696.50	1.7E-08	1.0E-03	3.40E-03	1826	1789	5867.66	6072.54	5868.76	15.87
KLX10	696.50	796.50	1.7E-08	1.0E-03	4.87E-02	1824	1789	6858.39	7096.60	7006.59	17.13
KLX10	796.50	896.50	1.7E-08	1.0E-03	1.29E-02	1818	1794	7802.87	8244.80	7808.50	18.87
KLX10	892.50	992.50	1.7E-08	1.0E-03	1.57E-04	1829	1776	8784.95	8989.70	8913.39	20.47
KLX10[1)]	105.20	125.20	1.7E-08	1.0E-03	5.51E-01	1228	1191	1085.32	1269.33	1086.70	12.36
KLX10	120.20	140.20	1.7E-08	1.0E-03	1.86E-01	1211	1209	1233.24	1434.13	1233.24	9.65
KLX10	140.20	160.20	1.7E-08	1.0E-03	2.13E-01	1224	1194	1424.25	1627.30	1424.81	9.42
KLX10	149.60	169.60	1.7E-08	1.0E-03	1.26E-01	1224	1216	1514.82	1716.25	1515.36	8.77
KLX10	174.60	194.60	1.7E-08	1.0E-03	4.32E-01	1223	1194	1760.71	1917.56	1761.81	10.90
KLX10	191.30	211.30	1.7E-08	1.0E-03	5.27E-01	1213	1206	1922.63	1998.24	1923.19	11.61
KLX10	214.00	234.00	1.7E-08	1.0E-03	1.33E-01	1216	1203	2143.28	2343.62	2143.28	9.44
KLX10	222.50	242.50	1.7E-08	1.0E-03	1.40E-01	1215	1203	2226.71	2429.93	2226.71	9.41
KLX10	242.50	262.50	1.7E-08	1.0E-03	1.44E-01	1214	1203	2421.97	2640.55	2423.21	9.61
KLX10	262.50	282.50	1.7E-08	1.0E-03	1.99E-03	1220	1193	2613.25	2814.00	2614.21	10.85
KLX10	282.50	302.50	1.7E-08	1.0E-03	4.72E-03	1220	1194	2809.20	3010.80	2810.17	11.12
KLX10	297.50	317.50	1.7E-08	1.0E-03	7.25E-04	1223	1194	2957.81	3157.60	2957.81	11.38
KLX10	318.20	338.20	1.7E-08	1.0E-03	6.76E-01	1210	1203	3160.35	3177.09	3162.55	11.51
KLX10	339.20	359.20	1.7E-08	1.0E-03	3.36E-02	1218	1200	3367.55	3543.74	3368.37	11.65
KLX10	359.20	379.20	1.7E-08	1.0E-03	7.96E-03	1221	1199	3563.91	3764.66	3564.33	12.25
KLX10	377.70	397.70	1.7E-08	1.0E-03	9.77E-03	1220	1199	3744.35	3946.89	3744.90	12.52
KLX10	398.60	418.60	1.7E-08	1.0E-03	3.14E-02	1220	1200	3950.18	4089.74	3950.73	12.57
KLX10	418.60	438.60	1.7E-08	1.0E-03	1.61E-01	1198	1221	4148.60	4353.61	4149.43	12.19

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
KLX10	432.50	452.50	1.7E-08	1.0E-03	2.53E-02	1220	1200	4283.07	4484.10	4282.79	13.16
KLX10	452.50	472.50	1.7E-08	1.0E-03	8.25E-04	1226	1194	4480.39	4681.01	4480.39	13.79
KLX10	472.50	492.50	4.7E-09	1.0E-03	2.62E-05	1221	1221	4711.75	4930.48	4791.06	13.97
KLX10	492.50	512.50	4.9E-09	1.0E-03	3.95E-05	1223	1196	4883.82	5095.14	4907.43	14.28
KLX10	512.50	532.50	1.7E-08	1.0E-03	3.40E-04	1219	1196	5070.71	5270.78	5127.52	14.59
KLX10	532.50	552.50	1.7E-08	1.0E-03	1.97E-03	1220	1197	5259.25	5460.80	5262.55	14.88
KLX10	552.50	572.50	1.7E-08	1.0E-03	1.20E-03	1219	1197	5462.88	5664.33	5517.77	15.19
KLX10	572.50	592.50	1.7E-08	1.0E-03	1.12E-04	1220	1196	5665.97	5899.65	5672.00	15.50
KLX10	592.50	612.50	1.7E-08	1.0E-03	1.93E-04	1219	1197	5860.82	6072.00	5962.91	15.80
KLX10	612.50	632.50	5.6E-09	1.0E-03	4.55E-05	1224	1221	6066.93	6254.80	6178.62	16.09
KLX10	632.50	652.50	1.7E-08	1.0E-03	2.04E-04	1231	1185	6243.80	6472.54	6230.76	16.39
KLX10	652.50	672.50	1.7E-08	1.0E-03	5.15E-05	1222	1196	6454.29	6680.84	6477.20	16.69
KLX10	672.50	692.50	5.5E-09	1.0E-03		798	321	6673.16	6876.65	6883.93	16.99
KLX10	696.50	716.50	1.7E-08	1.0E-03	3.89E-02	1216	1200	6870.00	7086.73	7010.72	16.81
KLX10	716.50	736.50	1.7E-08	1.0E-03	2.26E-04	1219	1197	7080.29	7285.29	7129.82	
KLX10	736.50	756.50	5.5E-09	1.0E-03		1236	1221	7297.23	7482.20	7522.27	16.09
KLX10	756.50	776.50	5.4E-09	1.0E-03		1196	542	7490.44	7698.46	7708.89	
KLX10	776.50	796.50	3.7E-09	1.0E-03	4.14E-05	1222	1221	7677.32	7890.01	7773.11	
KLX10	796.50	816.50	6.4E-09	1.0E-03		1196	1221	7880.69	8085.42	7952.04	
KLX10	816.50	836.50	1.7E-08	1.0E-03	1.23E-04	1222	1193	8011.18	8242.94	8010.77	
KLX10	836.50	856.50	1.7E-08	1.0E-03	3.89E-03	1216	1200	8202.73	8423.53	8203.97	
KLX10	856.50	876.50	4.0E-09	1.0E-03		56	321	8491.86	8657.90	8665.58	
KLX10	876.50	896.50	4.0E-09	1.0E-03	3.53E-05	1233	1220	8668.88	8852.48	8736.38	
KLX10	892.50	912.50	3.9E-09	1.0E-03		286	322	8823.52	9011.37	9016.31	
KLX10	912.50	932.50	3.9E-09	1.0E-03		403	311	9020.56	9207.88	9211.17	
KLX10	932.50	952.50	3.9E-09	1.0E-03		217	321	9207.04	9450.34	9452.12	
KLX10	952.50	972.50	3.9E-09	1.0E-03	4.83E-05	1217	1216	9381.20	9642.20	9516.34	
KLX10	972.50	992.50	5.2E-09	1.0E-03	1.17E-04	1234	1182	9581.11	9835.80	9755.65	
								1081.21	1281.13	1081.76	8.34
KLX10	120.20	125.20	1.7E-08	1.0E-03	5.47E-02	1203	1194	1588.37	1825.49	1805.73	9.46
KLX10	169.60	174.60	3.0E-09	1.0E-03		329	321	2812.22	3078.60	2813.46	11.34
KLX10	297.50	302.50	1.7E-08	1.0E-03	2.00E-04	1221	1180	2863.13	3168.03	2863.96	11.45

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
KLX10	302.50	307.50	1.7E-08	1.0E-03	1.55E-04	1222	1184	2909.10	3120.55	2908.96	11.56
KLX10	307.00	312.00	1.7E-08	1.0E-03	3.62E-04	1222	1184	2962.76	3250.91	2963.30	11.68
KLX10	312.50	317.50	1.7E-08	1.0E-03	8.06E-04	1233	1180	3242.13	3517.20	3243.23	12.06
KLX10	341.20	346.20	1.7E-08	1.0E-03	5.95E-03	1216	1200	3276.44	3518.90	3276.71	12.11
KLX10	344.50	349.50	1.7E-08	1.0E-03	1.70E-03	1225	1191	3314.72	3533.60	3324.46	12.13
KLX10	348.30	353.30	3.7E-09	1.0E-03	4.66E-05	1234	1187	3366.04	3560.62	3366.18	11.85
KLX10	353.30	358.30	1.7E-08	1.0E-03	3.20E-02	1212	1200	3413.24	3630.70	3413.37	12.23
KLX10	358.30	363.30	1.7E-08	1.0E-03	8.58E-03	1216	1200	3451.66	3651.59	3451.80	12.48
KLX10	362.40	367.40	1.7E-08	1.0E-03	7.74E-03	1229	1185	3503.81	3792.60	3510.54	12.43
KLX10	367.40	372.40	1.7E-08	1.0E-03	7.35E-05	1234	1182	3687.27	3841.78	3879.38	12.50
KLX10	372.40	377.40	7.2E-09	1.0E-03		72	321	3700.17	3847.54	3902.98	12.57
KLX10	377.40	382.40	6.0E-09	1.0E-03		89	321	3647.75	3848.60	3648.30	12.67
KLX10	382.40	387.40	1.7E-08	1.0E-03	1.74E-03	1217	1200	3700.85	3951.97	3700.45	12.73
KLX10	387.40	392.40	5.0E-09	1.0E-03	4.13E-05	1227	1220	3730.22	3970.76	3744.35	12.76
KLX10	389.00	394.00	5.0E-09	1.0E-03	2.78E-05	1228	1221	3750.94	3951.97	3751.48	12.71
KLX10	392.70	397.70	1.7E-08	1.0E-03	1.29E-02	1224	1194	3780.45	3981.88	3780.59	12.68
KLX10	395.70	400.70	1.7E-08	1.0E-03	1.64E-02	1218	1197	3881.58	4101.67	3881.02	13.09
KLX10	406.00	411.00	1.7E-08	1.0E-03	4.68E-03	1218	1200	3928.80	4129.67	3929.32	13.02
KLX10	411.00	416.00	1.7E-08	1.0E-03	1.31E-02	1221	1197	3958.69	4158.75	3959.51	13.21
KLX10	414.00	419.00	1.7E-08	1.0E-03	8.66E-03	1214	1203	4009.18	4201.50	4009.45	12.53
KLX10	419.00	424.00	1.7E-08	1.0E-03	6.72E-02	1215	1219	4058.86	4259.75	4059.42	13.29
KLX10	424.00	429.00	1.7E-08	1.0E-03	9.61E-03	1218	1200	4107.72	4266.74	4108.26	12.71
KLX10	429.00	434.00	1.7E-08	1.0E-03	6.56E-02	1215	1203	4157.11	4360.20	4157.66	13.17
KLX10	434.00	439.00	1.7E-08	1.0E-03	2.60E-02	1214	1203	4208.29	4439.78	4207.05	13.58
KLX10	439.00	444.00	1.7E-08	1.0E-03	7.64E-05	1216	1202	4238.61	4470.50	4239.44	13.66
KLX10	442.50	447.50	1.7E-08	1.0E-03	2.04E-04	1218	1197	4289.25	4519.78	4287.74	13.74
KLX10	447.50	452.50	1.7E-08	1.0E-03	2.55E-04	1215	1203	4338.65	4561.35	4338.25	13.77
KLX10	452.50	457.50	1.7E-08	1.0E-03	7.48E-04	1217	1199	4391.48	4602.80	4391.48	13.82
KLX10	457.50	462.50	1.7E-08	1.0E-03	1.00E-04	1217	1200	4510.58	4652.20	4700.50	13.90
KLX10	462.50	467.50	7.6E-09	1.0E-03		61	322	4520.60	4699.54	4522.11	13.97
KLX10	467.50	472.50	6.4E-09	1.0E-03	1.39E-05	1220	1221	4586.33	4750.44	4589.07	14.05
KLX10	472.50	477.50	3.9E-09	1.0E-03	1.08E-05	1217	1221	4618.58	4799.84	4811.37	14.12

