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Oskarshamn site investigation

Hydraulic injection tests in borehole KSH01A, 2003/2004

Sub-area Simpevarp

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December 2004

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Keywords: Site/project, Hydrogeology, Hydraulic tests, Injection test, Hydraulic parameters, Transmissivity.

Abstract

Hydraulic injection tests have been performed in Borehole KSH01A at the Simpevarp area, Oskarshamn. The tests are part of the general program for site investigations and specifically for the Simpevarp sub-area. The hydraulic testing programme has the aim to characterise the rock with respect to its hydraulic properties of the fractured zones and rock mass between them. Data is subsequently delivered for the site descriptive model.

This report describes the results and primary data evaluation of the hydraulic injection tests in borehole KSH01A performed between 4th December 2003 and 29th of January 2004.

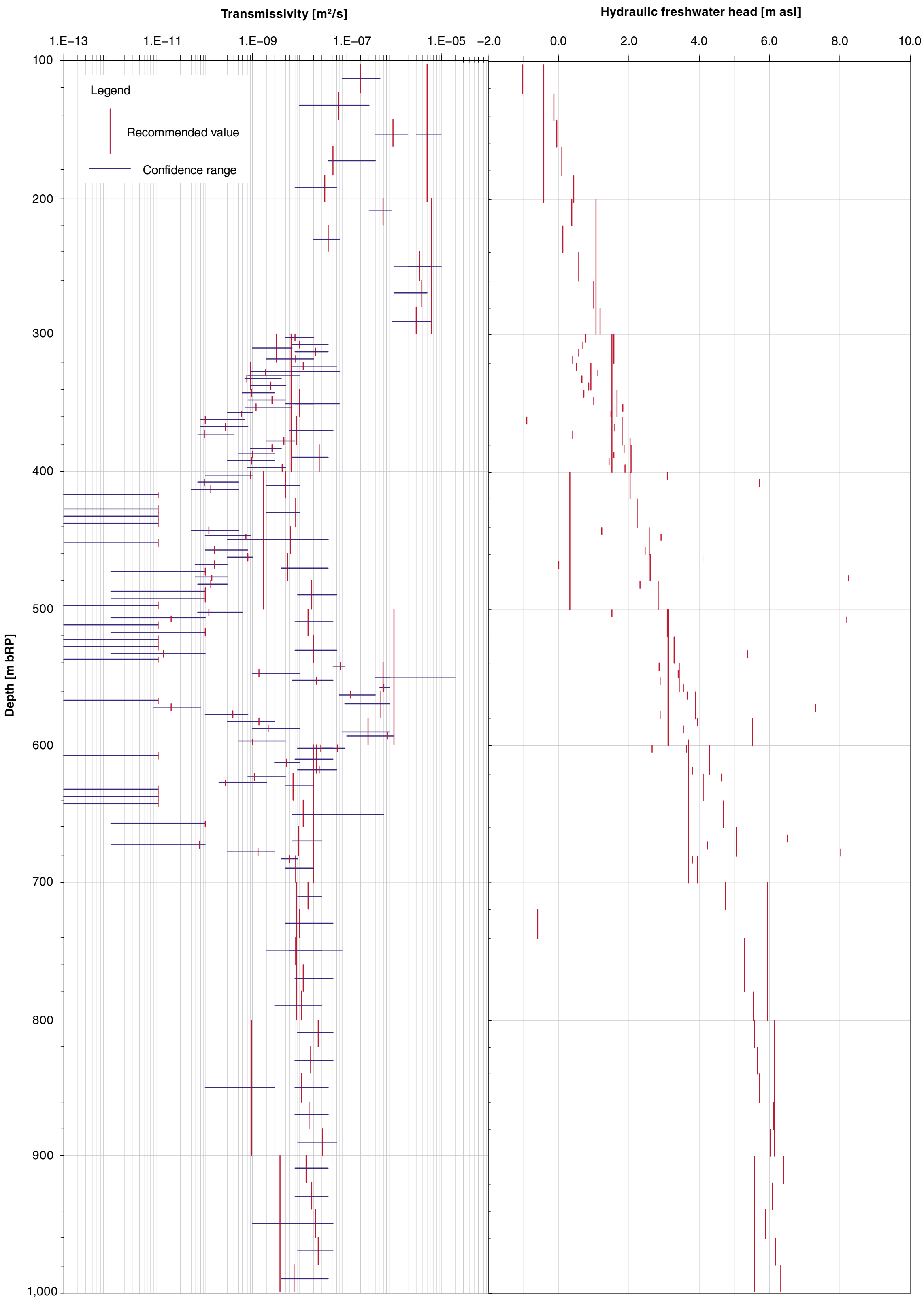
The objective of the hydrotests was to describe the rock around the borehole with respect of hydraulic parameters, mainly transmissivity (T) and hydraulic conductivity (K) at different measurement scales of 100 m 20 m and 5 m sections. Transient evaluation during flow and recovery period provided additional information such as flow regimes, hydraulic boundaries and cross-over flows. Constant pressure injection tests were conducted between 103–999 m below ToC. The results of the test interpretation are presented as transmissivity, hydraulic conductivity and hydraulic freshwater head.

Sammanfattning

Injektionstester har utförts i borrhål KSH01A i delområde Simpevarp, Oskarshamn. Testerna är en del av SKB:s platsundersökningar. Hydraultestprogrammet där injektions-testerna ingår har som mål att karakterisera berget med avseende på dess hydrauliska egenskaper av sprickzoner och mellanliggande bergmassa. Data från testerna används vid den platsbeskrivande modelleringen av området.

Denna rapport redovisar resultaten och utvärderingar av primärdata från de hydrauliska injektionstesterna i borrhål KSH01A. Testerna utfördes mellan den 4 december 2003 till den 29 januari 2004.

Syftet med hydrotesterna var framförallt att beskriva bergets hydrauliska egenskaper runt borrhålet med avseende på hydrauliska parametrar, i huvudsak transmissivitet (T), hydraulisk konduktivitet (K) vid olika mätskalor av 100 m, 20 m, och 5 m sektioner. Transient utvärdering under injektions- och återhämtningsfasen gav ytterligare information avseende flödesgeometri, hydrauliska gränser och sprickläckage. Injektionstester utfördes mellan 103–999 m borrhålslängd. Resultaten av test utvärderingen presenteras som transmissivitet, hydraulisk konduktivitet och grundvattennivå uttryckt i ekvivalent nivå sötvattenpelare (fresh-water head).



Borehole KSH01A – Summary of results.

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Appendix 1 File description table (only on attached CD)

Appendix 2 Test analyses diagrams (only on attached CD)

Appendix 3 Test summary sheets (only on attached CD)

Appendix 4 Nomenclature (only on attached CD)

Appendix 5 Transmissivity and freshwater head log (only on attached CD)

Appendix 6 SICADA data tables (only on attached CD)

1 Introduction

A general program for site investigations presenting survey methods has been prepared /SKB, 2001a/, as well as a site-specific program for the investigations in the Simpevarp area /SKB, 2001b/. The hydraulic injection tests form part of the site characterization program under item 1.1.5.8 in the work breakdown structure of the execution programme /SKB, 2002/.

Measurements were carried out according in borehole KSH01A during 4th December 2003 to 29th January 2004 following the methodology described in SKB MD 323.001 and in the activity plan AP PS 400-03-063 (SKB internal controlling documents). Data and results were delivered to the SKB site characterization database SICADA with field note number Simpevarp 138.

The hydraulic testing programme has the aim to characterise the rock with respect to its hydraulic properties of the fractured zones and rock mass between them. This report describes the results and primary data evaluation of the hydraulic injection tests in borehole KSH01A. The data is subsequently delivered for the site descriptive modelling. The commission was conducted by Golder Associates AB and Golder Associates GmbH.

Borehole KSH01A is situated at the Simpevarp peninsula about 200 m east of "Block 3" of the nuclear power plant at Simpevarp, Figure 1-1. The borehole was drilled 2002 at 1,003 m depth with an inner diameter of 76 mm and an inclination of –80.598°. The upper 101.67 m is cased with large diameter telescopic casing ranging from diameter (outer diameter) 273 mm–80 mm.

Figure 1-1. *The investigation area Simpevarp, Oskarshamn with location of borehole KSH01A.*

2 Objective

The objective of the hydrotests in borehole KSH01A is to describe the rock around the borehole with respect to hydraulic parameters, mainly transmissivity (T) and hydraulic conductivity (K). This is done at different measurement scales of 100 m, 20 m and 5 m sections. Among these parameters transient evaluation during the flow and recovery period provides additional information such as flow regimes, hydraulic boundaries and cross-over flows.

3 Scope of work

The scope of work consisted of preparation of the PSS2 tool which included cleaning of the down-hole tools, calibration and functional checks, injection tests of 100 m, 20 m and 5 m test sections, analysis and reporting.

Preparation for testing was done according to the Quality plan. This step mainly consists of functions checks of the equipment to be used, the PSS2 tool. Calibration checks and function checks were documented in the daily log and/or relevant documents.

The following test programme was performed

Table 3-1. Performed test programme at borehole KSH01A.

No of Injection tests	Interval	Positions	Time/test	Total test time
9	100 m	103–999 m	125 min	18.8 hrs
45	20 m	103–999 m	90 min	67.5 hrs
81	5 m	300–700 m	90 min	121.5 hrs

Total: 207.8 hrs.

3.1 Boreholes

The borehole is telescope drilled with specifications on its construction according to Table 3-2. The reference point in the boreholes is the centre of top of casing (ToC), given as Elevation in table below. The Swedish National coordinate system (RT90) is used in the x-y direction and RHB70 in the z-direction. Northing and Easting refer to the top of the boreholes at the ground surface. The borehole diameter in Table 3-2 refers to the final diameter of the drill bit after drilling to full depth.

Table 3-2. Information about KSH01A (from SICADA 2003-10-02).

Title	Value				
Borehole length (m):	1,003.000				
Drilling Period(s):	From Date	To Date	Secup (m)	Seclow (m)	Drilling Type
	2002-08-22	2002-09-17	0.000	100.240	Percussion drilling
	2002-10-07	2002-12-18	100.240	1,003.000	Core drilling
Starting point coordinate:	Length (m)	Northing (m)	Easting (m)	Elevation (masl)	Coord Sys.
(centerpoint of TOC)	0.000	6366013.461	1552442.978	5.314	RT90-RHB70
Angles:	Length (m)	Bearing Inclination		(– = down)	
	0.000	174.148			
		–80.598			
Borehole diameter:	Secup (m)	Seclow (m)	Hole Diam (m)		
	0.000	12.100	0.200		
	12.100	100.240	0.198		
	100.240				
	101.670	0.086			
	101.670	1,003.000	0.076		
Casing diameter:	Secup (m)	Seclow (m)	Case In (m)	Case Out (m)	
	0.000	2.200	0.263	0.273	
	0.000	12.100	0.200	0.208	
	97.020	97.020	0.195	0.199	
	101.670	101.670	0.076	0.080	
Grove milling:	Length (m)	Trace detectable			
	110.000	YES			
	150.000	YES			
	200.000	YES			
	250.000	YES			
	300.000	YES			
	350.000	YES			
	400.000	YES			
	450.000	YES			
	500.000	YES			
	550.000	YES			
	600.000	YES			
	650.000	YES			
	700.000	YES			
	750.000	YES			
	800.000	YES			
	850.000	YES			
	899.000	YES			
	950.000	YES			

During this testing campaign, the marker at 250 m could not be detected with the positioner.

3.2 Tests

Injection tests were conducted according to the Activity Plan AP PS 400-03-063 and the method description for hydraulic injection tests, SKB MD 323.001 (SKB internal documents). Tests were done in 100 m, 20 m test sections between 103–999 m below ToC and in 5 m test sections between 300–700 m below ToC. The initial criteria for performing injection tests in 20 m and 5 m test sections was a measurable flow of Q > 0.001 L/min (see Figure 3-1). In some 20 m sections higher flow rates than in the appropriate 100 m section were observed. Due to this it was decided to perform all planned 20 m and 5 m tests. The measurements were performed with SKB's custom made equipment for hydraulic testing called PSS2.

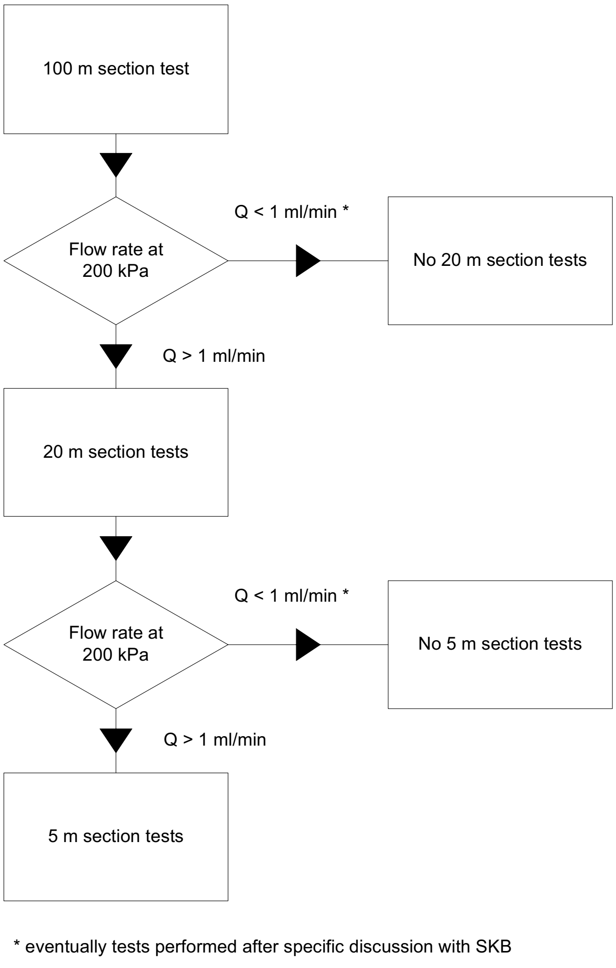

Figure 3-1. *Flow chart for test sections.*

Table 3-3. Tests performed.

Bh ID	Test section (m)	Test type[1]	Test no	Test start Date, time	Test stop Date, time
KSH01A	103–203	3	1	2003-12-09 11:01:05	2003-12-09 14:06:28
KSH01A	200–300	3	2	2003-12-10 10:18:11	2003-12-10 14:53:31
KSH01A	300–400	3	1	2003-12-10 16:33:39	2003-12-10 20:20:07
KSH01A	400–500	3	2	2003-12-14 09:18:38	2003-12-14 11:33:26
KSH01A	500–600	3	2	2003-12-11 14:58:15	2003-12-11 16:37:38
KSH01A	600–700	3	2	2003-12-12 07:06:50	2003-12-12 08:20:16
KSH01A	700–800	3	1	2003-12-12 10:03:16	2003-12-12 12:33:46
KSH01A	800–900	3	1	2003-12-12 13:59:54	2003-12-13 07:29:02
KSH01A	899–999	3	2	2003-12-13 13:28:38	2003-12-13 15:32:29
KSH01A	103–123	3	1	2003-12-15 11:03:35	2003-12-15 12:38:26
KSH01A	123–143	3	1	2003-12-15 13:10:59	2003-12-15 15:33:34
KSH01A	143–163	3	1	2003-12-15 16:09:58	2003-12-15 17:38:56
KSH01A	163–183	3	1	2003-12-15 18:10:27	2003-12-15 19:50:45
KSH01A	183–203	3	1	2003-12-16 08:19:38	2003-12-16 10:40:44
KSH01A	200–220	3	1	2003-12-16 11:13:31	2003-12-16 12:50:16
KSH01A	220–240	3	1	2003-12-16 13:37:31	2003-12-16 14:59:16
KSH01A	240–260	3	1	2003-12-16 15:34:37	2003-12-16 17:00:30
KSH01A	260–280	3	1	2003-12-16 17:29:56	2003-12-16 18:57:25
KSH01A	280–300	3	1	2003-12-17 08:17:19	2003-12-17 10:05:28
KSH01A	300–320	3	1	2003-12-17 10:41:38	2003-12-17 12:58:43
KSH01A	320–340	3	1	2003-12-17 13:27:34	2003-12-17 14:54:08
KSH01A	340–360	3	1	2003-12-17 15:38:17	2003-12-17 17:02:28
KSH01A	360–380	3	1	2003-12-17 17:32:15	2003-12-17 19:36:41
KSH01A	380–400	3	1	2003-12-18 08:10:25	2003-12-18 09:37:03
KSH01A	400–420	3	1	2003-12-18 14:53:45	2003-12-18 16:17:22

Bh ID	Test section (m)	Test type[1]	Test no	Test start Date, time	Test stop Date, time
KSH01A	420–440	3	1	2003-12-18 16:46:04	2003-12-18 18:18:35
KSH01A	440–460	3	1	2003-12-19 08:01:09	2003-12-19 09:31:18
KSH01A	460–480	3	1	2003-12-19 10:01:27	2003-12-19 11:23:30
KSH01A	480–500	3	1	2003-12-19 11:54:13	2003-12-19 13:41:42
KSH01A	500–520	3	1	2003-12-19 14:13:49	2003-12-19 15:37:32
KSH01A	520–540	3	1	2003-12-19 16:11:35	2003-12-19 17:34:17
KSH01A	540–560	3	1	2003-12-19 18:09:28	2003-12-19 21:12:51
KSH01A	560–580	3	1	2003-12-20 08:13:52	2003-12-20 09:49:52
KSH01A	580–600	3	1	2003-12-20 10:23:07	2003-12-20 14:19:11
KSH01A	600–620	3	1	2003-12-20 14:47:45	2003-12-20 17:47:10
KSH01A	620–640	3	1	2004-01-07 13:40:20	2004-01-07 15:08:41
KSH01A	640–660	3	1	2004-01-07 15:45:27	2004-01-07 17:11:00
KSH01A	660–680	3	1	2004-01-07 17:44:10	2004-01-07 19:11:35
KSH01A	680–700	3	1	2004-01-08 08:27:52	2004-01-08 10:03:48
KSH01A	700–720	3	1	2004-01-08 10:37:07	2004-01-08 12:29:23
KSH01A	720–740	3	1	2004-01-08 13:00:03	2004-01-08 14:54:44
KSH01A	740–760	3	1	2004-01-08 15:32:06	2004-01-08 17:03:07
KSH01A	760–780	3	1	2004-01-08 17:35:06	2004-01-08 19:18:29
KSH01A	780–800	3	1	2004-01-09 08:25:27	2004-01-09 09:59:20
KSH01A	800–820	3	1	2004-01-09 10:29:58	2004-01-09 12:02:18
KSH01A	820–840	3	1	2004-01-09 12:51:57	2004-01-09 14:27:20
KSH01A	840–860	3	1	2004-01-09 15:31:25	2004-01-09 17:14:05
KSH01A	860–880	3	1	2004-01-09 17:44:08	2004-01-09 19:21:58
KSH01A	880–900	3	1	2004-01-10 08:31:20	2004-01-10 10:06:52
KSH01A	899–919	3	1	2004-01-10 10:39:17	2004-01-10 12:08:30
KSH01A	919–939	3	1	2004-01-10 13:14:23	2004-01-10 14:32:23

Bh ID	Test section (m)	Test type[1]	Test no	Test start Date, time	Test stop Date, time
KSH01A	939–959	3	1	2004-01-10 15:07:04	2004-01-10 16:29:43
KSH01A	959–979	3	1	2004-01-10 17:00:10	2004-01-10 18:22:37
KSH01A	979–999	3	1	2004-01-11 08:23:57	2004-01-11 10:07:49
KSH01A	300–305	3	1	2004-01-12 16:06:45	2004-01-12 17:26:44
KSH01A	305–310	3	1	2004-01-12 17:53:54	2004-01-12 19:27:28
KSH01A	310–315	3	1	2004-01-13 08:37:00	2004-01-13 10:12:09
KSH01A	315–320	3	1	2004-01-13 10:37:25	2004-01-13 13:47:38
KSH01A	320–325	3	1	2004-01-13 14:12:20	2004-01-13 15:28:47
KSH01A	325–330	3	1	2004-01-13 15:58:10	2004-01-13 17:19:10
KSH01A	330–335	3	1	2004-01-13 17:42:19	2004-01-13 19:19:53
KSH01A	335–340	3	1	2004-01-14 08:15:33	2004-01-14 09:41:17
KSH01A	340–345	3	1	2004-01-14 10:09:16	2004-01-14 11:41:46
KSH01A	345–350	3	1	2004-01-14 12:10:16	2004-01-14 14:06:08
KSH01A	350–355	3	1	2004-01-14 14:29:01	2004-01-14 16:00:28
KSH01A	355–360	3	1	2004-01-14 16:26:05	2004-01-14 18:35:40
KSH01A	360–365	3	1	2004-01-15 08:28:05	2004-01-15 10:36:43
KSH01A	365–370	3	1	2004-01-15 11:02:05	2004-01-15 13:04:28
KSH01A	370–375	3	1	2004-01-15 13:30:20	2004-01-15 15:41:02
KSH01A	375–380	3	1	2004-01-15 16:10:38	2004-01-15 17:42:53
KSH01A	380–385	3	1	2004-01-15 18:07:00	2004-01-15 20:47:55
KSH01A	385–390	3	1	2004-01-16 08:25:04	2004-01-16 10:05:54
KSH01A	390–395	3	1	2004-01-16 10:32:53	2004-01-16 12:00:50
KSH01A	395–400	3	1	2004-01-16 13:05:03	2004-01-16 14:45:25
KSH01A	400–405	3	1	2004-01-16 15:10:17	2004-01-16 17:13:35
KSH01A	405–410	3	1	2004-01-16 17:37:40	2004-01-17 07:08:06
KSH01A	410–415	3	1	2004-01-17 08:25:23	2004-01-17 09:57:05

Bh ID	Test section (m)	Test type[1]	Test no	Test start Date, time	Test stop Date, time
KSH01A	415–420	3	1	2004-01-17 10:22:57	2004-01-17 11:24:54
KSH01A	420–425	3	1	2003-07-31 14:49:10	2003-07-31 17:50:05
KSH01A	425–430	3	1	2004-01-17 14:25:48	2004-01-17 15:08:58
KSH01A	430–435	3	1	2004-01-17 15:37:28	2004-01-17 16:35:27
KSH01A	435–440	3	1	2004-01-17 17:01:38	2004-01-17 17:50:46
KSH01A	440–445	3	1	2004-01-17 18:15:03	2004-01-18 05:36:05
KSH01A	445–450	3	1	2004-01-18 08:55:39	2004-01-18 11:22:58
KSH01A	450–455	3	1	2004-01-18 11:46:55	2004-01-18 13:35:40
KSH01A	455–460	3	1	2004-01-18 13:59:22	2004-01-18 15:49:22
KSH01A	460–465	3	1	2004-01-18 16:14:25	2004-01-18 23:50:13
KSH01A	465–470	3	1	2004-01-19 08:26:53	2004-01-19 10:47:54
KSH01A	470–475	3	1	2004-01-19 11:11:20	2004-01-19 13:01:03
KSH01A	475–480	3	1	2004-01-19 13:26:26	2004-01-19 15:39:57
KSH01A	480–485	3	1	2004-01-19 16:03:20	2004-01-19 18:01:02
KSH01A	485–490	3	1	2004-01-20 08:19:33	2004-01-20 09:51:50
KSH01A	490–495	3	1	2004-01-20 10:18:10	2004-01-20 12:17:56
KSH01A	495–500	3	1	2004-01-20 12:57:20	2004-01-20 13:55:53
KSH01A	500–505	3	1	2004-01-20 14:25:23	2004-01-20 16:43:52
KSH01A	505–510	3	1	2004-01-20 17:11:10	2004-01-21 06:42:55
KSH01A	510–515	3	1	2004-01-21 08:17:17	2004-01-21 09:16:03
KSH01A	515–520	3	2	2004-01-21 09:58:57	2004-01-21 12:05:55
KSH01A	520–525	3	1	2004-01-21 13:02:24	2004-01-21 14:02:36
KSH01A	525–530	3	1	2004-01-21 14:26:28	2004-01-21 15:30:43
KSH01A	530–535	3	1	2004-01-21 15:54:48	2004-01-21 18:09:52
KSH01A	535–540	3	1	2004-01-22 08:13:28	2004-01-22 09:13:45
KSH01A	540–545	3	1	2004-01-22 09:36:39	2004-01-22 11:43:05

Bh ID	Test section (m)	Test type[1]	Test no	Test start Date, time	Test stop Date, time
KSH01A	545–550	3	1	2004-01-22 13:11:23	2004-01-22 14:56:03
KSH01A	550–555	3	1	2004-01-22 15:21:13	2004-01-22 17:01:13
KSH01A	555–560	3	1	2004-01-22 17:25:31	2004-01-22 19:01:09
KSH01A	560–565	3	1	2004-01-23 08:20:16	2004-01-23 09:36:31
KSH01A	565–570	3	1	2004-01-23 10:02:16	2004-01-23 11:01:37
KSH01A	570–575	3	1	2004-01-23 11:27:48	2004-01-23 13:49:44
KSH01A	575–580	3	1	2004-01-23 14:13:17	2004-01-23 16:09:54
KSH01A	580–585	3	1	2004-01-23 16:34:13	2004-01-23 18:07:06
KSH01A	585–590	3	1	2004-01-24 08:15:56	2004-01-24 09:41:24
KSH01A	590–595	3	1	2004-01-24 10:05:57	2004-01-24 13:02:59
KSH01A	595–600	3	1	2004-01-24 13:30:40	2004-01-24 15:07:55
KSH01A	600–605	3	1	2004-01-24 15:31:48	2004-01-24 17:02:56
KSH01A	600–605	3	1	2004-01-28 10:42:02	2004-01-28 12:08:42
KSH01A	605–610	3	1	2004-01-24 17:27:06	2004-01-24 18:25:51
KSH01A	610–615	3	1	2004-01-25 08:23:48	2004-01-25 10:52:18
KSH01A	615–620	3	1	2004-01-25 11:16:40	2004-01-25 12:40:29
KSH01A	620–625	3	1	2004-01-25 13:40:39	2004-01-25 15:19:55
KSH01A	625–630	3	1	2004-01-25 15:44:29	2004-01-25 17:34:04
KSH01A	630–635	3	1	2004-01-25 17:56:51	2004-01-25 18:55:28
KSH01A	635–640	3	1	2004-01-26 08:16:40	2004-01-26 09:17:54
KSH01A	640–645	3	1	2004-01-26 09:48:56	2004-01-26 10:47:28
KSH01A	645–650	3	1	2004-01-26 11:16:35	2004-01-26 12:39:41
KSH01A	650–655	3	1	2004-01-26 13:05:23	2004-01-26 14:03:59
KSH01A	655–660	3	1	2004-01-26 14:32:29	2004-01-26 16:09:00
KSH01A	660–665	3	1	2004-01-26 16:36:56	2004-01-26 17:35:21
KSH01A	665–670	3	1	2004-01-26 18:02:00	2004-01-27 05:16:26

Bh ID	Test section (m)	Test type[1]	Test no	Test start Date, time	Test stop Date, time
KSH01A	670–675	3	1	2004-01-27 08:15:35	2004-01-27 09:59:58
KSH01A	675–680	3	1	2004-01-27 10:27:00	27.01.2004 12:20:53
KSH01A	680–685	3	1	2004-01-27 12:51:26	2004-01-27 15:39:49
KSH01A	685–690	3	1	2004-01-27 16:07:39	2004-01-27 17:07:05
KSH01A	690–695	3	1	2004-01-27 17:34:20	2004-01-27 18:32:52
KSH01A	695–700	3	1	2004-01-28 08:15:07	2004-01-28 09:14:02

1: 3: Injection test.

No other additional measurements except the actual hydraulic tests and related measurements of packer position and water level in annulus of borehole KSH01A were conducted.

3.3 Control of equipment

Control of equipment was mainly performed according to the Quality plan. The basis for equipment handling is described in the "Mätssystembeskrivning" SKB MD 345.101–123 which is composed of two parts 1) management description, 2) drawings and technical documents of the modified PSS2 tool.

Function checks were performed before and during the tests. Among these pressure sensors were checked at ground level and while running in the hole calculated to the static head. Temperature was checked at ground level and while running in. Leakage at joints in the pipe string was done at least every 100 m of running in.

Any malfunction was recorded, and measures were taken accordingly for proper operation. Approval was made according to SKB site manager, or Quality plan and the Mätssystembeskrivning.

4 Equipment

4.1 Description of equipment

The equipment called PSS2 (Pipe String System 2) is a highly integrated tool for testing boreholes at great depth (see conceptual drawing in the next figure). The system is built inside a container suitable for testing at any weather. Briefly, the components consists of a hydraulic rig, down-hole equipment including packers, pressure gauges, shut-in tool and level indicator, racks for pump, gauge carriers, breakpins, etc shelfs and drawers for tools and spare parts.

There are three spools for a multi-signal cable, a test valve hose and a packer inflation hose. There is a water tank for injection purposes, pressure vessels for injection of packers, to open test valve and for low flow injection. The PSS2 has been upgraded with a computerized flow regulation system. The office part of the container consists of a computer, regulation valves for the nitrogen system, a 24 V back-up system in case of power shut-offs and a flow regulation board.

PSS2 is documented in photographs 1–6.

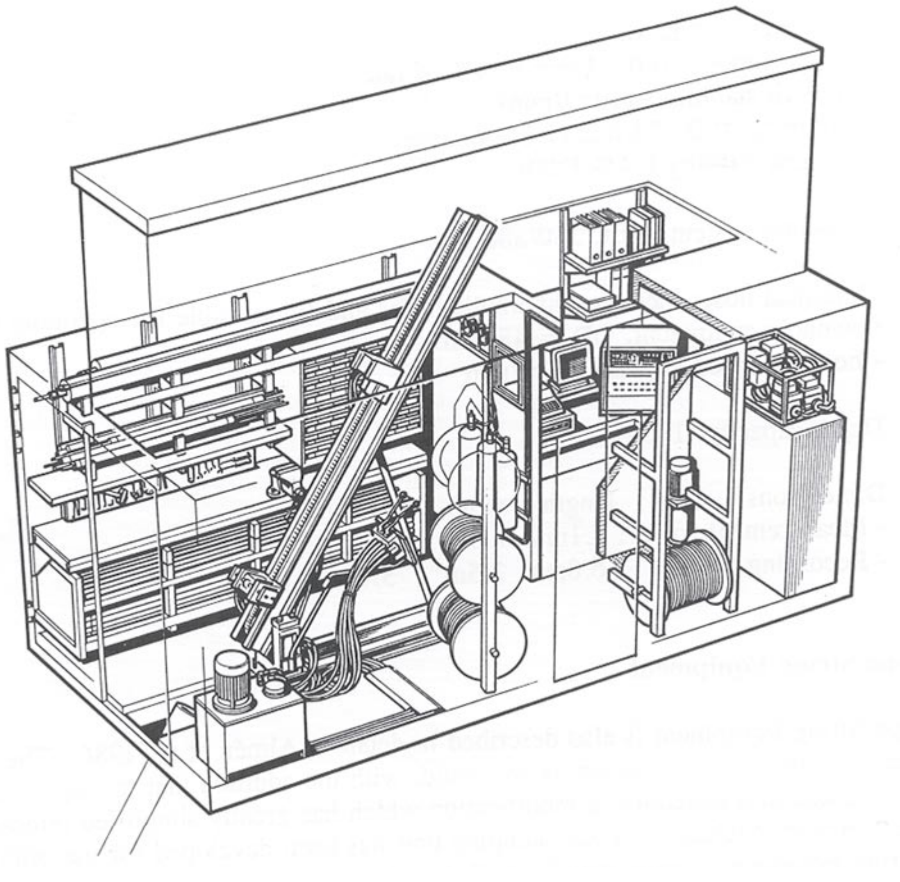

Figure 4-1. *A view of the layout and equipment of PSS2.*

Photo 1. *Hydraulic rig.*

Photo 2. *Rack for pump, down-hole equipment, workbench and drawers for tools.*

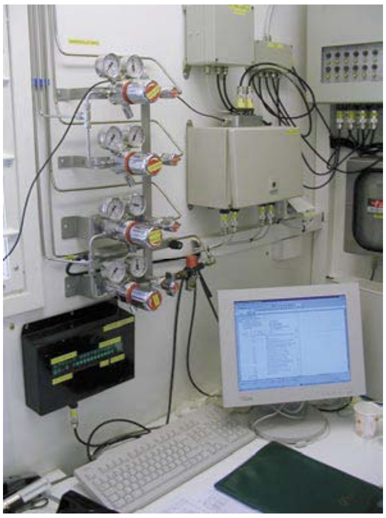

Photo 3. *Computer room, displays and gas regulators.*

Photo 4. *Pressure vessels for test valve, packers and injection.*

Photo 5. *Positioner, bottom end of down-in-hole string.*

Photo 6. *Packer and gauge carrier.*

The down-hole equipment consists from bottom to top of the following equipment:

- Level indicator – SS 630 mm pipe with OD 73 mm with 3 plastic wheels connected to a Hallswitch.
- Gauge carrier – SS 1.5 m carrying bottom section pressure transducer and connections from positioner.
- Lower packer – SS and PUR 1.5 m with OD 72 mm, stiff ends, tightening length 1.0 m, maximum pressure 6.5 MPa, working pressure 1.6 MPa.
- Contact carrier – SS 1.0 m carrying connections for sensors below.
- Pop joint – SS 1.0 or 0.5 m with OD 33 mm and ID 21 mm, double O-ring fittings, trapezoid thread, friction loss of 3 kPa/m at 50 L/min.
- Pipe string – SS 3.0 m with OD 33 mm and ID 21 mm, double O-ring fittings, trapezoid thread, friction loss of 3 kPa/m at 50 L/min.
- Gauge carrier with breakpin – SS 2.0 m carrying test section pressure transducer, temperature sensor and connections for sensors below. Breakpin with maximum load of 47.3 ($\pm$ 1.0) kN.
- Upper packer – SS and PUR 1.5 m with OD 72 mm, fixed ends, seal length 1.0 m, maximum pressure 6.5 MPa, working pressure 1.6 MPa.
- Breakpin – SS 250 mm with OD 33.7 mm. Maximum load of 47.3 ($\pm$ 1.0) kN.
- Pipe gauge carrier – SS 2.0 m carrying top section pressure transducer, connections from sensors below. Flow pipe is double bent at both ends to give room for sensor equipment.
- Shut-in tool (test valve) – SS 1.0 m with a OD of 48 mm, Teflon coated valve piston, friction loss of 11 kPa at 10 L/min (260 kPa–50 L/min). Working pressure 2.8–4.0 MPa.

The tool scheme is presented in Figure 4-2.

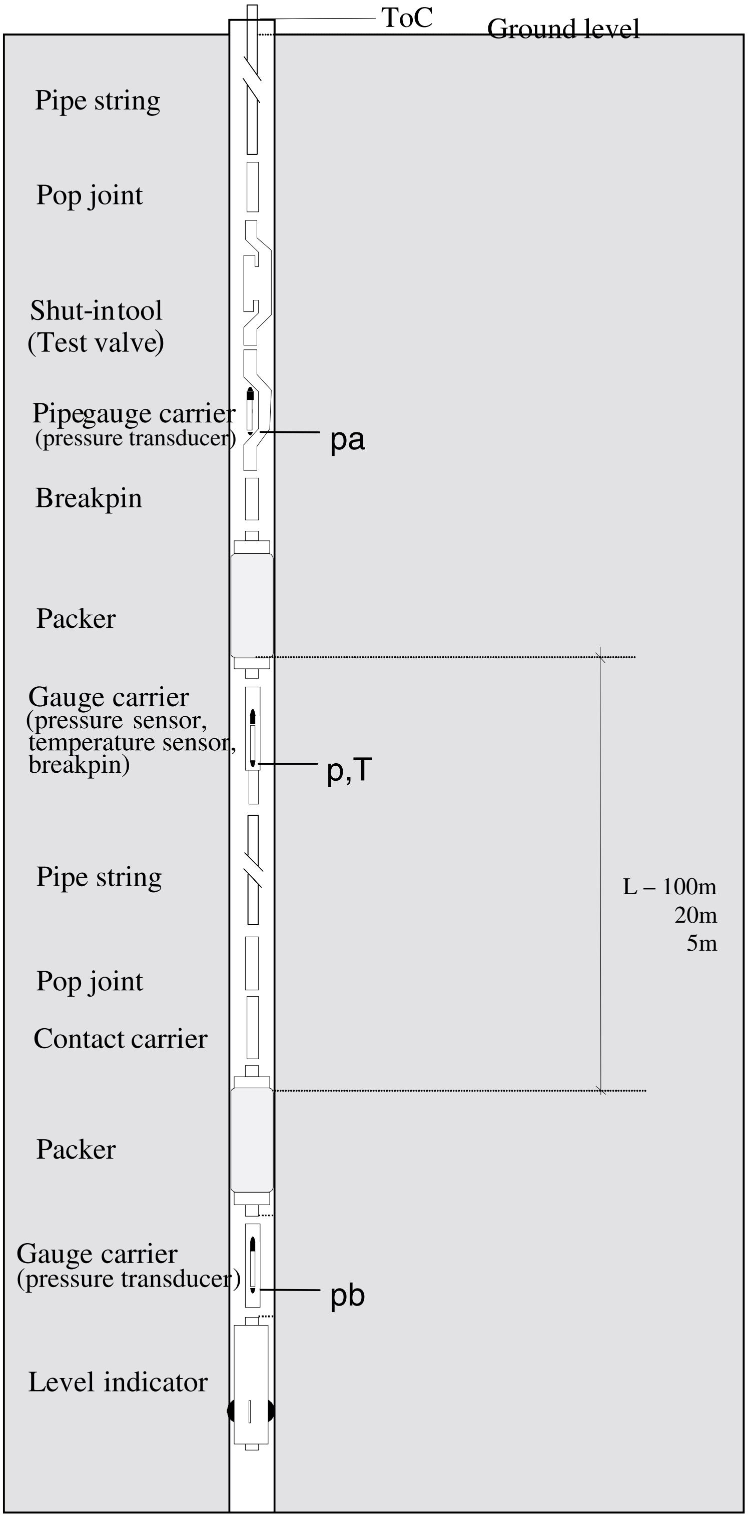

Figure 4-2. *Schematic drawing of the down-hole equipment in the PSS2 system.*

4.2 Sensors

Table 4-1. Technical specifications of sensors.

Keyword	Sensor	Name	Unit	Value/range	Comments
$p_{sec,a,b}$	Pressure	Druck PTX 162-1464abs	9–30 4–20 0–13.5 Resolution Accuracy	VDC mA MPa % of FS	
$T_{sec,surf,air}$	Temperature	BGI	18–24 4–20 0–32 0.1	VDC mA °C °C	
Q_{big}	Flow	Micro motion Elite sensor	0–100 ± 0.1	kg/min %	Massflow
Q_{small}	Flow	Micro motion Elite sensor	0–1.8 ± 0.1	kg/min %	Massflow
p_{air}	Pressure	Druck PTX 630	9–30 4–20 0–120 ± 0.1	VDC mA KPa % of FS	
p_{pack}	Pressure	Druck PTX 630	9–30 4–20 0–4 ± 0.1	VDC mA MPa % of FS	
$p_{in,out}$	Pressure	Druck PTX 1400	9–28 4–20 0–2.5	VDC mA MPa	

Table 4-2. Sensor positions and wellbore storage (WBS) controlling factors.

Borehole information			**Sensors**		**Equipment affecting WBS coefficient**		
ID	**Test section (m)**	**Test no**	**Type**	**Position (m fr ToC)**	**Position**	**Function**	**Outer diameter (mm)**
KSH01A	103–203	1	p_a p T p_b	100.5 104.25 104.5 205	Test section	Signal cable Pump string Packer line	9.1 33 6
KSH01A	103–123	1	p_a p T p_b	100.5 104.25 104.5 125	Test section	Signal cable Pump string Packer line	9.1 33 6
KSH01A	300–305	1	p_a p T p_b	297.5 301.25 301.5 307	Test section	Signal cable Pump string Packer line	9.1 33 6

4.3 Data acquisition system

The data acquisition system in the PSS2 container contains a stationary PC with the software Orchestrator, pump- and injection tests parameters such as pressure, temperature and flow are monitored and sensor data collected. A second laptop PC is connected to the stationary PC through a network containing evaluation software, Flowdim. While testing, data from previously tested section is converted with IPPlot and entered in Flowdim for evaluation.

The data acquisition system starts and stops the test automatically or can be disengaged for manual operation of magnetic and regulation valves within the injection/pumping system. The flow regulation board is used for differential pressure and valve settings prior testing and for monitoring valves during actual test. An outline of the data acquisition system is outlined in Figure 4-3.

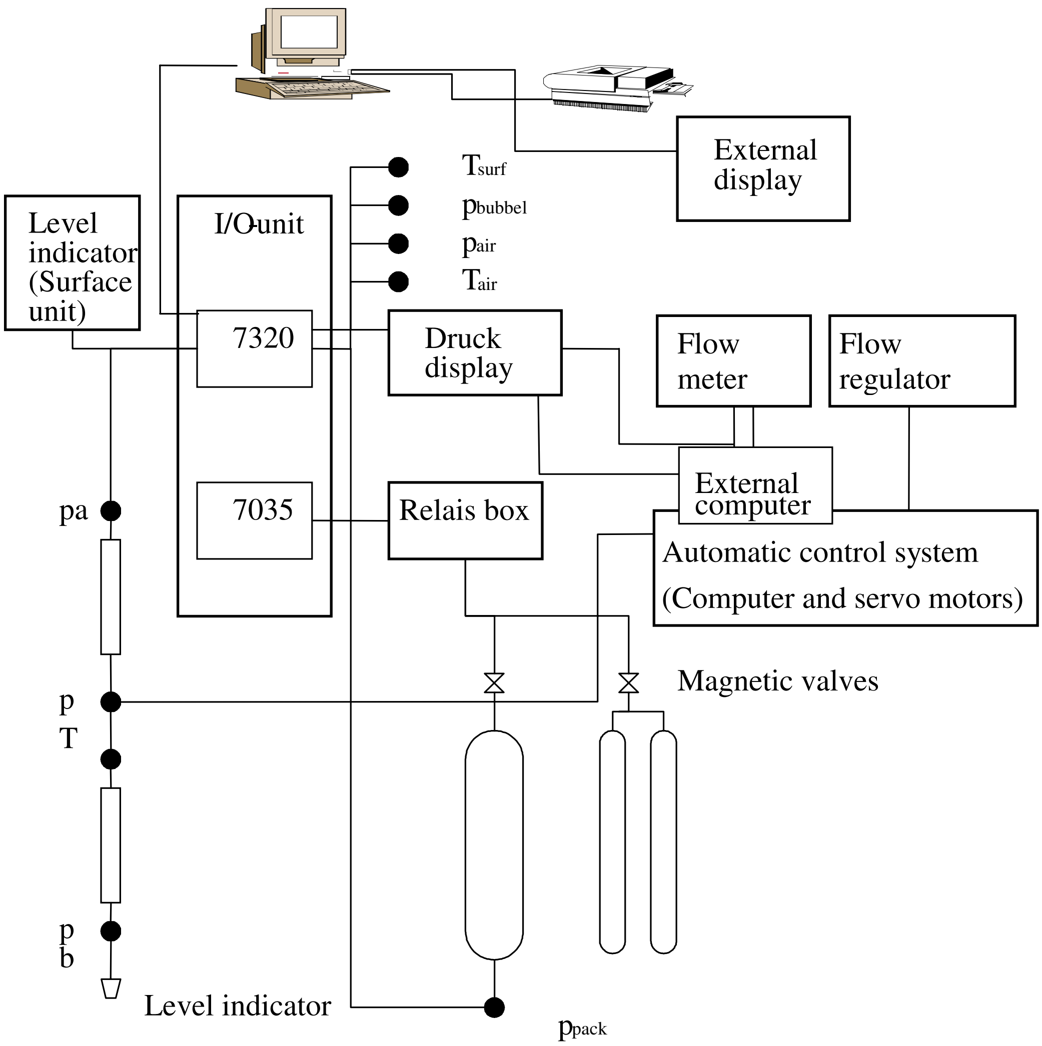

Figure 4-3. *Schematic drawing of the data acquisition system and the flow regulation control system in PSS2.*

5 Execution

5.1 Preparations

Following preparation work and functional checks were conducted prior to starting test activities:

- Place pallets and container, lifting rig up, installing fence on top of container, lifting tent on container.
- Clean and desinfect of Multikabel and hoses for packer and test valve. Clean the tubings with hot steam.
- Filling injection tank with water out of the borehole.
- Filling buffer tank with water.
- Filing vessels.
- Filling the hoses for test valve and packer.
- Entering calibration constants to system and regulation unit.
- Synchronize clocks on all computers.
- Function check of shut-in tool both ends, overpressure by 900 kPa for 5 min (OK).
- Check pressure gauges against atmospheric pressure and than on test depth against column of water.
- Translate all protocols into English.
- Filling packers with water and de-air.
- Measure and assemble test tool.

5.2 Execution of tests/measurements

5.2.1 Test principle

The tests were conducted as constant pressure injection (CHi phase) followed by a shut-in pressure recovery (CHir phase). In some cases, when the test section transmissivity was too low (typically lower than 1E–9 m^2/s) no measurable flow could be registered during the CHi phase ($Q < 1$ mL/min). Due to the very low test section transmissivity, the packer compliance period (PSR phase) lasted very long (typically several hours). As agreed with SKB, a test was skipped when there was no indication for a pressure stabilisation within 30 min (for 20 m and 5 m sections, see Figure 5-1). In such cases there was no active test conducted, the behaviour of the compliance period being taken as a proof of very low section transmissivity (lower than 1E–11 m^2/s).

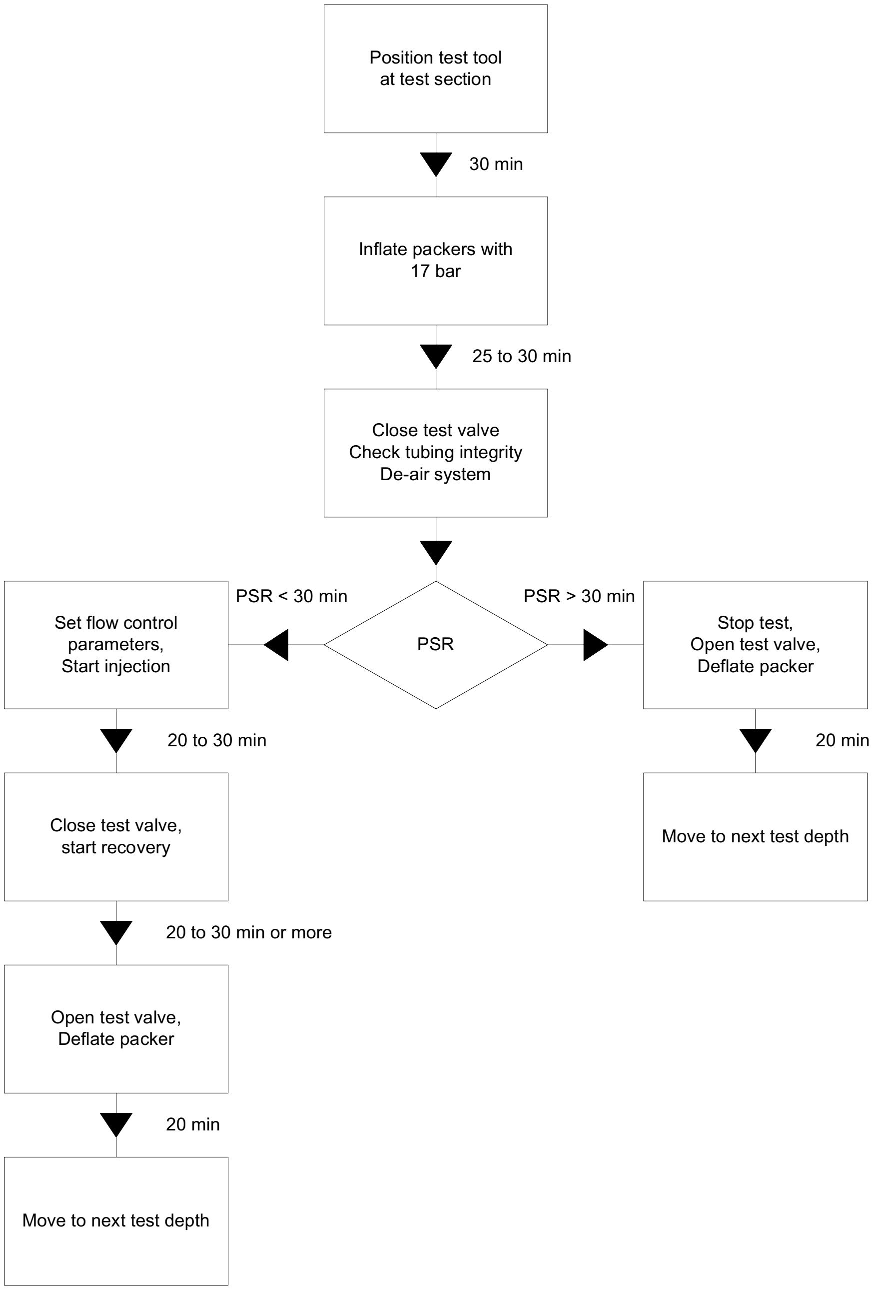

Figure 5-1. *Flow chart for test performance.*

5.2.2 Test procedure

A test cycle includes the following phases: 1) Transfer of down-hole equipment to the next section. 2) Packer inflation. 3) Pressure stabilisation. 4) Constant head injection. 5) Pressure recovery. 6) Packer deflation. The injection tests in KSH01A has been carried out by applying a constant injection pressure of ca 200 kPa (20 m water column) above the static formation pressure in the test section. Before start of the injection tests, approximately stable pressure conditions prevailed in the test section. After the injection period, the pressure recovery in the section was measured. In some cases, if small flow rates were expected, the automatic regulation unit was switched off and the test was performed manually.

The duration for each phase is presented in Table 3-3.

Table 5-1. Durations for packer inflation, pressure stabilisation, injection and recovery phase and packer deflation in KSH01A.

• Position test tool to new test section (correct position using the borehole markers)	Approx 30 min
• Inflate packers with 20 bar	25 min
• Close test valve	10 min
• Check tubing integrity with 9 bar	5 min
• De-air system	2 min
• Set automatic flow control parameters	5 min
• Start injection	20 to 45 min
• Close test valve, start recovery	20 min or more
• Open test valve	10 min
• Deflate packers	25 min
• Move to next test depth	…

In some cases injection and recovery phases were prolonged. This was due to testing zones of high interest for example high flow zones or low flow zones.

5.3 Data handling

The data handling followed several stages. The data acquisition software (Orchestrator) produced an ASCII raw data file (*.ht2) which contains the data in voltage and milliampere format plus calibration coefficients. The *.ht2 files were processed to *.dat files using the SKB program called IPPlot. These files contain the time, pressure, flow rate and temperature data. The *.dat files were synthesised in Excel to a *.xls file for plotting purposes. Finally, the test data to be delivered to SKB were exported from Excel in csv format. These files were also used for the subsequent test analysis.

5.4 Analyses and interpretation

5.4.1 Analysis software

The tests were analysed using a type curve matching method. The analysis was performed using Golder's test analysis program FlowDim. FlowDim is an interactive analysis environment allowing the user to interpret constant pressure, constant rate and slug/pulse tests in source as well as observation boreholes. The program allows the calculation of type-curves for homogeneous, dual porosity and composite flow models in variable flow geometries from linear to spherical.

5.4.2 Analysis approach

Constant pressure tests are analysed using a rate inverse approach. The method initially known as the /Jacob and Lohman,1952/ method was further improved for the use of type curve derivatives and for different flow models.

Constant pressure recovery tests are analysed using the method described by /Gringarten, 1986/ and /Bourdet et al. 1989/ by using type curve derivatives calculated for different flow models.

5.4.3 Analysis methodology

Each of the relevant test phases is subsequently analyzed using the following steps:

- **Injection Tests**
- Identification of the flow model by evaluation of the derivative on the log-log diagnostic plot. Initial estimates of the model parameters are obtained by conventional straight-line analysis.
- Superposition type curve matching in log-log coordinates. A non-linear regression algorithm is used to provide optimized model parameters in the latter stages.
- Non-linear regression in semi-log coordinates (superposition HORNER plot /Horner, 1951/). In this stage of the analysis, the static formation pressure is selected for regression.

The test analysis methodology is best explained in /Horne, 1990/.

- **Pulse Injection Tests**

A test is always initiated as a constant pressure injection. However, if after a few seconds of injection the rate quickly drops to zero, this indicates a very tight section. It is then decided to close the test valve and measure the pressure recovery. The pressure recovery is analysed as a pulse injection phase (PI).

During the brief injection phase a small volume is injected (derived from the flowmeter measurements). This injected volume produces the pressure increase of dp. Using a dV/dp approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity. Figure 5-2 below show an example of a typical pressure versus time evolution for such a tight section.

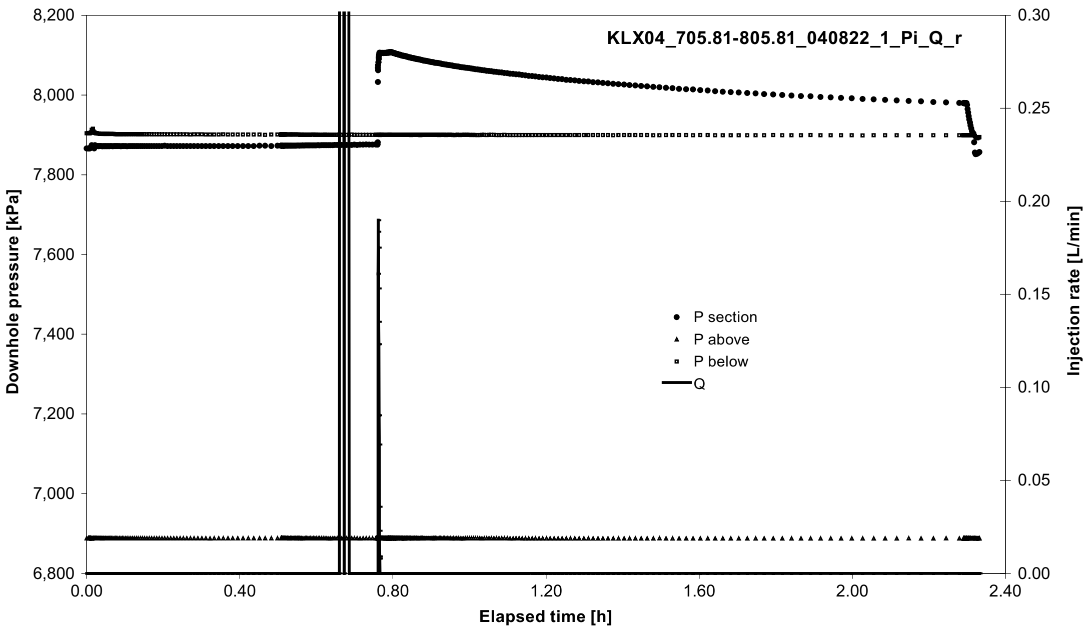

Figure 5-2. *Typical pressure versus time plot of a Pulse injection test.*

5.4.4 Steady state analysis

In addition to the type curve analysis, an interpretation based on the assumption of stationary conditions was performed as described by /Moye, 1967/.

5.4.5 Flow models used for analysis

The flow models used in analysis were derived from the shape of the pressure derivative calculated with respect to log time and plotted in log-log coordinates.

In several cases the pressure derivative suggests a change of transmissivity with the distance from the borehole. In such cases a composite flow model was used in the analysis.

If there were different flow models matching the data in comparable quality, the simplest model was preferred.

The flow dimension displayed by the test can be diagnosed from the slope of the pressure derivative. A slope of 0.5 indicates linear flow, a slope of 0 (horizontal derivative) indicates radial flow and a slope of –0.5 indicates spherical flow. The flow dimension diagnosis was commented for each of the tests. At tests where a flow regime could not clearly identified from the test data, we assume in general a radial flow regime as most likely (according to the experience from previous tests in this region) for this test section as the recommended flow model. The value of p* was then calculated according to this assumption.

5.4.6 Calculation of the static formation pressure and equivalent freshwater head

The static pressure measured at transducer depth, was derived from the pressure recovery (CHir) following the constant pressure injection phase by using straight line or type curve extrapolation in the Horner plot.

The equivalent freshwater head (expressed in meters above sea level) was calculated from the static formation pressure, corrected for athmospheric pressure measured by the surface gauge and corrected for the vertical depth considering the inclination of the drillhole, by assuming a water density of 1,000 kg/m^3 (freshwater). The equivalent freshwater head is the static water level an individual test interval would show if isolated and connected to the surface by tubing full of freshwater. Figure 5-2 shows the methodology schematically.

The freshwater head in meters above sea level is calculated as following:

$$h = \frac{(p_i - p_{atm})}{\rho \cdot g}$$

which is the P_i value expressed in a water column of freshwater.

With consideration of the elevation of the reference point (RP) and the gauge depth (Gd), the freshwater head is

$$head = RP_{elev} - Gd + \frac{(p_i - p_{atm})}{\rho \cdot g}$$

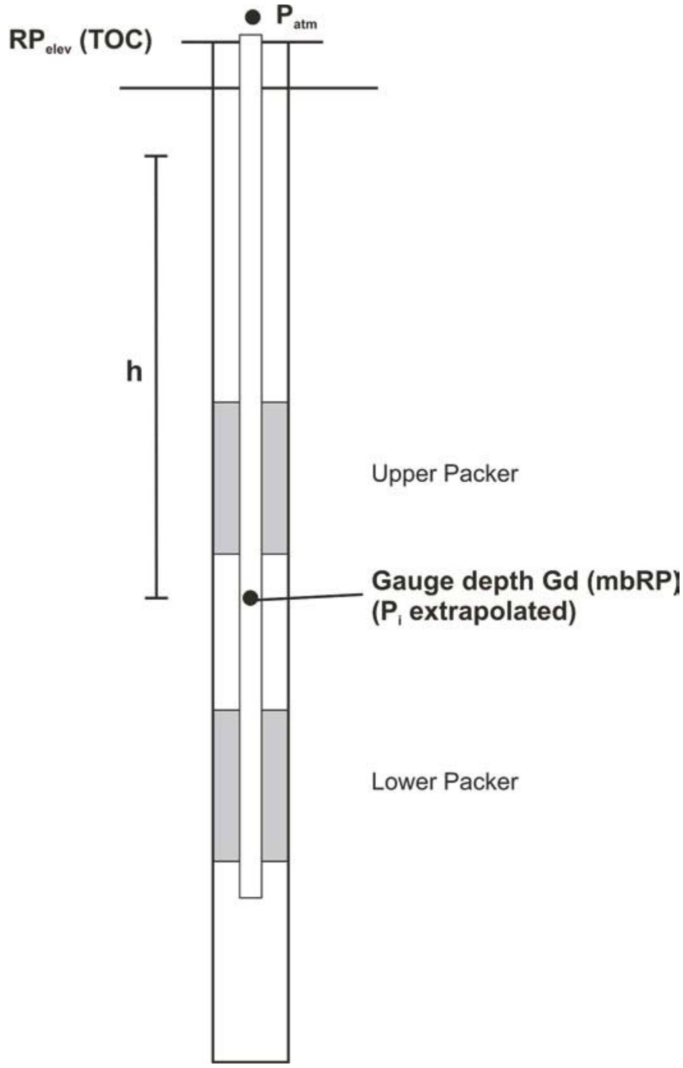

Figure 5-3. *Schematic methodologies for calculation of the freshwater head.*

5.4.7 Derivation of the recommended transmissivity and the confidence range

In most of the cases more than one analysis was conducted on a specific test. Typically both test phases were analysed (CHi and CHir) and in some cases the CHi or the CHir phase was analysed using two different flow models. The parameter sets (i.e. transmissivities) derived from the individual analyses of a specific test usually differ. In the case when the differences are small (which is typically the case) the recommended transmissivity value is chosen from the test phase that shows the best data and derivative quality. In cases when a composite flow model was deemed to be most representative for the hydraulic behaviour of the specific test section, than the outer zone transmissivity was selected as recommended value, because it is regarded as most representative for the large scale undisturbed formation properties.

In cases when the difference in results of the individual analyses was large (more than half order of magnitude) the test phases were compared in a normalized plot (which is not part of the report itself but used as tool for quality assurance) and the phase showing the best derivative quality was selected.

The confidence range of the transmissivity was derived using expert judgement. Factors considered were the range of transmissivities derived from the individual analyses of the test as well as additional sources of uncertainty such as noise in the flow rate measurement, numeric effects in the calculation of the derivative or possible errors in the measurement of the wellbore storage coefficient. No statistical calculations were performed to derive the confidence range of transmissivity.

In some cases the tests were not analysable due to the fact that the flow rates during the CHi phase were below the range of the flowmeter (< 0.5 mL/min) or because the compliance phase following packer inflation was too long, thus indicating a very low interval transmissivity. In such cases the interval transmissivity was recommended to a value of 1.0E–11 m^2/s which was in the same time regarded as the upper boundary of the confidence range. This value is consistent with the observations made during the analysis of the other tests in the borehole (i.e. the transmissivity must be lower than in the cases when the test was analysable).

6 Results

In the following, results of all tests are presented and analysed. Chapter 6.1 presents the 100 m tests, 6.2 the 20 m tests and 6.3 the 5 m tests. The results are given as general comments to test pereformance, the identified flow regimes and calculated parameters and finally the parameters which are considered as most representative are chosen and justification is given. All results are also summarised in Table 7-1 and 7-2 of the Synthesis chapter.

6.1 100 m single-hole injection tests

In the following, the 100 m section tests conducted in borehole KSH01A are presented and analysed.

6.1.1 Section 103–203 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 197 kPa, followed by a pressure recovery phase. No hydraulic connection between test interval and the adjacent zones was observed. The injection rate decreased from 1.57 L/min at start of the CHi phase to 1.37 L/min at the end, indicating a moderately high interval transmissivity. The early times of the CHi phase (first 7 minutes) are not analysable due to the time needed by the system to regulate constant pressure. However, the middle and late times of the CHi phase are of good quality and can be analysed quantitatively. The recovery phase (CHir) is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). The late times of the CHir phase show a negative slope of –0.5 indicative of spherical flow. However, based on the normalized derivative plot an infinite acting radial composite flow model was chosen for the analysis. The analysis is presented in Appendix 2-1. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 5.0E–6 m^2/s was derived from the analysis of the CHi phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3.0E–6 to 1.0E–5 m^2/s (the inner zone composite transmissivity is regarded as a local skin effect). The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,046.2 kPa.

The analysis of the CHi and CHir phases shows good consistency. No further analysis is recommended.

6.1.2 Section 200–300 m, test no 2, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between test interval and the adjacent zones was observed. The injection rate decreased from 14.1 L/min at start of the CHi phase to 8.2 L/min at the end, indicating a relatively high interval transmissivity. The early times of the CHi phase are not analysable due to the time needed by the system to regulate constant pressure. However, the middle and late times of the CHi phase are of good quality and can be analysed quantitatively. The recovery phase (CHir) is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). The CHir phase derivative shows a downward trend at late times indicating either an increase of transmissivity at some distance from the borehole or a flow dimension above 2. It was decided to use a flow dimension of 2 (radial flow) in the analysis. An infinite acting homogeneous radial flow model was chosen for the analysis of the CHi phase. For the analysis of the CHir phase a radial composite flow model was chosen. The analysis is presented in Appendix 2-2. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 6.3E–6 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2.0E–6 to 1.0E–5 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,985.2 kPa.

The analysis of the CHi and CHir phases shows good consistency. No further analysis is recommended.

6.1.3 Section 300–400 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between test interval and the adjacent zones was observed. The injection rate control during the CHi phase was not very good. In addition, due to the small injection rates (low transmissivity) the rate measurements are relatively noisy. The injection rate decreased from 24.7 mL/min at start of the CHi phase to 16.9 mL/min at the end, indicating a relatively low interval transmissivity. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). The CHir phase derivative shows an upward trend at late times indicating a decrease of transmissivity at some distance from the borehole. An infinite acting homogeneous radial flow model was chosen for the analysis of the CHi phase. For the analysis of the CHir phase a radial composite flow model was chosen. The analysis is presented in Appendix 2-3. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 6.6E–9 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5.0E–9 to 2.0E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,943.2 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis is recommended.

6.1.4 Section 400–500 m, test no 2, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of about 240 kPa, followed by a pressure recovery phase. The test was accomplished without using the automatic regulation system. During the injection phase the pressure in the interval rose by 6 kPa. No hydraulic connection between test interval and the adjacent zones was observed. The injection rate decreased from 25.3 mL/min at start of the CHi phase to 5.2 mL/min at the end, indicating a relatively low interval transmissivity. The early times of the CHi phase (first 50 seconds) are not analysable. However, the middle and late times of the CHi phase are of good quality and can be analysed quantitatively. The recovery phase (CHir) is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting radial composite flow model was chosen for the analysis of this phase. The CHir phase shows an upward trend indicating either a decrease of transmissivity at some distance from the borehole or a flow dimension below 2. A radial composite flow model was chosen for the analysis of this phase. The analysis is presented in Appendix 2-4. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.7E–9 m^2/s was derived from the analysis of the CHi phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3.0E–10 to 6E–9 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,883.7 kPa.

The analysis of the CHi and CHir phases shows good consistency. No further analysis is recommended.

6.1.5 Section 500–600 m, test no 2, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test data indicates a hydraulic connection between the test interval and the section below. The injection rate decreased from 4.97 L/min at beginning of the CHi phase to 2.27 L/min at the end, indicating a moderately high interval transmissivity. The first part of the CHi phase (first 8 to 9 minutes) is not analysable due to the time needed by the system to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of this phase. The CHir phase shows an upward trend indicating either a decrease of transmissivity at some distance from the borehole or a flow dimension below 2. A radial composite flow model was chosen for the analysis of this phase. Additionally an alternative analysis with a flow dimension of 1 (linear flow) for the outer zone of the composite model was performed. The analysis is presented in Appendix 2-5. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.0E–6 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 4E–7 to 2E–5 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,861.6 kPa.

The analysis of the CHi and CHir phases shows very good consistency. No further analysis is recommended.

6.1.6 Section 600–700 m, test no 2, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 203 kPa, followed by a pressure recovery phase. No hydraulic connection between test interval and the adjacent zones was observed. The injection rate decreased from 0.48 L/min at start of the CHi phase to 0.06 L/min at the end, indicating a relatively low interval transmissivity. The results of the CHi phase analysis should be regarded as order of magnitude only. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test none of the test phases (CHi and CHir) shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model was chosen for the analysis of the CHi phase. The CHir phase shows an upward trend indicating either a decrease of transmissivity at some distance from the borehole or a flow dimension below 2. A radial composite flow model was chosen for the analysis of this phase. The analysis is presented in Appendix 2-6. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.0E–8 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E–8 to 6E–7 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,818.2 kPa.

The analysis of the CHi and CHir phases shows very good consistency. No further analysis is recommended.

6.1.7 Section 700–800 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 177 kPa, followed by a pressure recovery phase. No hydraulic connection between test interval and the adjacent zones was observed. The injection rate decreased from 0.12 L/min at start of the CHi phase to 0.016 L/min at the end, indicating a relatively low interval transmissivity. The early and middle times of the CHi phase are not analysable due to the time needed to get constant pressure. However, the late times of the CHi phase are of good quality and can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model was chosen for the analysis of this phase. The CHir phase shows an upward trend indicating either a decrease of transmissivity at some distance from the borehole or a flow dimension below 2. A radial composite flow model was chosen for the analysis of this phase. Additionally an alternative analysis with a flow dimension of 1 (linear flow) for the outer zone of the composite model was performed. The analysis is presented in Appendix 2-7. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 8.7E–9 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2E–9 to 8E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6,790.7 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis is recommended.

6.1.8 Section 800–900 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 182 kPa, followed by a pressure recovery phase. No hydraulic connection between test interval and the adjacent zones was observed. The injection rate decreased from 4 mL/min at start of the CHi phase to 1 mL/min at the end, indicating a very low interval transmissivity. Due to the very small injection rates the rate measurements are relatively noisy. Because of this reason the results of the CHi analysis should be regarded as order of magnitude only. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test, due to the very small transmissivity, the flow model is difficult to diagnose. An infinite acting homogeneous radial flow model was chosen for the analysis. The analysis is presented in Appendix 2-8. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 9.4E–10 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E–10 to 3.0E–9 m^2/s. Due to the low transmissivity of the test section the flow dimension could not be diagnosed. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 7,737.7 kPa.

The analysis results of the two test phases show reasonable consistency. Due to the relatively poor data quality no further analysis is recommended.

6.1.9 Section 899–999 m, test no 2, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 208 kPa, followed by a pressure recovery phase. No hydraulic connection between test interval and the adjacent zones was observed. The injection rate decreased from 9.5 mL/min at start of the CHi phase to 6.6 mL/min at the end with a sharp drop after

7 minutes from 9 mL/min to 7 mL/min, indicating a very low interval transmissivity. The cause for the drop in the flow rate is unknown. The early times of the CHi phase (first 20 seconds) are not analysable due to the time needed by the system to regulate constant pressure. However, the middle and late times of the CHi phase are of good quality and can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of this phase. For the analysis of the CHir phase a radial composite flow model was used. The analysis is presented in Appendix 2-9. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 3.9E–9 m^2/s was derived from the analysis of the CHi phase, which although noisy, shows a flat derivative at late times. The confidence range for the interval transmissivity is estimated to be 1E–9 to 5E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 8,659.8 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis is recommended.

6.2 20 m single-hole injection tests

In the following, the 20 m section tests conducted in borehole KSH01A are presented and analysed.

6.2.1 Section 103–123 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 0.60 L/min at beginning of the CHi phase to 0.42 L/min at the end, indicating relatively low interval transmissivity. The first part of the CHi phase (first 10 minutes) is not analysable due to the time needed by the system to regulate constant pressure and because of a malfunction of the system after 7 minutes when the flow rate and so the pressure rose up suddenly and became stable again. However, the late times of the CHi phase can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of this phase. A radial composite flow model was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-10. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.0E–7 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–8 to 5E–7 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 1,040.4 kPa.

The analysis of the CHi and CHir phases shows good consistency. No further analysis is recommended.

6.2.2 Section 123–143 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 68.2 mL/min at beginning of the CHi phase to 61.28 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 2 minutes) is not analysable due to the time needed by the system to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). A radial composite flow model was chosen for the analysis of this phase. The CHir phase was analysed using an infinite acting homogeneous flow model with wellbore storage and skin. The analysis is presented in Appendix 2-11. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 6.6E–8 m^2/s was derived from the analysis of the CHi phase (outer zone), which although noisy, shows a flat derivative at late times . The confidence range for the interval transmissivity is estimated to be 1E–8 to 3E–7 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,239.5 kPa.

The analysis of the CHi and CHir phases shows some inconsistency that should be resolved in case further analysis of the test is planned.

6.2.3 Section 143–163 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 1.06 L/min at beginning of the CHi phase to 0.76 L/min at the end, indicating a moderately high interval transmissivity. The first part of the CHi phase (first 30 seconds) is not analysable due to the time needed to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test both phases (CHi and CHir) show a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). The CHi phase was analysed using a homogeneous infinite acting radial flow model. The CHir phase shows in middle times a downward trend indicating a flow dimension higher than 2. Therefore a radial two shell composite model with a flow dimension of 3 (spherical flow) for the inner shell was chosen for the analyses of this phase. The analysis is presented in Appendix 2-12. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 9.6E–7 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. It should be noted, that the results of both test phases can not be compared directly, because different flow dimensions were used. The confidence range for the interval transmissivity is estimated to be 4E–7 to 2E–6 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,431.3 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis is recommended.

6.2.4 Section 163–183 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test data indicates a hydraulic connection between the test interval and the section below. The injection rate decreased from 80.5 mL/min at beginning of the CHi phase to 63.3 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 4 to 5 minutes) is not analysable due to the time needed to regulate constant pressure. The middle and late times of the CHi phase are of better quality and amenable for quantitative analysis. The

CHir phase recovered to static conditions very quickly, such that the analysis should be regarded with caution.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the data quality does not allow for a specific determination of the flow dimension. The analysis was conducted assuming a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model was chosen for the analysis. The analysis is presented in Appendix 2-13. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 5.0E–8 m^2/s was derived from the analysis of the CHi phase, which although noisy, shows the more reliable data and derivative. The confidence range for the interval transmissivity is estimated to be 4E–8 to 4E–7 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,623.1 kPa.

The analysis of the CHi and CHir phases show some inconsistency that should be resolved in case further analysis of the test is planned. In this case we recommend conducting a full superposition transient analysis in order to account for pressure history effects and changing flow rates during the CHi phase.

6.2.5 Section 183–203 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 198 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 42.5 mL/min at beginning of the CHi phase to 19.1 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 5 minutes) is not analysable due to the time needed by the system to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively, although it is noisy. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a downward trend at late times, which is indicative of a flow dimension higher than 2. An infinite acting homogeneous radial flow model with a flow dimension of 3 (spherical flow) was chosen for the analysis of this phase. The CHir phase was analysed using an assumed radial composite flow model. The analysis is presented in Appendix 2-14. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 3.4E–8 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality, although no infinite acting radial flow was measured The confidence range for the interval transmissivity is estimated to be 8E–9 to 6E–8 m^2/s. The flow dimension displayed during the test is not unambiguous. The static pressure measured at transducer depth was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 1,817.0 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies concerning the flow dimension. To improve analysis consistency and if further analysis is intended, a full superposition analysis should be conducted.

6.2.6 Section 200–220 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 1.5 L/min at beginning of the CHi phase to 0.47 L/min at the end, indicating a moderately high interval transmissivity. The first part of the CHi phase (first 2 minutes) is not analysable due to the time needed by the system to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a downward trend at middle and late times, which is indicative of a flow dimension higher than 2. A regression line drawn through the entire middle and late times of the CHi phase derivative yields a flow dimension of 2.8. An infinite acting homogeneous radial flow model with a flow dimension of 3 was chosen for the analysis of this phase. The CHir phase shows a downward trend at late times indicating either an increase of transmissivity at some distance from the borehole or a flow dimension higher than 2. A radial composite flow model was chosen for the analysis of this phase. The analysis is presented in Appendix 2-15. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 5.7E–7 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E–7 to 9E–7 m^2/s. The flow dimension displayed during the test is not unambiguous. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,978.6 kPa.

It should be noted that the transmissivities derived from the CHi and the CHir phase are not directly comparable, because different flow dimensions were used. To improve analysis consistency and if further analysis is intended, a full superposition analysis should be conducted.

6.2.7 Section 220–240 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 0.12 L/min at beginning of the CHi phase to 0.06 L/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first minute) is not analysable due to the time needed by the system to regulate constant pressure. However, the middle and late times of the CHi phase can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test both phases (CHi and CHir) show a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model was chosen for the analysis of this phase. The analysis is presented in Appendix 2-16. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 4.0E–8 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2E–8 to 7E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,166.7 kPa.

The analysis of the CHi and CHir phases shows very good consistency. No further analysis is recommended.

6.2.8 Section 240–260 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test data indicates a hydraulic connection between the test interval and the section below. The injection rate decreased from 5.48 L/min at beginning of the CHi phase to 3.37 L/min at the end, indicating a moderately high interval transmissivity. The first part of the CHi phase (first 1.5 minutes) is not analysable due to the time needed by the system to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model was chosen for the analysis of this phase. The CHir phase shows an upward trend indicating either a decrease of transmissivity at some distance from the borehole or a flow dimension below 2. A radial composite flow model was chosen for the analysis of this phase. The analysis is presented in Appendix 2-17. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 3.5E–6 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E–6 to 6E–6 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,361.8 kPa.

The analysis of the CHi and CHir phases shows good consistency. No further analysis is recommended.

6.2.9 Section 260–280 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 198 kPa, followed by a pressure recovery phase. The test data indicates no hydraulic connection between the test interval and the adjacent sections. The injection rate decreased from 1.91 L/min at beginning of the CHi phase to 1.43 L/min at the end, indicating a moderately high interval transmissivity. The first part of the CHi phase (first 4 to 5 minutes) is not analysable due to the time needed by the system to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a downward trend at late times, which is indicative of a flow dimension higher than 2. An infinite acting homogeneous radial flow model with a flow dimension of 3 (spherical flow) was chosen for the analysis of this phase. The CHir phase shows a downward trend at late times as well, indicating either an increase of transmissivity at some distance from the borehole or a flow dimension above 2. A radial composite flow model was chosen for the analysis of this phase. The analysis is presented in Appendix 2-18. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 3.9E–6 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E–6 to 5E–6 m^2/s. The flow dimension displayed during the test is not unambiguous. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,556.7 kPa.

The analysis of the CHi and CHir phases show some inconsistencies concerning the flow dimension. To improve analysis consistency and if further analysis is intended, a full superposition analysis should be conducted.

6.2.10 Section 280–300 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test data indicates no hydraulic connection between the test interval and the adjacent zones. The injection rate decreased from 7.49 L/min at beginning of the CHi phase to 3.72 L/min at the end, indicating a relatively high interval transmissivity. The first part of the CHi phase (first 2 minutes) is not analysable due to the time needed by the system to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test both of the phases show a downward trend at late times, indicating either an increase of transmissivity or a flow dimension above 2. It was decided to use a flow dimension of 2 (radial flow). A radial 2 shell composite model with wellbore storage and skin was chosen for the analysis. The analysis is presented in Appendix 2-19. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.9E–6 m^2/s was derived from the analysis of the CHi phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E–7 to 6E–6 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 2,749.3 kPa.

The analysis of the CHi and CHir phases shows good consistency. No further analysis is recommended.

6.2.11 Section 300–320 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 220 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 15.54 mL/min at beginning of the CHi phase to 8.18 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 50 seconds) is not analysable due to the time needed to regulate constant pressure. However, the middle and late times of the CHi phase can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test both test phases show a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model was chosen for the analysis of the CHi phase. The CHir phase was analysed using a radial composite flow model with wellbore storage and skin. The analysis is presented in Appendix 2-20. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 3.2E–9 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E–9 to 7E–9 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,943.7 kPa.

The analysis of the CHi and CHir phases shows good consistency. No further analysis is recommended.

6.2.12 Section 320–340 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 199 kPa, followed by a pressure recovery phase. The test data indicates no hydraulic connection between the test interval and the adjacent sections. The injection rate decreased from 11.49 mL/min at beginning of the CHi phase to 4.35 mL/min at the end, indicating a low interval transmissivity. The first 30 seconds of the CHi phase is not analysable due to the time needed to regulate constant pressure. The middle and late times of the CHi phase are of better quality and amenable for quantitative analysis, although they are very noisy. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the data quality does not allow for a specific determination of the flow dimension. The analysis was conducted assuming a flow dimension of 2 (radial flow). The CHi phase shows an upward trend indicating a decrease of transmissivity at some distance from the borehole. A radial composite flow model was chosen for the analysis of this phase. The CHir phase was analysed using a radial composite flow model with wellbore storage and skin. The analysis is presented in Appendix 2-21. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 9.3E–10 m^2/s was derived from the analysis of the CHi phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–10 to 1E–8 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,127.8 kPa.

The analysis of the CHi and CHir phases shows some inconsistency that should be resolved in case further analysis of the test is planned. In this case we recommend conducting a full superposition transient analysis in order to account for pressure history effects and changing flow rates during the CHi phase.

6.2.13 Section 340–360 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 209 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 21.80 mL/min at beginning of the CHi phase to 11.20 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 8 to 9 minutes) is not analysable due to the time needed by the system to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model was chosen for the analysis of both phases. The analysis is presented in Appendix 2-22. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.0E–8 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–9 to 7E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,325.8 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis is recommended.

6.2.14 Section 360–380 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 26.6 mL/min at beginning of the CHi phase to 13.7 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 20 seconds) is not analysable due to the time needed to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-23. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 8.7E–9 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 6E–9 to 5E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,517.8 kPa.

The analysis of the CHi and CHir phases shows some inconsistency that should be resolved in case further analysis of the test is planned. In this case we recommend conducting a full superposition transient analysis in order to account for pressure history effects and changing flow rates during the CHi phase.

6.2.15 Section 380–400 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 202 kPa, followed by a pressure recovery phase. The test was accomplished without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 25.9 mL/min at start of the CHi phase to 12.6 mL/min at the end with a sharp drop after 2 minutes from 17.7 mL/min to 16.3 mL/min, indicating a low interval transmissivity. The cause for the drop in the flow rate is unknown. The first part of the CHi phase (first 3 to 4 minutes) is not analysable due to the time needed to regulate constant pressure and because of the dropdown of the flowrate. However, the second part of the CHi phase can be analysed quantitatively. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test both phases (CHi and CHir) show a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-24. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.6E–8 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E–9 to 4E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,710.6 kPa.

The analysis of the CHi and CHir phases shows good consistency. No further analysis is recommended.

6.2.16 Section 400–420 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 204 kPa, followed by a pressure recovery phase. The test was accomplished without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 13.7 mL/min at beginning of the CHi phase to 7.8 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 20 seconds) is not analysable due to the time needed to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The recovery phase (CHir) shows no problems and is amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-25. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 5.1E–9 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2E–9 to 1E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,900.4 kPa.

The analysis of the CHi and CHir phases shows some inconsistency that should be resolved in case further analysis of the test is planned.

6.2.17 Section 420–440 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 205 kPa, followed by a pressure recovery phase. The test was accomplished without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 10.8 mL/min at beginning of the CHi phase to 7.4 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 20 seconds) is not analysable due to the time needed to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively, although it is very noisy. The CHir phase shows relatively fast recovery, however, the data is of good quality and as such, amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting radial two shell composite flow model was chosen for the analysis of this phase. The CHir phase was analysed using an infinite acting homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-26. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 8.5E–9 m^2/s was derived from the analysis of the CHi phase (outer zone), which shows the best data and derivative quality. The inner zone transmissivity is regarded as a local skin effect. The confidence range for the interval transmissivity is estimated to be 2E–9 to 1E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,092.5 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis is recommended.

6.2.18 Section 440–460 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test was accomplished without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 22.4 mL/min at beginning of the CHi phase to 11.1 mL/min at the end, indicating a relatively low interval transmissivity. The CHi phase is noisy and shows not the best data quality, however, the late time data can be analysed quantitatively. The recovery phase (CHir) shows no problems and is amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-27. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 6.5E–9 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E–9 to 4E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,286.1 kPa.

The analysis of the CHi and CHir phases shows some inconsistency that should be resolved in case further analysis of the test is planned. In this case we recommend conducting a full superposition transient analysis in order to account for pressure history effects and changing flow rates during the CHi phase.

6.2.19 Section 460–480 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 205 kPa, followed by a pressure recovery phase. The test was accomplished without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 12.0 mL/min at beginning of the CHi phase to 6.9 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 20 seconds) is not analysable due to the time needed to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The CHir phase shows very fast recovery, such that the analysis does not provide reliable results. The results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-28. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 5.6E–9 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 4E–9 to 4E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,476.3 kPa.

The analysis of the CHi and CHir phases shows some inconsistency that should be resolved in case further analysis of the test is planned. In this case we recommend conducting a full superposition transient analysis in order to account for pressure history effects and changing flow rates during the CHi phase.

6.2.20 Section 480–500 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 203 kPa, followed by a pressure recovery phase. The test was accomplished without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 15.8 mL/min at beginning of the CHi phase to 11.6 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 20 seconds) is not analysable due to the time needed to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The CHir phase shows very fast recovery, such that the analysis does not provide reliable results. The results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-29. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.8E–8 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E–9 to 6E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,668.7 kPa.

The analysis of the CHi and CHir phases shows some inconsistency, essentially caused by the fast recovery of the CHir phase and from this resulting data quality of this phase. No further analysis recommended.

6.2.21 Section 500–520 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 202 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent sections was observed. The test was accomplished without using the automatic regulation system. The injection rate decreased from 19.1 mL/min at beginning of the CHi phase to 12.3 mL/min at the end, indicating a relatively low interval transmissivity. The first 20 seconds of the CHi phase is not analysable due to the time needed to regulate constant pressure. However, the remaining part of the CHi phase can be analysed quantitatively. The CHir phase shows very fast recovery, such that the analysis does not provide reliable results. The results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at middle and late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-30. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.5E–8 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality, although it is noisy. The confidence range for the interval transmissivity is estimated to be 8E–9 to 5E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,861.4 kPa.

The analysis of the CHi and CHir phases shows some inconsistency, essentially caused by the fast recovery of the CHir phase and from this resulting data quality of this phase. No further analysis recommended.

6.2.22 Section 520–540 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 202 kPa, followed by a pressure recovery phase. The test was accomplished without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 18.0 mL/min at beginning of the CHi phase to 12.2 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 30 seconds) is not analysable due to the time needed to regulate constant pressure. However, the remaining part of the CHi phase can be analysed quantitatively. The CHir phase shows very fast recovery, such that the analysis does not provide reliable results. The results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at middle and late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-31. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.0E–8 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality, although it is noisy. The confidence range for the interval transmissivity is estimated to be 8E–9 to 6E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,053.4 kPa.

The analysis of the CHi and CHir phases shows some inconsistency, mainly caused by the fast recovery of the CHir phase and from this resulting data quality of this phase. No further analysis recommended.

6.2.23 Section 540–560 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 1.38 L/min at beginning of the CHi phase to 0.79 L/min at the end, indicating a moderately high interval transmissivity. The injection rate control during the CHi phase was good. The flow data is adequate for quantitative analysis. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test both phases show a flat derivative at middle times, which is indicative of a flow dimension of 2 (radial flow). The CHir phase shows an upward trend at late times indicating a decrease of transmissivity. An infinite acting homogeneous flow model was chosen for the analysis of the CHi phase. The CHir phase was analysed using a 2 shell composite flow model. The analysis is presented in Appendix 2-32. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 5.8E–7 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 4E–7 to 8E–7 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5,244.9 kPa.

The analysis of the CHi and CHir phases shows very good consistency. No further analysis recommended.

6.2.24 Section 560–580 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 0.14 L/min at beginning of the CHi phase to 0.13 L/min at the end, indicating a middle interval transmissivity. The first part of the CHi phase (first 1.5 minutes) is not analysable due to the time needed by the system to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The CHir phase shows very fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). A radial 2 shell composite flow model was chosen for the analysis of this phase. The CHir phase was analysed using an infinite acting homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-33. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 5.4E–7 m^2/s was derived from the analysis of the CHi phase (outer zone), which shows the best data and derivative quality. The inner zone transmissivity is regarded as a local skin effect. The confidence range for the interval transmissivity is estimated to be 9E–8 to 8E–7 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,439.9 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis recommended.

6.2.25 Section 580–600 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test data indicates a hydraulic connection between the test interval and the section below. The injection rate decreased from 4.39 L/min at beginning of the CHi phase to 1.44 L/min at the end, indicating a relatively high interval transmissivity. Both phases are adequate for quantitative analysis, but it should be noted that the data are affected due to the hydraulic connection to the section below. So the results should be regarded with respect to this fact.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model was chosen for the analysis of this phase. The CHir phase shows at middle times a slope upward, indicating a decrease in transmissivity or a flow dimension below 2. It was decided to use a flow dimension of 2. A radial 2 shell composite model with wellbore storage and skin was chosen for the analysis of this phase. The analysis is presented in Appendix 2-34. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.8E–7 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–8 to 8E–7 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5,646.1 kPa.

The analysis of the CHi and CHir phases shows some inconsistency, which are mainly caused by the connection to the section below. Due to this, the value for C is unrealistic high.

6.2.26 Section 600–620 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test data indicates a hydraulic connection between the test interval and the section below. The injection rate decreased from 0.14 L/min at beginning of the CHi phase to 0.13 L/min at the end, indicating a middle interval transmissivity. The CHi phase is not adequate for quantitative analysis due to the time needed by the system to regulate constant pressure. Additionally the hydraulic connection to the section below impair the quality and reliability of the data. The results of the analysis of the CHi phase should be regarded as order of magnitude only. The recovery phase (CHir) shows no problems and is adequate for quantitative analysis, but the results should be regarded carefully as well because of the hydraulic connection to the section below.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at the end, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous flow model was chosen for the analysis of the CHi phase. The CHir phase shows an upward trend indicating a decrease of transmissivity. For the analysis of this phase a radial 2 shell composite model with wellbore storage and skin was chosen. The analysis is presented in Appendix 2-35. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.3E–8 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–9 to 5E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5,824.1 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis recommended.

6.2.27 Section 620–640 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 32.4 mL/min at beginning of the CHi phase to 11.7 mL/min at the end, indicating a relatively low interval transmissivity. For unknown reason the flow rate dropped down after 4 minutes from 17 mL/min to 14 mL/min. The CHi phase is not amenable for quantitative analysis due to the time needed by the system to regulate constant pressure and because of that sharp dropdown in flowrate. The results of the analysis of the CHi phase should be regarded as order of magnitude only. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHir phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-36. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 7.2E–9 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E–9 to 2E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 6,012.7 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis recommended.

6.2.28 Section 640–660 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 209 kPa, followed by a pressure recovery phase. The test was accomplished without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 16.5 mL/min at beginning of the CHi phase to 10.8 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 30 seconds) is not analysable due to the time needed to regulate constant pressure. However, the remaining part of the CHi phase can be analysed quantitatively. The CHir phase shows very fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model with wellbore storage and skin was chosen for the analysis. The analysis is presented in Appendix 2-37. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.2E–8 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality, although it is noisy. The confidence range for the interval transmissivity is estimated to be 7E–9 to 4E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 6,208.4 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies, mainly caused by the fast recovery of the CHir phase and from this resulting data quality of this phase. No further analysis recommended.

6.2.29 Section 660–680 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 205 kPa, followed by a pressure recovery phase. The test was accomplished without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 23.2 mL/min at beginning of the CHi phase to 12.0 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 20 seconds) is not analysable due to the time needed to regulate constant pressure. However, the remaining part of the CHi phase can be analysed quantitatively. The CHir phase shows very fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-38. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 9.7E–9 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E–9 to 3E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 6,402.2 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies, essentially caused by the fast recovery of the CHir phase. No further analysis recommended.

6.2.30 Section 680–700 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 2,081 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 30.1 mL/min at beginning of the CHi phase to 13.8 mL/min at the end, indicating a relatively low interval transmissivity. The rate regulation during the constant pressure injection (CHi) did not perform properly, the flow rate shows oscillations till the late times of the phase. Because of this reason the analysis of the CHi phase is only qualitative. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension cannot be clearly determined. The analysis was conducted using the radial flow assumption (flow dimension = 2). A radial 2 shell composite flow model was chosen for the analysis. The CHir phase was analysed using an infinite acting homogeneous flow model with wellbore storage and skin. The analysis is presented in Appendix 2-39. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 8.2E–9 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E–9 to 2E–8 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6,581.4 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis recommended.

6.2.31 Section 700–720 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 192 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 28.1 mL/min at beginning of the CHi phase to 15.2 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 15 seconds) is not analysable due to the time needed to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a downward slope, indicating an increase in transmissivity or a flow dimension above 2. It was decided to use a homogeneous flow model with a flow dimension of 3 for the analysis of this phase. The derivative of the CHir phase shows a downward slope at late times as well. A radial 2 shell composite flow model with a flow dimension of 3 for the inner zone and a flow dimension of 2 for the outer zone was chosen for the analysis of this phase. The analysis is presented in Appendix 2-40. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.5E–8 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E–9 to 3E–8 m^2/s. It should be noted that the transmissivities derived from the CHi and the CHir phase are not directly comparable, because different flow dimensions were used. The flow dimension displayed during the test is not unambiguous. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6,778.7 kPa.

To improve analysis consistency and if further analysis is intended, a full superposition analysis should be conducted.

6.2.32 Section 720–740 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 208 kPa, followed by a pressure recovery phase. The test was performed without using the automatic flow regulation. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 76.5 mL/min at beginning of the CHi phase to 17.3 mL/min at the end, indicating a relatively low interval transmissivity. After 7.5 minutes an unusual drop in flow rate was observed. The cause for the drop is unknown. The first part of the CHi phase (first 1.5 minutes) is not analysable due to the time needed by the system to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The CHir phase shows very fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. Both test phases show linear flow at early times (slope = 0.5). In addition, the derivative of the CHir phase flattens at late times indicating a transition to radial flow geometry. The CHi phase was analysed using a homogeneous flow model with a flow dimension of 1.25. The CHir phase was analysed using a composite flow model with a flow dimension of 1 in the inner zone and a dimension of 2 in the outer zone. The analysis is presented in Appendix 2-41. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity for this test section is 1E–8 m^2/s. It was derived from the analysis of the CHir phase (mean value of both zones), which shows the best data and derivative quality and it is consistent to the results of the steady state analysis. The confidence range for the interval transmissivity is estimated to be 5E–9 to 5E–8 m^2/s. The flow dimension displayed during the test is not clear. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6,916.0 kPa.

To improve analysis consistency and resolve the uncertainty concerning the flow dimension, a full superposition analysis coupled with a generalized radial flow analysis is recommended

6.2.33 Section 740–760 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 187 kPa, followed by a pressure recovery phase. The test was accomplished without using the automatic regulation system. During the CHi phase the pressure in the test section decreased by 7 kPa. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 20.4 mL/min at beginning of the CHi phase to 10.8 mL/min at the end, indicating a relatively low interval transmissivity. After 4 minutes an unusual dropdown of the flow rate was observed. Due to that fact the first part of the CHi phase is not analysable. However, the second part of the CHi phase can be analysed quantitatively. The CHir phase shows very fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-42. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 8.3E–9 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 6E–9 to 3E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 7,163.0 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies, mainly caused by the fast recovery of the CHir phase and resulting from that the poor data quality. No further analysis recommended.

6.2.34 Section 760–780 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 206 kPa, followed by a pressure recovery phase. The test was accomplished without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 21.4 mL/min at beginning of the CHi phase to 12.4 mL/min at the end, indicating a relatively low interval transmissivity. After 9 minutes a dropdown of the flow rate was observed. However, the data quality is good and amenable for quantitative analysis. The CHir phase shows a fast recovery, but the quality of the data is still adequate for qualitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at middle times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous radial flow model with wellbore storage and skin was used for the analysis of both phases. The analysis is presented in Appendix 2-43. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.2E–8 m^2/s was derived from the analysis of the CHi phase which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–9 to 5E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 7,352.1 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis recommended.

6.2.35 Section 780–800 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 12.9 mL/min at beginning of the CHi phase to 4.5 mL/min at the end, indicating a relatively low interval transmissivity. After 7 minutes a remarkable decrease of flow rate was observed. The CHir phase shows very fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at middle times, which is indicative of a flow dimension of 2 (radial flow). At late times the derivative shows a steep upward slope. Considering the normalised derivatives of both phases, it was decided to analyse only the first part of the CHi phase, which shows the most reliable results. An infinite acting homogeneous radial flow model with wellbore storage and skin was used. The analysis is presented in Appendix 2-44. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.1E–8 m^2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E–9 to 3E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 7,543.2 kPa.

Considering the uncertainties due to the change of flow rate and the fast recovery, the analysis of the CHi and CHir phases shows consistency. No further analysis recommended. Compared with the results of the transient analysis, the transmissivity of the steady state analysis is much lower. That is due to the fact, that the steady state calculations are based on the lower flow rates of the second part of the injection phase.

6.2.36 Section 800–820 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 206 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 18.6 mL/min at beginning of the CHi phase to 11.1 mL/min at the end, indicating a relatively low interval transmissivity. After 7 minutes a remarkable decrease of flow rate was observed. The CHir phase shows very fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at early times, which is indicative of a flow dimension of 2 (radial flow). At middle times the derivative shows a steep upward slope and stabilisation at a higher level. Considering the normalised derivatives of both phases, it was decided to analyse only the first part of the CHi phase, which shows the most reliable results. An infinite acting homogeneous flow model with wellbore storage and skin was used. The analysis is presented in Appendix 2-45. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.5E–8 m^2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E–9 to 5E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 7,732.3 kPa.

Considering the uncertainties due to the change of flow rate and the fast recovery, the analysis of the CHi and CHir phases shows consistency. No further analysis recommended.

6.2.37 Section 820–840 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 210 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 22.2 mL/min at beginning of the CHi phase to 13.3 mL/min at the end, indicating a relatively low interval transmissivity. After 7 minutes an abrupt decrease of flow rate was observed. The CHir phase shows very fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at early times, which is indicative of a flow dimension of 2 (radial flow). At middle times the derivative shows a steep upward slope and stabilisation at a higher level. Considering the normalised derivatives of both phases, it was decided to analyse only the first part of the CHi phase, which shows the most reliable results. An infinite acting homogeneous flow model with wellbore storage and skin was used. The analysis is presented in Appendix 2-46. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.7E–8 m^2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–9 to 5E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line curve extrapolation in the Horner plot to a value of 7,921.2 kPa.

Considering the uncertainties due to the change of flow rate and the fast recovery, the analysis of the CHi and CHir phases shows consistency. No further analysis recommended.

6.2.38 Section 840–860 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 192 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 16.6 mL/min at beginning of the CHi phase to 3.3 mL/min at the end, indicating a relatively low interval transmissivity. After 7 minutes an abrupt decrease of flow rate from 12 mL/min to 5 mL/min was observed. The CHir phase shows very fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at early times, which is indicative of a flow dimension of 2 (radial flow). At middle times the derivative shows a very steep upward slope. Considering the normalised derivatives of both test phases, it was decided to analyse only the first part of the CHi phase, which shows the most reliable results. An infinite acting homogeneous flow model with wellbore storage and skin was used for the analysis. The analysis is presented in Appendix 2-47. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.1E–8 m^2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–9 to 4E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 8,109.7 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis recommended. Compared with the results of the transient analysis, the transmissivity of the steady state analysis is much lower. That is due to the fact, that the steady state calculations are based on the lower flow rates of the second part of the injection phase.

6.2.39 Section 860–880 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 19.0 mL/min at beginning of the CHi phase to 6.9 mL/min at the end, indicating a relatively low interval transmissivity. After 8 minutes an abrupt decrease of flow rate from 14 mL/min to 8 mL/min was observed. The CHir phase shows fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at early times, which is indicative of a flow dimension of 2 (radial flow). At middle times the derivative shows a very steep upward slope. Considering the normalised derivatives of both test phases, it was decided to analyse only the first part of the CHi phase, which shows the most reliable results. An infinite acting homogeneous flow model with wellbore storage and skin was used for the analysis. The analysis is presented in Appendix 2-48. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.6E–8 m^2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–9 to 4E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 8,301.2 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis recommended. Compared with the results of the transient analysis, the transmissivity of the steady state analysis is much lower. That is due to the fact, that the steady state calculations are based on the lower flow rates of the second part of the injection phase.

6.2.40 Section 880–900 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 203 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 16.6 mL/min at beginning of the CHi phase to 3.3 mL/min at the end, indicating a relatively low interval transmissivity. After 6 minutes an abrupt decrease of flow rate from 20 mL/min to 13 mL/min was observed. The CHir phase shows fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at early times, which is indicative of a flow dimension of 2 (radial flow). At middle times the derivative shows a very steep upward slope and a second stabilisation at a higher level. Considering the normalised derivatives of both test phases, it was decided to analyse only the first part of the CHi phase, which shows the most reliable results. An infinite acting homogeneous flow model with wellbore storage and skin was used for the analysis. The analysis is presented in Appendix 2-49. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 3.1E–8 m^2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E–9 to 6E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 8,487.1 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis recommended. The results of the steady state calculations are lower, due to the fact, that the steady state calculations are based on the lower flow rates of the second part of the injection phase.

6.2.41 Section 899–919 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 201 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 19.4 mL/min at beginning of the CHi phase to 7.4 mL/min at the end, indicating a relatively low interval transmissivity. After 7 minutes an abrupt decrease of flow rate from 14 mL/min to 8 mL/min was observed. The CHir phase shows very fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at early times, which is indicative of a flow dimension of 2 (radial flow). At middle times the derivative shows a very steep upward slope. Considering the normalised derivatives of both test phases, it was decided to analyse only the first part of the CHi phase, which shows the most reliable results. An infinite acting homogeneous flow model with wellbore storage and skin was used for the analysis. The analysis is presented in Appendix 2-50. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.4E–8 m^2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–9 to 4E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 8,668.0 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis recommended. Compared with these results, the transmissivity of the steady state analysis is lower. That is due to the fact, that the steady state calculations are based on the lower flow rates of the second part of the injection phase.

6.2.42 Section 919–939 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 204 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 20.1 mL/min at beginning of the CHi phase to 8.0 mL/min at the end, indicating a relatively low interval transmissivity. After 8 minutes an abrupt decrease of flow rate from 16 mL/min to 10 mL/min was observed. The CHir phase shows very fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at early times, which is indicative of a flow dimension of 2 (radial flow). At middle times the derivative shows a very steep upward slope. Considering the normalised derivatives of both test phases, it was decided to analyse only the first part of the CHi phase, which shows the most reliable results. An infinite acting homogeneous flow model with wellbore storage and skin was used for the analysis. The analysis is presented in Appendix 2-51. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.8E–8 m^2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–9 to 4E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 8,850.5 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis recommended. The results of the steady state calculations are lower, due to the fact, that the steady state calculations are based on the lower flow rates of the second part of the injection phase.

6.2.43 Section 939–959 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 191 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 21.9 mL/min at beginning of the CHi phase to 13.6 mL/min at the end, indicating a relatively low interval transmissivity. After 8 minutes a fast decrease of flow rate from 17 mL/min to 14 mL/min was observed. The CHir phase shows very fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at early times, which is indicative of a flow dimension of 2 (radial flow). At middle times the derivative shows a very steep upward slope and a second stabilisation at a higher level. Considering the normalised derivatives of both test phases, it was decided to analyse only the first part of the CHi phase, which shows the most reliable results. An infinite acting homogeneous flow model with wellbore storage and skin was used for the analysis. The analysis is presented in Appendix 2-52. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.2E–8 m^2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E–9 to 4E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 9,033.7 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies, mainly caused by the fast recovery of the CHir phase. No further analysis recommended.

6.2.44 Section 959–979 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 205 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 22.2 mL/min at beginning of the CHi phase to 17.6 mL/min at the end, indicating a relatively low interval transmissivity. Excluding the first 30 seconds, the whole CHi phase is adequate for quantitative analysis. The CHir phase shows very fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at middle and late times, which is indicative of a flow dimension of 2 (radial flow). An infinite acting homogeneous flow model with wellbore storage and skin was used for the analysis. The analysis is presented in Appendix 2-53. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.5E–8 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E–9 to 5E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 9,221.1 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies, which are mainly caused by the fast recovery and the resulting poor data quality of the CHir phase. No further analysis recommended.

6.2.45 Section 979–999 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 192 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent sections was observed. The injection rate decreased from 20.9 mL/min at beginning of the CHi phase to 9.2 mL/min at the end, indicating a relatively low interval transmissivity. After 6 minutes an abrupt decrease of flow rate from 15.5 mL/min to 10.5 mL/min was observed. The cause for the drop is unknown. The CHir phase shows very fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at middle and late times, which is indicative of a flow dimension of 2 (radial flow). After the first stabilisation of the derivative, it shows a very steep upward slope and then again a stabilisation at a higher level. Considering the normalised derivatives of both test phases, it was decided to analyse the first part of the CHi phase, which shows the most reliable results. An infinite acting homogeneous flow model with wellbore storage and skin was used for the analysis. The analysis is presented in Appendix 2-54. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 7.6E–9 m^2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. It should be noted, that there are uncertainties for both analyses. The confidence range for the interval transmissivity is estimated to be 4E–9 to 4E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 9,406.8 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies, mainly caused by the drop in the flow rate during the injection phase and the very fast recovery of the CHir phase. To improve analysis consistency and if further analysis is intended, a full superposition analysis should be conducted.

6.3 5 m single-hole injection tests

In the following, the 5 m section tests conducted in borehole KSH01A are presented and analysed.

6.3.1 Section 300–305 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 207 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 18.4 mL/min at beginning of the CHi phase to 10.8 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 40 seconds) is not analysable due to the time needed to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The CHir phase shows very fast recovery. Therefore, the analysis results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative, which is indicative of a flow dimension of 2 (radial flow). A homogeneous infinite acting radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-55. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 8.0E–9 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E–9 to 2E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,935.9 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies, mainly caused by the very fast recovery of the CHir phase. No further analysis is recommended.

6.3.2 Section 305–310 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 201 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 18.0 mL/min at beginning of the CHi phase to 10.3 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first minute) is not analysable due to the time needed to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The CHir phase shows fast recovery. Therefore, the analysis results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative, which is indicative of a flow dimension of 2 (radial flow). A homogeneous infinite acting radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-56. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.0E–8 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E–9 to 4E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,982.8 kPa.

The analysis of the CHi and CHir phases shows limited consistency, mainly caused by the fast recovery of the CHir phase. No further analysis is recommended.

6.3.3 Section 310–315 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. During the injection phase the pressure in the test section decreased by 4 kPa. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 21.3 mL/min at beginning of the CHi phase to 12.9 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase (first 30 seconds) is not analysable due to the time needed to regulate constant pressure. However, the second part of the CHi phase can be analysed quantitatively. The CHir phase was conducted without problems and shows good data quality. The CHir phase is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test both test phases (CHi and CHir) show a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). A homogeneous infinite acting radial flow model with wellbore storage and skin was chosen for the analysis. The analysis is presented in Appendix 2-57. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.2E–8 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. Due to the low flow rate, the data of the CHi phase are a bit noisy. The confidence range for the interval transmissivity is estimated to be 8E–9 to 4E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,029.1 kPa.

The analysis of the CHi and CHir phases shows good consistency. No further analysis is recommended.

6.3.4 Section 315–320 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 211 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 10.2 mL/min at beginning of the CHi phase to 1.9 mL/min at the end, indicating a relatively low interval transmissivity. After 6 minutes an abrupt decrease of flow rate from 9 mL/min to 2.5 mL/min was observed. The cause for the drop in the flow rate is unknown. The CHir phase shows fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at the first part, which is indicative of a flow dimension of 2 (radial flow). At middle times the derivative shows a very steep upward slope. Considering the normalised derivatives of both test phases, it was decided to analyse only the first part of the CHi phase, which shows the most reliable results. A homogeneous infinite acting radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-58. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 8.2E–9 m^2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality, although there are uncertainties due to the low flow rate and the remarkable drop down after 6 minutes of the injection phase. Therefore the confidence range for the interval transmissivity is estimated to be 2E–9 to 2E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,075.1 kPa.

The analysis of the CHi and CHir phases shows some inconsistency due to the problems mentioned above. That should be resolved in case further analysis of the test is planned. In this case we recommend conducting a full superposition transient analysis in order to account for pressure history effects and changing flow rates during the CHi phase.

6.3.5 Section 320–325 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 206 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 15.8 mL/min at beginning of the CHi phase to 10.8 mL/min at the end, indicating a relatively low interval transmissivity. The CHi phase can be analysed quantitatively, although it is very noisy. The CHir phase recovered to static conditions very quickly, such that the analysis should be regarded with caution.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative, which is indicative of a flow dimension of 2 (radial flow). A homogeneous infinite acting radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-59. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.2E–8 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality, although there are uncertainties due to the low flow rate and the noise. Therefore the confidence range for the interval transmissivity is estimated to be 7E–9 to 6E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,123.8 kPa.

The analysis of the CHi and CHir phases shows some inconsistency due to the problems mentioned above. That should be resolved in case further analysis of the test is planned. In this case we recommend conducting a full superposition transient analysis in order to account for pressure history effects and changing flow rates during the CHi phase.

6.3.6 Section 325–330 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 203 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. During the injection phase the pressure in the test section rose by 7 kPa. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 6.6 mL/min at beginning of the CHi phase to 2.8 mL/min at the end, indicating a low interval transmissivity. After 7 minutes an abrupt decrease of flow rate from 5 mL/min to 3.5 mL/min was observed. The cause for the drop in the flow rate is unknown. The CHir phase shows fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative, which is indicative of a flow dimension of 2 (radial flow). At middle times the derivative shows a very steep upward slope. Considering the normalised derivatives of both test phases, it was decided to analyse only the first part of the CHi phase, which shows the most reliable results. A homogeneous infinite acting radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-60. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.9E–9 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality, although there are some uncertainties due to the low flow rate and the noisy data. The confidence range for the interval transmissivity is estimated to be 9E–10 to 7E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,177.4 kPa.

The analysis of the CHi and CHir phases shows some inconsistency due to the problems mentioned above. That should be resolved in case further analysis of the test is planned. In this case we recommend conducting a full superposition transient analysis in order to account for pressure history effects and changing flow rates during the CHi phase.

6.3.7 Section 330–335 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 202 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 7.5 mL/min at the beginning of the CHi phase to 2.6 mL/min at the end, indicating a low interval transmissivity. Due to the low flow rate the CHi phase is quite noisy. The CHir phase shows relatively fast recovery, such that the results of both test phases should be regarded as orders of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at middle times, which is indicative of a flow dimension of 2 (radial flow). At late times the derivative shows an upward slope. The CHi phase was analysed using an infinite acting radial 2 shell composite flow model to match the slope at late times. The CHir phase was analysed using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-61. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 7.6E–10 m^2/s was derived from the analysis of the CHi phase (outer zone). The confidence range for the interval transmissivity is estimated to be 7E–10 to 4E–9 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,220.7 kPa.

The analysis of the CHi and CHir phases shows inconsistencies, mainly caused by the fast recovery of the CHir phase. No further analysis is recommended.

6.3.8 Section 335–340 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 204 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 9.0 mL/min at beginning of the CHi phase to 2.6 mL/min at the end, indicating a low interval transmissivity. After

4 minutes a drop down in flow rate from 7 to 5 mL/min and after 6 minutes again a drop from 5 to 3 mL/min was observed. The reason for those drops is unknown. The CHir phase shows relatively fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at middle times, which is indicative of a flow dimension of 2 (radial flow). After that flat part, the derivative shows a steep slope upward. A homogeneous infinite acting radial flow model was chosen for the analysis of the first part of this phase and for analysing the CHir phase. The analysis is presented in Appendix 2-62. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.5E–9 m^2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E–10 to 5E–9 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,270.2 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies and uncertainties, mainly caused by the drop of the flow rate during the injection phase and the fast recovery of the CHir phase. That should be resolved in case further analysis of the test is planned. In this case we recommend conducting a full superposition transient analysis in order to account for pressure history effects and changing flow rates during the CHi phase.

6.3.9 Section 340–345 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 197 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 4.1 mL/min at beginning of the CHi phase to 1.3 mL/min at the end, indicating a low interval transmissivity. After 6 minutes a drop down of the flow rate from 2.5 to 1.5 mL/min was observed. The reason for that drop is unknown. Due to that drop and the low flow rate the data quality of the CHi phase is not amenable for quantitative analysis. The CHir phase shows fast recovery, such that the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at middle times, which is indicative of a flow dimension of 2 (radial flow). At late times the derivative shows an upward slope. A homogeneous infinite acting radial flow model was chosen for the analysis of both phases. With consideration of the slope at late times, an additional analysis of the CHi phase using an infinite acting radial 2 shell composite flow model was performed. Considering the normalised derivatives of both test phases, the analysis using the homogeneous model is preferable. The analysis is presented in Appendix 2-63. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 9.5E–10 m^2/s was derived from the analysis of the CHi phase. The confidence range for the interval transmissivity is estimated to be 5E–10 to 5E–9 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,316.6 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies, mainly caused by the low and noisy flow rate and the fast recovery of the CHir phase. No further analysis is recommended.

6.3.10 Section 345–350 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 202 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 4.8 mL/min at the beginning of the CHi phase to 1.0 mL/min at the end, indicating a low interval transmissivity. Due to the low flow rate the data are very noisy, such that the results should be regarded as order of magnitude only. The CHir phase shows no problems and is amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model cannot be determined clearly. The analysis was conducted assuming a flow dimension of 2 (radial flow). The CHi phase shows an upward slope at late times. A homogeneous infinite acting radial flow model with wellbore storage and skin was chosen for the analysis of both phases. With consideration of the slope at late times, an additional analysis of the CHi phase using an infinite acting radial 2 shell composite flow model was performed. The analysis is presented in Appendix 2-64. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.6E–9 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–10 to 7E–9 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,366.9 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies, mainly caused by the very noisy data of the CHi phase. No further analysis is recommended.

6.3.11 Section 350–355 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 207 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. The pressure in the test section rose by 10 kPa during the perturbation phase. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 5.3 mL/min at the beginning of the CHi phase to 1.2 mL/min at the end, indicating a low interval transmissivity. After 8 minutes a drop down in flow rate from 3 to 2 mL/min was observed. The reason for this drop is unknown. The CHir phase shows relatively fast recovery, however, the data is amenable for qualitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase, although it is very noisy, shows a flat derivative at early and middle times, which is indicative of a flow dimension of 2 (radial flow). At late times the derivative shows a slope upward. A homogeneous infinite acting radial flow model with wellbore storage and skin was chosen for the analysis. In addition, the CHi phase was analysed using an infinite acting radial 2 shell flow model. The analysis is presented in Appendix 2-65. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.2E–9 m^2/s was derived from the analysis of the CHi phase (first part), which is quite noisy, but showing the most reliable results. The confidence range for the interval transmissivity is estimated to be 7E–10 to 7E–9 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,422.8 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies, mainly caused by the low flow rate and the fast recovery of the CHir phase. No further analysis is recommended.

6.3.12 Section 355–360 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 196 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 3.3 mL/min at beginning of the CHi phase to 0.6 mL/min at the end, indicating a very low interval transmissivity. After 6 minutes a sharp drop down in flow rate from 1.5 to 0.8 mL/min was observed. The reason for this drop is unknown. The CHir phase shows no problems and is amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at middle times, which is indicative of a flow dimension of 2 (radial flow). After that flat part, the derivative shows a steep slope upward due to the drop in flow rate. It was decided to analyse only the first part of this phase. A homogeneous infinite acting radial flow model was chosen for the analysis of the first part of this phase and for analysing the CHir phase. The analysis is presented in Appendix 2-66. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 5.9E–10 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E–10 to 1E–9 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,467.0 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis is recommended.

6.3.13 Section 360–365 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 204 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 10.0 mL/min at the beginning of the CHi phase to 3.5 mL/min at the end, indicating a low interval transmissivity. The reason for this drop is unknown. The CHir phase shows fair data quality and is amenable for limited quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be clearly determined with one of the phases. It was decided to use the assumption of radial flow (flow dimension of 2). A homogeneous infinite acting flow model was chosen for the analysis of the CHi phase. The CHir phase was analysed using a radial two shell composite model. The analysis is presented in Appendix 2-67. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.0E–10 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. It should be noted, that due to the very low flow rate, the results have some uncertainties. The confidence range for the interval transmissivity is estimated to be 8E–11 to 7E–10 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,491.1 kPa.

The analysis of the CHi and CHir phases shows with regard to the low interval transmissivity good consistency. No further analysis is recommended.

6.3.14 Section 365–370 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 204 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 2.6 mL/min at the beginning of the CHi phase to 0.5 mL/min at the end, indicating a very low interval transmissivity. Due to the very low flow rate and due to this the very noisy data, the results of the analysis of the CHi phase should be regarded as order of magnitude only. The CHir phase shows the first 20 minutes no problems and is amenable for quantitative analysis. The second part of the CHir phase is not analysable due to some effects in the data curve. The reason for those effects is unknown.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension cannot be clearly derived from one of the phases. A homogeneous infinite acting flow model with a flow dimension of 2 (radial flow) was chosen for the analysis of both phases. The analysis is presented in Appendix 2-68. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.7E–10 m^2/s was derived from the analysis of the CHir phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–11 to 8E–10 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,563.3 kPa.

Considering the very low flow rate, the analysis of the CHi and CHir phases show good consistency. No further analysis is recommended.

6.3.15 Section 370–375 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 206 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 1.0 mL/min at the beginning of the CHi phase to 0.5 mL/min at the end, indicating a very low interval transmissivity. The dta of the CHi phase are very noisy and the results should be regarded as order of magnitude only. The CHir phase shows fair data quality and is amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived clearly from one of the phases It was decided to use a flow dimension of 2 (radial flow). A homogeneous infinite acting flow model was chosen for the analysis of the CHi phase. The CHir phase was analysed using a radial 2 shell composite flow model. The analysis is presented in Appendix 2-69. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 9.4E–11 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. It should be noted, that due to the very low interval transmissivity, the results are uncertain. The confidence range for the interval transmissivity is estimated to be 7E–11 to 4E–10 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,599.1 kPa.

The analysis of the CHi and CHir phases show consistency. No further analysis is recommended.

6.3.16 Section 375–380 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 201 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 7.1 mL/min at beginning of the CHi phase to 3.8 mL/min at the end, indicating a low interval transmissivity. The CHi phase is noisy due to the low flow rate, but still adequate for quantitative analysis. The CHir phase shows no problems and the data is of good quality and as such, amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test both phases show a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). A homogeneous infinite acting flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-70. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 4.6E–9 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2E–9 to 8E–9 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,662.6 kPa.

The analysis of the CHi and CHir phases shows good consistency. No further analysis is recommended.

6.3.17 Section 380–385 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 194 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. During the injection phase, the pressure in the test section rose by 4 kPa. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 6.1 mL/min at beginning of the CHi phase to 3.2 mL/min at the end, indicating a low interval transmissivity. The CHi phase is noisy due to the low flow rate, but the quality of the data is adequate for quantitative analysis. The CHir phase is of good quality and is amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test both phases show a flat derivative at late times, which is indicative of a flow dimension of 2 (radial flow). A homogeneous infinite acting flow model was chosen for the analysis of the CHi phase. The CHir phase was analysed using a radial 2 shell composite flow model. The analysis is presented in Appendix 2-71. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.6E–9 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E–10 to 4E–9 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,708.5 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis is recommended.

6.3.18 Section 385–390 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 2.0 mL/min at the beginning of the CHi phase to 1.0 mL/min at the end, indicating a very low interval transmissivity. Due to the very low flow rate, the data of the CHi phase are very noisy and the results should be regarded as order of magnitude only. The CHir phase shows no problems and is amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived clearly from one of the phases. The analysis was conducted using a flow dimension of 2 (radial flow). A homogeneous infinite acting flow model was chosen for the analysis of the test. The analysis is presented in Appendix 2-72. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.0E–9 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E–10 to 3E–9 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,753.3 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies and uncertainties, mainly caused by the very low flow rate. That should be resolved in case further analysis of the test is planned. In this case we recommend conducting a full superposition transient analysis in order to account for pressure history effects and changing flow rates during the CHi phase.

6.3.19 Section 390–395 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 204 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 2.0 mL/min at the beginning of the CHi phase to 0.6 mL/min at the end, indicating a low interval transmissivity. Due to the very low flow rate, the data of the CHi phase are very noisy, such that the results should be regarded as order of magnitude only. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension cannot be clearly derived from one of the phases. A homogeneous infinite acting flow model with wellbore storage and skin was chosen for the analysis of the CHi phase. The CHir phase was analysed assuming a radial 2 shell composite flow model. The analysis is presented in Appendix 2-73. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 9.7E–10 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E–10 to 3E–9 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,799.4 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies and uncertainties, mainly caused by the very low flow rate during the injection phase. No further analysis is recommended.

6.3.20 Section 395–400 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 204 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 3.1 mL/min at beginning of the CHi phase to 0.5 mL/min at the end, indicating a low interval transmissivity. After 11 minutes a drop down in flow rate from 1.2 mL/min to 0.05 mL/min. The reason for the drop is unknown. The CHir phase shows no problems and is amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at early and middle times, which is indicative of a flow dimension of 2 (radial flow). After that flat part, the derivative shows a steep slope upward. A homogeneous infinite acting flow model was chosen for the analysis of this phase. The CHir phase was analysed using a radial 2 shell composite flow model. The analysis is presented in Appendix 2-74. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 4.2E–9 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–10 to 5E–9 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,851.4 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies and uncertainties, mainly caused by the drop of the flow rate during the injection phase and the very noisy data of this phase. No further analysis is recommended.

6.3.21 Section 400–405 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 201 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate was during the whole perturbation phase below 1 mL/min, indicating a very low interval transmissivity. The data of the CHi phase are very noisy and should be regarded as order of magnitude only. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension cannot be clearly derived, because of the noisy data of the CHi phase. It was decided to use a flow dimension of 2 (radial flow). A homogeneous infinite acting radial flow model was chosen for the analysis of both phases. The analysis is presented in Appendix 2-75. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 9.0E–10 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E–10 to 1E–9 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,910.8 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies and uncertainties, mainly caused by the very low flow rate of the CHi phase. Considering that low flow rate, the transmissivity is lower than 1E–9 m^2/s. No further analysis is recommended.

6.3.22 Section 405–410 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 1.5 mL/min at the beginning to below 0.5 mL/min at the end of the CHi phase. Due to that flow rate, the results of the CHi phase should be regarded as order of magnitude only. The CHir phase ran over night for 12 hours. It is amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived clearly from one of the phases. The CHir phase shows an upward trend at late times with a slope of 2. Since this slope is to steep for a transition to a zone of lower transmissivity or a flow dimension of 1, the analysis was conducted without taking this last part in consideration. It was decided to use a flow dimension of 2 (radial flow). Both phases were analysed using a homogeneous infinite acting flow model with wellbore storage and skin. The analysis is presented in Appendix 2-76. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 9.7E–11 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E–11 to 5E–10 m^2/s. This analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,984.1 kPa.

The analysis of the CHi and CHir phases shows consistency. There are uncertainties about the last part of the CHir phase as mentioned above. That should be resolved in case further analysis of the test is planned. In this case we recommend conducting a full superposition transient analysis in order to account for pressure history effects and changing flow rates during the CHi phase.

6.3.23 Section 410–415 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 195 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 2.5 mL/min at the beginning of the CHi phase to below 0.5 mL/min at the end, indicating a very low interval transmissivity. After 13 minutes a drop down in flow rate from 0.6 to 0.3 mL/min was observed. The reason for this drop is unknown. After closing the test valve, the pressure in the interval rose the entire CHir phase (possibly extended packer compliance). The CHir phase is not analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived clearly from the CHi phase. The analysis was made using a flow dimension of 2 (radial flow). A homogeneous infinite acting flow model was chosen for the analysis of the CHi phase. The analysis is presented in Appendix 2-77. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.3E–10 m^2/s was derived from the analysis of the CHi phase, which is the only analysable phase. Due to the very low flow rate and the noisy data, the results are uncertain. The confidence range for the interval transmissivity is estimated to be 5E–11 to 5E–10 m^2/s. The analysis was conducted using a flow dimension of 2.

No further analysis is recommended.

6.3.24 Section 415–420 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 98 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model cannot be determined. No analysis was performed. The measured data is presented in Appendix 2-78.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.25 Section 420–425 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 128 kPa in 100 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model cannot be determined. No analysis was performed. The measured data is presented in Appendix 2-79.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.26 Section 425–430 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 159 kPa in 15 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model cannot be determined. No analysis was performed. The measured data is presented in Appendix 2-80.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.27 Section 430–435 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 86 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model cannot be determined. No analysis was performed. The measured data is presented in Appendix 2-81.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.28 Section 435–440 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 206 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model cannot be determined. No analysis was performed. The measured data is presented in Appendix 2-82.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.29 Section 440–445 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 211 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 2.5 mL/min at the beginning of the CHi phase to below 0.5 mL/min at the end, indicating a very low interval transmissivity. The CHir phase took 12 hours over night and is amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be clearly derived from one of the test phases. It was decided to use a flow dimension of 2 (radial flow). A homogeneous infinite acting flow model was chosen for the analysis of the CHi phase. For the analysis of the CHir phase a radial 2 shell composite flow model was chosen. The analysis is presented in Appendix 2-83. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.2E–10 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. It should be noted that due to the very low flow rate the results are uncertain. The confidence range for the interval transmissivity is estimated to be 5E–11 to 5E–10 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,272.7 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies and uncertainties, mainly caused by the very low flow rate. No further analysis is recommended.

6.3.30 Section 445–450 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 210 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate was during the entire perturbation phase below 1 mL/min, indicating a very low interval transmissivity. Due to that very low flow rate the data of the CHi phase is very noisy and the results should be regarded as order of magnitude only. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be clearly derived, because of the very noisy data of the CHi phase. It was decided to use a flow dimension of 2 (radial flow). A homogeneous infinite acting flow model was chosen for the analysis of both phases. The analysis is presented in Appendix 2-84. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 7.2E–10 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E–10 to 9E–10 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,336.8 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies and uncertainties, mainly caused by the very low flow rate and the noisy data of the CHi phase. No further analysis is recommended.

6.3.31 Section 450–455 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 174 kPa in 80 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-85.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.32 Section 455–460 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 183 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 2.0 mL/min at the beginning of the CHi phase to less than 1 mL/min at the end, indicating a very low interval transmissivity. The CHi data are very noisy and the results should be regarded as order of magnitude only. The CHir phase was conducted without problems and shows good data quality. The CHir phase is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived unambiguous. It was decided to use a flow dimension of 2 (radial flow). A homogeneous infinite acting flow model was chosen for the analysis of the CHi phase. The CHir phase shows an upward trend at late times, indicating a transition to a zone of lower transmissivity. An infinite acting 2 shell composite flow model was chosen for the analysis of this phase. The analysis is presented in Appendix 2-86. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.6E–10 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E–10 to 8E–10 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,427.4 kPa.

The analysis of the CHi and CHir phases shows some minor inconsistencies and uncertainties, mainly caused by the very low flow rate and the noisy data of the CHi phase. No further analysis is recommended.

6.3.33 Section 460–465 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 195 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The pressure in the test section shows unusual sharp pressure drops during the PSR phase. The reason for this behaviour is unknown. The injection rate was during the entire perturbation phase at around 1 mL/min, indicating a very low interval transmissivity. The first 2.5 to 3 hours, the CHir phase shows no problems and is amenable for quantitative analysis. After this part, the pressure in the test section shows an unusual drop down and is no longer adequate for analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived unambiguous from one of the test phases. It was decided to analyse the test assuming radial flow conditions (flow dimension of 2). Both test phases were analysed using a homogeneous infinite acting radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-87. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 8.1E–10 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E–10 to 1E–9 m^2/s. The analysis was performed using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,491.1 kPa.

The analysis of the CHi and CHir phases shows some minor inconsistencies and uncertainties, mainly caused by the very low flow rate of the CHi phase. No further analysis is recommended.

6.3.34 Section 465–470 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate was during the entire injection phase below 1 mL/min, indicating a very low interval transmissivity. Due to the very low flow rate the results of the CHi phase should be regarded as order of magnitude only. The CHir phase shows good data quality.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived unambiguous. It was decided to use a flow dimension of 2 (radial flow). Both test phases were analysed using a homogeneous infinite acting flow model with wellbore storage and skin. The analysis is presented in Appendix 2-88. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.6E–10 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 6E–11 to 3E–10 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,498.2 kPa.

Considering the very low transmissivity, the analysis of the CHi and CHir phases shows good consistency. No further analysis is recommended.

6.3.35 Section 470–475 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 206 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate was during the entire perturbation phase below 1 mL/min, indicating a very low interval transmissivity. During the CHir phase, the pressure in the interval decreased in 20 minutes by 10 kPa only. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-89.

Selected representative parameters

The steady state analysis was calculated with a flow rate of 0.2 mL/min.

Based on the very low injection rates, the interval transmissivity is lower than 1E–10 m^2/s.

6.3.36 Section 475–480 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. The pressure in the test section shows unusual pressure drops during the PSR phase. The reason for this behaviour is unknown. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate was during the entire injection phase below 1 mL/min, indicating a very low interval transmissivity. Considering the very low transmissivity, the CHir phase shows good data quality and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived unambiguous. It was decided to use a flow dimension of 2 (radial flow). A homogeneous infinite acting radial flow model with wellbore storage and skin was chosen for the analysis of both phases. The analysis is presented in Appendix 2-90. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.4E–10 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 6E–11 to 3E–10 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve line extrapolation in the Horner plot to a value of 4,674.3 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis is recommended.

6.3.37 Section 480–485 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 207 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate was during the entire perturbation below 1 mL/min, indicating a very low interval transmissivity. Due to that, the results from the CHi phase should be regarded as order of magnitude only. The CHir phase shows good data quality, but the results should be regarded as order of magnitude, either.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived of one of the test phases. It was decided to use a flow dimension of 2 (radial flow). A homogeneous infinite acting flow model with wellbore storage and skin was chosen for the analysis of this test. The analysis is presented in Appendix 2-91. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.3E–10 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E–11 to 3E–10 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,663.6 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis is recommended.

6.3.38 Section 485–490 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 214 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate oscillated during the entire perturbation between 0 and 0.5 mL/min, indicating a very low interval transmissivity. After closing the test valve and starting the recovery phase, the pressure in the test section rose steadily and it was decided to stop the recovery. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model cannot be determined. No analysis was performed. The measured data is presented in Appendix 2-92.

Selected representative parameters

Based on the very low flow rate, the interval transmissivity is lower than 1E–10 m^2/s.

No further analysis recommended.

6.3.39 Section 490–495 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 188 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate oscillated during the entire perturbation between 0 and 0.5 mL/min, indicating a very low interval transmissivity. After closing the test valve and starting the recovery phase, the pressure in the test section rose steadily. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model cannot be determined. No analysis was performed. The measured data is presented in Appendix 2-93.

Selected representative parameters

Based on the very low flow rate, the interval transmissivity is lower than 1E–10 m^2/s.

No further analysis recommended.

6.3.40 Section 495–500 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 58 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model cannot be determined. No analysis was performed. The measured data is presented in Appendix 2-94.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.41 Section 500–505 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 193 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate oscillated during the entire perturbation phase between 0.2 and 1 mL/min. Due to that, the CHi data are not analysable. The CHir phase was conducted without problems and shows good data quality. The CHir phase is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived unambiguous. It was decided to use a flow dimension of 2 (radial flow). A homogeneous infinite acting flow model was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-95. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.2E–10 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E–11 to 6E–10 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,845.8 kPa.

No further analysis is recommended.

6.3.42 Section 505–510 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 193 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate oscillated during the entire perturbation phase between 0 and 0.5 mL/min. Due to that, the CHi data are not analysable. The CHir phase was conducted without problems and shows good data quality. The CHir phase is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived unambiguous. It was decided to use a flow dimension of 2 (radial flow). The CHir phase shows an upward trend at late times with a slope above 2. Since this slope is to steep for a transition to a zone of lower transmissivity or a flow dimension of 1, the analysis was conducted without taking this last part in consideration. It was decided to use a flow dimension of 2 (radial flow). A homogeneous infinite acting flow model was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-96. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.9E–11 m^2/s was derived from the analysis of the CHir phase. Based on the very low injection rates, the confidence range for the interval transmissivity is estimated to be 1E–10 m^2/s or lower. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,958.9 kPa.

No further analysis is recommended.

6.3.43 Section 510–515 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 157 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-97.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.44 Section 515–520 m, test no 2, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 214 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate oscillated during the entire perturbation between 0 and 0.5 mL/min, indicating a very low interval transmissivity. After closing the test valve and starting the recovery phase, the pressure in the test section rose steadily for 40 minutes. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model cannot be determined. No analysis was performed. The measured data is presented in Appendix 2-98.

Selected representative parameters

Based on the very low flow rate, the interval transmissivity is lower than 1E–10 m^2/s.

No further analysis recommended.

6.3.45 Section 520–525 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 120 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-99.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.46 Section 525–530 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 75 kPa in 35 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-100.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.47 Section 530–535 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 212 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate was during the perturbation phase below 1 mL/min, indicating a very low interval transmissivity. The CHi phase is not analysable. The CHir phase shows better data quality, but the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived unambiguous. It was decided to use a flow dimension of 2 (radial flow). At middle and late times, the derivative of the CHir phase shows an upward trend indicating a transition to a zone of lower transmissivity. For the analysis a radial two shell composite flow model was chosen. The analysis is presented in Appendix 2-101. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.3E–11 m^2/s was derived from the analysis of the CHir phase (outer zone). Based on the very low injection rates, the confidence range for the interval transmissivity is estimated to be 1E–10 m^2/s or lower. The analysis was conducted using a flow dimension of 2. . The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5,168.9 kPa.

No further analysis is recommended.

6.3.48 Section 535–540 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 162 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-102.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.49 Section 540–545 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 0.17 L/min at the beginning of the CHi phase to 0.10 L/min at the end, indicating a moderate interval transmissivity. The first 2 minutes of the CHi phase are not analysable due to the time needed by the system to regulate constant pressure. The CHir phase shows no problems and is amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivatives of both phases are horizontal at middle and late times indicating a flow dimension of 2 (radial flow). A homogeneous infinite acting flow model with wellbore storage and skin was chosen for the analysis. The analysis is presented in Appendix 2-103. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 7.4E–8 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E–8 to 9E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,239.3 kPa.

The analysis of the CHi and CHir phases shows very good consistency. No further analysis is recommended.

6.3.50 Section 545–550 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 205 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate oscillated during the CHi phase between 4 and 2.5 mL/min, indicating a low interval transmissivity. The CHi data are very noisy and the results should be regarded as order of magnitude only. The CHir phase shows very fast recovery and the results should be regarded as order of magnitude, either.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase, although very noisy, shows a flat derivative at middle and late times indicating a flow dimension of 2 (radial flow). A homogeneous infinite acting flow model was chosen for the analysis of both phases. The analysis is presented in Appendix 2-104. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.4E–9 m^2/s was derived from the analysis of the CHi phase. Although it is very noisy, it shows the more reliable results. But it should be noted, that due to the very noisy data of the CHi phase and the fast recovery of the CHir phase the results of both analysis are very uncertain. The confidence range for the interval transmissivity is estimated to be 1E–9 to 1E–8 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,292.4 kPa.

To improve analysis consistency and if further analysis is intended, a full superposition analysis should be conducted.

6.3.51 Section 550–555 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 201 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 19.5 mL/min at the beginning of the CHi phase to 11.5 mL/min at the end, indicating a low interval transmissivity. The CHi data are noisy at middle and late times, but still adequate for quantitative analysis. The CHir phase shows fast recovery, but it shows good data quality. The CHir phase is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows at middle and late times a downward trend, indicating a flow dimension above 2. This phase was analysed using a homogeneous flow model with a flow dimension of 3 (spherical flow). The CHir phase shows an downward trend at late times, indicating a transition to a zone of higher transmissivity. An infinite acting 2 shell composite radial flow model was chosen for the analysis of this phase. The analysis is presented in Appendix 2-105. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.3E–8 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. It should be noted, that the results of both test phases can not be compared directly due to the fact, that they were analysed using different flow dimensions. The confidence range for the interval transmissivity is estimated to be 7E–9 to 5E–8 m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,334.8 kPa.

The analysis of the CHi and CHir phases shows some inconsistency, which is mainly caused by the uncertainty concerning the flow dimension. To improve analysis consistency and if further analysis is intended, a full superposition analysis should be conducted. Further there is room for interpretation as far as the flow dimension is concerned. This additional uncertainty could be further explored using GRF analysis.

6.3.52 Section 555–560 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 1.4 L/min at the beginning of the CHi phase to 0.72 L/min at the end, indicating a moderate interval transmissivity. The CHi data are a bit noisy at middle and late times, but still adequate for quantitative analysis. The CHir phase shows no problems and is amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test both test phases show a flat derivative at middle and late times, indicating a flow dimension of 2 (radial flow). Both phases were analysed using a homogeneous infinite acting radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-106. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 6.2E–7 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E–7 to 8E–7 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,388.9 kPa.

The analysis of the CHi and CHir phases shows very good consistency. No further analysis is recommended.

6.3.53 Section 560–565 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 0.21 L/min at the beginning of the CHi phase to 0.15 L/min at the end, indicating a relatively low interval transmissivity. The CHi data are noisy at middle and late times, but still adequate for quantitative analysis. The first part of the CHi phase (first 8 minutes) is not analysable due to the time needed by the system to regulate constant pressure. However, the second part is of good quality and amenable for quantitative analysis. The CHir phase shows very fast recovery and the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows at late times a flat derivative, indicating a flow dimension of 2 (radial flow). Both phases were analysed using a homogeneous infinite acting radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-107. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.2E–7 m^2/s was derived from the analysis of the CHi phase, which shows at late times the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E–8 to 4E–7 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,437.6 kPa.

The analysis of the CHi and CHir phases shows some inconsistency, which is mainly caused by very fast recovery of the CHir phase. No further analysis is recommended.

6.3.54 Section 565–570 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 300 kPa in 35 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-108.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.55 Section 570–575 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 202 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate oscillated during the entire phase between 0 and 0.5 mL/min, indicating a very low interval transmissivity. The CHi phase is not analysable. The CHir phase shows no problems and is amenable for quantitative analysis. It should be noted, that the results are uncertain due to the very low interval transmissivity.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be determinate. The test was analysed using a radial flow approach (flow dimension = 2). The CHir phase was analysed using a homogeneous infinite acting flow model with wellbore storage and skin. The analysis is presented in Appendix 2-109. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.9E–11 m^2/s was derived from the analysis of the CHir phase, which is the only analysable phase. The confidence range for the interval transmissivity is estimated to be 8E–12 to 8E–11 m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,568.5 kPa.

The analysis of the CHi and CHir phases shows some inconsistency, which is mainly caused by the uncertainty concerning the flow dimension. To improve analysis consistency and if further analysis is intended, a full superposition analysis should be conducted. Further there is room for interpretation as far as the flow dimension is concerned. This additional uncertainty could be further explored using GRF analysis.

6.3.56 Section 575–580 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 201 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 3.5 mL/min at the beginning of the CHi phase to 1 mL/min at the end, indicating a very low interval transmissivity. The CHi data are noisy at middle and late times, but still adequate for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived clearly from one of the test phases. It was decided to use a flow dimension of 2 (radial flow). The CHi phase was analysed using a homogeneous infinite acting flow model. For the analysis of the CHir phase a radial 2 shell composite flow model was chosen. The analysis is presented in Appendix 2-110. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 3.8E–10 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E–10 to 8E–10 m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5,572.6 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis is recommended.

6.3.57 Section 580–585 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 204 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate oscillated during the perturbation phase between 0.5 and 2 mL/min, indicating a low interval transmissivity. The CHi data are very noisy. The results of the CHi phase should be regarded as order of magnitude only. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be clearly determinate. The test was analysed using the flow dimension of 2 (radial flow). Both phases were analysed using a homogeneous flow model with wellbore storage and skin. The analysis is presented in Appendix 2-111. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.4E–9 m^2/s was derived from the analysis of the CHir phase, which is less noisy and shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E–10 to 3E–9 m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5,630.6 kPa.

The analysis of the CHi and CHir phases shows some inconsistency, which is mainly caused by the poor data quality of the CHi phase. To improve analysis consistency and if further analysis is intended, a full superposition analysis should be conducted.

6.3.58 Section 585–590 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 5.5 mL/min at the beginning of the CHi phase to 4.0 mL/min at the end, indicating a low interval transmissivity. The CHi data are very noisy, but still adequate for quantitative analysis. The CHir phase shows fast recovery and the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived unambiguous. The analysis was conducted using a flow dimension of 2 (radial flow). For the analysis of both phases a homogeneous flow model was chosen. The analysis is presented in Appendix 2-112. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.2E–9 m^2/s was derived from the analysis of the CHi phase, which shows the more reliable results. The confidence range for the interval transmissivity is estimated to be 1E–9 to 1E–8 m^2/s. The flow dimension displayed during the testis 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,674.3 kPa.

The analysis of the CHi and CHir phases shows some inconsistency, which is mainly caused by the reduced data quality of the CHi phase and the fast recovery of the CHir phase. To improve analysis consistency and if further analysis is intended, a full superposition analysis should be conducted.

6.3.59 Section 590–595 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 201 kPa, followed by a pressure recovery phase. The test data indicates a hydraulic connection between the test interval and the section below. The injection rate decreased from 5.82 L/min at the beginning of the CHi phase to 1.43 L/min at the end, indicating a relatively high interval transmissivity. The first part of the CHi phase is not analysable due to the time needed by the system to regulate constant pressure. However, the second part is of good quality and adequate for quantitative analysis. The CHir phase shows no problems and is amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test there is ambiguity concerning the flow dimension. The upward trend of the CHir derivative at middle and late times can be interpreted as a flow dimension below 2 or can represent the transition to a zone of higher transmissivity. This phase was analysed using a radial 2 shell composite flow model with the flow dimension of 2 for both shells. In addition, it was analysed using the same flow model with a flow dimension of 2 for the inner zone and n = 1 for the outer zone. The CHi phase was analysed using a homogeneous infinite acting flow model. The analysis is presented in Appendix 2-113. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 7.2E–7 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. It should be noted, that the results of both analysis of the CHir phase can not be compared directly due to the fact, that they were analysed using different flow dimensions. The confidence range for the interval transmissivity is estimated to be 1E–7 to 1E–6 m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5,741.2 kPa.

The analysis of the CHi and CHir phases shows some inconsistency, which is mainly caused by the uncertainty concerning the flow dimension. To improve analysis consistency and if further analysis is intended, a full superposition analysis should be conducted. Further there is room for interpretation as far as the flow dimension is concerned. This additional uncertainty could be further explored using GRF analysis.

6.3.60 Section 595–600 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 213 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 4 mL/min at the beginning of the CHi phase to 2 mL/min at the end, indicating a low interval transmissivity. The CHi data are noisy due to the low flow rate, but still adequate for quantitative analysis. The CHir phase shows fast recovery and the results should be regarded as order of magnitude only.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the analysis was conducted assuming a flow dimension of 2 (radial flow). This test was analysed using a homogeneous flow model with wellbore storage and skin. The analysis is presented in Appendix 2-114. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.0E–9 m^2/s was derived from the analysis of the CHi phase, which shows the more reliable results. The confidence range for the interval transmissivity is estimated to be 5E–10 to 5E–9 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,770.8 kPa.

The analysis of the CHi and CHir phases shows some inconsistency, which is mainly caused by the low flow rate and the noisy data of the CHi phase and the fast recovery of the CHir phase. To improve analysis consistency and if further analysis is intended, a full superposition analysis should be conducted.

6.3.61 Section 600–605 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 183 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. During the perturbation phase, the pressure in the interval dropped by 15 kPa. The test was repeated and both tests were analysed. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 44 mL/min at the beginning of the CHi phase to 24 mL/min at the end, indicating a relatively low interval transmissivity. The CHi phase shows good data quality and is amenable for quantitative analysis. The CHir phase shows fast recovery, but it shows good data quality. The CHir phase is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at late times, indicating a flow dimension of 2. For the analysis of the CHi phase a homogeneous infinite acting flow model with wellbore storage and skin was chosen. The derivative of the CHir phase shows at late times a downward trend, which is indicative for transition to a zone with a higher transmissivity. For this phase a radial two shell composite flow model was chosen. The analysis is presented in Appendix 2-115. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.8E–8 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E–9 to 5E–8 m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,817.6 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis is recommended.

6.3.62 Section 600–605 m, test no 1, injection

Comments to test

This is the second test in this section, because at the first time, the pressure in the test section decreased during the perturbation phase by 15 kPa. The test was composed of a constant pressure injection test phase with a pressure difference of 198 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 51 mL/min at the beginning of the CHi phase to 30 mL/min at the end, indicating a low interval transmissivity. The first part of the CHi data is not analysable due to the time needed by the system to regulate constant pressure. However, the second part is amenable for quantitative analysis. The CHir phase shows no problems and is amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivative of the CHi phase becomes flat at late times, indicating a flow dimension of 2 (radial flow). This phase was analysed using a homogeneous flow model with wellbore storage and skin. The derivative of the CHir phase shows at late times a downward trend, which is indicative for transition to a zone with a higher transmissivity. For this phase a radial two shell composite flow model was chosen for analysis. The analysis is presented in Appendix 2-116. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 6.5E–8 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E–8 to 9E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,808.1 kPa.

The analysis of the CHi and CHir phases shows good consistency. No further analysis is recommended. The results of this test show good consistency to those of the first test made in this section. Due to the decreasing of the pressure during the injection phase at the first test in this section, only the results of this second test in the section is understood as representative for the section.

6.3.63 Section 605–610 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 184 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-117.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.64 Section 610–615 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 204 kPa, followed by a pressure recovery phase. The test data indicates a hydraulic connection between the test section and the section below. The injection rate decreased from 0.18 L/min at the beginning to 0.04 L/min at the end of the CHi phase, indicating a moderate interval transmissivity. The first part of the CHi phase is not analysable due to the time needed by the system to regulate constant pressure. However, the second part is good and amenable for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be clearly derived from one of the test phases. The derivative of the CHi phase becomes flat at late times, which is indicative of a flow dimension of 2 (radial flow). This phase was analysed using a homogeneous infinite acting flow model. The CHir phase shows at middle and late times an upward trend with a slope of 0.5, indicating a flow dimension of 1. The CHir phase was analysed using a 2 shell composite flow model with a flow dimension of 2 for the inner zone and 1 for the outer zone. The analysis is presented in Appendix 2-118. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 5.2E–9 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. It should be noted, that the results of both phases can not be compared directly due to the fact, that they were analysed using different flow dimensions. The confidence range for the interval transmissivity is estimated to be 3E–9 to 1E–8 m^2/s.

The analysis of the CHi and CHir phases shows some inconsistency, which is mainly caused by the uncertainty concerning the flow dimension. To improve analysis consistency and if further analysis is intended, a full superposition analysis should be conducted. Further there is room for interpretation as far as the flow dimension is concerned. This additional uncertainty could be further explored using GRF analysis.

6.3.65 Section 615–620 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 30.3 mL/min at the beginning of the CHi phase to 21.7 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase is not analysable due to the time needed by the system to regulate constant pressure. The second part is amenable for quantitative analysis. The CHir phase shows relatively fast recovery, however, the data is of good quality and as such, amenable for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivative of the CHi phase becomes flat at middle times, indicating a flow dimension of 2. This test phase was analysed using a homogeneous flow model. The CHir phase shows a flat curve at late times and was analysed using a radial 2 shell composite flow model. The analysis is presented in Appendix 2-119. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.6E–8 m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E–9 to 6E–8 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,962.0 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis is recommended.

6.3.66 Section 620–625 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 212 kPa, followed by a pressure recovery phase. During the perturbation phase, the pressure in the interval increased by 10 kPa. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 6 mL/min at the beginning of the CHi phase to 2 mL/min at the end, indicating a low interval transmissivity. The CHi data are very noisy, but amenable for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can be best derived from the CHir derivative. At middle times the derivative is flat, indicating a flow dimension of 2 (radial flow). At late times it shows an upward trend, indicating a transition to a zone of lower transmissivity. This phase was analysed using a radial 2 shell composite flow model. For the analysis of the CHi phase, a radial homogeneous infinite acting flow model was chosen. The analysis is presented in Appendix 2-120. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.1E–9 m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E–10 to 5E–9 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6,017.7 kPa.

The analysis of the CHi and CHir phases shows consistency. No further analysis is recommended.

6.3.67 Section 625–630 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 195 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 10 mL/min at the beginning of the CHi phase to 2 mL/min at the end, indicating a low interval transmissivity. The CHi data are noisy, but amenable for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be clearly determinated. Both phases show an upward trend at late times, indicating either a transition to zone of lower transmissivity or a flow dimension below 2. The CHi phase was analysed using a radial 2 shell composite model with a flow dimension of 2 for both zones. For analysing the CHir phase, a radial 2 shell composite flow model with a flow dimension of 2 for the inner zone and a flow dimension of 1 for the outer zone was chosen. The analysis is presented in Appendix 2-121. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 2.7E–10 m^2/s was derived from the analysis of the CHi phase. It should be noted, that the results of both phases can not be compared directly, because different flow dimension were used. The confidence range for the interval transmissivity is estimated to be 2E–10 to 2E–9 m^2/s.

The analysis of the CHi and CHir phases shows some inconsistency, which is mainly caused by the uncertainty concerning the flow dimension. To improve analysis consistency and if further analysis is intended, a full superposition analysis should be conducted. Further there is room for interpretation as far as the flow dimension is concerned. This additional uncertainty could be further explored using GRF analysis.

6.3.68 Section 630–635 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 101 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-122.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.69 Section 635–640 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 105 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-123.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.70 Section 640–645 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 178 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-124.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.71 Section 645–650 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 117 kPa in 54 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-125.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.72 Section 650–655 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 224 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-126.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.73 Section 655–660 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 194 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate during the perturbation phase was most of the time not measurable. After closing the test valve, the pressure in the interval rose the entire CHir phase (possibly extended packer compliance). The CHir phase is not analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-127.

Selected representative parameters

The steady state analysis was conducted using a flow rate of 0.1 mL/min. The results of this calculations should be seen as maximum values for the transmissivity of this section.

No further analysis is recommended.

6.3.74 Section 660–665 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 167 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-128.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.75 Section 665–670 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 195 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate was during the entire CHi phase below 1 mL/min and most of the time below the measurement limit of the flowmeter. Due to that, the CHi phase is not analysable. The CHir phase took 12 hours (overnight). The first part of it is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can not be derived from the CHir phase. The derivative of the CHir phase shows at middle and late times an upward trend, which was interpreted as transition to a zone of lower permeability. The analysis was conducted using a radial 2 shell composite flow model. In addition, an alternative analysis using a homogeneous infinite acting radial flow model was made. The analysis is presented in Appendix 2-129. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.8E–11 m^2/s was derived from the analysis of the CHir phase using the composite flow model (outer zone), which shows the best data and derivative quality. Based on this analysis and the very low injection rates (below measurement range of flowmeter), the interval transmissivity is lower than 5E–11 m^2/s.

The flow dimension used for this analysis is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 6,463.9 kPa.

No further analysis is recommended.

6.3.76 Section 670–675 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 205 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate was during the entire perturbation phase below 0.5 mL/min. The CHi phase is not analysable. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can no be derived clearly. It was decided to use a flow dimension of 2. The CHir phase was analysed using a homogeneous infinite acting flow model. For an alternative analysis, a radial 2 shell composite flow model was chosen. The analysis is presented in Appendix 2-130. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 7.6E–11 m^2/s was derived from the analysis of the CHir phase using the homogeneous flow model. Based on this analysis and the very low injection rates (below measurement range of flowmeter), the interval transmissivity is lower than 1E–10 m^2/s. A flow dimension of 2 was used for the analysis. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6,489.1 kPa.

Both analysis of the CHir phase show good consistency. No further analysis is recommended.

6.3.77 Section 675–680 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 200 kPa, followed by a pressure recovery phase. The test was performed without using the automatic regulation system. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 2.2 mL/min at the beginning of the CHi phase to 0.5 mL/min at the end, indicating a low interval transmissivity. The CHi data are very noisy and the results should be regarded as order of magnitude only. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can be derived from the CHi derivative, which is flat at late times, indicating a flow dimension of 2 (radial flow). Both phases were analysed using a homogeneous infinite acting radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-131. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 1.3E–9 m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E–10 to 3E–9 m^2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6,573.9 kPa.

The analysis of the CHi and CHir phases shows some inconsistencies, mainly caused by the very low flow rate. No further analysis is recommended.

6.3.78 Section 680–685 m, test no 1, injection

Comments to test

The test was composed of a constant pressure injection test phase with a pressure difference of 215 kPa, followed by a pressure recovery phase. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 21 mL/min at the beginning of the CHi phase to 13 mL/min at the end, indicating a relatively low interval transmissivity. The first part of the CHi phase is not analysable due to the time needed by the system to regulate constant pressure, However, the second part is amenable for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow dimension can be best derived from the CHi phase. At middle times the derivative is flat, indicating a flow dimension of 2 (radial flow). This phase was analysed using a homogeneous infinite acting flow model. The derivative of the CHir phase shows at middle times an upward trend and at late times a stabilisation, indicating a transition to a zone of lower transmissivity. For the analysis of the CHir phase, a radial composite flow model was chosen. The analysis is presented in Appendix 2-132. The Table 7-2 presents relevant parameters with respect to the selected model.

Selected representative parameters

The recommended transmissivity of 6.1E–9 m^2/s was derived from the analysis of the CHi phase. The confidence range for the interval transmissivity is estimated to be 4E–9 to 9E–9 m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6,579.8 kPa.

The analysis of the CHi and CHir phases shows good consistency. No further analysis is recommended.

6.3.79 Section 685–690 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 30 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-133.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.80 Section 690–695 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 224 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-134.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

6.3.81 Section 695–700 m, test no 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by 156 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). The test shows no hydraulic communication between the test interval and the adjacent zones. None of the test phases is analysable.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the flow model can not be determined. No analysis was performed. The measured data is presented in Appendix 2-135.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E–11 m^2/s.

No further analysis recommended.

7 Synthesis

The synthesis chapter summarizes the basic test parameters and analysis results. In addition, the correlation between steady state and transient transmissivities as well as between the matched and the theoretical wellbore storage (WBS) coefficient are presented and discussed.

7.1 Summary of results

Table 7-1. General test data from constant head injection tests in KSH01A.

Borehole secup (m)	Borehole seclow (m)	Date and time for test, start YYYYMMDD hh:mm	Date and time for test, stop YYYYMMDD hh:mm	Q_p (m^3/s)	Q_m (m^3/s)	tp (s)	t_F (s)	p_0 (kPa)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	Test phases measured Analysed test phases marked bold	
103	203	20031209 11:00	20031209 14:08	2.28E-05	2.31E-05	1800	1800	1053	1045	1242	1051	8.9	CHi	CHir
200	300	20031210 10:20	20031210 14:53	1.37E-04	1.55E-04	1800	1800	1982	1985	2184	1997	9.8	CHi	CHir
300	400	20031210 16:33	20031210 20:20	2.90E-07	3.61E-07	1800	5400	2950	2951	3152	2954	11.3	CHi	CHir
400	500	20031214 09:18	20031214 11:33	8.97E-08	1.53E-07	1800	3600	3887	3894	4134	3930	12.7	CHi	CHir
500	600	20031211 14:57	20031211 16:37	3.78E-05	5.75E-05	1800	3600	4874	4870	5071	4895	14.0	CHi	CHir
600	700	20031212 07:06	20031212 08:20	1.00E-06	1.58E-06	1800	1800	5841	5828	6031	5878	15.5	CHi	CHir
700	800	20031212 10:02	20031212 12:33	2.92E-07	4.63E-07	1800	3600	6793	6788	6966	6813	17.0	CHi	CHir
800	900	20031212 13:59	20031213 07:29	1.45E-08	2.54E-08	1800	57600	7746	7780	7962	7741	18.5	CHi	CHir
899	999	20031213 13:28	20031213 15:32	1.12E-07	1.56E-07	1800	1800	8668	8682	8890	8670	20.0	CHi	CHir
103	123	20031215 11:03	20031215 12:37	6.94E-06	8.28E-06	1200	1800	1054	1048	1248	1054	8.8	CHi	CHir
123	143	20031215 13:10	20031215 15:33	1.03E-06	1.11E-06	1200	1200	1245	1241	1441	1240	9.1	CHi	CHir
143	163	20031215 16:09	20031215 17:38	1.28E-05	1.33E-05	1200	1200	1435	1430	1630	1432	9.4	CHi	CHir
163	183	20031215 18:09	20031215 19:50	1.06E-06	1.16E-06	1800	1200	1628	1624	1823	1623	9.6	CHi	CHir
183	203	20031216 08:19	20031216 09:40	3.19E-07	3.82E-07	1200	1200	1819	1819	2017	1821	9.9	CHi	CHir
200	220	20031216 11:13	20031216 12:49	6.94E-06	8.84E-06	1200	1200	1982	1979	2179	1987	10.0	CHi	CHir
220	240	20031216 13:37	20031216 14:58	9.10E-07	1.03E-06	1200	1200	2175	2172	2371	2178	10.3	CHi	CHir
240	260	20031216 15:34	20031216 17:00	5.61E-05	6.11E-05	1200	1200	2367	2363	2562	2369	10.5	CHi	CHir
260	280	20031216 17:29	20031216 18:57	2.40E-05	2.49E-05	1200	1200	2561	2558	2756	2559	10.8	CHi	CHir
280	300	20031217 08:19	20031217 10:04	6.20E-05	7.20E-05	1800	1200	2752	2752	2951	2759	11.1	CHi	CHir
300	320	20031217 10:41	20031217 12:58	1.36E-07	1.74E-07	1200	4080	2945	2947	3169	2956	11.3	CHi	CHir
320	340	20031217 13:27	20031217 14:54	7.26E-08	1.09E-07	1200	1200	3138	3137	3336	3136	11.6	CHi	CHir
340	360	20031217 15:37	20031217 17:02	1.88E-07	2.19E-07	1200	1200	3329	3328	3537	3328	11.9	CHi	CHir
360	380	20031217 17:31	20031217 19:36	2.28E-07	2.65E-07	1200	1800	3521	3519	3718	3519	12.1	CHi	CHir
380	400	20031218 08:09	20031218 09:36	2.10E-07	2.54E-07	1200	1800	3715	3713	3915	3716	12.4	CHi	CHir
400	420	20031218 14:53	20031218 16:16	1.30E-07	1.44E-07	1200	1200	3905	3903	4107	3902	12.7	CHi	CHir

Borehole secup (m)	Borehole seclow (m)	Date and time for test, start YYYYMMDD hh:mm	Date and time for test, stop YYYYMMDD hh:mm	Q_p (m^3/s)	Q_m (m^3/s)	tp (s)	t_F (s)	p_0 (kPa)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	Test phases measured Analysed test phases marked bold	
420	440	20031218 16:45	20031218 18:18	1.23E-07	1.41E-07	1200	1200	4096	4094	4299	4093	12.9	CHi	CHir
440	460	20031219 08:00	20031219 09:30	1.83E-07	2.14E-07	1200	1200	4287	4291	4491	4289	13.2	CHi	CHir
460	480	20031219 10:00	20031219 11:23	1.14E-07	1.40E-07	1200	1200	4480	4478	4683	4478	13.5	CHi	CHir
480	500	20031219 11:53	20031219 13:41	1.92E-07	2.07E-07	1200	1200	4672	4670	4873	4669	13.8	CHi	CHir
500	520	20031219 14:13	20031219 15:37	2.00E-07	2.26E-07	1200	1200	4864	4863	5065	4861	14.1	CHi	CHir
520	540	20031219 16:11	20031219 17:33	2.04E-07	2.28E-07	1200	1200	5056	5055	5257	5054	14.3	CHi	CHir
540	560	20031219 18:09	20031219 21:12	1.33E-05	1.51E-05	1200	7200	5249	5244	5444	5249	14.6	CHi	CHir
560	580	20031220 08:13	20031220 09:49	2.17E-06	2.27E-06	1200	1200	5445	5440	5640	5440	14.9	CHi	CHir
580	600	20031220 10:22	20031220 14:18	2.37E-05	4.12E-05	1800	3600	5637	5637	5831	5677	15.2	CHi	CHir
600	620	20031220 14:47	20031220 17:46	8.26E-07	1.45E-06	1200	3600	5830	5835	6035	5850	15.5	CHi	CHir
620	640	20040107 13:39	20040107 15:08	2.01E-07	2.61E-07	1200	1200	6024	6020	6221	6035	15.8	CHi	CHir
640	660	20040107 15:44	20040107 17:10	1.76E-07	1.96E-07	1800	1800	6211	6210	6418	6209	16.1	CHi	CHir
660	680	20040107 17:43	20040107 19:11	2.08E-07	2.31E-07	1800	1800	6404	6407	6612	6404	16.4	CHi	CHir
680	700	20040108 08:27	20040108 10:03	2.31E-07	3.36E-07	1200	1800	6595	6591	6791	6601	16.7	CHi	CHir
700	720	20040108 10:36	20040108 12:28	2.55E-07	3.05E-07	1200	2400	6786	6786	6978	6787	17.0	CHi	CHir
720	740	20040108 12:59	20040108 14:54	2.84E-07	4.77E-07	1200	2400	6975	6974	7182	7001	17.3	CHi	CHir
740	760	20040108 15:31	20040108 17:02	1.89E-07	2.07E-07	1200	1200	7166	7165	7352	7163	17.6	CHi	CHir
760	780	20040108 17:34	20040108 19:17	2.01E-07	2.36E-07	1200	1200	7358	7355	7560	7355	17.9	CHi	CHir
780	800	20040109 08:24	20040109 09:58	7.99E-08	1.26E-07	1200	1200	7550	7544	7750	7544	18.2	CHi	CHir
800	820	20040109 10:29	20040109 12:01	1.85E-07	2.27E-07	1200	1200	7737	7734	7927	7733	18.5	CHi	CHir
820	840	20040109 12:51	20040109 14:26	2.25E-07	2.52E-07	1200	1200	7925	7922	8132	7921	18.8	CHi	CHir
840	860	20040109 15:30	20040109 17:13	5.91E-08	1.19E-07	1800	1200	8113	8110	8302	8112	19.1	CHi	CHir
860	880	20040109 17:43	20040109 19:21	1.13E-07	1.80E-07	1200	1200	8303	8301	8501	8302	19.4	CHi	CHir
880	900	20040110 08:30	20040110 10:06	1.99E-07	2.61E-07	1200	1200	8492	8487	8690	8487	19.7	CHi	CHir
899	919	20040110 10:38	20040110 12:08	1.25E-07	1.91E-07	1200	1200	8668	8668	8669	8669	20.0	CHi	CHir
919	939	20040110 13:13	20040110 14:31	1.34E-07	2.09E-07	1200	600	8855	8852	9056	8852	20.3	CHi	CHir
939	959	20040110 15:06	20040110 16:29	2.26E-07	2.71E-07	1200	300	9041	9037	9228	9037	20.6	CHi	CHir
959	979	20040110 16:59	20040110 18:22	2.96E-07	3.17E-07	1200	300	9225	9223	9428	9223	20.9	CHi	CHir
979	999	20040111 08:23	20040111 10:07	1.61E-07	2.12E-07	1200	1200	9409	9406	9610	9407	21.2	CHi	CHir

Borehole secup (m)	Borehole seclow (m)	Date and time for test, start YYYYMMDD hh:mm	Date and time for test, stop YYYYMMDD hh:mm	Q_p (m^3/s)	Q_m (m^3/s)	tp (s)	t_F (s)	p_0 (kPa)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	Test phases measured Analysed test phases marked bold	
300	305	20040112 16:06	20040112 17:24	1.79E-07	1.98E-07	1200	300	2947	2939	3145	2938	11.4	CHi	CHir
305	310	20040112 17:53	20040112 19:26	1.69E-07	1.88E-07	1200	1200	2986	2984	3185	2984	11.5	CHi	CHir
310	315	20040113 08:36	20040113 10:11	2.09E-07	2.31E-07	1200	1200	3032	3032	3232	3035	11.5	CHi	CHir
315	320	20040113 10:36	20040113 13:47	3.58E-08	7.47E-08	1200	1200	3080	3074	3285	3075	11.5	CHi	CHir
320	325	20040113 14:11	20040113 15:28	1.72E-07	1.83E-07	1200	300	3123	3124	3330	3124	11.6	CHi	CHir
325	330	20040113 15:57	20040113 17:18	5.05E-08	6.92E-08	1200	600	3172	3177	3380	3177	11.7	CHi	CHir
330	335	20040113 17:41	20040113 19:19	4.80E-08	6.75E-08	1200	1200	3221	3222	3424	3222	11.7	CHi	CHir
335	340	20040114 08:15	20040114 09:41	4.56E-08	7.09E-08	1200	900	3272	3271	3475	3272	11.8	CHi	CHir
340	345	20040114 10:08	20040114 11:41	2.60E-08	3.74E-08	1200	1200	3320	3333	3530	3327	11.9	CHi	CHir
345	350	20040114 12:09	20040114 14:05	1.86E-08	3.16E-08	1200	1500	3368	3380	3582	3374	11.9	CHi	CHir
350	355	20040114 14:28	20040114 16:00	2.35E-08	4.31E-08	1200	1200	3416	3424	3631	3423	12.0	CHi	CHir
355	360	20040114 16:25	20040114 18:35	9.98E-09	2.19E-08	1200	3600	3464	3486	3682	3482	12.1	CHi	CHir
360	365	20040115 08:27	20040115 10:36	7.53E-09	1.27E-08	1200	1800	3512	3514	3715	3569	12.1	CHi	CHir
365	370	20040115 11:01	20040115 13:04	7.53E-09	1.36E-08	1200	3240	3561	3570	3764	3593	12.2	CHi	CHir
370	375	20040115 13:29	20040115 15:40	6.32E-09	9.94E-09	1200	1800	3609	3623	3829	3668	12.3	CHi	CHir
375	380	20040115 16:10	20040115 17:42	6.77E-08	7.84E-08	1200	1200	3657	3662	3863	3674	12.3	CHi	CHir
380	385	20040115 18:06	20040115 20:47	5.29E-08	6.83E-08	1200	3600	3705	3711	3905	3714	12.4	CHi	CHir
385	390	20040116 08:24	20040116 10:05	1.98E-08	2.70E-08	1200	1200	3752	3762	3962	3775	12.5	CHi	CHir
390	395	20040116 10:32	20040116 12:00	1.12E-08	1.59E-08	1200	1200	3800	3816	4013	3815	12.5	CHi	CHir
395	400	20040116 13:04	20040116 14:44	7.53E-09	2.54E-08	1200	1800	3848	3849	4053	3868	12.6	CHi	CHir
400	405	20040116 15:09	20040116 17:13	6.32E-09	1.00E-08	1200	2700	3896	3914	4115	3916	12.7	CHi	CHir
405	410	20040116 17:37	20040117 07:07	2.62E-09	1.31E-08	1200	43200	3944	3970	4170	3965	12.7	CHi	CHir
410	415	20040117 08:24	20040117 09:56	9.98E-09	1.28E-08	1200	1200	3996	4024	4219	4236	12.8	CHi	CHir
415	420	20040117 10:22	20040117 11:24	#NV	#NV	#NV	#NV	4043	#NV	#NV	#NV	12.9	–	–
420	425	20040117 11:49	20040117 13:58	#NV	#NV	#NV	#NV	4090	#NV	#NV	#NV	13.0	–	–
425	430	20040117 14:25	20040117 15:09	#NV	#NV	#NV	#NV	4138	#NV	#NV	#NV	13.0	–	–
430	435	20040117 15:36	20040117 16:35	#NV	#NV	#NV	#NV	4186	#NV	#NV	#NV	13.1	–	–
435	440	20040117 17:01	20040117 17:50	#NV	#NV	#NV	#NV	4233	#NV	#NV	#NV	13.2	–	–
440	445	20040117 18:14	20040118 05:35	6.32E-09	1.16E-08	1200	36000	4281	4290	4501	4277	13.3	CHi	CHir

Borehole secup (m)	Borehole seclow (m)	Date and time for test, start YYYYMMDD hh:mm	Date and time for test, stop YYYYMMDD hh:mm	Q_p (m^3/s)	Q_m (m^3/s)	tp (s)	t_F (s)	p_0 (kPa)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	Test phases measured Analysed test phases marked bold	
445	450	20040118 08:55	20040118 11:22	9.98E-09	1.57E-08	1200	1200	4330	4346	4556	4361	13.3	CHi	CHir
450	455	20040118 11:46	20040118 13:35	#NV	#NV	#NV	#NV	4379	#NV	#NV	#NV	13.4	–	–
455	460	20040118 13:58	20040118 15:48	1.12E-08	1.86E-08	1200	1200	4426	4459	4642	4506	13.5	CHi	CHir
460	465	20040118 16:13	20040118 23:49	1.12E-08	1.52E-08	1200	21600	4475	4496	4691	4477	13.5	CHi	CHir
465	470	20040119 08:26	20040119 10:47	2.62E-09	9.68E-09	1200	1800	4524	4559	4759	4576	13.6	CHi	CHir
470	475	20040119 11:10	20040119 13:00	3.33E-09	4.86E-09	1200	1200	4571	4600	4806	4794	13.7	CHi	–
475	480	20040119 13:25	20040119 15:39	2.50E-09	6.50E-09	1200	1200	4618	4644	4844	4785	13.7	CHi	CHir
480	485	20040119 16:02	20040119 18:00	2.50E-09	6.69E-09	1200	1800	4666	4696	4903	4721	13.8	CHi	CHir
485	490	20040120 08:19	20040120 09:51	2.62E-09	4.67E-09	1200	240	4714	4752	4967	4972	13.9	–	–
490	495	20040120 10:17	20040120 12:17	1.42E-09	2.93E-09	1200	2400	4763	4796	4983	5009	13.9	–	–
495	500	20040120 12:56	20040120 13:55	#NV	#NV	#NV	#NV	4809	#NV	#NV	#NV	14.0	–	–
500	505	20040120 14:24	20040120 16:43	3.87E-09	6.91E-09	1200	2400	4856	4889	5082	4881	14.1	CHi	CHir
505	510	20040120 17:10	20040121 06:42	2.62E-09	4.53E-09	1200	43200	4903	4928	5133	4961	14.1	CHi	CHir
510	515	20040121 08:16	20040121 09:16	#NV	#NV	#NV	#NV	4952	#NV	#NV	#NV	14.2	–	–
515	520	20040121 09:58	20040121 12:05	1.42E-09	3.31E-09	1200	2400	4999	5041	5249	5342	14.3	–	–
520	525	20040121 13:01	20040121 14:02	#NV	#NV	#NV	#NV	5050	#NV	#NV	#NV	14.4	–	–
525	530	20040121 14:25	20040121 15:30	#NV	#NV	#NV	#NV	5098	#NV	#NV	#NV	14.4	–	–
530	535	20040121 15:54	20040121 18:09	2.62E-09	3.36E-09	1200	1800	5147	5172	5384	5310	14.5	CHi	CHir
535	540	20040122 08:13	20040122 09:13	#NV	#NV	#NV	#NV	5191	#NV	#NV	#NV	14.6	–	–
540	545	20040122 09:36	20040122 11:42	1.73E-06	1.95E-06	1200	1800	5240	5243	5443	5250	14.6	CHi	CHir
545	550	20040122 13:10	20040122 14:55	5.05E-08	5.56E-08	1200	1200	5288	5294	5499	5293	14.7	CHi	CHir
550	555	20040122 15:20	20040122 17:00	2.00E-07	2.05E-07	1200	900	5338	5338	5539	5339	14.8	CHi	CHir
555	560	20040122 17:25	20040122 19:00	1.21E-05	1.35E-05	1200	1800	5387	5386	5586	5397	14.9	CHi	CHir
560	565	20040123 08:19	20040123 09:36	2.44E-06	2.61E-06	1200	600	5436	5437	5635	5438	14.9	CHi	CHir
565	570	20040123 10:01	20040123 11:01	#NV	#NV	#NV	#NV	5486	#NV	#NV	#NV	15.0	–	–
570	575	20040123 11:27	20040123 13:49	1.42E-09	3.84E-09	1200	1200	5533	5554	5756	5712	15.1	CHir	
575	580	20040123 14:12	20040123 16:09	1.61E-08	2.58E-08	1200	2400	5580	5598	5799	5604	15.1	CHi	CHir
580	585	20040123 16:33	20040123 18:06	1.37E-08	1.69E-08	1200	1200	5629	5642	5846	5642	15.2	CHi	CHir
585	590	20040124 08:15	20040124 9:41	7.38E-08	7.87E-08	1200	600	5673	5676	5876	5675	15.3	CHi	CHir
590	595	20040124 10:05	20040124 13:02	2.39E-05	4.30E-05	1800	3600	5724	5729	5929	5768	15.4	CHi	CHir

Borehole secup (m)	Borehole seclow (m)	Date and time for test, start YYYYMMDD hh:mm	Date and time for test, stop YYYYMMDD hh:mm	Q_p (m^3/s)	Q_m (m^3/s)	tp (s)	t_F (s)	p_0 (kPa)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	Test phases measured Analysed test phases marked bold	
595	600	20040124 13:30	20040124 15:07	3.70E-08	4.77E-08	1200	1200	5775	5777	5990	5776	15.4	CHi	CHir
600	605	20040124 15:31	20040124 17:02	3.98E-07	4.29E-07	1200	1200	5823	5822	6005	5823	15.5	CHi	CHir
600	605	20040128 10:41	20040128 12:08	4.86E-07	5.21E-07	1200	1200	5804	5811	6009	5813	15.5	CHi	CHir
605	610	20040124 17:26	20040124 18:25	#NV	#NV	#NV	#NV	5869	#NV	#NV	#NV	15.6	–	–
610	615	20040125 08:23	20040125 10:51	6.50E-07	1.18E-06	1200	2400	5915	5922	6120	5973	15.6	CHi	CHir
615	620	20040125 11:16	20040125 12:39	3.77E-07	3.89E-07	1200	1200	5964	5964	6164	5964	15.7	CHi	CHir
620	625	20040125 13:40	20040125 15:19	3.45E-08	4.91E-08	1200	1200	6013	6019	6231	6047	15.8	CHi	CHir
625	630	20040125 15:44	20040125 17:33	2.96E-08	5.99E-08	1200	2100	6061	6084	6279	6152	15.8	CHi	CHir
630	635	20040125 17:56	20040125 18:54	#NV	#NV	#NV	#NV	6109	#NV	#NV	#NV	15.9	–	–
635	640	20040126 08:16	20040126 09:16	#NV	#NV	#NV	#NV	6154	#NV	#NV	#NV	16.0	–	–
640	645	20040126 09:48	20040126 10:47	#NV	#NV	#NV	#NV	6200	#NV	#NV	#NV	16.1	–	–
645	650	20040126 11:16	20040126 12:39	#NV	#NV	#NV	#NV	6249	#NV	#NV	#NV	16.1	–	–
650	655	20040126 13:04	20040126 14:04	#NV	#NV	#NV	#NV	6298	#NV	#NV	#NV	16.2	–	–
655	660	20040126 14:32	20040126 16:08	1.67E-09	1.67E-09	1200	1200	6345	6376	6570	6631	16.3	–	–
660	665	20040126 16:36	20040126 17:35	#NV	#NV	#NV	#NV	6391	#NV	#NV	#NV	16.4	–	–
665	670	20040126 18:01	20040127 05:16	1.10E-09	1.10E-09	1200	36000	6439	6471	6666	6486	16.4	CHi	CHir
670	675	20040127 08:15	20040127 09:59	2.62E-09	5.00E-09	1200	1200	6485	6505	6710	6558	16.5	CHi	CHir
675	680	20040127 10:26	20040127 12:20	1.37E-08	1.69E-08	1200	1800	6533	6558	6758	6581	16.6	CHi	CHir
680	685	20040127 12:50	20040127 15:39	2.19E-07	2.87E-07	1200	1200	6586	6596	6812	6615	16.7	CHi	CHir
685	690	20040127 16:07	20040127 17:07	#NV	#NV	#NV	#NV	6632	#NV	#NV	#NV	16.7	–	–
690	695	20040127 17:33	20040127 18:32	#NV	#NV	#NV	#NV	6680	#NV	#NV	#NV	16.8	–	–
695	700	20040128 08:14	20040128 09:13	#NV	#NV	#NV	#NV	6726	#NV	#NV	#NV	16.9	–	–

#NV Not analysed.
CHi Constant head injection phase.
CHir Recovery phase following the constant head injection phase.

Table 7-2. Results from analysis of constant head tests in KSH01A.

Interval position		Stationary flow parameters		Transient analysis													Static conditions	
				Flow regime		Formation parameters												
up	low	Q/s	T_M	Perturb.	Recovery	T_{f1}	T_{f2}	T_{s1}	T_{s2}	T_T	T_{TMIN}	T_{TMAX}	C	ξ	dt_1	dt_2	p*	h_{wif}
m btoc	m btoc	m²/s	m²/s	Phase	Phase	m²/s	m²/s	m²/s	m²/s	m²/s	m²/s	m²/s	m³/Pa	–	min	min	kPa	masl
103	203	1.12E-06	1.46E-06	22	WBS22	5.8E-07	5.0E-06	6.6E-07	1.8E-06	5.0E-06	3.0E-06	1.0E-05	1.27E-09	–0.6	6.1	26.9	1046.2	–0.44
200	300	6.72E-06	8.75E-06	2	WBS22	#NV	6.3E-06	4.2E-06	7.2E-06	6.3E-06	2.0E-06	1.0E-05	7.14E-09	–2.6	9.1	27.3	1985.2	1.05
300	400	1.42E-08	1.85E-08	2	WBS22	#NV	9.7E-06	1.3E-08	6.6E-09	6.6E-09	5.0E-09	2.0E-08	3.44E-10	–0.6	11.8	15.6	2943.2	1.51
400	500	3.67E-09	4.78E-09	22	WBS22	5.0E-09	1.7E-09	4.9E-09	4.9E-10	1.7E-09	3.0E-10	6.0E-09	3.84E-10	0.0	2.4	22.8	3883.7	0.33
500	600	1.84E-06	2.40E-06	2	WBS22	#NV	6.0E-07	1.1E-05	1.0E-06	1.0E-06	4.0E-07	2.0E-05	4.58E-08	–0.8	–	–	4861.6	3.12
600	700	4.85E-08	6.32E-08	2	WBS22	#NV	2.2E-08	1.1E-07	2.0E-08	2.0E-08	1.0E-08	6.0E-07	8.95E-10	–3.3	–	–	5818.2	3.68
700	800	1.61E-08	2.10E-08	2	WBS22	#NV	2.3E-09	7.6E-08	8.7E-09	8.7E-09	2.0E-09	8.0E-08	5.18E-10	0.3	–	–	6790.7	5.95
800	900	7.82E-10	1.02E-09	2	WBS2	#NV	2.2E-10	#NV	9.4E-10	9.4E-10	1.0E-10	3.0E-09	1.55E-10	9.1	–	–	7737.7	6.13
899	999	5.27E-09	6.87E-09	2	WBS22	#NV	3.9E-09	2.4E-09	3.0E-08	3.9E-09	1.0E-09	5.0E-08	2.79E-10	0.0	4.5	23.3	8659.8	5.56
103	123	3.40E-07	3.56E-07	2	WBS22	#NV	3.7E-07	8.0E-08	2.0E-07	2.0E-07	8.0E-08	5.0E-07	2.29E-10	–2.2	21.5	29.4	1040.4	–1.03
123	143	5.05E-08	5.28E-08	22	WBS2	1.3E-08	6.6E-08	#NV	3.2E-07	6.6E-08	1.0E-08	3.0E-07	2.20E-10	–0.1	1.8	18.0	1239.5	–0.15
143	163	6.27E-07	6.56E-07	2	WBS32	#NV	9.6E-07	5.1E-08	2.7E-06	9.6E-07	4.0E-07	2.0E-06	2.17E-11	2.5	0.5	17.0	1431.1	–0.04
163	183	5.20E-08	5.44E-08	2	WBS2	#NV	5.0E-08	#NV	3.5E-07	5.0E-08	4.0E-08	4.0E-07	1.49E-10	0.0	5.1	21.2	1623.1	0.09
183	203	1.58E-08	1.65E-08	3	WBS22	#NV	1.1E-09	1.0E-08	3.4E-08	3.4E-08	8.0E-09	6.0E-08	2.32E-10	–1.2	–	–	1817.0	0.42
200	220	3.40E-07	3.56E-07	3	WBS22	#NV	2.6E-08	2.6E-07	5.7E-07	5.7E-07	3.0E-07	9.0E-07	1.71E-09	–2.7	–	–	1978.6	0.38
220	240	4.49E-08	4.69E-08	2	WBS2	#NV	4.0E-08	#NV	5.4E-08	4.0E-08	2.0E-08	7.0E-08	1.12E-10	0.0	0.9	13.6	2166.7	0.11
240	260	2.77E-06	2.90E-06	2	WBS22	#NV	3.5E-06	5.2E-06	4.0E-06	3.5E-06	1.0E-06	6.0E-06	1.97E-09	0.0	1.7	17.8	2361.8	0.56
260	280	1.19E-06	1.24E-06	3	WBS22	#NV	9.2E-08	1.2E-06	3.9E-06	3.9E-06	1.0E-06	5.0E-06	1.09E-09	–0.1	12.5	17.3	2556.7	0.99
280	300	3.06E-06	3.20E-06	22	WBS22	1.1E-06	2.9E-06	1.3E-06	6.3E-06	2.9E-06	9.0E-07	6.0E-06	4.24E-11	–4.8	–	–	2749.3	1.18
300	320	6.03E-09	6.30E-09	2	WBS22	#NV	3.2E-09	5.6E-09	3.8E-09	3.2E-09	1.0E-09	7.0E-09	1.11E-10	–1.2	0.8	17.9	2943.7	1.57
320	340	3.58E-09	3.74E-09	22	WBS2	3.7E-09	9.3E-10	#NV	2.1E-08	9.3E-10	8.0E-10	1.0E-08	1.00E-10	0.0	0.6	1.6	3127.8	0.91
340	360	8.82E-09	9.22E-09	2	WBS2	#NV	1.0E-08	#NV	6.2E-08	1.0E-08	8.0E-09	7.0E-08	7.26E-11	2.0	0.5	11.2	3325.8	1.66
360	380	1.13E-08	1.18E-08	2	WBS2	#NV	8.7E-09	#NV	4.3E-08	8.7E-09	6.0E-09	5.0E-08	7.66E-11	0.0	4.9	17.9	3517.8	1.81
380	400	1.02E-08	1.07E-08	2	WBS2	#NV	8.1E-09	#NV	2.6E-08	2.6E-08	7.0E-09	4.0E-08	9.04E-11	7.9	14.1	18.6	3710.6	2.06
400	420	6.26E-09	6.55E-09	2	WBS2	#NV	5.1E-09	#NV	4.1E-08	5.1E-09	2.0E-09	1.0E-08	6.26E-11	1.0	2.0	16.6	3900.4	2.03
420	440	5.88E-09	6.15E-09	22	WBS2	3.4E-09	8.5E-09	#NV	4.0E-09	8.5E-09	2.0E-09	1.0E-08	6.08E-11	0.0	0.2	13.7	4092.5	2.23
440	460	8.97E-09	9.39E-09	2	WBS2	#NV	6.5E-09	#NV	3.2E-08	6.5E-09	5.0E-09	4.0E-08	7.84E-11	0.0	4.2	9.9	4286.1	2.59
460	480	5.47E-09	5.72E-09	2	WBS2	#NV	5.6E-09	#NV	4.0E-08	5.6E-09	4.0E-09	4.0E-08	6.25E-11	1.5	0.3	14.4	4476.3	2.59

Interval position		Stationary flow parameters		Transient analysis													Static conditions	
				Flow regime		Formation parameters												
up	low	Q/s	T_M	Perturb.	Recovery	T_{f1}	T_{f2}	T_{s1}	T_{s2}	T_T	T_{TMIN}	T_{TMAX}	C	ξ	dt_1	dt_2	p*	h_{wif}
m btoc	m btoc	m²/s	m²/s	Phase	Phase	m²/s	m²/s	m²/s	m²/s	m²/s	m²/s	m²/s	m³/Pa	–	min	min	kPa	masl
480	500	9.26E-09	9.68E-09	2	WBS2	#NV	1.8E-08	#NV	5.6E-08	1.8E-08	9.0E-09	6.0E-08	4.88E-11	6.9	0.6	14.0	4668.7	2.84
500	520	9.79E-09	1.02E-08	2	WBS2	#NV	1.5E-08	#NV	6.5E-08	1.5E-08	8.0E-09	5.0E-08	5.48E-11	4.4	0.4	17.9	4861.4	3.10
520	540	9.90E-09	1.04E-08	2	WBS2	#NV	2.0E-08	#NV	6.4E-08	2.0E-08	8.0E-09	6.0E-08	5.91E-11	6.7	0.5	15.9	5053.4	3.29
540	560	6.54E-07	6.84E-07	2	WBS22	#NV	5.8E-07	6.6E-07	4.2E-07	5.8E-07	4.0E-07	8.0E-07	7.29E-10	–1.7	0.7	15.0	5244.9	3.42
560	580	1.07E-07	1.11E-07	22	WBS2	4.4E-08	5.4E-07	#NV	6.9E-07	5.4E-07	9.0E-08	8.0E-07	1.73E-10	0.0	1.5	12.7	5439.9	3.90
580	600	1.20E-06	1.25E-06	2	WBS22	#NV	2.8E-07	8.8E-06	4.7E-07	2.8E-07	8.0E-08	8.0E-07	3.84E-08	–2.6	6.7	19.7	5646.1	5.53
600	620	4.05E-08	4.24E-08	2	WBS22	#NV	1.5E-08	4.3E-07	2.3E-08	2.3E-08	8.0E-09	5.0E-08	1.36E-09	–0.4	–	–	5824.1	4.28
620	640	9.88E-09	1.03E-08	2	WBS2	#NV	8.0E-09	#NV	7.2E-09	7.2E-09	5.0E-09	2.0E-08	7.27E-11	–1.0	9.7	18.6	6012.7	4.12
640	660	8.24E-09	8.62E-09	2	WBS2	#NV	1.2E-08	#NV	5.4E-08	1.2E-08	7.0E-09	4.0E-08	4.87E-11	4.0	0.5	8.1	6208.4	4.69
660	680	9.93E-09	1.04E-08	2	WBS2	#NV	9.7E-09	#NV	6.6E-08	9.7E-09	7.0E-09	3.0E-08	6.10E-11	1.1	0.2	14.0	6402.2	5.06
680	700	1.13E-08	1.18E-08	22	WBS22	1.1E-08	3.8E-09	1.5E-08	8.2E-09	8.2E-09	5.0E-09	2.0E-08	3.41E-10	–0.4	–	–	6581.4	3.95
700	720	1.30E-08	1.36E-08	3	WBS32	#NV	9.5E-10	1.1E-09	1.5E-08	1.5E-08	9.0E-09	3.0E-08	8.51E-11	–1.8	25.4	34.7	6778.7	4.73
720	740	1.34E-08	1.40E-08	1.25	WBS12	#NV	4.3E-07	1.6E-07	1.6E-09	1.0E-08	5.0E-09	5.0E-08	1.23E-10	–3.0	–	–	6916.0	–0.59
740	760	9.92E-09	1.04E-08	2	WBS2	#NV	8.3E-09	#NV	6.4E-08	8.3E-09	6.0E-09	3.0E-08	4.57E-11	0.6	2.8	15.1	7163.0	5.29
760	780	9.59E-09	1.00E-08	2	WBS2	#NV	1.2E-08	#NV	4.6E-08	1.2E-08	8.0E-09	5.0E-08	5.43E-11	2.3	0.4	8.7	7352.1	5.30
780	800	3.81E-09	3.98E-09	2	WBS2	#NV	1.1E-08	#NV	2.4E-08	1.1E-08	3.0E-09	3.0E-08	7.68E-11	4.4	0.5	3.6	7543.2	5.54
800	820	9.38E-09	9.81E-09	2	WBS2	#NV	2.5E-08	#NV	4.9E-08	2.5E-08	9.0E-09	5.0E-08	5.00E-11	7.0	0.3	3.8	7732.3	5.58
820	840	1.05E-08	1.10E-08	2	WBS2	#NV	1.7E-08	#NV	4.6E-08	1.7E-08	8.0E-09	5.0E-08	4.34E-11	4.7	0.6	2.8	7921.2	5.65
840	860	3.00E-09	3.14E-09	2	WBS2	#NV	1.1E-08	#NV	2.4E-08	1.1E-08	8.0E-09	4.0E-08	9.31E-11	2.3	0.3	4.6	8109.7	5.71
860	880	5.54E-09	5.80E-09	2	WBS2	#NV	1.6E-08	#NV	3.6E-08	1.6E-08	8.0E-09	4.0E-08	7.04E-11	3.8	0.3	2.3	8301.2	6.13
880	900	9.61E-09	1.01E-08	2	WBS2	#NV	3.1E-08	#NV	5.1E-08	3.1E-08	9.0E-09	6.0E-08	5.65E-11	6.6	0.4	3.2	8487.1	6.02
899	919	6.08E-09	6.36E-09	2	WBS2	#NV	1.4E-08	#NV	3.9E-08	1.4E-08	8.0E-09	4.0E-08	7.35E-11	2.8	0.2	4.5	8668.0	6.40
919	939	6.44E-09	6.74E-09	2	WBS2	#NV	1.8E-08	#NV	4.0E-08	1.8E-08	8.0E-09	4.0E-08	6.47E-11	4.2	0.3	5.3	8850.5	6.07
939	959	1.15E-08	1.20E-08	2	WBS2	#NV	2.2E-08	#NV	8.0E-08	2.2E-08	9.0E-09	4.0E-08	5.09E-11	4.5	0.4	5.0	9033.7	5.88
959	979	1.42E-08	1.48E-08	2	WBS2	#NV	2.5E-08	#NV	6.1E-08	2.5E-08	9.0E-09	5.0E-08	4.39E-11	6.0	0.4	10.2	9221.1	6.17
979	999	7.74E-09	8.09E-09	2	WBS2	#NV	7.6E-09	#NV	4.5E-08	7.6E-09	4.0E-09	4.0E-08	5.72E-11	–0.4	1.7	3.4	9406.8	6.32
300	305	8.50E-09	7.01E-09	2	WBS2	#NV	8.0E-09	#NV	5.6E-08	8.0E-09	5.0E-09	2.0E-08	1.87E-11	1.0	0.8	15.1	2935.9	0.77
305	310	8.27E-09	6.83E-09	2	WBS2	#NV	1.0E-08	#NV	3.7E-08	1.0E-08	7.0E-09	4.0E-08	2.46E-11	2.6	1.1	12.4	2982.8	0.69
310	315	1.02E-08	8.41E-09	2	WBS2	#NV	1.1E-08	#NV	2.2E-08	2.2E-08	8.0E-09	4.0E-08	3.00E-11	7.0	7.3	17.2	3029.1	0.56

Interval position		Stationary flow parameters		Transient analysis														
				Flow regime		Formation parameters											Static conditions	
up	low	Q/s	T_M	Perturb.	Recovery	T_{f1}	T_{f2}	T_{s1}	T_{s2}	T_T	T_{TMIN}	T_{TMAX}	C	ξ	dt_1	dt_2	p*	h_{wif}
m btoc	m btoc	m²/s	m²/s	Phase	Phase	m²/s	m²/s	m²/s	m²/s	m²/s	m²/s	m²/s	m³/Pa	–	min	min	kPa	masl
315	320	1.66E-09	1.37E-09	2	WBS2	#NV	8.2E-09	#NV	1.5E-08	8.2E-09	2.0E-09	2.0E-08	4.07E-11	3.2	0.3	3.7	3075.1	0.39
320	325	8.19E-09	6.76E-09	2	WBS2	#NV	1.2E-08	#NV	5.3E-08	1.2E-08	7.0E-09	6.0E-08	1.76E-11	4.4	0.2	13.3	3123.8	0.50
325	330	2.45E-09	2.02E-09	2	WBS2	#NV	1.9E-09	#NV	1.3E-08	1.9E-09	9.0E-10	7.0E-08	2.23E-11	0.1	0.5	5.1	3177.4	1.11
330	335	2.34E-09	1.93E-09	22	WBS22	2.3E-9	7.6E-10	#NV	1.3E-08	7.6E-10	7.0E-10	4.0E-09	2.96E-11	0.0	–	–	3220.7	0.66
335	340	2.20E-09	1.82E-09	2	WBS2	#NV	2.5E-09	#NV	1.4E-08	2.5E-09	9.0E-10	5.0E-09	3.03E-11	0.0	0.1	2.2	3270.2	0.86
340	345	1.29E-09	1.07E-09	2	WBS2	#NV	9.5E-10	#NV	5.5E-09	9.5E-10	6.0E-10	3.0E-09	2.44E-11	0.0	0.3	4.1	3316.6	0.73
345	350	9.02E-10	7.45E-10	2	WBS2	#NV	7.3E-10	#NV	2.6E-09	2.6E-09	8.0E-10	5.0E-09	3.98E-11	7.4	–	–	3366.9	1.00
350	355	1.11E-09	9.19E-10	2	WBS2	#NV	1.2E-09	#NV	7.7E-09	1.2E-09	7.0E-10	7.0E-09	3.32E-11	0.0	0.3	4.1	3422.8	1.83
355	360	5.00E-10	4.12E-10	2	WBS2	#NV	8.9E-10	#NV	5.9E-10	5.9E-10	3.0E-10	1.0E-09	3.16E-11	0.5	–	–	3467.0	1.49
360	365	3.68E-10	3.03E-10	2	WBS22	#NV	9.7E-11	5.0E-10	1.0E-10	1.0E-10	8.0E-11	7.0E-10	2.39E-11	0.6	–	–	3491.1	–0.91
365	370	3.83E-10	3.16E-10	2	WBS2	#NV	1.1E-10	#NV	2.7E-10	2.7E-10	8.0E-11	8.0E-10	2.86E-11	0.0	–	–	3563.3	1.60
370	375	3.02E-10	2.50E-10	2	WBS22	#NV	1.7E-10	2.8E-10	9.4E-11	9.4E-11	7.0E-11	4.0E-10	2.21E-11	1.2	–	–	3599.1	0.39
375	380	3.32E-09	2.74E-09	2	WBS2	#NV	2.3E-09	#NV	4.6E-09	4.6E-09	2.0E-09	8.0E-09	2.35E-11	2.9	12.4	18.0	3662.6	2.02
380	385	2.68E-09	2.21E-09	2	WBS22	#NV	1.9E-09	1.3E-09	2.6E-09	2.6E-09	9.0E-10	4.0E-09	2.11E-11	–1.1	28.6	51.8	3708.5	1.85
385	390	9.71E-10	8.02E-10	2	WBS2	#NV	5.3E-10	#NV	1.0E-09	1.0E-09	5.0E-10	3.0E-09	3.46E-11	1.6	–	–	3753.3	1.57
390	395	5.62E-10	4.64E-10	2	WBS22	#NV	2.8E-10	2.4E-10	9.7E-10	9.7E-10	3.0E-10	3.0E-09	1.67E-11	–0.3	–	–	3799.4	1.42
395	400	3.62E-10	2.99E-10	2	WBS22	#NV	8.1E-10	4.2E-10	4.2E-09	4.2E-09	8.0E-10	5.0E-09	5.62E-11	–0.4	–	–	3851.4	1.87
400	405	3.08E-10	2.54E-10	2	WBS2	#NV	1.4E-10	#NV	9.0E-10	9.0E-10	1.0E-10	1.0E-09	2.74E-11	11.2	–	–	3910.8	3.09
405	410	1.28E-10	1.06E-10	2	WBS2	#NV	2.8E-10	#NV	9.7E-01	9.7E-11	7.0E-11	5.0E-10	4.11E-11	–1.3	–	–	3984.1	5.71
410	415	5.02E-10	4.15E-10	2	#NV	#NV	1.3E-10	#NV	#NV	1.3E-10	5.0E-11	5.0E-10	#NV	–1.5	–	–	#NV	#NV
415	420	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
420	425	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
425	430	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
430	435	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
435	440	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
440	445	2.94E-10	2.42E-10	2	WBS22	#NV	6.8E-11	1.2E-09	1.2E-10	1.2E-10	5.0E-11	5.0E-10	1.57E-11	–0.3	–	–	4272.7	1.22
445	450	4.66E-10	3.85E-10	2	WBS2	#NV	2.2E-10	#NV	7.2E-10	7.2E-10	1.0E-10	9.0E-10	2.38E-11	3.5	–	–	4336.8	2.91
450	455	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
455	460	6.02E-10	4.97E-10	2	WBS22	#NV	3.9E-10	5.7E-10	1.6E-10	1.6E-10	1.0E-10	8.0E-10	2.36E-11	–0.3	–	–	4427.4	2.45

Interval position		Stationary flow parameters		Transient analysis														
				Flow regime		Formation parameters											Static conditions	
up	low	Q/s	T_M	Perturb.	Recovery	T_{f1}	T_{f2}	T_{s1}	T_{s2}	T_T	T_{TMIN}	T_{TMAX}	C	ξ	dt_1	dt_2	p*	h_{wif}
m btoc	m btoc	m²/s	m²/s	Phase	Phase	m²/s	m²/s	m²/s	m²/s	m²/s	m²/s	m²/s	m³/Pa	–	min	min	kPa	masl
460	465	5.65E-10	4.66E-10	2	WBS2	#NV	2.6E-10	#NV	8.1E-10	8.1E-10	3.0E-10	1.0E-09	2.38E-11	3.8	–	–	4491.1	4.10
465	470	1.28E-10	1.06E-10	2	WBS2	#NV	9.8E-11	#NV	1.6E-10	1.6E-10	6.0E-11	3.0E-10	2.59E-11	1.7	–	–	4498.2	–0.01
470	475	1.59E-10	1.31E-10	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-10	1.0E-12	1.0E-10	#NV	#NV	–	–	#NV	#NV
475	480	1.23E-10	1.01E-10	2	WBS2	#NV	8.4E-11	#NV	1.4E-10	1.4E-10	6.0E-11	3.0E-10	2.79E-11	–1.8	–	–	4674.3	8.25
480	485	1.18E-10	9.78E-11	2	WBS2	#NV	1.1E-10	#NV	1.3E-10	1.3E-10	7.0E-11	3.0E-10	1.75E-11	1.7	–	–	4663.6	2.32
485	490	1.20E-10	9.90E-11	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-10	1.0E-12	1.0E-10	#NV	#NV	–	–	#NV	#NV
490	495	7.39E-11	6.10E-11	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-10	1.0E-12	1.0E-10	#NV	#NV	–	–	#NV	#NV
495	500	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
500	505	6.02E-10	4.97E-10	#NV	WBS2	#NV	#NV	#NV	1.2E-10	1.2E-10	7.0E-11	6.0E-10	1.51E-11	0.7	–	–	4845.8	1.51
505	510	1.25E-10	1.03E-10	#NV	WBS2	#NV	#NV	#NV	1.9E-11	1.9E-11	1.0E-12	1.0E-10	2.82E-11	2.2	–	–	4958.9	8.20
510	515	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
515	520	6.68E-11	5.52E-11	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-10	1.0E-12	1.0E-10	#NV	#NV	–	–	#NV	#NV
520	525	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
525	530	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
530	535	1.21E-10	9.99E-11	#NV	WBS22	#NV	#NV	2.7E-10	1.3E-11	1.3E-11	1.0E-12	1.0E-10	9.24E-12	–0.4	–	–	5168.9	5.36
535	540	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
540	545	8.48E-08	7.00E-08	2	WBS2	#NV	7.9E-08	#NV	7.4E-08	7.4E-08	5.0E-08	9.0E-08	4.01E-11	–0.9	3.7	25.4	5239.3	2.85
545	550	2.42E-09	1.99E-09	2	WBS2	#NV	1.4E-09	#NV	1.1E-08	1.4E-09	1.0E-09	1.0E-08	2.66E-11	–0.1	0.8	10.1	5292.4	3.41
550	555	9.77E-09	8.06E-09	3	WBS22	#NV	7.0E-10	5.7E-09	2.3E-08	2.3E-08	7.0E-09	5.0E-08	3.50E-11	0.0	–	–	5334.8	2.89
555	560	5.93E-07	4.89E-07	2	WBS2	#NV	6.8E-07	#NV	6.2E-07	6.2E-07	5.0E-07	8.0E-07	7.93E-10	–1.1	1.6	27.4	5388.9	3.55
560	565	1.21E-07	9.95E-08	2	WBS2	#NV	1.2E-07	#NV	7.7E-07	1.2E-07	7.0E-08	4.0E-07	9.56E-11	0.4	8.6	18.7	5437.6	3.66
565	570	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
570	575	6.88E-11	5.68E-11	#NV	WBS2	#NV	#NV	#NV	1.9E-11	1.9E-11	8.0E-12	8.0E-11	2.06E-11	0.8	–	–	5568.5	7.31
575	580	7.87E-10	6.50E-10	2	WBS22	#NV	1.7E-10	1.5E-09	3.8E-10	3.8E-10	1.0E-10	8.0E-10	2.29E-11	0.0	–	–	5572.6	2.88
580	585	6.58E-10	5.43E-10	2	WBS2	#NV	2.7E-10	#NV	1.4E-09	1.4E-09	3.0E-10	3.0E-09	1.94E-11	8.1	–	–	5630.6	3.95
585	590	3.62E-09	2.99E-09	2	WBS2	#NV	2.2E-09	#NV	1.9E-08	2.2E-09	1.0E-09	1.0E-08	2.10E-11	0.0	3.0	9.7	5674.3	3.55
590	595	1.17E-06	9.68E-07	2	WBS22	#NV	1.5E-07	1.5E-05	7.2E-07	7.2E-07	1.0E-07	1.0E-06	4.05E-08	0.0	–	–	5741.2	5.52
595	600	1.70E-09	1.41E-09	2	WBS2	#NV	1.0E-09	#NV	6.8E-09	1.0E-09	5.0E-10	5.0E-09	3.65E-11	0.0	0.4	10.7	5770.8	3.69
600	605	2.13E-08	1.76E-08	2	WBS22	#NV	2.8E-08	1.6E-08	4.9E-08	–	–	–	1.09E-10	3.1	3.7	13.3	5817.6	3.62

Interval position		Stationary flow parameters		Transient analysis														
				Flow regime		Formation parameters											Static conditions	
up	low	Q/s	T_M	Perturb.	Recovery	T_{f1}	T_{f2}	T_{s1}	T_{s2}	T_T	T_{TMIN}	T_{TMAX}	C	ξ	dt_1	dt_2	p*	h_{wif}
m btoc	m btoc	m²/s	m²/s	Phase	Phase	m²/s	m²/s	m²/s	m²/s	m²/s	m²/s	m²/s	m³/Pa	–	min	min	kPa	masl
600	605	2.41E-08	1.99E-08	2	WBS22	#NV	5.4E-08	1.8E-08	6.5E-08	6.5E-08	3.0E-08	9.0E-08	1.01E-10	0.0	–	–	5808.1	2.65
605	610	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
610	615	3.22E-08	2.66E-08	2	WBS21	#NV	5.2E-09	4.2E-07	1.1E-05	5.2E-09	3.0E-09	1.0E-08	3.75E-10	–4.2	11.4	19.1	#NV	#NV
615	620	1.85E-08	1.53E-08	2	WBS22	#NV	2.6E-08	9.9E-09	5.8E-08	2.6E-08	9.0E-09	6.0E-08	1.19E-11	3.8	0.8	8.6	5962.0	3.80
620	625	1.60E-09	1.32E-09	2	WBS22	#NV	8.3E-10	2.5E-09	1.1E-09	1.1E-09	8.0E-10	5.0E-09	1.94E-11	1.9	6.4	17.7	6017.7	4.63
625	630	1.49E-09	1.23E-09	22	WBS21	8.1E-10	2.7E-10	9.9E-09	1.4E-07	2.7E-10	2.0E-10	2.0E-09	2.96E-11	–2.1	–	–	#NV	#NV
630	635	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
635	640	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
640	645	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
645	650	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
650	655	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
655	660	8.34E-11	6.96E-11	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-10	1.0E-12	1.0E-10	#NV	#NV	–	–	#NV	#NV
660	665	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
665	670	5.51E-11	4.55E-11	#NV	WBS22	#NV	#NV	6.4E-10	1.8E-11	1.8E-11	1.0E-13	5.0E-11	2.35E-12	1.8	–	–	6463.9	6.50
670	675	1.25E-10	1.03E-10	#NV	WBS2	#NV	#NV	#NV	7.6E-11	7.6E-11	1.0E-12	1.0E-10	1.31E-11	–0.2	–	–	6489.1	4.23
675	680	6.71E-10	5.54E-10	2	WBS2	#NV	2.9E-10	#NV	1.3E-09	1.3E-09	3.0E-10	3.0E-09	2.20E-11	5.3	–	–	6573.9	8.03
680	685	9.97E-09	8.23E-09	2	WBS22	#NV	6.1E-09	4.3E-08	5.4E-09	6.1E-09	4.0E-09	9.0E-09	8.60E-11	–1.0	2.3	13.6	6579.8	3.79
685	690	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
690	695	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV
695	700	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	–	–	#NV	#NV

1 T1 and T2 refer to the transmissivity(s) derived
reported, in case a two zones composite model was recommended both T1 and T2 are given.

The recommended transmissivity TT typically refers to the T2 value (far field transmissivity).

2 The parameter p* denoted the static formation p
extrapolation.

3 The flow regime description refers to The recomme
the flow dimension used in the analysis (1 = linear flow
was used in the analysis, if two numbers are given (WBS22 or 22) a 2 zones composite model was used.

#NV Not analysed.

The Figures 7-1 to 7-3 present the transmissivity, conductivity and hydraulic freshwater head profiles.

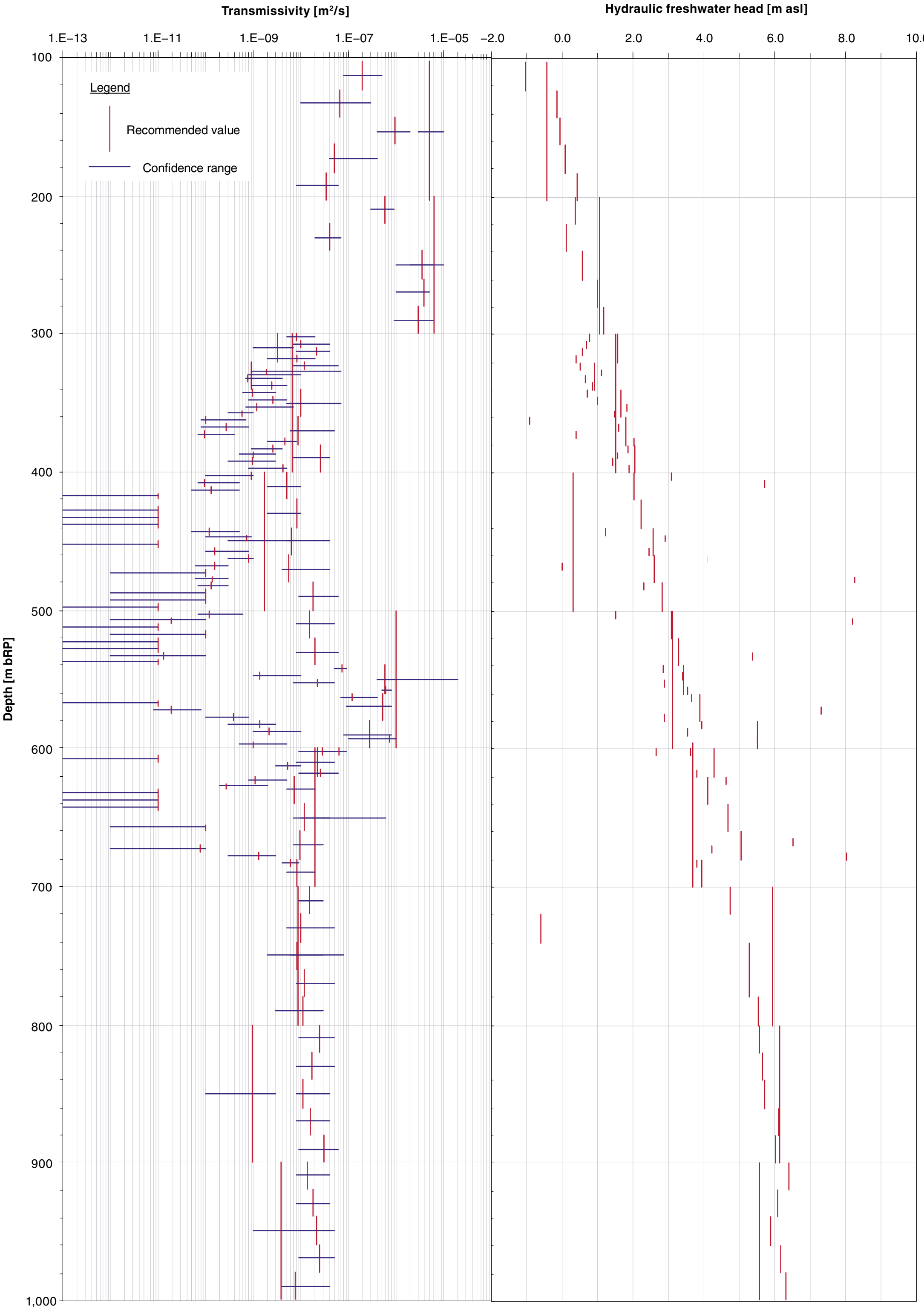

Figure 7-1. *Results summary – profiles of Transmissivity and equivalent freshwater head, transmissivities derived from injectiontests, freshwater head extrapolated.*

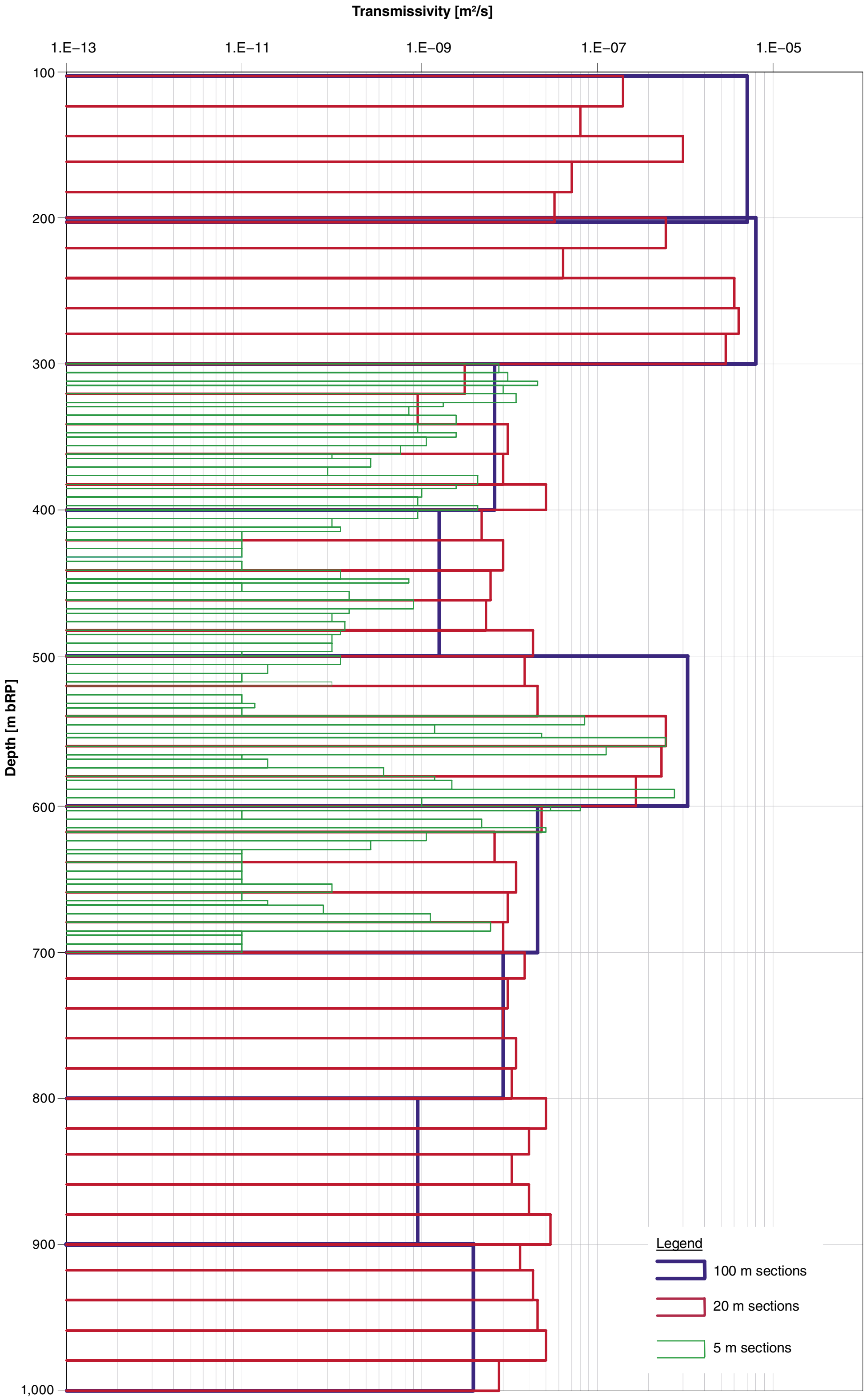

Figure 7-2. *Results summary – profile of transmissivity.*

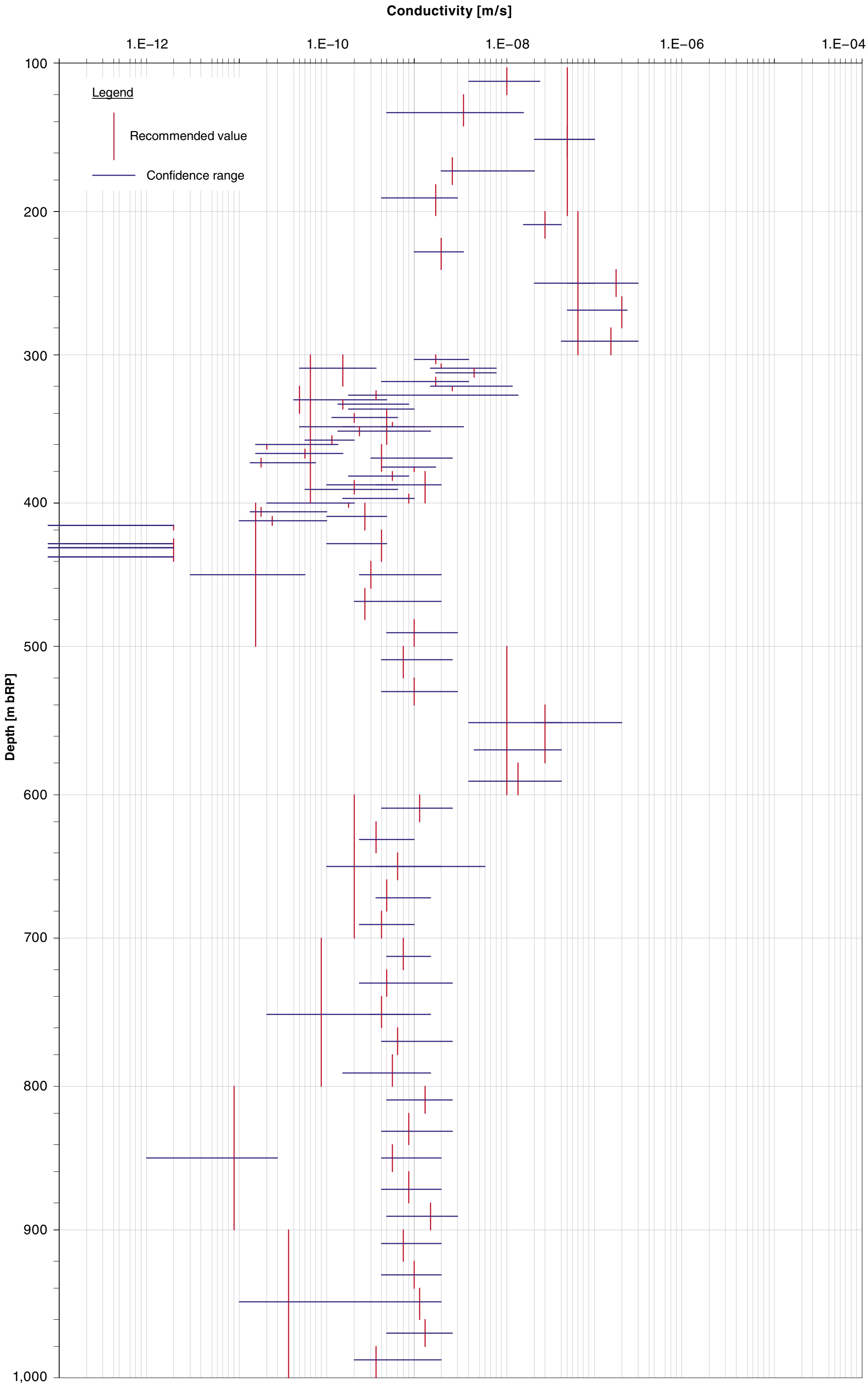

Figure 7-3. Results summary – profile of hydraulic conductivity.