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
KLX10	477.50	482.50	5.2E-09	1.0E-03		62	321	4652.06	4844.85	4737.82	14.22
KLX10	482.50	487.50	6.4E-09	1.0E-03		1198	1221	4716.14	4893.15	4876.68	14.28
KLX10	487.50	492.50	6.8E-09	1.0E-03		84	321	4884.64	4941.87	5060.56	14.35
KLX10	492.50	497.50	6.8E-09	1.0E-03		65	321	4890.82	4987.56	5042.45	14.43
KLX10	497.50	502.50	6.8E-09	1.0E-03		60	321	4847.32	5037.51	5042.99	14.50
KLX10	502.50	507.50	5.6E-09	1.0E-03		65	321	4892.33	5086.40	4876.68	14.58
KLX10	507.50	512.50	1.7E-08	1.0E-03	4.29E-05	1220	1197	5048.21	5133.97	5202.18	14.65
KLX10	512.50	517.50	6.8E-09	1.0E-03		61	321	4975.62	5191.33	5056.71	14.72
KLX10	517.50	522.50	1.7E-08	1.0E-03	2.67E-04	1219	1200	5076.47	5241.70	5109.96	14.80
KLX10	522.50	527.50	6.8E-09	1.0E-03	2.04E-05	1217	1221	5085.26	5288.90	5071.54	14.88
KLX10	527.50	532.50	1.7E-08	1.0E-03	9.31E-05	1207	1203	5120.00	5364.09	5130.26	14.95
KLX10	532.50	537.50	1.7E-08	1.0E-03	1.27E-04	1217	1200	5158.12	5361.80	5158.26	15.02
KLX10	537.50	542.50	1.7E-08	1.0E-03	1.57E-03	1213	1205	5214.11	5472.76	5212.05	15.10
KLX10	542.50	547.50	1.7E-08	1.0E-03	6.70E-04	1221	1194	5293.01	5515.17	5340.49	15.18
KLX10	547.50	552.50	3.9E-09	1.0E-03	3.70E-05	1228	1194	5312.90	5561.27	5318.53	15.26
KLX10	552.50	557.50	1.7E-08	1.0E-03	2.29E-04	1223	1193	5361.48	5582.68	5410.74	15.33
KLX10	557.50	562.50	1.7E-08	1.0E-03	1.28E-03	1221	1196	5549.61	5647.86	5691.22	15.40
KLX10	562.50	567.50	3.9E-09	1.0E-03		115	321	5655.27	5699.31	5862.47	15.49
KLX10	567.50	572.50	5.2E-09	1.0E-03		121	321	5536.85	5750.64	5756.54	15.56
KLX10	572.50	577.50	2.7E-09	1.0E-03		296	322	5702.33	5800.99	5781.23	15.64
KLX10	577.50	582.50	5.2E-09	1.0E-03		113	321	5616.99	5849.02	5616.57	15.71
KLX10	582.50	587.50	1.7E-08	1.0E-03	9.68E-05	1216	1200	5802.78	5898.14	5910.77	15.79
KLX10	587.50	592.50	5.2E-09	1.0E-03		145	322	5783.57	5945.35	5872.34	15.86
KLX10	592.50	597.50	3.9E-09	1.0E-03		648	322	5768.20	5995.29	5955.78	15.94
KLX10	597.50	602.50	3.9E-09	1.0E-03		597	321	5853.00	6032.48	5950.83	16.02
KLX10	602.50	607.50	3.9E-09	1.0E-03		703	322	5871.66	6090.39	5992.55	16.09
KLX10	607.50	612.50	1.7E-08	1.0E-03	1.55E-04	1227	1193	5920.64	6135.90	6035.92	16.16
KLX10[1)]	612.50	617.50	3.9E-09	1.0E-03	3.91E-05	2121	1221	6013.68	6183.01	6163.25	16.24
KLX10	617.50	622.50	3.9E-09	1.0E-03		375	322	6041.13	6230.08	6201.13	16.30
KLX10	622.50	627.50	3.9E-09	1.0E-03		395	321	6152.14	6279.06	6267.53	16.38
KLX10	627.50	632.50	3.9E-09	1.0E-03		525	322	6284.42	6329.15	6464.04	16.46
KLX10	632.50	637.50	5.2E-09	1.0E-03		122	321	6170.39	6378.97	6156.66	16.52

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
KLX10	637.50	642.50	3.9E-09	1.0E-03	1.94E-05	1225	1221	6236.12	6418.75	6411.35	16.60
KLX10	642.50	647.50	3.9E-09	1.0E-03		84	322	6231.31	6469.20	6244.48	16.67
KLX10	647.50	652.50	1.7E-08	1.0E-03	5.51E-04	1230	1191	6316.67	6523.50	6329.01	16.75
KLX10	652.50	657.50	1.7E-08	1.0E-03	3.63E-05	1228	1189	6436.32	6573.67	6642.43	16.82
KLX10	657.50	662.50	3.9E-09	1.0E-03		95	321	6480.78	6623.21	6638.58	16.90
KLX10	662.50	667.50	7.6E-09	1.0E-03		638	322	6510.96	6663.83	6760.97	16.97
KLX10	667.50	672.50	4.9E-09	1.0E-03		109	321	6668.90	6868.43	6670.41	17.33
KLX10	691.50	696.50	1.7E-08	1.0E-03	2.26E-03	1219	1197	6720.77	6940.74	6855.93	17.09
KLX10	696.50	701.50	1.7E-08	1.0E-03	3.91E-02	1213	1203	6781.01	6983.41	6781.84	17.58
KLX10	701.50	706.50	1.7E-08	1.0E-03	4.56E-03	1224	1193	6862.66	7082.62	7104.57	17.56
KLX10	706.50	711.50	5.2E-09	1.0E-03		184	322	6929.62	7133.66	7125.44	17.64
KLX10	711.50	716.50	7.6E-09	1.0E-03		209	363				
KLX10[2)]	105.20	205.20	1.7E-08	1.0E-03		72	23	1074.88	1075.02	1074.88	8.54
KLX10[2)]	105.20	205.20	1.7E-08	1.0E-03	5.13E-05	101	138	1073.78	1073.92	1073.78	8.56
KLX10[2)]	105.20	205.20	1.7E-08	1.0E-03		11	0	1075.70	1075.70	1075.70	
KLX10[2)]	105.20	205.20	1.7E-08	1.0E-03		108	458	1074.33	1074.88	1073.24	8.25
KLX10[2)]	105.20	205.20	1.7E-08	1.0E-03		858	26	1075.29	1076.12	1075.98	12.05
KLX10[2)]	312.50	317.50	1.7E-08	1.0E-03	4.50E-04	523	0	2962.76	3436.16		11.69

[1)] The injection period is longer than usual.
[2)] The tests were interrupted for various reasons or did not provide satisfying data for the evaluation and were hence re-performed later

KLX10 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	bc_tm	value_type_tm	hydr_cond_moye	formation_width_b
KLX10	20060113 08:36	20060113 10:56	105.20	205.20	3	1	9.78E-05	0	1.27E-04	0	0	1.27E-06	100.00
KLX10	20060116 14:41	20060116 16:38	203.50	303.50	3	1	2.15E-05	0	2.80E-05	0	0	2.80E-07	100.00
KLX10	20060116 17:46	20060116 19:29	301.00	401.00	3	1	2.87E-04	0	3.74E-04	0	0	3.74E-06	100.00
KLX10	20060117 10:06	20060117 11:57	398.60	498.60	3	1	6.30E-06	0	8.21E-06	0	0	8.21E-08	100.00
KLX10	20060117 15:01	20060117 16:57	497.50	597.50	3	1	1.10E-07	0	1.43E-07	0	0	1.43E-09	100.00
KLX10	20060117 18:19	20060117 20:09	596.50	696.50	3	1	7.76E-08	0	1.01E-07	0	0	1.01E-09	100.00
KLX10	20060118 09:56	20060118 11:50	696.50	796.50	3	1	4.08E-07	0	5.32E-07	1	0	5.32E-09	100.00
KLX10	20060118 14:19	20060118 16:10	796.50	896.50	3	1	1.40E-07	0	1.82E-07	0	0	1.82E-09	100.00
KLX10	20060118 17:36	20060118 19:25	892.50	992.50	3	1	1.63E-09	0	2.12E-09	0	0	2.12E-11	100.00
0													
KLX10	20060216 17:28	20060216 19:00	105.20	125.20	3	1	2.34E-05	0	2.45E-05	0	0	1.22E-06	20.00
KLX10	20060216 19:45	20060216 21:01	120.20	140.20	3	1	7.25E-06	0	7.59E-06	0	0	3.80E-07	20.00
KLX10	20060217 08:22	20060217 09:43	140.20	160.20	3	1	8.15E-06	0	8.53E-06	0	0	4.27E-07	20.00
KLX10	20060217 10:28	20060217 11:50	149.60	169.60	3	1	5.04E-06	0	5.28E-06	0	0	2.64E-07	20.00
KLX10	20060220 08:59	20060220 10:14	174.60	194.60	3	1	2.17E-05	0	2.27E-05	0	0	1.14E-06	20.00
KLX10	20060220 11:01	20060220 12:15	191.30	211.30	3	1	5.56E-05	0	5.82E-05	0	0	2.91E-06	20.00
KLX10	20060220 13:19	20060220 14:33	214.00	234.00	3	1	5.20E-06	0	5.44E-06	0	0	2.72E-07	20.00
KLX10	20060220 14:51	20060220 16:05	222.50	242.50	3	1	5.47E-06	0	5.73E-06	0	0	2.86E-07	20.00
KLX10	20060220 16:25	20060220 17:39	242.50	262.50	3	1	5.18E-06	0	5.42E-06	0	0	2.71E-07	20.00
KLX10	20060124 16:07	20060124 17:29	262.50	282.50	3	1	7.09E-08	0	7.42E-08	0	0	3.71E-09	20.00
KLX10	20060124 17:54	20060124 19:09	282.50	302.50	3	1	1.71E-07	0	1.79E-07	0	0	8.97E-09	20.00
KLX10	20060125 08:05	20060125 09:32	297.50	317.50	3	1	2.70E-08	0	2.83E-08	0	0	1.41E-09	20.00
KLX10	20060125 10:01	20060125 11:16	318.20	338.20	3	1	3.05E-04	0	3.19E-04	0	0	1.60E-05	20.00
KLX10	20060125 11:44	20060125 12:58	339.20	359.20	3	1	1.48E-06	0	1.55E-06	0	0	7.73E-08	20.00
KLX10	20060125 14:17	20060125 15:44	359.20	379.20	3	1	2.88E-07	0	3.02E-07	0	0	1.51E-08	20.00
KLX10	20060125 16:21	20060125 17:41	377.70	397.70	3	1	2.80E-07	0	2.93E-07	0	0	1.47E-08	20.00
KLX10	20060125 18:10	20060125 19:30	398.60	418.60	3	1	1.69E-06	0	1.77E-06	0	0	8.87E-08	20.00
KLX10	20060126 07:45	20060126 09:01	418.60	438.60	3	1	6.11E-06	0	6.39E-06	0	0	3.20E-07	20.00
KLX10	20060126 09:25	20060126 10:40	432.50	452.50	3	1	9.31E-07	0	9.75E-07	0	0	4.87E-08	20.00
KLX10	20060126 13:55	20060126 15:11	452.50	472.50	3	1	3.04E-08	0	3.18E-08	0	0	1.59E-09	20.00

idcode	start_date	stop_date	secup	seclow	test_type	formation_type	spec_capacity_q_s	value_type_q_s	transmissivity_moye	bc_tm	value_type_tm	hydr_cond_moye	formation_width_b
KLX10	20060221 08:19	20060221 09:35	472.50	492.50	3	1	8.08E-10	0	8.45E-10	0	0	4.23E-11	20.00
KLX10	20060221 10:05	20060221 11:18	492.50	512.50	3	1	1.10E-09	0	1.15E-09	0	0	5.73E-11	20.00
KLX10	20060221 11:33	20060221 13:23	512.50	532.50	3	1	8.50E-09	0	8.89E-09	0	0	4.45E-10	20.00
KLX10	20060221 13:43	20060221 14:57	532.50	552.50	3	1	7.36E-08	0	7.70E-08	0	0	3.85E-09	20.00
KLX10	20060221 15:20	20060221 16:35	552.50	572.50	3	1	3.38E-08	0	3.54E-08	0	0	1.77E-09	20.00
KLX10	20060221 17:03	20060221 18:16	572.50	592.50	3	1	2.74E-09	0	2.87E-09	0	0	1.43E-10	20.00
KLX10	20060222 07:45	20060222 08:59	592.50	612.50	3	1	3.79E-09	0	3.97E-09	0	0	1.98E-10	20.00
KLX10	20060222 09:22	20060222 10:36	612.50	632.50	3	1	6.56E-10	0	6.86E-10	0	0	3.43E-11	20.00
KLX10	20060222 11:04	20060222 12:19	632.50	652.50	3	1	5.58E-09	0	5.84E-09	0	0	2.92E-10	20.00
KLX10	20060222 13:09	20060222 14:23	652.50	672.50	3	1	9.96E-10	0	1.04E-09	0	0	5.21E-11	20.00
KLX10	20060222 14:44	20060222 15:37	672.50	692.50	3	1	2.73E-10	-1	2.86E-10	0	-1	1.43E-11	20.00
KLX10	20060222 16:10	20060222 17:23	696.50	716.50	3	1	4.98E-07	0	5.21E-07	0	0	2.60E-08	20.00
KLX10	20060222 17:46	20060222 19:00	716.50	736.50	3	1	6.13E-09	0	6.42E-09	0	0	3.21E-10	20.00
KLX10	20060222 19:21	20060222 20:34	736.50	756.50	3	1	2.73E-10	-1	2.86E-10	0	-1	1.43E-11	20.00
KLX10	20060223 08:31	20060223 09:34	756.50	776.50	3	1	2.68E-10	-1	2.81E-10	0	-1	1.40E-11	20.00
KLX10	20060223 09:58	20060223 11:11	776.50	796.50	3	1	5.08E-10	0	5.31E-10	1	0	2.66E-11	20.00
KLX10	20060223 11:29	20060223 12:42	796.50	816.50	3	1	3.19E-10	-1	3.34E-10	0	-1	1.67E-11	20.00
KLX10	20060223 13:18	20060223 14:50	816.50	836.50	3	1	3.51E-09	0	3.68E-09	0	0	1.84E-10	20.00
KLX10	20060223 15:11	20060223 16:26	836.50	856.50	3	1	1.24E-07	0	1.30E-07	0	0	6.48E-09	20.00
KLX10	20060223 16:45	20060223 17:29	856.50	876.50	3	1	2.00E-10	-1	2.09E-10	0	-1	1.05E-11	20.00
KLX10	20060223 17:52	20060223 19:06	876.50	896.50	3	1	3.26E-10	0	3.41E-10	1	0	1.71E-11	20.00
KLX10	20060224 07:44	20060224 08:31	892.50	912.50	3	1	1.97E-10	-1	2.06E-10	0	-1	1.03E-11	20.00
KLX10	20060224 08:55	20060224 09:44	912.50	932.50	3	1	1.97E-10	-1	2.06E-10	0	-1	1.03E-11	20.00
KLX10	20060227 09:21	20060227 10:09	932.50	952.50	3	1	1.97E-10	-1	2.06E-10	0	-1	1.03E-11	20.00
KLX10	20060227 10:38	20060227 11:57	952.50	972.50	3	1	8.02E-10	0	8.39E-10	0	0	4.19E-11	20.00
KLX10	20060227 13:18	20060227 14:37	972.50	992.50	3	1	1.06E-09	0	1.10E-09	0	0	5.52E-11	20.00
KLX10	20060301 09:38	20060301 11:17	120.20	125.20	3	1	1.98E-06	0	1.63E-06	0	0	3.27E-07	5.00
KLX10	20060301 12:43	20060301 13:48	169.60	174.60	3	1	1.51E-10	-1	1.24E-10	0	-1	2.49E-11	5.00
KLX10	20060301 15:22	20060301 16:44	297.50	302.50	3	1	4.18E-09	0	3.45E-09	0	0	6.90E-10	5.00
KLX10	20060301 17:02	20060301 18:23	302.50	307.50	3	1	3.09E-09	0	2.55E-09	0	0	5.10E-10	5.00
KLX10	20060301 18:42	20060301 19:58	307.00	312.00	3	1	1.28E-08	0	1.06E-08	0	0	2.11E-09	5.00
KLX10	20060309 08:12	20060310 09:29	312.50	317.50	3	1	2.13E-08	0	1.76E-08	0	0	3.52E-09	5.00
KLX10	20060309 10:39	20060309 11:55	341.20	346.20	3	1	1.62E-07	0	1.34E-07	0	0	2.67E-08	5.00

idcode	start_date	stop_date	secup	seclow	test_type	formation_type	spec_capacity_q_s	value_type_q_s	transmissivity_moye	bc_tm	value_type_tm	hydr_cond_moye	formation_width_b
KLX10	20060309 12:59	20060309 14:14	344.50	349.50	3	1	5.10E-08	0	4.22E-08	0	0	8.43E-09	5.00
KLX10	20060309 14:28	20060309 15:45	348.30	353.30	3	1	6.05E-10	0	5.00E-10	1	0	9.99E-11	5.00
KLX10	20060309 15:59	20060309 17:17	353.30	358.30	3	1	1.23E-06	0	1.02E-06	0	0	2.04E-07	5.00
KLX10	20060309 17:29	20060309 18:43	358.30	363.30	3	1	2.80E-07	0	2.31E-07	0	0	4.62E-08	5.00
KLX10	20060310 07:15	20060310 08:31	362.40	367.40	3	1	2.72E-07	0	2.24E-07	0	0	4.49E-08	5.00
KLX10	20060310 08:46	20060310 10:03	367.40	372.40	3	1	1.53E-09	0	1.26E-09	0	0	2.53E-10	5.00
KLX10	20060310 10:18	20060310 11:03	372.40	377.40	3	1	3.62E-10	-1	2.99E-10	0	-1	5.98E-11	5.00
KLX10	20060313 08:15	20060313 08:55	377.40	382.40	3	1	3.01E-10	-1	2.48E-10	0	-1	4.97E-11	5.00
KLX10	20060313 09:16	20060313 10:31	382.40	387.40	3	1	5.31E-08	0	4.39E-08	0	0	8.77E-09	5.00
KLX10	20060313 10:41	20060313 12:02	387.40	392.40	3	1	8.67E-10	0	7.16E-10	0	0	1.43E-10	5.00
KLX10	20060313 12:28	20060313 13:43	389.00	394.00	3	1	6.55E-10	0	5.41E-10	0	0	1.08E-10	5.00
KLX10	20060313 13:50	20060313 15:06	392.70	397.70	3	1	4.33E-07	0	3.57E-07	0	0	7.15E-08	5.00
KLX10	20060313 15:22	20060313 16:35	395.70	400.70	3	1	5.75E-07	0	4.75E-07	0	0	9.50E-08	5.00
KLX10	20060313 16:54	20060313 18:08	406.00	411.00	3	1	1.51E-07	0	1.24E-07	0	0	2.49E-08	5.00
KLX10	20060314 07:31	20060314 08:47	411.00	416.00	3	1	3.98E-07	0	3.29E-07	0	0	6.58E-08	5.00
KLX10	20060314 08:56	20060314 10:15	414.00	419.00	3	1	2.96E-07	0	2.45E-07	0	0	4.90E-08	5.00
KLX10	20060314 10:46	20060314 11:59	419.00	424.00	3	1	2.79E-06	0	2.30E-06	0	0	4.60E-07	5.00
KLX10	20060314 13:30	20060314 14:43	424.00	429.00	3	1	3.41E-07	0	2.82E-07	0	0	5.64E-08	5.00
KLX10	20060314 14:56	20060314 16:10	429.00	434.00	3	1	3.28E-06	0	2.71E-06	0	0	5.42E-07	5.00
KLX10	20060314 16:21	20060314 17:34	434.00	439.00	3	1	9.37E-07	0	7.74E-07	0	0	1.55E-07	5.00
KLX10	20060314 17:46	20060314 19:11	439.00	444.00	3	1	2.33E-09	0	1.93E-09	0	0	3.85E-10	5.00
KLX10	20060315 07:26	20060315 08:47	442.50	447.50	3	1	5.80E-09	0	4.79E-09	0	0	9.57E-10	5.00
KLX10	20060315 09:03	20060315 10:16	447.50	452.50	3	1	8.53E-09	0	7.05E-09	0	0	1.41E-09	5.00
KLX10	20060315 10:26	20060315 11:40	452.50	457.50	3	1	2.63E-08	0	2.17E-08	0	0	4.34E-09	5.00
KLX10	20060315 12:27	20060315 13:41	457.50	462.50	3	1	3.58E-09	0	2.96E-09	0	0	5.92E-10	5.00
KLX10	20060315 13:54	20060315 14:33	462.50	467.50	3	1	3.80E-10	-1	3.14E-10	0	-1	6.28E-11	5.00
KLX10	20060315 14:51	20060315 16:06	467.50	472.50	3	1	3.83E-10	0	3.17E-10	0	0	6.33E-11	5.00
KLX10	20060315 16:14	20060315 17:28	472.50	477.50	3	1	4.54E-10	0	3.75E-10	0	0	7.51E-11	5.00
KLX10	20060315 17:38	20060315 18:19	477.50	482.50	3	1	2.58E-10	-1	2.13E-10	0	-1	4.26E-11	5.00
KLX10	20060316 07:17	20060316 08:31	482.50	487.50	3	1	3.19E-10	-1	2.63E-10	0	-1	5.27E-11	5.00
KLX10	20060316 08:41	20060316 09:22	487.50	492.50	3	1	3.41E-10	-1	2.82E-10	0	-1	5.63E-11	5.00
KLX10	20060316 09:36	20060316 10:16	492.50	497.50	3	1	3.41E-10	-1	2.82E-10	0	-1	5.63E-11	5.00
KLX10	20060316 10:25	20060316 11:04	497.50	502.50	3	1	3.41E-10	-1	2.82E-10	0	-1	5.63E-11	5.00
KLX10	20060316 11:13	20060316 12:32	502.50	507.50	3	1	2.80E-10	-1	2.31E-10	0	-1	4.62E-11	5.00