7.2 Correlation analysis

A correlation analysis was used with the aim of examining the consistency of results and deriving general conclusion regarding the testing and analysis methods used.

7.2.1 Comparison of steady state and transient analysis results

The steady state derived transmissivities (T_M and Q/s) were compared in a cross-plot with the recommended transmissivity values derived from the transient analysis (see following figure).

The correlation analysis shows that most of the steady state derived transmissivities differ by one order of magnitude or less from the transmissivities derived from the transient analysis.

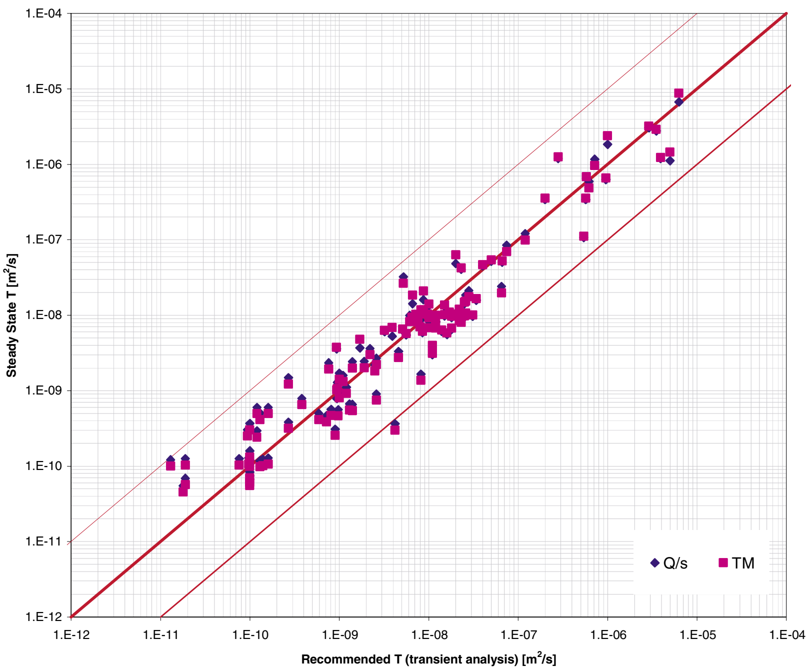

Figure 7-4. *Correlation analysis of transmissivities derived by steady state and transient methods.*

7.2.2 Comparison between the matched and theoretical wellbore storage coefficient

The wellbore storage coefficient describes the capacity of the test interval to store fluid as result to a unit pressure change in the interval. For a closed system (i.e. closed downhole valve) the theoretical value of the wellbore storage coefficient is given by the product between the interval volume and the test zone compressibility. The interval volume is calculated from the borehole radius and interval length. There are uncertainties concerning the interval volume calculation. Cavities or high transmissivity fractures intersecting the interval may enlarge the effective volume of the interval. The test zone compressibility is given by the sum of compressibilities of the individual components present in the interval (water, packer elements, other test tool components, and the borehole wall). A minimum value for the test zone compressibility is given by the water compressibility which is approximately 5E–10 1/Pa. For the calculation of the theoretical wellbore storage coefficient a test zone compressibility 0f 7E–10 1/Pa was used. The matched wellbore storage coefficient is derived from the transient type curve analysis by matching the unit slope early times derivative plotted in log-log coordinates.

The following figure presents a cross-plot of the matched and theoretical wellbore storage coefficients.

It can be seen that the matched wellbore storage coefficients are up to three orders of magnitude larger than the theoretical values. A three orders of magnitude increase is difficult to explain by volume uncertainty. Even if large fractures are connected to the interval, a volume increase by three orders of magnitude does not seem probable. The discrepancy can be more likely explained by increased compressibility of the packer system. In order to better understand this phenomenon, a serried of tool compressibility tests should be conducted in order to measure the tool compressibility and to assess to what extent the system behaves elastically.

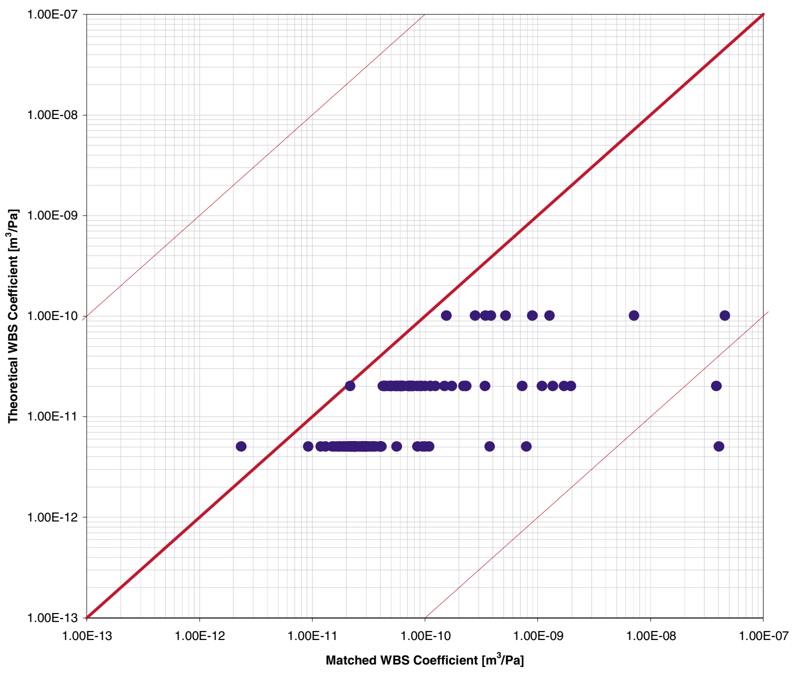

Figure 7-5. *Correlation analysis of theoretical and matched wellbore storage coefficients.*

8 Conclusions

8.1 Transmissivity

Figure 7-1 presents a profile of transmissivity, including the confidence ranges derived from the transient analysis. The method used for deriving the recommended transmissivity and its confidence range is described in Section 5.4.7.

Whenever possible, the transmissivities derived are representative for the "undisturbed formation" further away from the borehole. The borehole vicinity was typically described using a skin effect.

In some cases the tests were not analysable due to the fact that the flow rates during the CHi phase were below the range of the flowmeter (< 0.5 mL/min) or because the compliance phase following packer inflation was too long, thus indicating a very low interval transmissivity. In such cases the interval transmissivity was recommended to a value of 1.0E–11 m^2/s which was in the same time regarded as the upper boundary of the confidence range. This value is consistent with the observations made during the analysis of the other tests in the borehole (i.e. the transmissivity must be lower than in the cases when the test was analysable).

The transmissivity profile in Figure 7-1 shows in the upper part from 103 to 300 m relatively high transmissivities of 1E–7 to 1E–5 m^2/s. From 300 m depth down to the bottom of the hole the transmissivities are quite constant with values in the range of 1E–9 to 1E–8 m^2/s. The interval between 500 m and 600 m depth is an exception. It shows a transmissivity of 1E–6 m^2/s.

Some shorter intervals show larger transmissivities than the appropriate longer interval (e.g. 800–900 m, 899–999 m). This can be explained with crossflow and connection to the zone above. A connection to the upper zone is very hard to detect.

8.2 Equivalent freshwater head

Figure 7-1 presents a profile of the derived equivalent freshwater head expressed in meters above sea level. The method used for deriving the equivalent freshwater head is described in Section 5.4.6.

The head profile shows a freshwater head for the first zone between 103 and 203 m depth of about –0.5 m asl. Down to 700 m depth, the freshwater head increases continuously by approximately 1 m per 100 m depth. From 700 m to 1,000 m depth the freshwater head is nearly constant at about 5 m to 6 m asl. The profile shows no distinct zones, which means that there is a good vertical connectivity in the formation around the borehole.

It should be noted that the head differences may be explained by salinity differences if we assume that the salinity increases with depth. In this case the freshwater heads would have to increase with depth, what the actual profile shows.

8.3 Flow regimes encountered

The flow models used in analysis were derived from the shape of the pressure derivative calculated with respect to log time and plotted in log-log coordinates.

In several cases the pressure derivative suggests a change of transmissivity with the distance from the borehole. In such cases a composite flow model was used in the analysis.

If there were different flow models matching the data in comparable quality, the simplest model was preferred.

In some cases very large skins has been observed. This is unusual and should be further examined. There are several possible explanations to this behaviour:

- If the behaviour is to be completely attributed to changes of transmissivity in the formation, this indicates the presence of larger transmissivity zones in the borehole vicinity, which could be caused by steep fractures that do not intersect the test interval, but are connected to the interval by lower transmissivity fractures. The fact that in many cases the test derivatives of adjacent test sections converge at late times seems to support this hypothesis.
- A further possibility is that the large skins are caused by turbulent flow taking place in the tool or in fractures connected to the test interval. This hypothesis is more difficult to examine. However, considering the fact that high skins were observed in sections with transmissivities as low as 1E–9 m^2/s (which imply low flow rates) seems to speak against this hypothesis.

The flow dimension displayed by the test can be diagnosed from the slope of the pressure derivative. A slope of 0.5 indicates linear flow, a slope of 0 (horizontal derivative) indicates radial flow and a slope of –0.5 indicates spherical flow. The flow dimension diagnosis was commented for each of the tests. In most of the cases it was possible to get a good match quality by using radial flow geometry. In some cases composite flow models with different flow dimension for each of the zones were used.

9 References

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APPENDIX 1

File Description Table

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KSH01A				
TEST- AND FILEPROTOCOL					**Testorder dated : 2003-12-04**				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
09.12.2003	11:00	103	203	__KSH01A_0103.00_200312091100.ht2	KSH01A_103-203_031209_1_CHir_Q_r.csv	Injection	21.12.2003	11.12.2003	
09.12.2003	15:32	200	300	__KSH01A_0200.00_200312091532.ht2	KSH01A_200-300_031209_1_CHir_Q_r.csv	Injection	21.12.2003	11.12.2003	
10.12.2003	13:51	200	300	__KSH01A_0200.00_200312101017.ht2	KSH01A_200-300_031209_2_CHir_Q_r.csv	Injection	21.12.2003	11.12.2003	
10.12.2003	16:33	300	400	__KSH01A_0300.00_200312101633.ht2	KSH01A_300-400_031210_1_CHir_Q_r.csv	Injection	21.12.2003	11.12.2003	
11.12.2003	09:19	400	500	__KSH01A_0400.00_200312110919.ht2	KSH01A_400-500_031211_1_CHir_Q_r.csv	Injection	21.12.2003	11.12.2003	
11.12.2003	13:28	500	600	__KSH01A_0500.00_200312111328.ht2	KSH01A_500-600_031211_1_CHir_Q_r.csv	Injection	21.12.2003	11.12.2003	
11.12.2003	14:57	500	600	__KSH01A_0500.00_200312111457.ht2	KSH01A_500-600_031211_2_CHir_Q_r.csv	Injection	21.12.2003	11.12.2003	
11.12.2003	17:44	600	700	__KSH01A_0600.00_200312111743.ht2	KSH01A_600-700_031211_1_CHir_Q_r.csv	Injection	21.12.2003	12.12.2003	
12.12.2003	07:06	600	700	__KSH01A_0600.00_200312120706.ht2	KSH01A_600-700_031212_2_CHir_Q_r.csv	Injection	21.12.2003	12.12.2003	
12.12.2003	10:02	700	800	__KSH01A_0700.00_200312121002.ht2	KSH01A_700-800_031212_1_CHir_Q_r.csv	Injection	21.12.2003	12.12.2003	
12.12.2003	13:59	800	900	__KSH01A_0800.00_200312121359.ht2	KSH01A_800-900_031212_1_CHir_Q_r.csv	Injection	21.12.2003	13.12.2003	
13.12.2003	08:56	899	999	__KSH01A_0899.00_200312130856.ht2	KSH01A_899-999_031213_1_CHir_Q_r.csv	Injection	21.12.2003	13.12.2003	
13.12.2003	13:28	899	999	__KSH01A_0899.00_200312131328.ht2	KSH01A_899-999_031213_2_CHir_Q_r.csv	Injection	21.12.2003	13.12.2003	
14.12.2003	09:18	400	500	__KSH01A_0400.00_200312140918.ht2	KSH01A_400-500_031214_2_CHir_Q_r.csv	Injection	21.12.2003	14.12.2003	
15.12.2003	11:03	103	123	__KSH01A_0103.00_200312151103.ht2	KSH01A_103-123_031215_1_CHir_Q_r.csv	Injection	21.12.2003	15.12.2003	
15.12.2003	13:10	123	143	__KSH01A_0123.00_200312151310.ht2	KSH01A_123-143_031215_1_CHir_Q_r.csv	Injection	21.12.2003	15.12.2003	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KSH01A				
TEST- AND FILEPROTOCOL					Testorder dated : 2003-12-04				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
15.12.2003	16:09	143	163	__KSH01A_0143.00_200312151609.ht2	KSH01A_143-163_031215_1_CHir_Q_r.csv	Injection	21.12.2003	15.12.2003	
15.12.2003	18:09	163	183	__KSH01A_0163.00_200312151809.ht2	KSH01A_163-183_031215_1_CHir_Q_r.csv	Injection	21.12.2003	16.12.2003	
16.12.2003	08:19	183	203	__KSH01A_0183.00_200312160819.ht2	KSH01A_183-203_031216_1_CHir_Q_r.csv	Injection	21.12.2003	16.12.2003	
16.12.2003	11:13	200	220	__KSH01A_0200.00_200312161113.ht2	KSH01A_200-220_031216_1_CHir_Q_r.csv	Injection	21.12.2003	16.12.2003	
16.12.2003	13:37	220	240	__KSH01A_0220.00_200312161337.ht2	KSH01A_220-240_031216_1_CHir_Q_r.csv	Injection	21.12.2003	16.12.2003	
16.12.2003	15:34	240	260	__KSH01A_0240.00_200312161534.ht2	KSH01A_240-260_031216_1_CHir_Q_r.csv	Injection	21.12.2003	16.12.2003	
16.12.2003	17:29	260	280	__KSH01A_0260.00_200312161729.ht2	KSH01A_260-280_031216_1_CHir_Q_r.csv	Injection	21.12.2003	17.12.2003	
17.12.2003	08:16	280	300	__KSH01A_0280.00_200312170816.ht2	KSH01A_280-300_031217_1_CHir_Q_r.csv	Injection	21.12.2003	17.12.2003	
17.12.2003	10:41	300	320	__KSH01A_0300.00_200312171041.ht2	KSH01A_300-320_031217_1_CHir_Q_r.csv	Injection	21.12.2003	17.12.2003	
17.12.2003	13:27	320	340	__KSH01A_0320.00_200312171327.ht2	KSH01A_320-340_031217_1_CHir_Q_r.csv	Injection	21.12.2003	17.12.2003	
17.12.2003	15:37	340	360	__KSH01A_0340.00_200312171537.ht2	KSH01A_340-360_031217_1_CHir_Q_r.csv	Injection	21.12.2003	17.12.2003	
17.12.2003	17:31	360	380	__KSH01A_0360.00_200312171731.ht2	KSH01A_360-380_031217_1_CHir_Q_r.csv	Injection	21.12.2003	18.12.2003	
18.12.2003	08:09	380	400	__KSH01A_0380.00_200312180809.ht2	KSH01A_380-400_031218_1_CHir_Q_r.csv	Injection	21.12.2003	18.12.2003	
18.12.2003	14:53	400	420	__KSH01A_0400.00_200312181453.ht2	KSH01A_400-420_031218_1_CHir_Q_r.csv	Injection	21.12.2003	18.12.2003	
18.12.2003	16:45	420	440	__KSH01A_0420.00_200312181645.ht2	KSH01A_420-440_031218_1_CHir_Q_r.csv	Injection	21.12.2003	18.12.2003	
19.12.2003	08:00	440	460	__KSH01A_0440.00_200312190800.ht2	KSH01A_440-460_031219_1_CHir_Q_r.csv	Injection	21.12.2003	19.12.2003	
19.12.2003	10:00	460	480	__KSH01A_0460.00_200312191000.ht2	KSH01A_460-480_031219_1_CHir_Q_r.csv	Injection	21.12.2003	19.12.2003	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KSH01A				
TEST- AND FILEPROTOCOL					**Testorder dated : 2003-12-04**				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
19.12.2003	11:53	480	500	__KSH01A_0480.00_200312191153.ht2	KSH01A_480-500_031219_1_CHir_Q_r.csv	Injection	21.12.2003	19.12.2003	
19.12.2003	14:13	500	520	__KSH01A_0500.00_200312191413.ht2	KSH01A_500-520_031219_1_CHir_Q_r.csv	Injection	21.12.2003	19.12.2003	
19.12.2003	16:11	520	540	__KSH01A_0520.00_200312191611.ht2	KSH01A_520-540_031219_1_CHir_Q_r.csv	Injection	21.12.2003	19.12.2003	
19.12.2003	18:09	540	560	__KSH01A_0540.00_200312191808.ht2	KSH01A_540-560_031219_1_CHir_Q_r.csv	Injection	21.12.2003	20.12.2003	
20.12.2003	08:13	560	580	__KSH01A_0560.00_200312200813.ht2	KSH01A_560-580_031220_1_CHir_Q_r.csv	Injection	21.12.2003	20.12.2003	
20.12.2003	10:22	580	600	__KSH01A_0580.00_200312201022.ht2	KSH01A_580-600_031220_1_CHir_Q_r.csv	Injection	21.12.2003	20.12.2003	
20.12.2003	14:47	600	620	__KSH01A_0600.00_200312201447.ht2	KSH01A_600-620_031220_1_CHir_Q_r.csv	Injection	21.12.2003	20.12.2003	
07.01.2004	13:39	620	640	__KSH01A_0620.00_200401071339.ht2	KSH01A_620-640_040107_1_CHir_Q_r.csv	Injection	29.01.2004	07.01.2004	
07.01.2004	15:44	640	660	__KSH01A_0640.00_200401071544.ht2	KSH01A_640-660_040107_1_CHir_Q_r.csv	Injection	29.01.2004	07.01.2004	
07.01.2004	17:43	660	680	__KSH01A_0660.00_200401071743.ht2	KSH01A_660-680_040107_1_CHir_Q_r.csv	Injection	29.01.2004	08.01.2004	
08.01.2004	08:27	680	700	__KSH01A_0680.00_200401080827.ht2	KSH01A_680-700_040108_1_CHir_Q_r.csv	Injection	29.01.2004	08.01.2004	
08.01.2004	10:36	700	720	__KSH01A_0700.00_200401081036.ht2	KSH01A_700-720_040108_1_CHir_Q_r.csv	Injection	29.01.2004	08.01.2004	
08.01.2004	12:59	720	740	__KSH01A_0720.00_200401081259.ht2	KSH01A_720-740_040108_1_CHir_Q_r.csv	Injection	29.01.2004	08.01.2004	
08.01.2004	15:31	740	760	__KSH01A_0740.00_200401081531.ht2	KSH01A_740-760_040108_1_CHir_Q_r.csv	Injection	29.01.2004	08.01.2004	
08.01.2004	17:34	760	780	__KSH01A_0760.00_200401081734.ht2	KSH01A_760-780_040108_1_CHir_Q_r.csv	Injection	29.01.2004	09.01.2004	
09.01.2004	08:24	780	800	__KSH01A_0780.00_200401090824.ht2	KSH01A_780-800_040109_1_CHir_Q_r.csv	Injection	29.01.2004	09.01.2004	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KSH01A				
TEST- AND FILEPROTOCOL					**Testorder dated : 2003-12-04**				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
09.01.2004	10:29	800	820	__KSH01A_0800.00_200401091029.ht2	KSH01A_800-820_040109_1_CHir_Q_r.csv	Injection	29.01.2004	09.01.2004	
09.01.2004	12:51	820	840	__KSH01A_0820.00_200401091251.ht2	KSH01A_820-840_040109_1_CHir_Q_r.csv	Injection	29.01.2004	09.01.2004	
09.01.2004	15:30	840	860	__KSH01A_0840.00_200401091530.ht2	KSH01A_840-860_040109_1_CHir_Q_r.csv	Injection	29.01.2004	09.01.2004	
09.01.2004	17:43	860	880	__KSH01A_0860.00_200401091743.ht2	KSH01A_860-880_040109_1_CHir_Q_r.csv	Injection	29.01.2004	10.01.2004	
10.01.2004	08:30	880	900	__KSH01A_0880.00_200401100830.ht2	KSH01A_880-900_040110_1_CHir_Q_r.csv	Injection	29.01.2004	10.01.2004	
10.01.2004	10:38	899	919	__KSH01A_0899.00_200401101038.ht2	KSH01A_899-919_040110_1_CHir_Q_r.csv	Injection	29.01.2004	10.01.2004	
10.01.2004	13:13	919	939	__KSH01A_0919.00_200401101313.ht2	KSH01A_919-939_040110_1_CHir_Q_r.csv	Injection	29.01.2004	10.01.2004	
10.01.2004	15:06	939	959	__KSH01A_0939.00_200401101506.ht2	KSH01A_939-959_040110_1_CHir_Q_r.csv	Injection	29.01.2004	10.01.2004	
10.01.2004	16:59	959	979	__KSH01A_0959.00_200401101659.ht2	KSH01A_959-979_040110_1_CHir_Q_r.csv	Injection	29.01.2004	11.01.2004	
11.01.2004	08:23	979	999	__KSH01A_0979.00_200401110823.ht2	KSH01A_979-999_040111_1_CHir_Q_r.csv	Injection	29.01.2004	11.01.2004	
12.01.2004	16:06	300	305	__KSH01A_0300.00_200401121606.ht2	KSH01A_300-305_040112_1_CHir_Q_r.csv	Injection	29.01.2004	12.01.2004	
12.01.2004	17:53	305	310	__KSH01A_0305.00_200401121753.ht2	KSH01A_305-310_040112_1_CHir_Q_r.csv	Injection	29.01.2004	13.01.2004	
13.01.2004	08:36	310	315	__KSH01A_0310.00_200401130836.ht2	KSH01A_310-315_040113_1_CHir_Q_r.csv	Injection	29.01.2004	13.01.2004	
13.01.2004	10:36	315	320	__KSH01A_0315.00_200401131036.ht2	KSH01A_315-320_040113_1_CHir_Q_r.csv	Injection	29.01.2004	13.01.2004	
13.01.2004	14:11	320	325	__KSH01A_0320.00_200401131411.ht2	KSH01A_320-325_040113_1_CHir_Q_r.csv	Injection	29.01.2004	13.01.2004	
13.01.2004	15:57	325	330	__KSH01A_0325.00_200401131557.ht2	KSH01A_325-330_040113_1_CHir_Q_r.csv	Injection	29.01.2004	13.01.2004	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KSH01A				
TEST- AND FILEPROTOCOL					**Testorder dated : 2003-12-04**				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
13.01.2004	17:41	330	335	__KSH01A_0330.00_200401131741.ht2	KSH01A_330-335_040113_1_CHir_Q_r.csv	Injection	29.01.2004	14.01.2004	
14.01.2004	08:15	335	340	__KSH01A_0335.00_200401140815.ht2	KSH01A_335-340_040114_1_CHir_Q_r.csv	Injection	29.01.2004	14.01.2004	
14.01.2004	10:08	340	345	__KSH01A_0340.00_200401141008.ht2	KSH01A_340-345_040114_1_CHir_Q_r.csv	Injection	29.01.2004	14.01.2004	
14.01.2004	12:09	345	350	__KSH01A_0345.00_200401141209.ht2	KSH01A_345-350_040114_1_CHir_Q_r.csv	Injection	29.01.2004	14.01.2004	
14.01.2004	14:28	350	355	__KSH01A_0350.00_200401141428.ht2	KSH01A_350-355_040114_1_CHir_Q_r.csv	Injection	29.01.2004	14.01.2004	
14.01.2004	16:25	355	360	__KSH01A_0355.00_200401141625.ht2	KSH01A_355-360_040114_1_CHir_Q_r.csv	Injection	29.01.2004	15.01.2004	
15.01.2004	08:27	360	365	__KSH01A_0360.00_200401150827.ht2	KSH01A_360-365_040115_1_CHir_Q_r.csv	Injection	29.01.2004	15.01.2004	
15.01.2004	11:01	365	370	__KSH01A_0365.00_200401151101.ht2	KSH01A_365-370_040115_1_CHir_Q_r.csv	Injection	29.01.2004	15.01.2004	
15.01.2004	13:29	370	375	__KSH01A_0370.00_200401151329.ht2	KSH01A_370-375_040115_1_CHir_Q_r.csv	Injection	29.01.2004	15.01.2004	
15.01.2004	16:10	375	380	__KSH01A_0375.00_200401151610.ht2	KSH01A_375-380_040115_1_CHir_Q_r.csv	Injection	29.01.2004	15.01.2004	
15.01.2004	18:06	380	385	__KSH01A_0380.00_200401151806.ht2	KSH01A_380-385_040115_1_CHir_Q_r.csv	Injection	29.01.2004	16.01.2004	
16.01.2004	08:24	385	390	__KSH01A_0385.00_200401160824.ht2	KSH01A_385-390_040116_1_CHir_Q_r.csv	Injection	29.01.2004	16.01.2004	
16.01.2004	10:32	390	395	__KSH01A_0390.00_200401161032.ht2	KSH01A_390-395_040116_1_CHir_Q_r.csv	Injection	29.01.2004	16.01.2004	
16.01.2004	13:04	395	400	__KSH01A_0395.00_200401161304.ht2	KSH01A_395-400_040116_1_CHir_Q_r.csv	Injection	29.01.2004	16.01.2004	
16.01.2004	15:09	400	405	__KSH01A_0400.00_200401161509.ht2	KSH01A_400-405_040116_1_CHir_Q_r.csv	Injection	29.01.2004	16.01.2004	
16.01.2004	17:37	405	410	__KSH01A_0405.00_200401161737.ht2	KSH01A_405-410_040116_1_CHir_Q_r.csv	Injection	29.01.2004	17.01.2004	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KSH01A				
TEST- AND FILEPROTOCOL					**Testorder dated : 2003-12-04**				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
17.01.2004	08:24	410	415	__KSH01A_0410.00_200401170824.ht2	KSH01A_410-415_040117_1_CHir_Q_r.csv	Injection	29.01.2004	17.01.2004	
17.01.2004	10:22	415	420	__KSH01A_0415.00_200401171022.ht2	KSH01A_415-420_040117_1_CHir_Q_r.csv	Injection	29.01.2004	17.01.2004	
17.01.2004	11:49	420	425	__KSH01A_0420.00_200401171149.ht2	KSH01A_420-425_040117_1_CHir_Q_r.csv	Injection	29.01.2004	17.01.2004	
17.01.2004	14:25	425	430	__KSH01A_0425.00_200401171425.ht2	KSH01A_425-430_040117_1_CHir_Q_r.csv	Injection	29.01.2004	17.01.2004	
17.01.2004	15:36	430	435	__KSH01A_0430.00_200401171536.ht2	KSH01A_430-435_040117_1_CHir_Q_r.csv	Injection	29.01.2004	17.01.2004	
17.01.2004	17:01	435	440	__KSH01A_0435.00_200401171701.ht2	KSH01A_435-440_040117_1_CHir_Q_r.csv	Injection	29.01.2004	17.01.2004	
17.01.2004	18:14	440	445	__KSH01A_0440.00_200401171814.ht2	KSH01A_440-445_040117_1_CHir_Q_r.csv	Injection	29.01.2004	18.01.2004	
18.01.2004	08:55	445	450	__KSH01A_0445.00_200401180855.ht2	KSH01A_445-450_040118_1_CHir_Q_r.csv	Injection	29.01.2004	18.01.2004	
18.01.2004	11:46	450	455	__KSH01A_0450.00_200401181146.ht2	KSH01A_450-455_040118_1_CHir_Q_r.csv	Injection	29.01.2004	18.01.2004	
18.01.2004	13:58	455	460	__KSH01A_0455.00_200401181358.ht2	KSH01A_455-460_040118_1_CHir_Q_r.csv	Injection	29.01.2004	18.01.2004	
18.01.2004	16:13	460	465	__KSH01A_0460.00_200401181613.ht2	KSH01A_460-465_040118_1_CHir_Q_r.csv	Injection	29.01.2004	19.01.2004	
19.01.2004	08:24	465	470	__KSH01A_0465.00_200401190826.ht2	KSH01A_465-470_040119_1_CHir_Q_r.csv	Injection	29.01.2004	19.01.2004	
19.01.2004	11:10	470	475	__KSH01A_0470.00_200401191110.ht2	KSH01A_470-475_040119_1_CHir_Q_r.csv	Injection	29.01.2004	19.01.2004	
19.01.2004	13:25	475	480	__KSH01A_0475.00_200401191325.ht2	KSH01A_475-480_040119_1_CHir_Q_r.csv	Injection	29.01.2004	19.01.2004	
19.01.2004	16:02	480	485	__KSH01A_0480.00_200401191602.ht2	KSH01A_480-485_040119_1_CHir_Q_r.csv	Injection	29.01.2004	19.01.2004	
20.01.2004	08:19	485	490	__KSH01A_0485.00_200401200819.ht2	KSH01A_485-490_040120_1_CHir_Q_r.csv	Injection	29.01.2004	20.01.2004	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KSH01A				
TEST- AND FILEPROTOCOL					**Testorder dated : 2003-12-04**				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
20.01.2004	10:17	490	495	__KSH01A_0490.00_200401201017.ht2	KSH01A_490-495_040120_1_CHir_Q_r.csv	Injection	29.01.2004	20.01.2004	
20.01.2004	12:56	495	500	__KSH01A_0495.00_200401201256.ht2	KSH01A_495-500_040120_1_CHir_Q_r.csv	Injection	29.01.2004	20.01.2004	
20.01.2004	14:24	500	505	__KSH01A_0500.00_200401201424.ht2	KSH01A_500-505_040120_1_CHir_Q_r.csv	Injection	29.01.2004	20.01.2004	
20.01.2004	17:10	505	510	__KSH01A_0505.00_200401201710.ht2	KSH01A_505-510_040120_1_CHir_Q_r.csv	Injection	29.01.2004	21.01.2004	
21.01.2004	08:16	510	515	__KSH01A_0510.00_200401210816.ht2	KSH01A_510-515_040121_1_CHir_Q_r.csv	Injection	29.01.2004	21.01.2004	
21.01.2004	09:49	515	520	__KSH01A_0515.00_200401210949.ht2	KSH01A_515-520_040121_1_CHir_Q_r.csv	Injection	29.01.2004	21.01.2004	
21.01.2004	09:58	515	520	__KSH01A_0515.00_200401210958.ht2	KSH01A_515-520_040121_2_CHir_Q_r.csv	Injection	29.01.2004	21.01.2004	
21.01.2004	13:01	520	525	__KSH01A_0520.00_200401211301.ht2	KSH01A_520-525_040121_1_CHir_Q_r.csv	Injection	29.01.2004	21.01.2004	
21.01.2004	14:25	525	530	__KSH01A_0525.00_200401211425.ht2	KSH01A_525-530_040121_1_CHir_Q_r.csv	Injection	29.01.2004	21.01.2004	
21.01.2004	15:54	530	535	__KSH01A_0530.00_200401211554.ht2	KSH01A_530-535_040121_1_CHir_Q_r.csv	Injection	29.01.2004	22.01.2004	
22.01.2004	08:13	535	540	__KSH01A_0535.00_200401220813.ht2	KSH01A_535-540_040122_1_CHir_Q_r.csv	Injection	29.01.2004	22.01.2004	
22.01.2004	09:36	540	545	__KSH01A_0540.00_200401220936.ht2	KSH01A_540-545_040122_1_CHir_Q_r.csv	Injection	29.01.2004	22.01.2004	
22.01.2004	13:10	545	550	__KSH01A_0545.00_200401221310.ht2	KSH01A_545-550_040122_1_CHir_Q_r.csv	Injection	29.01.2004	22.01.2004	
22.01.2004	15:20	550	555	__KSH01A_0550.00_200401221520.ht2	KSH01A_550-555_040122_1_CHir_Q_r.csv	Injection	29.01.2004	22.01.2004	
22.01.2004	17:25	555	560	__KSH01A_0555.00_200401221725.ht2	KSH01A_555-560_040122_1_CHir_Q_r.csv	Injection	29.01.2004	23.01.2004	
23.01.2004	08:19	560	565	__KSH01A_0560.00_200401230819.ht2	KSH01A_560-565_040123_1_CHir_Q_r.csv	Injection	29.01.2004	23.01.2004	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KSH01A				
TEST- AND FILEPROTOCOL					Testorder dated : 2003-12-04				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
23.01.2004	10:01	565	570	__KSH01A_0565.00_200401231001.ht2	KSH01A_565-570_040123_1_CHir_Q_r.csv	Injection	29.01.2004	23.01.2004	
23.01.2004	11:27	570	575	__KSH01A_0570.00_200401231127.ht2	KSH01A_570-575_040123_1_CHir_Q_r.csv	Injection	29.01.2004	23.01.2004	
23.01.2004	14:12	575	580	__KSH01A_0575.00_200401231412.ht2	KSH01A_575-580_040123_1_CHir_Q_r.csv	Injection	29.01.2004	23.01.2004	
23.01.2004	16:33	580	585	__KSH01A_0580.00_200401231633.ht2	KSH01A_580-585_040123_1_CHir_Q_r.csv	Injection	29.01.2004	23.01.2004	
24.01.2004	08:15	585	590	__KSH01A_0585.00_200401240815.ht2	KSH01A_585-590_040124_1_CHir_Q_r.csv	Injection	29.01.2004	27.01.2004	
24.01.2004	10:05	590	595	__KSH01A_0590.00_200401241005.ht2	KSH01A_590-595_040124_1_CHir_Q_r.csv	Injection	29.01.2004	24.01.2004	
24.01.2004	13:30	595	600	__KSH01A_0595.00_200401241330.ht2	KSH01A_595-600_040124_1_CHir_Q_r.csv	Injection	29.01.2004	24.01.2004	
24.01.2004	15:31	600	605	__KSH01A_0600.00_200401241531.ht2	KSH01A_600-605_040124_1_CHir_Q_r.csv	Injection	29.01.2004	24.01.2004	
24.01.2004	17:26	605	610	__KSH01A_0605.00_200401241726.ht2	KSH01A_605-610_040124_1_CHir_Q_r.csv	Injection	29.01.2004	25.01.2004	
25.01.2004	08:23	610	615	__KSH01A_0610.00_200401250823.ht2	KSH01A_610-615_040125_1_CHir_Q_r.csv	Injection	29.01.2004	25.01.2004	
25.01.2004	11:16	615	620	__KSH01A_0615.00_200401251116.ht2	KSH01A_615-620_040125_1_CHir_Q_r.csv	Injection	29.01.2004	25.01.2004	
25.01.2004	13:40	620	625	__KSH01A_0620.00_200401251340.ht2	KSH01A_620-625_040125_1_CHir_Q_r.csv	Injection	29.01.2004	25.01.2004	
25.01.2004	15:44	625	630	__KSH01A_0625.00_200401251544.ht2	KSH01A_625-630_040125_1_CHir_Q_r.csv	Injection	29.01.2004	25.01.2004	
25.01.2004	17:56	630	635	__KSH01A_0630.00_200401251756.ht2	KSH01A_630-635_040125_1_CHir_Q_r.csv	Injection	29.01.2004	26.01.2004	
26.01.2004	08:16	635	640	__KSH01A_0635.00_200401260816.ht2	KSH01A_635-640_040126_1_CHir_Q_r.csv	Injection	29.01.2004	26.01.2004	
26.01.2004	09:48	640	645	__KSH01A_0640.00_200401260948.ht2	KSH01A_640-645_040126_1_CHir_Q_r.csv	Injection	29.01.2004	26.01.2004	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KSH01A				
TEST- AND FILEPROTOCOL					**Testorder dated : 2003-12-04**				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
26.01.2004	11:16	645	650	__KSH01A_0645.00_200401261116.ht2	KSH01A_645-650_040126_1_CHir_Q_r.csv	Injection	29.01.2004	26.01.2004	
26.01.2004	13:04	650	655	__KSH01A_0650.00_200401261304.ht2	KSH01A_650-655_040126_1_CHir_Q_r.csv	Injection	29.01.2004	26.01.2004	
26.01.2004	14:32	655	660	__KSH01A_0655.00_200401261432.ht2	KSH01A_655-660_040126_1_CHir_Q_r.csv	Injection	29.01.2004	26.01.2004	
26.01.2004	16:36	660	665	__KSH01A_0660.00_200401261636.ht2	KSH01A_660-665_040126_1_CHir_Q_r.csv	Injection	29.01.2004	26.01.2004	
26.01.2004	18:01	665	670	__KSH01A_0665.00_200401261801.ht2	KSH01A_665-670_040126_1_CHir_Q_r.csv	Injection	29.01.2004	27.01.2004	
27.01.2004	08:15	670	675	__KSH01A_0670.00_200401270815.ht2	KSH01A_670-675_040127_1_CHir_Q_r.csv	Injection	29.01.2004	27.01.2004	
27.01.2004	10:26	675	680	__KSH01A_0675.00_200401271026.ht2	KSH01A_675-680_040127_1_CHir_Q_r.csv	Injection	29.01.2004	27.01.2004	
27.01.2004	12:50	680	685	__KSH01A_0680.00_200401271250.ht2	KSH01A_680-685_040127_1_CHir_Q_r.csv	Injection	29.01.2004	27.01.2004	
27.01.2004	16:07	685	690	__KSH01A_0685.00_200401271607.ht2	KSH01A_685-690_040127_1_CHir_Q_r.csv	Injection	29.01.2004	27.01.2004	
27.01.2004	17:33	690	695	__KSH01A_0690.00_200401271733.ht2	KSH01A_690-695_040127_1_CHir_Q_r.csv	Injection	29.01.2004	28.01.2004	
28.01.2004	08:14	695	700	__KSH01A_0695.00_200401280814.ht2	KSH01A_695-700_040128_1_CHir_Q_r.csv	Injection	29.01.2004	28.01.2004	
28.01.2004	10:41	600	605	__KSH01A_0600.00_200401281041.ht2	KSH01A_600-605_040128_2_CHir_Q_r.csv	Injection	29.01.2004	28.01.2004	

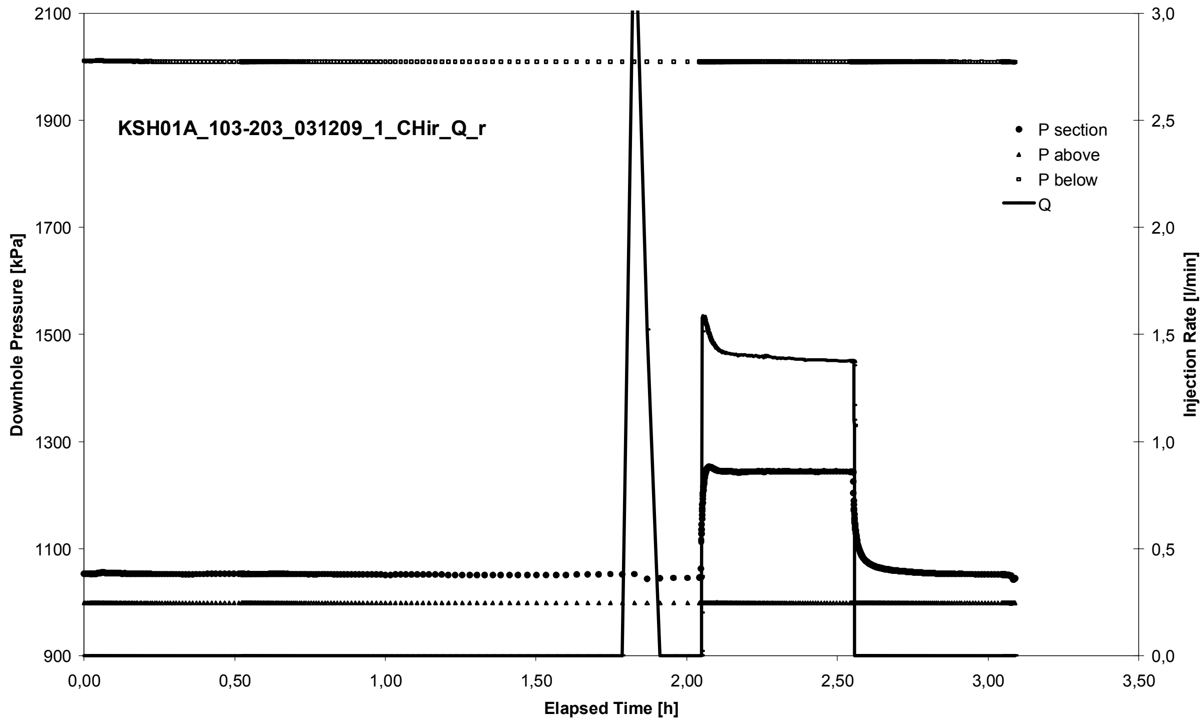
APPENDIX 2

Test Analyses Diagrams

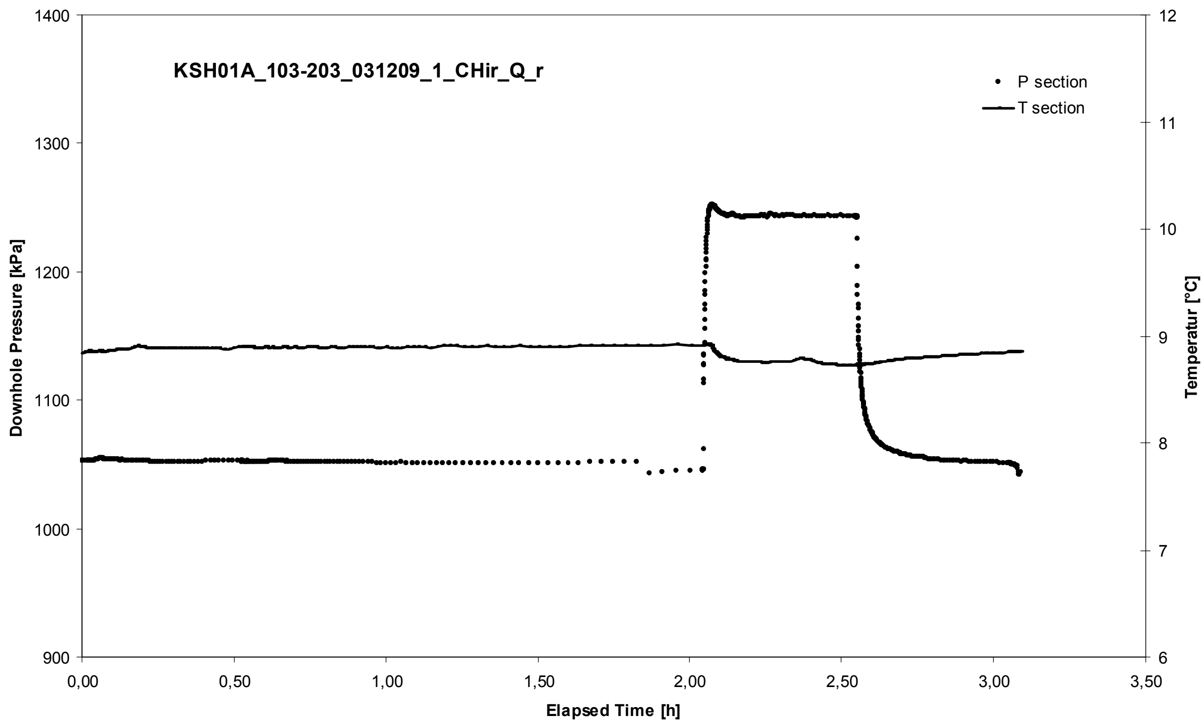
APPENDIX 2-1

Test 103 – 203 m

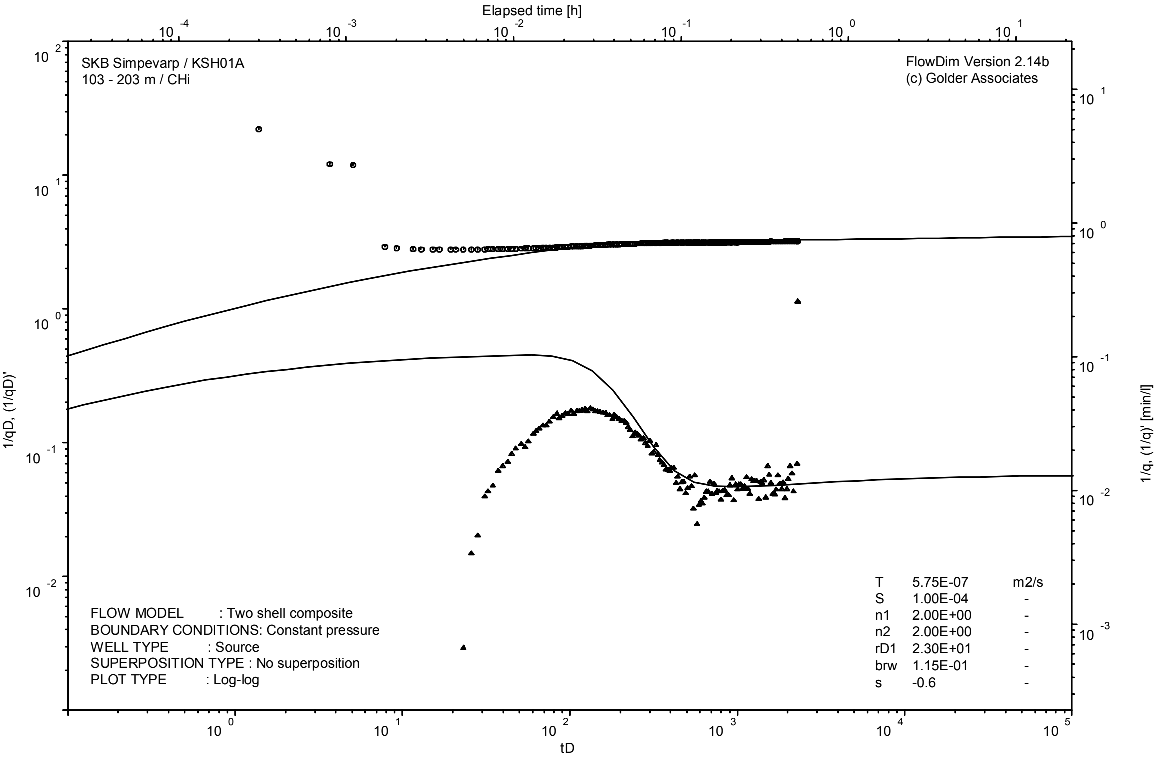
Analysis diagrams



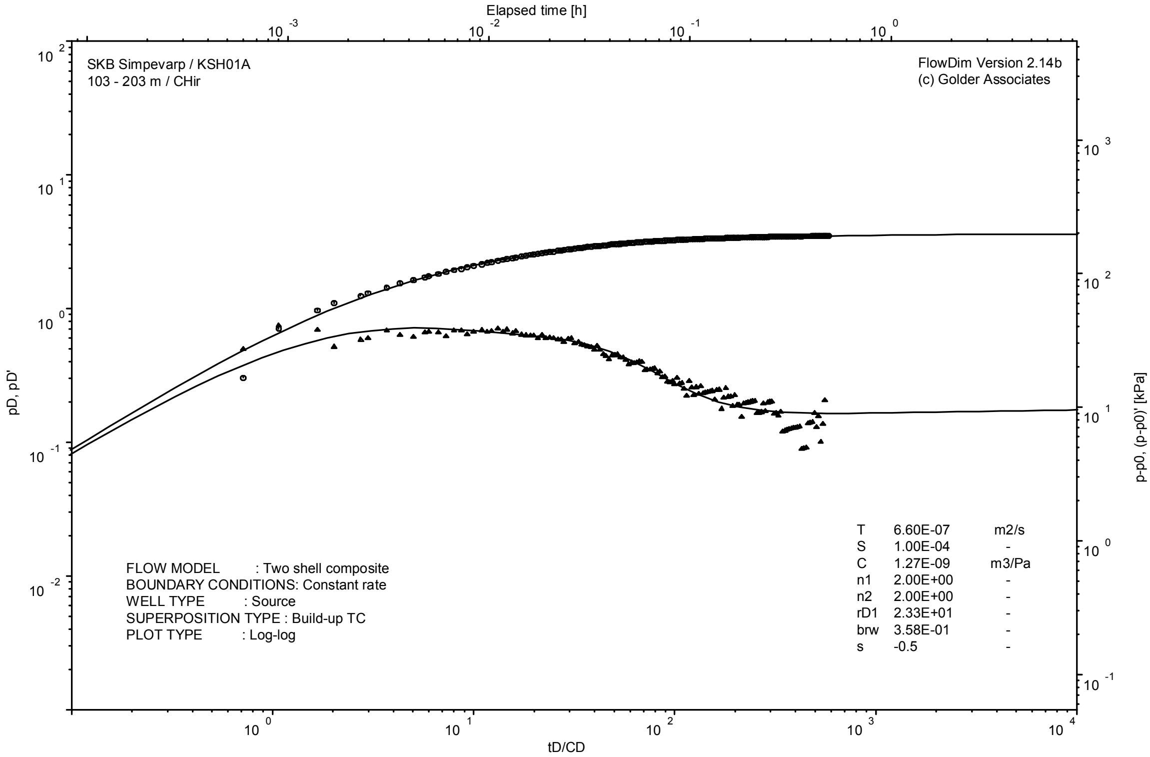
Pressure and flow rate vs. time; cartesian plot



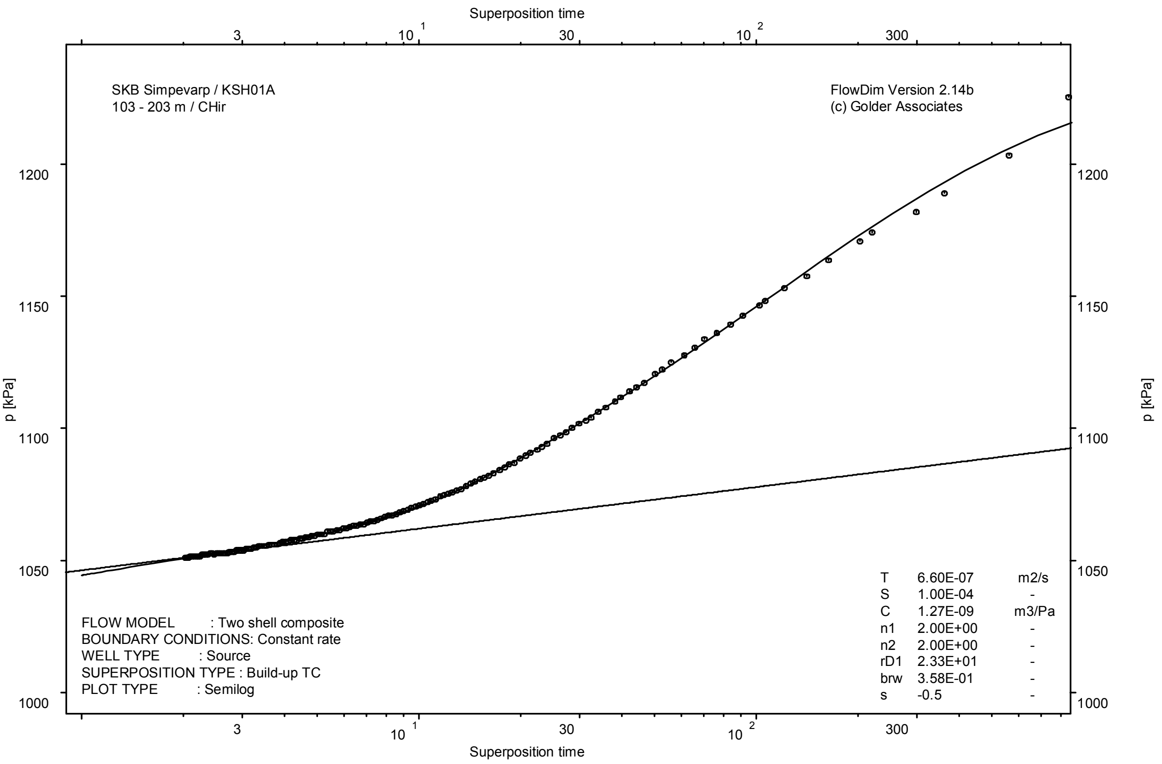
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

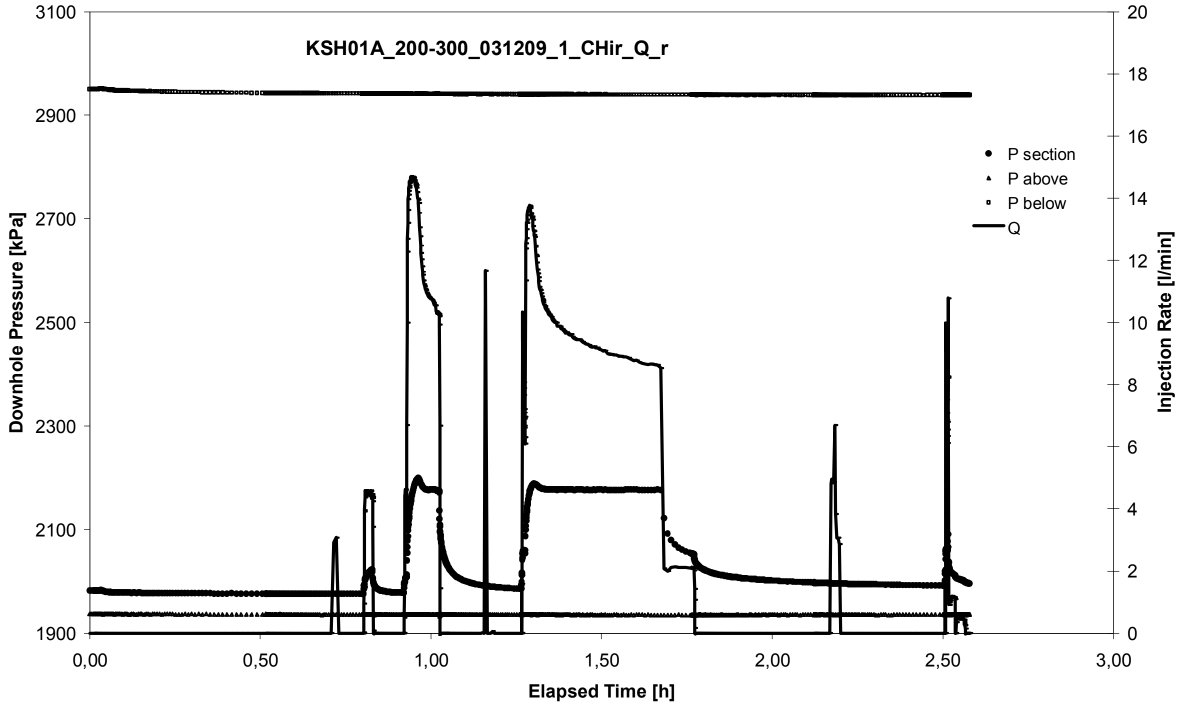


CHIR phase; HORNER match

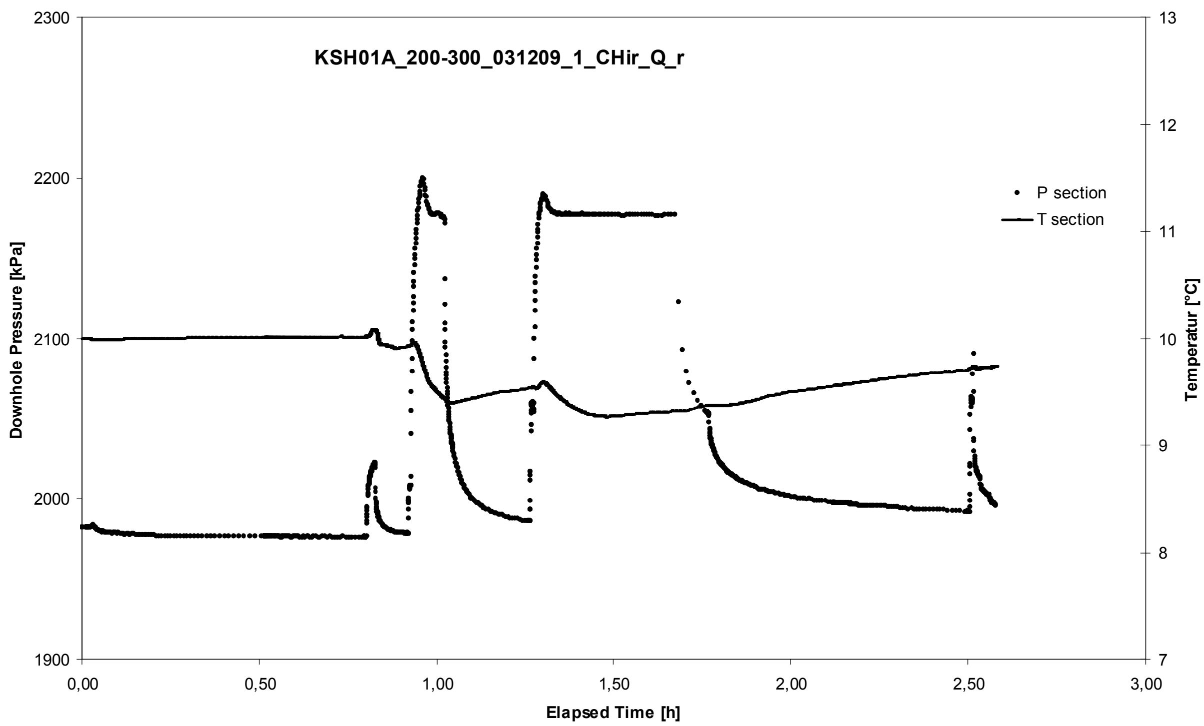
APPENDIX 2-2

Test 200 – 300 m

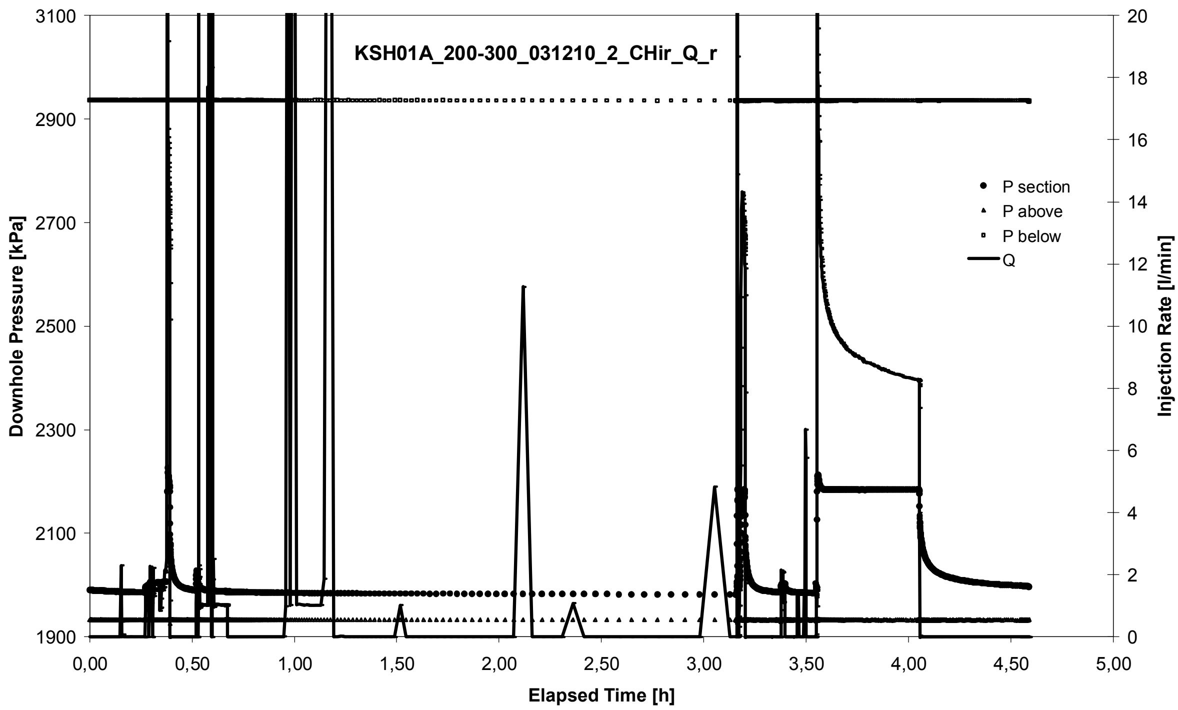
Analysis diagrams



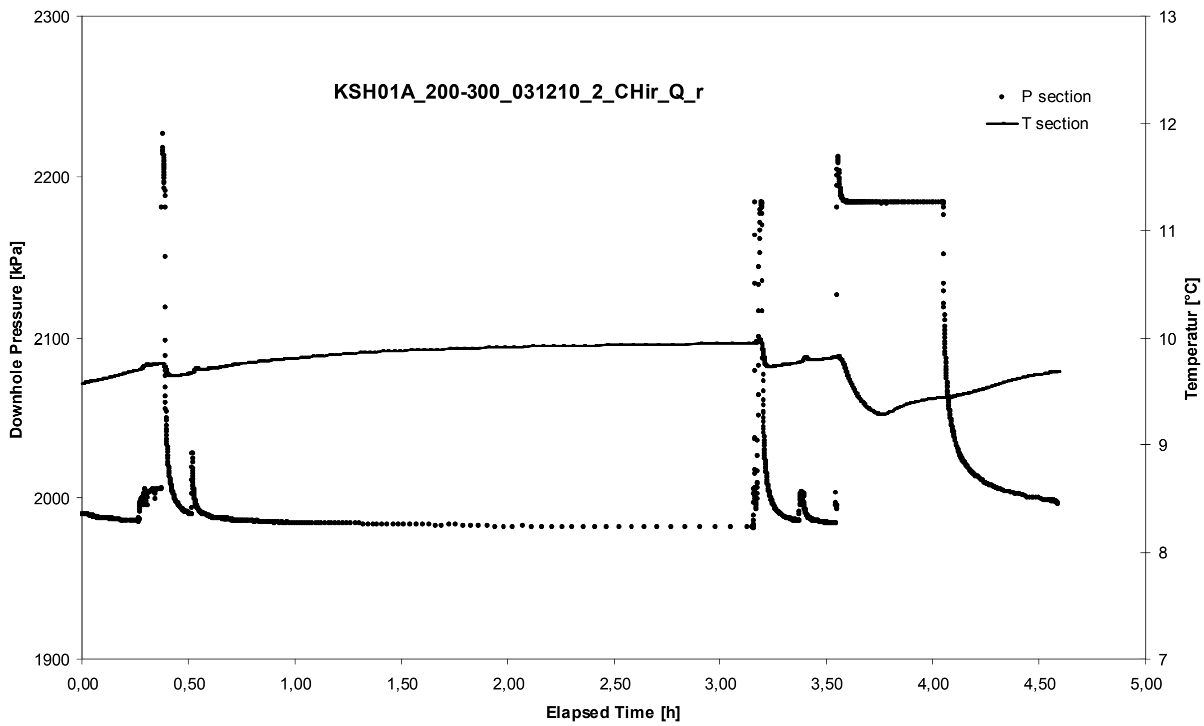
Pressure and flow rate vs. time; cartesian plot (test repeated)



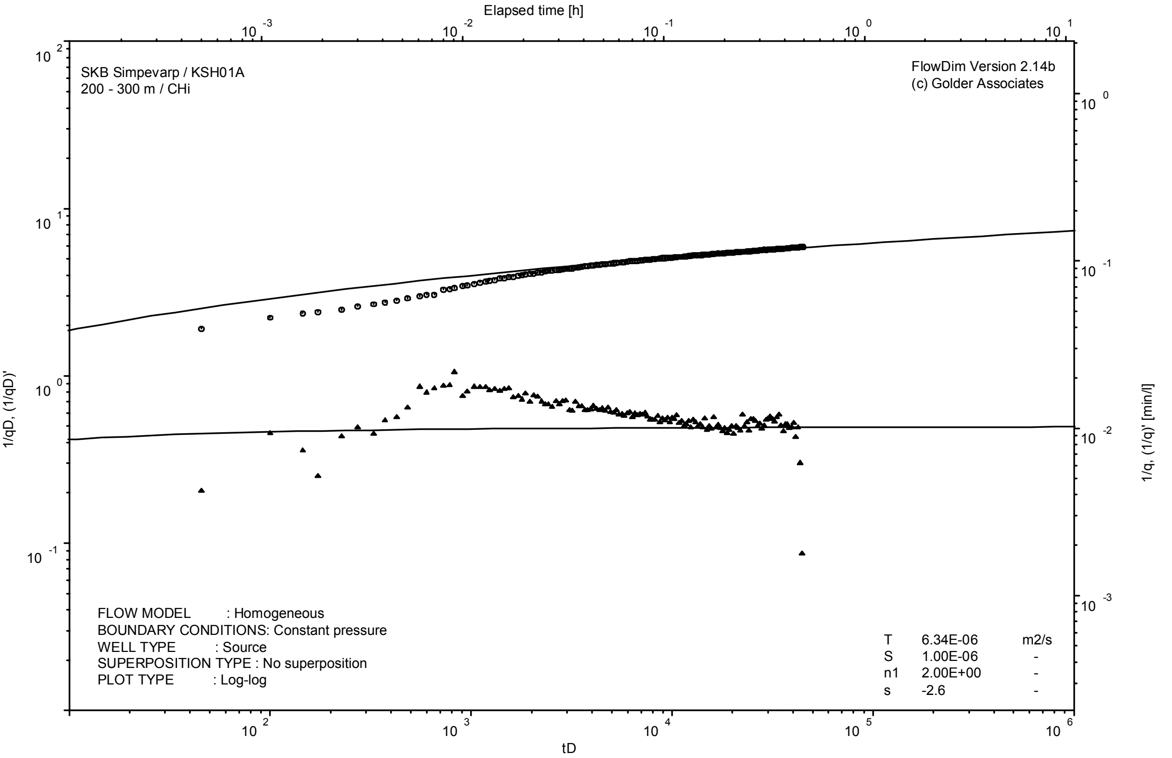
Interval pressure and temperature vs. time; cartesian plot (test repeated)



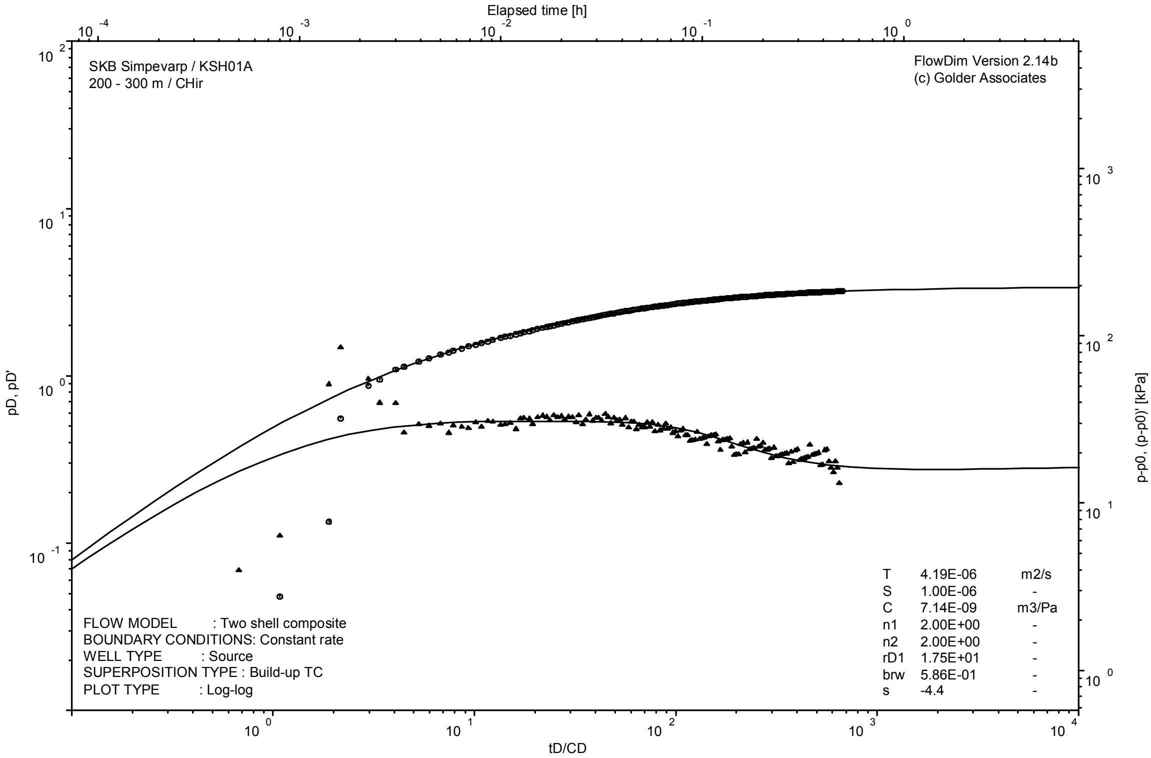
Pressure and flow rate vs. time; cartesian plot (analysed)



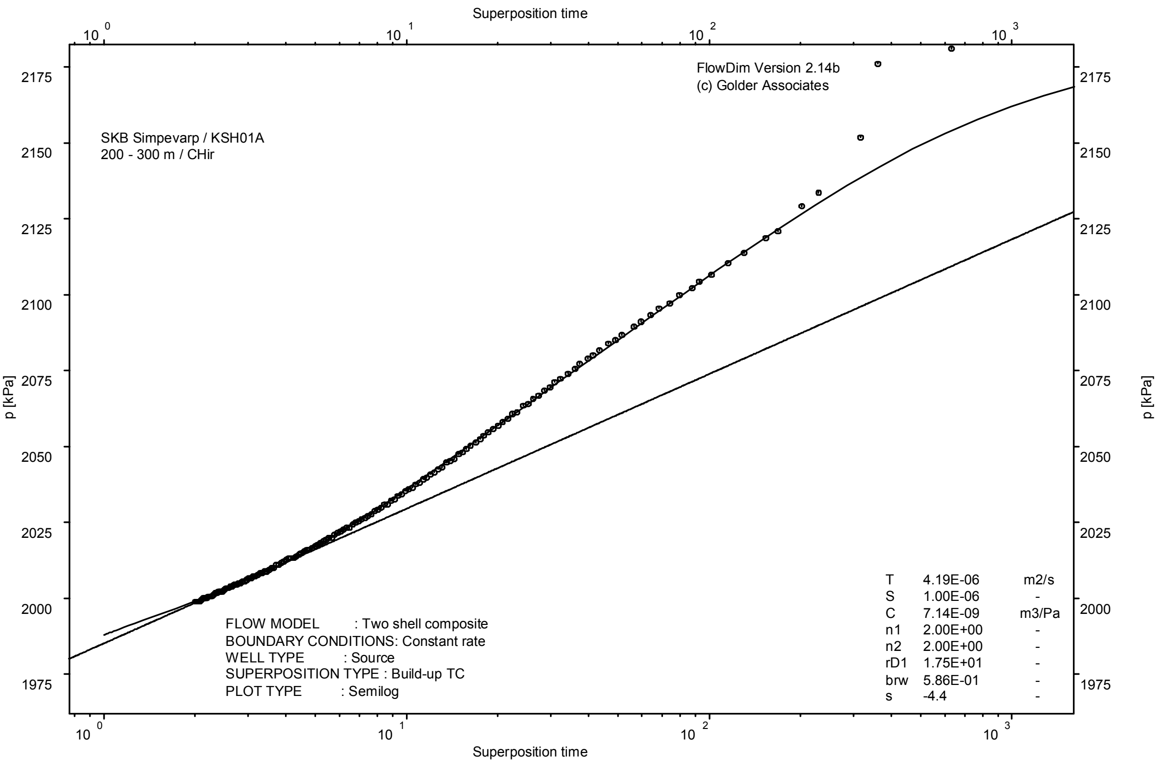
Interval pressure and temperature vs. time; cartesian plot (analysed)



CHI phase; log-log match



CHIR phase; log-log match

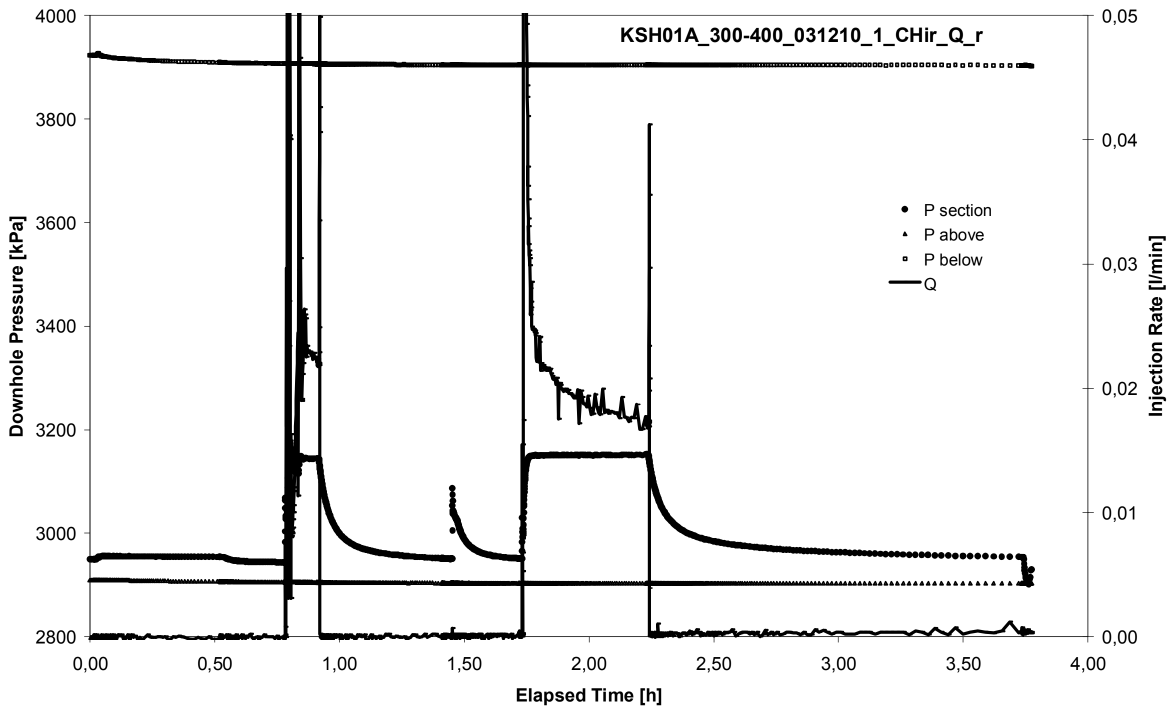


CHIR phase; HORNER match

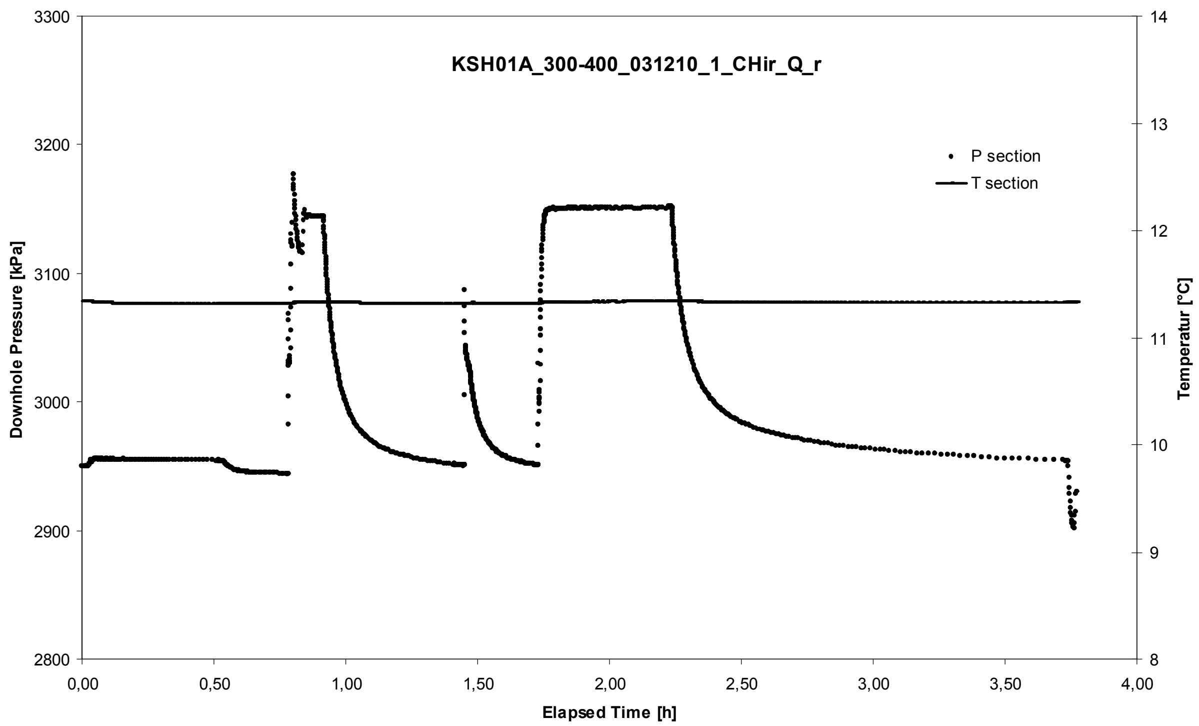
APPENDIX 2-3

Test 300 – 400 m

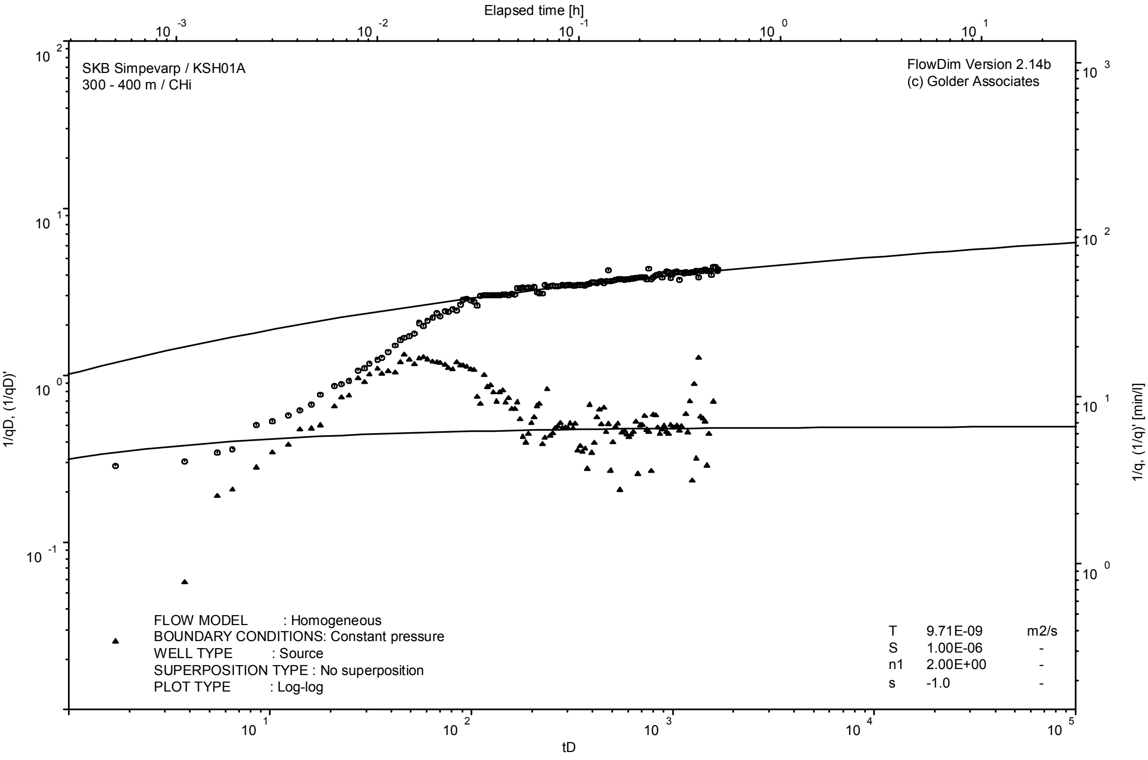
Analysis diagrams



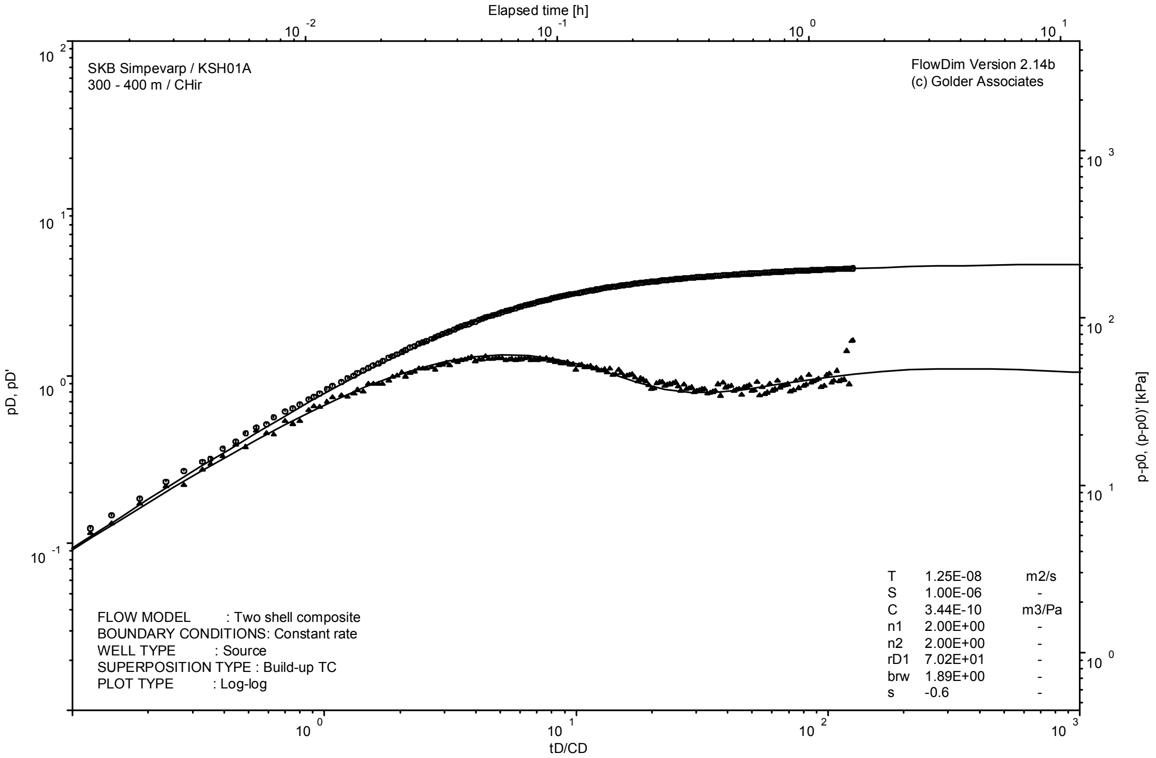
Pressure and flow rate vs. time; cartesian plot



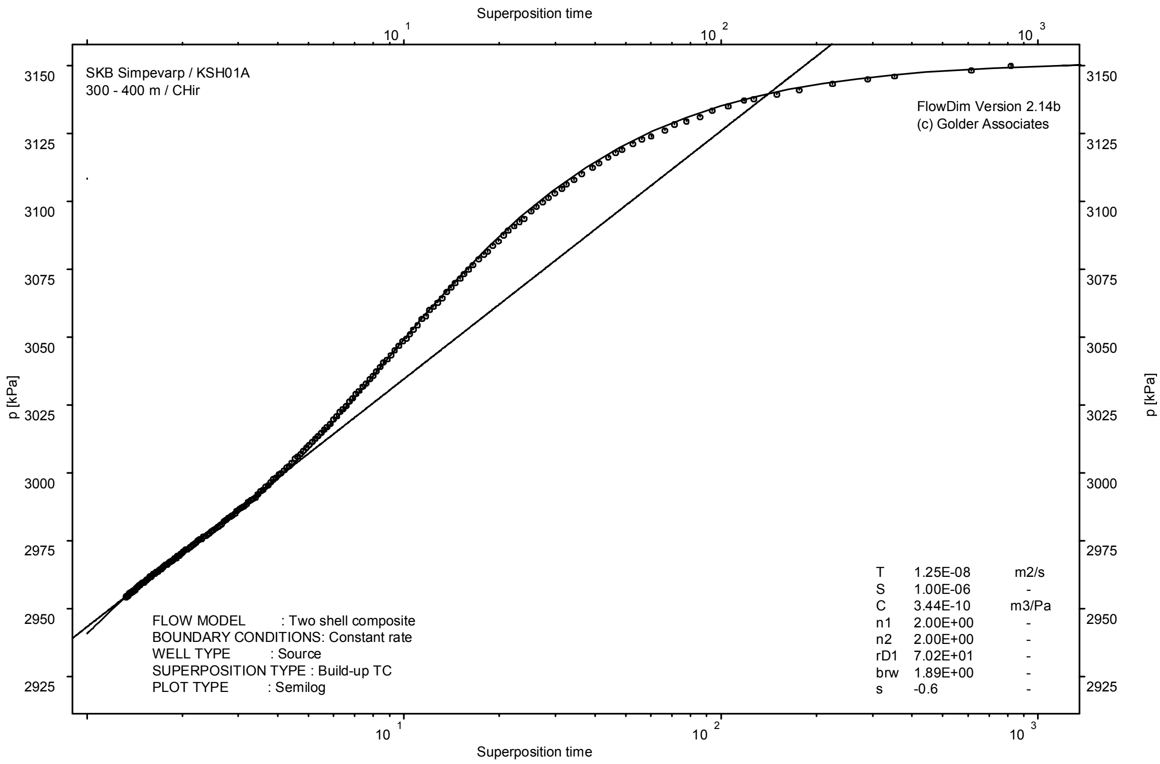
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

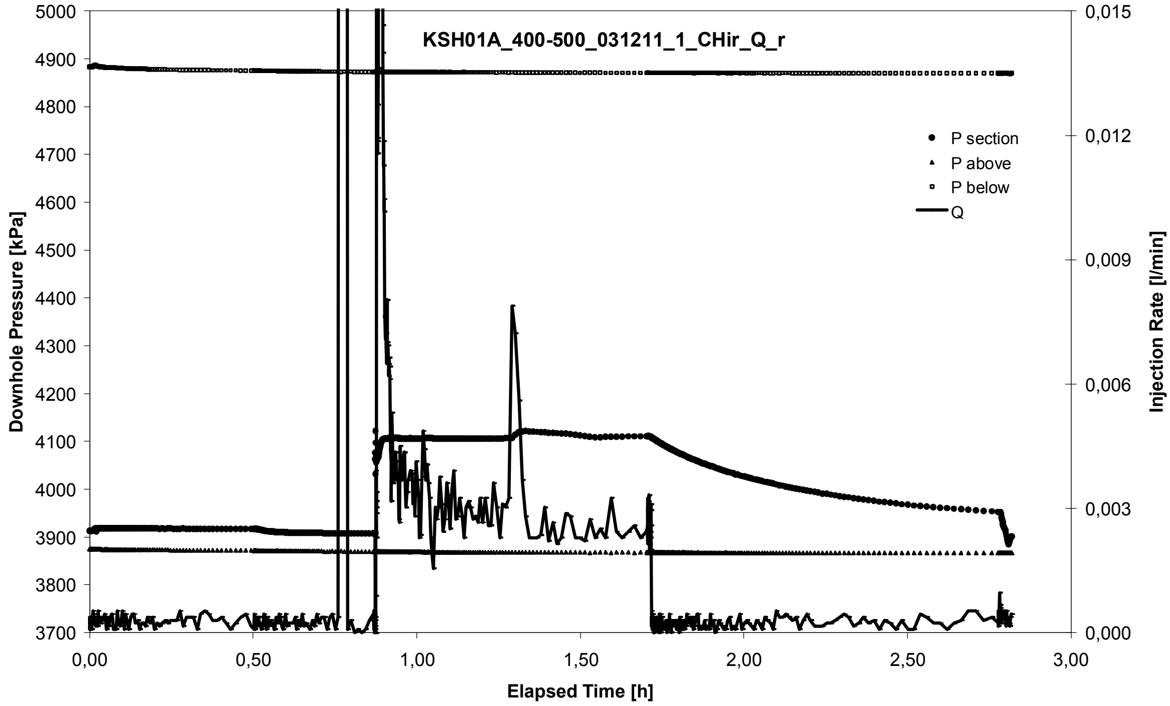


CHIR phase; HORNER match

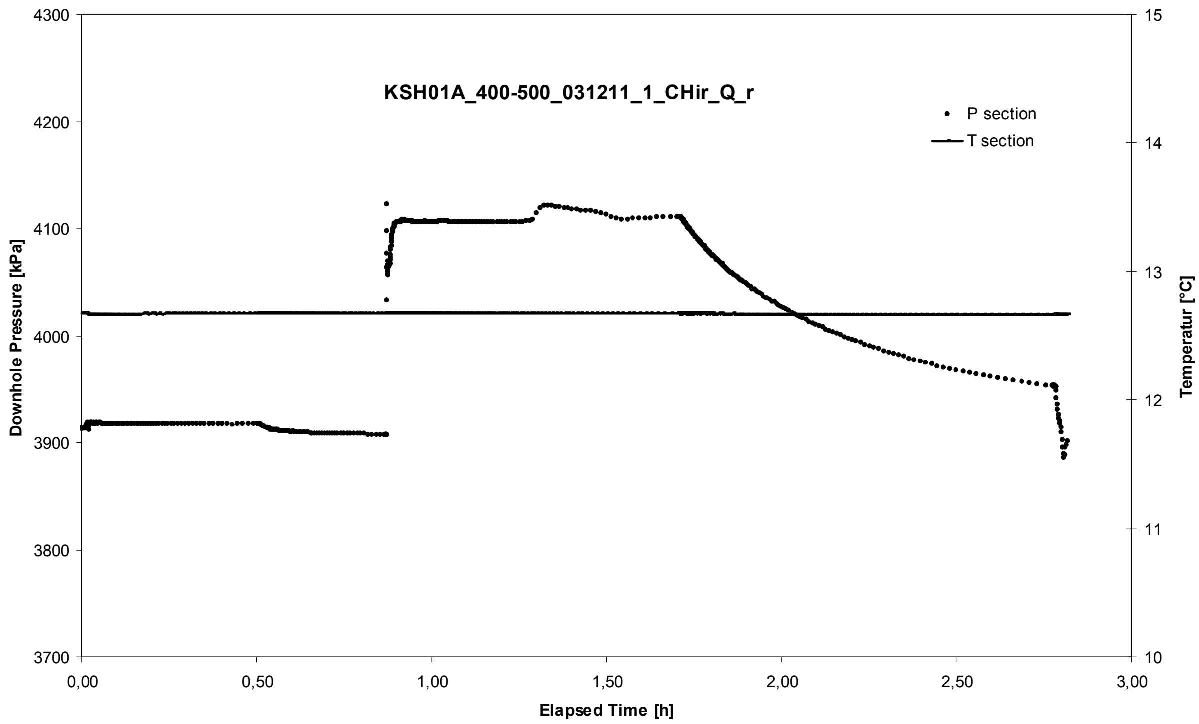
APPENDIX 2-4

Test 400 – 500 m

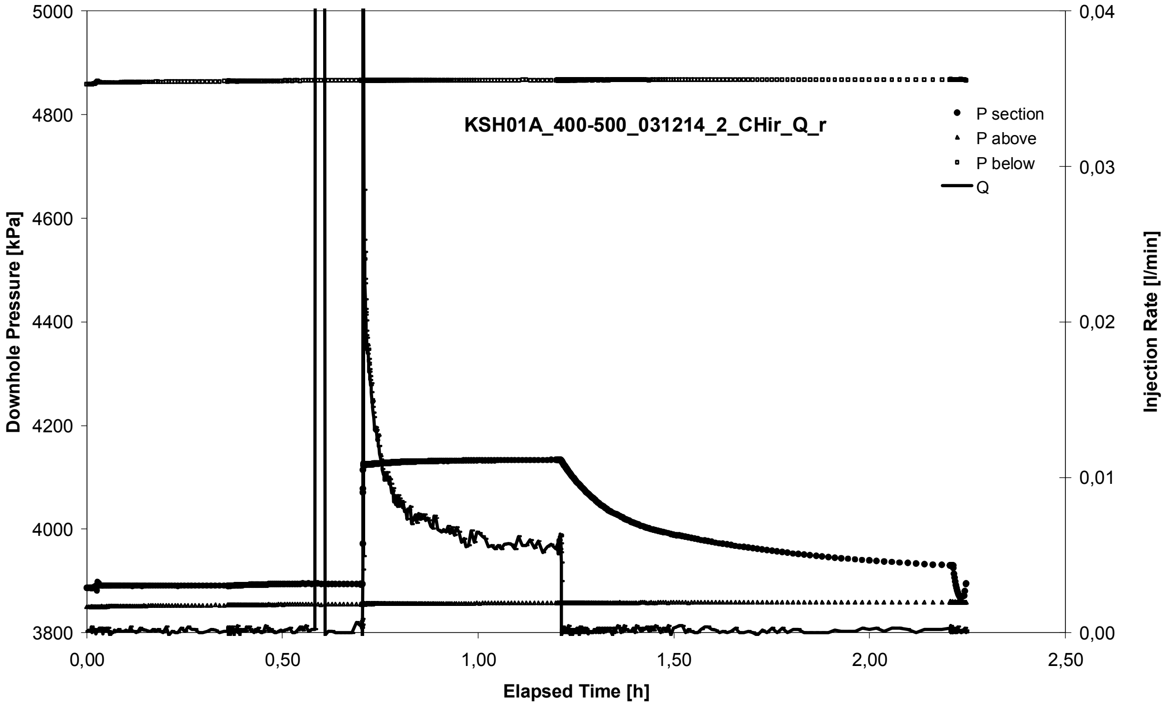
Analysis diagrams



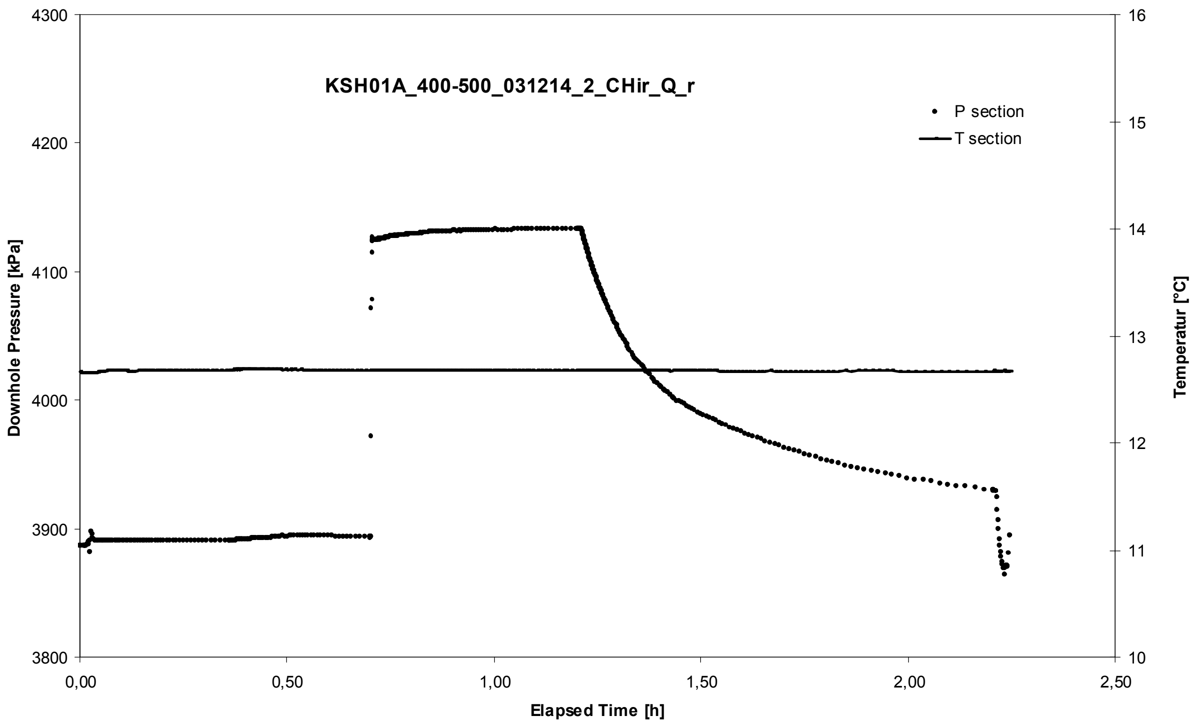
Pressure and flow rate vs. time; cartesian plot (test repeated)



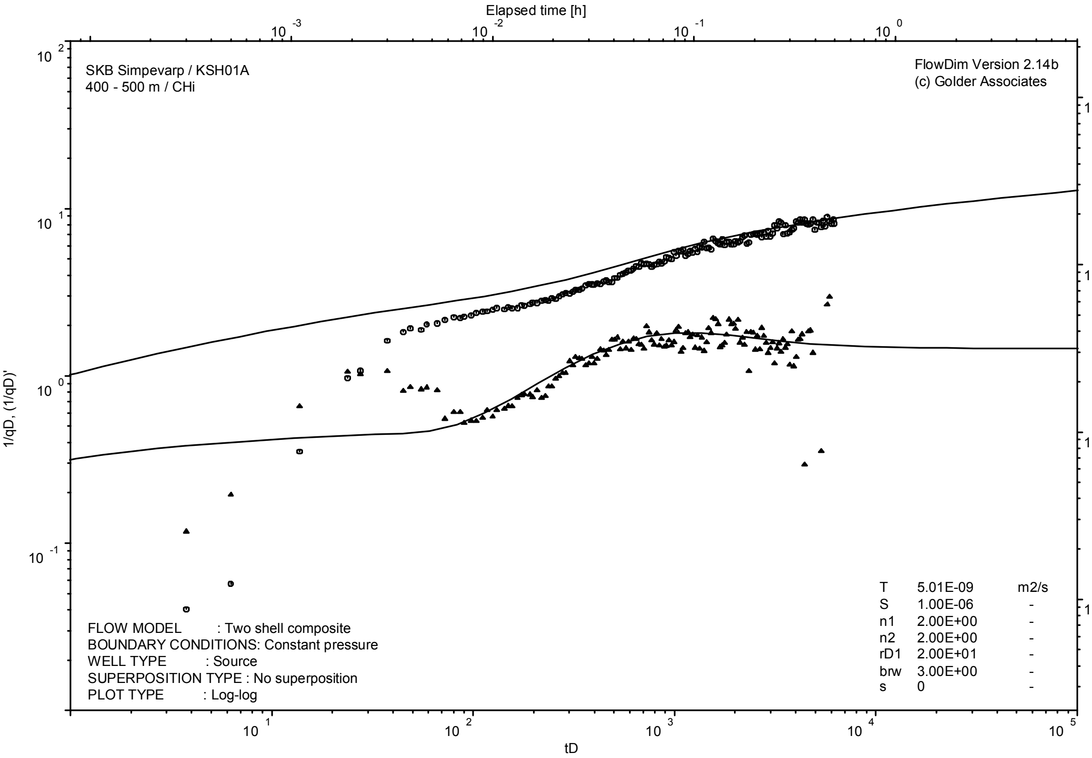
Interval pressure and temperature vs. time; cartesian plot (test repeated)



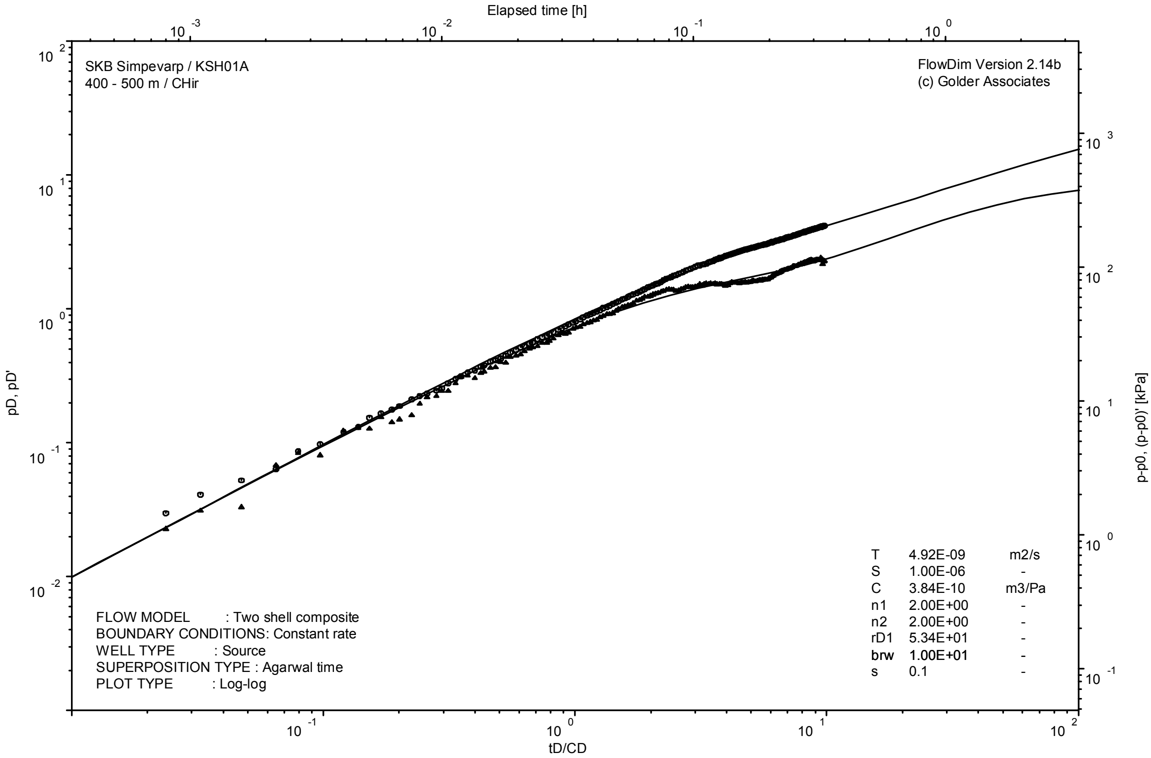
Pressure and flow rate vs. time; cartesian plot (analysed)



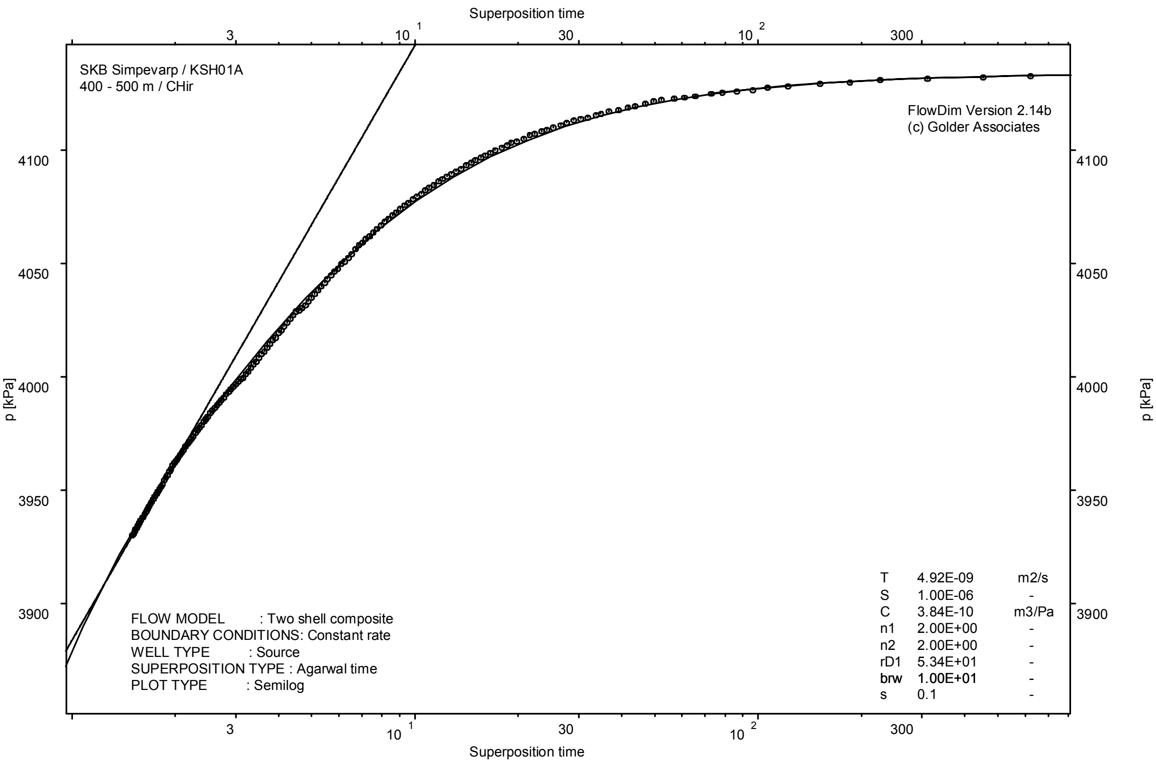
Interval pressure and temperature vs. time; cartesian plot (analysed)



CHI phase; log-log match



CHIR phase; log-log match

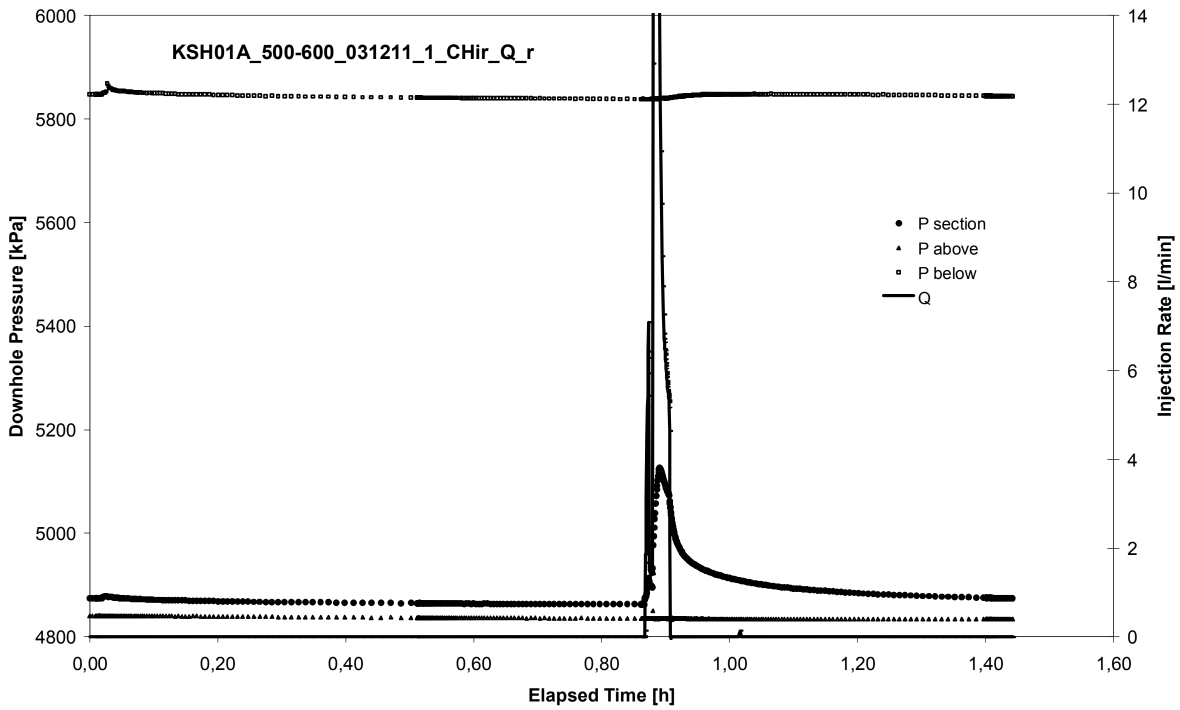


CHIR phase; HORNER match

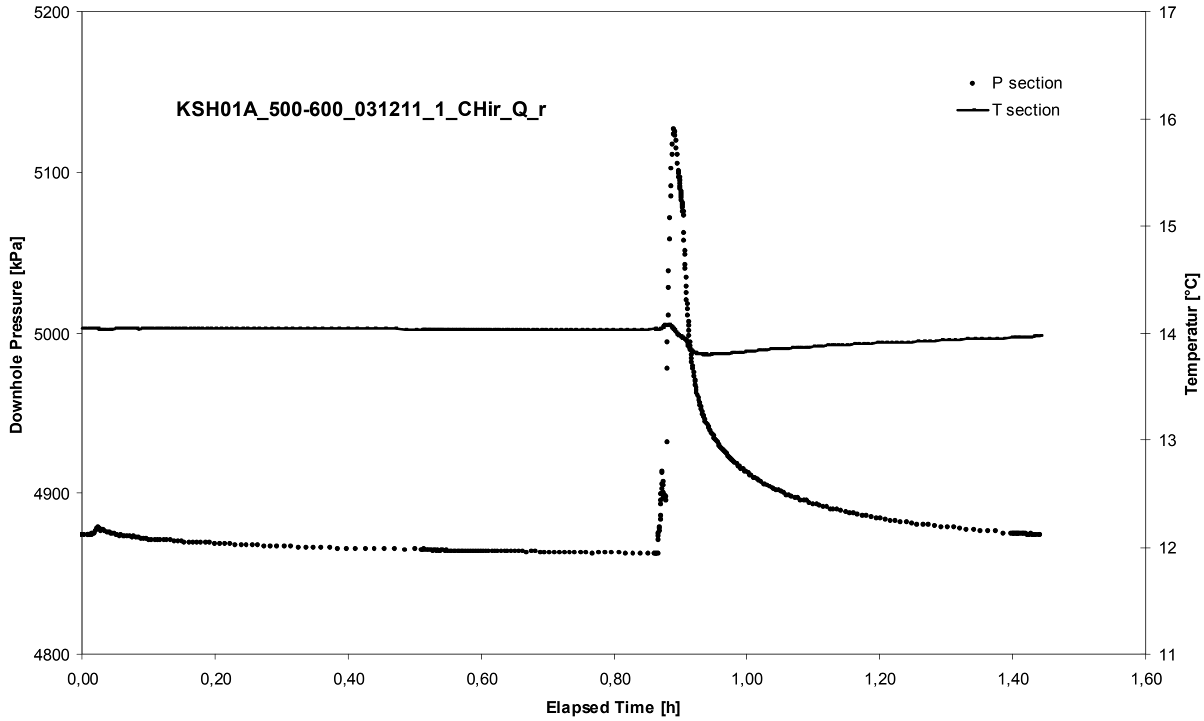
APPENDIX 2-5

Test 500 – 600 m

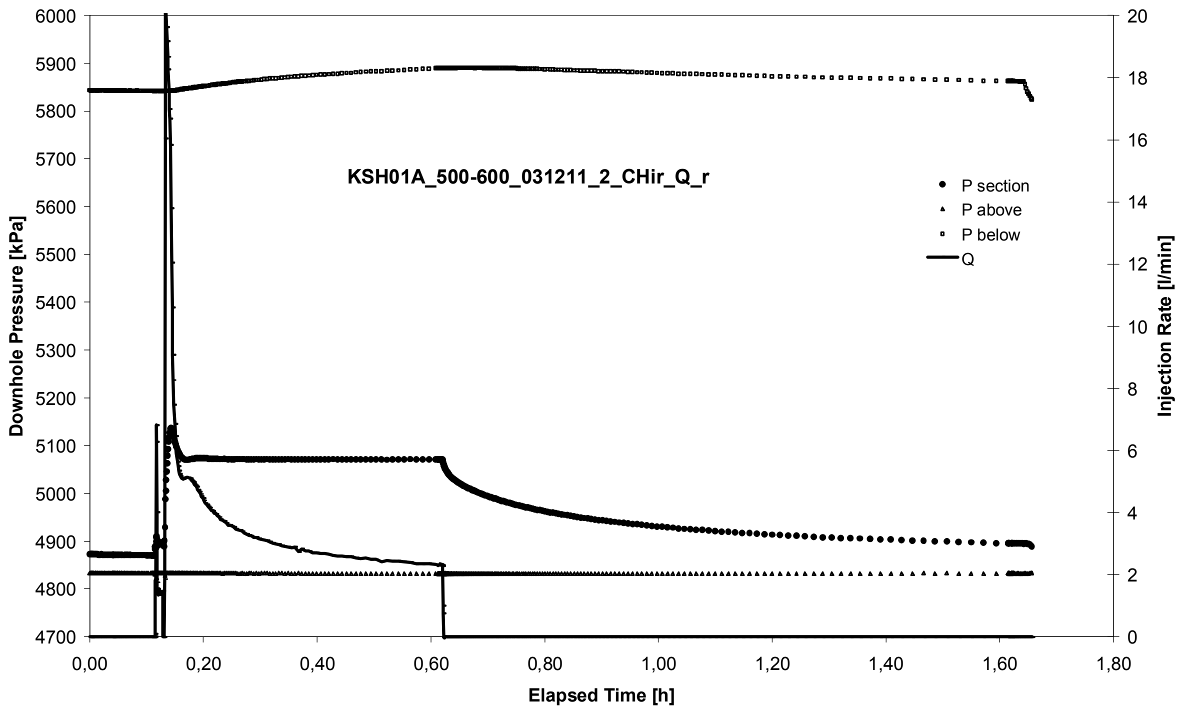
Analysis diagrams



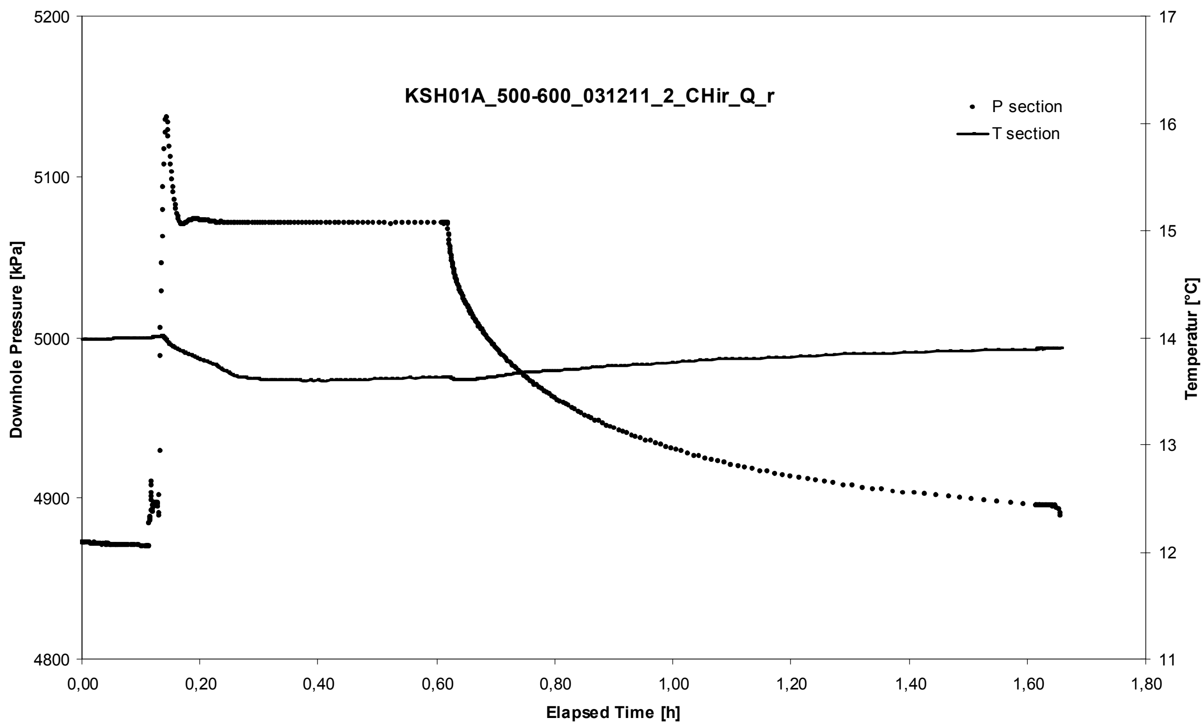
Pressure and flow rate vs. time; cartesian plot (test repeated)



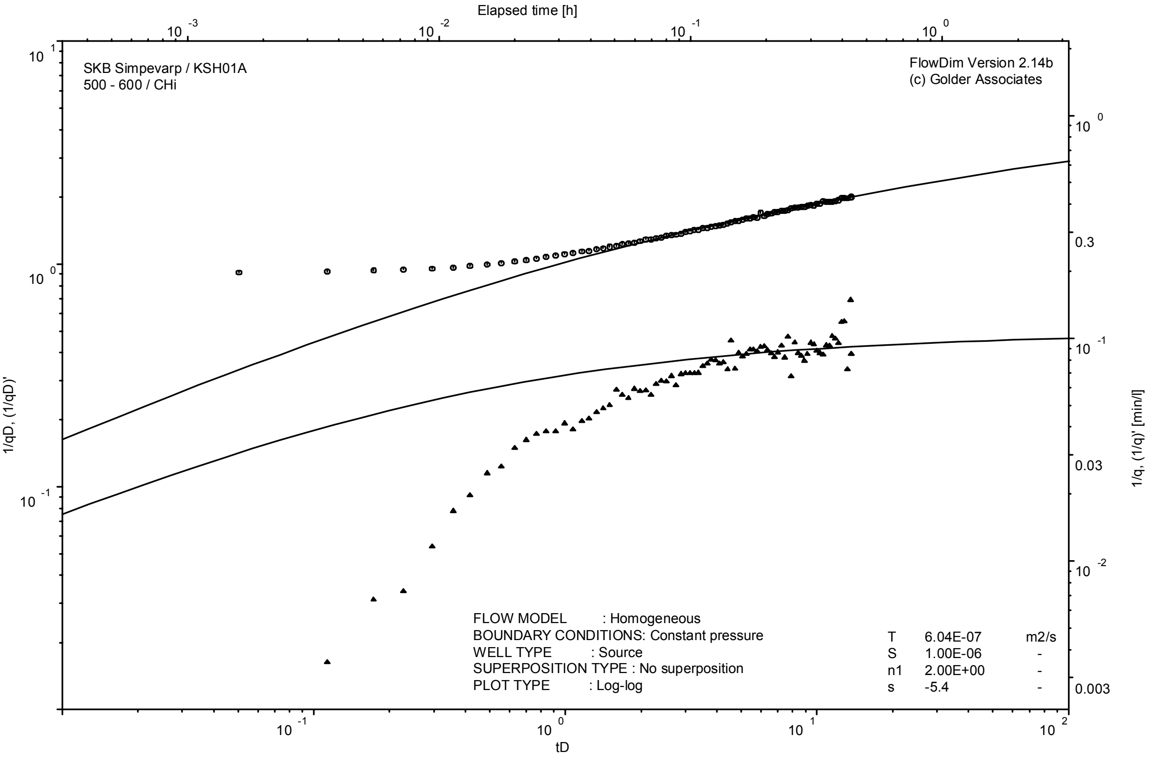
Interval pressure and temperature vs. time; cartesian plot (test repeated)



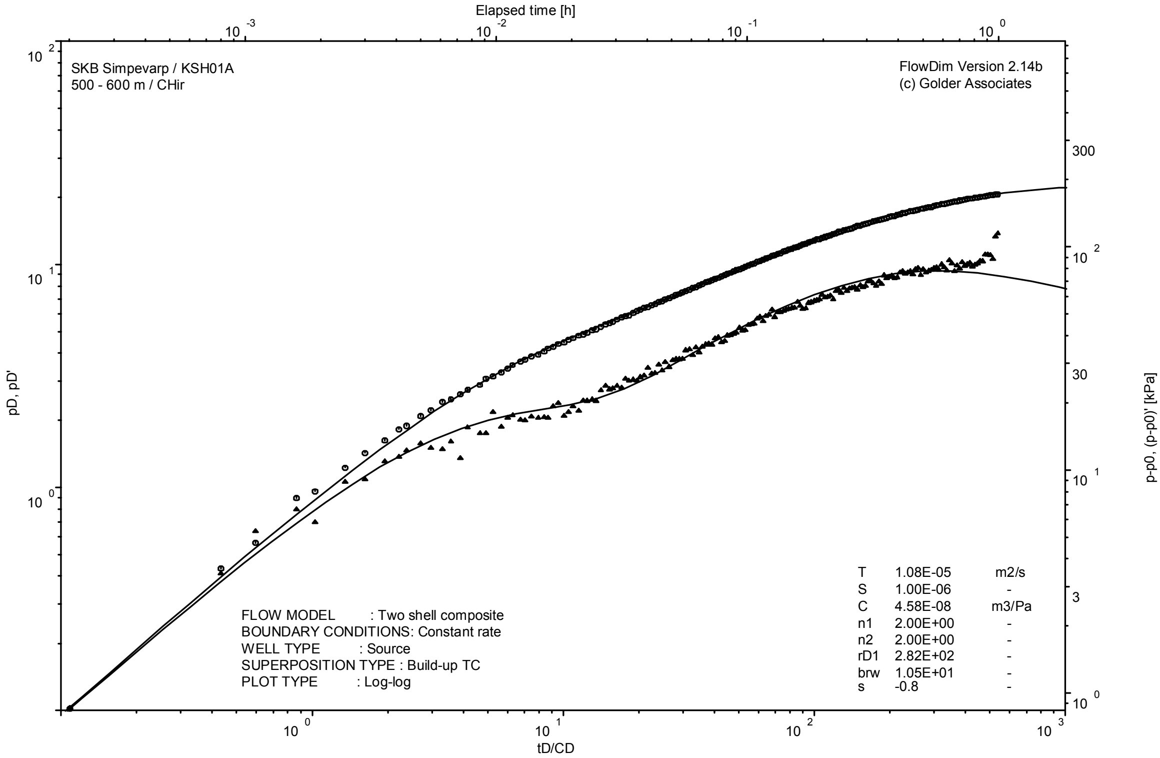
Pressure and flow rate vs. time; cartesian plot (analysed)



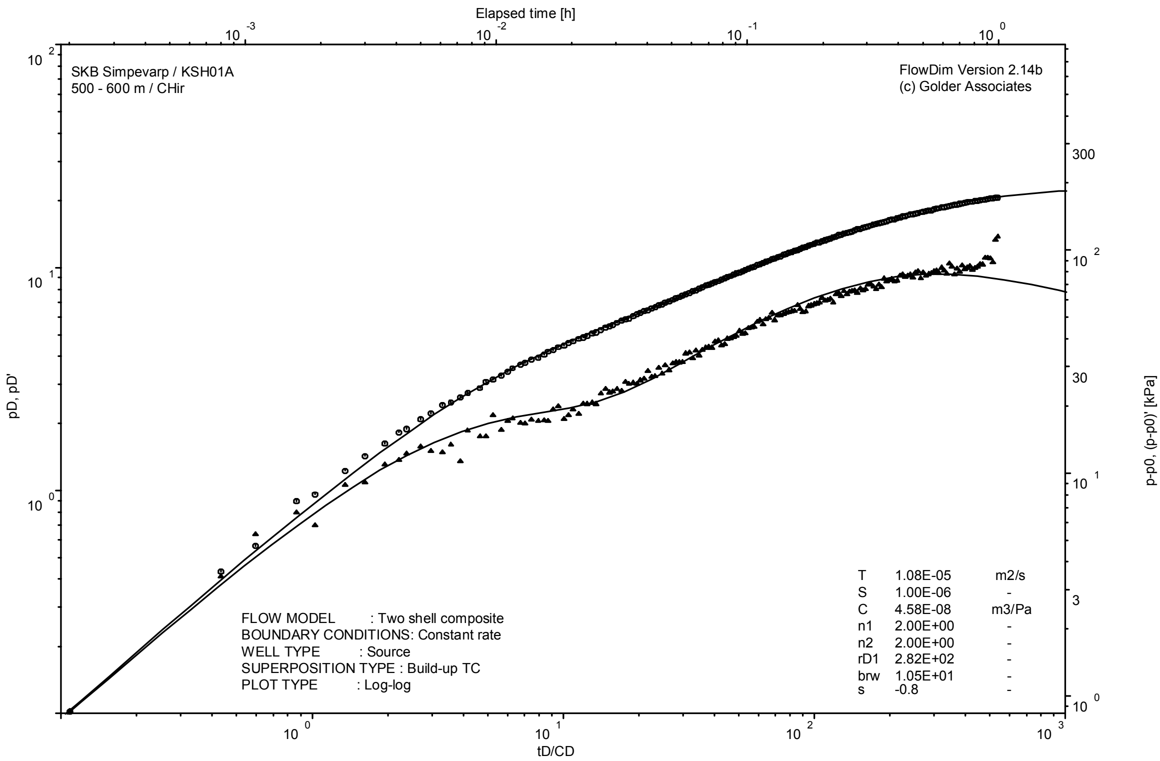
Interval pressure and temperature vs. time; cartesian plot (analysed)



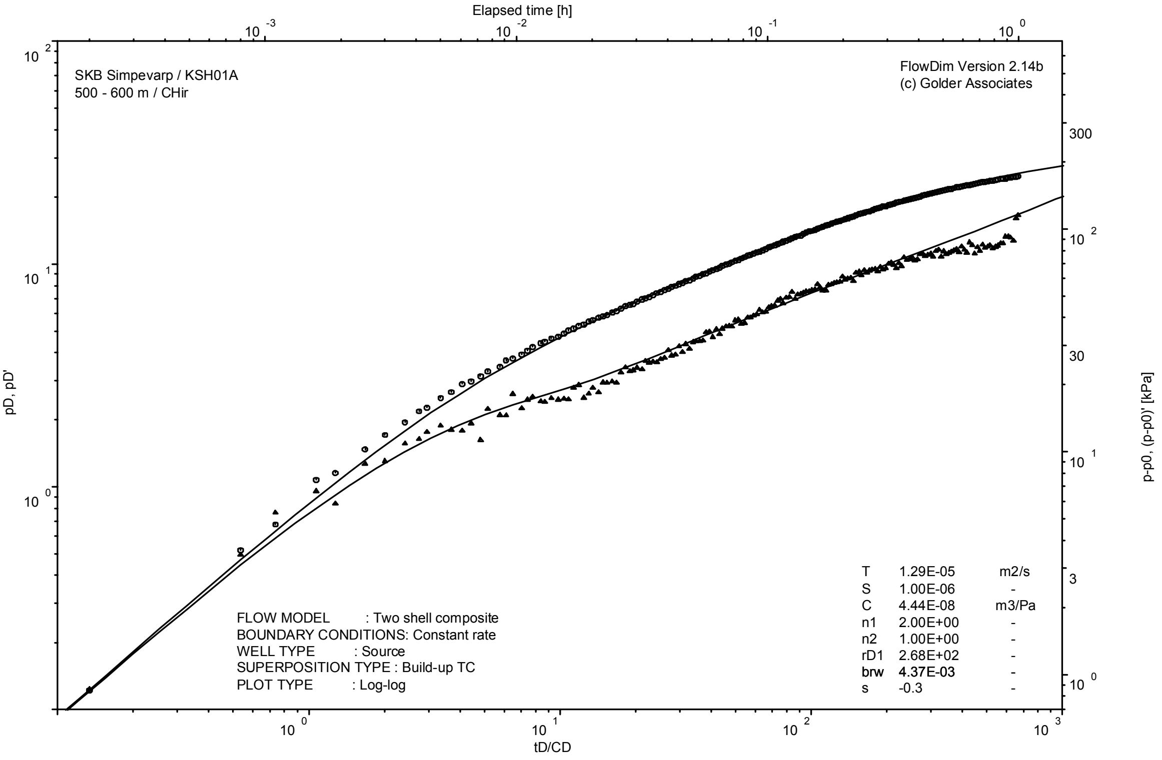
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

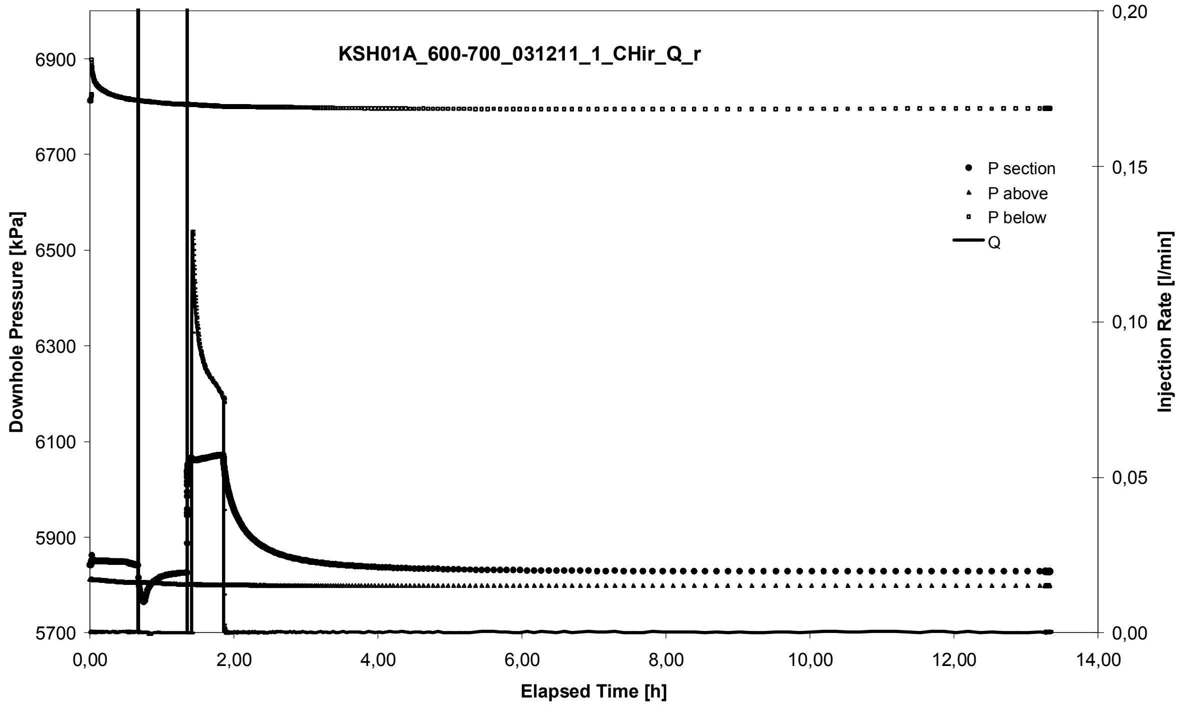


CHIR phase; alternative log-log match (n2=1, linear flow)

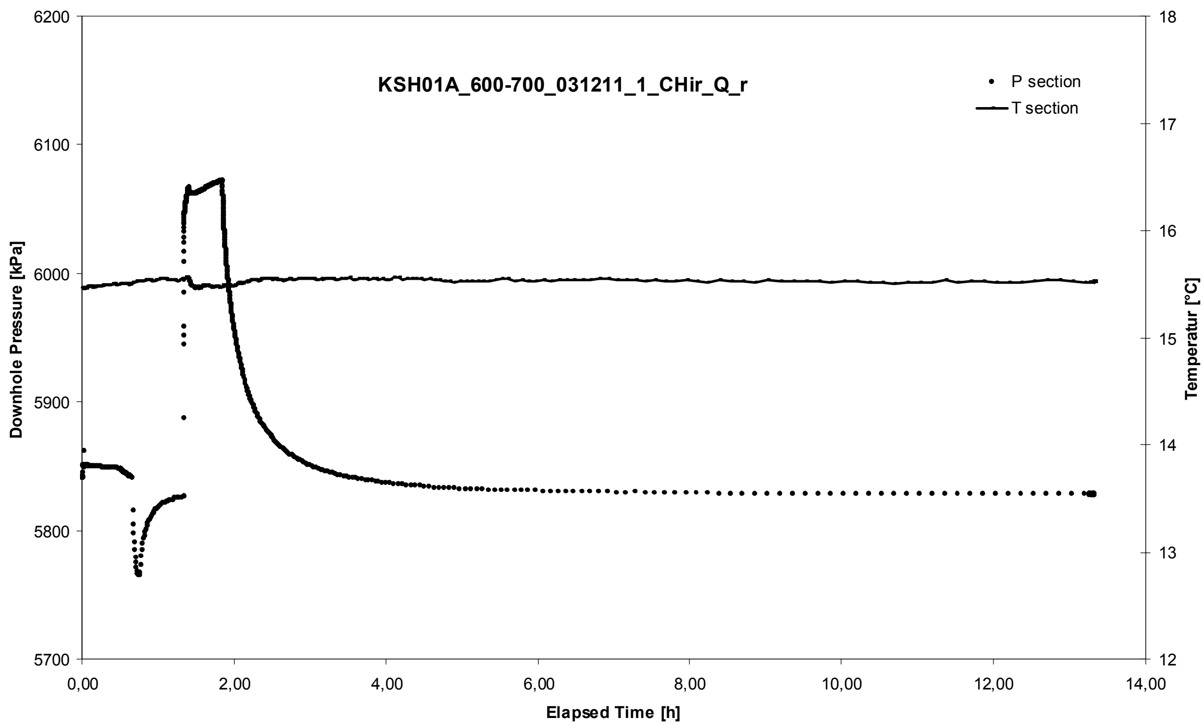
APPENDIX 2-6

Test 600 – 700 m

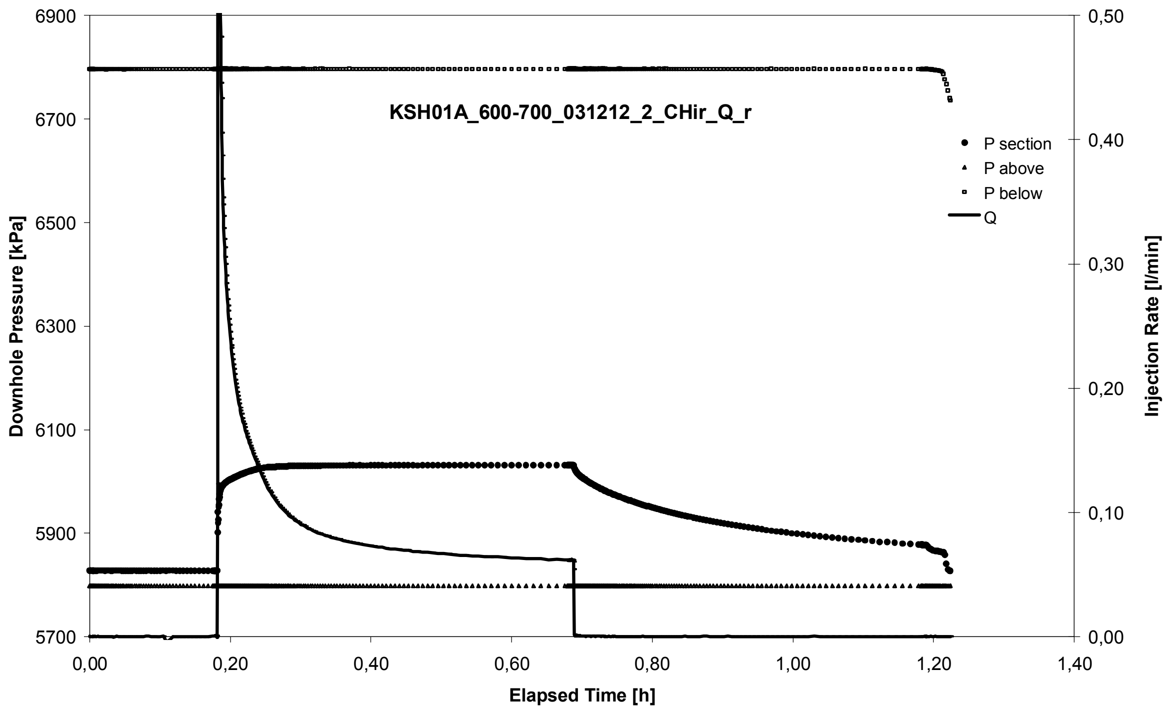
Analysis diagrams



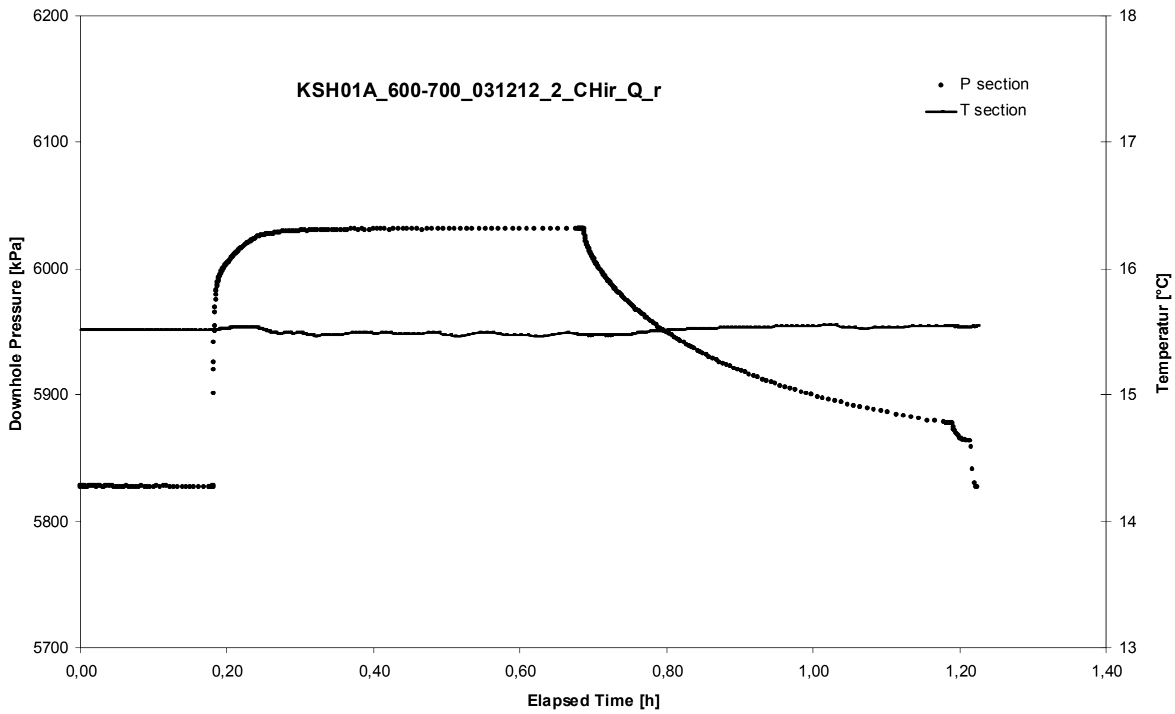
Pressure and flow rate vs. time; cartesian plot (test repeated)



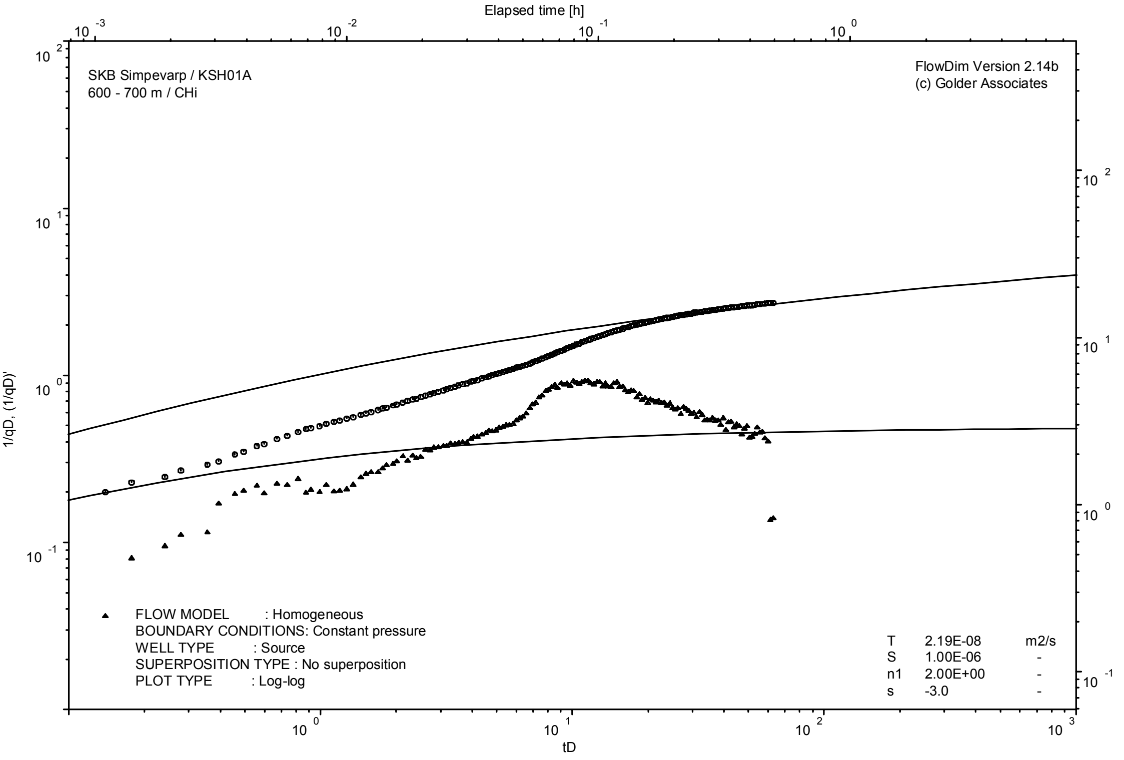
Interval pressure and temperature vs. time; cartesian plot (test repeated)



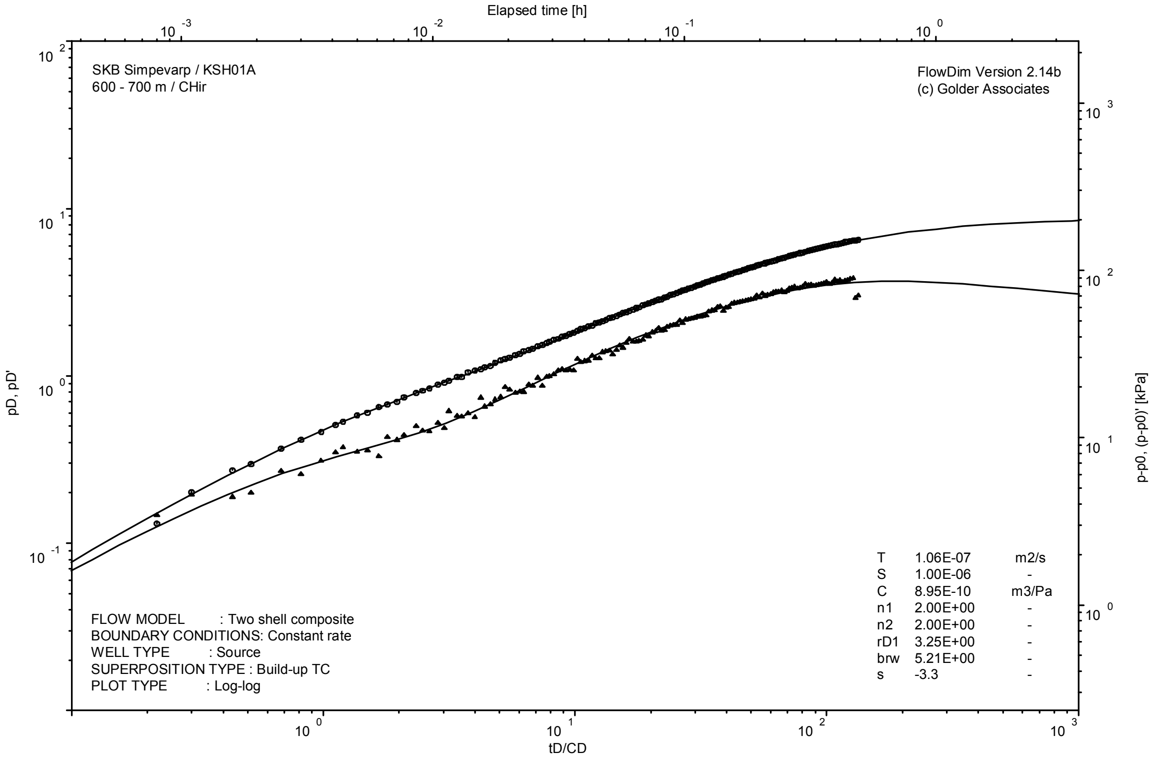
Pressure and flow rate vs. time; cartesian plot (analysed)



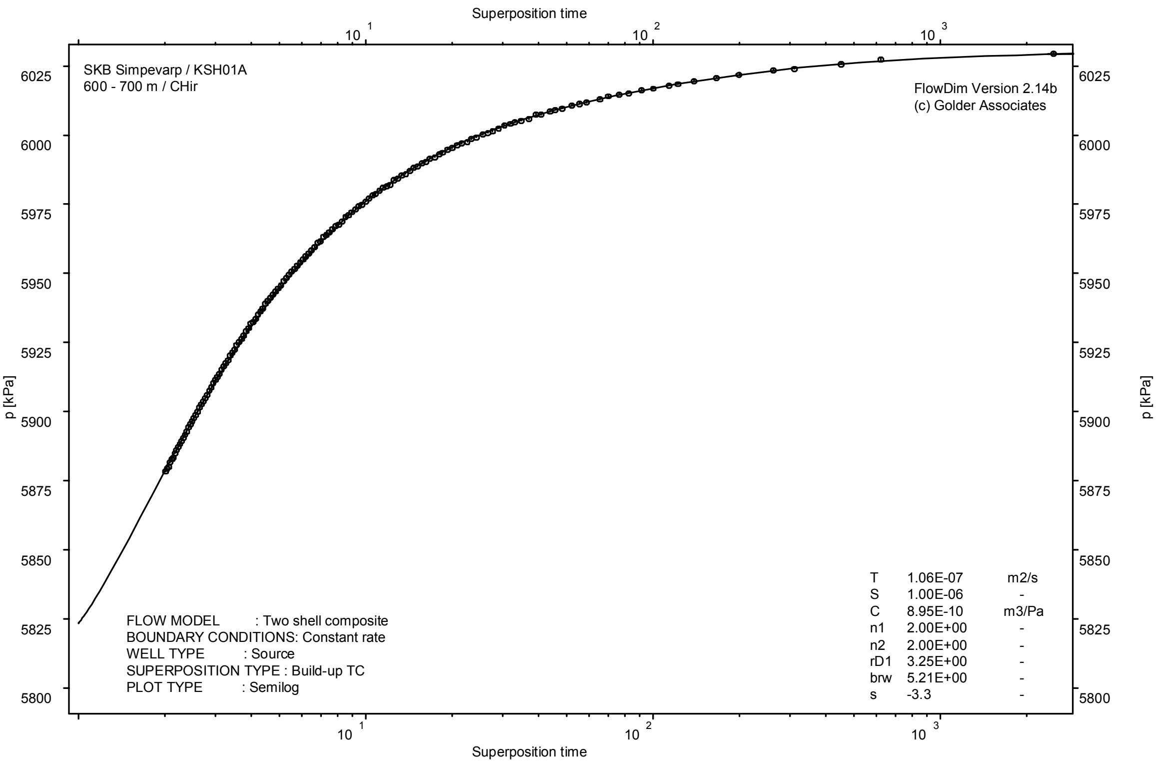
Interval pressure and temperature vs. time; cartesian plot (analysed)



CHI phase; log-log match



CHIR phase; log-log match

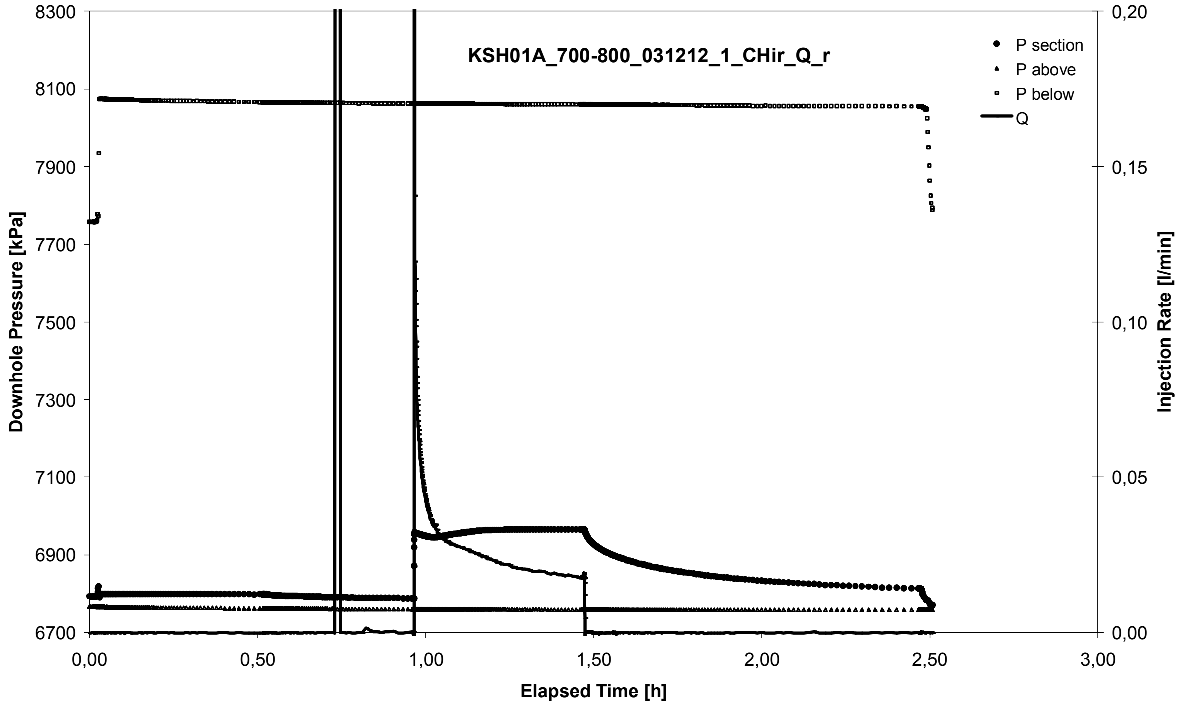


CHIR phase; HORNER match

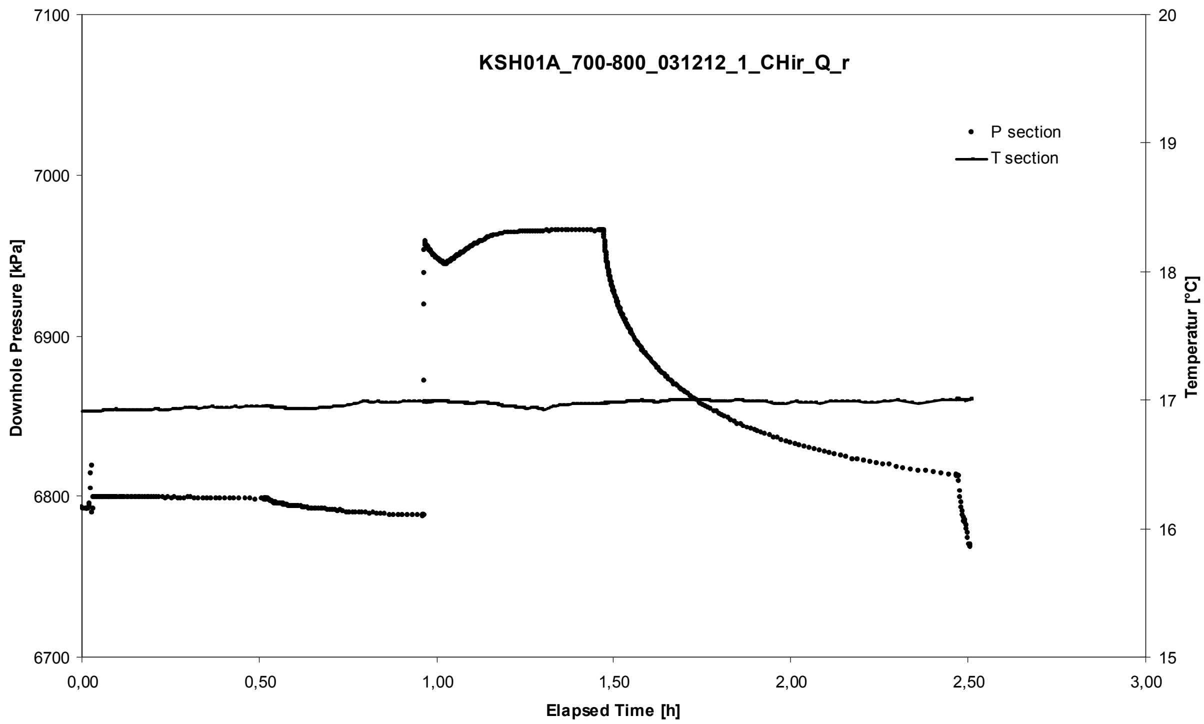
APPENDIX 2-7

Test 700 – 800 m

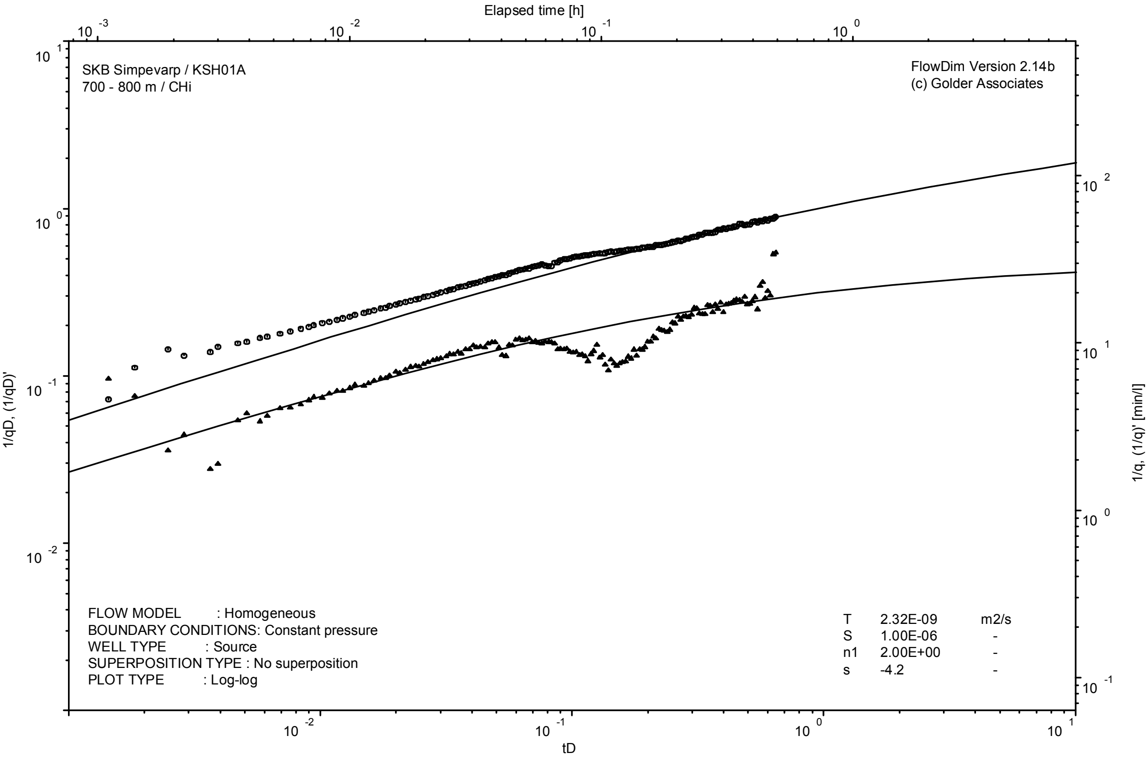
Analysis diagrams



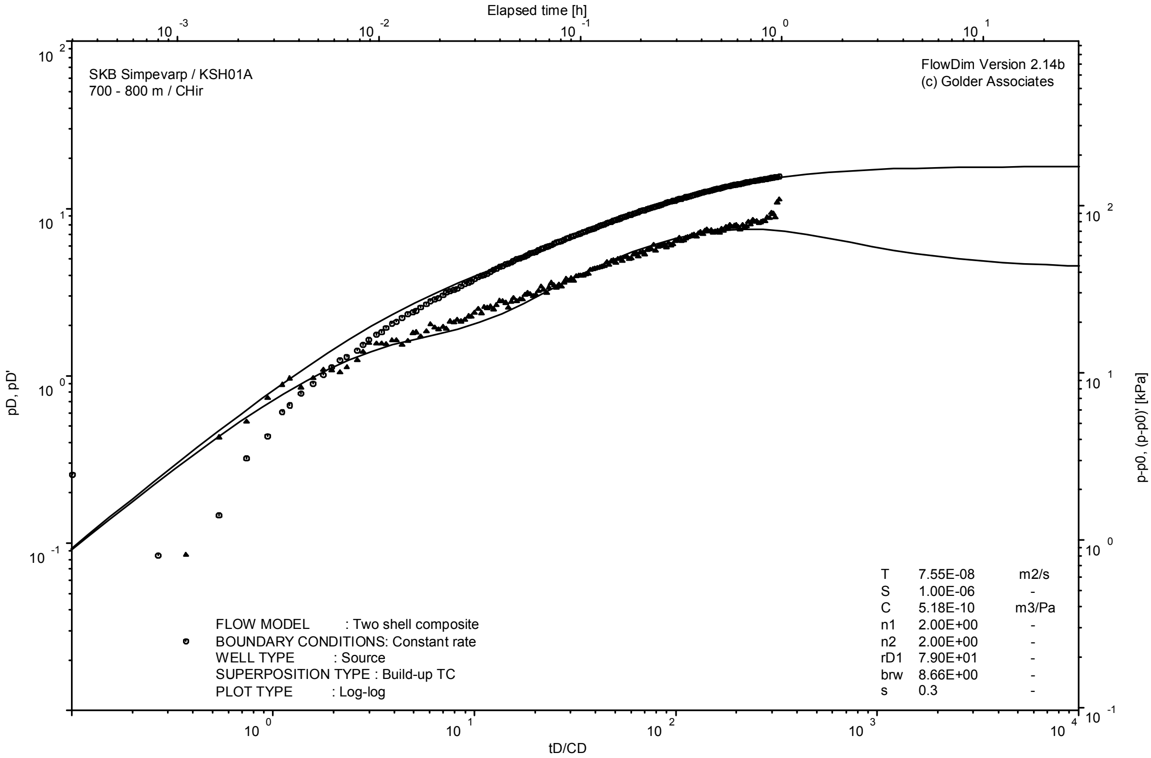
Pressure and flow rate vs. time; cartesian plot



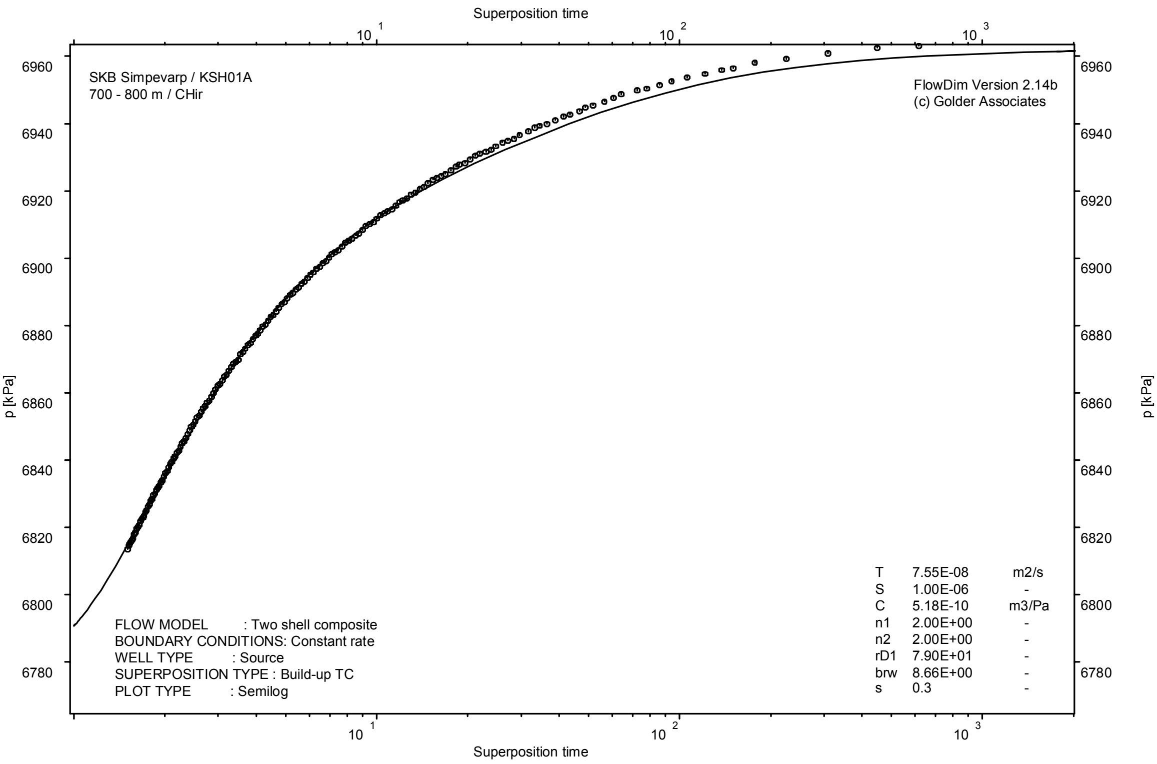
Interval pressure and temperature vs. time; cartesian plot



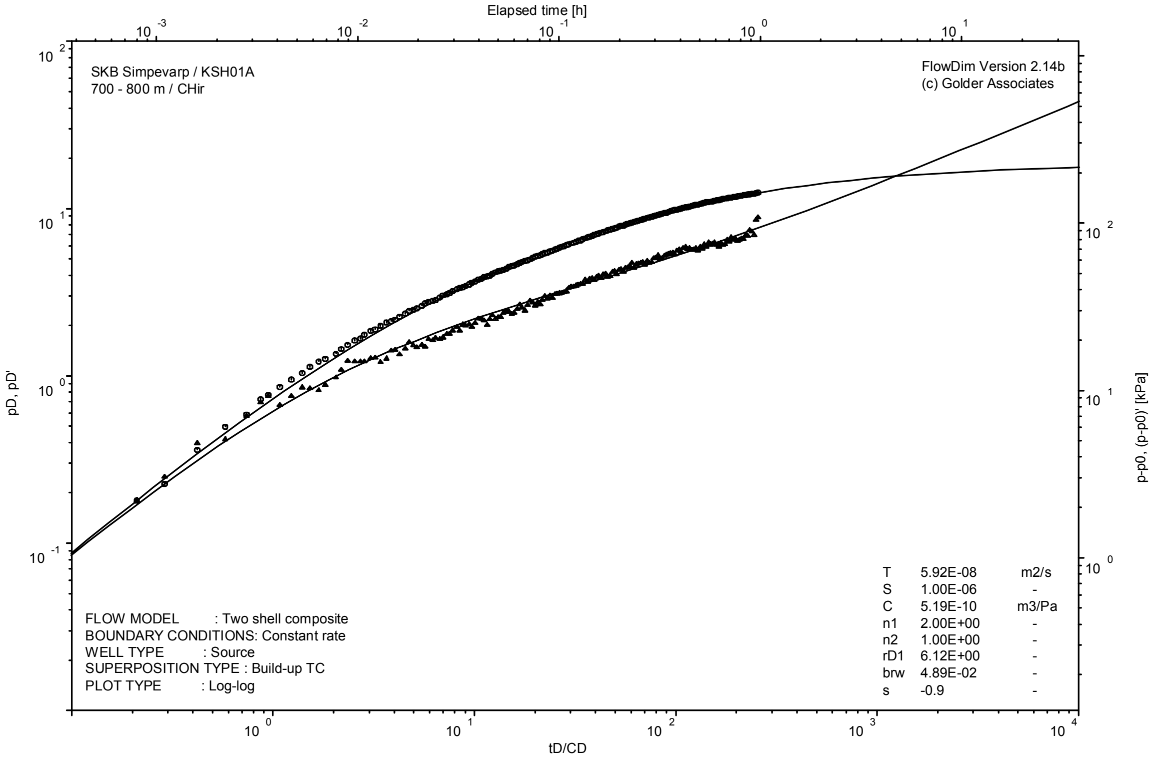
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

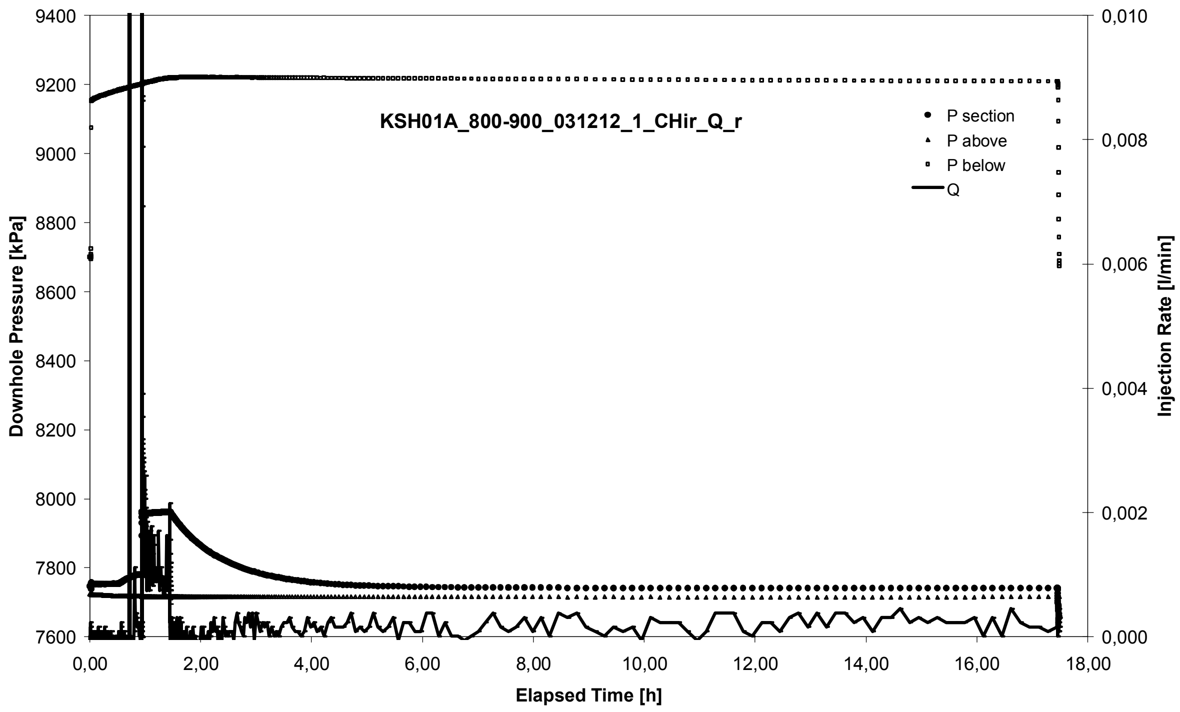


CHIR phase; alternative log-log match (n2=1, linear flow)

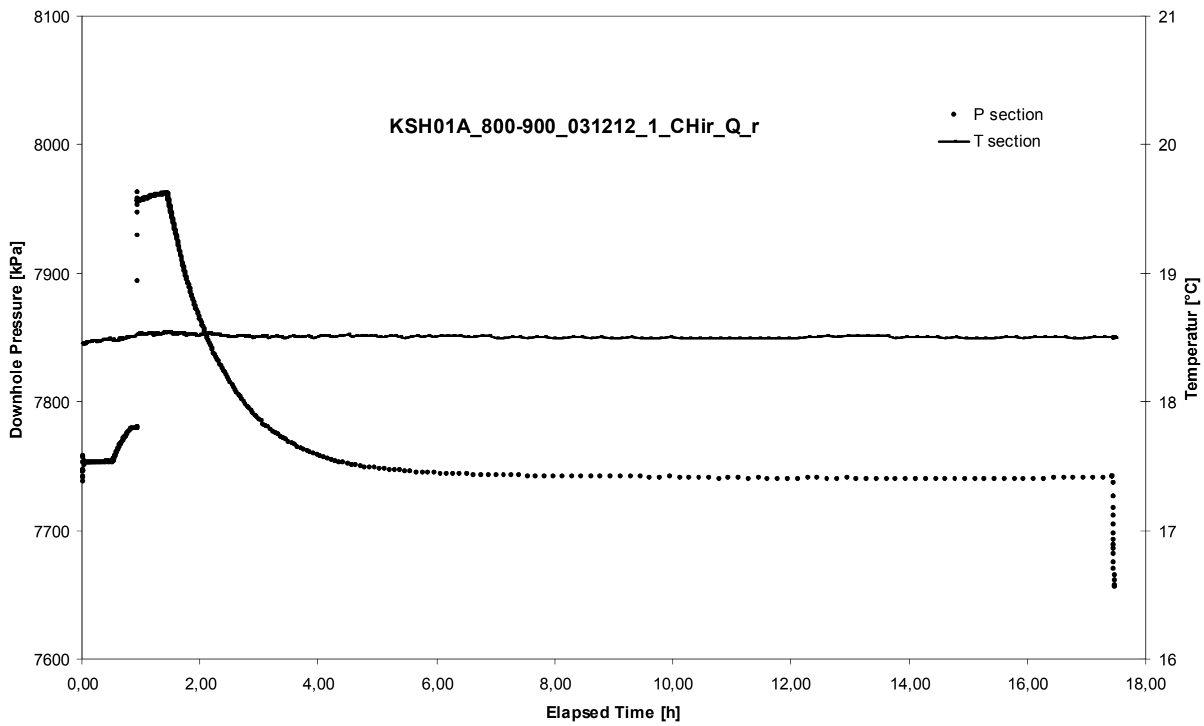
APPENDIX 2-8

Test 800 – 900 m

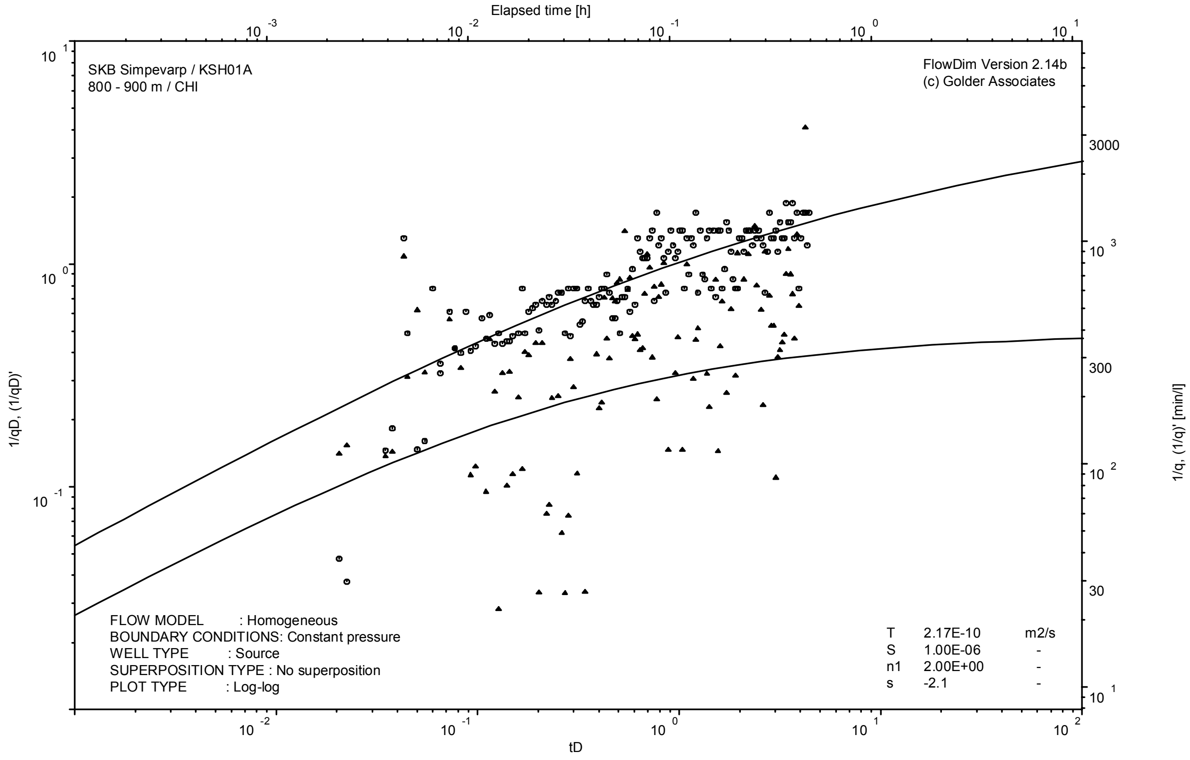
Analysis diagrams



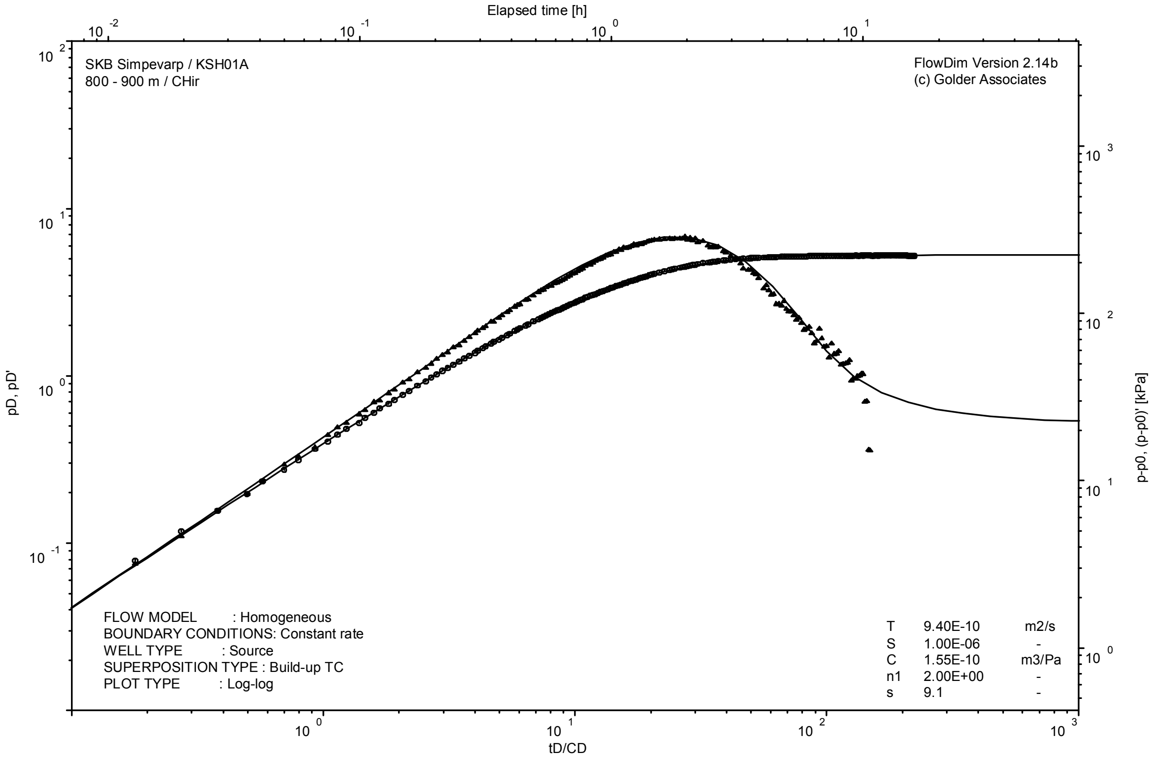
Pressure and flow rate vs. time; cartesian plot



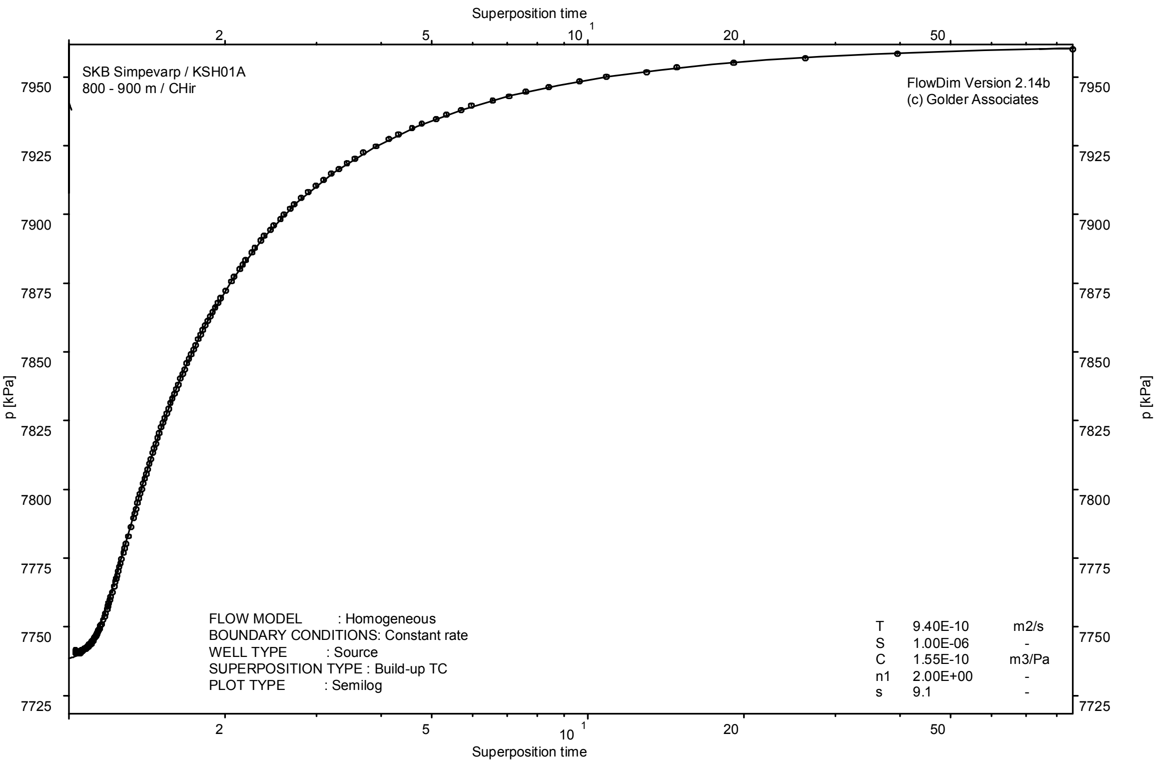
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

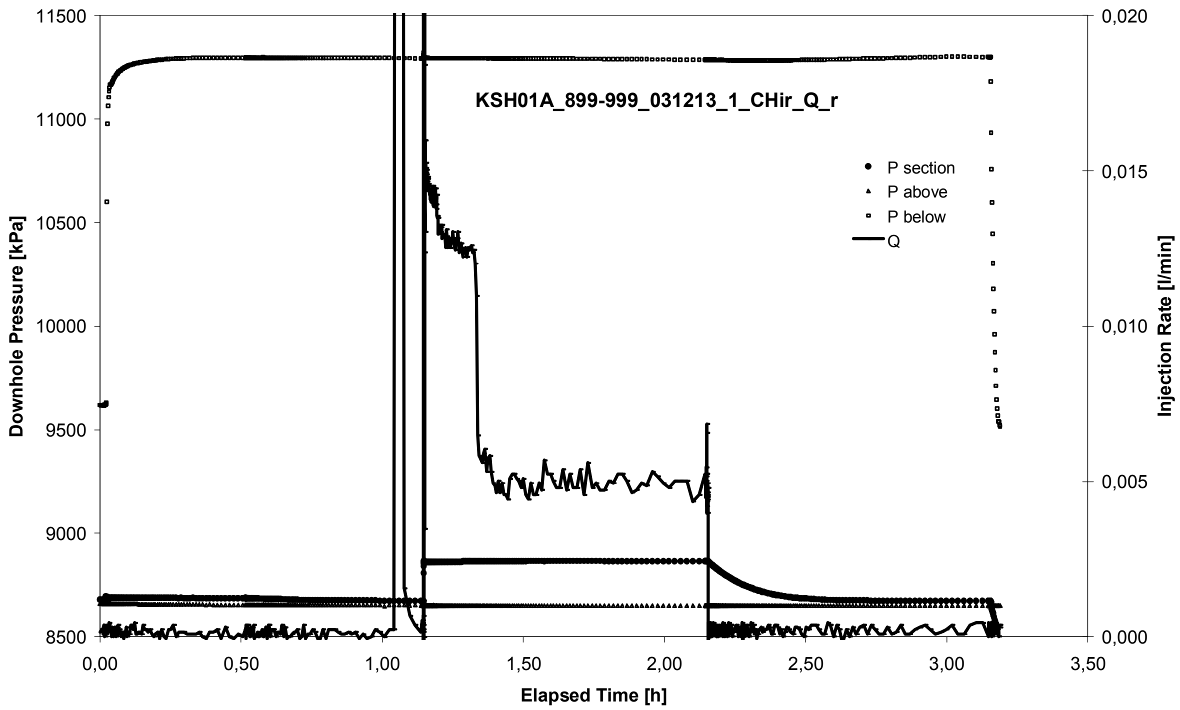


CHIR phase; HORNER match

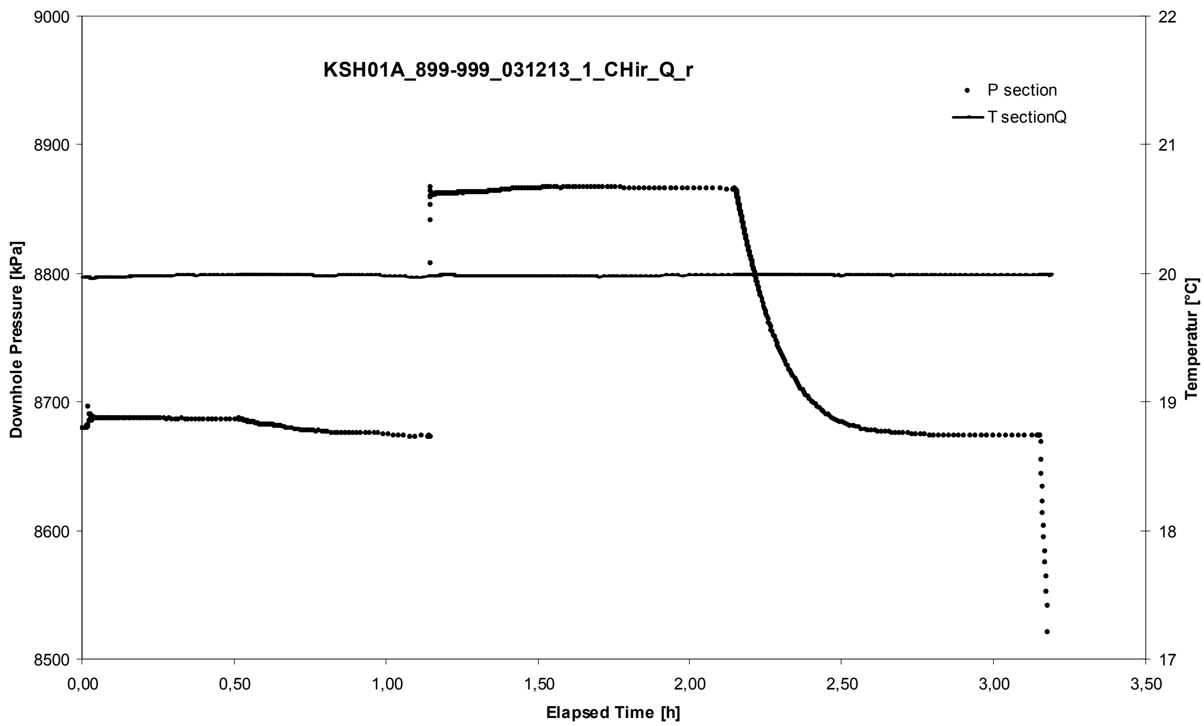
APPENDIX 2-9

Test 899 – 999 m

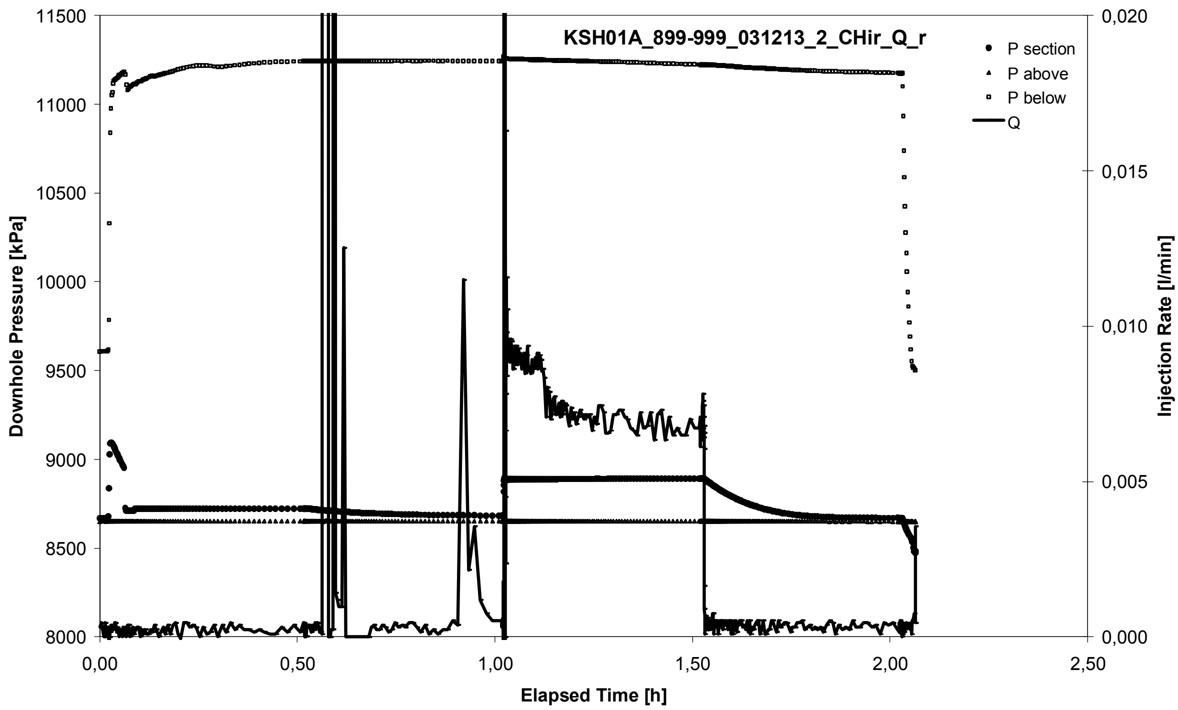
Analysis diagrams



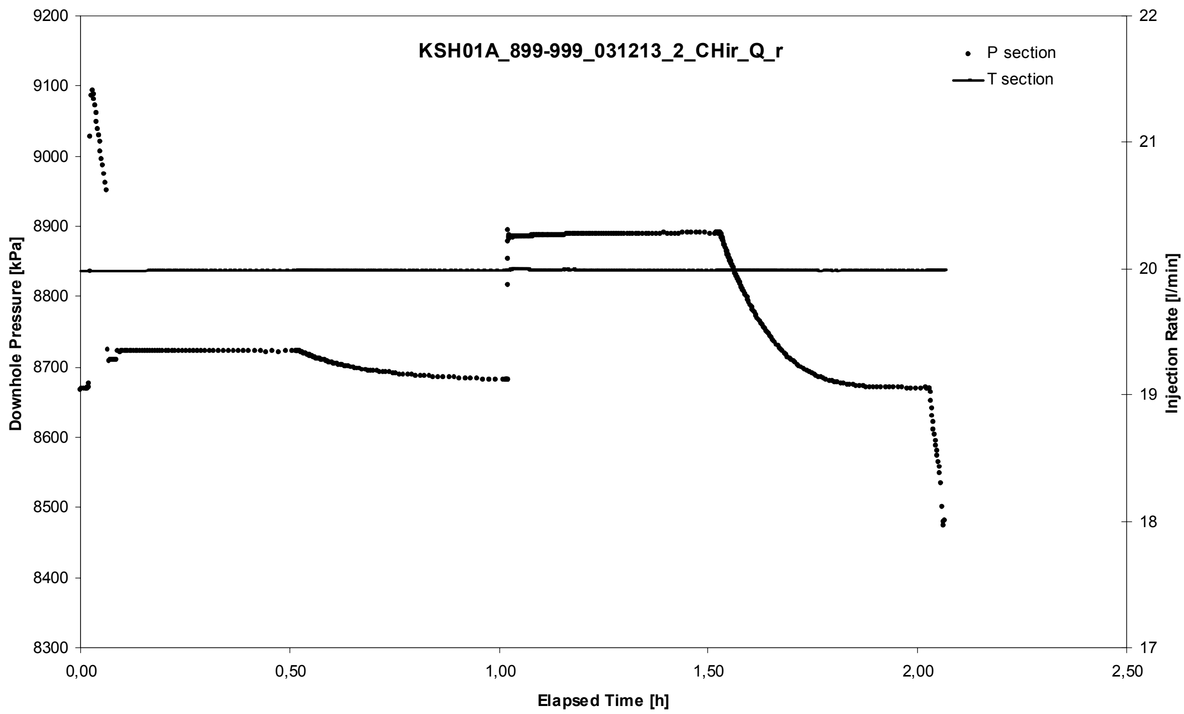
Pressure and flow rate vs. time; cartesian plot (test repeated)



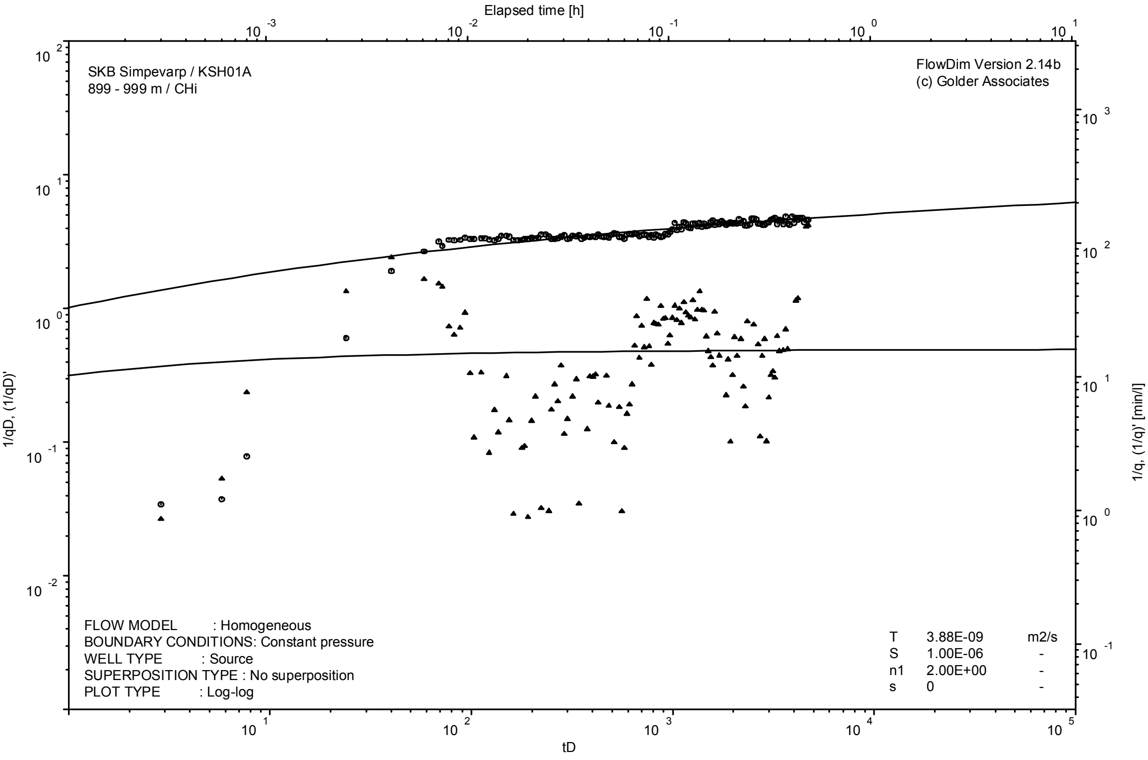
Interval pressure and temperature vs. time; cartesian plot (test repeated)



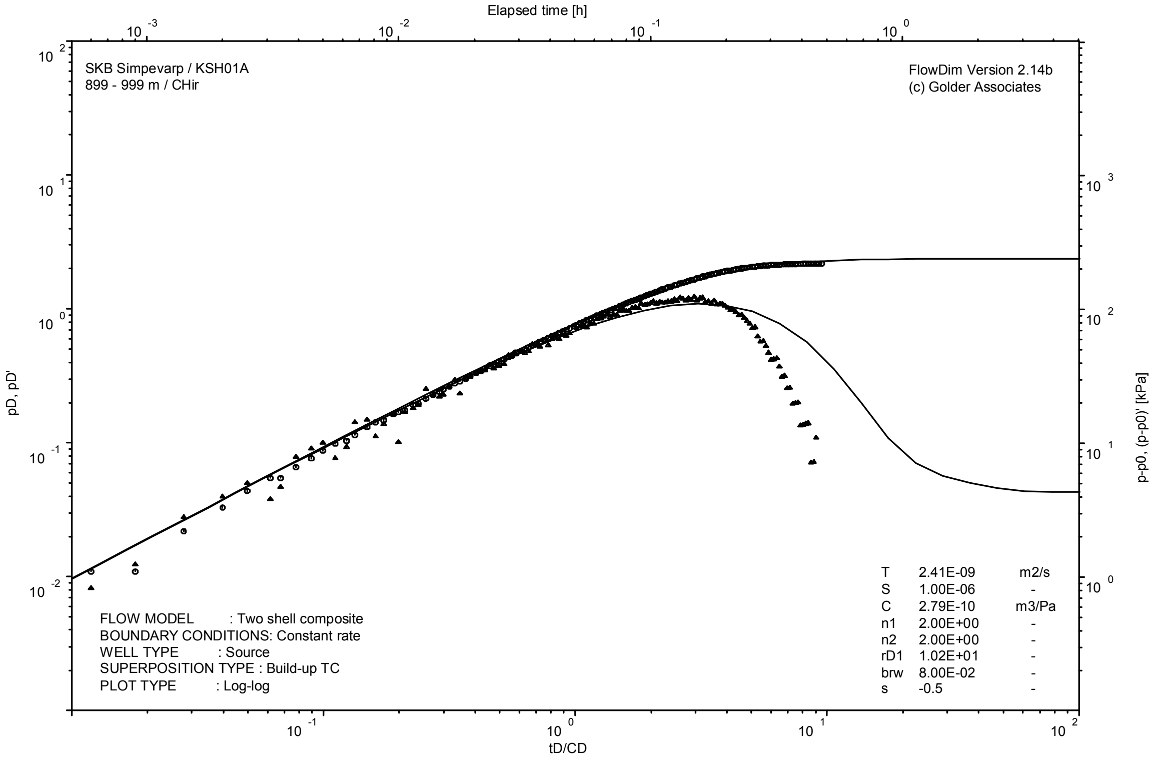
Pressure and flow rate vs. time; cartesian plot (analysed)



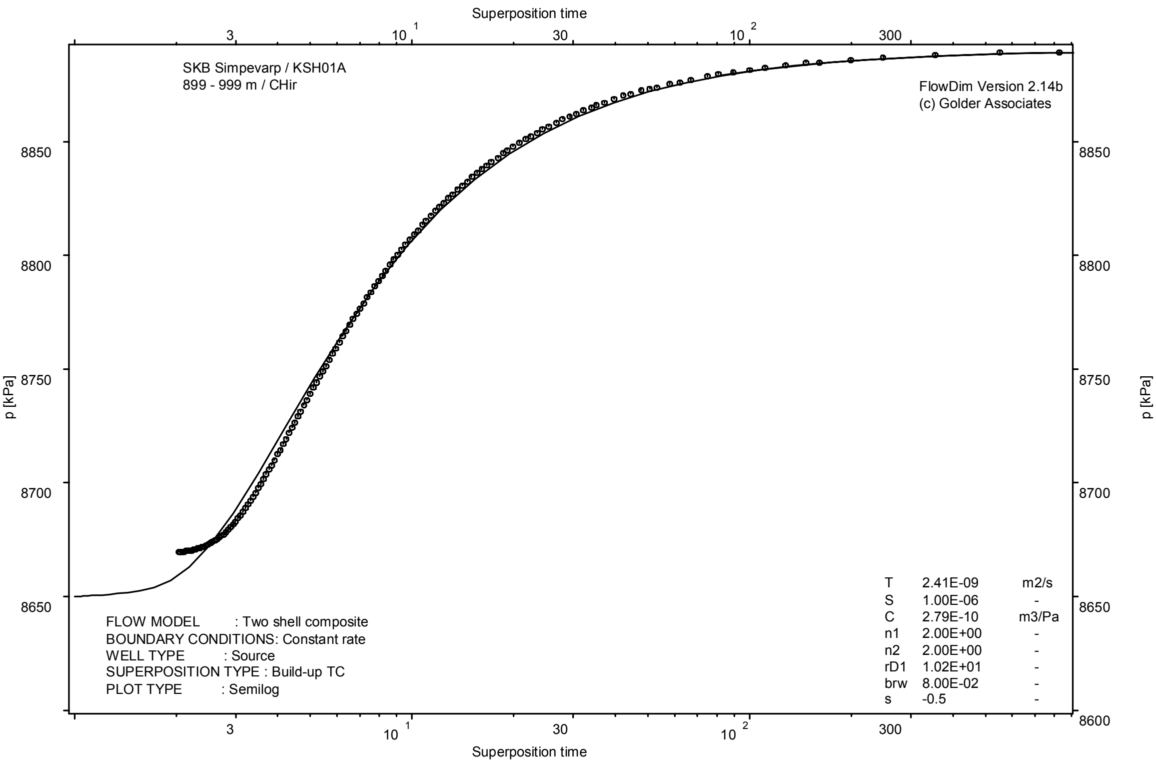
Interval pressure and temperature vs. time; cartesian plot (analysed)



CHI phase; log-log match



CHIR phase; log-log match

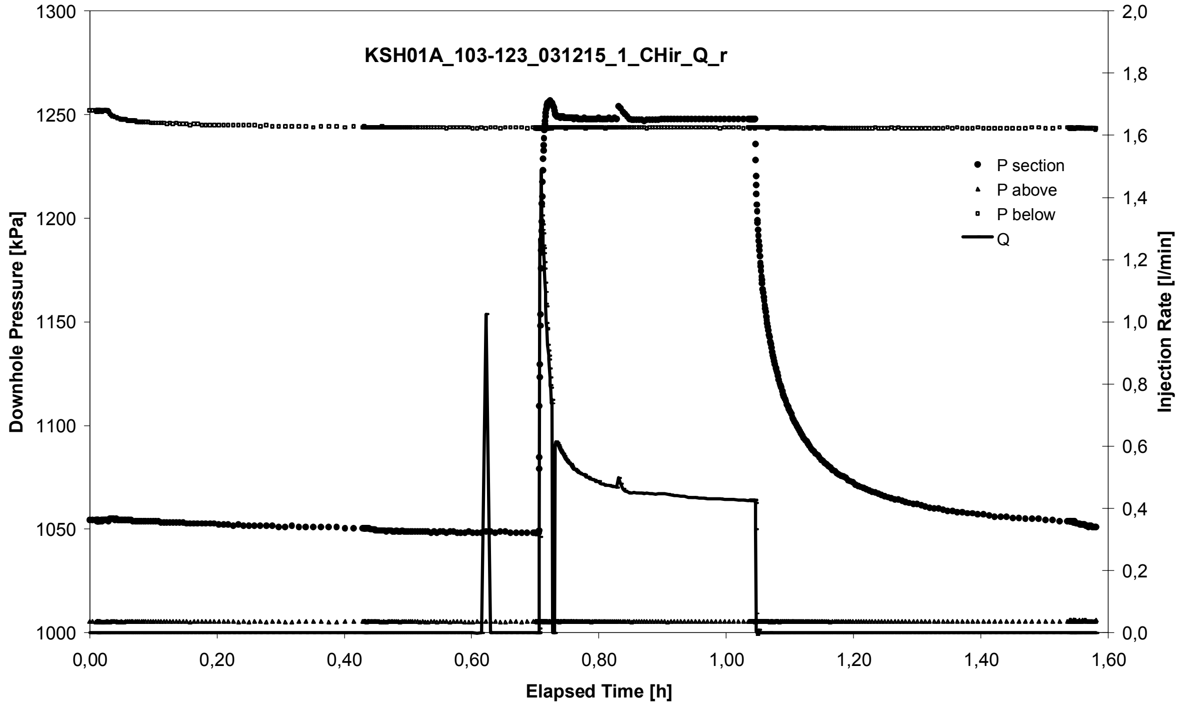


CHIR phase; HORNER match

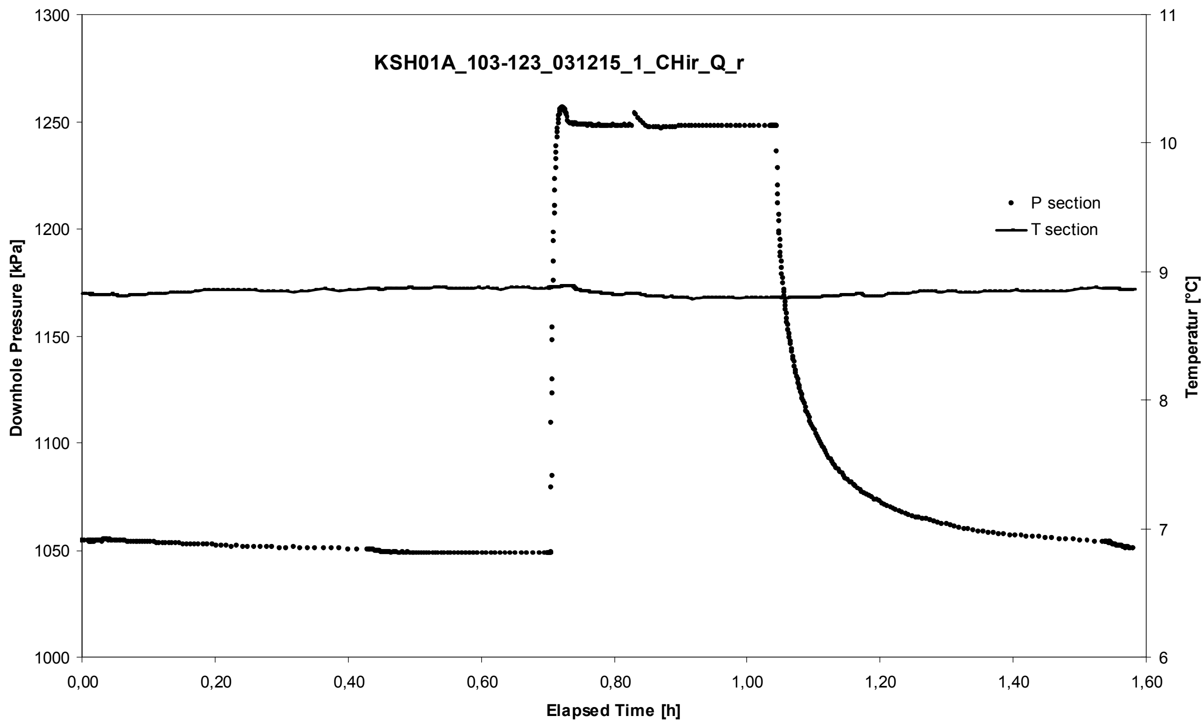
APPENDIX 2-10

Test 103 – 123 m

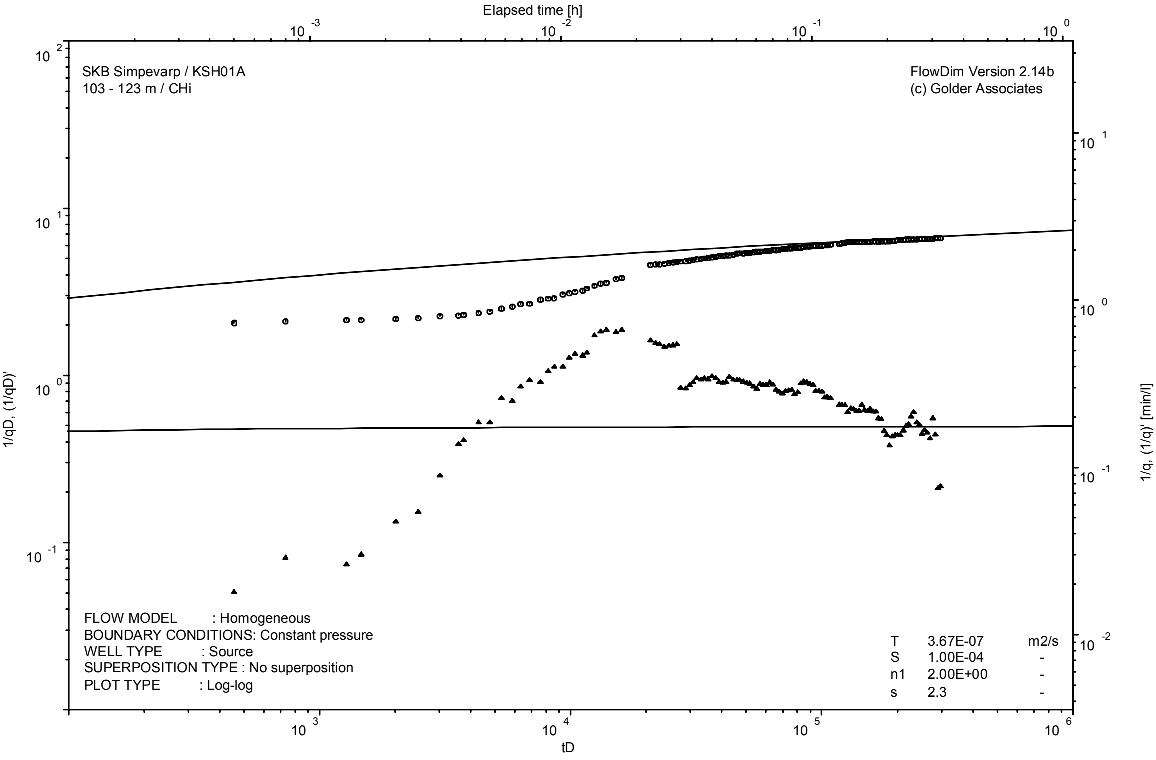
Analysis diagrams



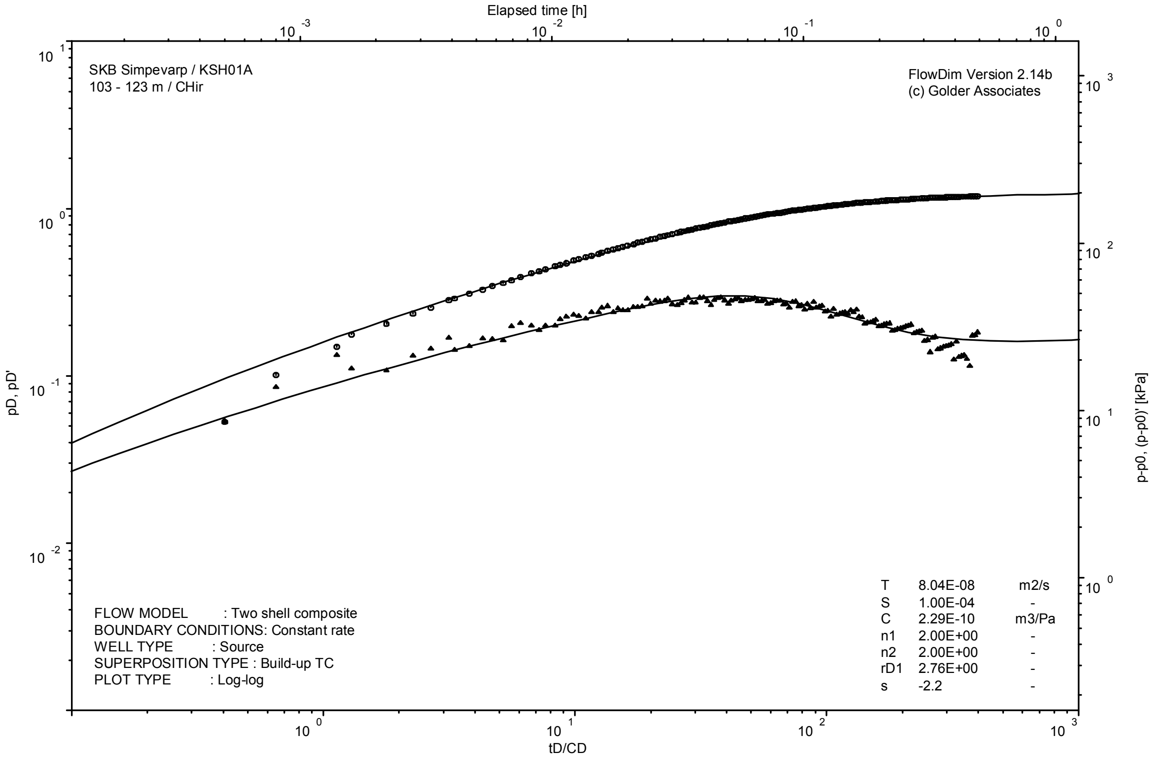
Pressure and flow rate vs. time; cartesian plot



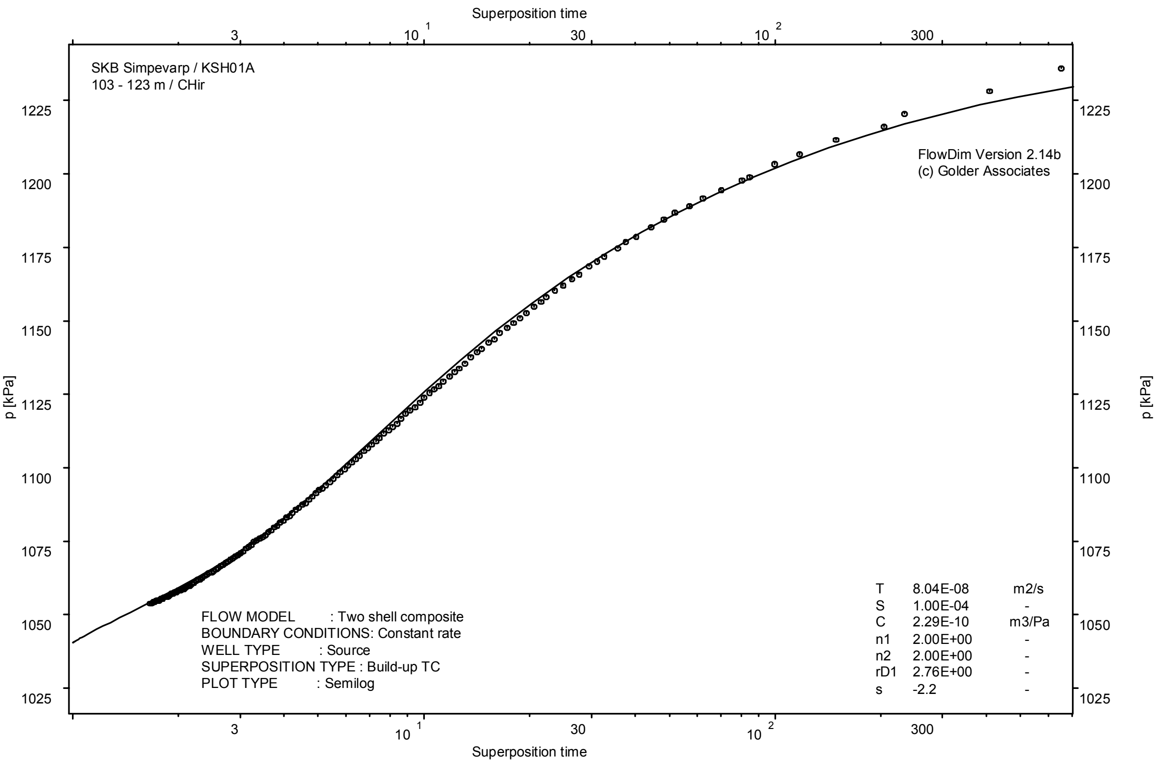
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