idcode	start_date	stop_date	secup	seclow	test_type	formation_type	spec_capacity_q_s	value_type_q_s	transmissivity_moye	bc_tm	value_type_tm	hydr_cond_moye	formation_width_b
KLX10	20060316 12:45	20060316 13:59	507.50	512.50	3	1	1.41E-09	0	1.16E-09	0	0	2.32E-10	5.00
KLX10	20060316 14:10	20060316 14:50	512.50	517.50	3	1	3.41E-10	-1	2.82E-10	0	-1	5.63E-11	5.00
KLX10	20060316 14:58	20060316 16:11	517.50	522.50	3	1	6.04E-09	0	4.99E-09	0	0	9.97E-10	5.00
KLX10	20060316 16:21	20060316 17:35	522.50	527.50	3	1	7.88E-10	0	6.50E-10	0	0	1.30E-10	5.00
KLX10	20060317 07:45	20060317 09:01	527.50	532.50	3	1	3.51E-09	0	2.90E-09	0	0	5.80E-10	5.00
KLX10	20060317 09:09	20060317 10:24	532.50	537.50	3	1	3.46E-09	0	2.86E-09	0	0	5.71E-10	5.00
KLX10	20060317 10:36	20060317 11:51	537.50	542.50	3	1	6.13E-08	0	5.06E-08	0	0	1.01E-08	5.00
KLX10	20060320 13:37	20060320 14:54	542.50	547.50	3	1	1.96E-08	0	1.62E-08	0	0	3.23E-09	5.00
KLX10	20060320 15:19	20060320 16:47	547.50	552.50	3	1	1.05E-09	0	8.67E-10	0	0	1.73E-10	5.00
KLX10	20060320 17:03	20060320 18:22	552.50	557.50	3	1	6.35E-09	0	5.25E-09	0	0	1.05E-09	5.00
KLX10	20060321 08:25	20060321 09:43	557.50	562.50	3	1	3.42E-08	0	2.83E-08	0	0	5.65E-09	5.00
KLX10	20060321 09:56	20060321 10:39	562.50	567.50	3	1	1.97E-10	-1	1.63E-10	0	-1	3.25E-11	5.00
KLX10	20060321 10:58	20060321 11:41	567.50	572.50	3	1	2.58E-10	-1	2.13E-10	0	-1	4.26E-11	5.00
KLX10	20060321 12:04	20060321 13:42	572.50	577.50	3	1	1.36E-10	-1	1.12E-10	0	-1	2.24E-11	5.00
KLX10	20060321 13:58	20060321 14:45	577.50	582.50	3	1	2.58E-10	-1	2.13E-10	0	-1	4.26E-11	5.00
KLX10	20060321 14:59	20060321 16:18	582.50	587.50	3	1	3.41E-09	0	2.81E-09	0	0	5.63E-10	5.00
KLX10	20060321 16:30	20060321 17:21	587.50	592.50	3	1	2.58E-10	-1	2.13E-10	0	-1	4.26E-11	5.00
KLX10	20060321 17:45	20060321 18:39	592.50	597.50	3	1	1.97E-10	-1	1.63E-10	0	-1	3.25E-11	5.00
KLX10	20060321 18:54	20060321 19:46	597.50	602.50	3	1	1.97E-10	-1	1.63E-10	0	-1	3.25E-11	5.00
KLX10	20060322 08:31	20060322 09:32	602.50	607.50	3	1	1.97E-10	-1	1.63E-10	0	-1	3.25E-11	5.00
KLX10	20060322 09:46	20060322 11:06	607.50	612.50	3	1	2.56E-09	0	2.11E-09	0	0	4.23E-10	5.00
KLX10	20060322 11:21	20060322 13:53	612.50	617.50	3	1	4.86E-10	0	4.01E-10	1	0	8.02E-11	5.00
KLX10	20060322 14:14	20060322 15:03	617.50	622.50	3	1	1.97E-10	-1	1.63E-10	0	-1	3.25E-11	5.00
KLX10	20060322 15:15	20060322 16:10	622.50	627.50	3	1	1.97E-10	-1	1.63E-10	0	-1	3.25E-11	5.00
KLX10	20060322 16:28	20060322 17:17	627.50	632.50	3	1	1.97E-10	-1	1.63E-10	0	-1	3.25E-11	5.00
KLX10	20060322 17:29	20060322 18:12	632.50	637.50	3	1	2.58E-10	-1	2.13E-10	0	-1	4.26E-11	5.00
KLX10	20060322 18:29	20060322 19:44	637.50	642.50	3	1	7.74E-10	0	6.39E-10	1	0	1.28E-10	5.00
KLX10	20060323 08:19	20060323 09:02	642.50	647.50	3	1	1.97E-10	-1	1.63E-10	0	-1	3.25E-11	5.00
KLX10	20060323 11:07	20060323 12:29	647.50	652.50	3	1	1.71E-08	0	1.41E-08	0	0	2.83E-09	5.00
KLX10	20060323 13:42	20060323 15:00	652.50	657.50	3	1	9.69E-10	0	8.00E-10	0	0	1.60E-10	5.00
KLX10	20060323 16:59	20060323 17:41	657.50	662.50	3	1	1.97E-10	-1	1.63E-10	0	-1	3.25E-11	5.00
KLX10	20060323 18:06	20060323 18:58	662.50	667.50	3	1	3.80E-10	-1	3.14E-10	0	-1	6.28E-11	5.00
KLX10	20060324 07:27	20060324 08:21	667.50	672.50	3	1	2.44E-10	-1	2.02E-10	0	-1	4.03E-11	5.00
KLX10	20060324 08:51	20060324 10:09	691.50	696.50	3	1	8.15E-08	0	6.73E-08	0	0	1.35E-08	5.00

idcode	start_date	stop_date	secup	seclow	test_type	formation_type	spec_capacity_q_s	value_type_q_s	transmissivity_moye	bc_tm	value_type_tm	hydr_cond_moye	formation_width_b
KLX10	20060324 10:28	20060324 11:43	696.50	701.50	3	1	5.54E-07	0	4.58E-07	0	0	9.15E-08	5.00
KLX10	20060327 13:44	20060327 15:06	701.50	706.50	3	1	1.62E-07	0	1.34E-07	0	0	2.68E-08	5.00
KLX10	20060327 15:29	20060327 16:14	706.50	711.50	3	1	2.58E-10	-1	2.13E-10	0	-1	4.26E-11	5.00
KLX10	20060327 16:34	20060327 17:20	711.50	716.50	3	1	3.80E-10	-1	3.14E-10	0	-1	6.28E-11	5.00
KLX10[1)]	20060109 14:55	20060109 19:09	105.20	205.20	3	1							100.00
KLX10[1)]	20060110 10:19	20060110 11:04	105.20	205.20	3	1							100.00
KLX10[1)]	20060110 11:17	20060110 18:58	105.20	205.20	3	1							100.00
KLX10[1)]	20060112 17:38	20060112 18:35	105.20	205.20	3	1							100.00
KLX10[1)]	20060112 18:43	20060112 19:39	105.20	205.20	3	1							100.00
KLX10[1)]	20060302 08:24	20060302 09:15	312.50	317.50	3	1							5.00

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

KLX10 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
KLX10	105.20	205.20	1.85E-04	0	1	2.4E-09	5.0E-04	9.52E-06	9.52E-06	281.38	-1			3.65			
KLX10	203.50	303.50	3.00E-05	0	1	1.1E-09	5.0E-04	3.84E-06	3.84E-06	178.86	-1			0.60			
KLX10	301.00	401.00	1.85E-04	0	1	1.1E-08	5.0E-04	9.51E-06	9.51E-06	280.34	0			-4.98		700	1800
KLX10	398.60	498.60	1.50E-05	0	1	8.1E-10	5.0E-04	2.71E-06	2.71E-06	86.43	1			4.83		50	600
KLX10	497.50	597.50	5.78E-08	0	1	8.0E-10	5.0E-04	1.68E-07	1.68E-07	30.46	0			-3.88		200	1200
KLX10	596.50	696.50	5.35E-08	0	1	8.0E-10	5.0E-04	1.62E-07	1.62E-07	36.58	0			-2.65		150	1800
KLX10	696.50	796.50		0	0	6.9E-10	5.0E-04	5.10E-07	5.10E-07	65.39							
KLX10	796.50	896.50	1.51E-07	0	1	3.7E-10	5.0E-04	2.72E-07	2.72E-07	29.57	1			-0.69		200	700
KLX10	892.50	992.50	1.40E-10	0	1	8.0E-10	5.0E-04	8.28E-09	8.28E-09	8.22	1						
				-1	0	8.3E-10	5.0E-04										
KLX10	105.20	125.20	2.83E-05	0	1	8.9E-10	5.0E-04	3.73E-06	3.73E-06	144.94	-1			-0.03			
KLX10	120.20	140.20	1.06E-05	0	1	8.1E-10	5.0E-04	2.28E-06	2.28E-06	112.49	-1			1.57			
KLX10	140.20	160.20	1.21E-05	0	1	8.1E-10	5.0E-04	2.43E-06	2.43E-06	116.98	-1			1.60			
KLX10	149.60	169.60	1.28E-05	0	1	8.1E-10	5.0E-04	2.50E-06	2.50E-06	118.57	-1			8.36			
KLX10	174.60	194.60	4.17E-05	0	1	1.0E-09	5.0E-04	4.52E-06	4.52E-06	101.87	-1			3.92		200	500
KLX10	191.30	211.30	9.46E-05	0	1	2.2E-09	5.0E-04	6.81E-06	6.81E-06	194.74	-1			2.48			
KLX10	214.00	234.00	1.20E-05	0	1	8.2E-10	5.0E-04	2.42E-06	2.42E-06	115.47	0			6.35		100	1200
KLX10	222.50	242.50	1.94E-05	0	1	8.0E-10	5.0E-04	3.08E-06	3.08E-06	130.32	0			14.08		100	1200
KLX10	242.50	262.50	8.45E-06	0	1	7.5E-10	5.0E-04	2.04E-06	2.04E-06	106.51	-1			2.78			
KLX10	262.50	282.50	8.41E-08	0	1	8.1E-10	5.0E-04	2.03E-07	2.03E-07	16.72	1			0.17		50	300
KLX10	282.50	302.50	1.68E-07	0	1	8.1E-10	5.0E-04	2.87E-07	2.87E-07	39.75	0			-0.89		100	1200
KLX10	297.50	317.50	3.52E-08	0	1	8.2E-10	5.0E-04	1.31E-07	1.31E-07	26.90	0			1.51		50	1200
KLX10	318.20	338.20	2.82E-04	0	1	9.8E-09	5.0E-04	1.18E-05	1.18E-05	254.50	0			-3.09		200	1200
KLX10	339.20	359.20	2.09E-06	0	1	9.3E-10	5.0E-04	1.01E-06	1.01E-06	75.23	-1			1.53			
KLX10	359.20	379.20	2.58E-07	0	1	8.1E-10	5.0E-04	3.55E-07	3.55E-07	44.61	0			-1.56		20	1220
KLX10	377.70	397.70	6.38E-08	0	1	8.1E-10	5.0E-04	1.77E-07	1.77E-07	31.22	0			-5.73		500	1200
KLX10	398.60	418.60	1.75E-06	0	1	1.2E-09	5.0E-04	9.25E-07	9.25E-07	71.38	1			-1.13		100	1200
KLX10	418.60	438.60	1.20E-05	0	1	8.0E-10	5.0E-04	2.42E-06	2.42E-06	81.73	1			4.05		60	600