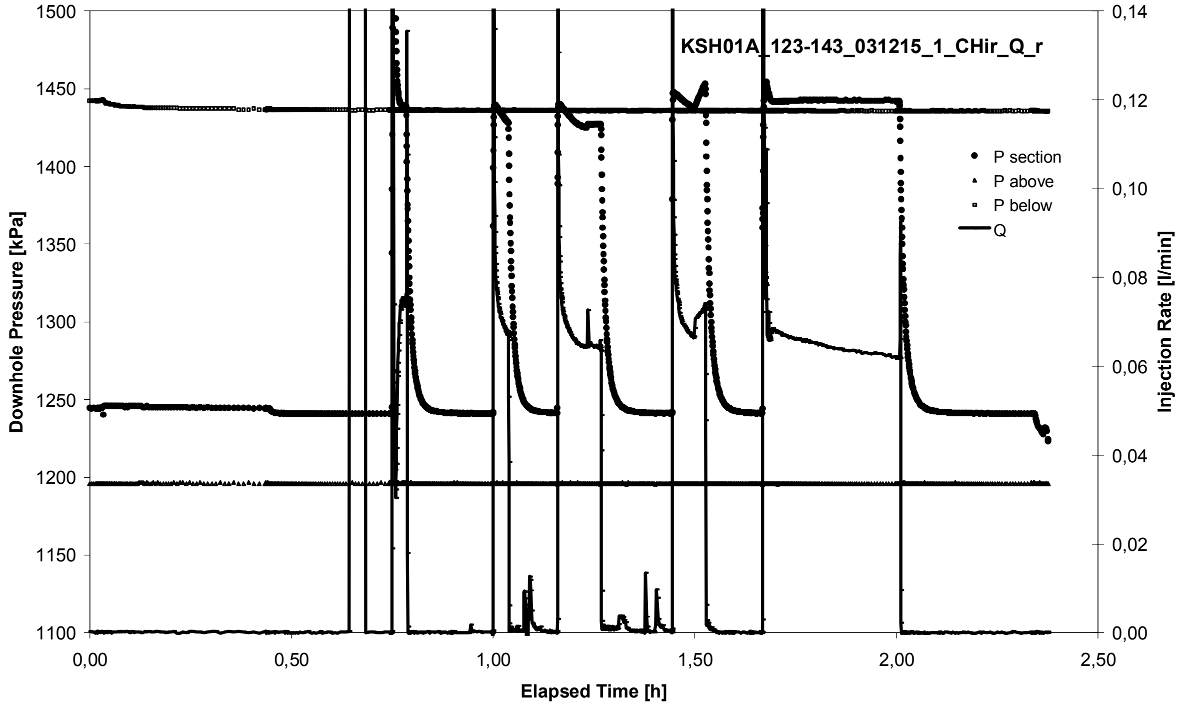


CHIR phase; HORNER match

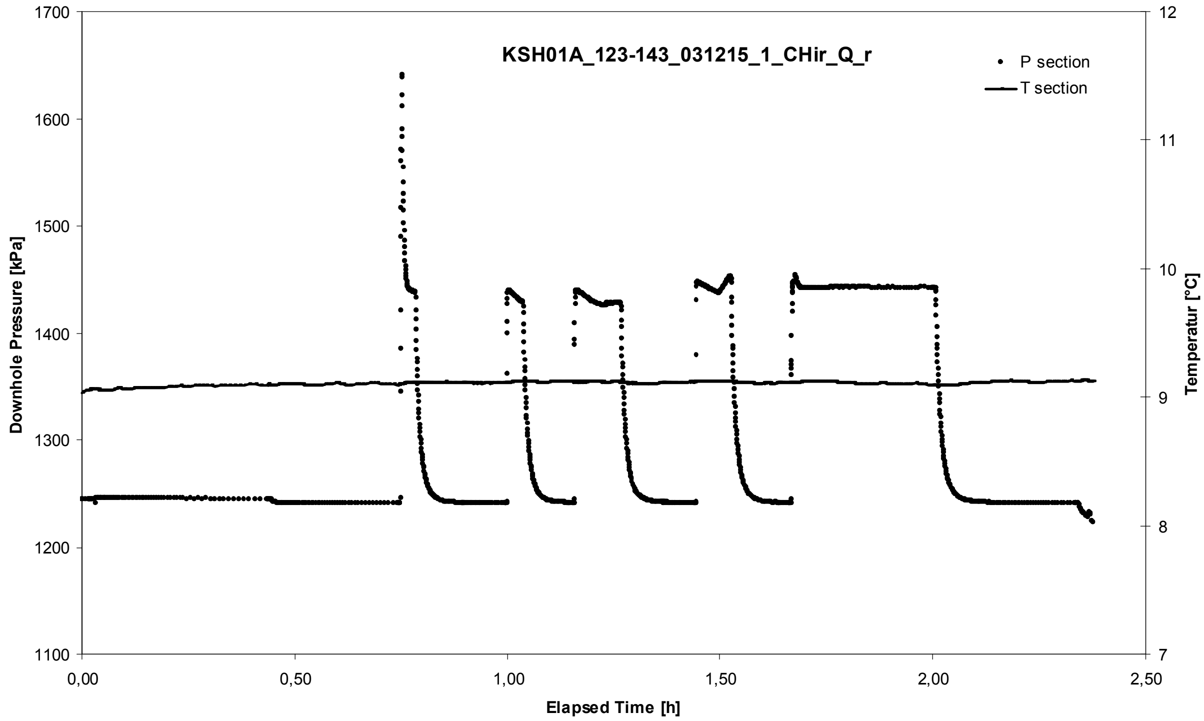
APPENDIX 2-11

Test 123 – 143 m

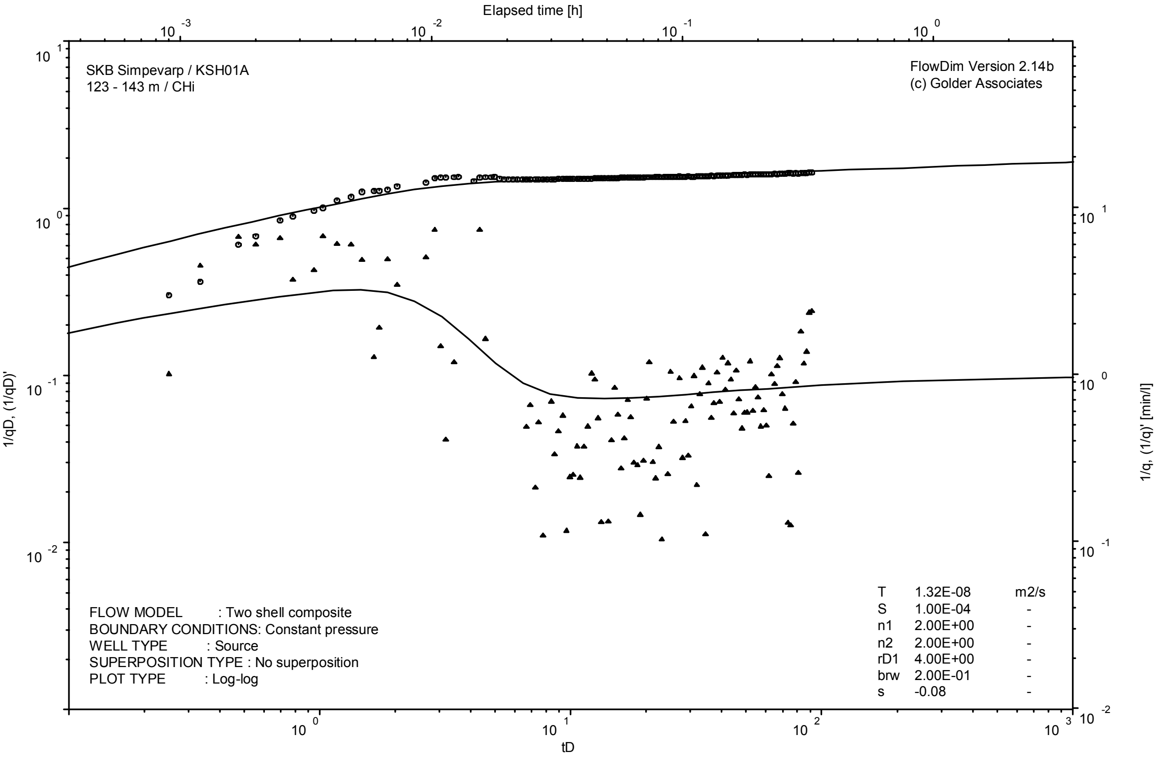
Analysis diagrams



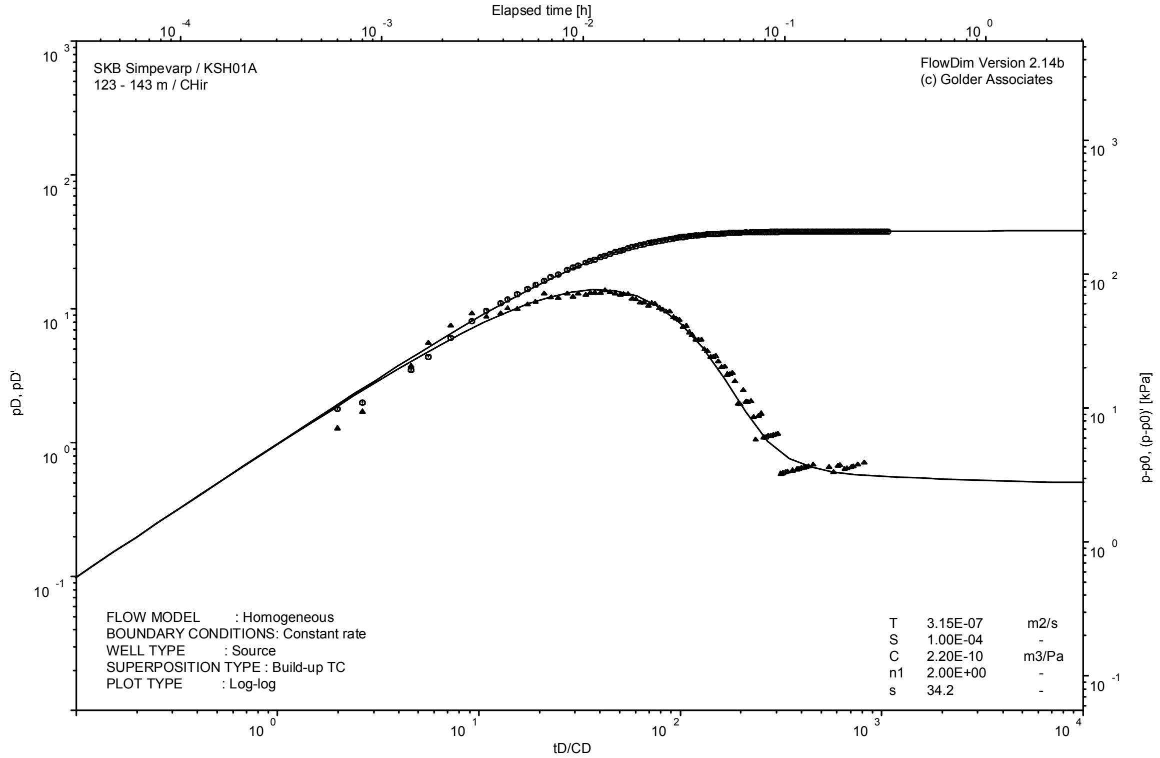
Pressure and flow rate vs. time; cartesian plot



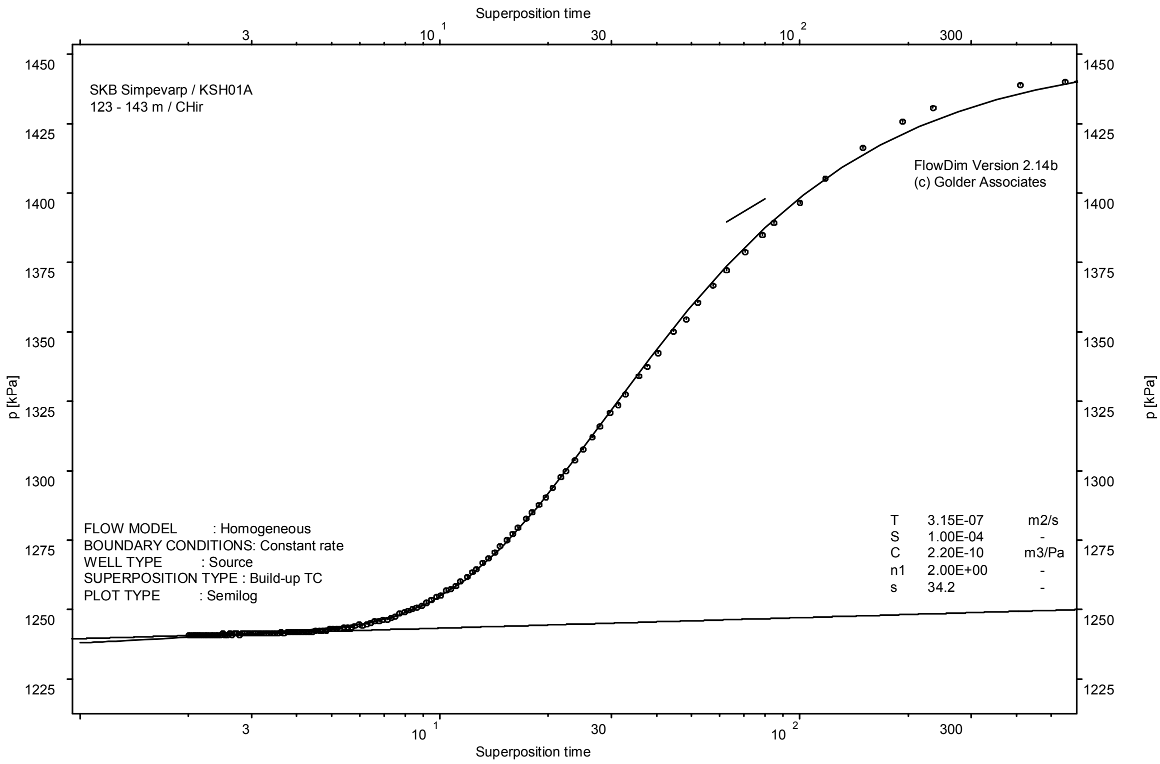
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

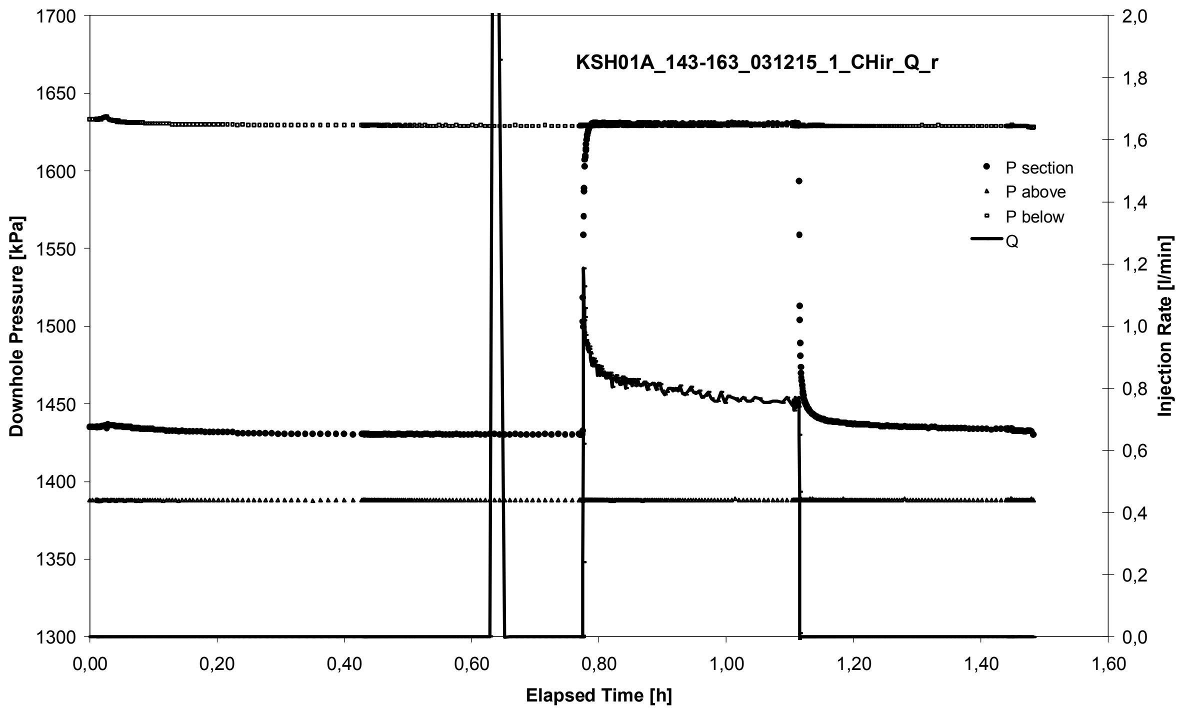


CHIR phase; HORNER match

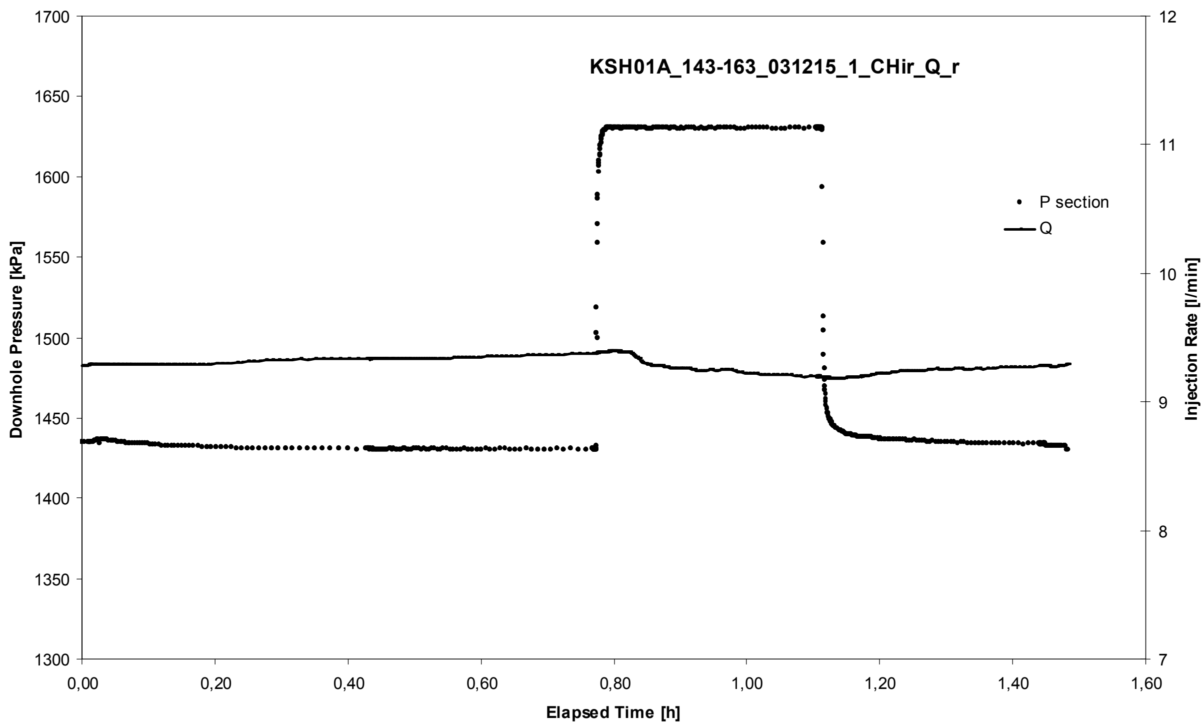
APPENDIX 2-12

Test 143 – 163 m

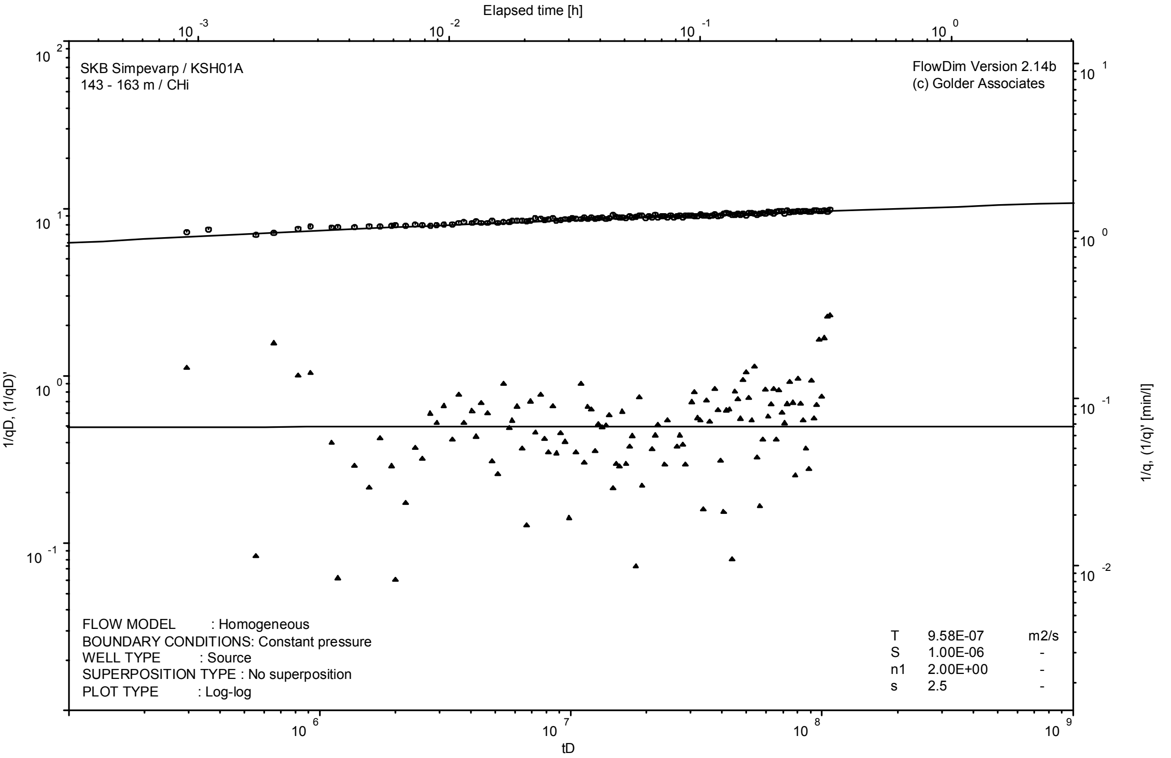
Analysis diagrams



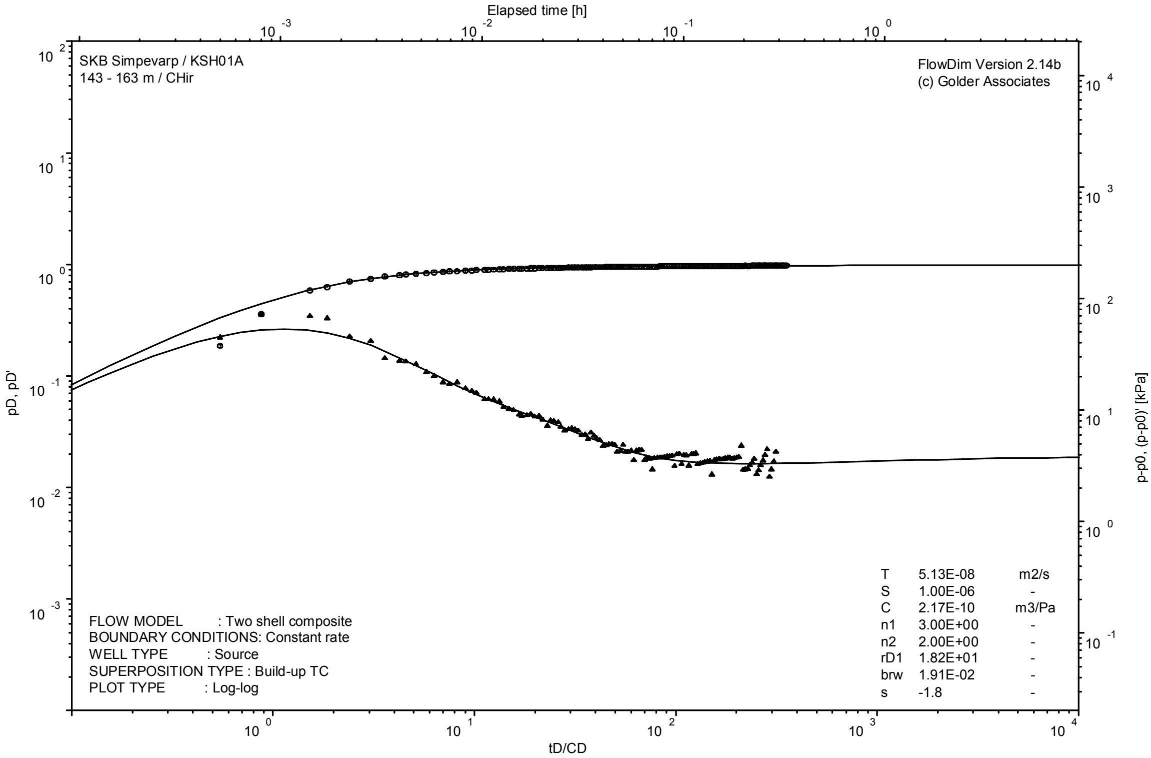
Pressure and flow rate vs. time; cartesian plot



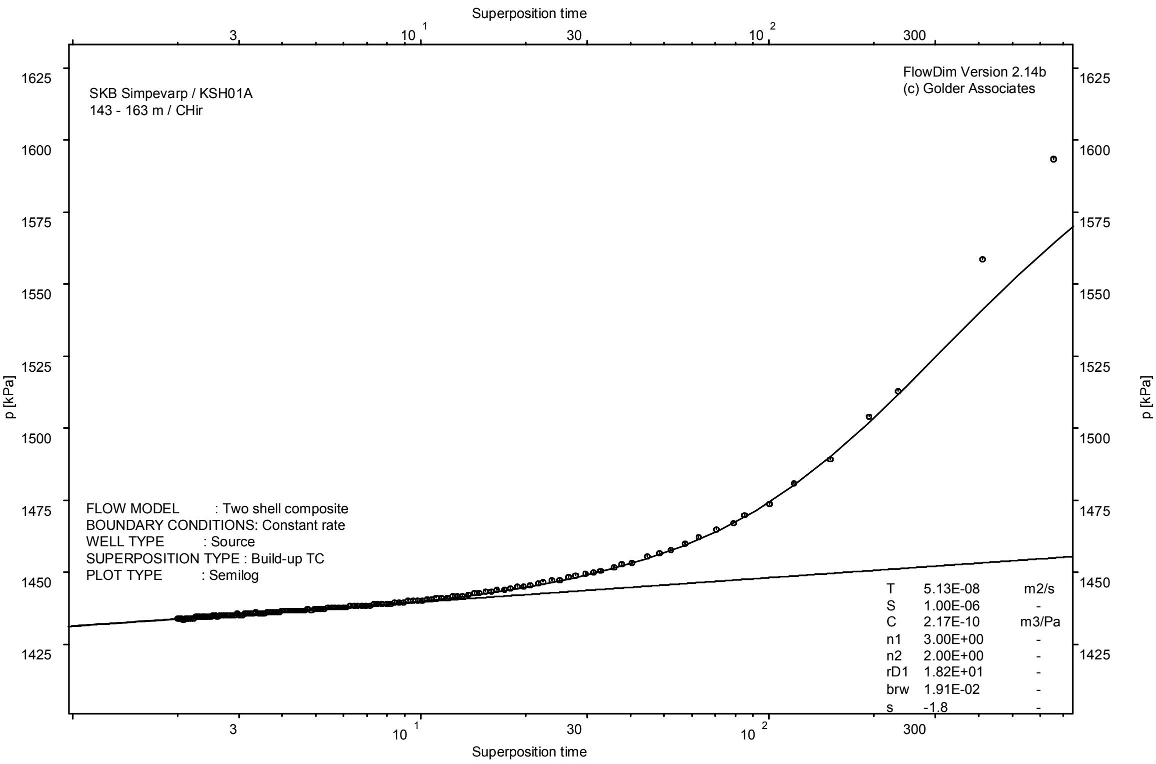
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

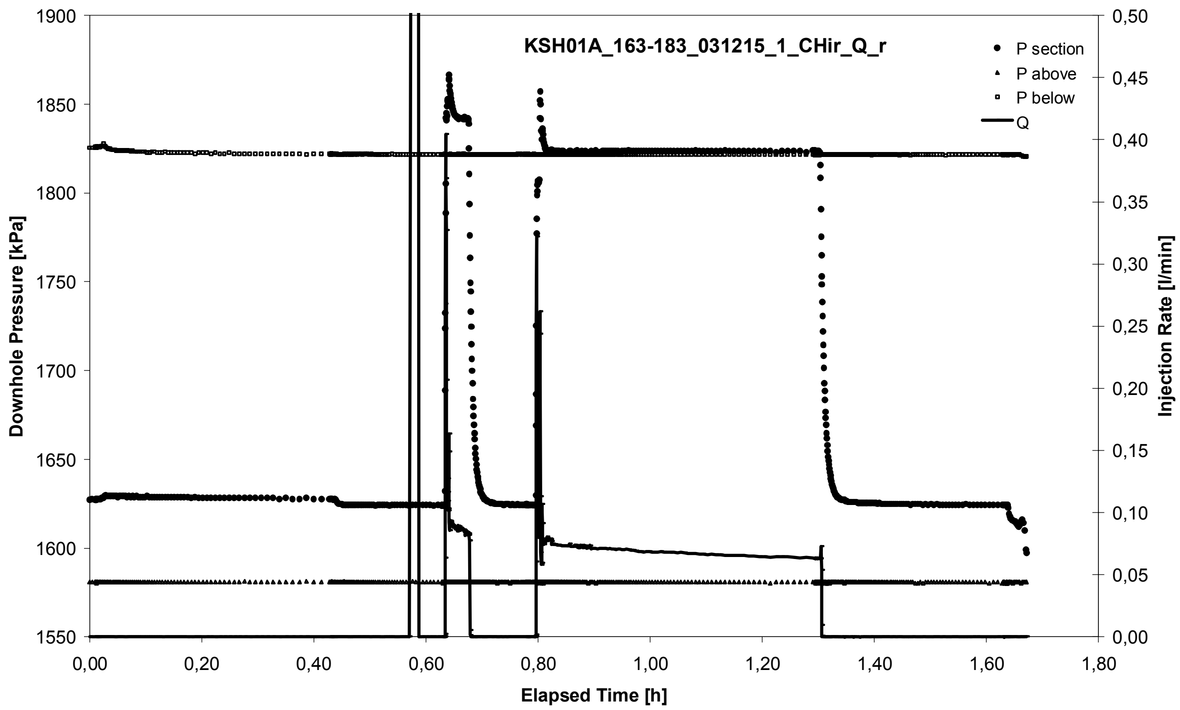


CHIR phase; HORNER match

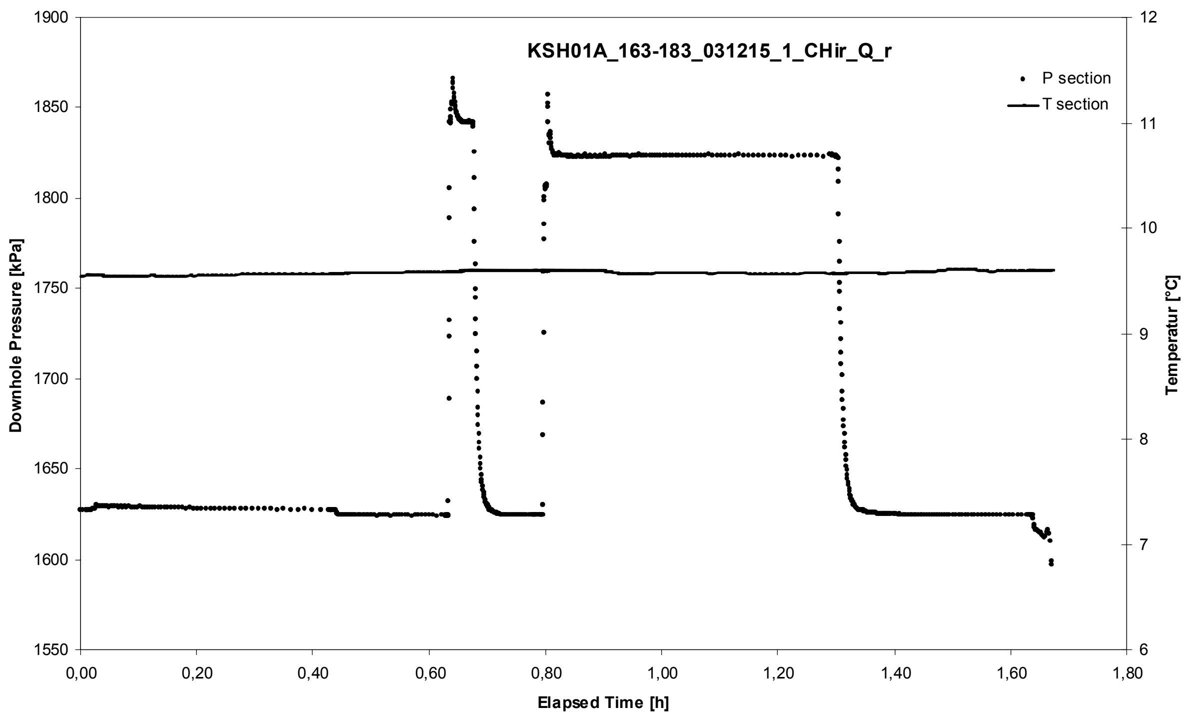
APPENDIX 2-13

Test 163 – 183 m

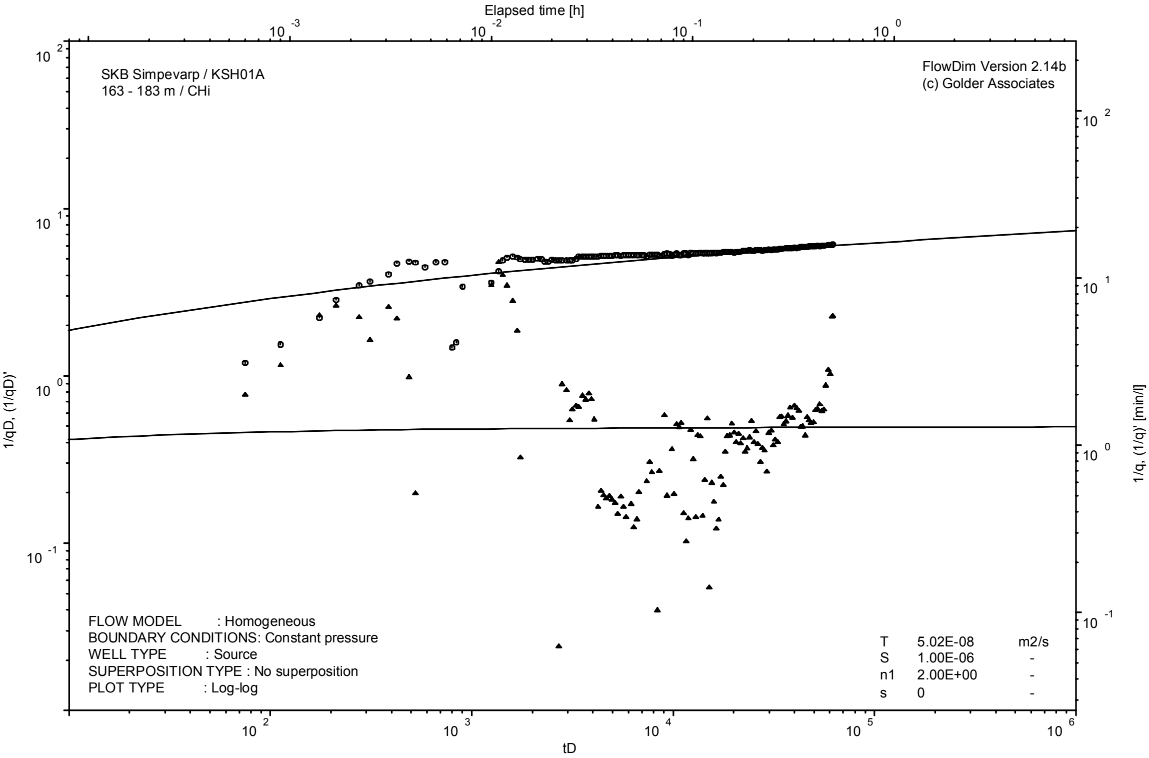
Analysis diagrams



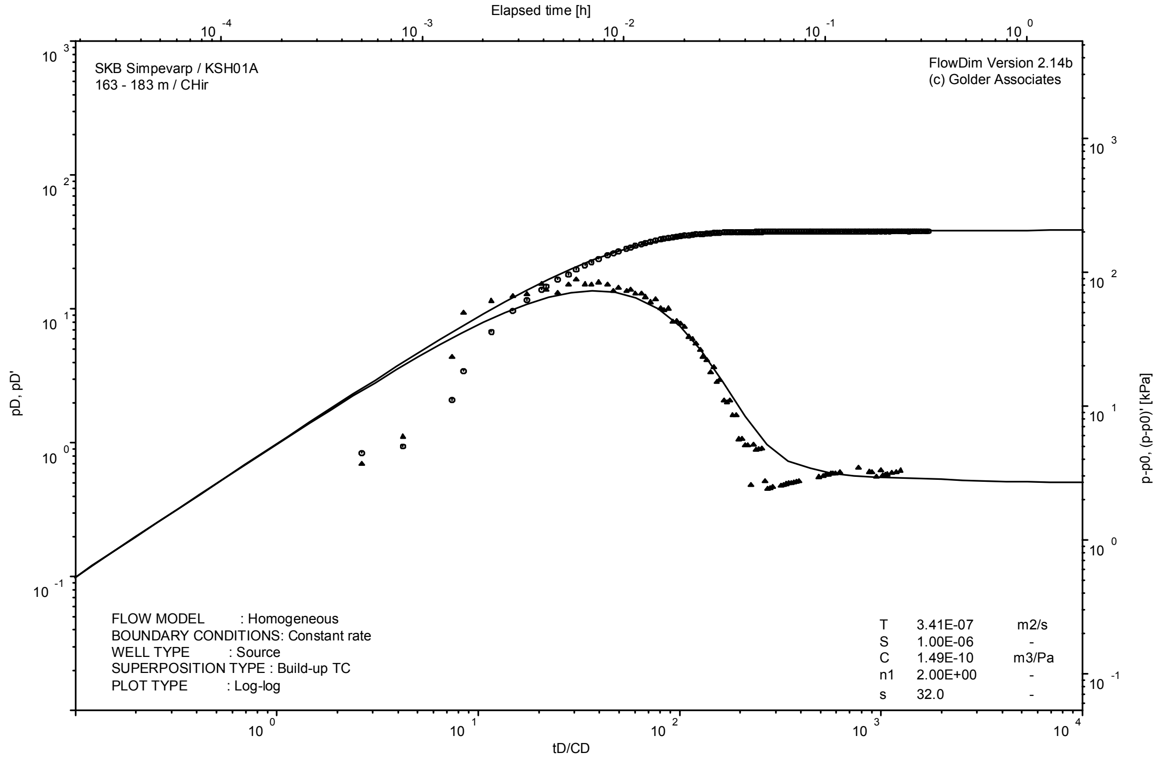
Pressure and flow rate vs. time; cartesian plot



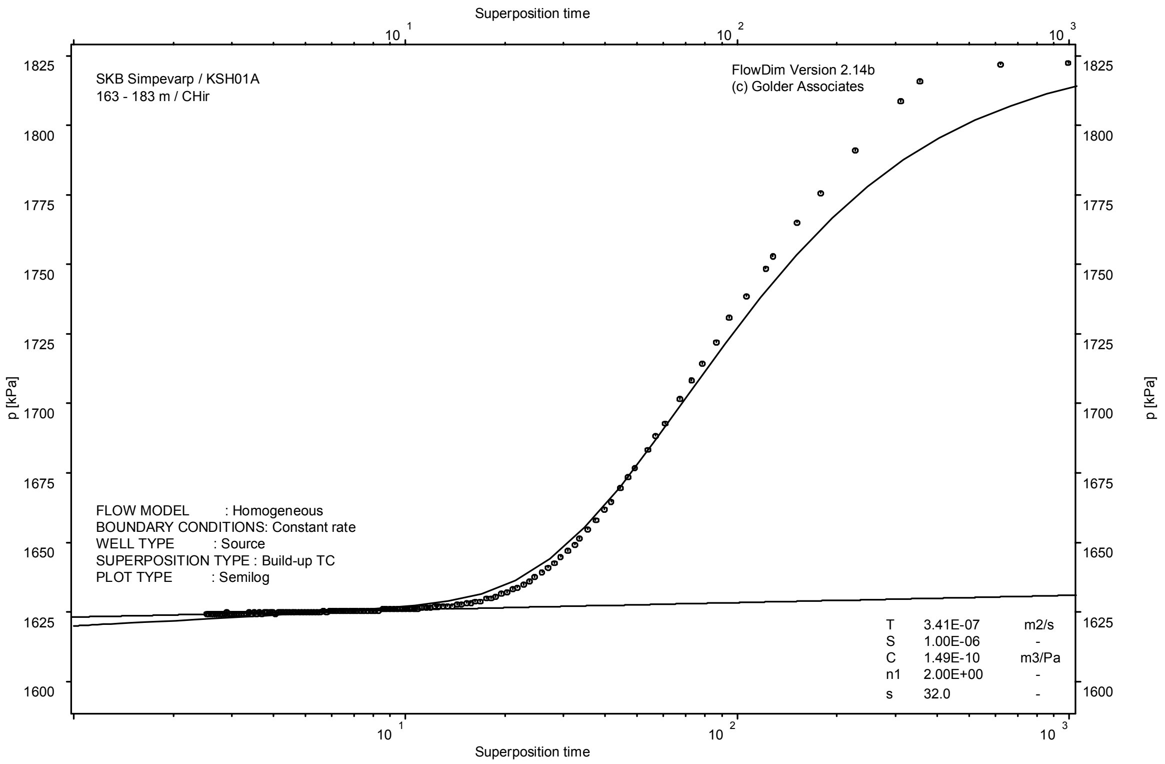
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

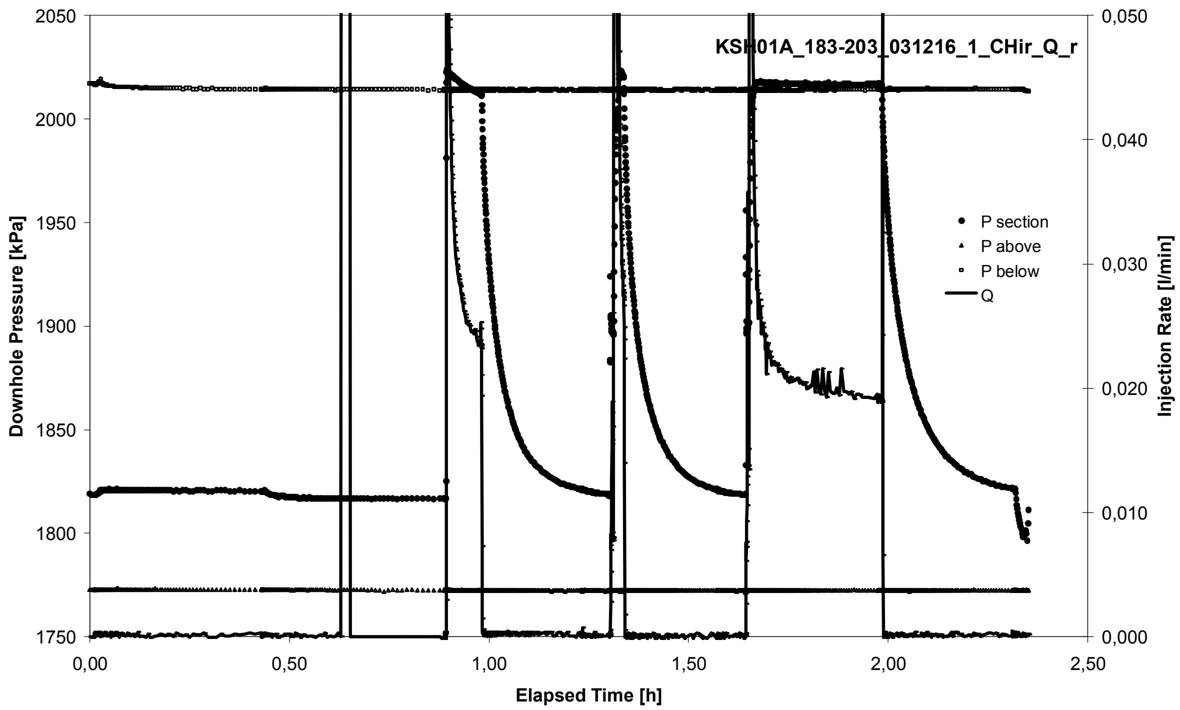


CHIR phase; HORNER match

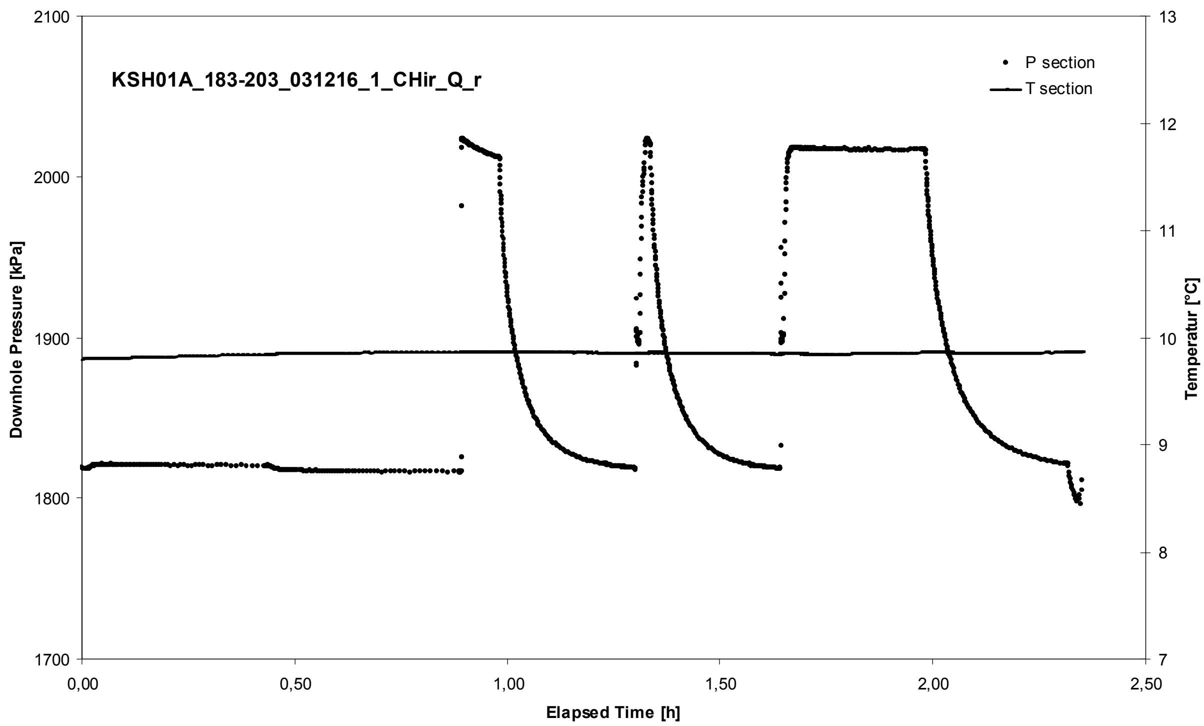
APPENDIX 2-14

Test 183 – 203 m

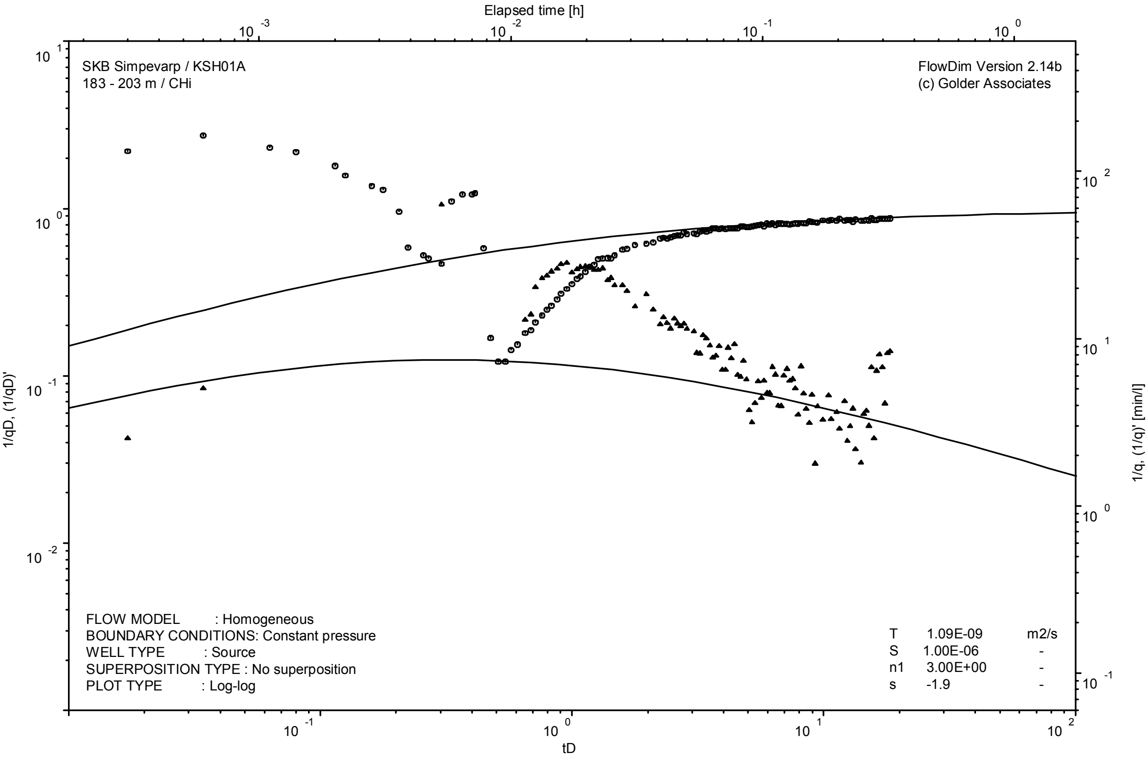
Analysis diagrams



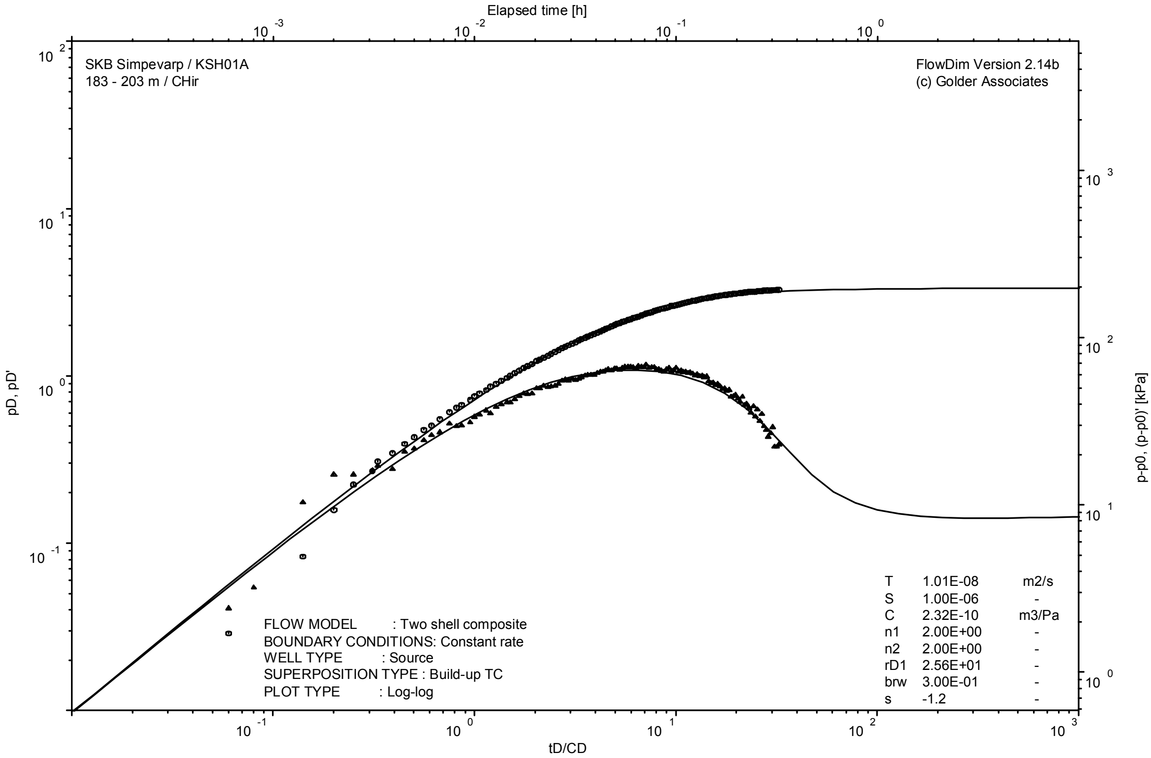
Pressure and flow rate vs. time; cartesian plot



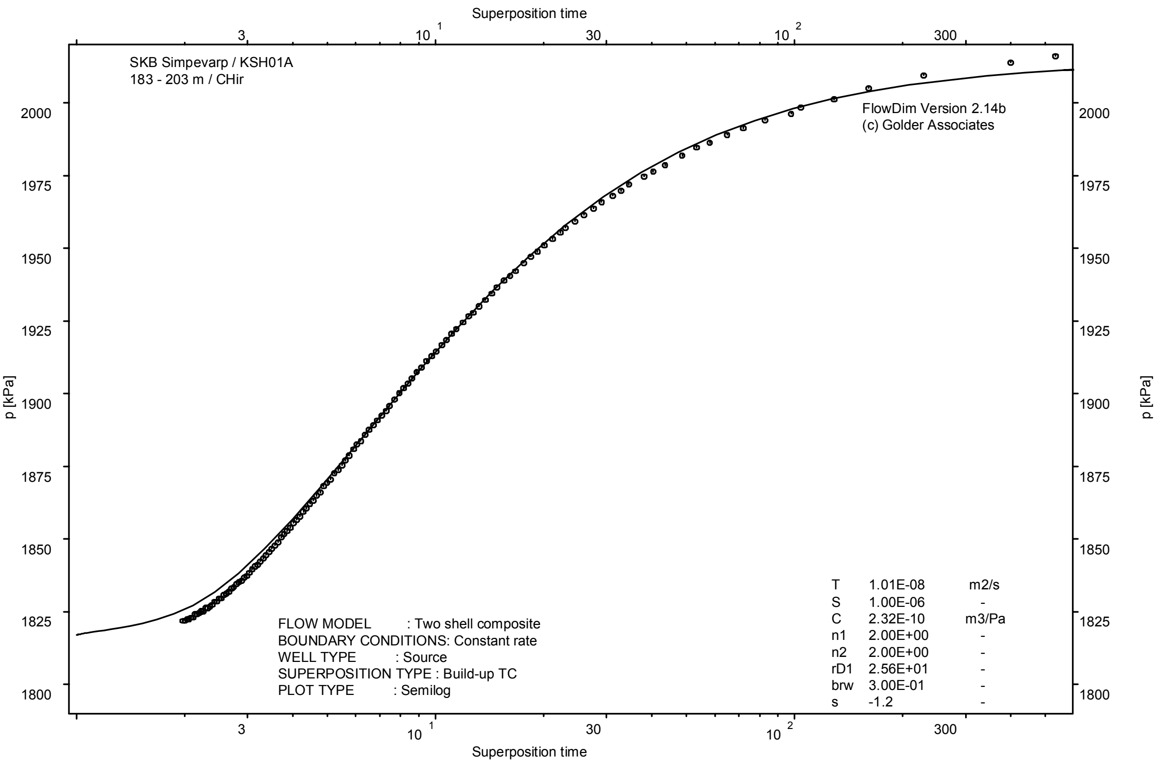
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

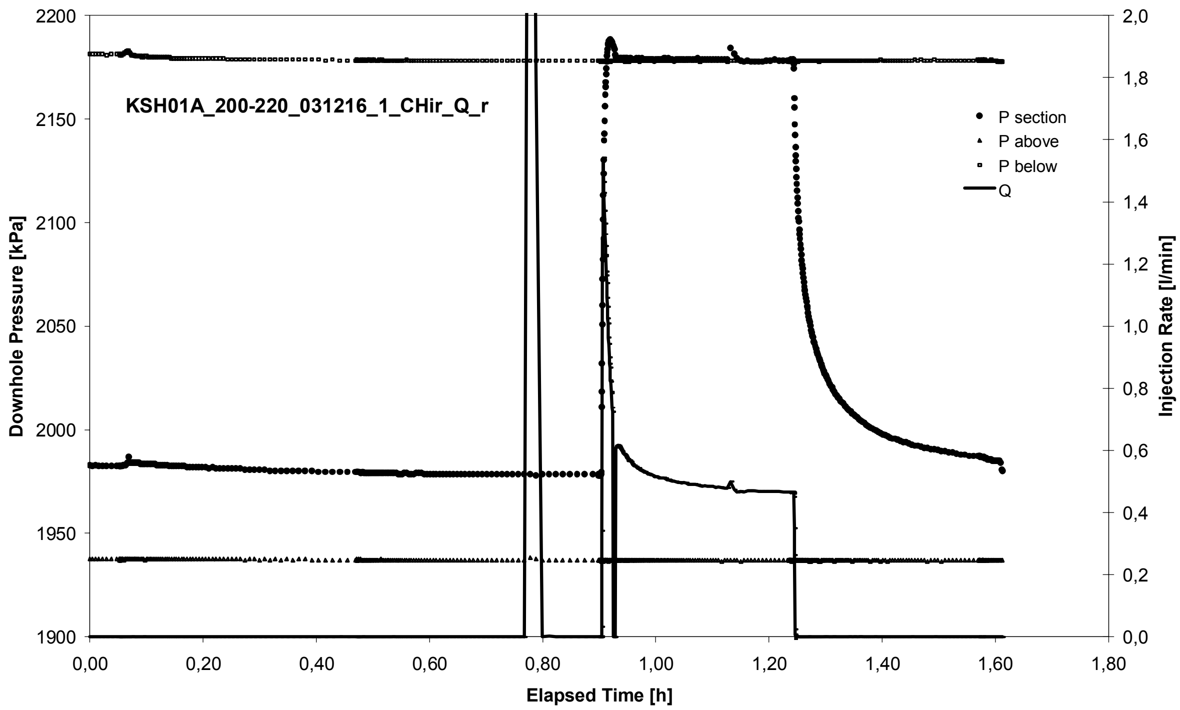


CHIR phase; HORNER match

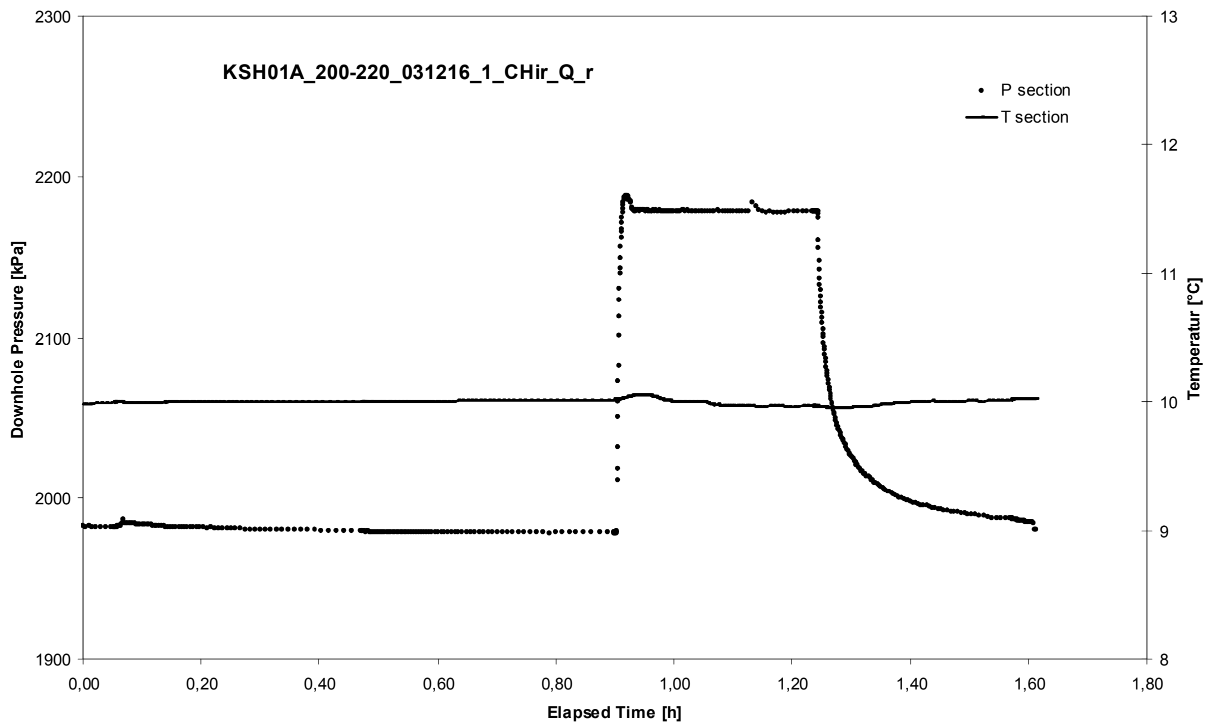
APPENDIX 2-15

Test 200 – 220 m

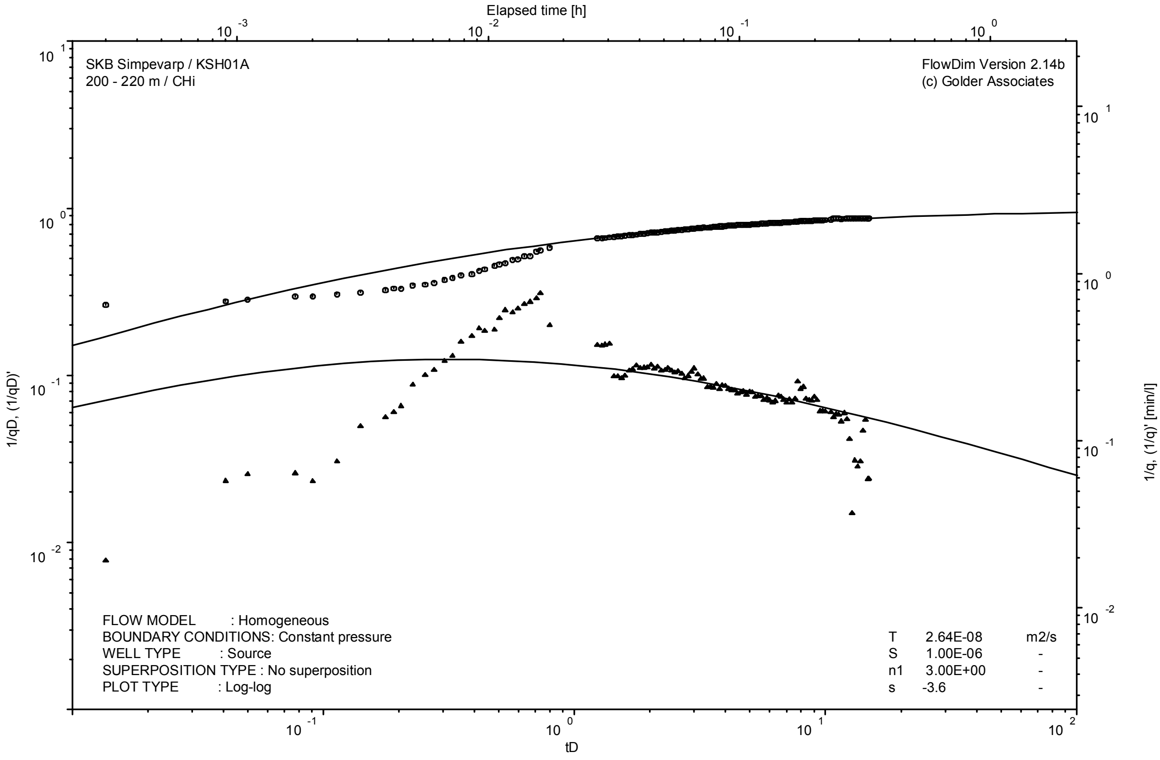
Analysis diagrams



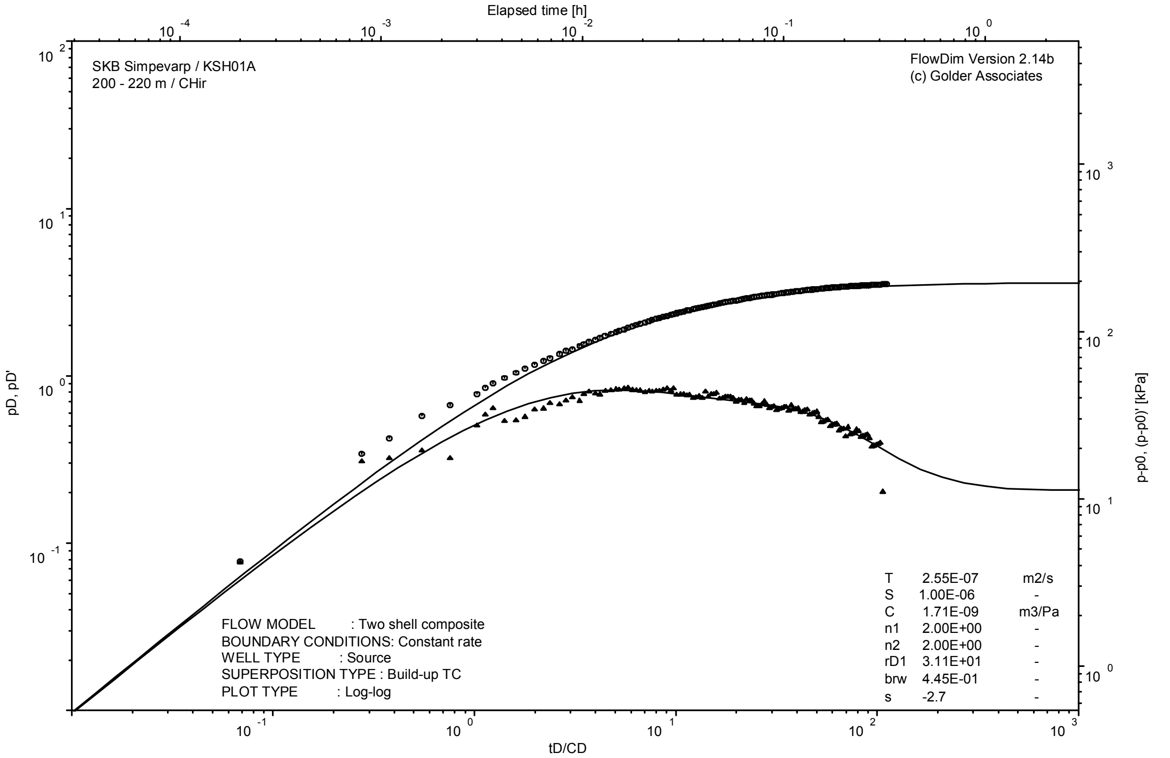
Pressure and flow rate vs. time; cartesian plot



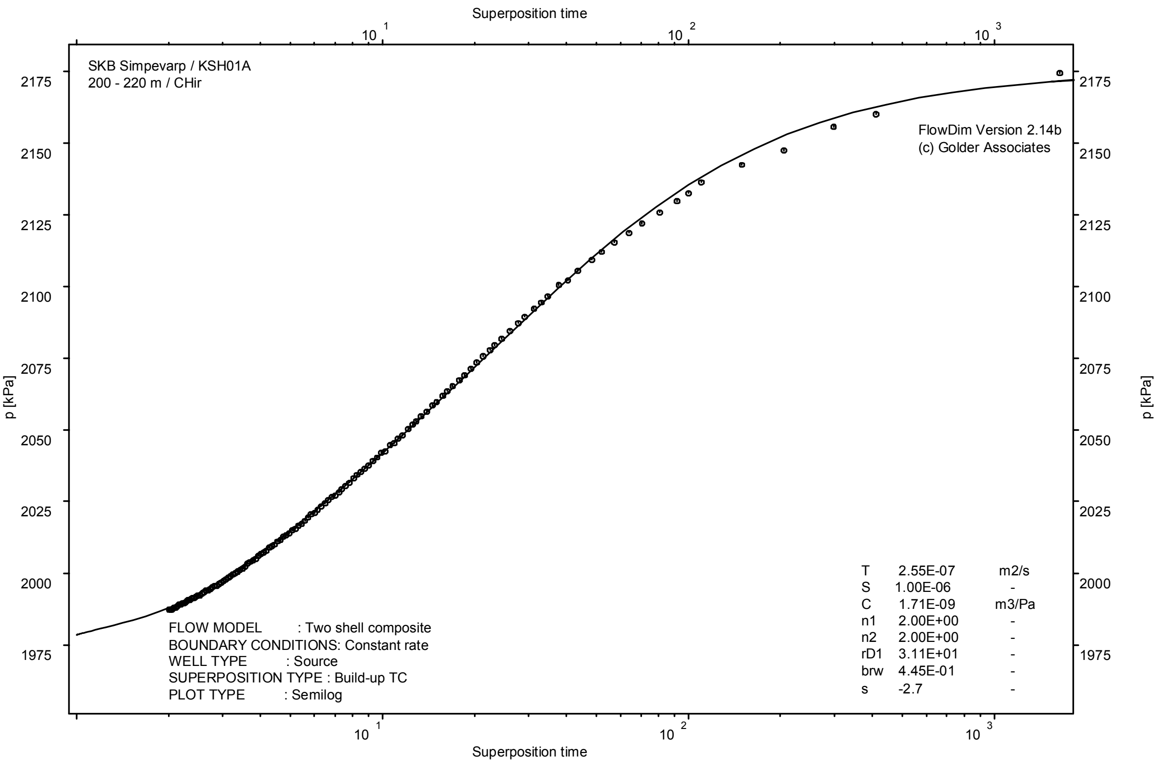
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

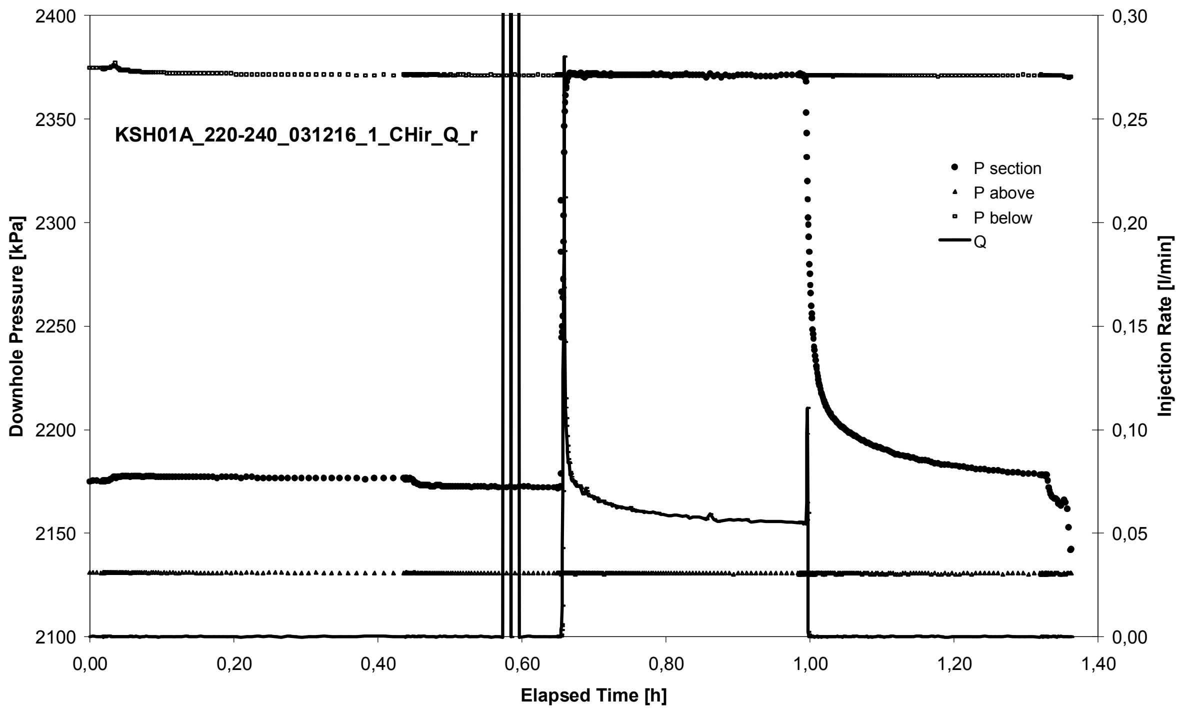


CHIR phase; HORNER match

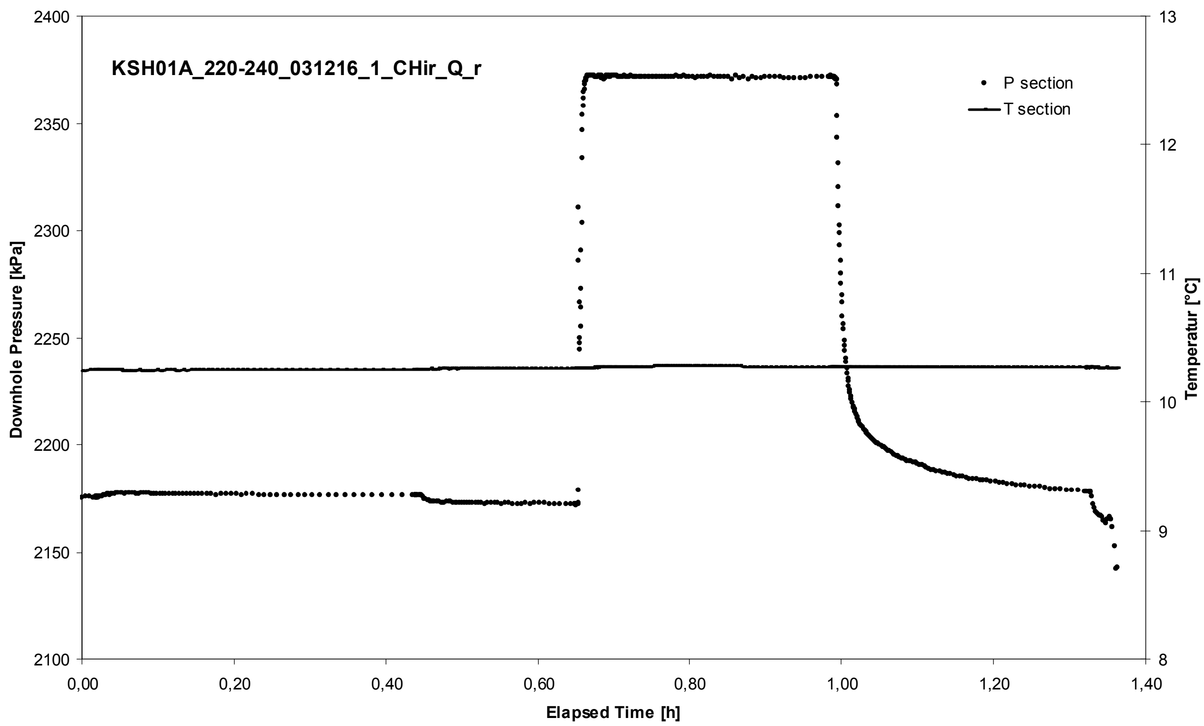
APPENDIX 2-16

Test 220 – 240 m

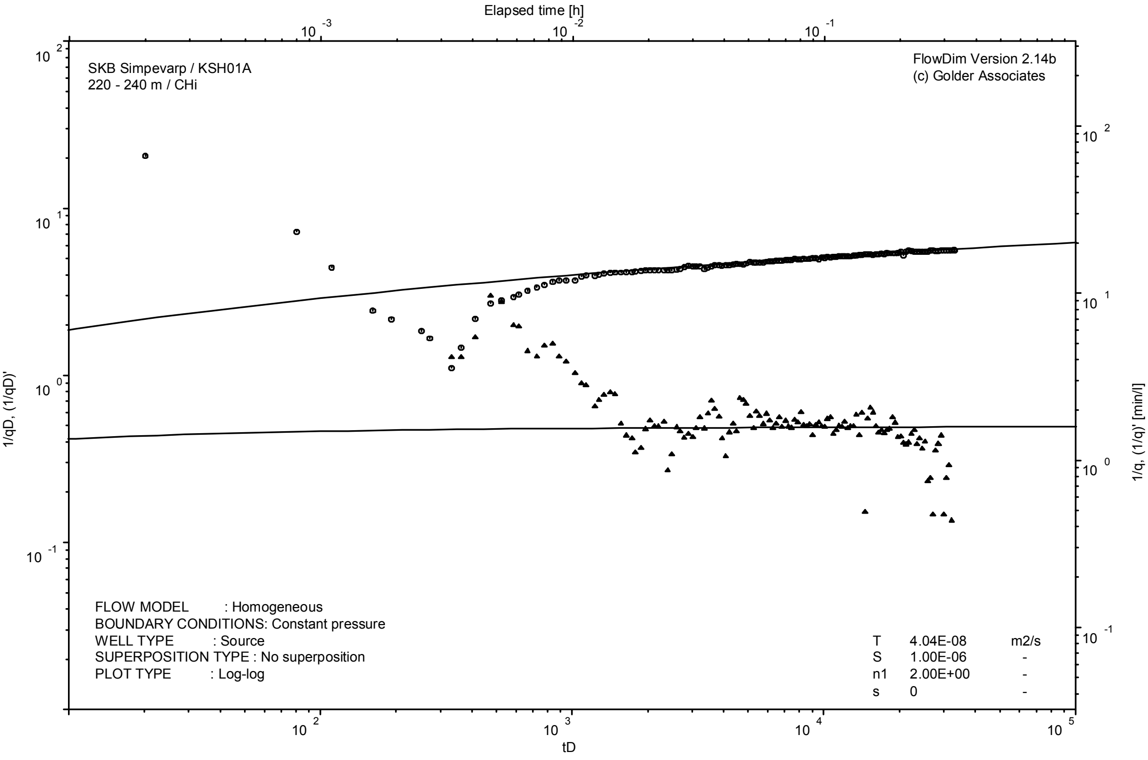
Analysis diagrams



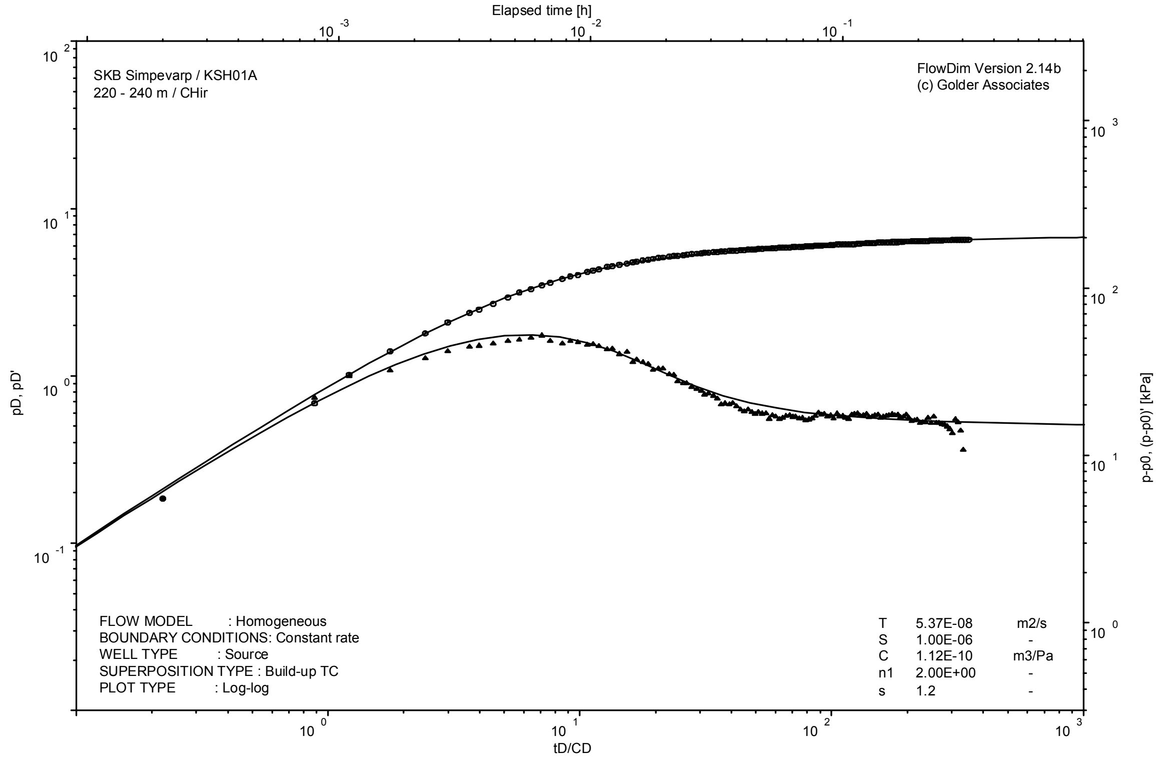
Pressure and flow rate vs. time; cartesian plot



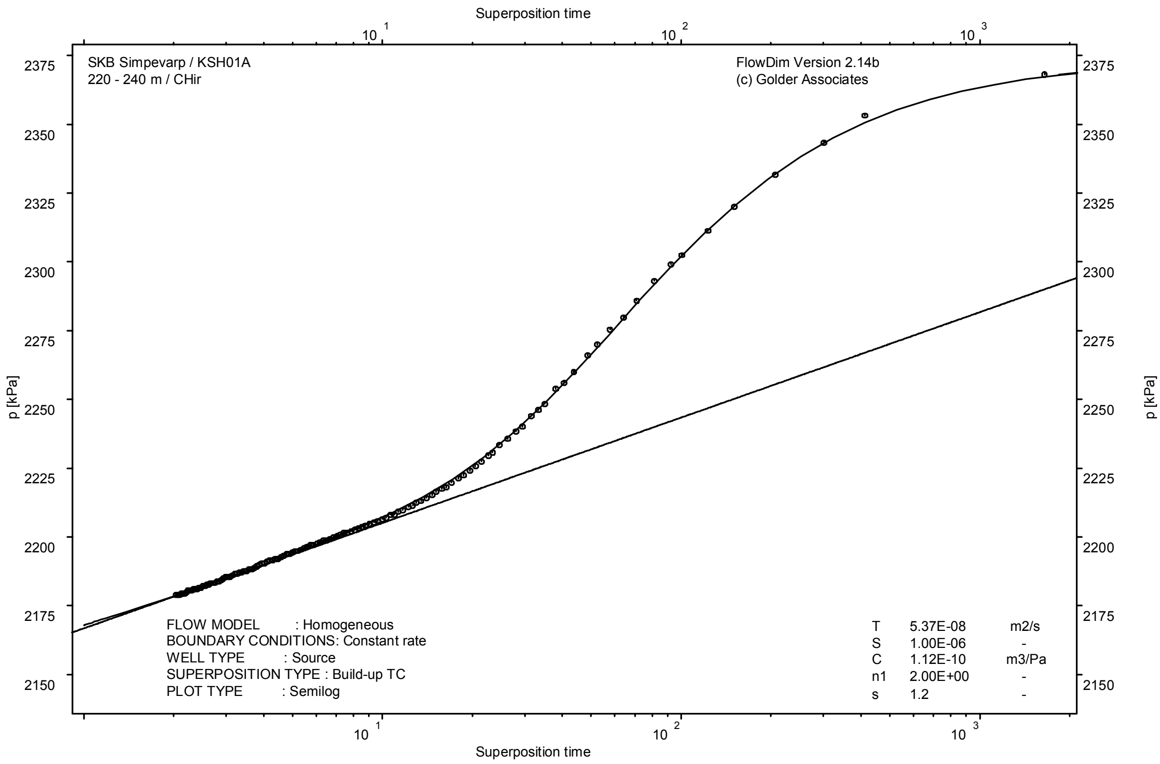
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

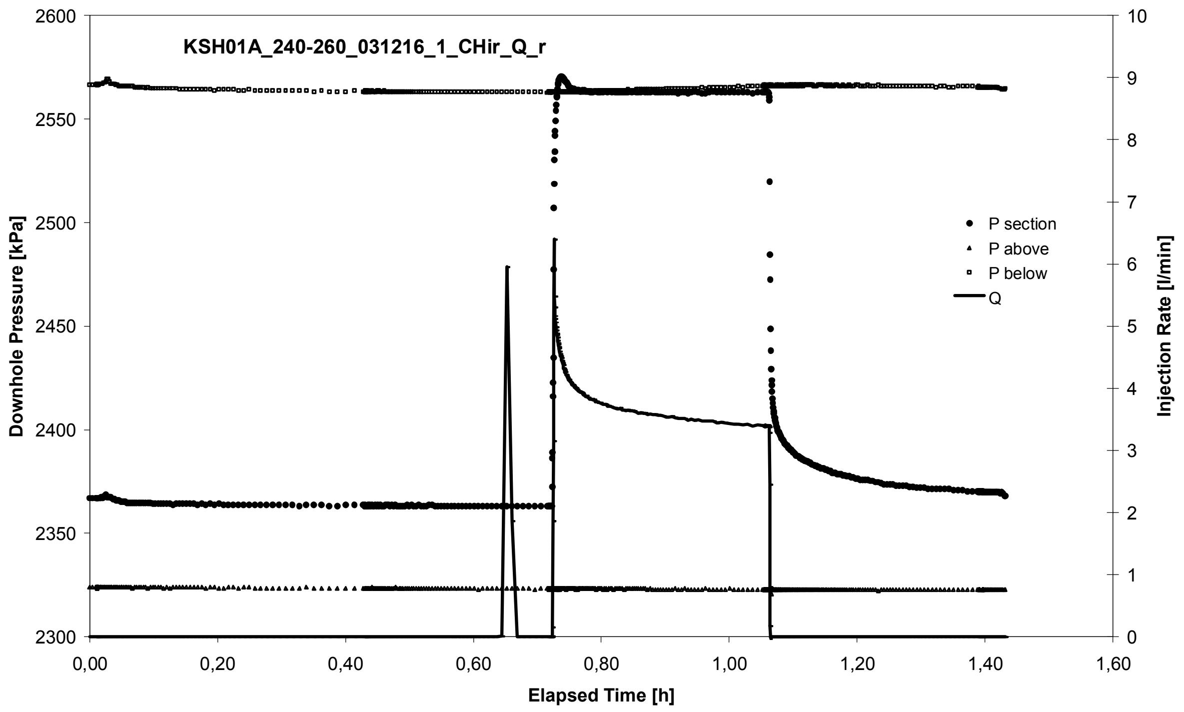


CHIR phase; HORNER match

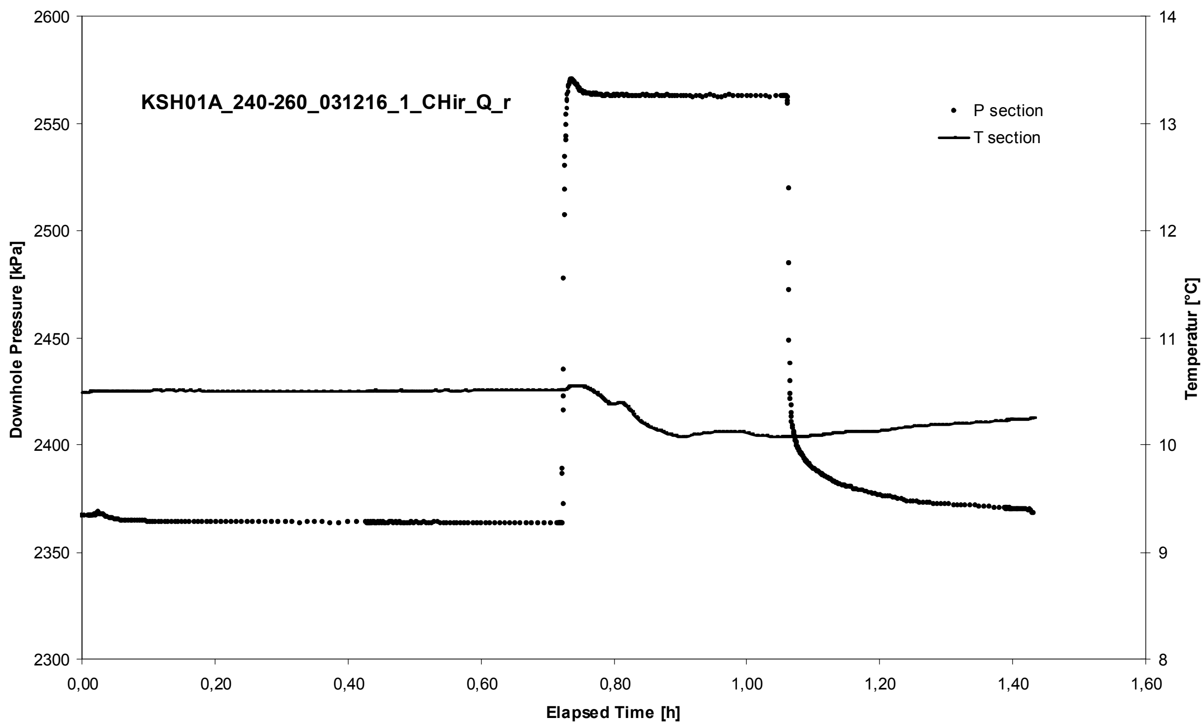
APPENDIX 2-17

Test 240 – 260 m

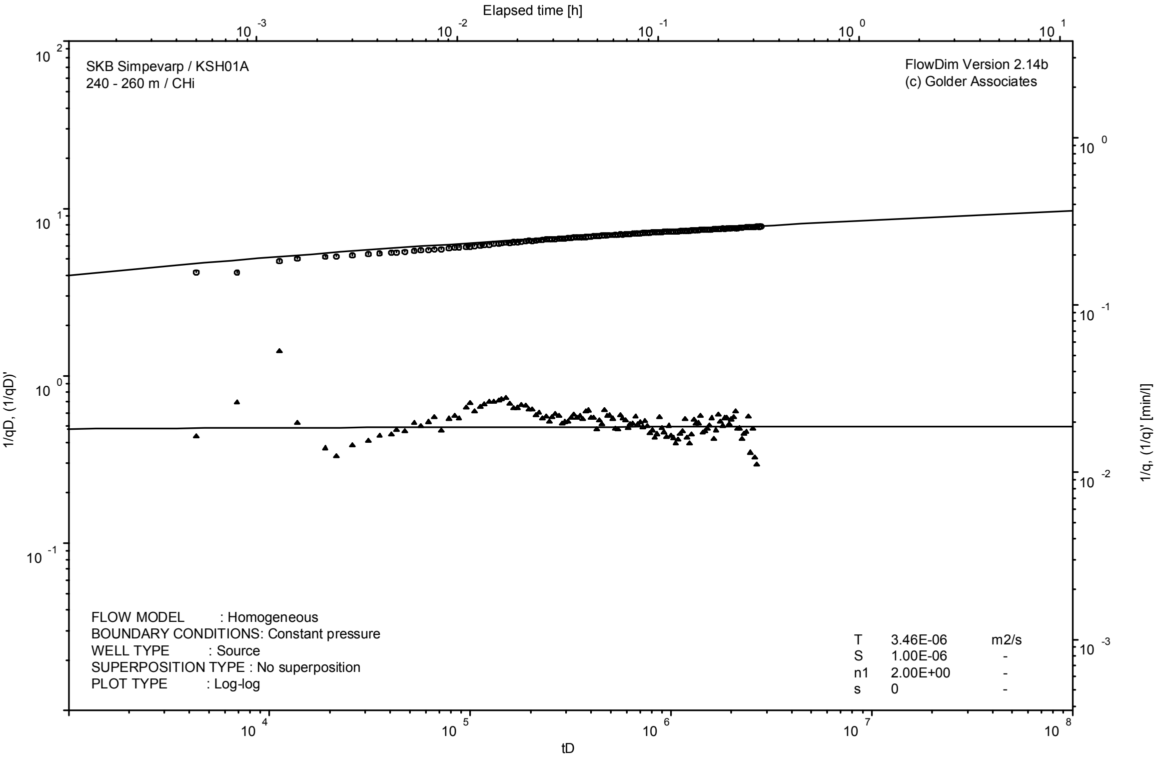
Analysis diagrams



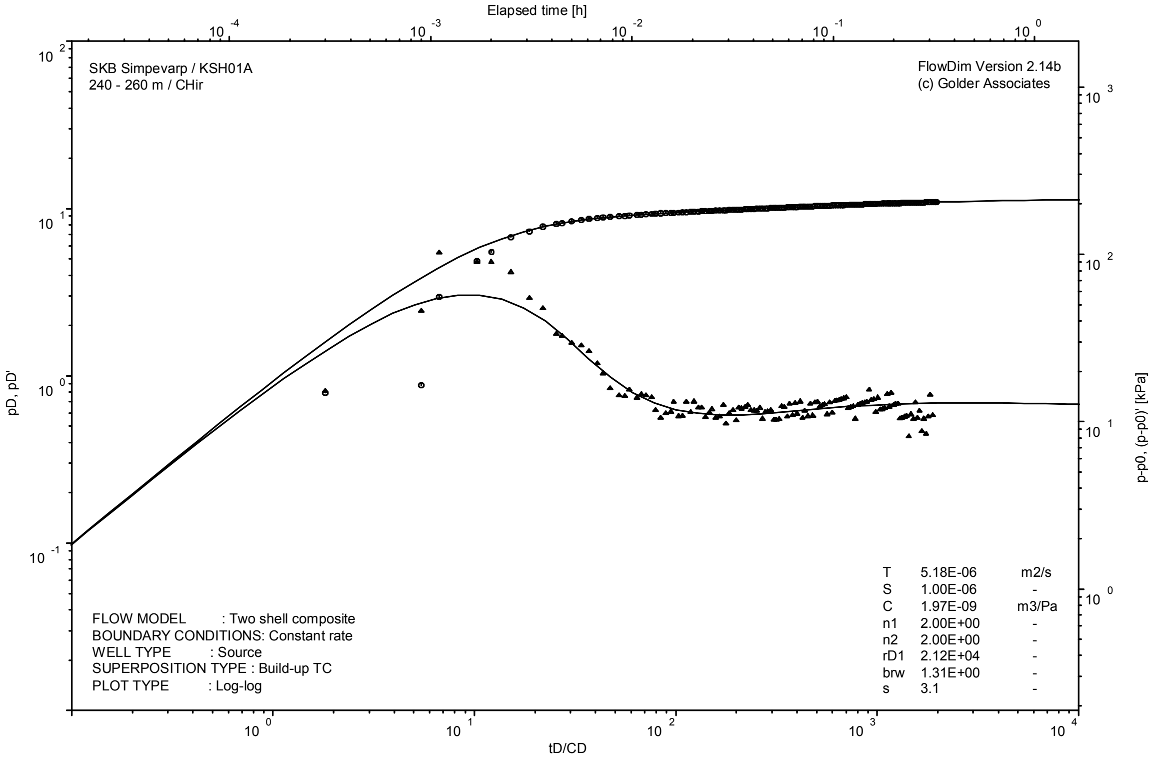
Pressure and flow rate vs. time; cartesian plot



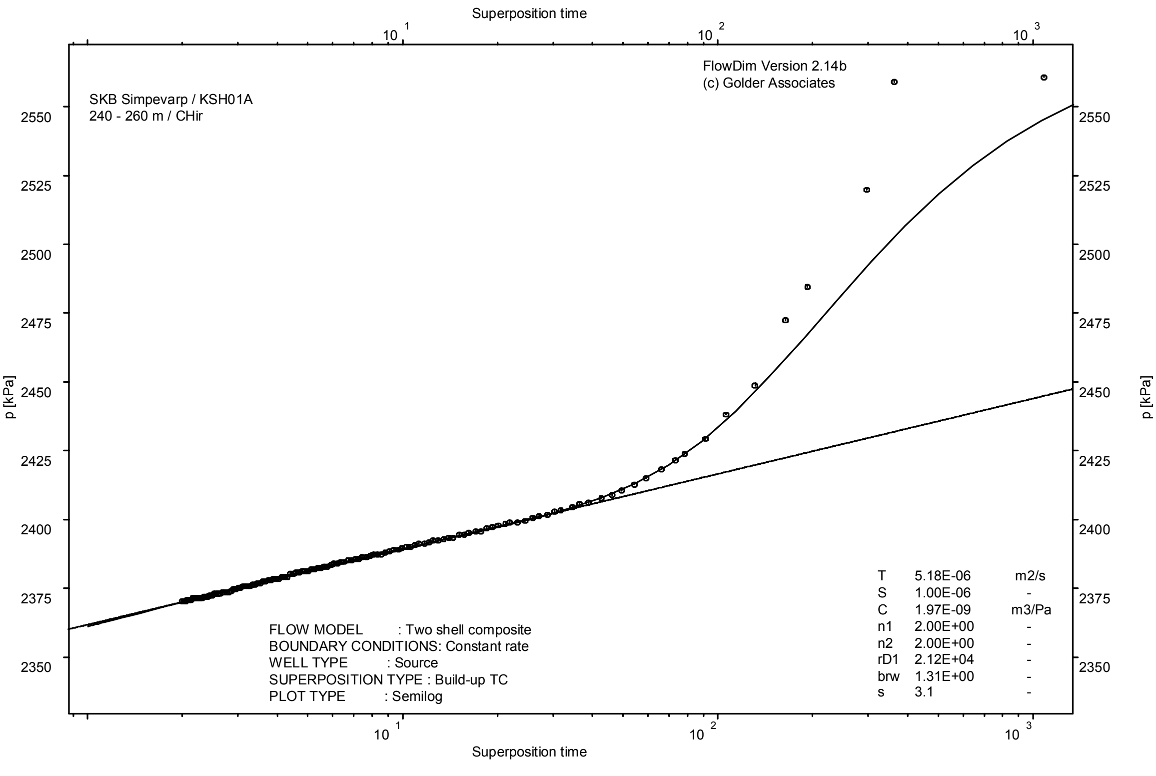
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

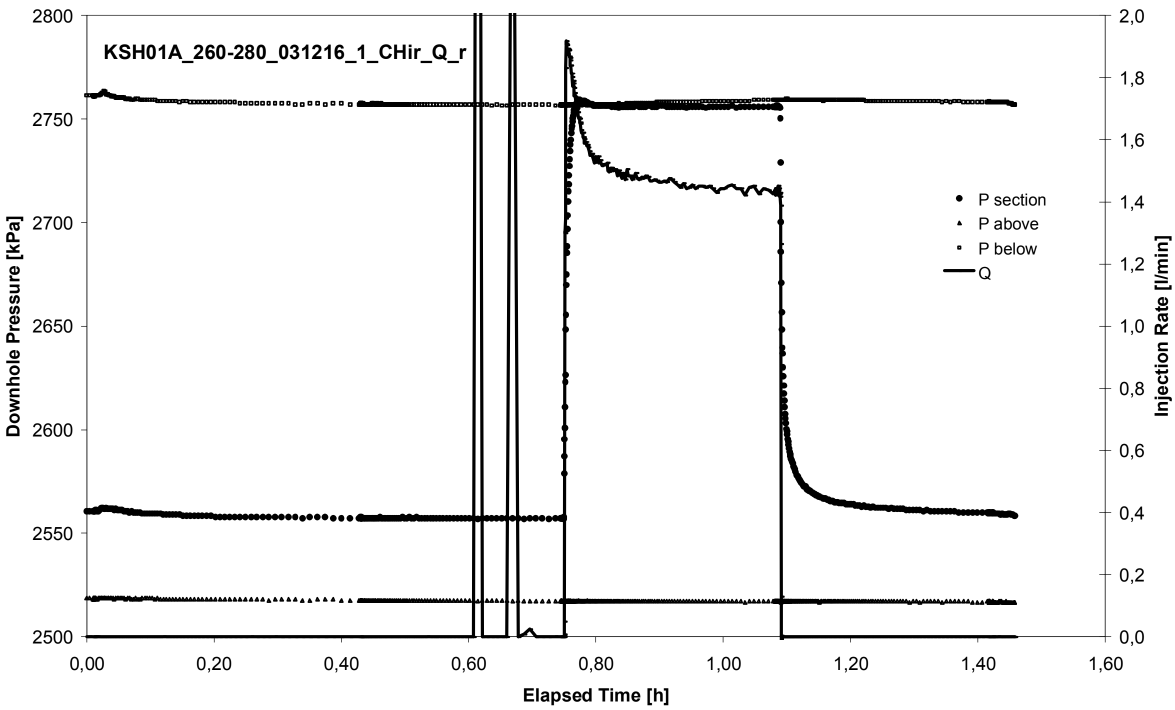


CHIR phase; HORNER match

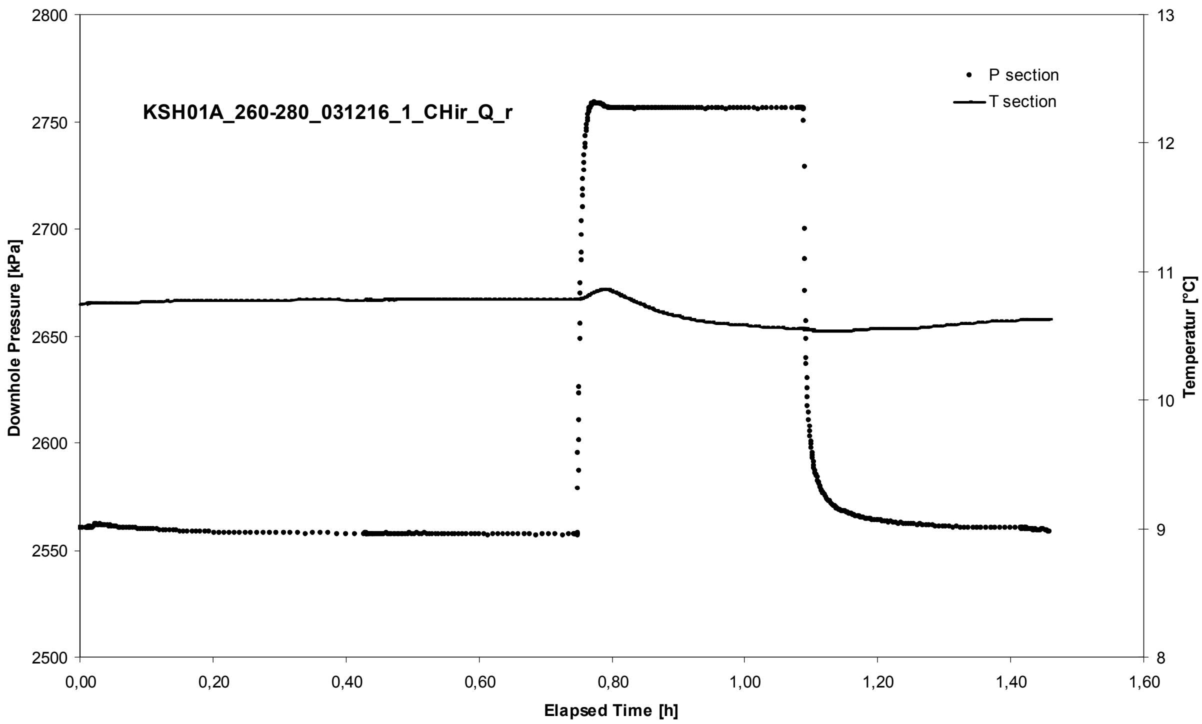
APPENDIX 2-18

Test 260 – 280 m

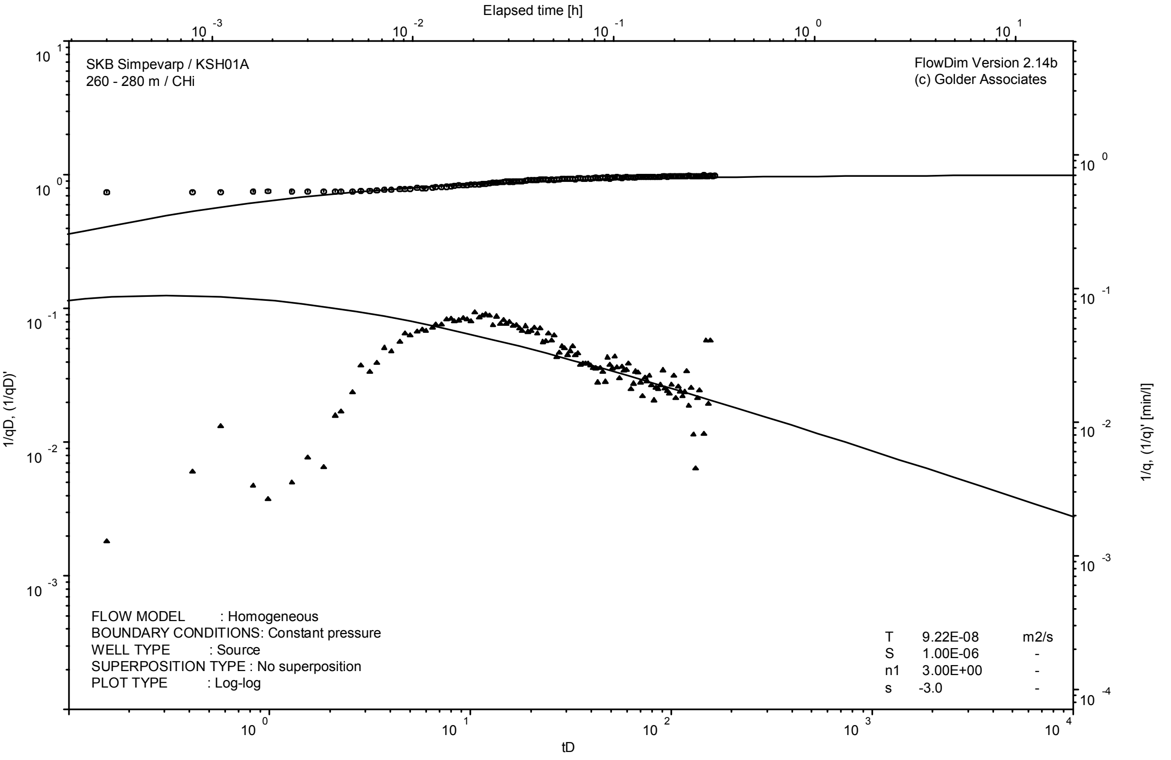
Analysis diagrams



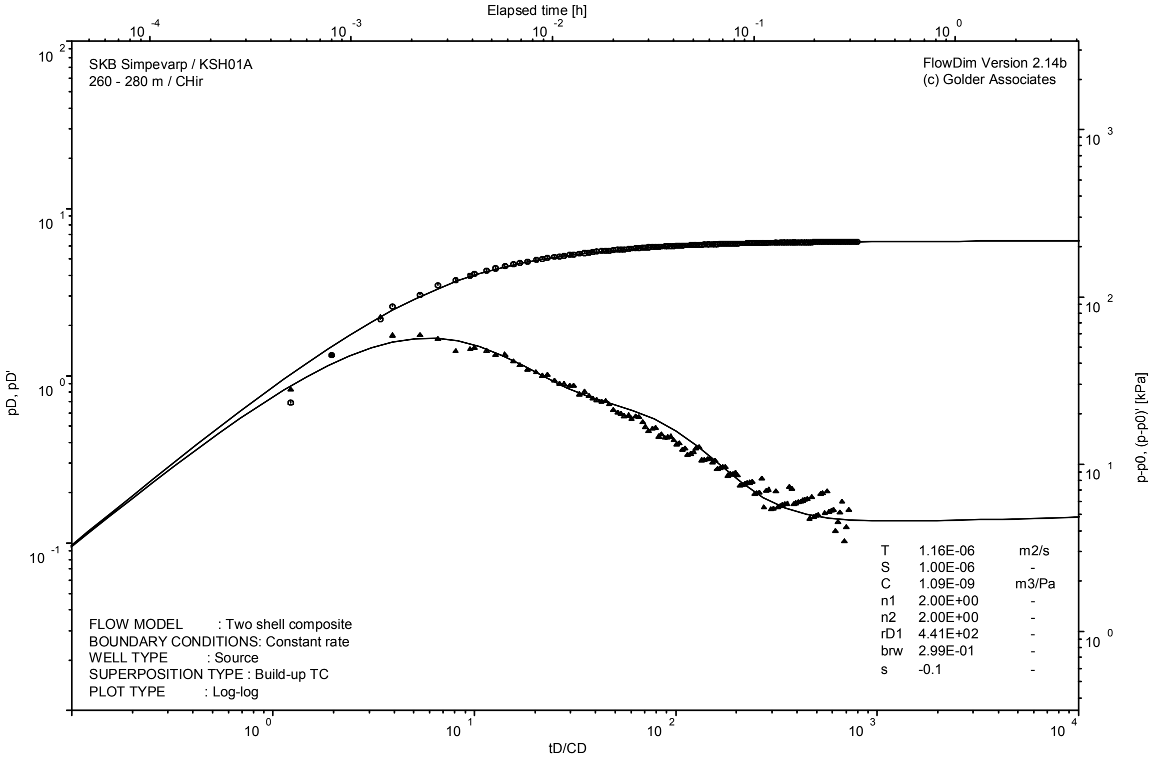
Pressure and flow rate vs. time; cartesian plot



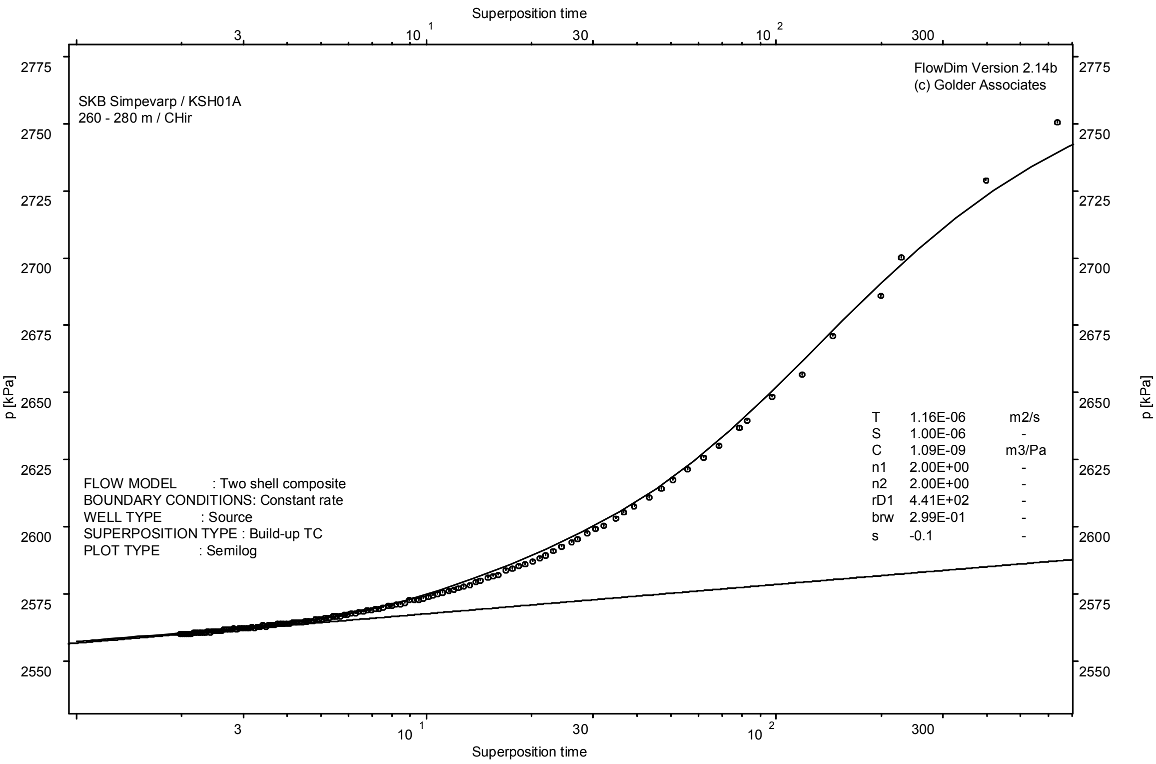
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

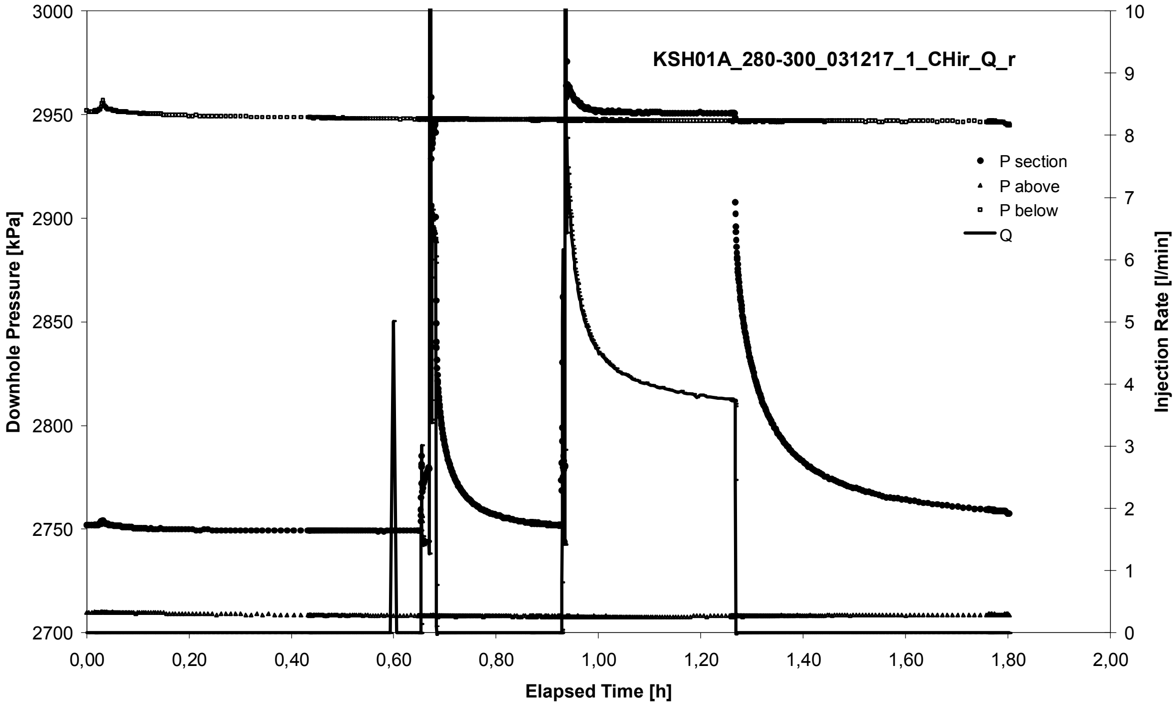


CHIR phase; HORNER match

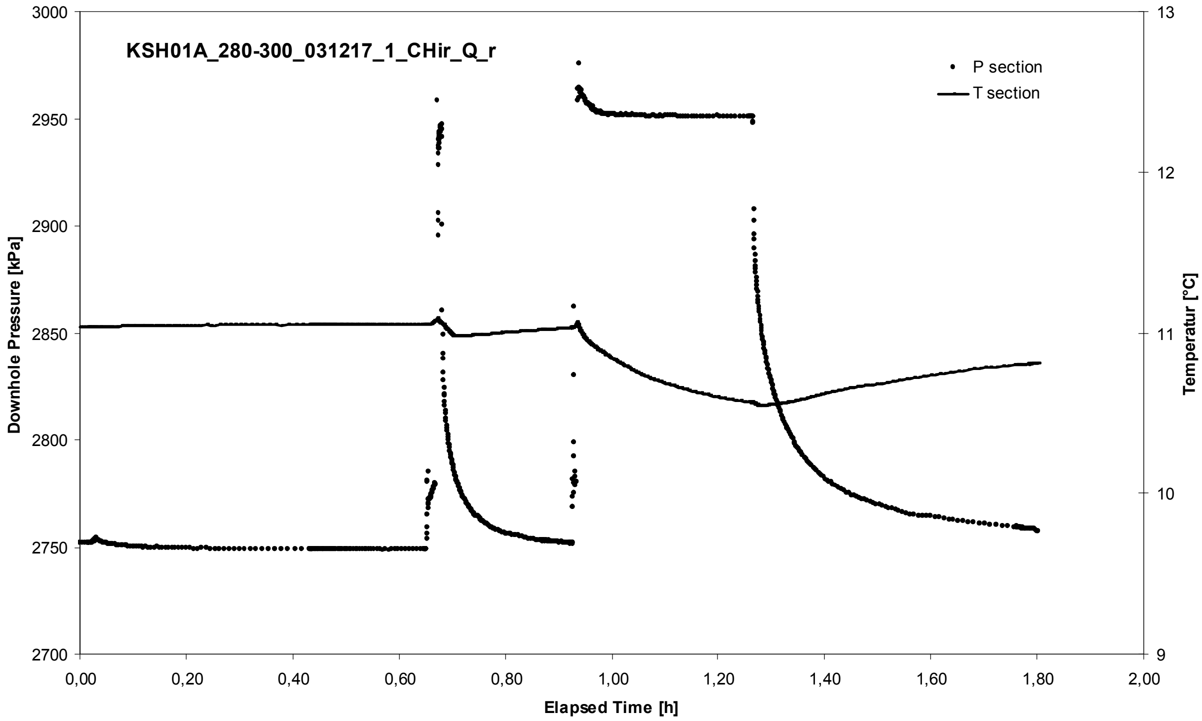
APPENDIX 2-19

Test 280 – 300 m

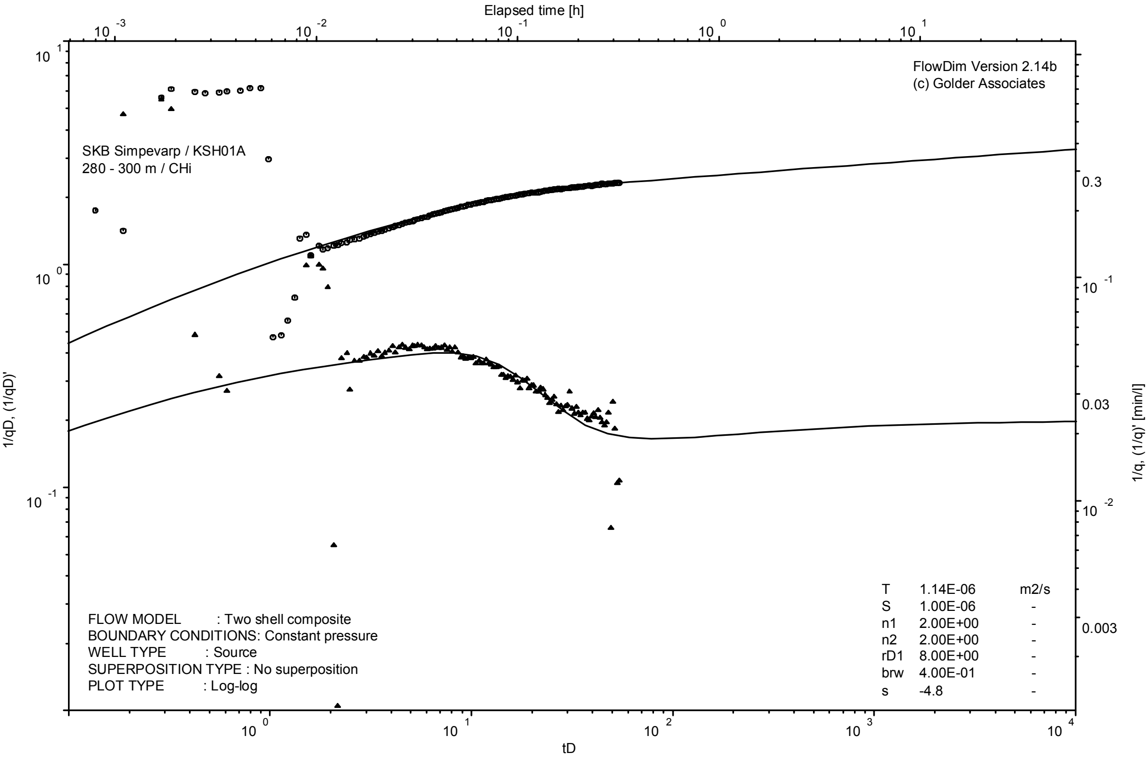
Analysis diagrams



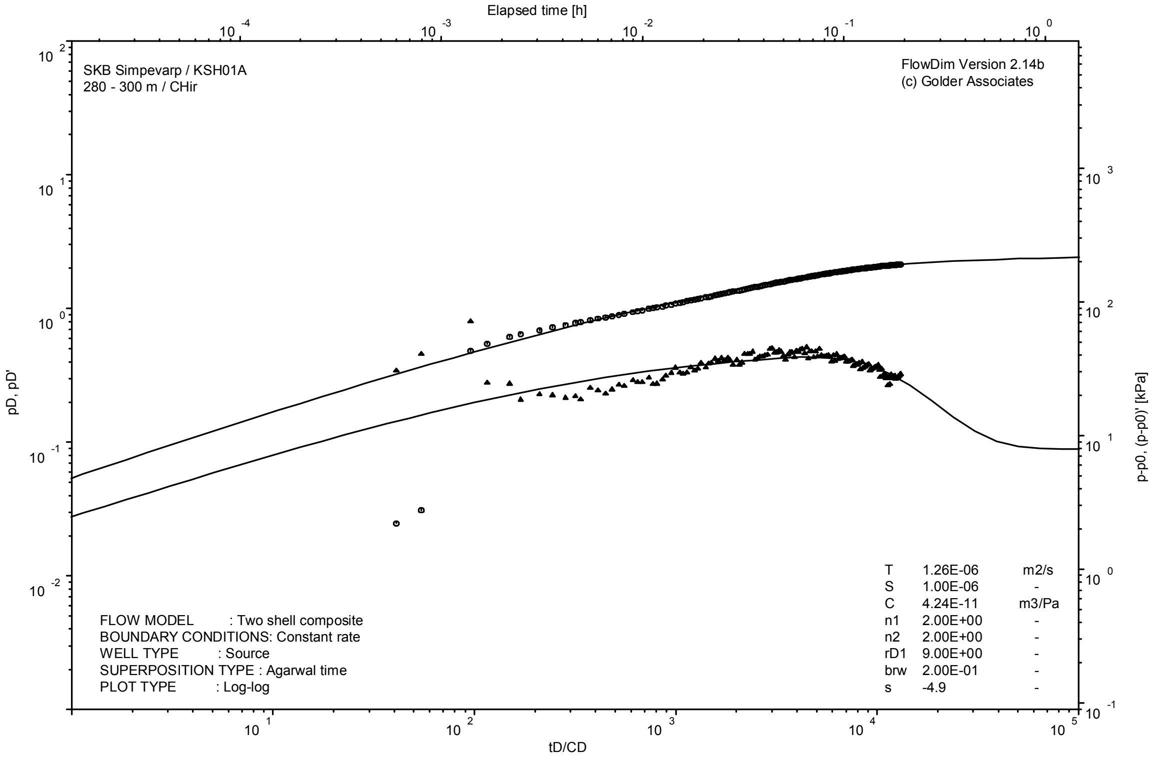
Pressure and flow rate vs. time; cartesian plot



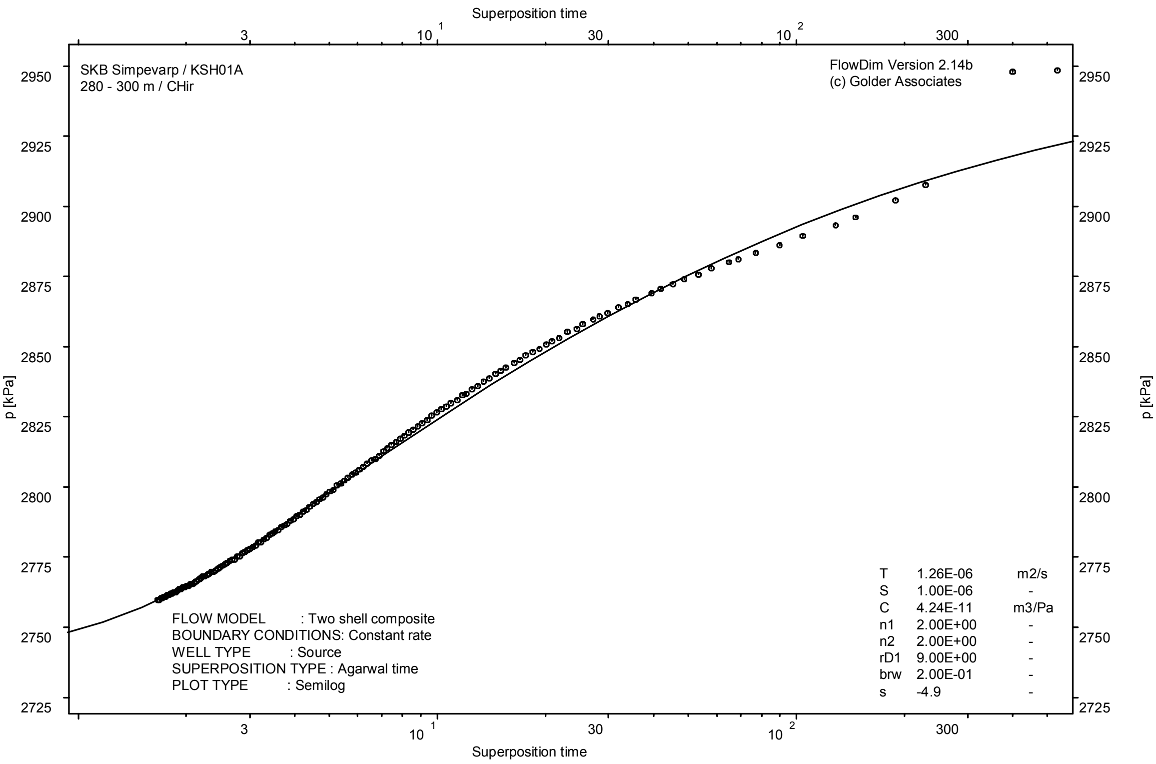
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

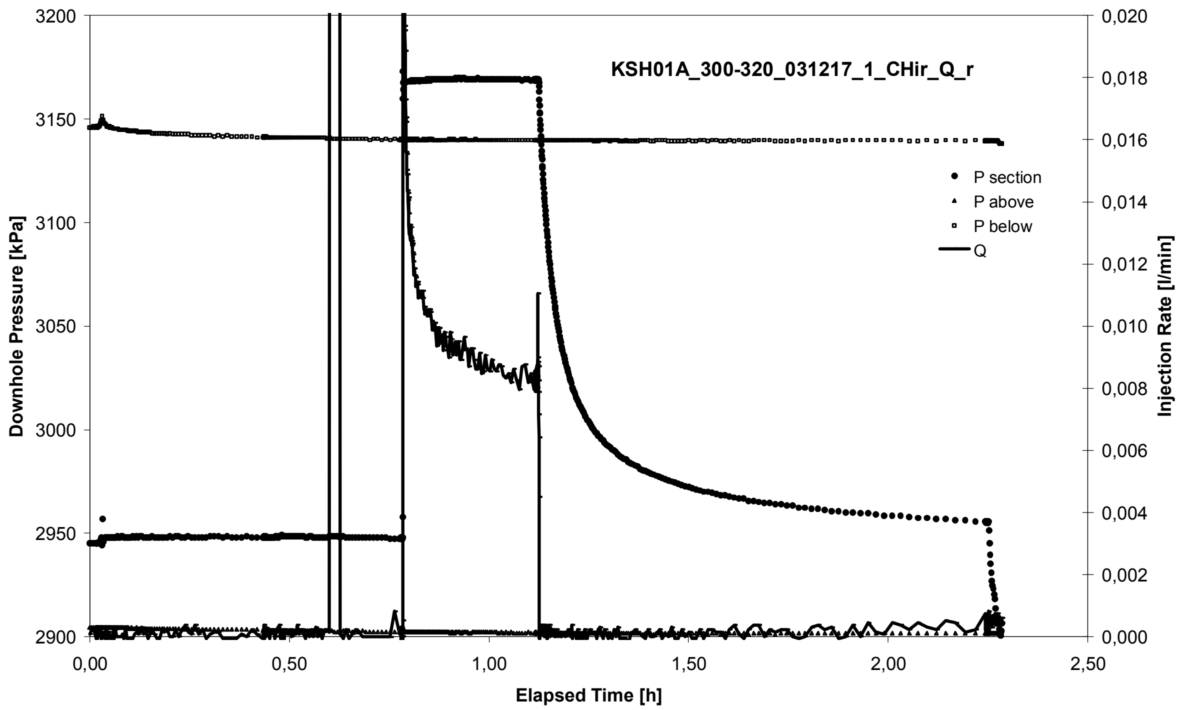


CHIR phase; HORNER match

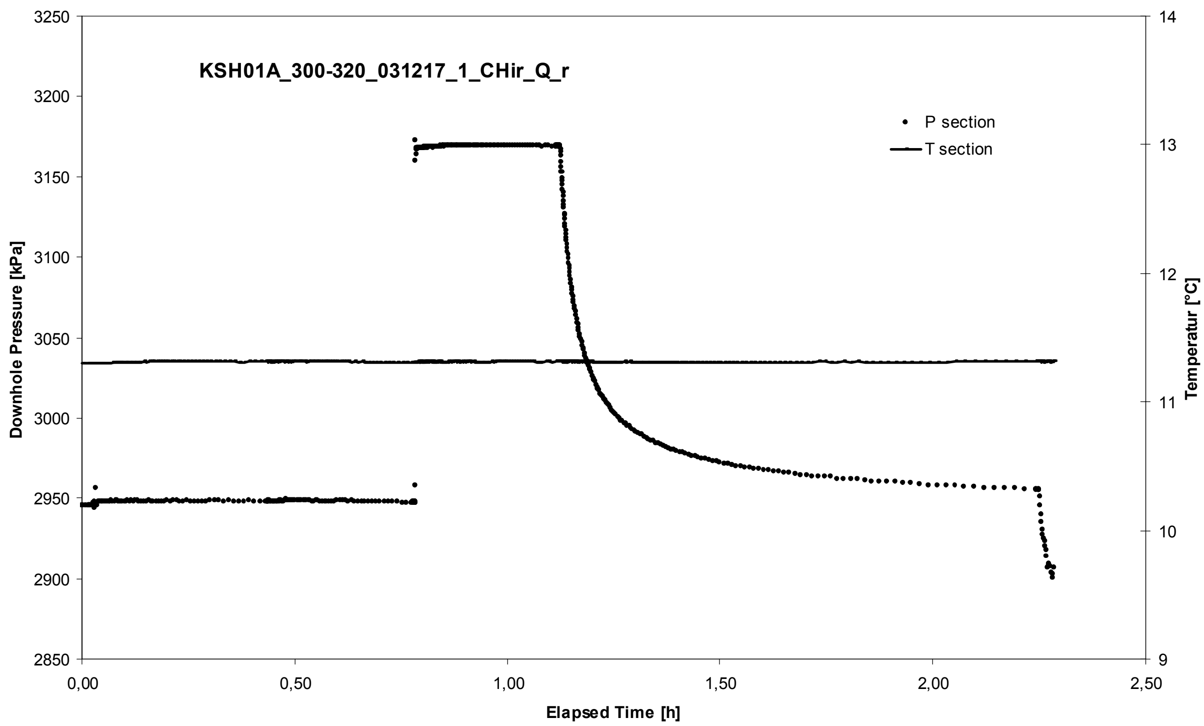
APPENDIX 2-20

Test 300 – 320 m

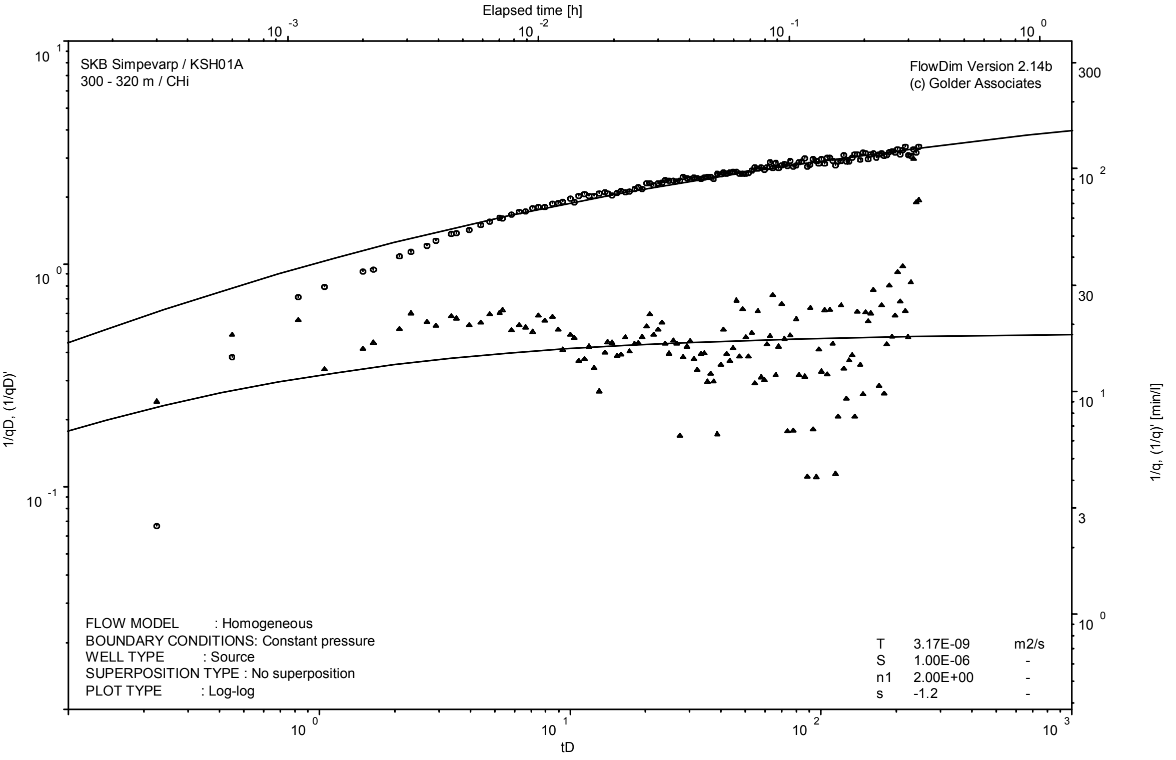
Analysis diagrams



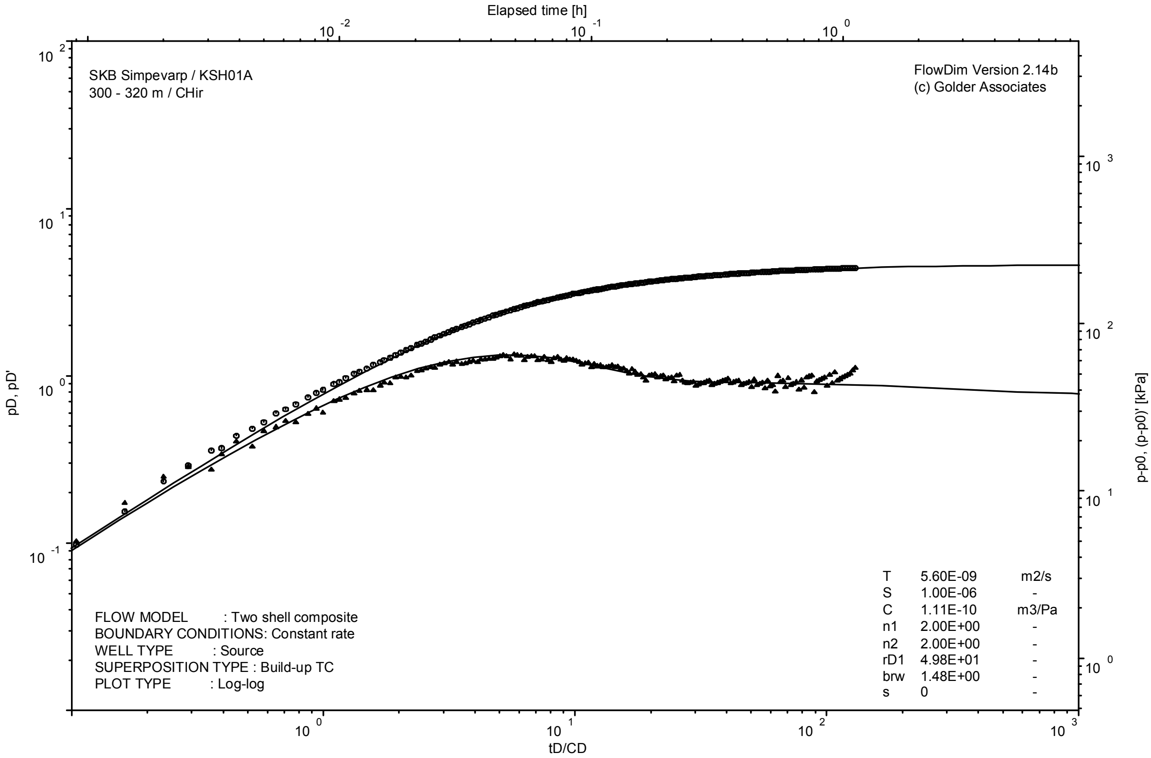
Pressure and flow rate vs. time; cartesian plot



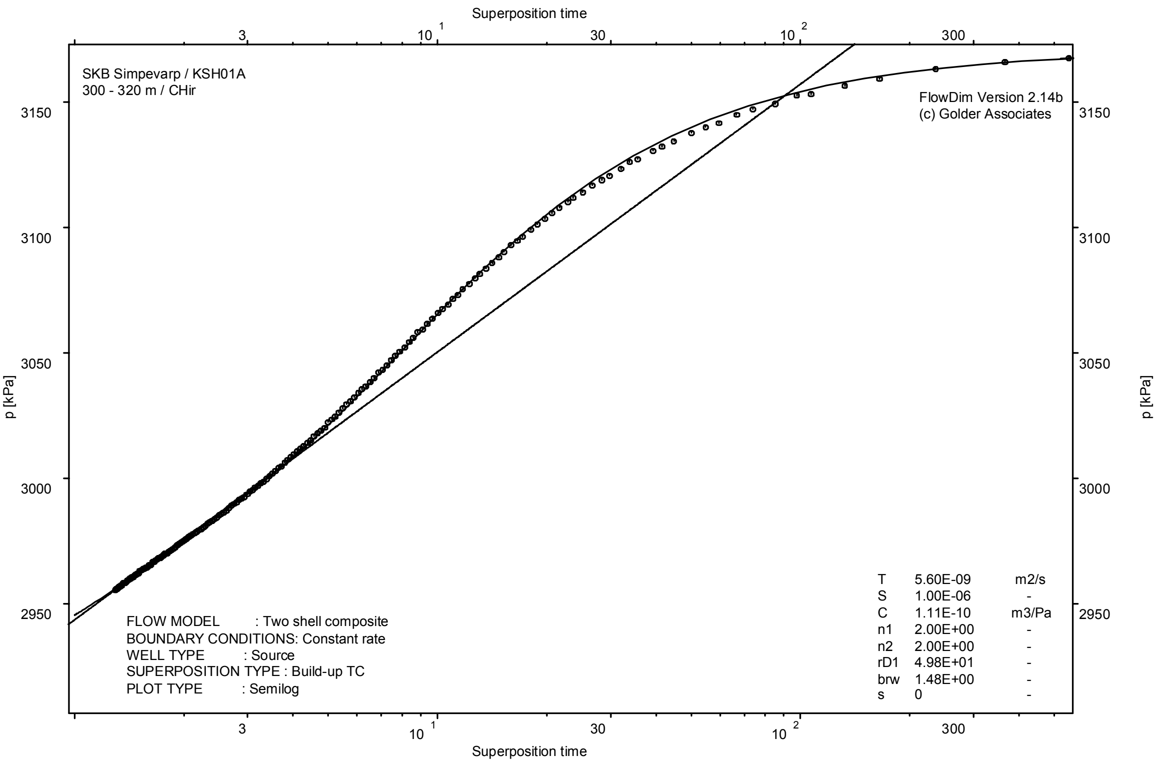
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

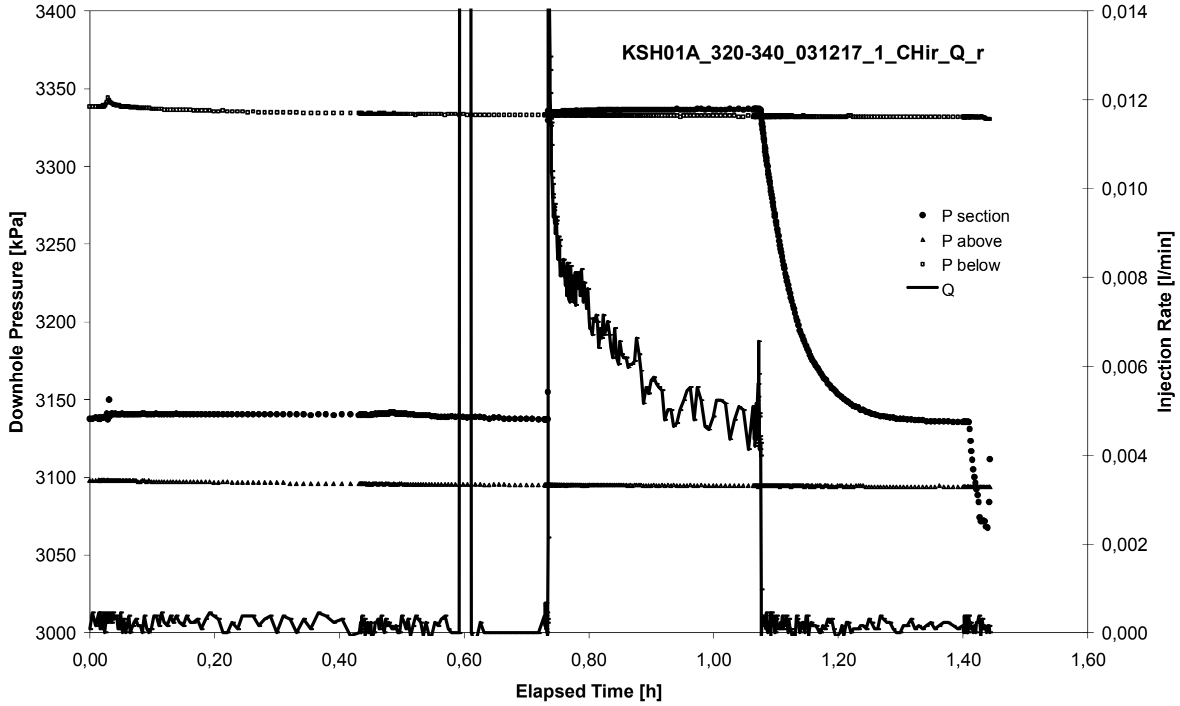


CHIR phase; HORNER match

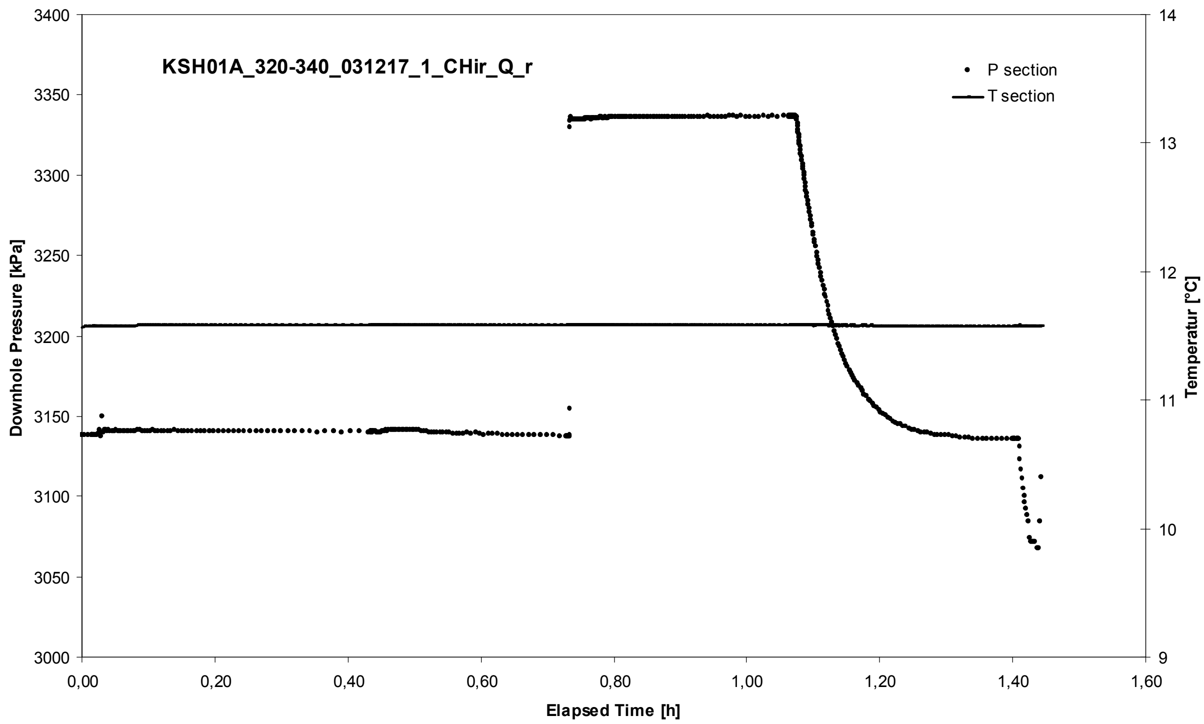
APPENDIX 2-21

Test 320 – 340 m

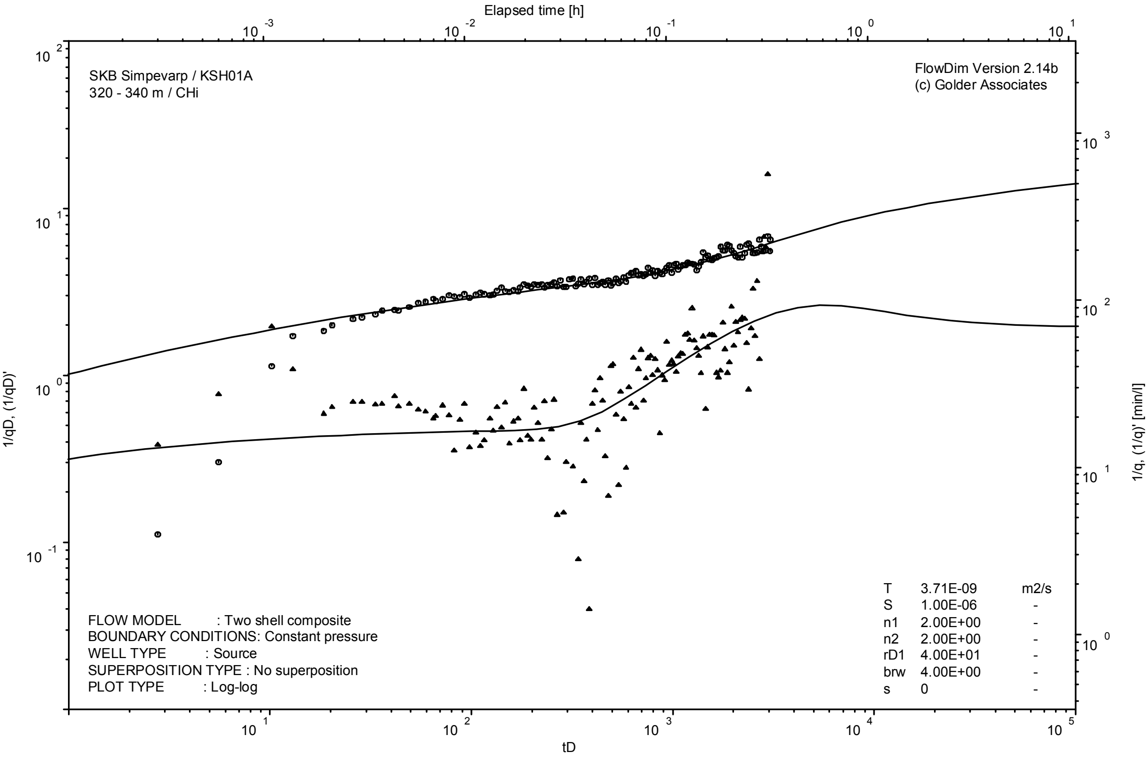
Analysis diagrams



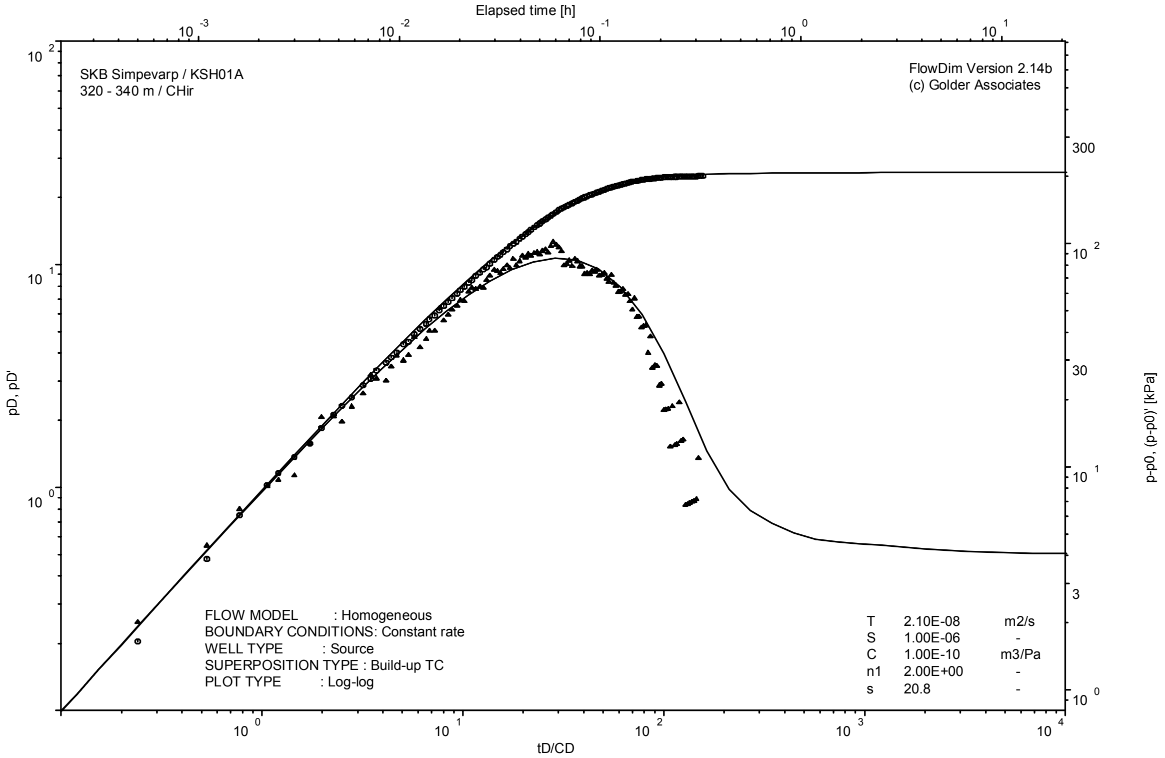
Pressure and flow rate vs. time; cartesian plot)



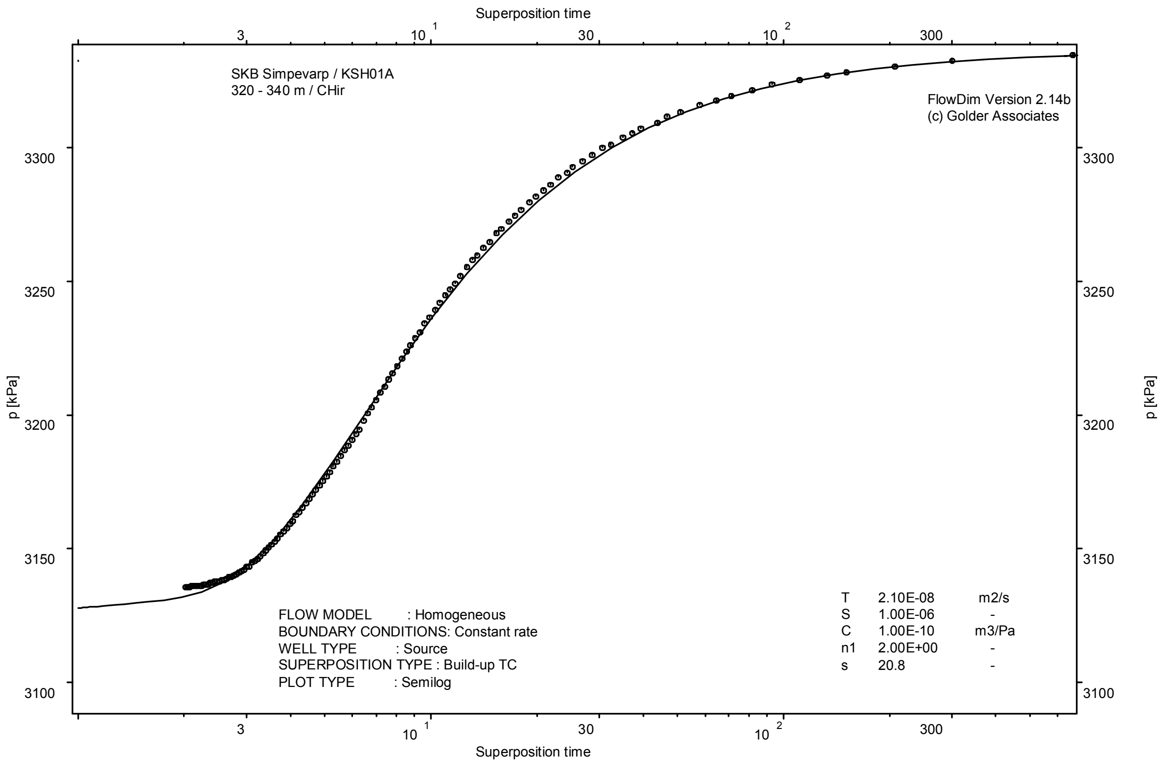
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

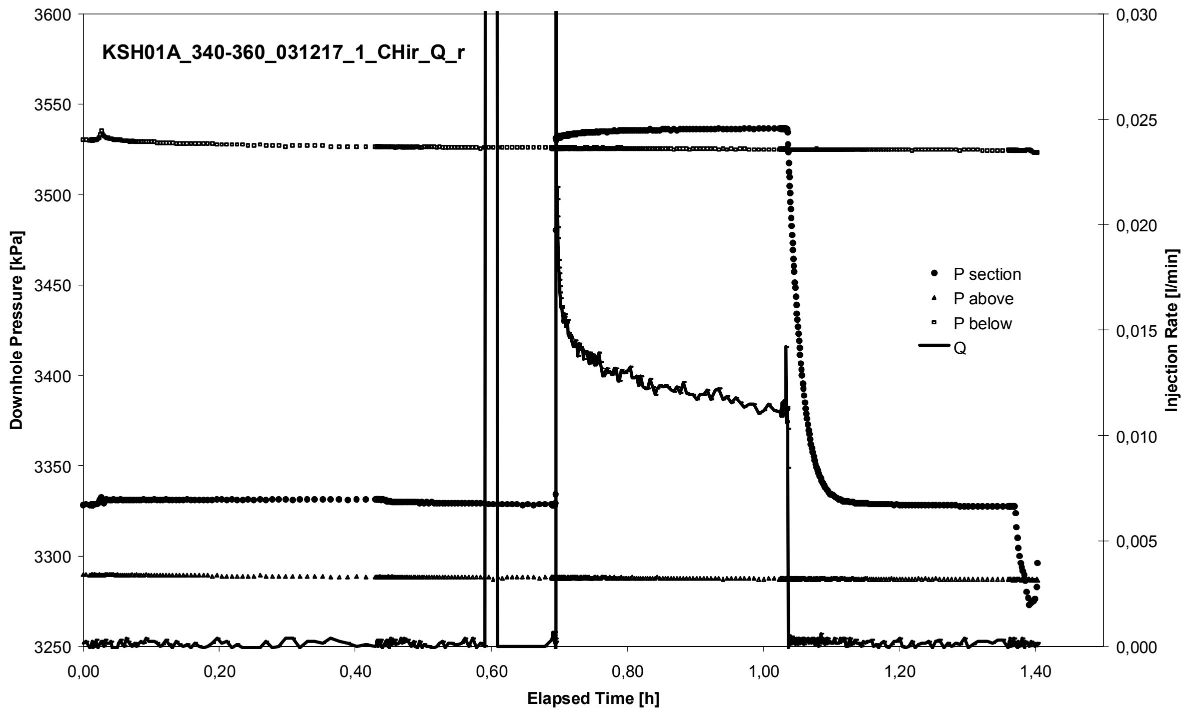


CHIR phase; HORNER match

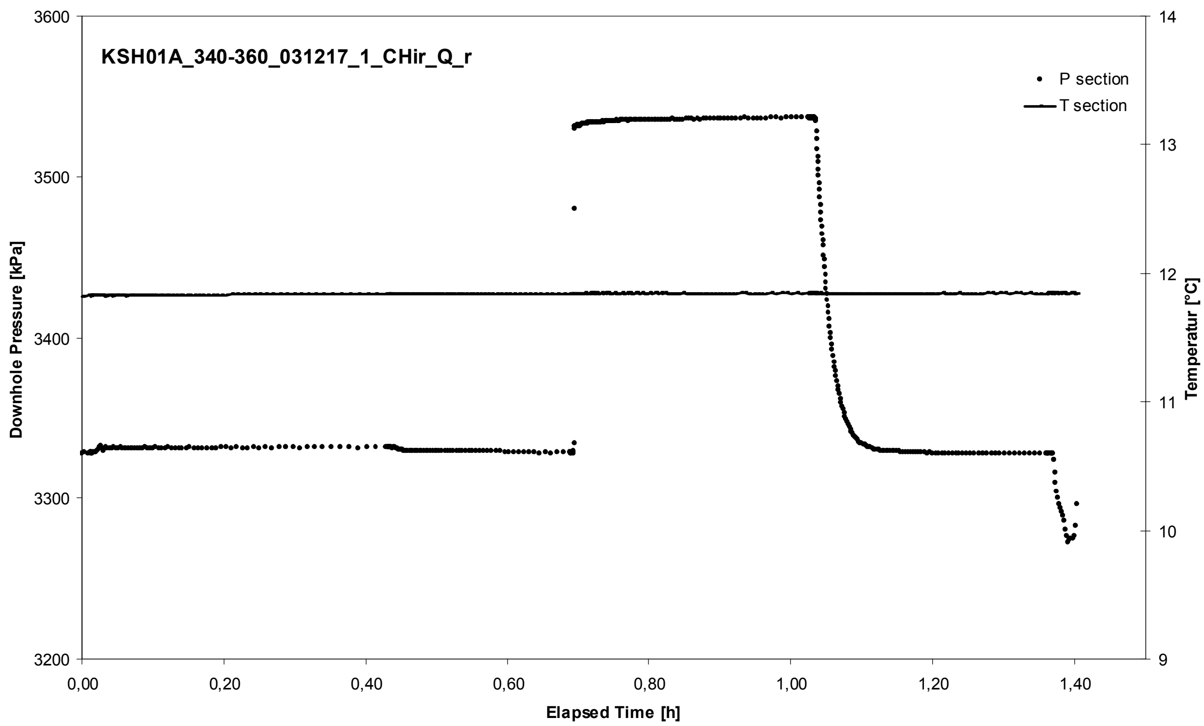
APPENDIX 2-22

Test 340 – 360 m

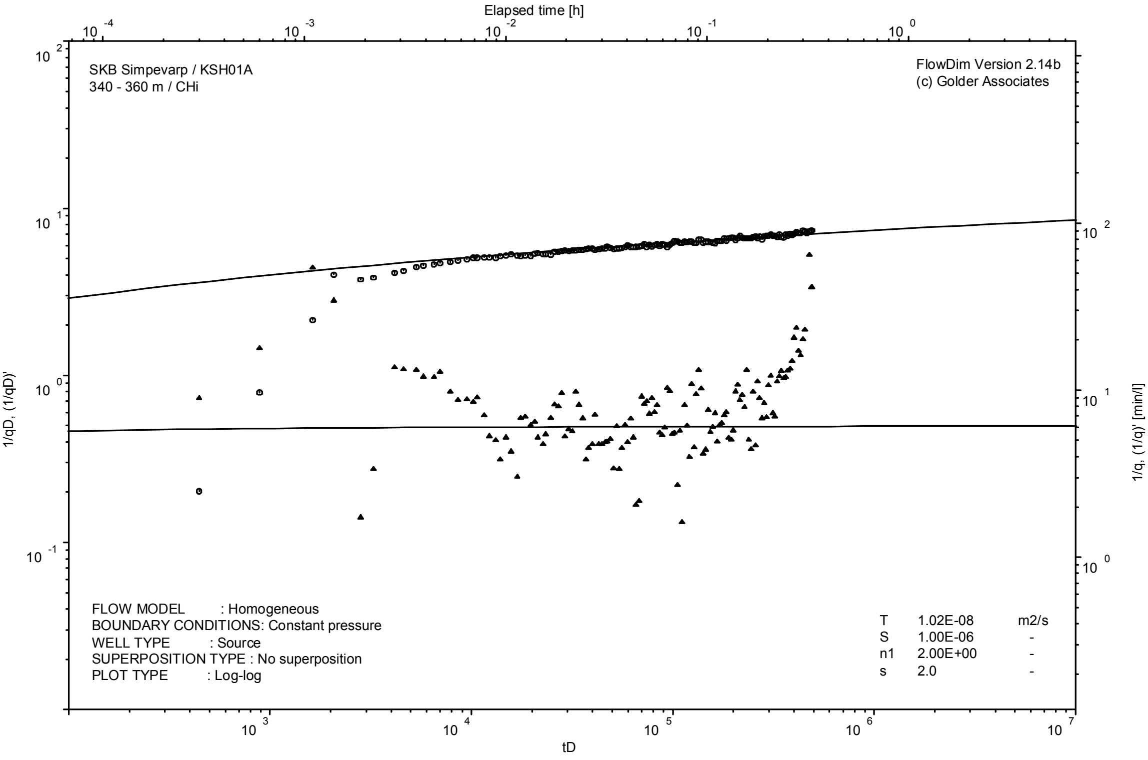
Analysis diagrams



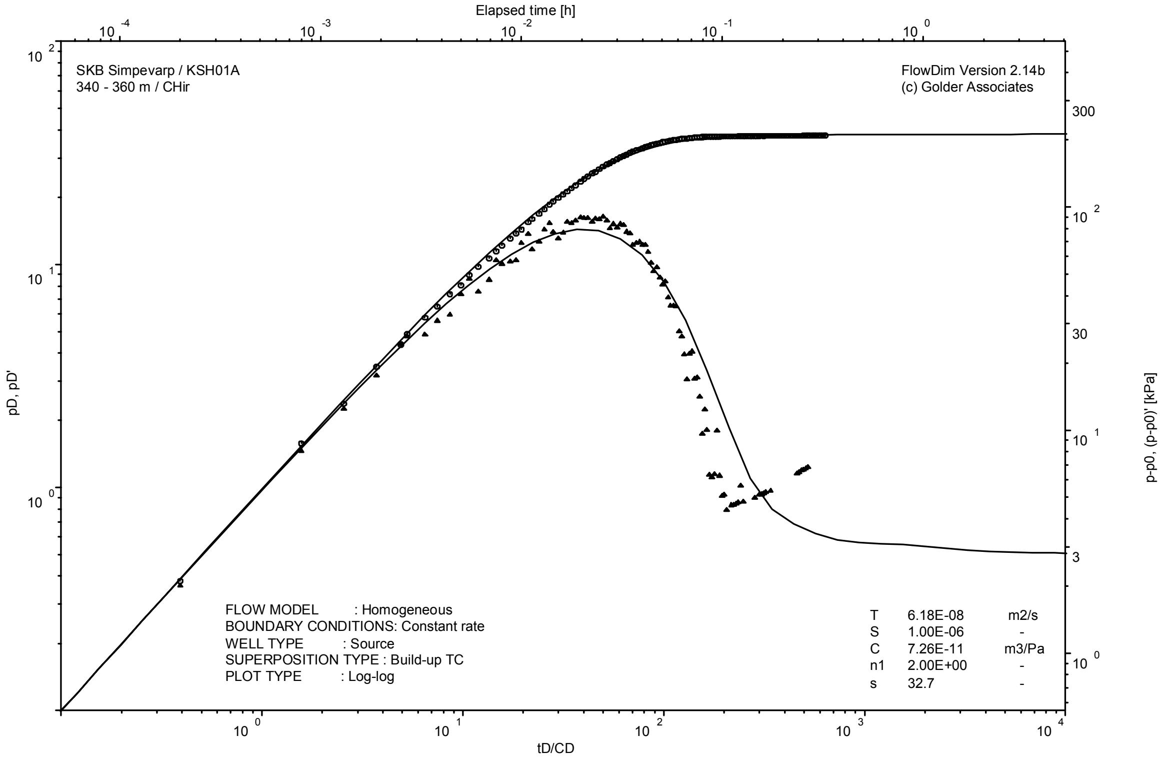
Pressure and flow rate vs. time; cartesian plot



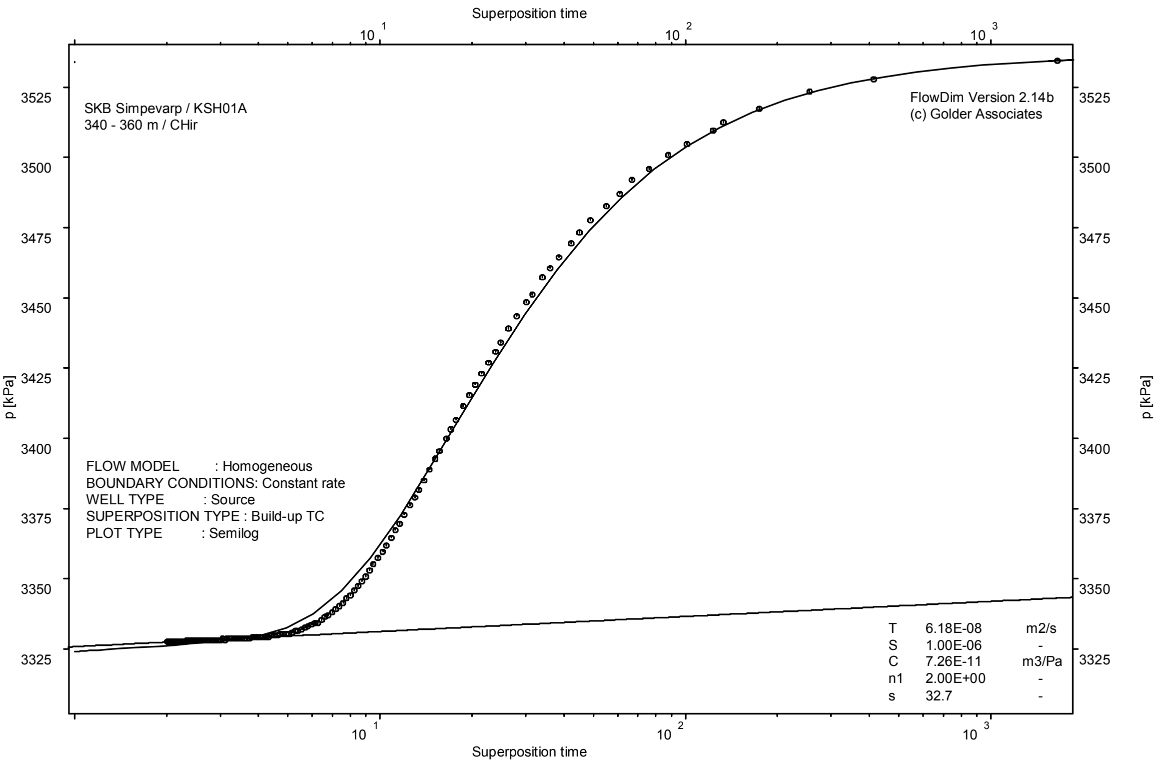
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

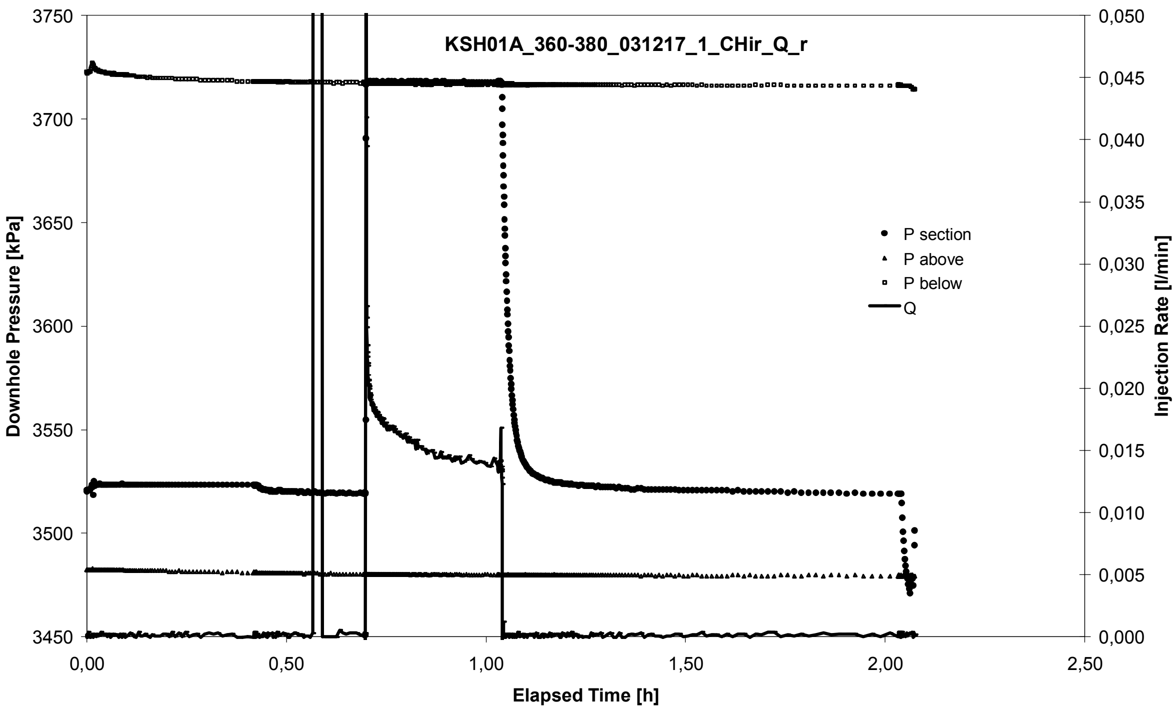


CHIR phase; HORNER match

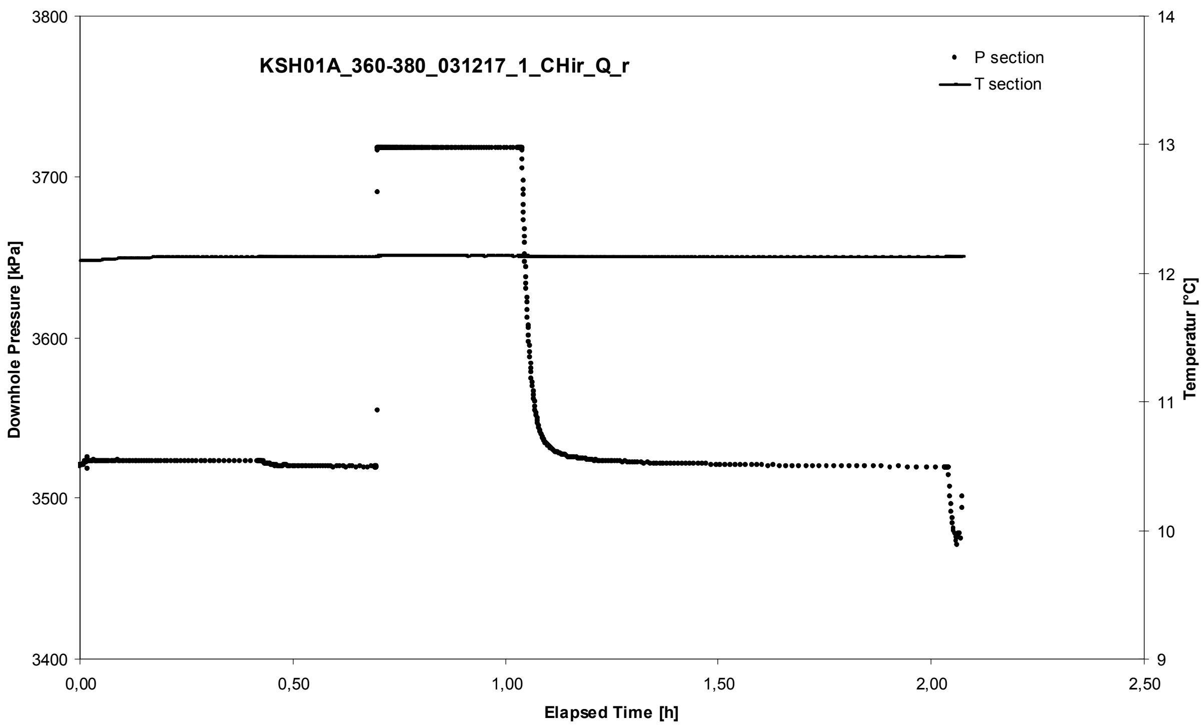
APPENDIX 2-23

Test 360 – 380 m

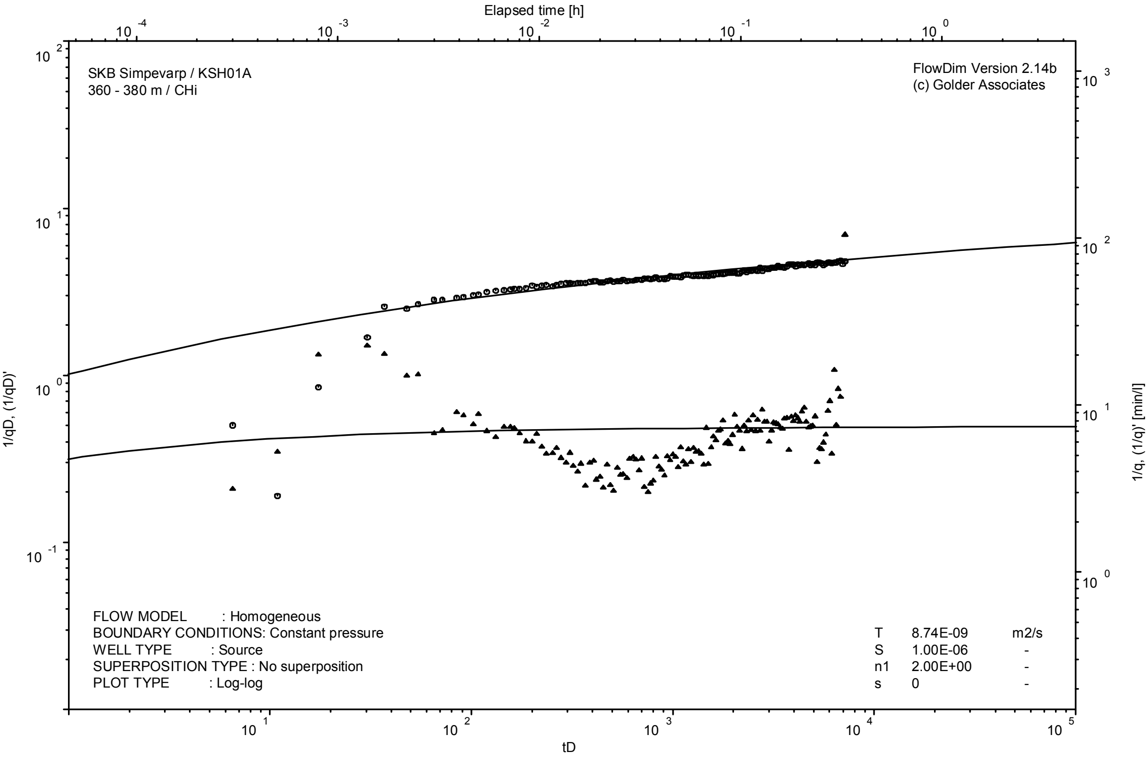
Analysis diagrams



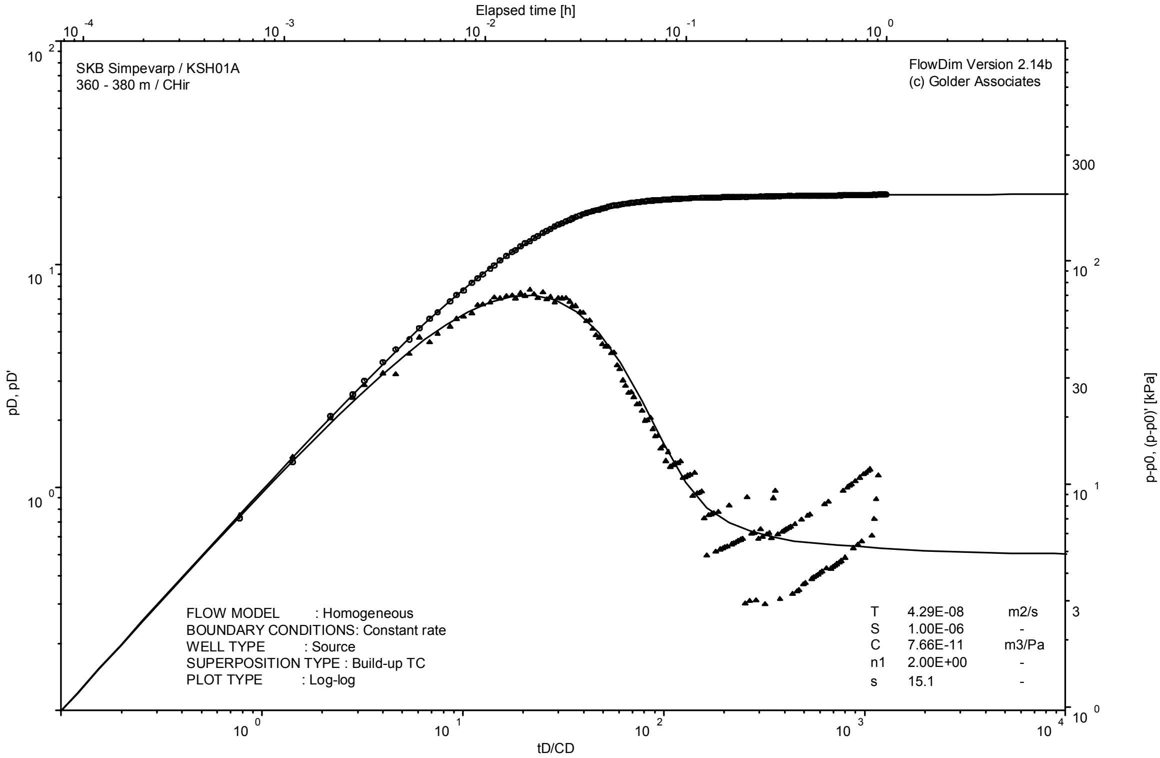
Pressure and flow rate vs. time; cartesian plot



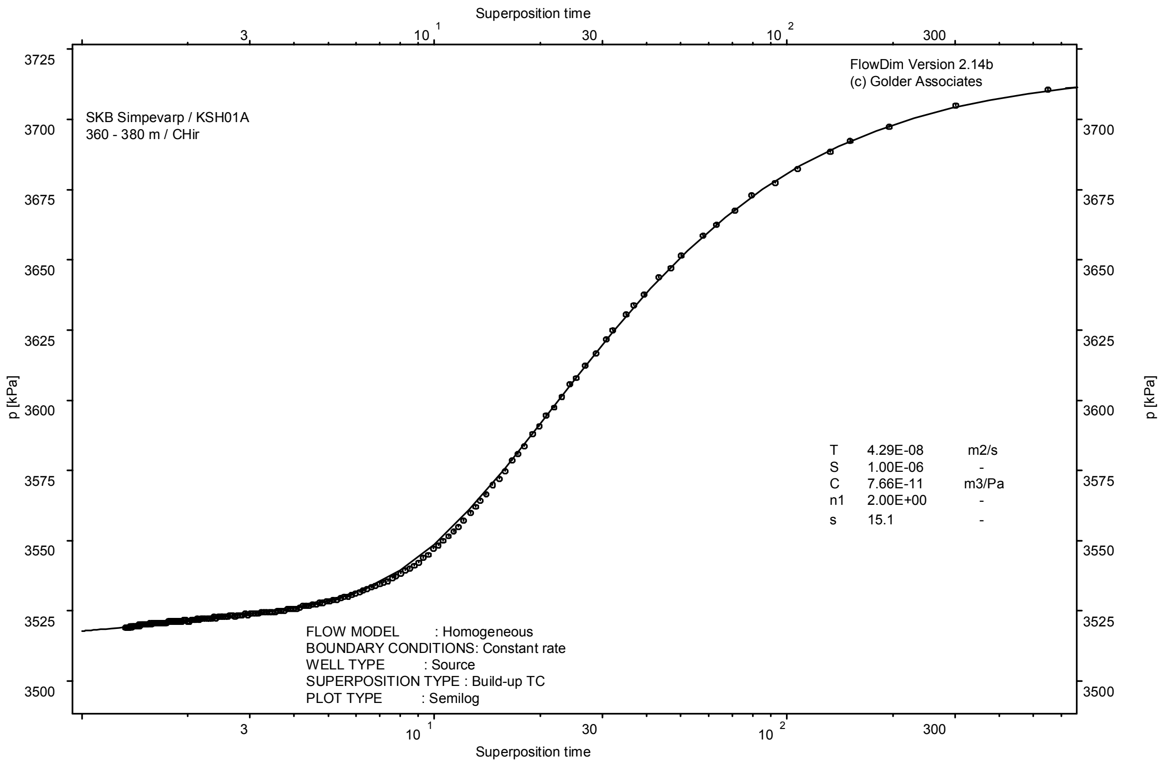
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

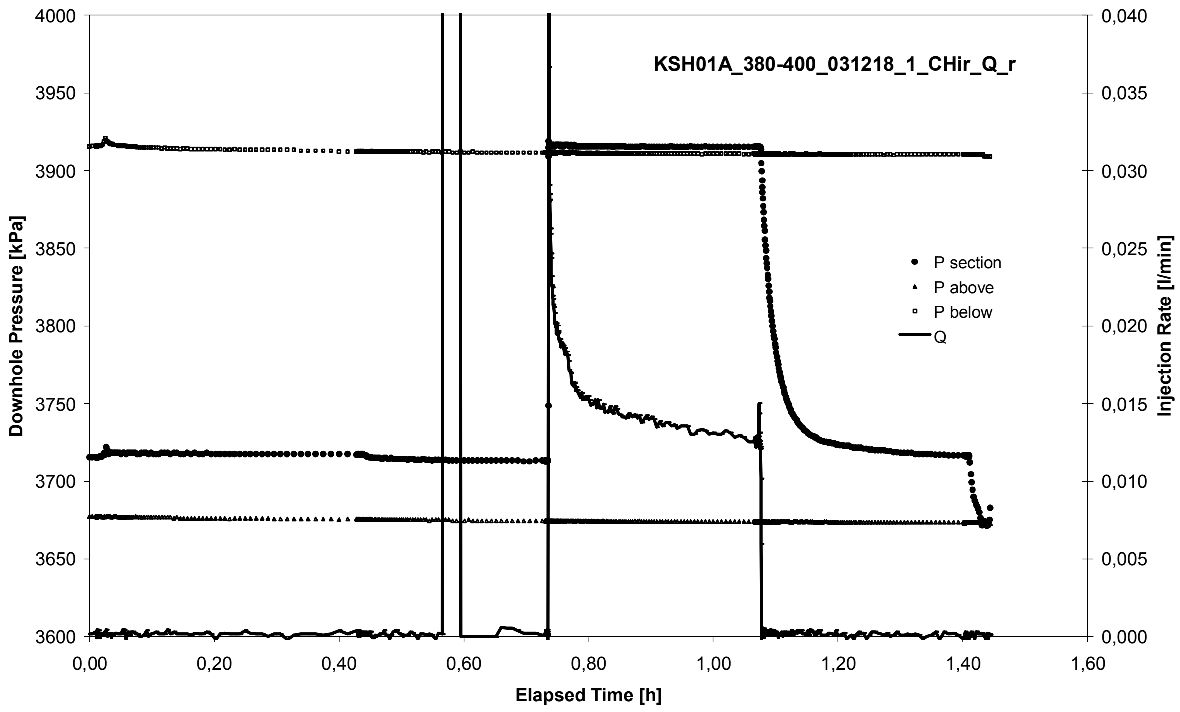


CHIR phase; HORNER match

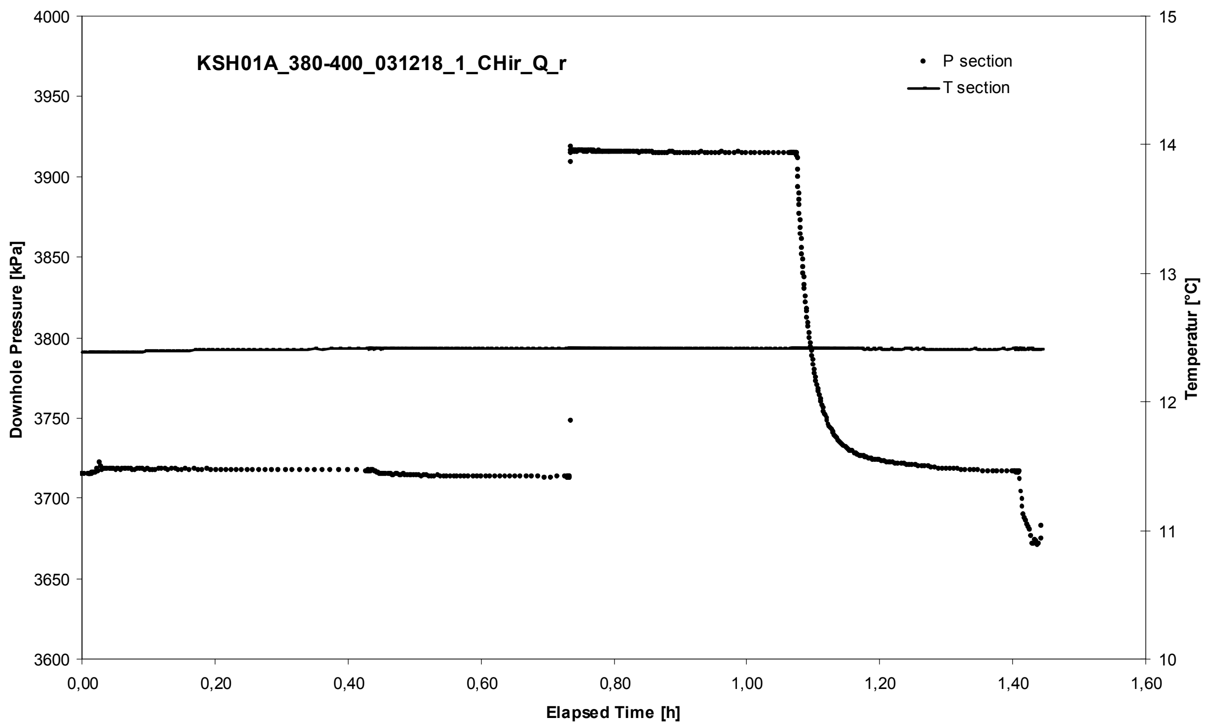
APPENDIX 2-24

Test 380 – 400 m

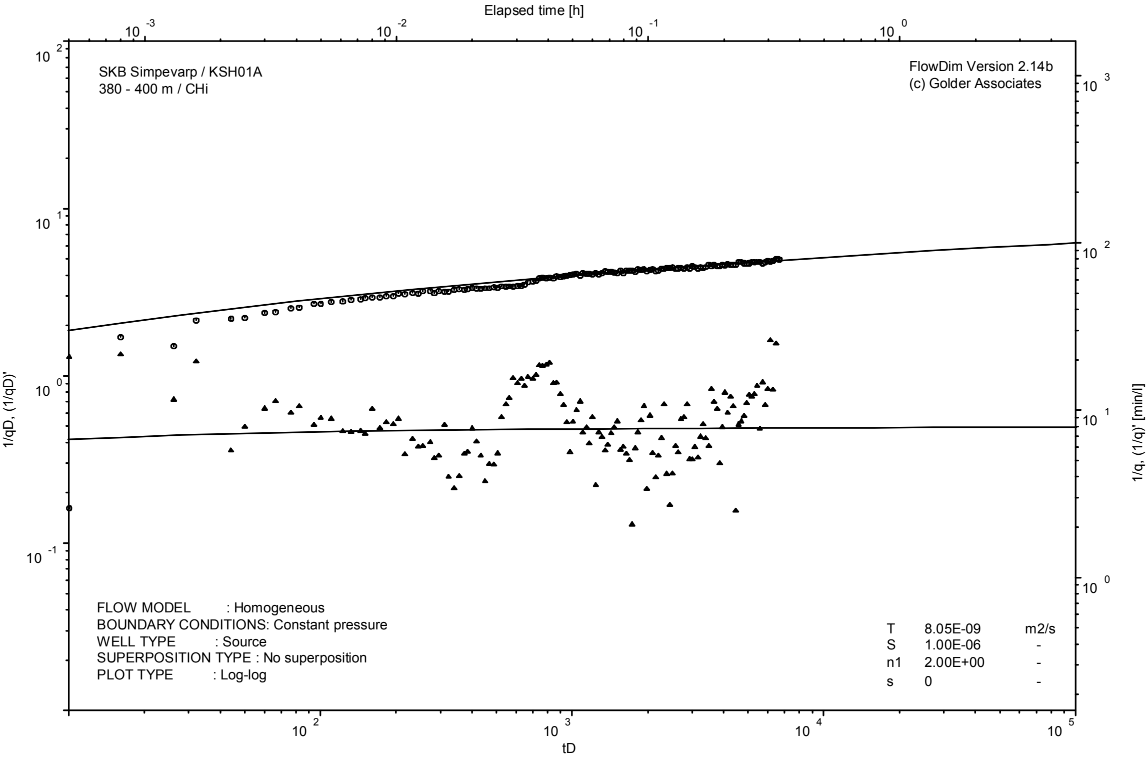
Analysis diagrams



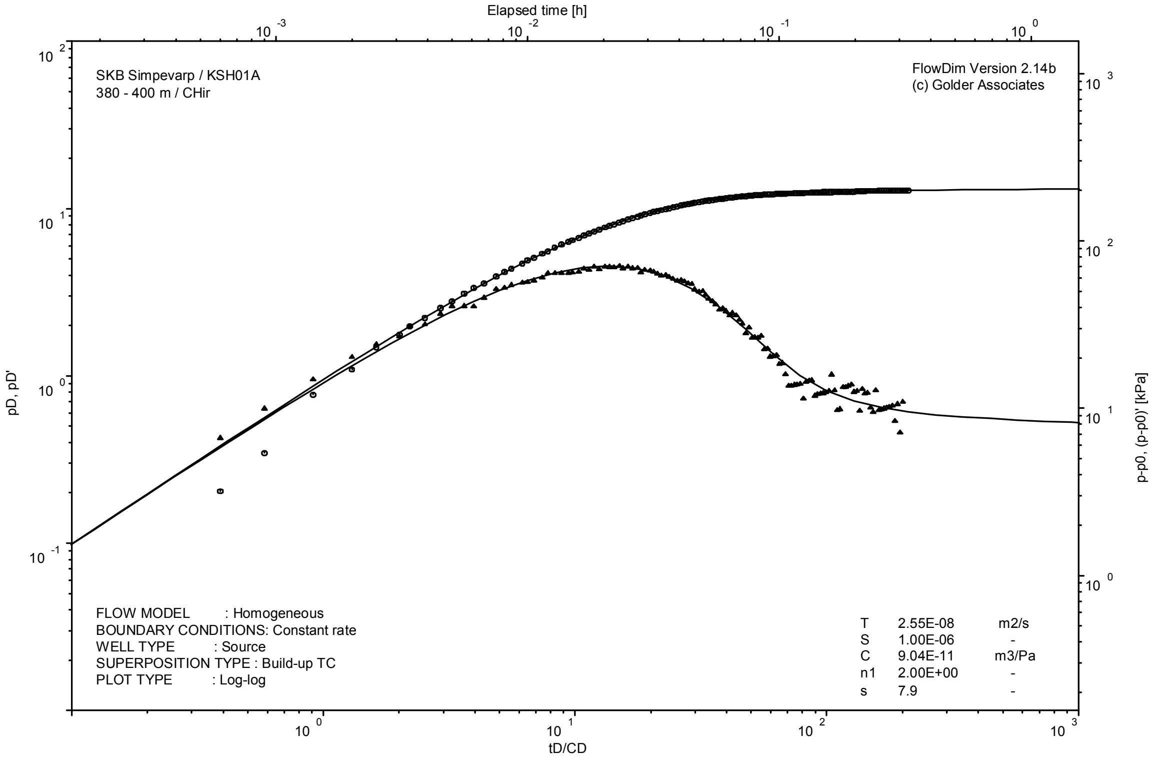
Pressure and flow rate vs. time; cartesian plot



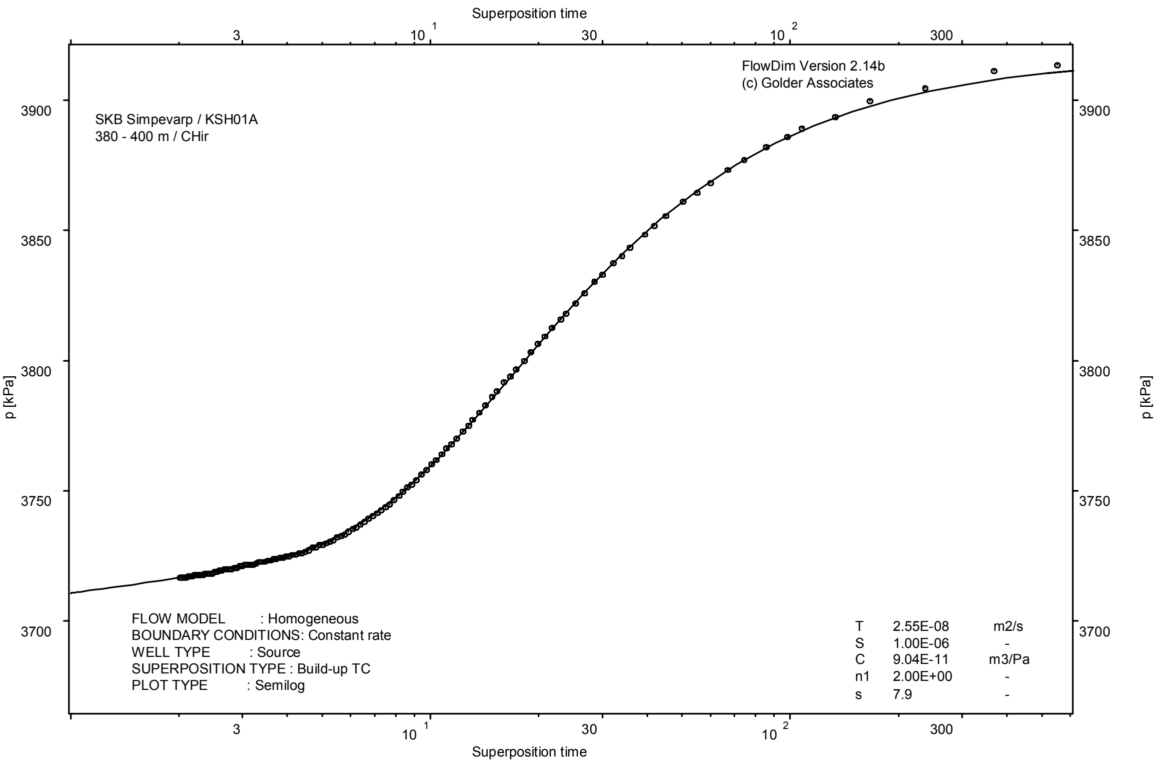
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

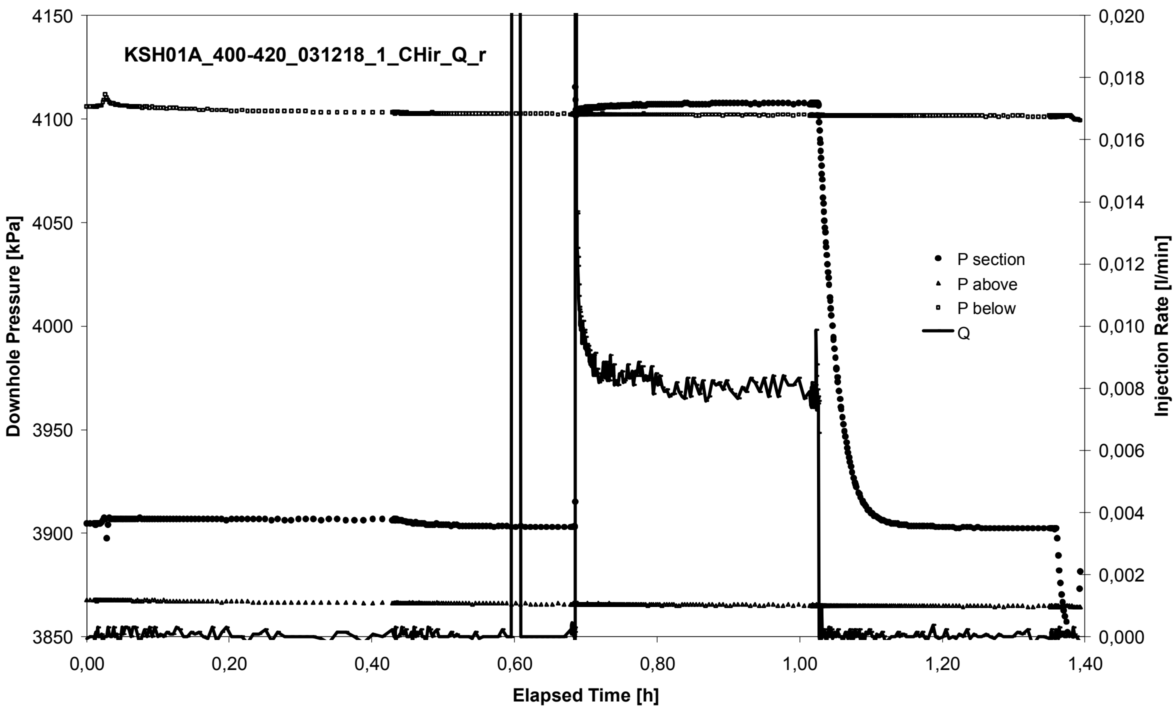


CHIR phase; HORNER match

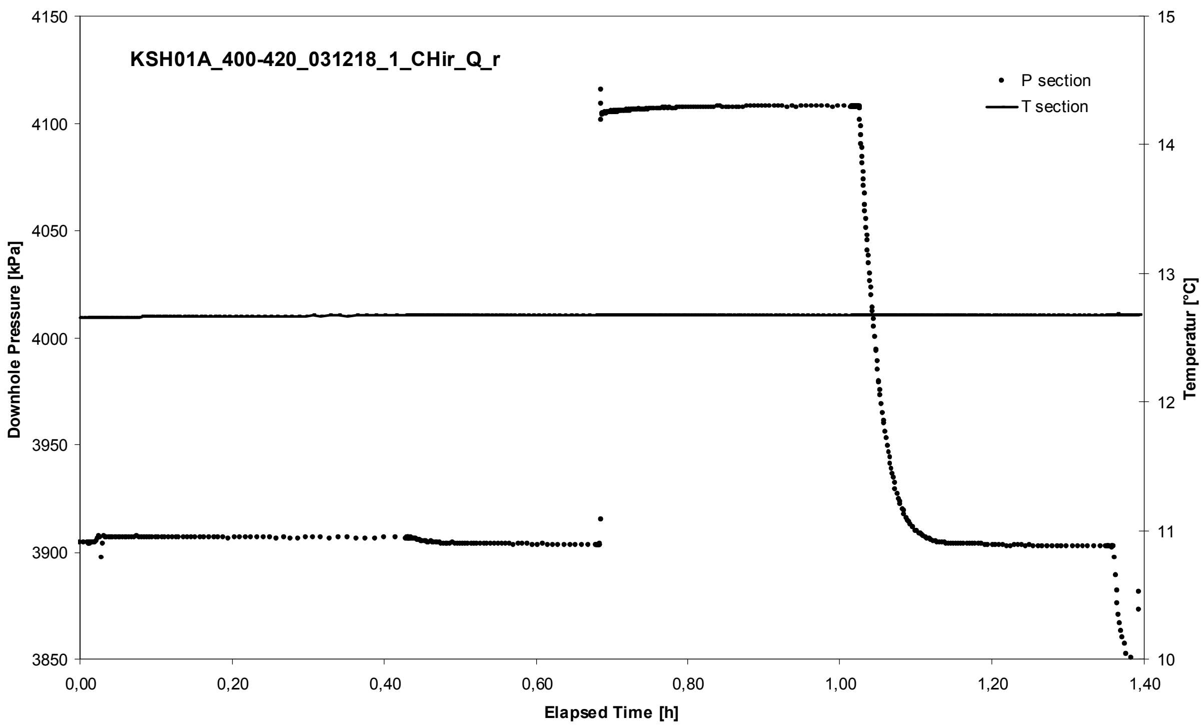
APPENDIX 2-25

Test 400 – 420 m

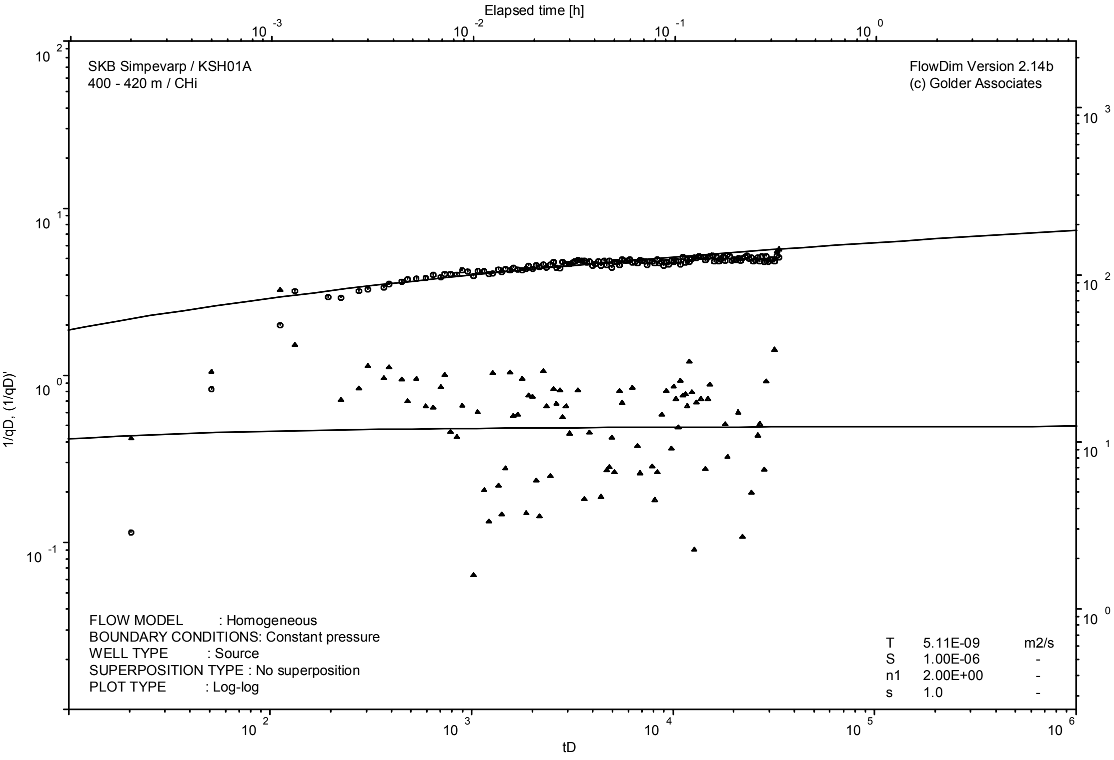
Analysis diagrams



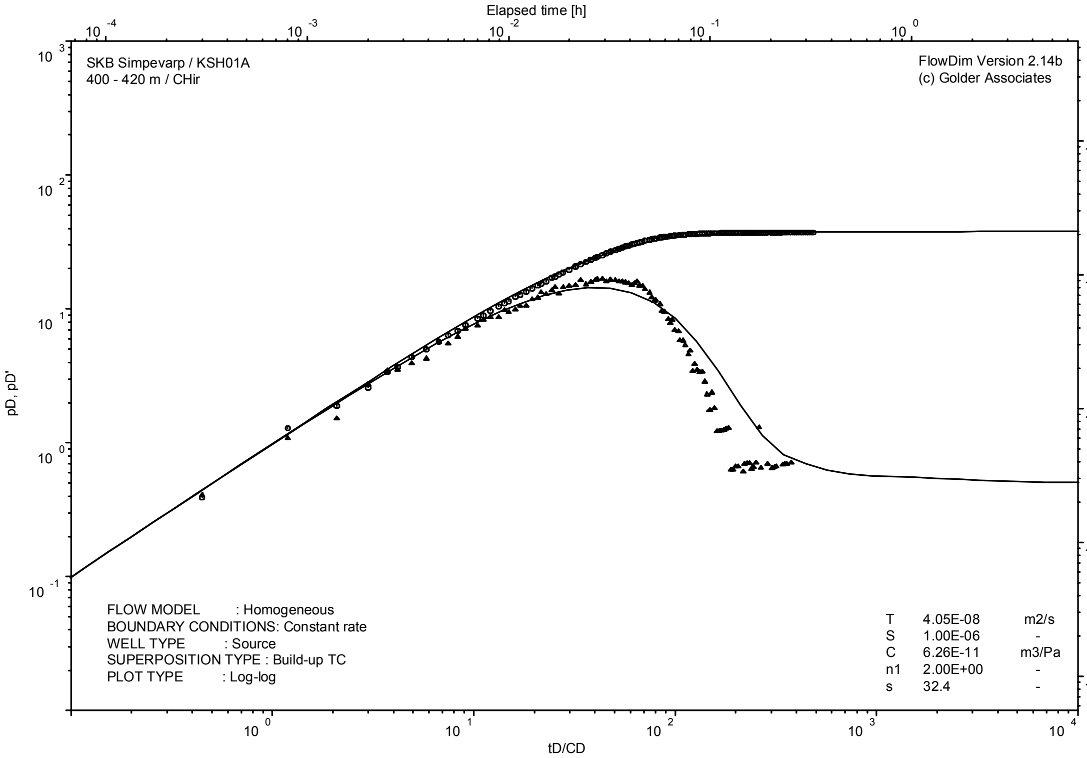
Pressure and flow rate vs. time; cartesian plot



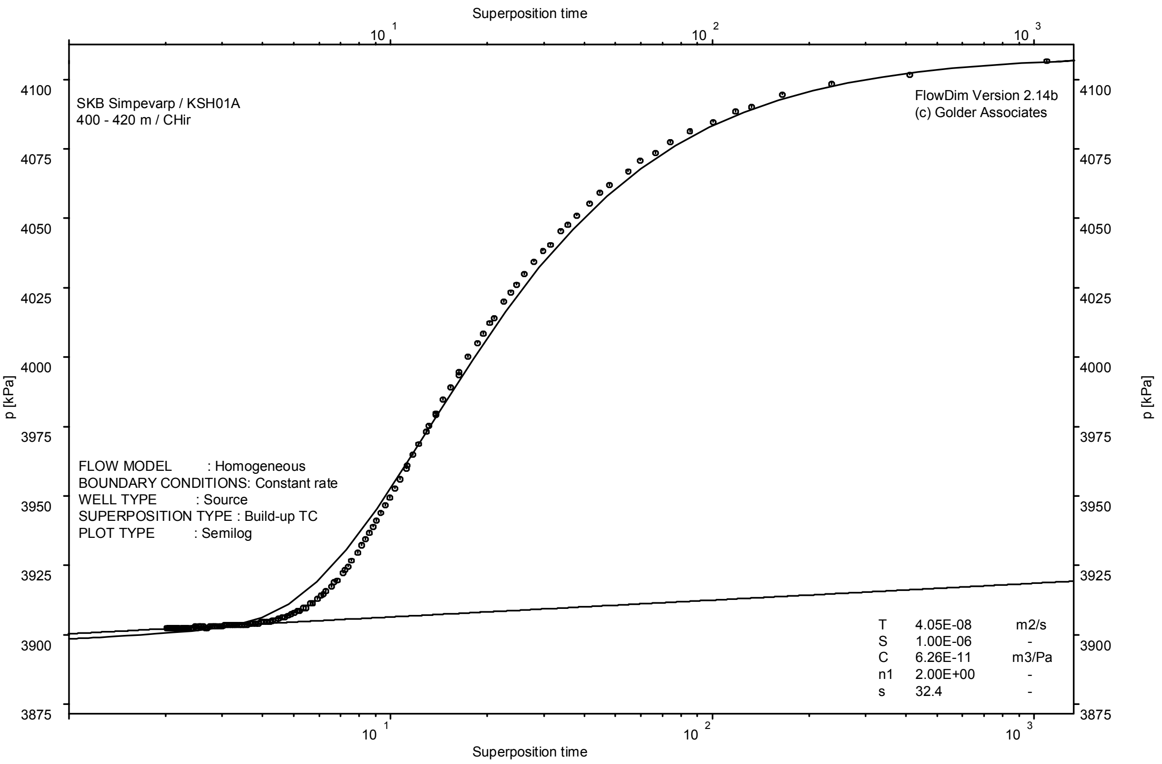
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

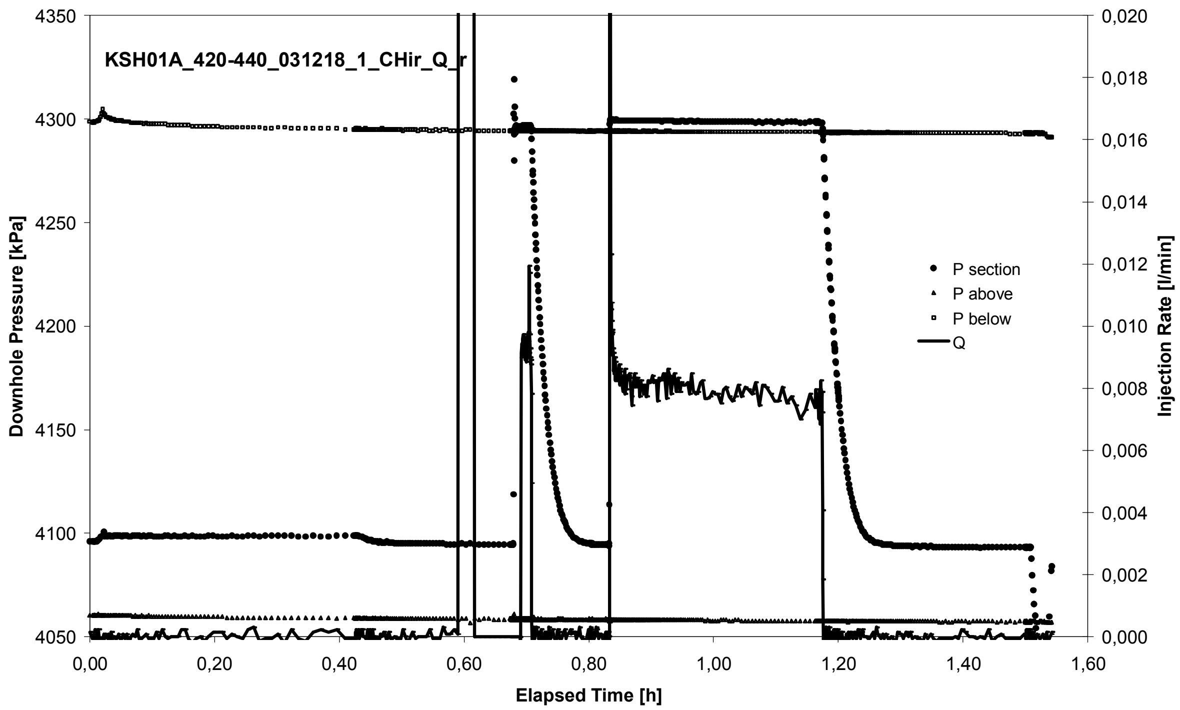


CHIR phase; HORNER match

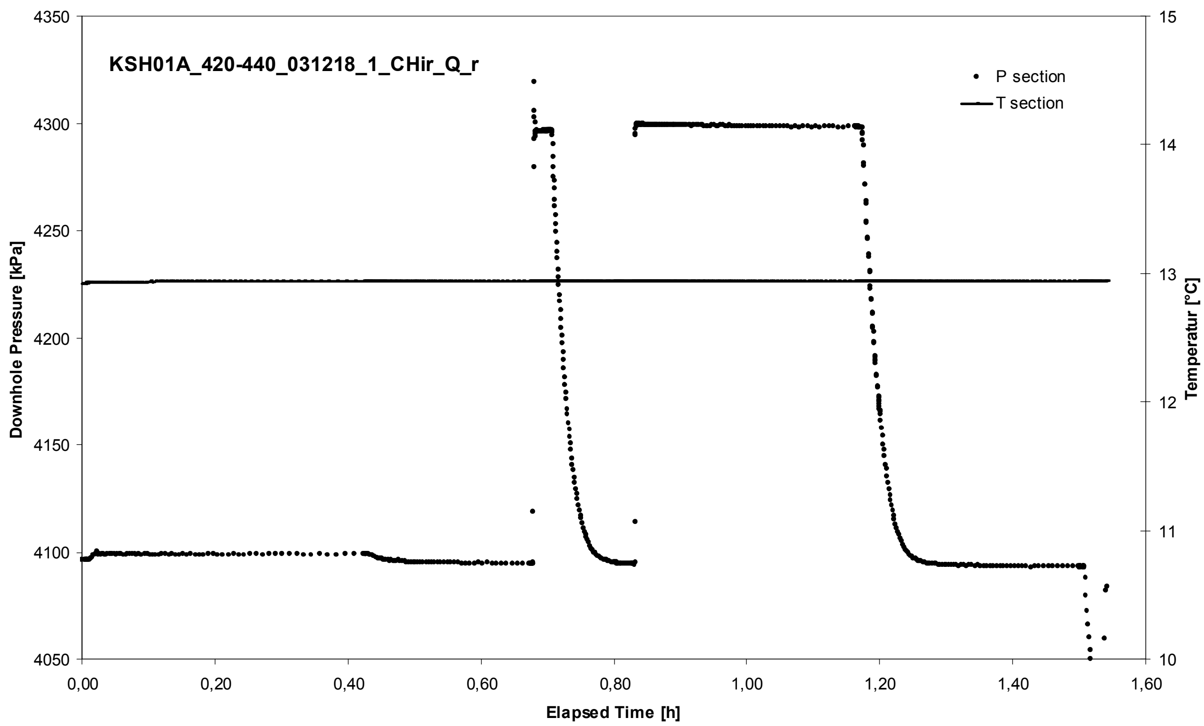
APPENDIX 2-26

Test 420 – 440 m

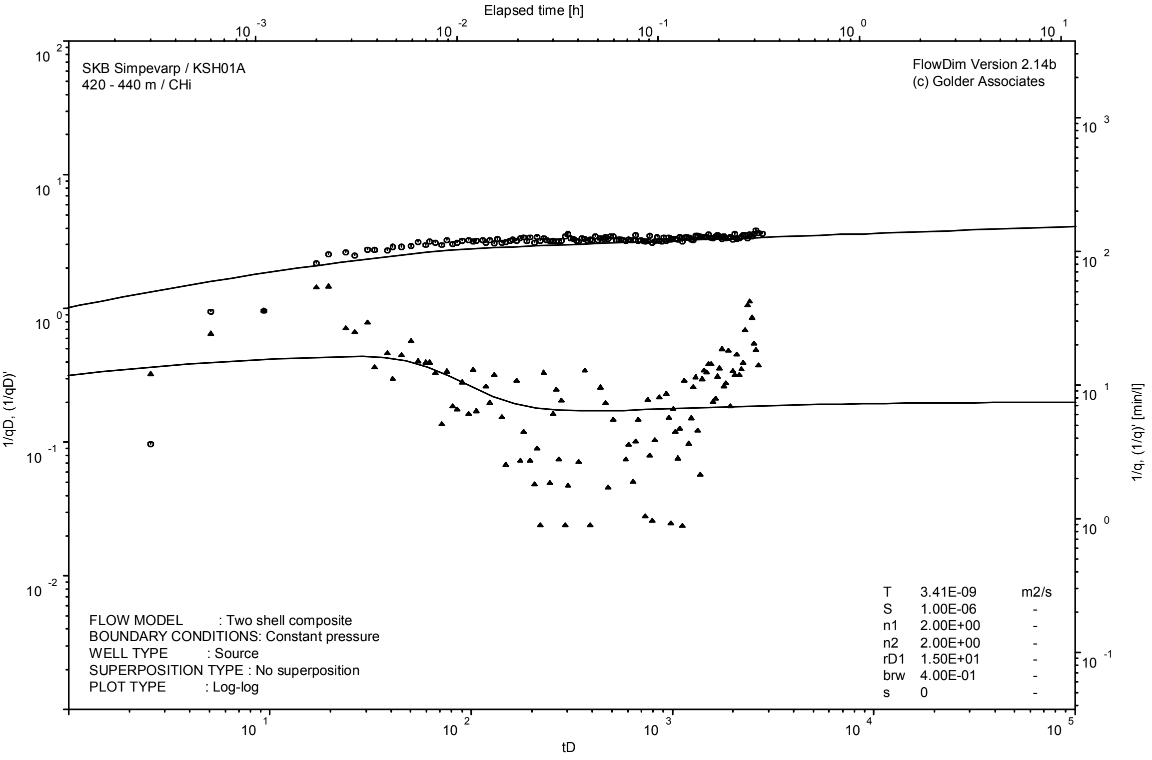
Analysis diagrams



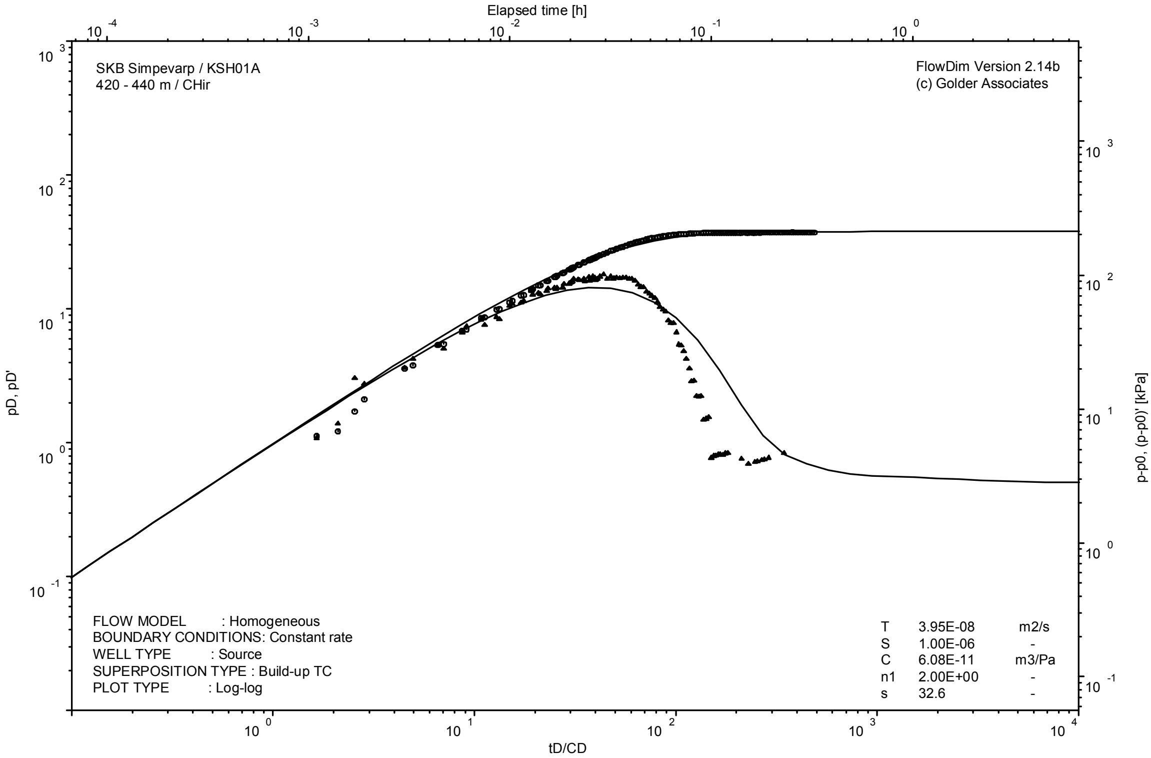
Pressure and flow rate vs. time; cartesian plot