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
KLX10	432.50	452.50	9.57E-07	0	1	8.1E-10	5.0E-04	6.85E-07	6.85E-07	61.43	0			-1.05		40	1200
KLX10	452.50	472.50	5.28E-08	0	1	8.2E-10	5.0E-04	1.61E-07	1.61E-07	30.09	-1			4.09			
KLX10	472.50	492.50	2.28E-10	0	1	2.1E-10	5.0E-04	1.06E-08	1.06E-08	7.63	0	5.94E-11		-3.74		100	1200
KLX10	492.50	512.50	3.53E-10	0	1	2.3E-10	5.0E-04	1.31E-08	1.31E-08	8.51	1	5.06E-11		-3.50		100	1200
KLX10	512.50	532.50	1.77E-09	0	1	8.2E-10	5.0E-04	2.94E-08	2.94E-08	12.84	0						
KLX10	532.50	552.50	5.91E-08	0	1	8.1E-10	5.0E-04	1.70E-07	1.70E-07	27.95	-1			-1.25		200	1000
KLX10	552.50	572.50	7.88E-09	0	1	8.1E-10	5.0E-04	6.21E-08	6.21E-08	18.50	0			-5.16		80	1200
KLX10	572.50	592.50	1.49E-09	0	1	7.0E-10	5.0E-04	2.70E-08	2.70E-08	12.21	0	5.45E-11		-2.56		70	1200
KLX10	592.50	612.50	4.98E-10	0	1	7.7E-10	5.0E-04	1.56E-08	1.56E-08	9.35	0						
KLX10	612.50	632.50	9.30E-11	0	1	2.9E-10	5.0E-04	6.75E-09	6.75E-09	6.15	1			-5.70			
KLX10	632.50	652.50	1.32E-08	0	1	7.2E-10	5.0E-04	8.04E-08	8.04E-08	12.15	1	6.11E-11		4.79		20	400
KLX10	652.50	672.50	8.58E-10	0	1	7.2E-10	5.0E-04	2.05E-08	2.05E-08	10.63	0	4.46E-11		-0.13		100	1200
KLX10	672.50	692.50		-1	0	2.7E-10	5.0E-04										
KLX10	696.50	716.50	2.79E-07	0	1	7.5E-10	5.0E-04	3.70E-07	3.70E-07	45.13	1						
KLX10	716.50	736.50	3.59E-09	0	1	8.0E-10	5.0E-04	4.19E-08	4.19E-08	7.60	1			-3.26			
KLX10	736.50	756.50		-1	0	2.7E-10	5.0E-04										
KLX10	756.50	776.50		-1	0	2.7E-10	5.0E-04										
KLX10	776.50	796.50	1.96E-10	0	0	1.7E-10	5.0E-04	1.61E-08	1.61E-08	9.51	1			-4.35			
KLX10	796.50	816.50		-1	0	3.2E-10	5.0E-04										
KLX10	816.50	836.50	3.90E-09	0	1	7.1E-10	5.0E-04	4.37E-08	4.37E-08	15.52	0			1.28		20	1200
KLX10	836.50	856.50	1.56E-07	0	1	7.4E-10	5.0E-04	2.77E-07	2.77E-07	15.94	1			-0.04		60	200
KLX10	856.50	876.50		-1	0	2.0E-10	5.0E-04										
KLX10	876.50	896.50	5.64E-11	0	0	2.1E-10	5.0E-04	1.29E-08	1.29E-08	8.56	1	3.73E-11		-4.23			
KLX10	892.50	912.50		-1	0	2.0E-10	5.0E-04										
KLX10	912.50	932.50		-1	0	2.0E-10	5.0E-04										
KLX10	932.50	952.50		-1	0	2.0E-10	5.0E-04										
KLX10	952.50	972.50	1.19E-10	0	1	1.5E-10	5.0E-04	7.64E-09	7.64E-09	6.53	0	6.52E-11					
KLX10	972.50	992.50	1.22E-10	0	1	2.0E-10	5.0E-04	7.74E-09	7.74E-09	6.48	1						
KLX10	120.20	125.20	1.11E-06	0	1	8.2E-10	5.0E-04	7.38E-07	7.38E-07	63.78	0			-4.00		150	1200
KLX10	169.60	174.60		-1	0	1.5E-10	5.0E-04										
KLX10	297.50	302.50	1.21E-09	0	1	6.1E-10	5.0E-04	2.43E-08	2.43E-08	9.46	0	1.98E-11		-4.28		300	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
KLX10	302.50	307.50	1.07E-09	0	1	5.4E-10	5.0E-04	2.29E-08	2.29E-08	11.33	1			-3.78			
KLX10	307.00	312.00	1.39E-08	0	1	7.7E-10	5.0E-04	8.25E-08	8.25E-08	21.32	0			0.41		100	1200
KLX10	312.50	317.50	4.56E-08	0	1	5.7E-10	5.0E-04	1.49E-07	1.49E-07	28.70	0			6.70		600	1200
KLX10	341.20	346.20	1.67E-07	0	1	5.9E-10	5.0E-04	2.86E-07	2.86E-07	39.71	0			-0.51		200	1200
KLX10	344.50	349.50	6.32E-08	0	1	6.7E-10	5.0E-04	1.76E-07	1.76E-07	31.13	0			0.81		200	1200
KLX10	348.30	353.30	4.62E-10	0	0	1.7E-10	5.0E-04	1.56E-08	1.56E-08	9.42	0	9.79E-12		-2.98		100	1800
KLX10	353.30	358.30	1.27E-06	0	1	8.4E-10	5.0E-04	7.89E-07	7.89E-07	65.94	0			-1.10		50	1200
KLX10	358.30	363.30	1.56E-07	0	1	7.5E-10	5.0E-04	2.76E-07	2.76E-07	39.03	0			-3.59		200	1200
KLX10	362.40	367.40	2.51E-07	0	1	8.2E-10	5.0E-04	3.50E-07	3.50E-07	40.11	-1			-1.27		400	1000
KLX10	367.40	372.40	4.75E-10	0	1	5.7E-10	5.0E-04	1.53E-08	1.53E-08	9.17	0	1.38E-11		-3.93		100	1200
KLX10	372.40	377.40		-1	0	3.6E-10	5.0E-04										
KLX10	377.40	382.40		-1	0	3.0E-10	5.0E-04										
KLX10	382.40	387.40	6.94E-08	0	1	8.1E-10	5.0E-04	1.84E-07	1.84E-07	13.01	1			-1.00		20	200
KLX10	387.40	392.40	1.07E-09	0	1	2.0E-10	5.0E-04	2.29E-08	2.29E-08	4.58	1	1.41E-11		-0.70		20	200
KLX10	389.00	394.00	5.25E-10	0	1	2.0E-10	5.0E-04	1.60E-08	1.60E-08	3.84	1			-2.08		20	200
KLX10	392.70	397.70	6.20E-07	0	1	8.1E-10	5.0E-04	5.51E-07	5.51E-07	22.49	1			-0.07		20	200
KLX10	395.70	400.70	1.32E-06	0	1	8.1E-10	5.0E-04	8.05E-07	8.05E-07	33.30	1			4.76		20	300
KLX10	406.00	411.00	1.11E-07	0	1	7.4E-10	5.0E-04	2.33E-07	2.33E-07	35.85	0			-2.39		200	1200
KLX10	411.00	416.00	4.87E-07	0	1	8.1E-10	5.0E-04	4.89E-07	4.89E-07	29.96	1			-1.28		100	400
KLX10	414.00	419.00	1.01E-07	0	1	8.2E-10	5.0E-04	2.23E-07	2.23E-07	35.22	-1			-4.66			
KLX10	419.00	424.00	7.43E-06	0	1	8.5E-10	5.0E-04	1.91E-06	1.91E-06	102.53	0			8.80		70	1200
KLX10	424.00	429.00	2.57E-07	0	1	8.1E-10	5.0E-04	3.55E-07	3.55E-07	44.21	0			-2.44		600	1200
KLX10	429.00	434.00	2.06E-06	0	1	1.0E-09	5.0E-04	1.00E-06	1.00E-06	74.87	-1			-2.66			
KLX10	434.00	439.00	1.36E-06	0	1	8.1E-10	5.0E-04	8.16E-07	8.16E-07	27.37	1			0.73		30	200
KLX10	439.00	444.00	2.51E-09	0	1	7.1E-10	5.0E-04	3.51E-08	3.51E-08	13.90	0	2.40E-11		0.70		20	1200
KLX10	442.50	447.50	4.24E-09	0	1	7.1E-10	5.0E-04	4.56E-08	4.56E-08	15.84	0			-1.72		40	1200
KLX10	447.50	452.50	2.00E-08	0	1	7.1E-10	5.0E-04	9.91E-08	9.91E-08	23.37	0			8.49		100	1200
KLX10	452.50	457.50	3.42E-08	0	1	7.3E-10	5.0E-04	1.29E-07	1.29E-07	26.90	-1			2.18			
KLX10	457.50	462.50	5.10E-09	0	1	7.7E-10	5.0E-04	5.00E-08	5.00E-08	16.60	0			3.10		20	1200
KLX10	462.50	467.50		-1	0	3.8E-10	5.0E-04										
KLX10	467.50	472.50	2.56E-10	0	1	3.5E-10	5.0E-04	1.12E-08	1.12E-08	7.92	-1			-1.58			
KLX10	472.50	477.50	2.76E-10	0	1	2.4E-10	5.0E-04	1.16E-08	1.16E-08	8.01	0			-0.81		50	1200

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
KLX10	477.50	482.50		-1	0	2.6E-10	5.0E-04										
KLX10	482.50	487.50		-1	0	3.2E-10	5.0E-04										
KLX10	487.50	492.50		-1	0	3.4E-10	5.0E-04										
KLX10	492.50	497.50		-1	0	3.4E-10	5.0E-04										
KLX10	497.50	502.50		-1	0	3.4E-10	5.0E-04										
KLX10	502.50	507.50		-1	0	2.8E-10	5.0E-04										
KLX10	507.50	512.50	1.11E-09	0	1	7.8E-10	5.0E-04	2.33E-08	2.33E-08	11.32	0	1.67E-11		-0.55		20	1200
KLX10	512.50	517.50		-1	0	3.4E-10	5.0E-04										
KLX10	517.50	522.50	1.17E-09	0	1	7.6E-10	5.0E-04	2.40E-08	2.40E-08	11.49	0					700	1200
KLX10	522.50	527.50	1.89E-10	0	1	4.1E-10	5.0E-04	9.62E-09	9.62E-09	7.28	0					100	1200
KLX10	527.50	532.50	2.59E-09	0	1	7.6E-10	5.0E-04	3.56E-08	3.56E-08	14.06	-1			0.19			
KLX10	532.50	537.50	8.21E-10	0	1	6.7E-10	5.0E-04	2.01E-08	2.01E-08	10.59	-1			-3.86			
KLX10	537.50	542.50	2.44E-08	0	1	8.0E-10	5.0E-04	1.09E-07	1.09E-07	24.60	-1			-2.51			
KLX10	542.50	547.50	2.11E-08	0	1	6.3E-10	5.0E-04	1.02E-07	1.02E-07	23.88	-1			0.48			
KLX10	547.50	552.50	3.15E-10	0	1	1.7E-10	5.0E-04	1.24E-08	1.24E-08	8.37	-1	1.28E-11		-3.43			
KLX10	552.50	557.50	7.63E-09	0	1	6.6E-10	5.0E-04	6.12E-08	6.12E-08	5.30	1			0.22		10	100
KLX10	557.50	562.50	9.15E-09	0	1	7.4E-10	5.0E-04	6.70E-08	6.70E-08	19.21	0			-4.90		100	1200
KLX10	562.50	567.50		-1	0	2.0E-10	5.0E-04										
KLX10	567.50	572.50		-1	0	2.6E-10	5.0E-04										
KLX10	572.50	577.50		-1	0	1.4E-10	5.0E-04										
KLX10	577.50	582.50		-1	0	2.6E-10	5.0E-04										
KLX10	582.50	587.50	5.51E-09	0	1	7.0E-10	5.0E-04	5.20E-08	5.20E-08	11.96	0	2.18E-11		4.56			
KLX10	587.50	592.50		-1	0	2.6E-10	5.0E-04										
KLX10	592.50	597.50		-1	0	2.0E-10	5.0E-04										
KLX10	597.50	602.50		-1	0	2.0E-10	5.0E-04										
KLX10	602.50	607.50		-1	0	2.0E-10	5.0E-04										
KLX10	607.50	612.50	6.58E-10	0	1	7.5E-10	5.0E-04	1.79E-08	1.79E-08	9.92	1						
KLX10	612.50	617.50		0	0	1.8E-10	5.0E-04	1.40E-08	1.40E-08	11.68							
KLX10	617.50	622.50		-1	0	2.0E-10	5.0E-04										
KLX10	622.50	627.50		-1	0	2.0E-10	5.0E-04										
KLX10	627.50	632.50		-1	0	2.0E-10	5.0E-04										
KLX10	632.50	637.50		-1	0	2.6E-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
KLX10	637.50	642.50		0	0	1.9E-10	5.0E-04	1.77E-08	1.77E-08	9.98		1.82E-11					
KLX10	642.50	647.50		-1	0	2.0E-10	5.0E-04										
KLX10	647.50	652.50	1.84E-08	0	1	6.9E-10	5.0E-04	9.48E-08	9.48E-08	28.00	0			0.27		20	1200
KLX10	652.50	657.50	5.13E-10	0	1	7.9E-10	5.0E-04	1.59E-08	1.59E-08	11.45	0	2.94E-11		-2.45		30	1200
KLX10	657.50	662.50		-1	0	2.0E-10	5.0E-04										
KLX10	662.50	667.50		-1	0	3.8E-10	5.0E-04										
KLX10	667.50	672.50		-1	0	2.4E-10	5.0E-04										
KLX10	691.50	696.50	1.58E-07	0	1	8.2E-10	5.0E-04	2.79E-07	2.79E-07	25.29	1			4.10		50	500
KLX10	696.50	701.50	2.35E-07	0	1	7.4E-10	5.0E-04	3.39E-07	3.39E-07	43.27	1						
KLX10	701.50	706.50	2.81E-07	0	1	8.1E-10	5.0E-04	3.71E-07	3.71E-07	26.12	1			2.98		80	400
KLX10	706.50	711.50		-1	0	2.6E-10	5.0E-04										
KLX10	711.50	716.50		-1	0	3.8E-10	5.0E-04										
KLX10																	
KLX10[1)]	105.20	205.20															
KLX10[1)]	105.20	205.20															
KLX10[1)]	105.20	205.20															
KLX10[1)]	105.20	205.20															
KLX10[1)]	105.20	205.20															
KLX10[1)]	312.50	317.50															

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

KLX10 plu_s_hole_test_obs (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
KLX10	20060113 08:36	20060113 10:56	105.20	205.20	102.13	104.20	1058.72	1055.71	1057.90				
KLX10	20060113 08:36	20060113 10:56	105.20	205.20	206.20	1001.20				2064.23	2068.09	2065.88	
KLX10	20060116 14:41	20060116 16:38	203.50	303.50	102.13	202.50	1052.33	1055.20	1053.01				
KLX10	20060116 14:41	20060116 16:38	203.50	303.50	304.50	1001.20				3022.65	3026.10	3024.58	
KLX10	20060116 17:46	20060116 19:29	301.00	401.00	102.13	300.00	1050.62	1052.12	1052.12				
KLX10	20060116 17:46	20060116 19:29	301.00	401.00	402.00	1001.20				3976.69	3981.91	3979.43	
KLX10	20060117 10:06	20060117 11:57	398.60	498.60	102.13	397.60	1052.44	1054.90	1054.07				
KLX10	20060117 10:06	20060117 11:57	398.60	498.60	499.60	1001.20				4923.12	4920.09	4918.29	
KLX10	20060117 15:01	20060117 16:57	497.50	597.50	102.13	496.50	1055.34	1055.89	1056.43				
KLX10	20060117 15:01	20060117 16:57	497.50	597.50	598.50	1001.20				5890.08	5885.95	5882.50	
KLX10	20060117 18:19	20060117 20:09	596.50	696.50	102.13	595.50	1059.99	1060.54	1061.09				
KLX10	20060117 18:19	20060117 20:09	596.50	696.50	697.50	1001.20				6854.57	6862.97	6852.79	
KLX10	20060118 09:56	20060118 11:50	696.50	796.50	102.13	695.50	1063.08	1063.76	1064.17				
KLX10	20060118 09:56	20060118 11:50	696.50	796.50	797.50	1001.20				7812.31	7812.31	7812.03	
KLX10	20060118 14:19	20060118 16:10	796.50	896.50	102.13	795.50	1064.24	1065.19	1066.14				
KLX10	20060118 14:19	20060118 16:10	796.50	896.50	897.50	1001.20				8844.84	8837.41	8828.59	
KLX10	20060118 17:36	20060118 19:25	892.50	992.50	102.13	891.50	1066.95	1067.90	1068.45				
KLX10	20060118 17:36	20060118 19:25	892.50	992.50	993.50	1001.20				10262.80	10253.10	10238.00	
KLX10	20060216 17:28	20060216 19:00	105.20	125.20	102.13	104.20	1057.39	1056.16	1057.25				
KLX10	20060216 17:28	20060216 19:00	105.20	125.20	126.20	1001.20				1285.62	1287.55	1286.99	
KLX10	20060217 08:22	20060217 09:43	120.20	140.20	102.13	119.20	1056.49	1057.58	1056.49				
KLX10	20060217 08:22	20060217 09:43	120.20	140.20	141.20	1001.20				1432.46	1433.01	1432.46	
KLX10	20060217 08:22	20060217 09:43	140.20	160.20	102.13	139.20	1053.82	1053.96	1053.82				
KLX10	20060217 08:22	20060217 09:43	140.20	160.20	161.20	1001.20				1625.16	1625.85	1625.30	
KLX10	20060217 10:28	20060217 11:50	149.60	169.60	102.13	148.60	1052.62	1053.31	1053.17				
KLX10	20060217 10:28	20060217 11:50	149.60	169.60	170.60	1001.20				1716.20	1716.76	1716.20	
KLX10	20060220 08:59	20060220 10:14	174.60	194.60	102.13	173.60	1052.98	1053.39	1052.98				

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KLX10	20060220 08:59	20060220 10:14	174.60	194.60	195.60	1001.20				1961.67	1965.11	1962.50	
KLX10	20060220 11:01	20060220 12:15	191.30	211.30	102.13	190.30	1051.43	1052.67	1051.43				
KLX10	20060220 11:01	20060220 12:15	191.30	211.30	212.30	1001.20				2124.21	2126.14	2125.04	
KLX10	20060220 13:19	20060220 14:33	214.00	234.00	102.13	213.00	1050.24	1051.89	1050.24				
KLX10	20060220 13:19	20060220 14:33	214.00	234.00	235.00	1001.20				2345.15	2345.43	2345.43	
KLX10	20060220 14:51	20060220 16:05	222.50	242.50	102.13	221.50	1050.19	1051.69	1050.74				
KLX10	20060220 14:51	20060220 16:05	222.50	242.50	243.50	1001.20				2427.93	2428.62	2428.07	
KLX10	20060220 16:25	20060220 17:39	242.50	262.50	102.13	241.50	1049.58	1051.22	1050.26				
KLX10	20060220 16:25	20060220 17:39	242.50	262.50	263.50	1001.20				2623.12	2624.77	2623.67	
KLX10	20060124 16:07	20060124 17:29	262.50	282.50	102.13	261.50	1053.98	1054.25	1053.71				
KLX10	20060124 16:07	20060124 17:29	262.50	282.50	283.50	1001.20				2819.07	2819.07	2819.63	
KLX10	20060124 17:54	20060124 19:09	282.50	302.50	102.13	281.50	1053.77	1053.77	1054.32				
KLX10	20060124 17:54	20060124 19:09	282.50	302.50	303.50	1001.20				3014.67	3014.81	3015.21	
KLX10	20060125 08:05	20060125 09:32	297.50	317.50	102.13	296.50	1054.24	1054.11	1054.11				
KLX10	20060125 08:05	20060125 09:32	297.50	317.50	318.50	1001.20				3161.78	3161.78	3161.78	
KLX10	20060125 10:01	20060125 11:16	318.20	338.20	102.13	317.20	1053.75	1054.98	1054.98				
KLX10	20060125 10:01	20060125 11:16	318.20	338.20	339.20	1001.20				3363.85	3368.40	3366.73	
KLX10	20060125 11:44	20060125 12:58	339.20	359.20	102.13	338.20	1054.55	1055.10	1055.10				
KLX10	20060125 11:44	20060125 12:58	339.20	359.20	360.20	1001.20				3570.60	3571.29	3571.15	
KLX10	20060125 14:17	20060125 15:44	359.20	379.20	102.13	358.20	1055.17	1055.17	1055.17				
KLX10	20060125 14:17	20060125 15:44	359.20	379.20	380.20	1001.20				3766.20	3766.20	3766.20	
KLX10	20060125 16:21	20060125 17:41	377.70	397.70	102.13	376.70	1054.61	1055.15	1055.15				
KLX10	20060125 16:21	20060125 17:41	377.70	397.70	398.70	1001.20				3946.65	3947.06	3946.93	
KLX10	20060125 18:10	20060125 19:30	398.60	418.60	102.13	397.60	1056.26	1056.67	1056.26				
KLX10	20060125 18:10	20060125 19:30	398.60	418.60	419.60	1001.20				4152.43	4154.64	4152.43	
KLX10	20060126 07:45	20060126 09:01	418.60	438.60	102.13	417.60	1057.97	1059.60	1059.06				
KLX10	20060126 07:45	20060126 09:01	418.60	438.60	439.60	1001.20				4342.39	4339.77	4338.12	
KLX10	20060126 09:25	20060126 10:40	432.50	452.50	102.13	431.50	1056.49	1056.49	1056.49				
KLX10	20060126 09:25	20060126 10:40	432.50	452.50	453.50	1001.20				4476.41	4473.38	4471.46	
KLX10	20060126 13:55	20060126 15:11	452.50	472.50	102.13	451.50	1056.55	1056.55	1056.00				
KLX10	20060126 13:55	20060126 15:11	452.50	472.50	473.50	1001.20				4672.01	4668.98	4666.50	
KLX10	20060221 08:19	20060221 09:35	472.50	492.50	102.13	471.50	1052.70	1052.70	1052.70				

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KLX10	20060221 08:19	20060221 09:35	472.50	492.50	493.50	1001.20				4867.81	4864.64	4862.85	
KLX10	20060221 10:05	20060221 11:18	492.50	512.50	102.13	491.50	1053.86	1054.41	1054.41				
KLX10	20060221 10:05	20060221 11:18	492.50	512.50	513.50	1001.20				5063.94	5060.64	5058.44	
KLX10	20060221 11:33	20060221 13:23	512.50	532.50	102.13	511.50	1055.57	1055.98	1056.12				
KLX10	20060221 11:33	20060221 13:23	512.50	532.50	533.50	1001.20				5255.14	5252.94	5251.84	
KLX10	20060221 13:43	20060221 14:57	532.50	552.50	102.13	531.50	1056.73	1056.73	1056.73				
KLX10	20060221 13:43	20060221 14:57	532.50	552.50	553.50	1001.20				5456.25	5452.39	5449.64	
KLX10	20060221 15:20	20060221 16:35	552.50	572.50	102.13	551.50	1057.48	1057.34	1057.90				
KLX10	20060221 15:20	20060221 16:35	552.50	572.50	573.50	1001.20				5652.39	5648.54	5645.79	
KLX10	20060221 17:03	20060221 18:16	572.50	592.50	102.13	571.50	1058.51	1058.37	1058.51				
KLX10	20060221 17:03	20060221 18:16	572.50	592.50	593.50	1001.20				5849.64	5845.65	5842.49	
KLX10	20060222 07:45	20060222 08:59	592.50	612.50	102.13	591.50	1058.44	1058.57	1059.12				
KLX10	20060222 07:45	20060222 08:59	592.50	612.50	613.50	1001.20				6046.21	6042.49	6040.28	
KLX10	20060222 09:22	20060222 10:36	612.50	632.50	102.13	611.50	1059.46	1059.73	1060.29				
KLX10	20060222 09:22	20060222 10:36	612.50	632.50	633.50	1001.20				6241.94	6238.23	6235.88	
KLX10	20060222 11:04	20060222 12:19	632.50	652.50	102.13	631.50	1061.04	1061.17	1061.44				
KLX10	20060222 11:04	20060222 12:19	632.50	652.50	653.50	1001.20				6438.64	6434.78	6432.57	
KLX10	20060222 13:09	20060222 14:23	652.50	672.50	102.13	651.50	1062.60	1062.74	1063.15				
KLX10	20060222 13:09	20060222 14:23	652.50	672.50	673.50	1001.20				6635.48	6632.03	6629.28	
KLX10	20060222 14:44	20060222 15:37	672.50	692.50	102.13	671.50	1063.49	1063.49	1063.22				
KLX10	20060222 14:44	20060222 15:37	672.50	692.50	693.50	1001.20				6829.42	6826.26	6824.88	
KLX10	20060222 16:10	20060222 17:23	696.50	716.50	102.13	695.50	1062.43	1062.84	1062.98				**Tsec out of order**
KLX10	20060222 16:10	20060222 17:23	696.50	716.50	717.50	1001.20				7028.73	7028.73	7028.19	
KLX10	20060222 17:46	20060222 19:00	716.50	736.50	102.13	715.50	1062.50	1062.50	1062.50				**Tsec out of order**
KLX10	20060222 17:46	20060222 19:00	716.50	736.50	737.50	1001.20				7223.78	7223.78	7223.78	
KLX10	20060222 19:21	20060222 20:34	736.50	756.50	102.13	735.50	1063.25	1063.11	1063.65				**Tsec out of order**
KLX10	20060222 19:21	20060222 20:34	736.50	756.50	757.50	1001.20				7420.49	7420.21	7420.49	
KLX10	20060223 08:31	20060223 09:34	756.50	776.50	102.13	755.50	1064.82	1064.96	1065.37				**Tsec out of order**
KLX10	20060223 08:31	20060223 09:34	756.50	776.50	777.50	1001.20				7619.11	7618.84	7618.84	
KLX10	20060223 09:58	20060223 11:11	776.50	796.50	102.13	775.50	1064.89	1064.76	1065.44				**Tsec out of order**
KLX10	20060223 09:58	20060223 11:11	776.50	796.50	797.50	1001.20				7814.43	7813.88	7813.33	
KLX10	20060223 11:29	20060223 12:42	796.50	816.50	102.13	795.50	1064.96	1064.96	1064.96				**Tsec out of order**