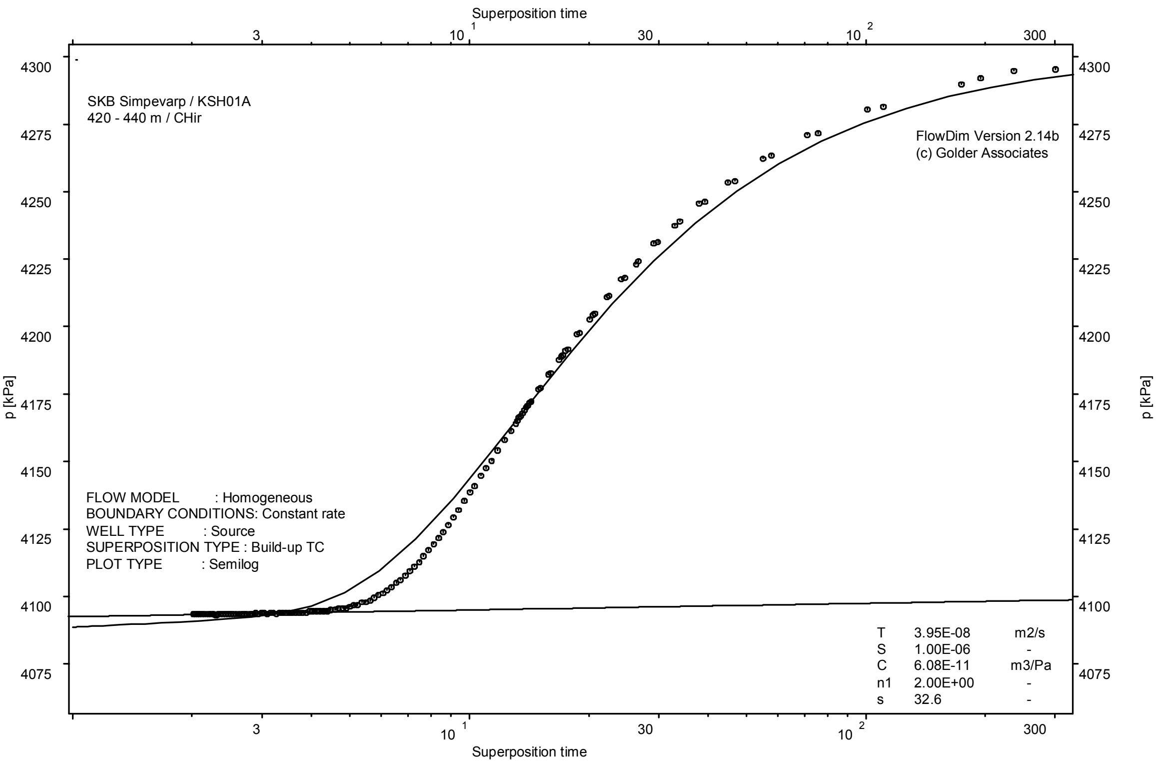
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

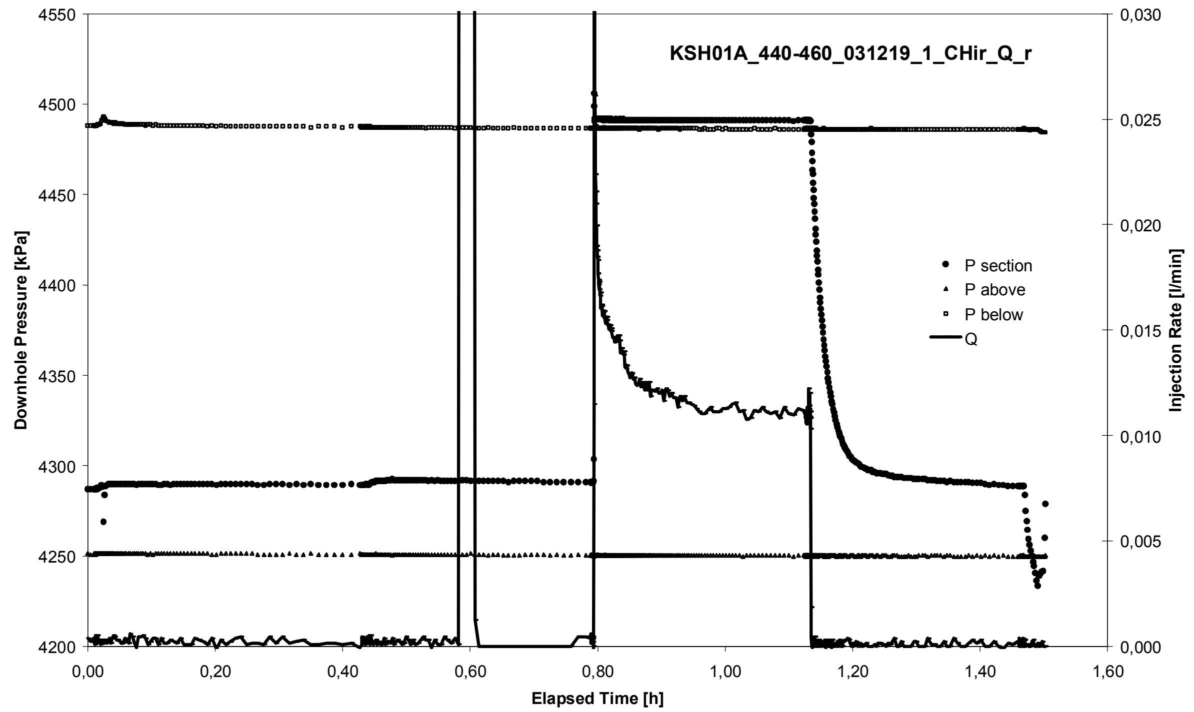


CHIR phase; HORNER match

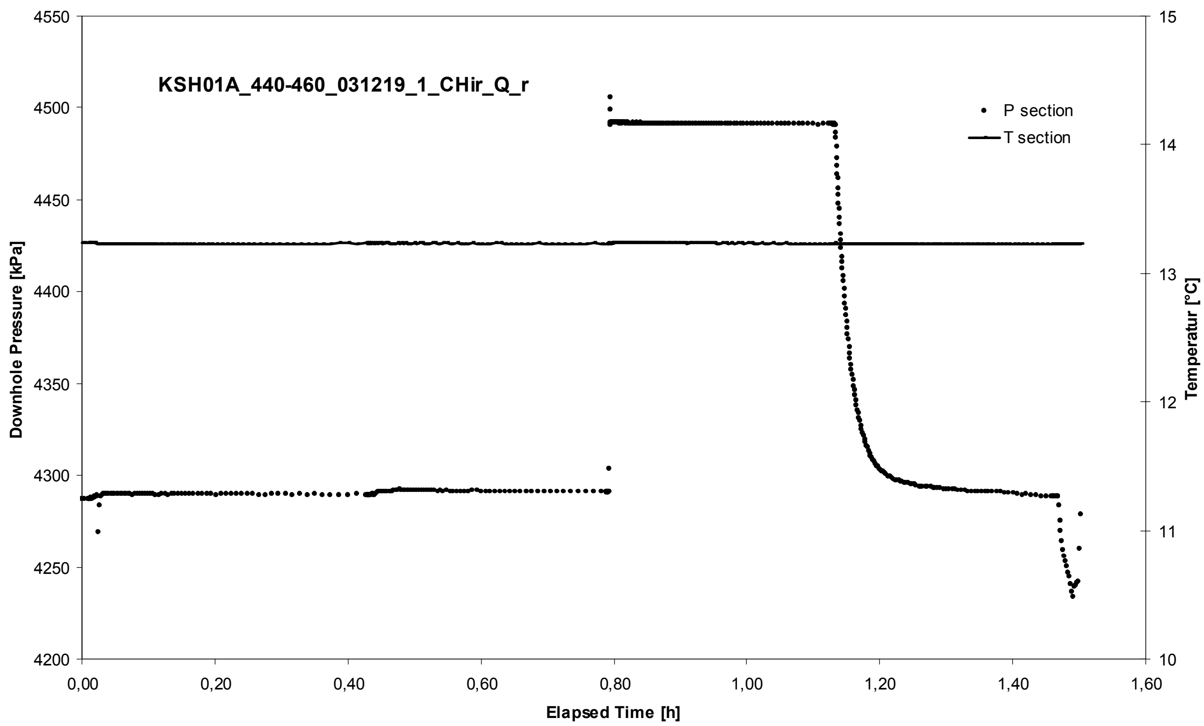
APPENDIX 2-27

Test 440 – 460 m

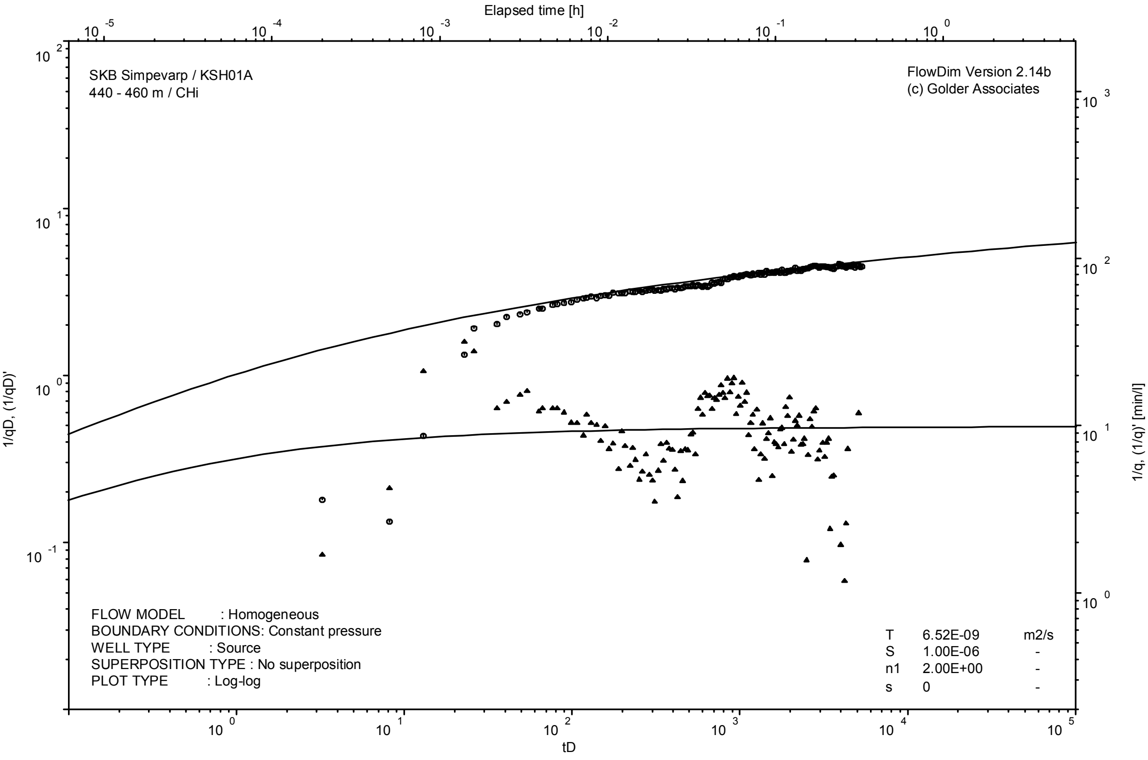
Analysis diagrams



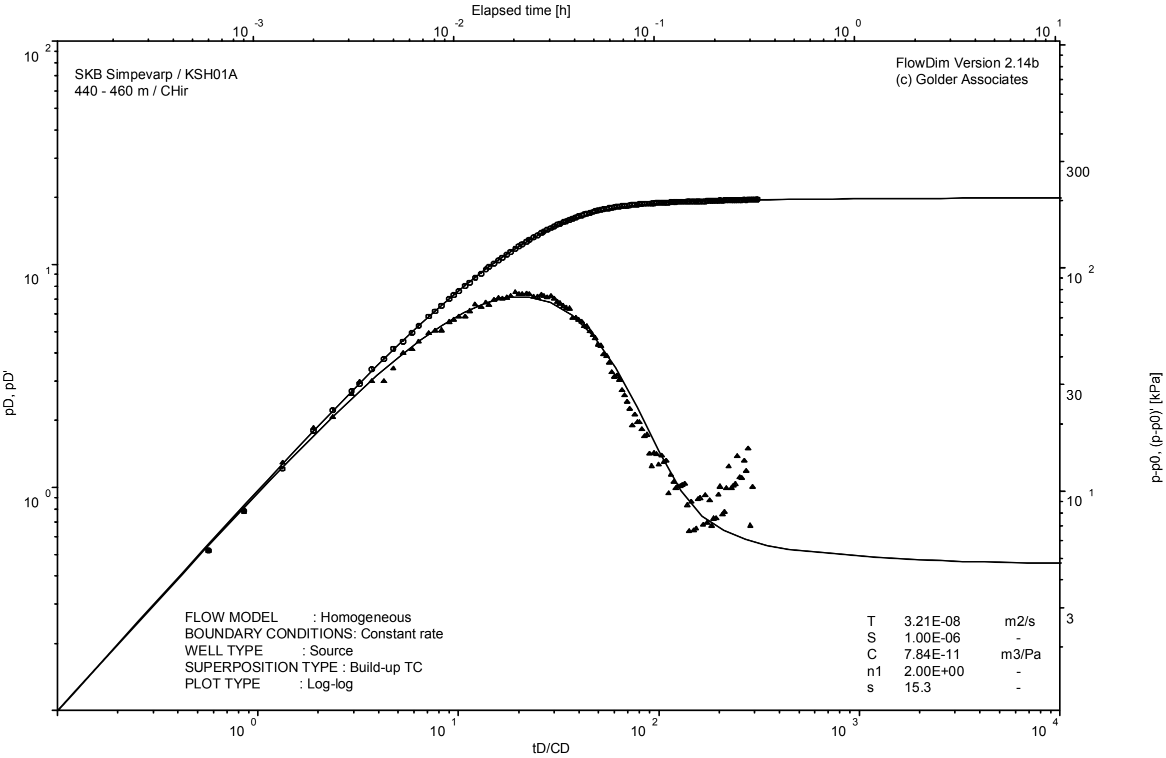
Pressure and flow rate vs. time; cartesian plot



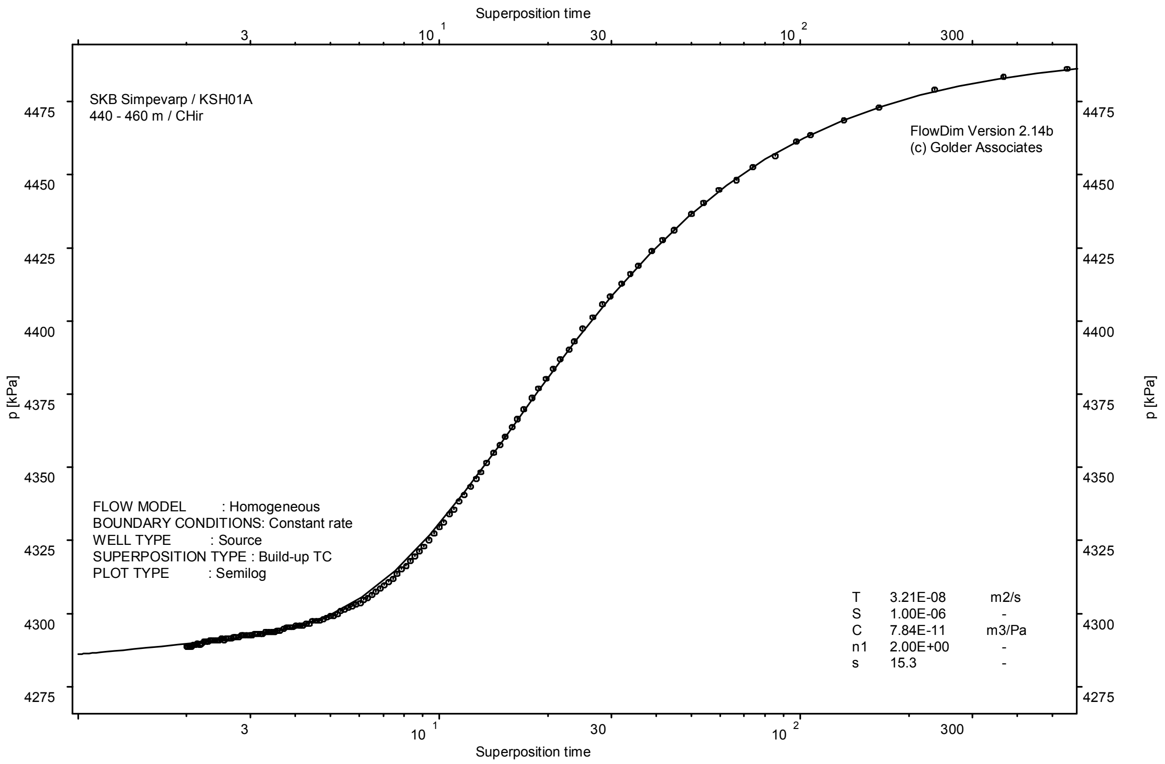
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

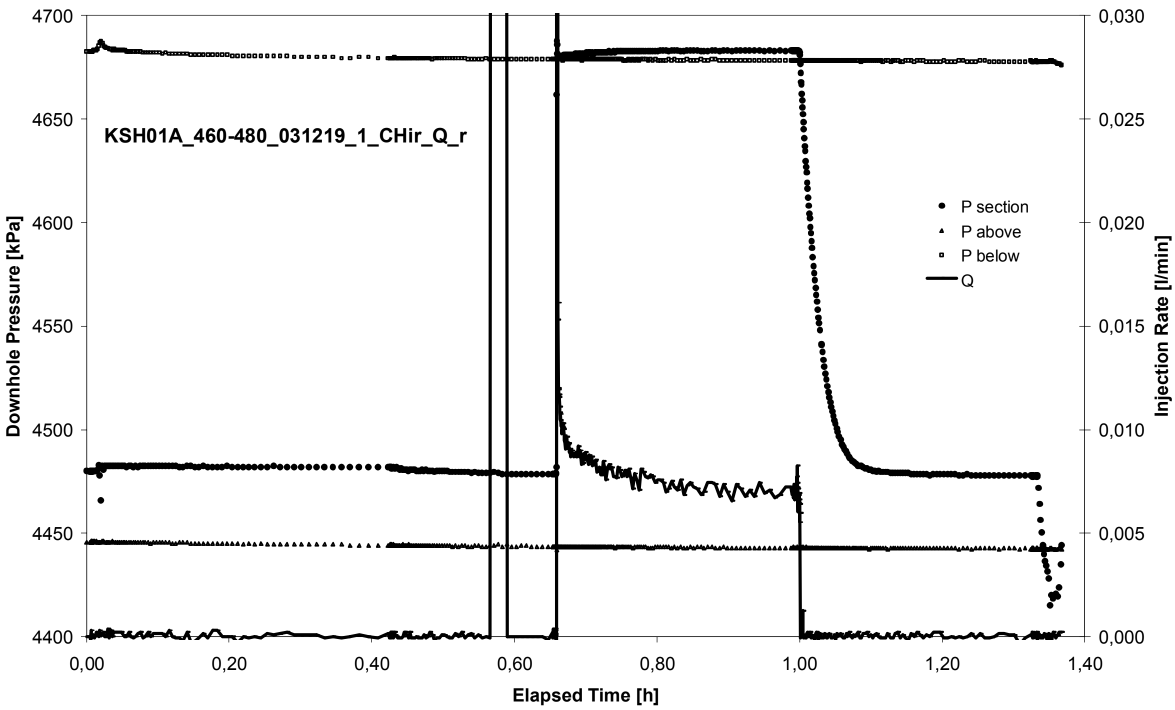


CHIR phase; HORNER match

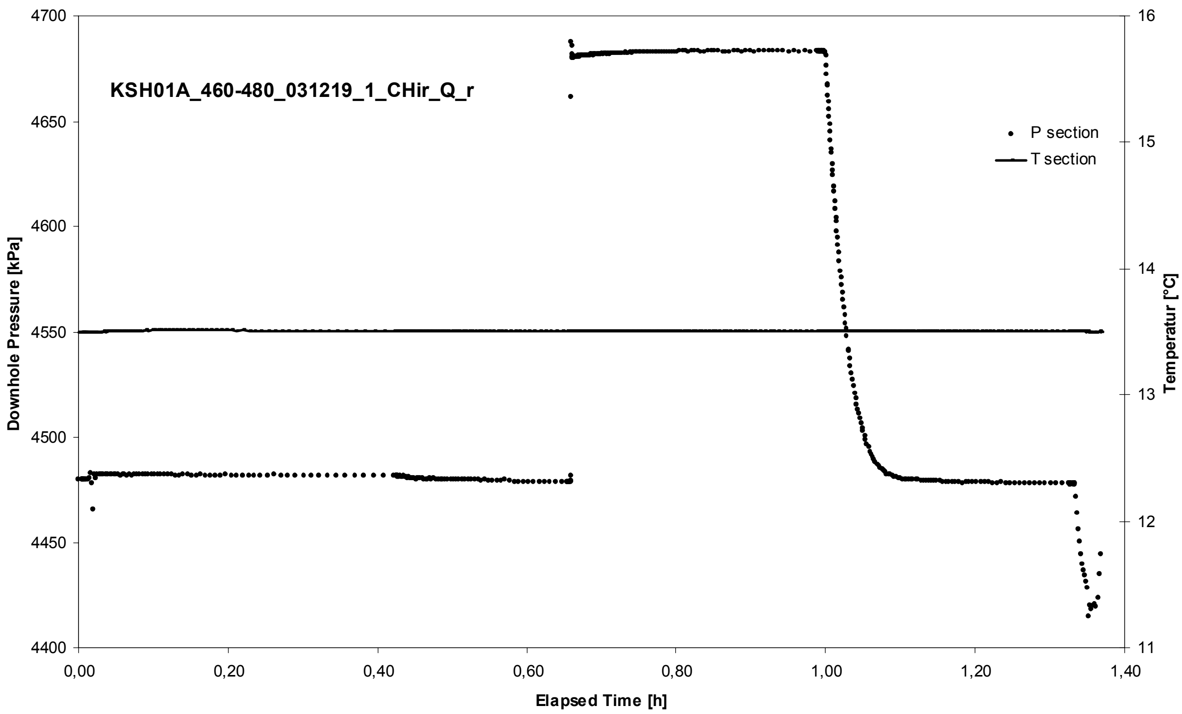
APPENDIX 2-28

Test 460 – 480 m

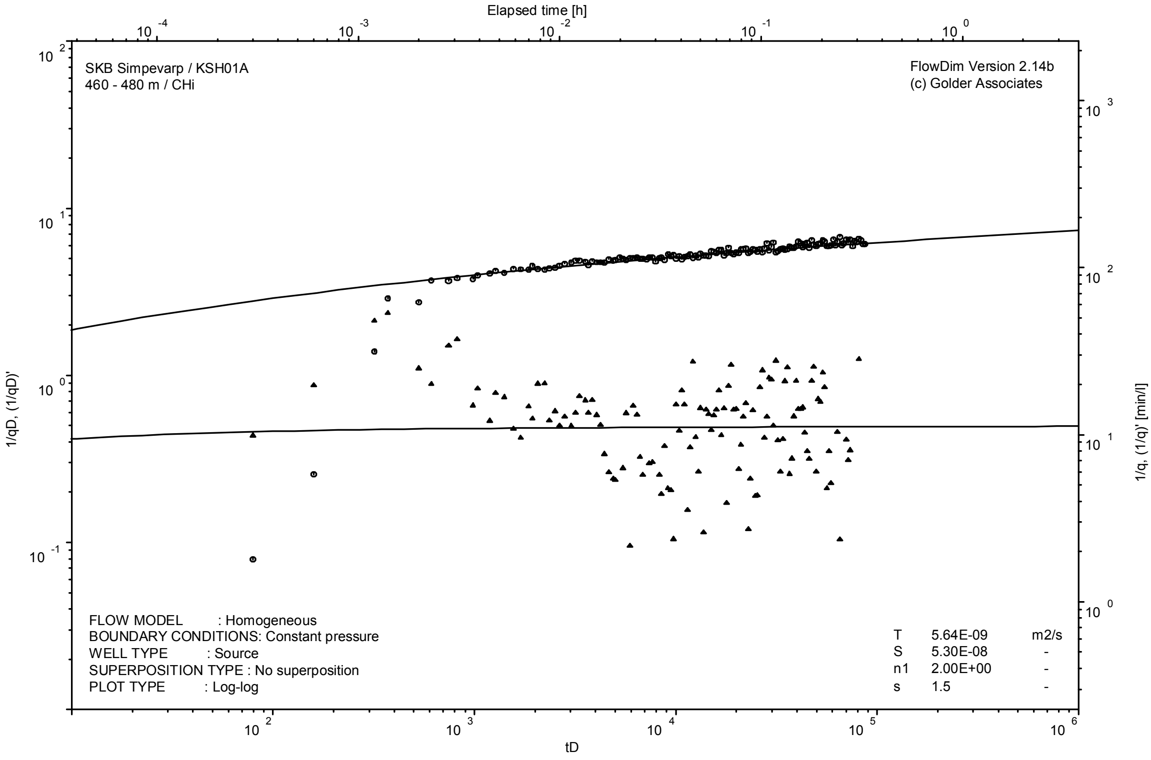
Analysis diagrams



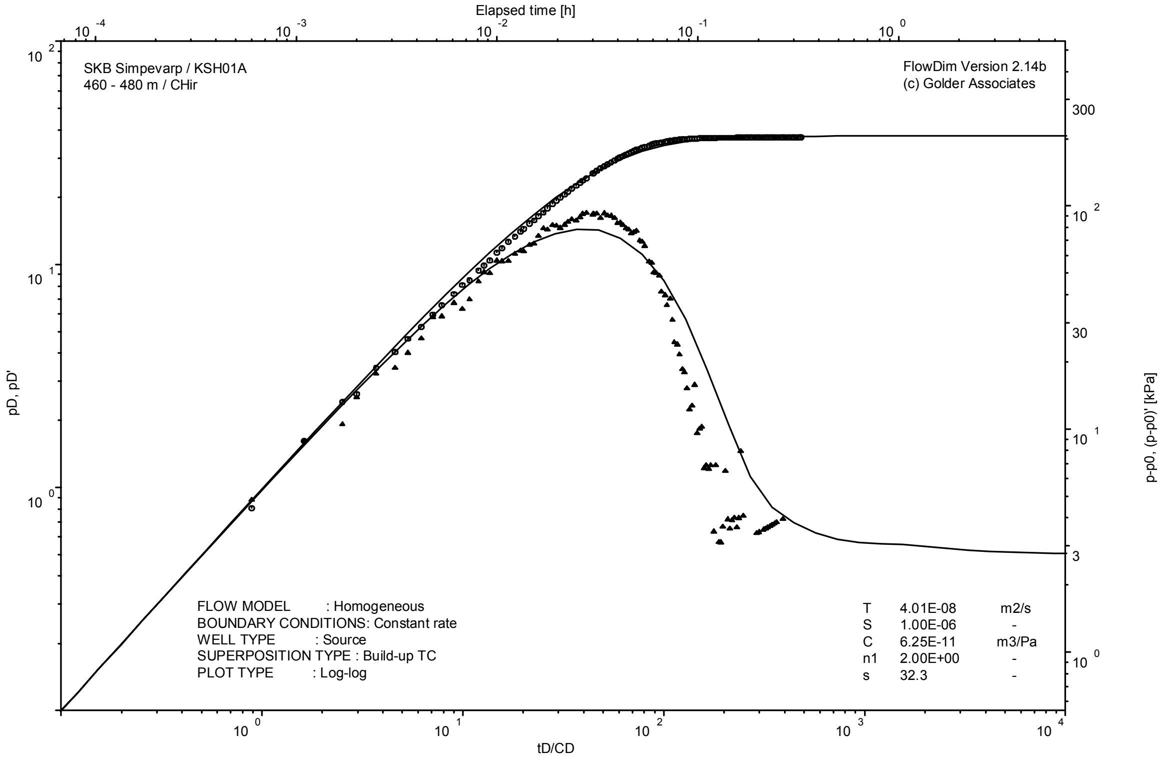
Pressure and flow rate vs. time; cartesian plot



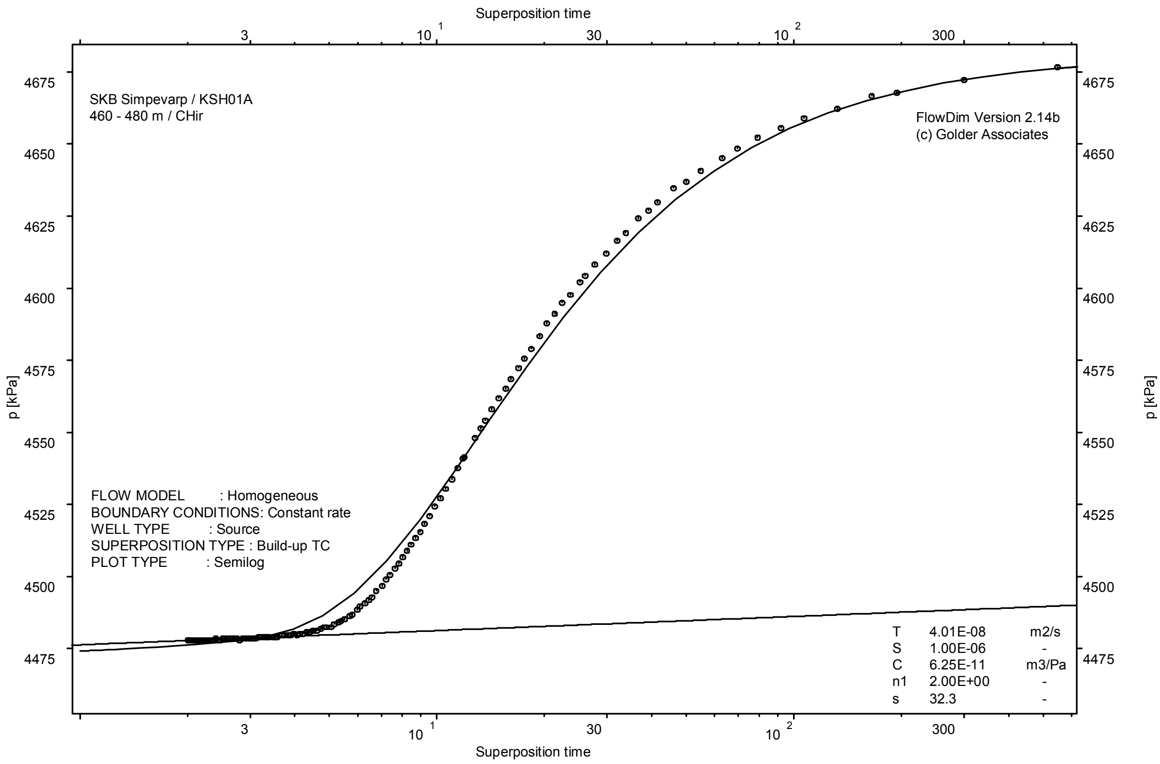
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

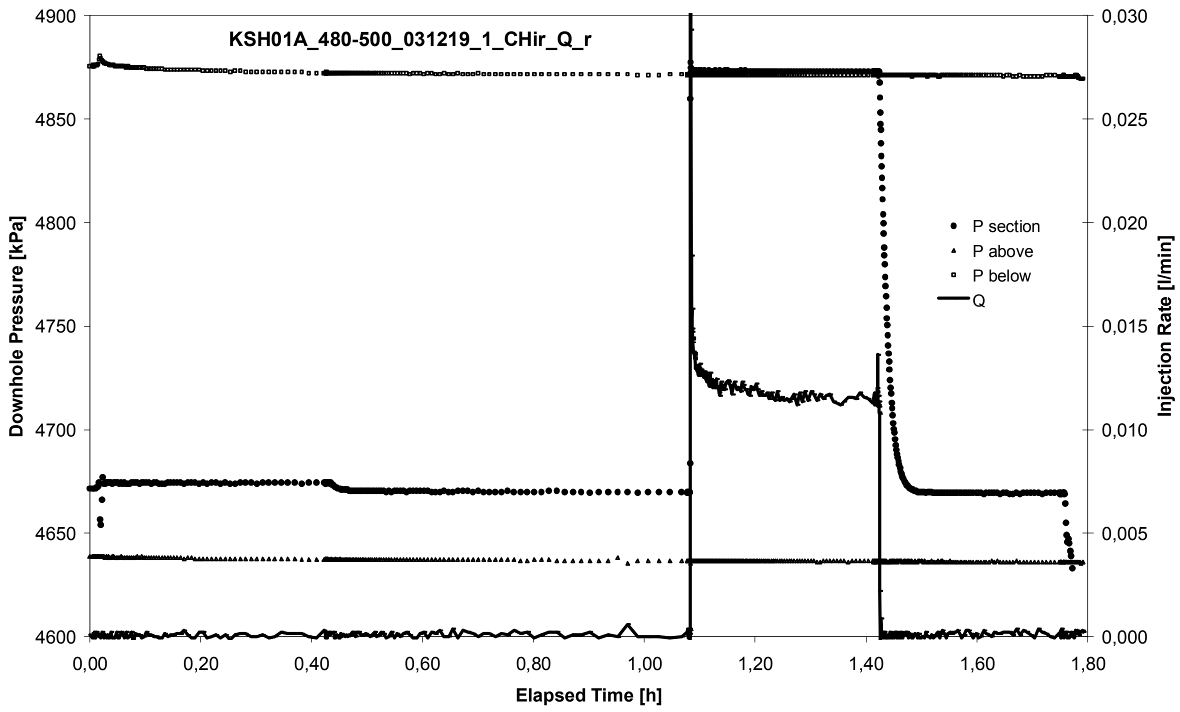


CHIR phase; HORNER match

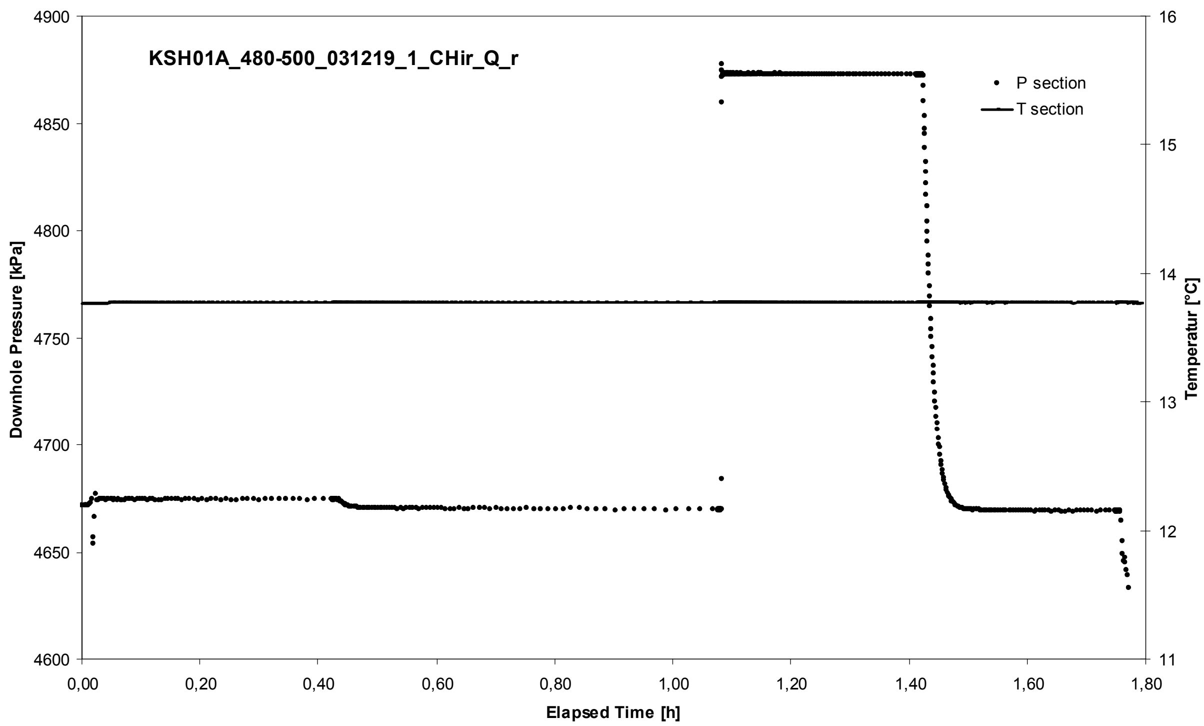
APPENDIX 2-29

Test 480 – 500 m

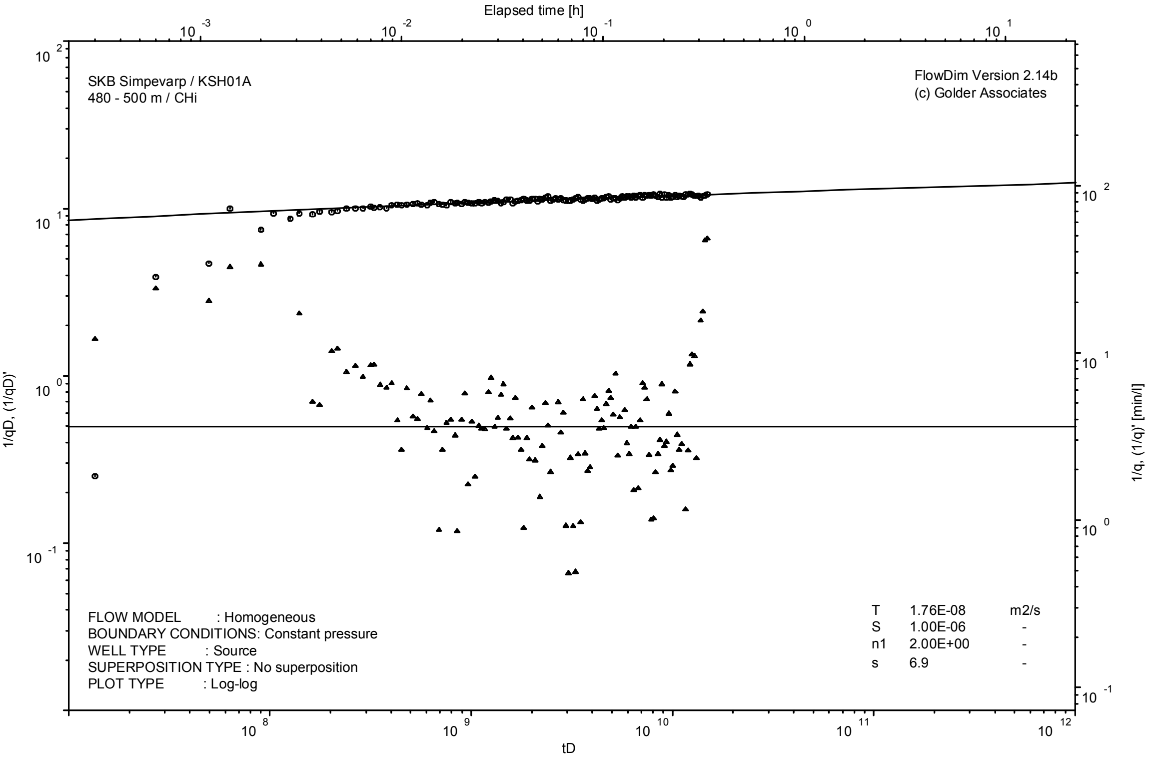
Analysis diagrams



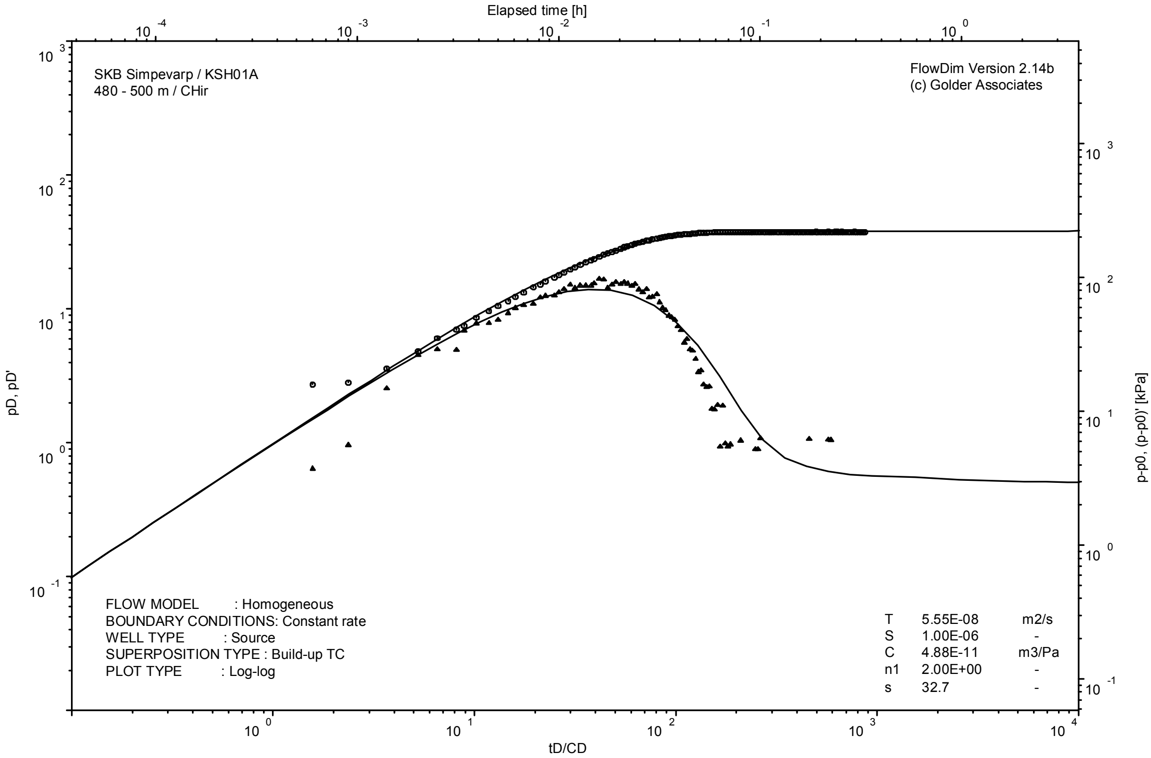
Pressure and flow rate vs. time; cartesian plot



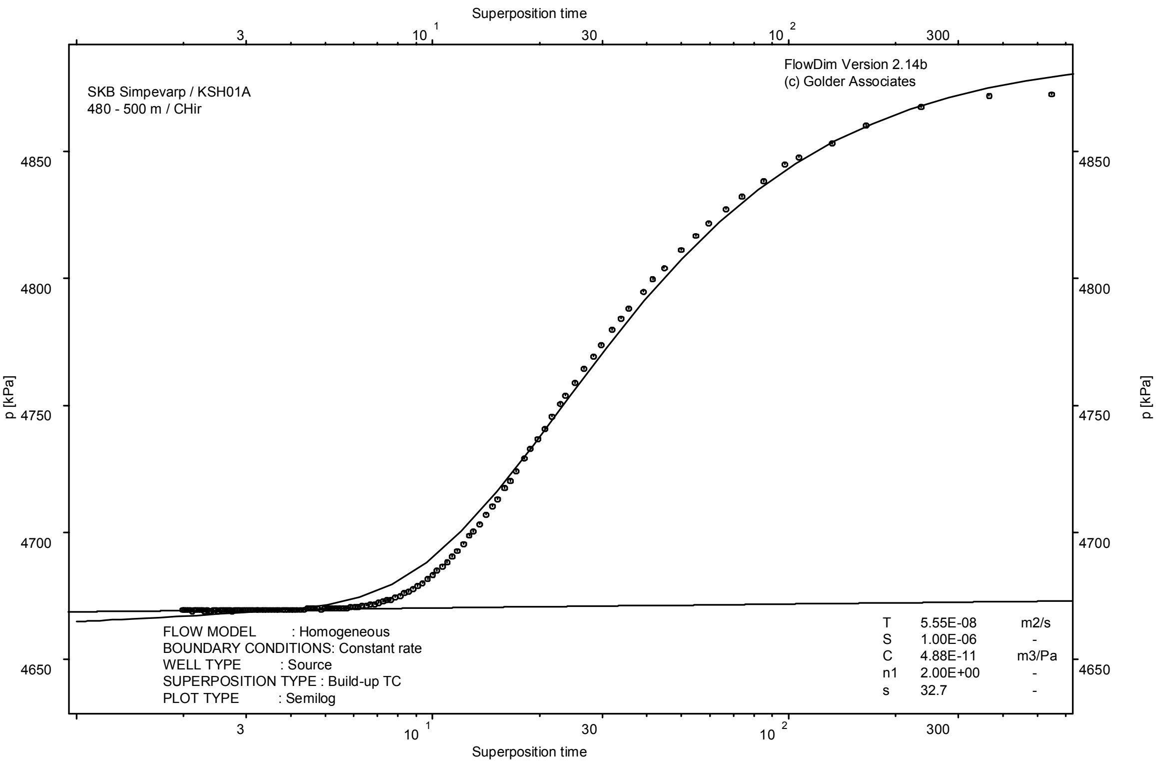
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

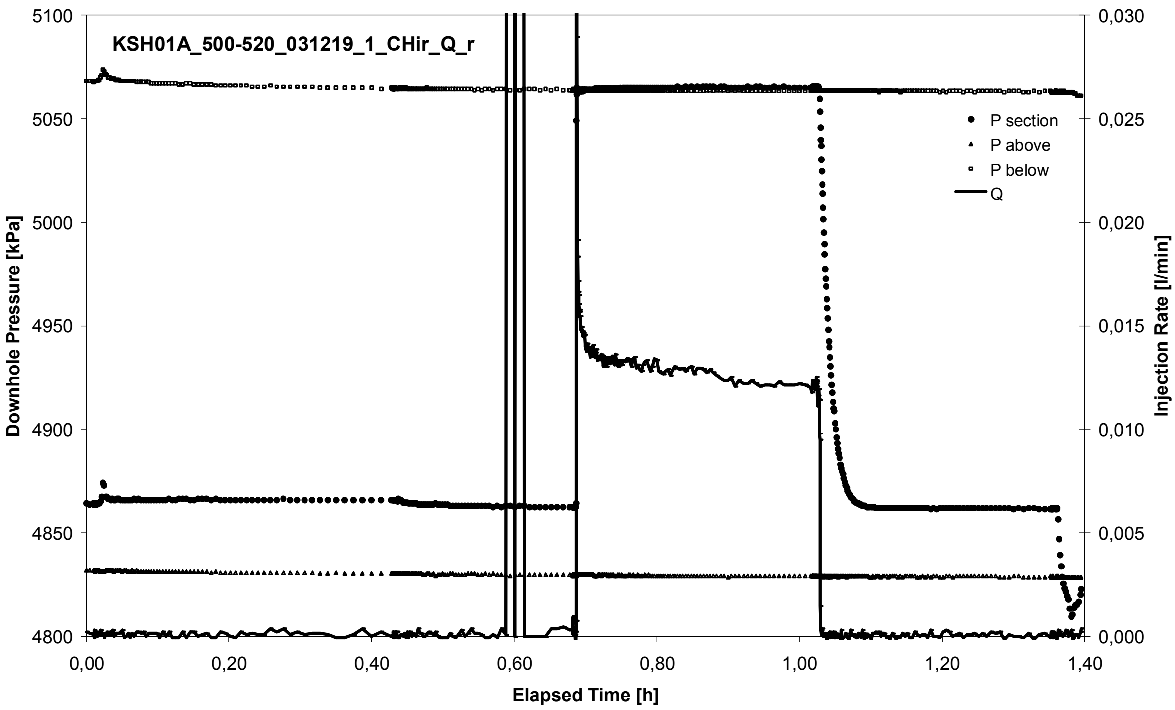


CHIR phase; HORNER match

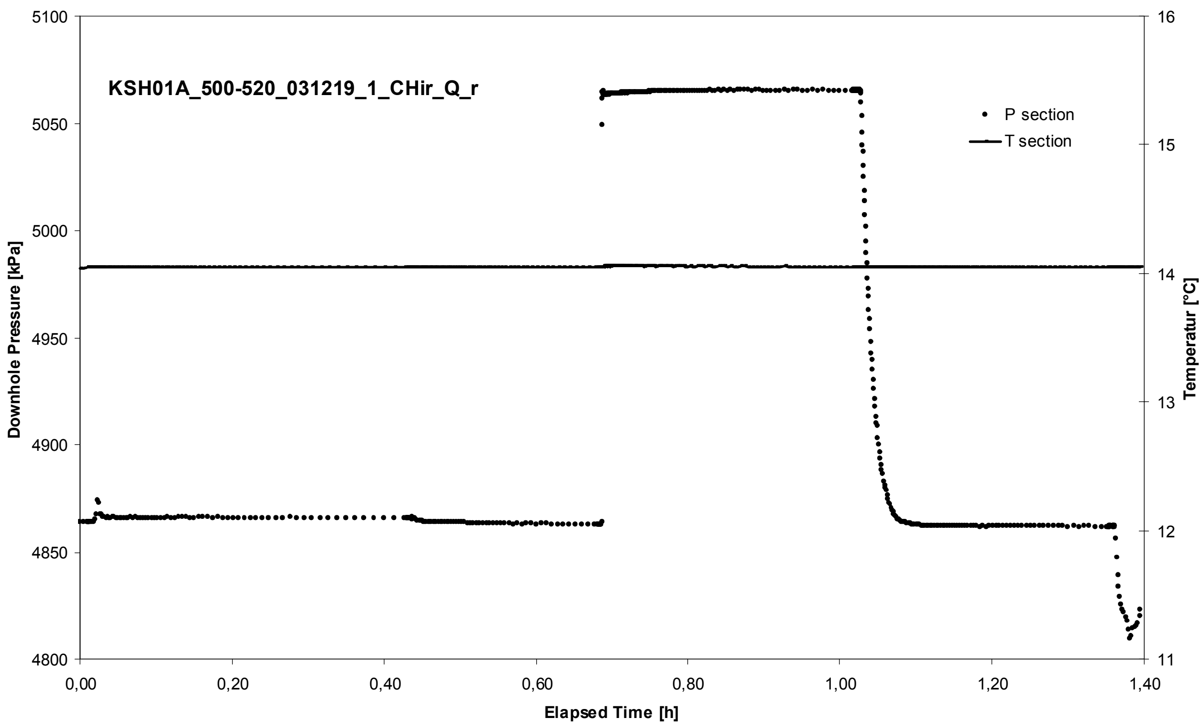
APPENDIX 2-30

Test 500 – 520 m

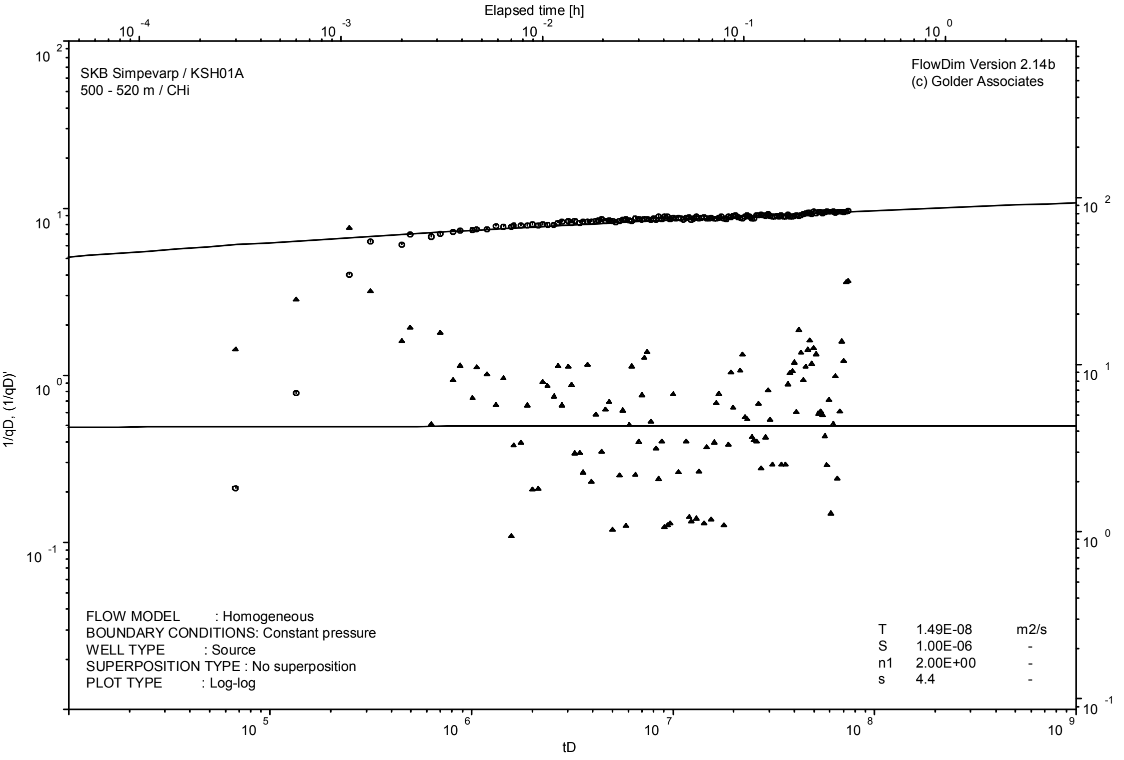
Analysis diagrams



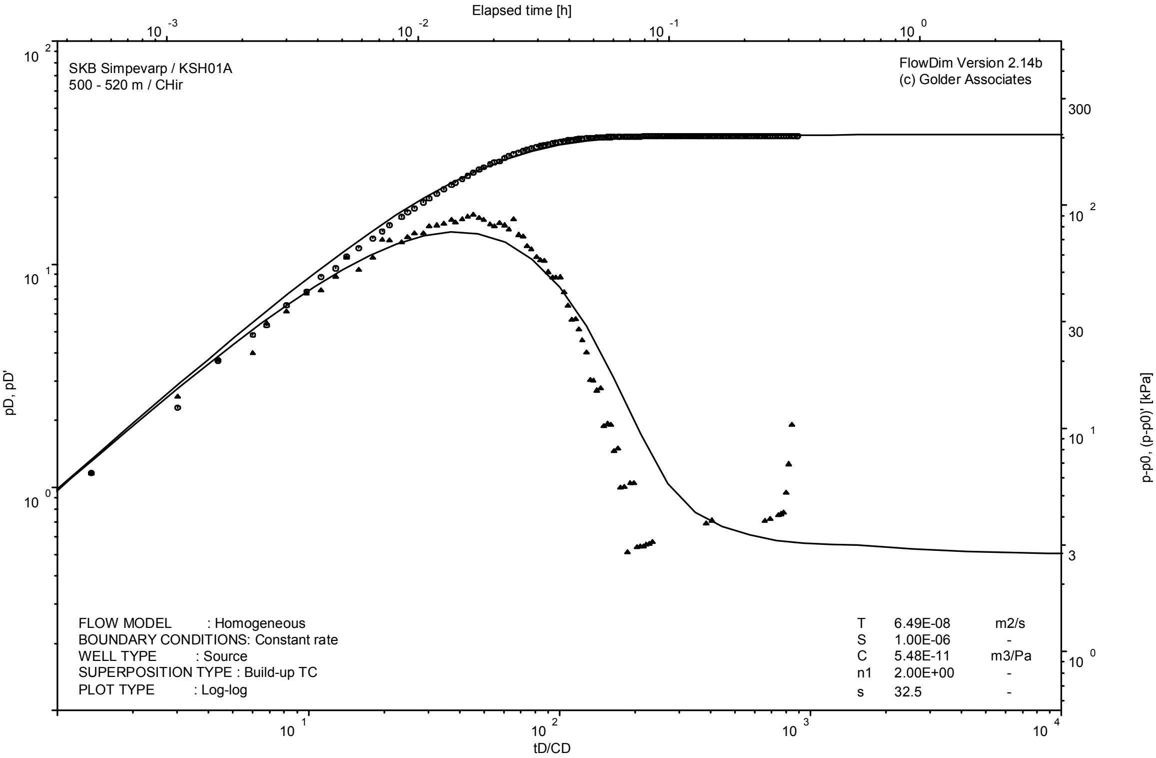
Pressure and flow rate vs. time; cartesian plot



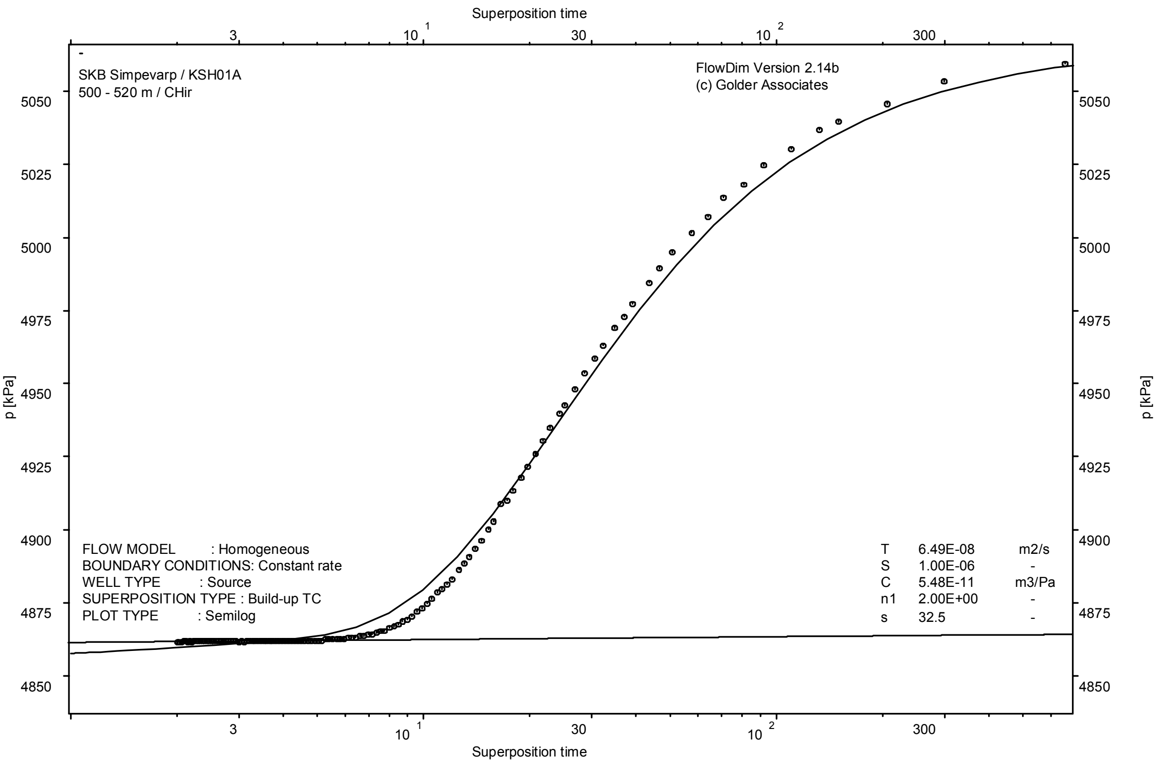
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

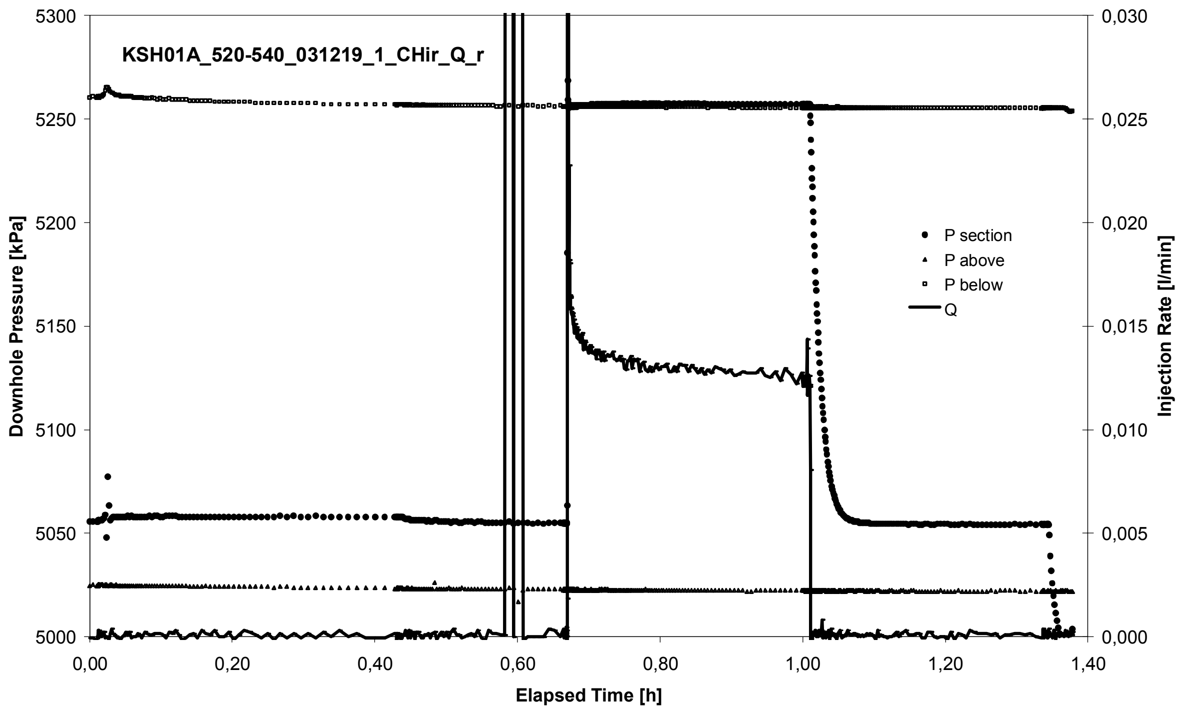


CHIR phase; HORNER match

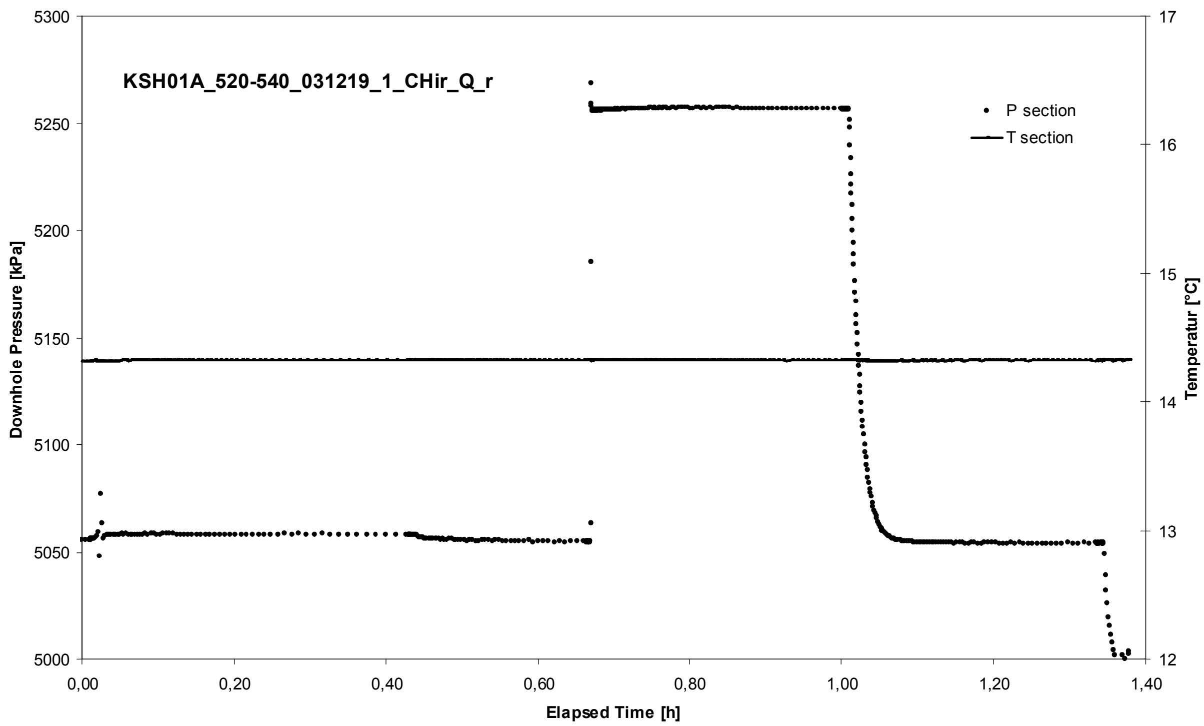
APPENDIX 2-31

Test 520 – 540 m

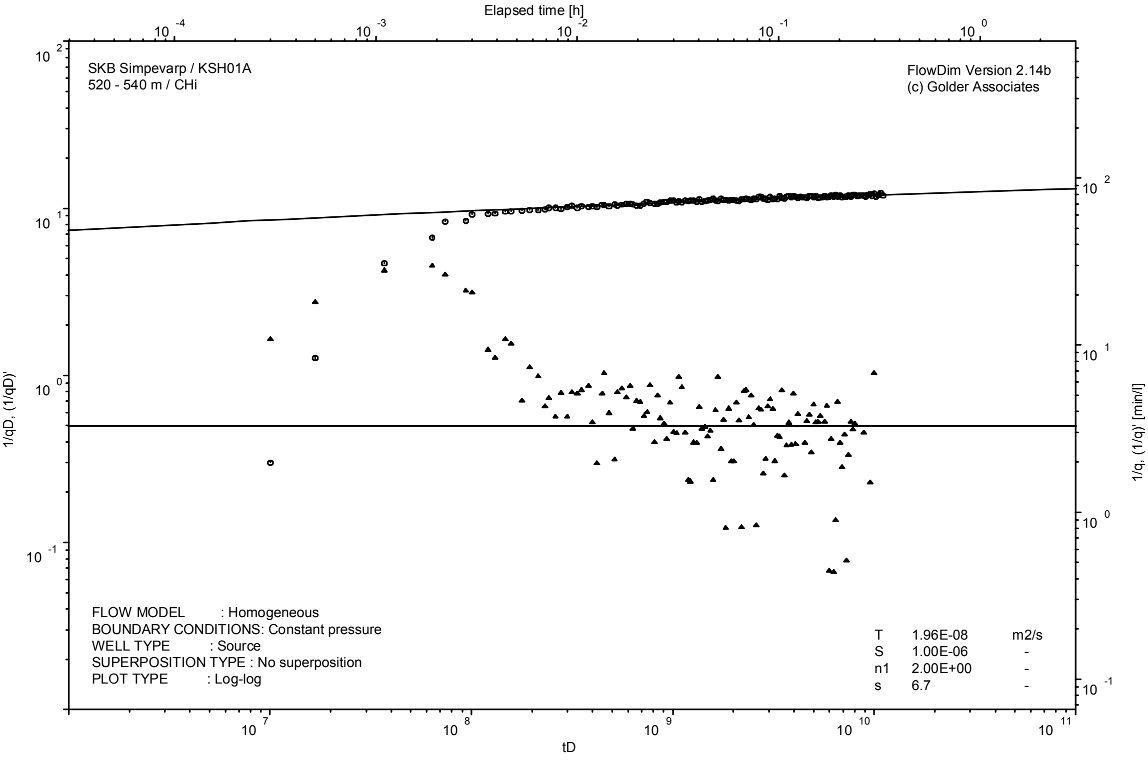
Analysis diagrams



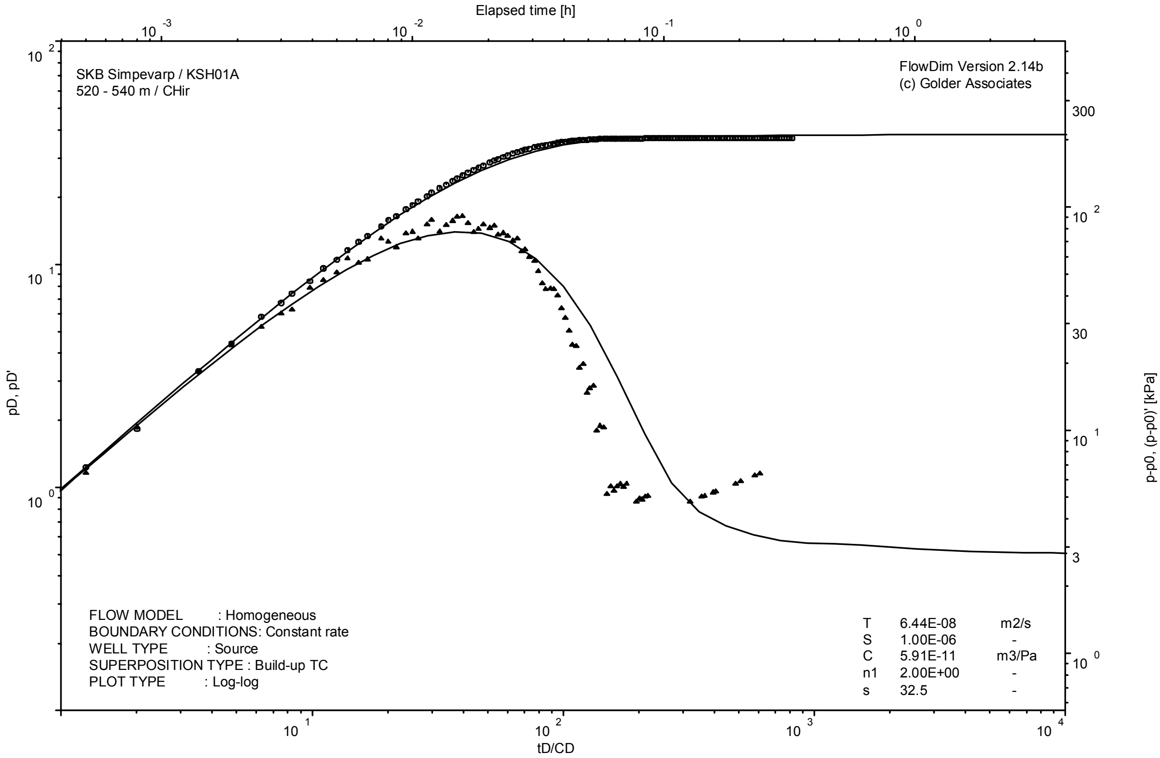
Pressure and flow rate vs. time; cartesian plot



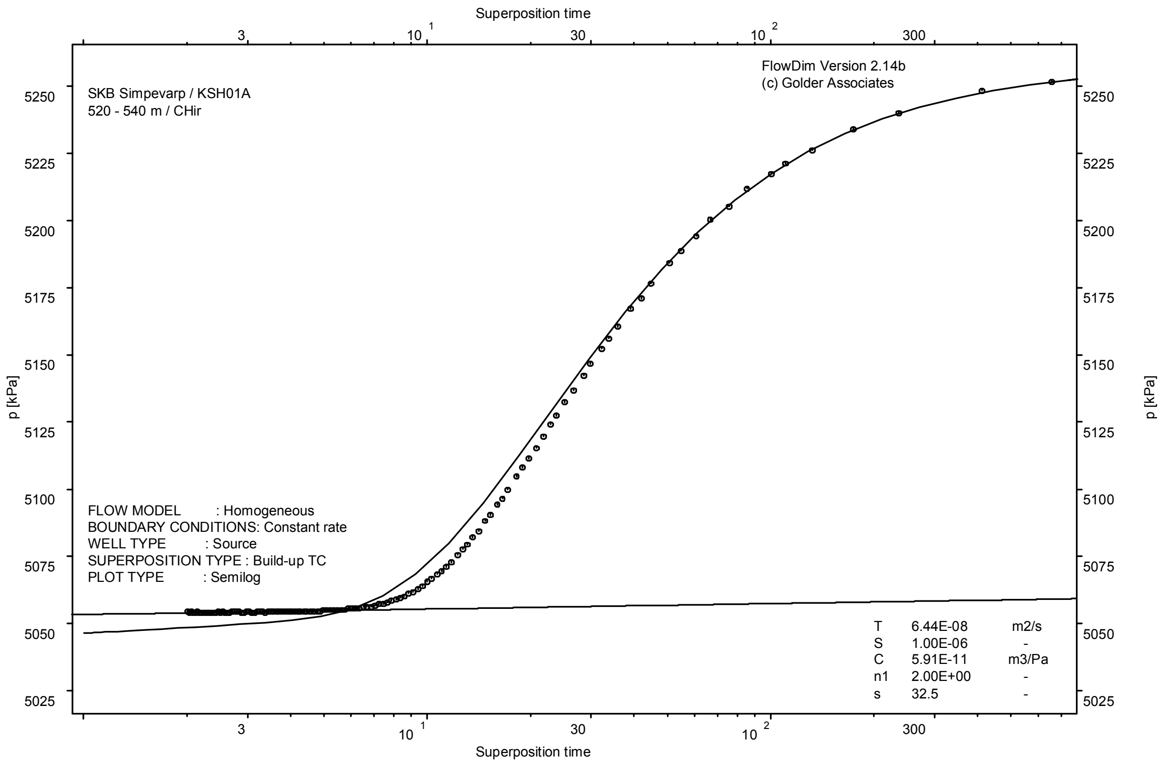
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

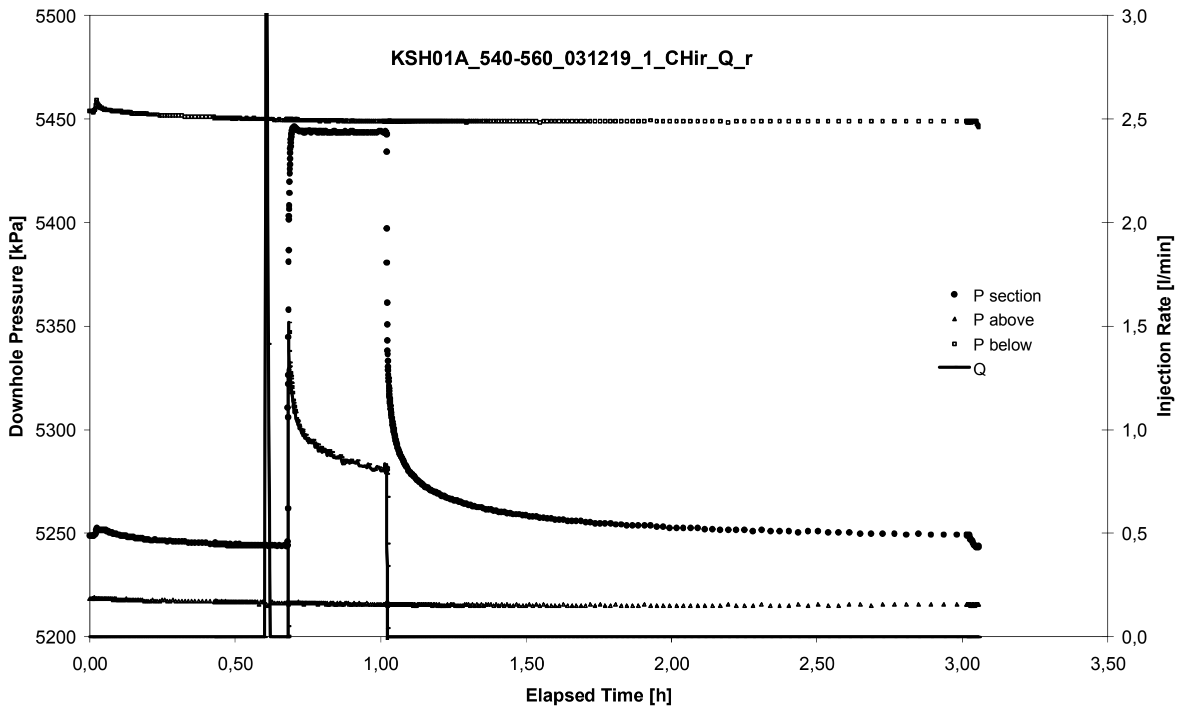


CHIR phase; HORNER match

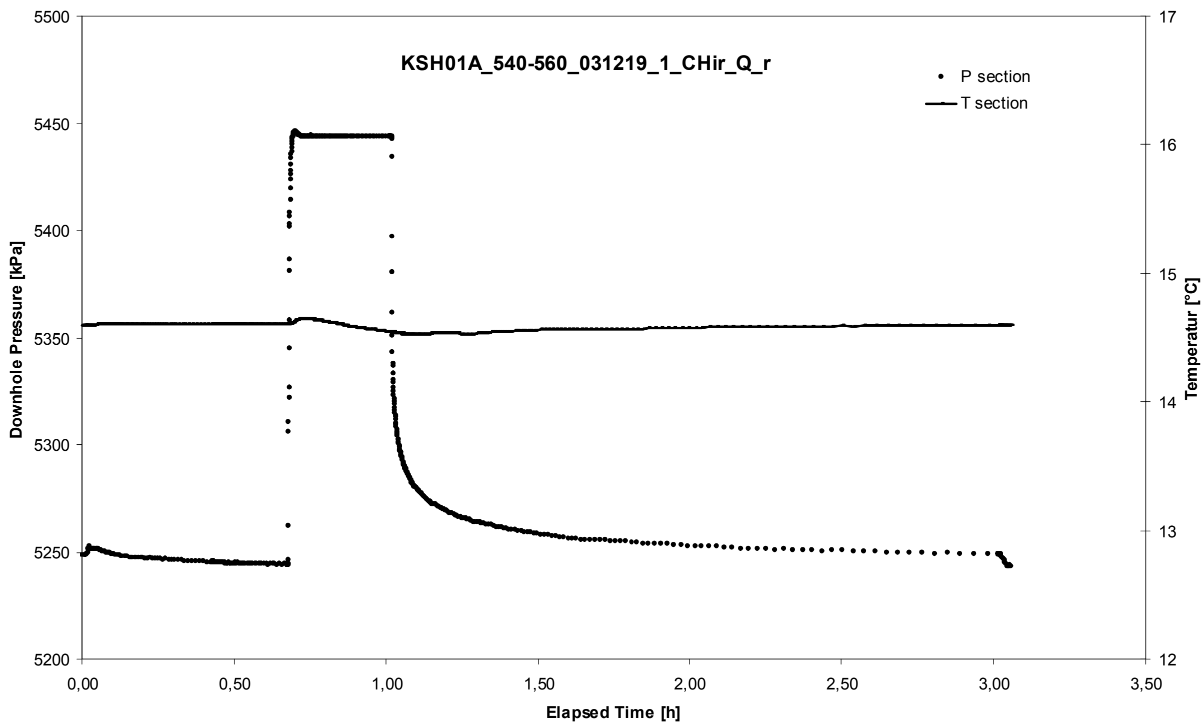
APPENDIX 2-32

Test 540 – 560 m

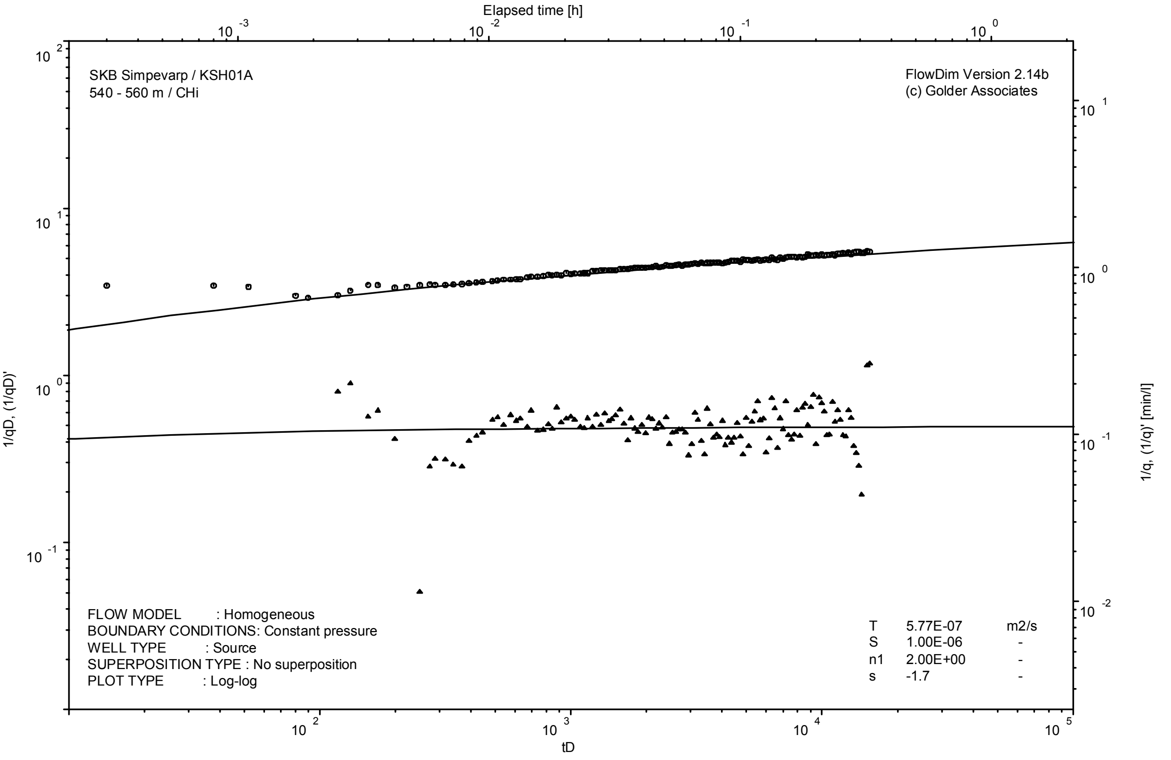
Analysis diagrams



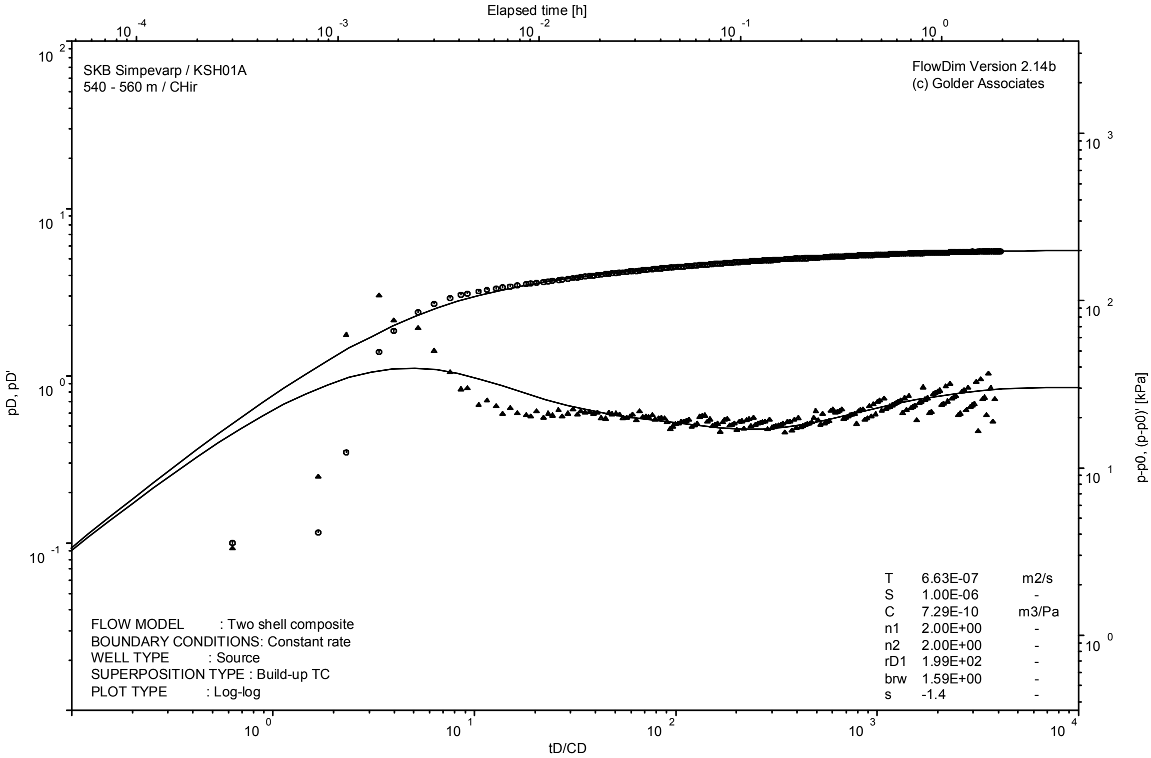
Pressure and flow rate vs. time; cartesian plot (analysed)



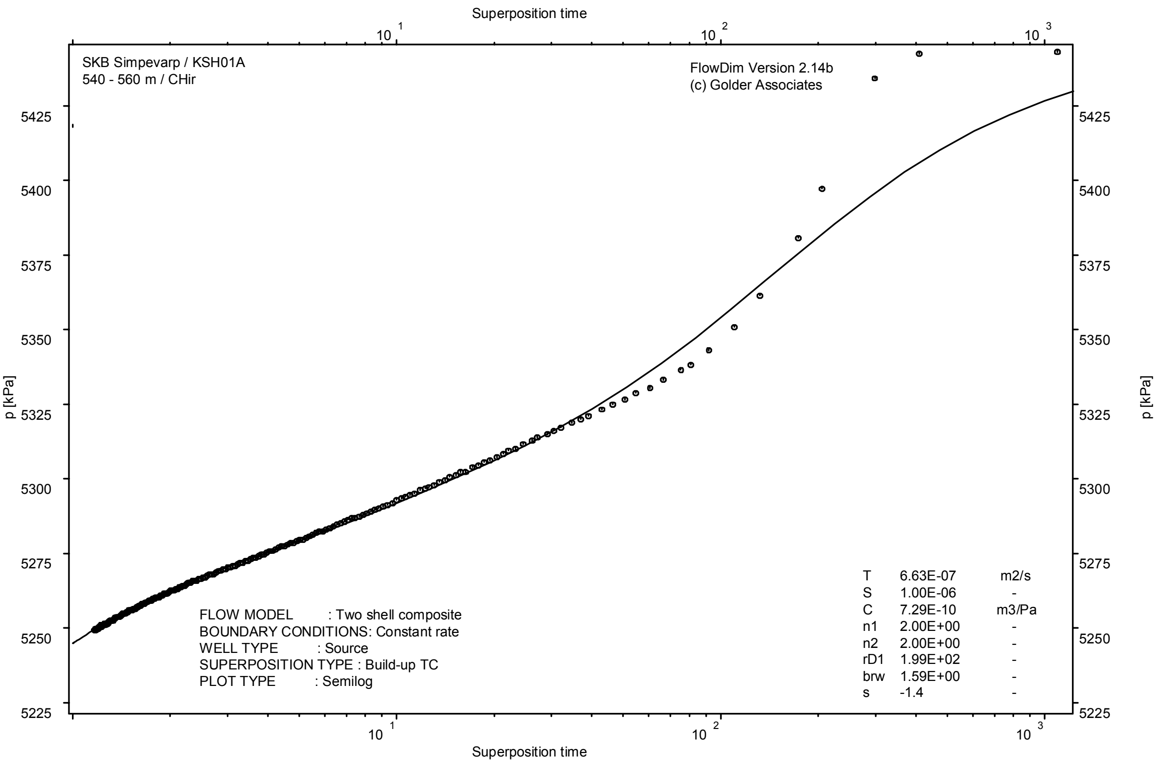
Interval pressure and temperature vs. time; cartesian plot (analysed)



CHI phase; log-log match



CHIR phase; log-log match

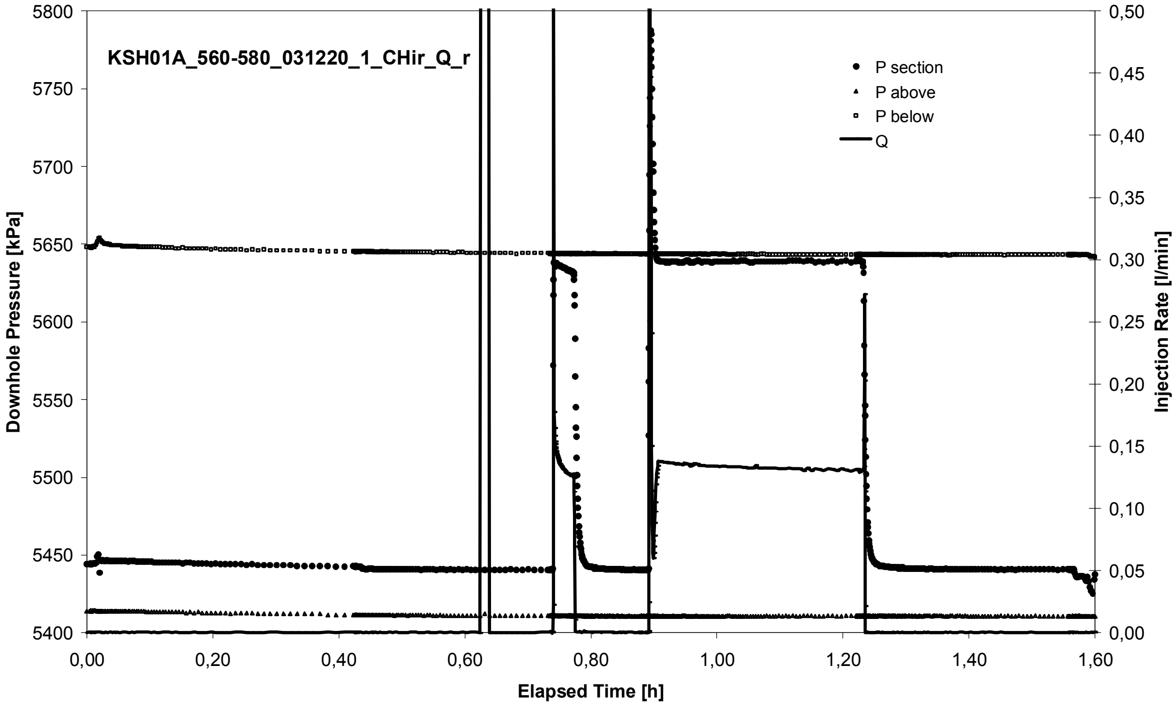


CHIR phase; HORNER match

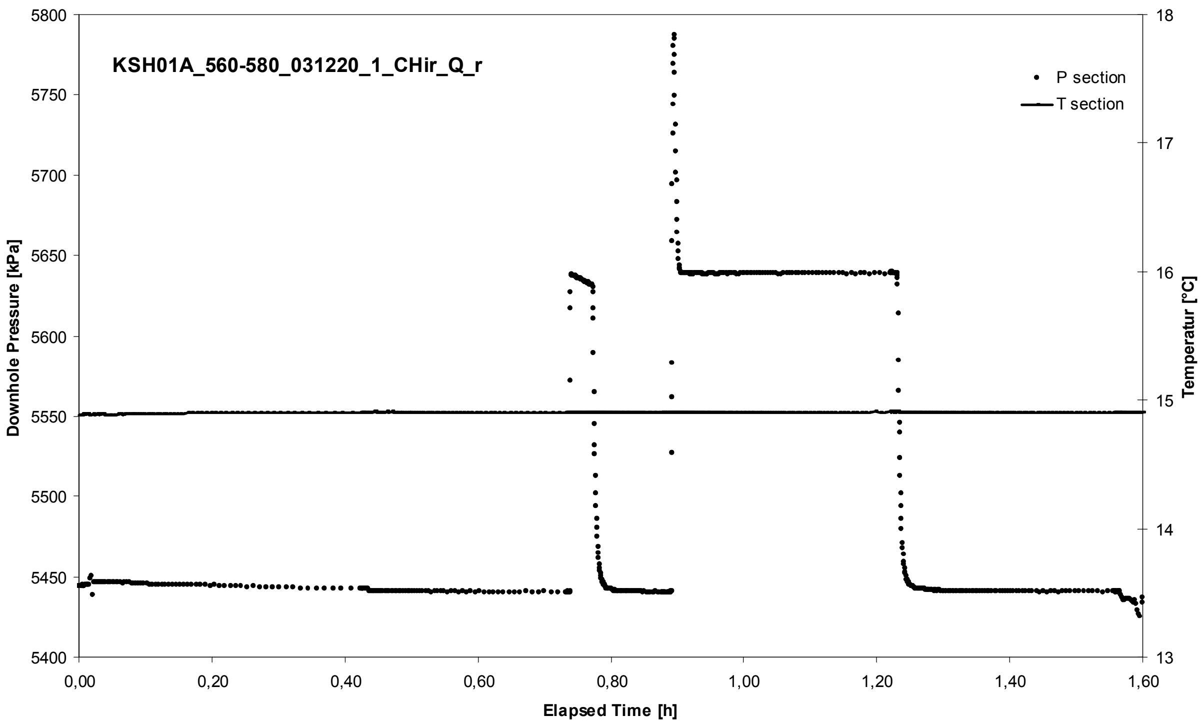
APPENDIX 2-33

Test 560 – 580 m

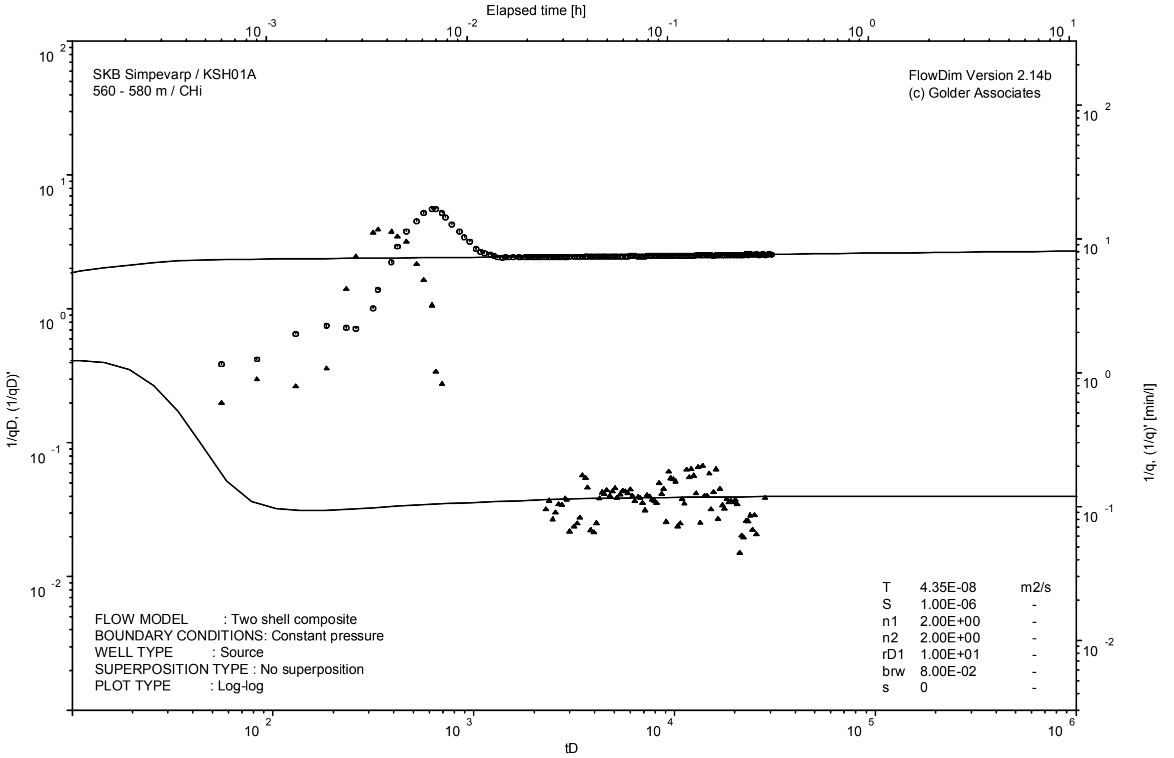
Analysis diagrams



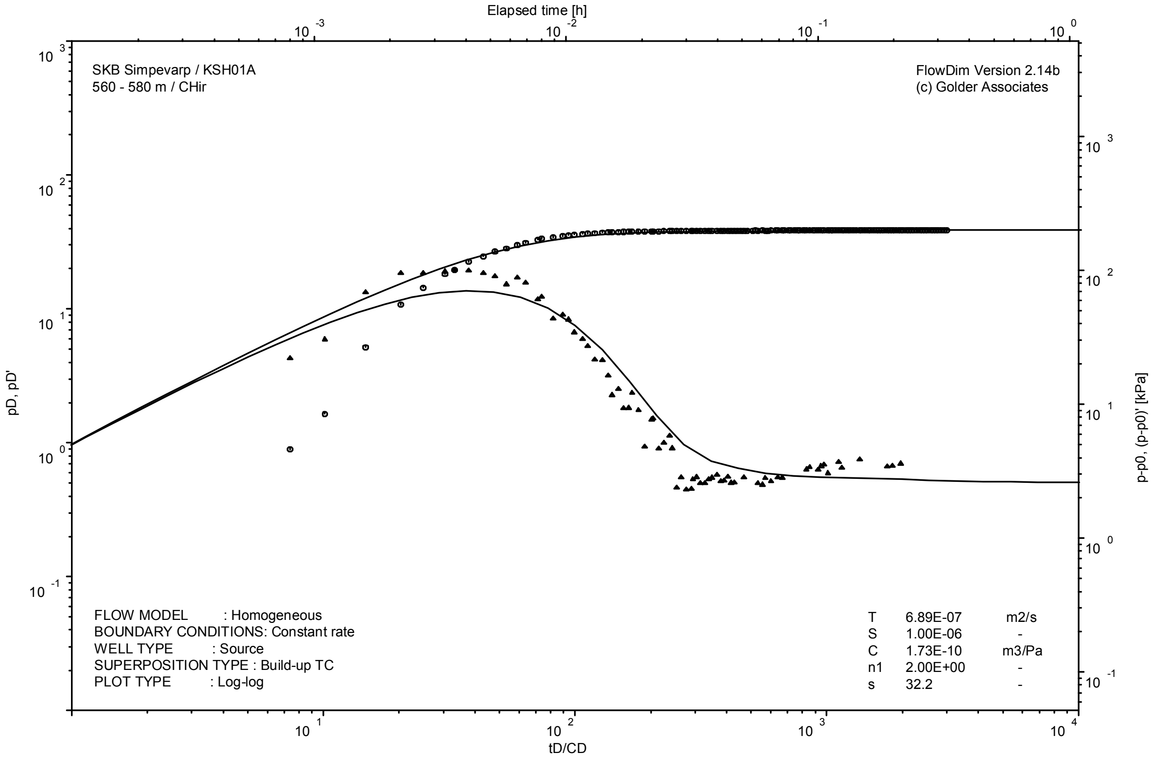
Pressure and flow rate vs. time; cartesian plot



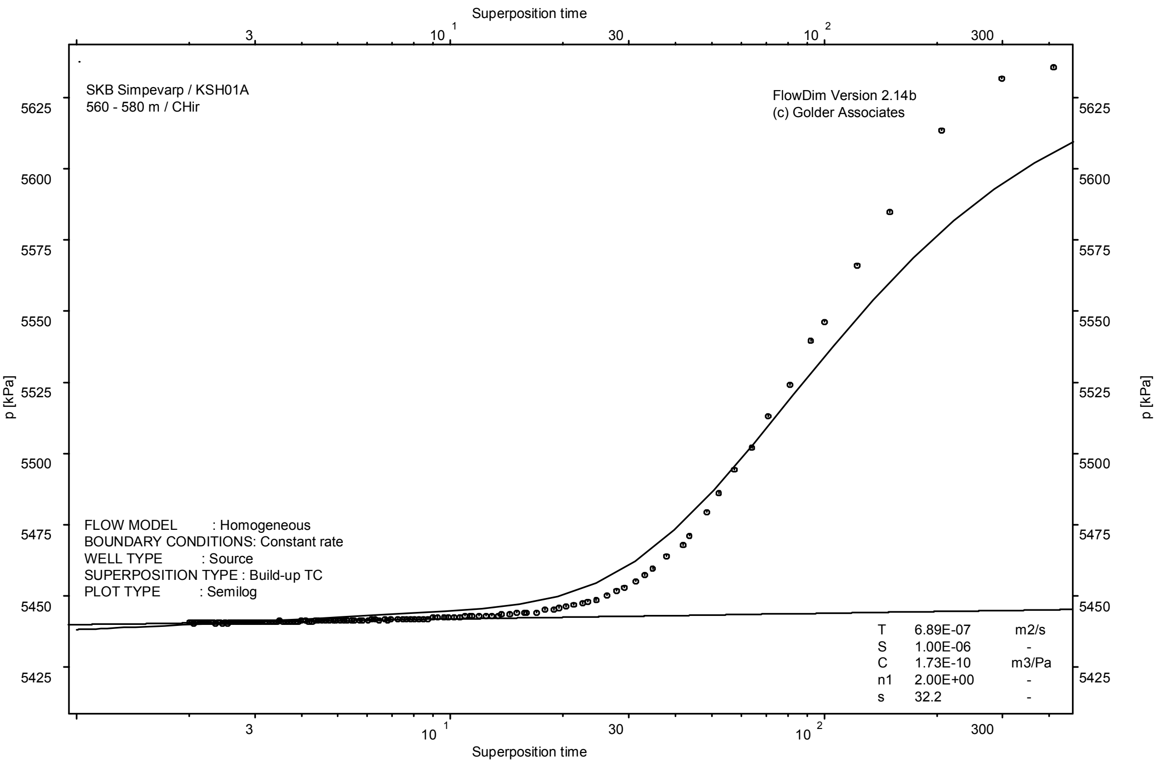
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

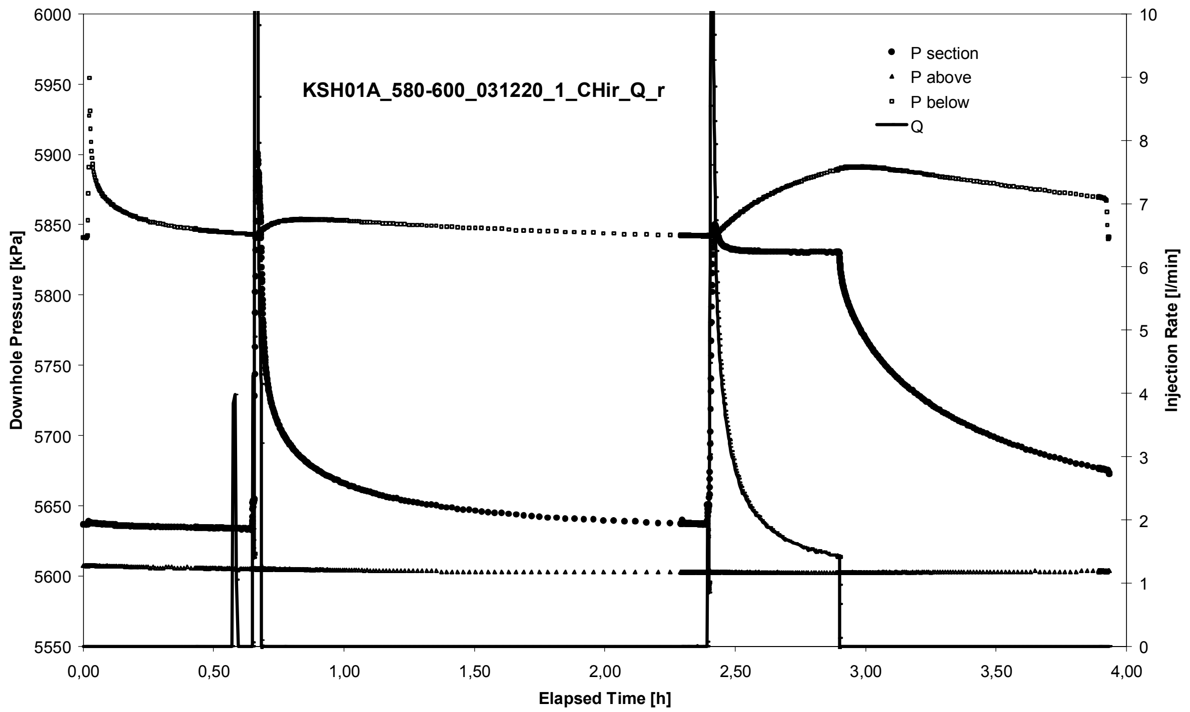


CHIR phase; HORNER match

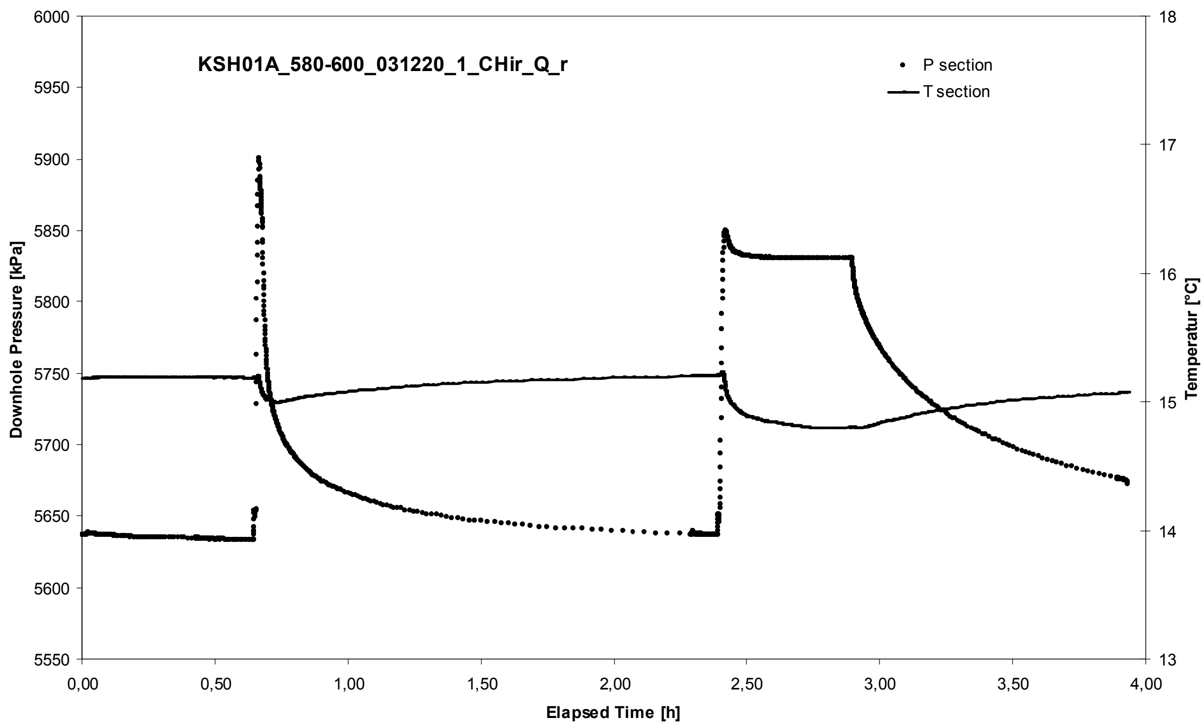
APPENDIX 2-34

Test 580 – 600 m

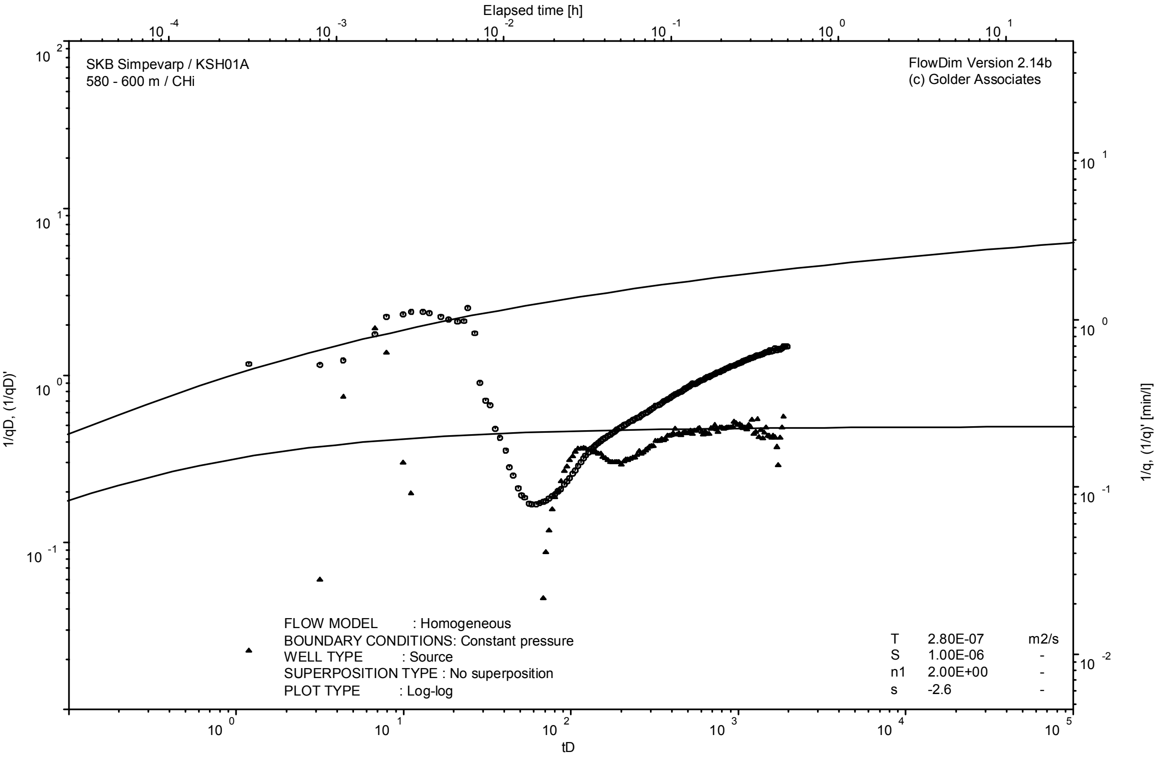
Analysis diagrams



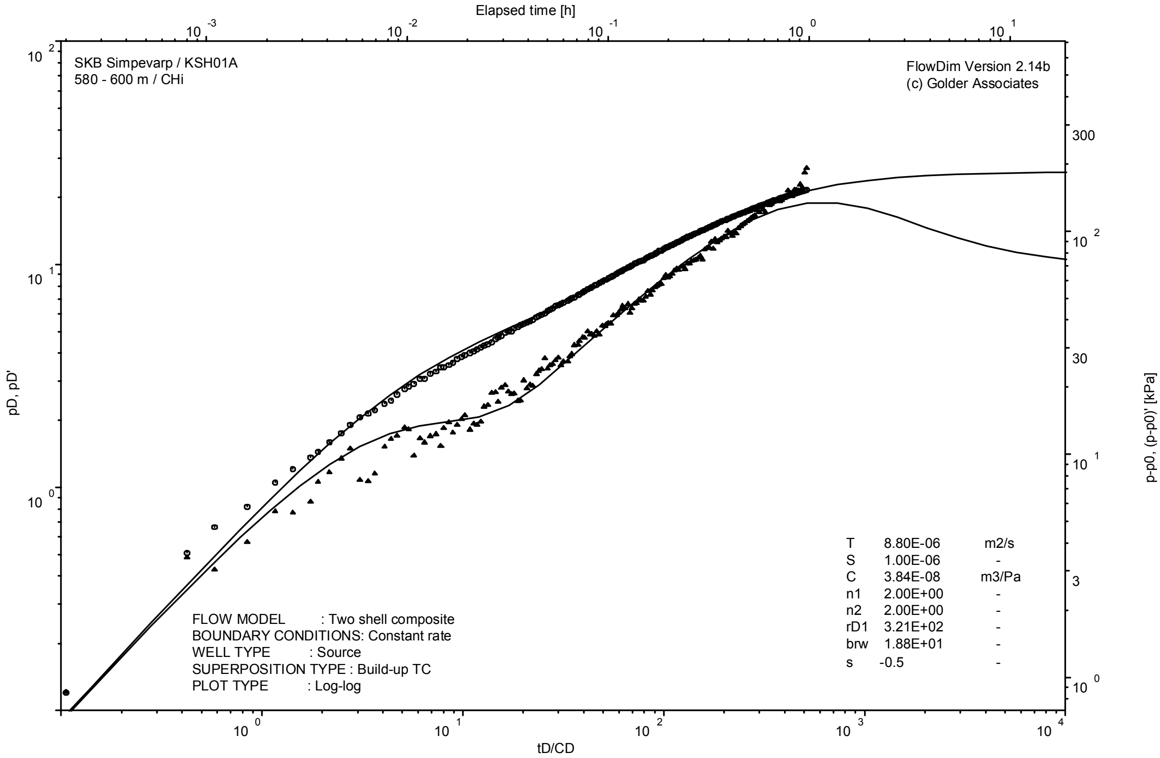
Pressure and flow rate vs. time; cartesian plot



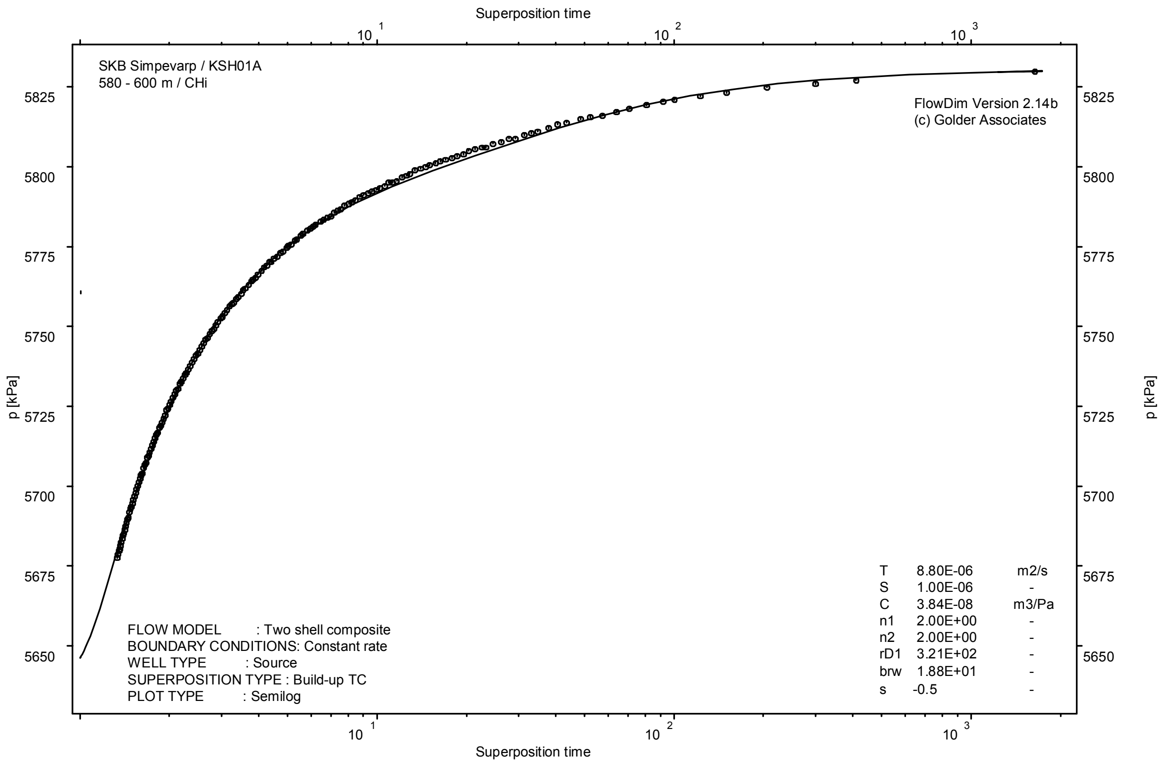
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

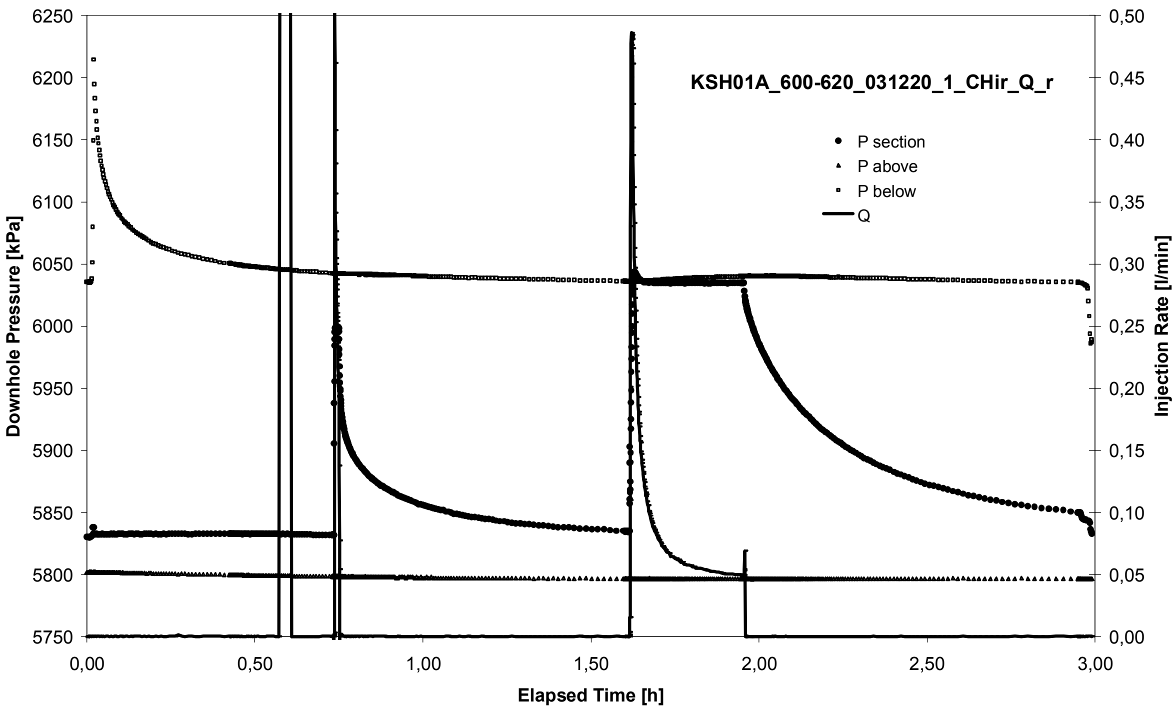


CHIR phase; HORNER match

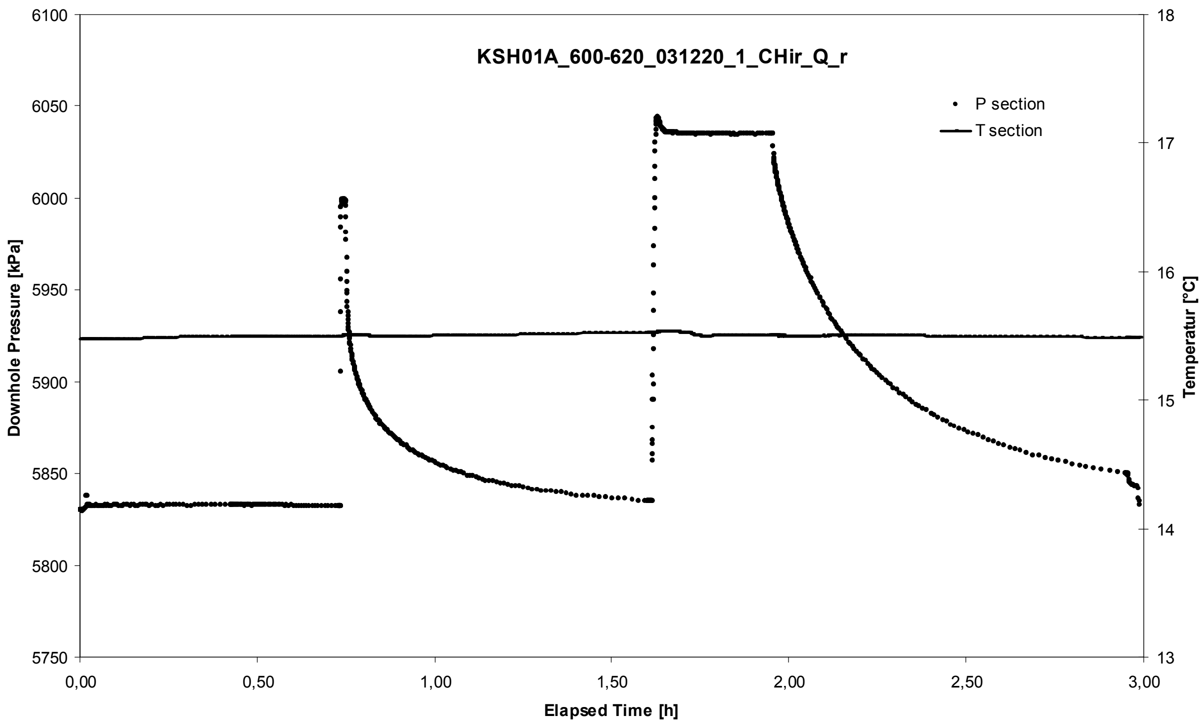
APPENDIX 2-35

Test 600 – 620 m

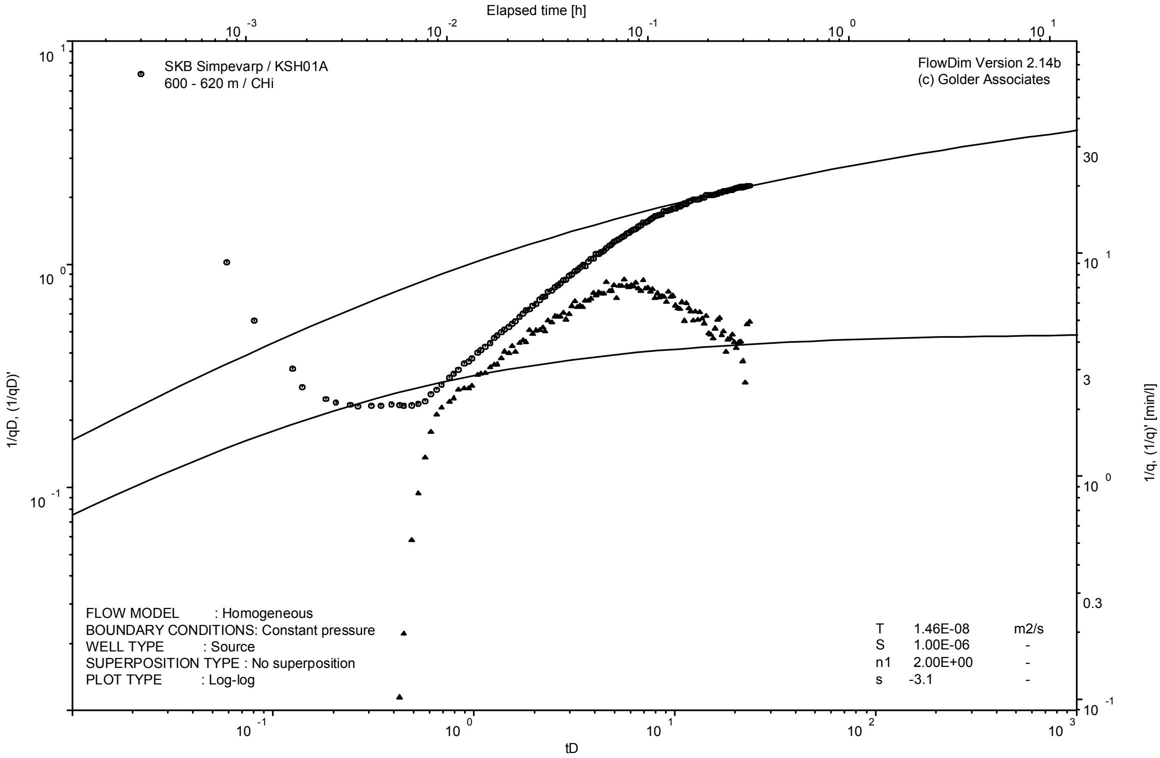
Analysis diagrams



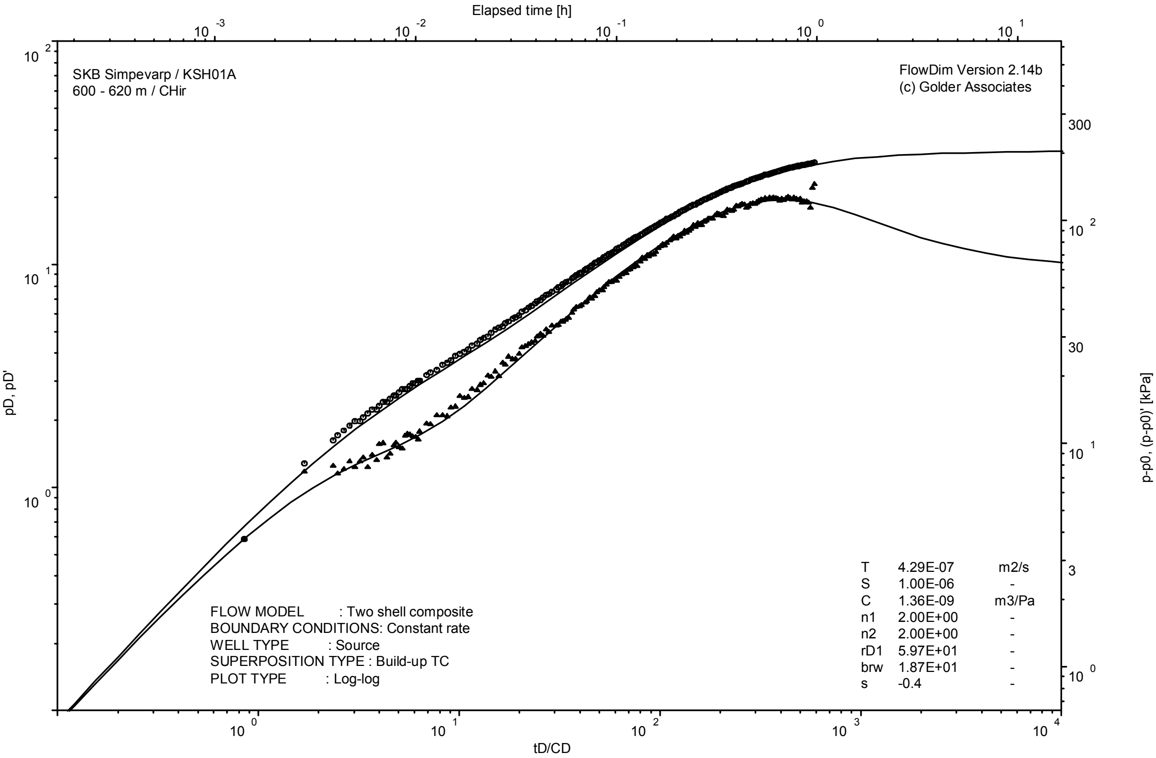
Pressure and flow rate vs. time; cartesian plot



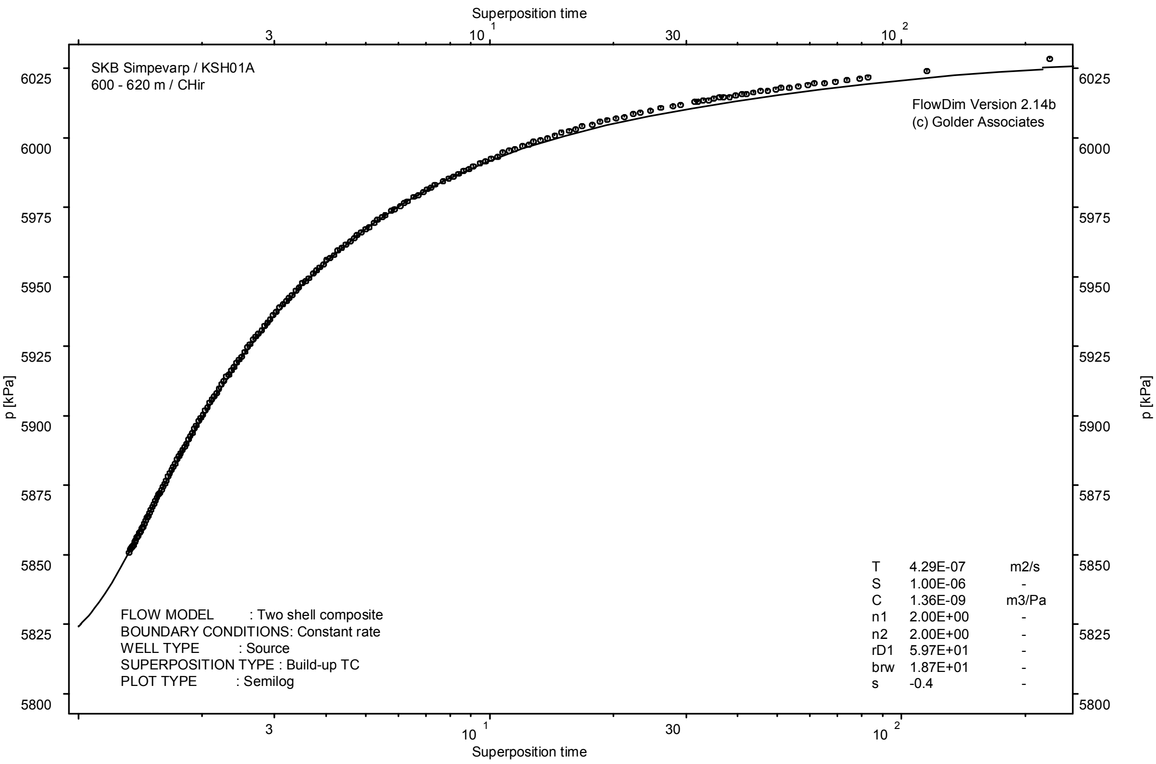
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

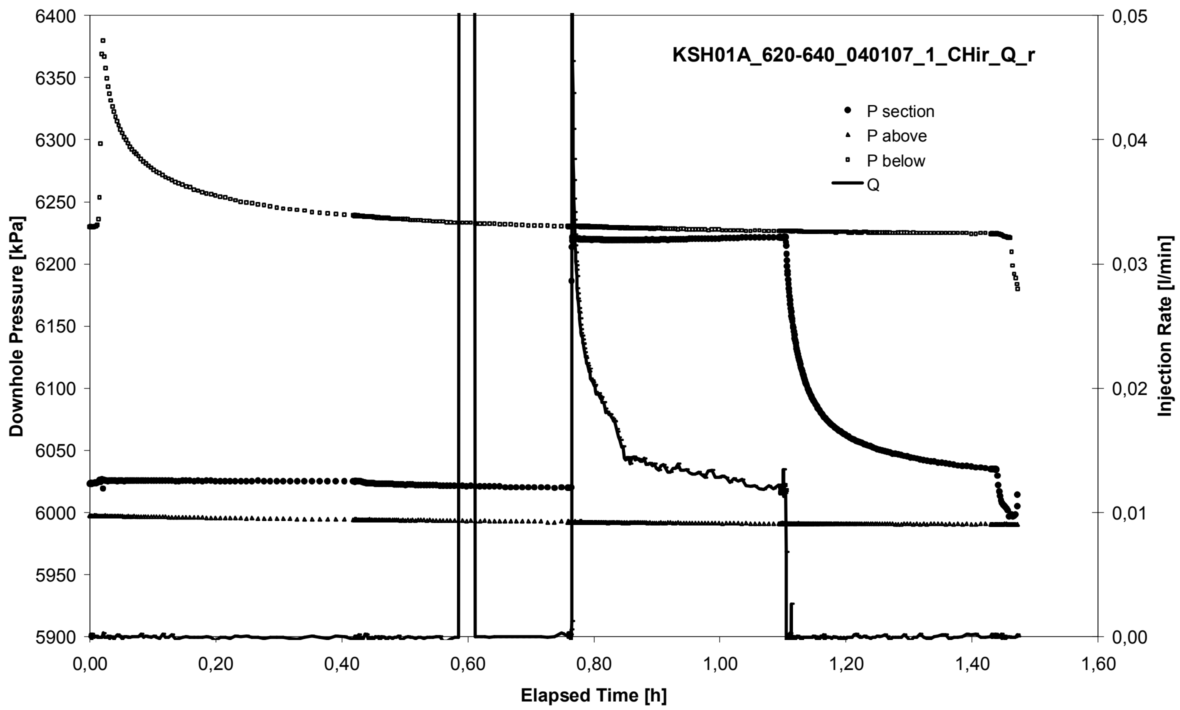


CHIR phase; HORNER match

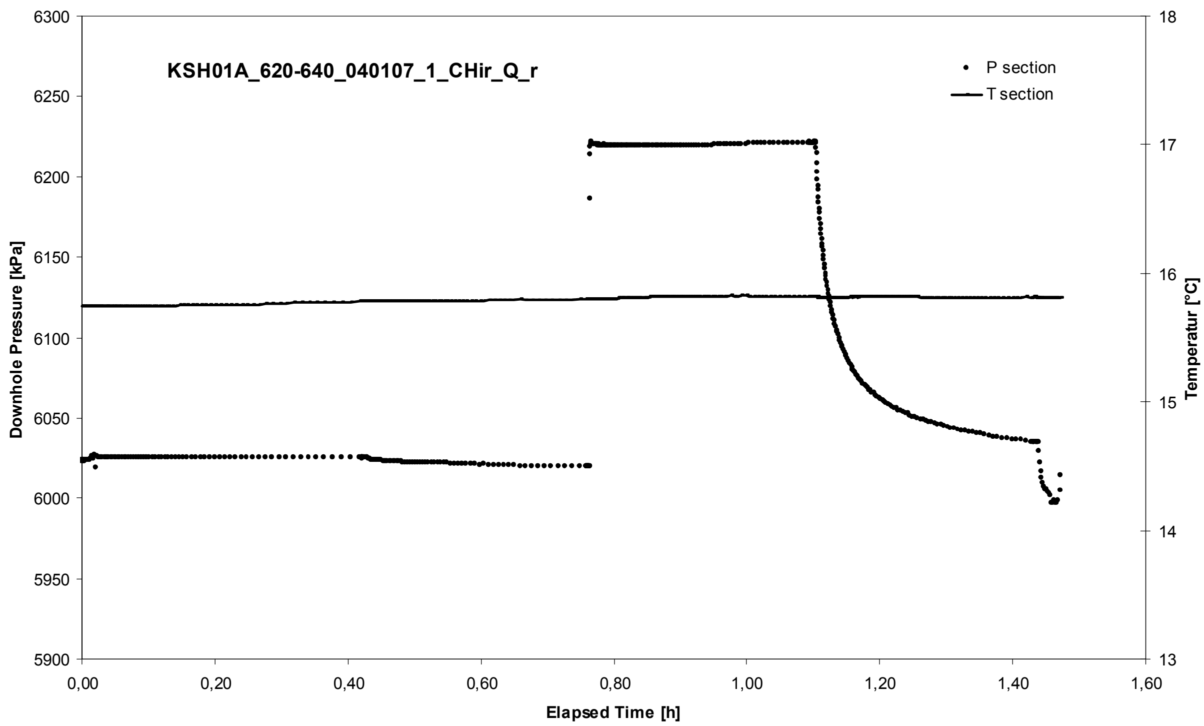
APPENDIX 2-36

Test 620 – 640 m

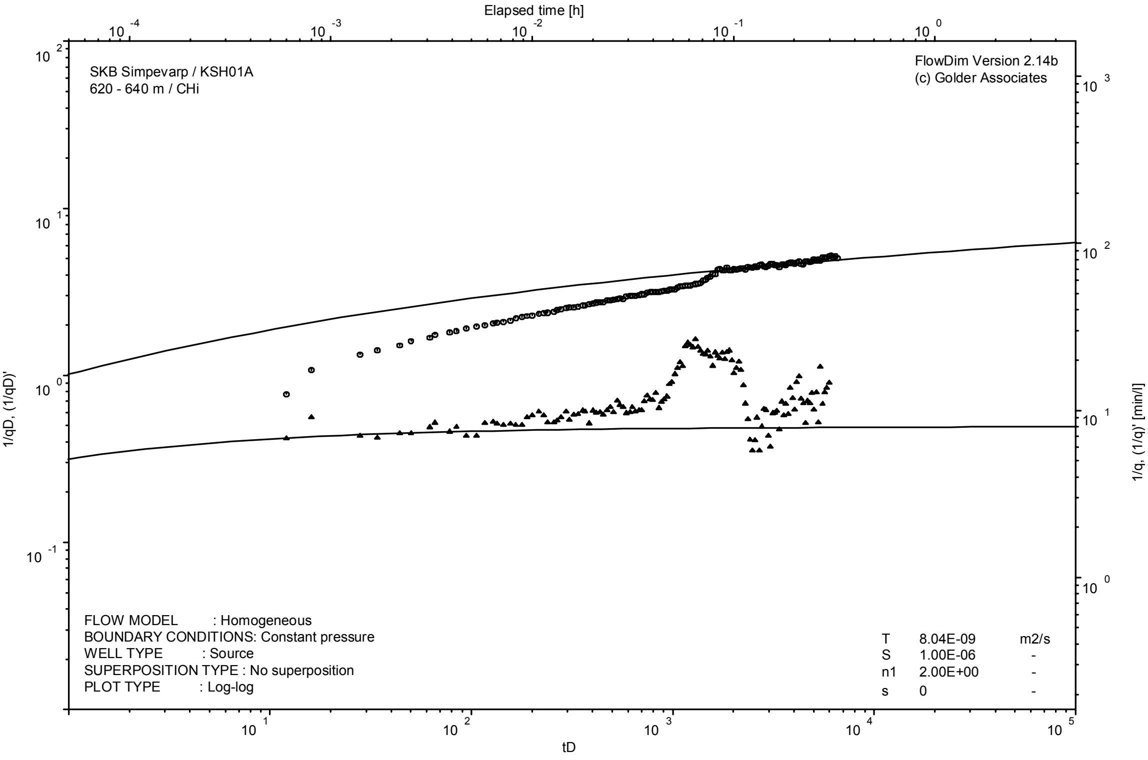
Analysis diagrams



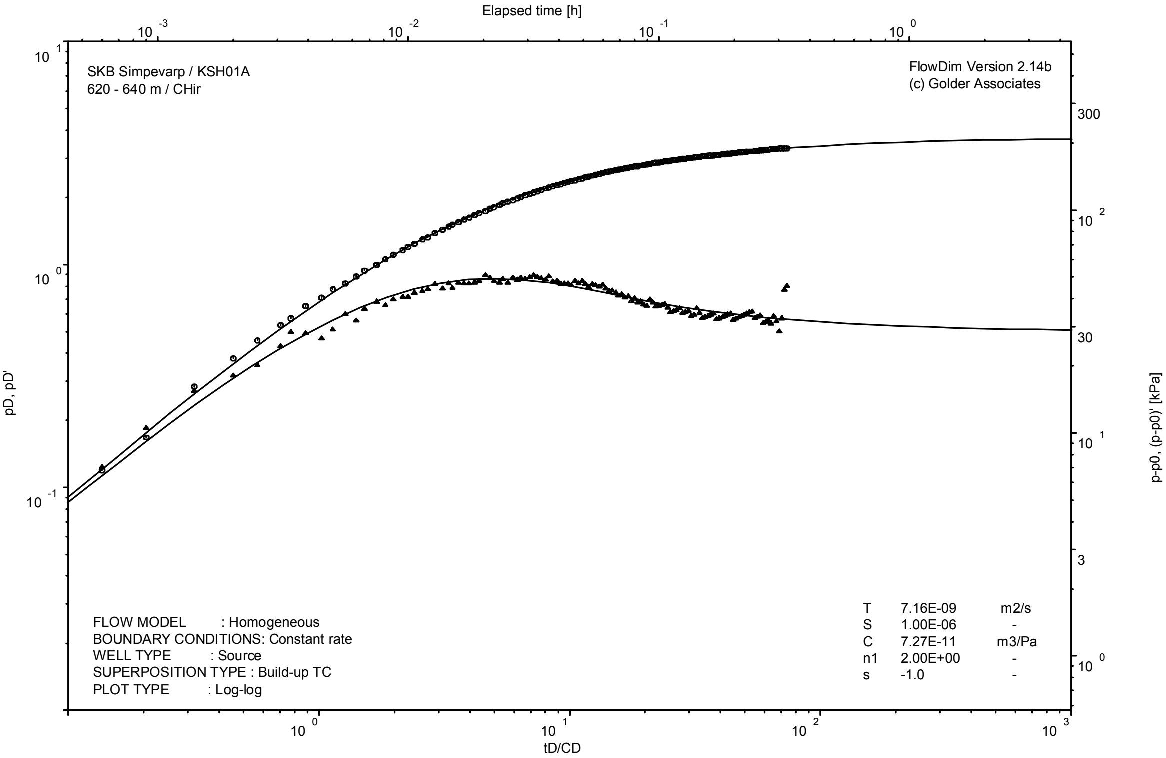
Pressure and flow rate vs. time; cartesian plot



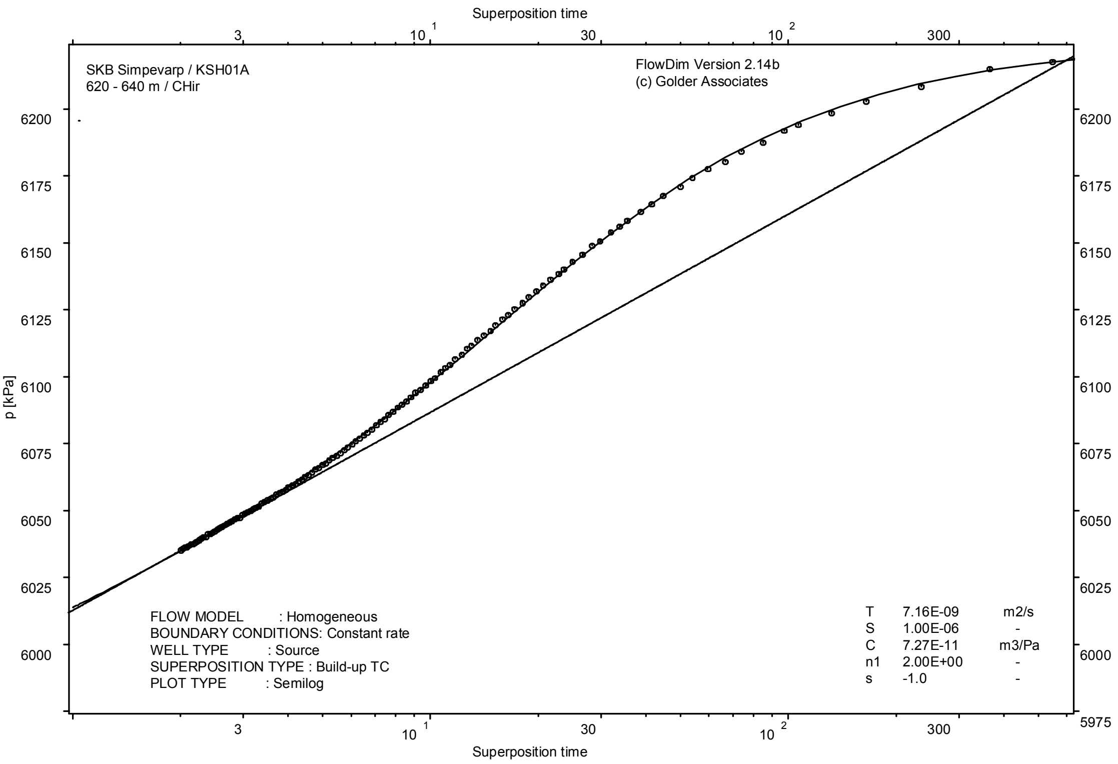
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

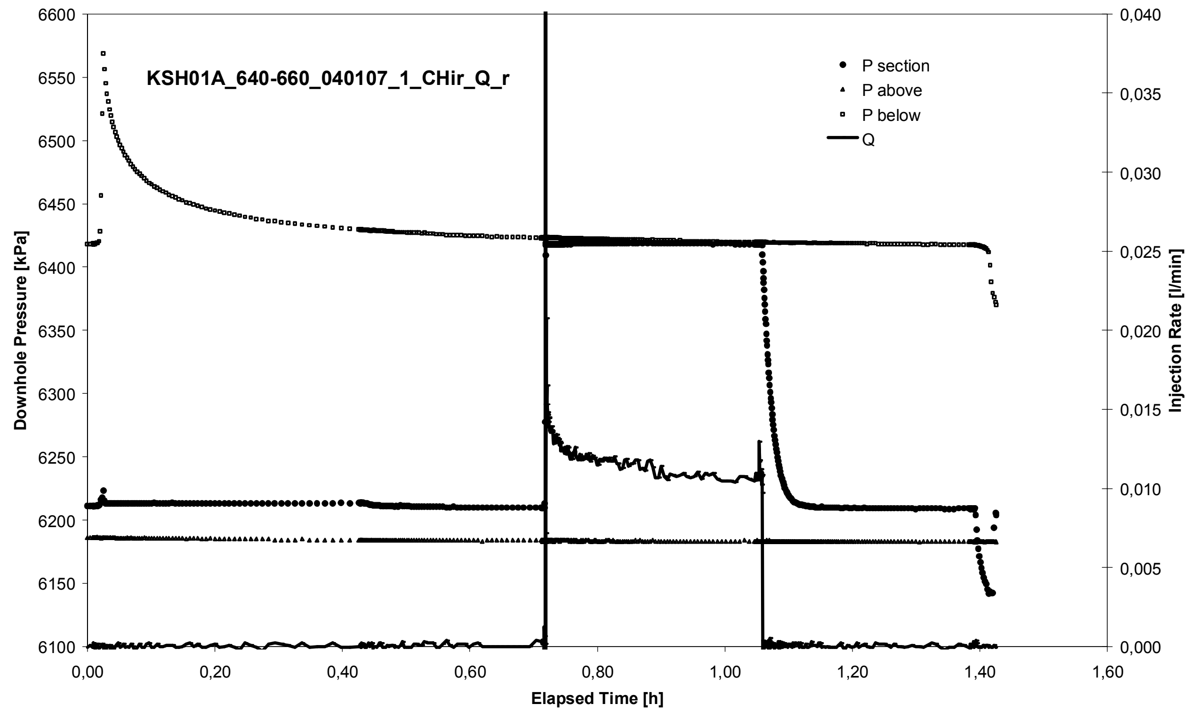


CHIR phase; HORNER match

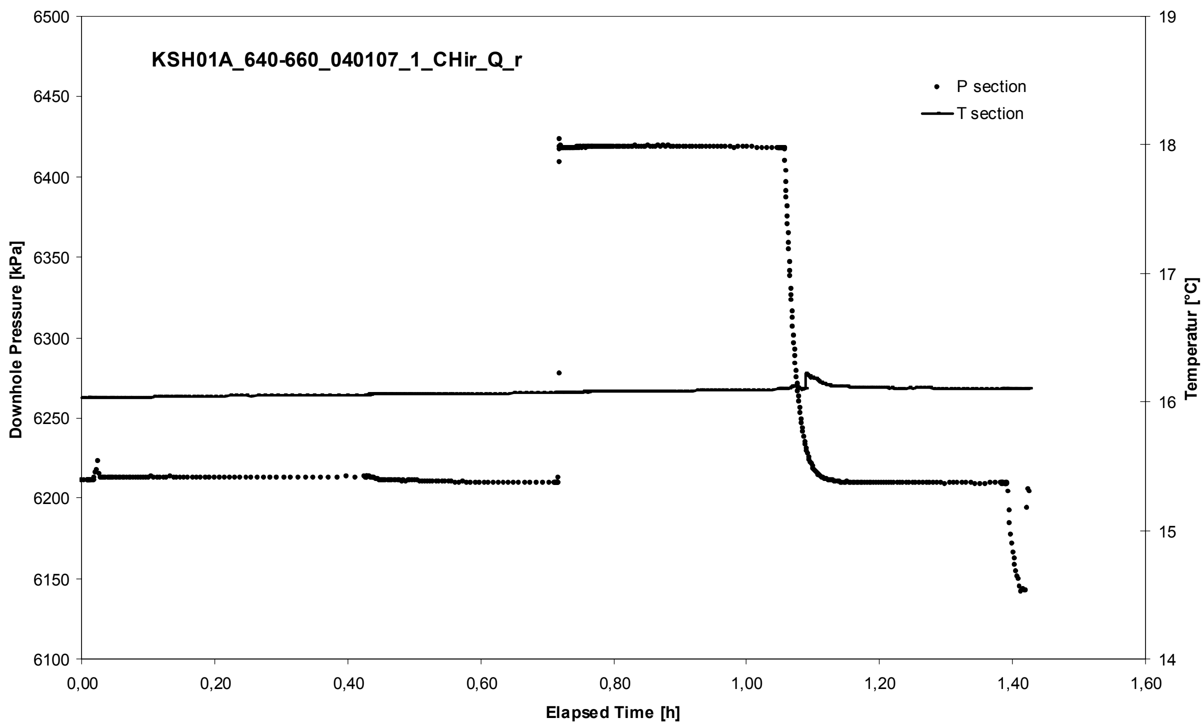
APPENDIX 2-37

Test 640 – 660 m

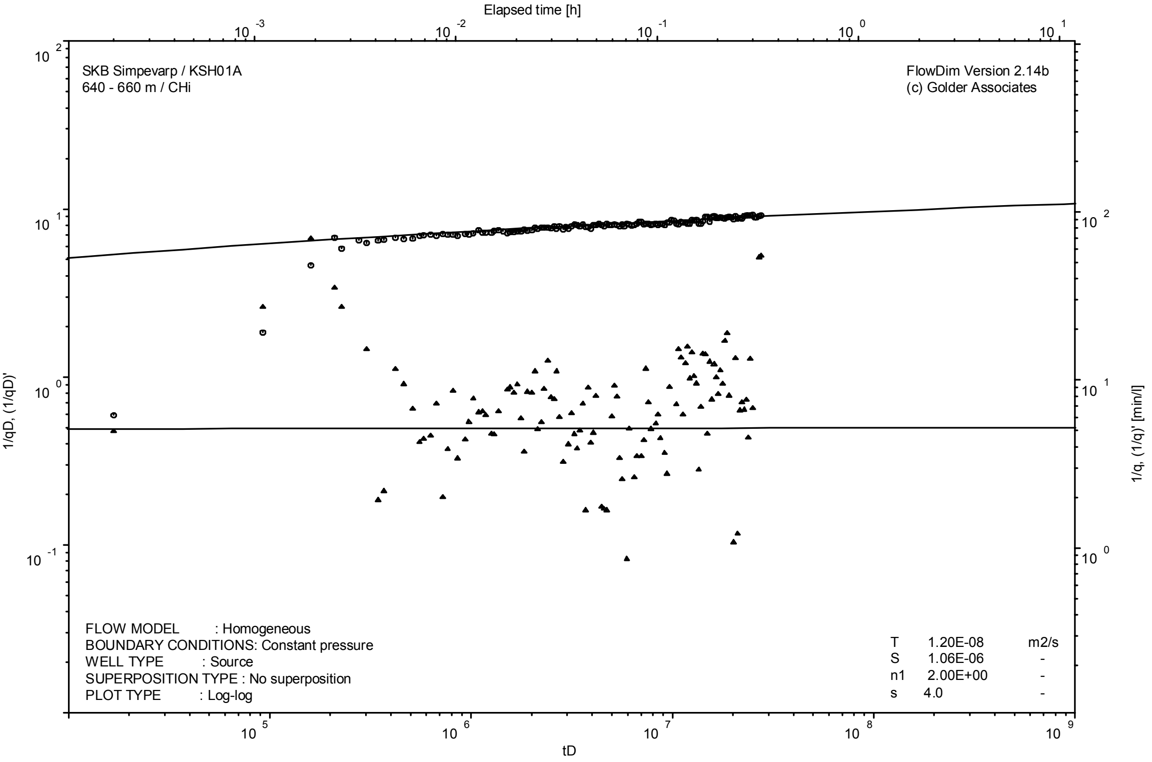
Analysis diagrams



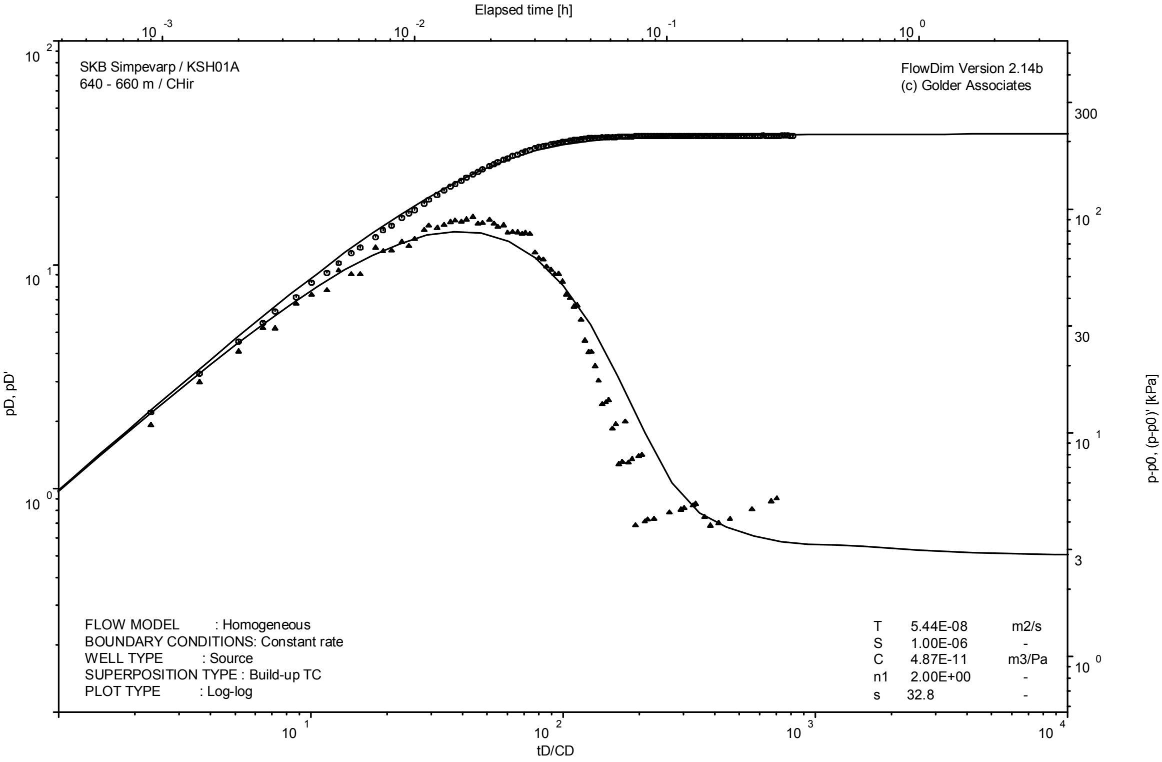
Pressure and flow rate vs. time; cartesian plot



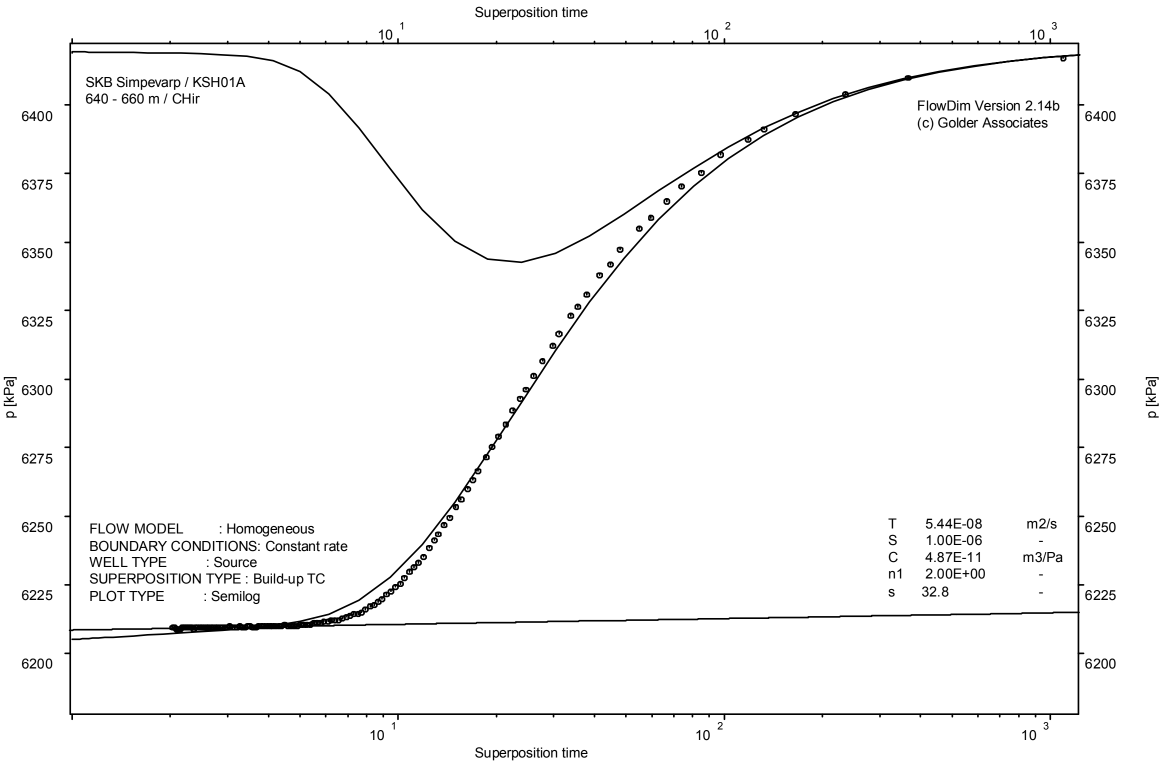
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

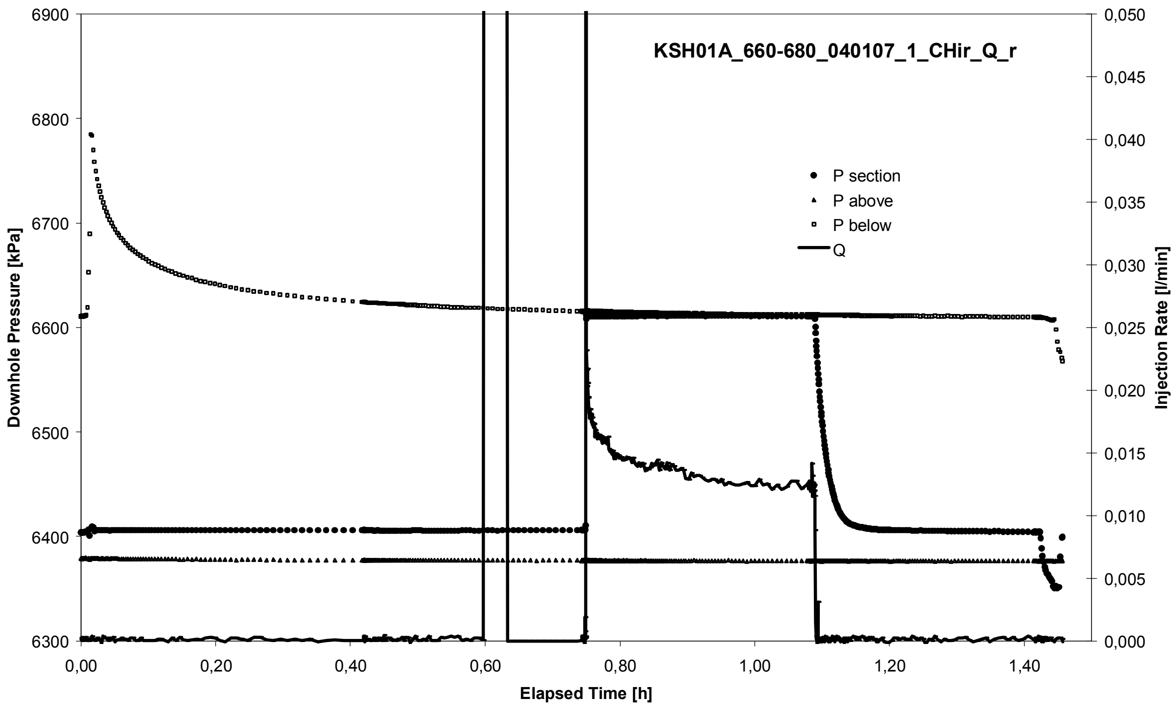


CHIR phase; HORNER match

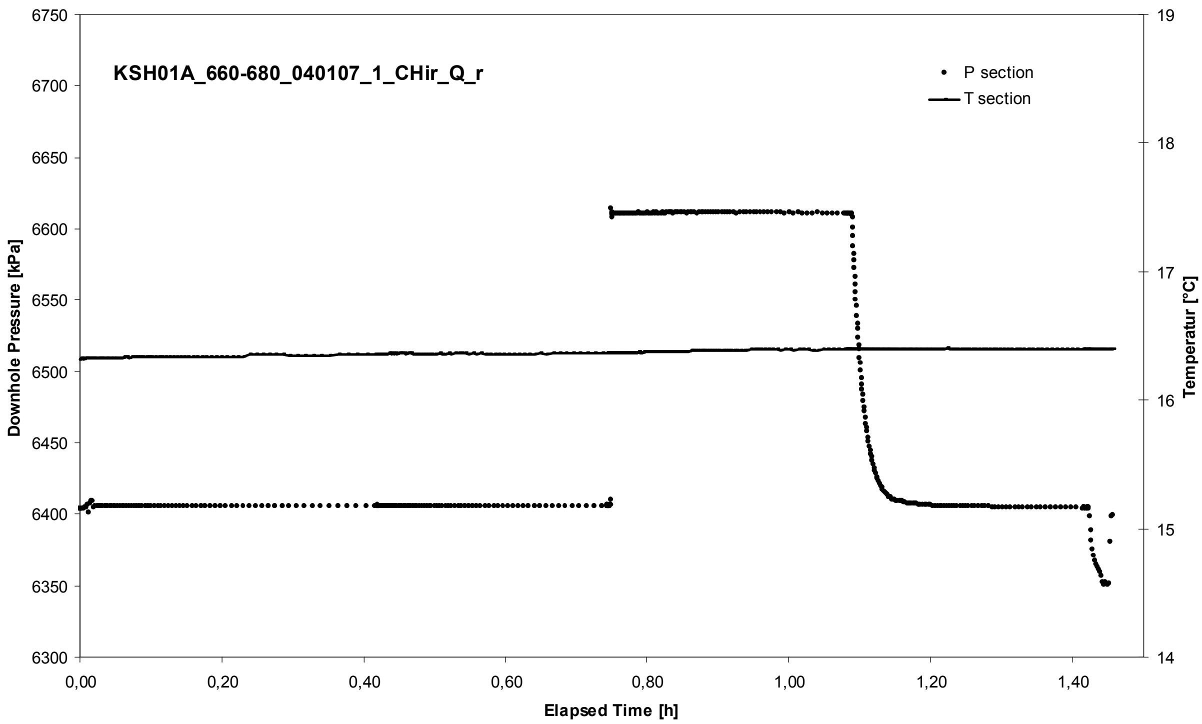
APPENDIX 2-38

Test 660 – 680 m

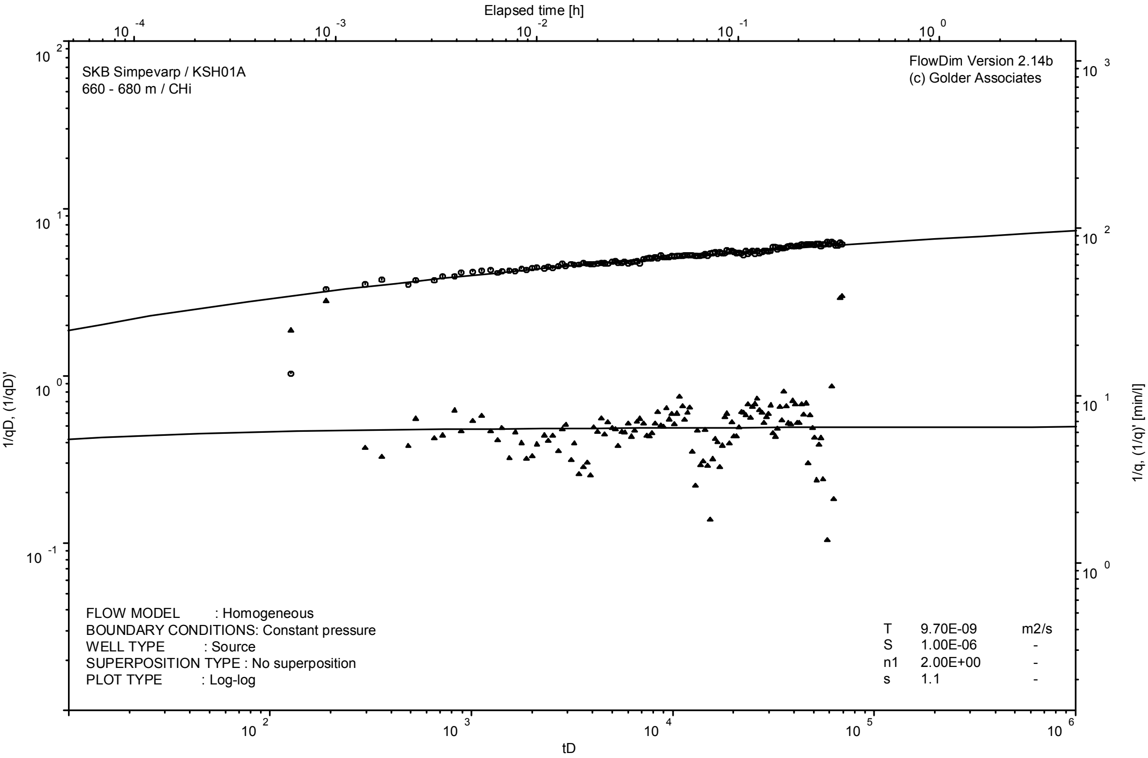
Analysis diagrams



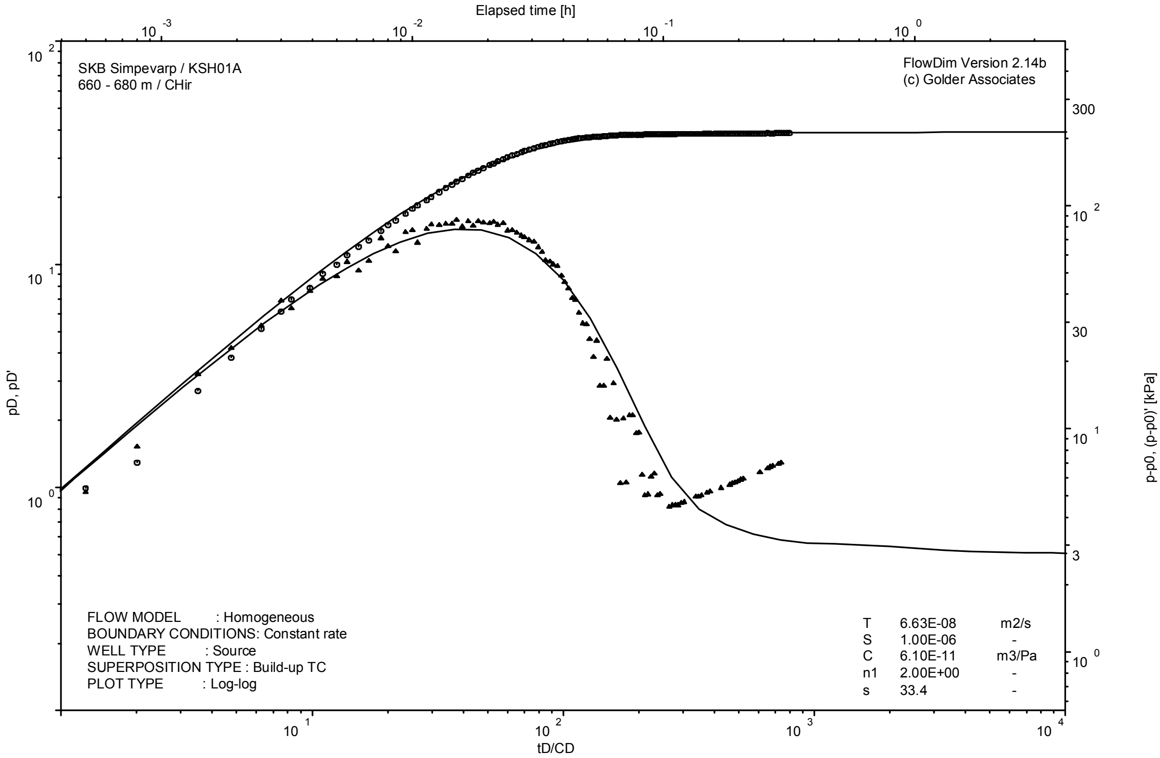
Pressure and flow rate vs. time; cartesian plot



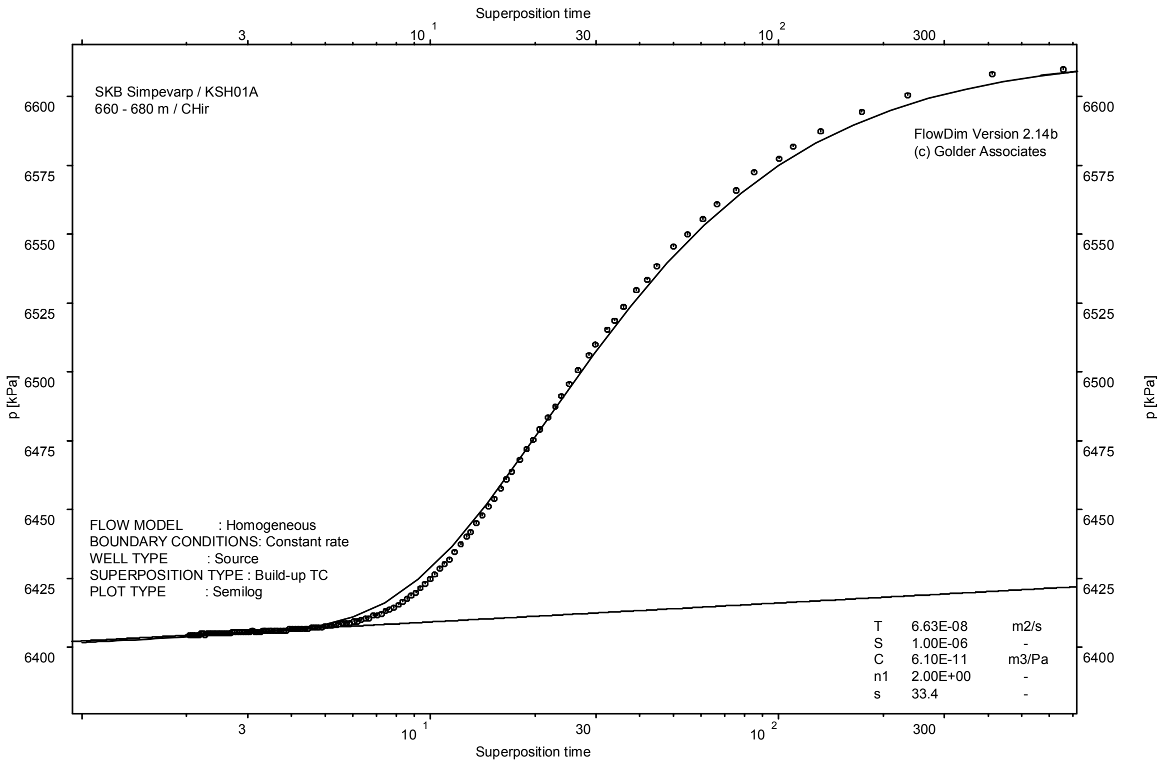
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

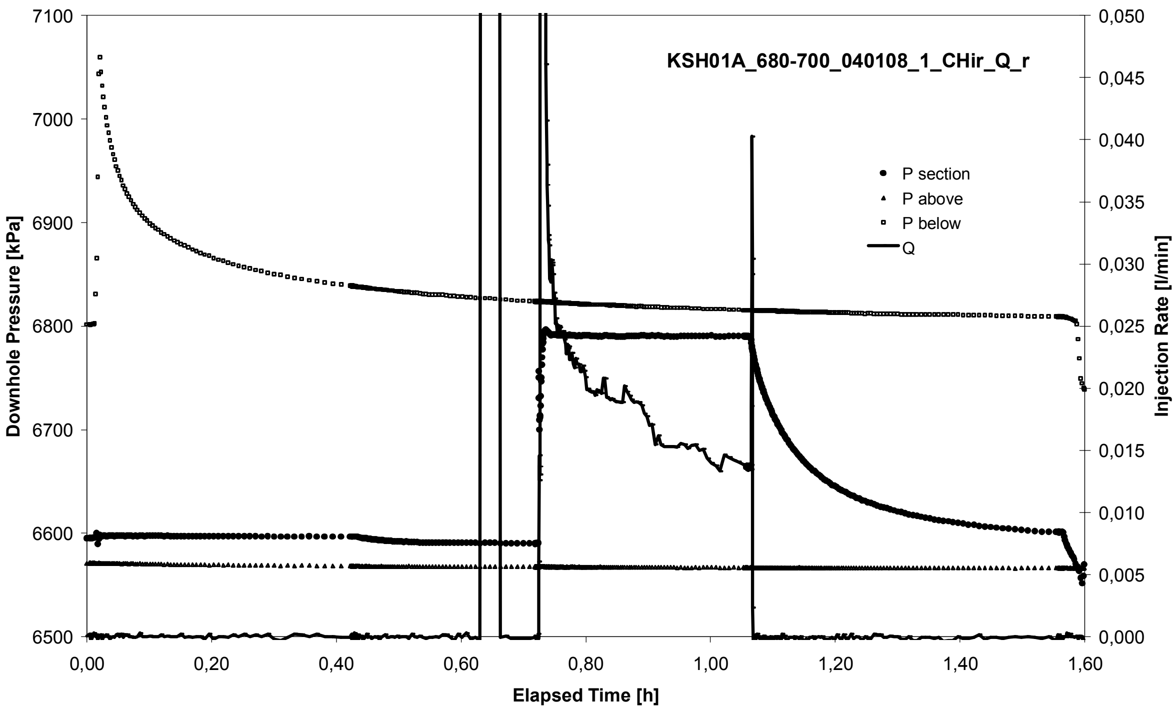


CHIR phase; HORNER match

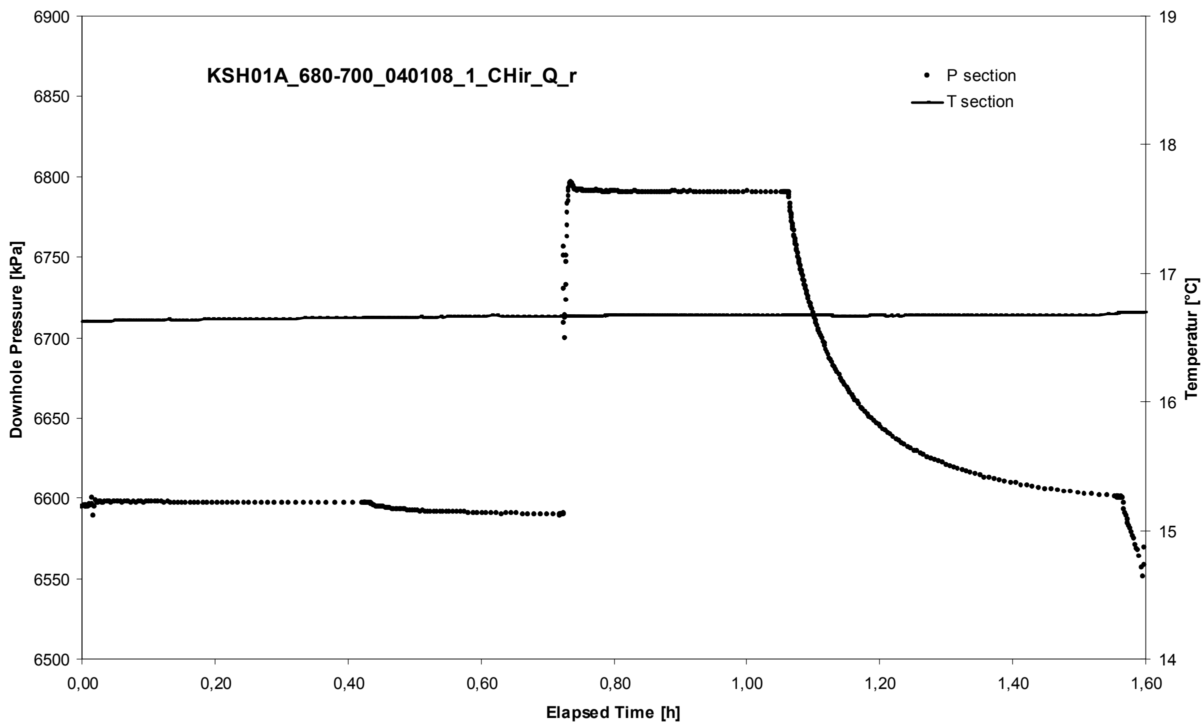
APPENDIX 2-39

Test 680 – 700 m

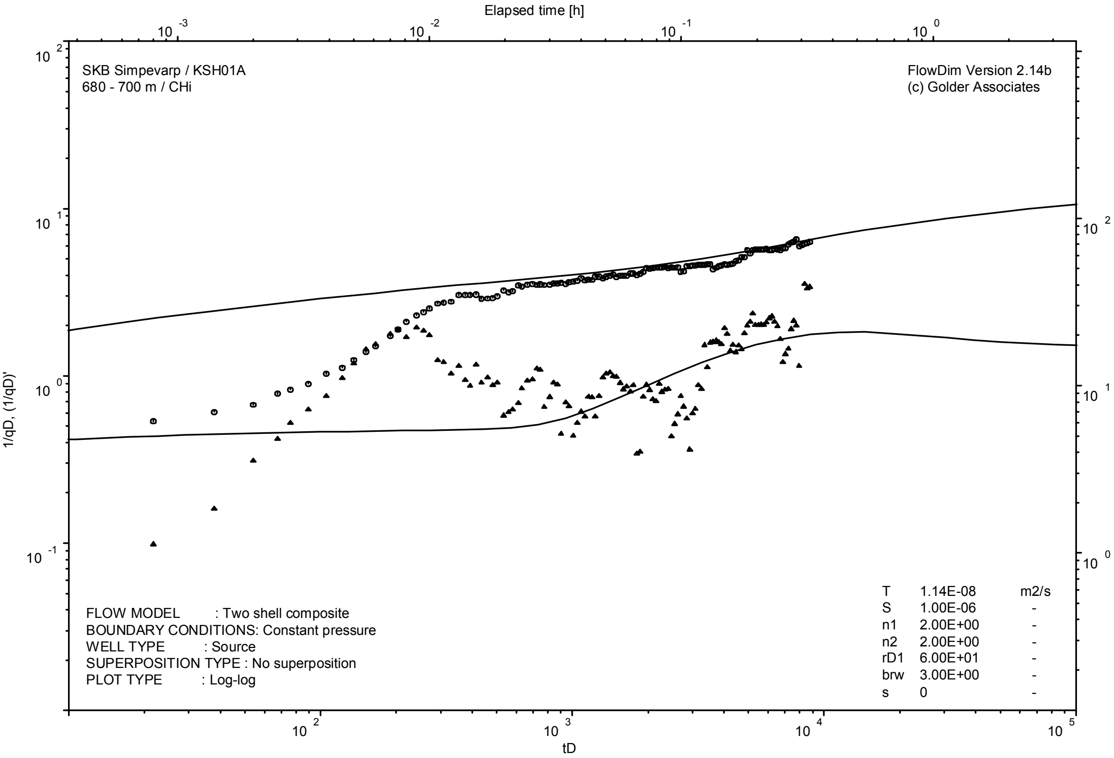
Analysis diagrams



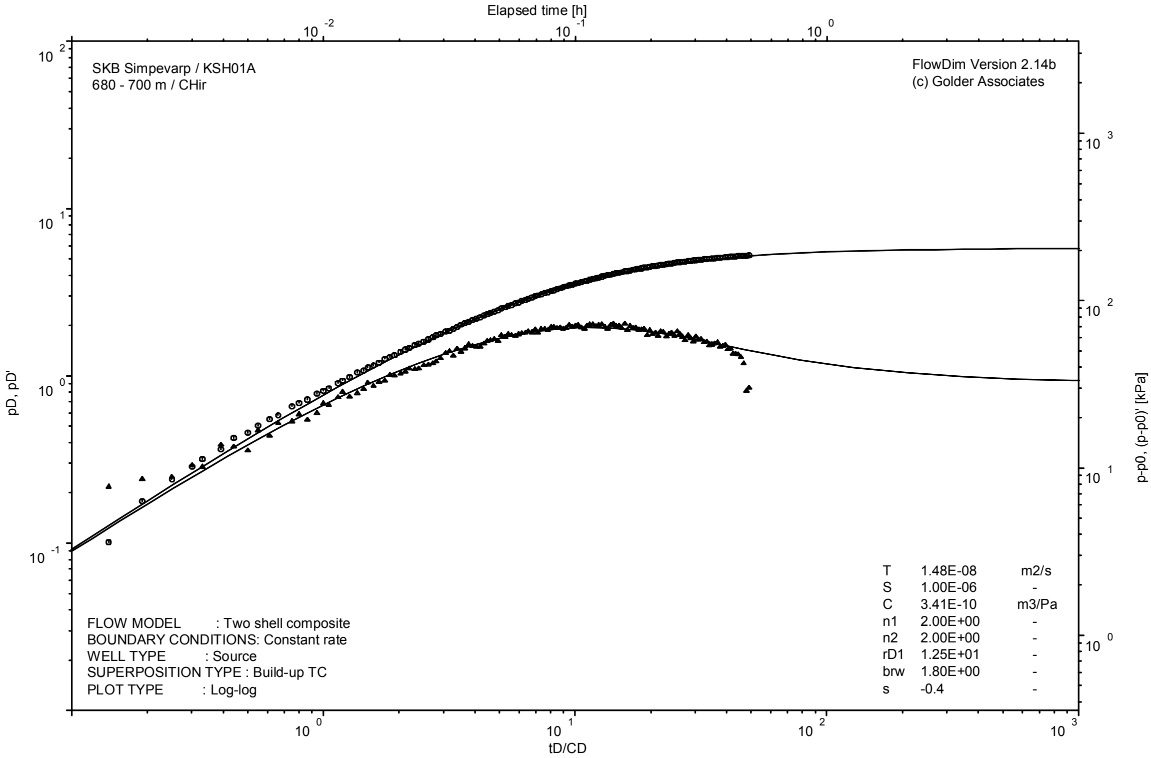
Pressure and flow rate vs. time; cartesian plot



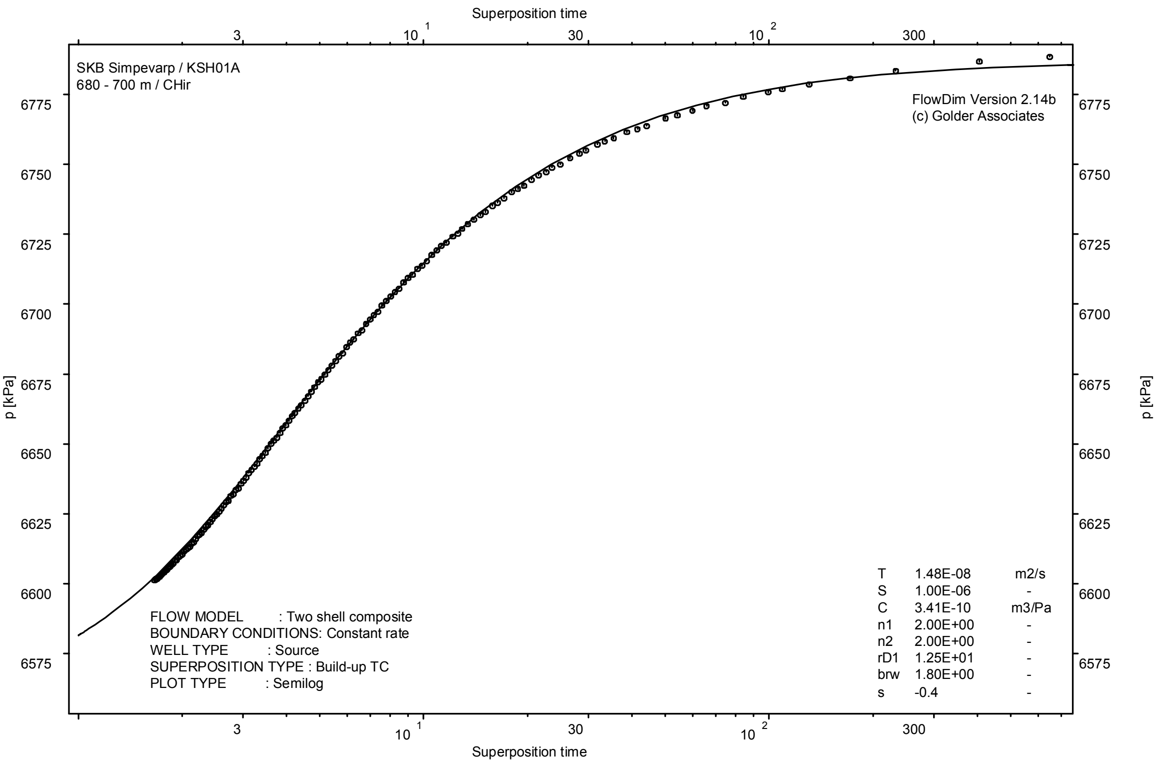
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

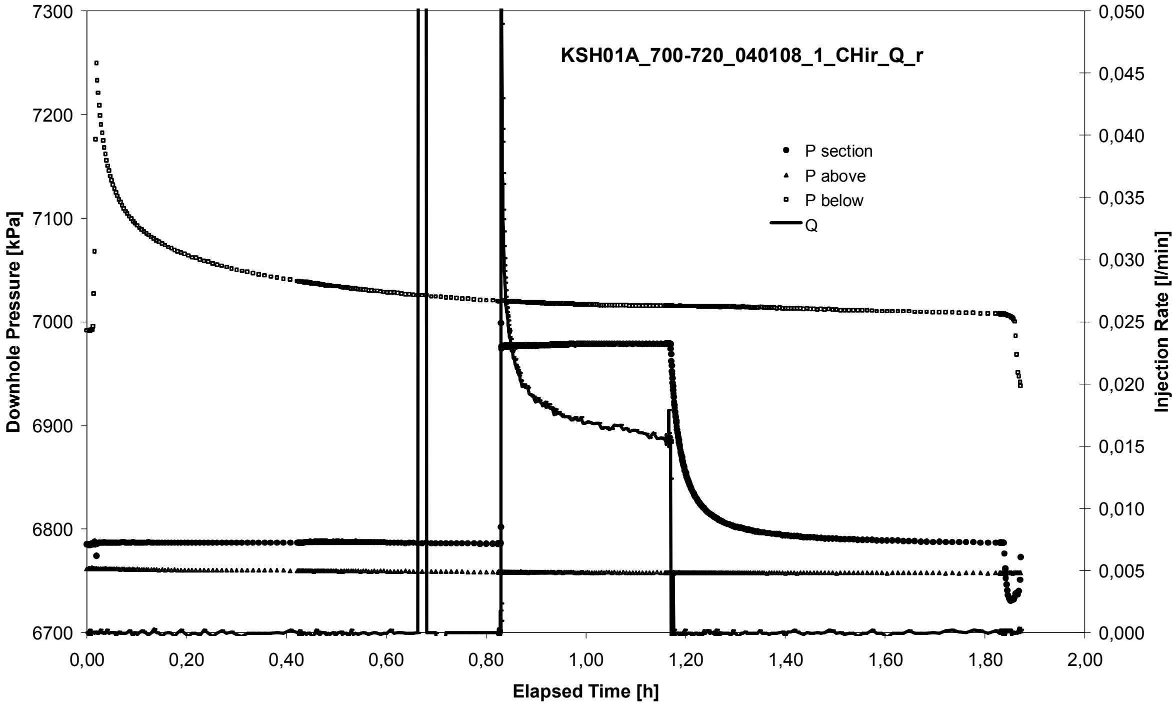


CHIR phase; HORNER match

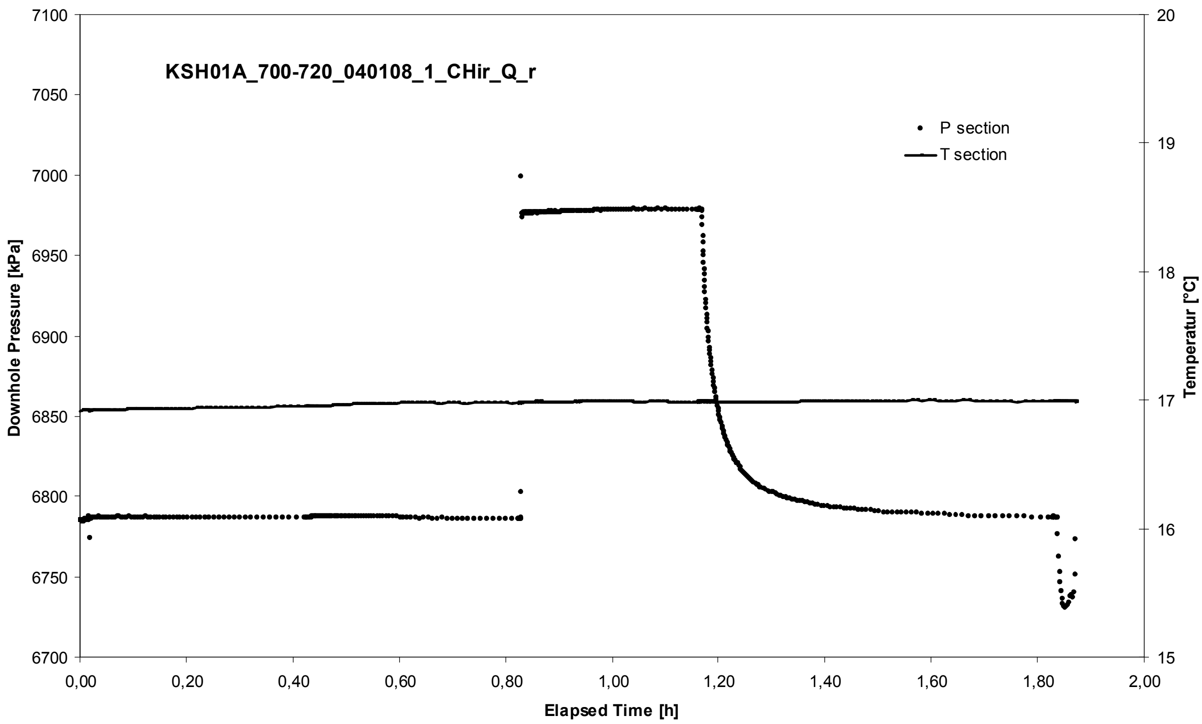
APPENDIX 2-40

Test 700 – 720 m

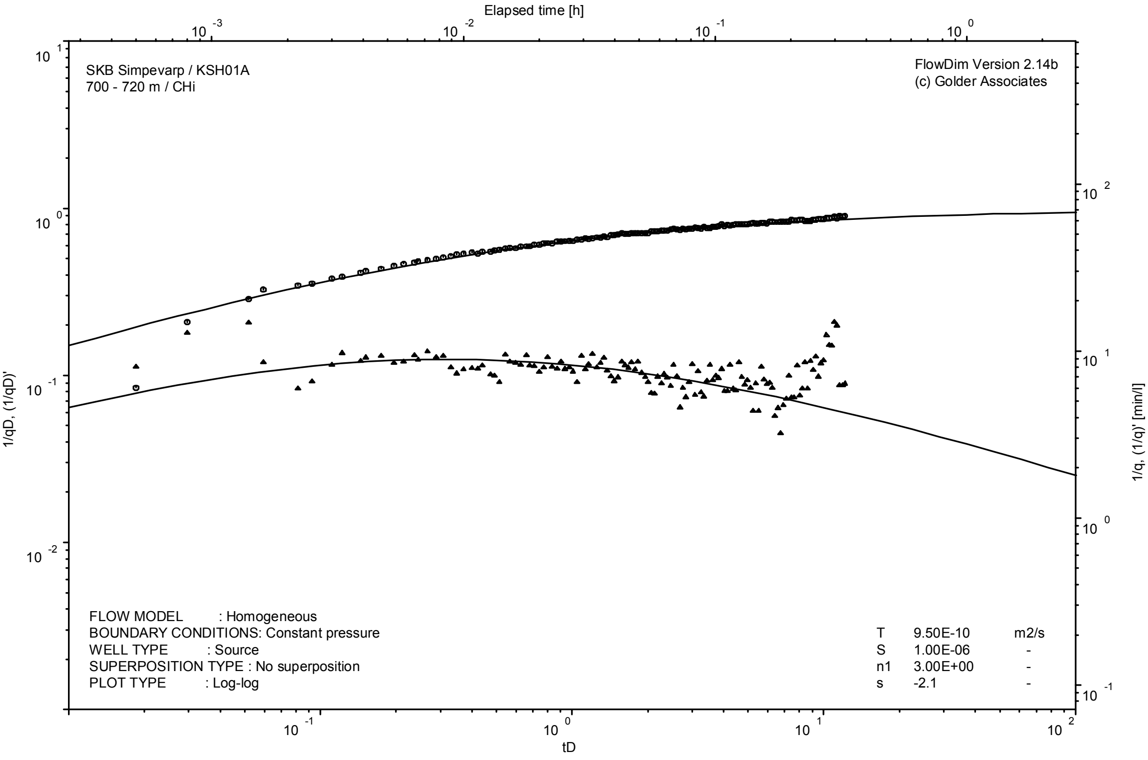
Analysis diagrams



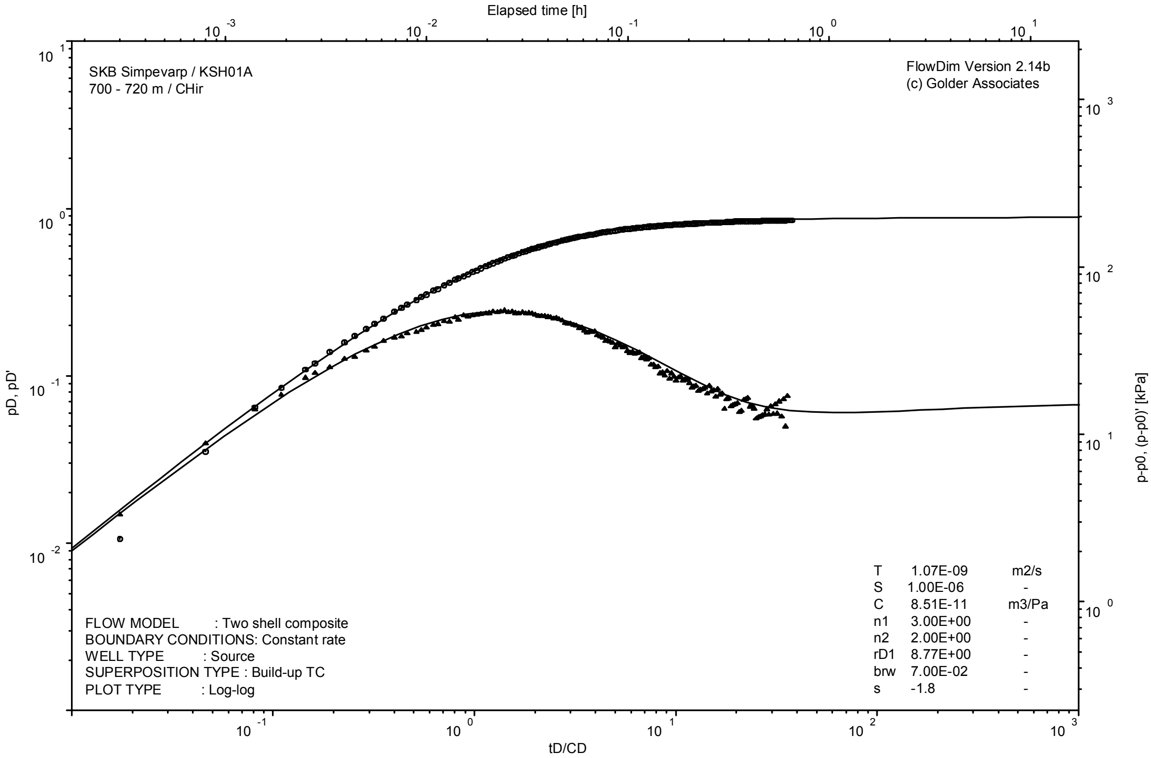
Pressure and flow rate vs. time; cartesian plot



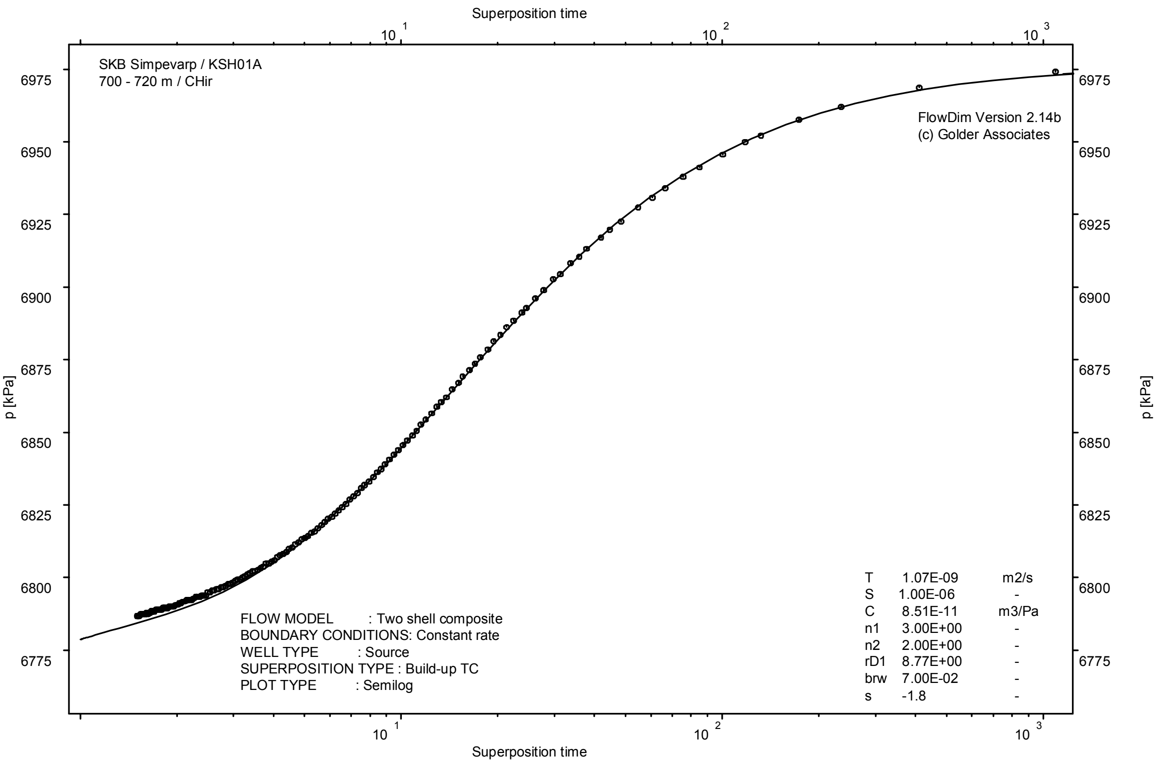
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

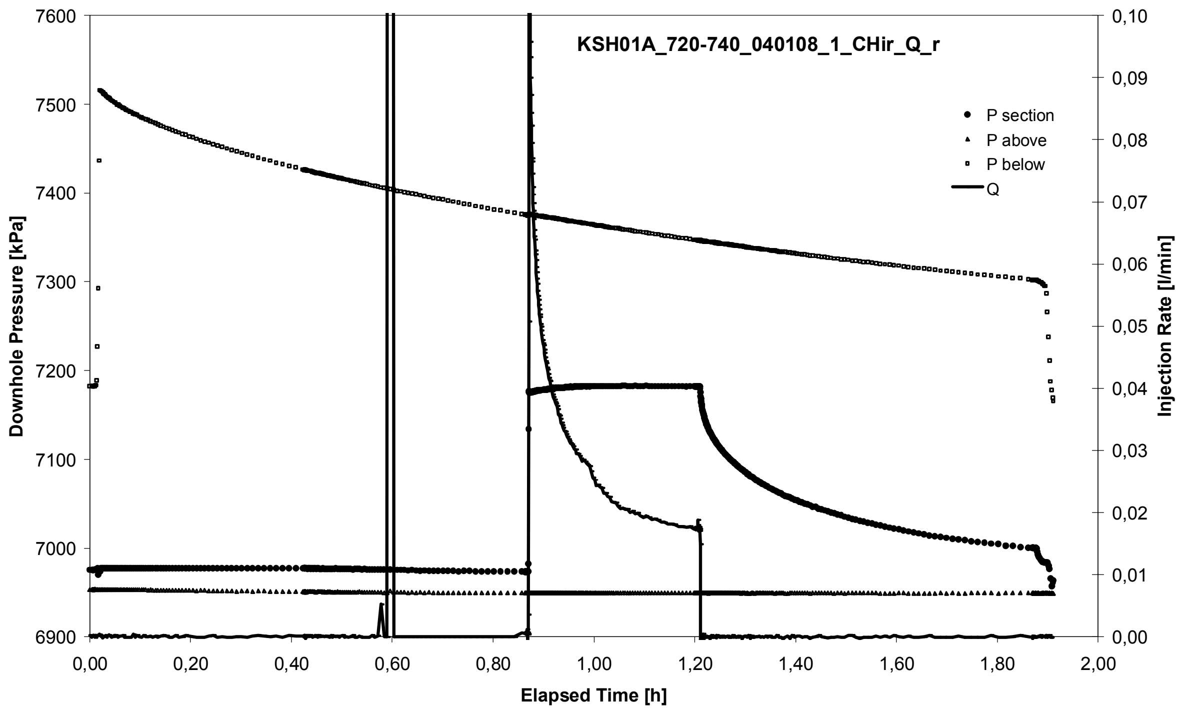


CHIR phase; HORNER match

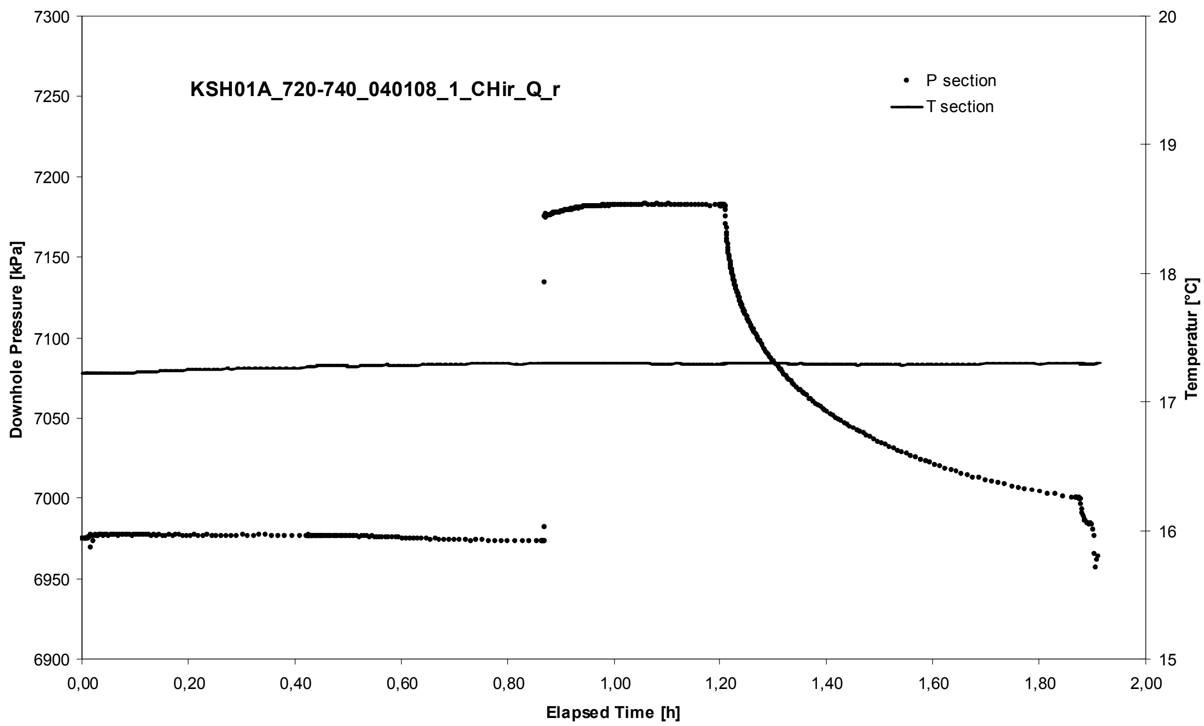
APPENDIX 2-41

Test 720 – 740 m

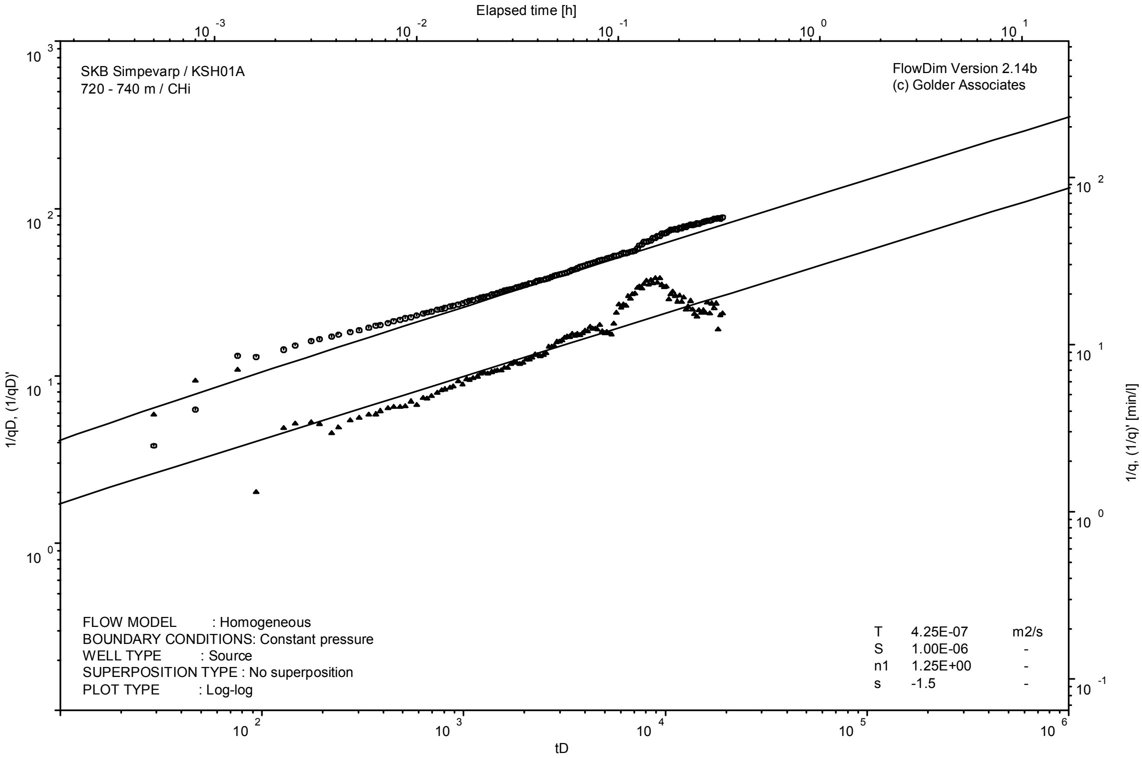
Analysis diagrams



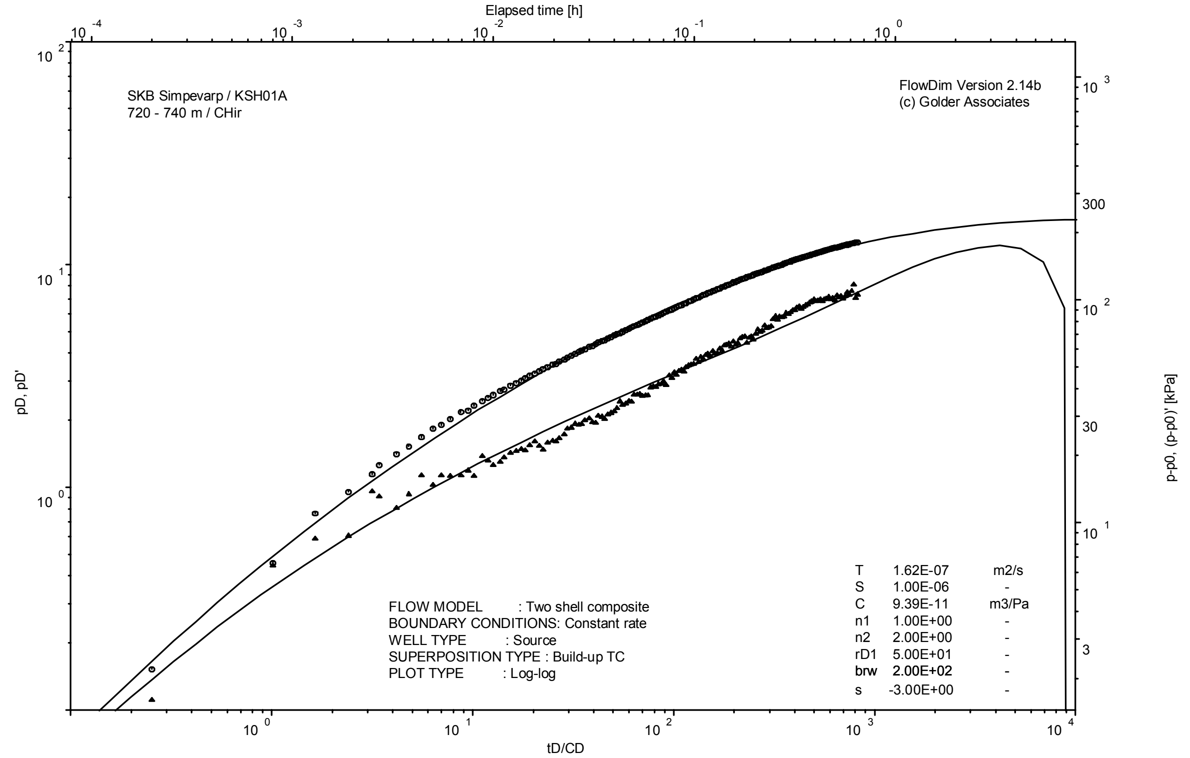
Pressure and flow rate vs. time; cartesian plot



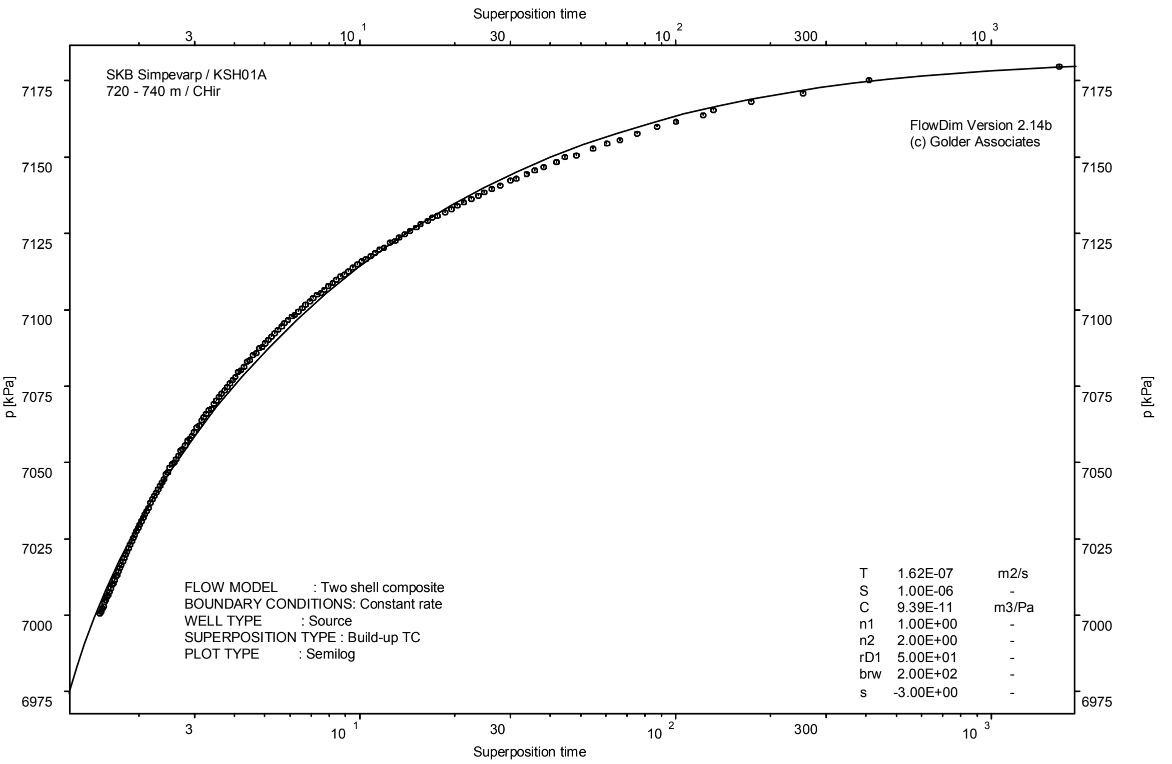
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

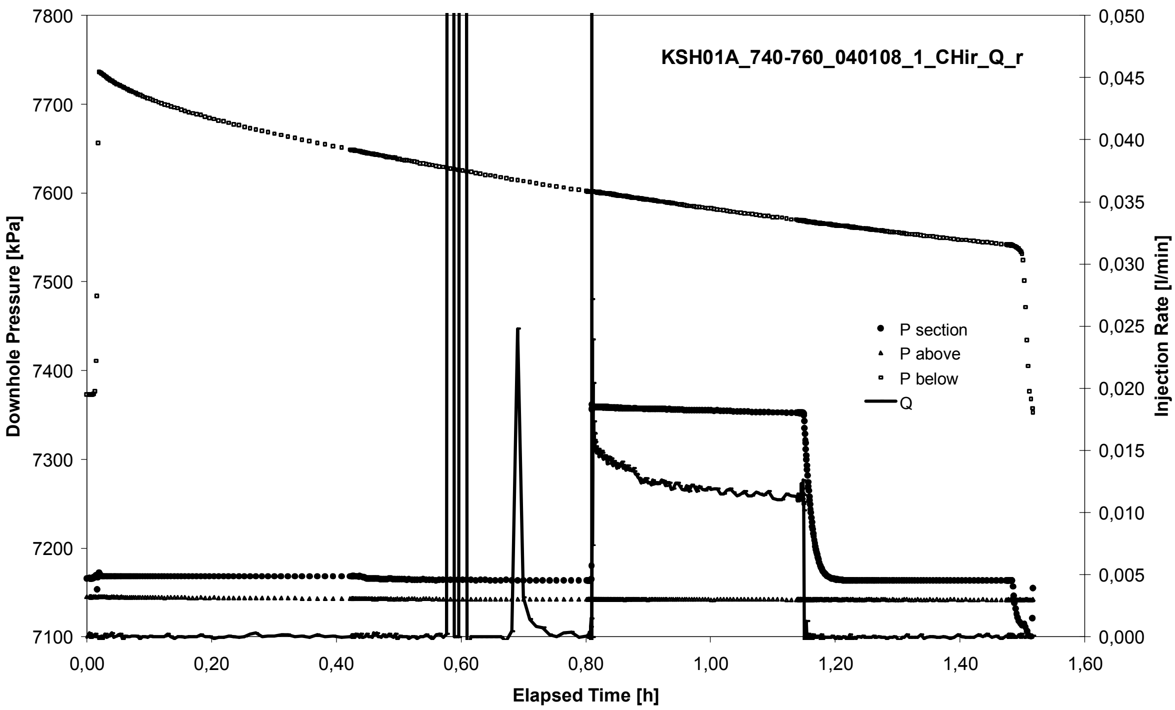


CHIR phase; HORNER match

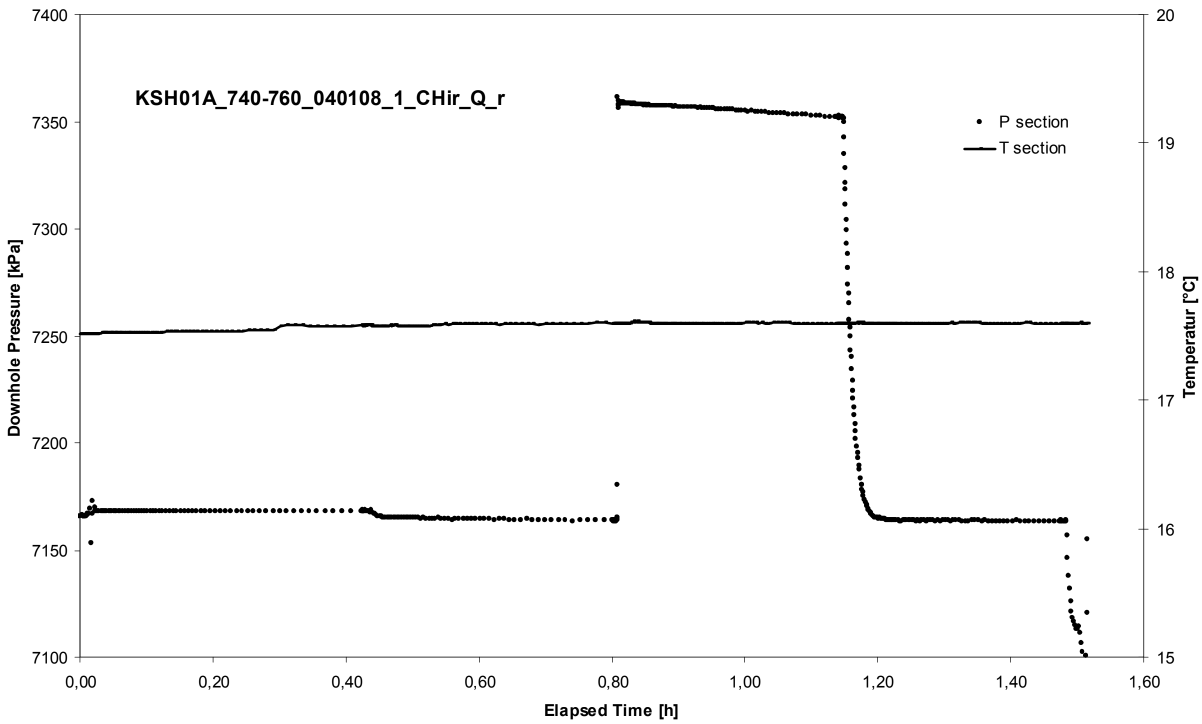
APPENDIX 2-42

Test 740 – 760 m

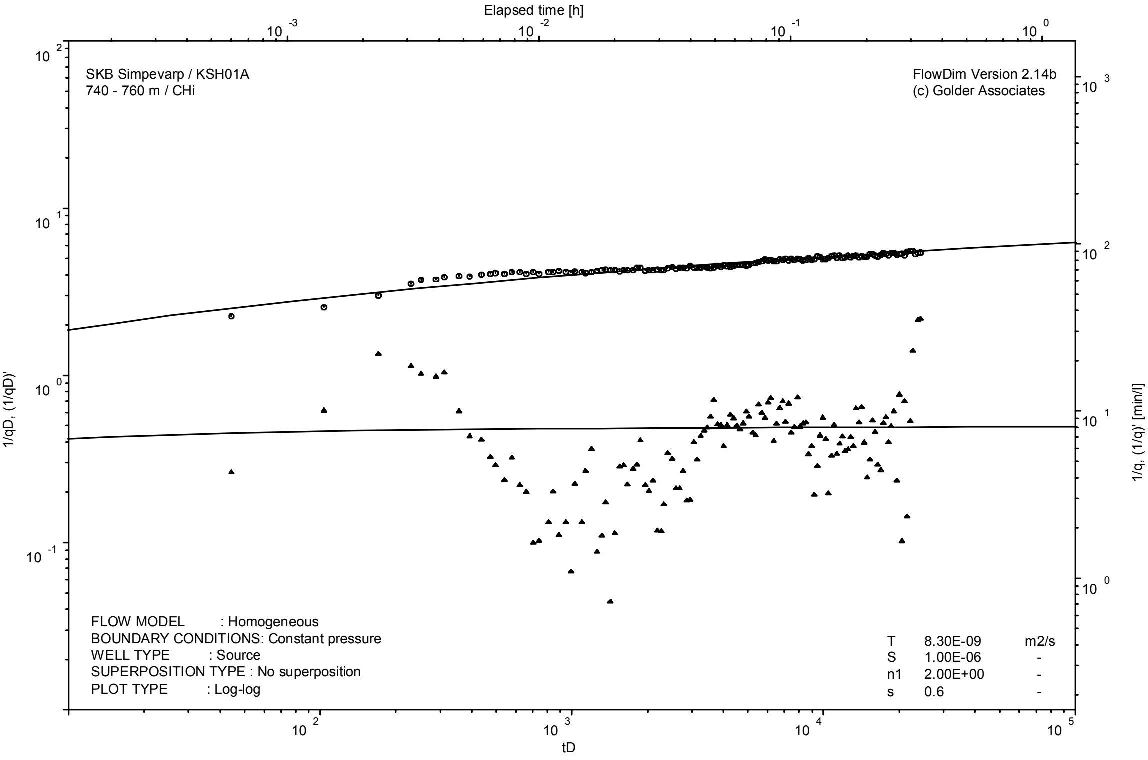
Analysis diagrams



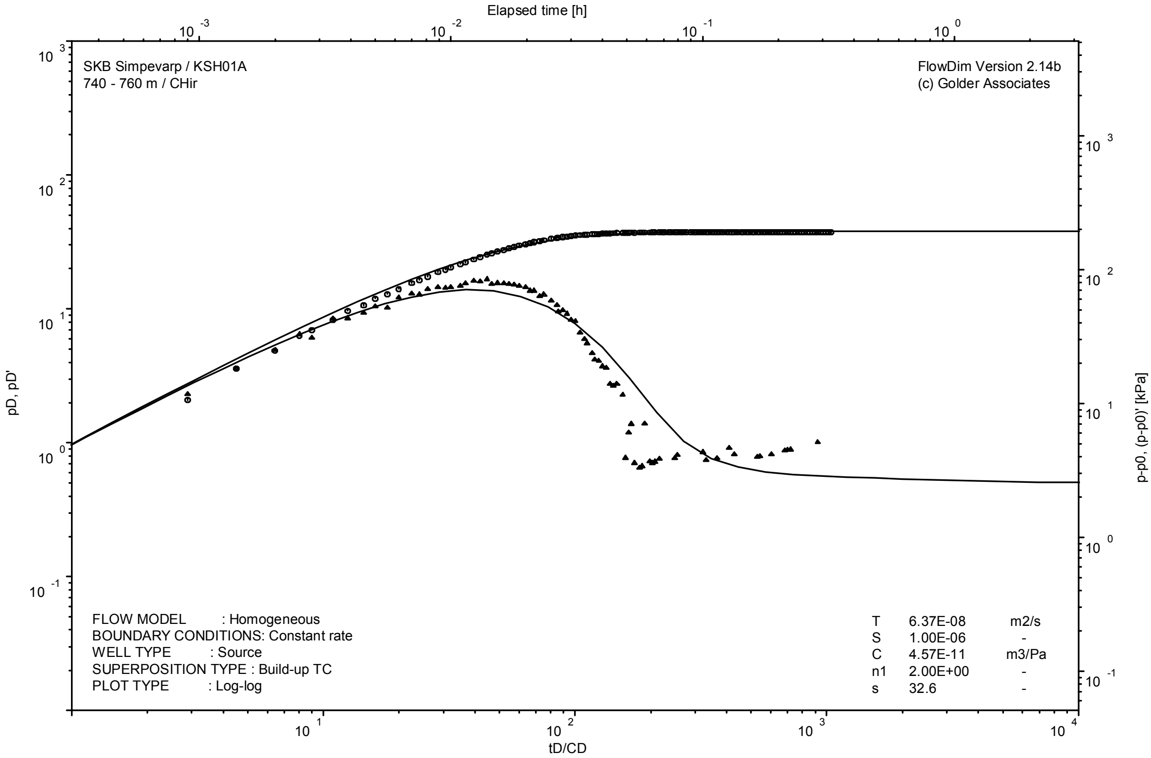
Pressure and flow rate vs. time; cartesian plot



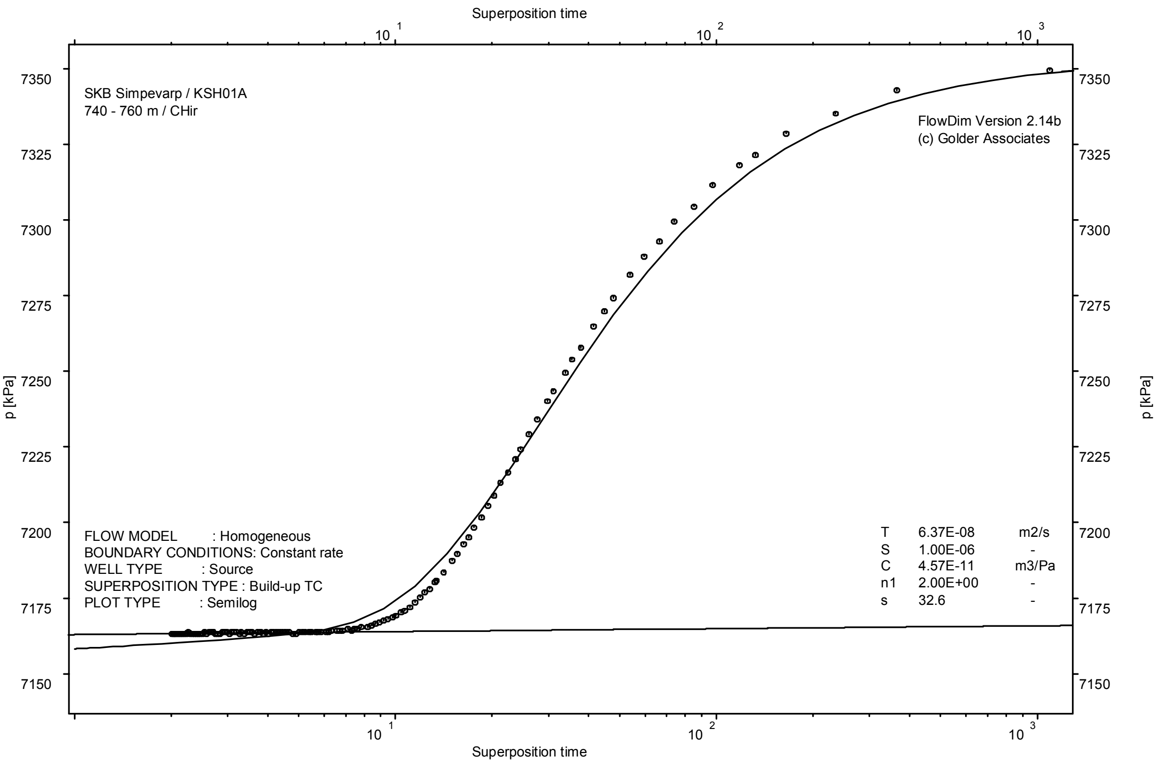
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

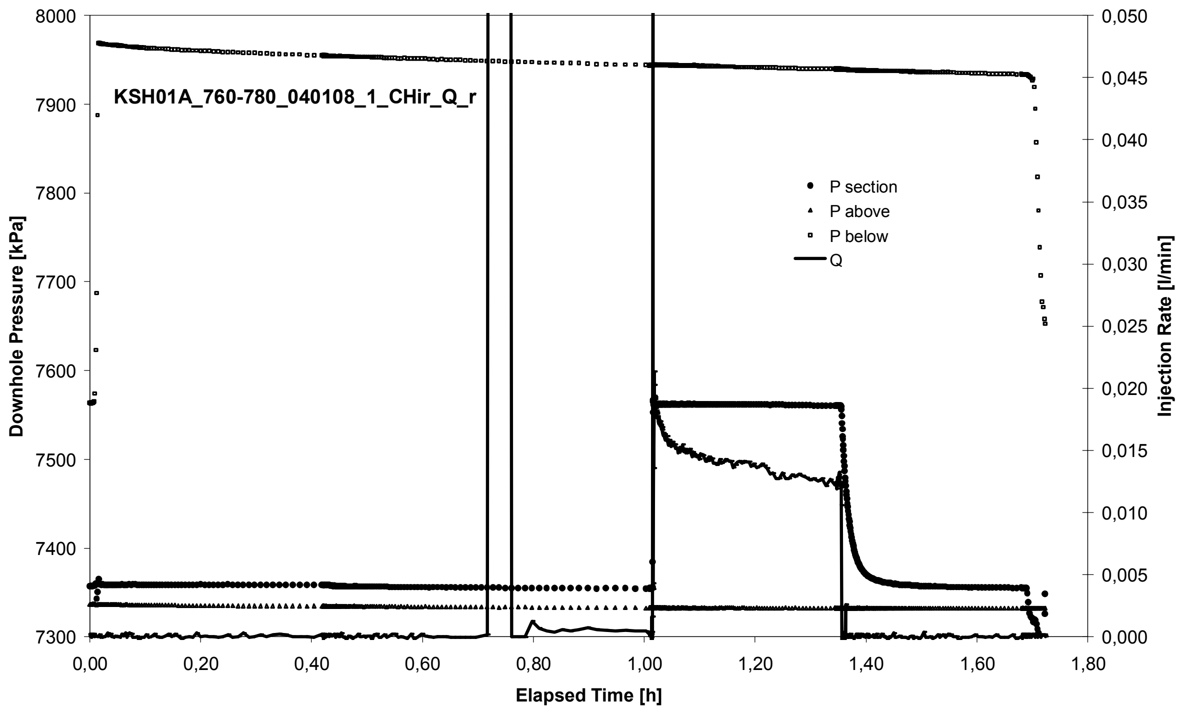


CHIR phase; HORNER match

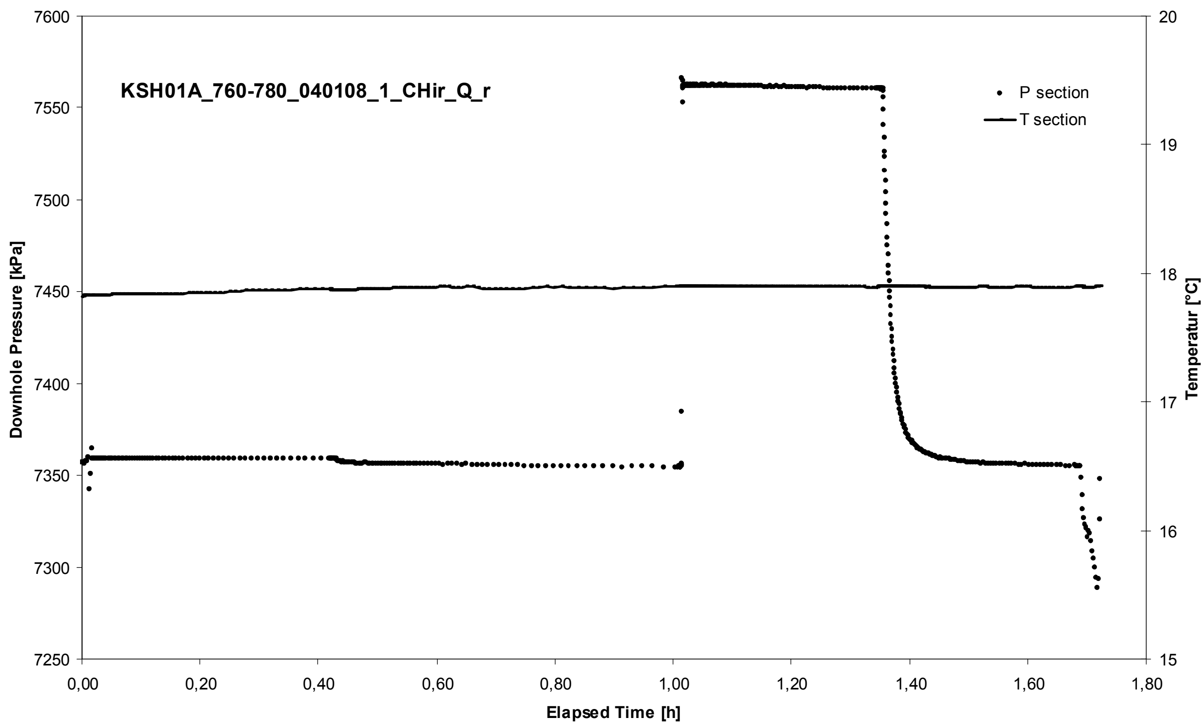
APPENDIX 2-43

Test 760 – 780 m

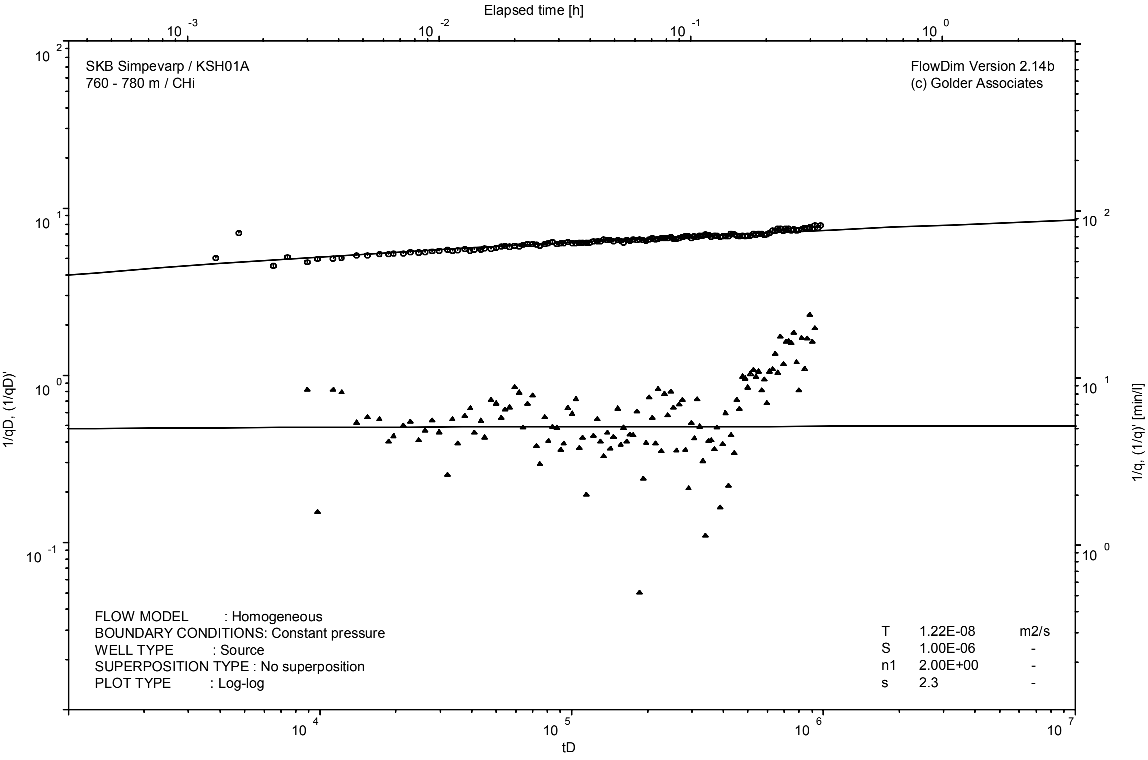
Analysis diagrams



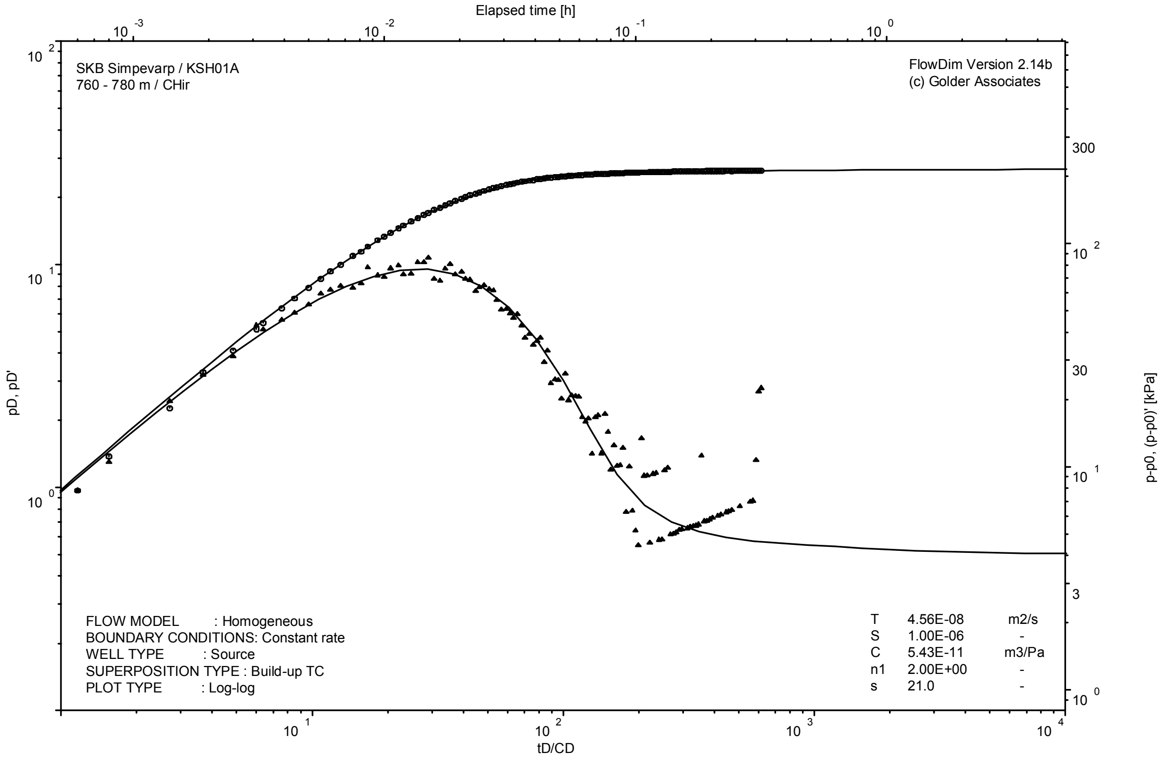
Pressure and flow rate vs. time; cartesian plot



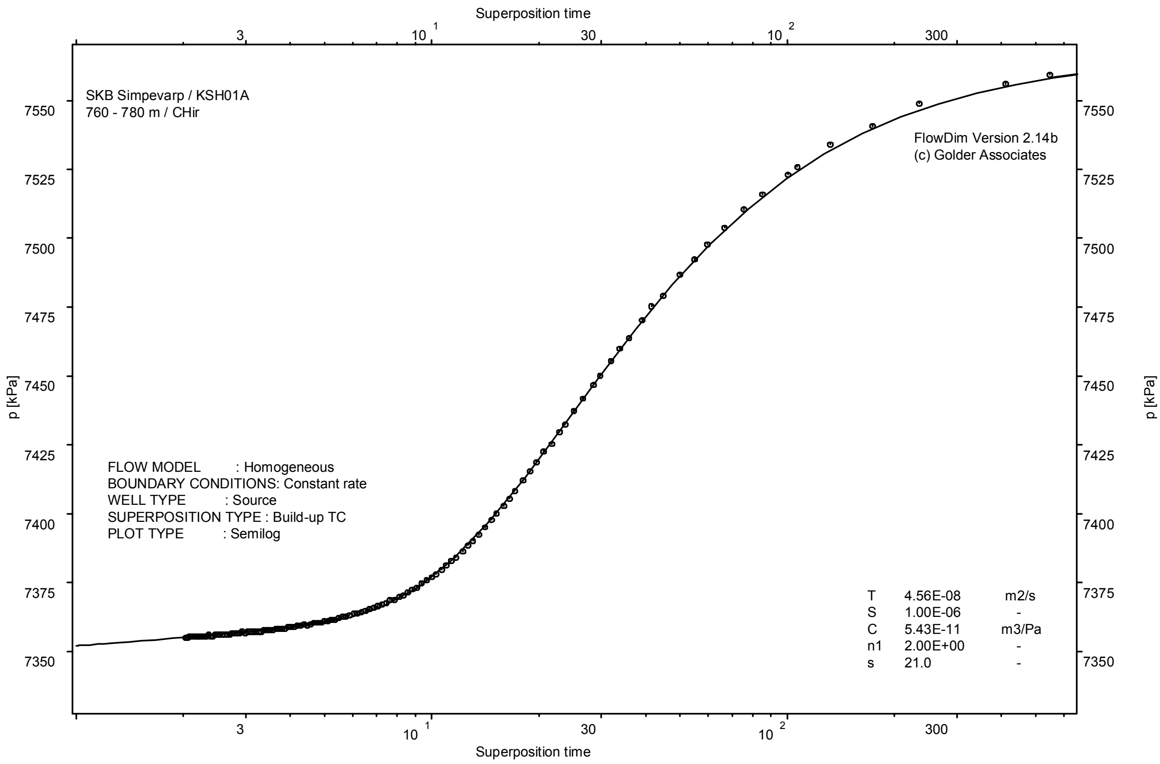
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

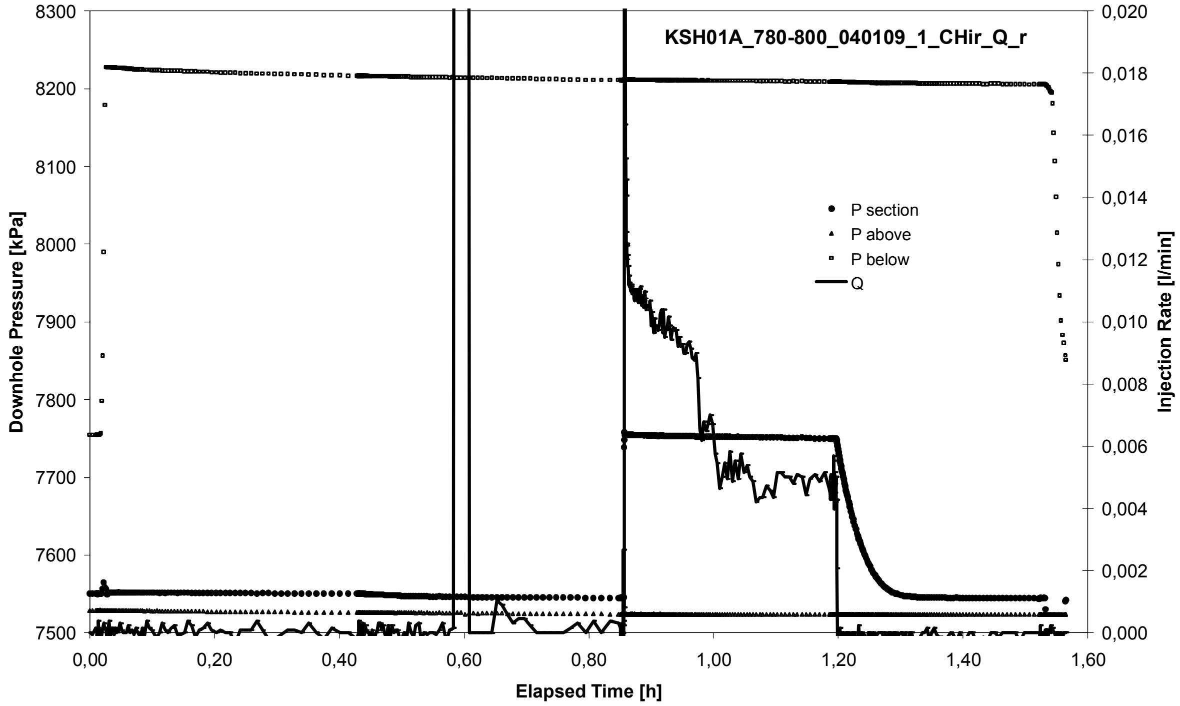


CHIR phase; HORNER match

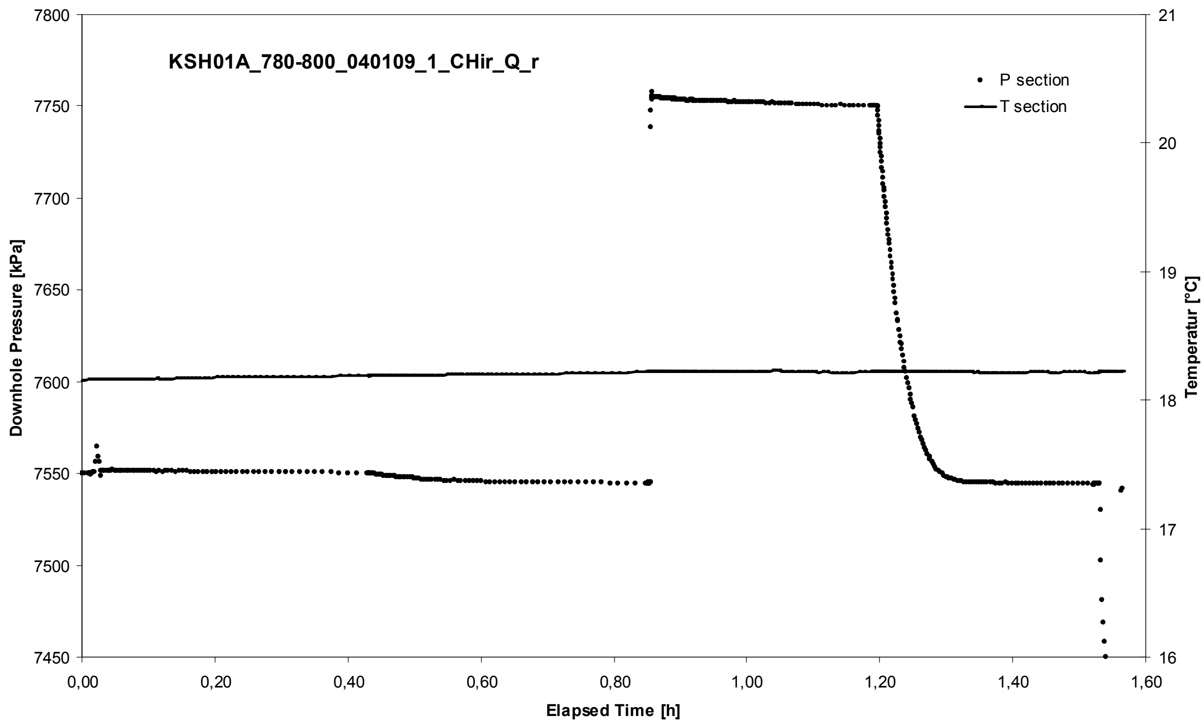
APPENDIX 2-44

Test 780 – 800 m

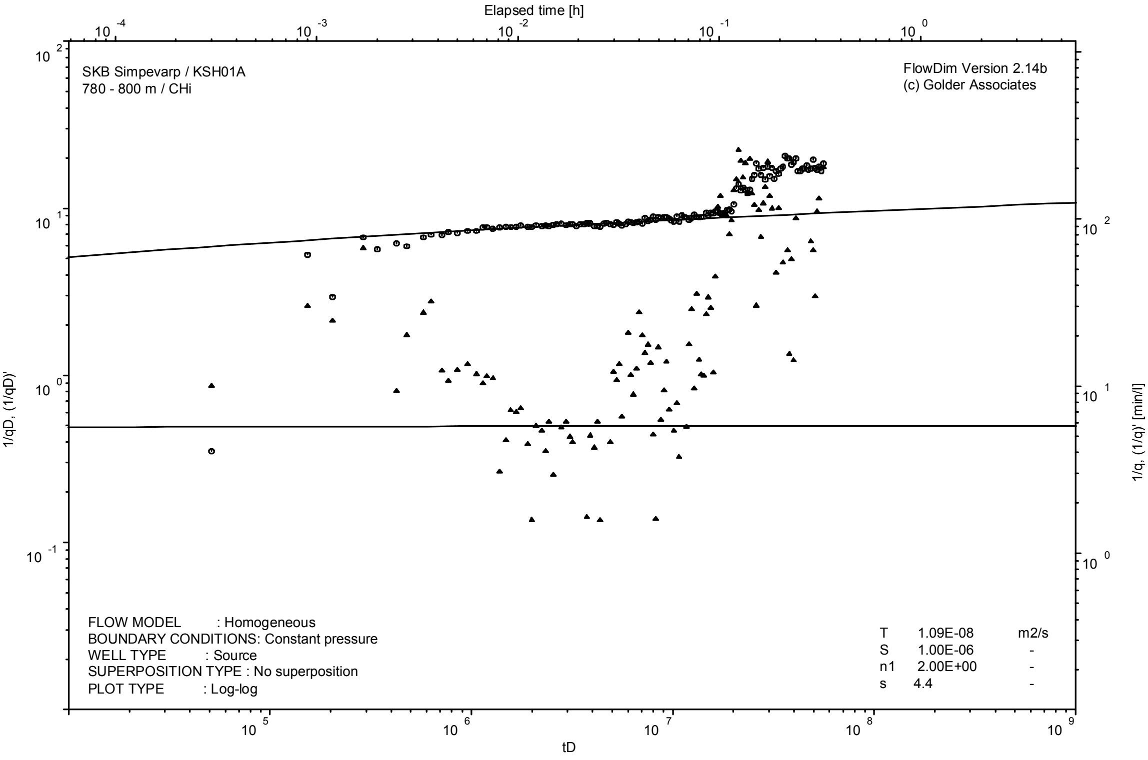
Analysis diagrams



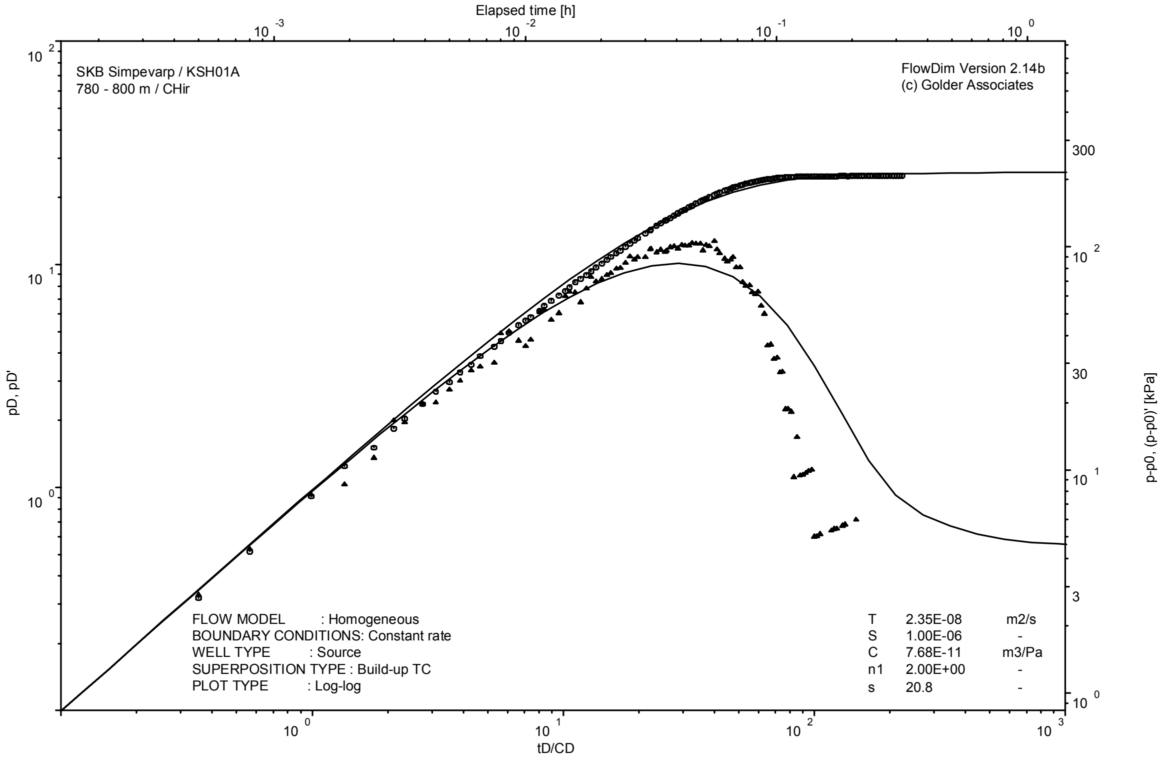
Pressure and flow rate vs. time; cartesian plot



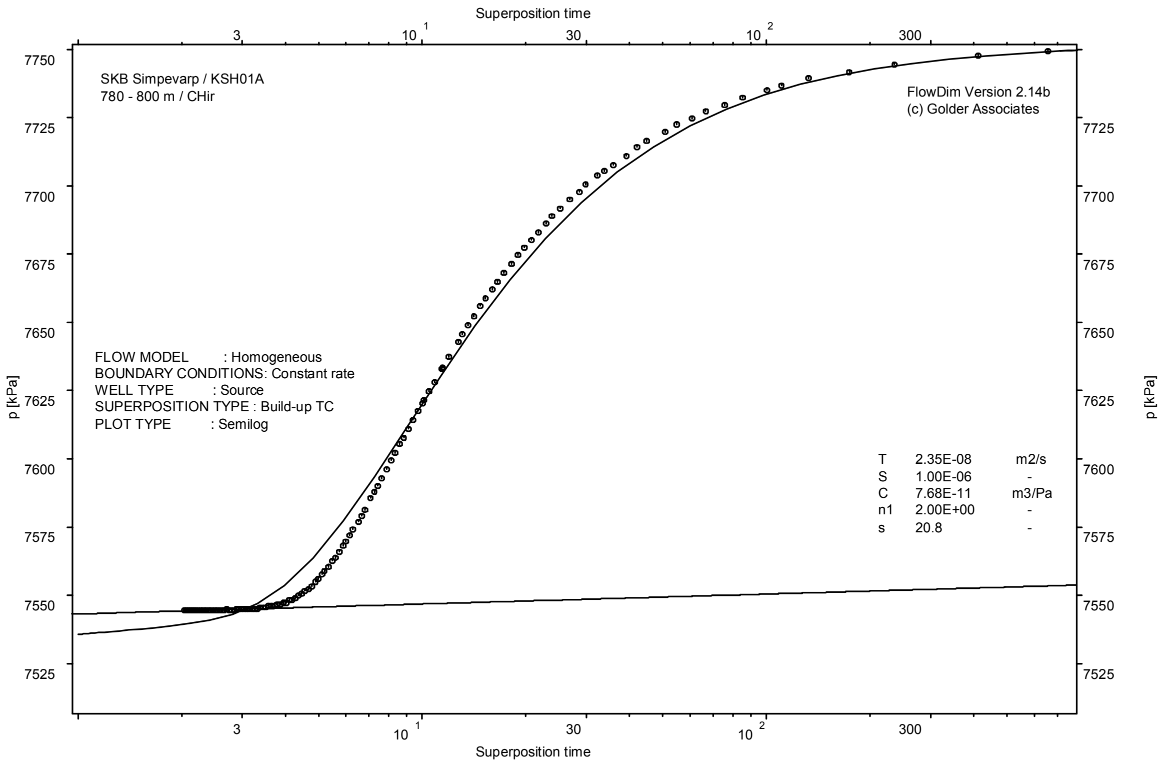
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

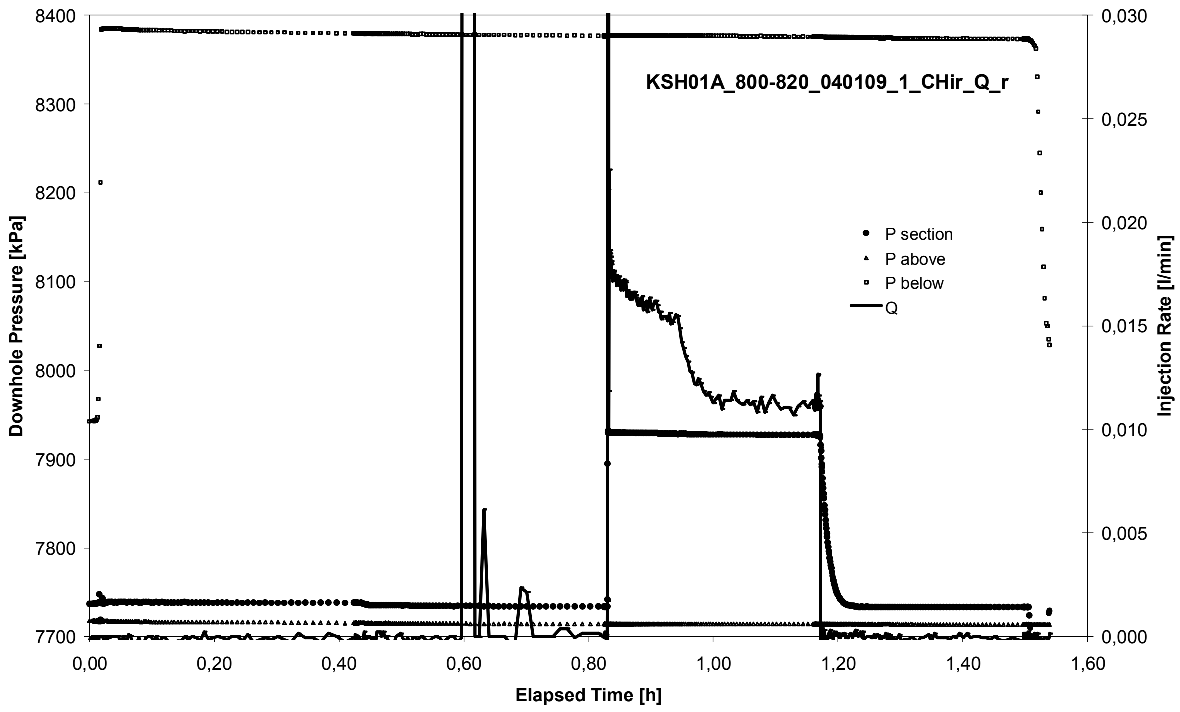


CHIR phase; HORNER match

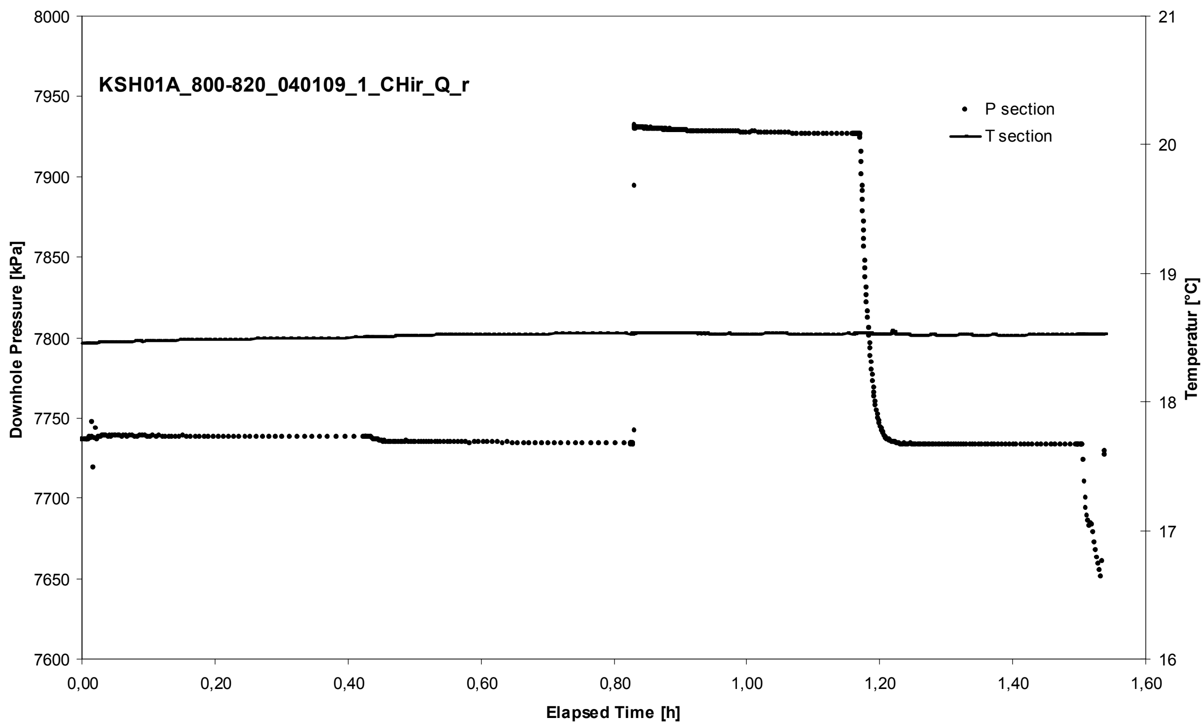
APPENDIX 2-45

Test 800 – 820 m

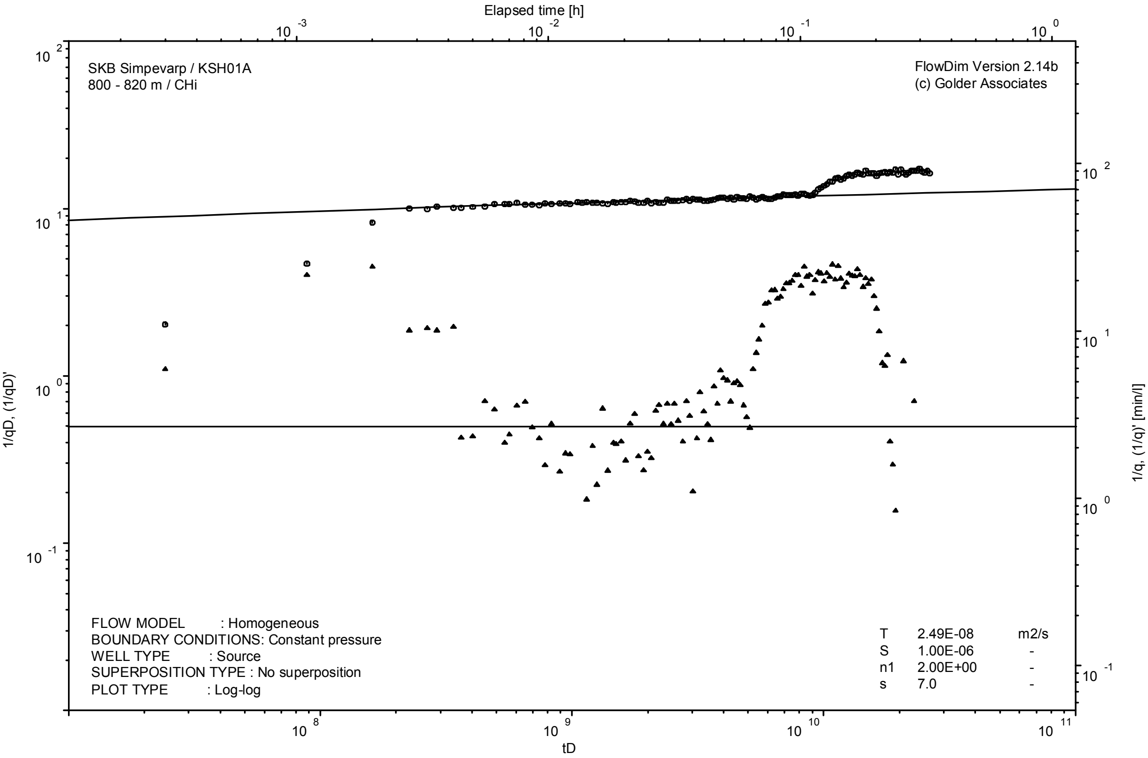
Analysis diagrams



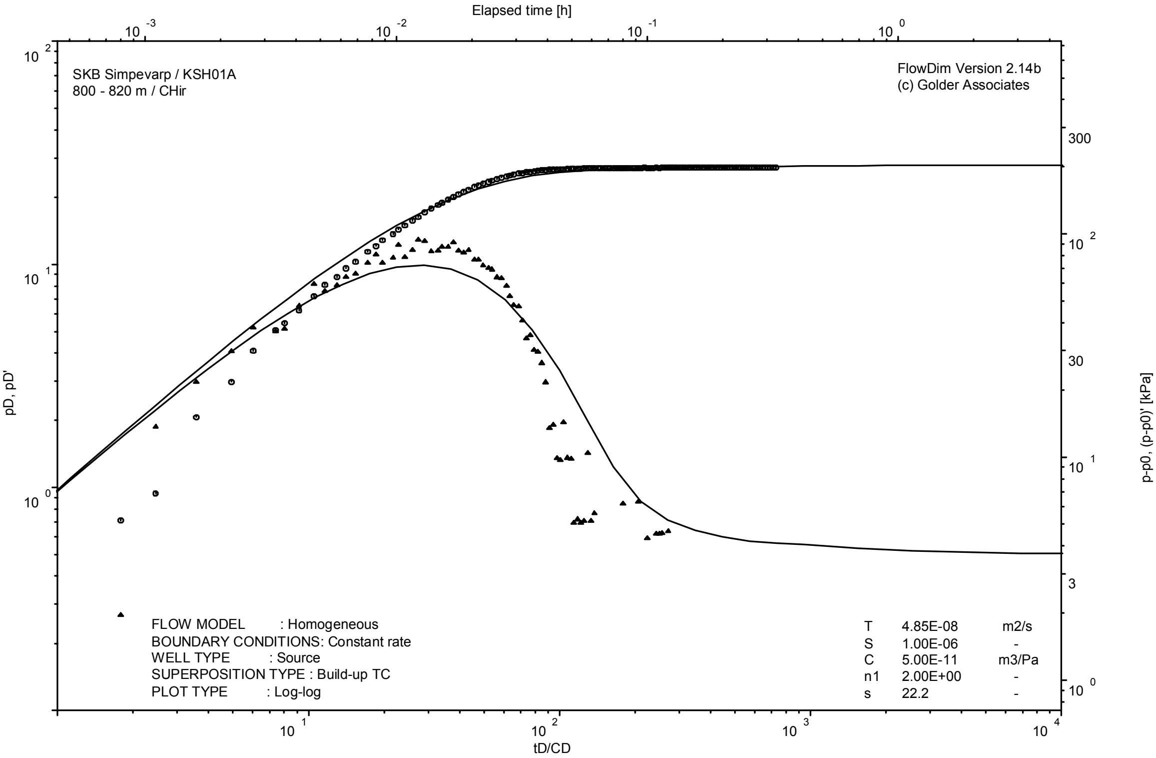
Pressure and flow rate vs. time; cartesian plot



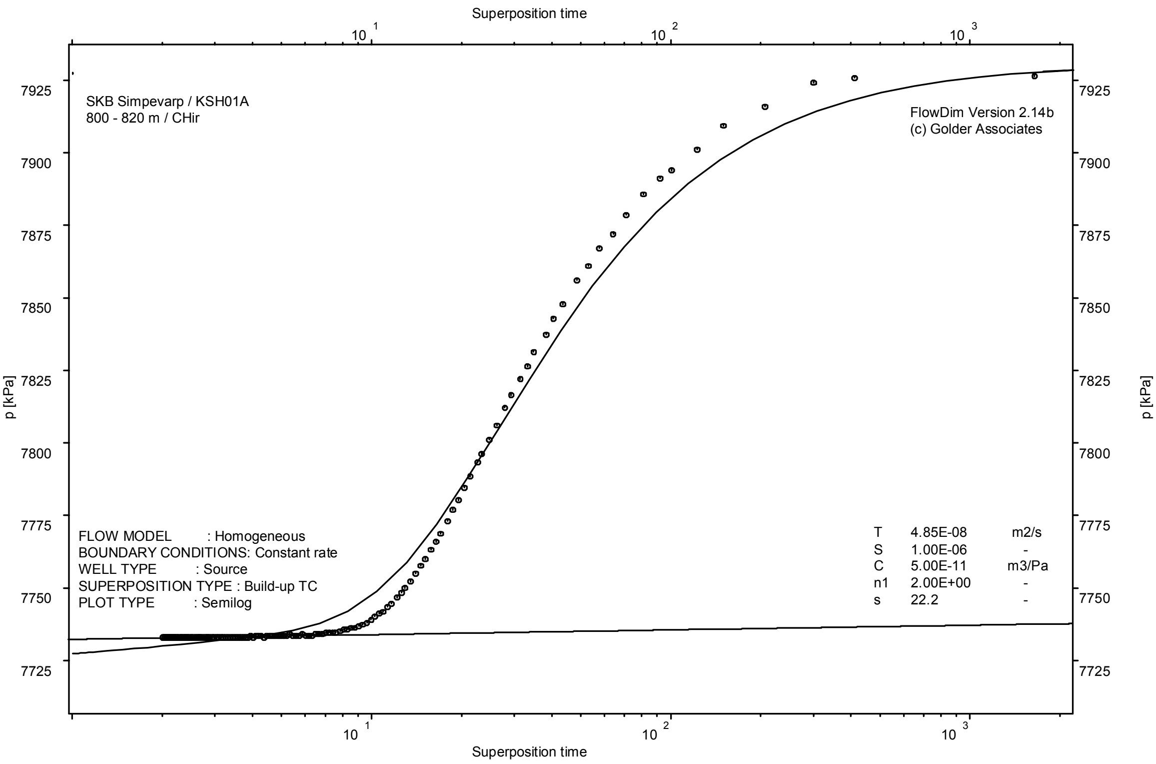
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

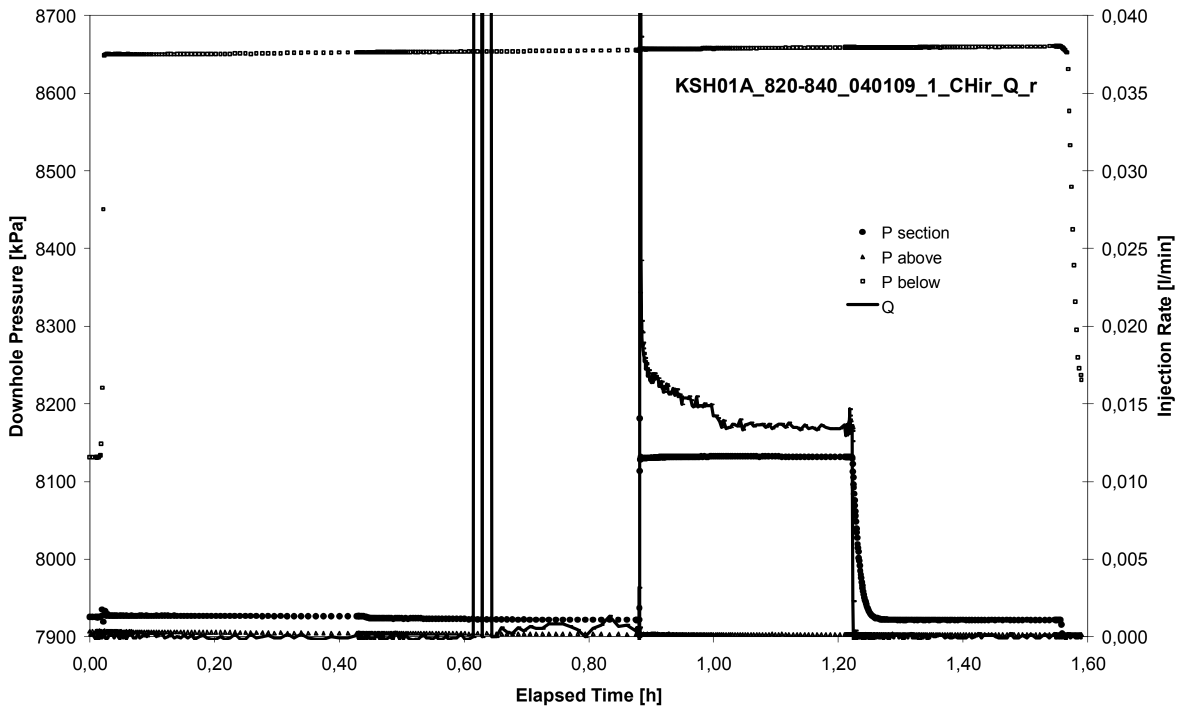


CHIR phase; HORNER match

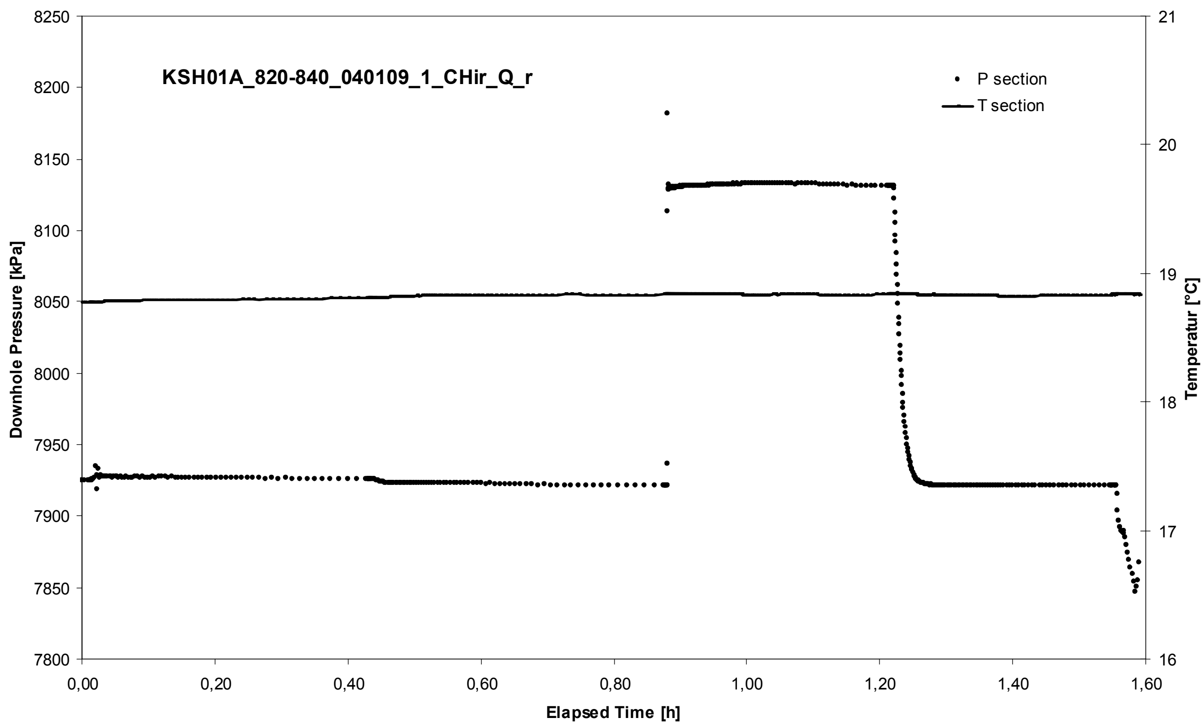
APPENDIX 2-46

Test 820 – 840 m

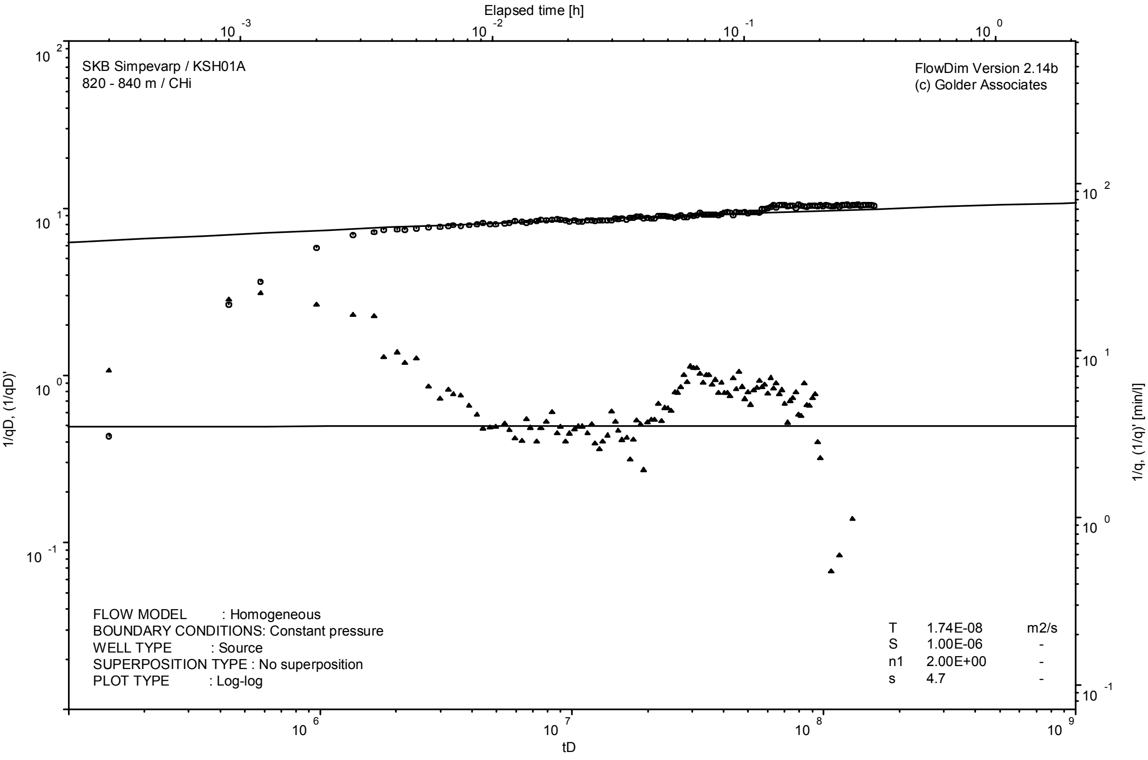
Analysis diagrams



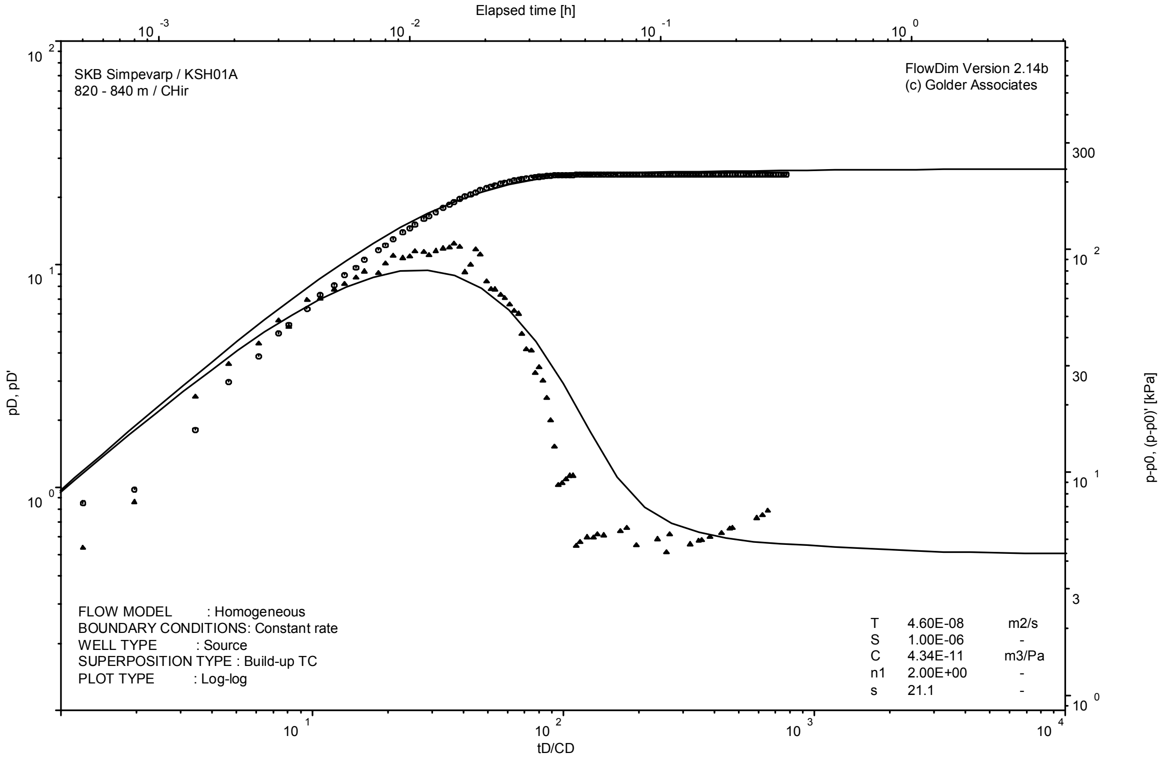
Pressure and flow rate vs. time; cartesian plot



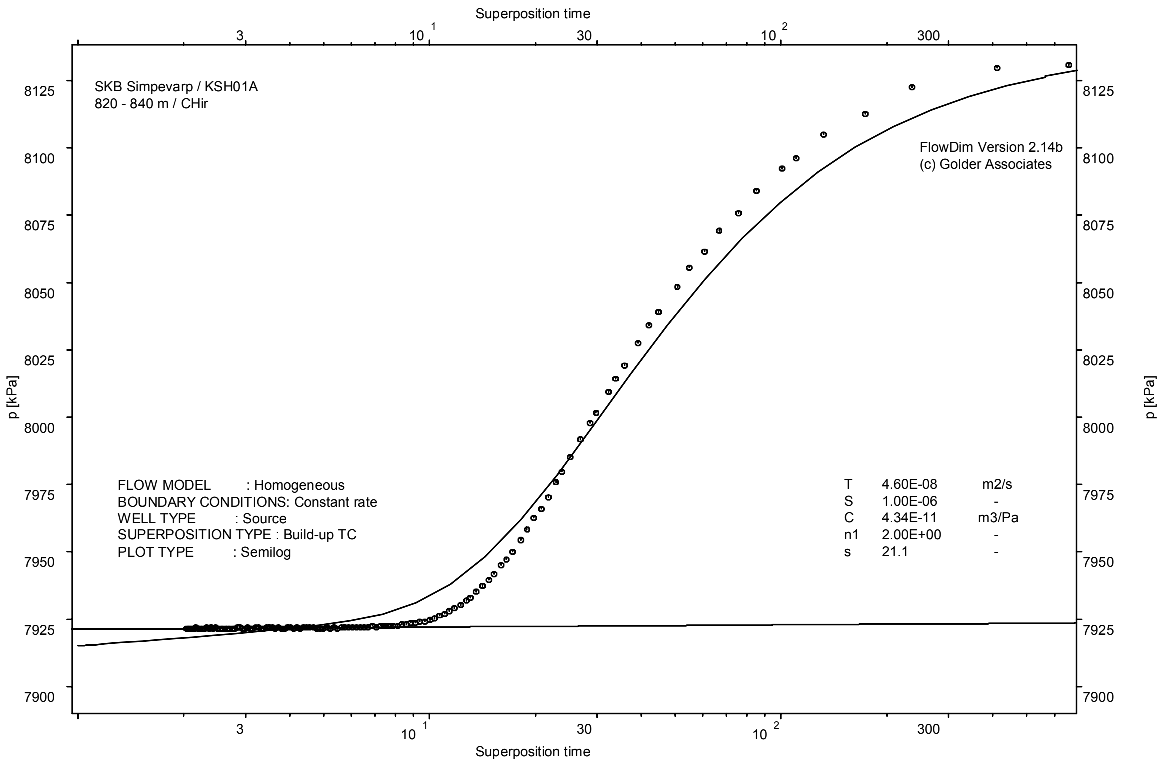
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

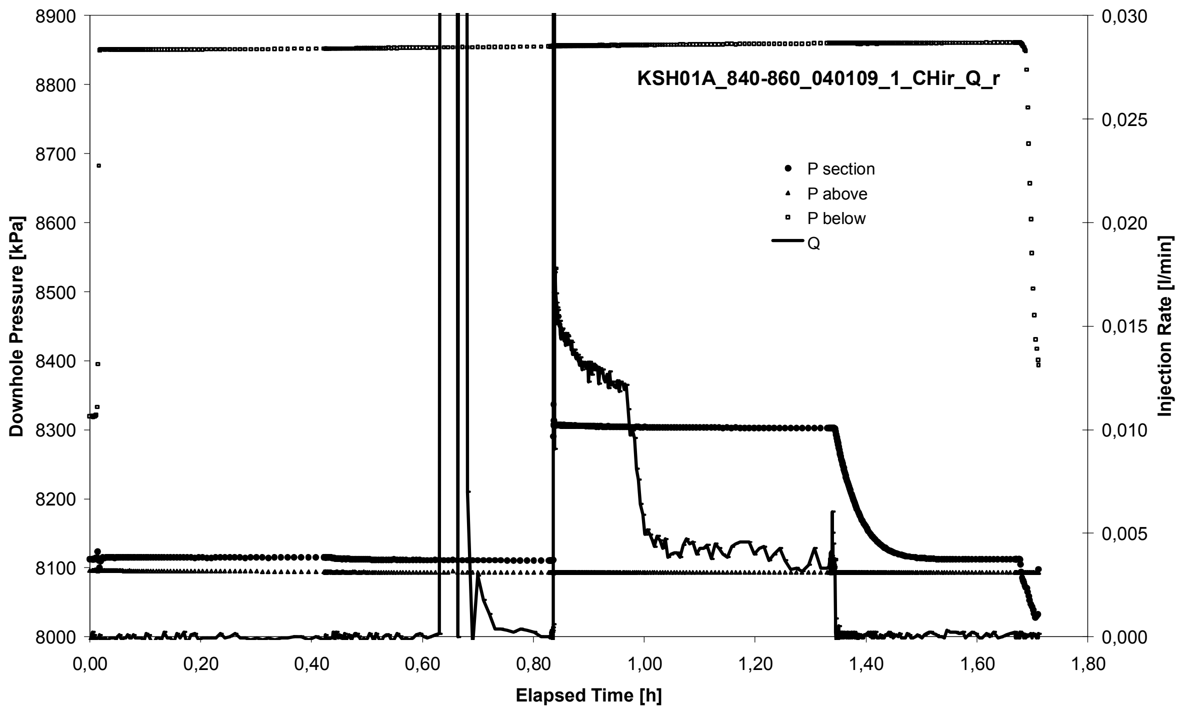


CHIR phase; HORNER match

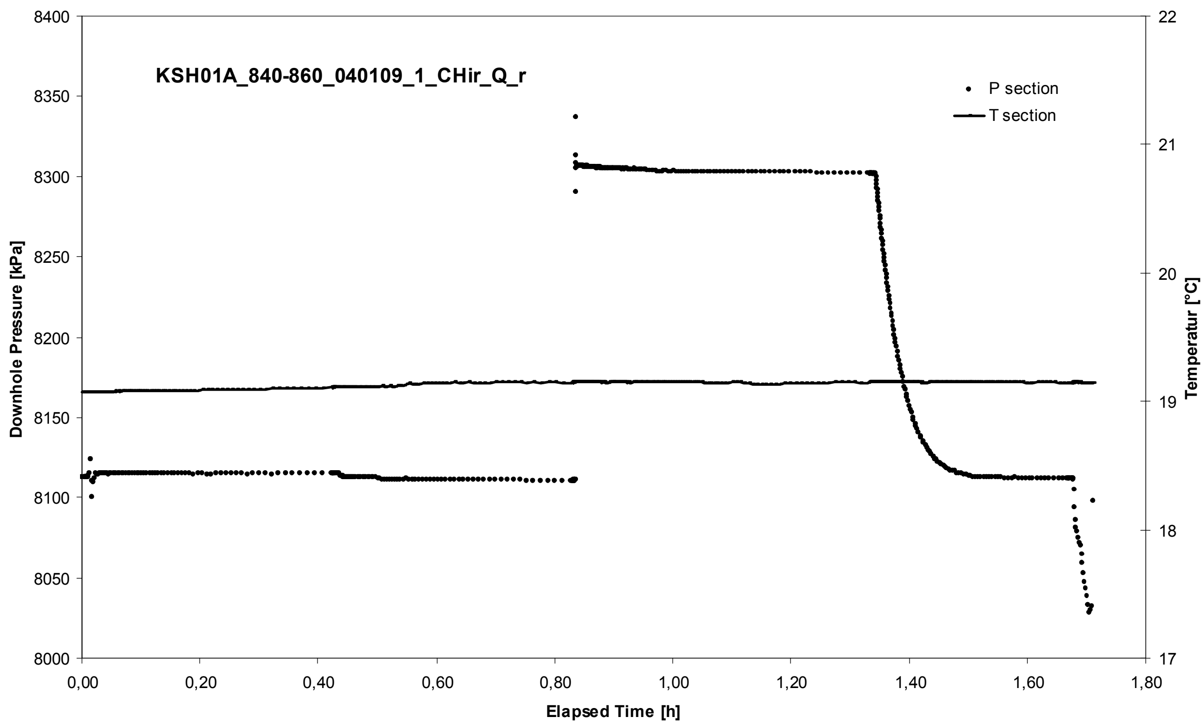
APPENDIX 2-47

Test 840 – 860 m

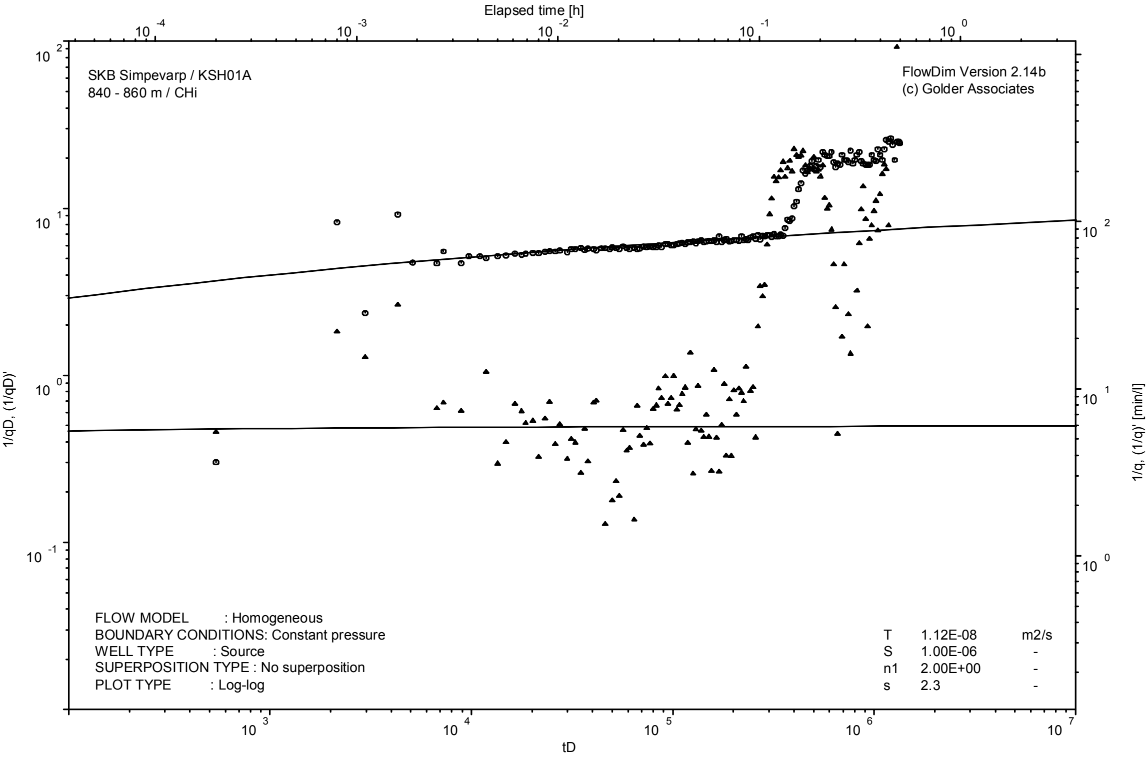
Analysis diagrams



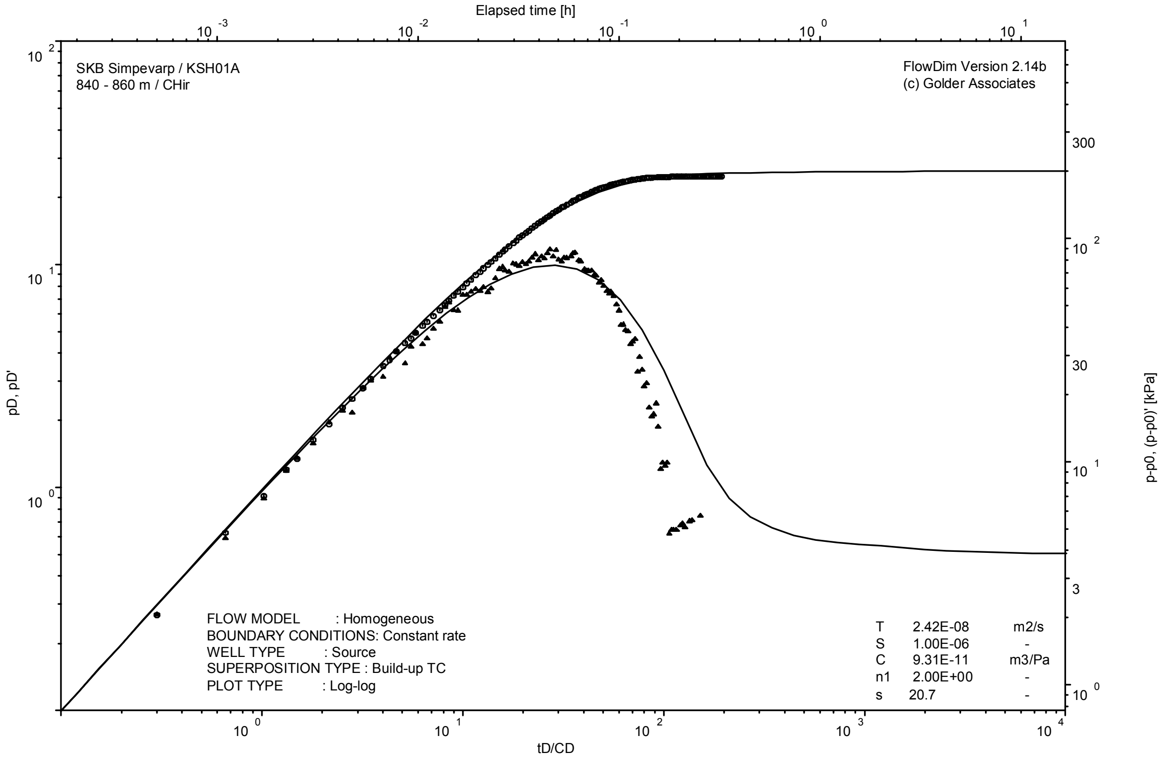
Pressure and flow rate vs. time; cartesian plot



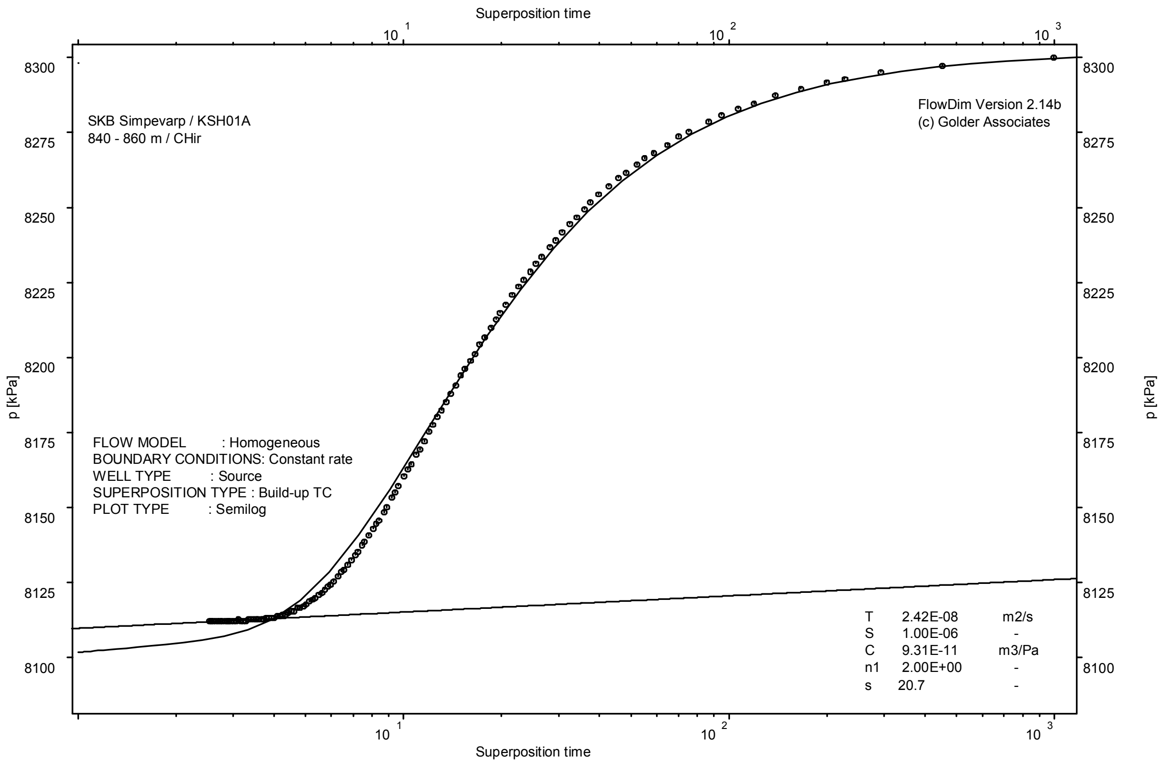
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

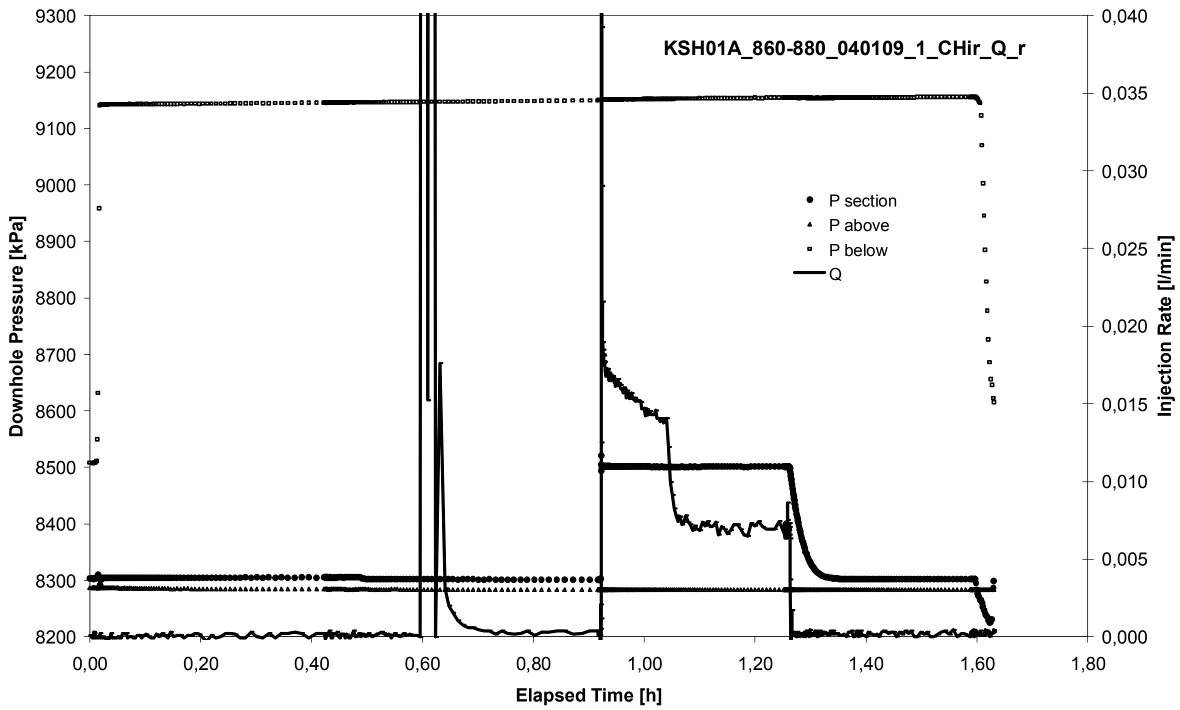


CHIR phase; HORNER match

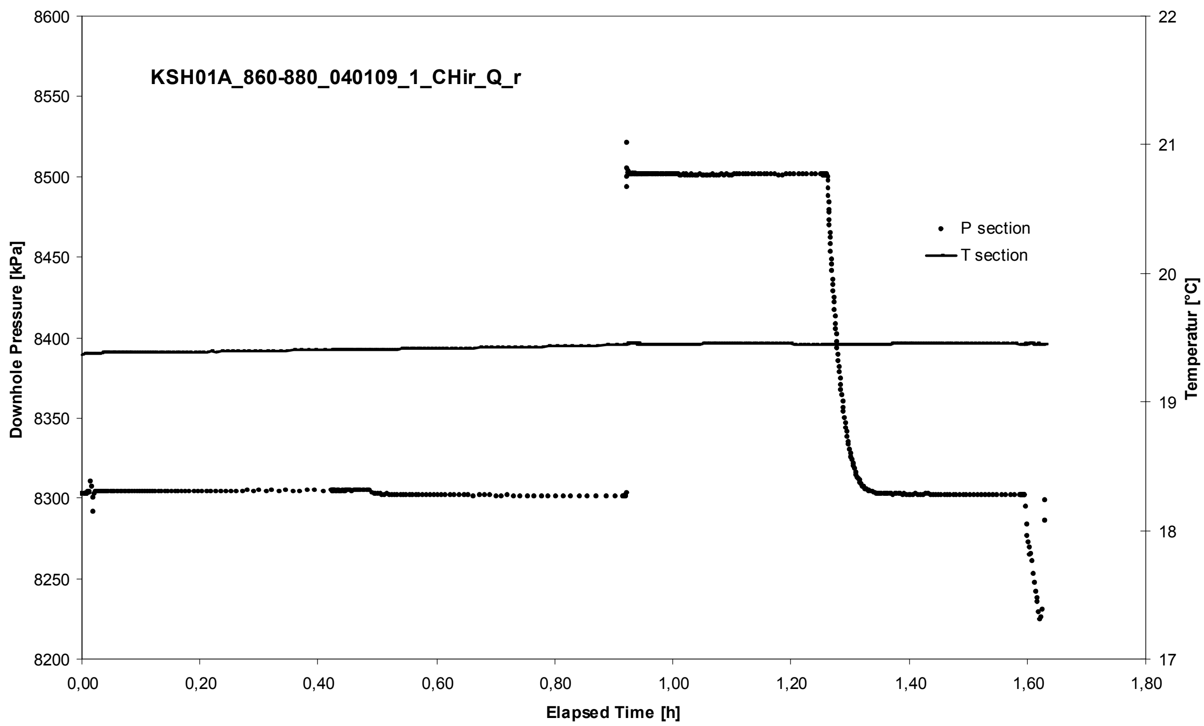
APPENDIX 2-48

Test 860 – 880 m

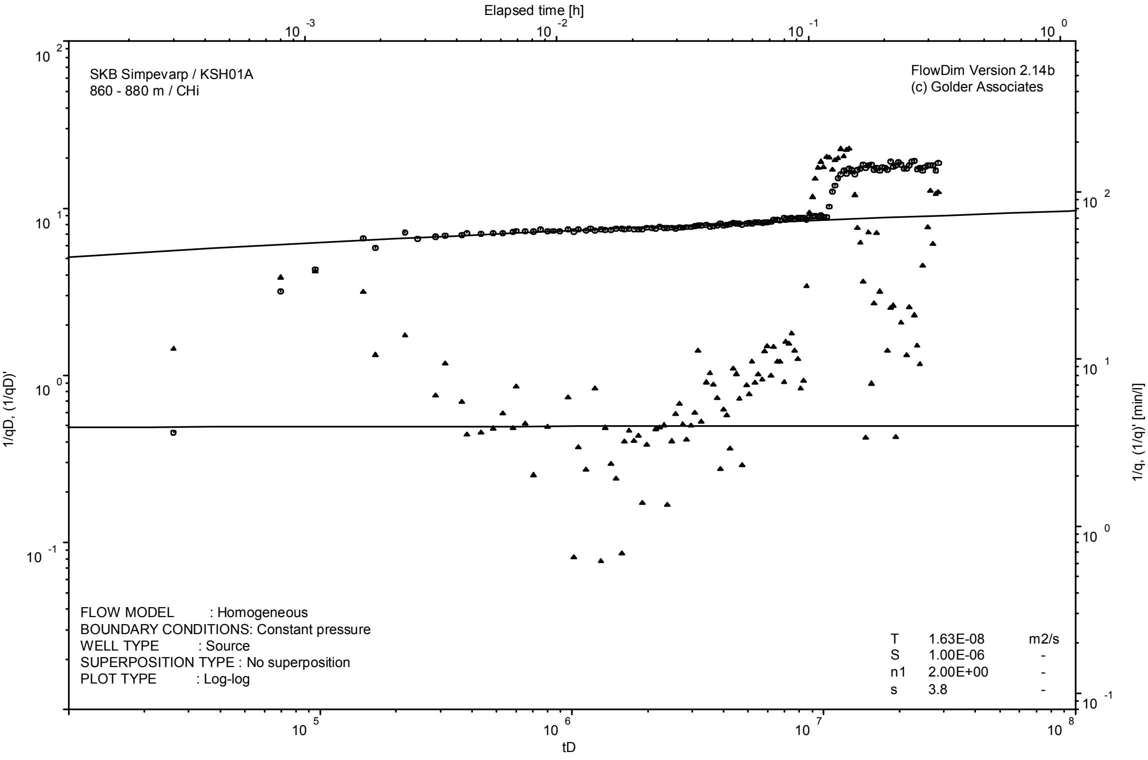
Analysis diagrams



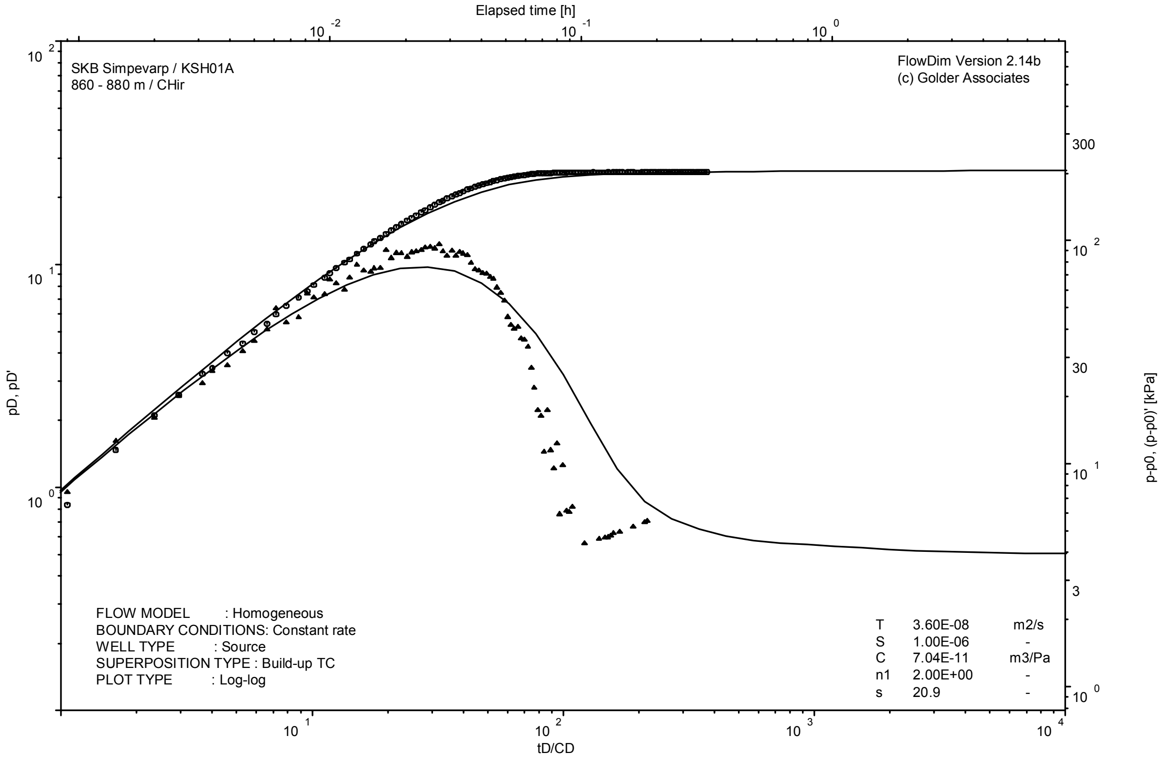
Pressure and flow rate vs. time; cartesian plot



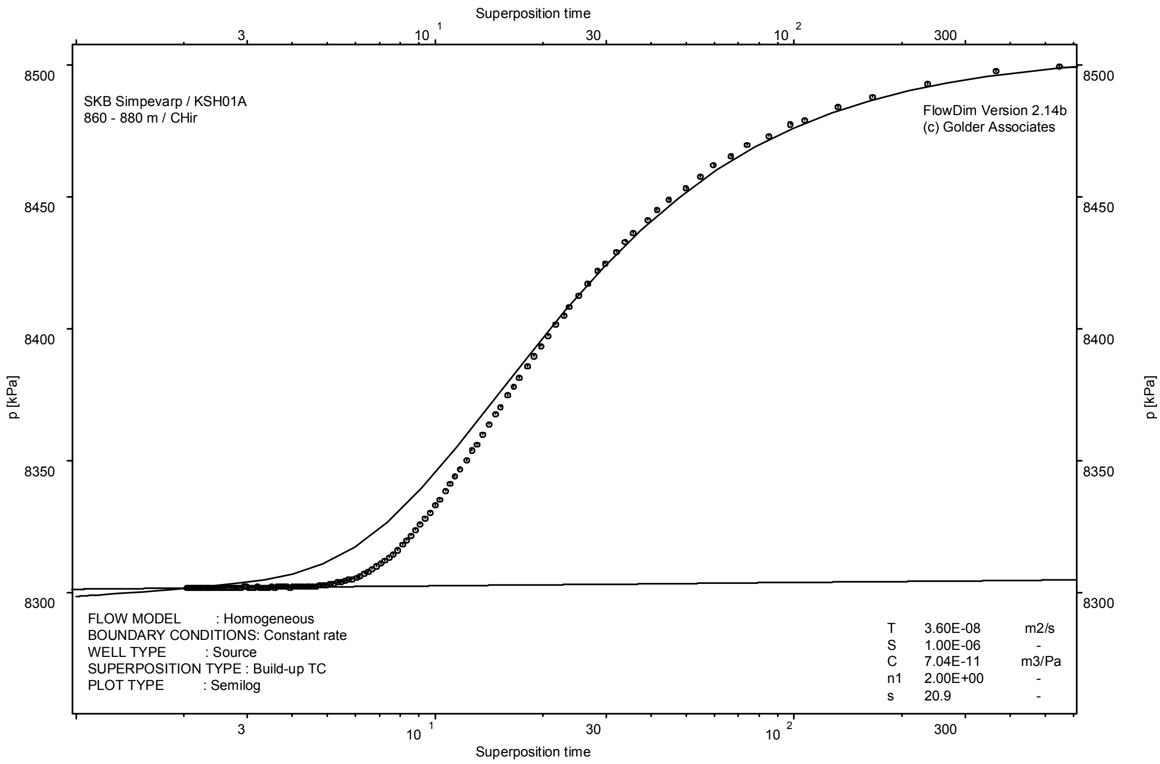
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

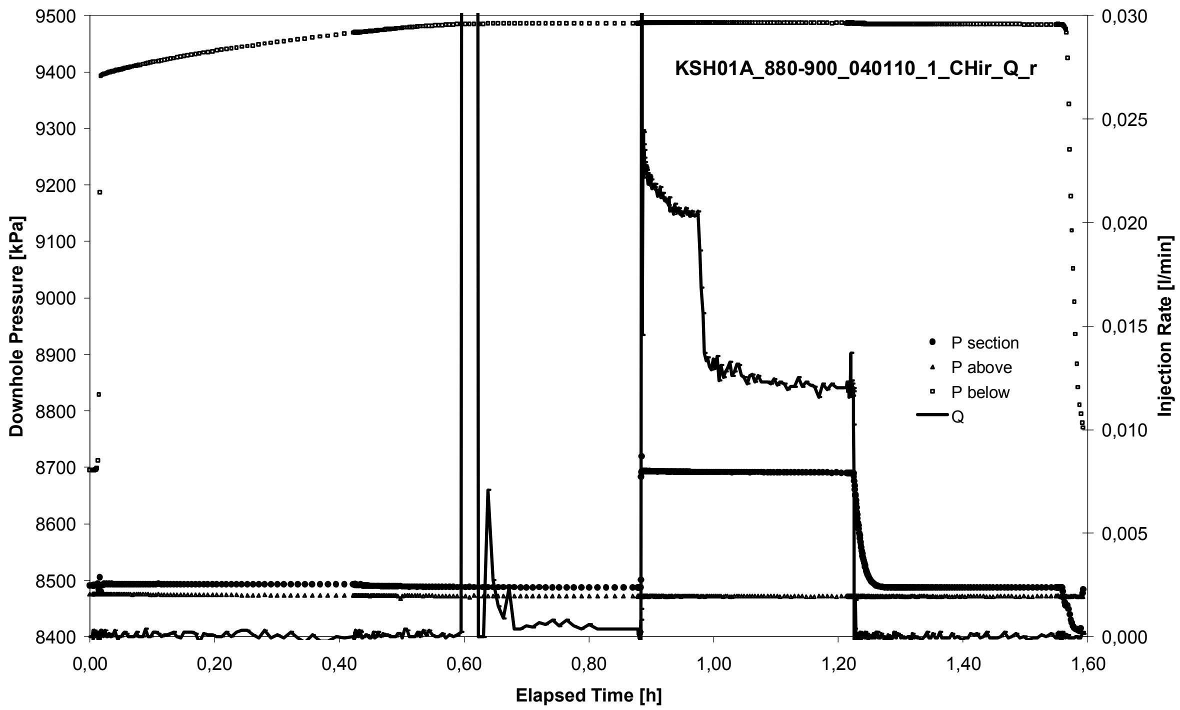


CHIR phase; HORNER match

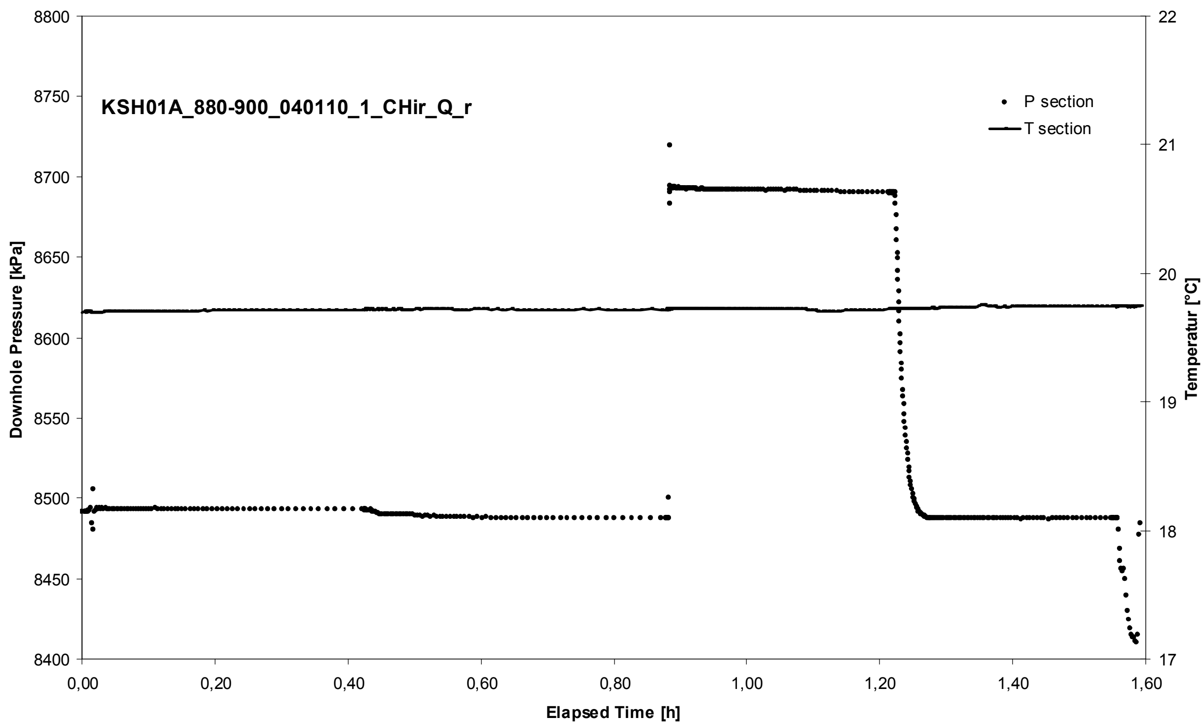
APPENDIX 2-49

Test 880 – 900 m

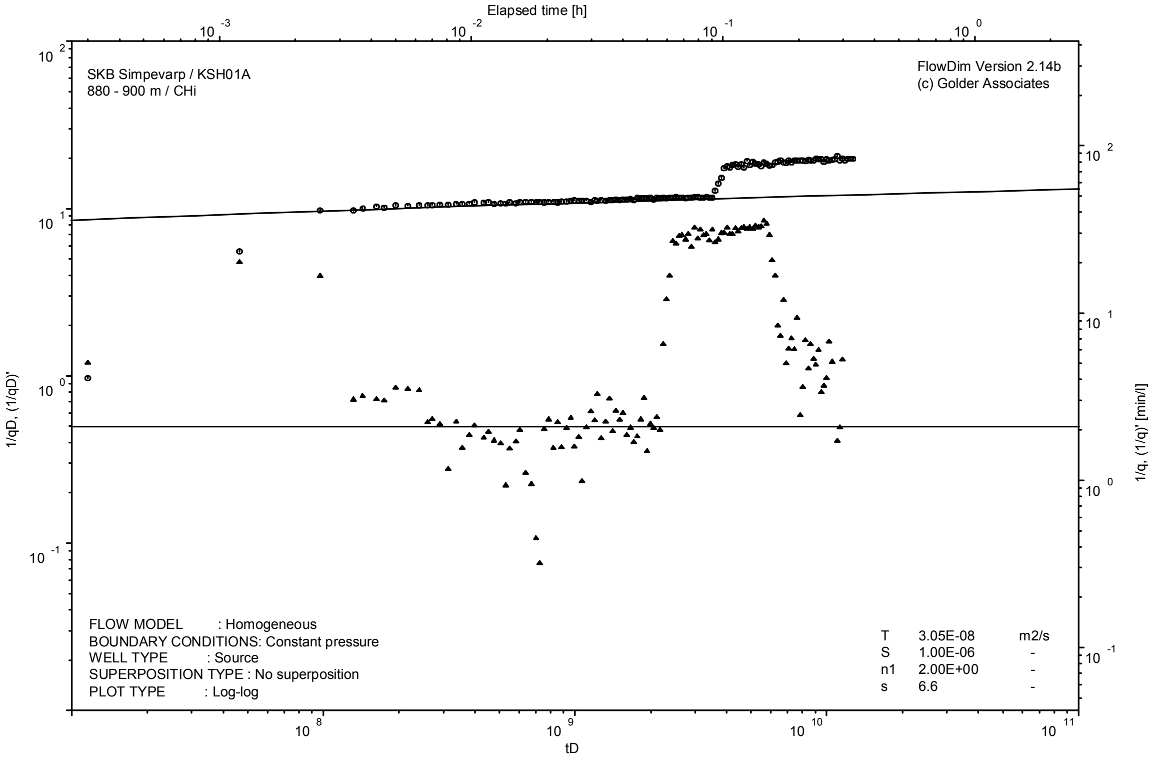
Analysis diagrams



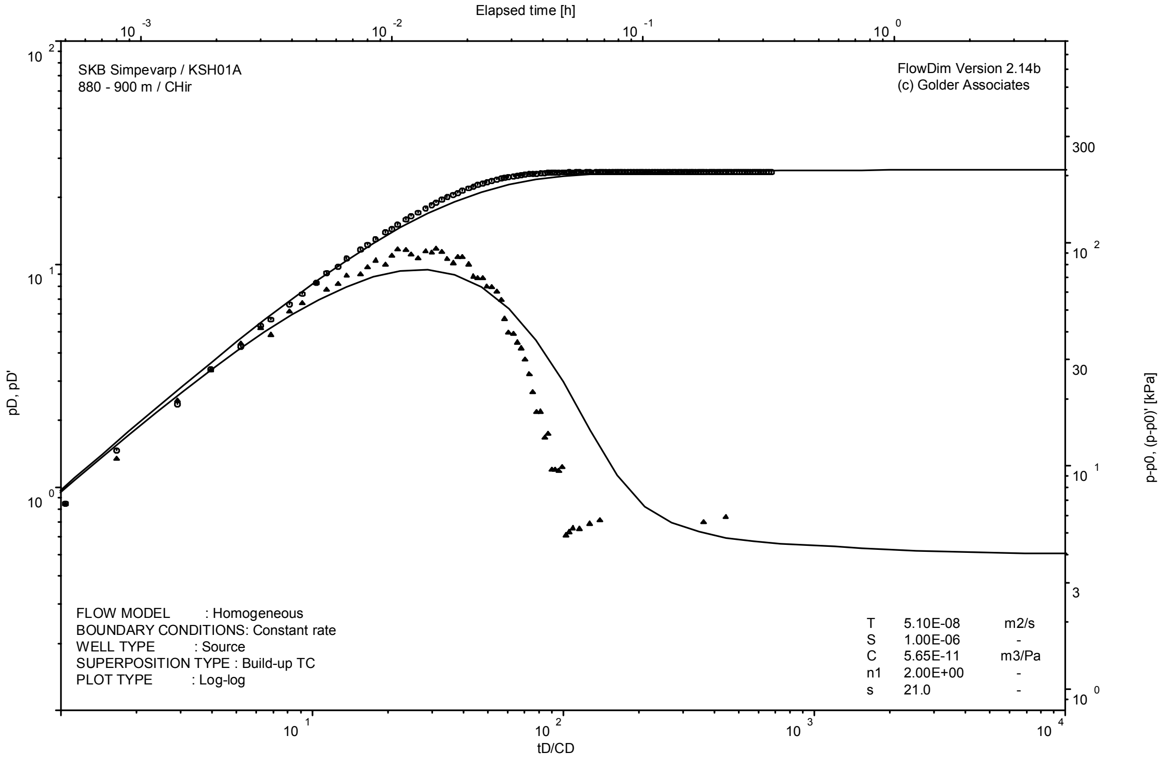
Pressure and flow rate vs. time; cartesian plot



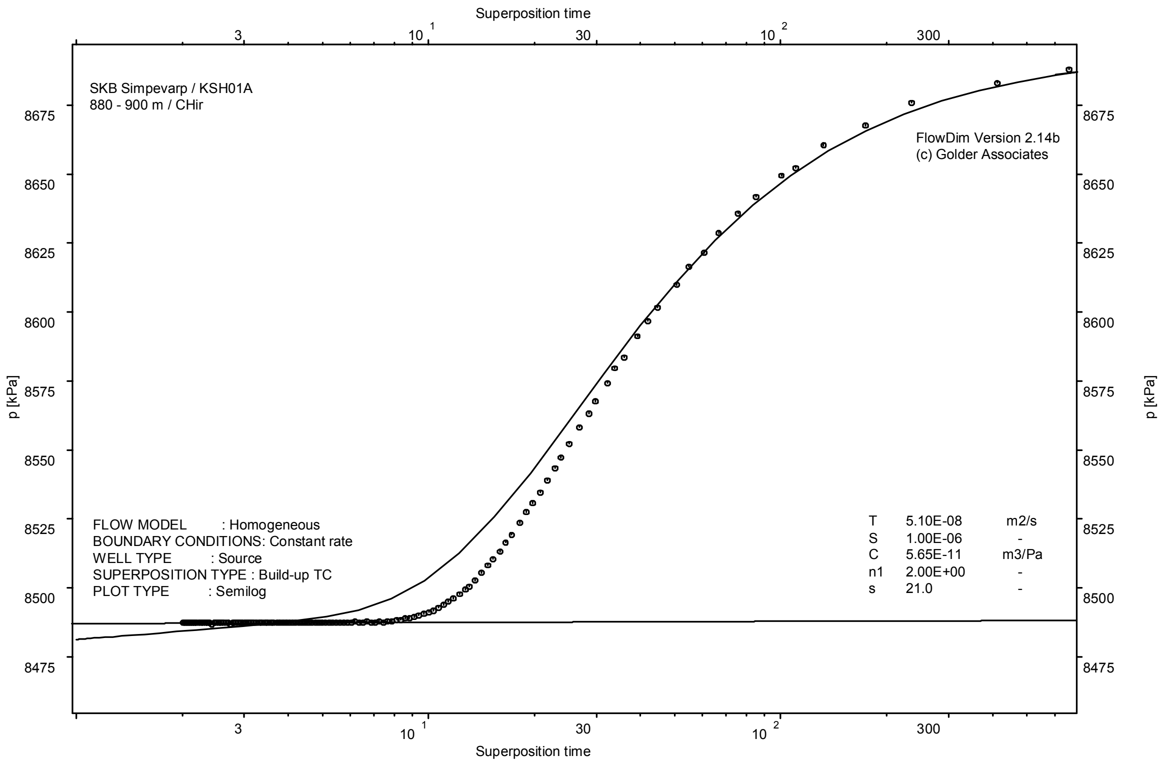
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

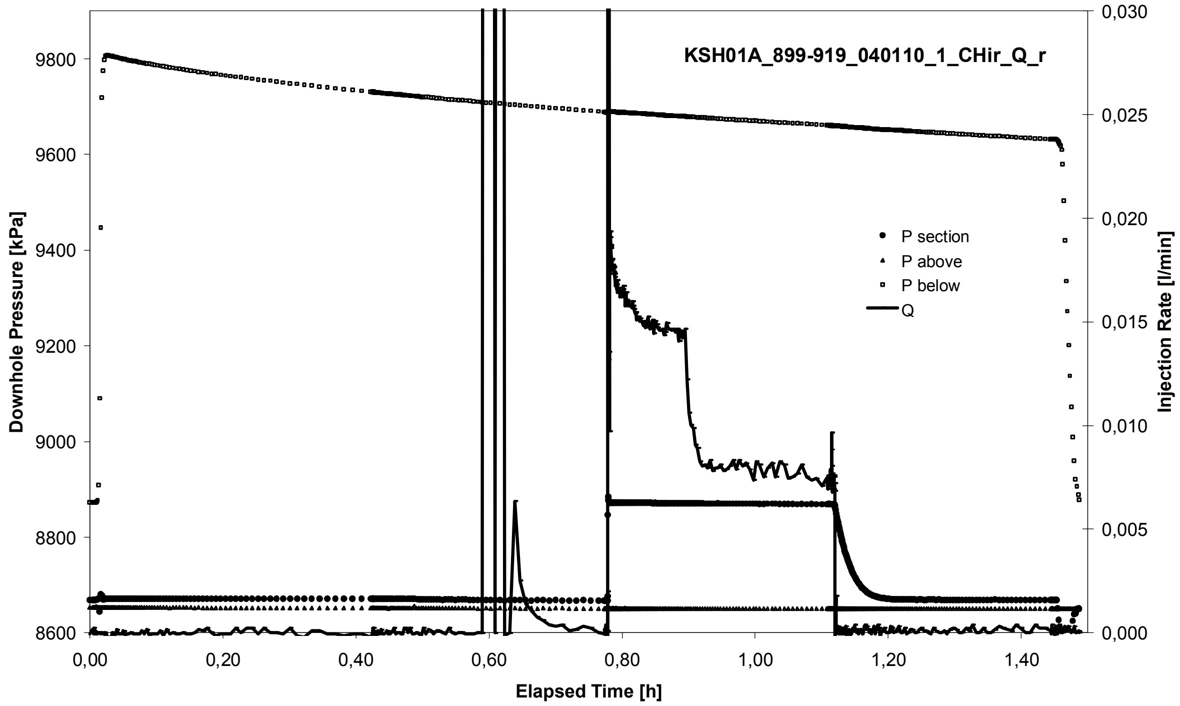


CHIR phase; HORNER match

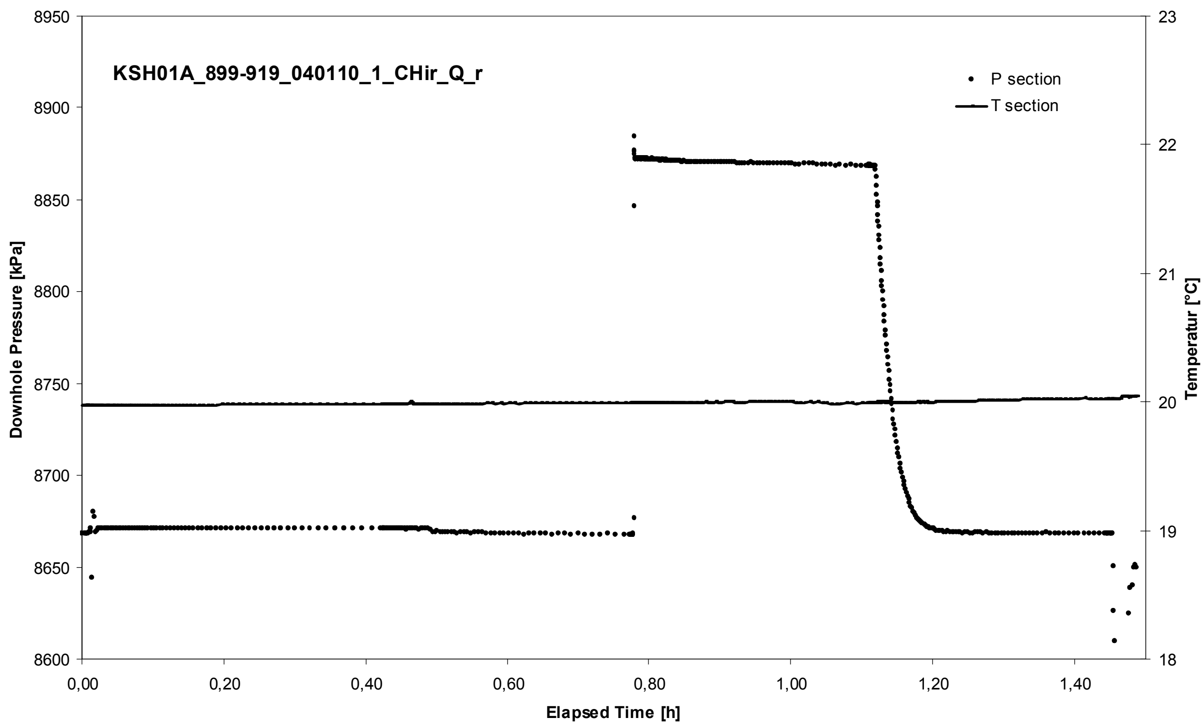
APPENDIX 2-50

Test 899 – 919 m

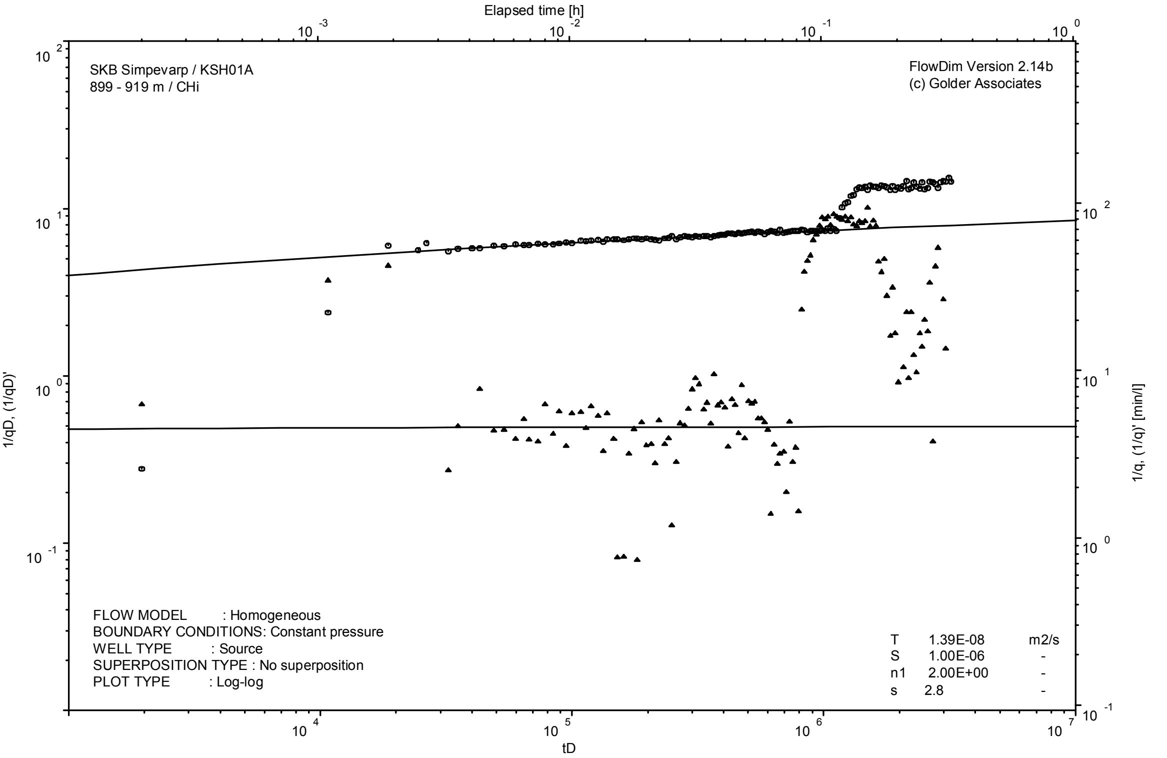
Analysis diagrams



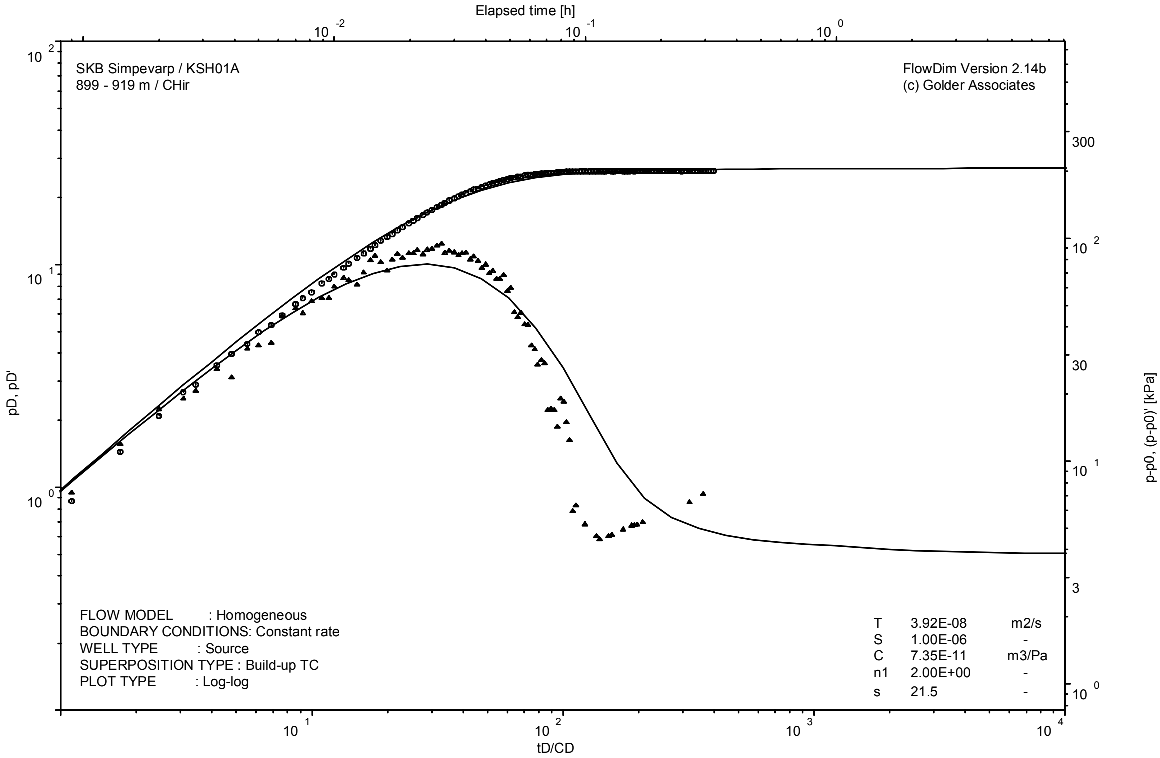
Pressure and flow rate vs. time; cartesian plot



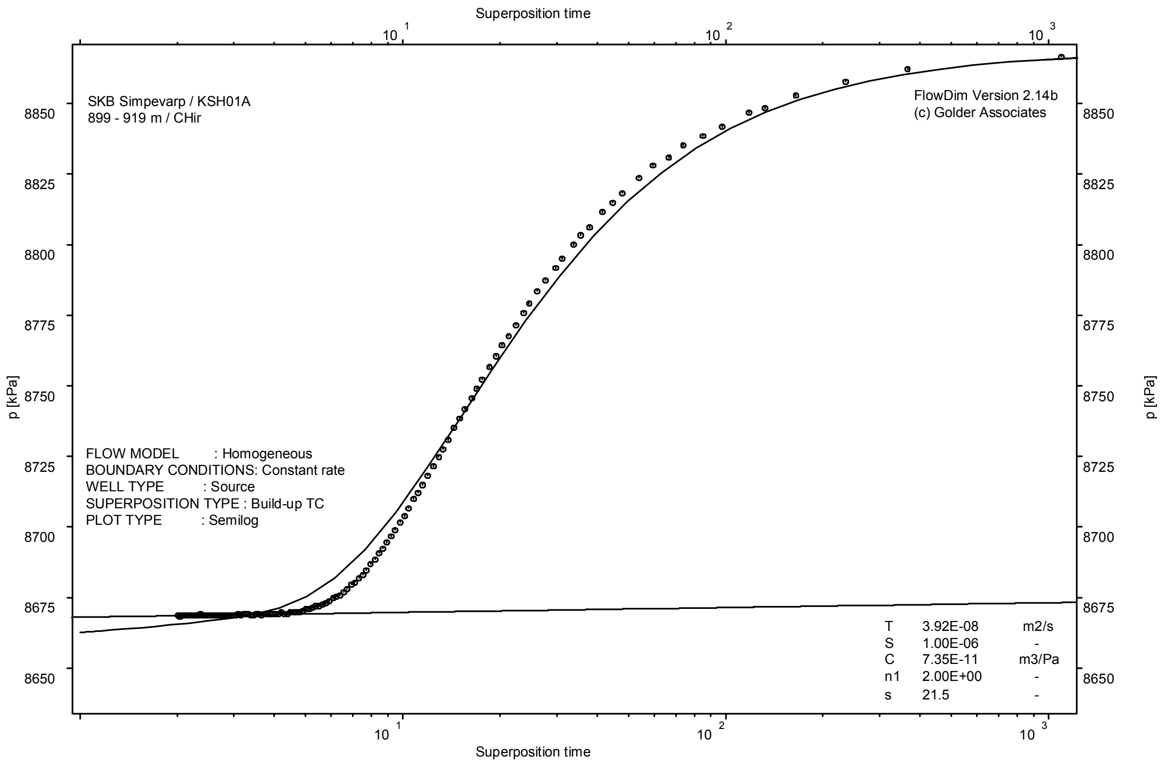
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

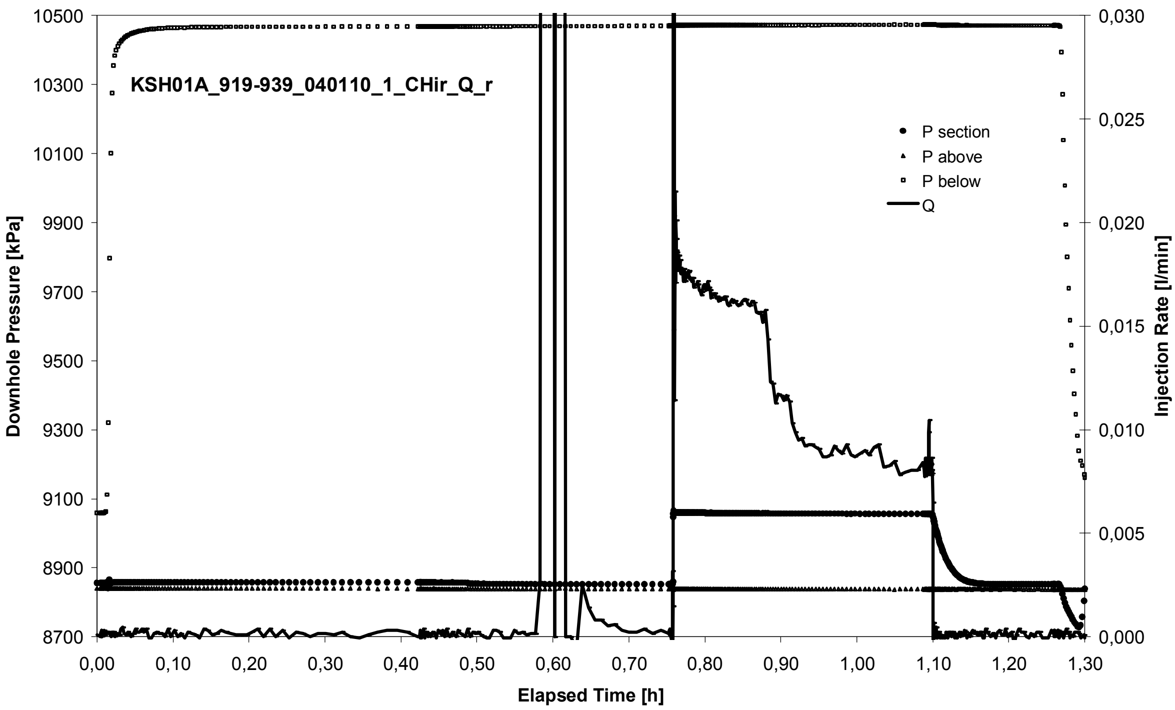


CHIR phase; HORNER match

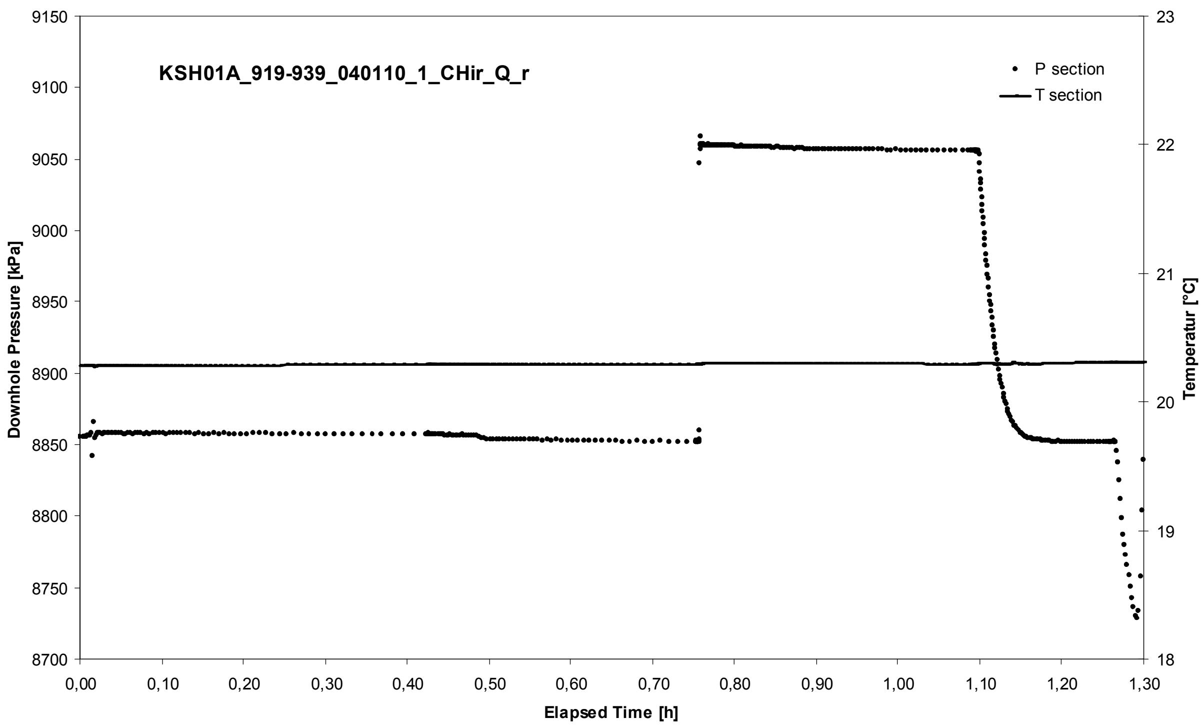
APPENDIX 2-51

Test 919 – 939 m

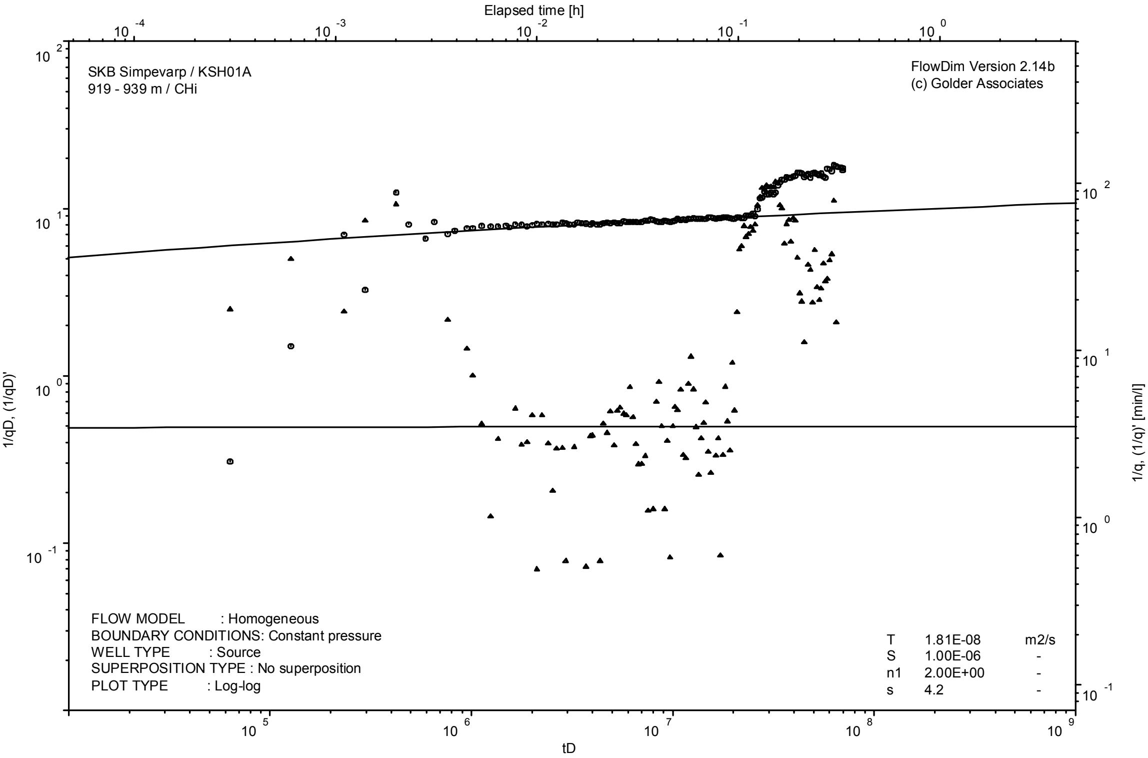
Analysis diagrams



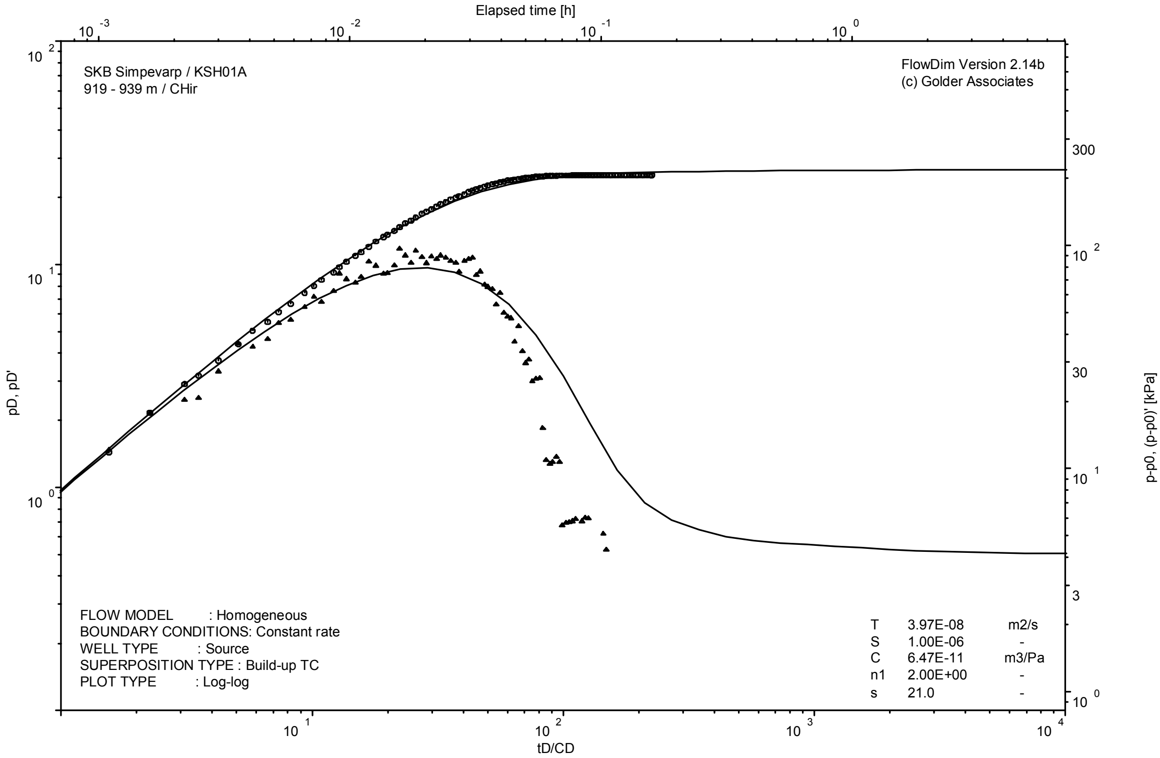
Pressure and flow rate vs. time; cartesian plot



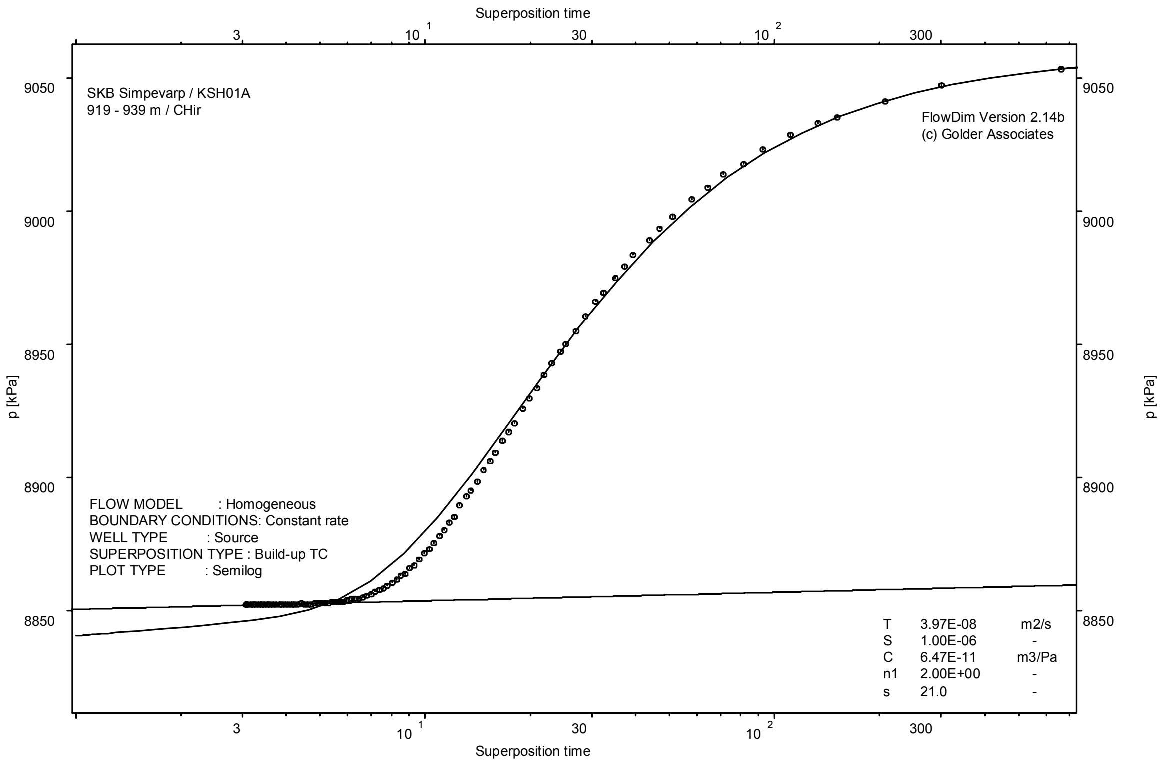
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

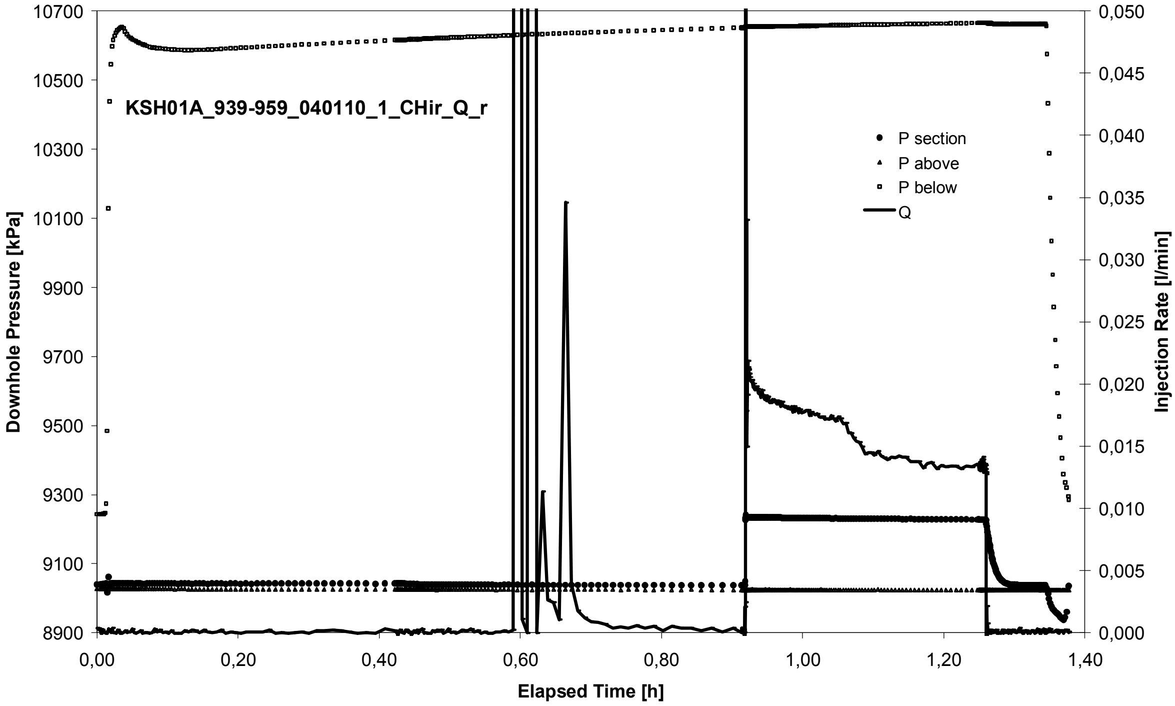


CHIR phase; HORNER match

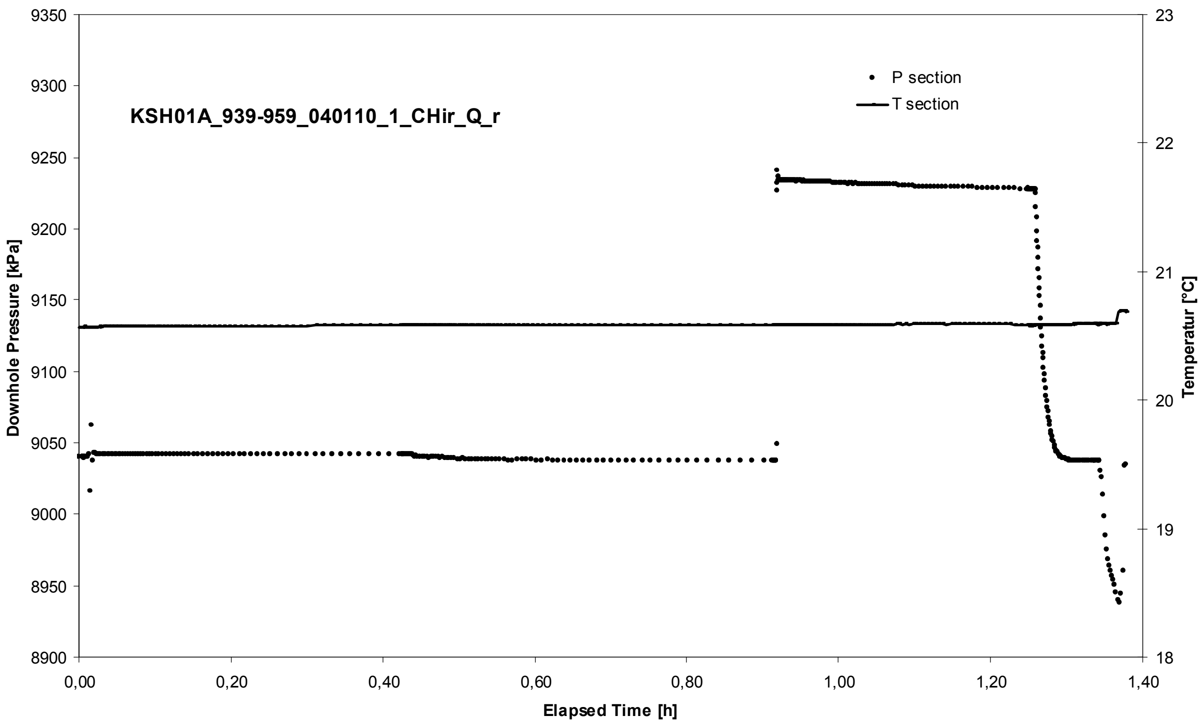
APPENDIX 2-52

Test 939 – 959 m

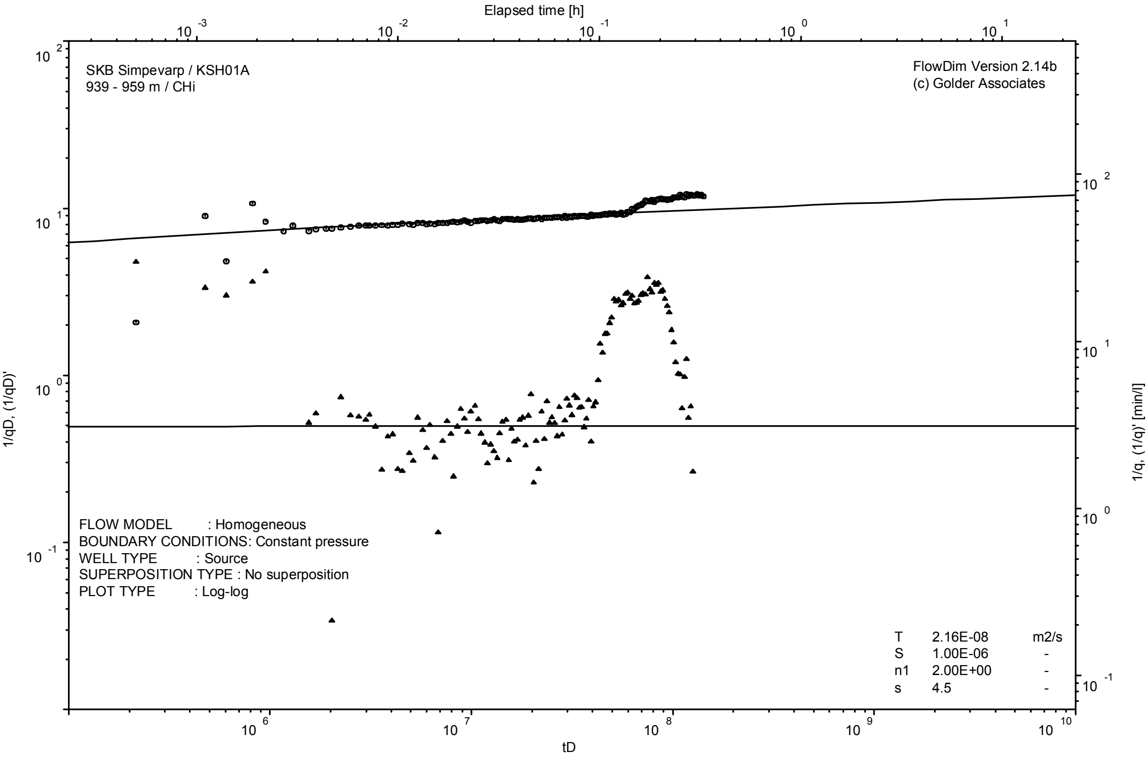
Analysis diagrams



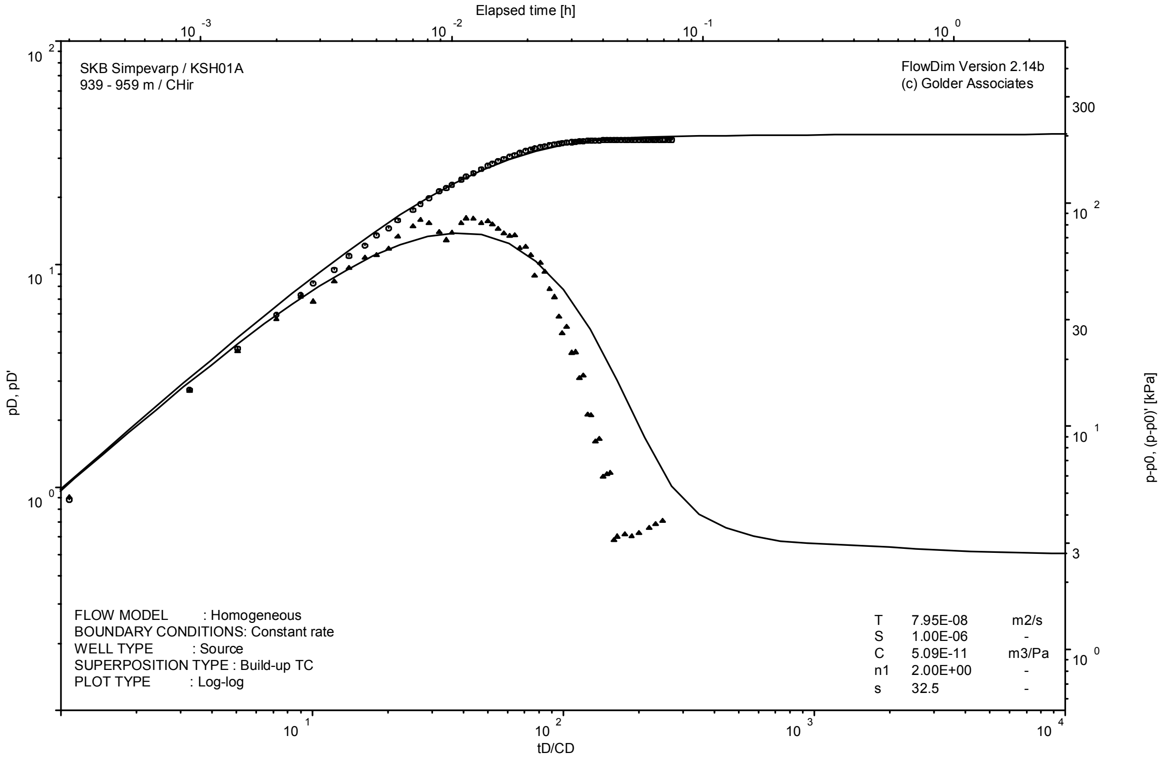
Pressure and flow rate vs. time; cartesian plot



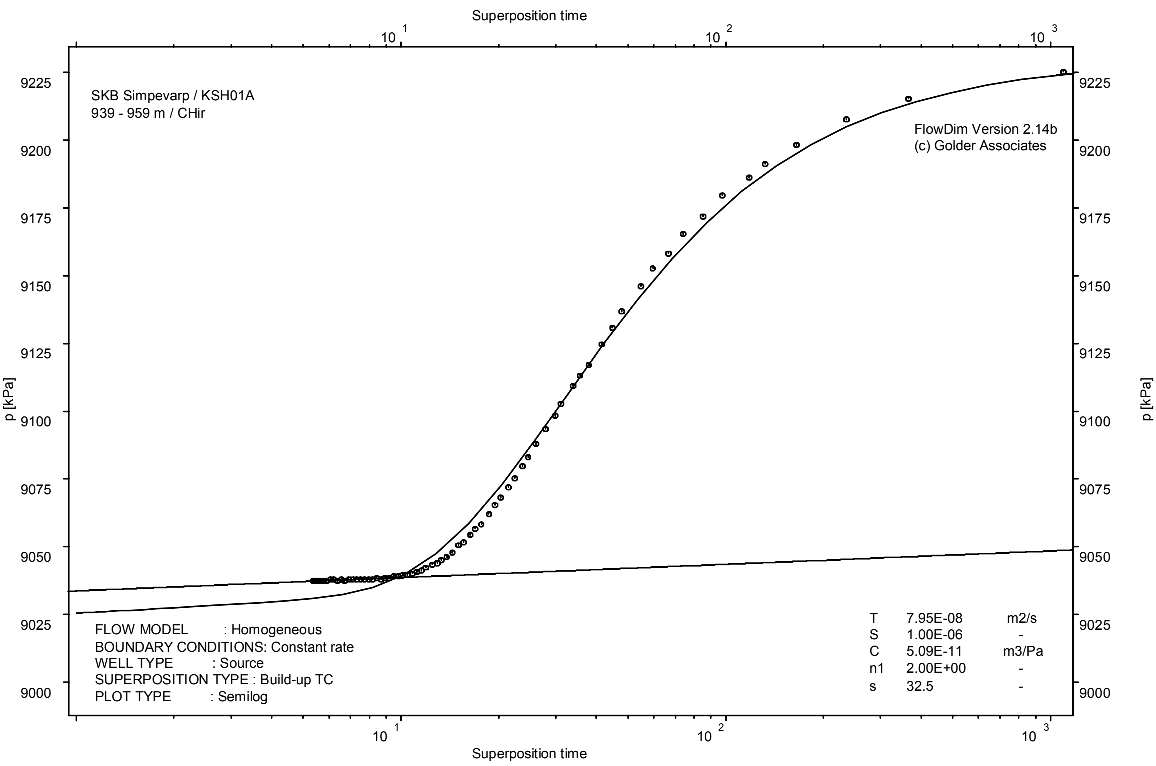
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

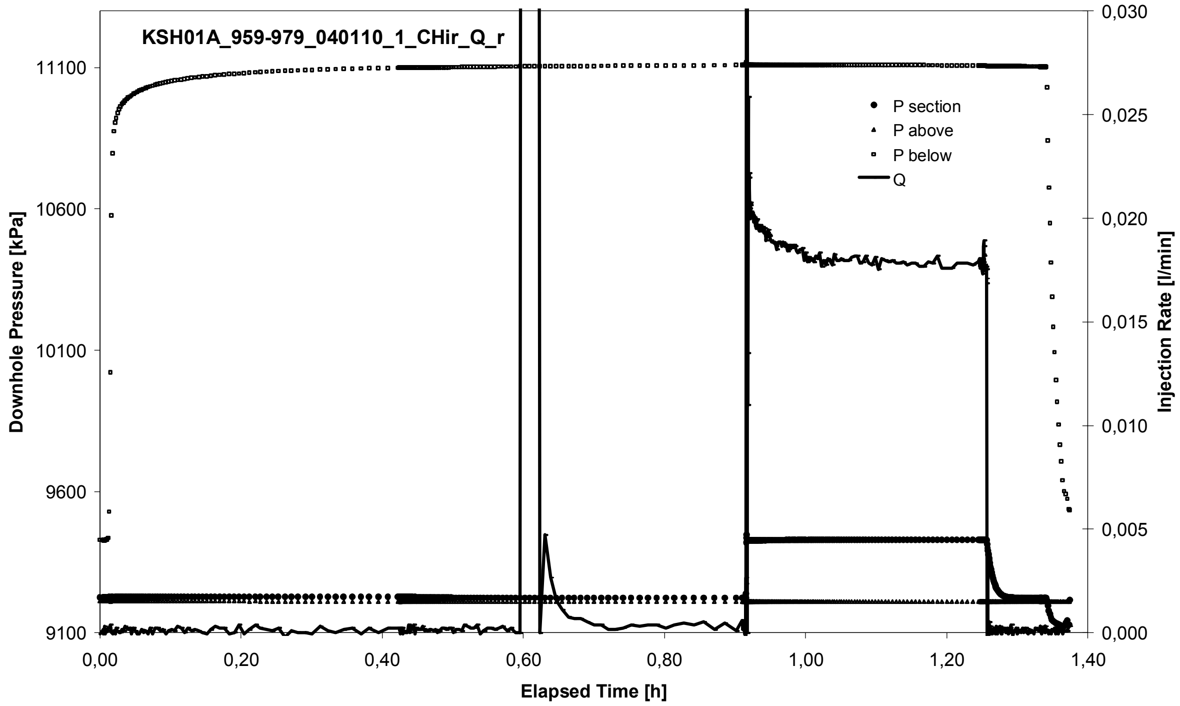


CHIR phase; HORNER match

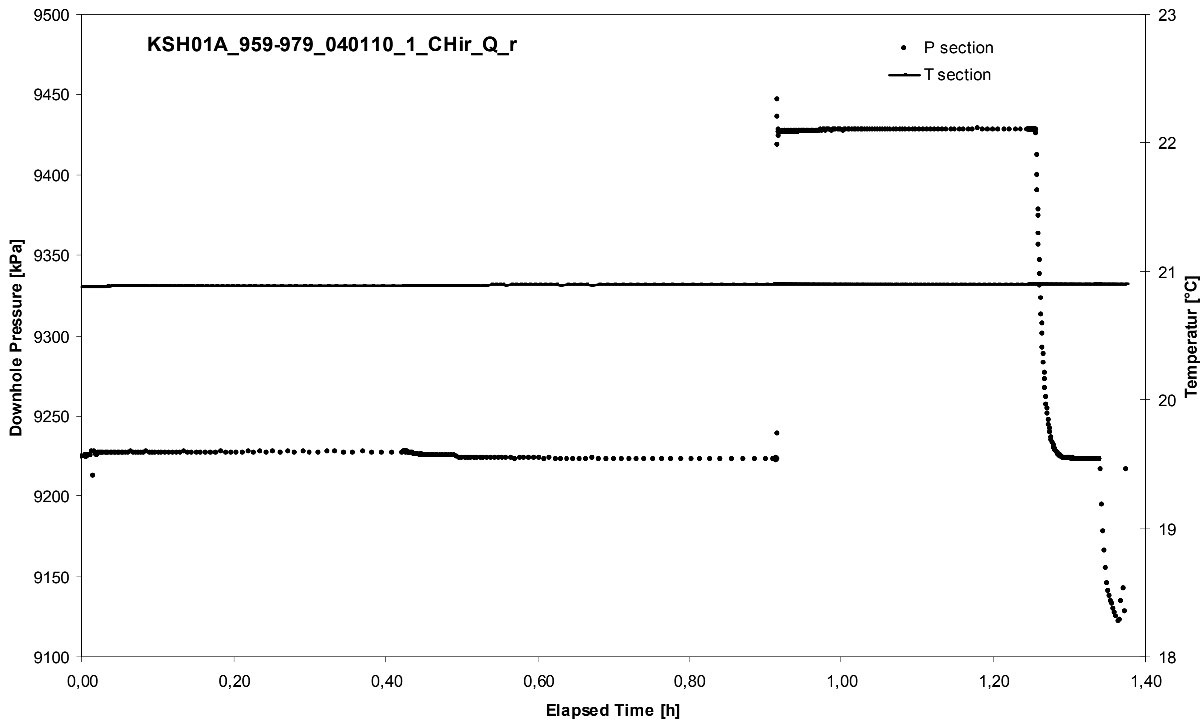
APPENDIX 2-53

Test 959 – 979 m

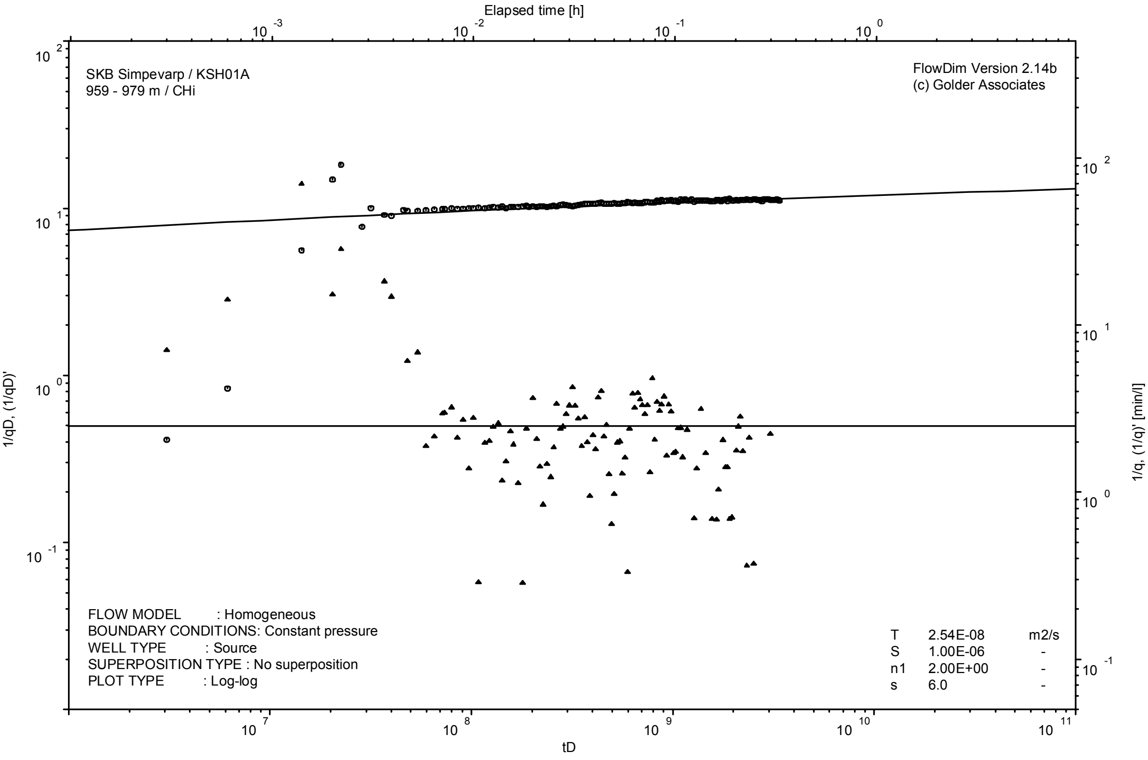
Analysis diagrams



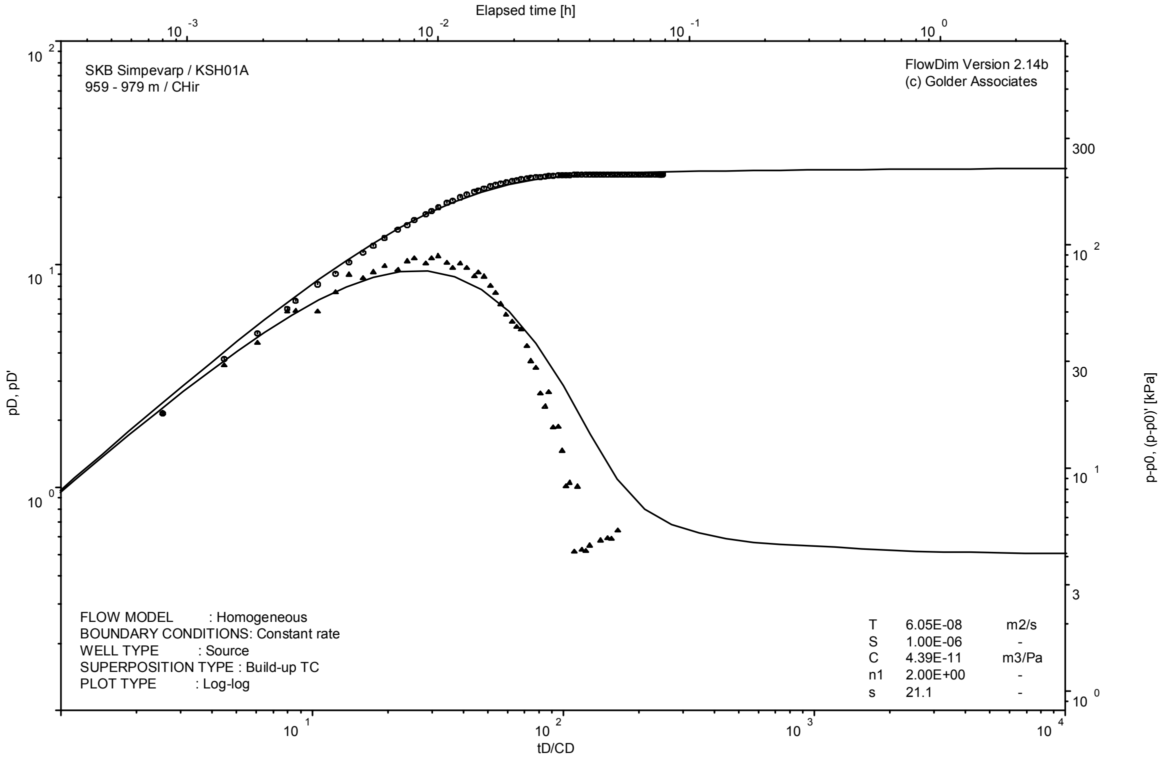
Pressure and flow rate vs. time; cartesian plot



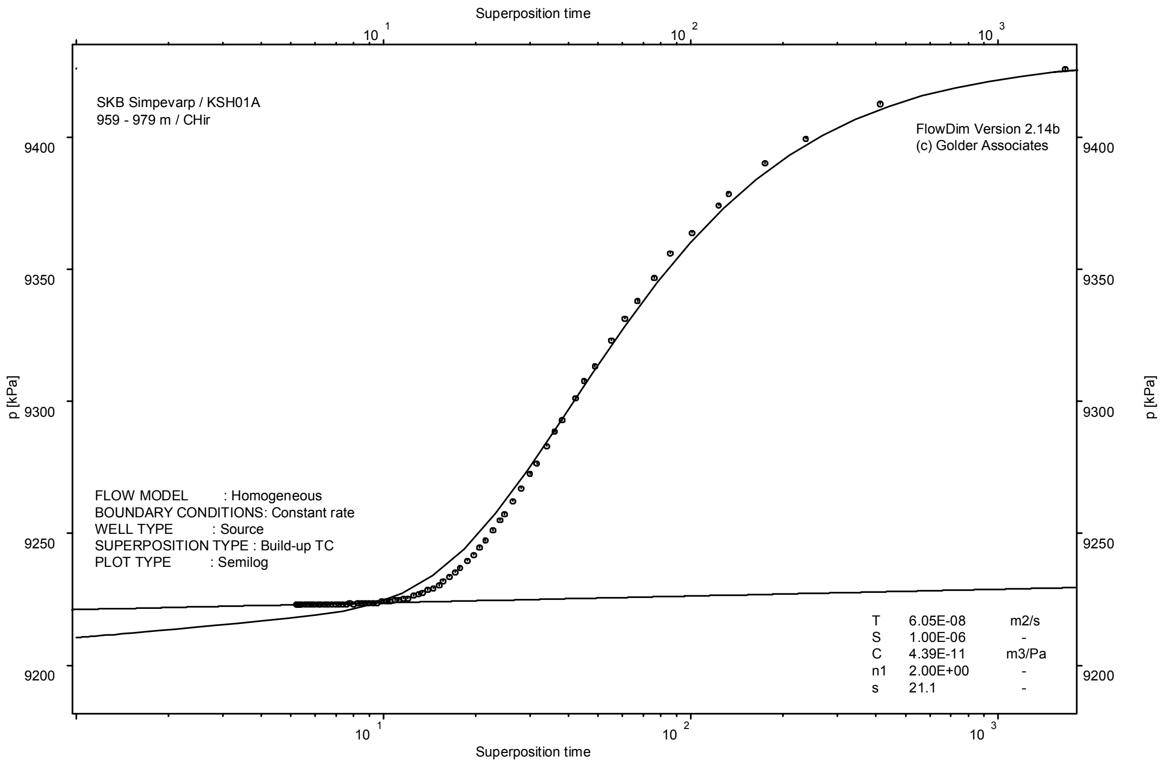
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

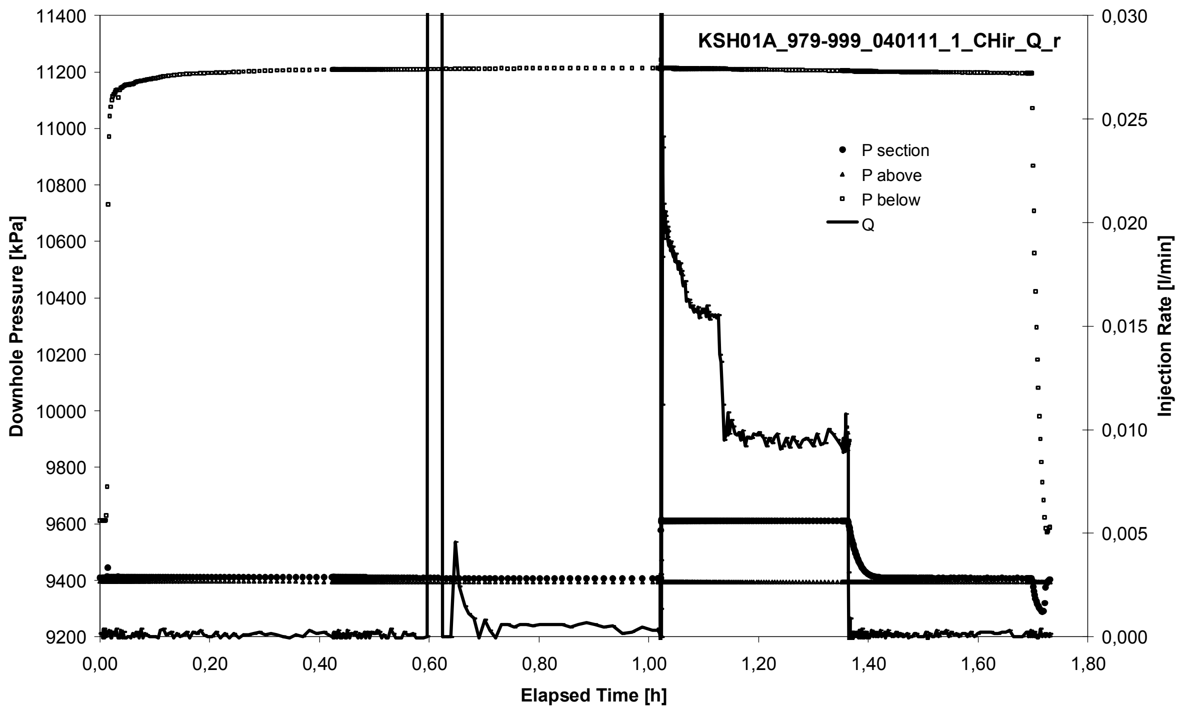


CHIR phase; HORNER match

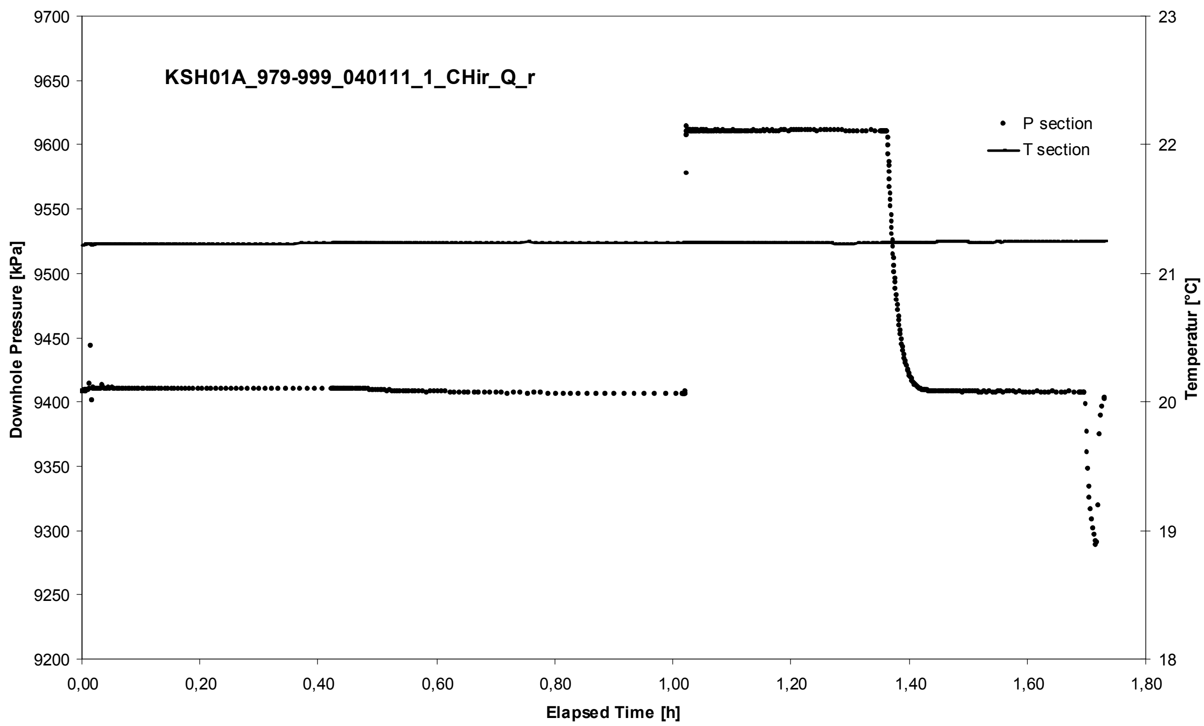
APPENDIX 2-54

Test 979 – 999 m

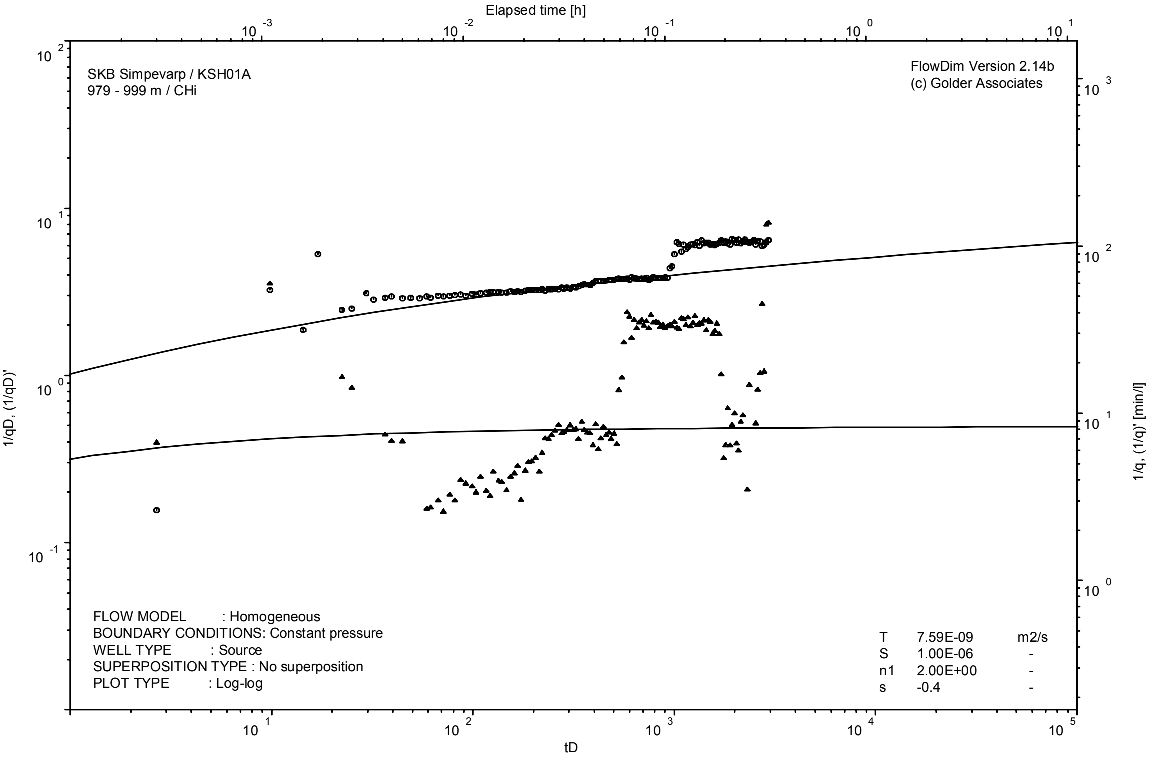
Analysis diagrams



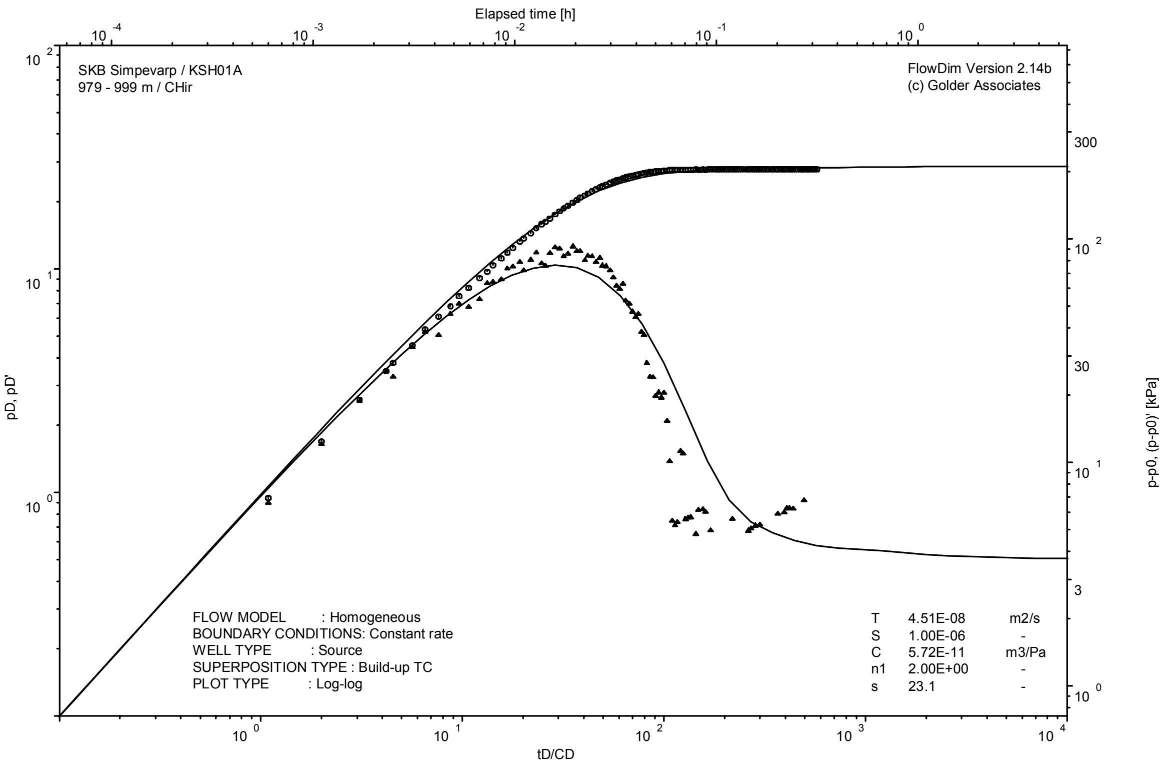
Pressure and flow rate vs. time; cartesian plot



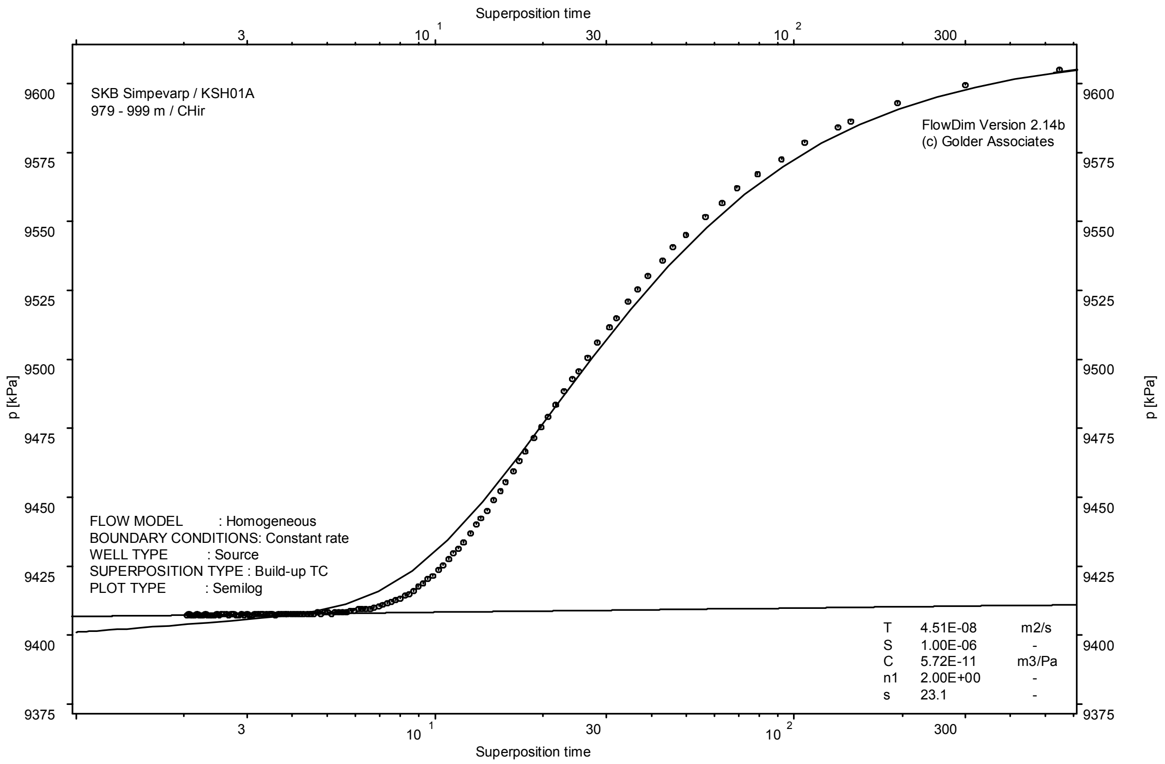
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

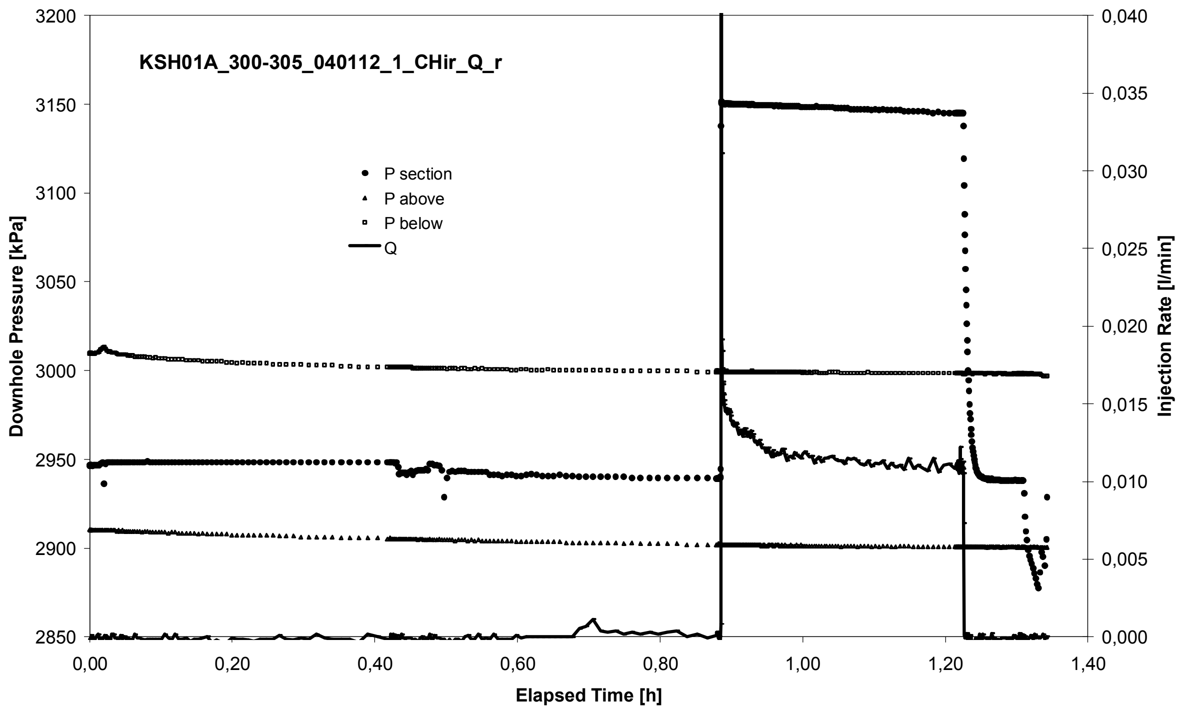


CHIR phase; HORNER match

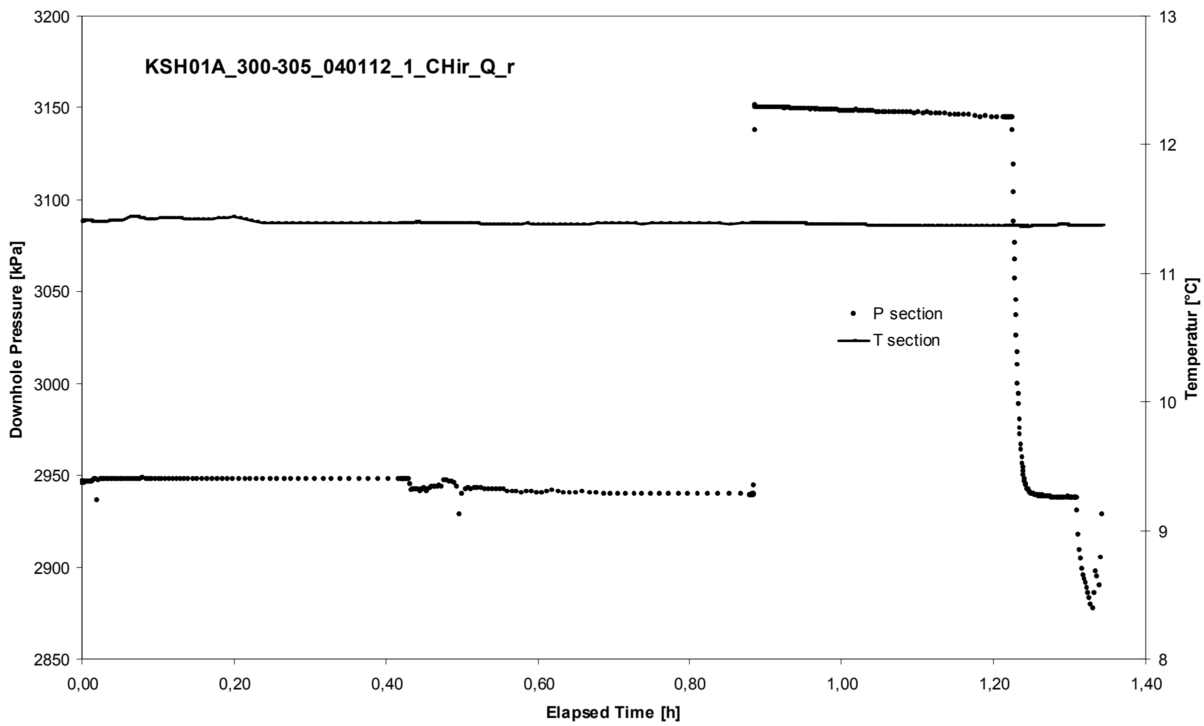
APPENDIX 2-55

Test 300 – 305 m

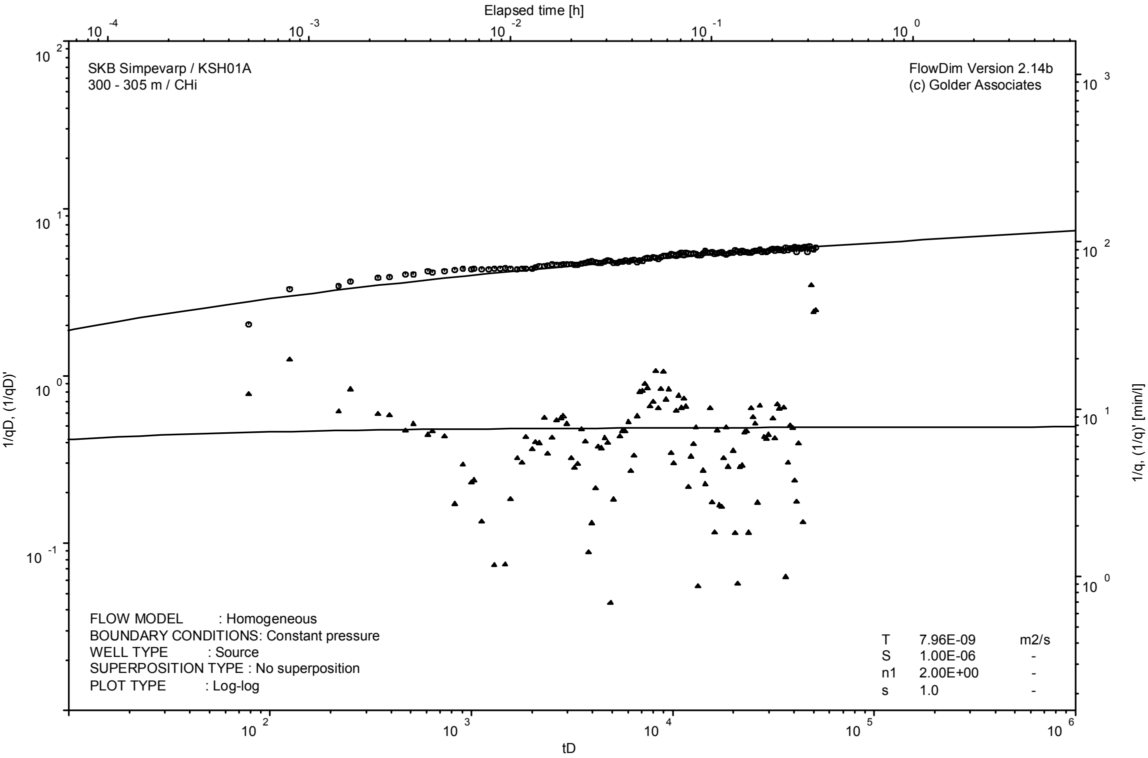
Analysis diagrams



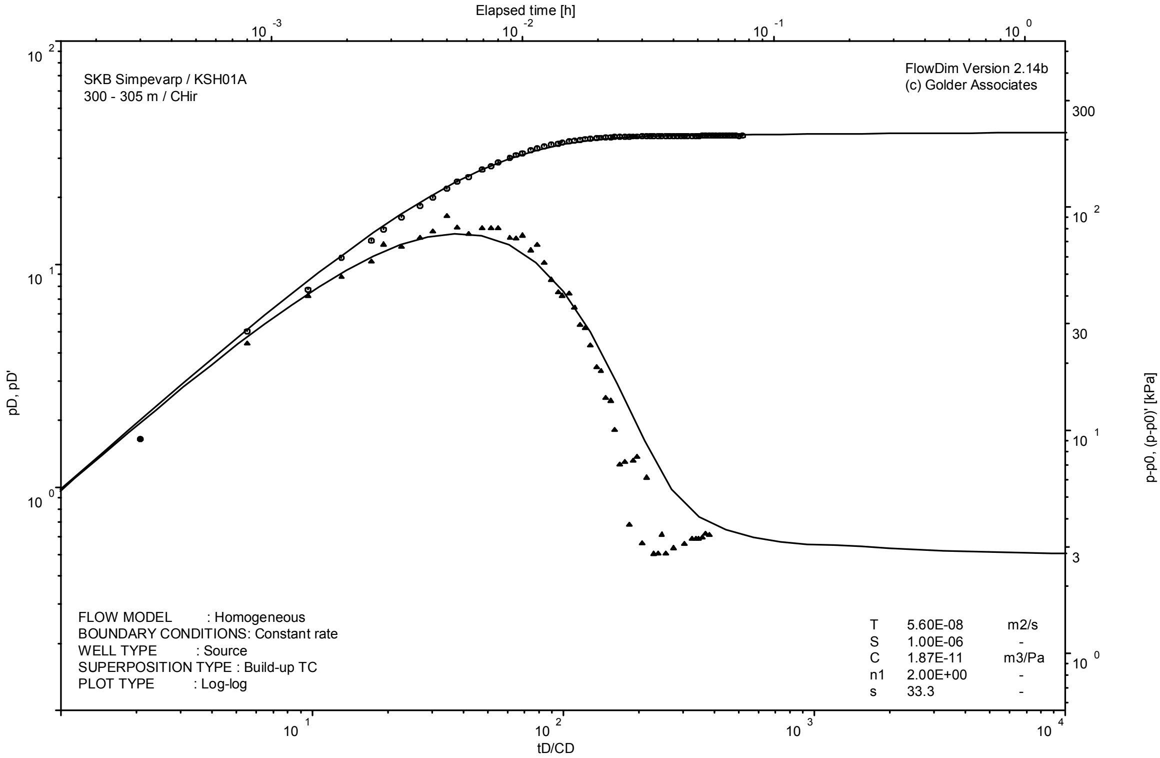
Pressure and flow rate vs. time; cartesian plot



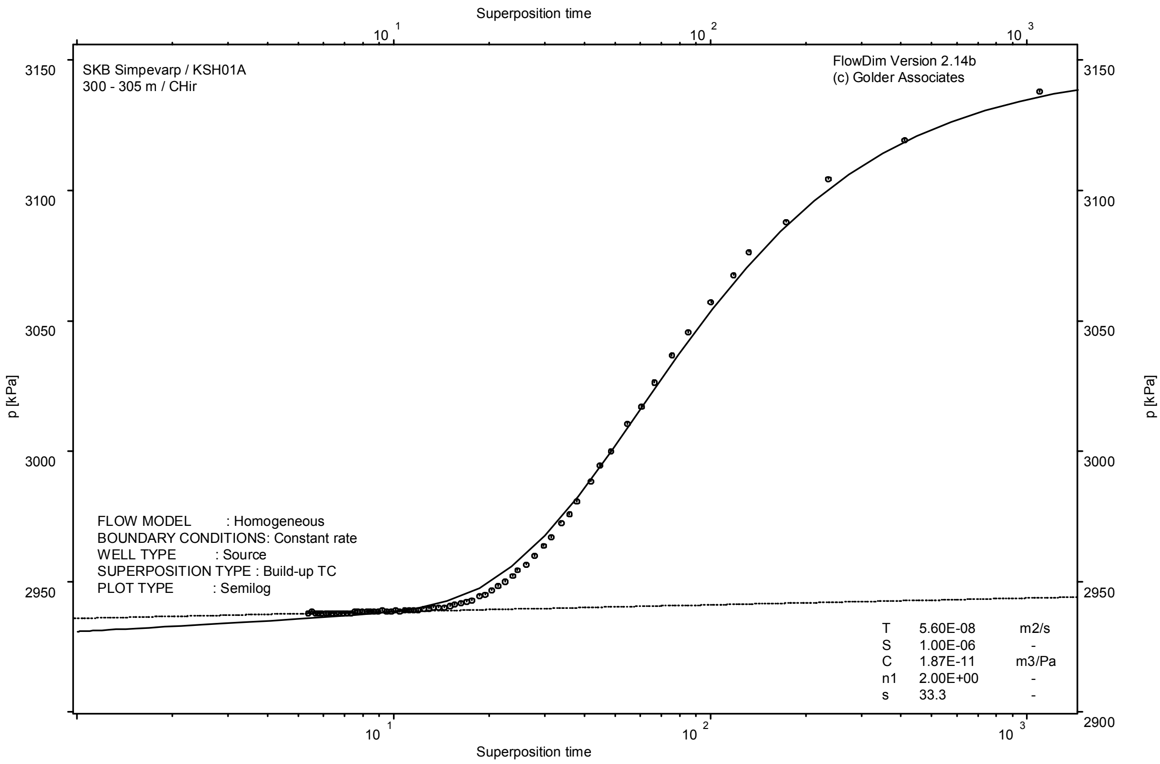
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

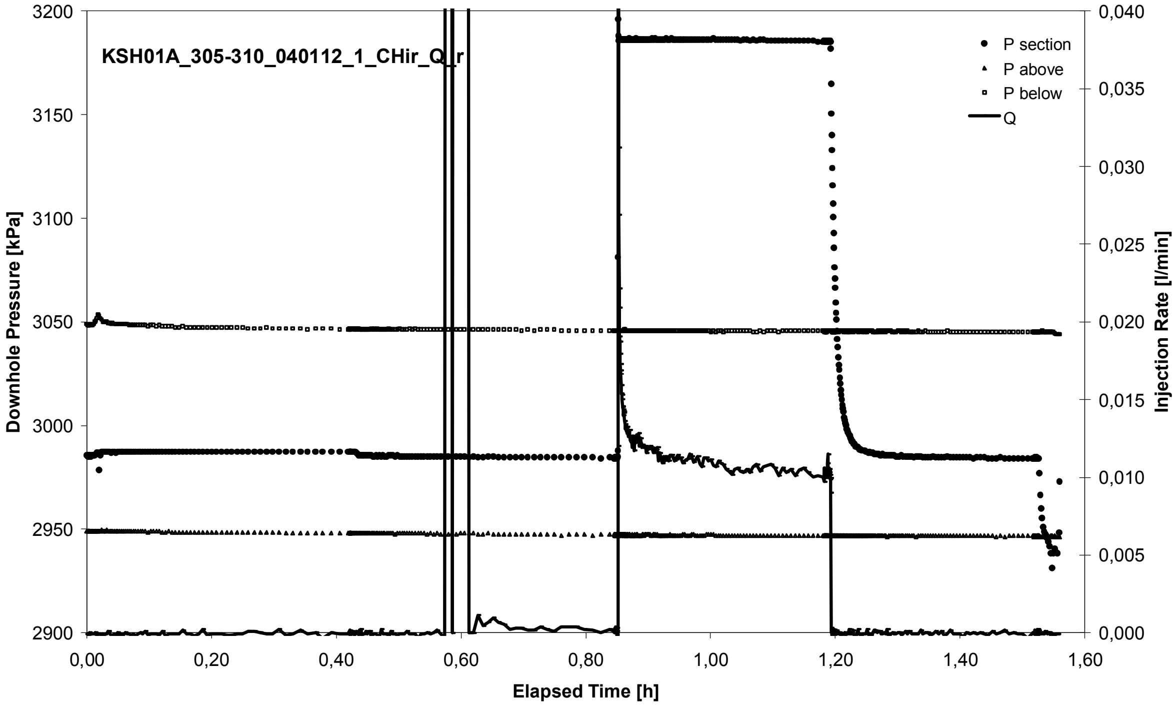


CHIR phase; HORNER match

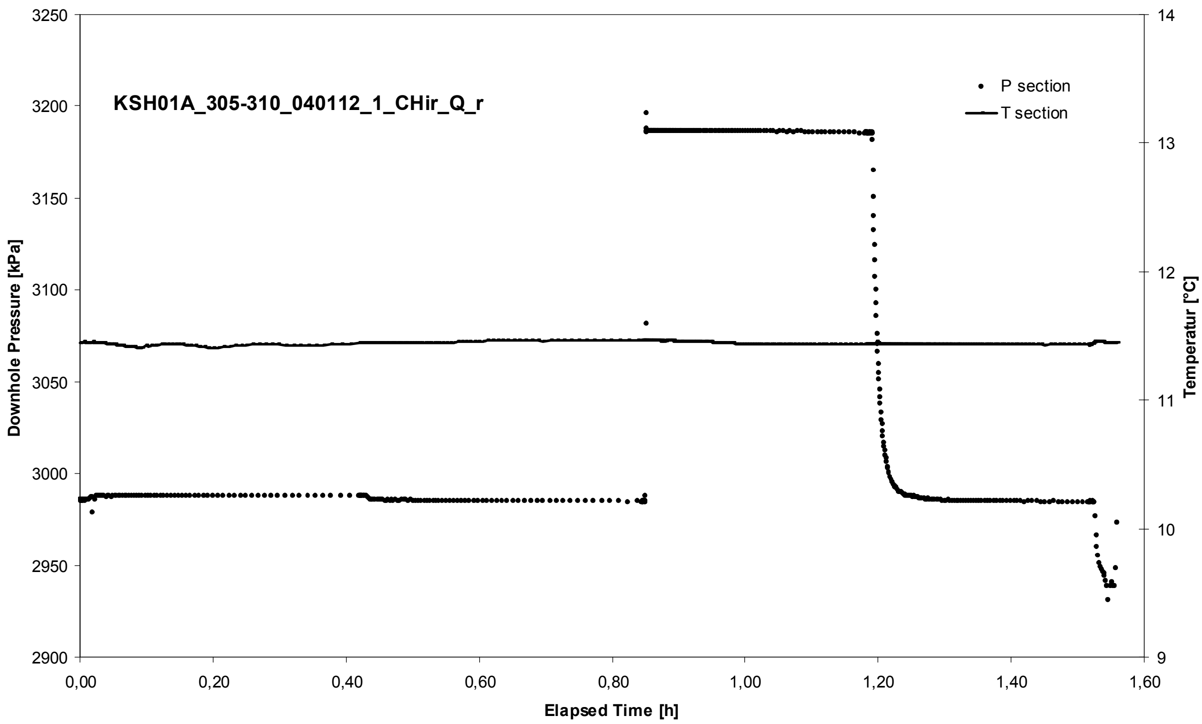
APPENDIX 2-56

Test 305 – 310 m

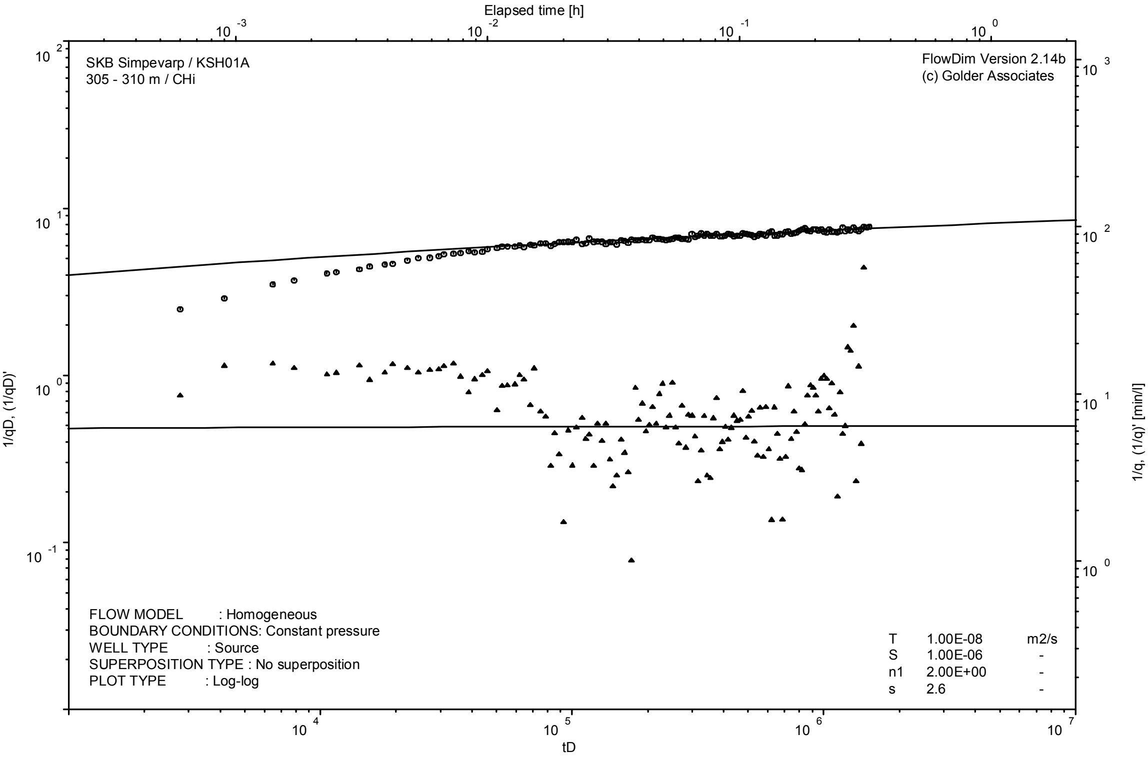
Analysis diagrams



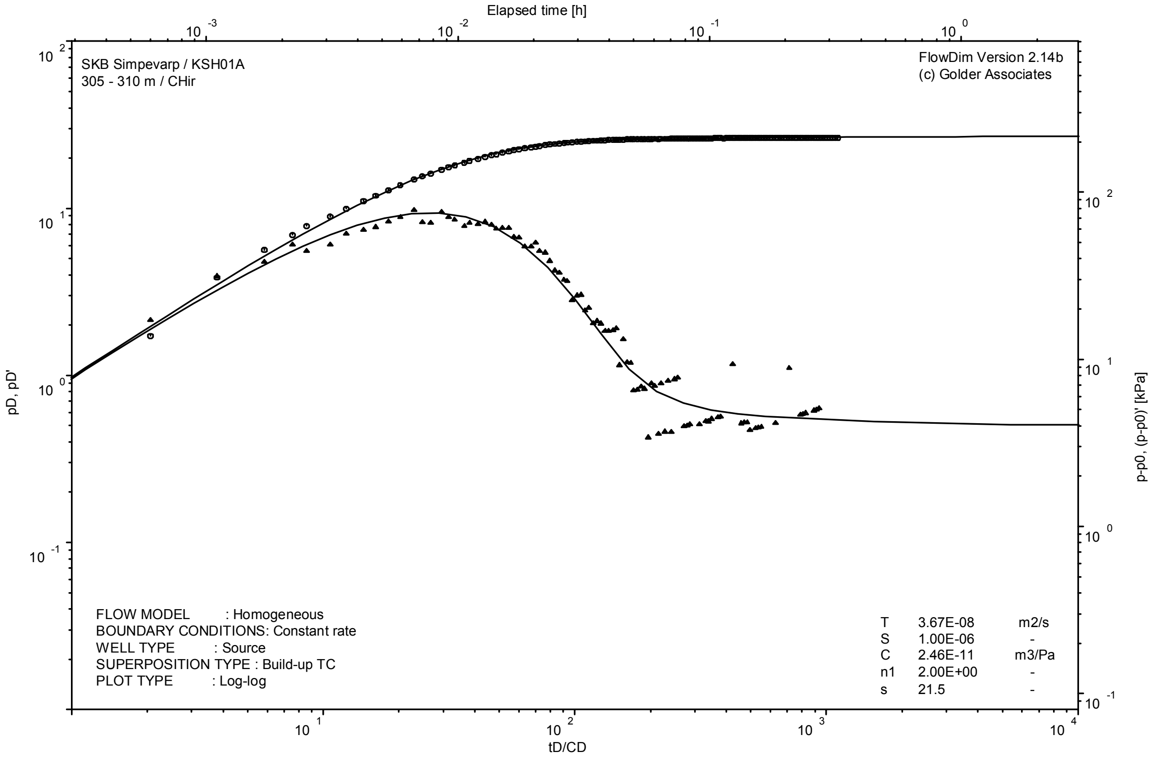
Pressure and flow rate vs. time; cartesian plot



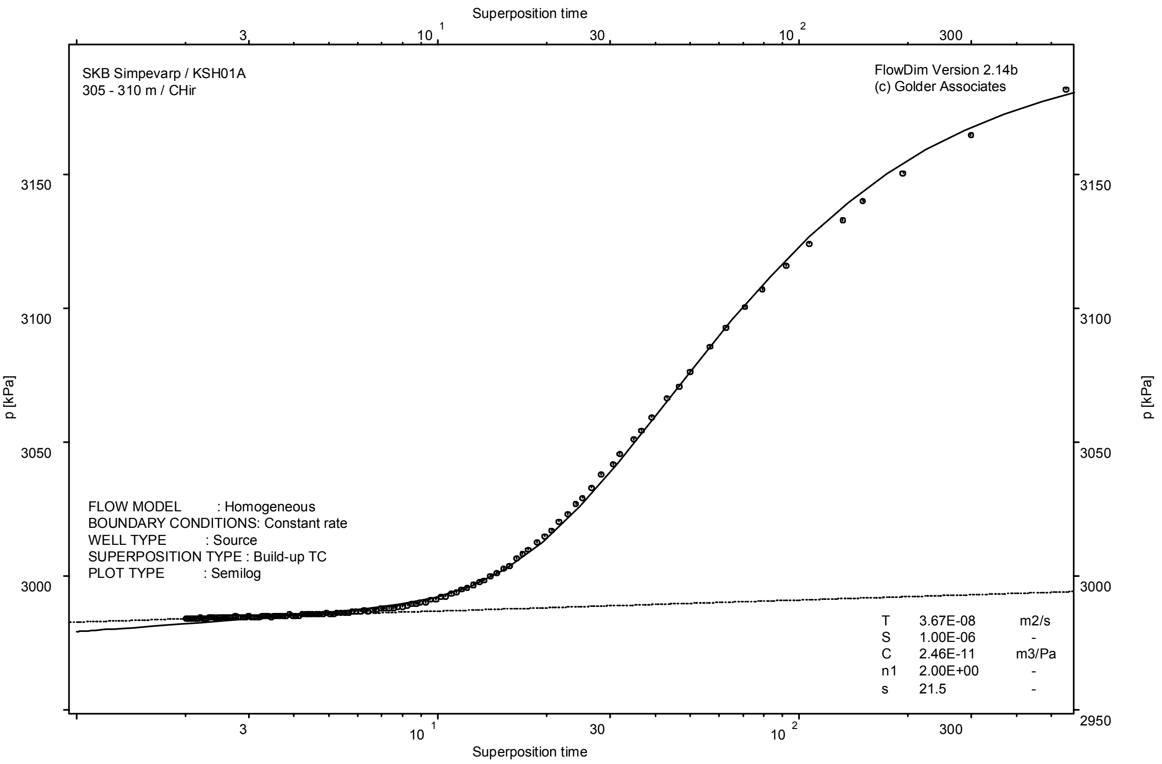
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