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KLX10	20060223 11:29	20060223 12:42	796.50	816.50	817.50	1001.20				8009.48	8009.07	8009.48	
KLX10	20060223 13:18	20060223 14:50	816.50	836.50	102.13	815.50	1065.58	1065.98	1066.12				**Tsec out of order**
KLX10	20060223 13:18	20060223 14:50	816.50	836.50	837.50	1001.20				8205.63	8205.63	8205.63	
KLX10	20060223 15:11	20060223 16:26	836.50	856.50	102.13	835.50	1065.65	1065.92	1066.19				**Tsec out of order**
KLX10	20060223 15:11	20060223 16:26	836.50	856.50	857.50	1001.20				8460.31	8449.43	8440.89	
KLX10	20060223 16:45	20060223 17:29	856.50	876.50	102.13	855.50	1065.72	1065.85	1066.26				**Tsec out of order**
KLX10	20060223 16:45	20060223 17:29	856.50	876.50	877.50	1001.20				8667.62	8669.00	8665.69	
KLX10	20060223 17:52	20060223 19:06	876.50	896.50	102.13	875.50	1064.83	1065.23	1065.23				**Tsec out of order**
KLX10	20060223 17:52	20060223 19:06	876.50	896.50	897.50	1001.20				8857.98	8849.59	8842.01	
KLX10	20060224 07:44	20060224 08:31	892.50	912.50	102.13	891.50	1067.81	1068.08	1067.81				**Tsec out of order**
KLX10	20060224 07:44	20060224 08:31	892.50	912.50	913.50	1001.20				9017.63	9016.11	9013.92	
KLX10	20060224 08:55	20060224 09:44	912.50	932.50	102.13	911.50	1067.06	1066.92	1067.33				**Tsec out of order**
KLX10	20060224 08:55	20060224 09:44	912.50	932.50	933.50	1001.20				9221.62	9217.09	9213.37	
KLX10	20060227 09:21	20060227 10:09	932.50	952.50	102.13	931.50	1063.71	1063.44	1063.58				**Tsec out of order**
KLX10	20060227 09:21	20060227 10:09	932.50	952.50	953.50	1001.20				9413.37	9412.13	9407.32	
KLX10	20060227 10:38	20060227 11:57	952.50	972.50	102.13	951.50	1063.92	1064.05	1064.74				**Tsec out of order**
KLX10	20060227 10:38	20060227 11:57	952.50	972.50	973.50	1001.20				9633.49	9615.58	9601.81	
KLX10	20060227 13:18	20060227 14:37	972.50	992.50	102.13	971.50	1065.35	1065.08	1065.35				**Tsec out of order**
KLX10	20060227 13:18	20060227 14:37	972.50	992.50	993.50	1001.20				10174.30	10174.10	10175.90	
KLX10	20060301 09:38	20060301 11:17	120.20	125.20	102.13	119.20	1054.44	1055.40	1054.31				
KLX10	20060301 09:38	20060301 11:17	120.20	125.20	126.20	1001.20				1284.10	1284.24	1284.24	
KLX10	20060301 12:43	20060301 13:48	169.60	174.60	102.13	168.60	1052.15	1052.15	1052.15				
KLX10	20060301 12:43	20060301 13:48	169.60	174.60	175.60	1001.20				1764.42	1764.69	1764.69	
KLX10	20060301 15:22	20060301 16:44	297.50	302.50	102.13	296.50	1048.68	1048.95	1049.64				
KLX10	20060301 15:22	20060301 16:44	297.50	302.50	303.50	1001.20				3011.97	3012.10	3012.66	
KLX10	20060301 17:02	20060301 18:23	302.50	307.50	102.13	301.50	1050.20	1050.46	1050.46				
KLX10	20060301 17:02	20060301 18:23	302.50	307.50	308.50	1001.20				3061.69	3062.11	3062.25	
KLX10	20060301 18:42	20060301 19:58	307.00	312.00	102.13	306.00	1051.00	1051.27	1051.27				
KLX10	20060301 18:42	20060301 19:58	307.00	312.00	313.00	1001.20				3106.47	3106.47	3106.88	
KLX10	20060309 08:12	20060310 09:29	312.50	317.50	102.13	311.50	1050.51	1050.51	1050.51				
KLX10	20060309 08:12	20060310 09:29	312.50	317.50	318.50	1001.20				3161.98	3161.98	3161.98	

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KLX10	20060309 10:39	20060309 11:55	341.20	346.20	102.13	340.20	1049.53	1049.66	1049.66				
KLX10	20060309 10:39	20060309 11:55	341.20	346.20	347.20	1001.20				3441.87	3442.01	3441.87	
KLX10	20060309 12:59	20060309 14:14	344.50	349.50	102.13	343.50	1050.59	1050.72	1050.72				
KLX10	20060309 12:59	20060309 14:14	344.50	349.50	350.50	1001.20				3474.93	3474.93	3474.93	
KLX10	20060309 14:28	20060309 15:45	348.30	353.30	102.13	347.30	1051.28	1051.28	1051.28				
KLX10	20060309 14:28	20060309 15:45	348.30	353.30	354.30	1001.20				3512.39	3512.39	3512.95	
KLX10	20060309 15:59	20060309 17:17	353.30	358.30	102.13	352.30	1053.75	1053.89	1053.75				
KLX10	20060309 15:59	20060309 17:17	353.30	358.30	359.30	1001.20				3563.64	3564.60	3564.18	
KLX10	20060309 17:29	20060309 18:43	358.30	363.30	102.13	357.30	1051.86	1051.72	1051.30				
KLX10	20060309 17:29	20060309 18:43	358.30	363.30	364.30	1001.20				3610.61	3610.75	3610.47	
KLX10	20060310 07:15	20060310 08:31	362.40	367.40	102.13	361.40	1050.69	1050.97	1050.56				
KLX10	20060310 07:15	20060310 08:31	362.40	367.40	368.40	1001.20				3650.13	3650.13	3650.13	
KLX10	20060310 08:46	20060310 10:03	367.40	372.40	102.13	366.40	1051.12	1051.26	1051.40				
KLX10	20060310 08:46	20060310 10:03	367.40	372.40	373.40	1001.20				3699.05	3699.19	3699.19	
KLX10	20060310 10:18	20060310 11:03	372.40	377.40	102.13	371.40	1051.83	1051.70	1051.70				
KLX10	20060310 10:18	20060310 11:03	372.40	377.40	378.40	1001.20				3748.63	3748.49	3748.77	
KLX10	20060313 08:15	20060313 08:55	377.40	382.40	102.13	376.40	1051.99	1051.99	1051.99				
KLX10	20060313 08:15	20060313 08:55	377.40	382.40	383.40	1001.20				3797.25	3797.25	3797.25	
KLX10	20060313 09:16	20060313 10:31	382.40	387.40	102.13	381.40	1052.27	1052.27	1052.27				
KLX10	20060313 09:16	20060313 10:31	382.40	387.40	388.40	1001.20				3846.29	3846.56	3846.84	
KLX10	20060313 10:41	20060313 12:02	387.40	392.40	102.13	386.40	1053.11	1053.11	1053.11				
KLX10	20060313 10:41	20060313 12:02	387.40	392.40	393.40	1001.20				3895.87	3895.87	3895.87	
KLX10	20060313 12:28	20060313 13:43	389.00	394.00	102.13	388.00	1053.72	1053.86	1054.40				
KLX10	20060313 12:28	20060313 13:43	389.00	394.00	395.00	1001.20				3911.99	3911.99	3912.41	
KLX10	20060313 13:50	20060313 15:06	392.70	397.70	102.13	391.70	1034.47	1034.74	1034.74				
KLX10	20060313 13:50	20060313 15:06	392.70	397.70	398.70	1001.20				3948.78	3949.33	3948.78	
KLX10	20060313 15:22	20060313 16:35	395.70	400.70	102.13	394.70	1053.91	1054.47	1054.47				
KLX10	20060313 15:22	20060313 16:35	395.70	400.70	401.70	1001.20				3977.97	3979.08	3977.97	
KLX10	20060313 16:54	20060313 18:08	406.00	411.00	102.13	405.00	1054.30	1054.16	1053.75				
KLX10	20060313 16:54	20060313 18:08	406.00	411.00	412.00	1001.20				4078.80	4079.35	4078.80	
KLX10	20060314 07:31	20060314 08:47	411.00	416.00	102.13	410.00	1052.95	1053.50	1053.50				
KLX10	20060314 07:31	20060314 08:47	411.00	416.00	417.00	1001.20				4126.74	4127.84	4126.74	

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KLX10	20060314 08:56	20060314 10:15	414.00	419.00	102.13	413.00	1053.67	1053.67	1054.21				
KLX10	20060314 08:56	20060314 10:15	414.00	419.00	420.00	1001.20				4156.35	4157.04	4156.49	
KLX10	20060314 10:46	20060314 11:59	419.00	424.00	102.13	418.00	1054.37	1055.46	1055.06				
KLX10	20060314 10:46	20060314 11:59	419.00	424.00	425.00	1001.20				4206.08	4210.07	4206.62	
KLX10	20060314 13:30	20060314 14:43	424.00	429.00	102.13	423.00	1054.79	1054.79	1054.79				
KLX10	20060314 13:30	20060314 14:43	424.00	429.00	430.00	1001.20				4255.25	4256.77	4255.67	
KLX10	20060314 14:56	20060314 16:10	429.00	434.00	102.13	428.00	1054.82	1055.64	1055.64				
KLX10	20060314 14:56	20060314 16:10	429.00	434.00	435.00	1001.20				4302.50	4312.42	4304.15	
KLX10	20060314 16:21	20060314 17:34	434.00	439.00	102.13	433.00	1055.38	1055.93	1055.93				
KLX10	20060314 16:21	20060314 17:34	434.00	439.00	440.00	1001.20				4346.03	4343.27	4341.62	
KLX10	20060314 17:46	20060314 19:11	439.00	444.00	102.13	438.00	1054.99	1055.12	1055.12				
KLX10	20060314 17:46	20060314 19:11	439.00	444.00	445.00	1001.20				4391.48	4389.14	4387.35	
KLX10	20060315 07:26	20060315 08:47	442.50	447.50	102.13	441.50	1053.68	1053.96	1054.23				
KLX10	20060315 07:26	20060315 08:47	442.50	447.50	448.50	1001.20				4425.91	4423.30	4421.50	
KLX10	20060315 09:03	20060315 10:16	447.50	452.50	102.13	446.50	1053.97	1053.97	1053.97				
KLX10	20060315 09:03	20060315 10:16	447.50	452.50	453.50	1001.20				4474.40	4472.19	4469.99	
KLX10	20060315 10:26	20060315 11:40	452.50	457.50	102.13	451.50	1054.81	1054.81	1054.81				
KLX10	20060315 10:26	20060315 11:40	452.50	457.50	458.50	1001.20				4523.31	4520.14	4517.94	
KLX10	20060315 12:27	20060315 13:41	457.50	462.50	102.13	456.50	1055.38	1055.52	1055.65				
KLX10	20060315 12:27	20060315 13:41	457.50	462.50	463.50	1001.20				4573.72	4570.41	4568.07	
KLX10	20060315 13:54	20060315 14:33	462.50	467.50	102.13	461.50	1055.81	1055.67	1055.40				
KLX10	20060315 13:54	20060315 14:33	462.50	467.50	468.50	1001.20				4621.93	4621.51	4620.96	
KLX10	20060315 14:51	20060315 16:06	467.50	472.50	102.13	466.50	1055.82	1056.23	1056.23				
KLX10	20060315 14:51	20060315 16:06	467.50	472.50	473.50	1001.20				4671.52	4668.35	4666.69	
KLX10	20060315 16:14	20060315 17:28	472.50	477.50	102.13	471.50	1056.39	1056.39	1056.52				
KLX10	20060315 16:14	20060315 17:28	472.50	477.50	478.50	1001.20				4719.59	4716.42	4714.08	
KLX10	20060315 17:38	20060315 18:19	477.50	482.50	102.13	476.50	1056.53	1056.67	1056.26				
KLX10	20060315 17:38	20060315 18:19	477.50	482.50	483.50	1001.20				4768.62	4768.21	4767.52	
KLX10	20060316 07:17	20060316 08:31	482.50	487.50	102.13	481.50	1055.87	1055.87	1056.01				
KLX10	20060316 07:17	20060316 08:31	482.50	487.50	488.50	1001.20				4819.18	4816.01	4813.81	
KLX10	20060316 08:41	20060316 09:22	487.50	492.50	102.13	486.50	1056.31	1056.17	1056.31				
KLX10	20060316 08:41	20060316 09:22	487.50	492.50	493.50	1001.20				4866.57	4866.15	4865.60	