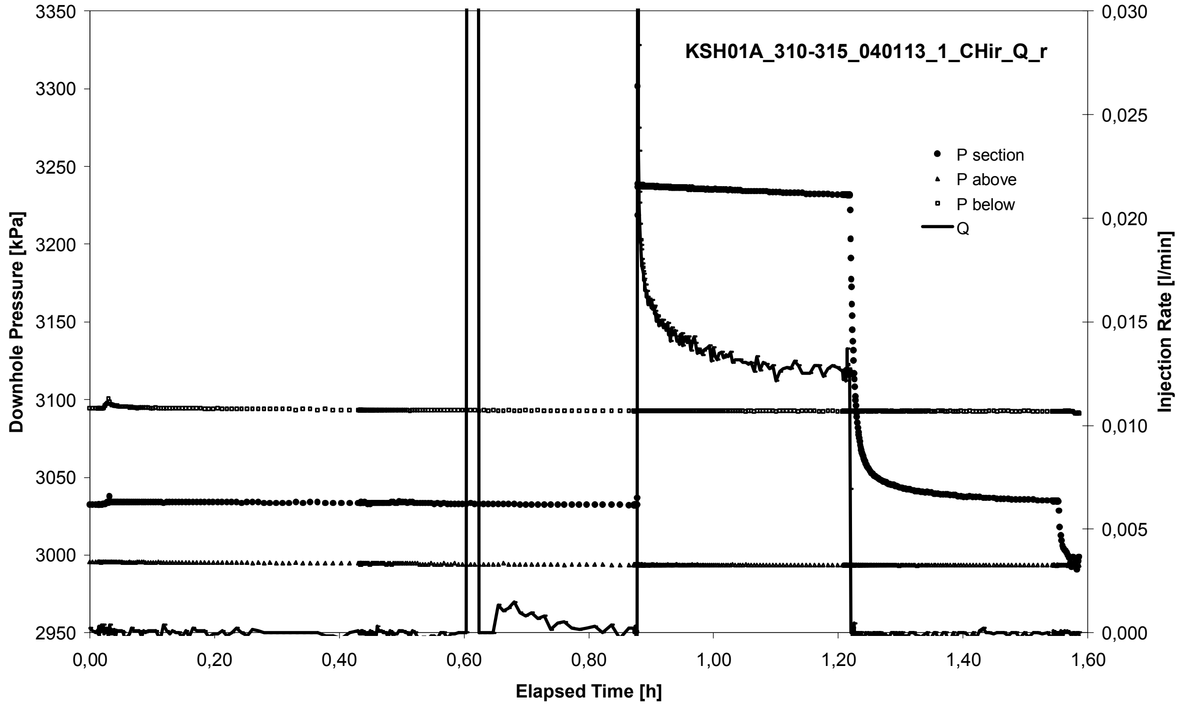


CHIR phase; HORNER match

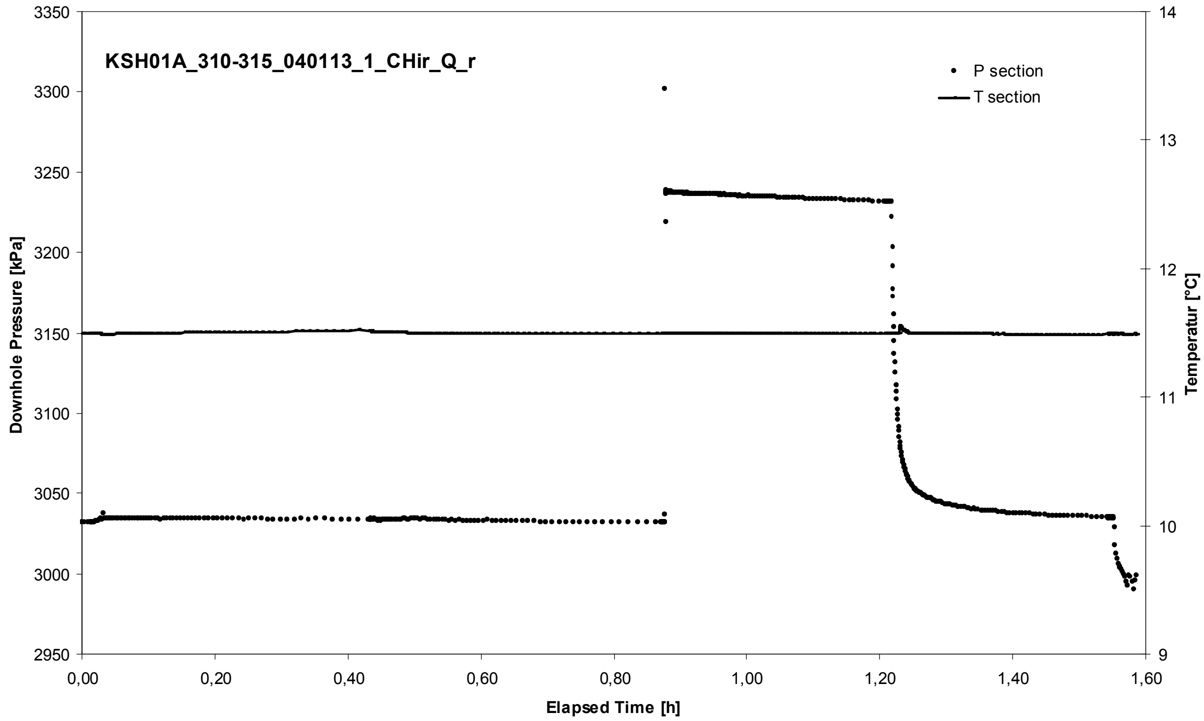
APPENDIX 2-57

Test 310 – 315 m

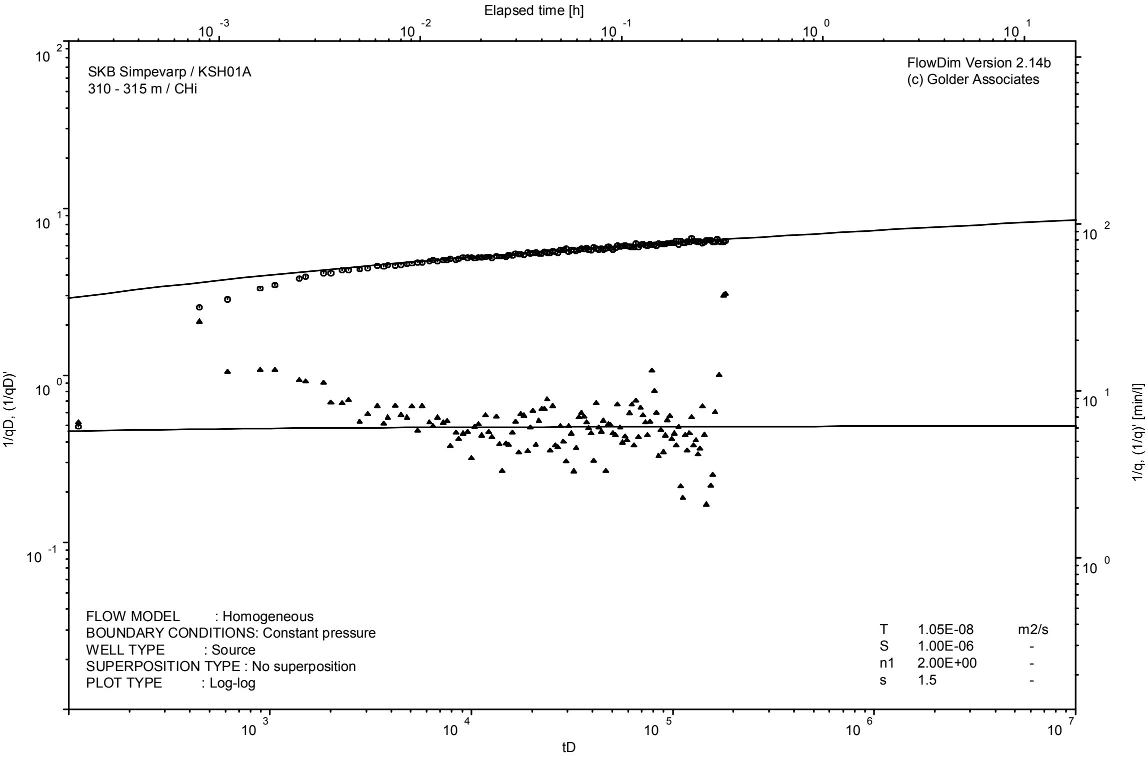
Analysis diagrams



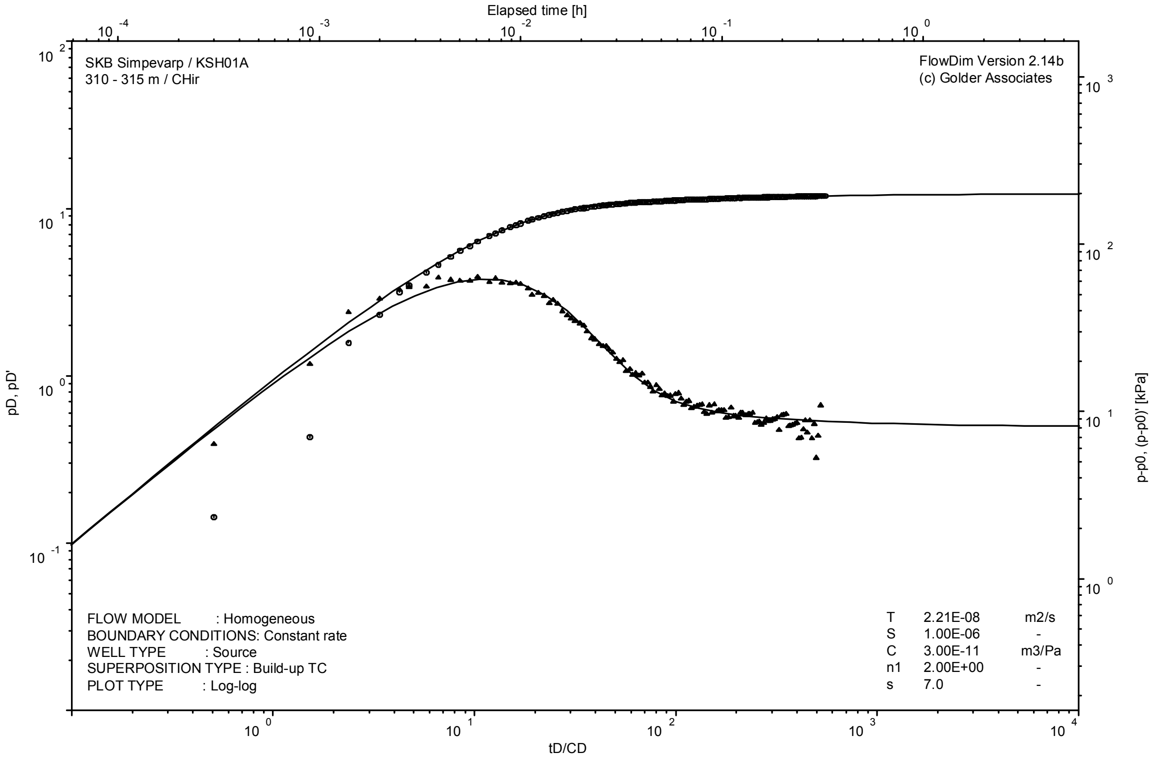
Pressure and flow rate vs. time; cartesian plot



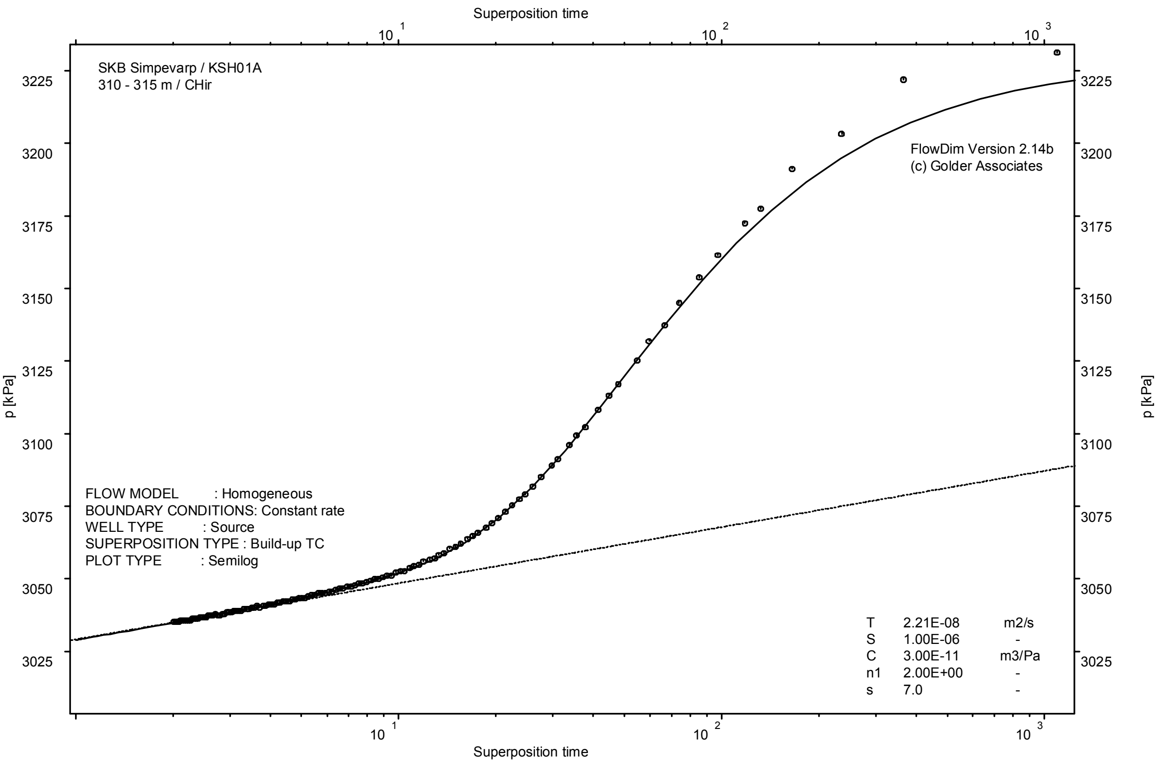
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

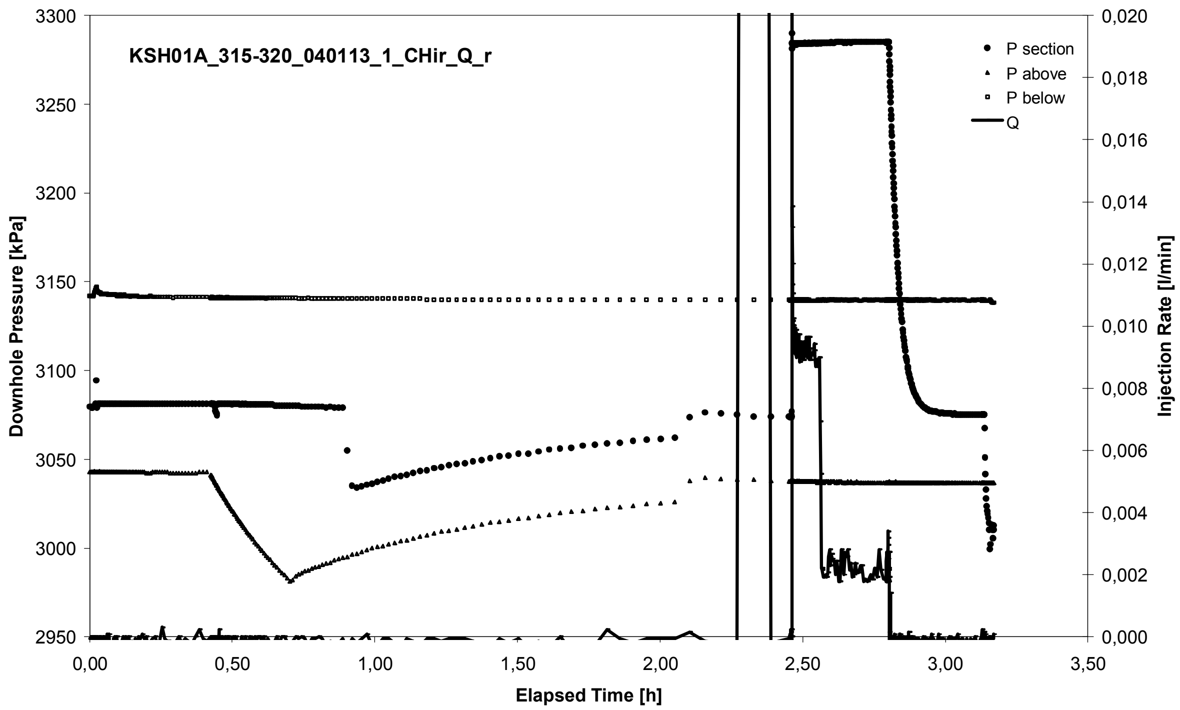


CHIR phase; HORNER match

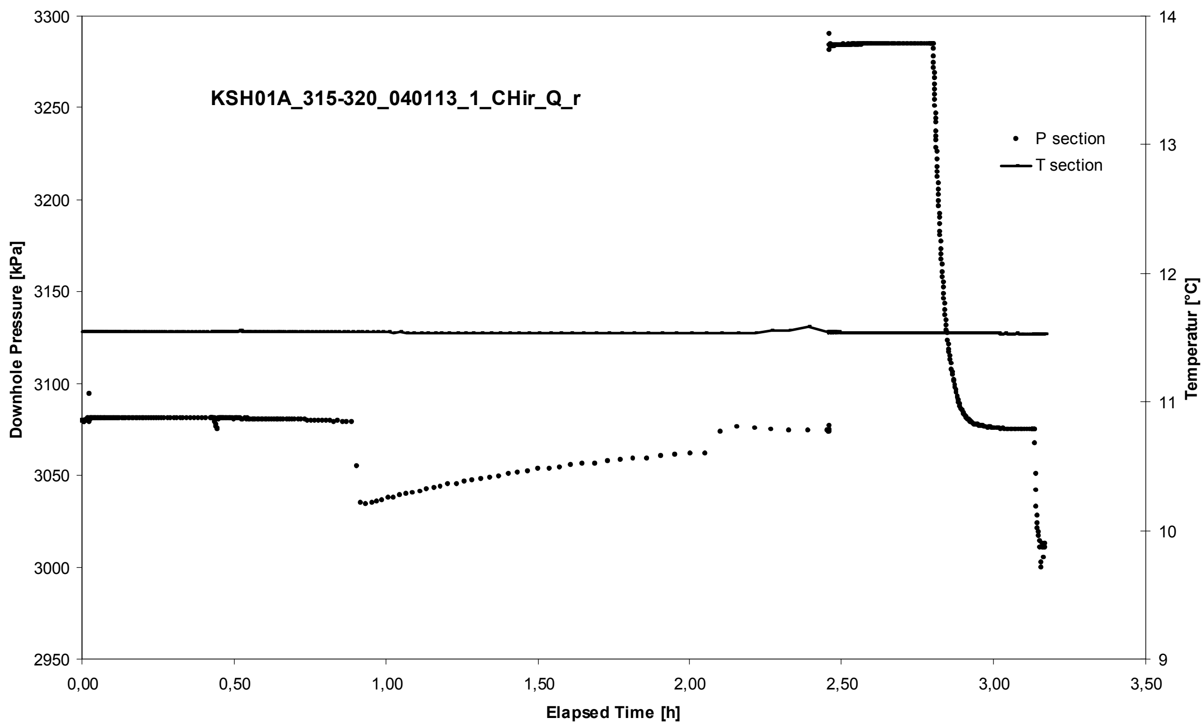
APPENDIX 2-58

Test 315 – 320 m

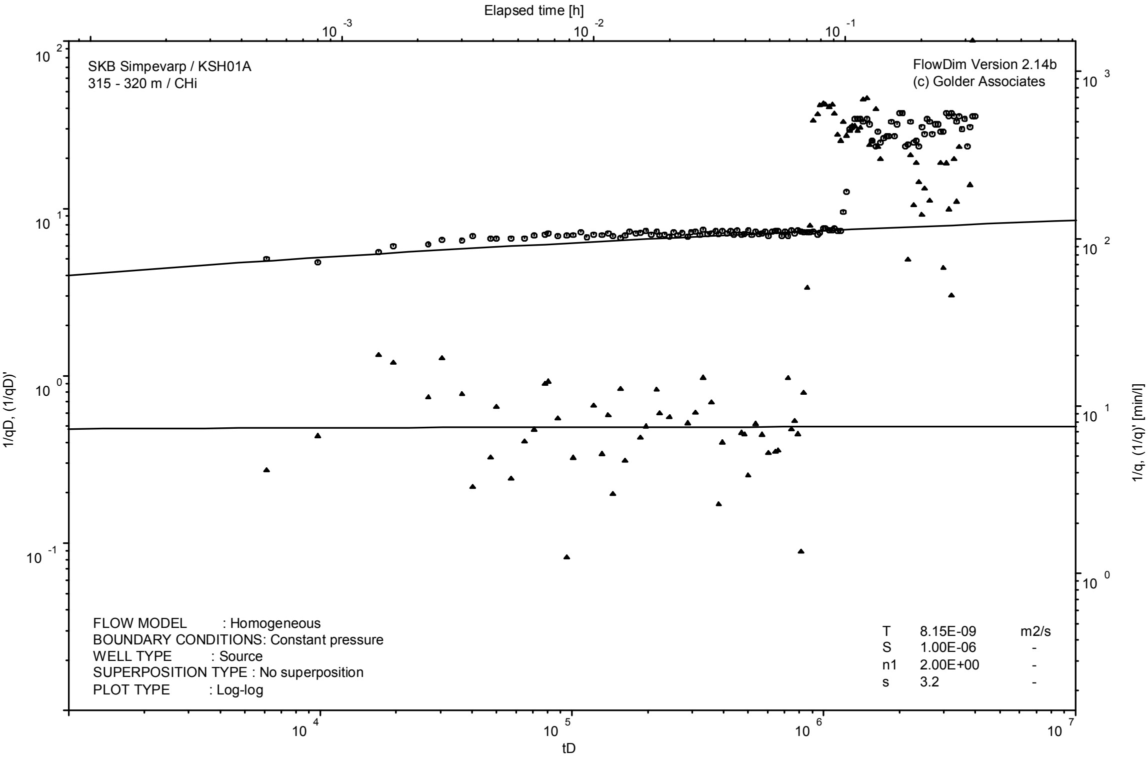
Analysis diagrams



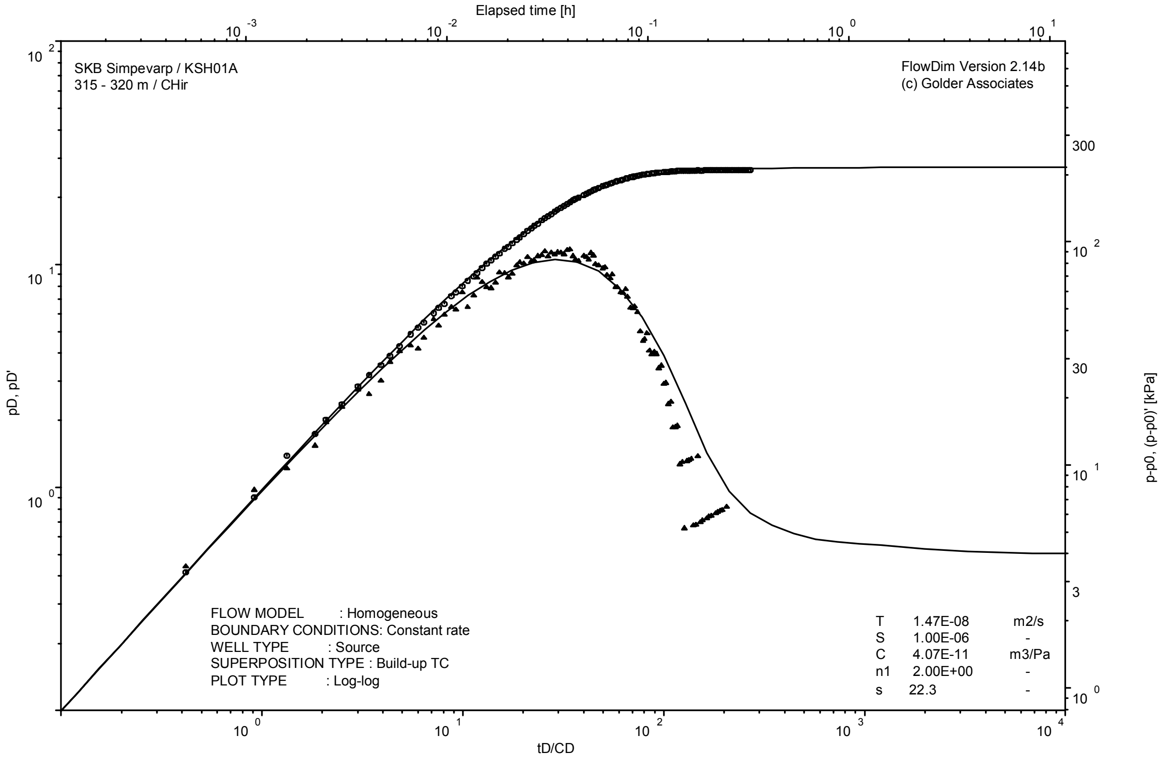
Pressure and flow rate vs. time; cartesian plot



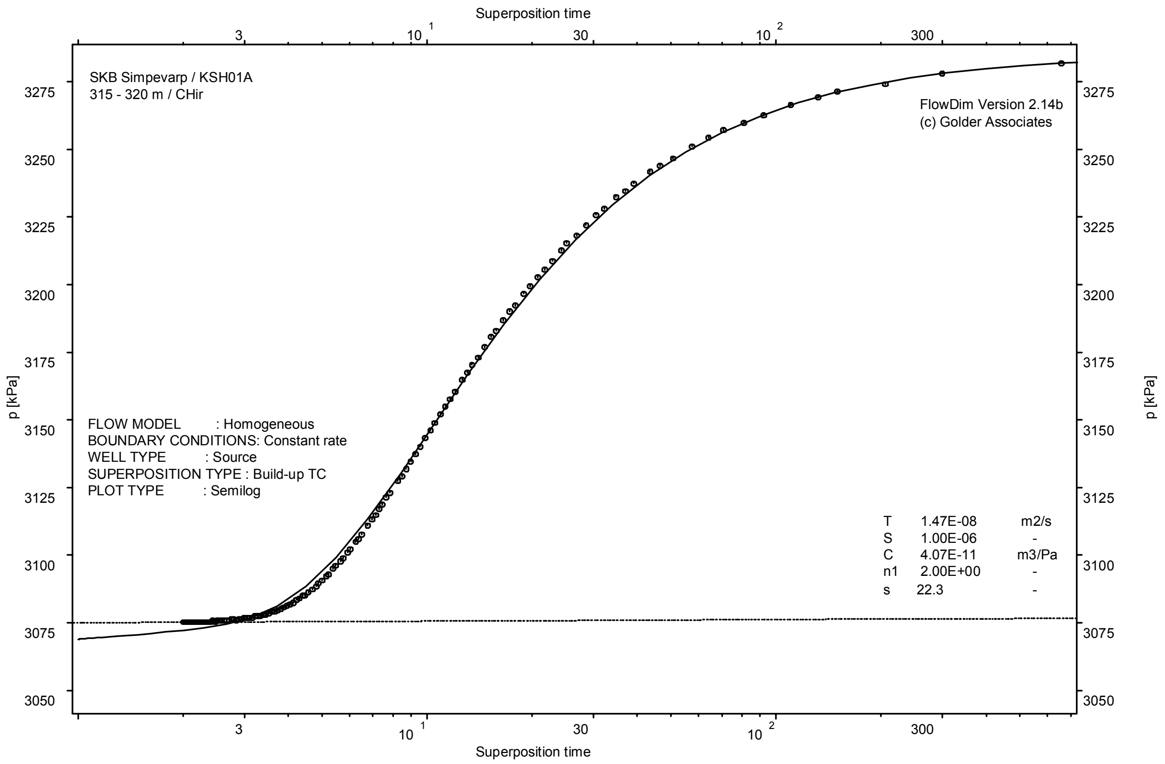
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

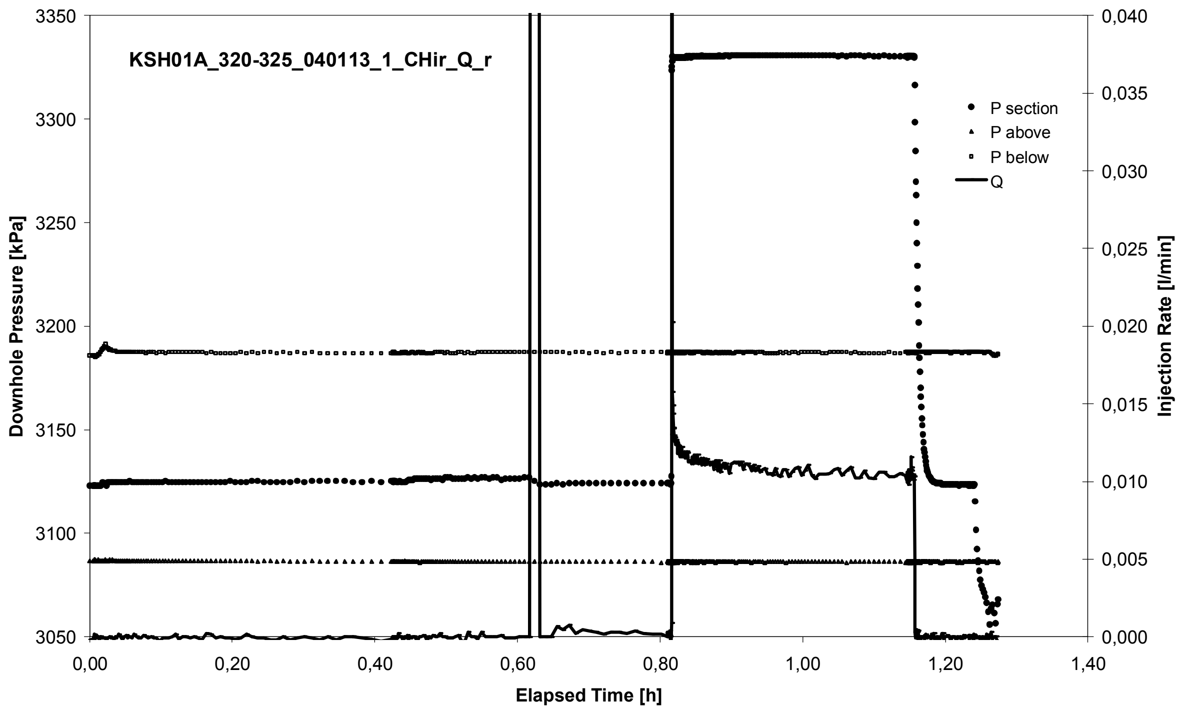


CHIR phase; HORNER match

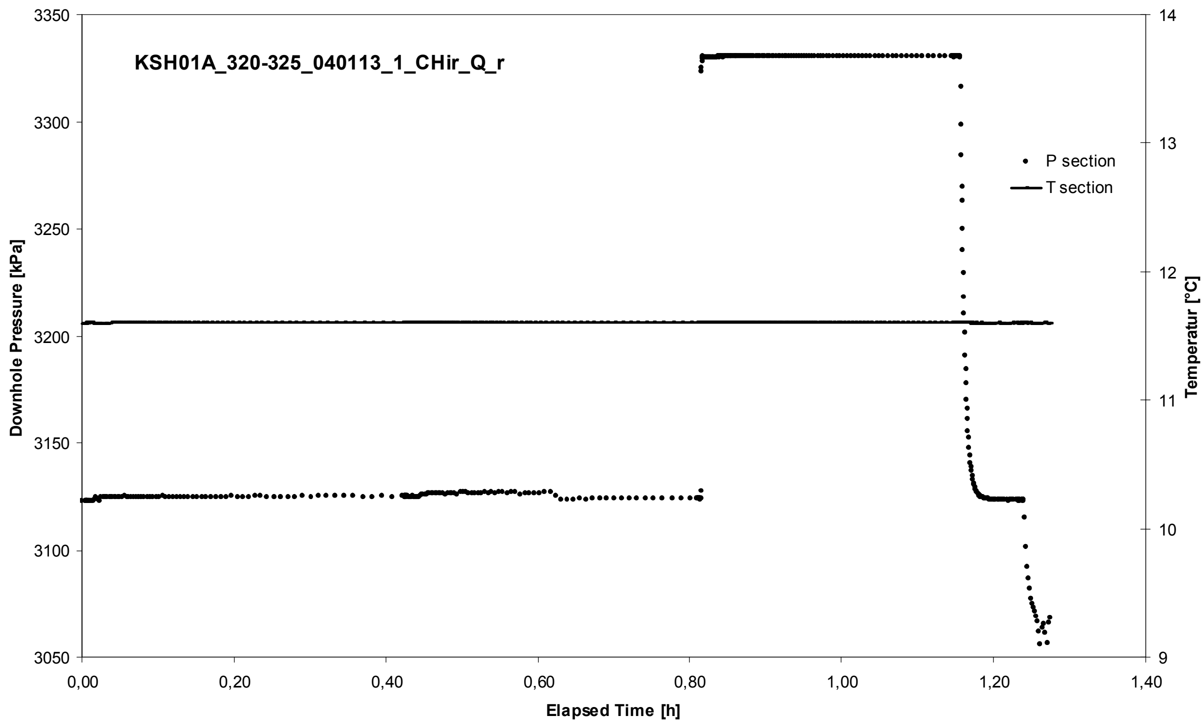
APPENDIX 2-59

Test 320 – 325 m

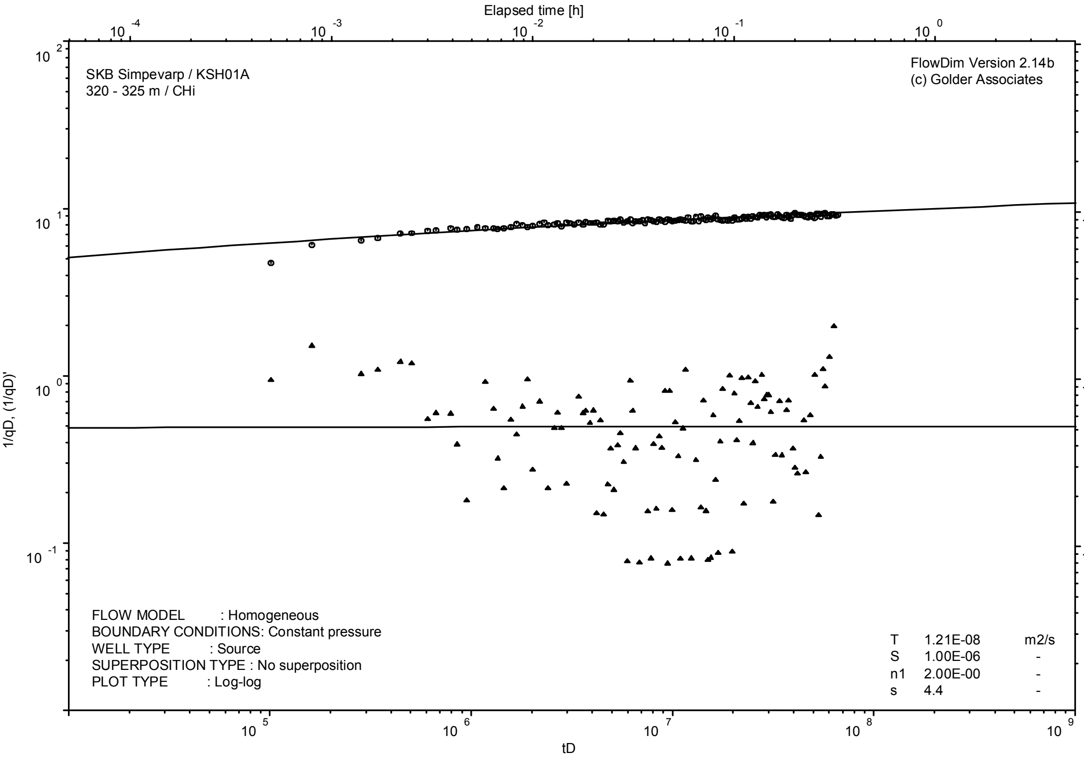
Analysis diagrams



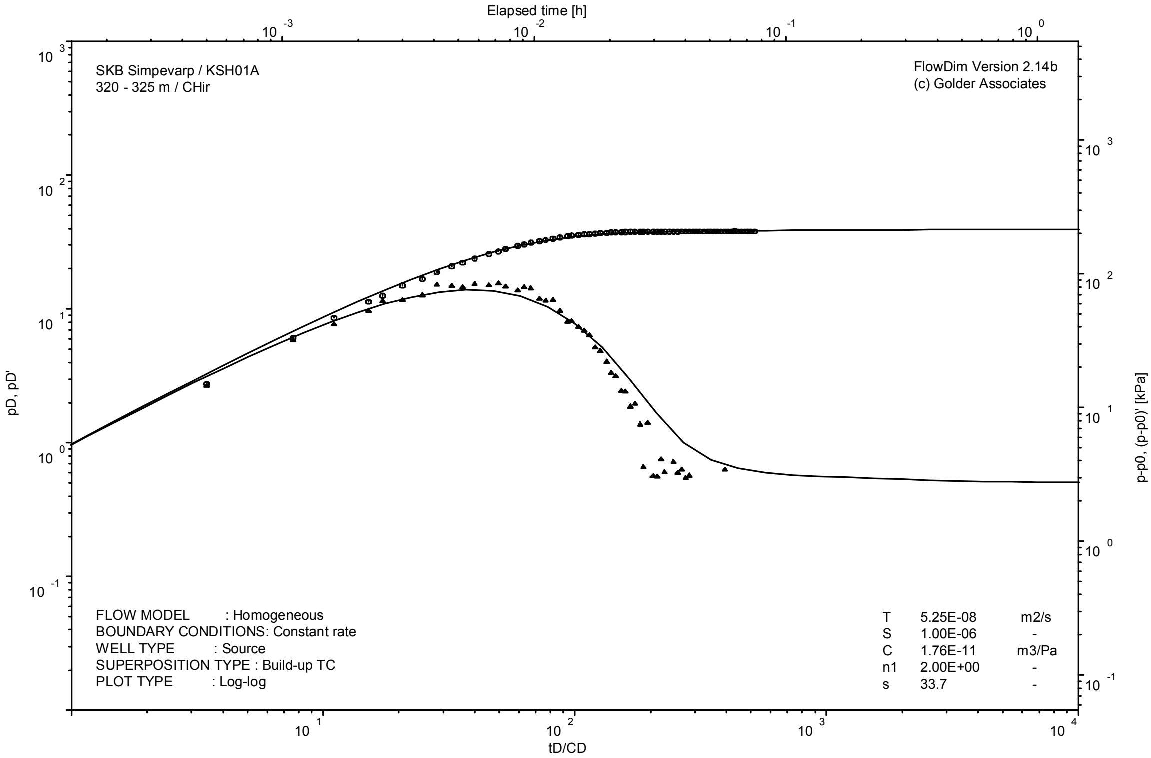
Pressure and flow rate vs. time; cartesian plot



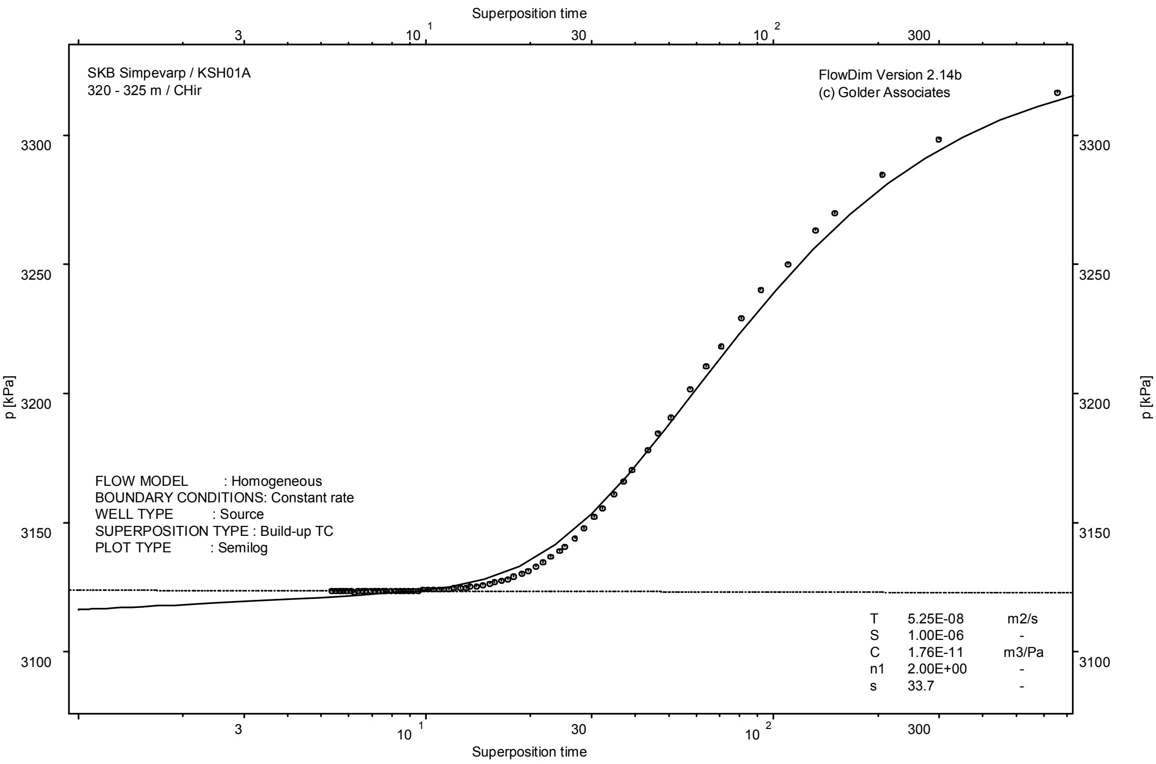
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

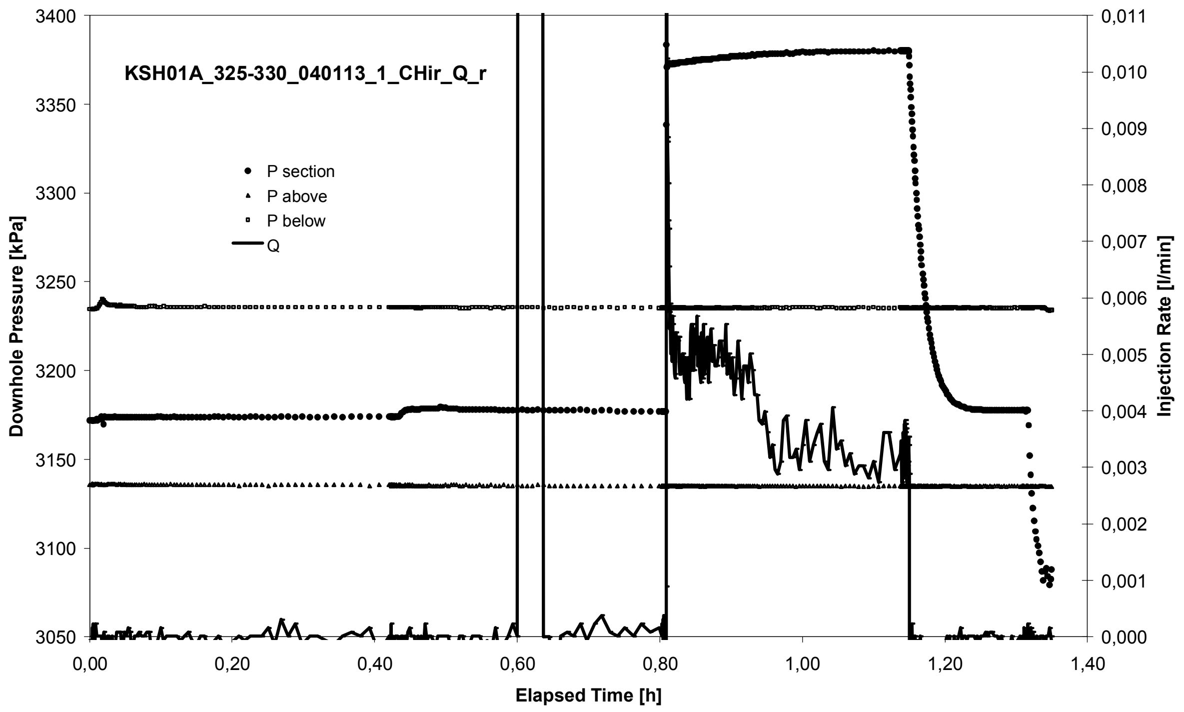


CHIR phase; HORNER match

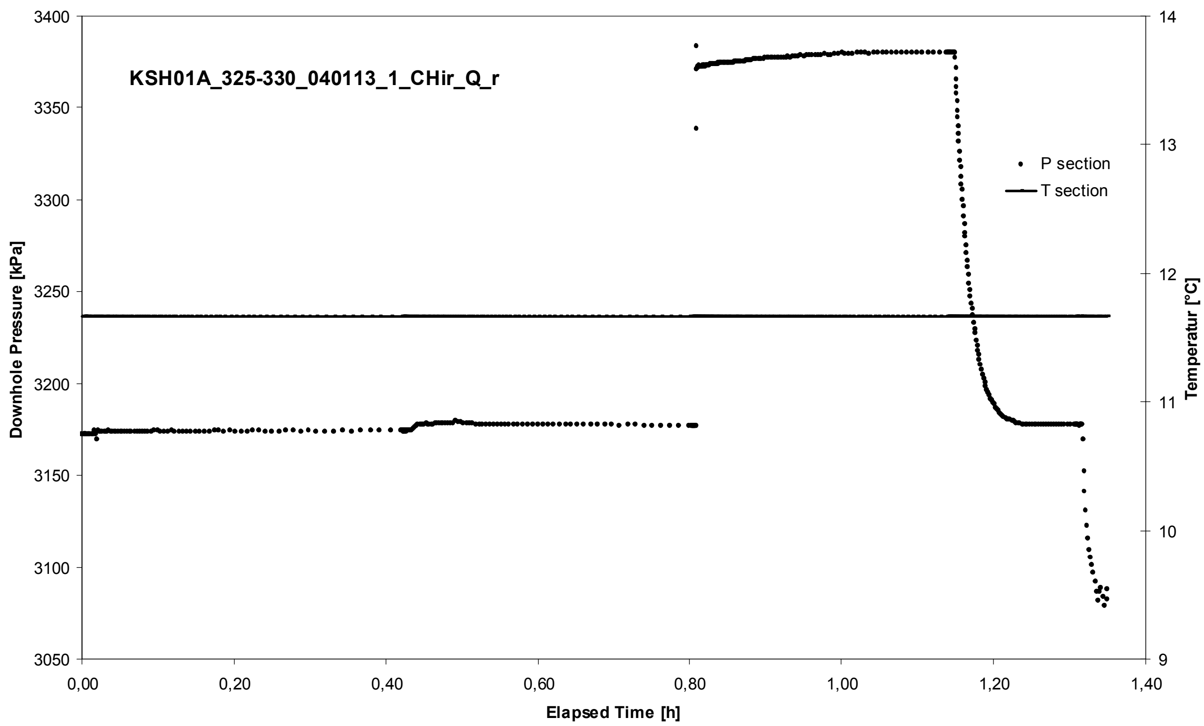
APPENDIX 2-60

Test 325 – 330 m

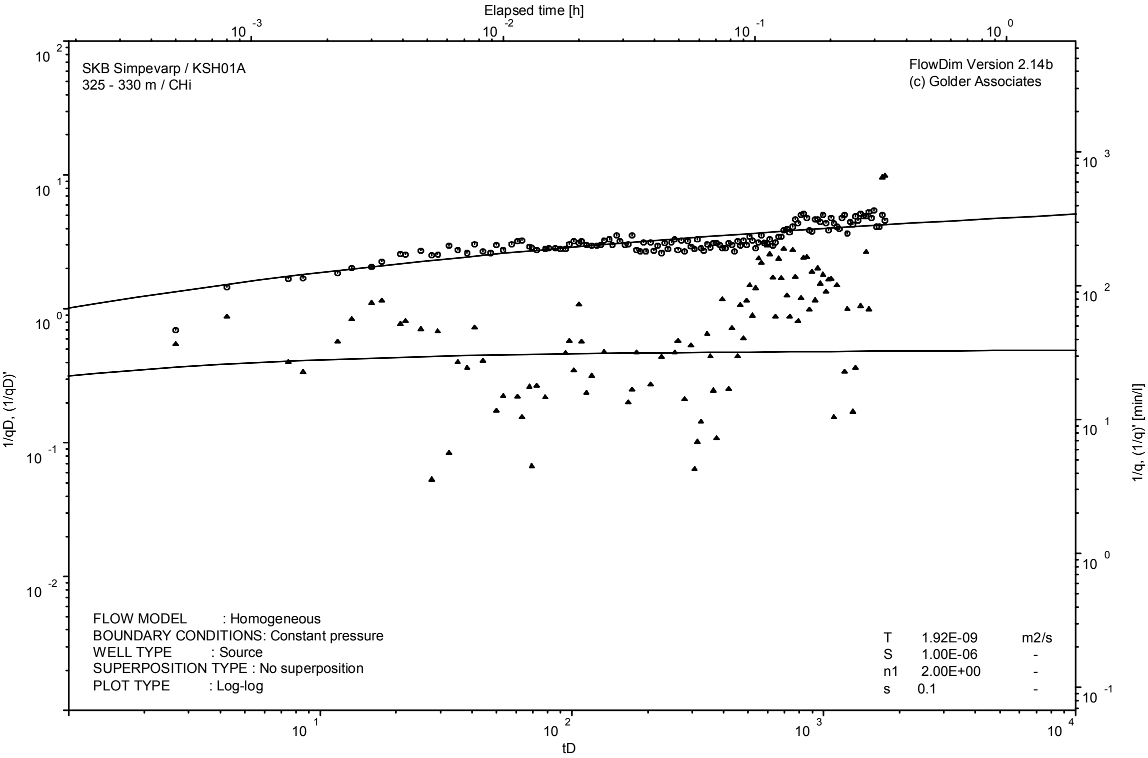
Analysis diagrams



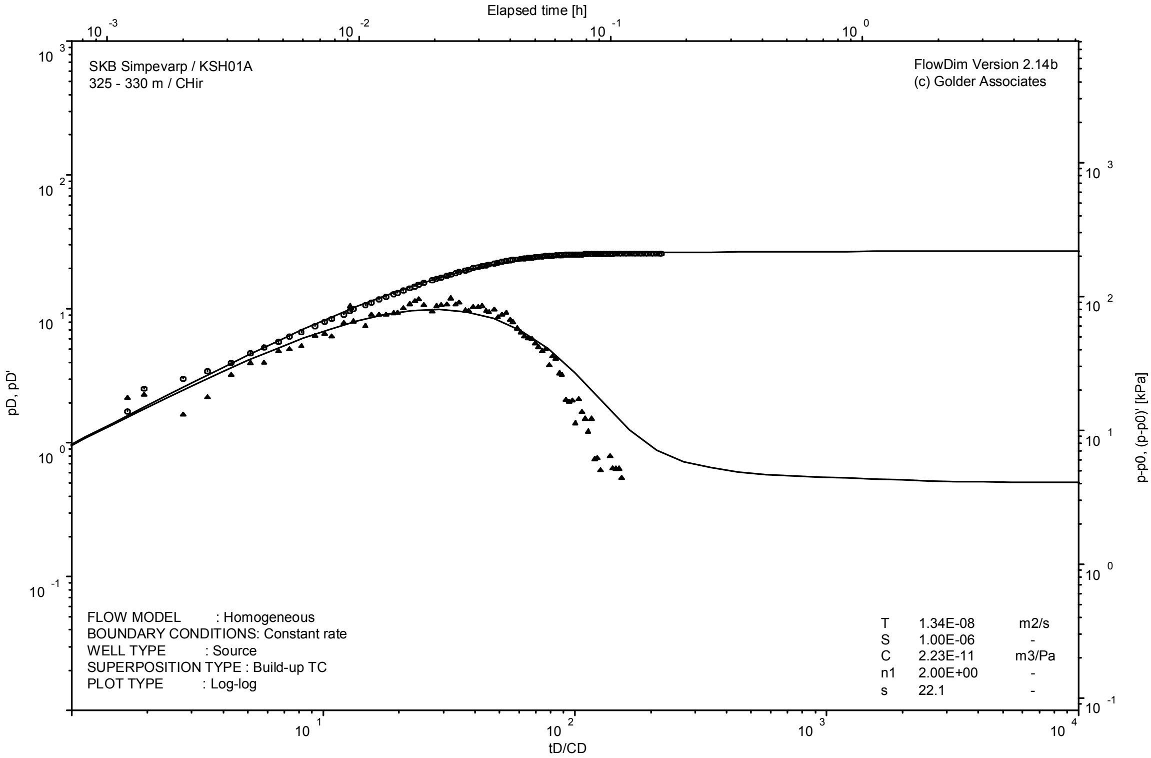
Pressure and flow rate vs. time; cartesian plot



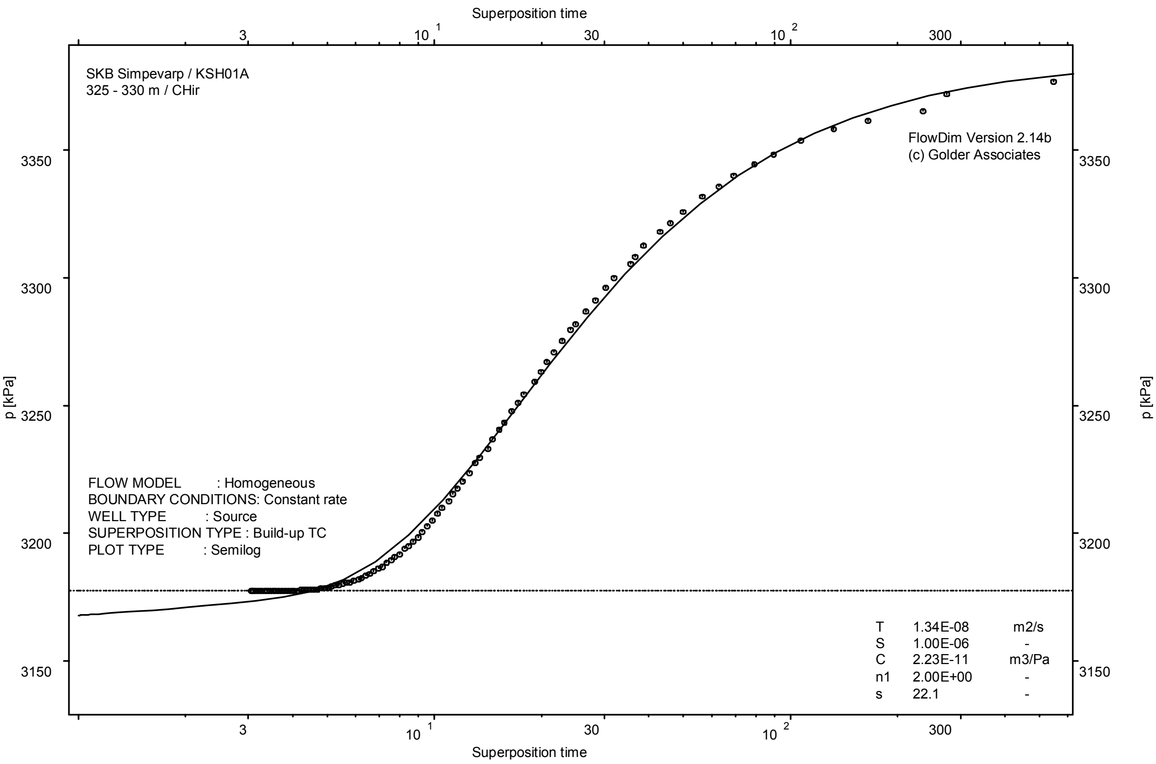
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

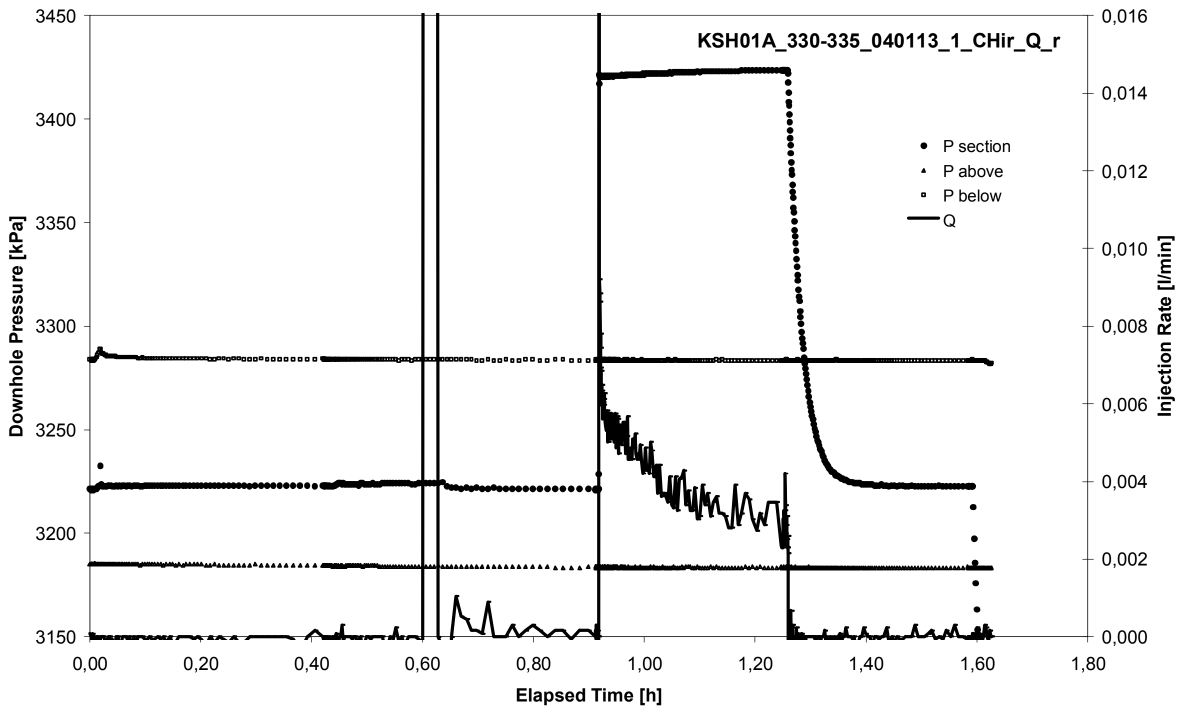


CHIR phase; HORNER match

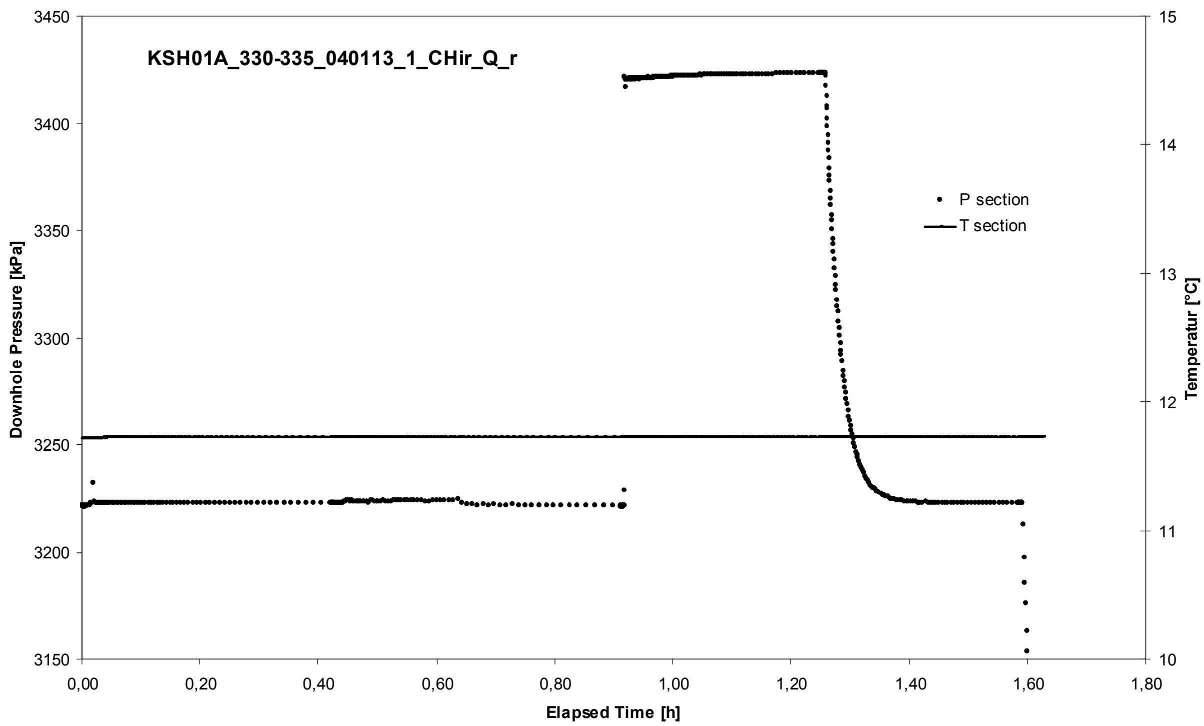
APPENDIX 2-61

Test 330 – 335 m

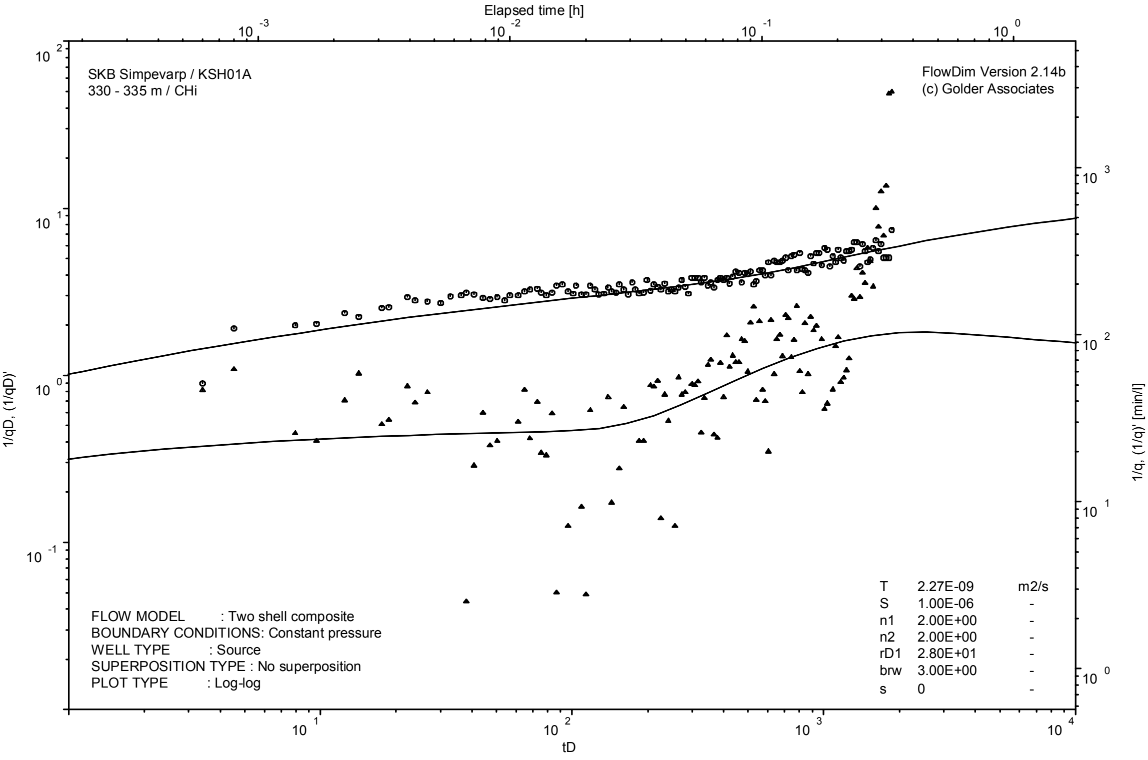
Analysis diagrams



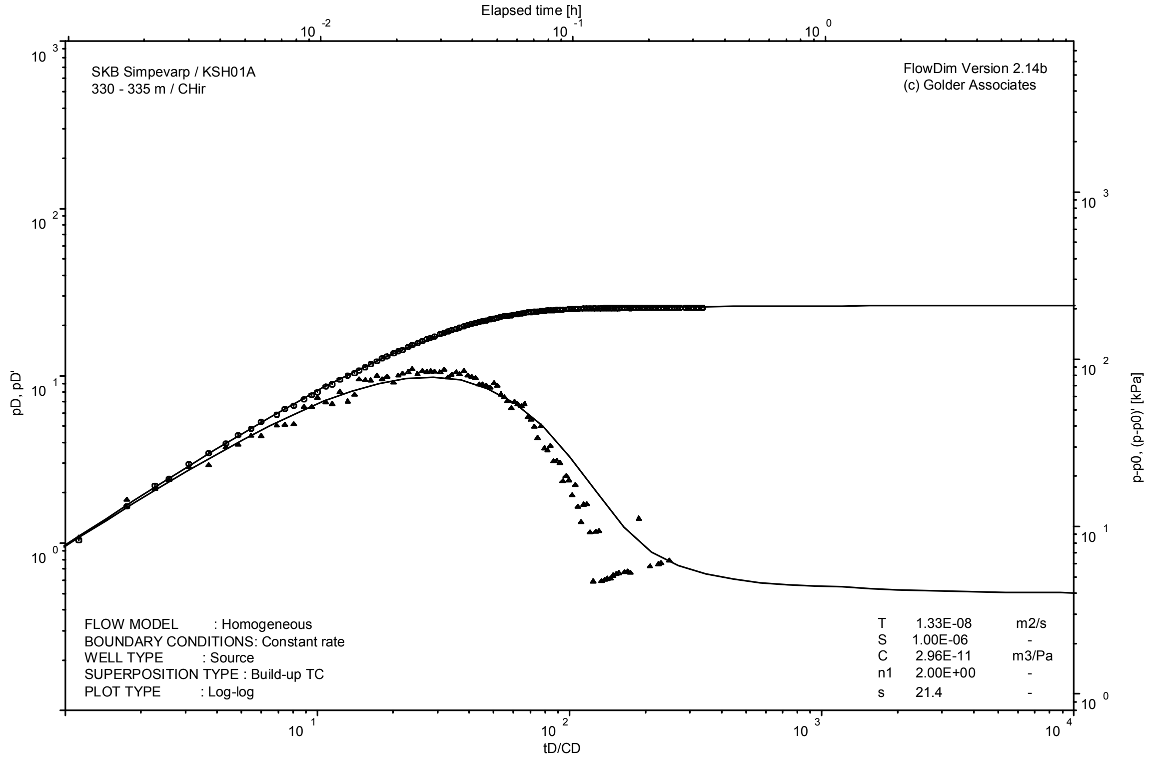
Pressure and flow rate vs. time; cartesian plot



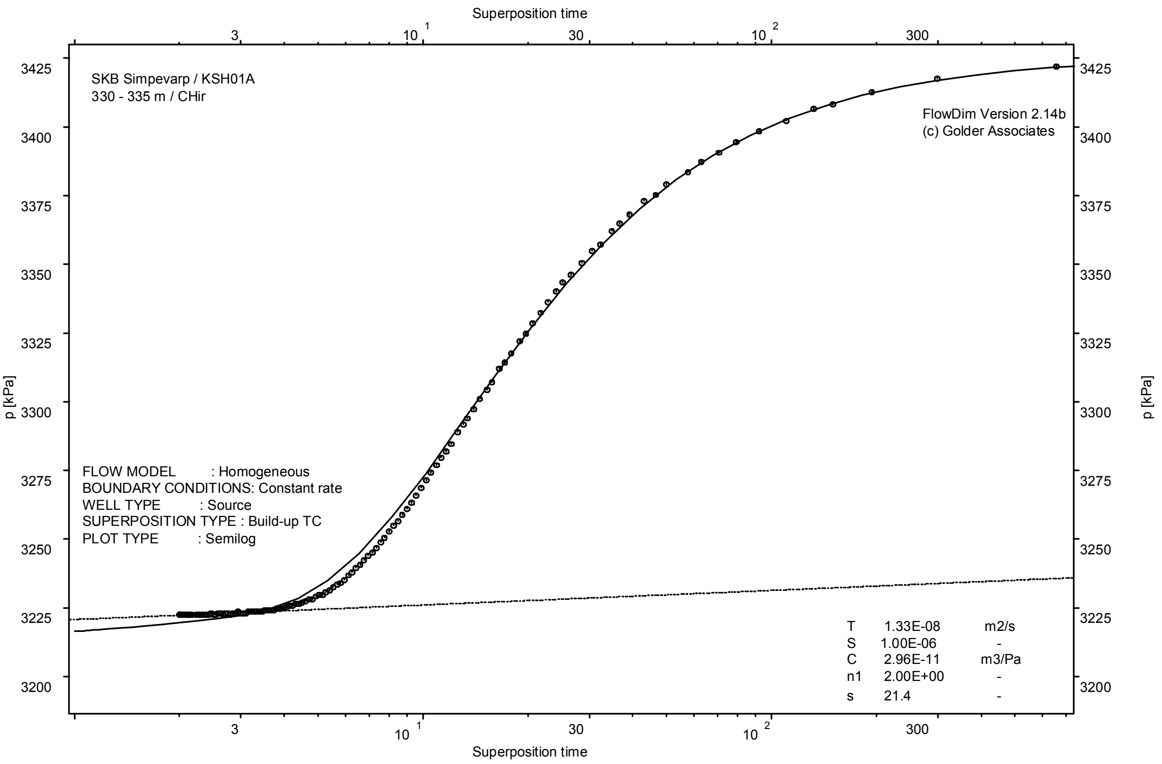
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

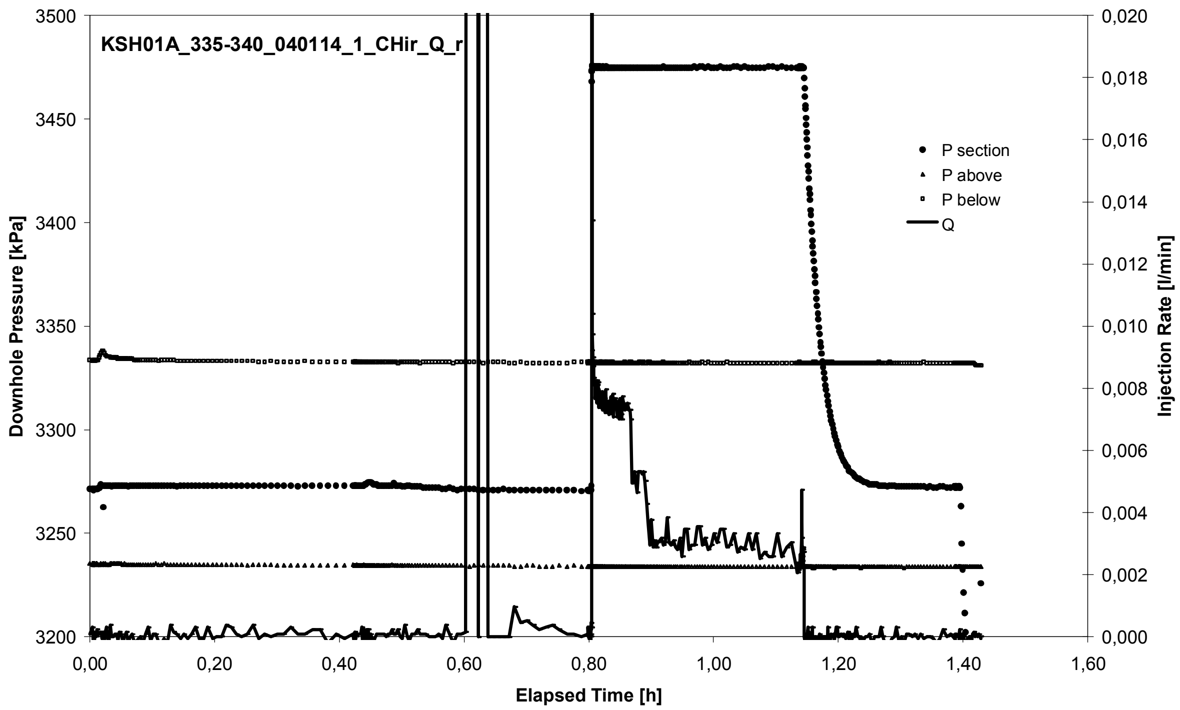


CHIR phase; HORNER match

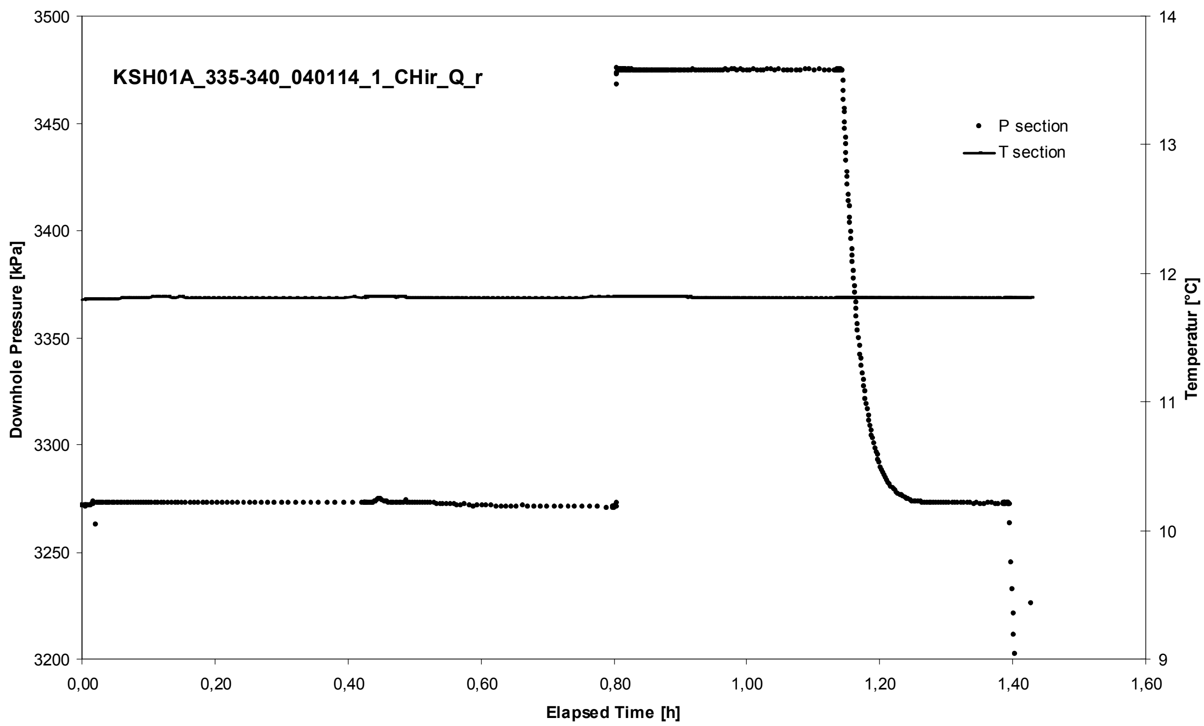
APPENDIX 2-62

Test 335 – 340 m

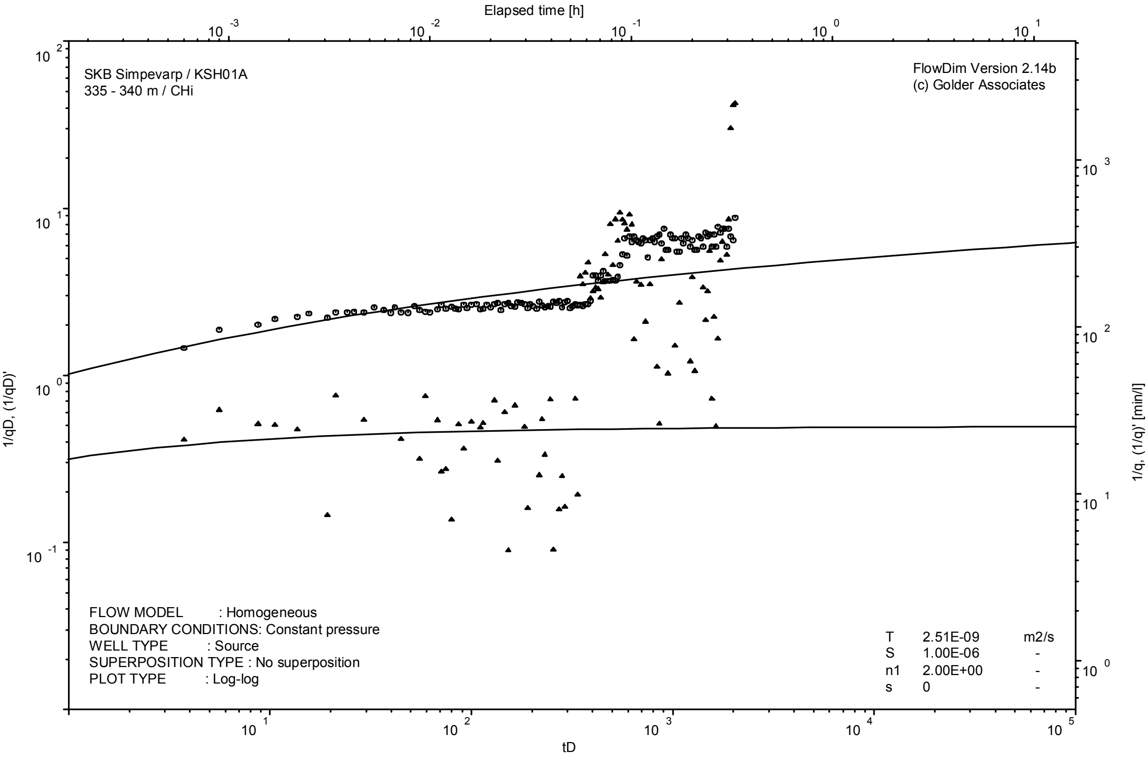
Analysis diagrams



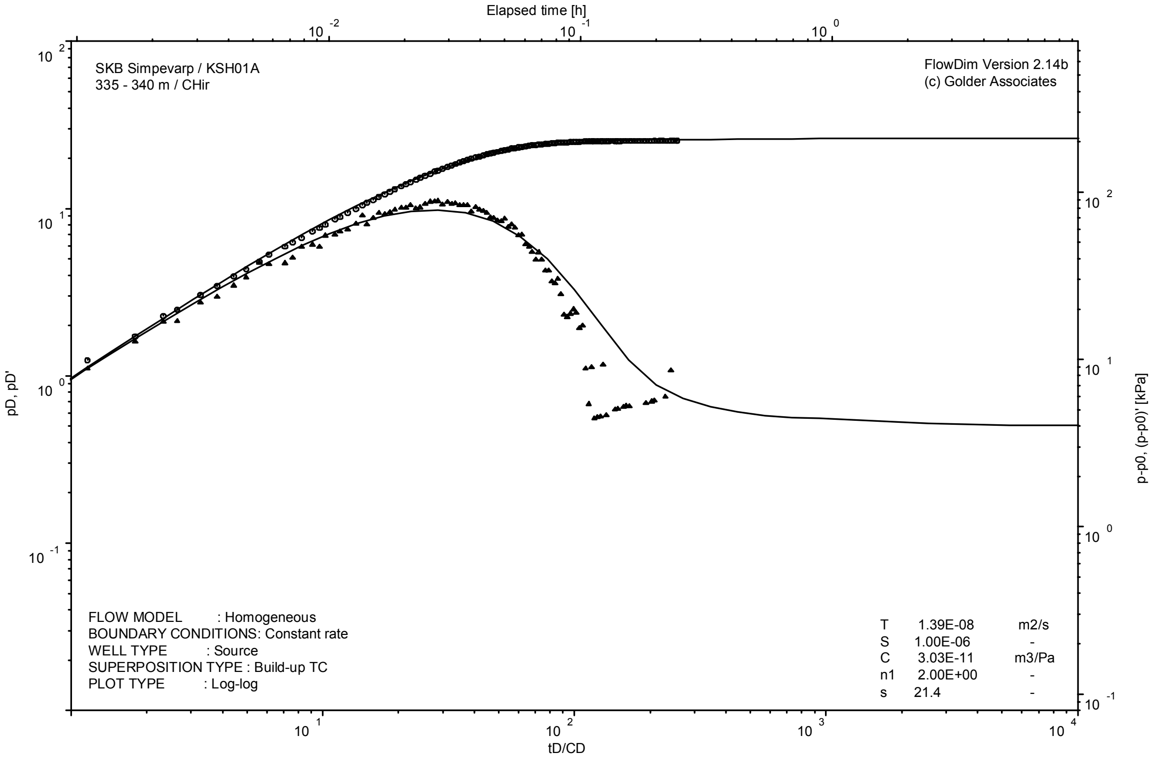
Pressure and flow rate vs. time; cartesian plot



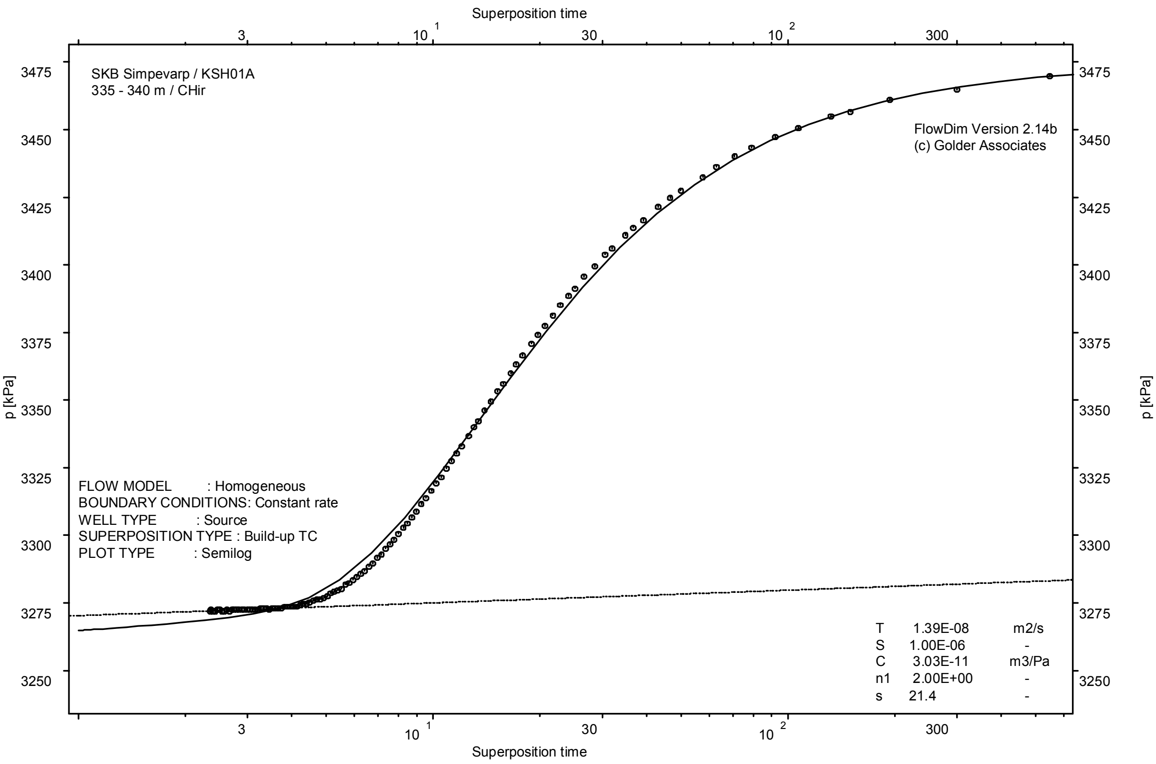
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

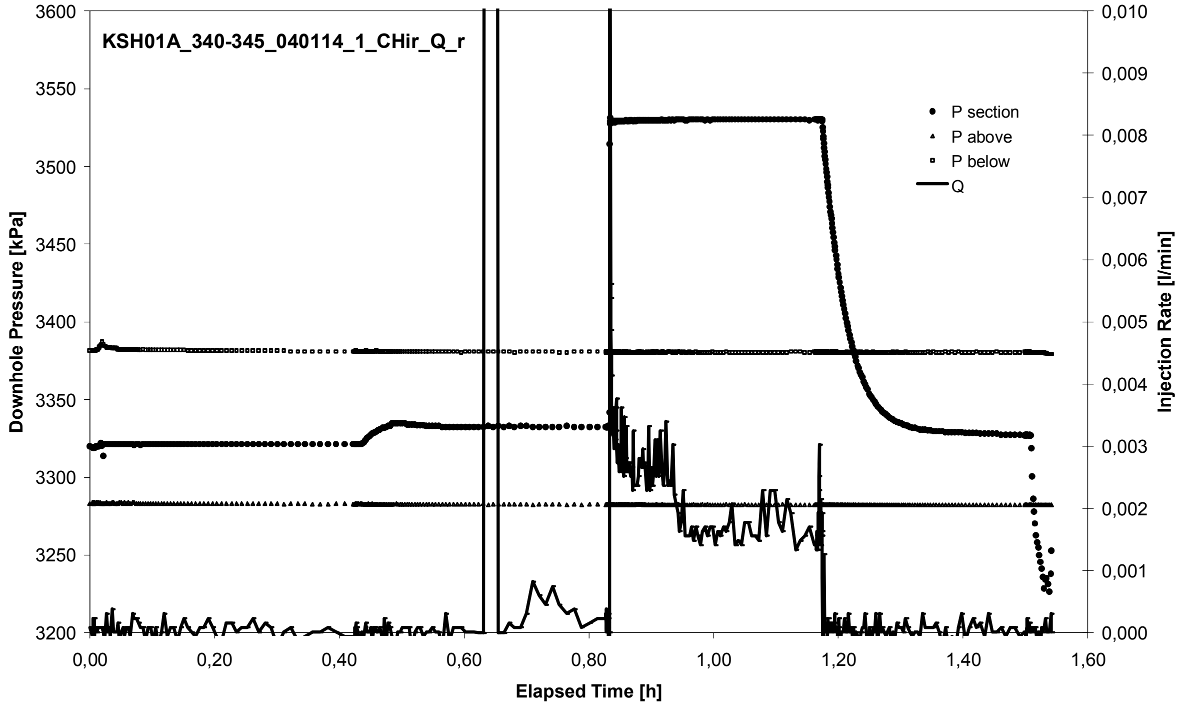


CHIR phase; HORNER match

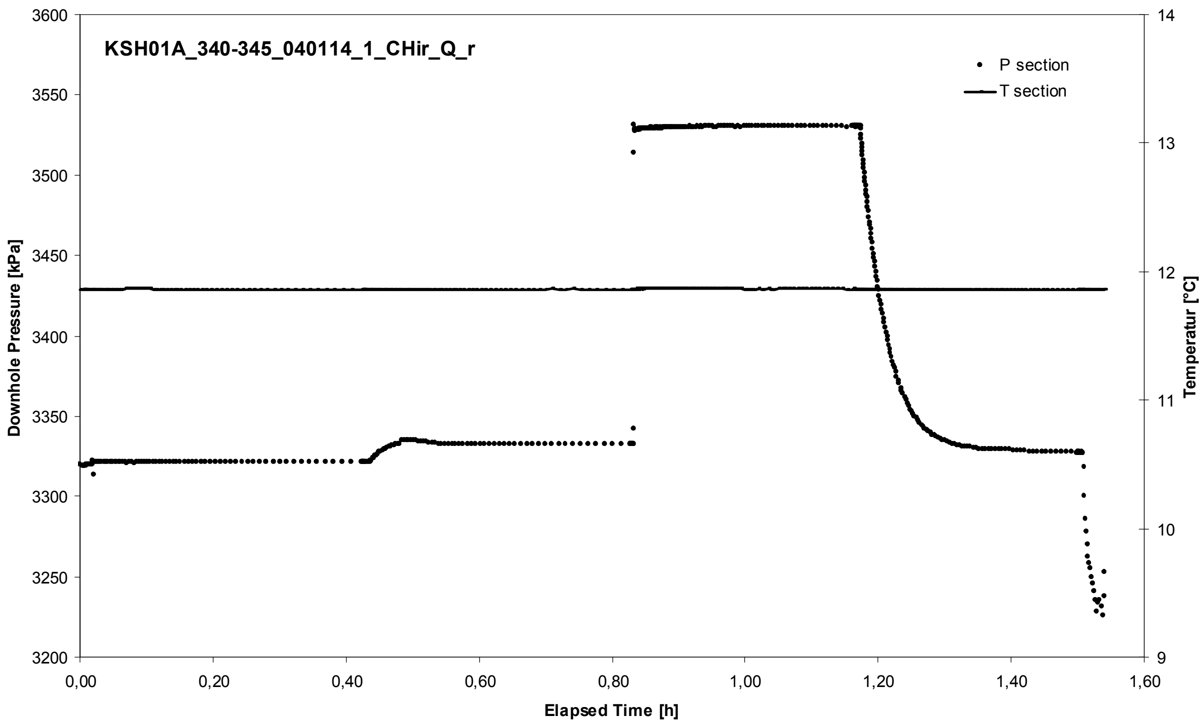
APPENDIX 2-63

Test 340 – 345 m

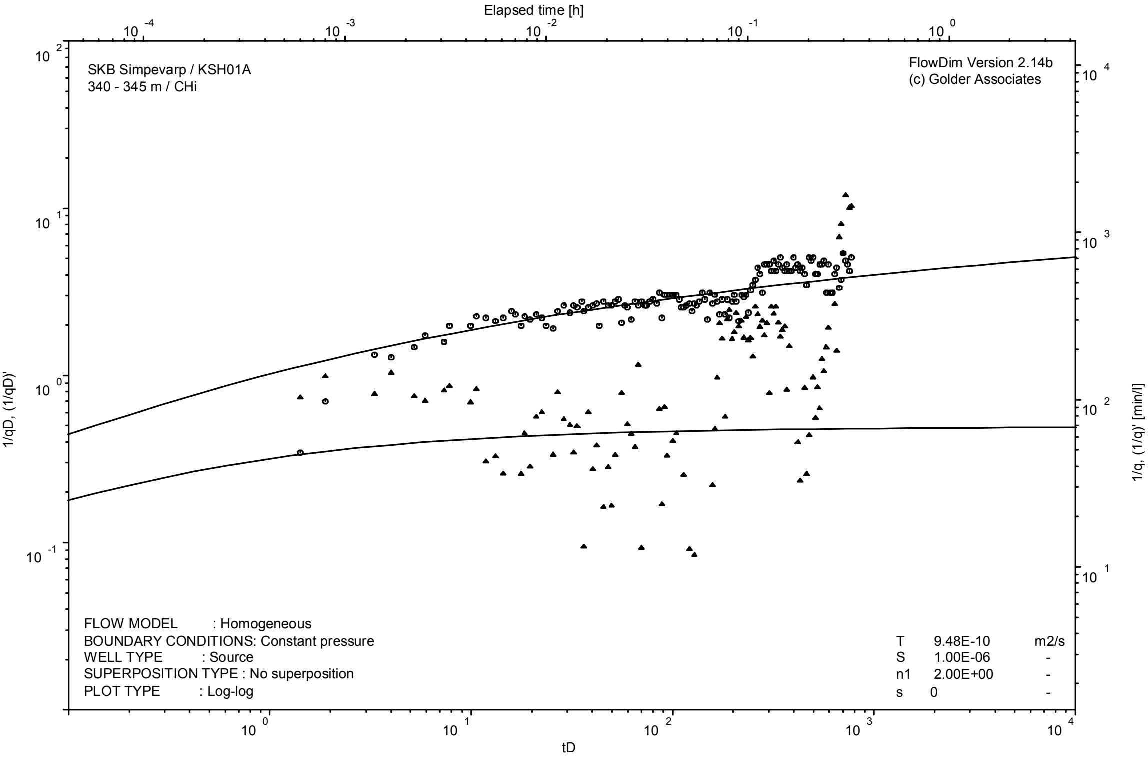
Analysis diagrams



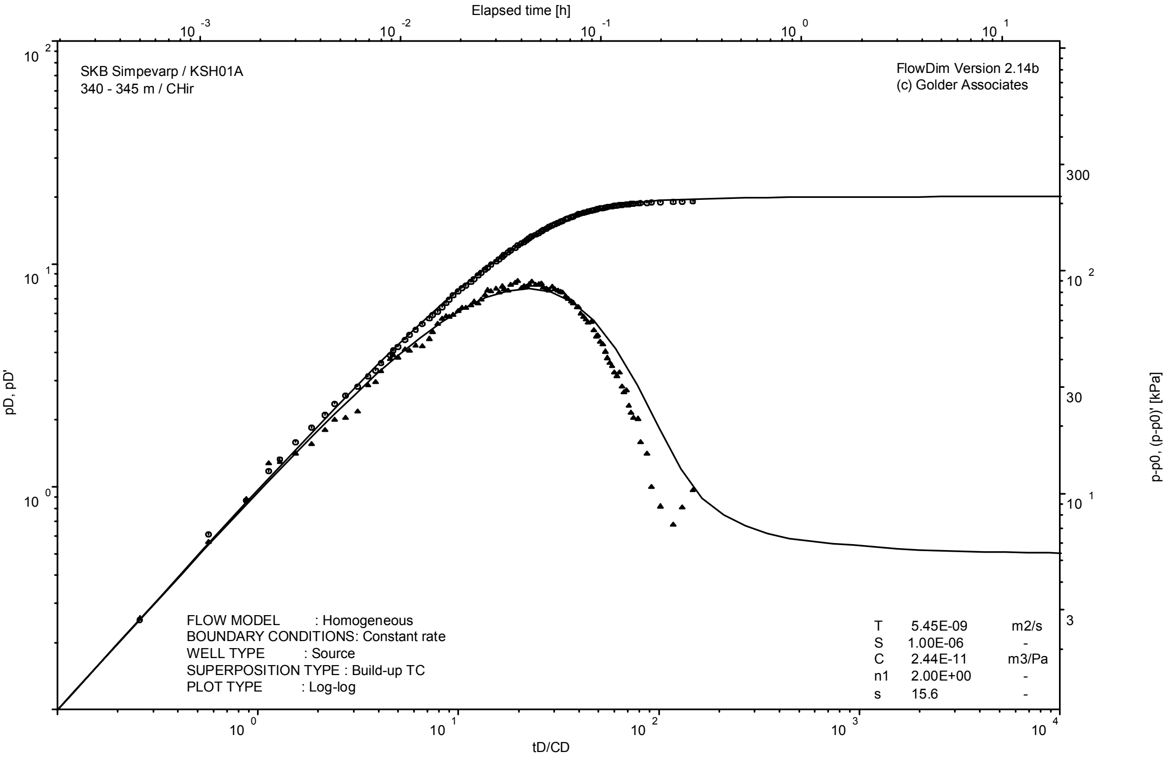
Pressure and flow rate vs. time; cartesian plot



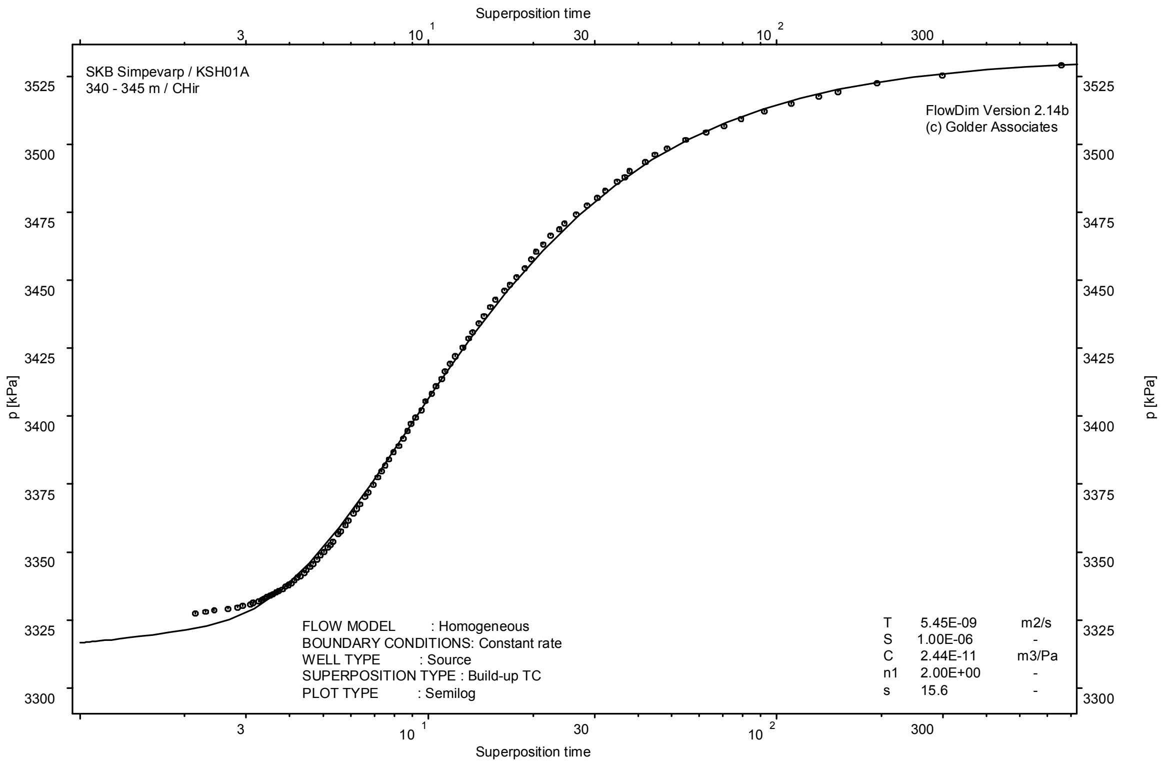
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

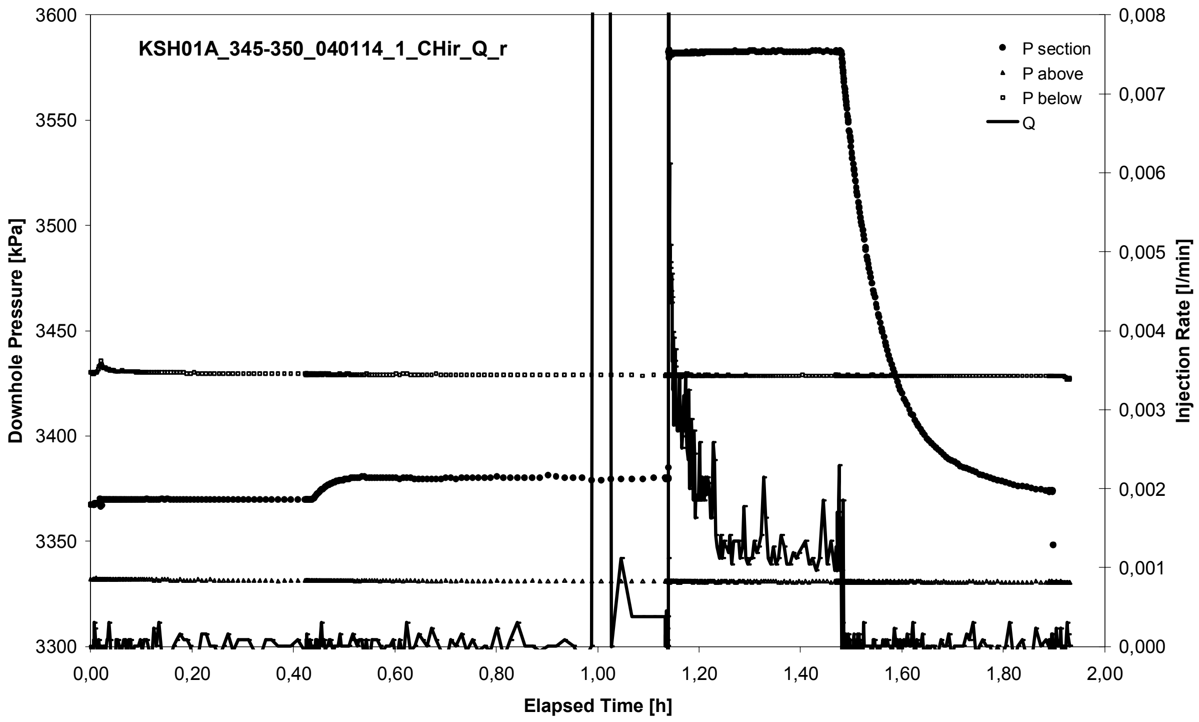


CHIR phase; HORNER match

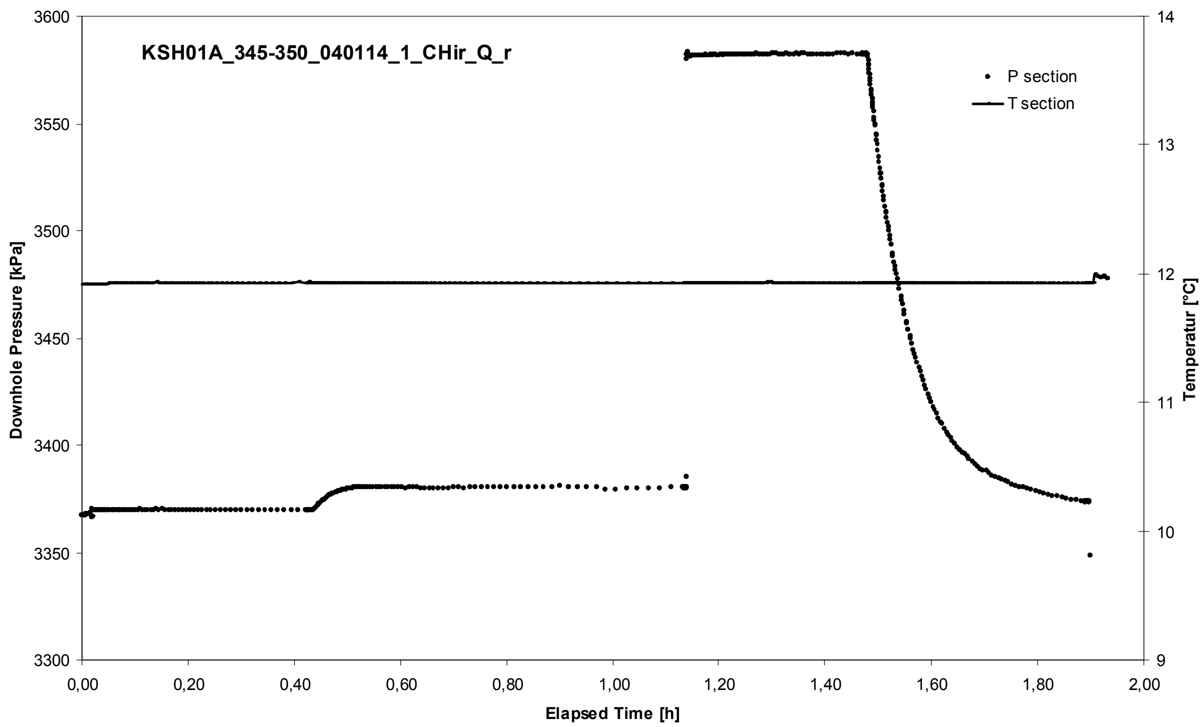
APPENDIX 2-64

Test 345 – 350 m

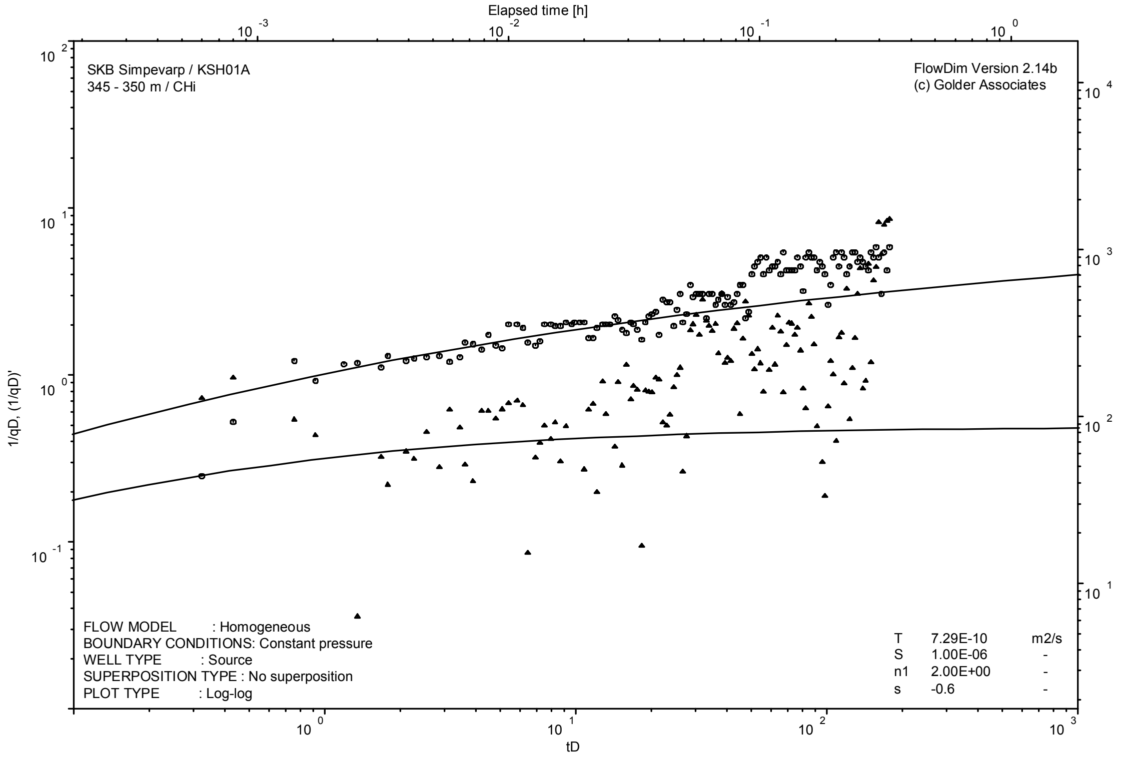
Analysis diagrams



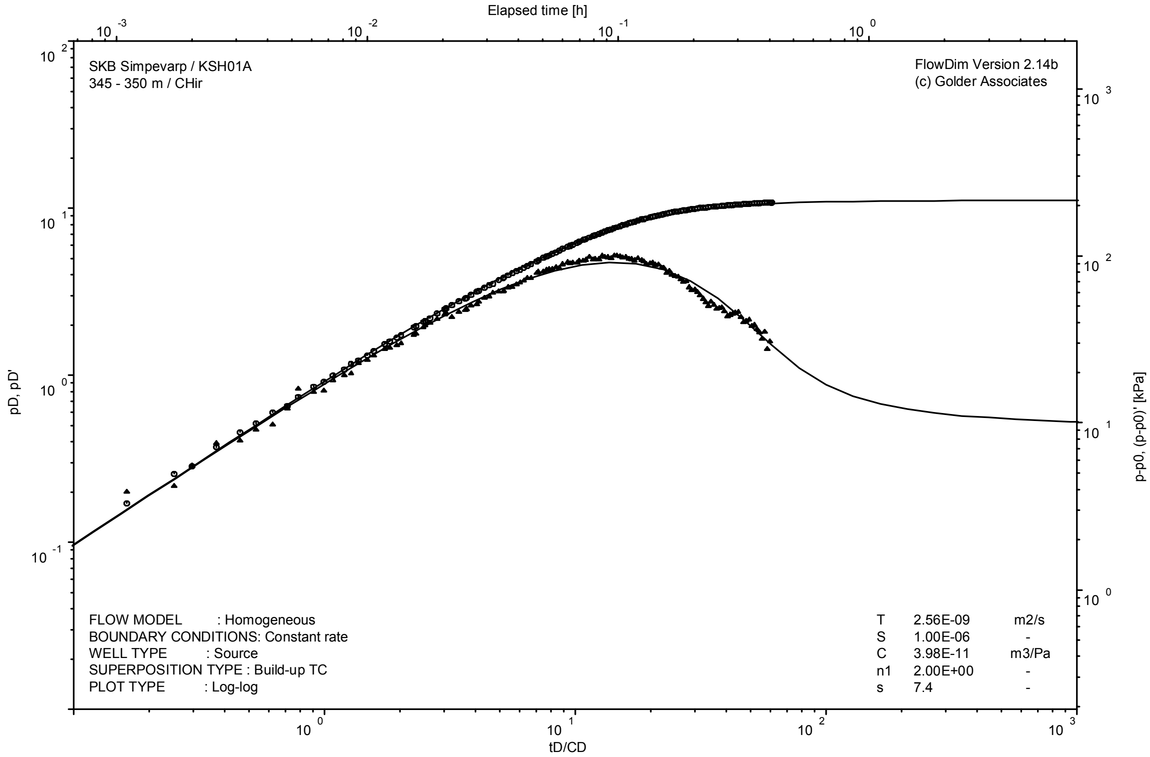
Pressure and flow rate vs. time; cartesian plot



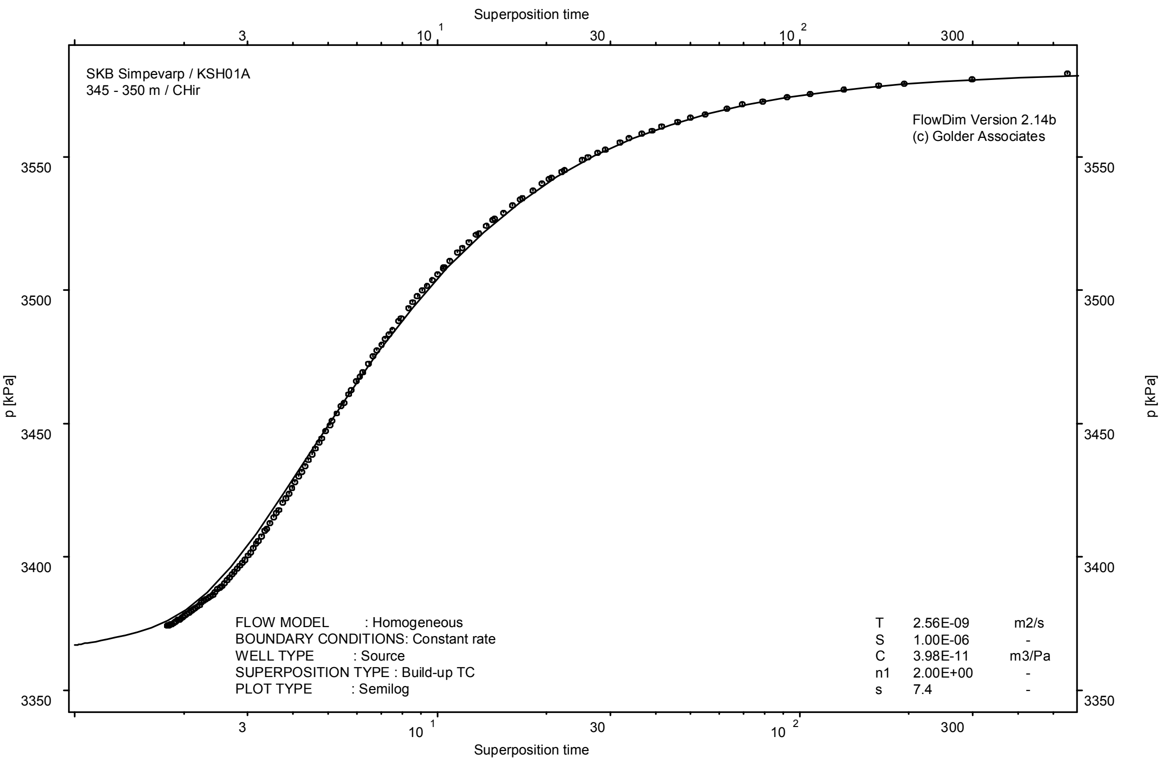
Interval pressure and temperature vs. time; cartesian plot



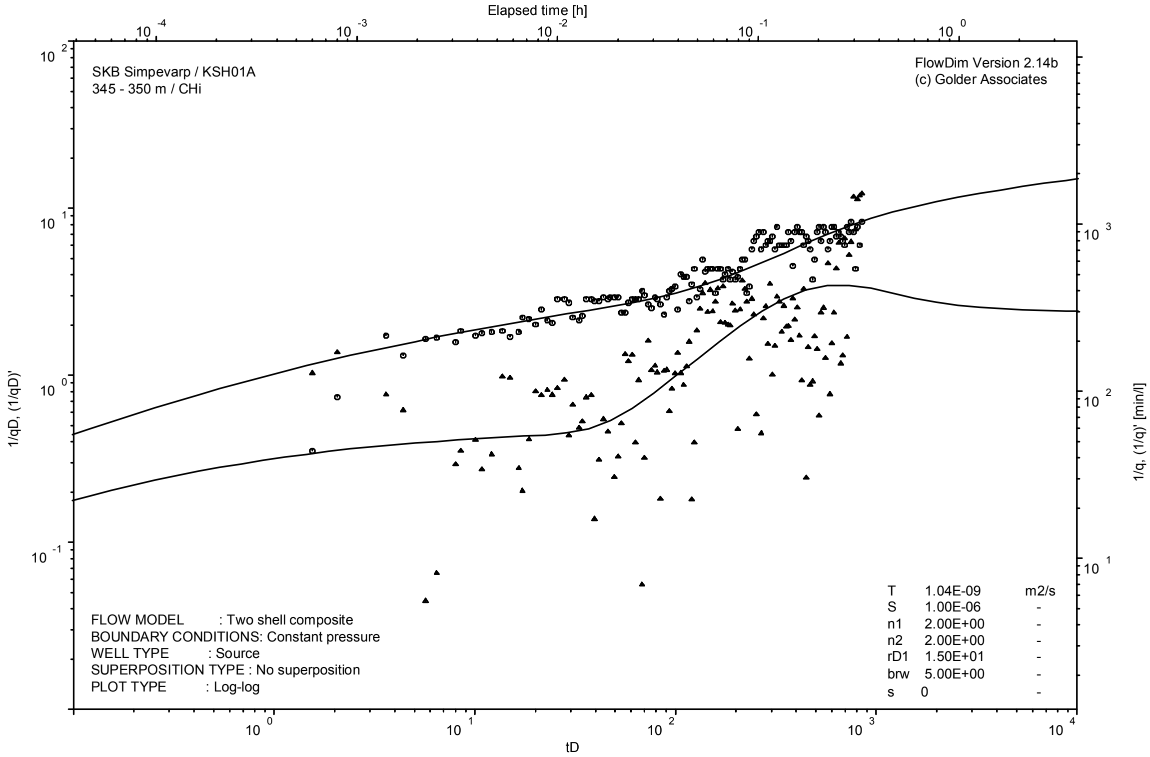
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

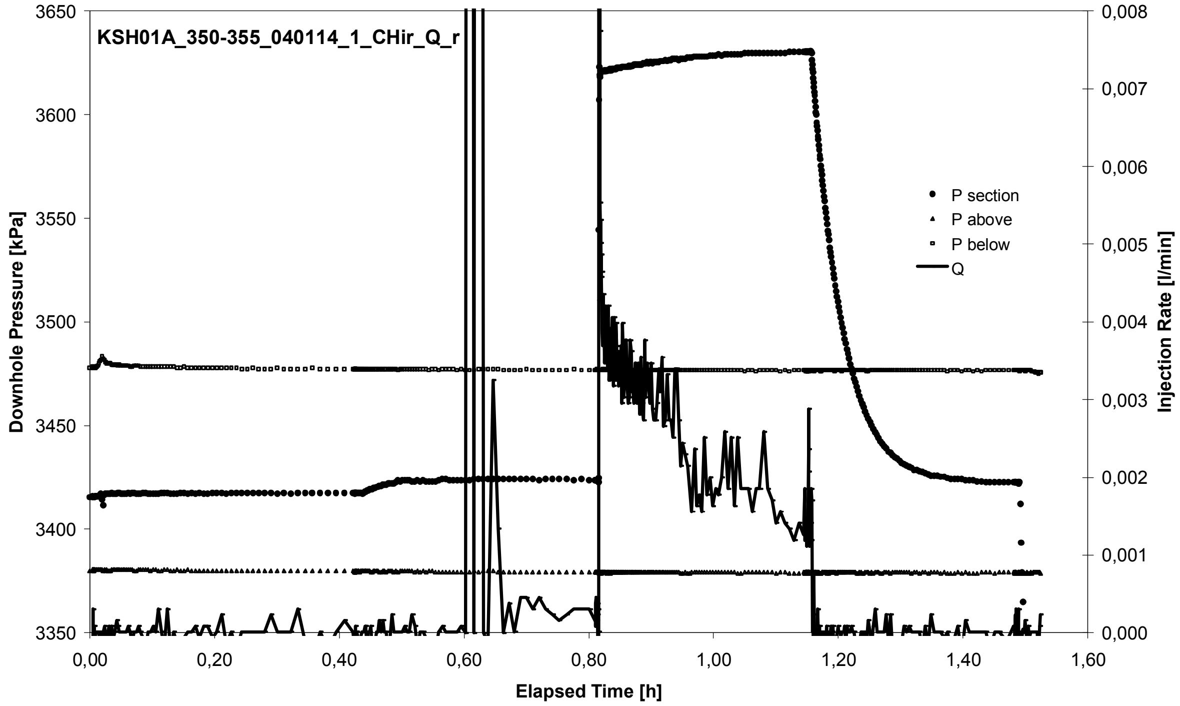


CHI phase, alternative log-log match

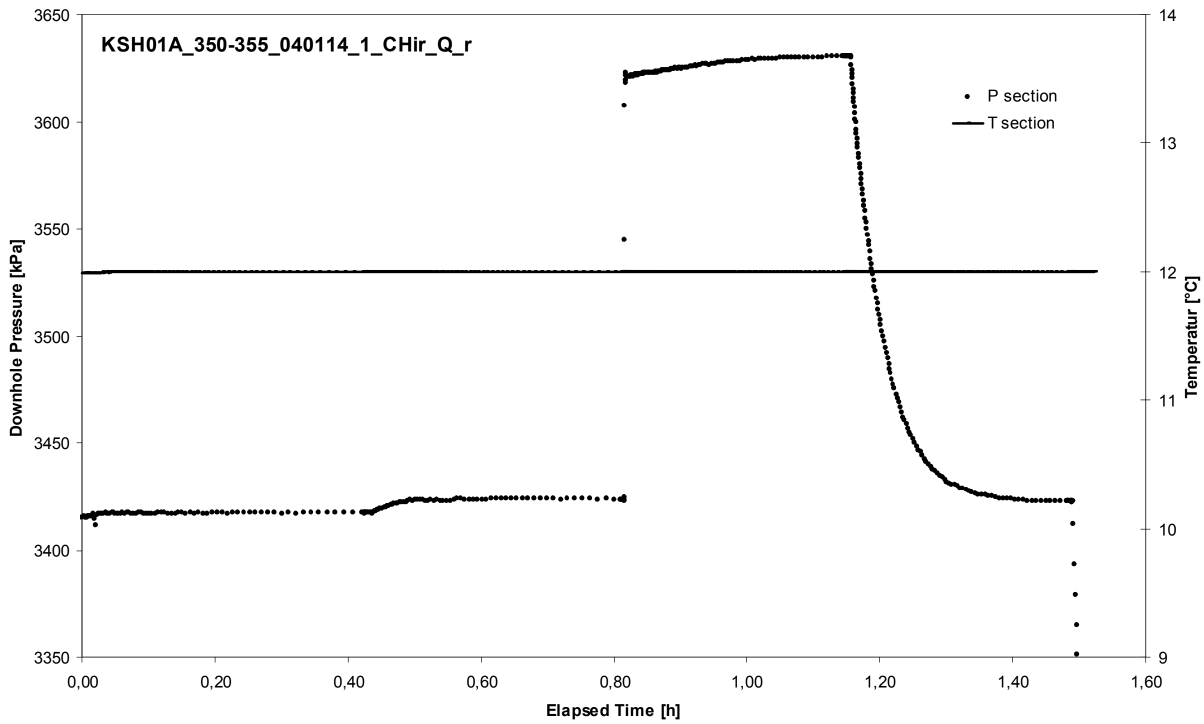
APPENDIX 2-65

Test 350 – 355 m

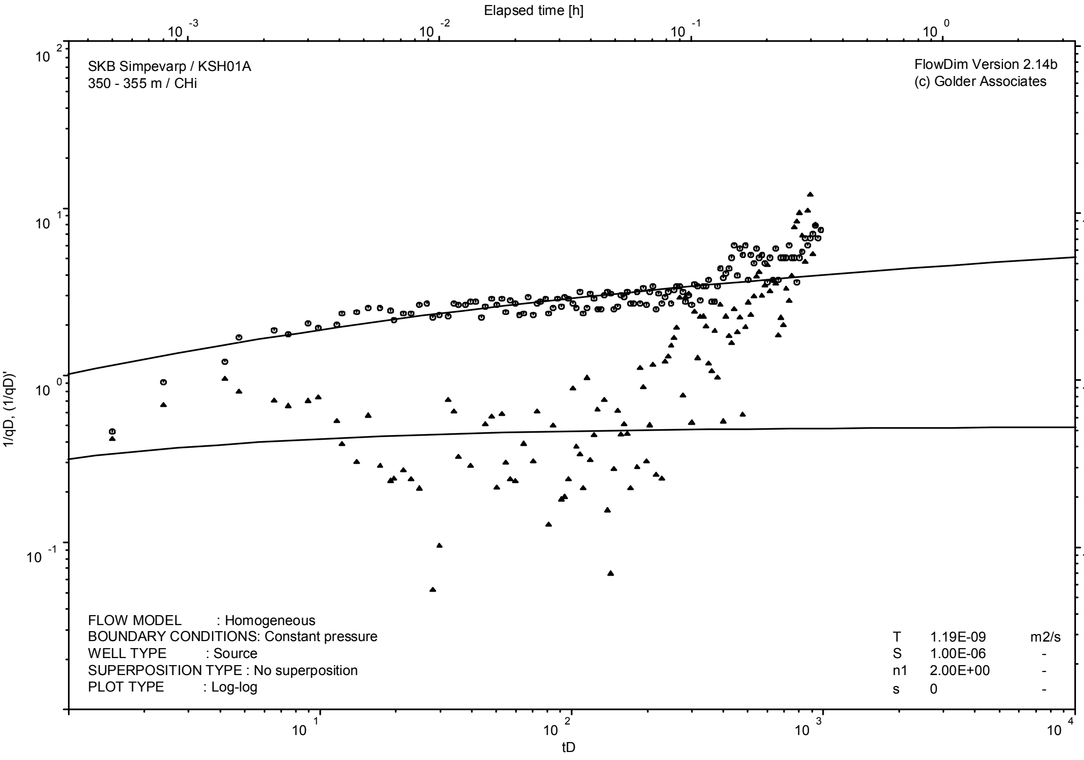
Analysis diagrams



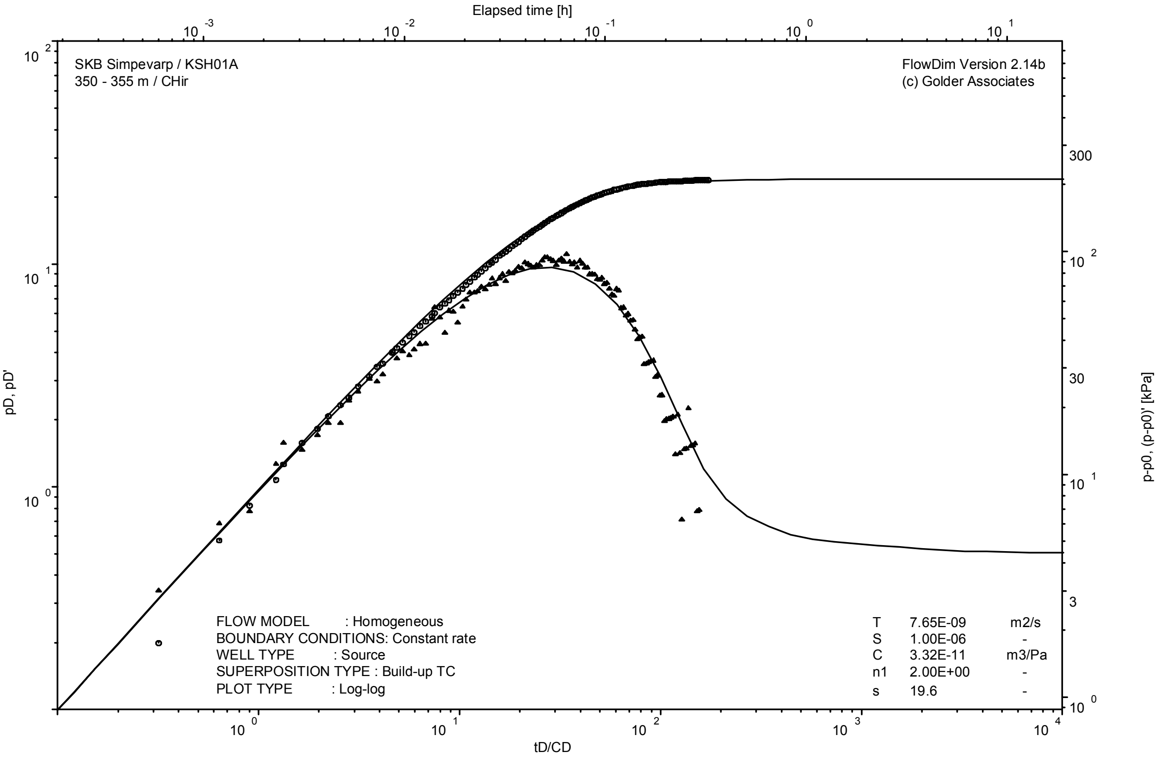
Pressure and flow rate vs. time; cartesian plot



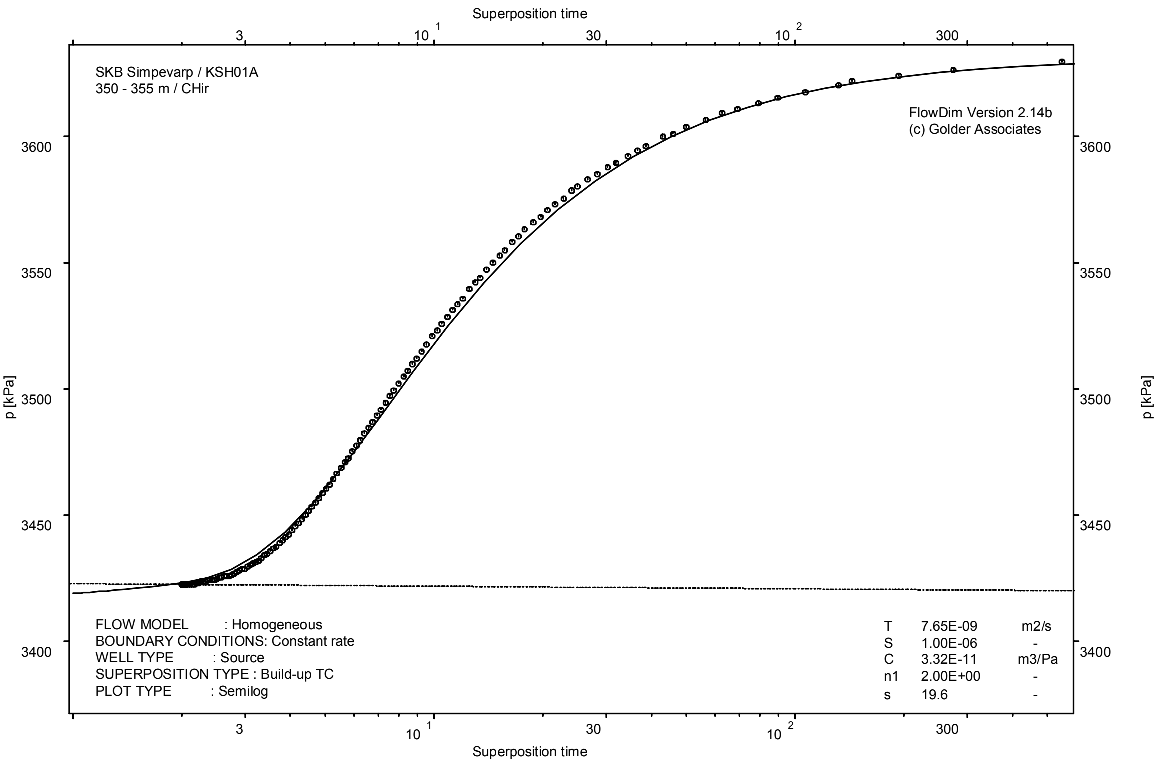
Interval pressure and temperature vs. time; cartesian plot



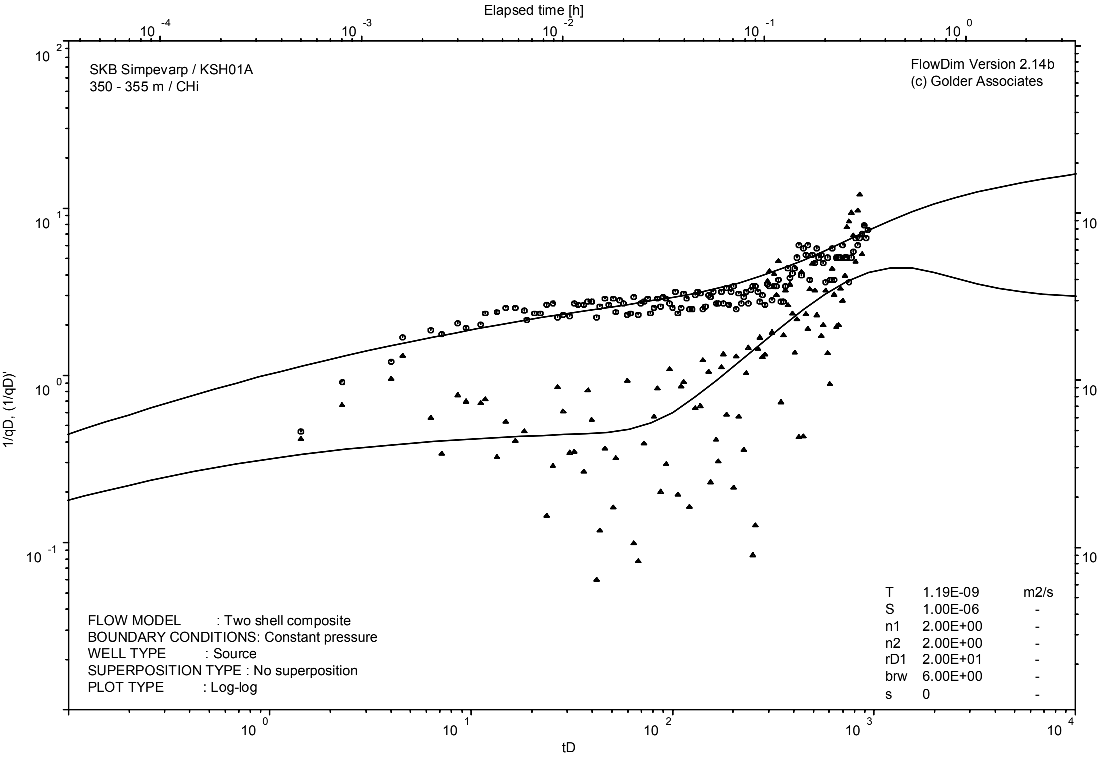
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

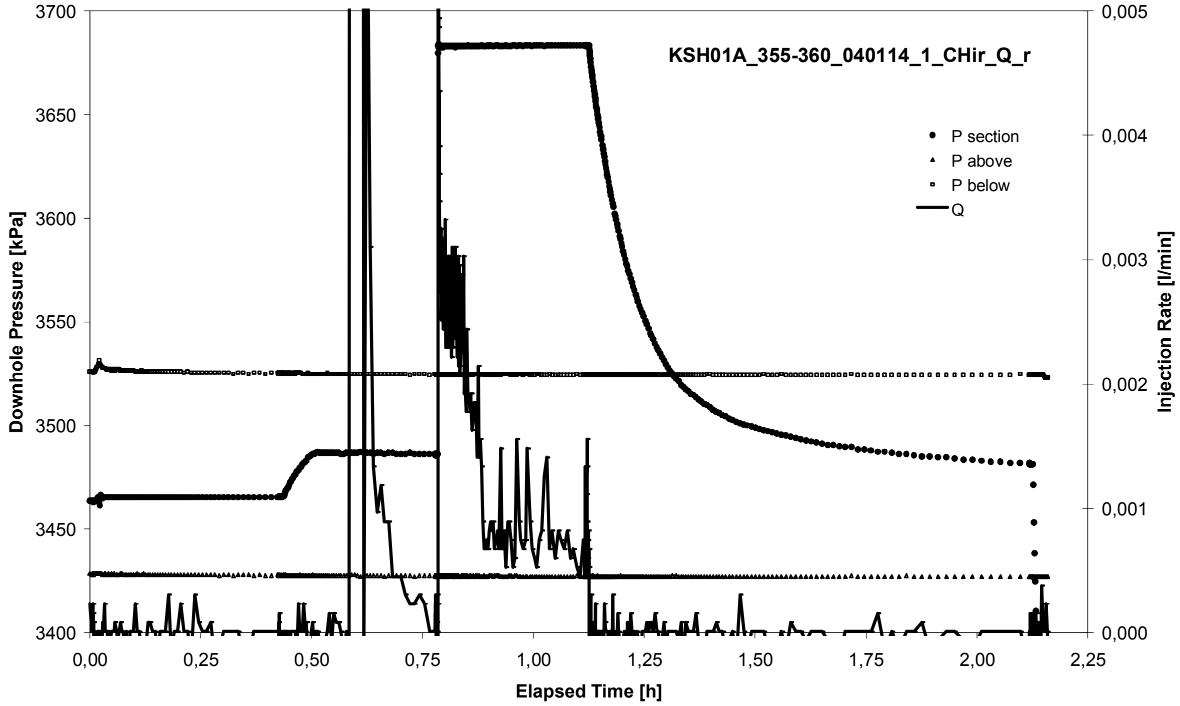


CHI phase, alternative log-log match

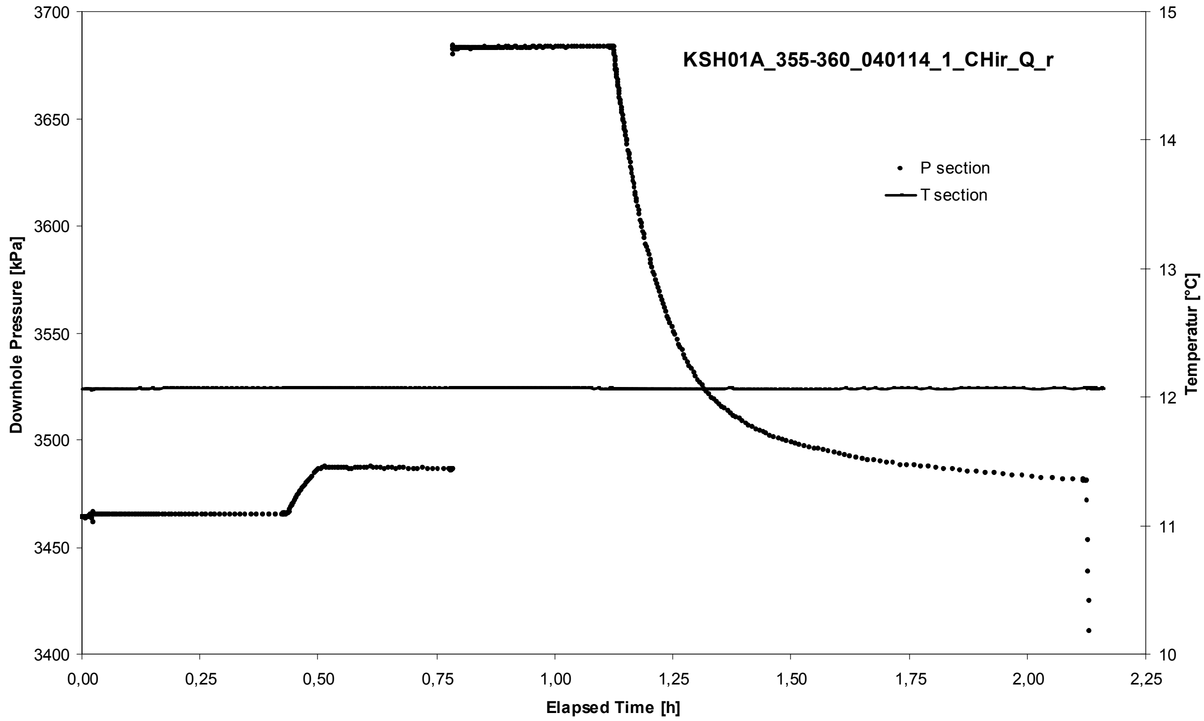
APPENDIX 2-66

Test 355 – 360 m

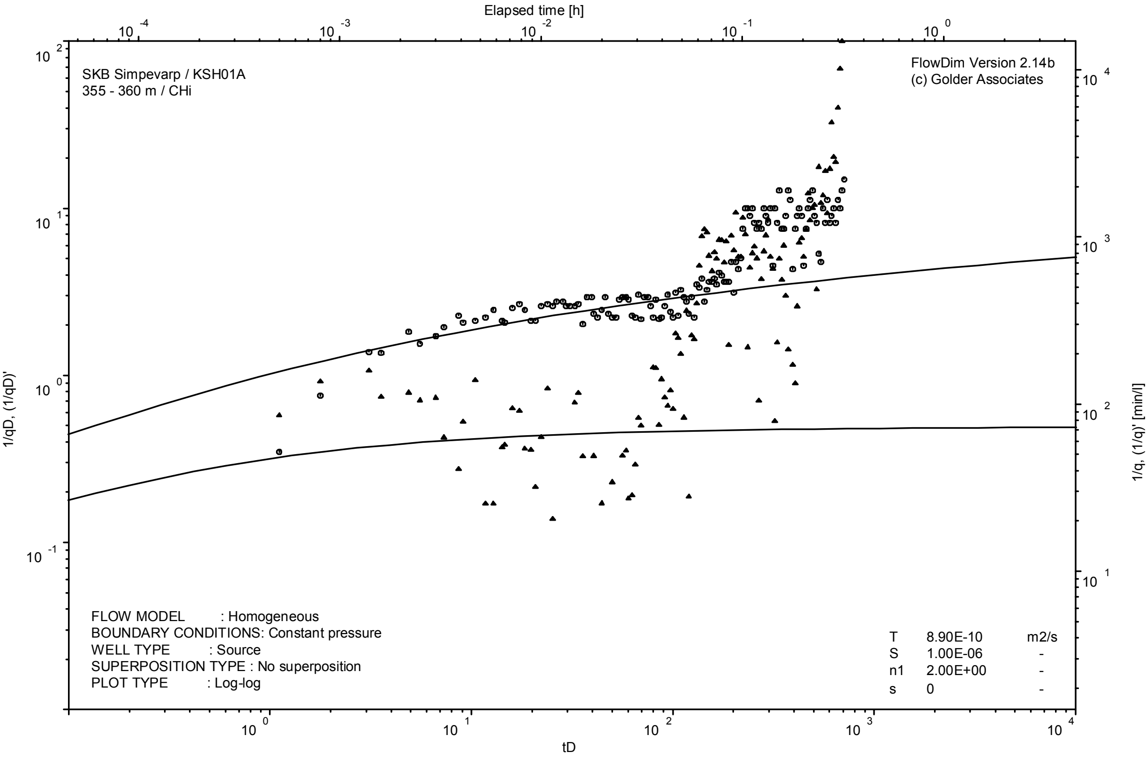
Analysis diagrams



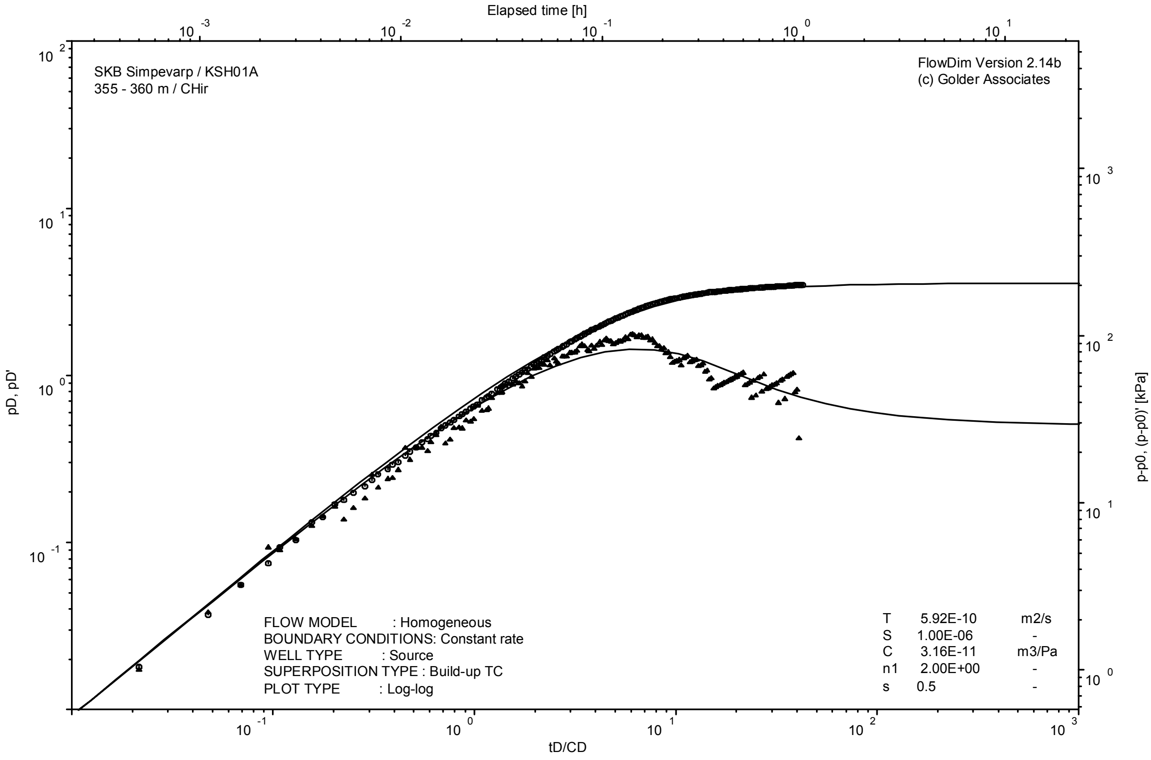
Pressure and flow rate vs. time; cartesian plot



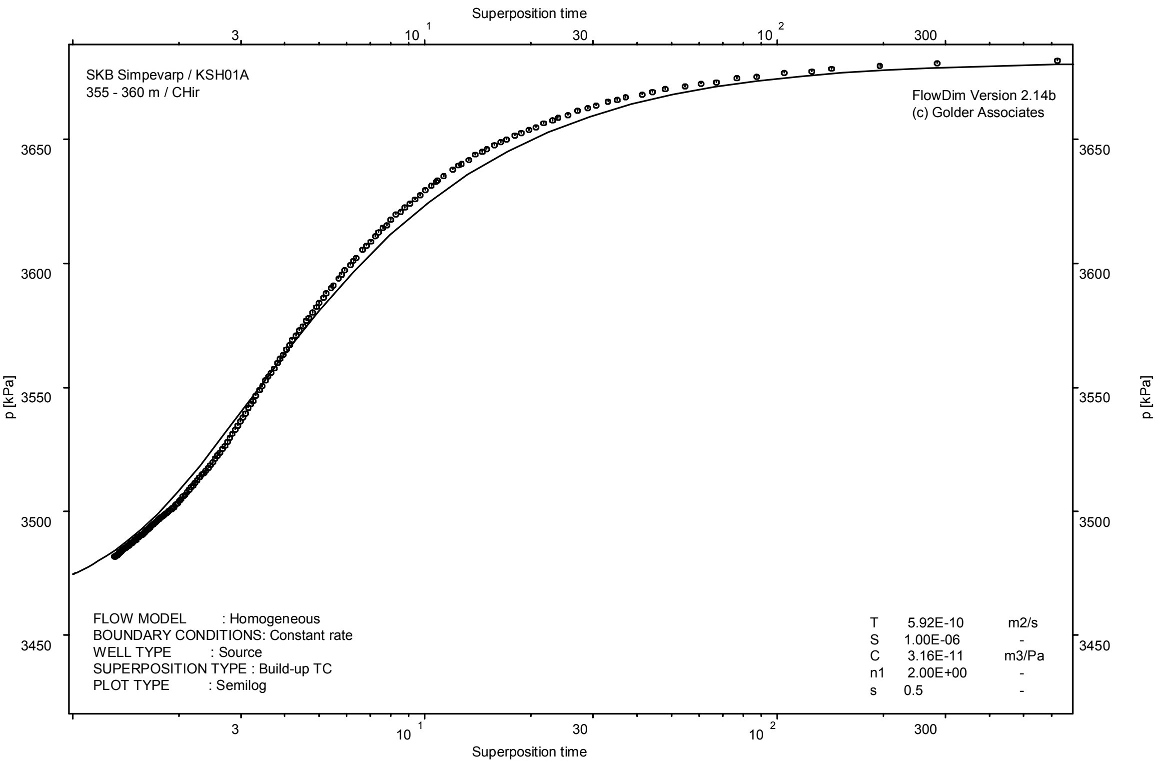
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

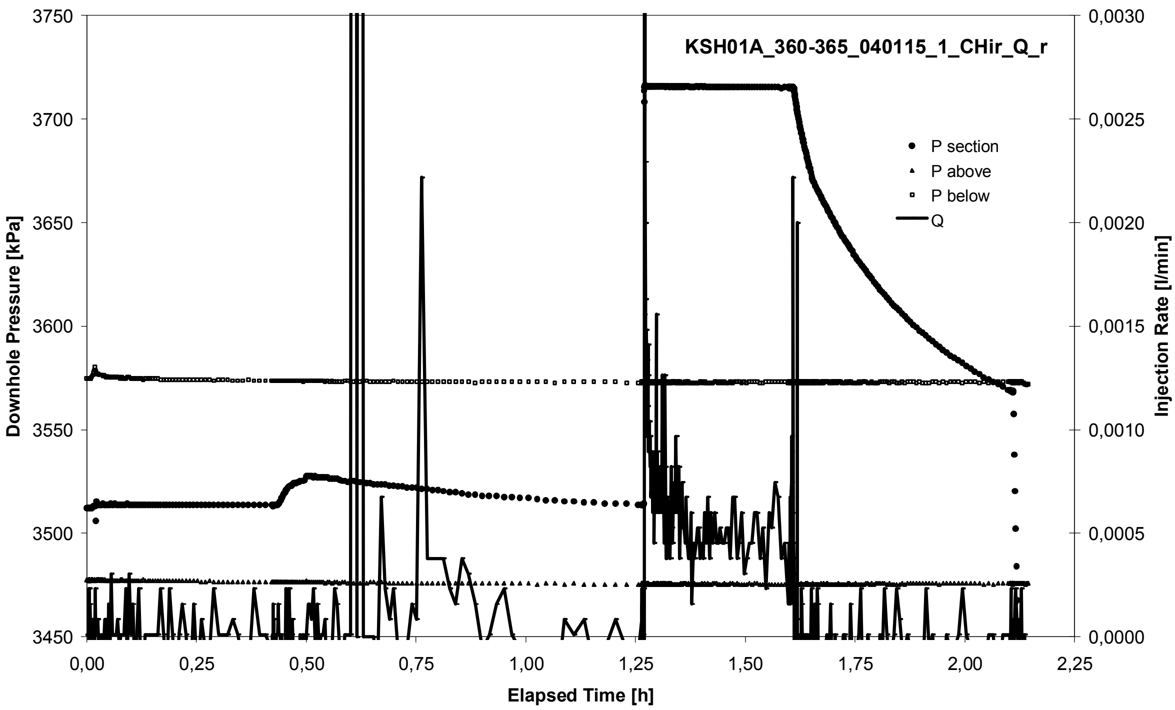


CHIR phase; HORNER match

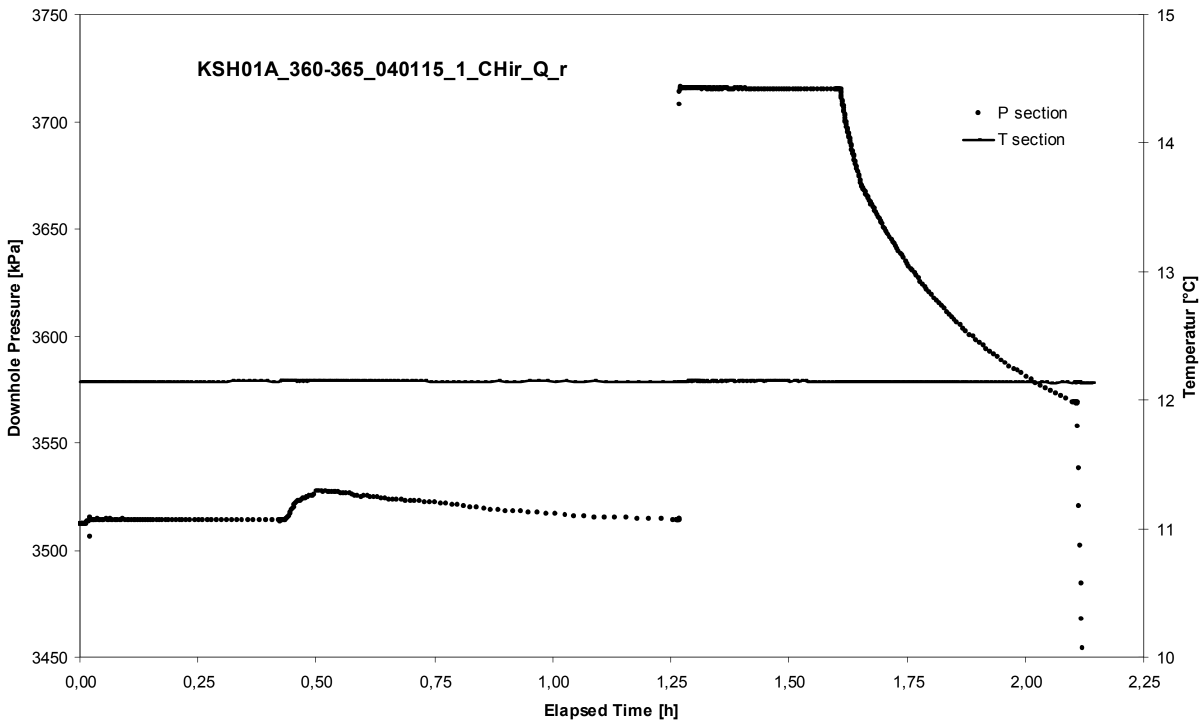
APPENDIX 2-67

Test 360 – 365 m

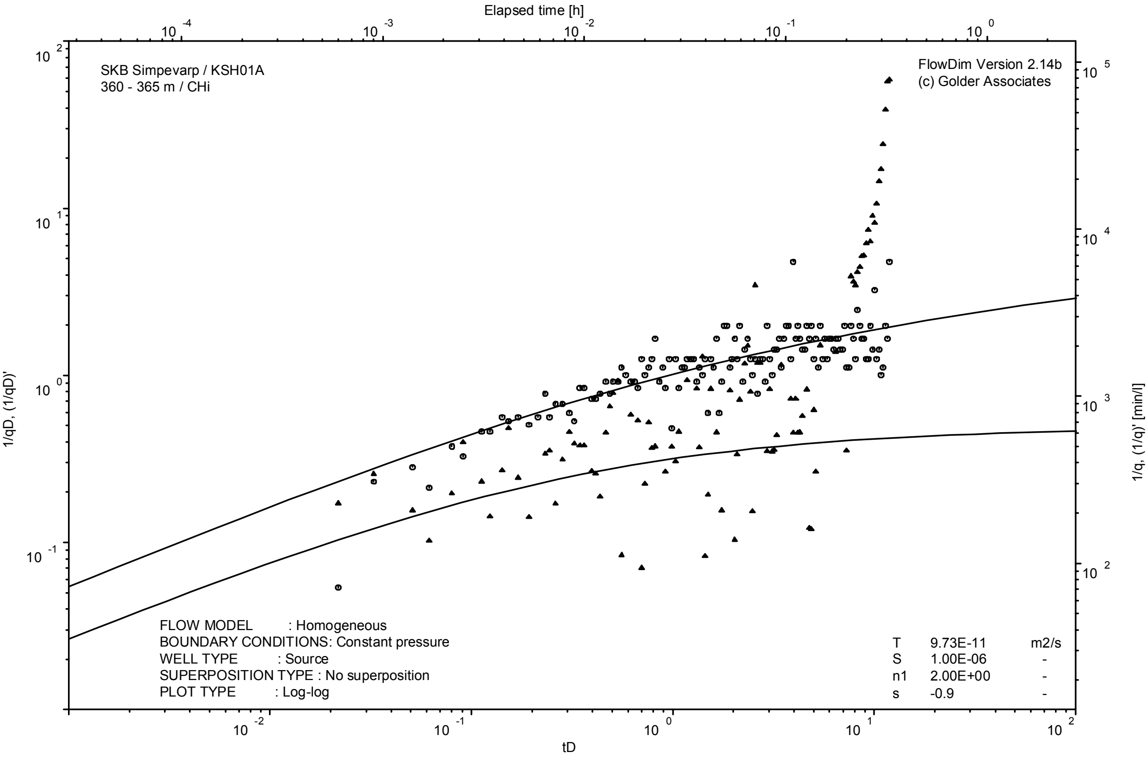
Analysis diagrams



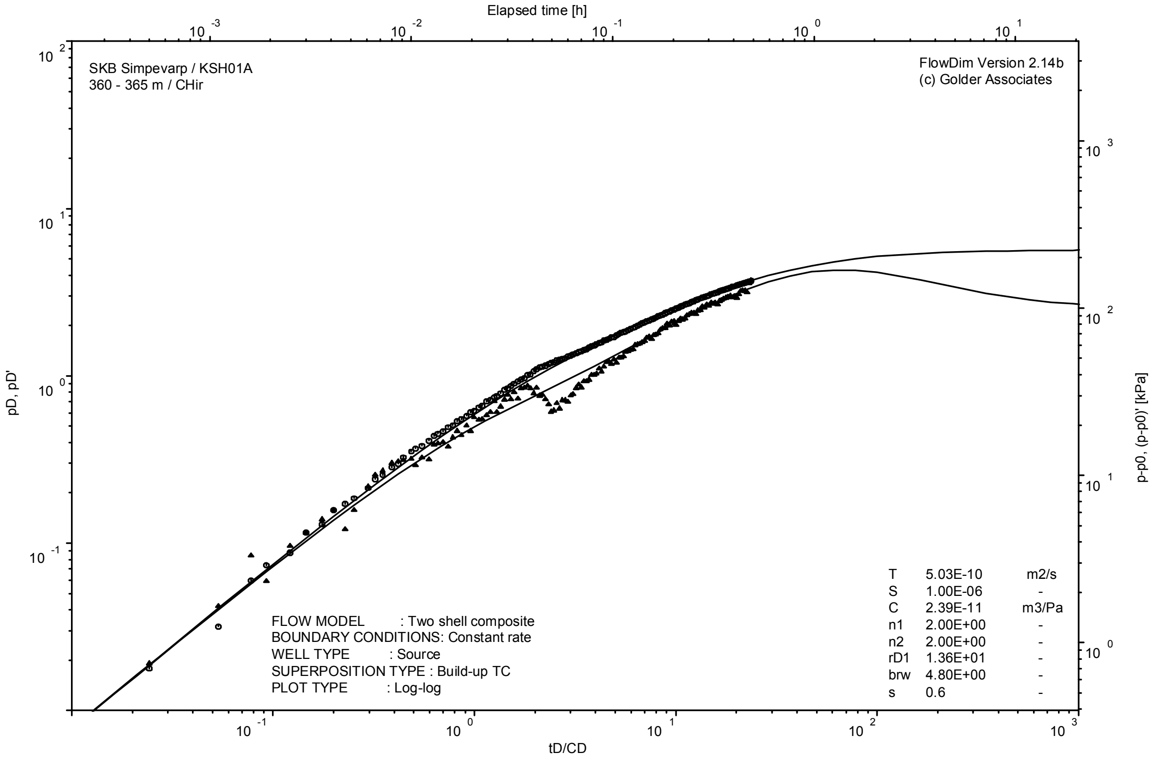
Pressure and flow rate vs. time; cartesian plot



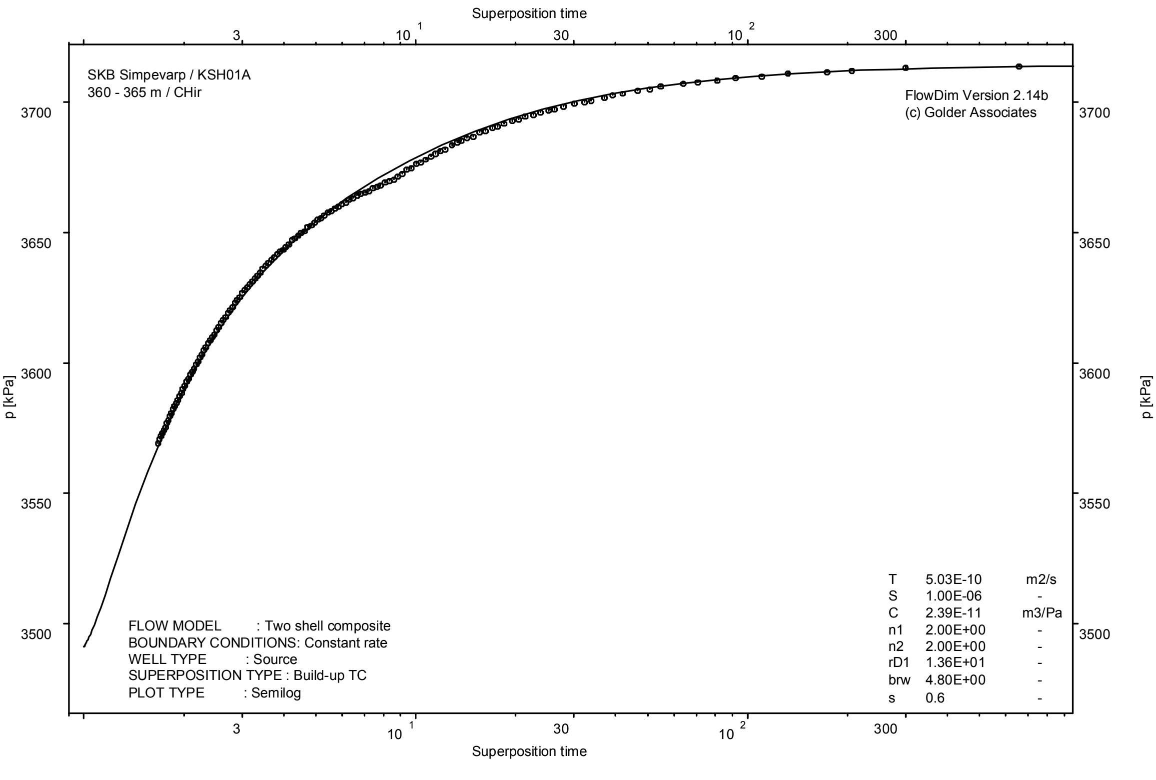
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

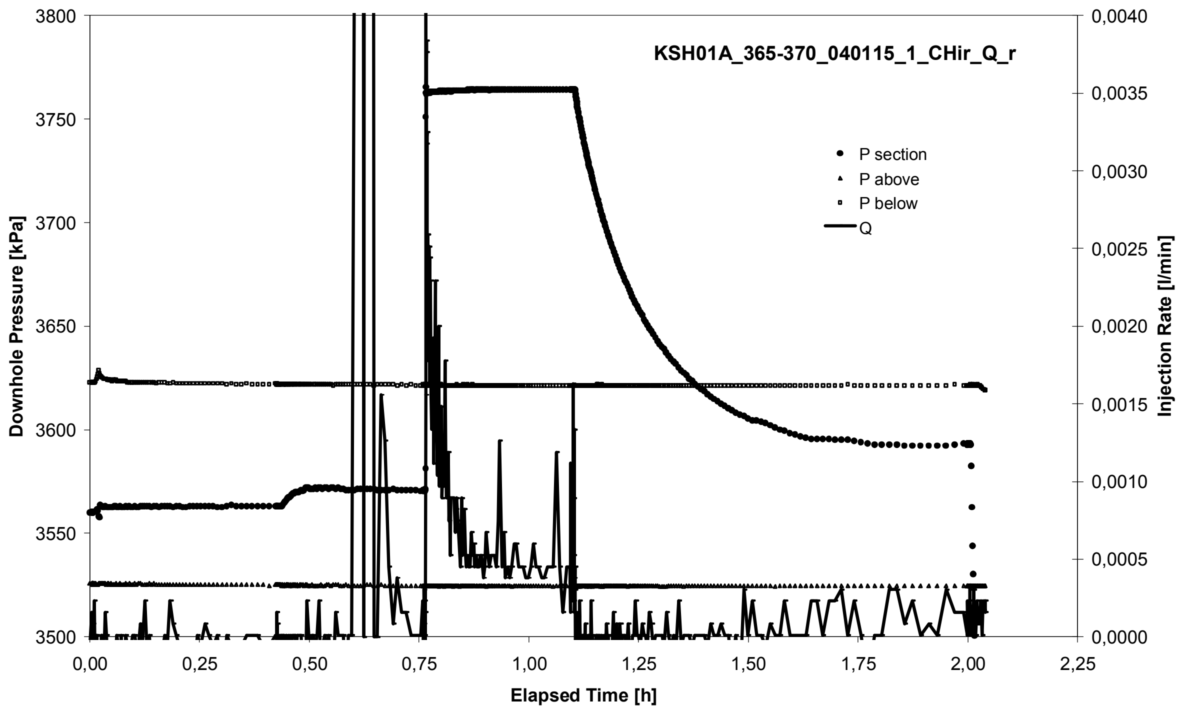


CHIR phase; HORNER match

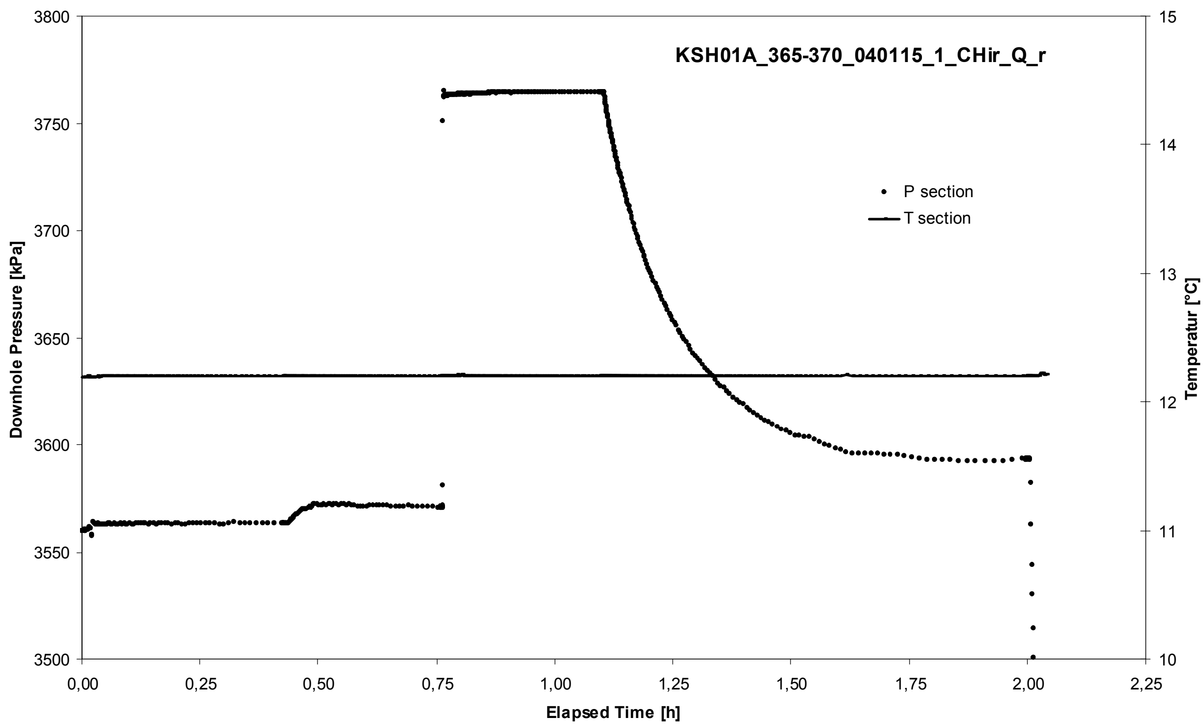
APPENDIX 2-68

Test 365 – 370 m

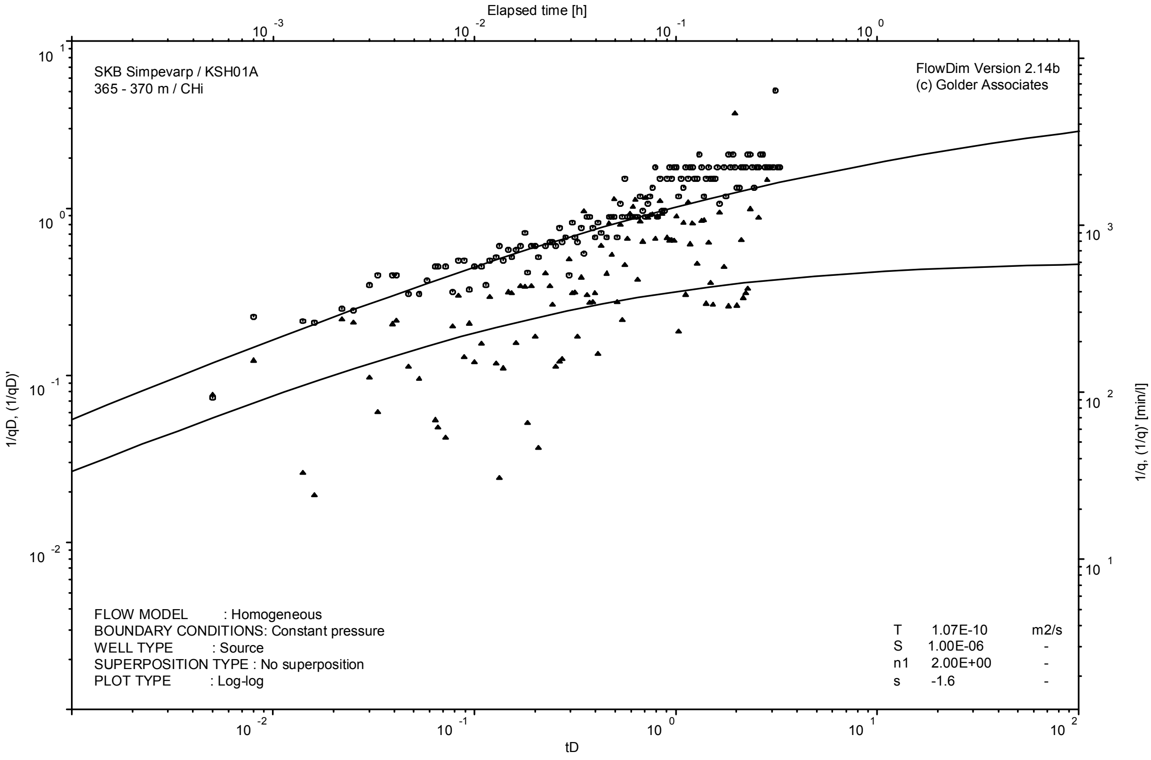
Analysis diagrams



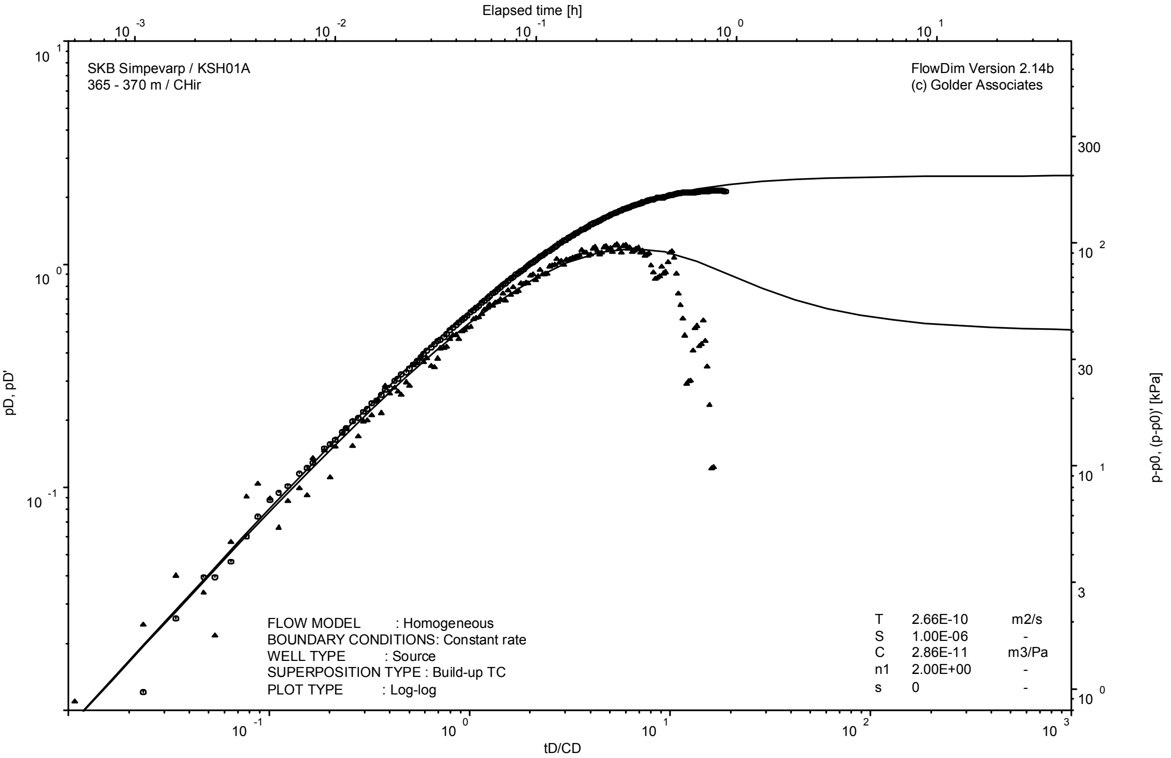
Pressure and flow rate vs. time; cartesian plot



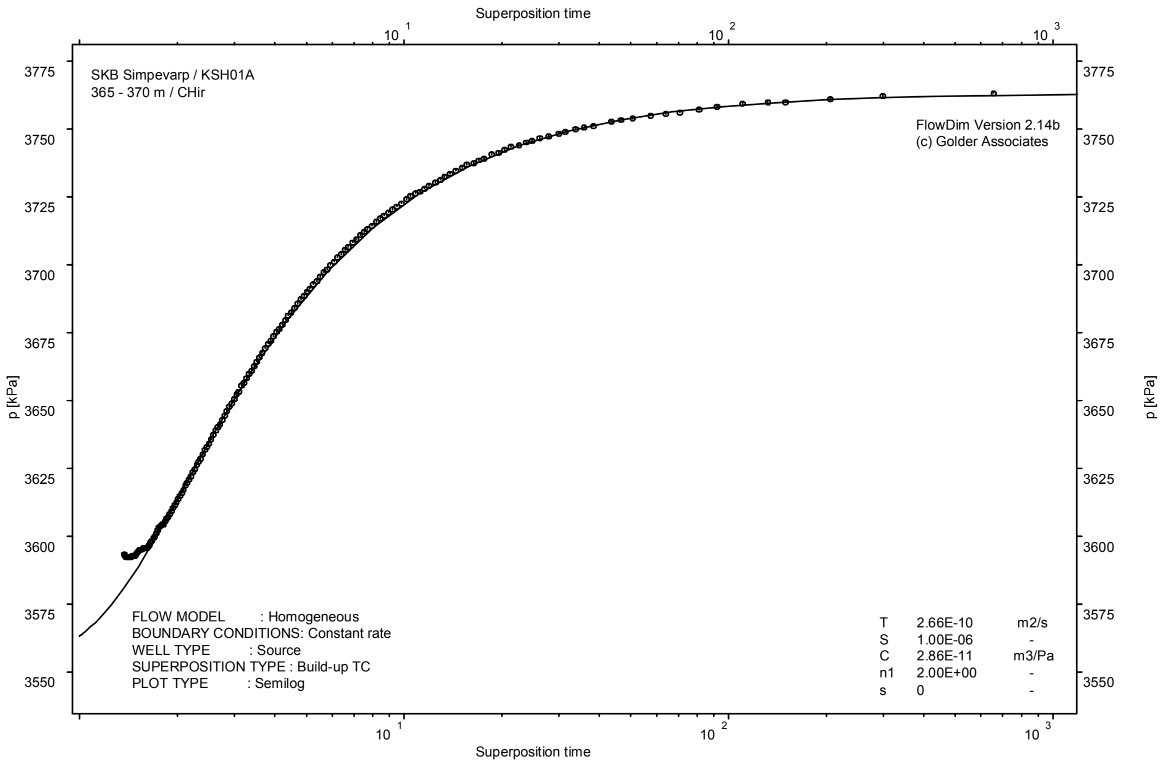
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

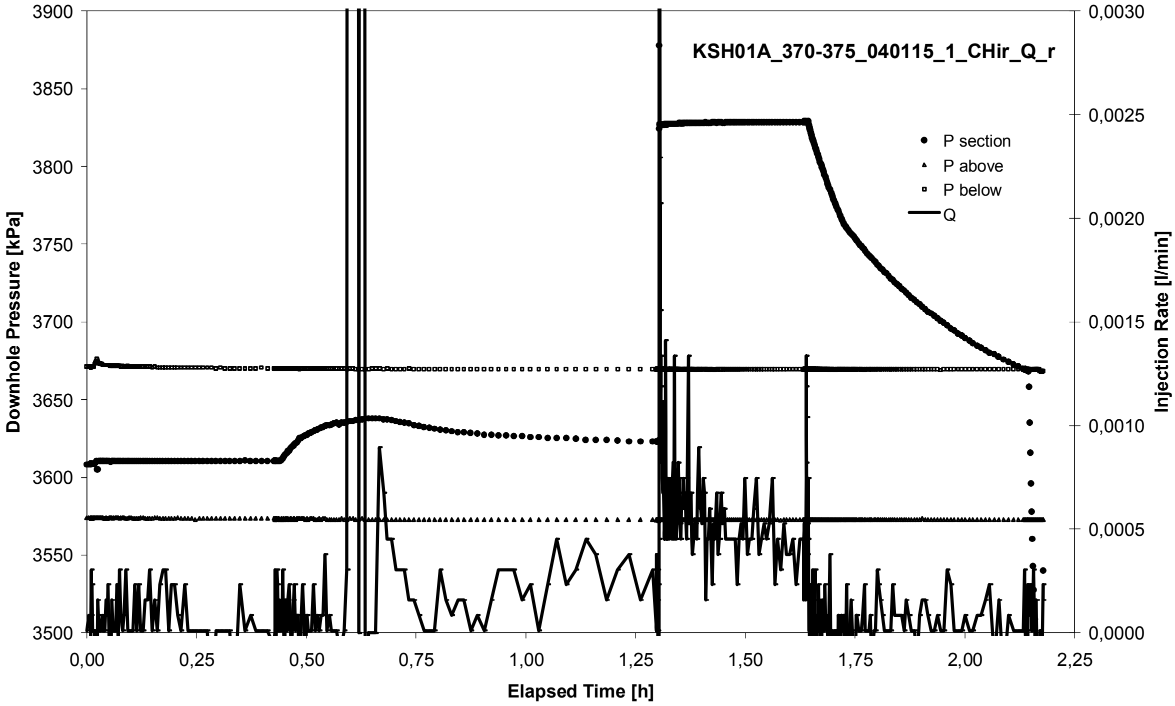


CHIR phase; HORNER match

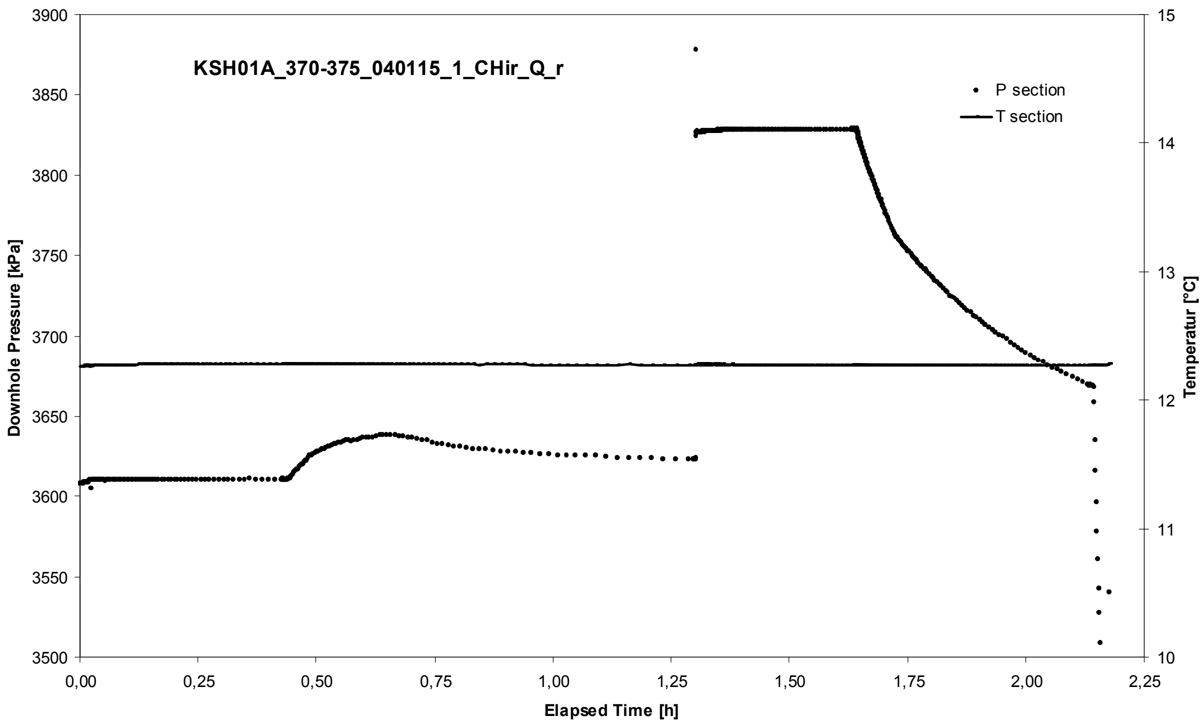
APPENDIX 2-69

Test 370 – 375 m

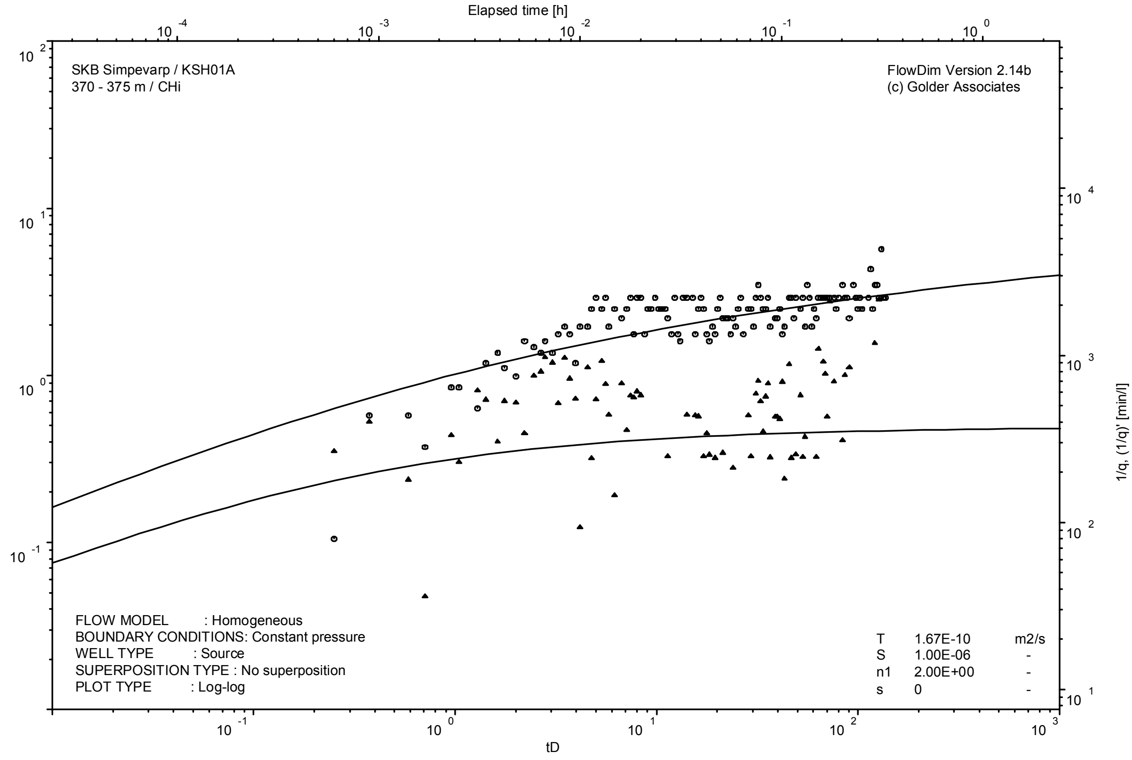
Analysis diagrams



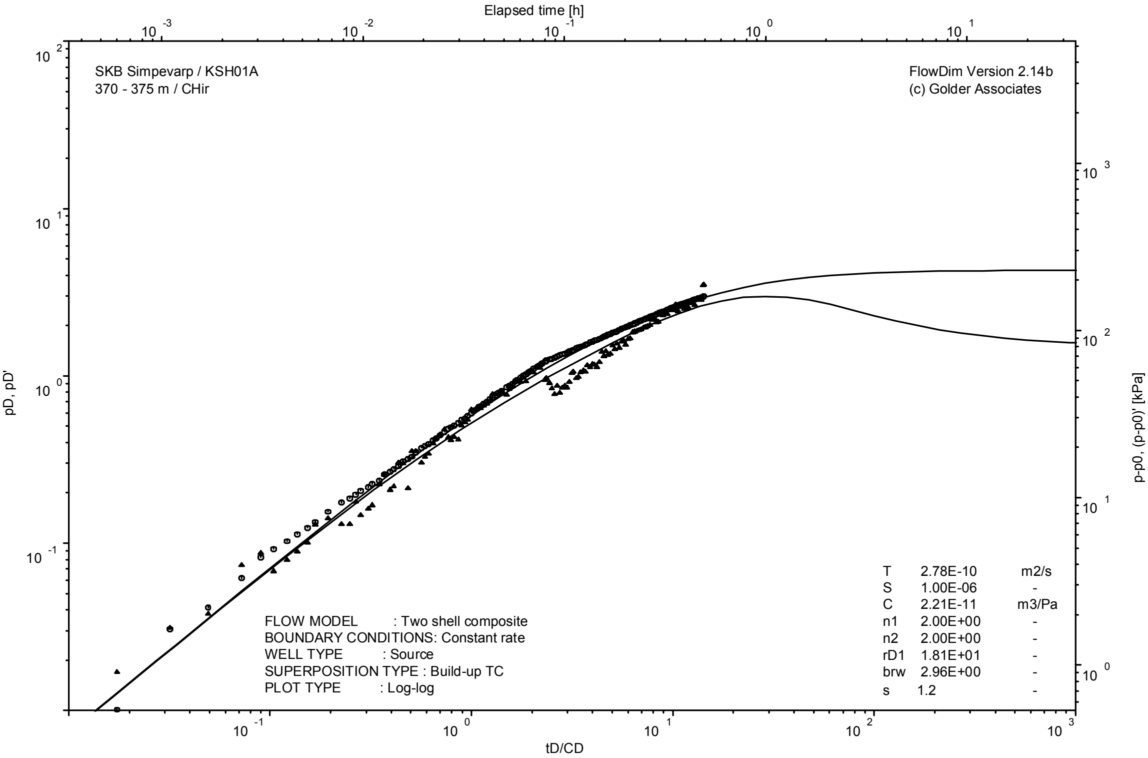
Pressure and flow rate vs. time; cartesian plot



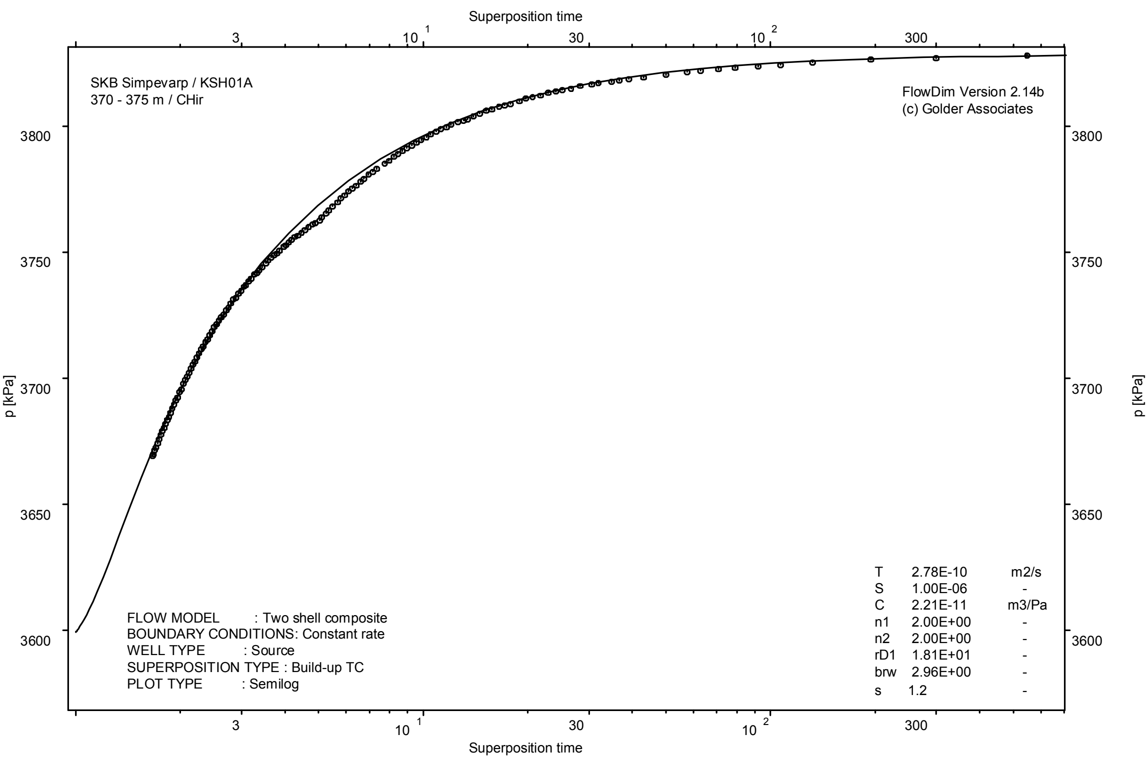
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

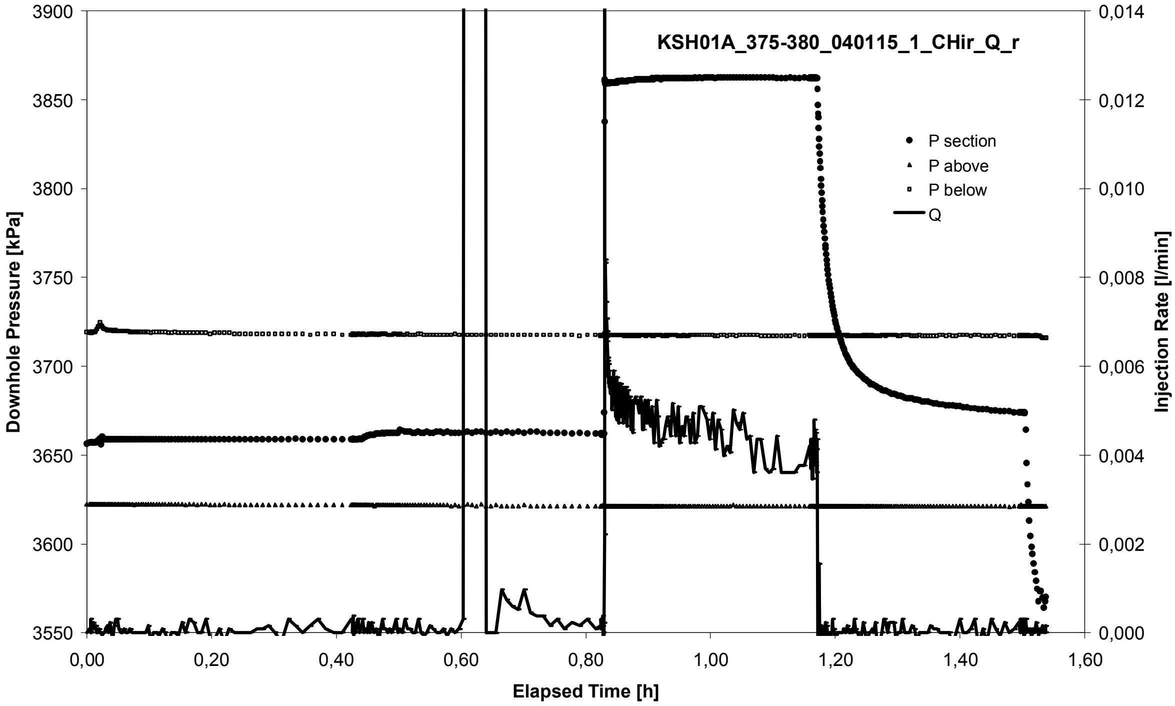


CHIR phase; HORNER match

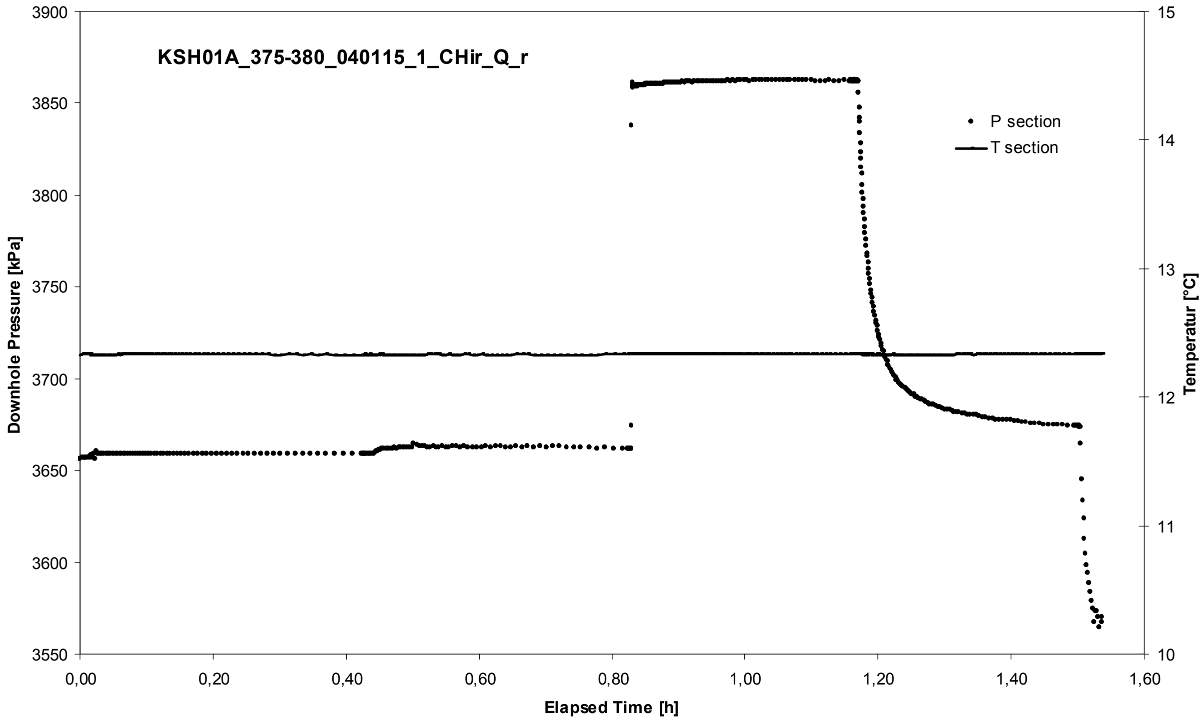
APPENDIX 2-70

Test 375 – 380 m

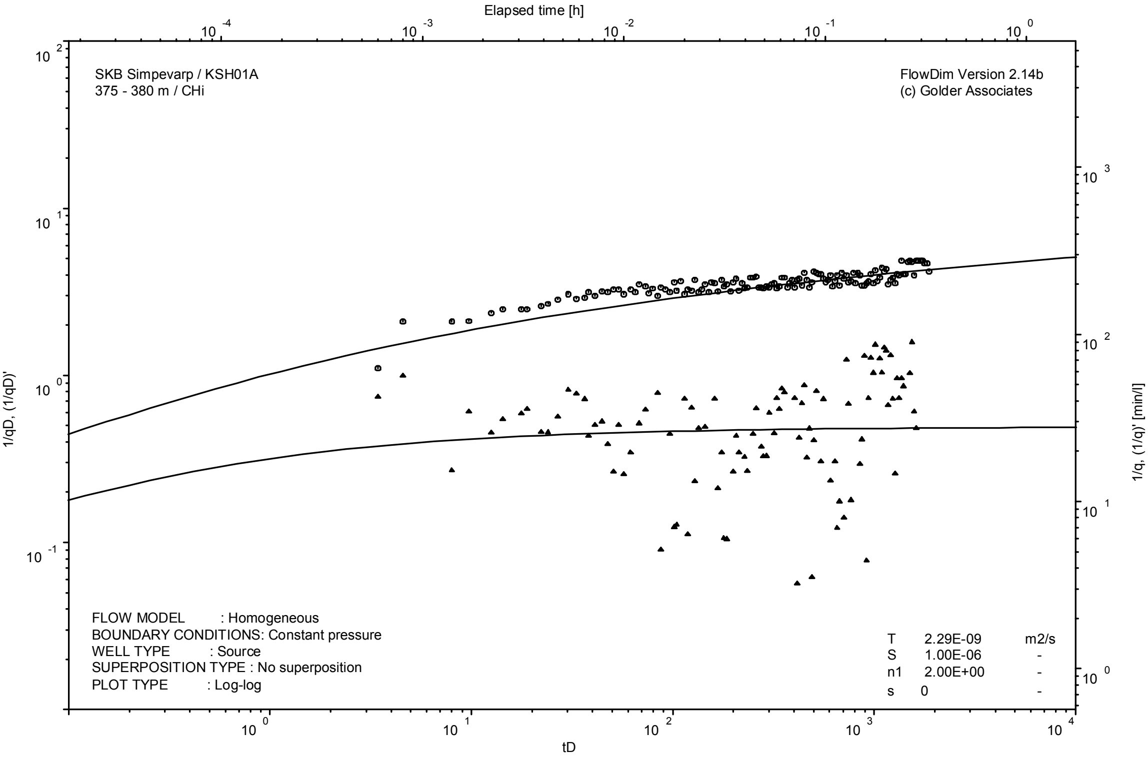
Analysis diagrams



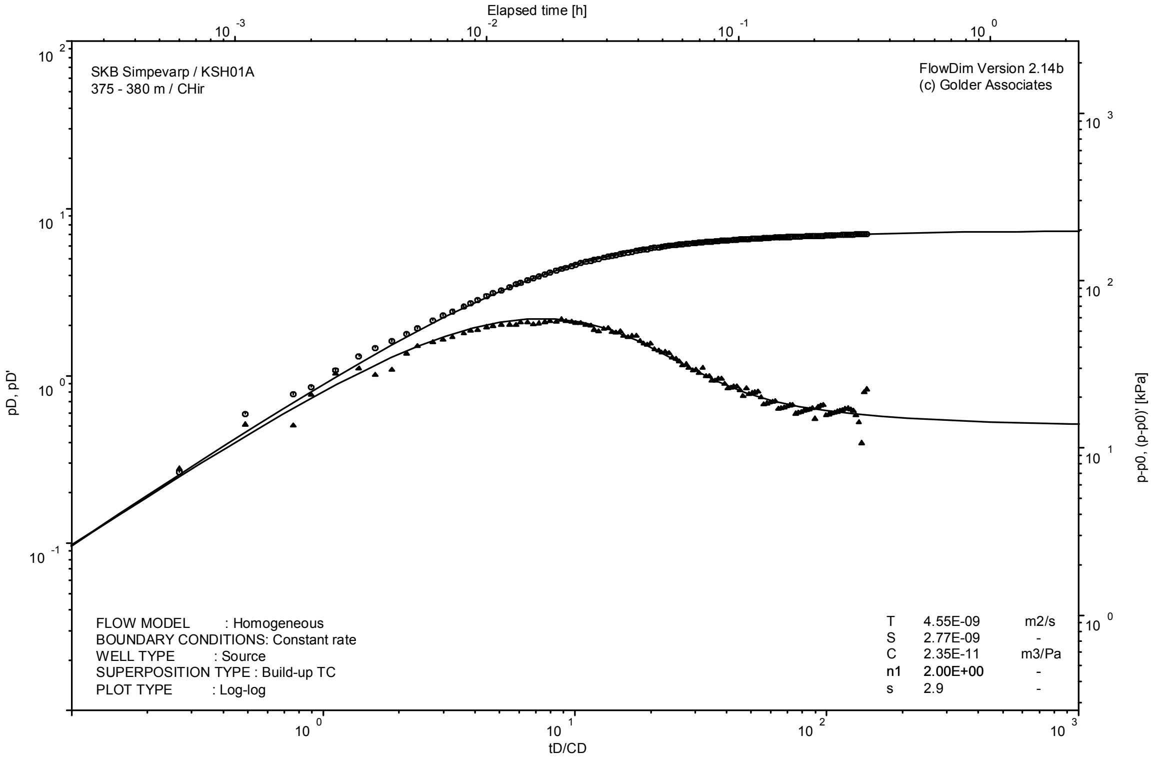
Pressure and flow rate vs. time; cartesian plot



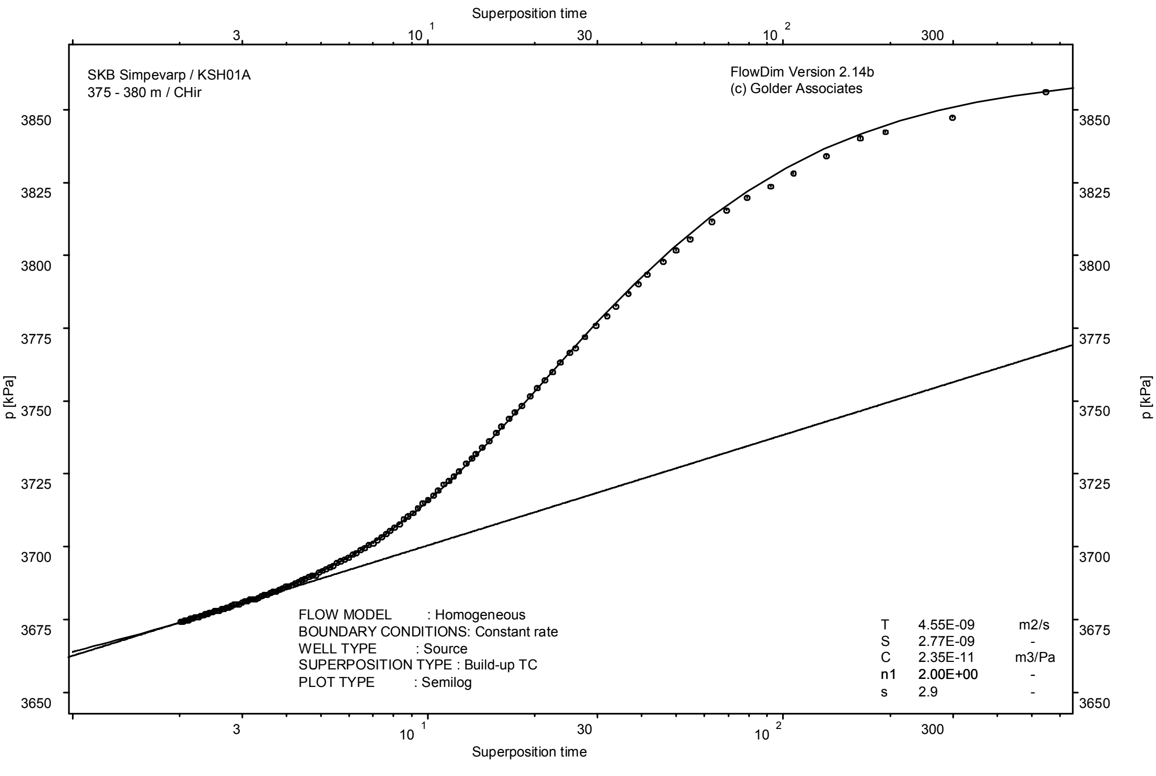
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

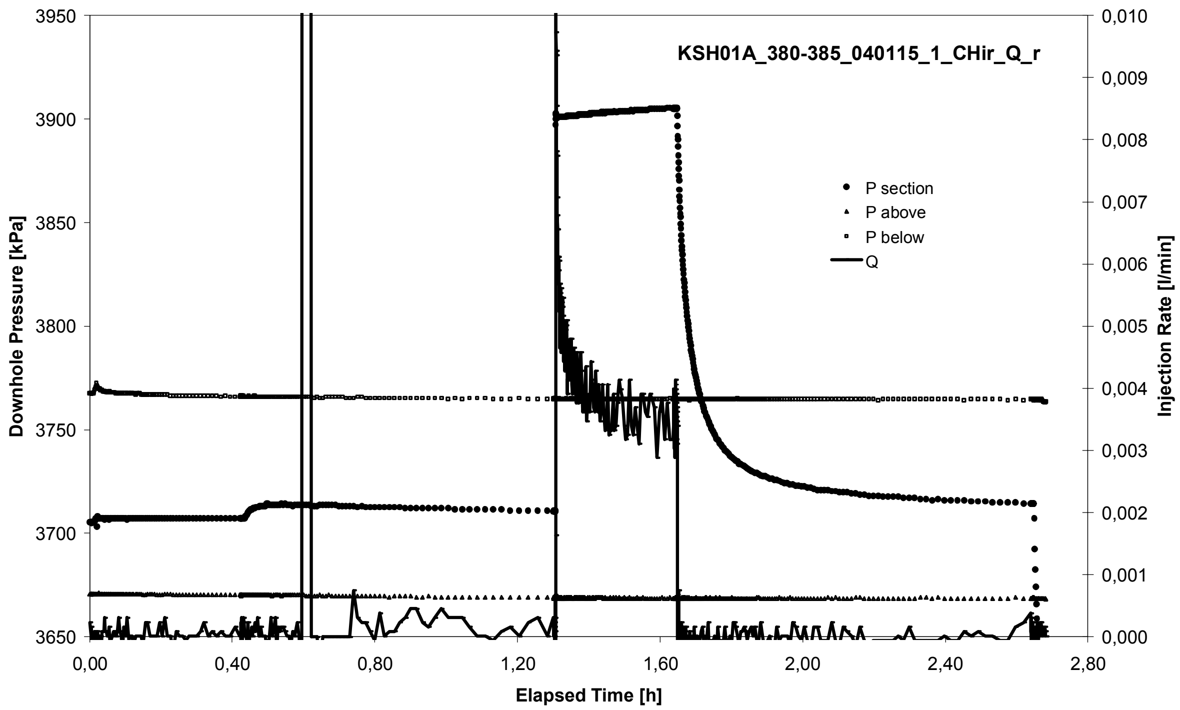


CHIR phase; HORNER match

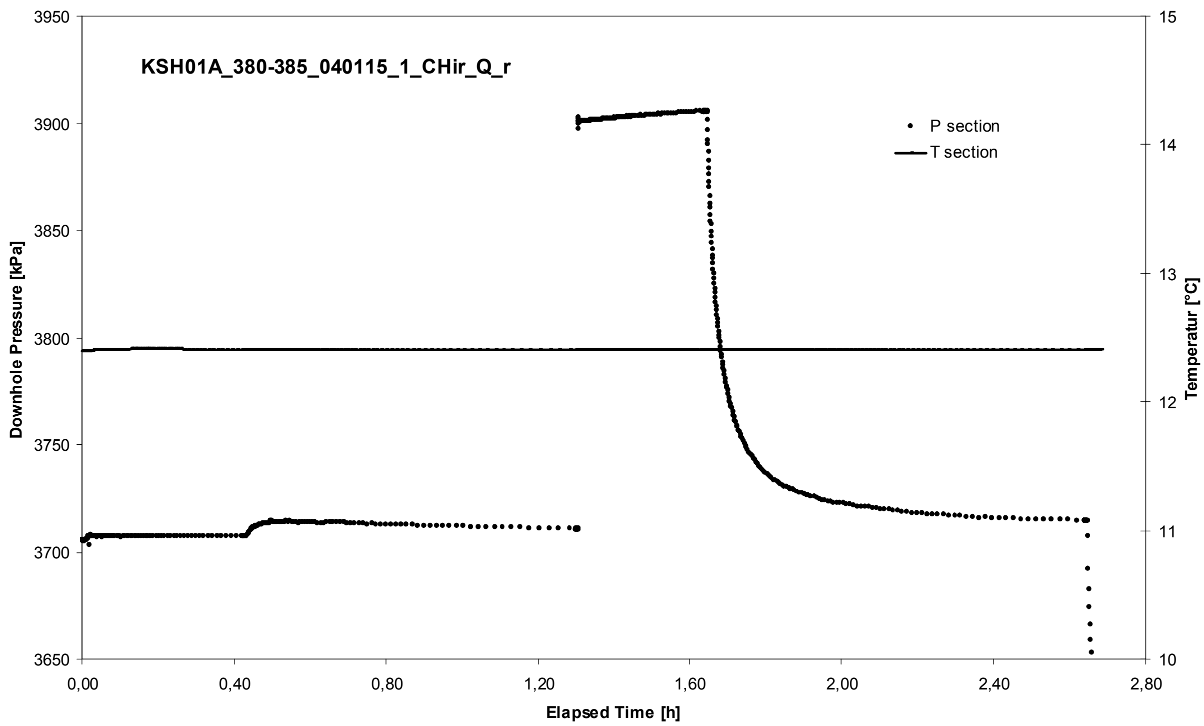
APPENDIX 2-71

Test 380 – 385 m

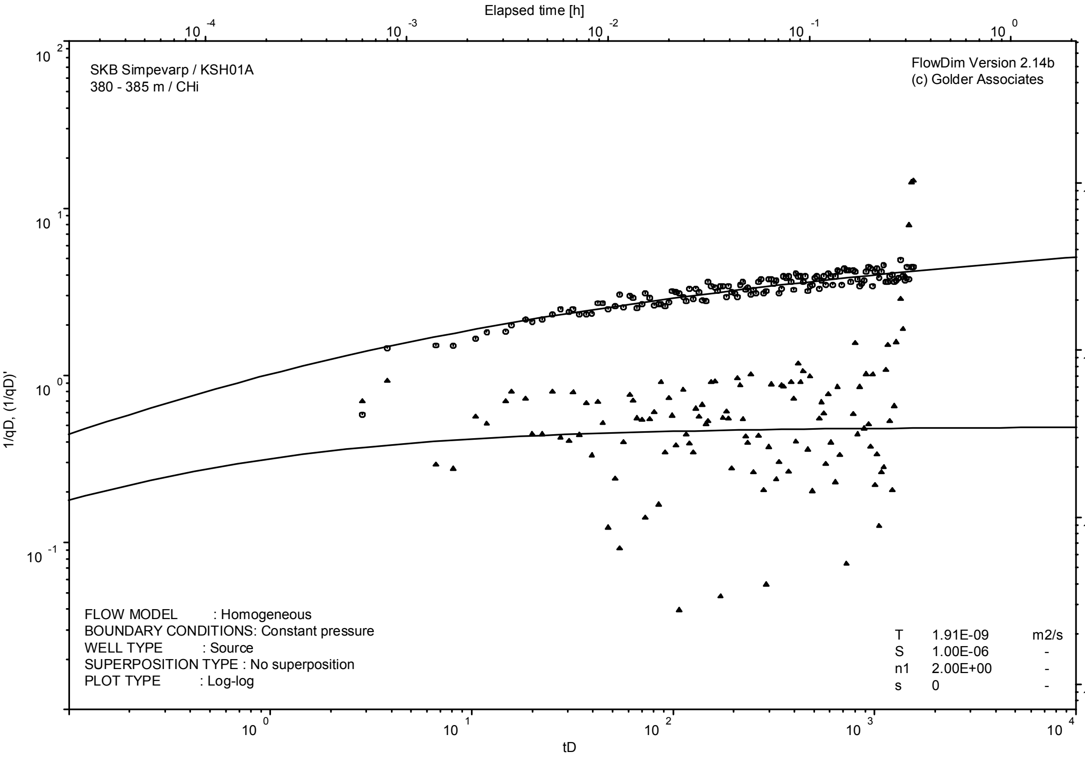
Analysis diagrams



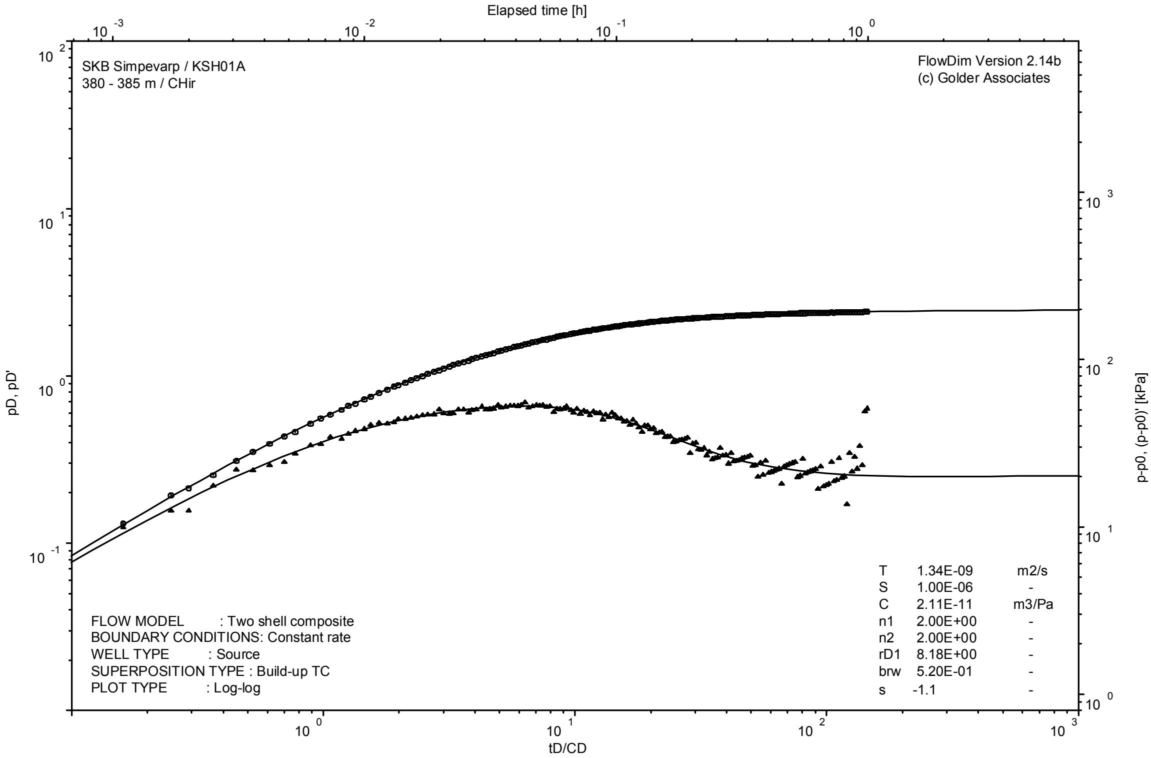
Pressure and flow rate vs. time; cartesian plot



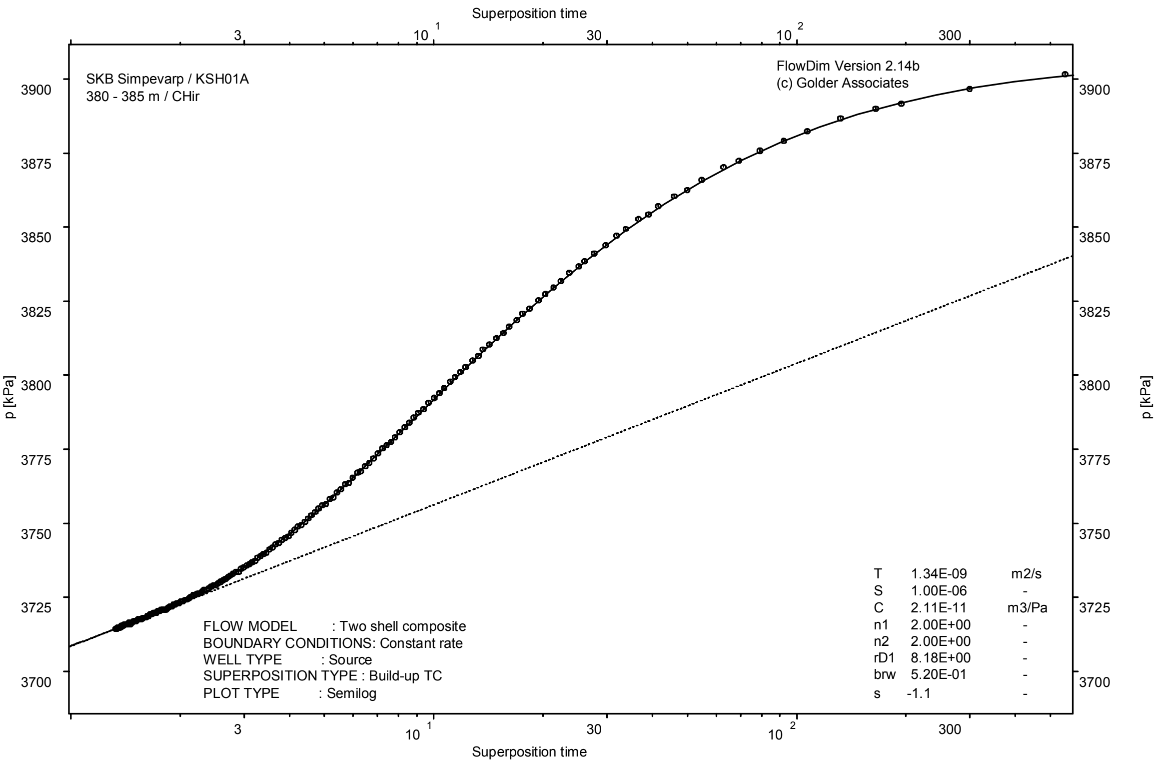
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

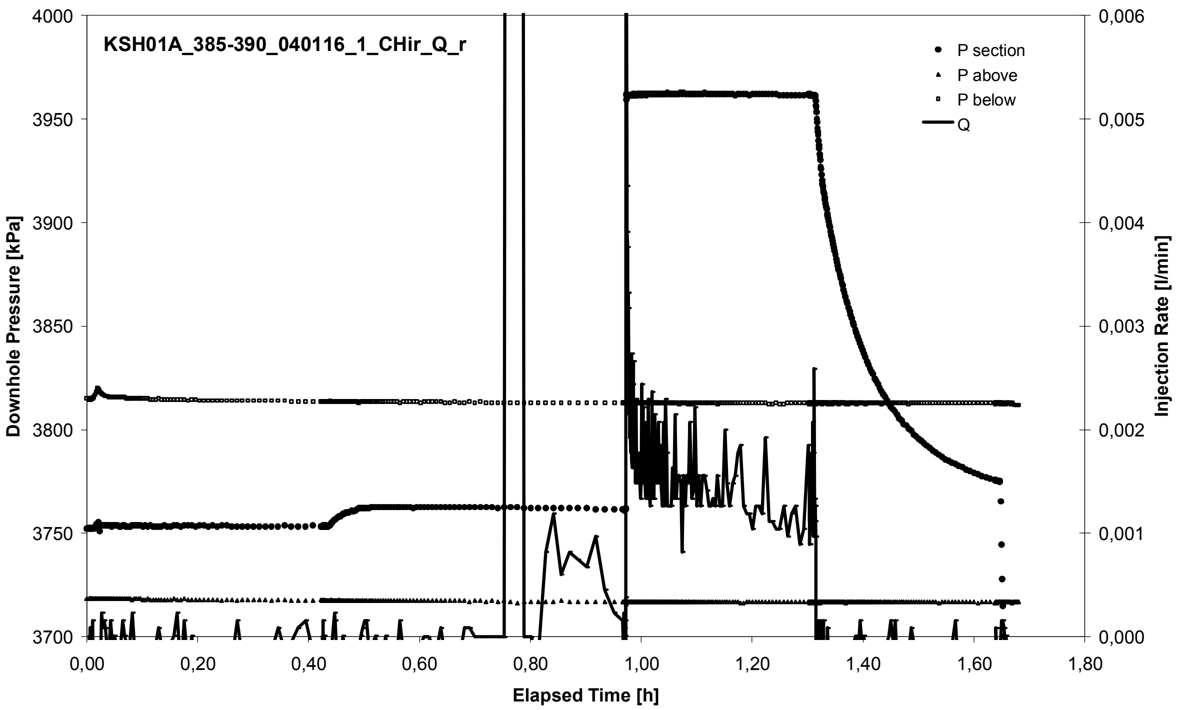


CHIR phase; HORNER match

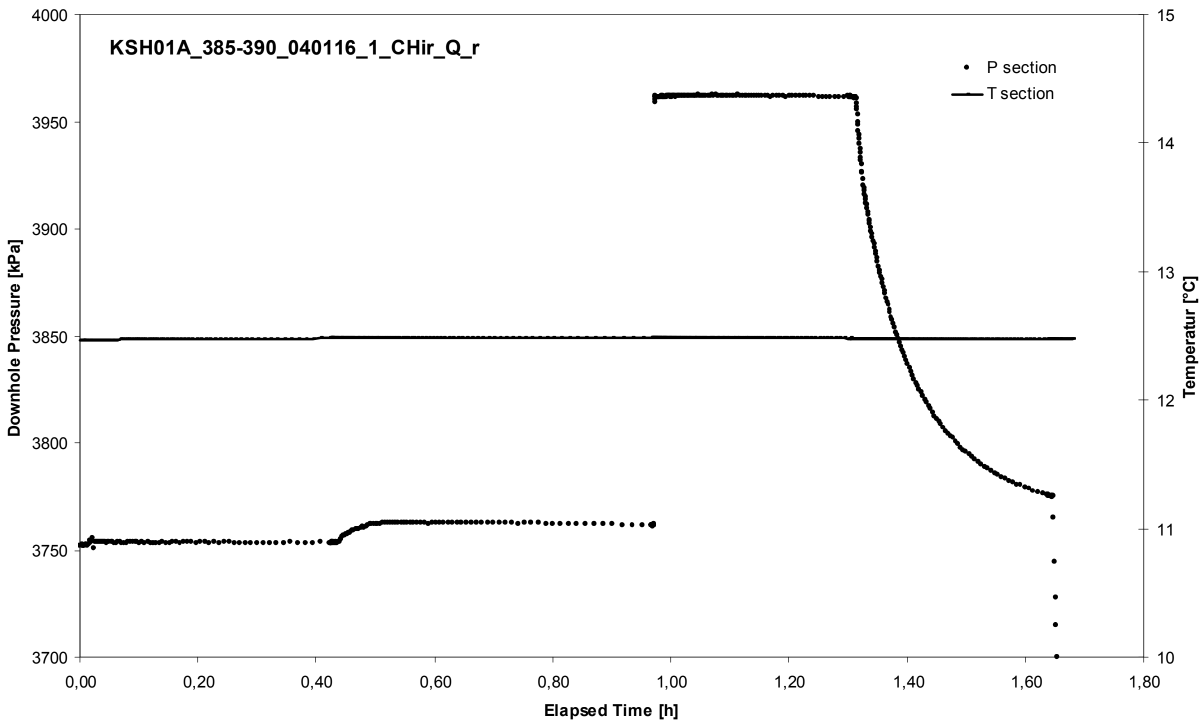
APPENDIX 2-72

Test 385 – 390 m

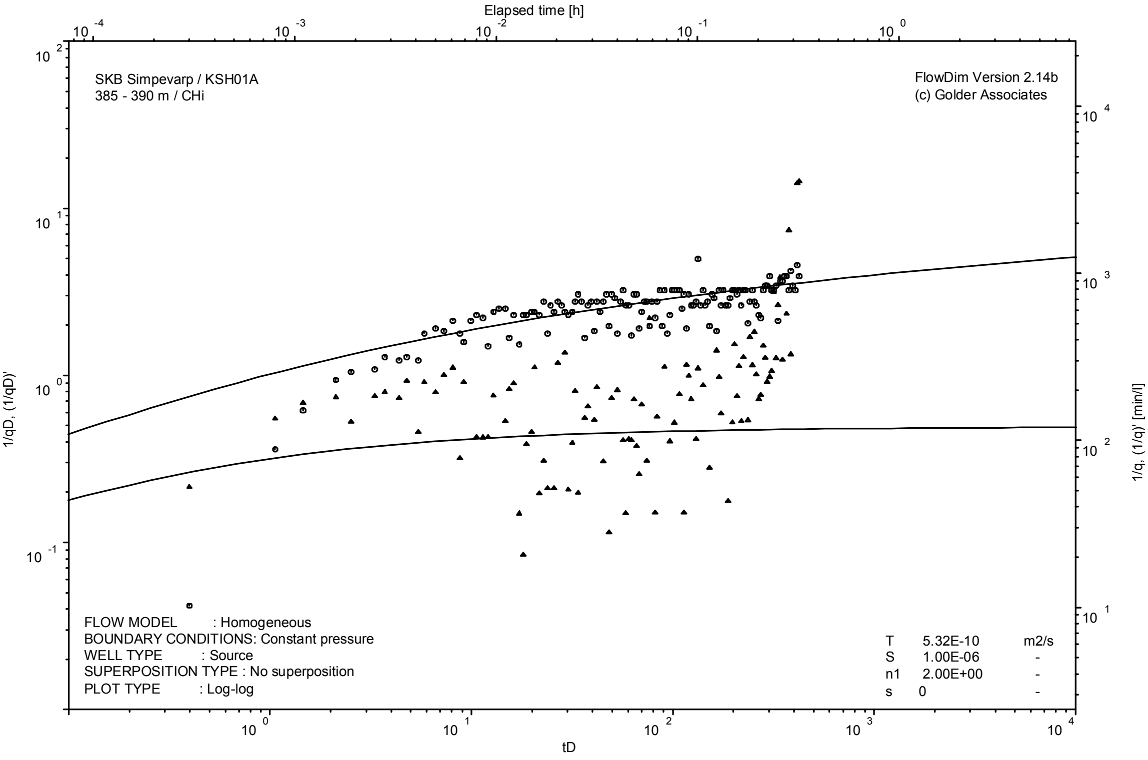
Analysis diagrams



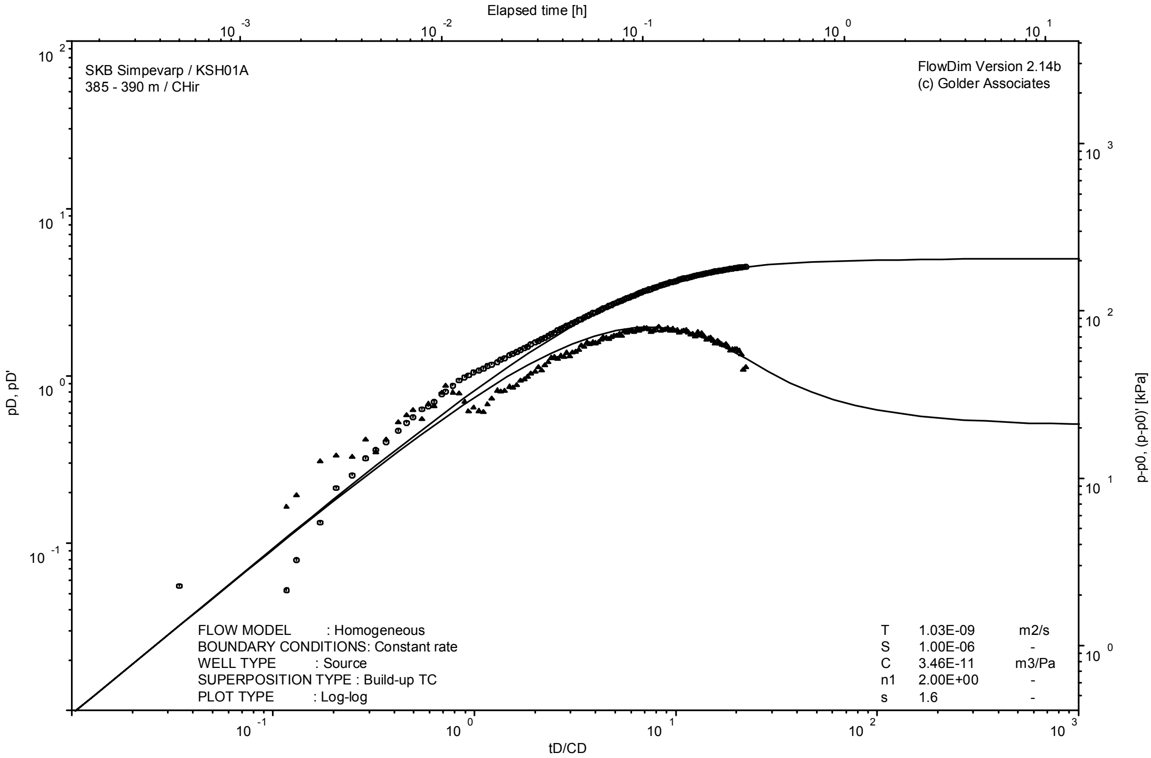
Pressure and flow rate vs. time; cartesian plot



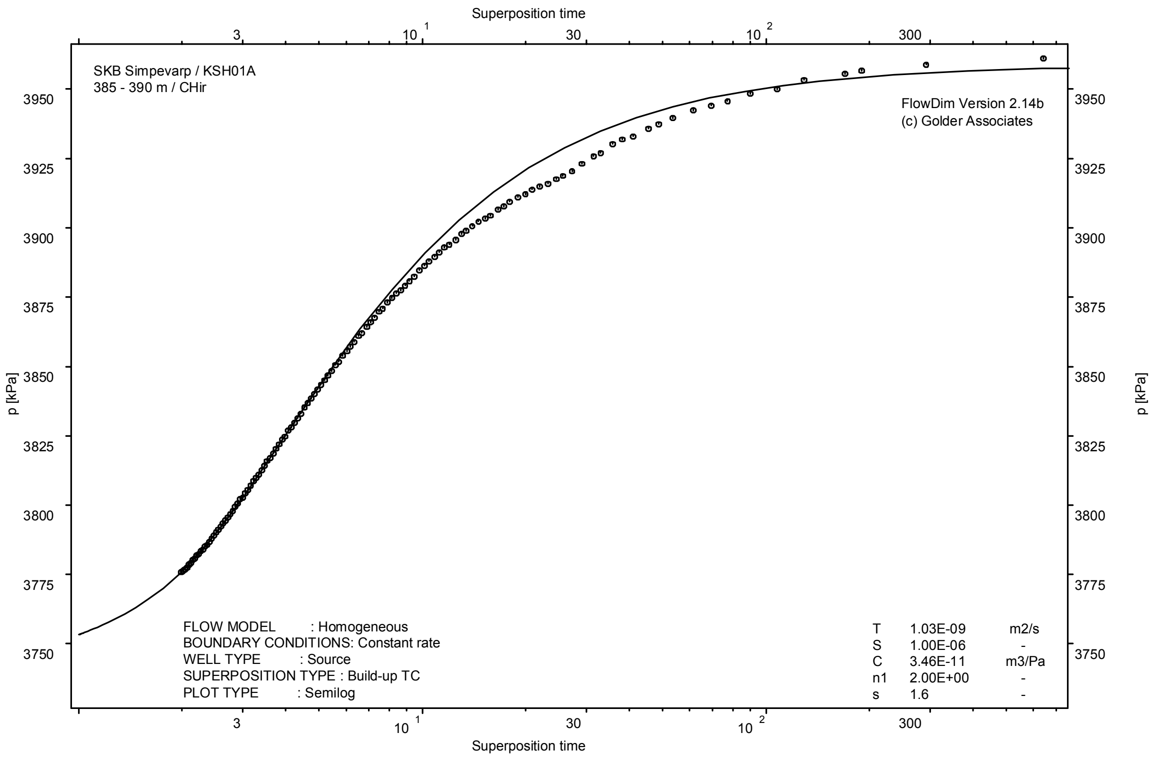
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

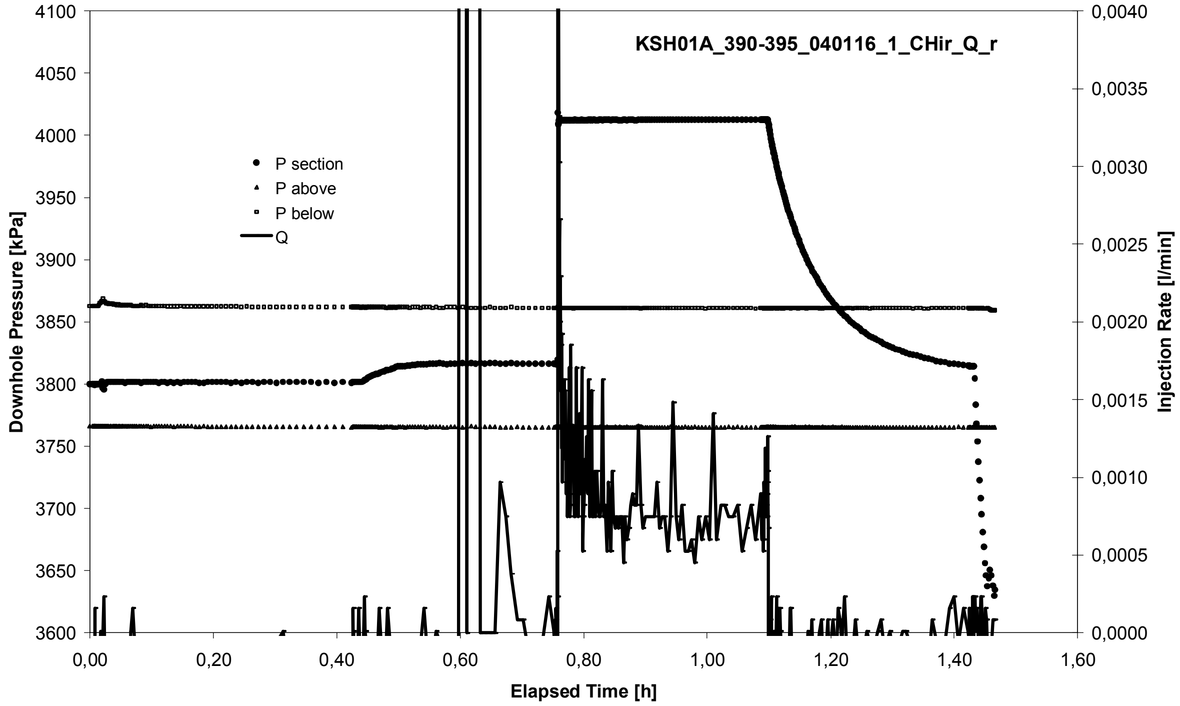


CHIR phase; HORNER match

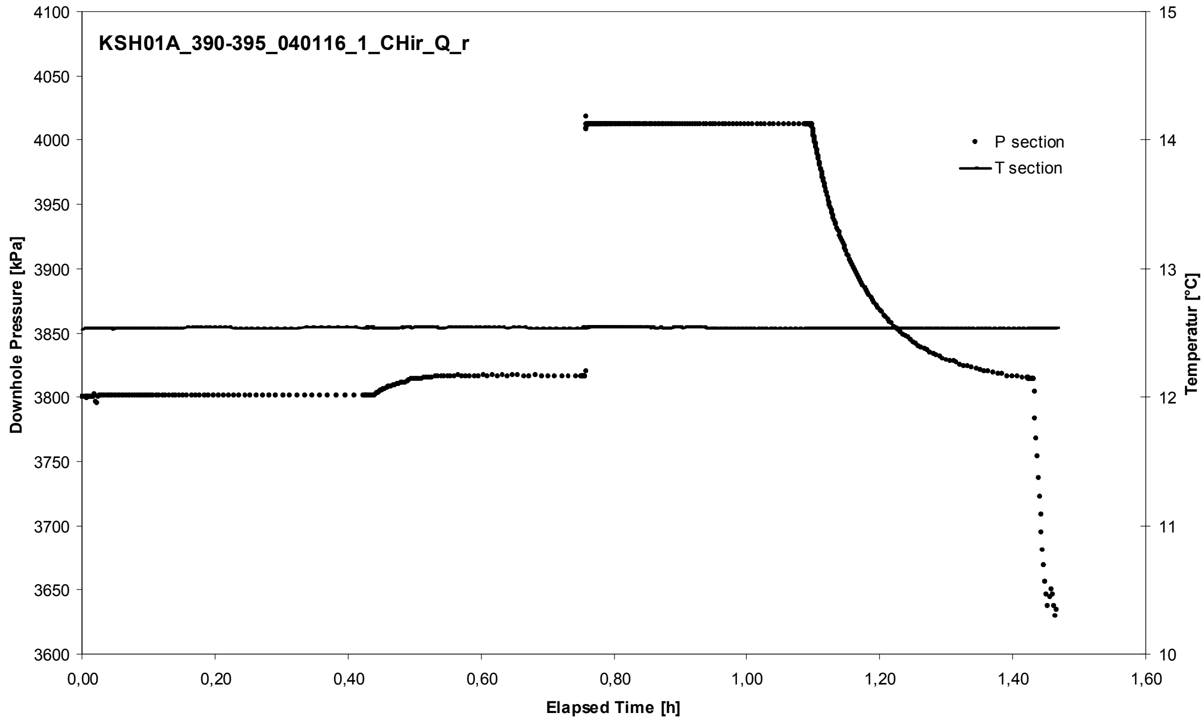
APPENDIX 2-73

Test 390 – 395 m

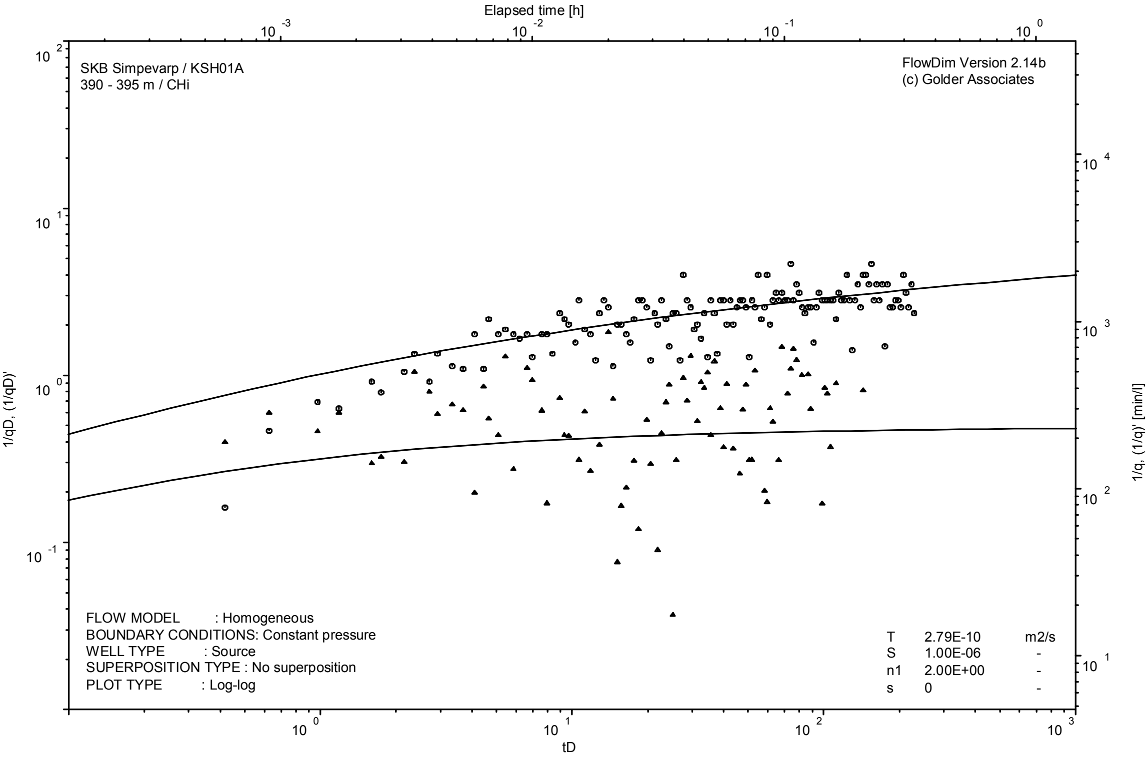
Analysis diagrams



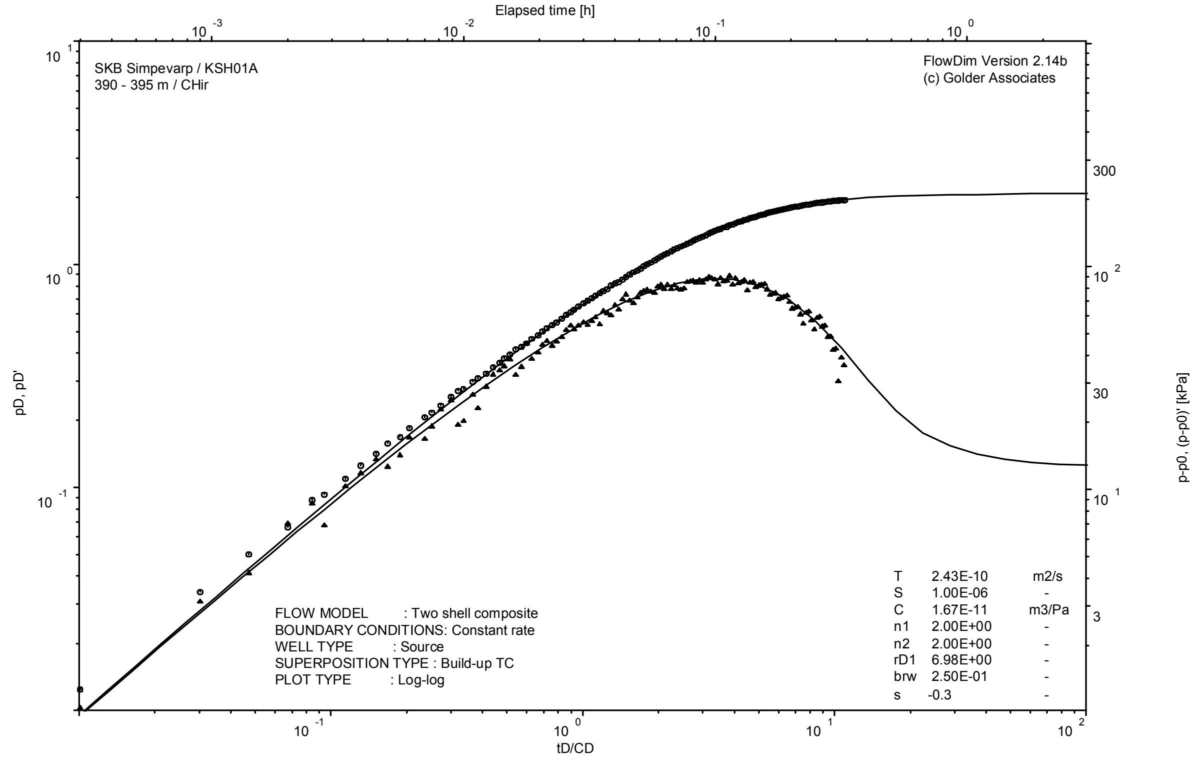
Pressure and flow rate vs. time; cartesian plot



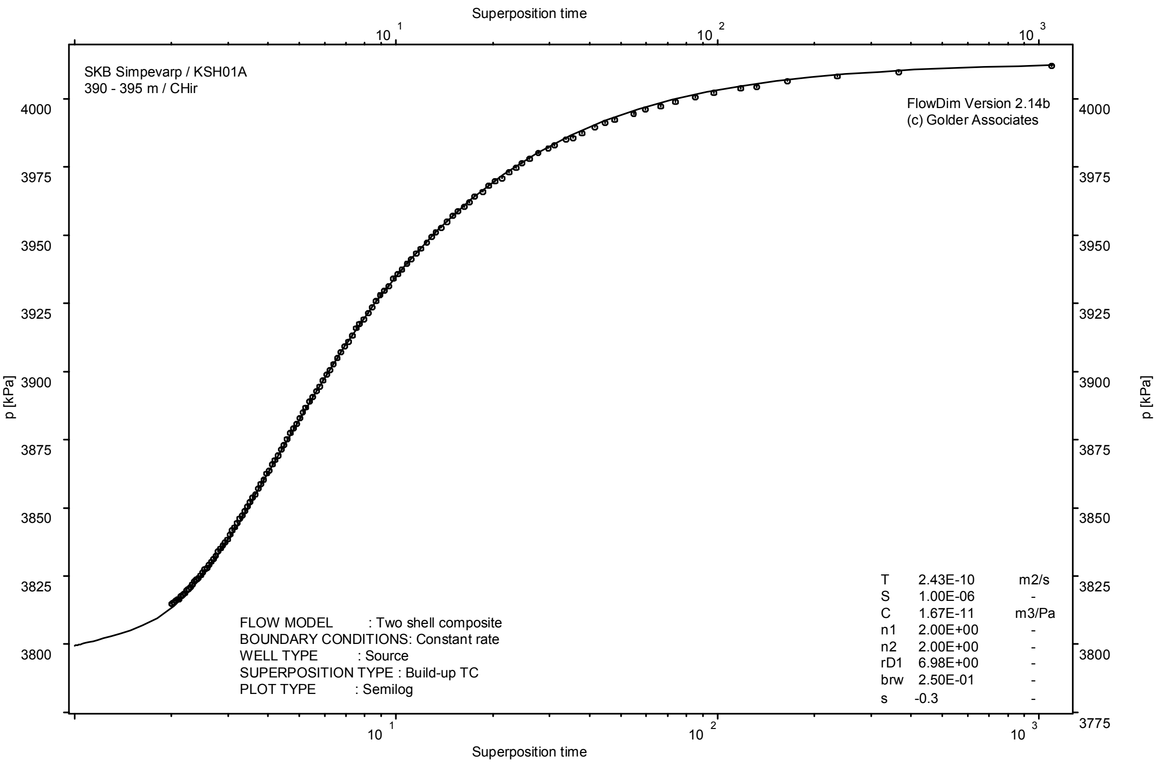
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

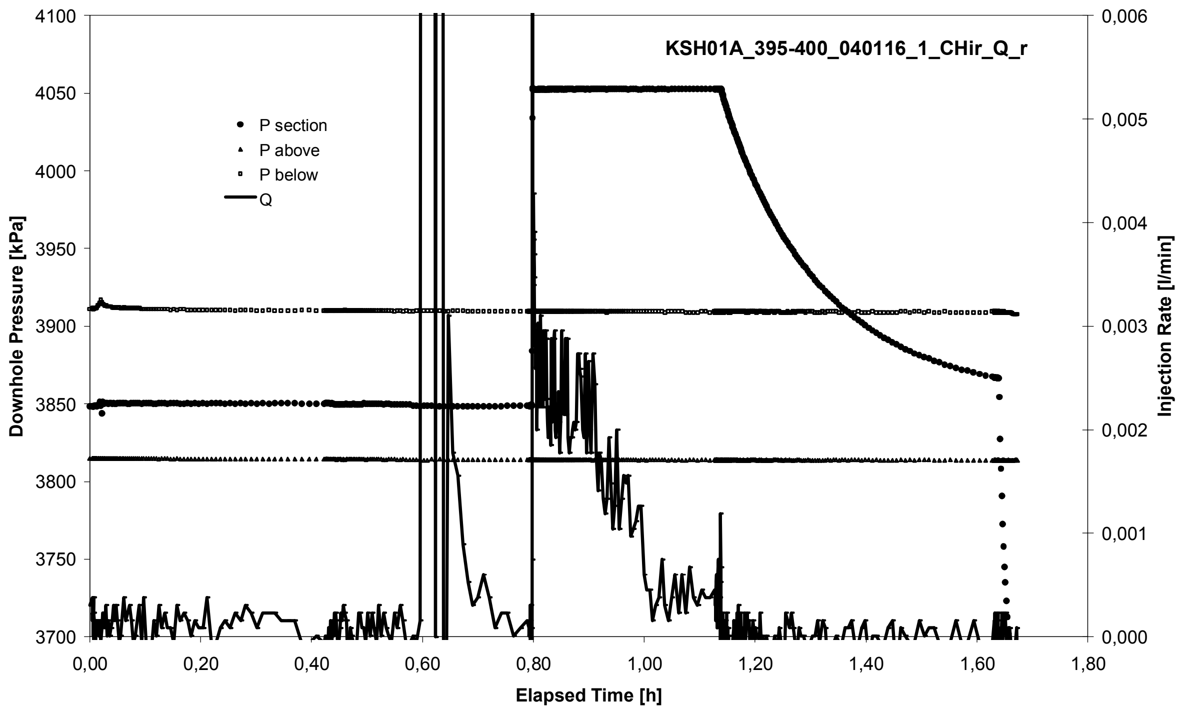


CHIR phase; HORNER match

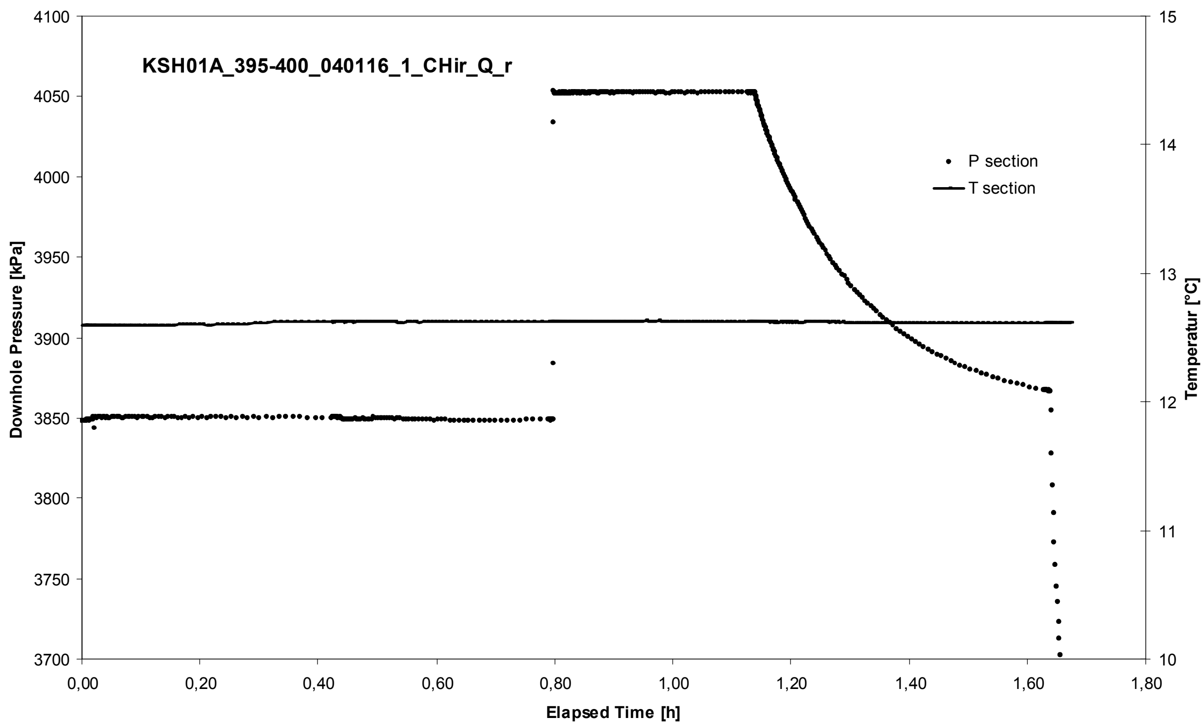
APPENDIX 2-74

Test 395 – 400 m

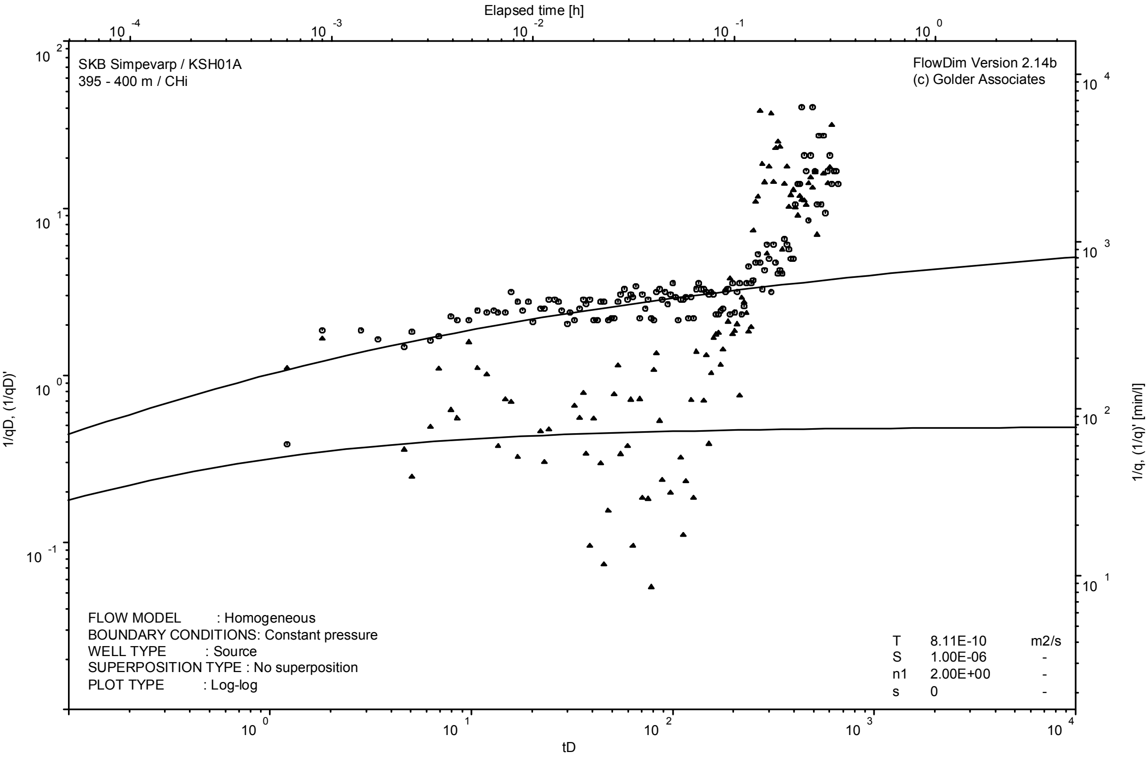
Analysis diagrams



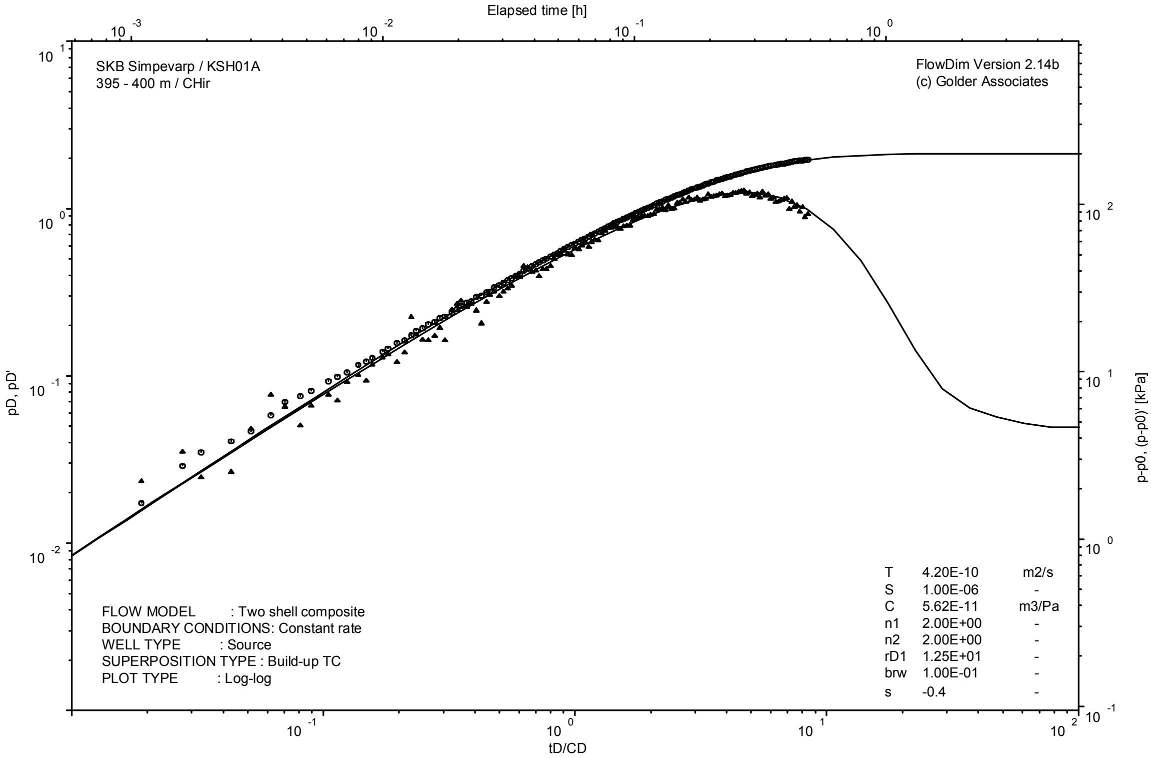
Pressure and flow rate vs. time; cartesian plot



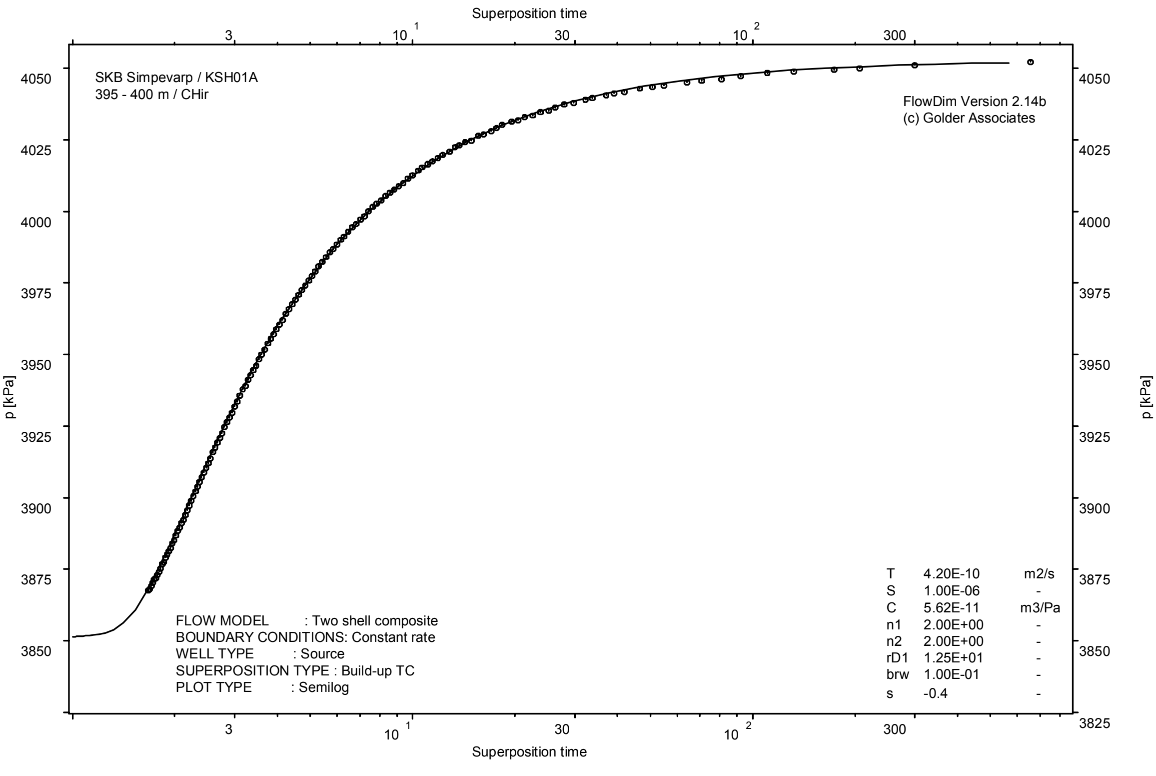
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

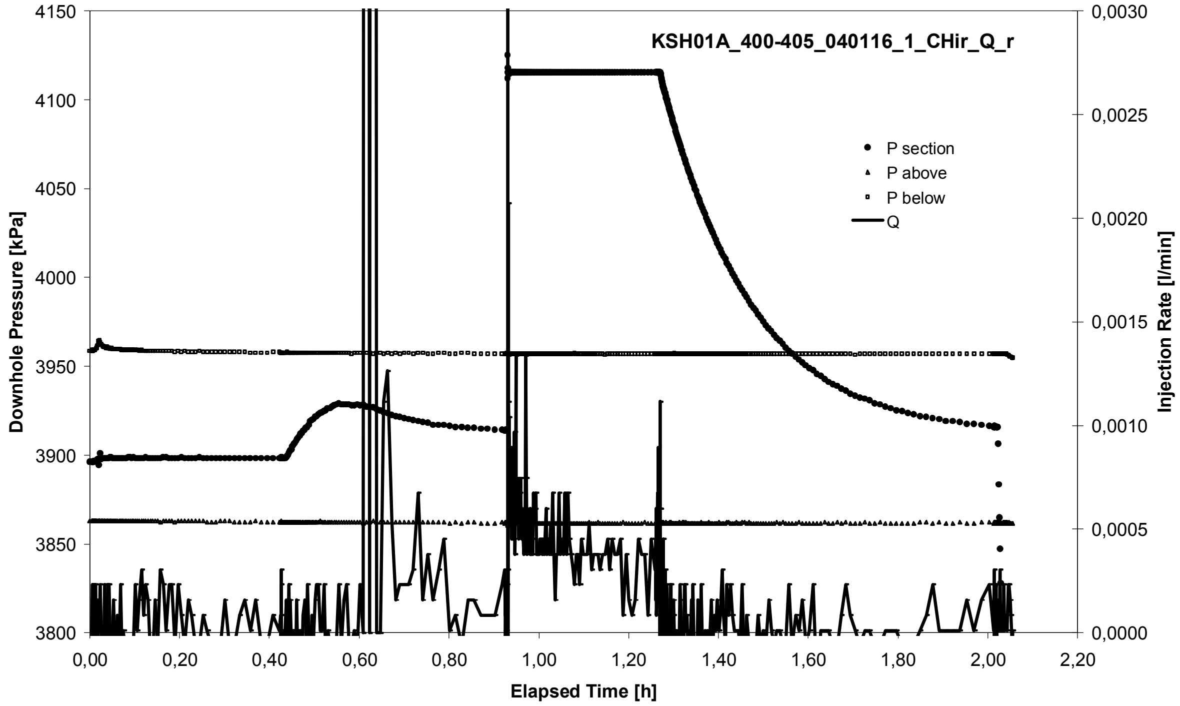


CHIR phase; HORNER match

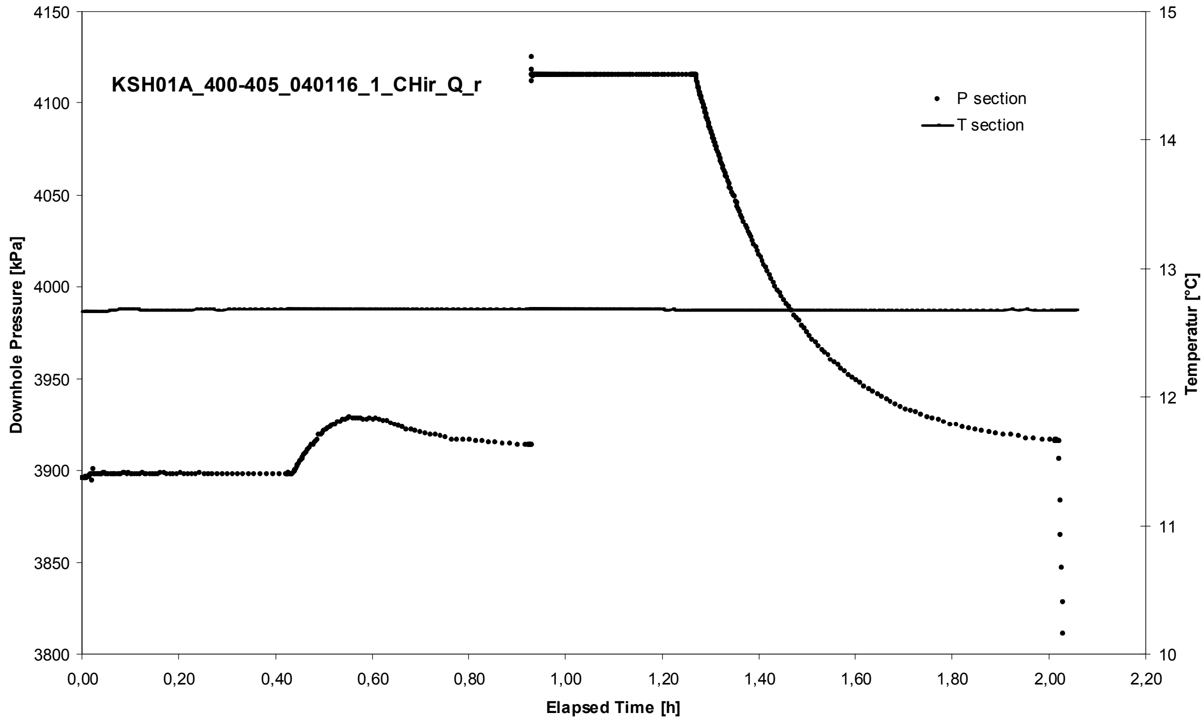
APPENDIX 2-75

Test 400 – 405 m

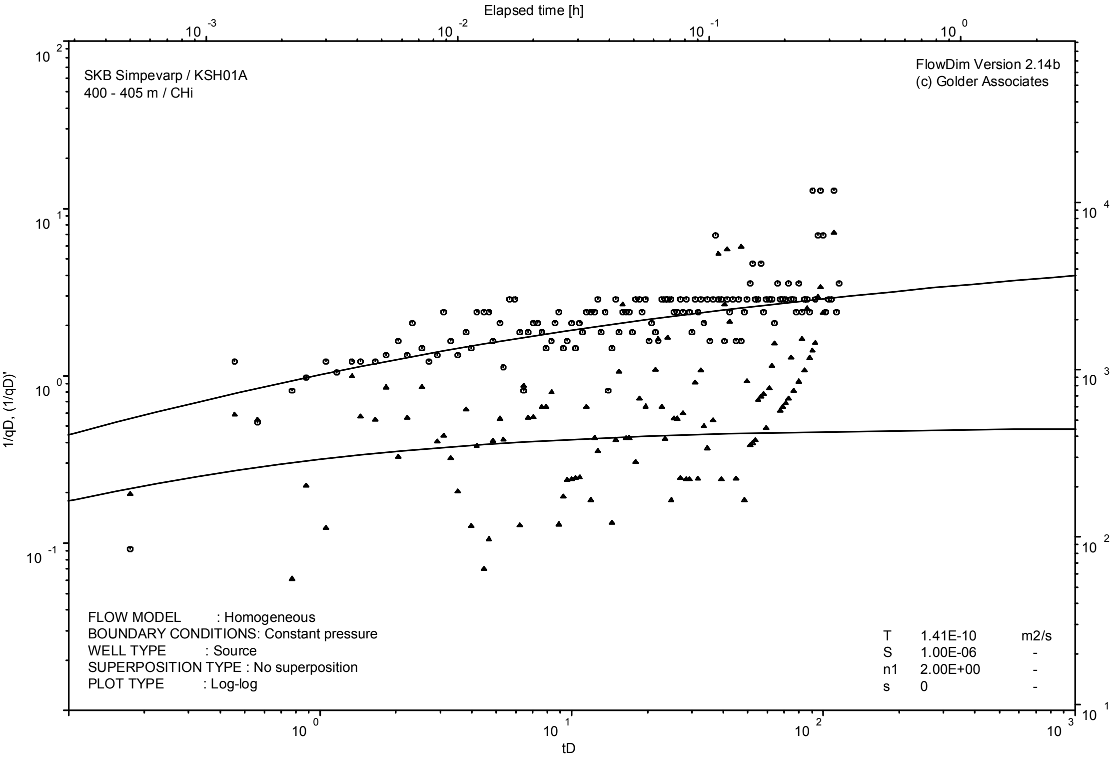
Analysis diagrams



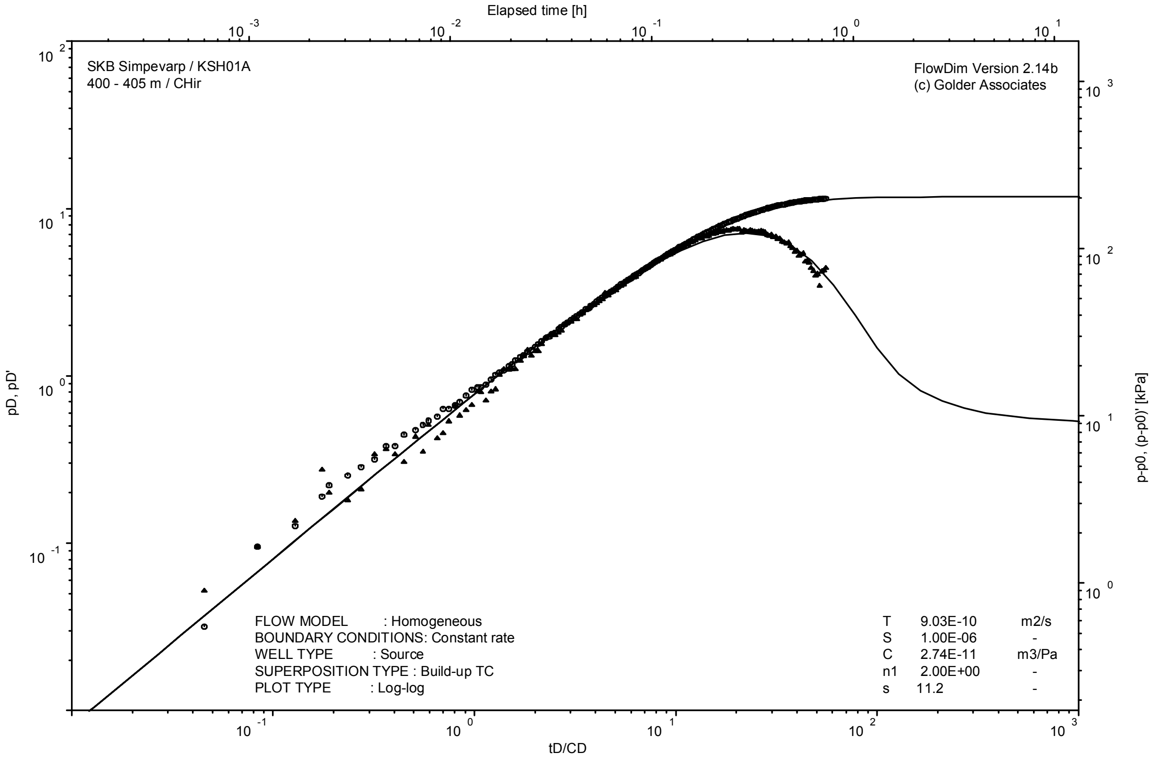
Pressure and flow rate vs. time; cartesian plot



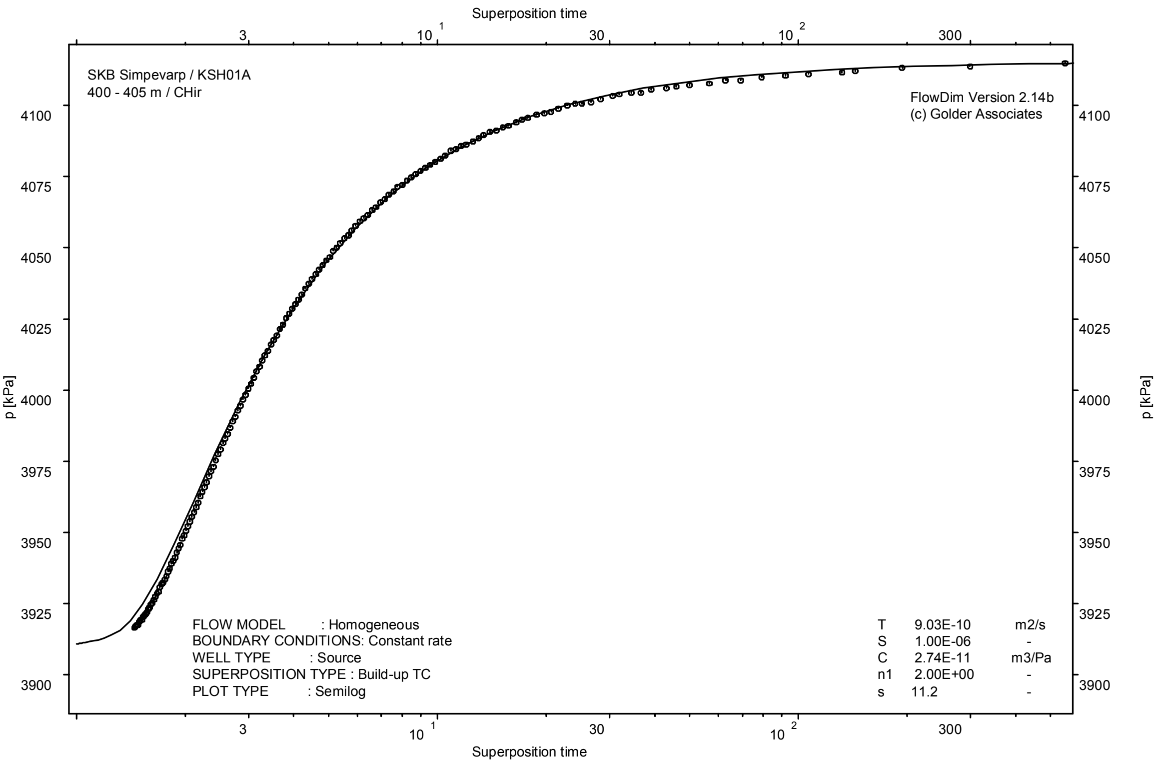
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

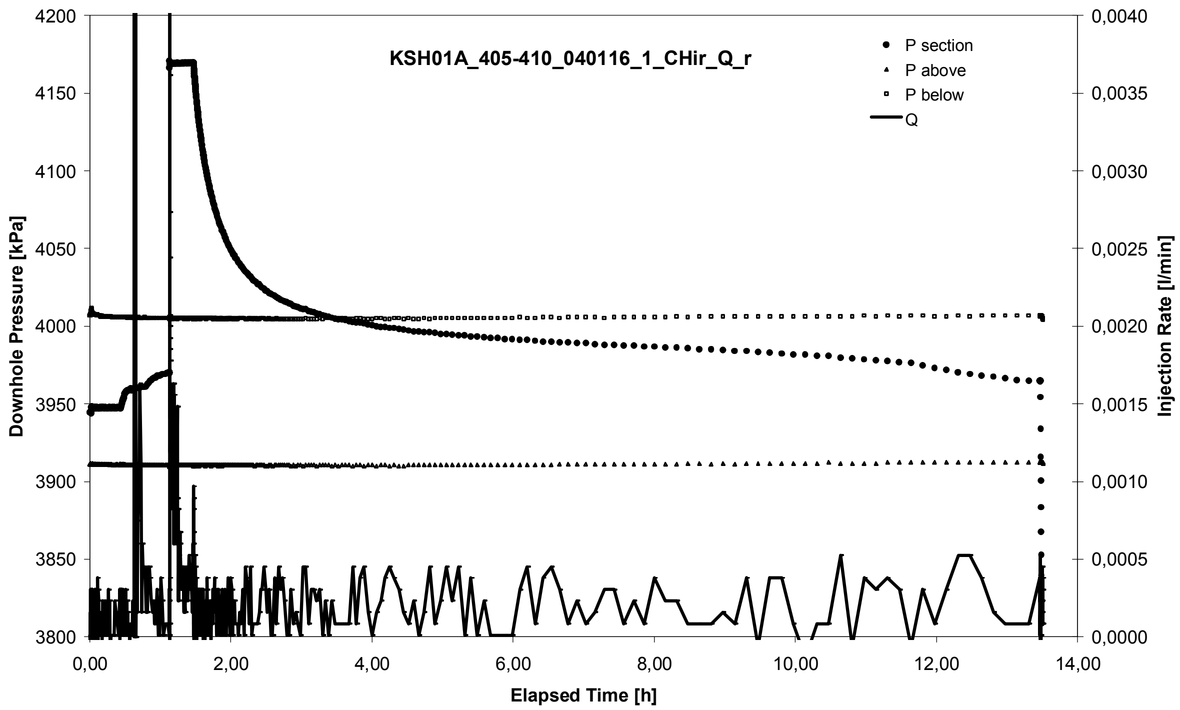


CHIR phase; HORNER match

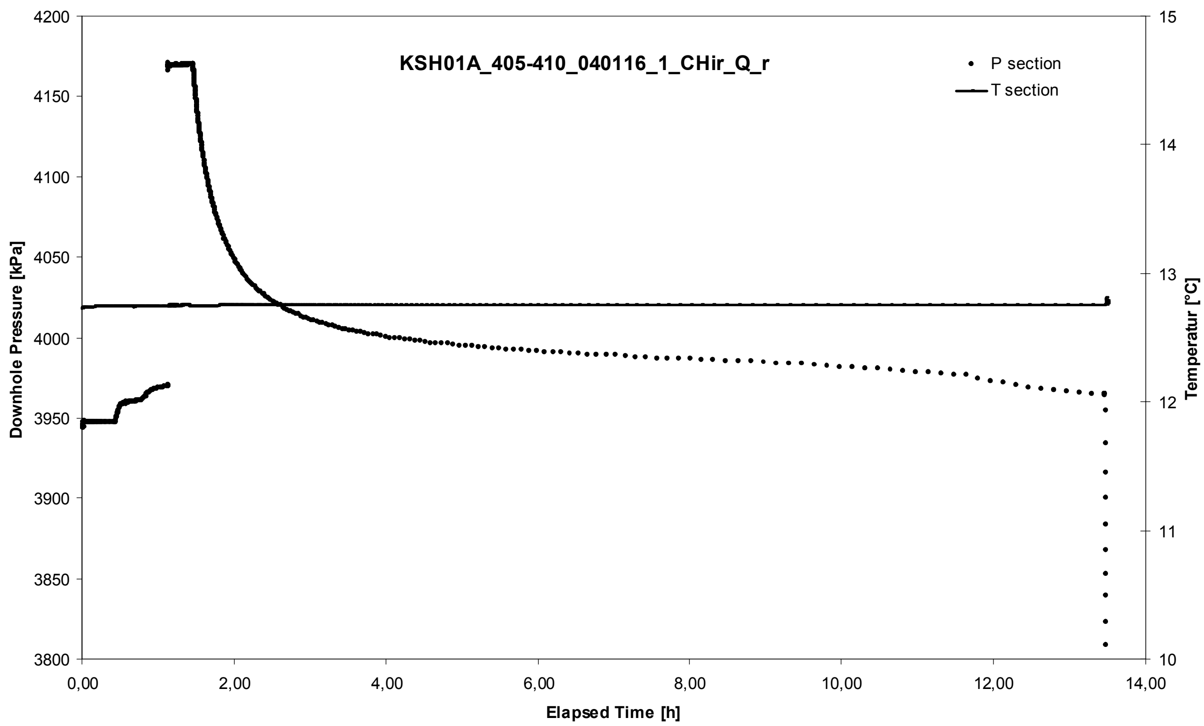
APPENDIX 2-76

Test 405 – 410 m

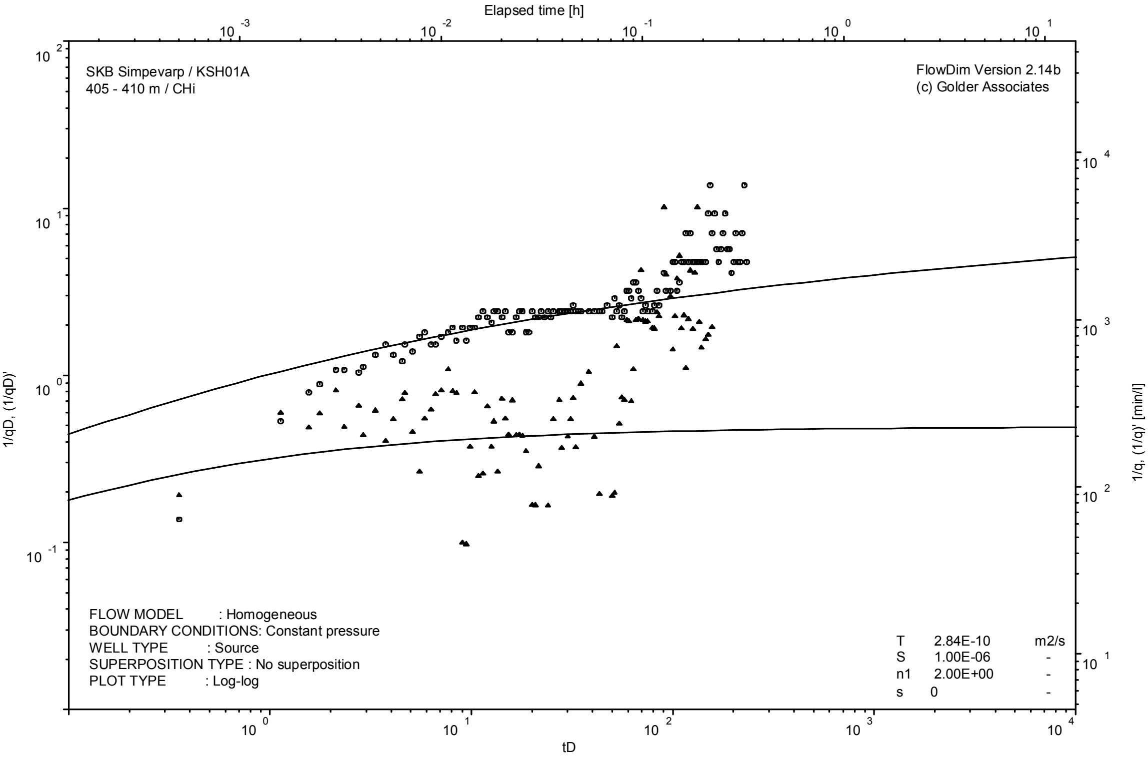
Analysis diagrams



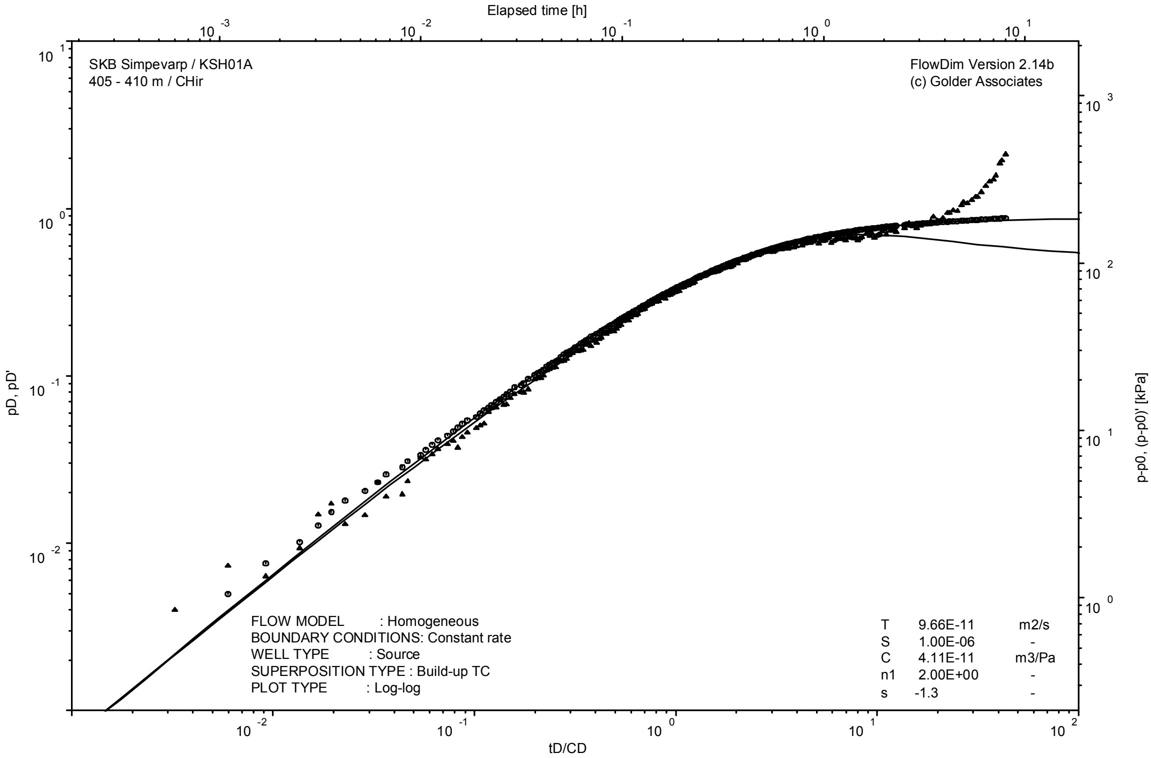
Pressure and flow rate vs. time; cartesian plot



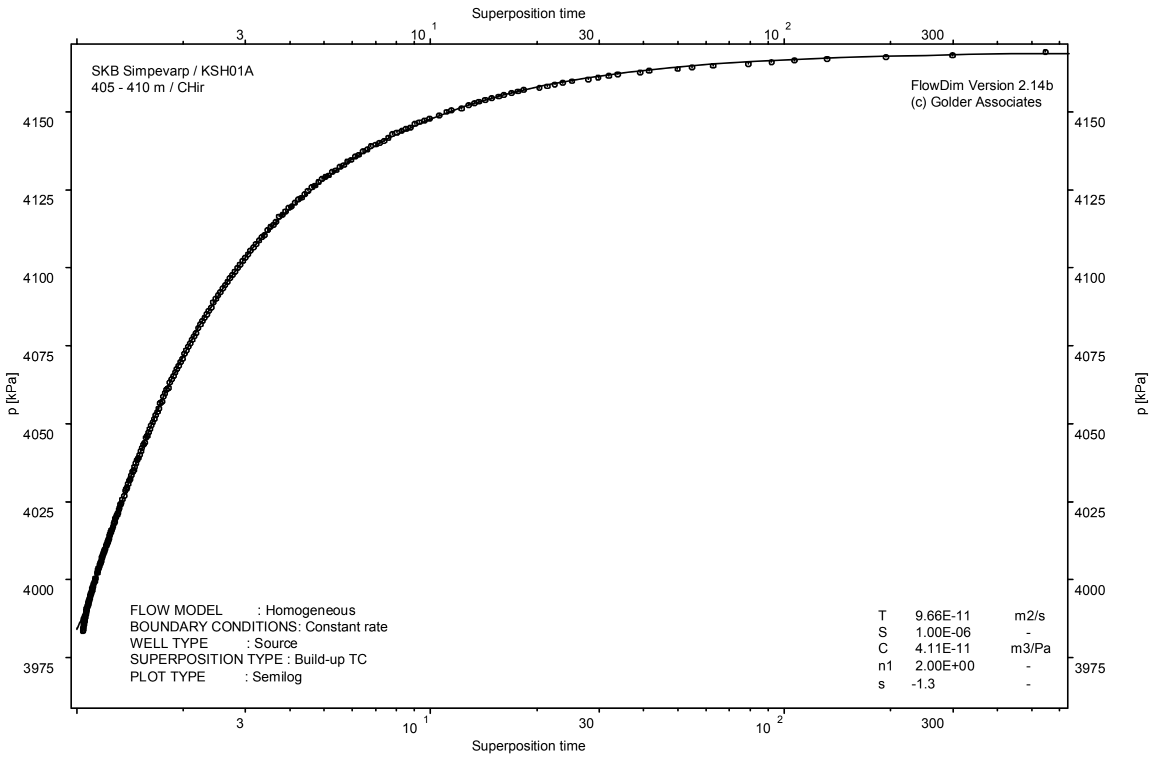
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

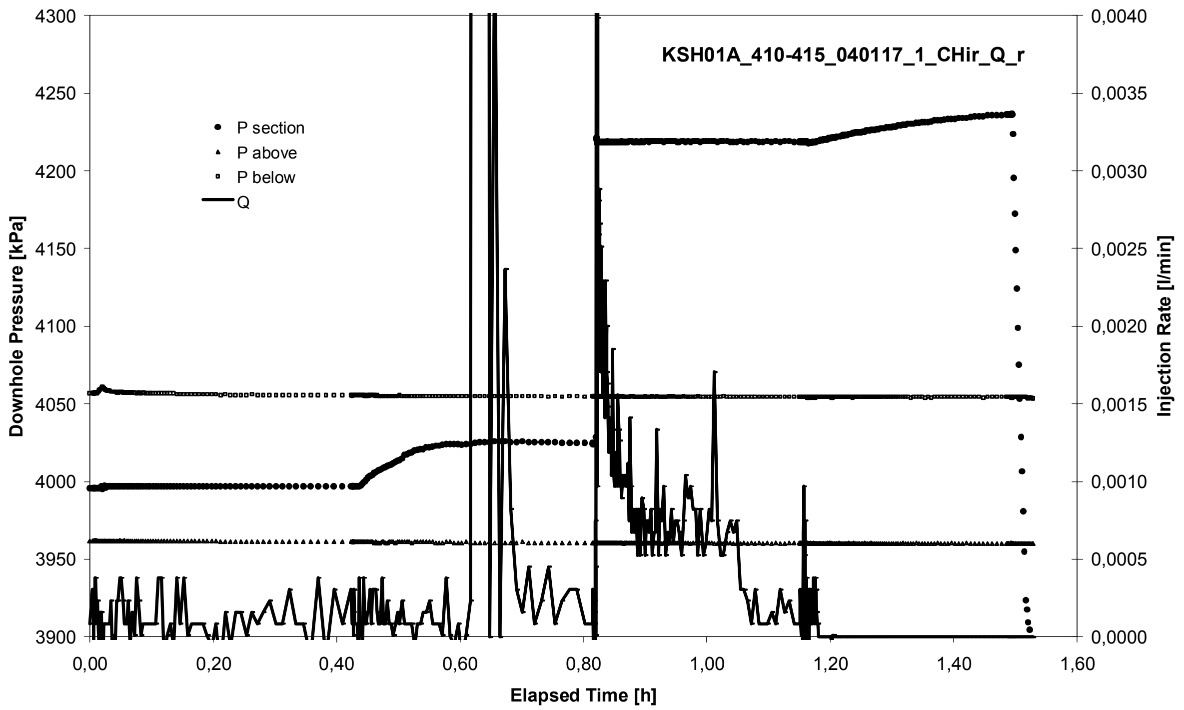


CHIR phase; HORNER match

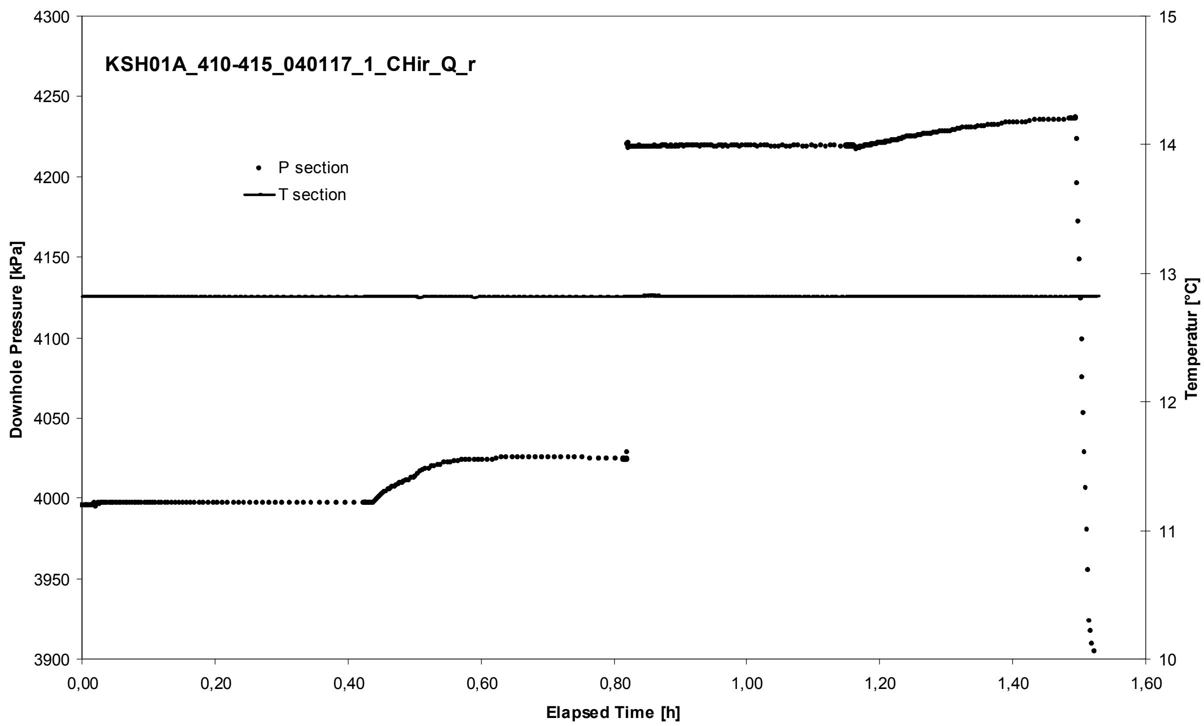
APPENDIX 2-77

Test 410 – 415 m

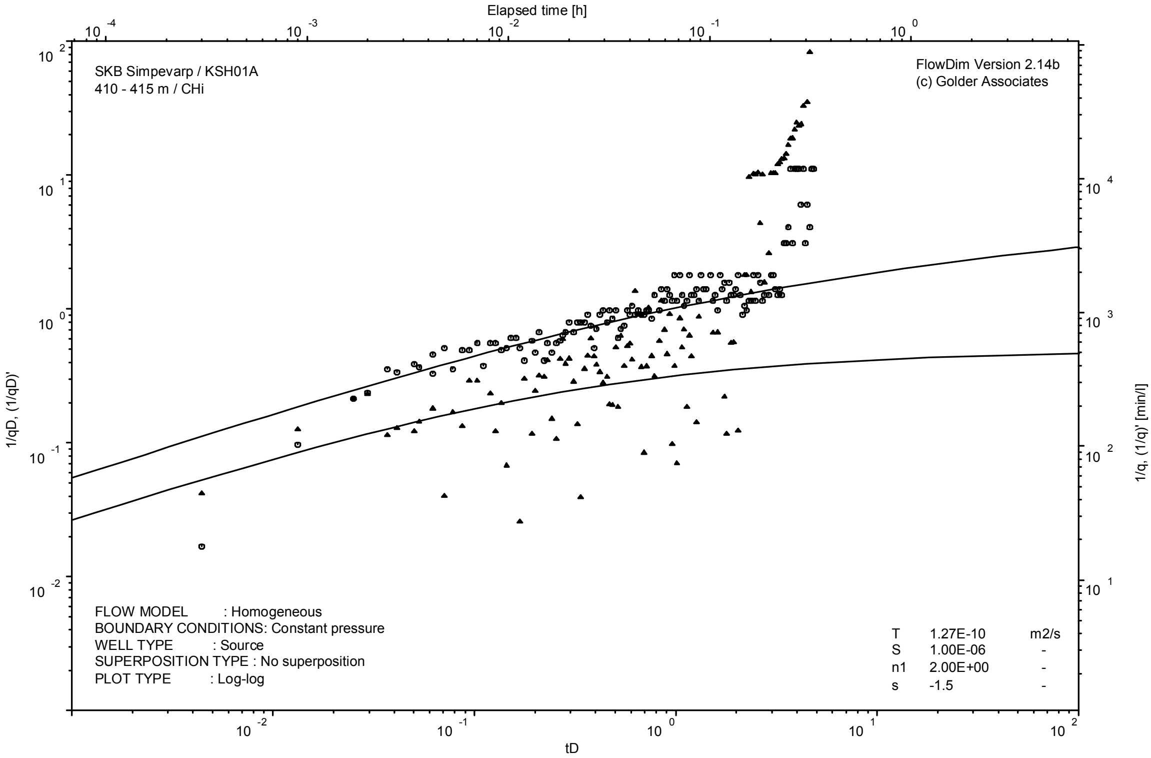
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

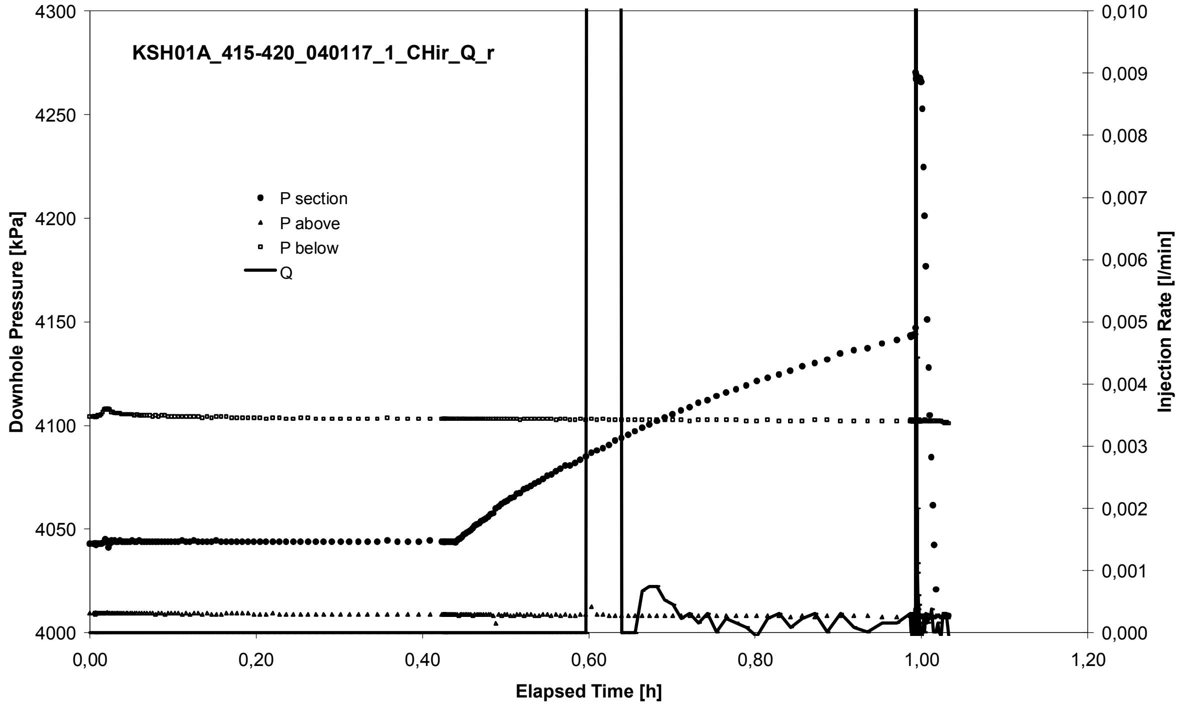
Not Analysed

CHIR phase; HORNER match

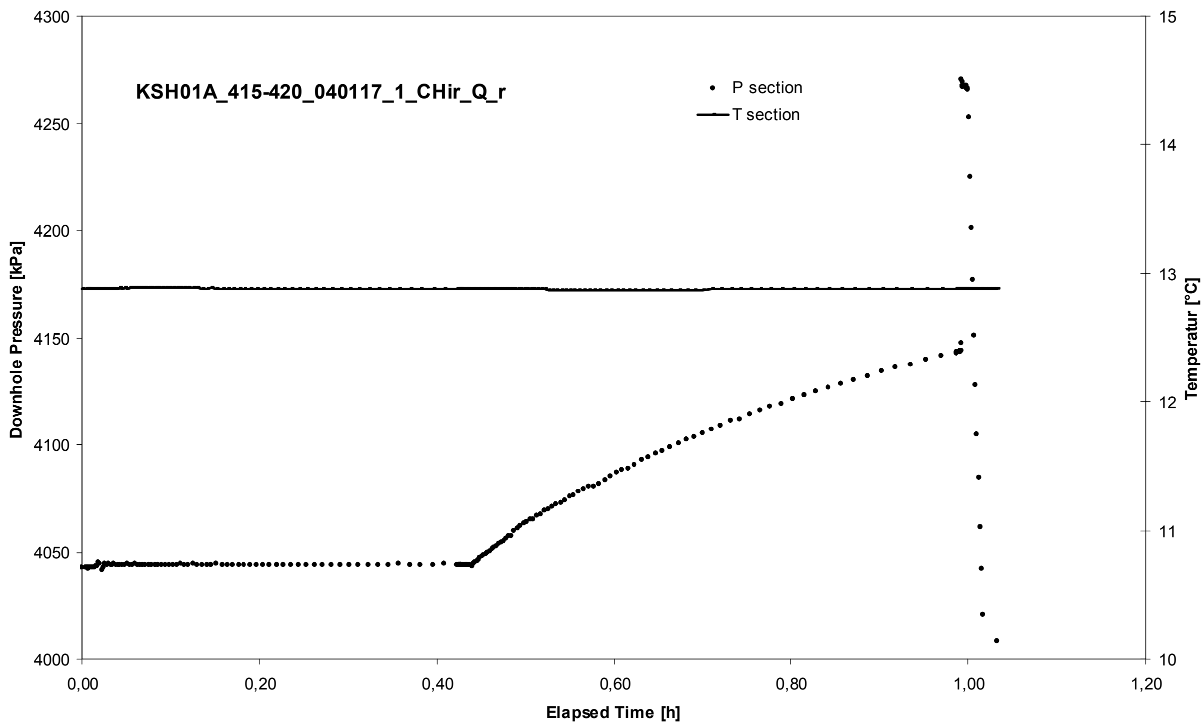
APPENDIX 2-78

Test 415 – 420 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

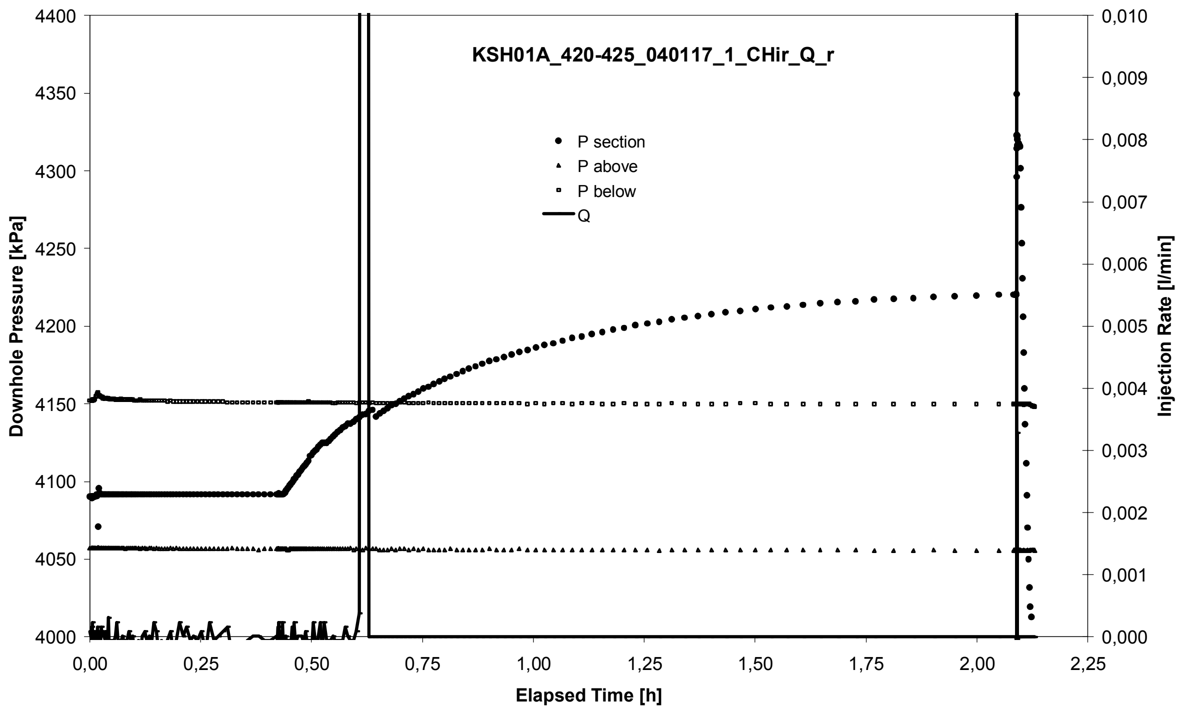
Not Analysed

CHIR phase; HORNER match

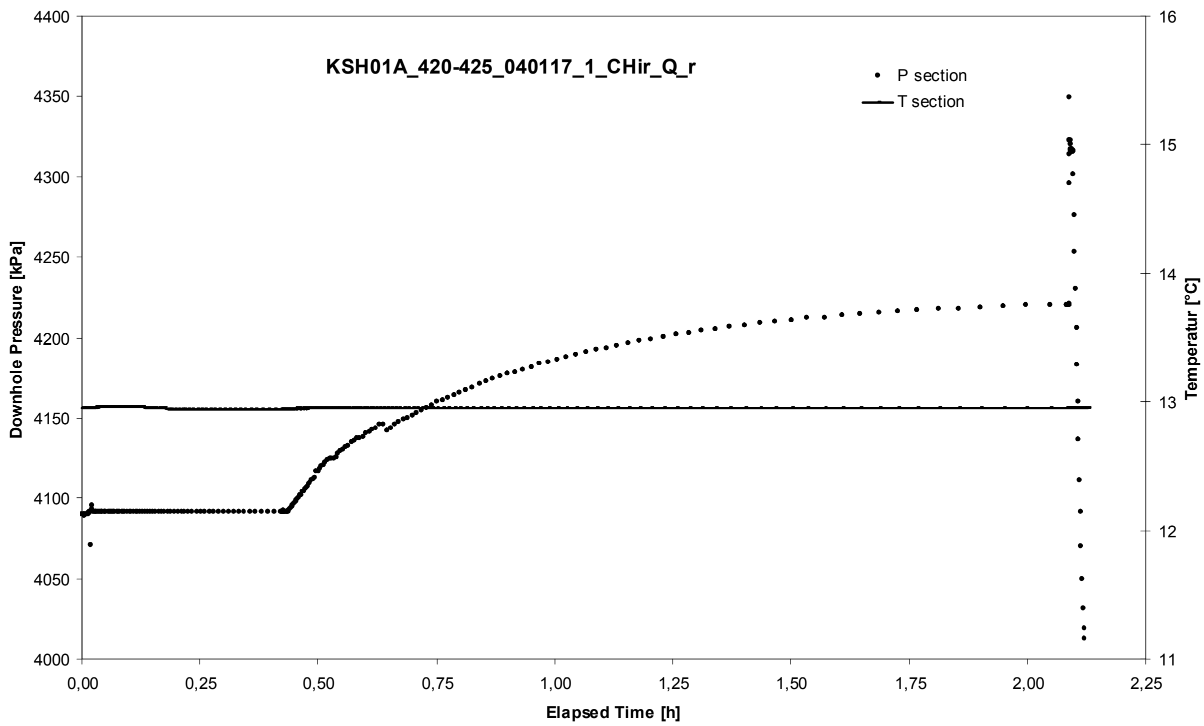
APPENDIX 2-79

Test 420 – 425 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

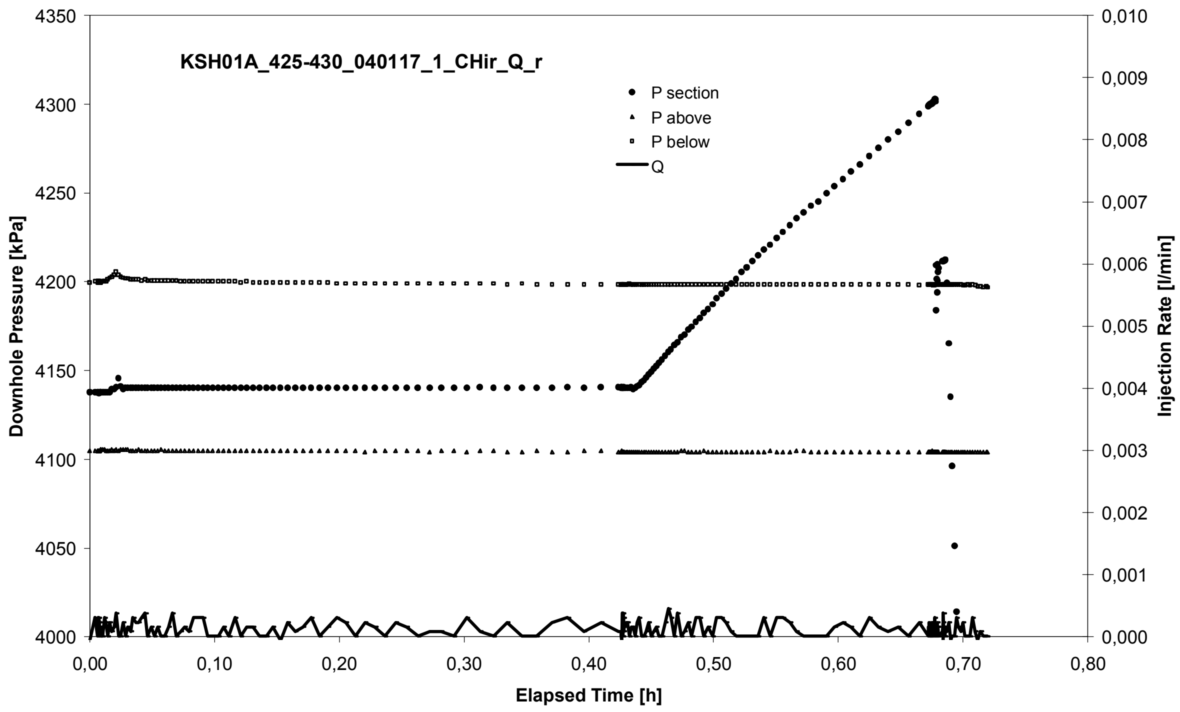
Not Analysed

CHIR phase; HORNER match

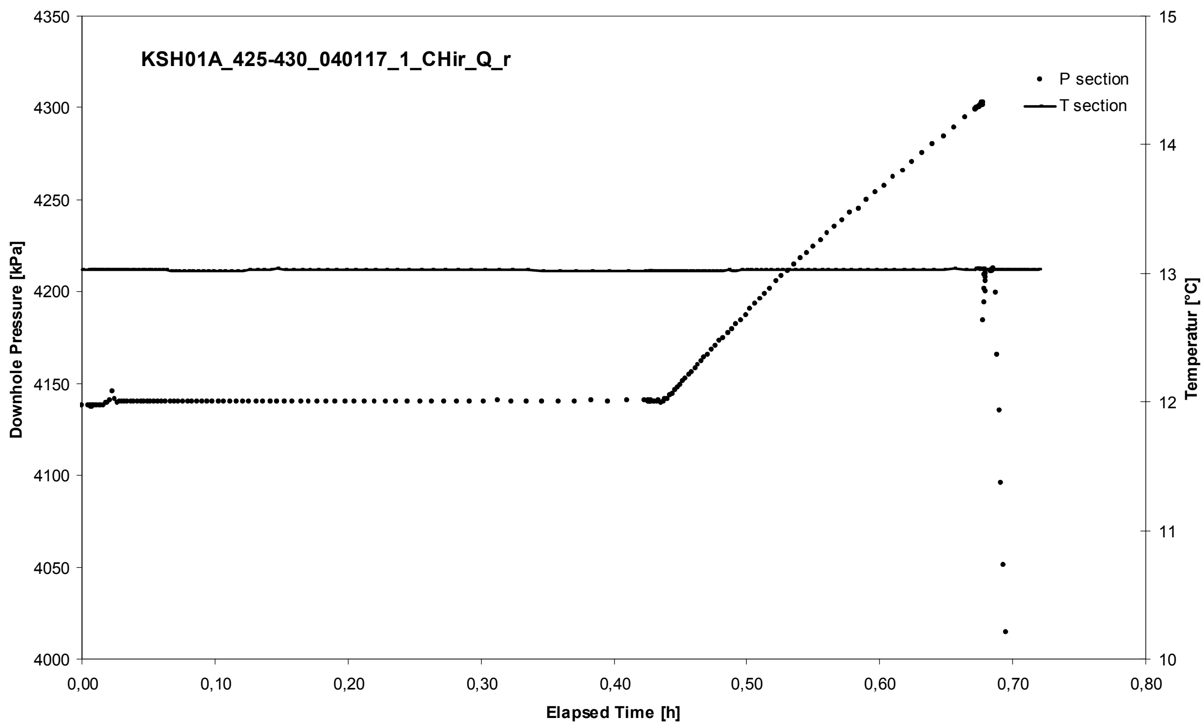
APPENDIX 2-80

Test 425 – 430 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

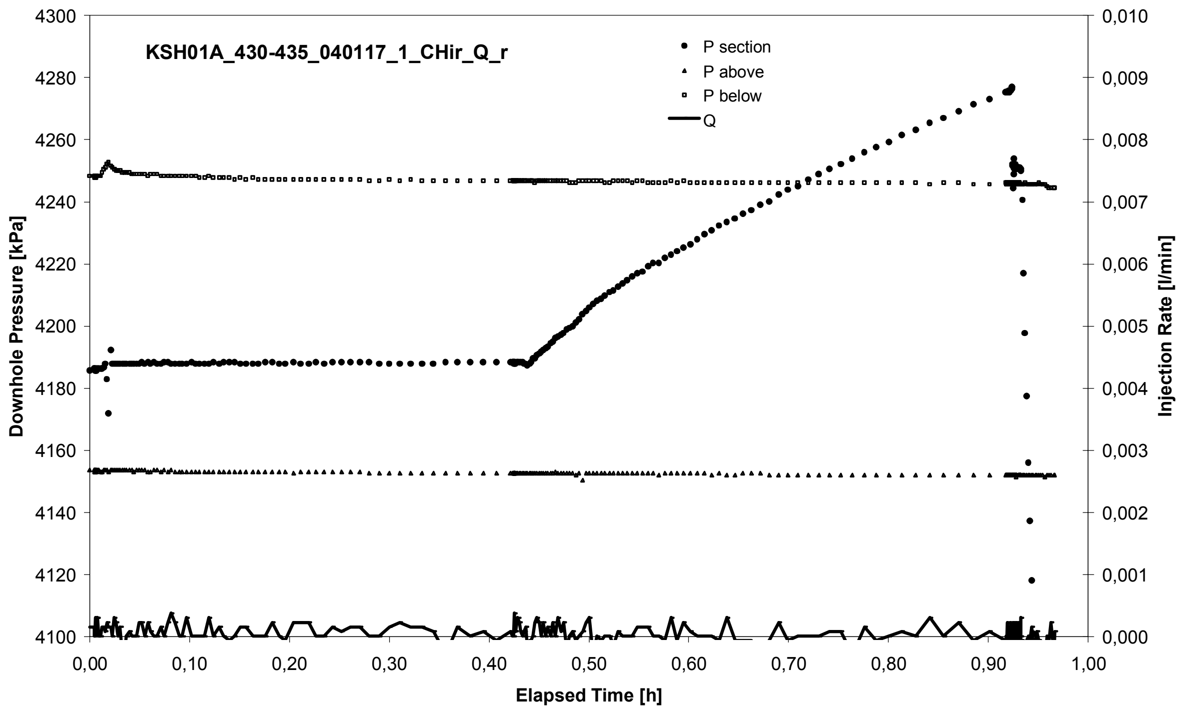
Not Analysed

CHIR phase; HORNER match

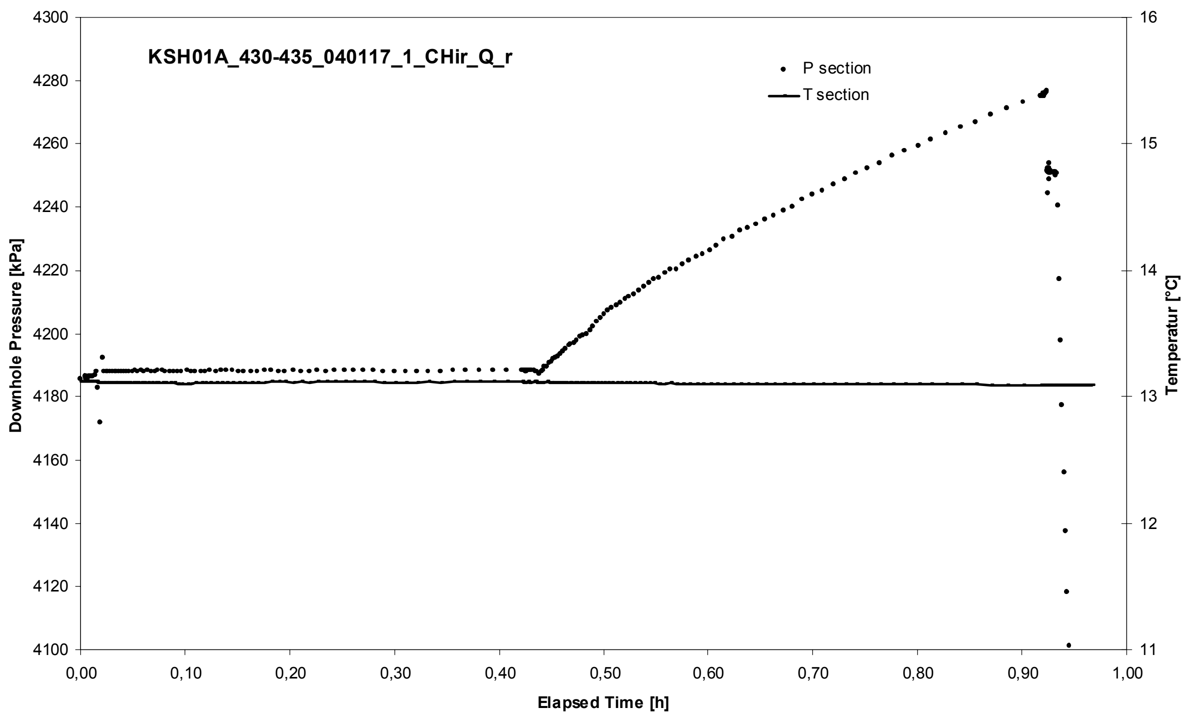
APPENDIX 2-81

Test 430 – 435 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

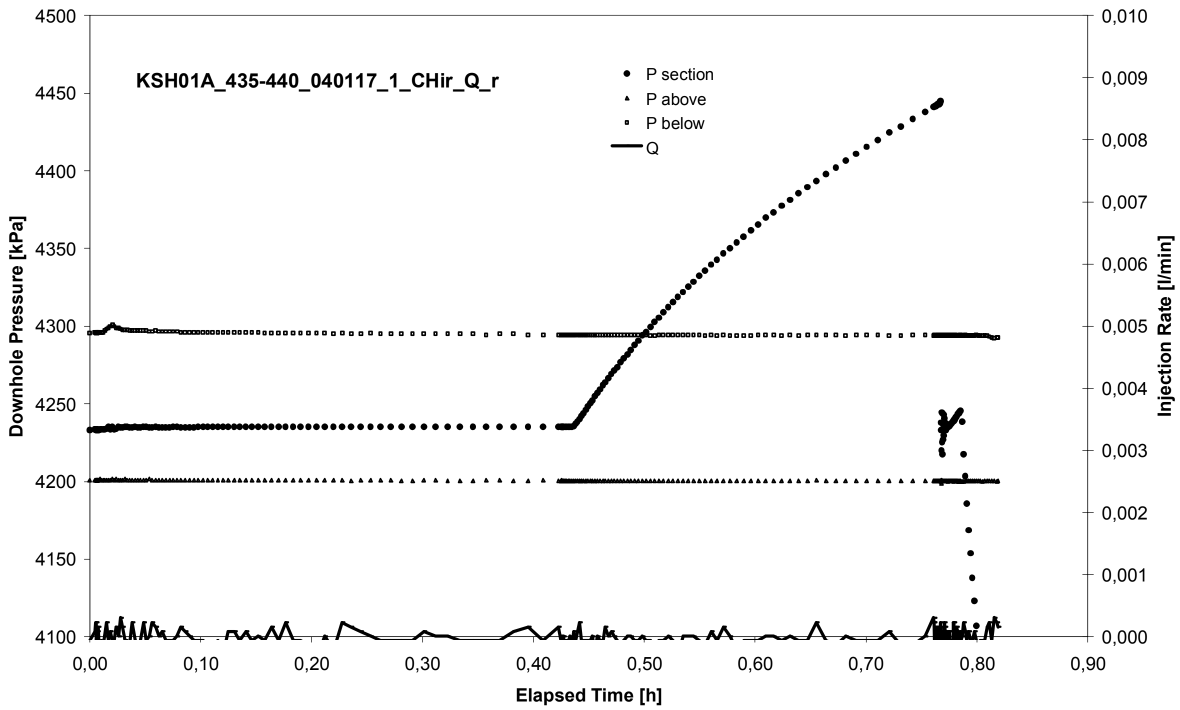
Not Analysed

CHIR phase; HORNER match

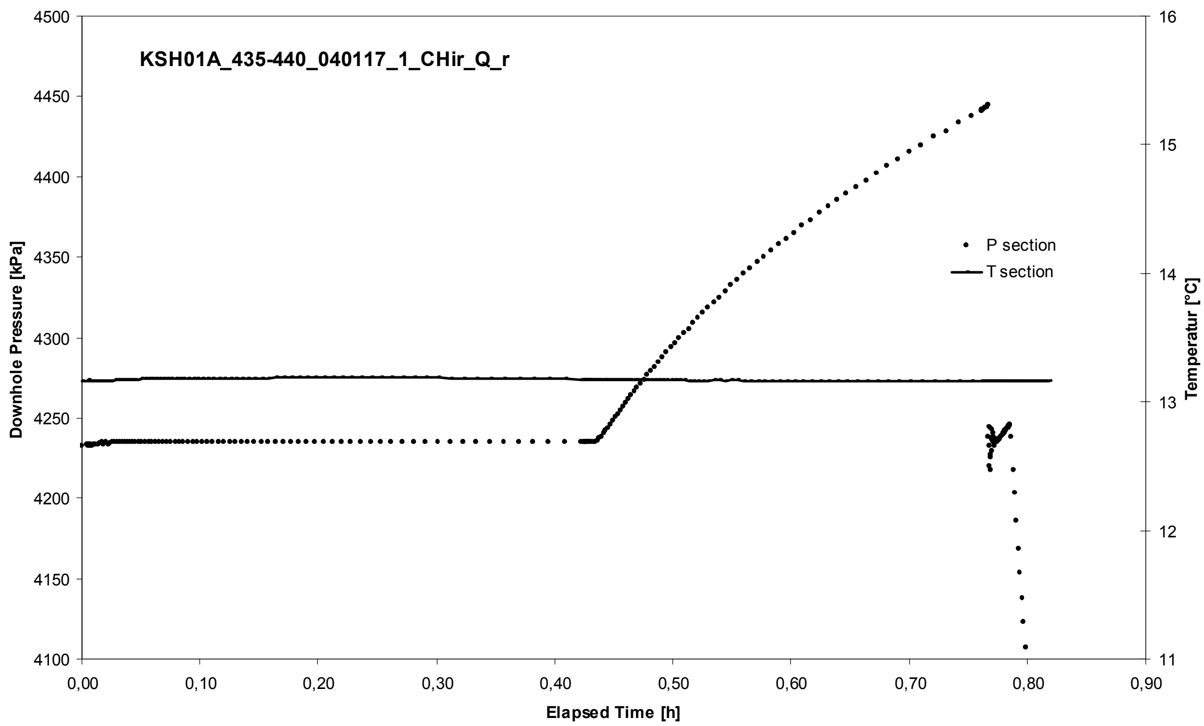
APPENDIX 2-82

Test 435 – 440 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

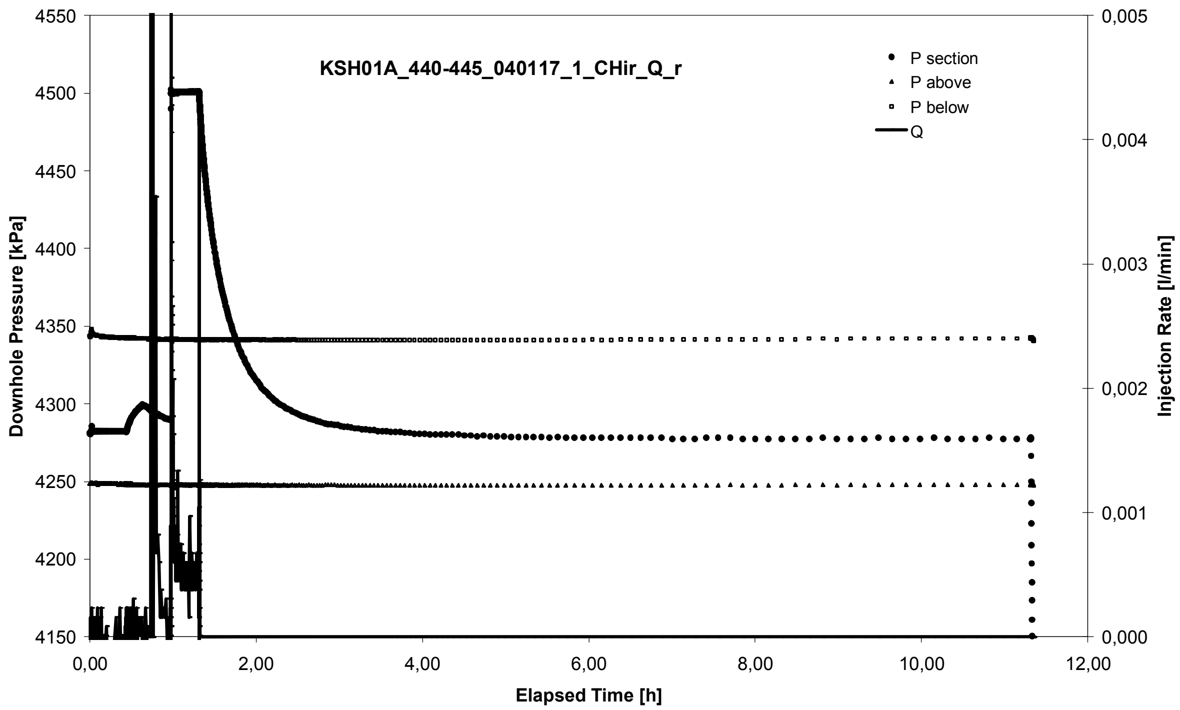
Not Analysed

CHIR phase; HORNER match

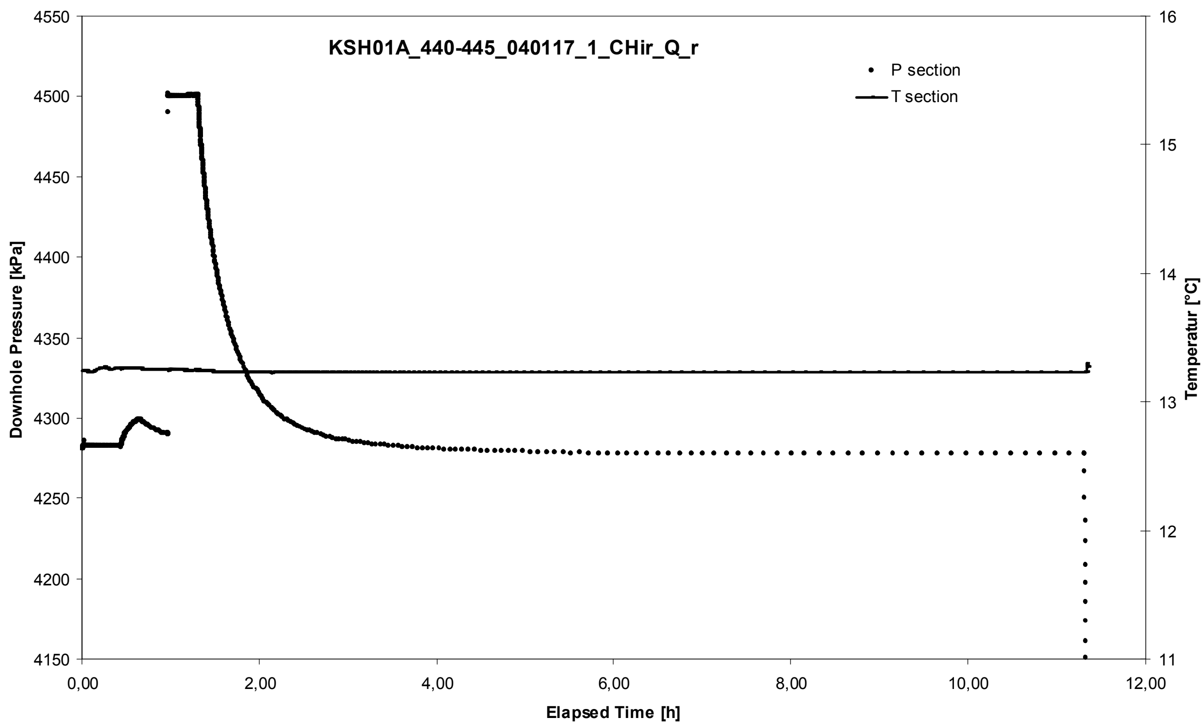
APPENDIX 2-83

Test 440 – 445 m

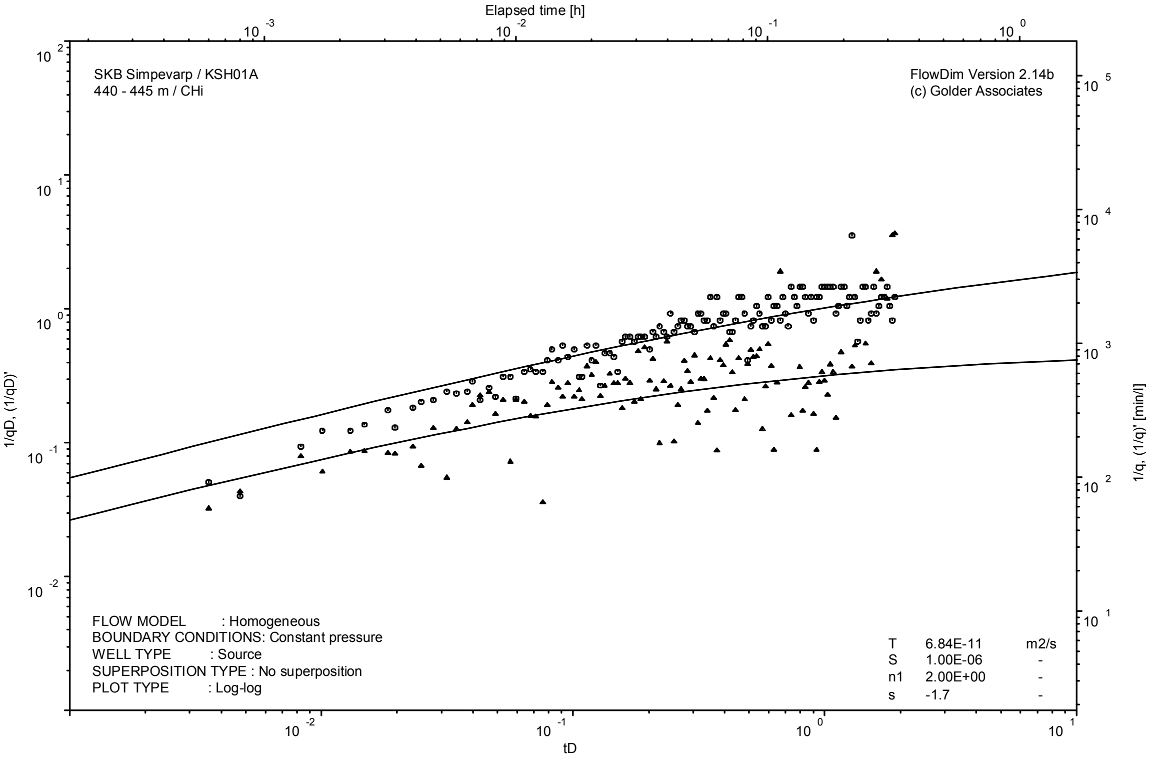
Analysis diagrams



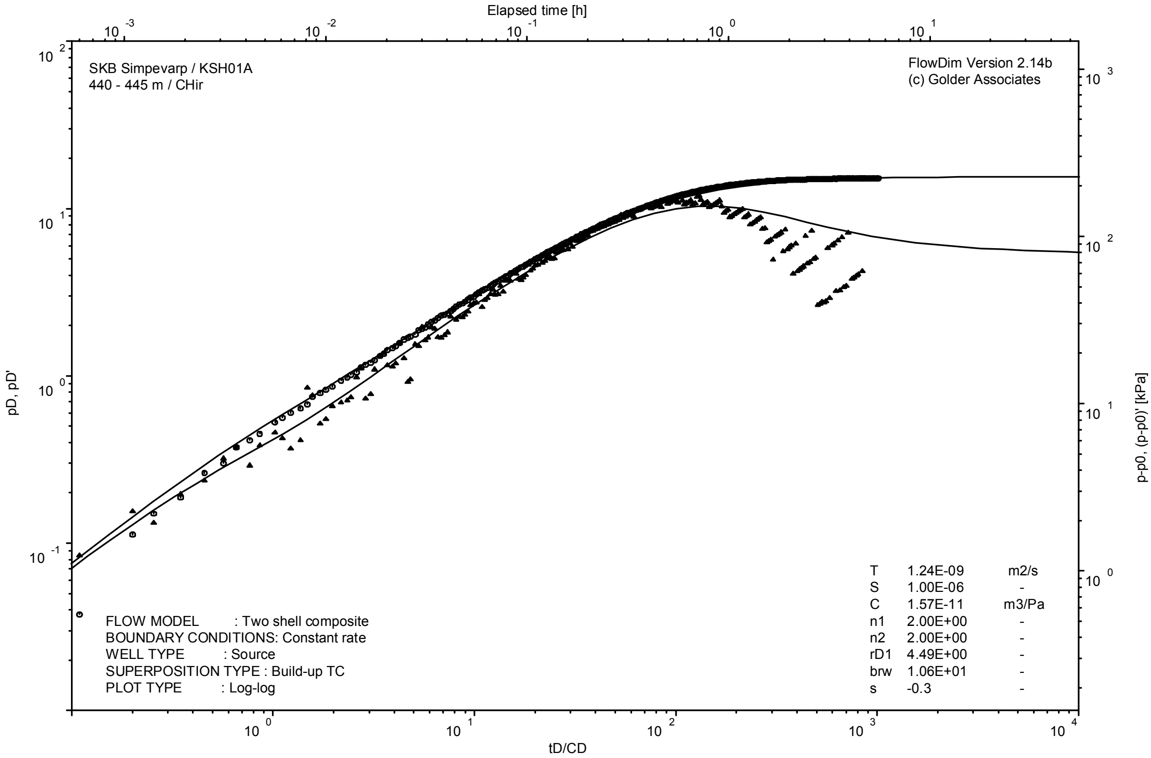
Pressure and flow rate vs. time; cartesian plot



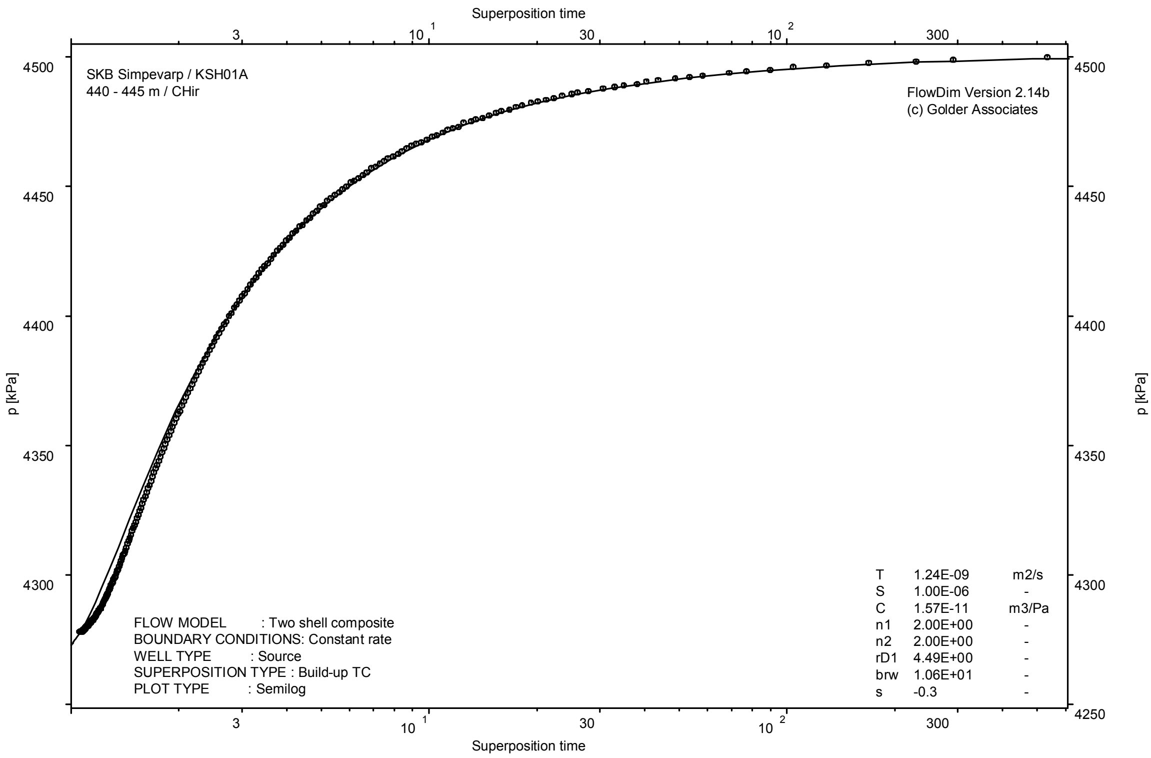
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

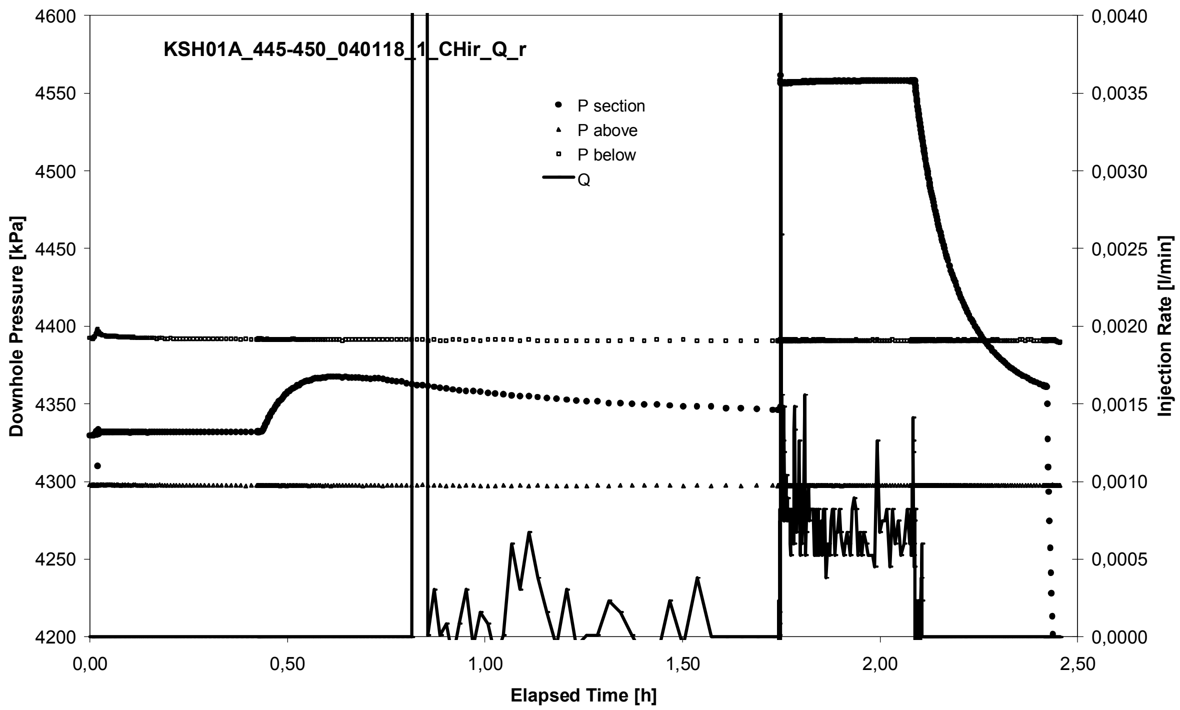


CHIR phase; HORNER match

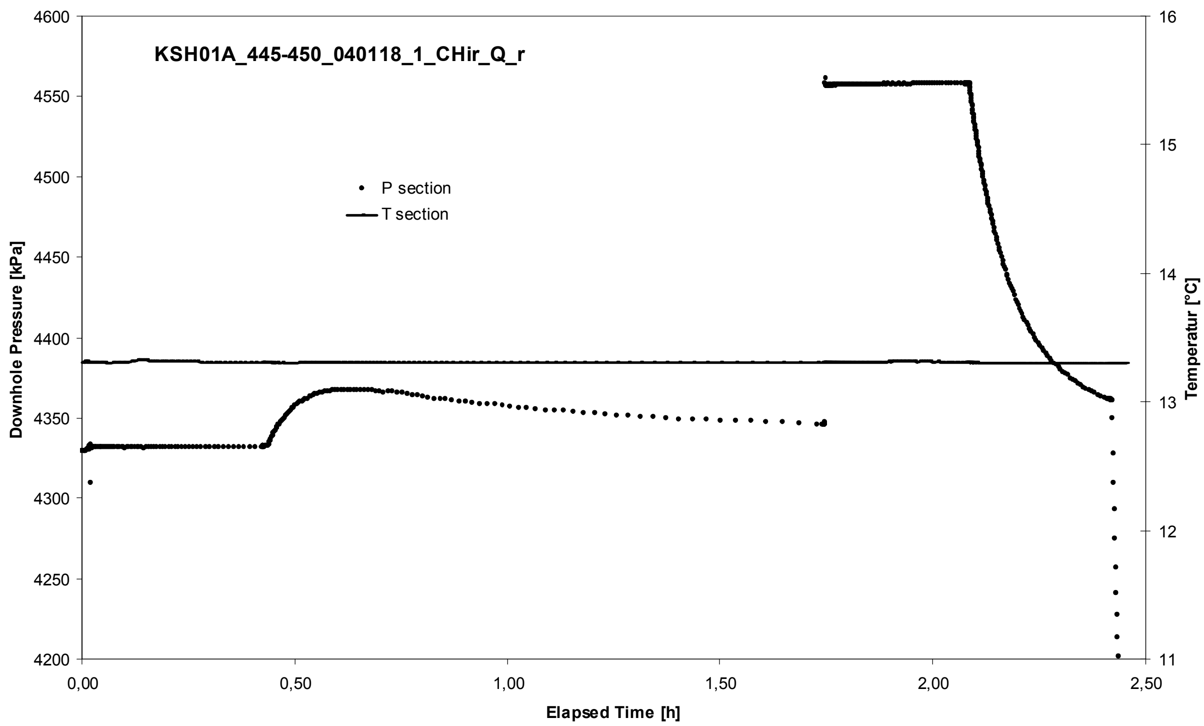
APPENDIX 2-84

Test 445 – 450 m

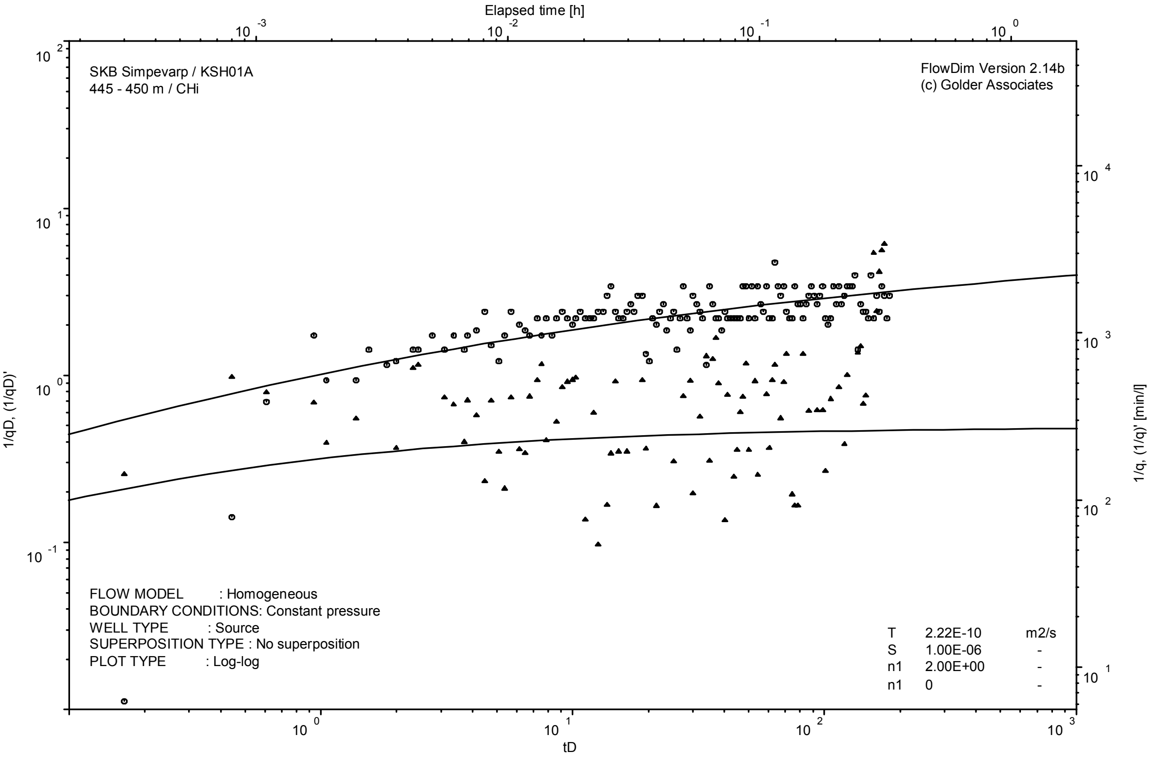
Analysis diagrams



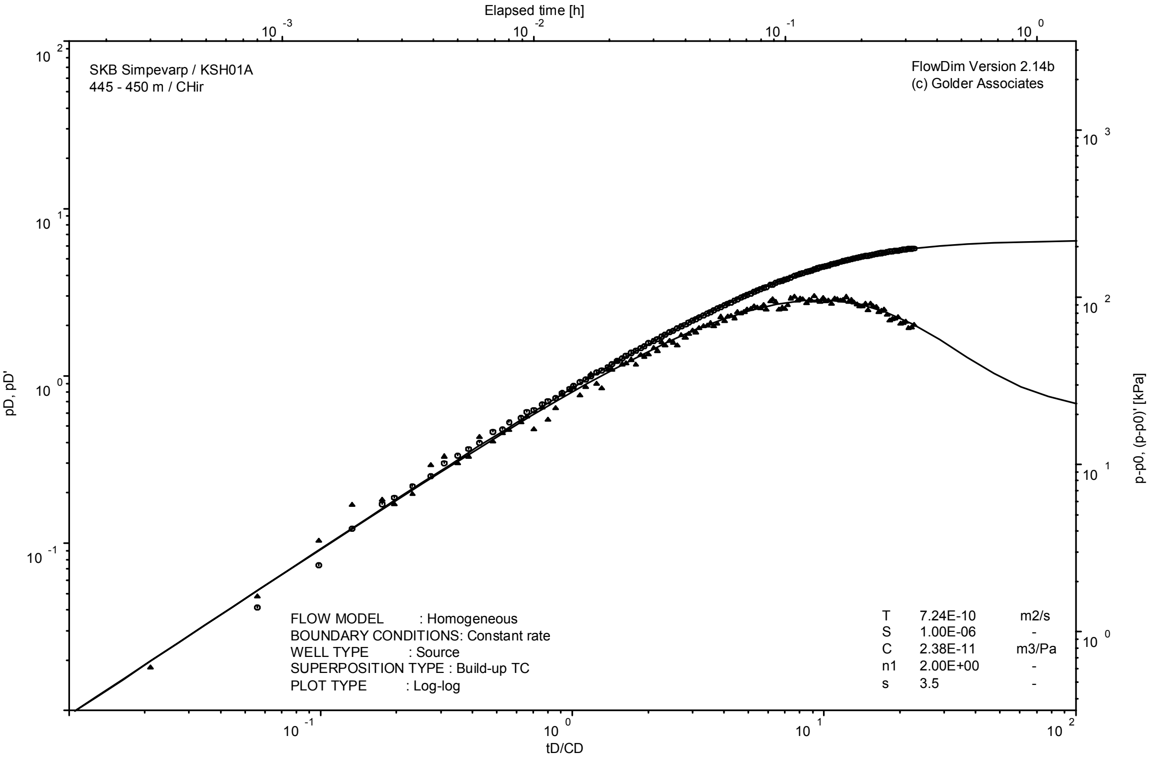
Pressure and flow rate vs. time; cartesian plot



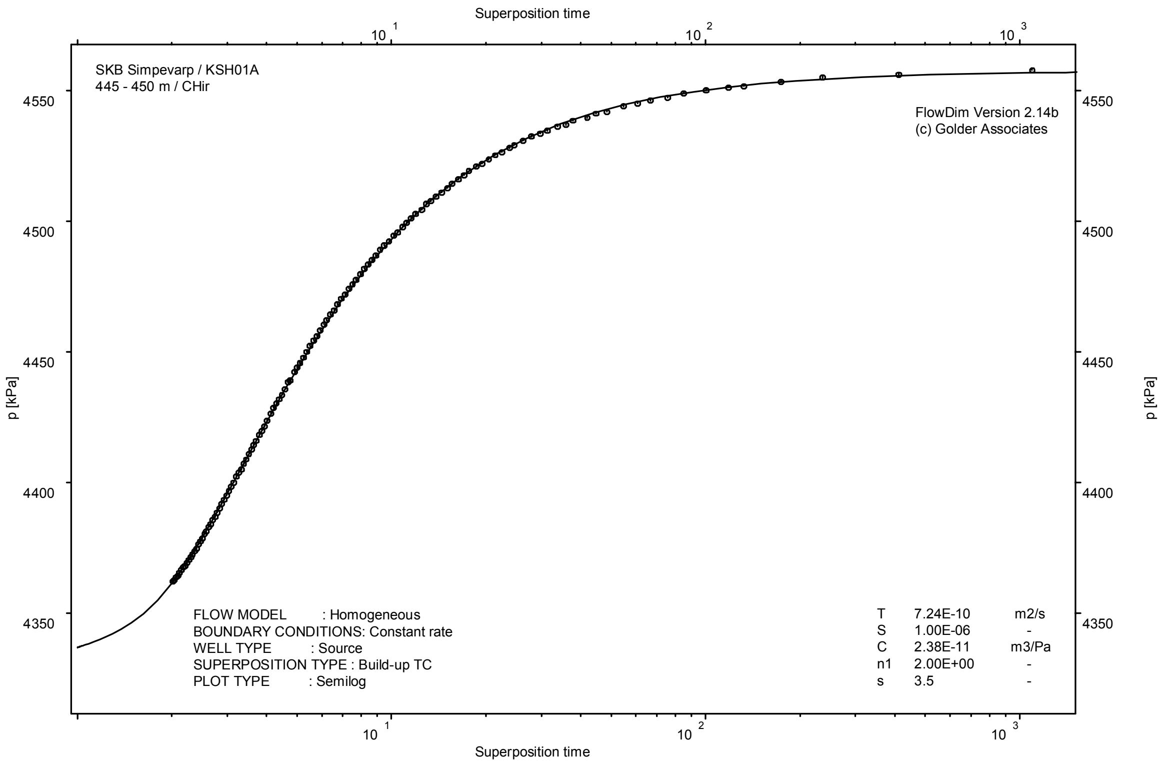
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

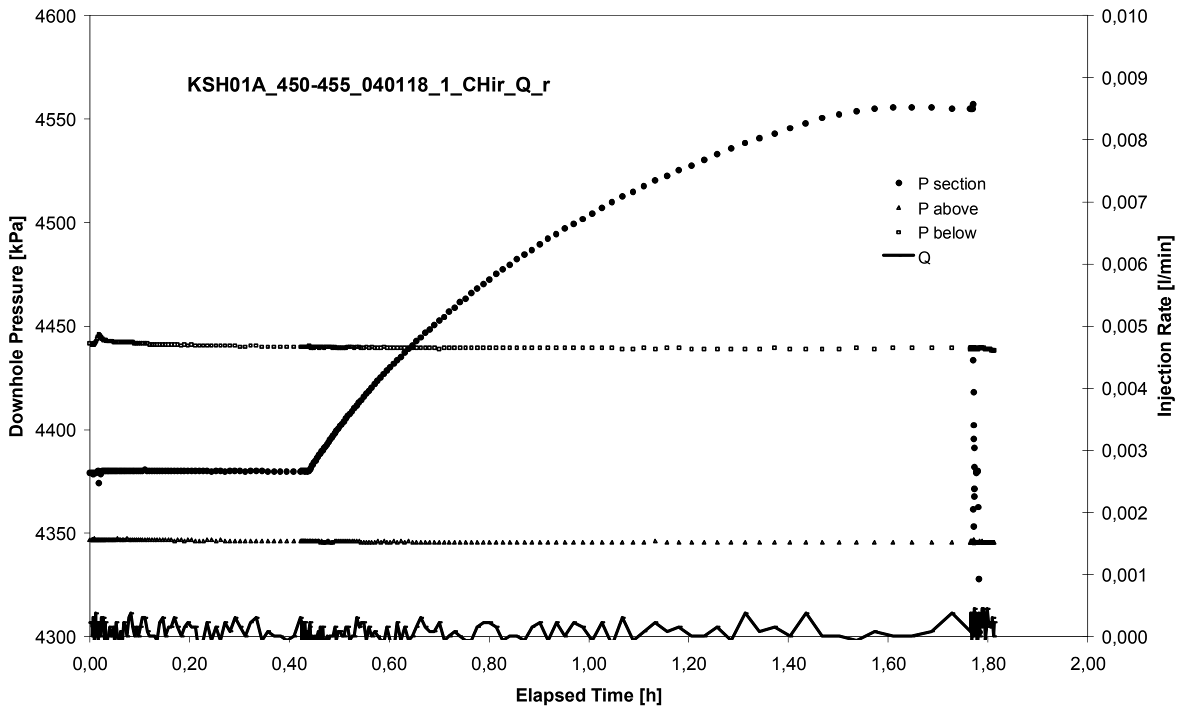


CHIR phase; HORNER match

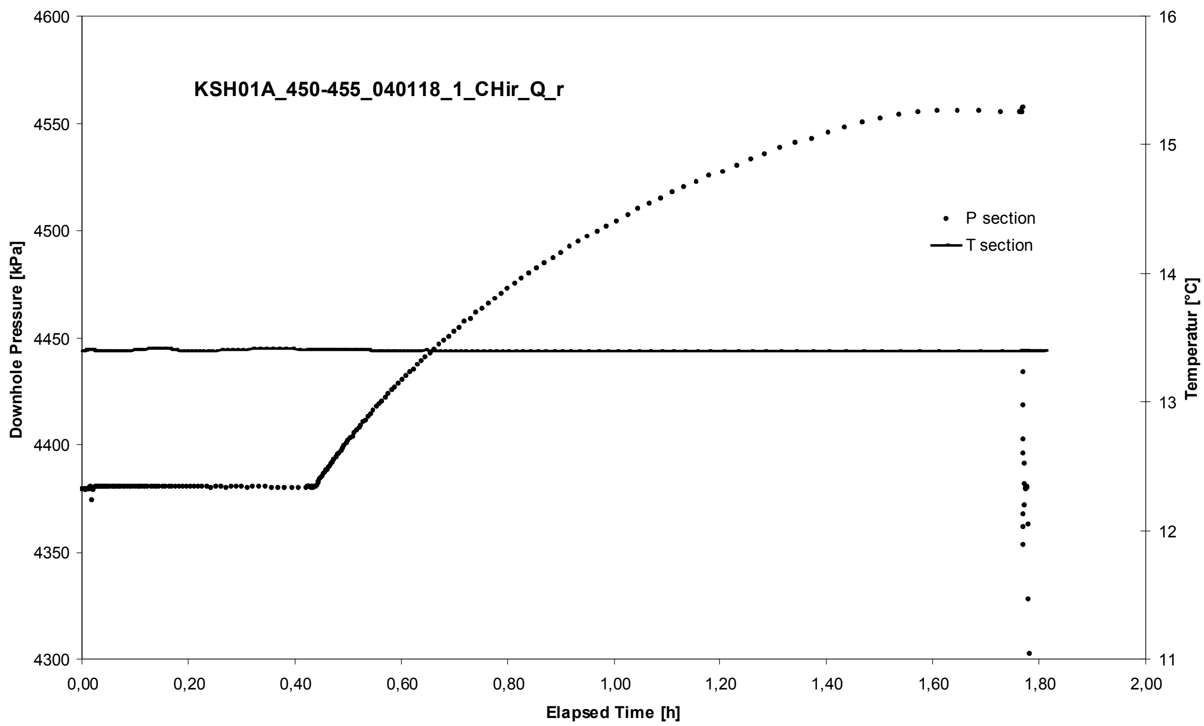
APPENDIX 2-85

Test 450 – 455 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

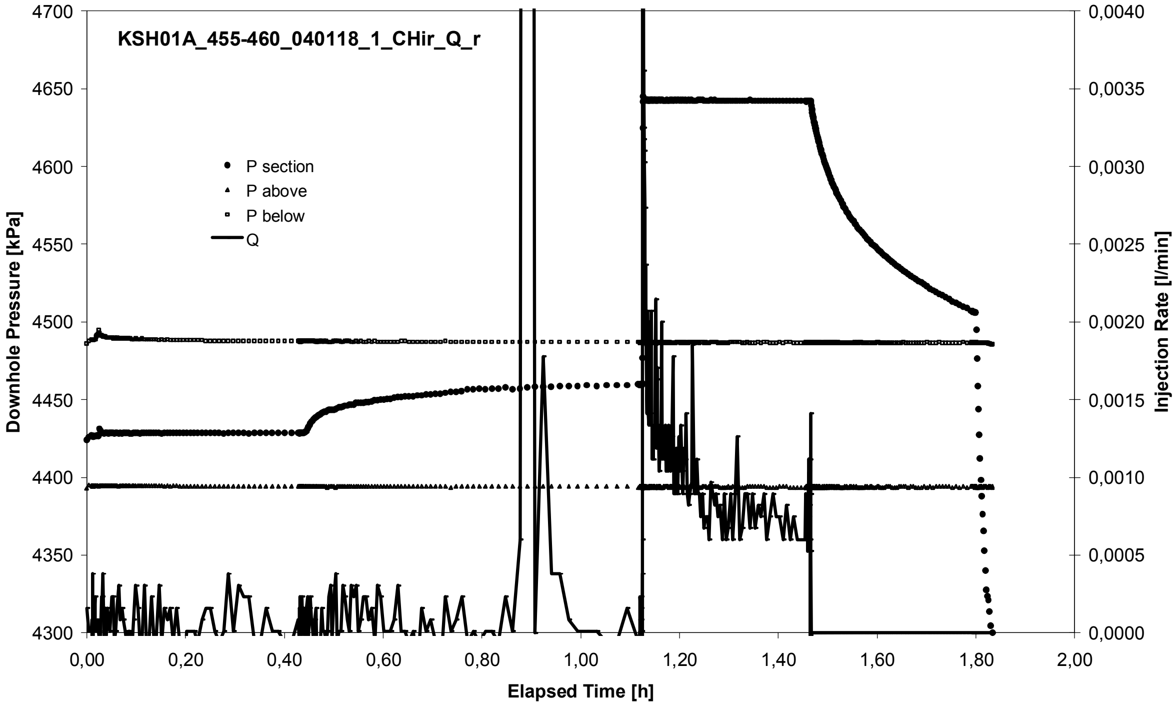
Not Analysed

CHIR phase; HORNER match

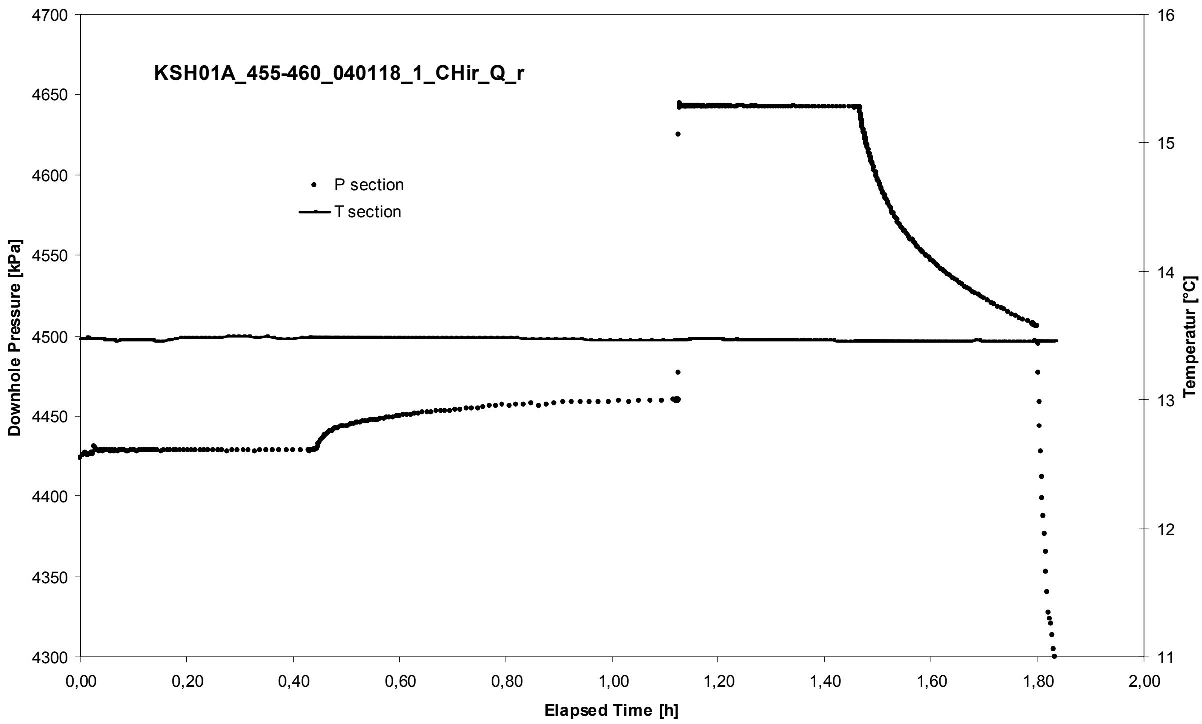
APPENDIX 2-86

Test 455 – 460 m

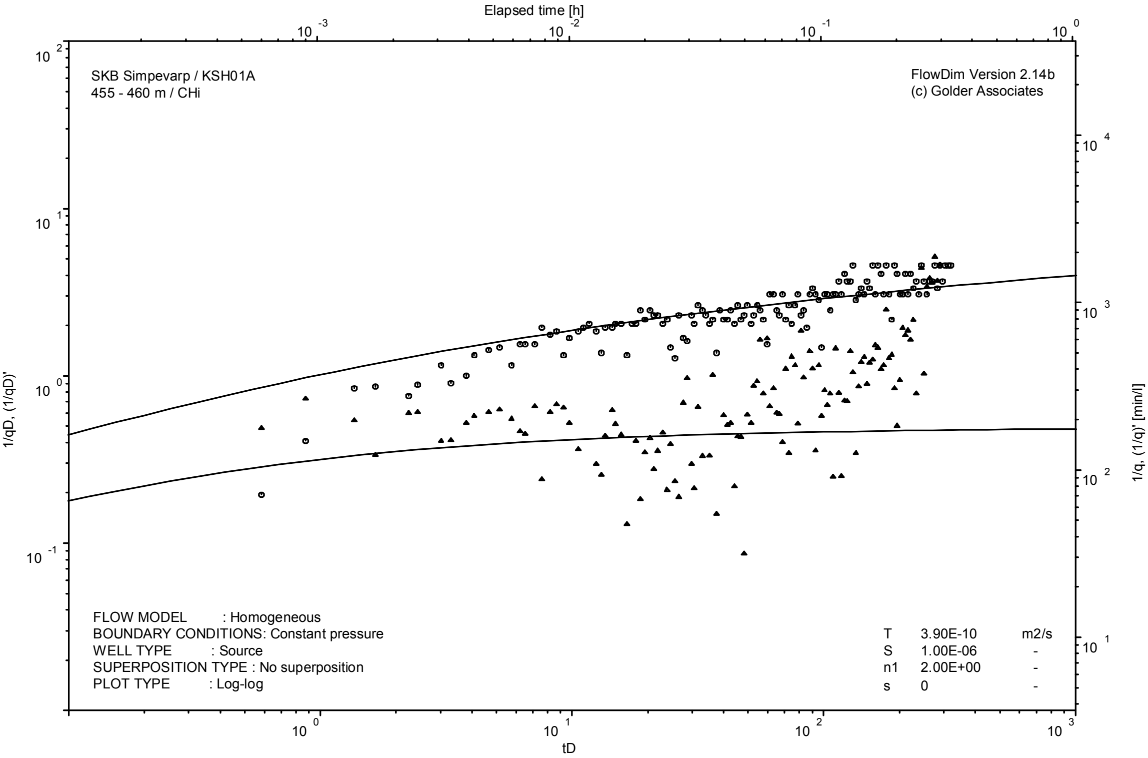
Analysis diagrams



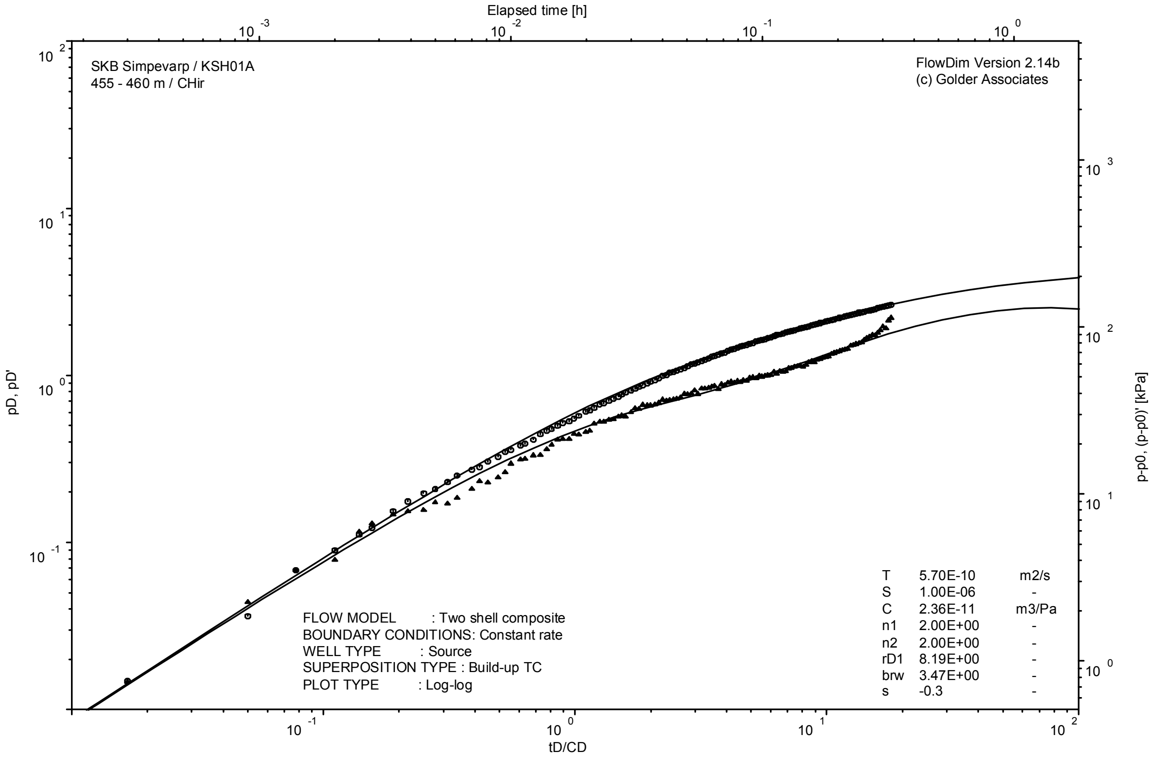
Pressure and flow rate vs. time; cartesian plot



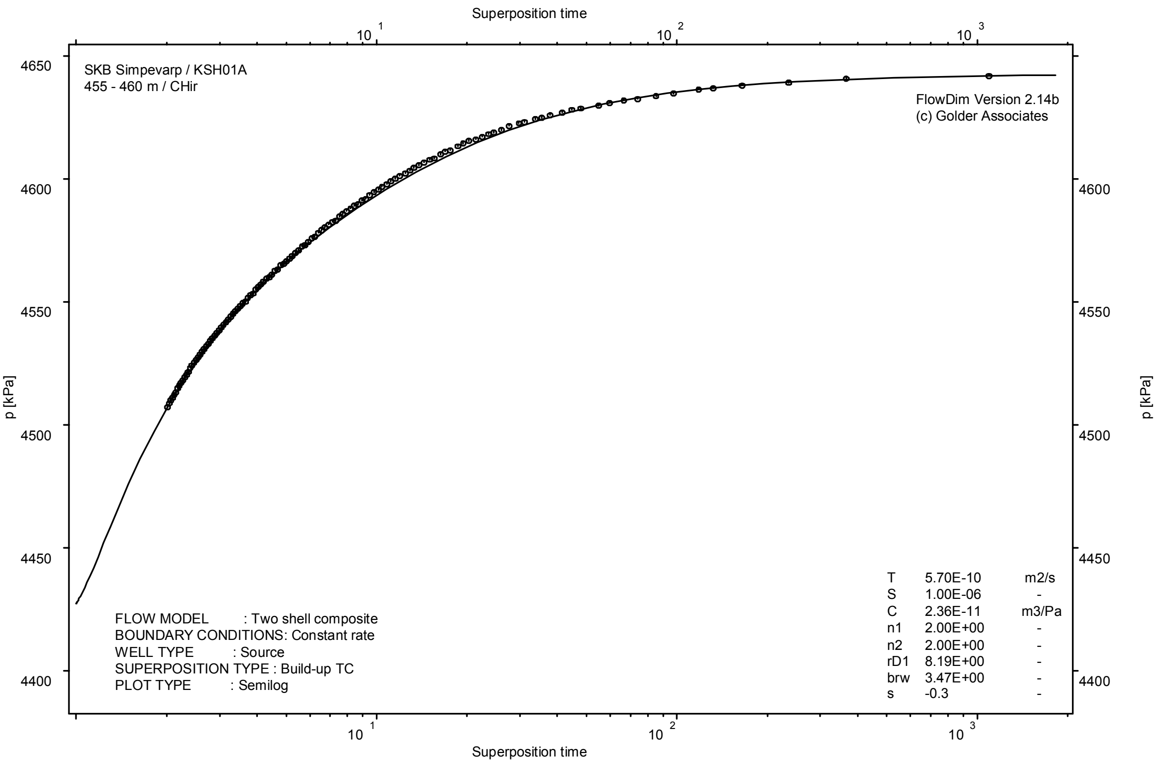
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

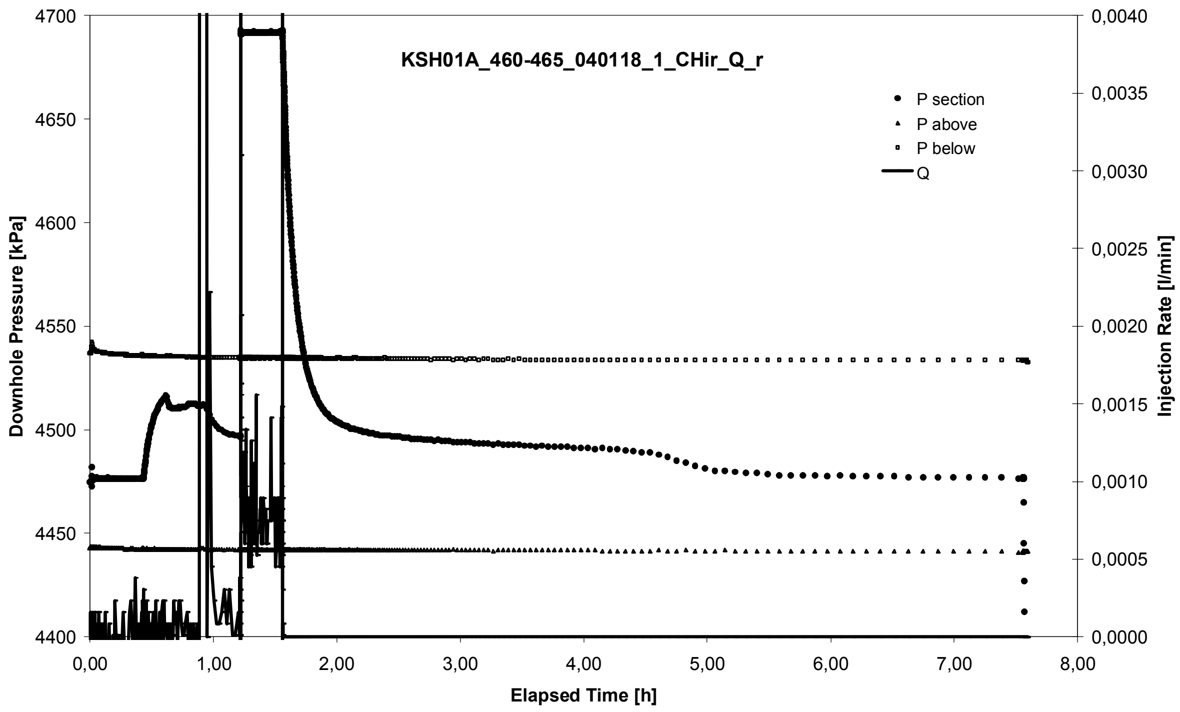


CHIR phase; HORNER match

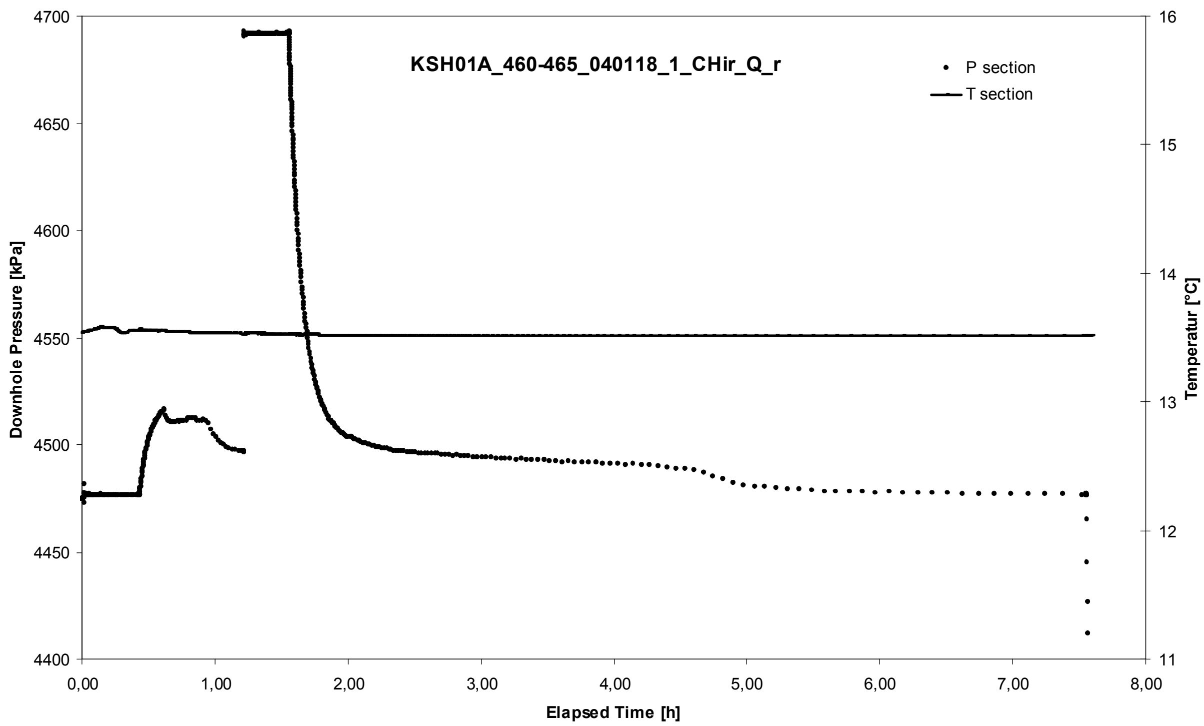
APPENDIX 2-87

Test 460 – 465 m

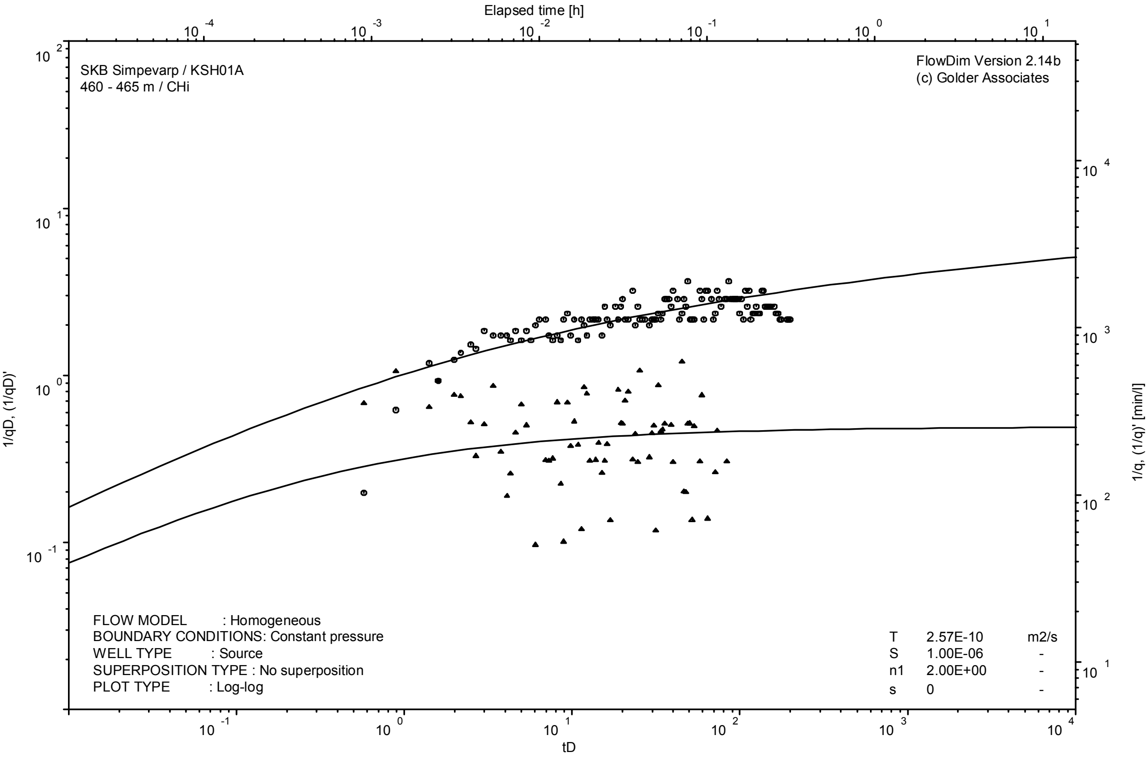
Analysis diagrams



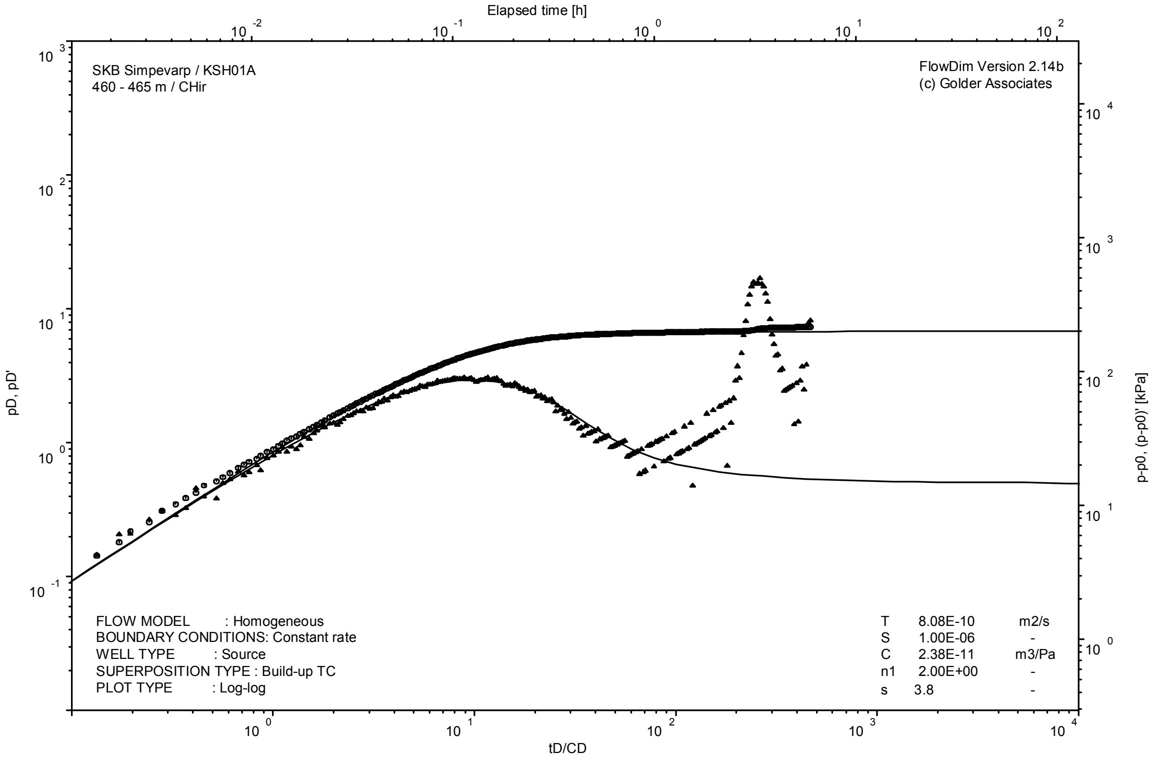
Pressure and flow rate vs. time; cartesian plot



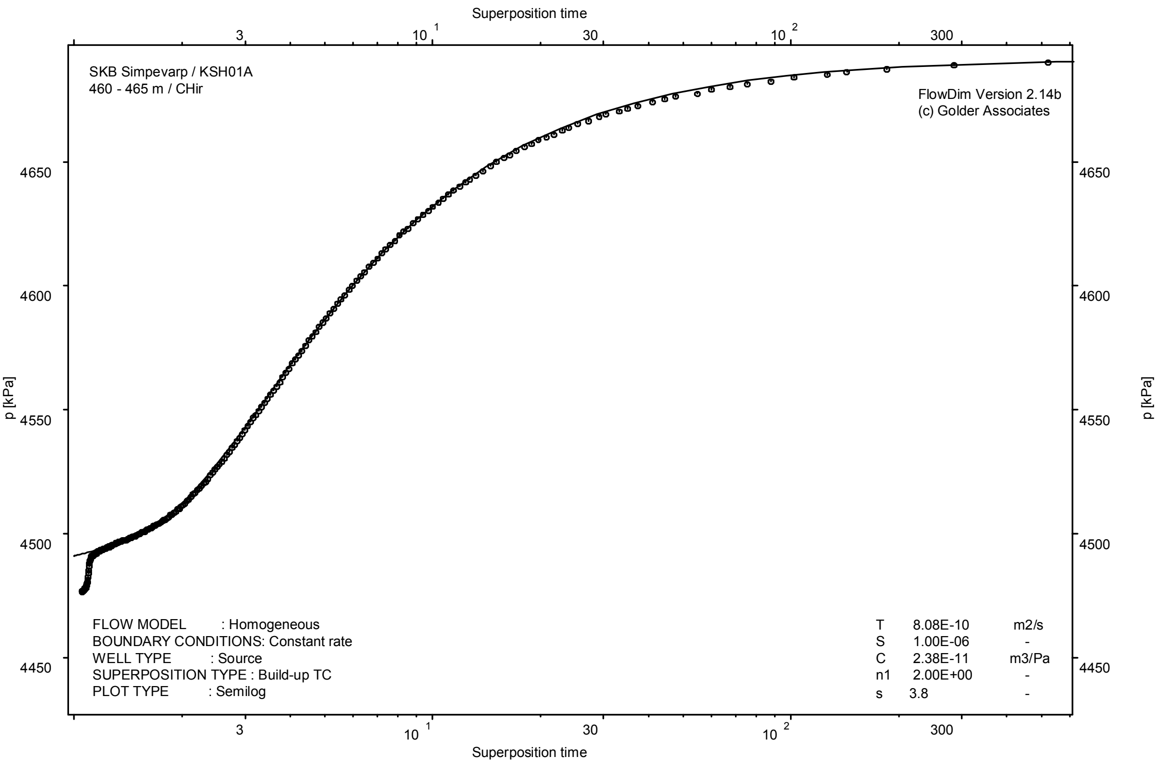
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

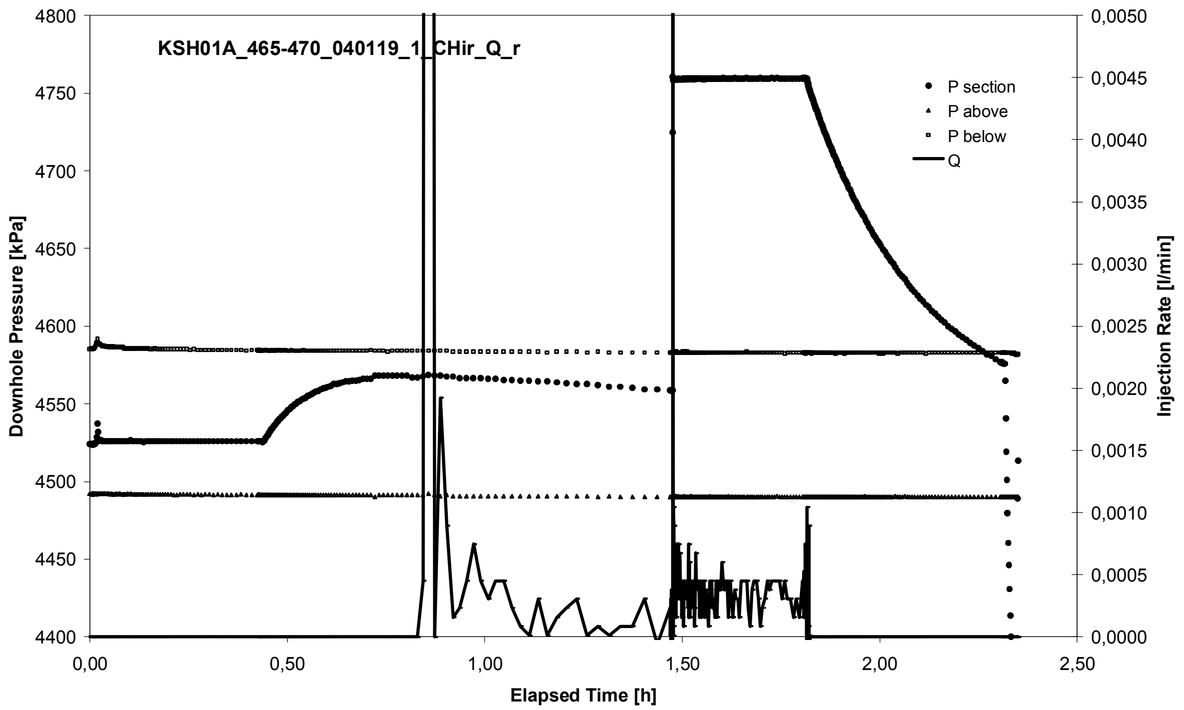


CHIR phase; HORNER match

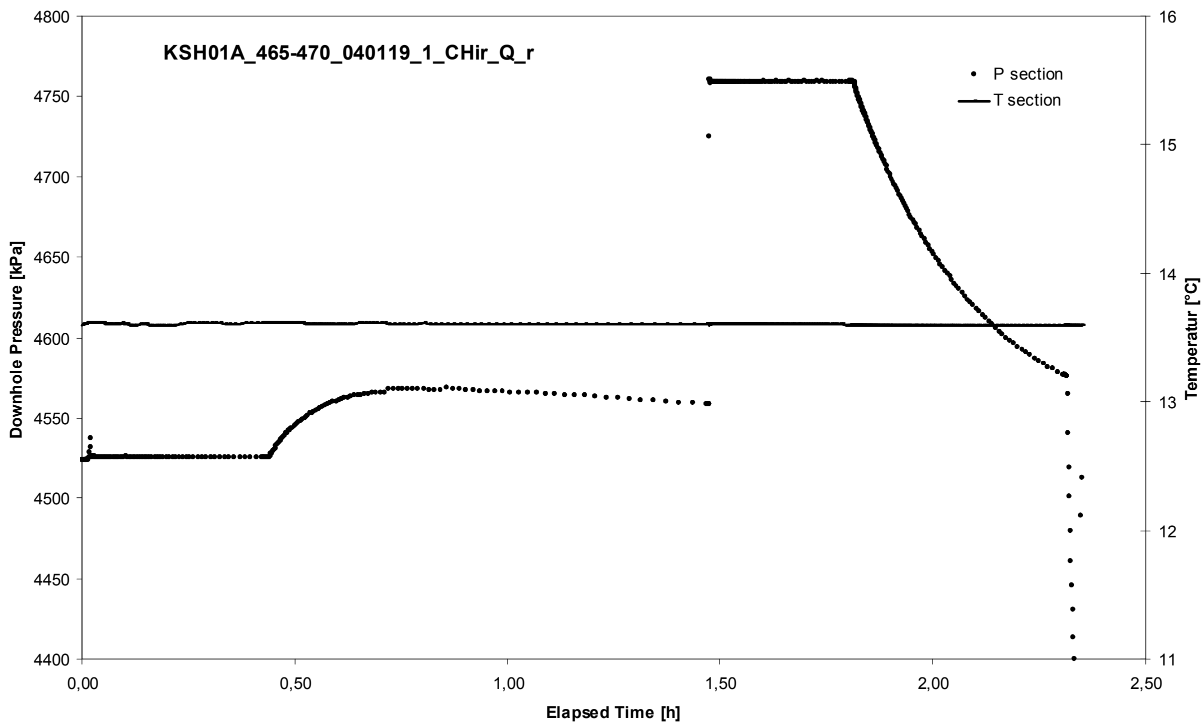
APPENDIX 2-88

Test 465 – 470 m

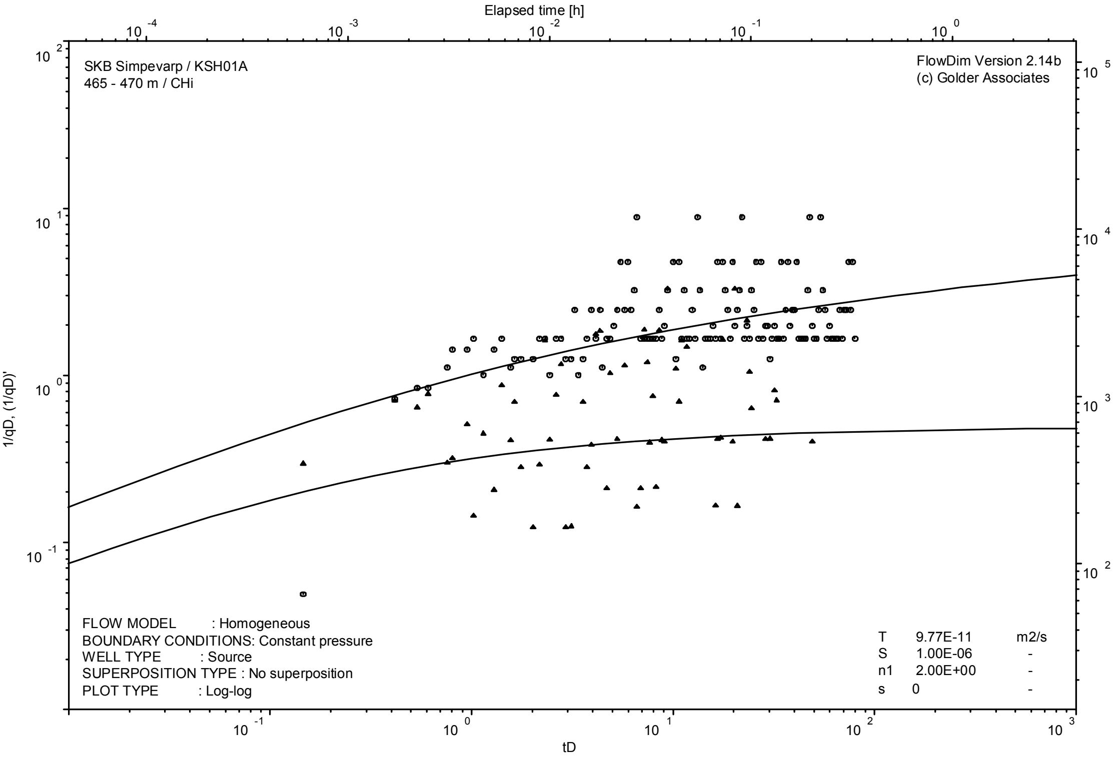
Analysis diagrams



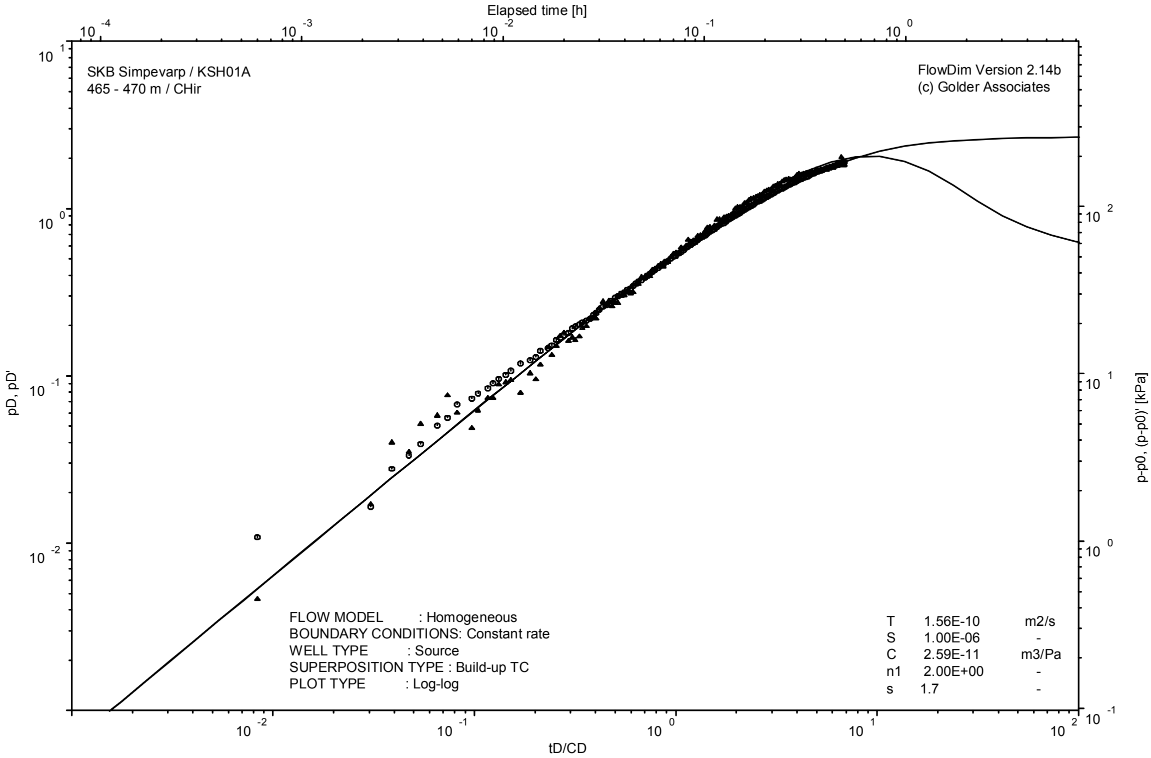
Pressure and flow rate vs. time; cartesian plot



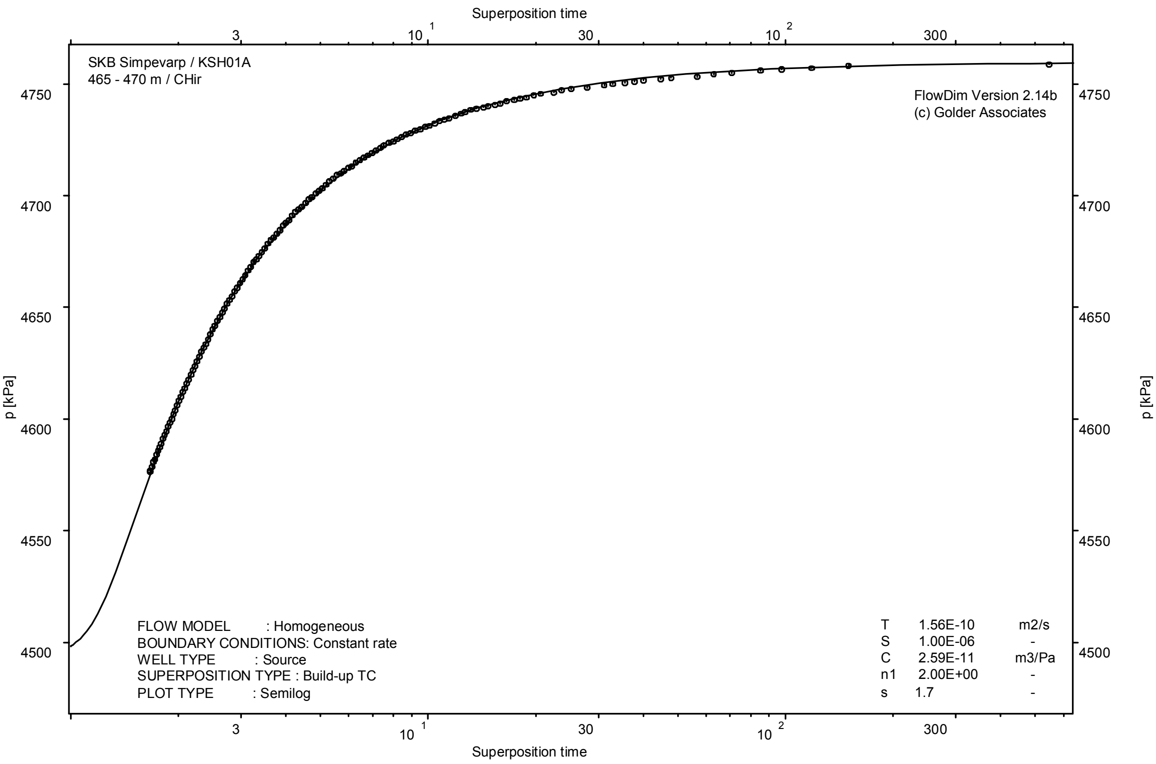
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

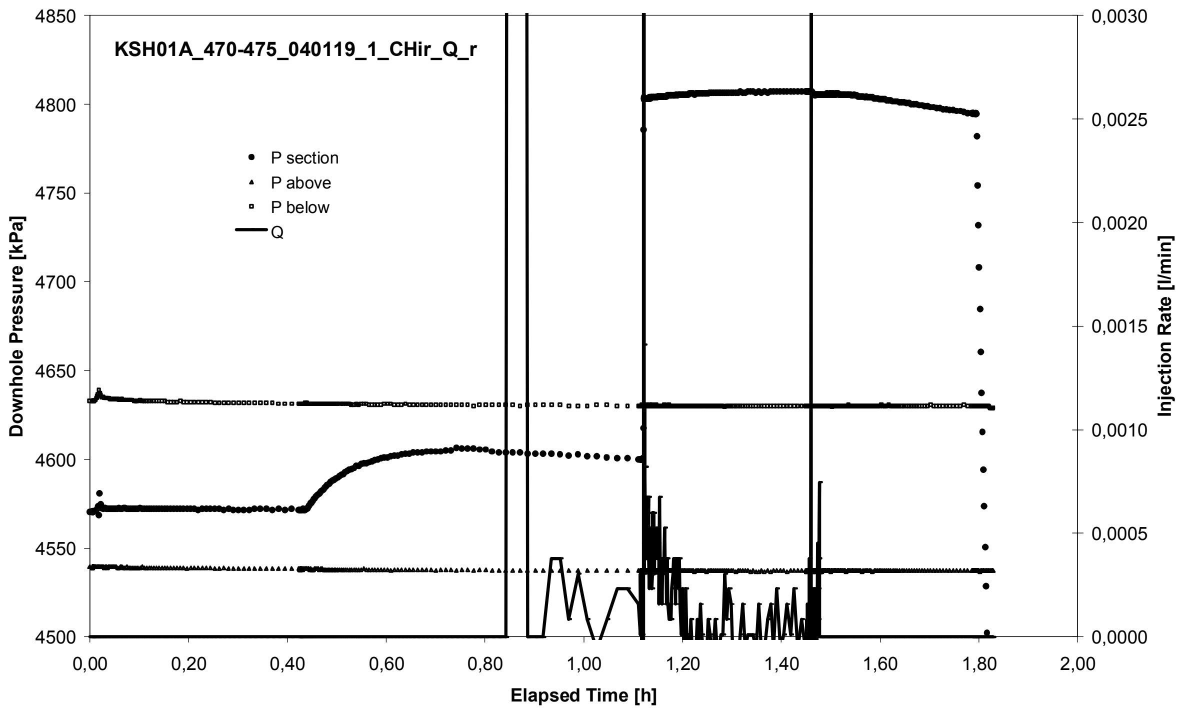


CHIR phase; HORNER match

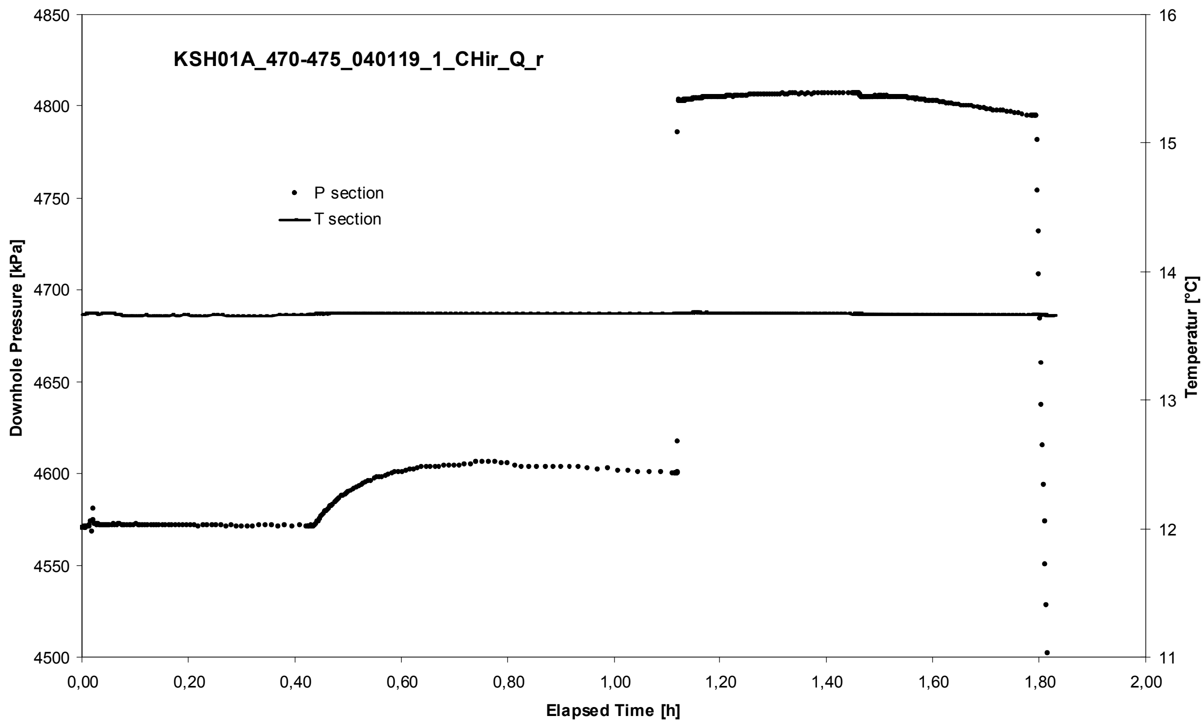
APPENDIX 2-89

Test 470 – 475 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

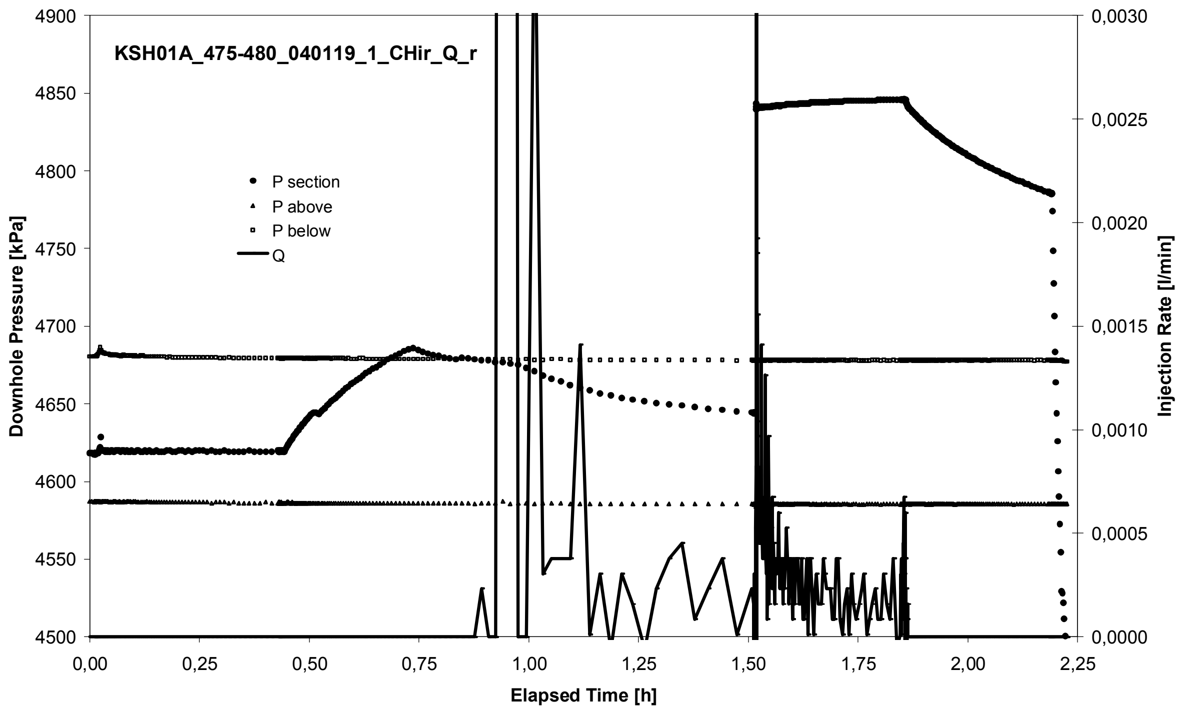
Not Analysed

CHIR phase; HORNER match

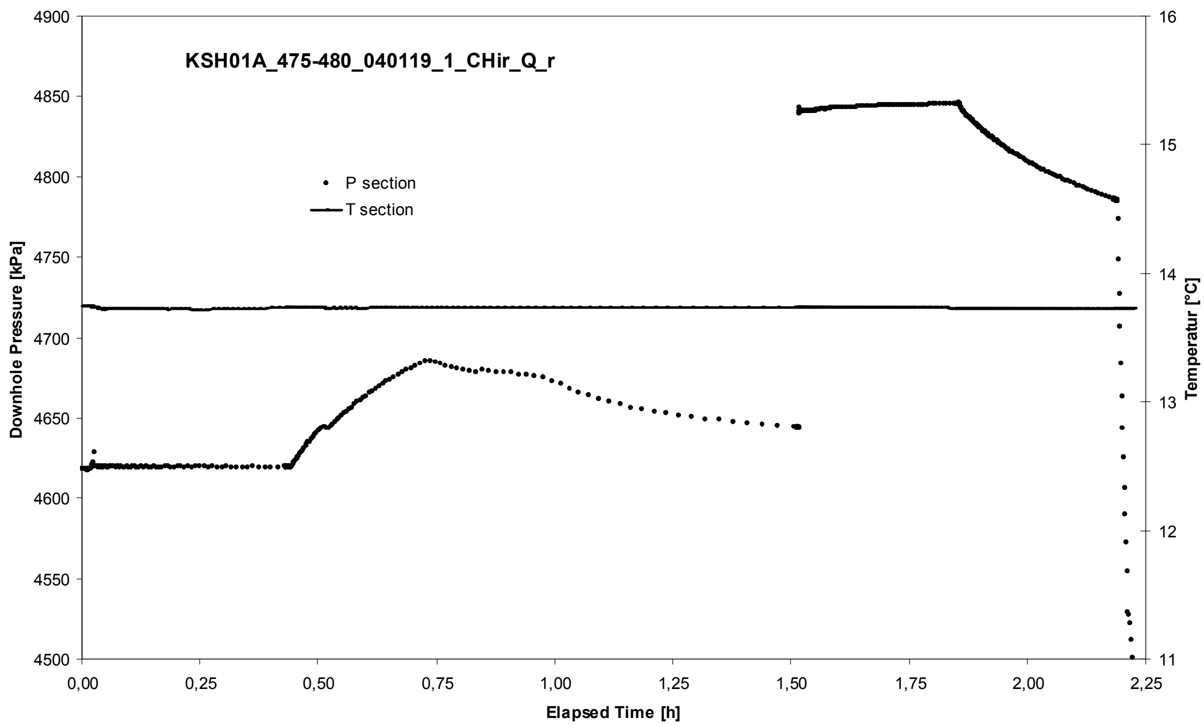
APPENDIX 2-90

Test 475 – 480 m

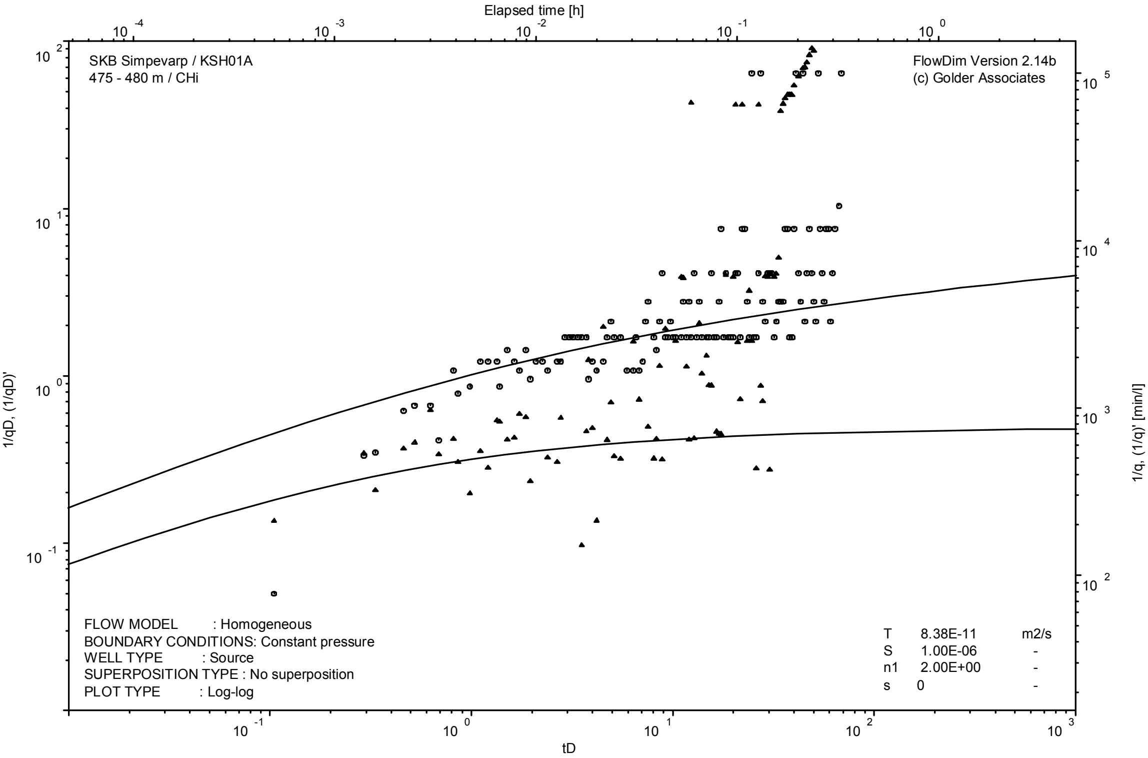
Analysis diagrams



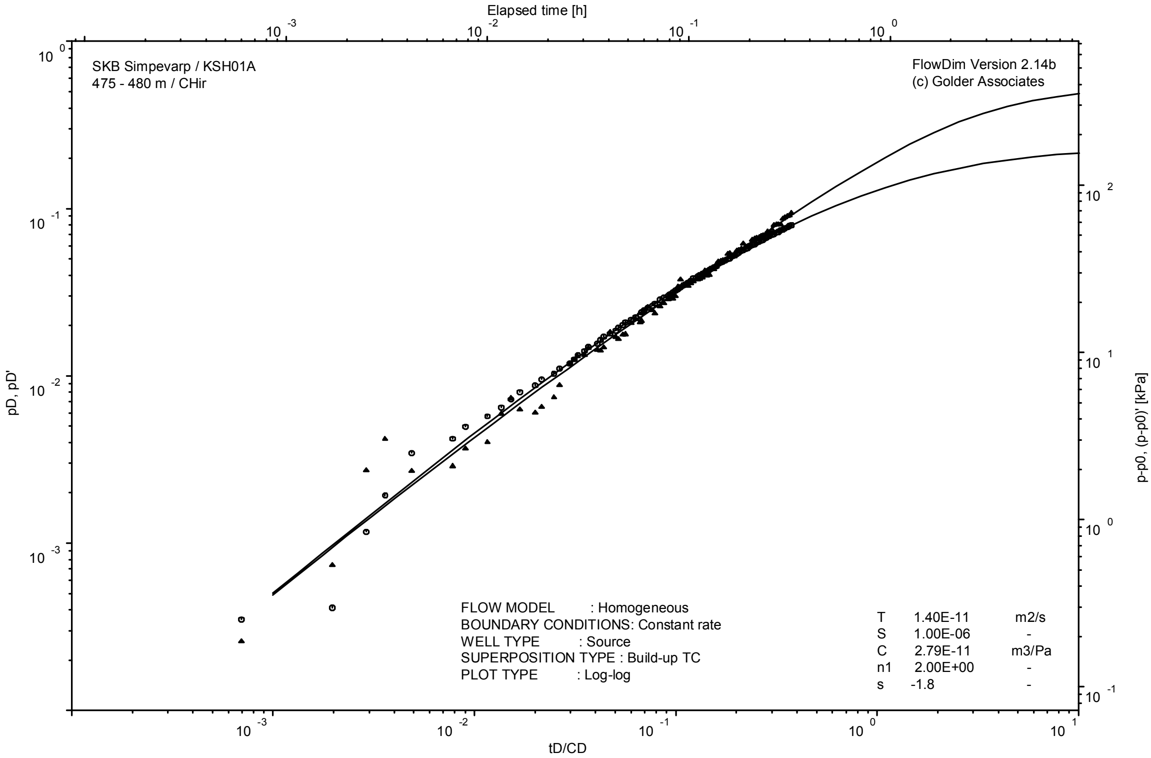
Pressure and flow rate vs. time; cartesian plot



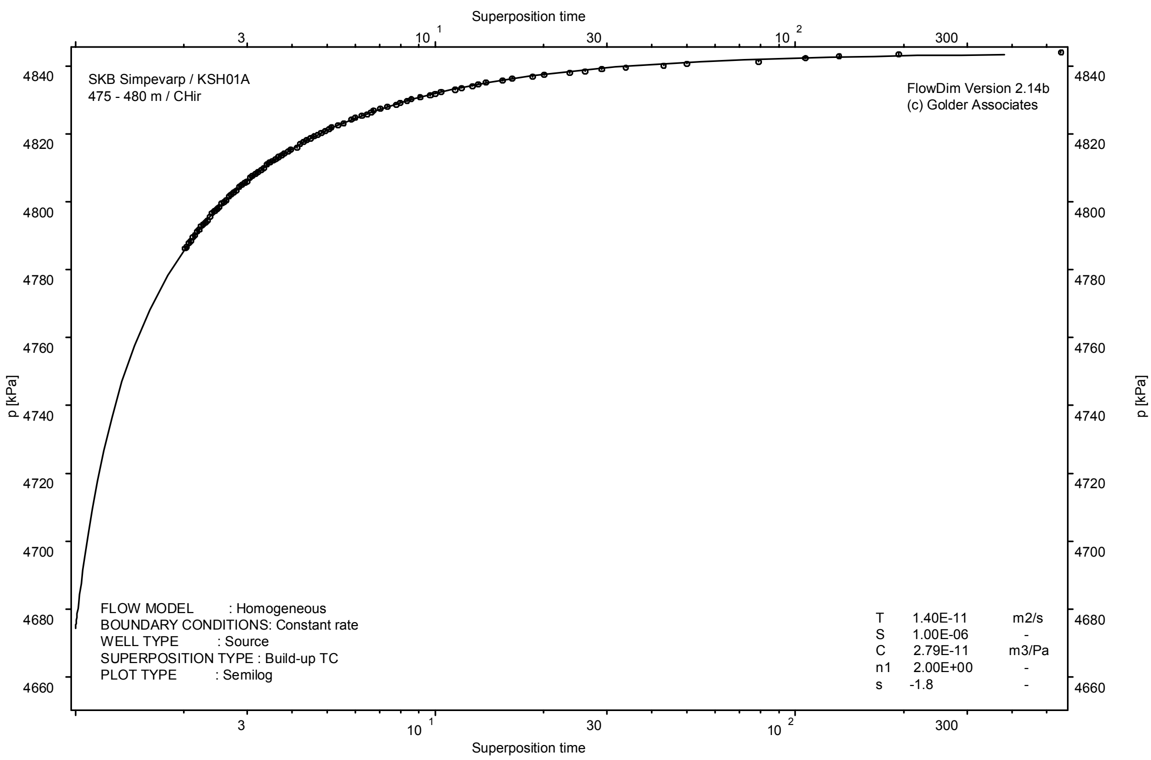
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

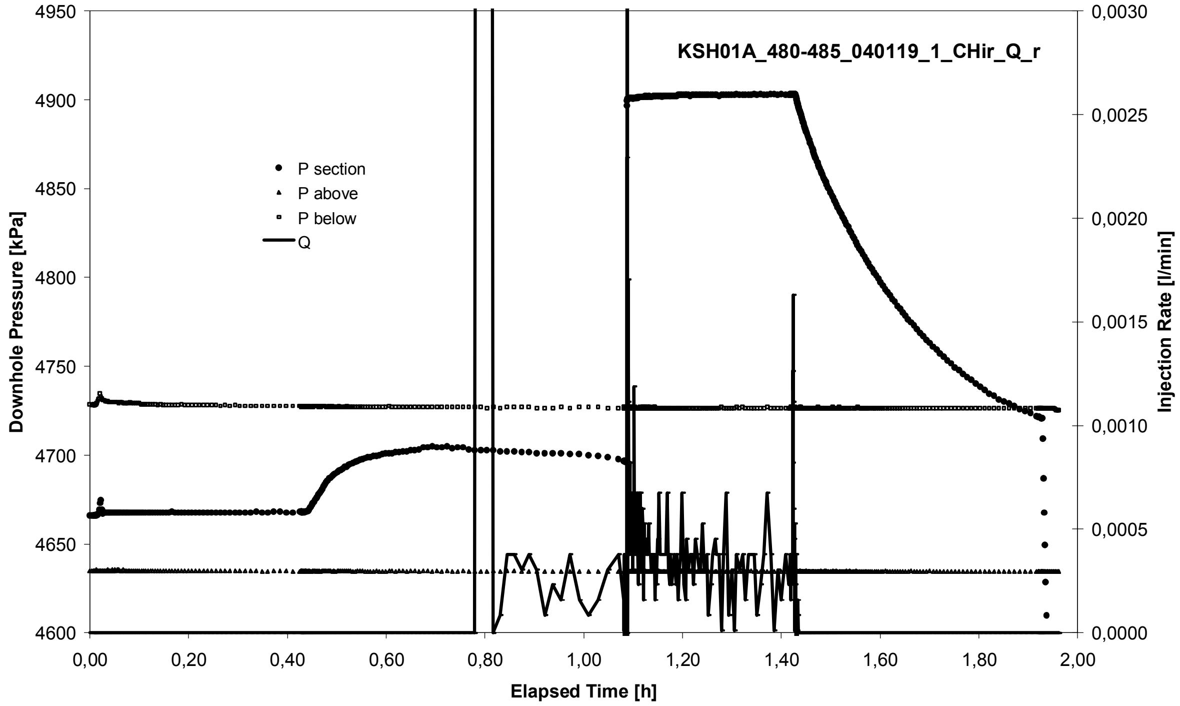


CHIR phase; HORNER match

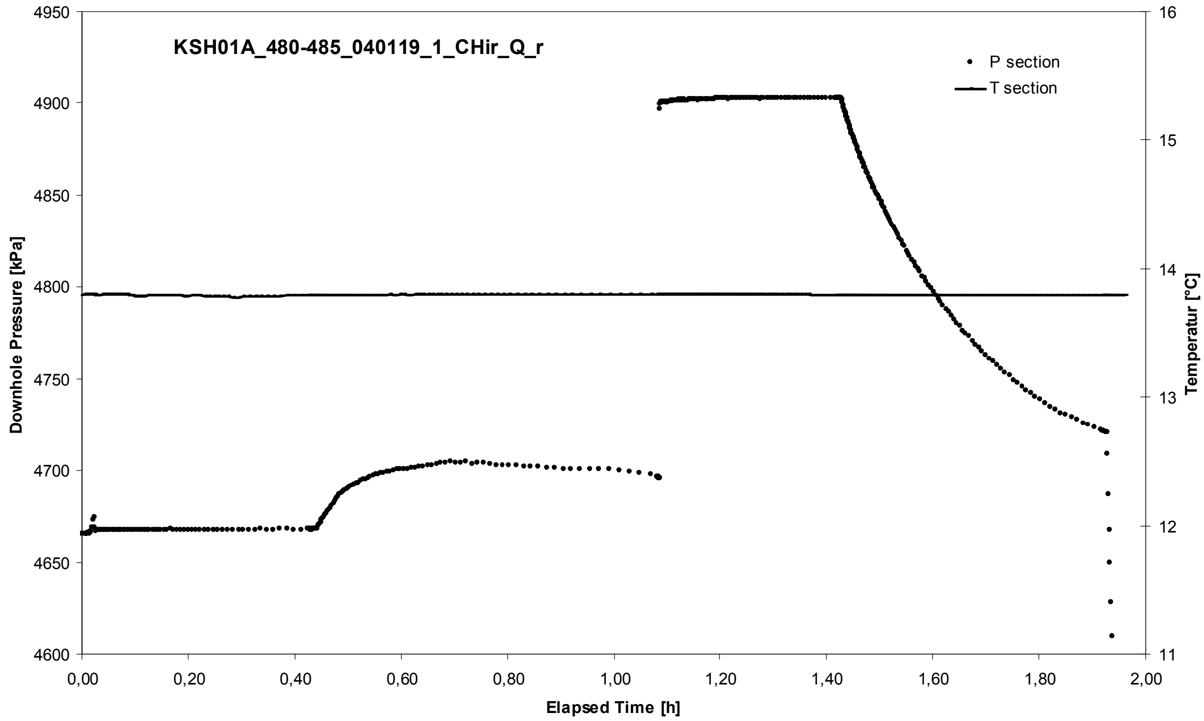
APPENDIX 2-91

Test 480 – 485 m

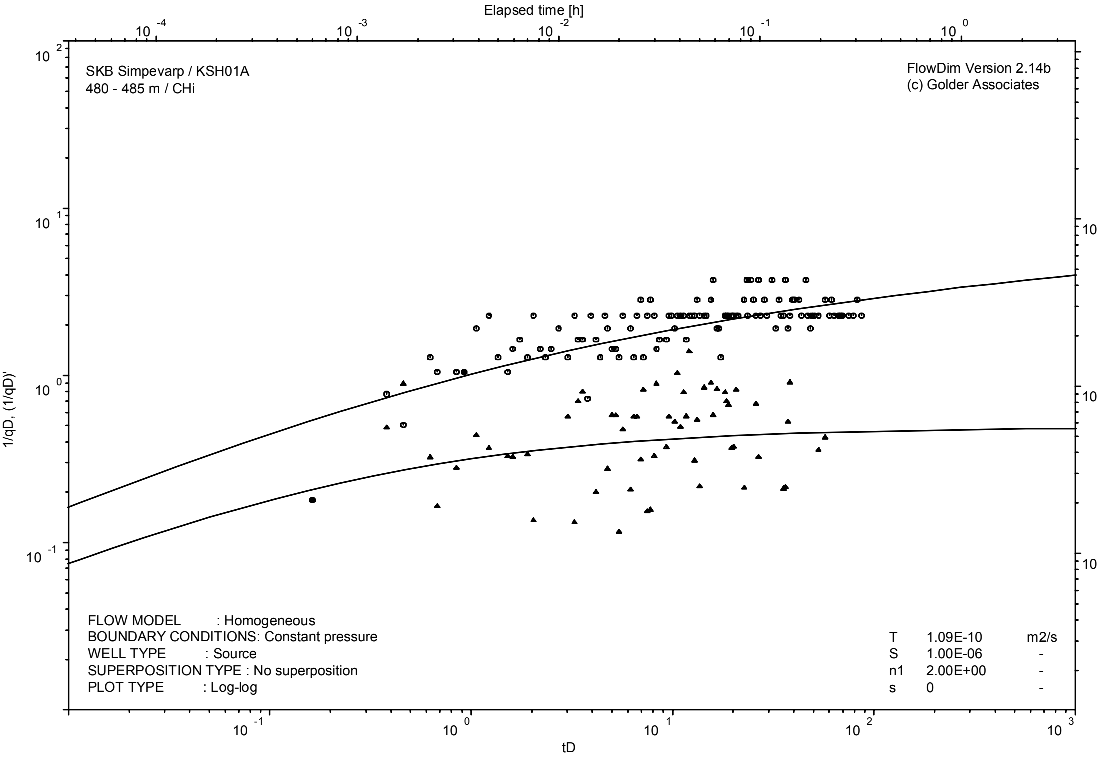
Analysis diagrams



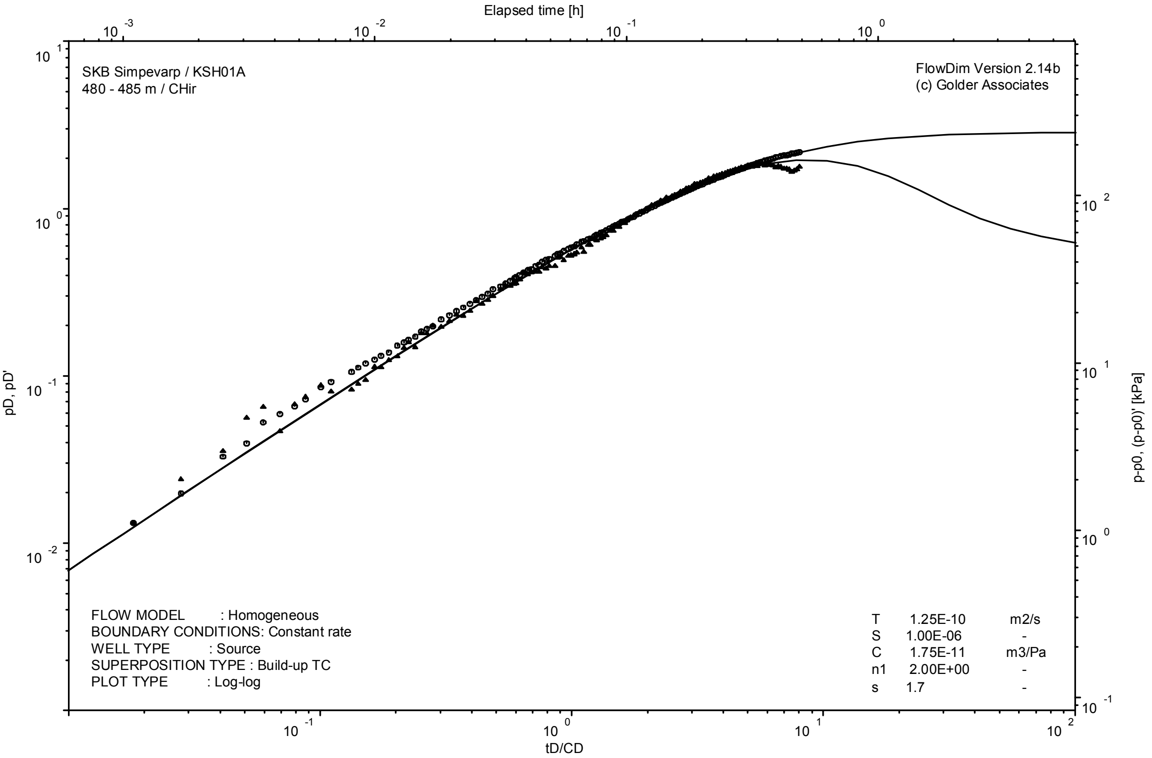
Pressure and flow rate vs. time; cartesian plot



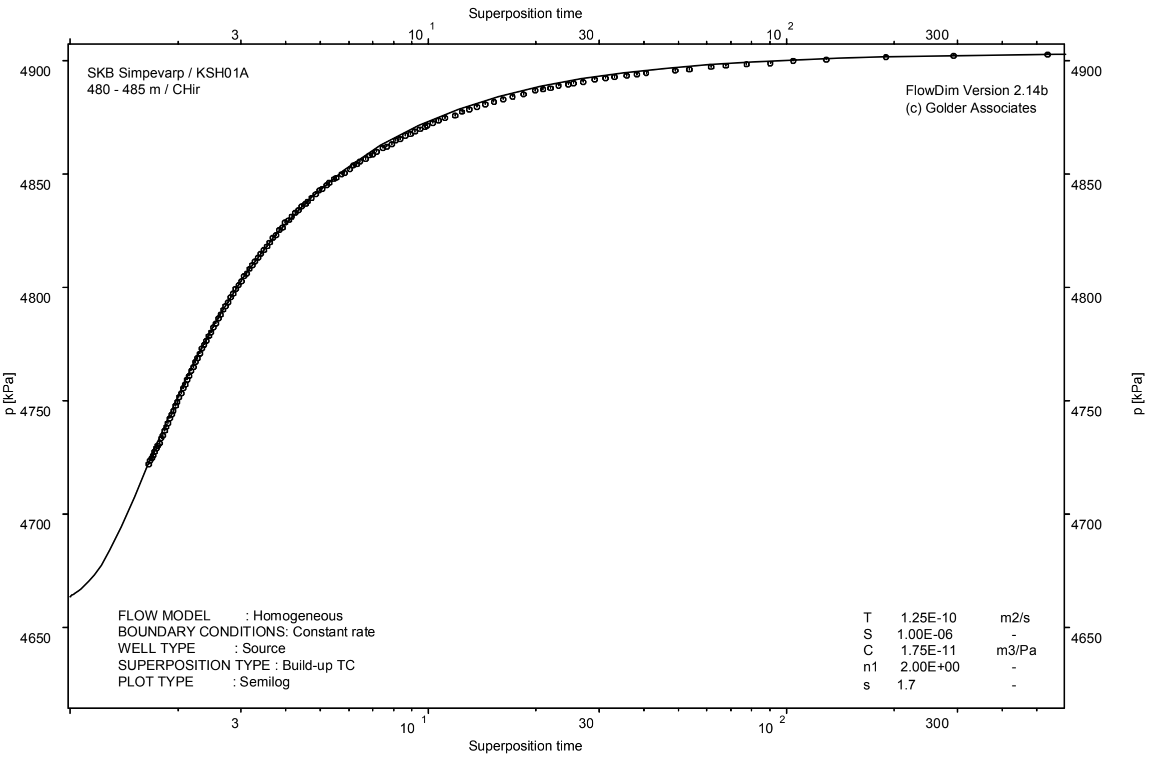
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