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KLX10	20060316 09:36	20060316 10:16	492.50	497.50	102.13	491.50	1056.60	1056.32	1056.60				
KLX10	20060316 09:36	20060316 10:16	492.50	497.50	498.50	1001.20				4916.15	4916.15	4915.19	
KLX10	20060316 10:25	20060316 11:04	497.50	502.50	102.13	496.50	1056.75	1056.47	1056.89				
KLX10	20060316 10:25	20060316 11:04	497.50	502.50	503.50	1001.20				4964.91	4964.77	4963.67	
KLX10	20060316 11:13	20060316 12:32	502.50	507.50	102.13	501.50	1057.18	1057.18	1057.18				
KLX10	20060316 11:13	20060316 12:32	502.50	507.50	508.50	1001.20				5008.58	5008.58	5008.30	
KLX10	20060316 12:45	20060316 13:59	507.50	512.50	102.13	506.50	1057.46	1057.59	1058.00				
KLX10	20060316 12:45	20060316 13:59	507.50	512.50	513.50	1001.20				5062.57	5059.53	5057.34	
KLX10	20060316 14:10	20060316 14:50	512.50	517.50	102.13	511.50	1057.76	1057.76	1057.76				
KLX10	20060316 14:10	20060316 14:50	512.50	517.50	518.50	1001.20				5111.33	5111.33	5110.23	
KLX10	20060316 14:58	20060316 16:11	517.50	522.50	102.13	516.50	1058.04	1058.18	1058.59				
KLX10	20060316 14:58	20060316 16:11	517.50	522.50	523.50	1001.20				5160.92	5158.03	5155.41	
KLX10	20060316 16:21	20060316 17:35	522.50	527.50	102.13	521.50	1058.88	1059.15	1059.43				
KLX10	20060316 16:21	20060316 17:35	522.50	527.50	528.50	1001.20				5210.37	5207.07	5205.00	
KLX10	20060317 07:45	20060317 09:01	527.50	532.50	102.13	526.50	1058.21	1058.08	1058.08				
KLX10	20060317 07:45	20060317 09:01	527.50	532.50	533.50	1001.20				5260.10	5257.21	5254.58	
KLX10	20060317 09:09	20060317 10:24	532.50	537.50	102.13	531.50	1058.64	1058.78	1058.91				
KLX10	20060317 09:09	20060317 10:24	532.50	537.50	538.50	1001.20				5308.04	5305.14	5303.07	
KLX10	20060317 10:36	20060317 11:51	537.50	542.50	102.13	536.50	1058.93	1058.65	1058.65				
KLX10	20060317 10:36	20060317 11:51	537.50	542.50	543.50	1001.20				5357.07	5354.04	5352.11	
KLX10	20060320 13:37	20060320 14:54	542.50	547.50	102.13	541.50	1056.36	1056.22	1056.22				
KLX10	20060320 13:37	20060320 14:54	542.50	547.50	548.50	1001.20				5405.01	5401.84	5399.50	
KLX10	20060320 15:19	20060320 16:47	547.50	552.50	102.13	546.50	1057.19	1057.33	1057.61				
KLX10	20060320 15:19	20060320 16:47	547.50	552.50	553.50	1001.20				5451.84	5449.22	5446.88	
KLX10	20060320 17:03	20060320 18:22	552.50	557.50	102.13	551.50	1057.90	1057.76	1057.90				
KLX10	20060320 17:03	20060320 18:22	552.50	557.50	558.50	1001.20				5501.70	5498.53	5496.47	
KLX10	20060321 08:25	20060321 09:43	557.50	562.50	102.13	556.50	1055.72	1055.72	1056.00				
KLX10	20060321 08:25	20060321 09:43	557.50	562.50	563.50	1001.20				5551.29	5548.26	5545.50	
KLX10	20060321 09:56	20060321 10:39	562.50	567.50	102.13	561.50	1056.83	1056.83	1056.83				
KLX10	20060321 09:56	20060321 10:39	562.50	567.50	568.50	1001.20				5599.64	5599.50	5598.40	
KLX10	20060321 10:58	20060321 11:41	567.50	572.50	102.13	566.50	1057.81	1057.67	1057.67				
KLX10	20060321 10:58	20060321 11:41	567.50	572.50	573.50	1001.20				5650.05	5649.78	5648.54	

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KLX10	20060321 12:04	20060321 13:42	572.50	577.50	102.13	571.50	1058.64	1058.51	1058.51				
KLX10	20060321 12:04	20060321 13:42	572.50	577.50	578.50	1001.20				5692.07	5691.52	5690.97	
KLX10	20060321 13:58	20060321 14:45	577.50	582.50	102.13	576.50	1059.07	1059.07	1058.80				
KLX10	20060321 13:58	20060321 14:45	577.50	582.50	583.50	1001.20				5746.62	5746.06	5744.96	
KLX10	20060321 14:59	20060321 16:18	582.50	587.50	102.13	581.50	1059.50	1059.36	1059.09				
KLX10	20060321 14:59	20060321 16:18	582.50	587.50	588.50	1001.20				5795.64	5791.93	5789.59	
KLX10	20060321 16:30	20060321 17:21	587.50	592.50	102.13	586.50	1059.79	1059.79	1059.92				
KLX10	20060321 16:30	20060321 17:21	587.50	592.50	593.50	1001.20				5844.55	5844.13	5843.03	
KLX10	20060321 17:45	20060321 18:39	592.50	597.50	102.13	591.50	1059.67	1059.80	1060.21				
KLX10	20060321 17:45	20060321 18:39	592.50	597.50	598.50	1001.20				5894.82	5892.76	5891.51	
KLX10	20060321 18:54	20060321 19:46	597.50	602.50	102.13	596.50	1060.64	1060.51	1060.51				
KLX10	20060321 18:54	20060321 19:46	597.50	602.50	603.50	1001.20				5944.28	5942.35	5941.67	
KLX10	20060322 08:31	20060322 09:32	602.50	607.50	102.13	601.50	1061.34	1060.93	1060.80				
KLX10	20060322 08:31	20060322 09:32	602.50	607.50	608.50	1001.20				5994.42	5992.49	5991.25	
KLX10	20060322 09:46	20060322 11:06	607.50	612.50	102.13	606.50	1061.63	1061.49	1061.63				
KLX10	20060322 09:46	20060322 11:06	607.50	612.50	613.50	1001.20				6042.49	6039.18	6036.43	
KLX10	20060322 11:21	20060322 13:53	612.50	617.50	102.13	611.50	1061.51	1060.82	1060.29				
KLX10	20060322 11:21	20060322 13:53	612.50	617.50	618.50	1001.20				6082.57	6079.13	6077.20	
KLX10	20060322 14:14	20060322 15:03	617.50	622.50	102.13	616.50	1060.58	1060.30	1060.02				
KLX10	20060322 14:14	20060322 15:03	617.50	622.50	623.50	1001.20				6138.35	6137.25	6136.15	
KLX10	20060322 15:15	20060322 16:10	622.50	627.50	102.13	621.50	1059.36	1059.22	1059.22				
KLX10	20060322 15:15	20060322 16:10	622.50	627.50	628.50	1001.20				6185.19	6183.81	6182.98	
KLX10	20060322 16:28	20060322 17:17	627.50	632.50	102.13	626.50	1059.52	1059.52	1059.52				
KLX10	20060322 16:28	20060322 17:17	627.50	632.50	633.50	1001.20				6236.16	6234.23	6233.68	
KLX10	20060322 17:29	20060322 18:12	632.50	637.50	102.13	631.50	1060.90	1060.90	1060.90				
KLX10	20060322 17:29	20060322 18:12	632.50	637.50	638.50	1001.20				6286.02	6285.89	6284.92	
KLX10	20060322 18:29	20060322 19:44	637.50	642.50	102.13	636.50	1062.01	1061.74	1061.74				
KLX10	20060322 18:29	20060322 19:44	637.50	642.50	643.50	1001.20				6336.43	6332.30	6329.55	
KLX10	20060323 08:19	20060323 09:02	642.50	647.50	102.13	641.50	1058.75	1058.75	1058.20				
KLX10	20060323 08:19	20060323 09:02	642.50	647.50	648.50	1001.20				6385.19	6385.05	6384.09	
KLX10	20060323 11:07	20060323 12:29	647.50	652.50	102.13	646.50	1060.40	1060.27	1060.68				
KLX10	20060323 11:07	20060323 12:29	647.50	652.50	653.50	1001.20				6434.09	6431.06	6428.17	

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KLX10	20060323 13:42	20060323 15:00	652.50	657.50	102.13	651.50	1060.96	1061.10	1061.51				
KLX10	20060323 13:42	20060323 15:00	652.50	657.50	658.50	1001.20				6483.82	6479.96	6477.75	
KLX10	20060323 16:59	20060323 17:41	657.50	662.50	102.13	656.50	1062.35	1062.35	1062.35				
KLX10	20060323 16:59	20060323 17:41	657.50	662.50	663.50	1001.20				6531.62	6531.62	6530.65	
KLX10	20060323 18:06	20060323 18:58	662.50	667.50	102.13	661.50	1062.64	1063.05	1062.64				
KLX10	20060323 18:06	20060323 18:58	662.50	667.50	668.50	1001.20				6581.48	6579.14	6578.60	
KLX10	20060324 07:27	20060324 08:21	667.50	672.50	102.13	666.50	1060.20	1060.20	1060.20				
KLX10	20060324 07:27	20060324 08:21	667.50	672.50	673.50	1001.20				6629.28	6628.87	6628.18	
KLX10	20060324 08:51	20060324 10:09	691.50	696.50	102.13	690.50	1060.51	1060.78	1061.05				
KLX10	20060324 08:51	20060324 10:09	691.50	696.50	697.50	1001.20				6864.55	6876.12	6866.75	
KLX10	20060324 10:28	20060324 11:43	696.50	701.50	102.13	695.50	1061.89	1062.43	1062.98				
KLX10	20060324 10:28	20060324 11:43	696.50	701.50	702.50	1001.20				6911.24	7078.89	7028.73	
KLX10	20060327 13:44	20060327 15:06	701.50	706.50	102.13	700.50	1063.13	1063.13	1063.26				
KLX10	20060327 13:44	20060327 15:06	701.50	706.50	707.50	1001.20				6930.67	6930.67	6930.11	
KLX10	20060327 15:29	20060327 16:14	706.50	711.50	102.13	705.50	1063.28	1063.55	1063.55				
KLX10	20060327 15:29	20060327 16:14	706.50	711.50	712.50	1001.20				6979.70	6979.70	6979.70	
KLX10	20060327 16:34	20060327 17:20	711.50	716.50	102.13	710.50	1063.31	1063.31	1063.31				
KLX10	20060327 16:34	20060327 17:20	711.50	716.50	717.50	1001.20				7027.09	7027.09	7027.09	
KLX10	20060109 14:55	20060109 19:09	105.20	205.20	102.13	104.20	1058.03	1058.03	1058.44				**Incomplete test, interrupted and reperformed later**
KLX10	20060109 14:55	20060109 19:09	105.20	205.20	206.20	1001.20				2063.40	2063.27	2063.68	**Incomplete test, interrupted and reperformed later**
KLX10	20060110 10:19	20060110 11:04	105.20	205.20	102.13	104.20	1057.35	1057.35	1057.35				**Incomplete test, interrupted and reperformed later**
KLX10	20060110 10:19	20060110 11:04	105.20	205.20	206.20	1001.20				2062.85	2063.13	2062.58	**Incomplete test, interrupted and reperformed later**
KLX10	20060110 11:17	20060110 18:58	105.20	205.20	102.13	104.20	0.00	0.00	0.00				**Incomplete test, interrupted and reperformed later**
KLX10	20060110 11:17	20060110 18:58	105.20	205.20	206.20	1001.20				2065.99	0.00	0.00	**Incomplete test, interrupted and reperformed later**
KLX10	20060112 17:38	20060112 18:35	105.20	205.20	102.13	104.20	1057.35	1057.35	1057.35				**Incomplete test, interrupted and reperformed later**
KLX10	20060112 17:38	20060112 18:35	105.20	205.20	206.20	1001.20				2062.58	2063.13	2063.13	**Incomplete test, interrupted and reperformed later**
KLX10	20060112 18:43	20060112 19:39	105.20	205.20	102.13	104.20	1057.35	1055.71	1055.71				**Incomplete test, interrupted and reperformed later**
KLX10	20060112 18:43	20060112 19:39	105.20	205.20	206.20	1001.20				2063.13	2064.51	2064.78	**Incomplete test, interrupted and reperformed later**
KLX10	20060302 08:24	20060302 09:15	312.50	317.50	102.13	311.50	1051.74	1051.87	0.00				**Incomplete test, interrupted and 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
KLX10	20060302 08:24	20060302 09:15	312.50	317.50	318.50	1001.20				3160.74	3160.87	0.00	**Incomplete test, interrupted and reperformed later**