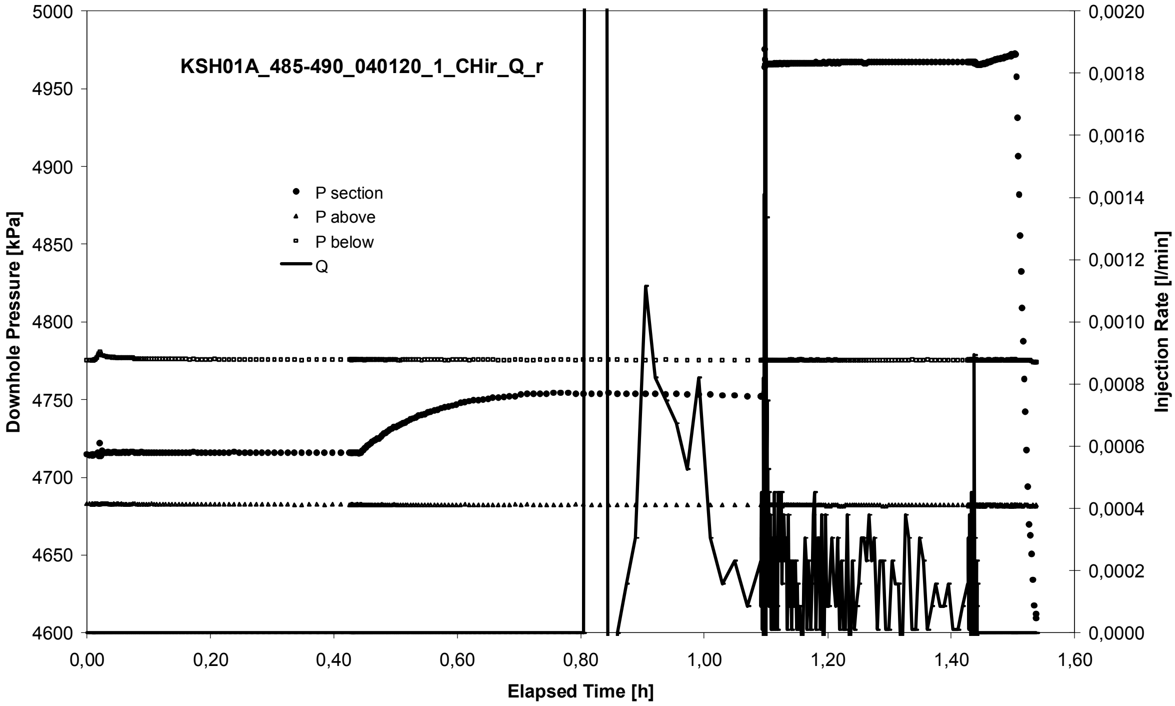


CHIR phase; HORNER match

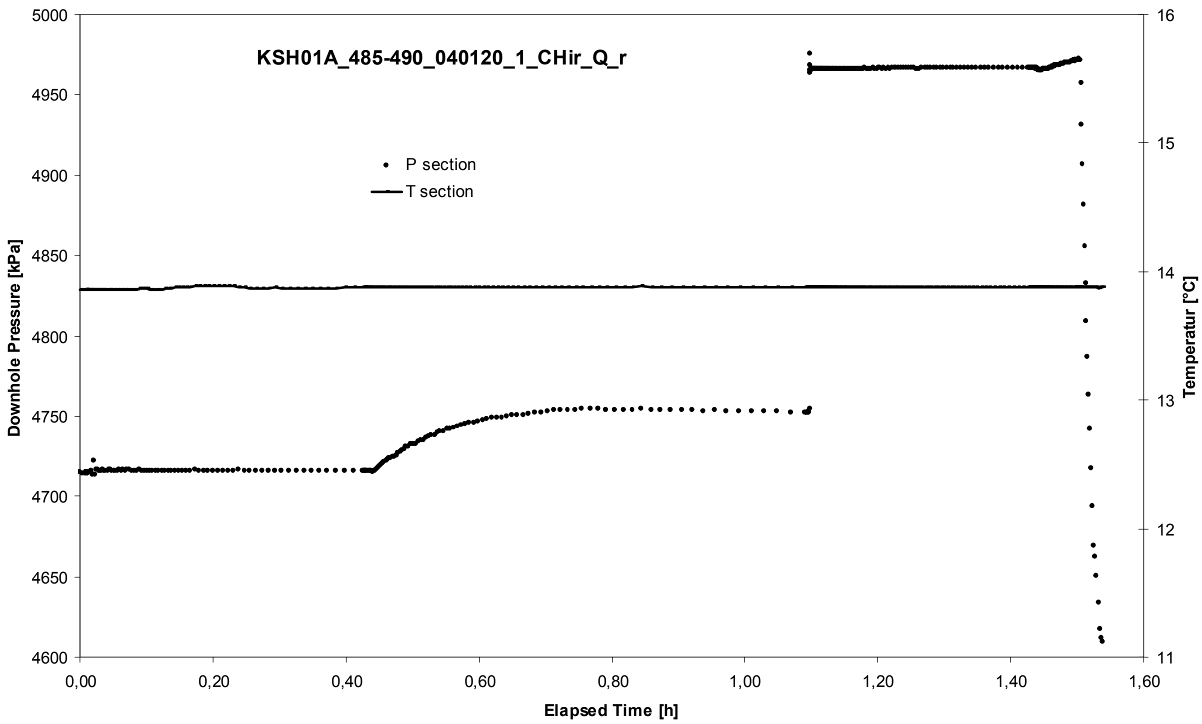
APPENDIX 2-92

Test 485 – 490 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

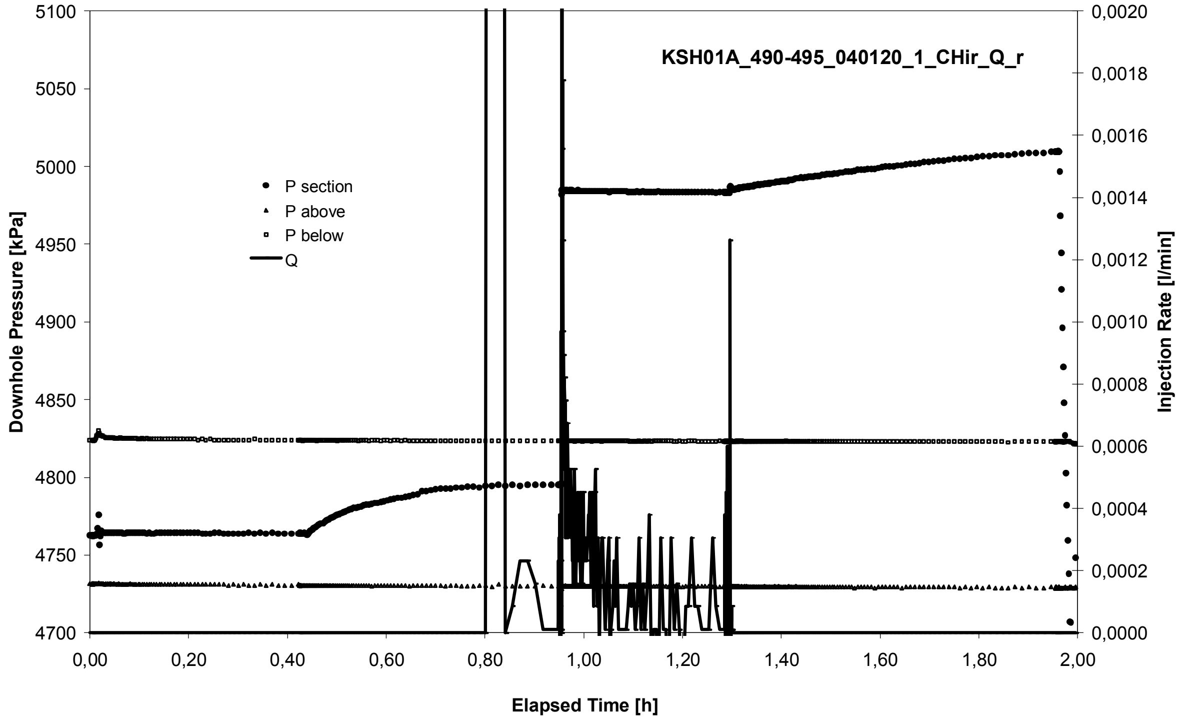
Not Analysed

CHIR phase; HORNER match

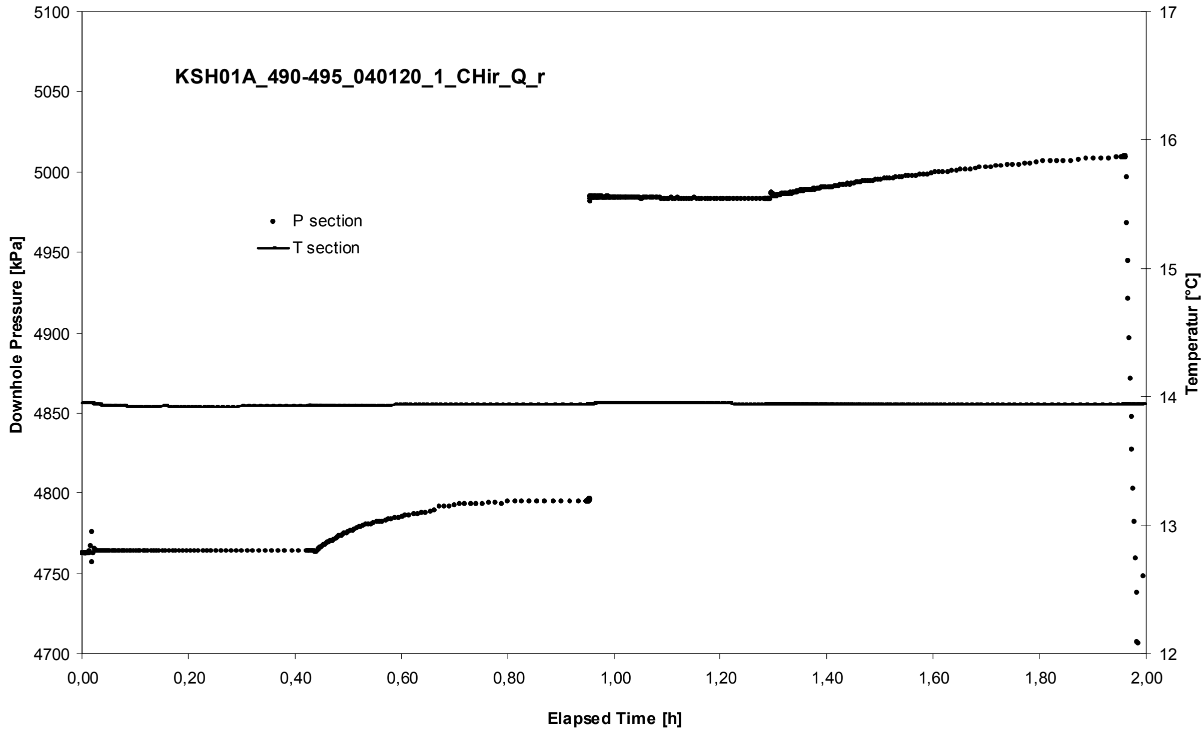
APPENDIX 2-93

Test 490 – 495 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

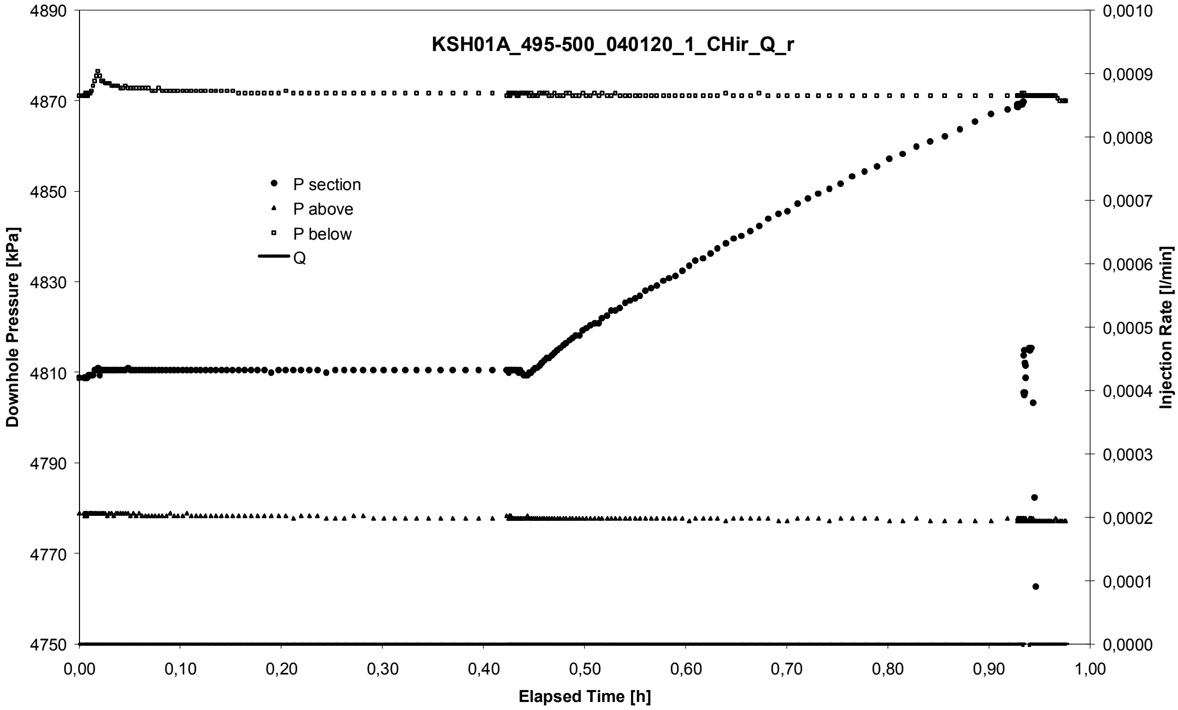
Not Analysed

CHIR phase; HORNER match

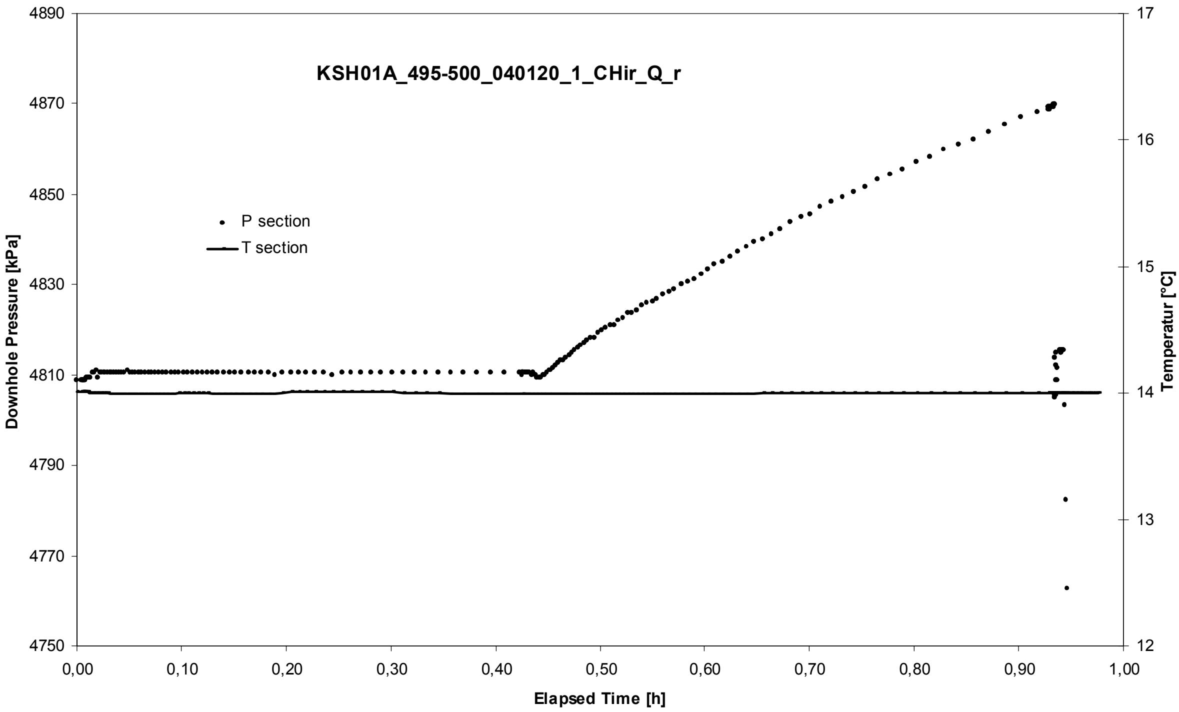
APPENDIX 2-94

Test 495 – 500 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

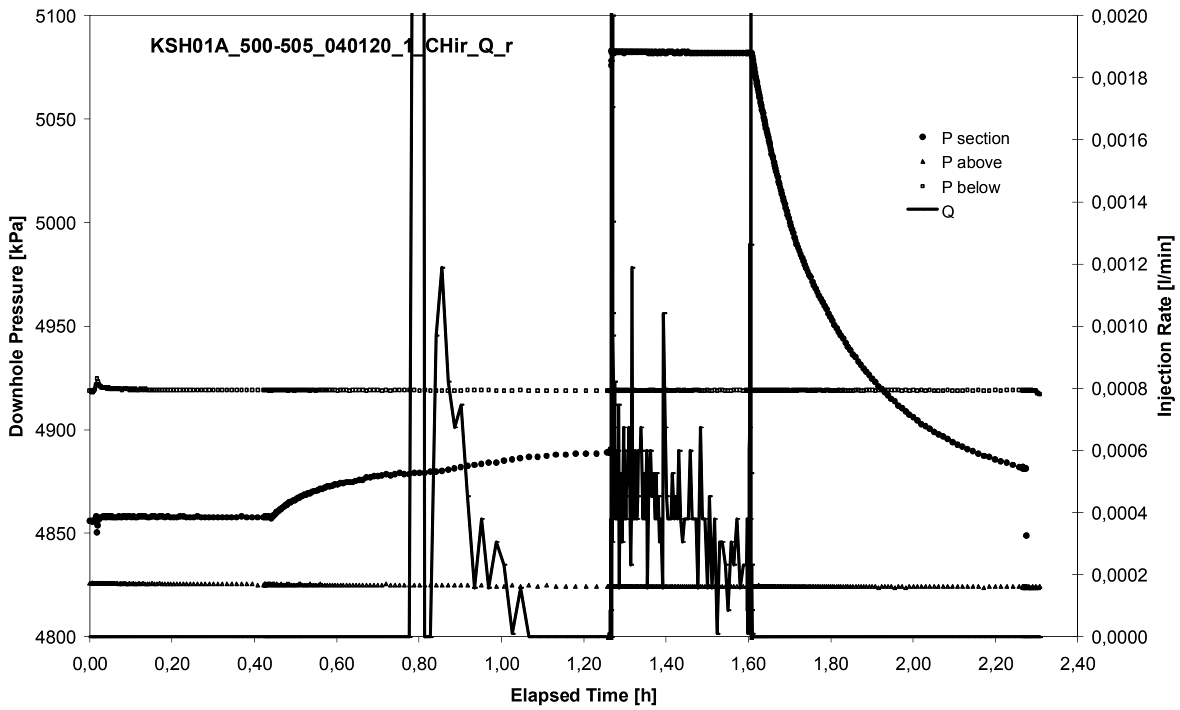
Not Analysed

CHIR phase; HORNER match

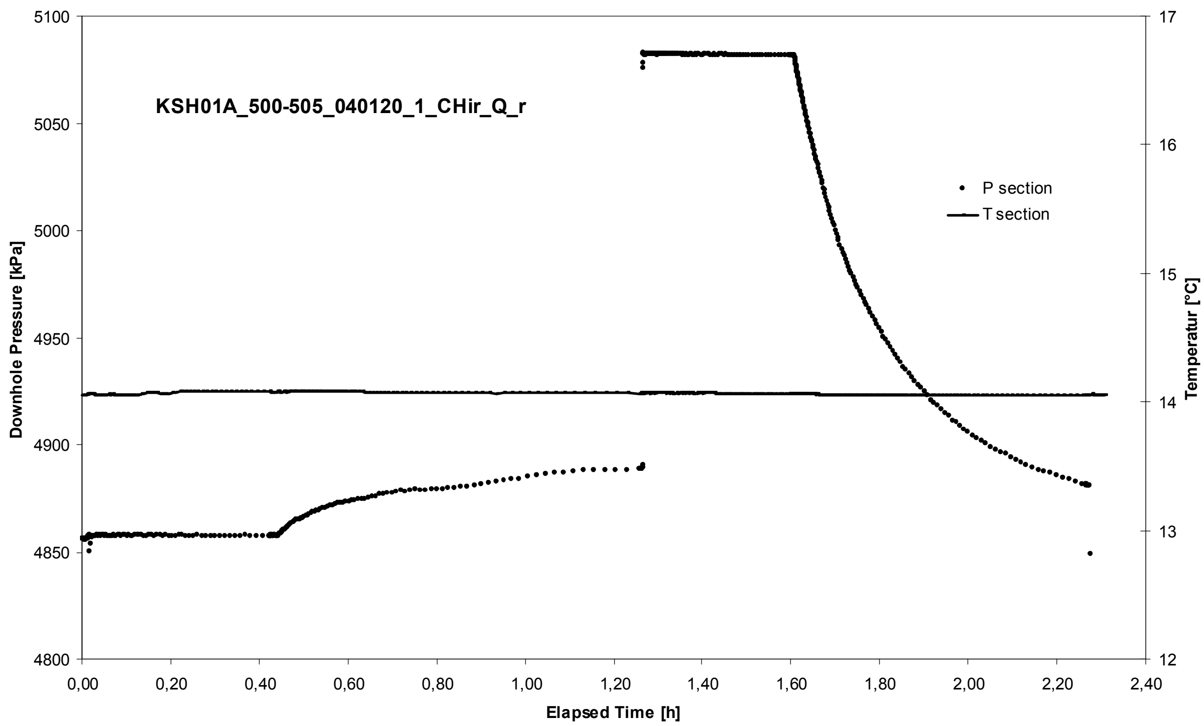
APPENDIX 2-95

Test 500 – 505 m

Analysis diagrams



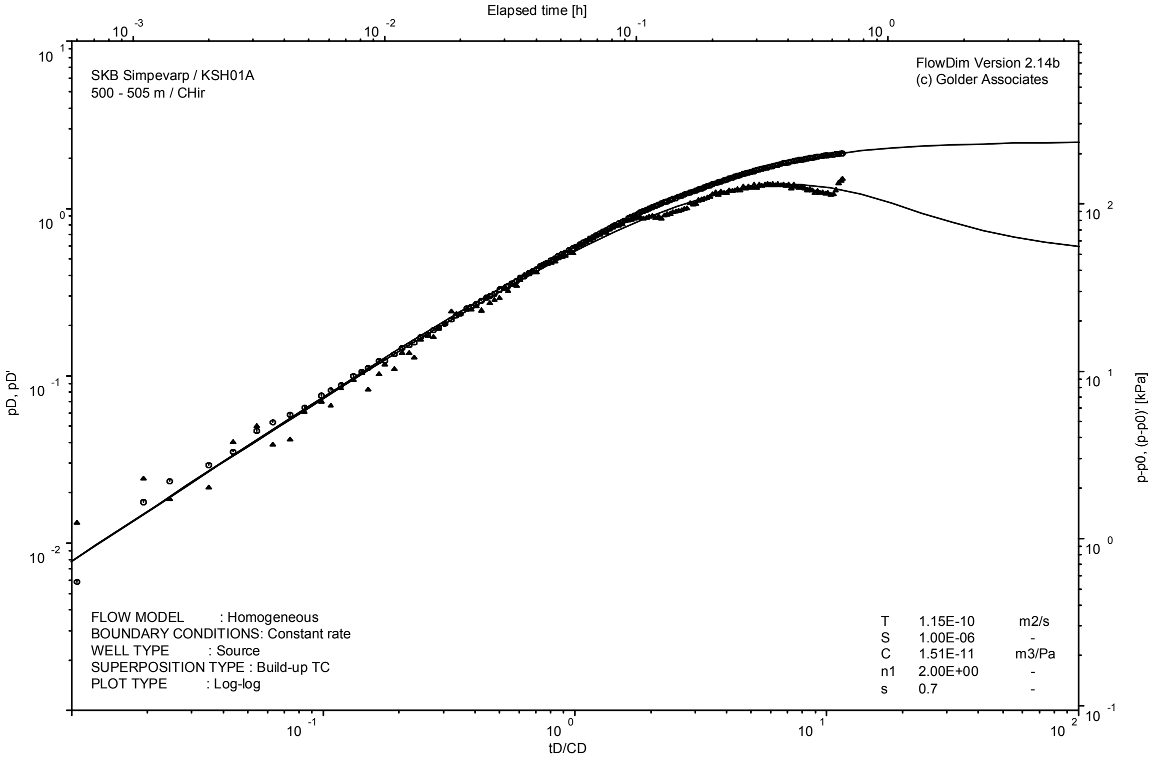
Pressure and flow rate vs. time; cartesian plot



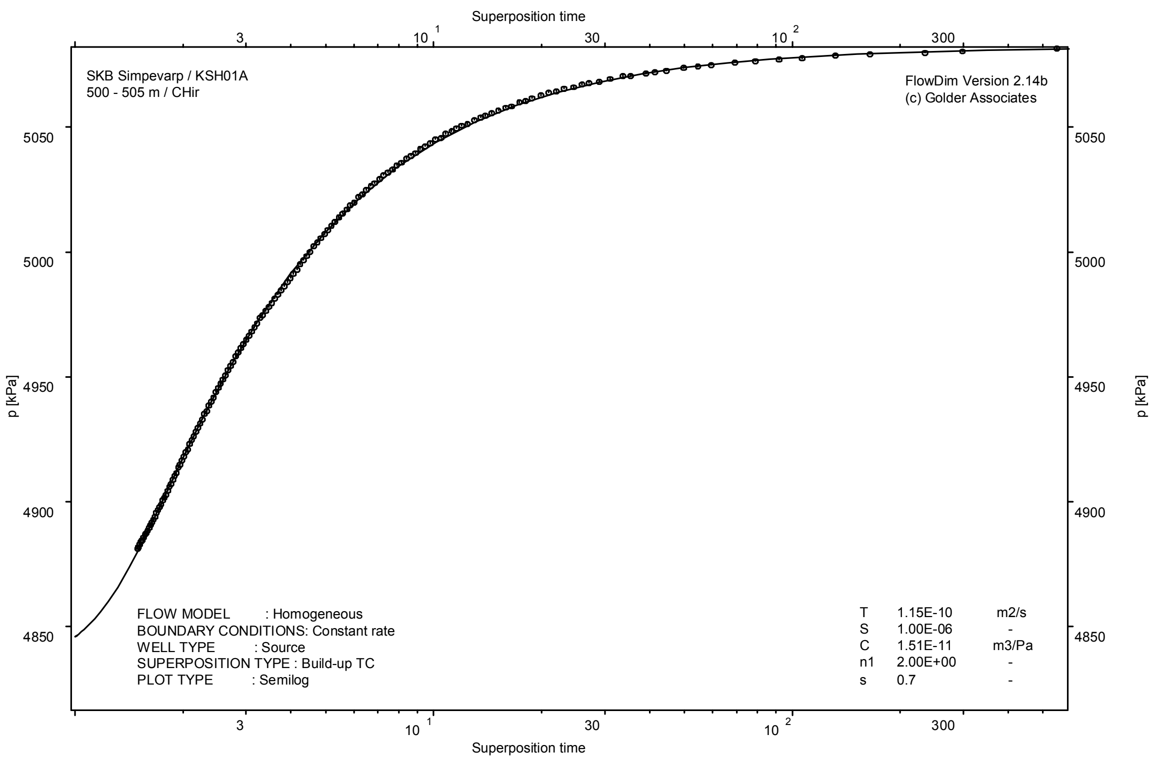
Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match



CHIR phase; log-log match

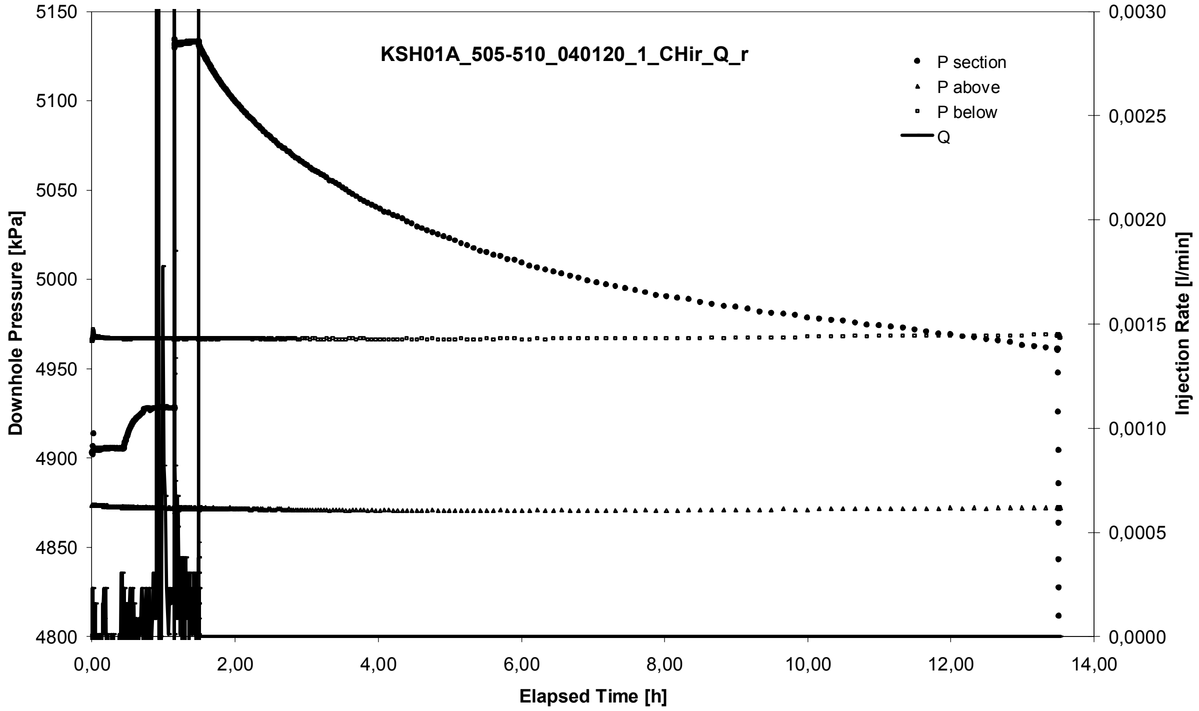


CHIR phase; HORNER match

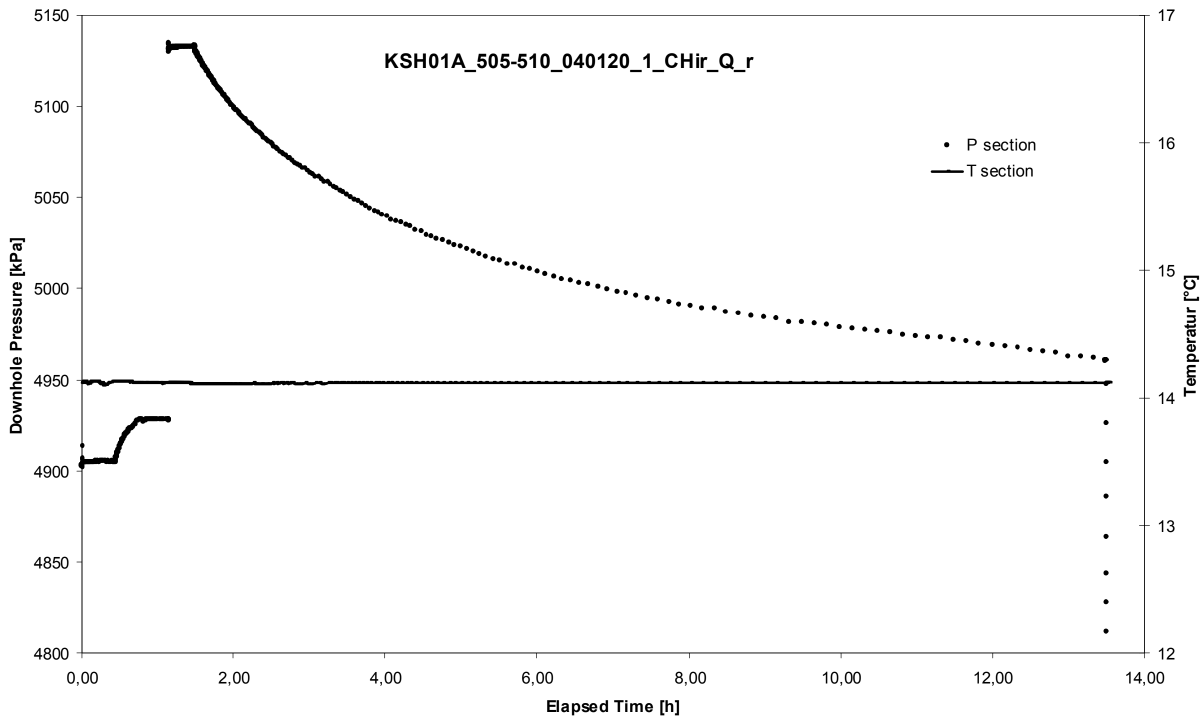
APPENDIX 2-96

Test 505 – 510 m

Analysis diagrams



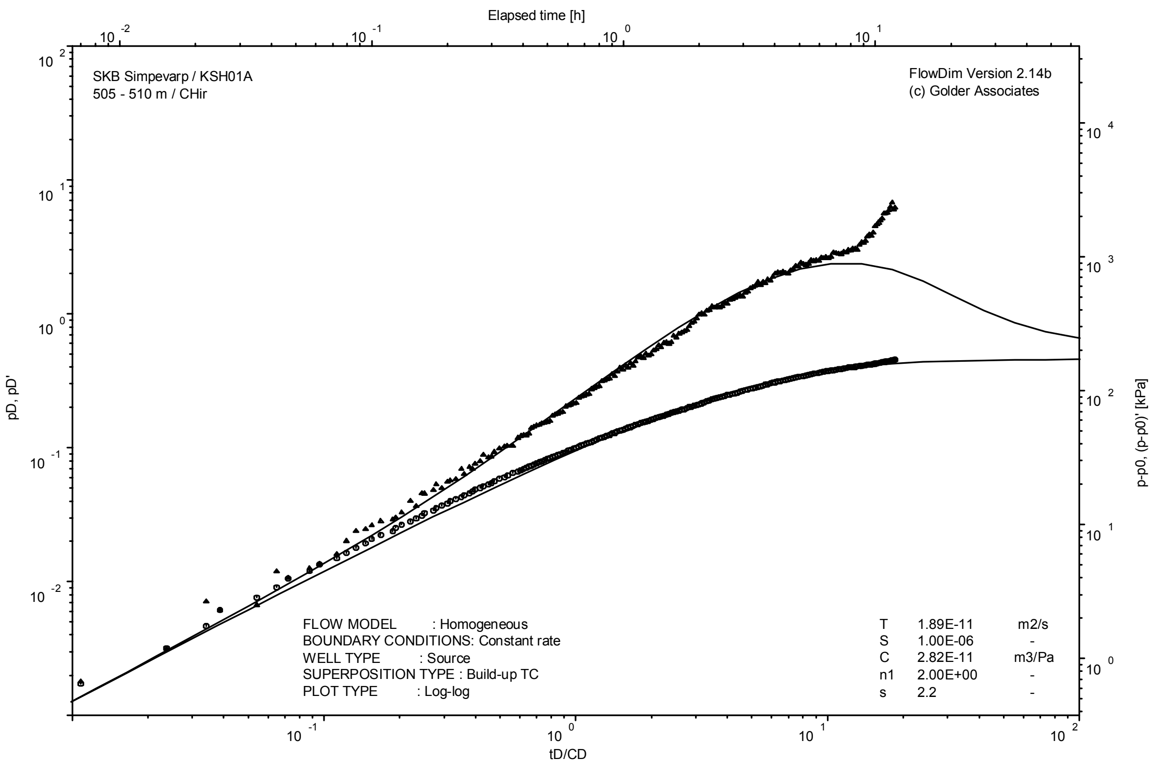
Pressure and flow rate vs. time; cartesian plot



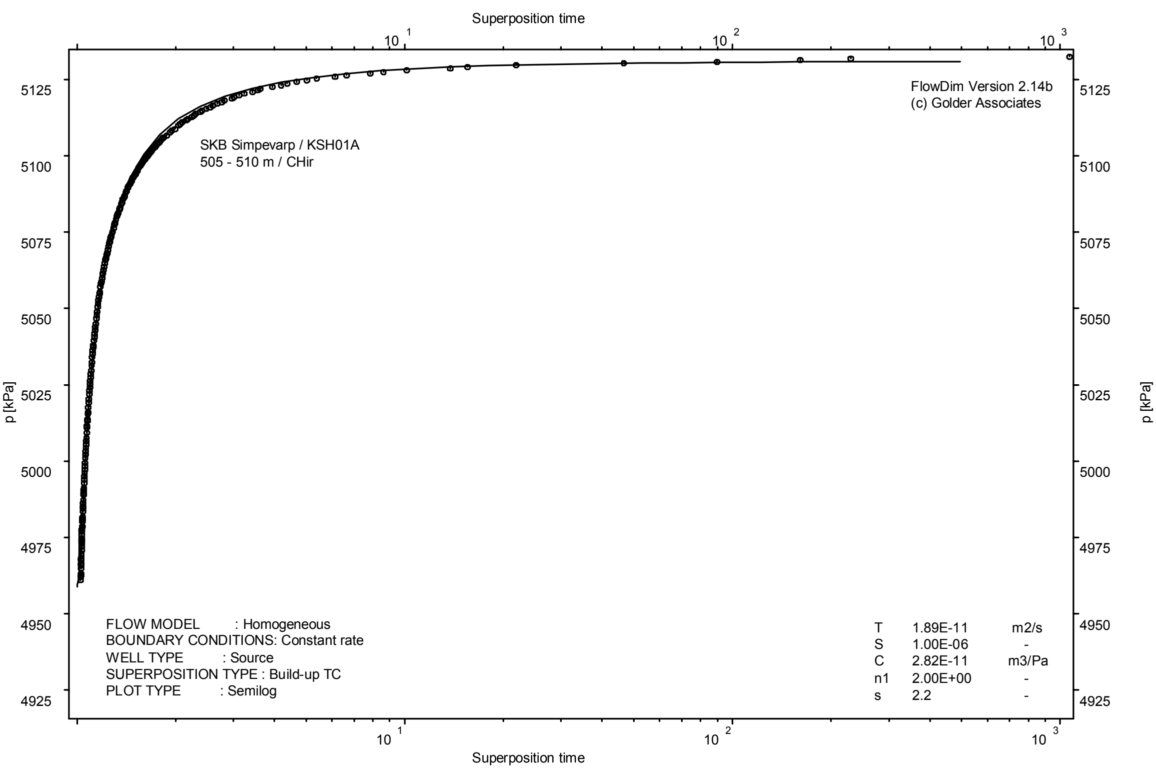
Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match



CHIR phase; log-log match

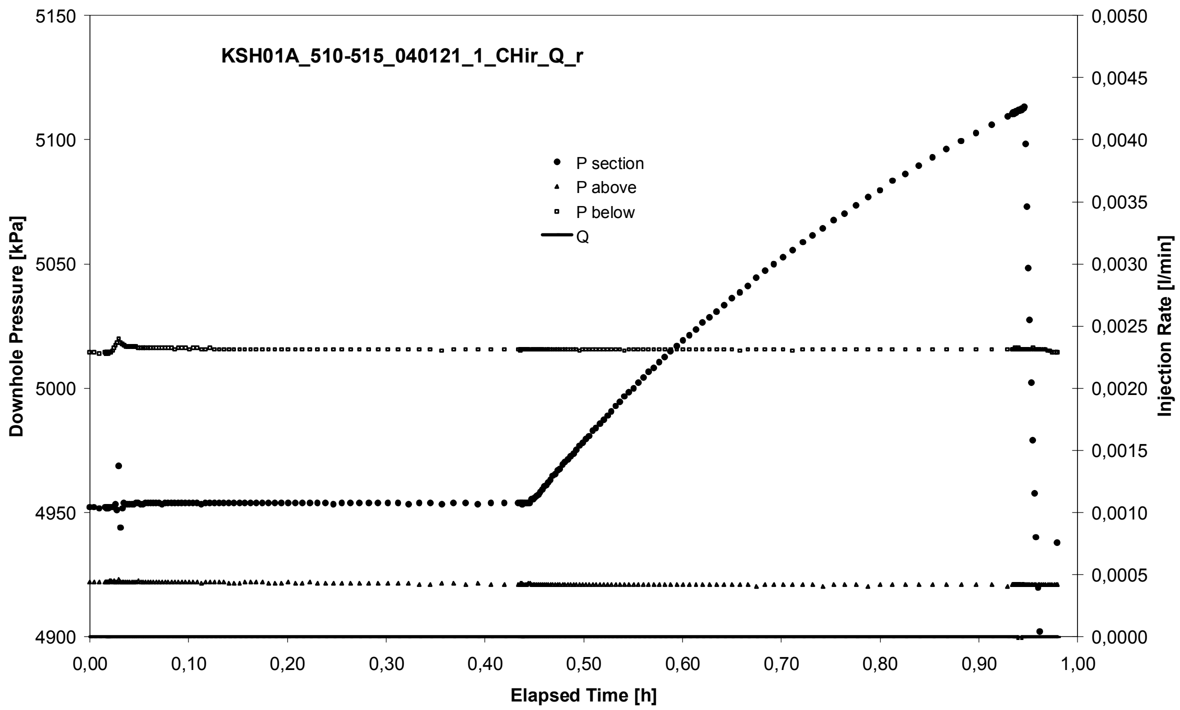


CHIR phase; HORNER match

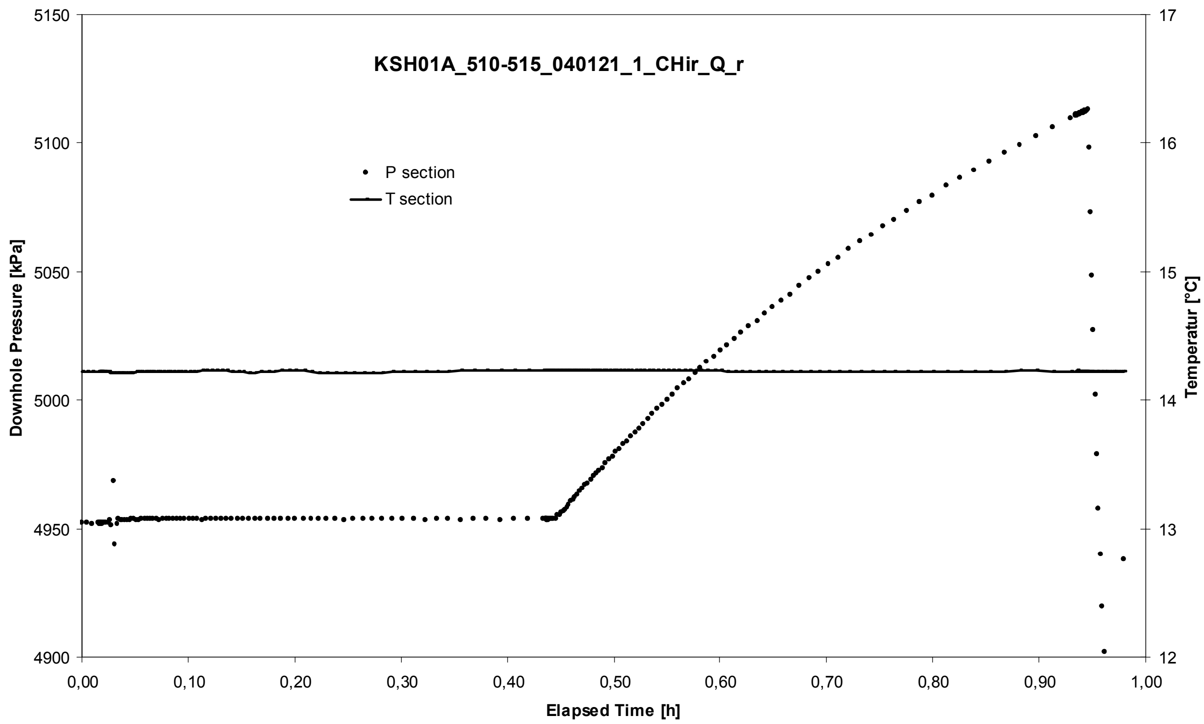
APPENDIX 2-97

Test 510 – 515 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

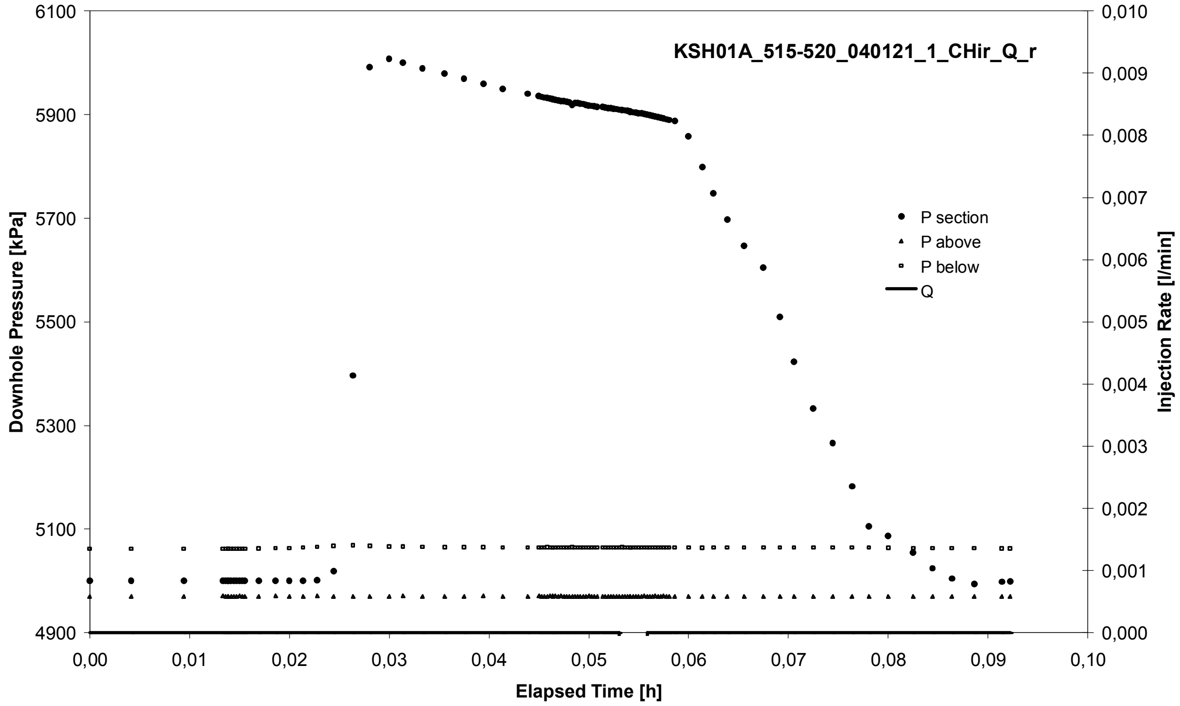
Not Analysed

CHIR phase; HORNER match

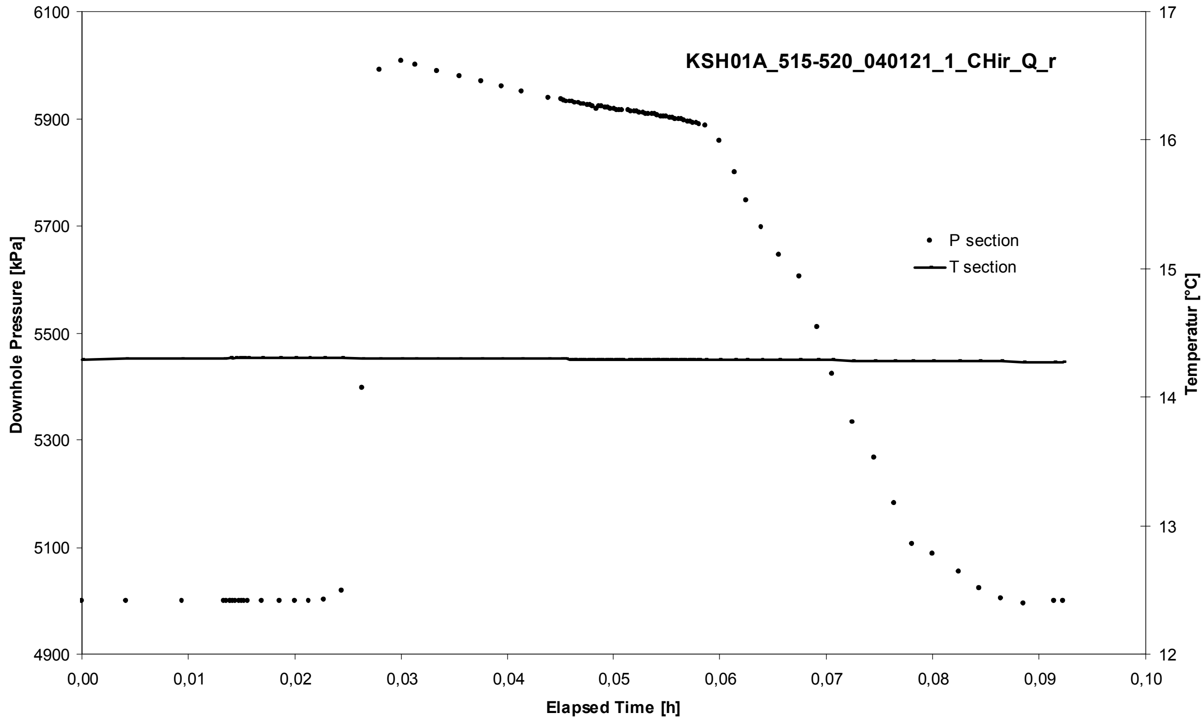
APPENDIX 2-98

Test 515 – 520 m

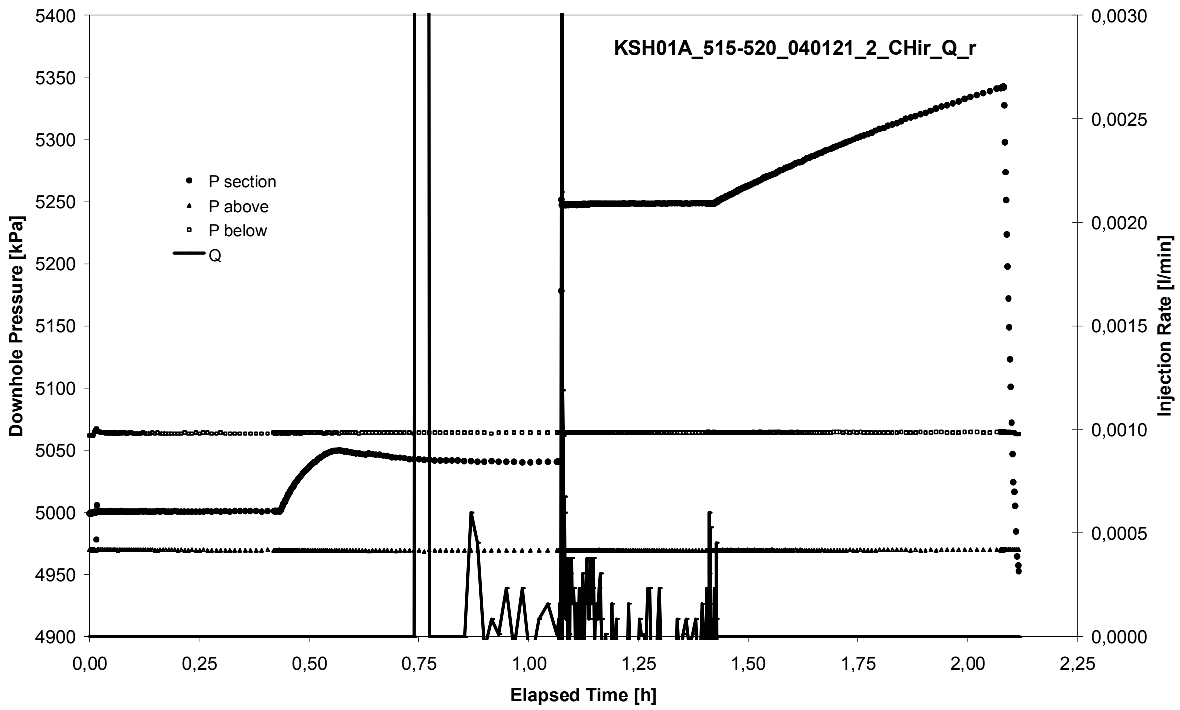
Analysis diagrams



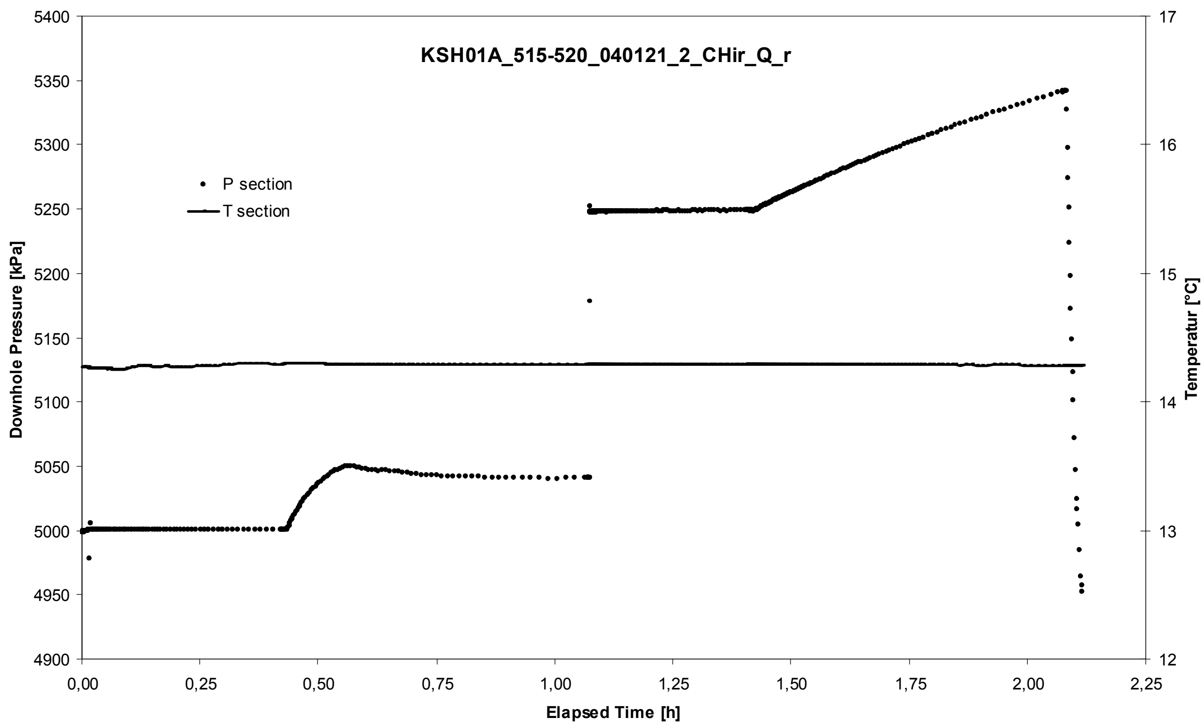
Pressure and flow rate vs. time; cartesian plot (test repeated)



Interval pressure and temperature vs. time; cartesian plot (test repeated)



Pressure and flow rate vs. time; cartesian plot (analysed)



Interval pressure and temperature vs. time; cartesian plot (analysed)

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

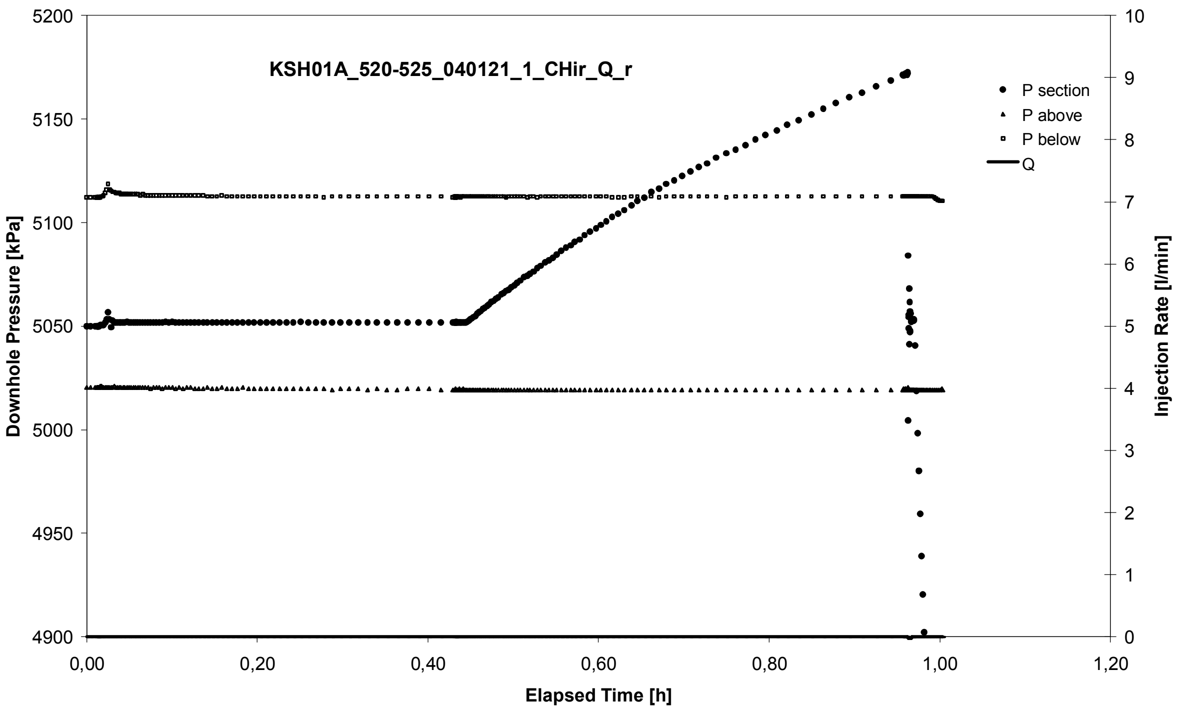
Not Analysed

CHIR phase; HORNER match

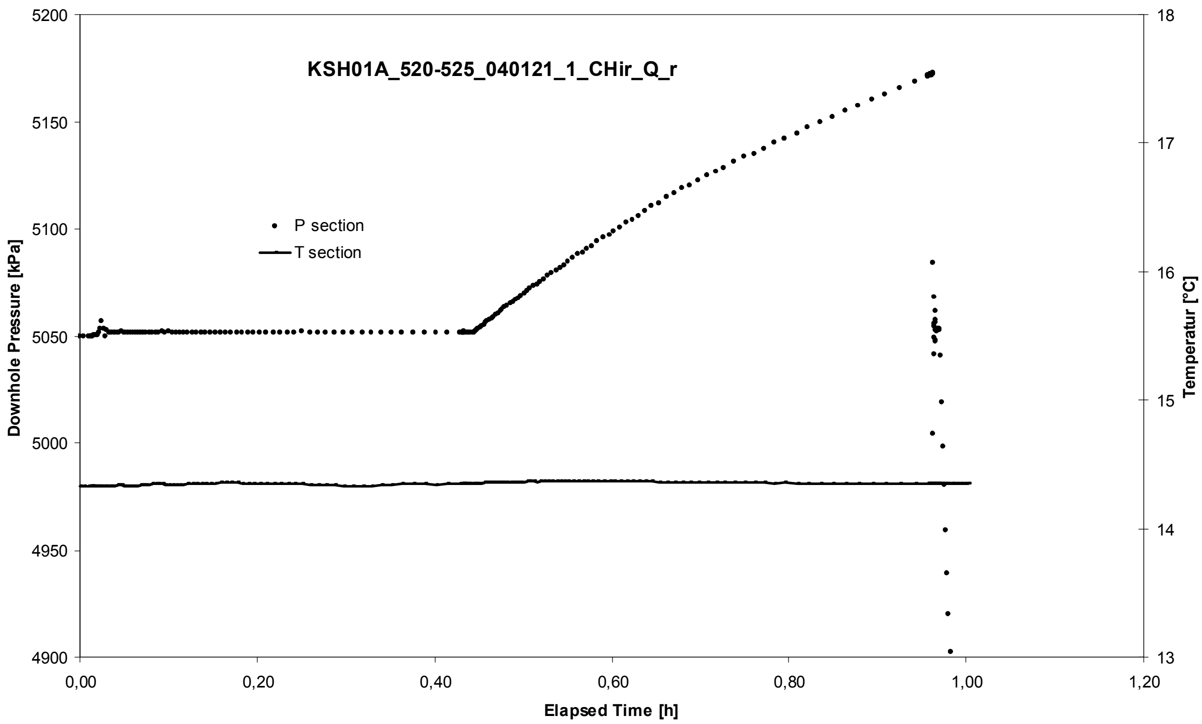
APPENDIX 2-99

Test 520 – 525 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

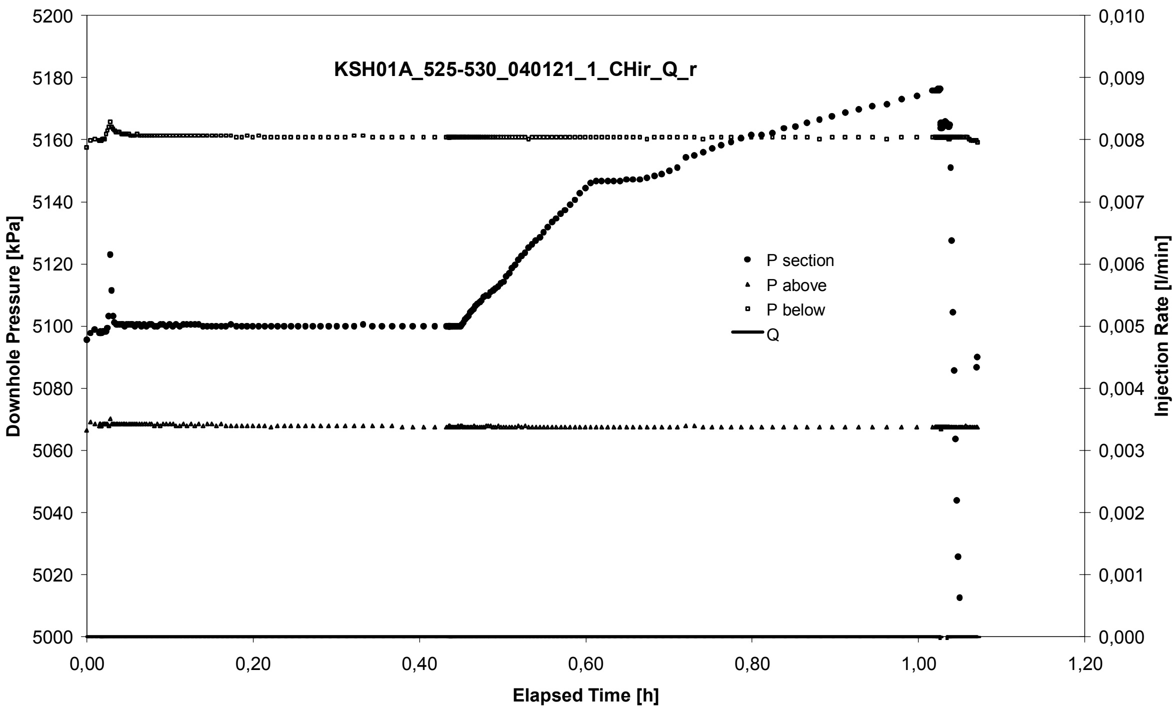
Not Analysed

CHIR phase; HORNER match

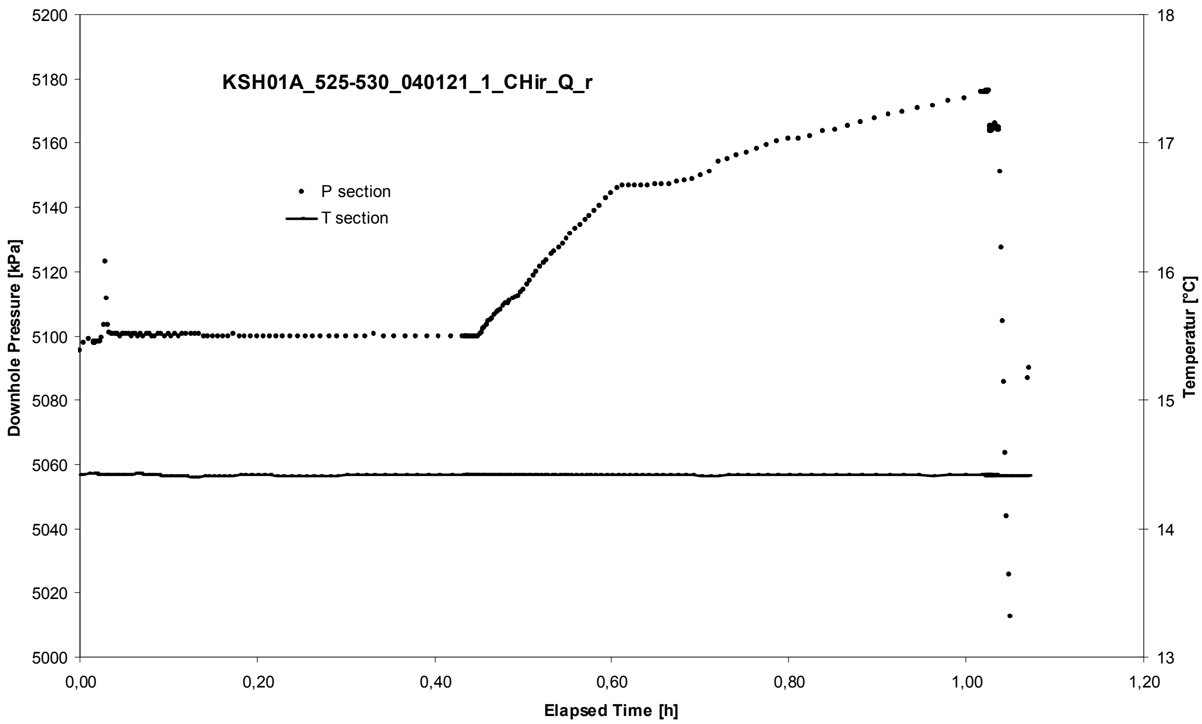
APPENDIX 2-100

Test 525 – 530 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

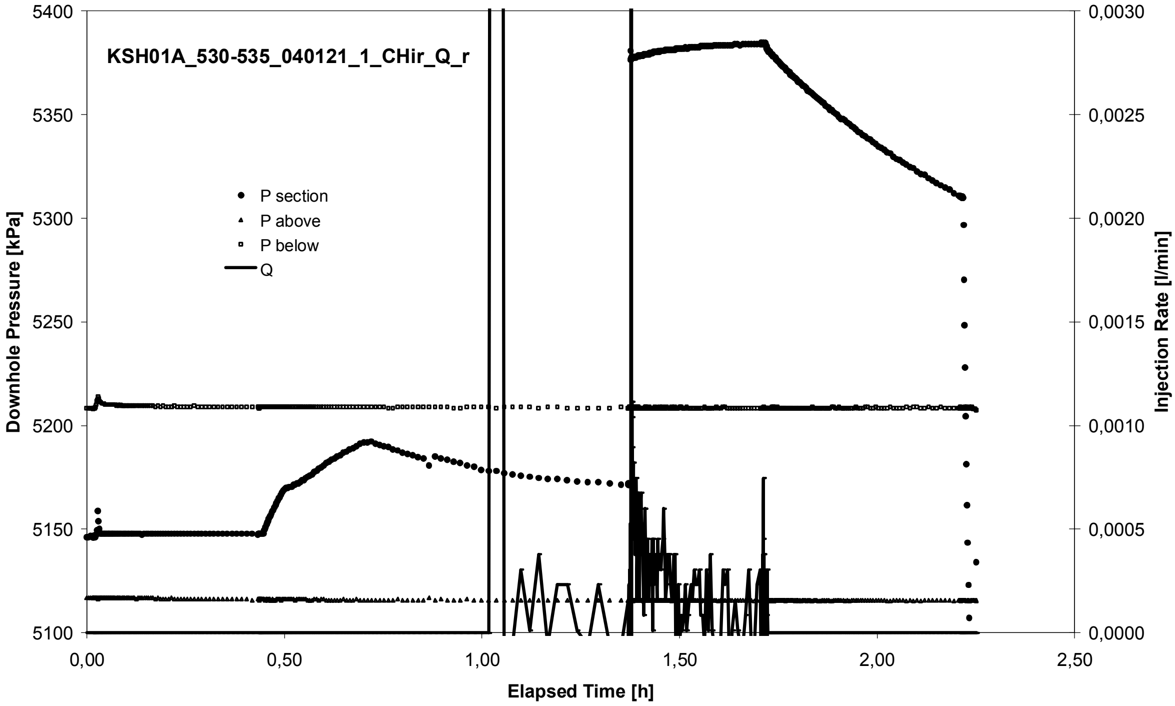
Not Analysed

CHIR phase; HORNER match

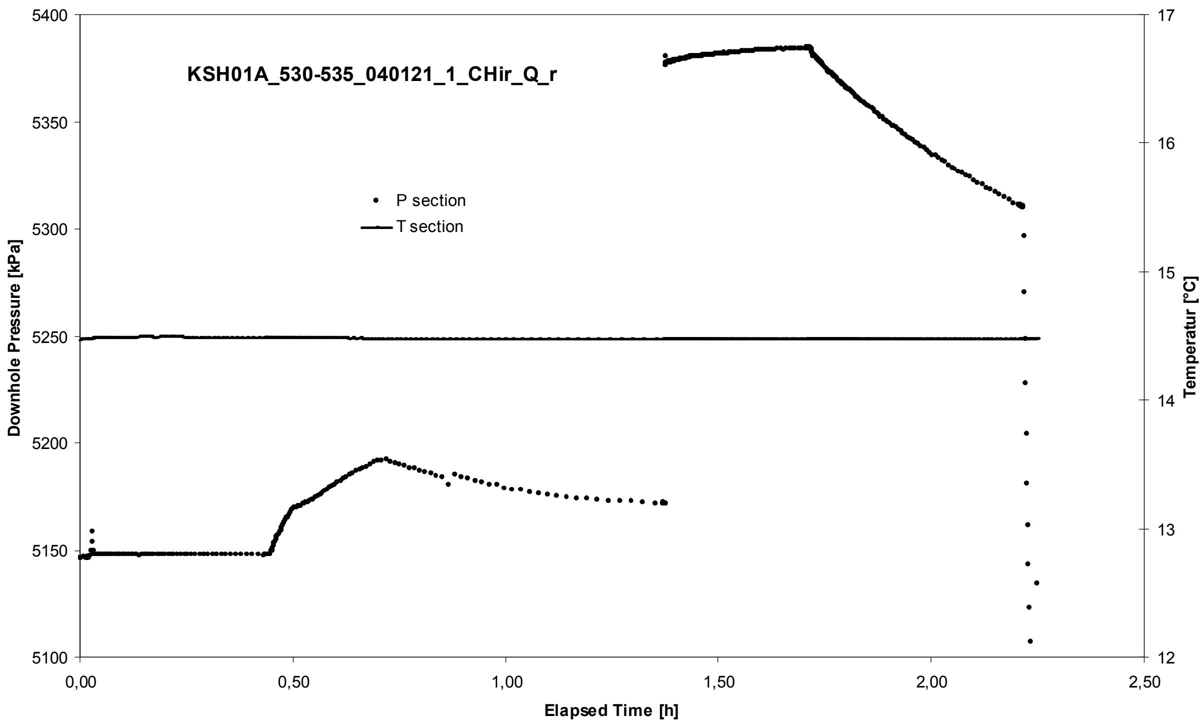
APPENDIX 2-101

Test 530 – 535 m

Analysis diagrams



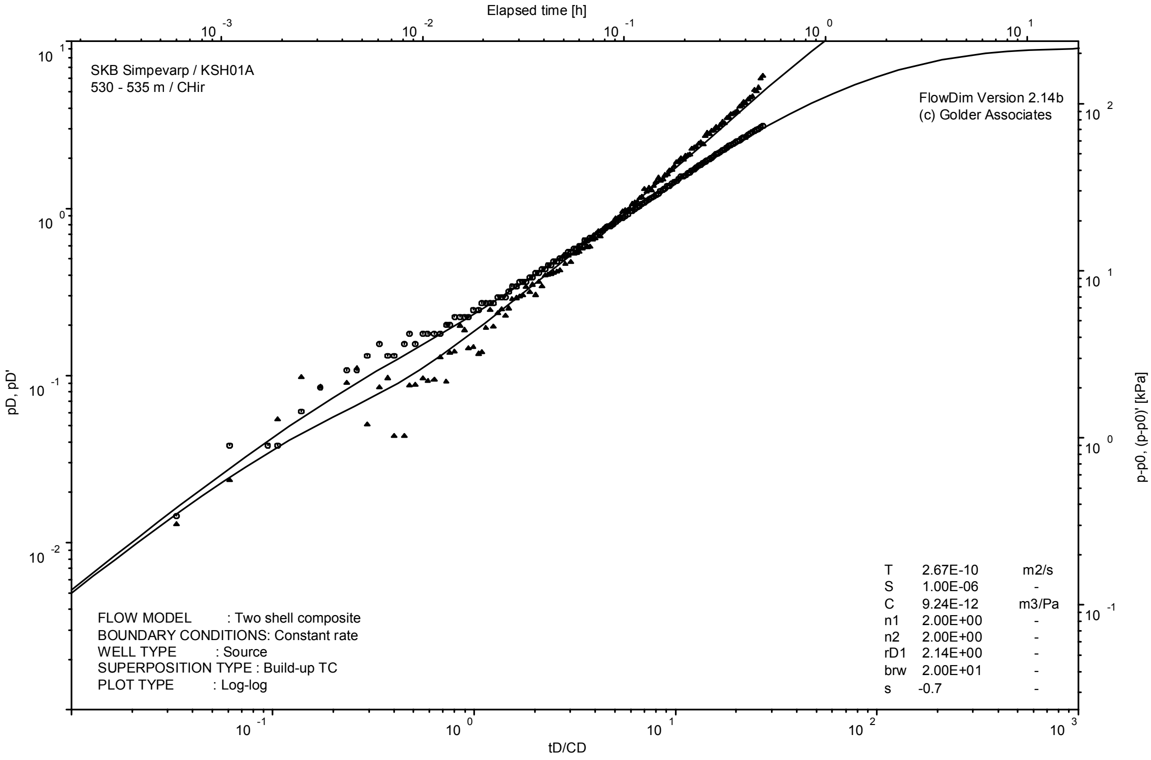
Pressure and flow rate vs. time; cartesian plot



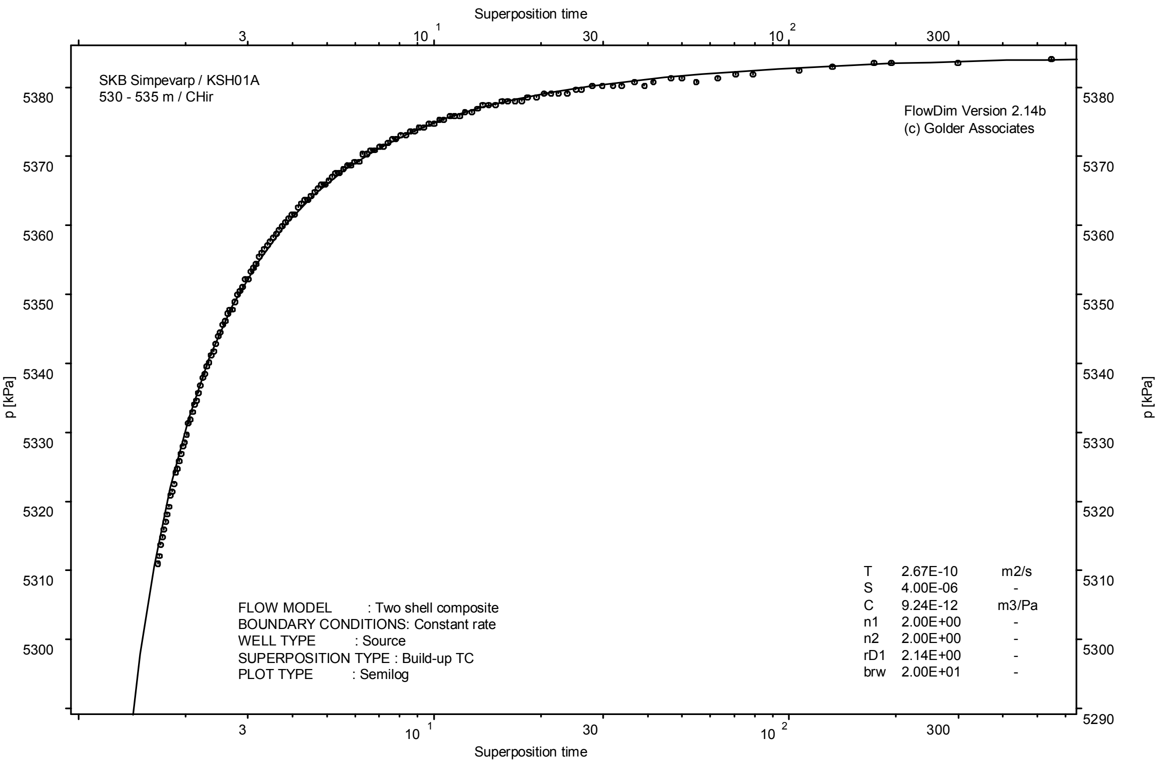
Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match



CHIR phase; log-log match

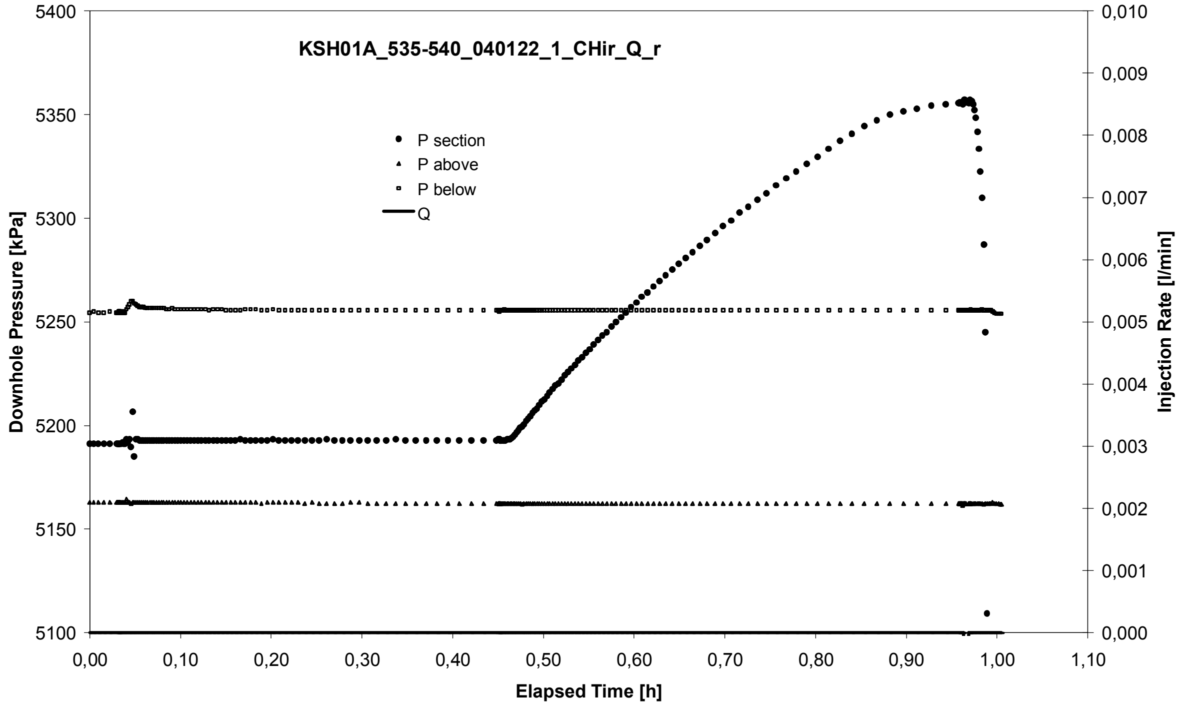


CHIR phase; HORNER match

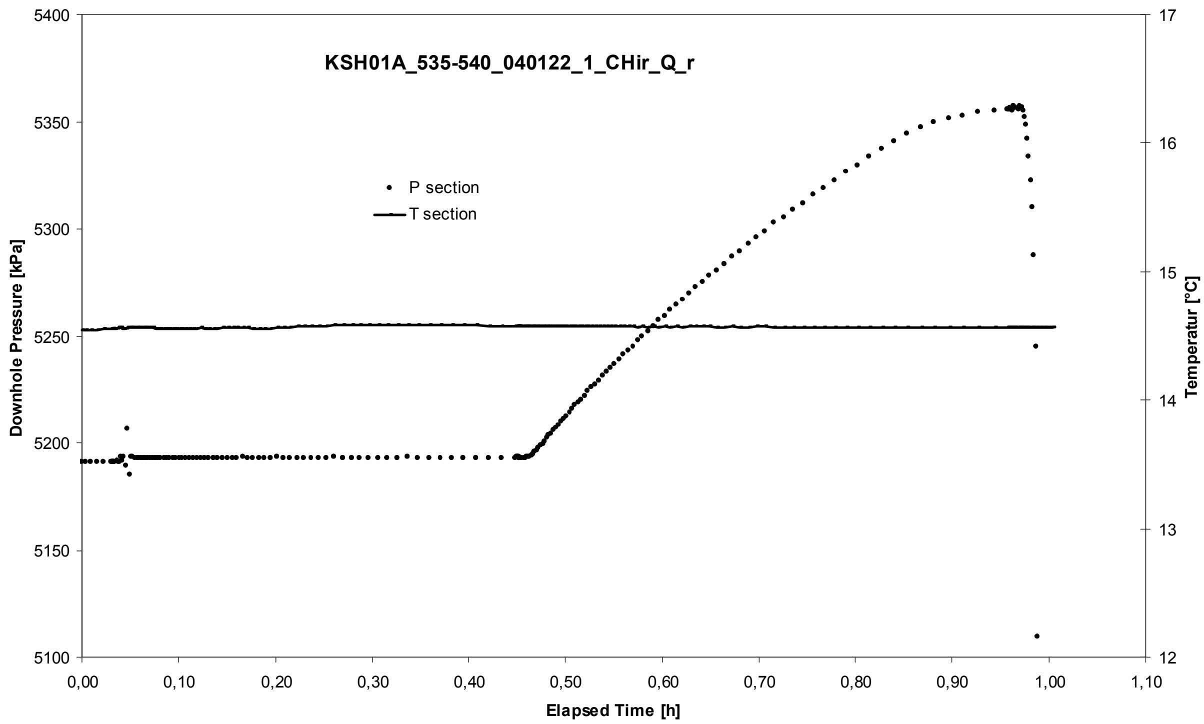
APPENDIX 2-102

Test 535 – 540 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

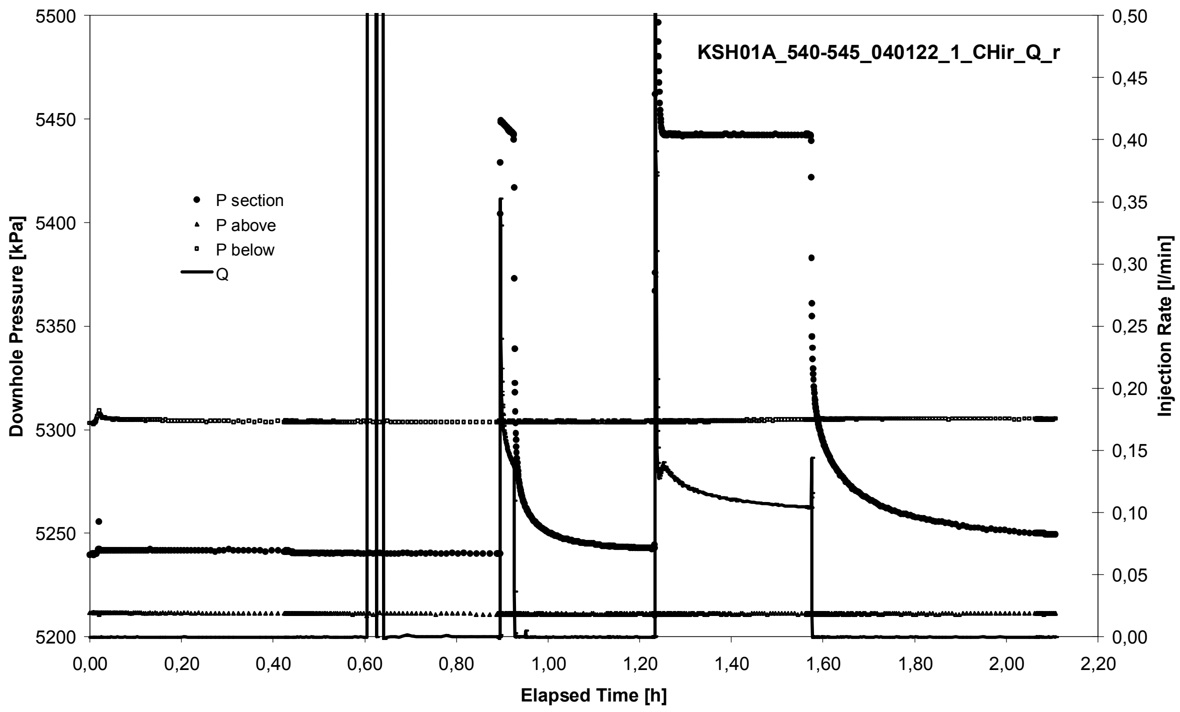
Not Analysed

CHIR phase; HORNER match

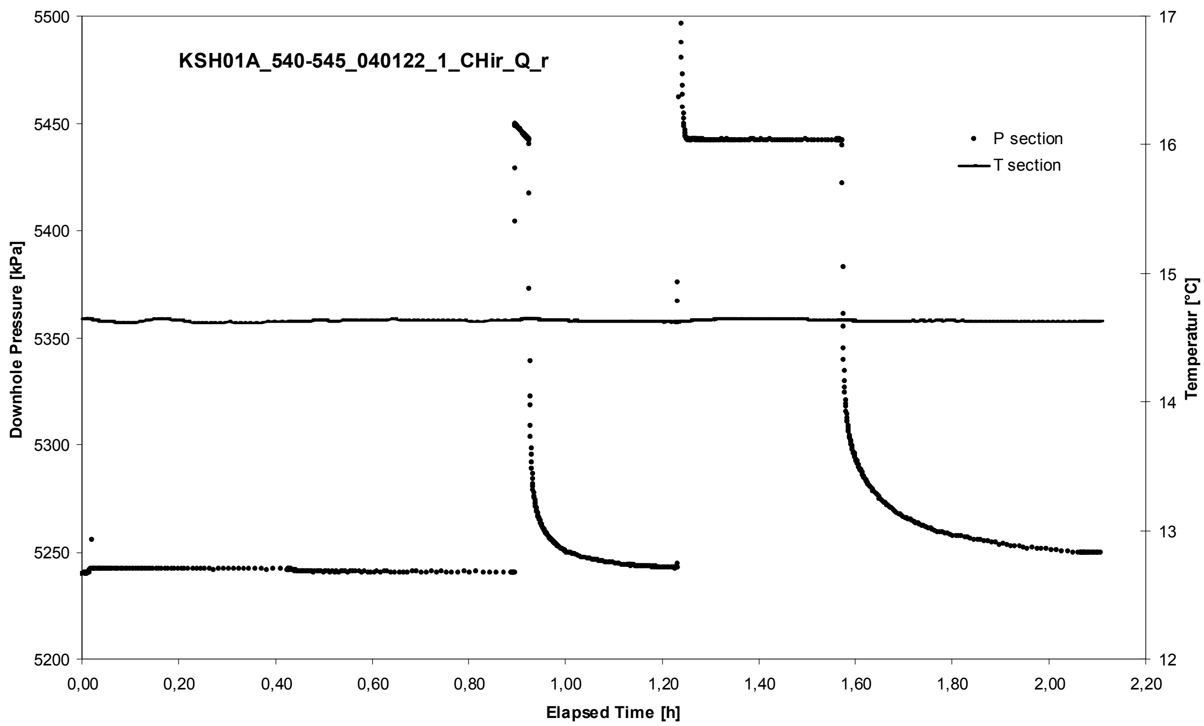
APPENDIX 2-103

Test 540 – 545 m

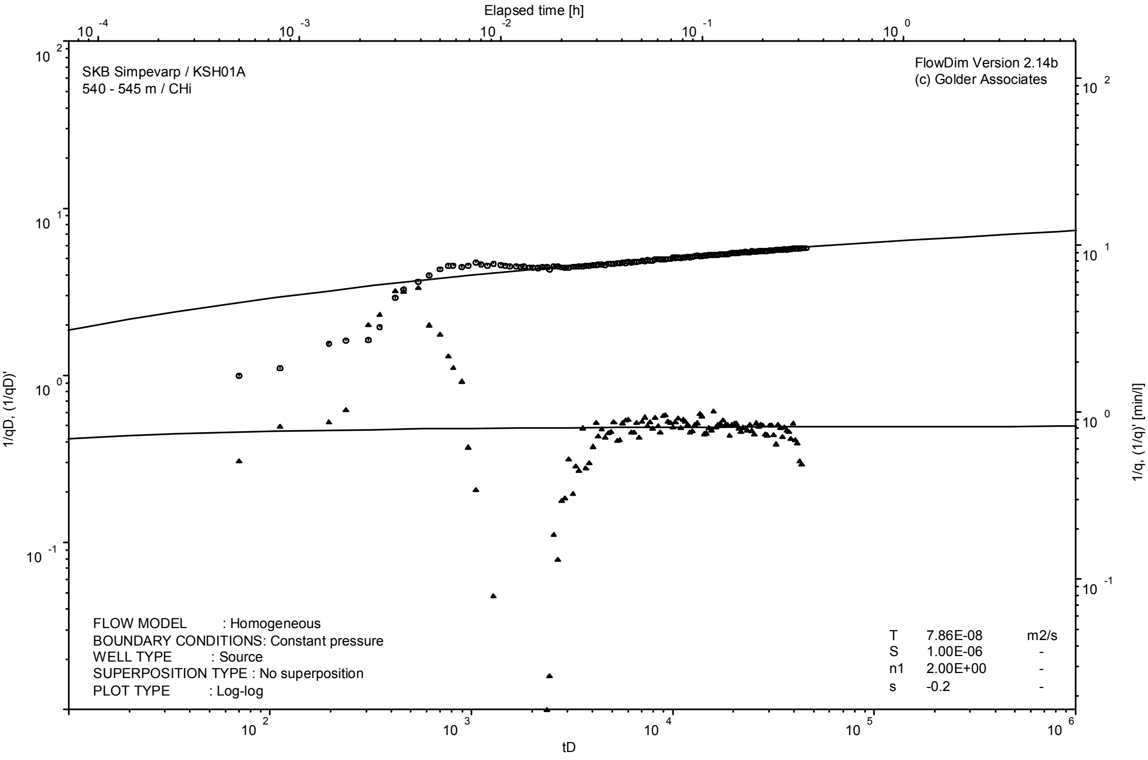
Analysis diagrams



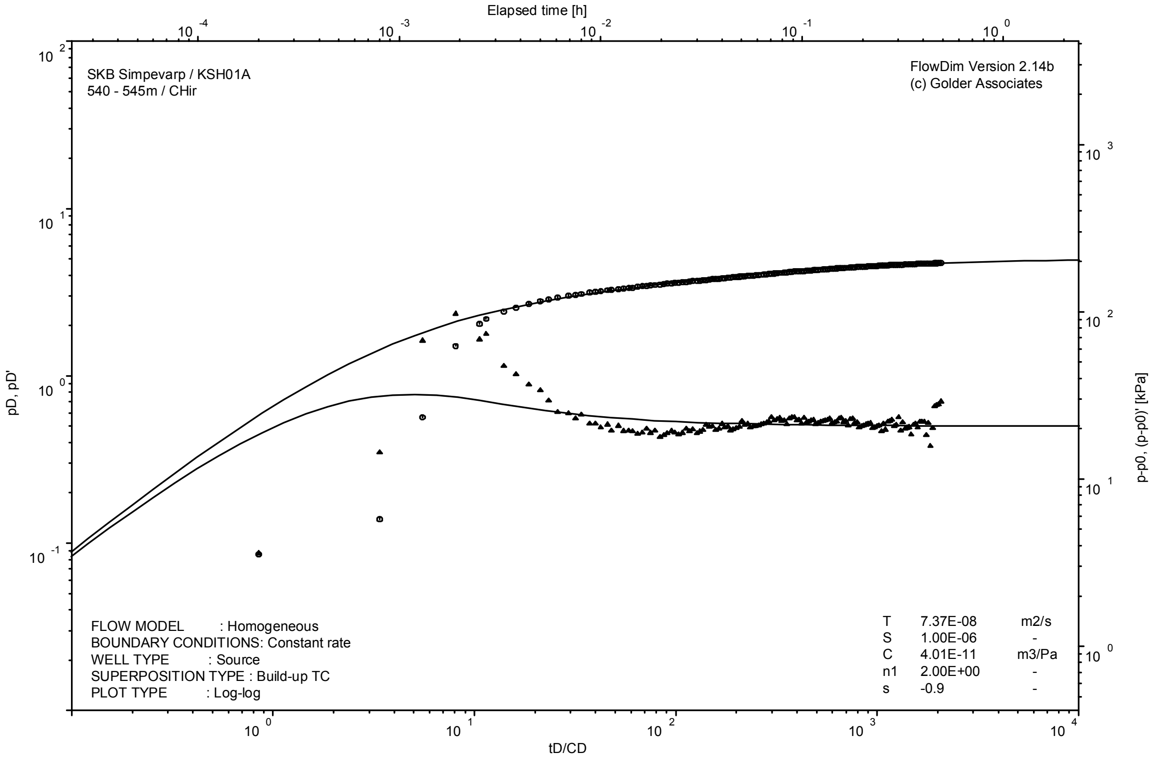
Pressure and flow rate vs. time; cartesian plot



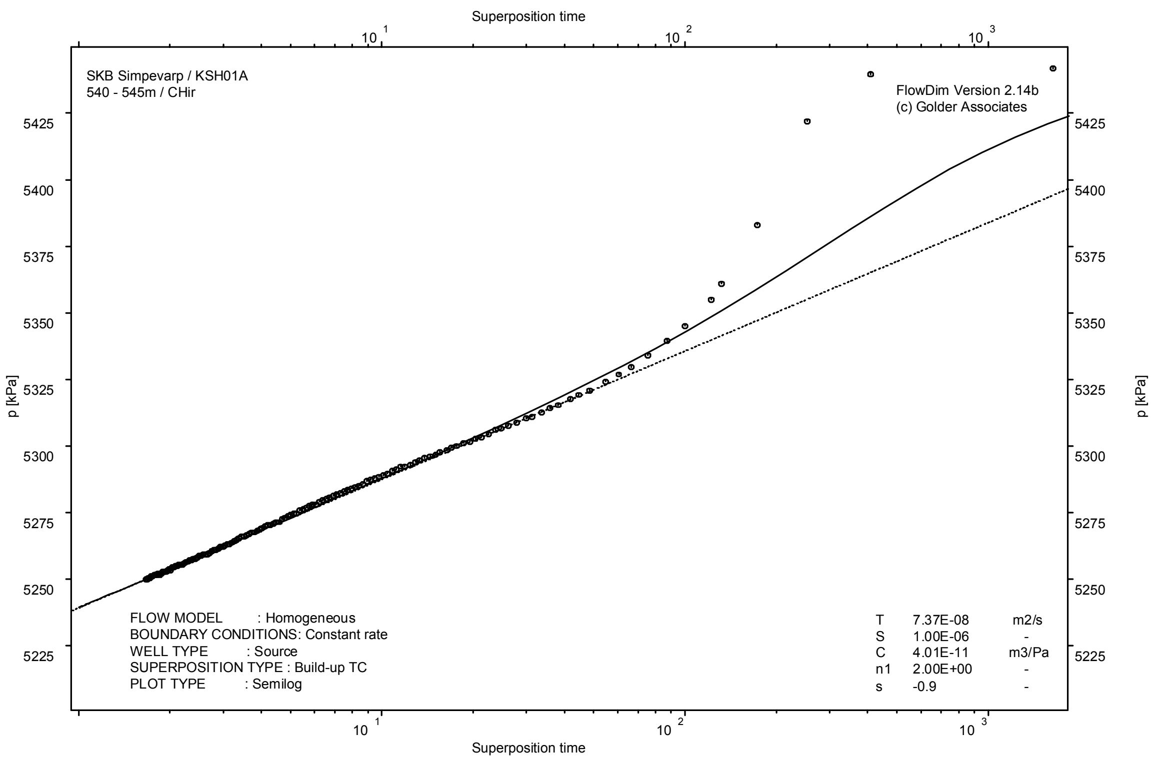
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

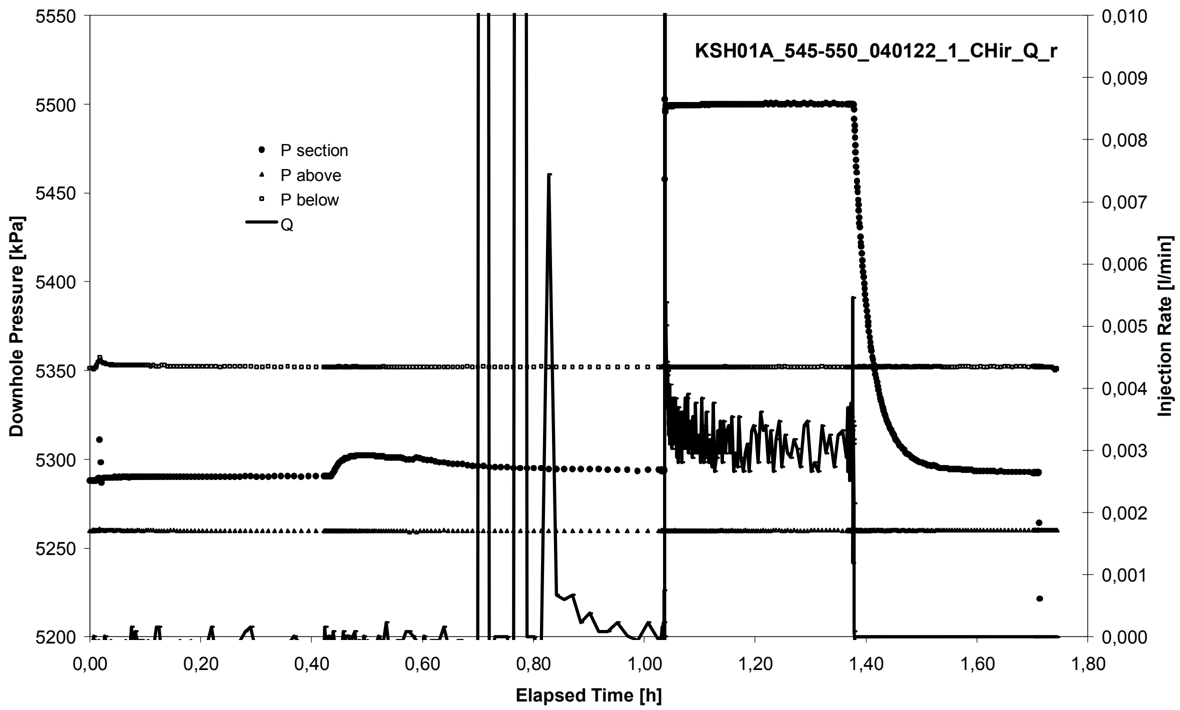


CHIR phase; HORNER match

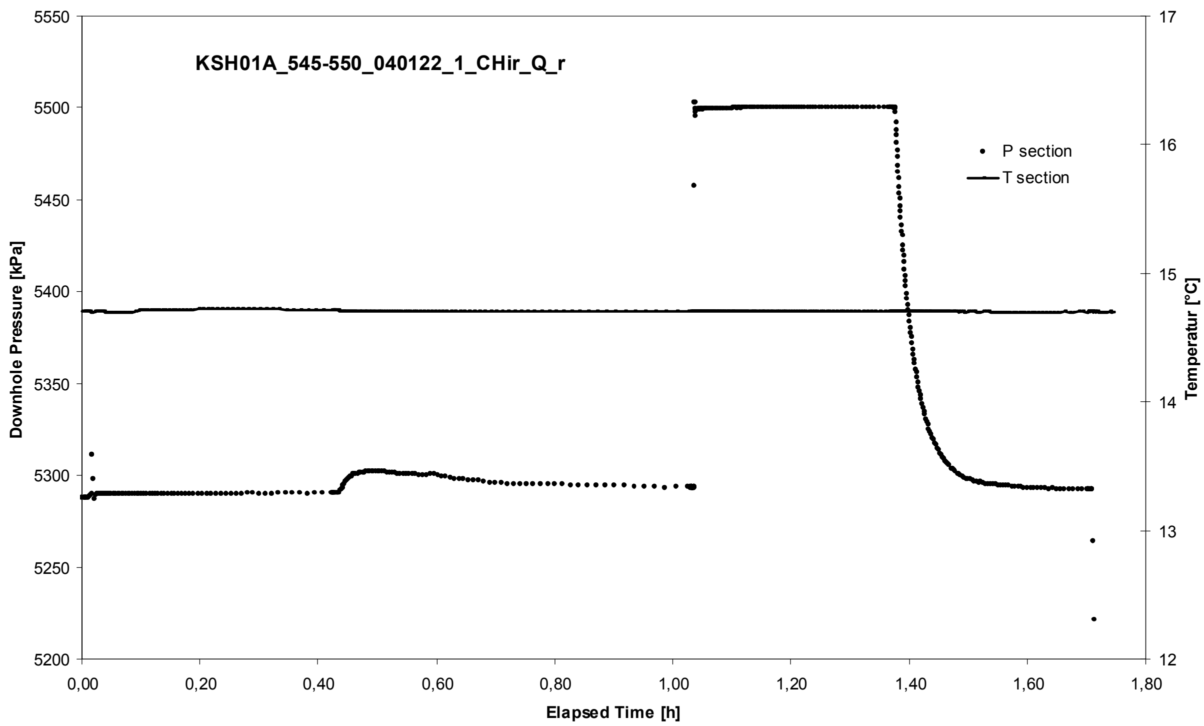
APPENDIX 2-104

Test 545 – 550 m

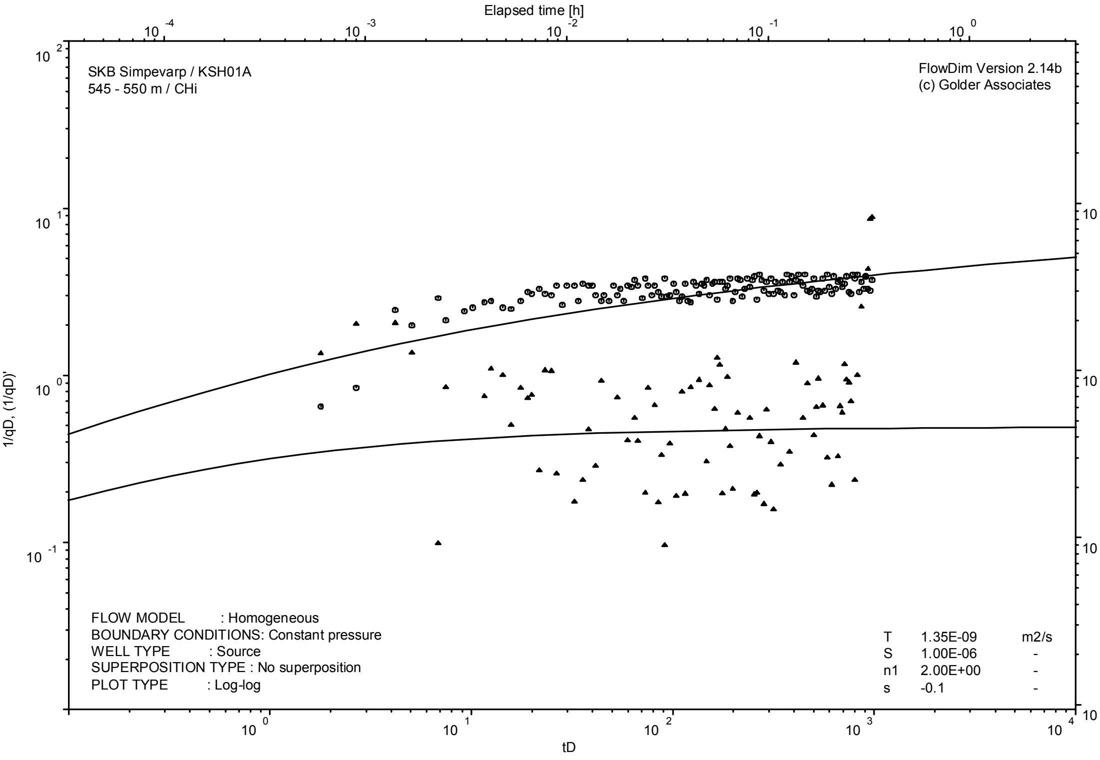
Analysis diagrams



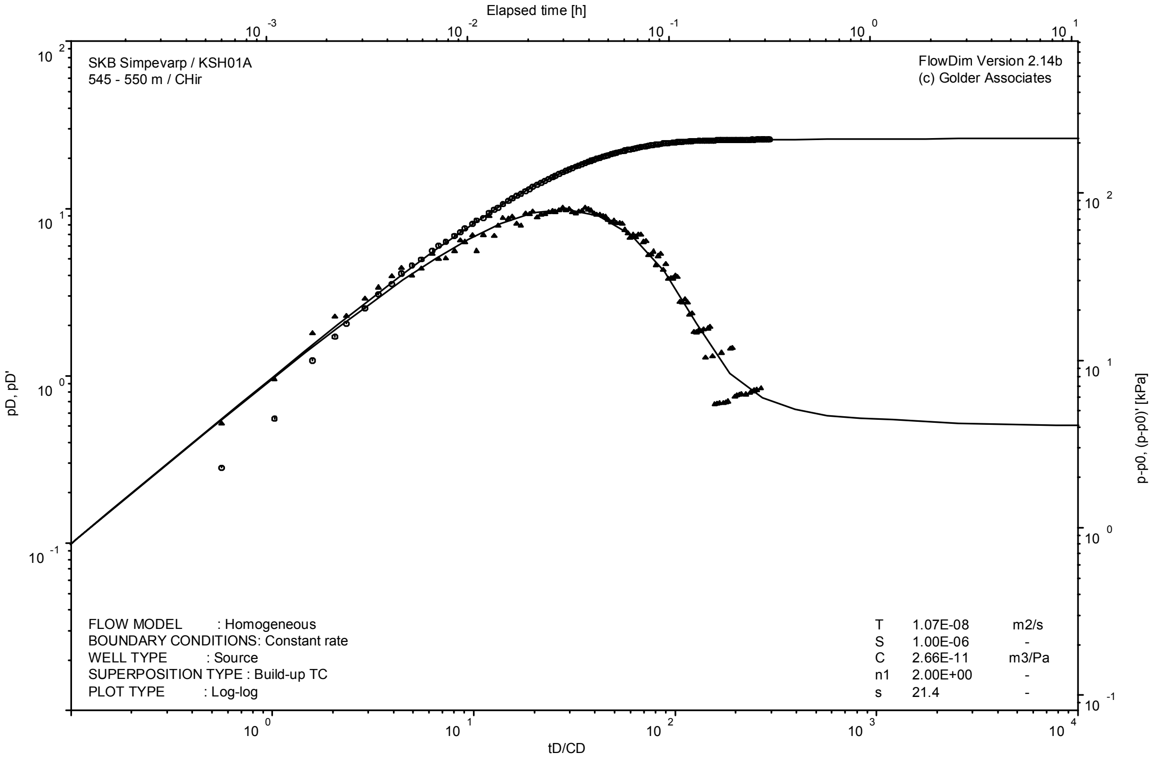
Pressure and flow rate vs. time; cartesian plot



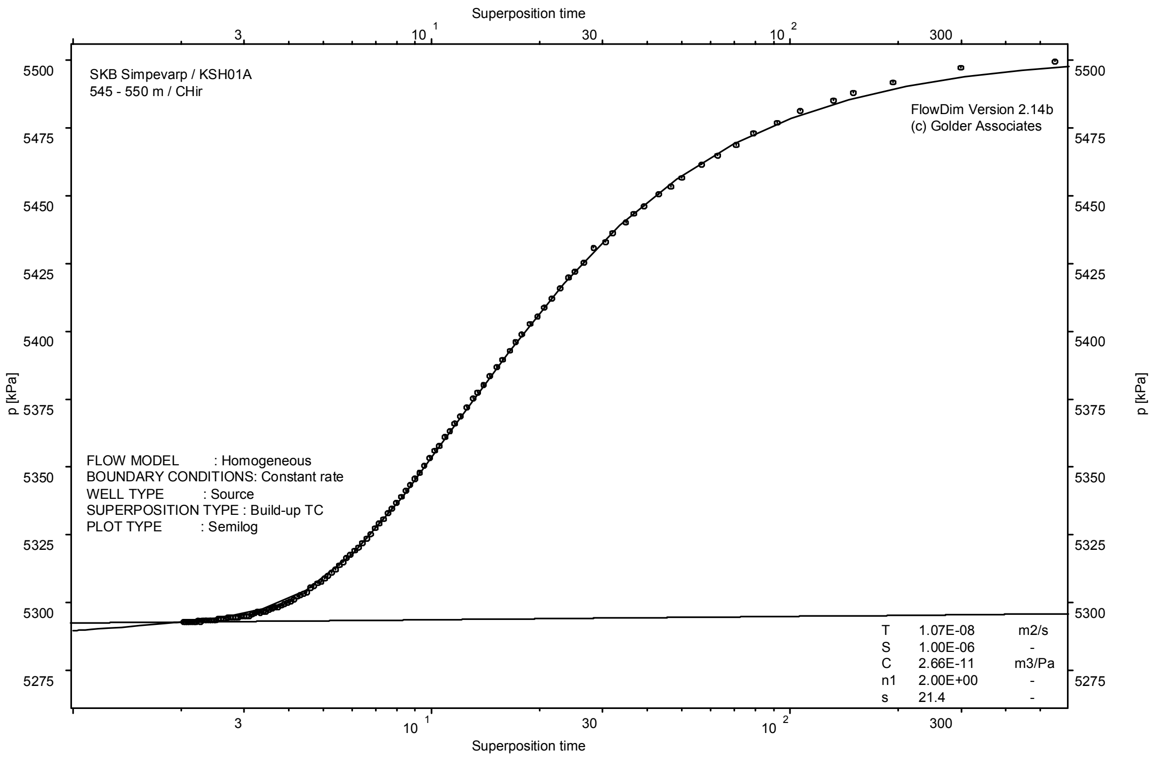
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

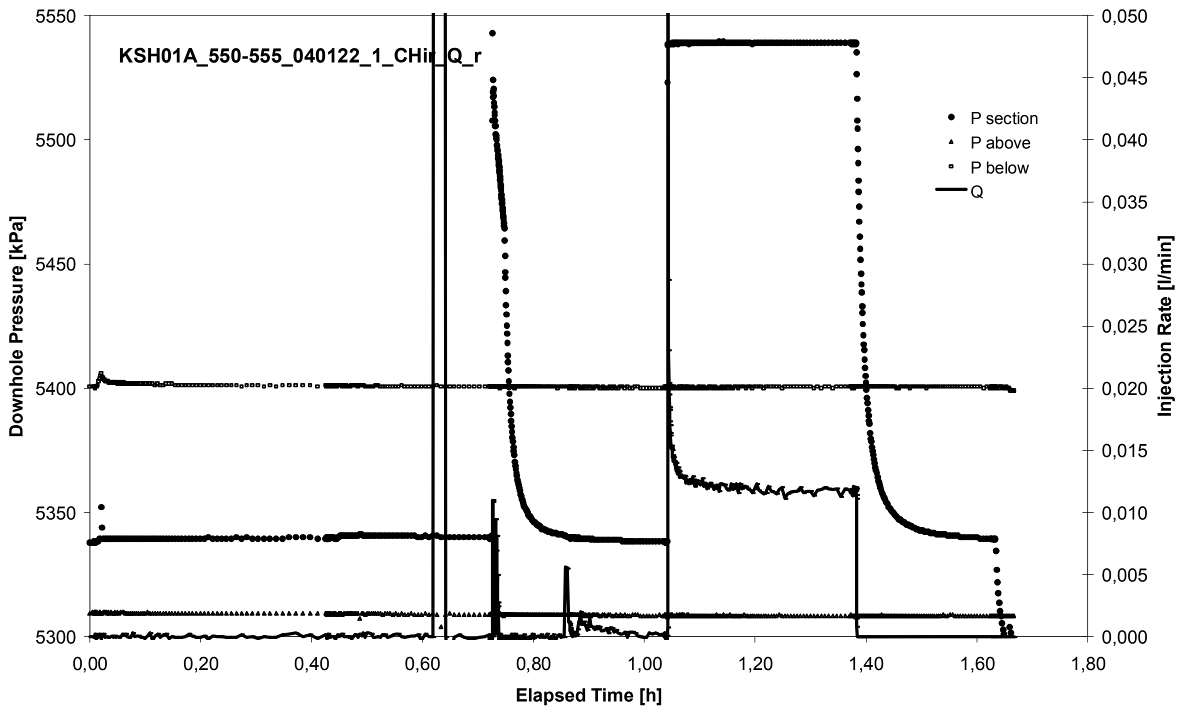


CHIR phase; HORNER match

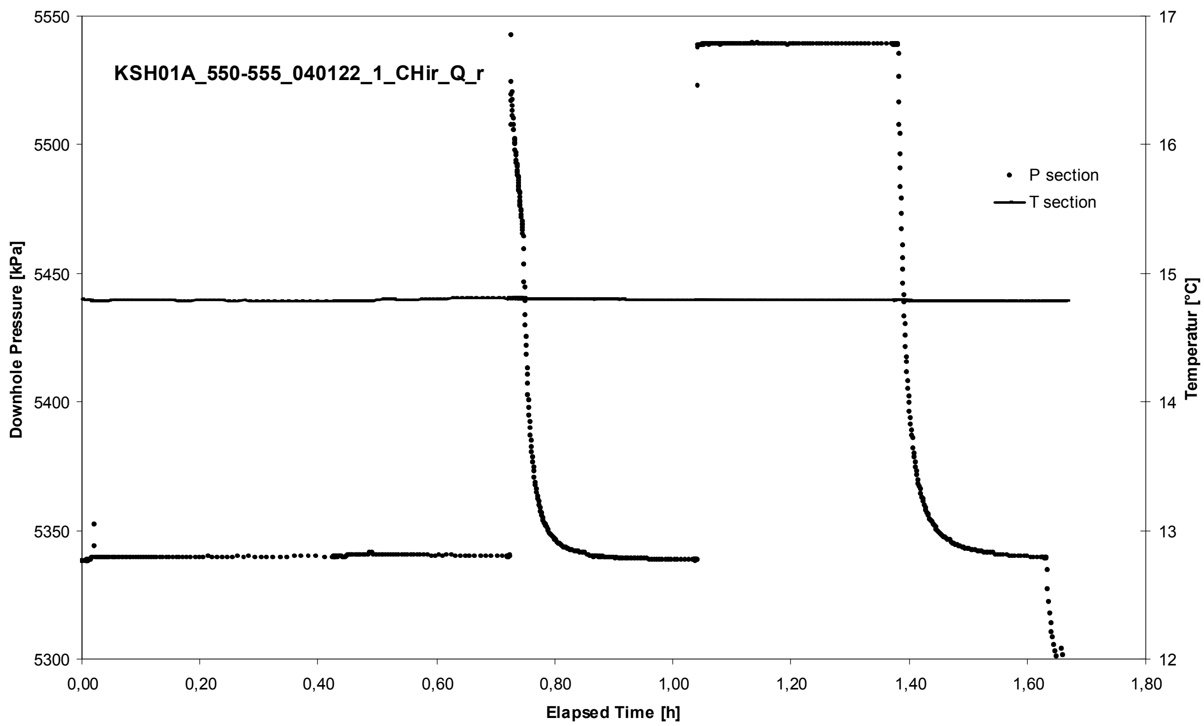
APPENDIX 2-105

Test 550 – 555 m

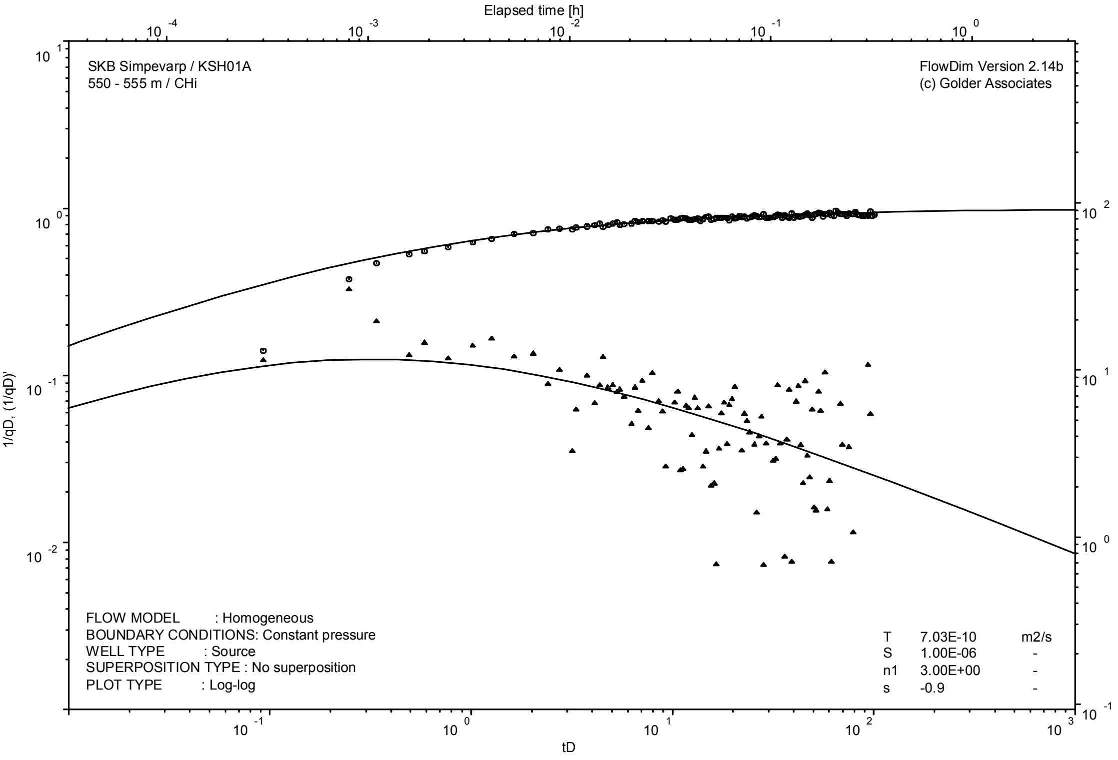
Analysis diagrams



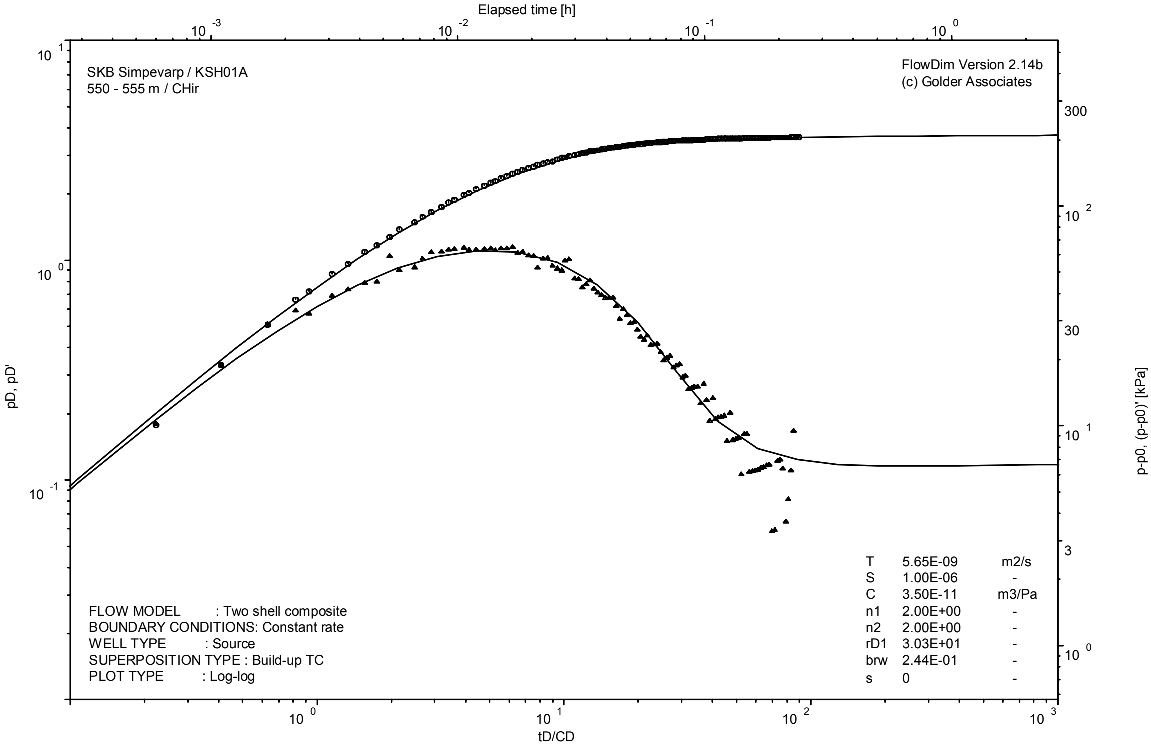
Pressure and flow rate vs. time; cartesian plot



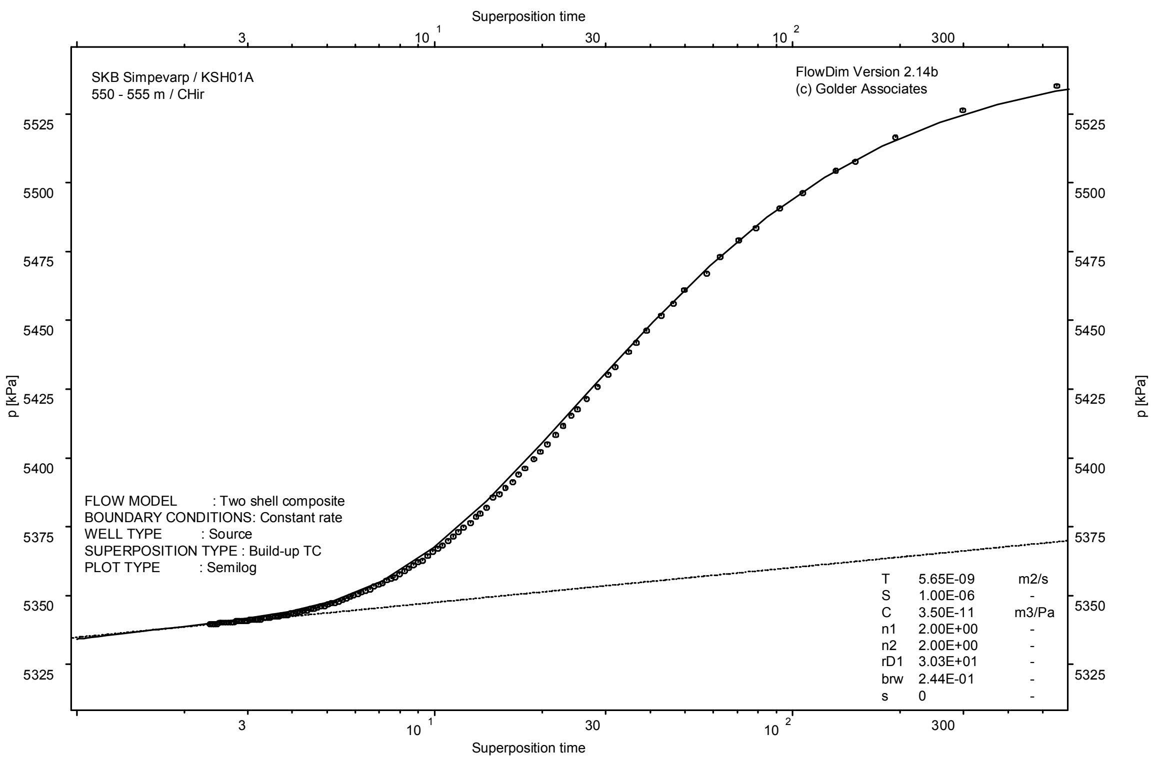
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

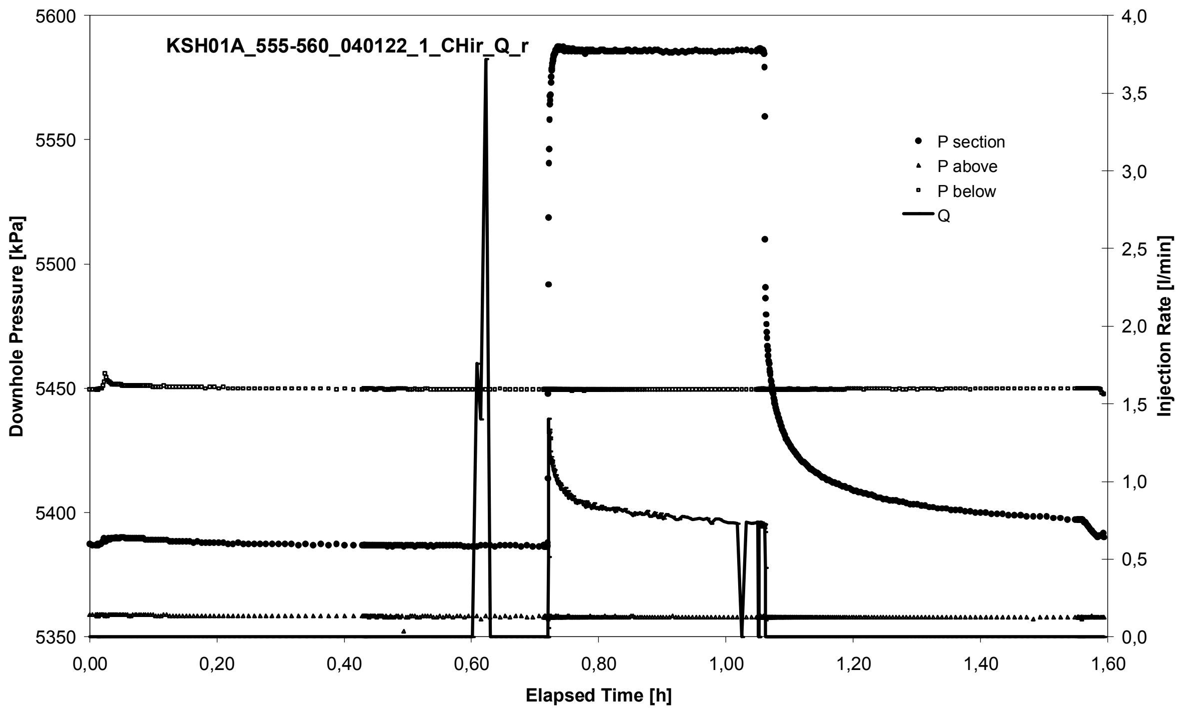


CHIR phase; HORNER match

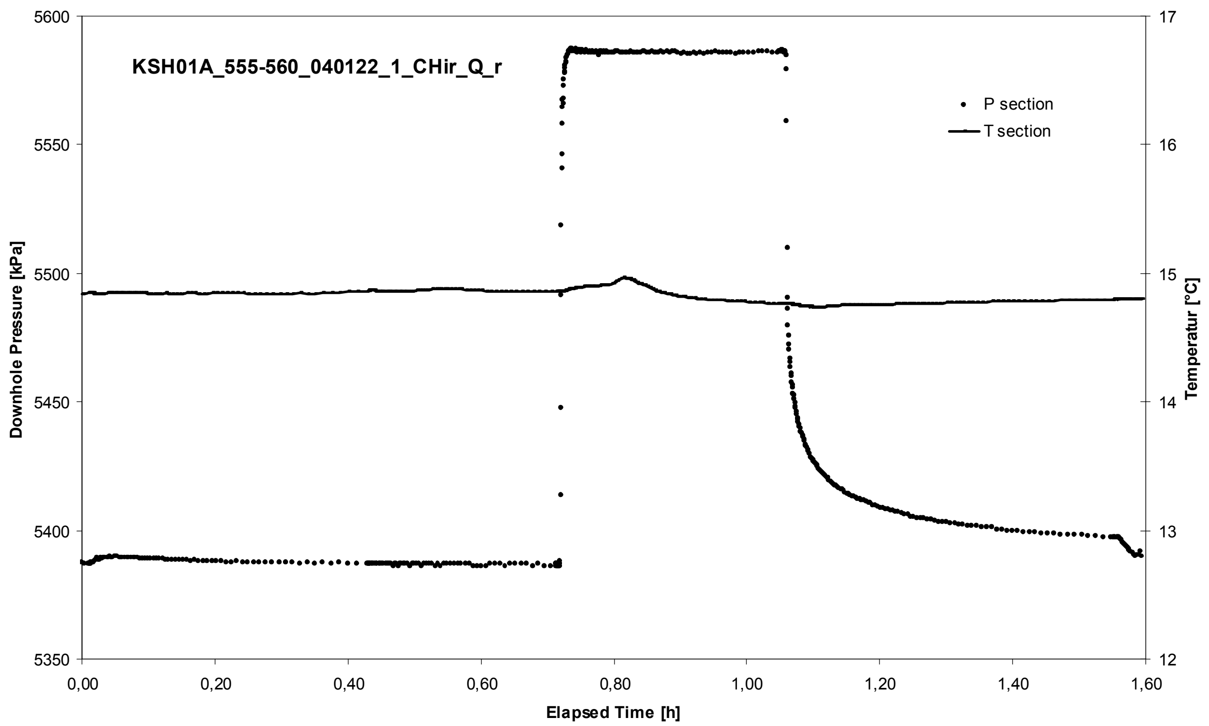
APPENDIX 2-106

Test 555 – 560 m

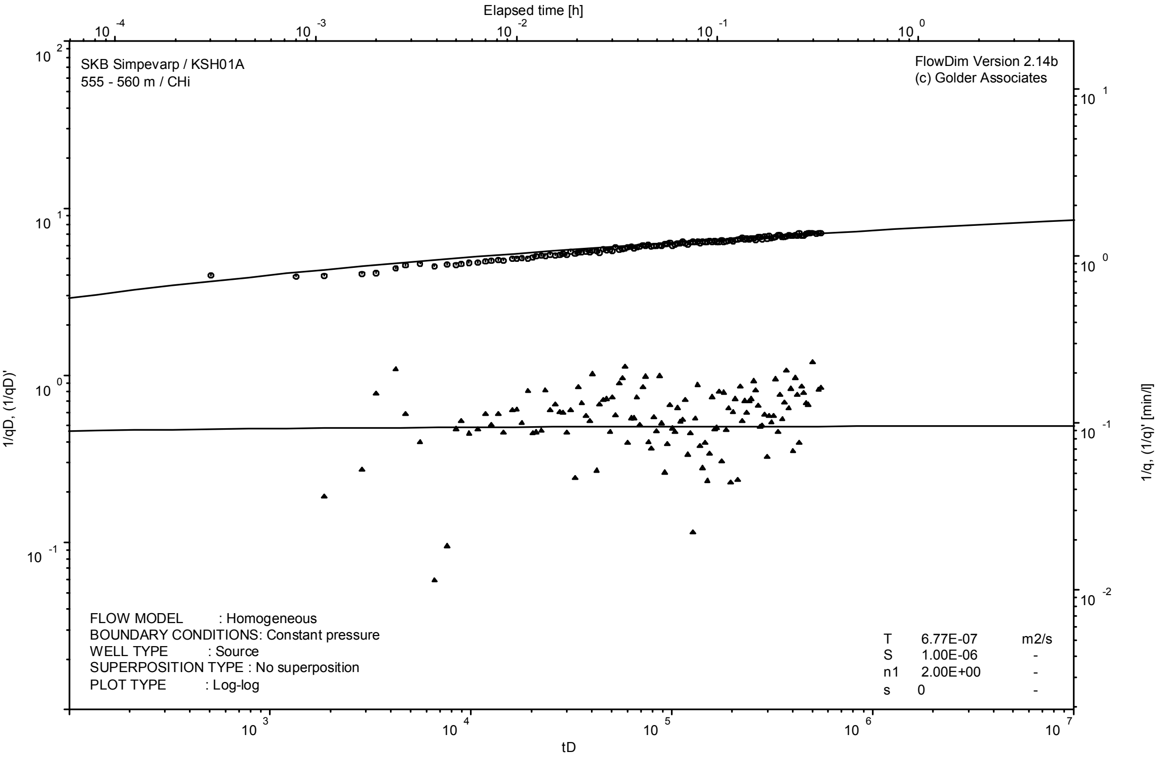
Analysis diagrams



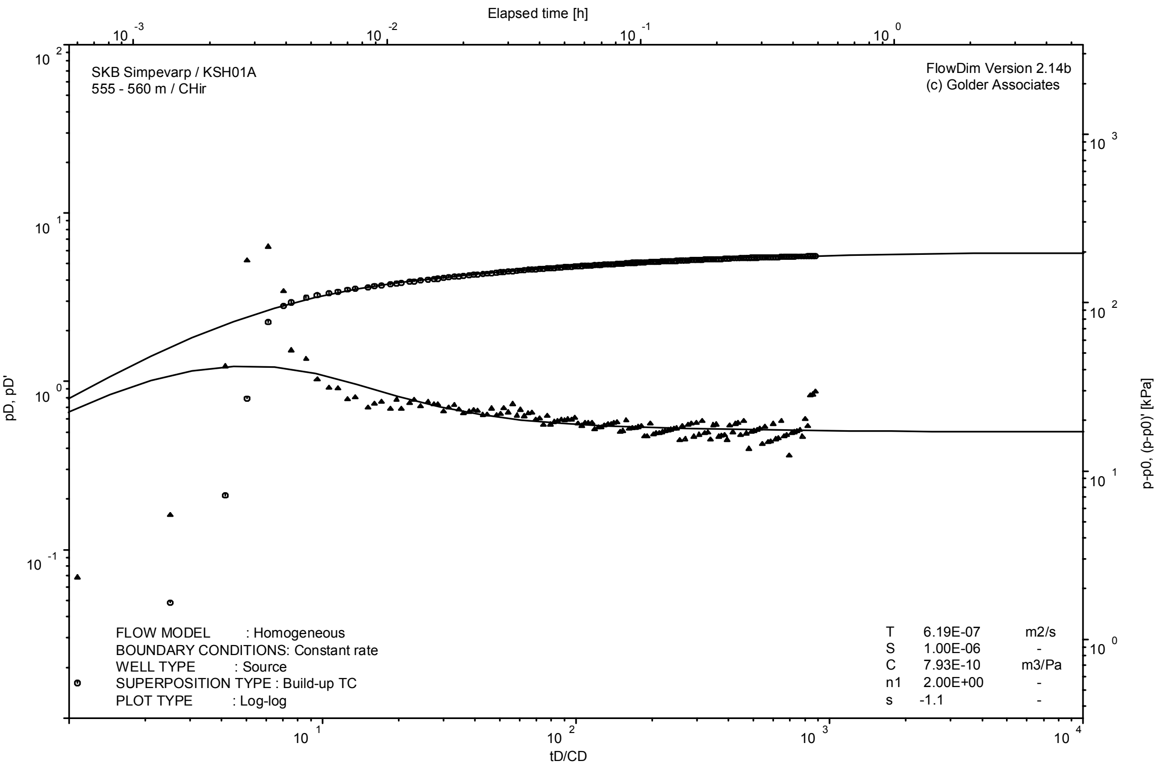
Pressure and flow rate vs. time; cartesian plot



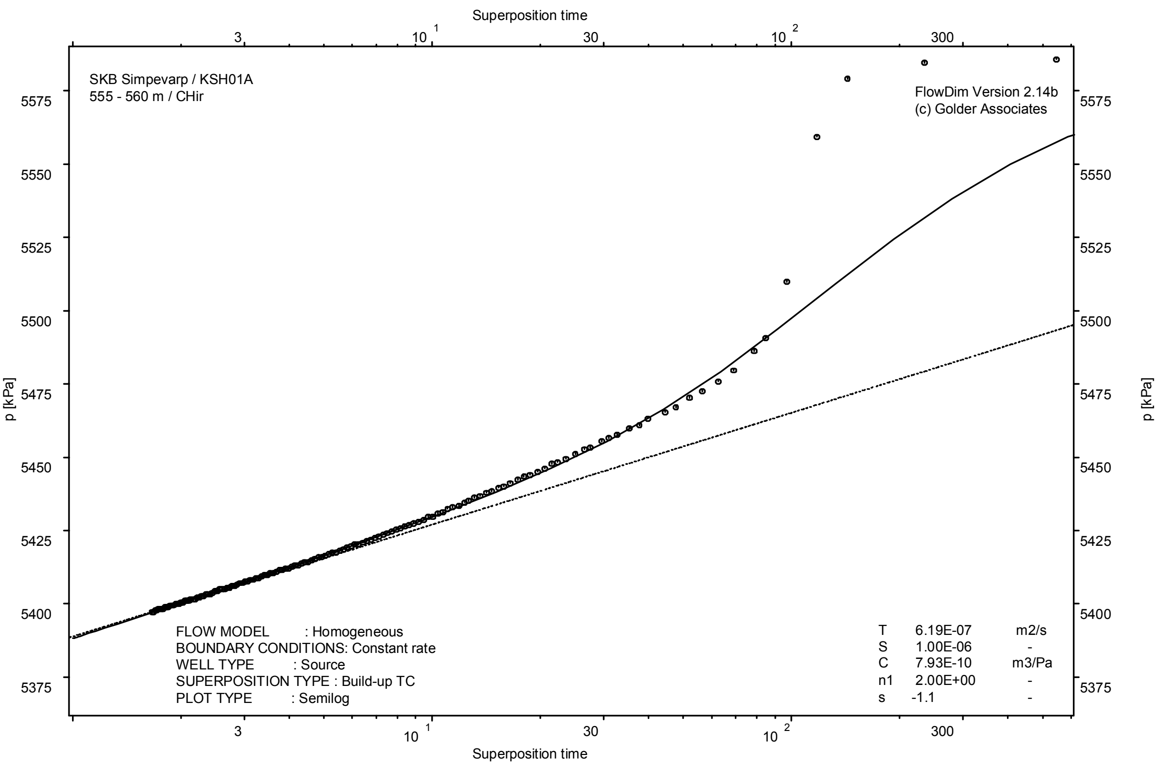
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

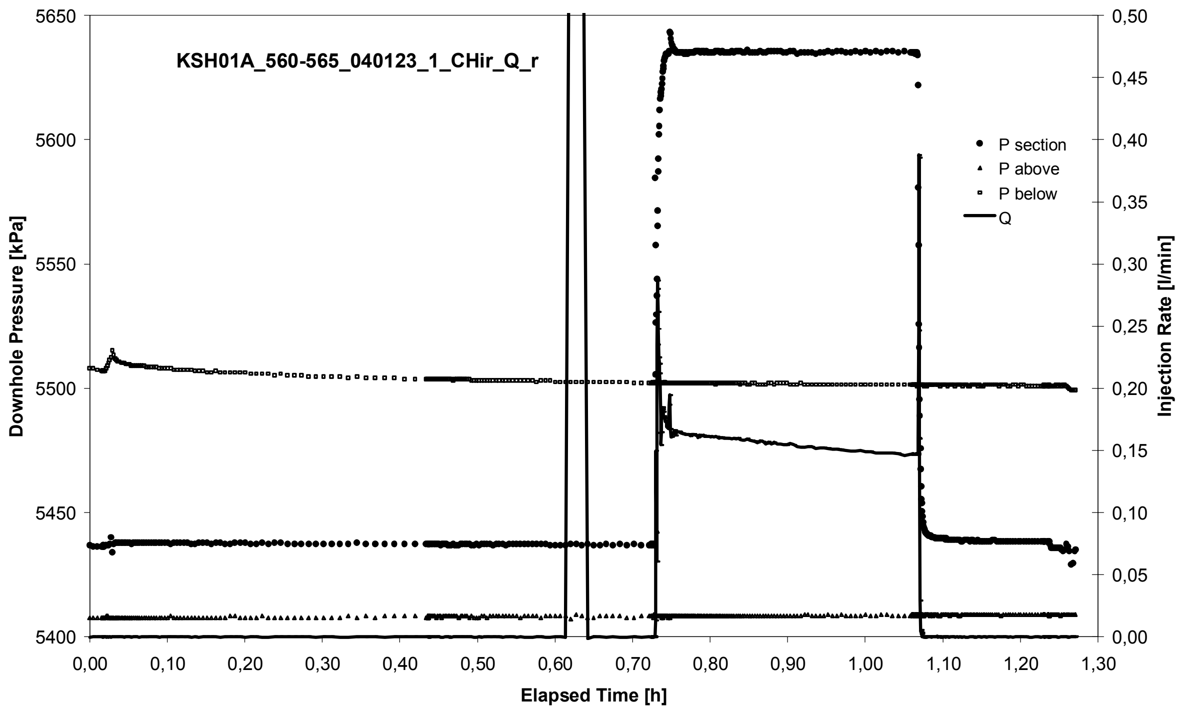


CHIR phase; HORNER match

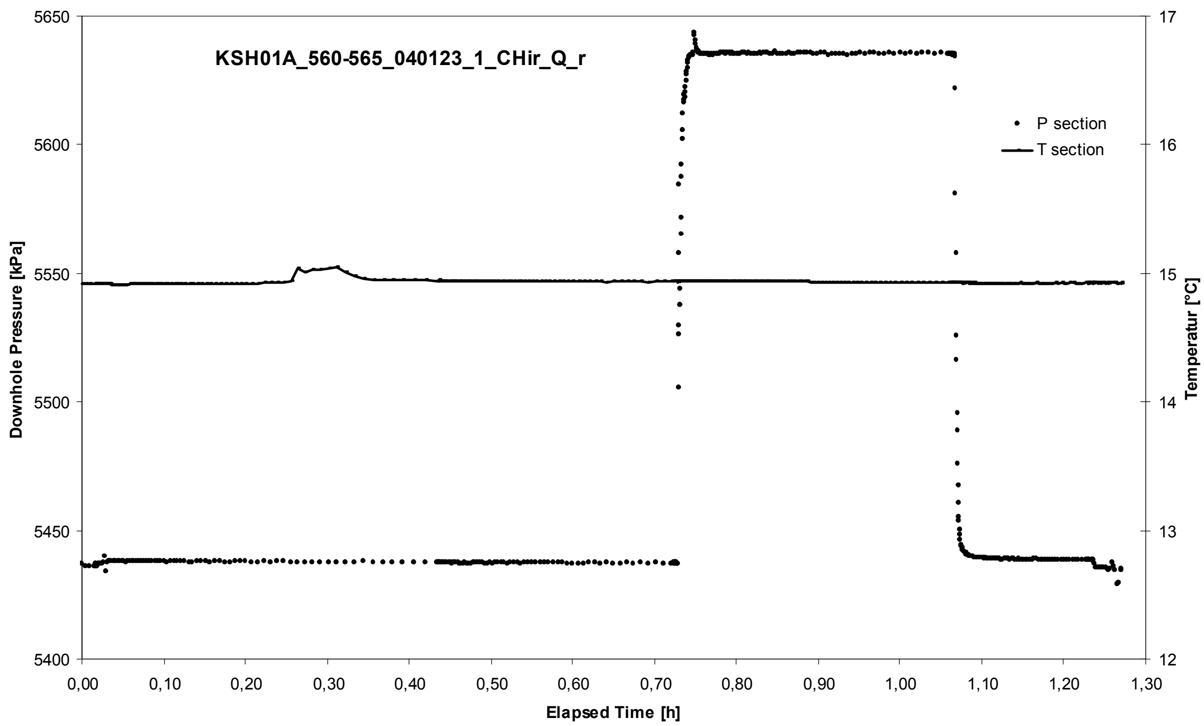
APPENDIX 2-107

Test 560 – 565 m

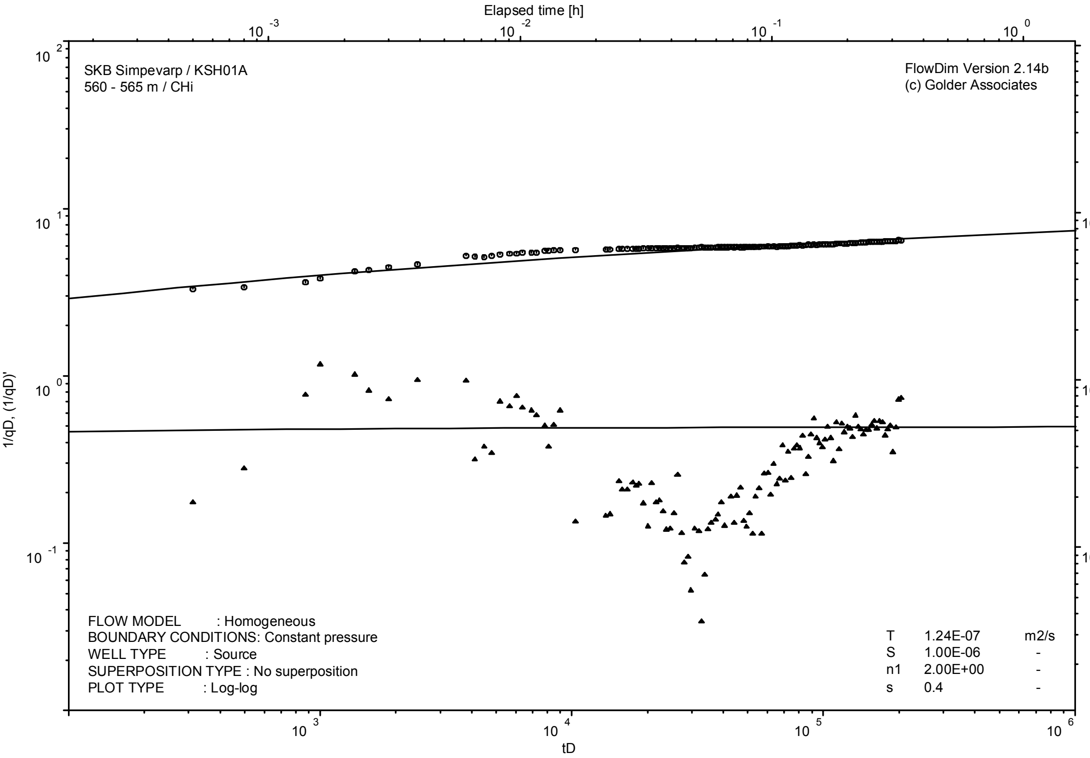
Analysis diagrams



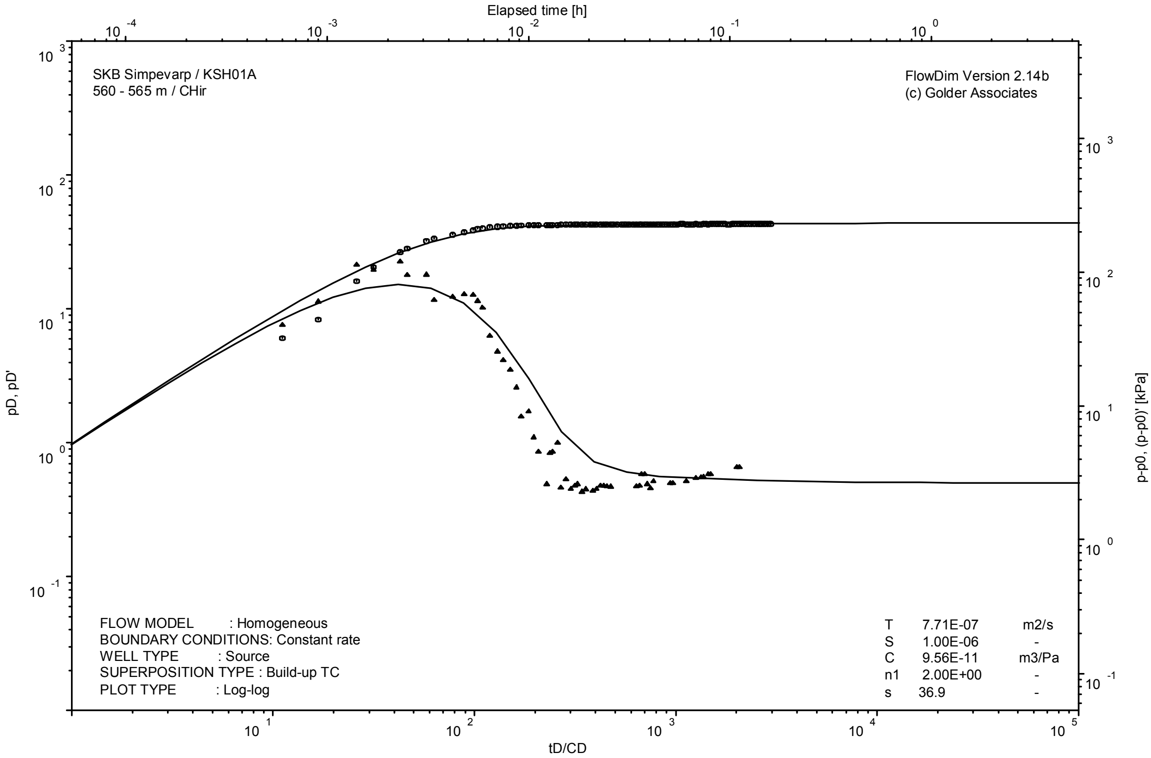
Pressure and flow rate vs. time; cartesian plot



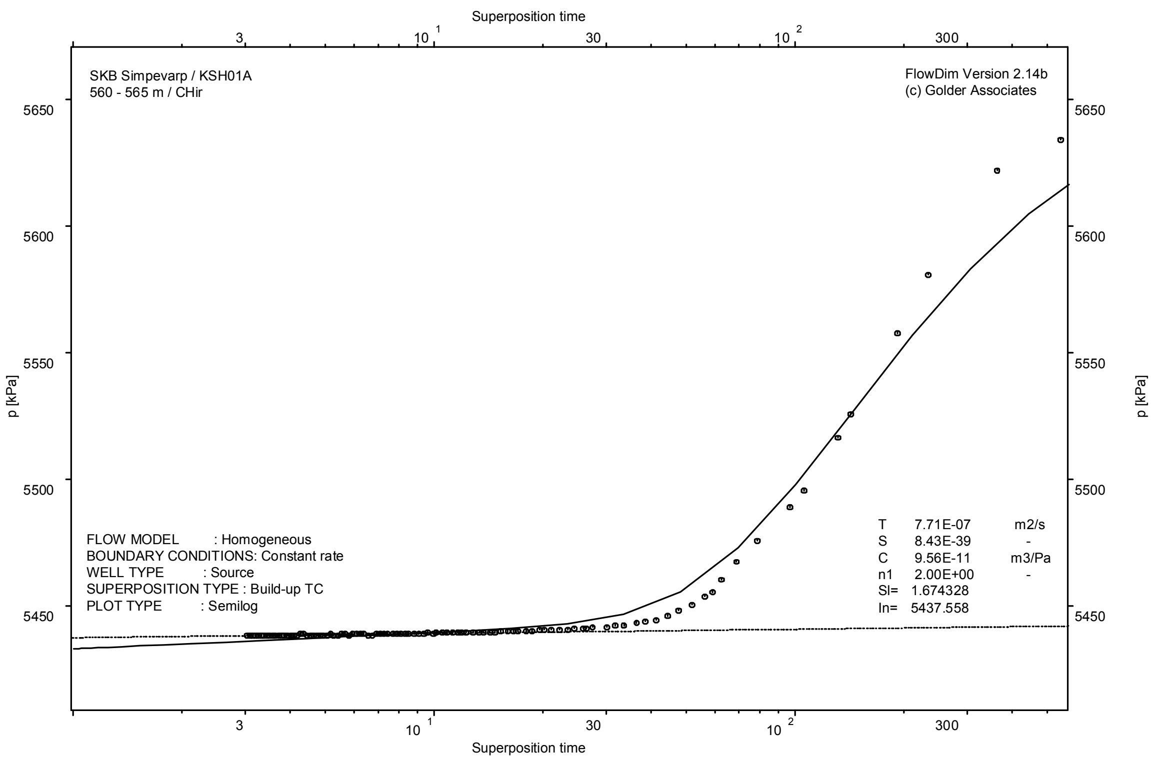
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

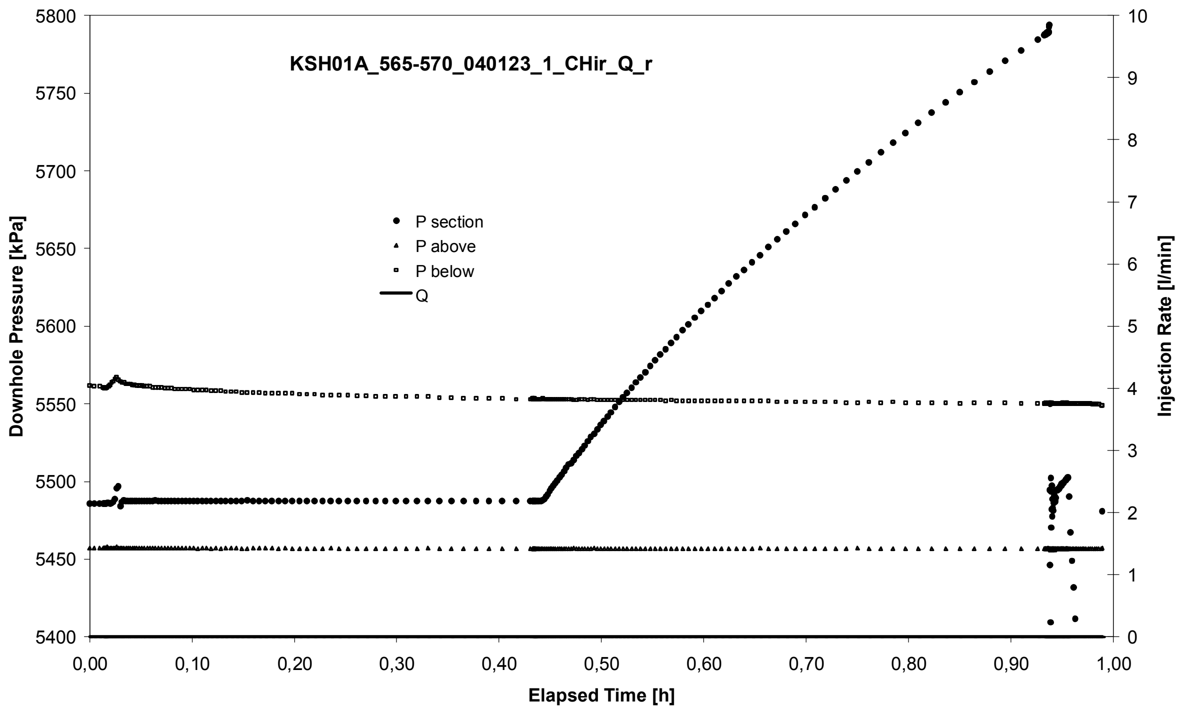


CHIR phase; HORNER match

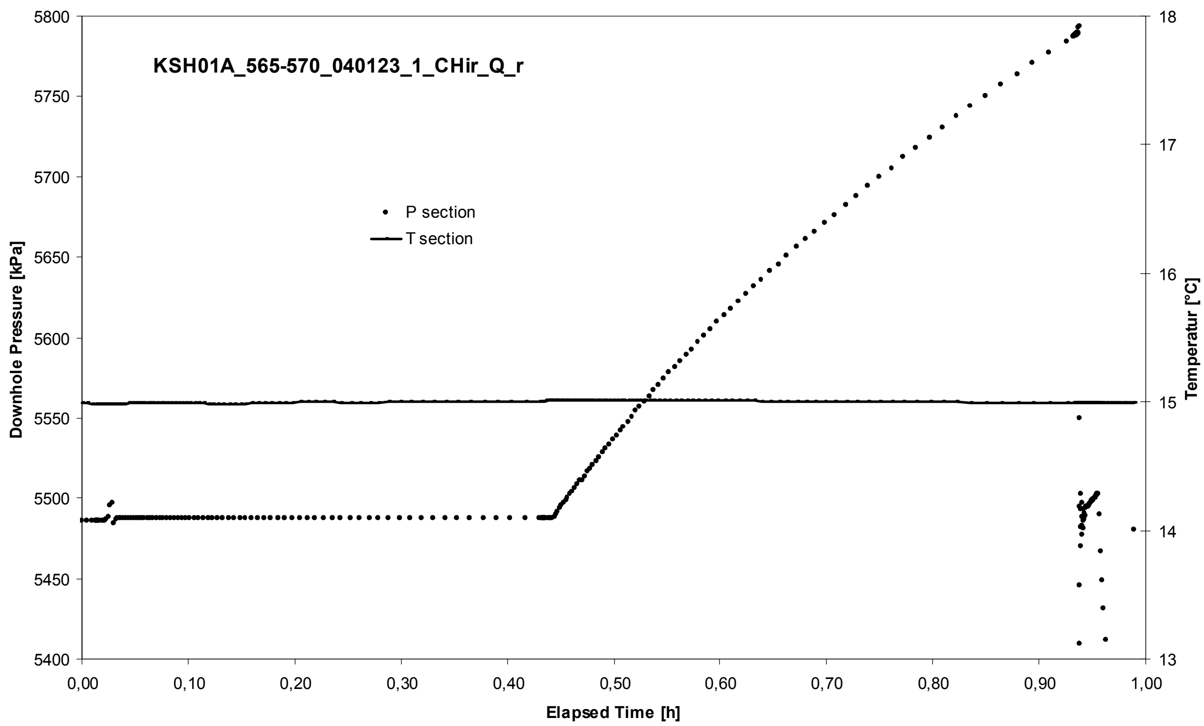
APPENDIX 2-108

Test 565 – 570 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

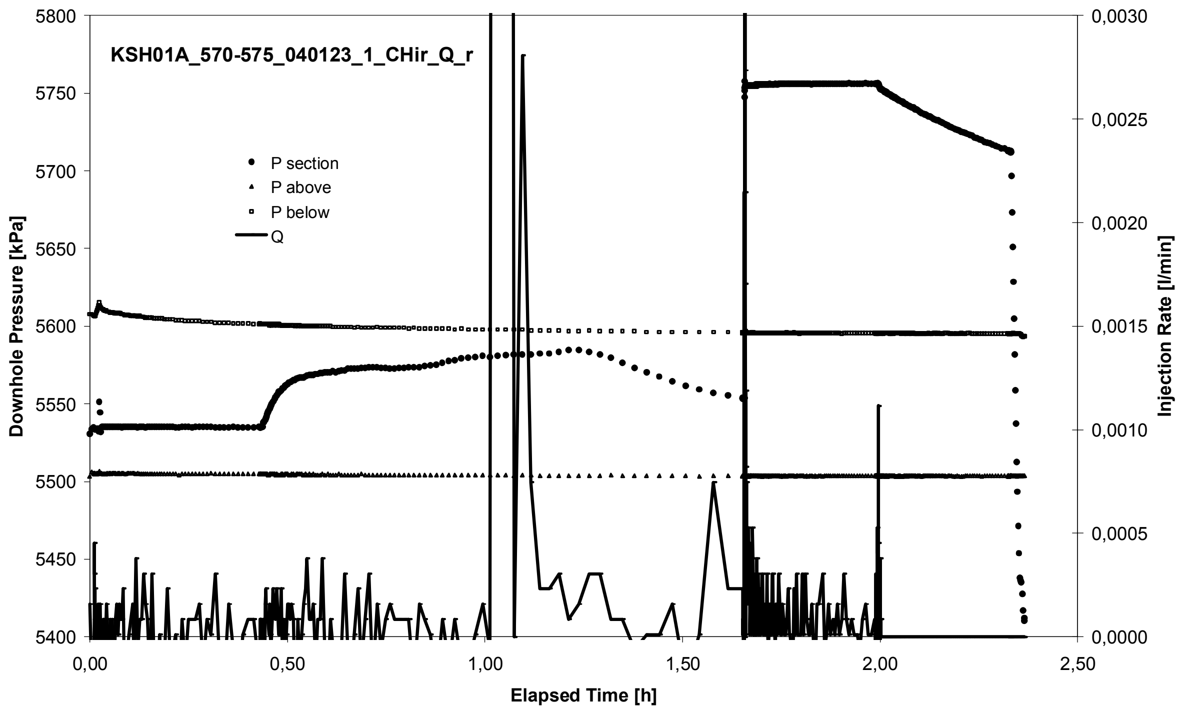
Not Analysed

CHIR phase; HORNER match

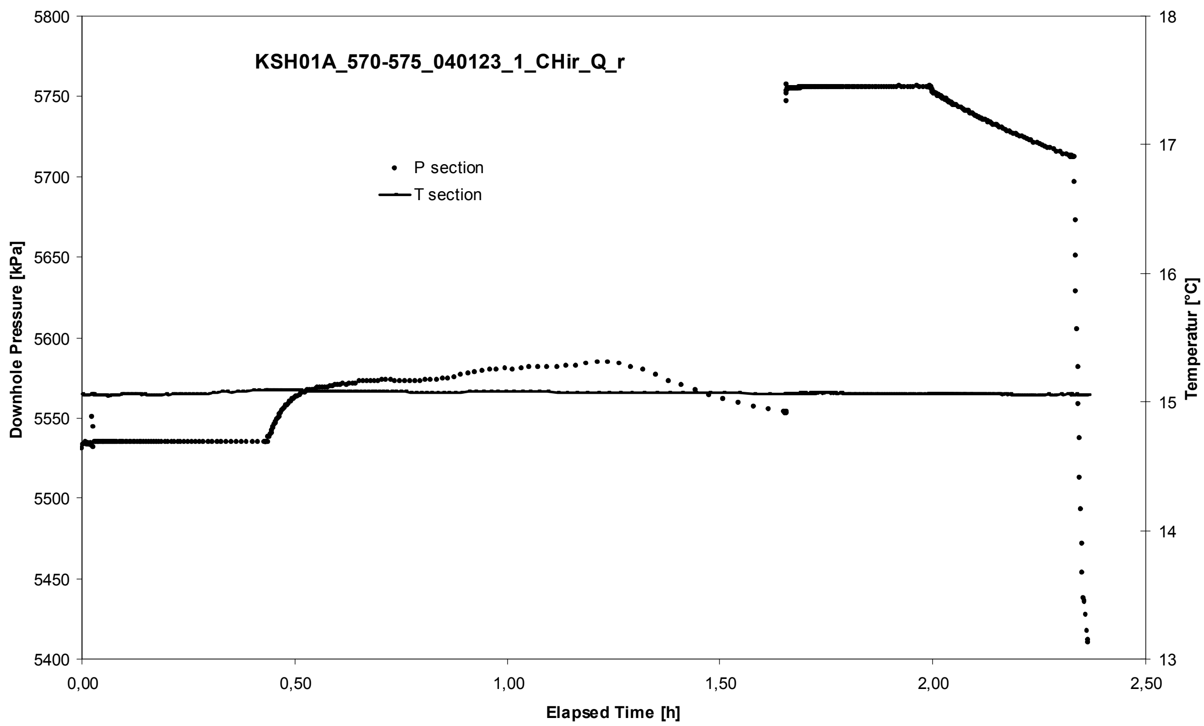
APPENDIX 2-109

Test 570 – 575 m

Analysis diagrams



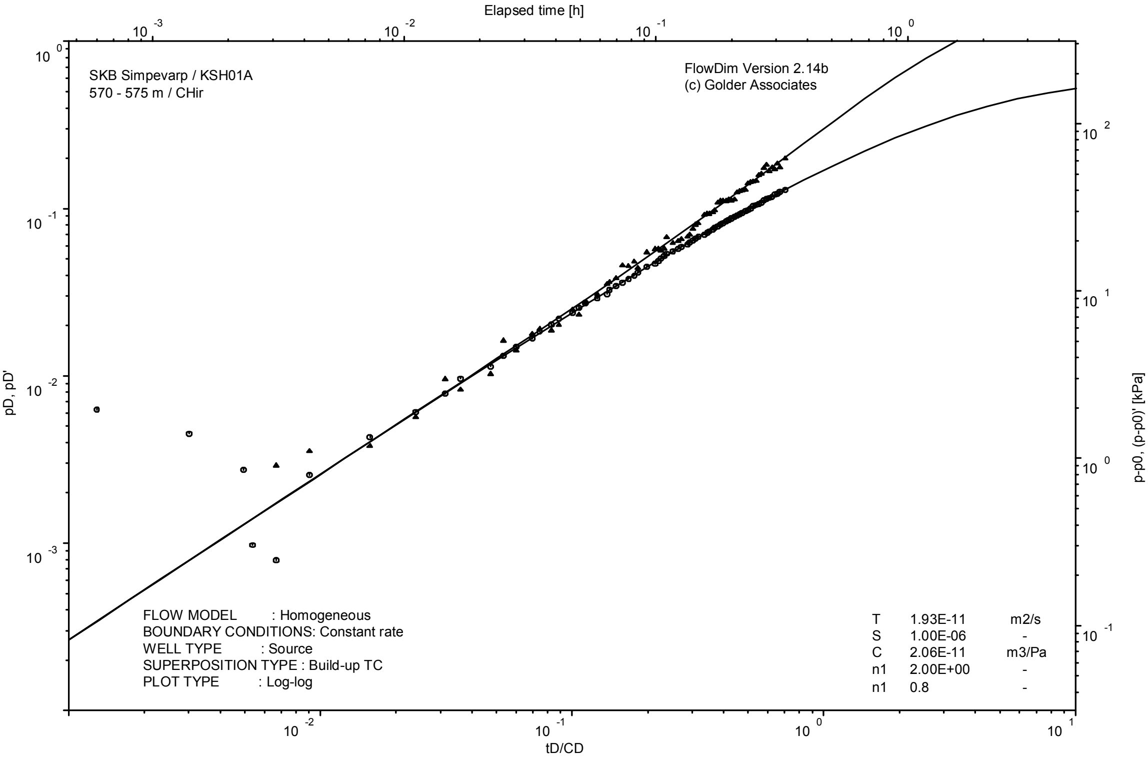
Pressure and flow rate vs. time; cartesian plot



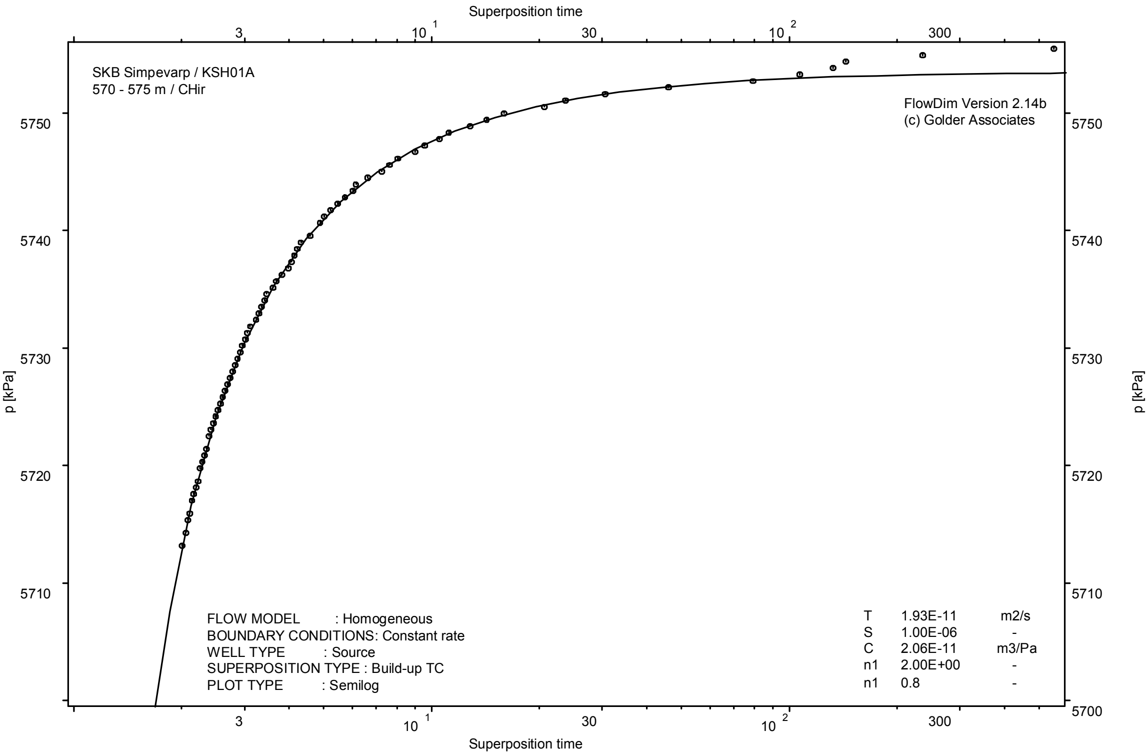
Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match



CHIR phase; log-log match

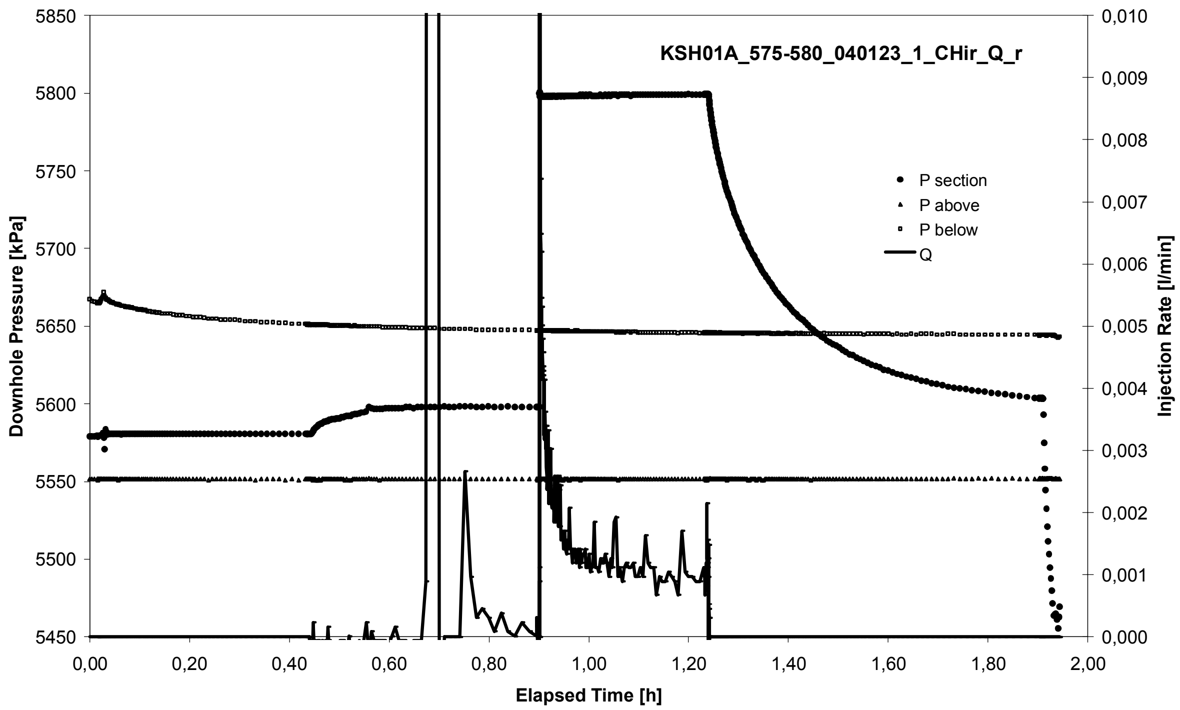


CHIR phase; HORNER match

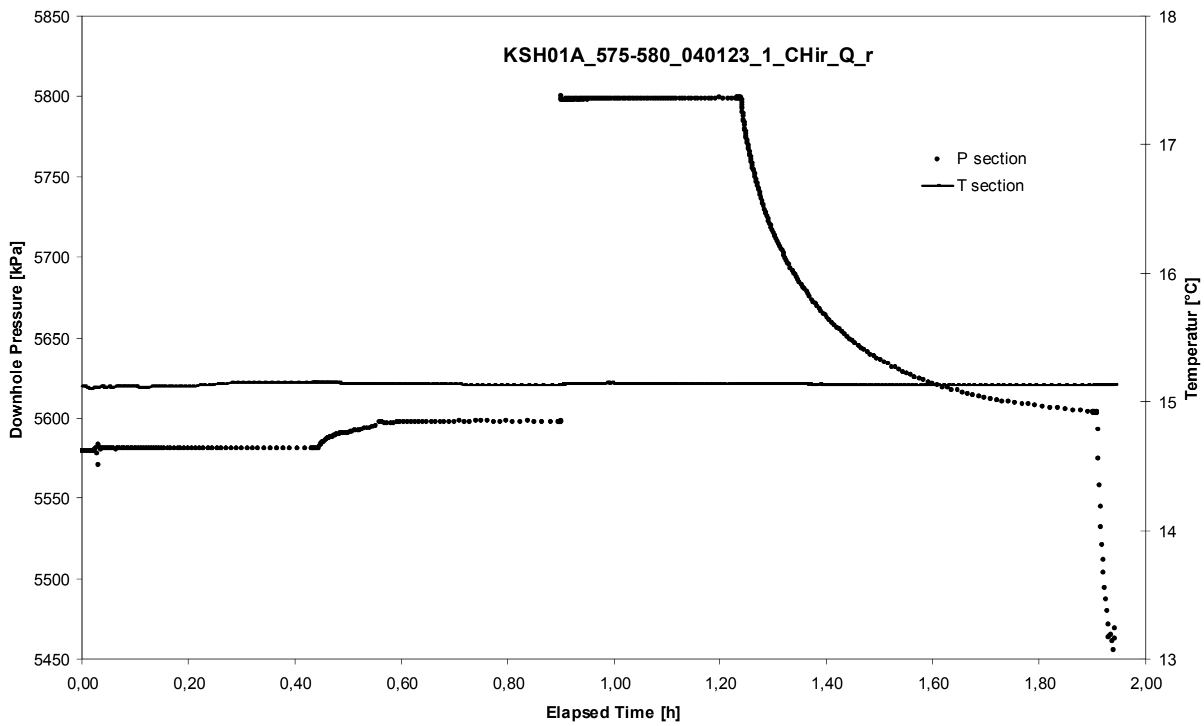
APPENDIX 2-110

Test 575 – 580 m

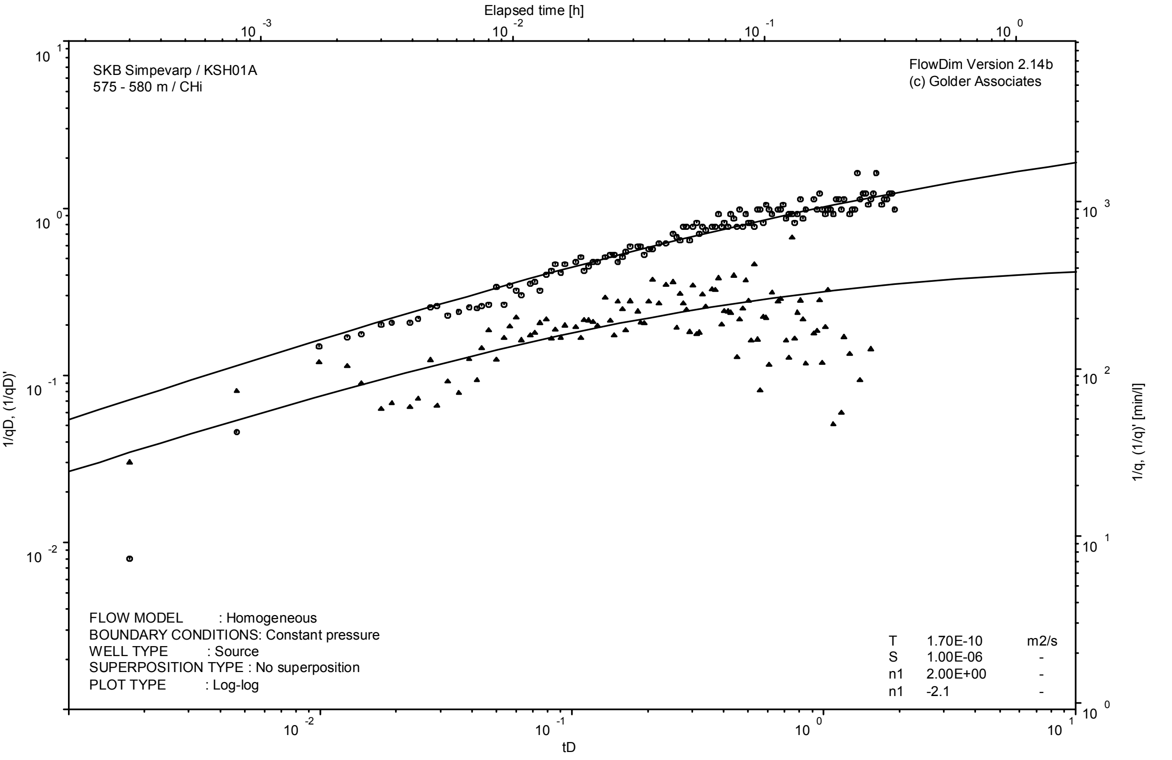
Analysis diagrams



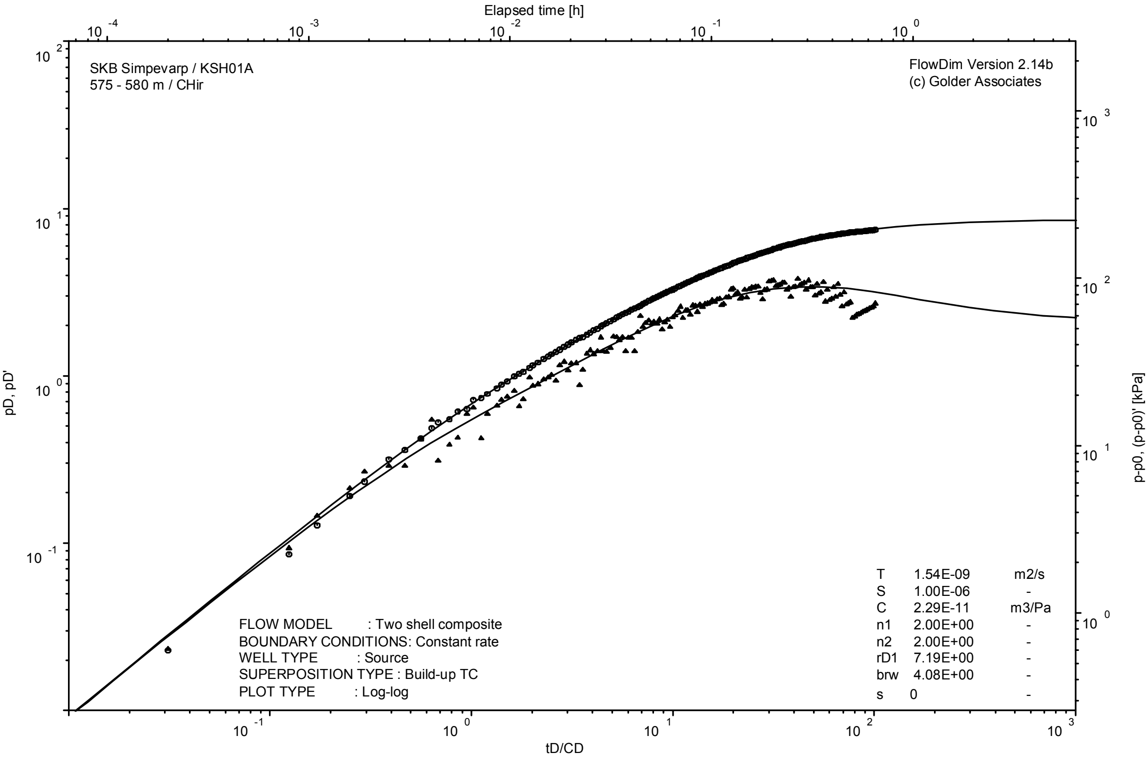
Pressure and flow rate vs. time; cartesian plot



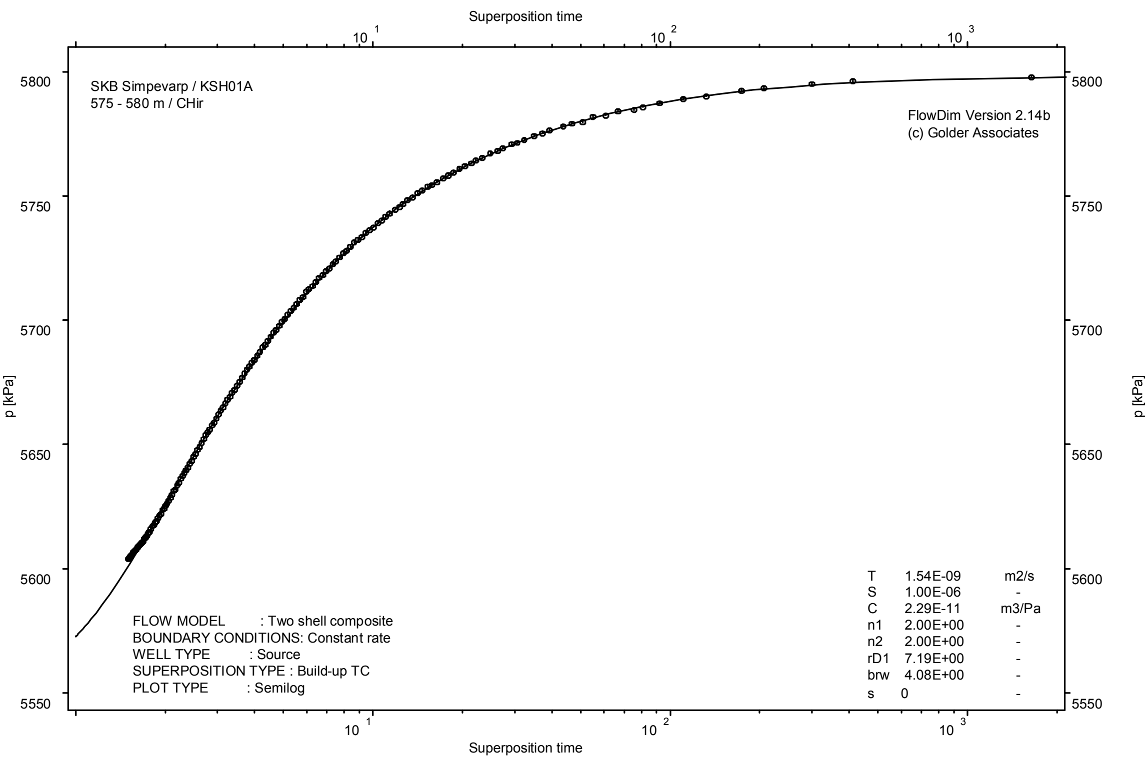
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

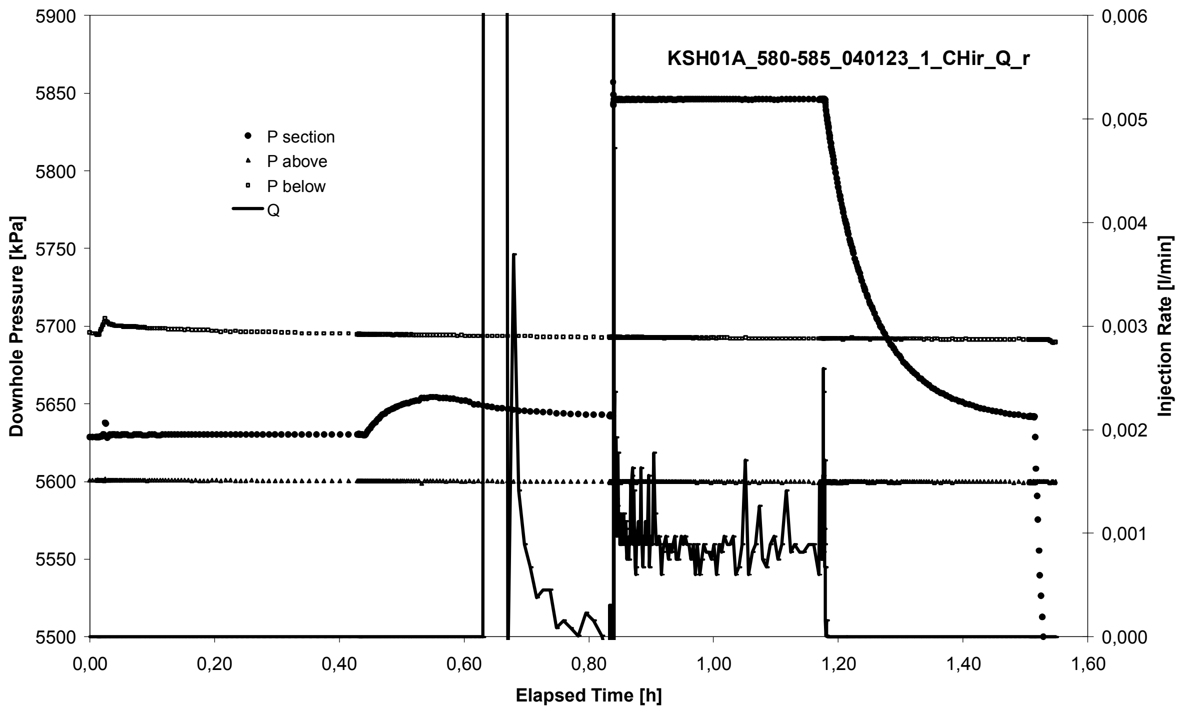


CHIR phase; HORNER match

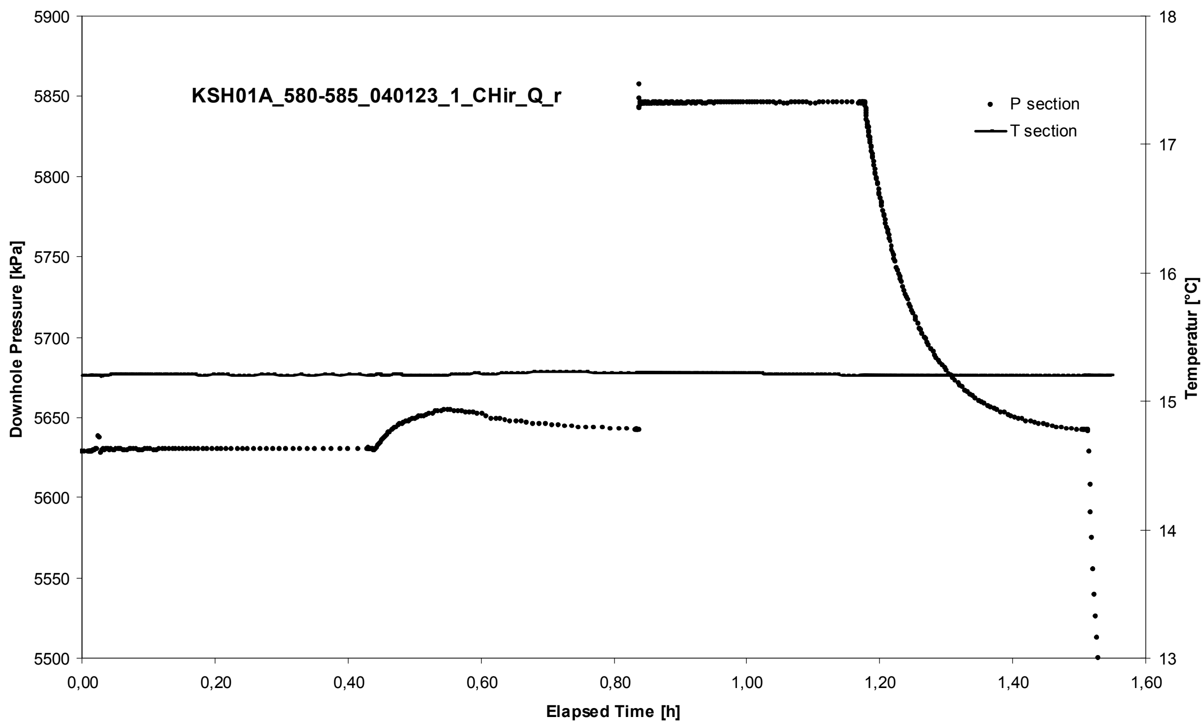
APPENDIX 2-111

Test 580 – 585 m

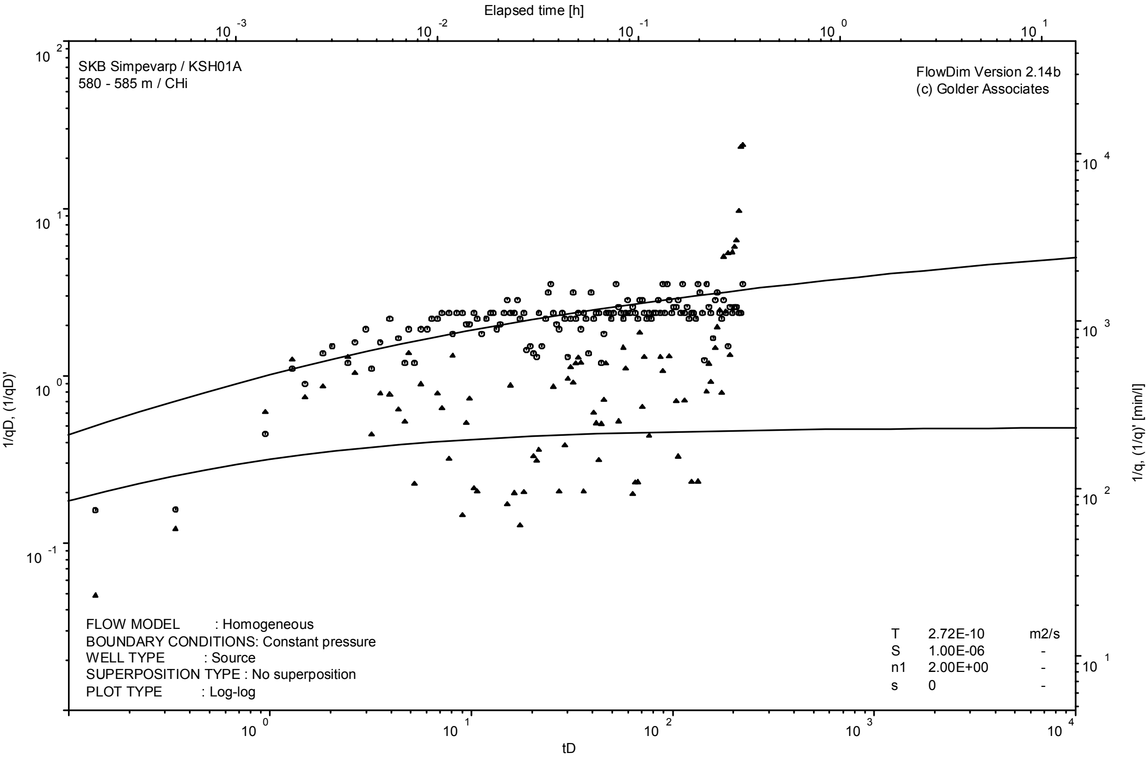
Analysis diagrams



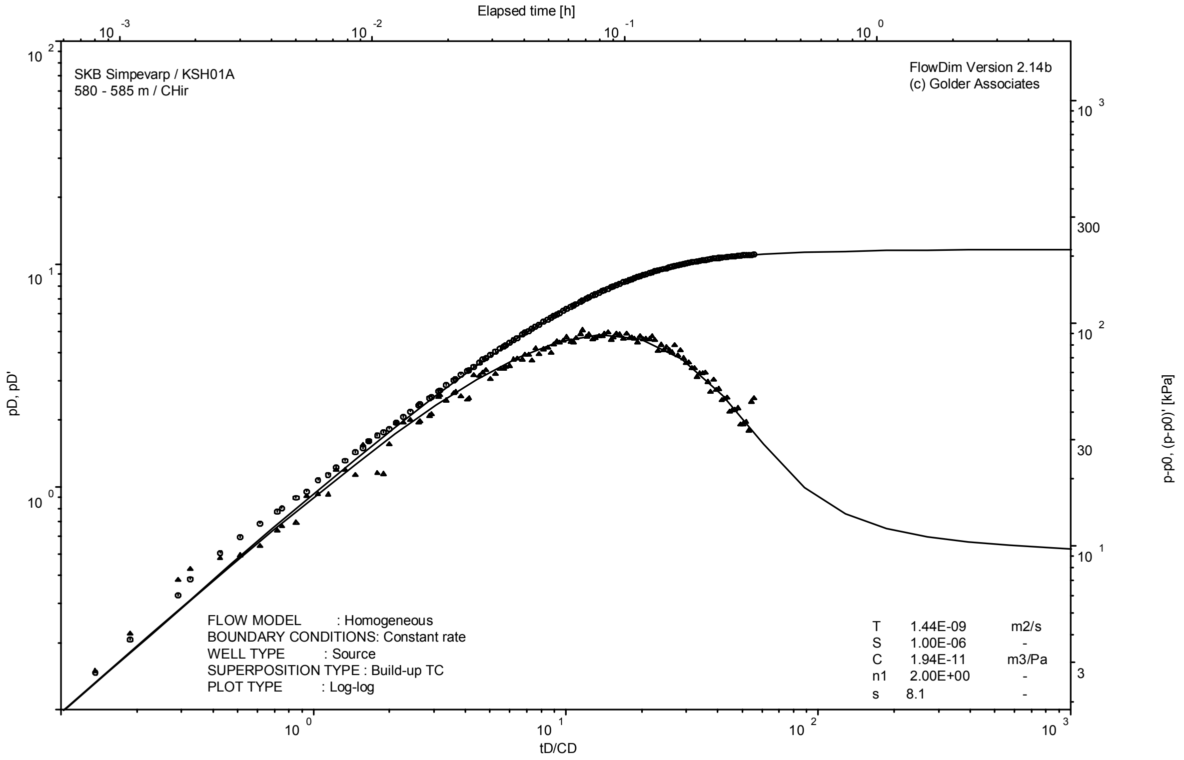
Pressure and flow rate vs. time; cartesian plot



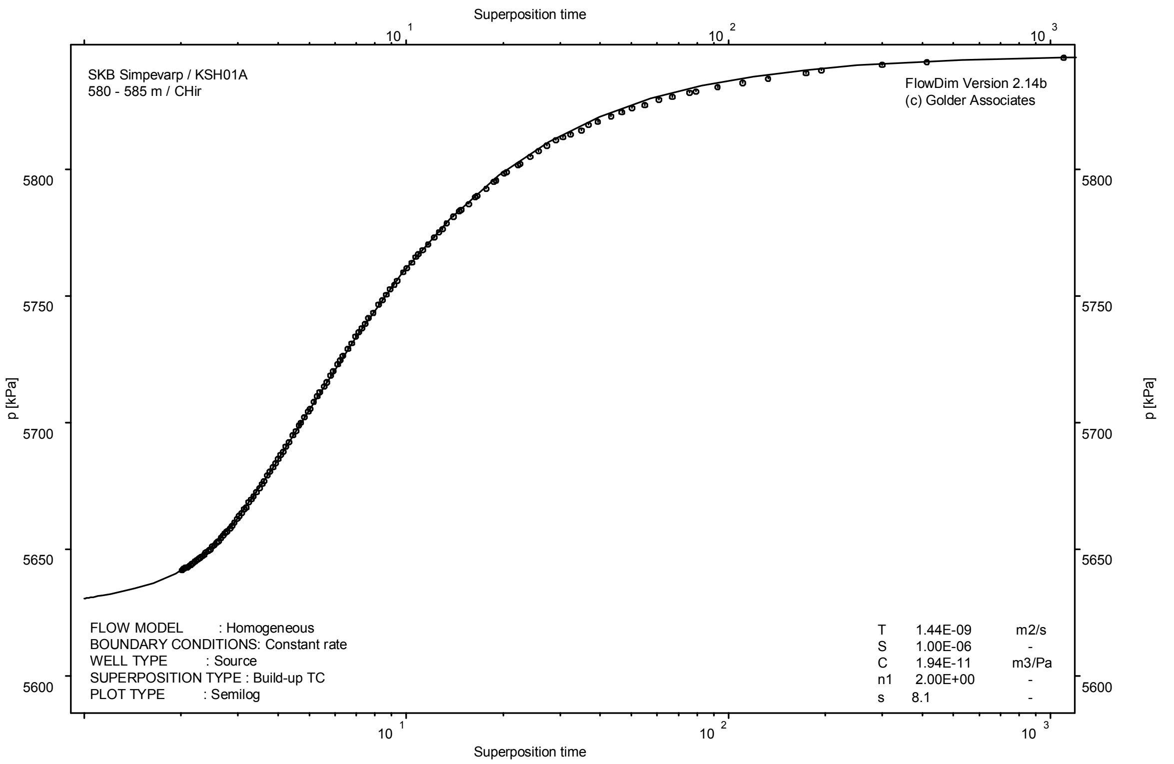
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

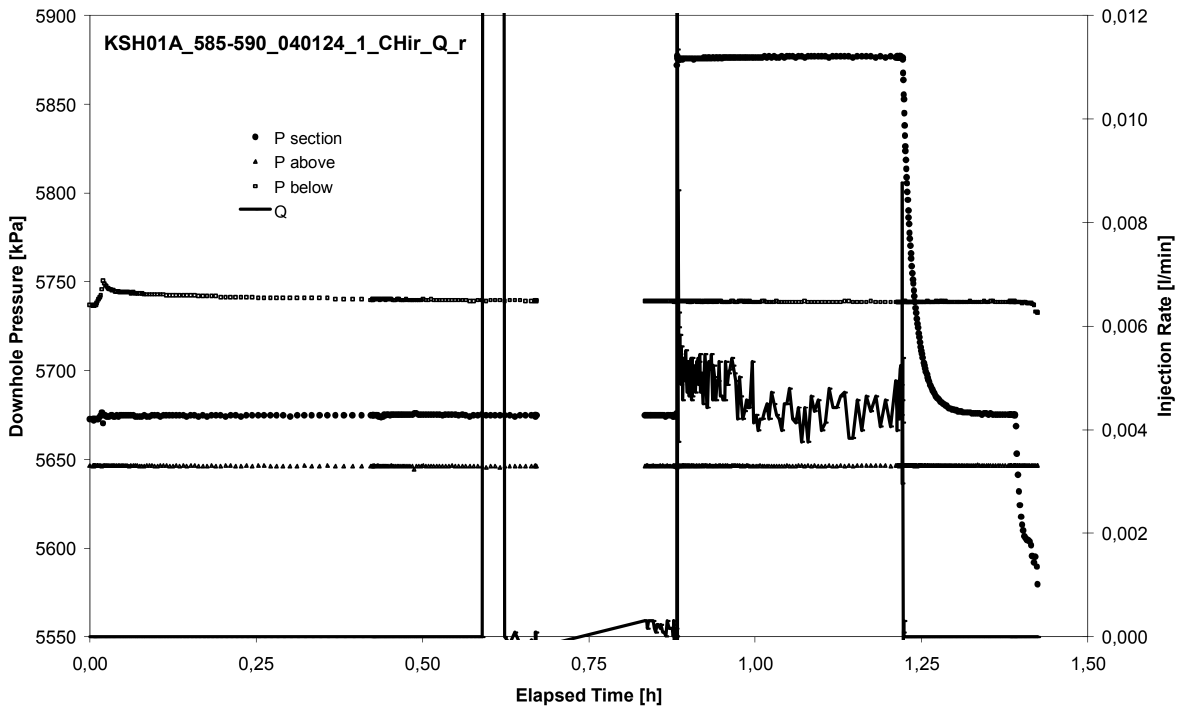


CHIR phase; HORNER match

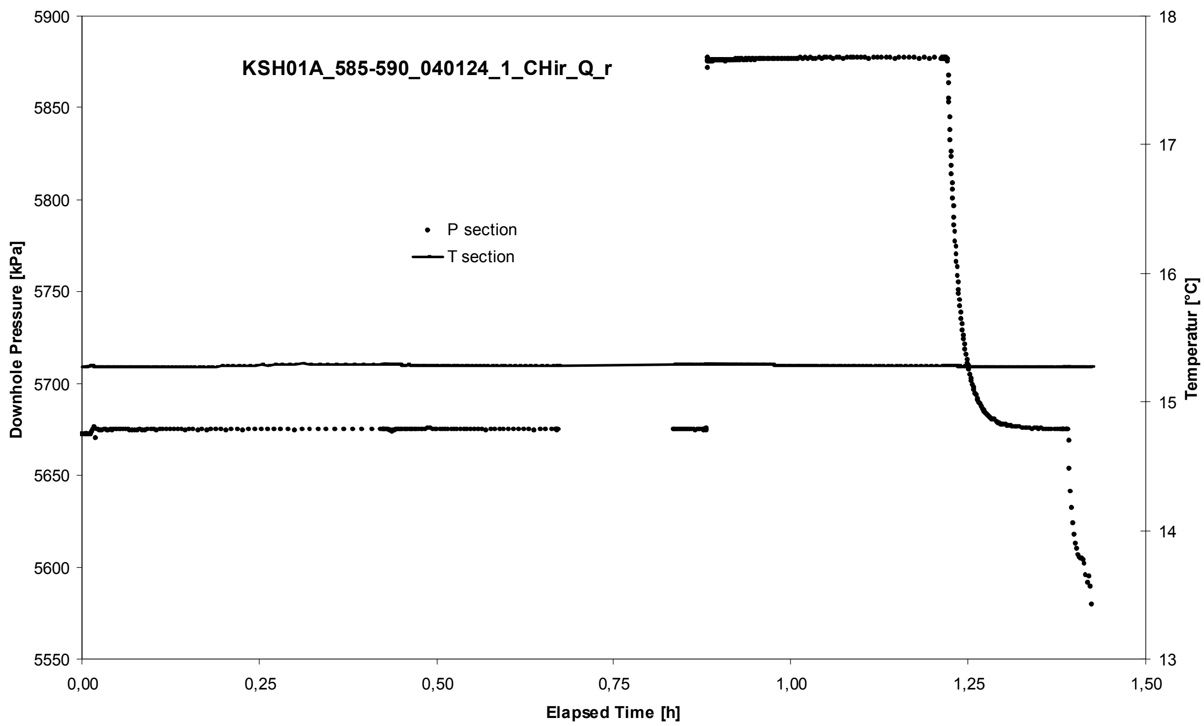
APPENDIX 2-112

Test 585 – 590 m

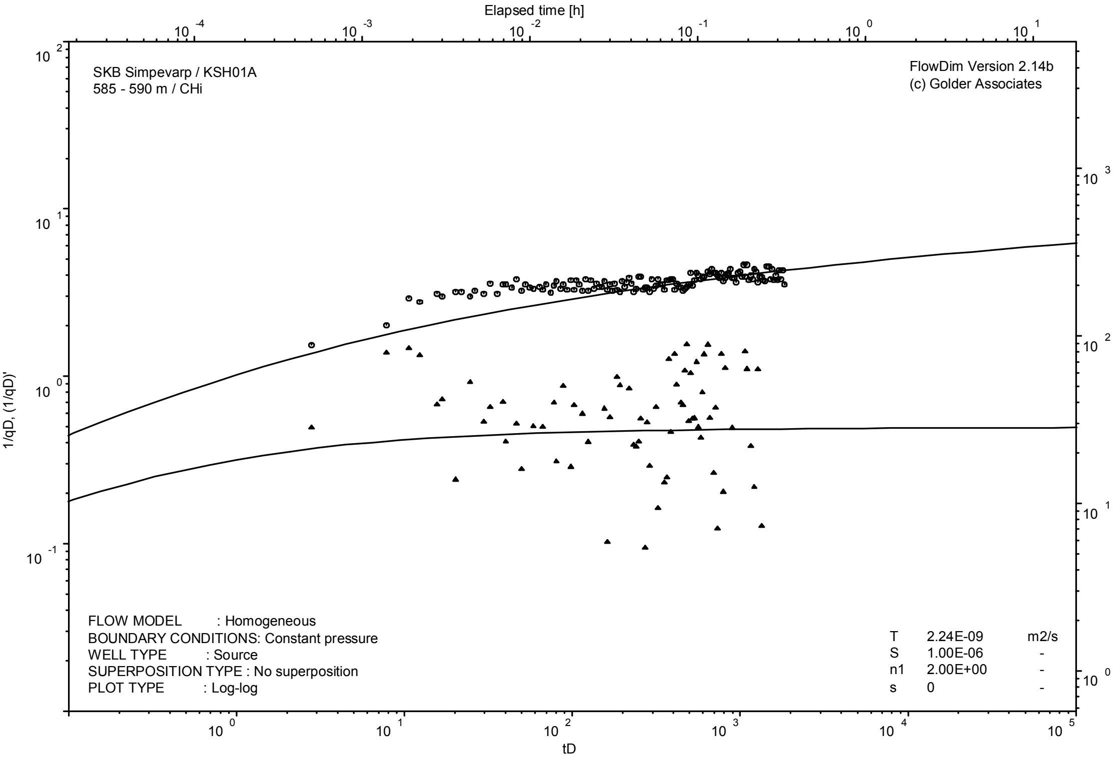
Analysis diagrams



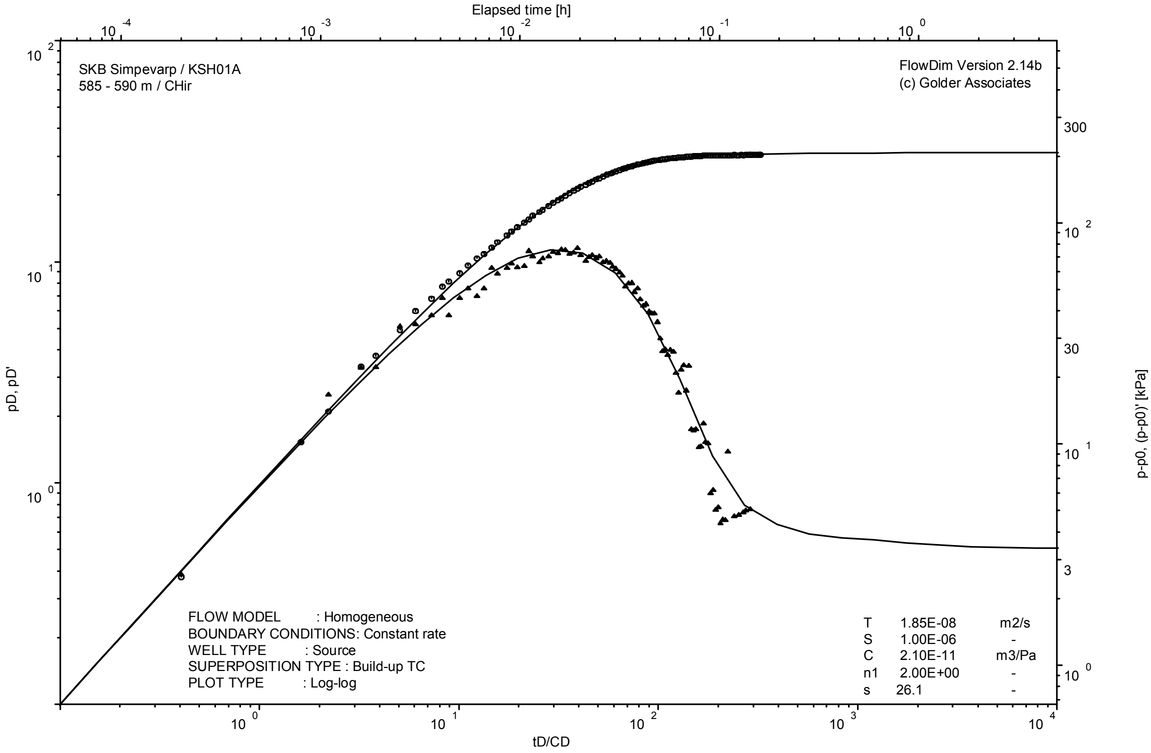
Pressure and flow rate vs. time; cartesian plot



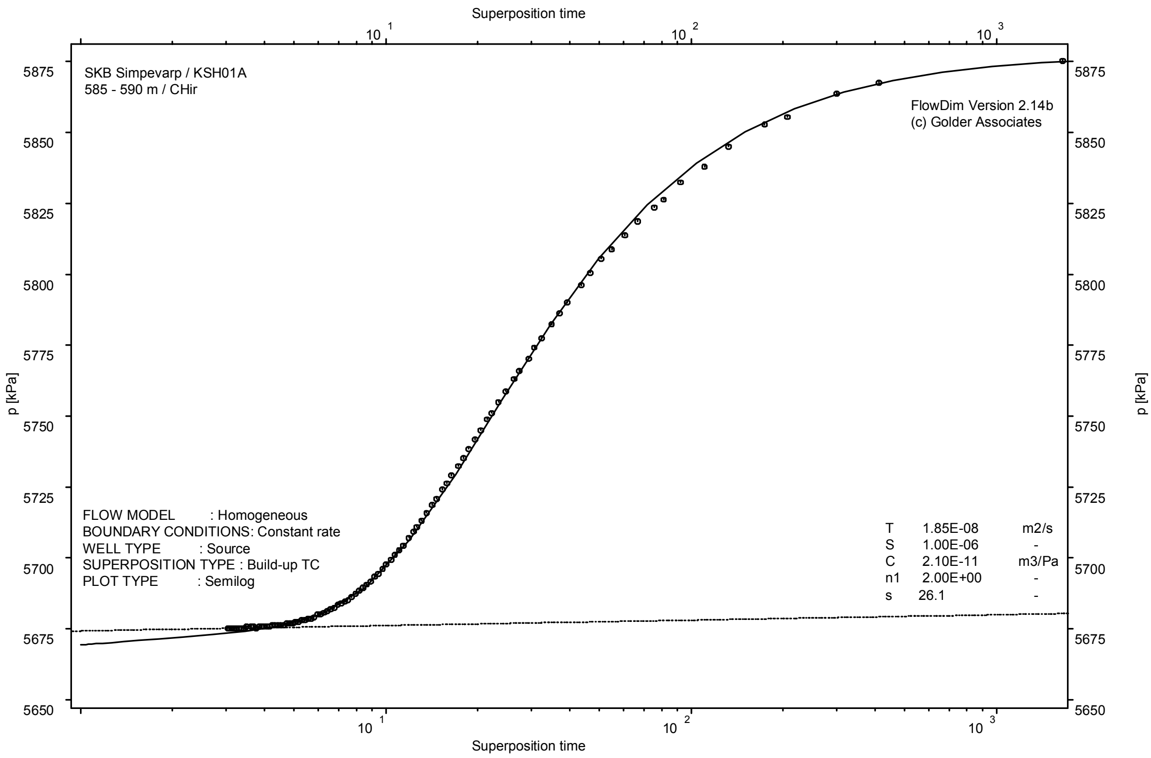
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

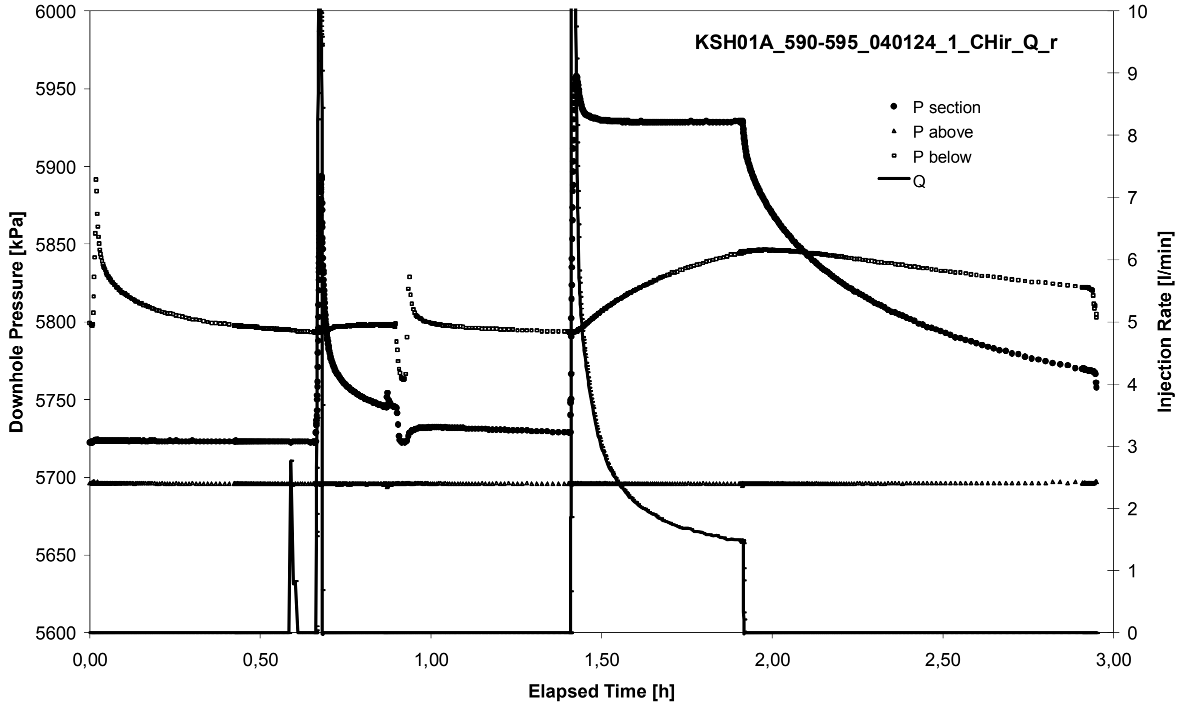


CHIR phase; HORNER match

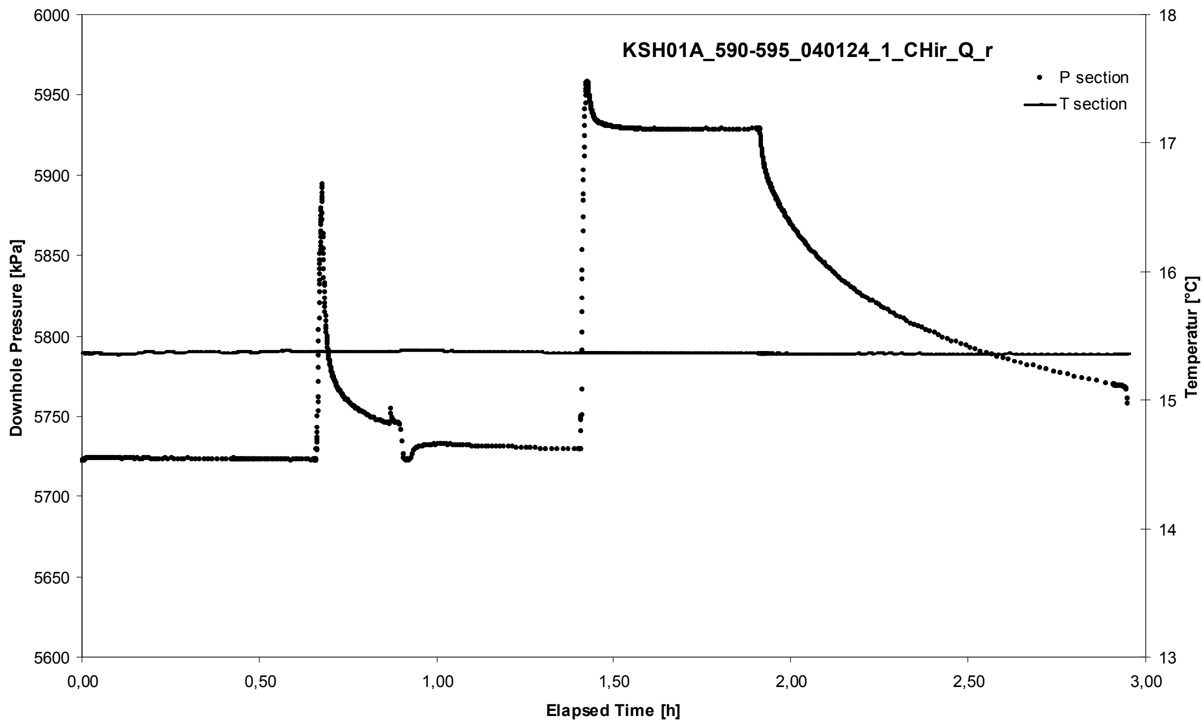
APPENDIX 2-113

Test 590 – 595 m

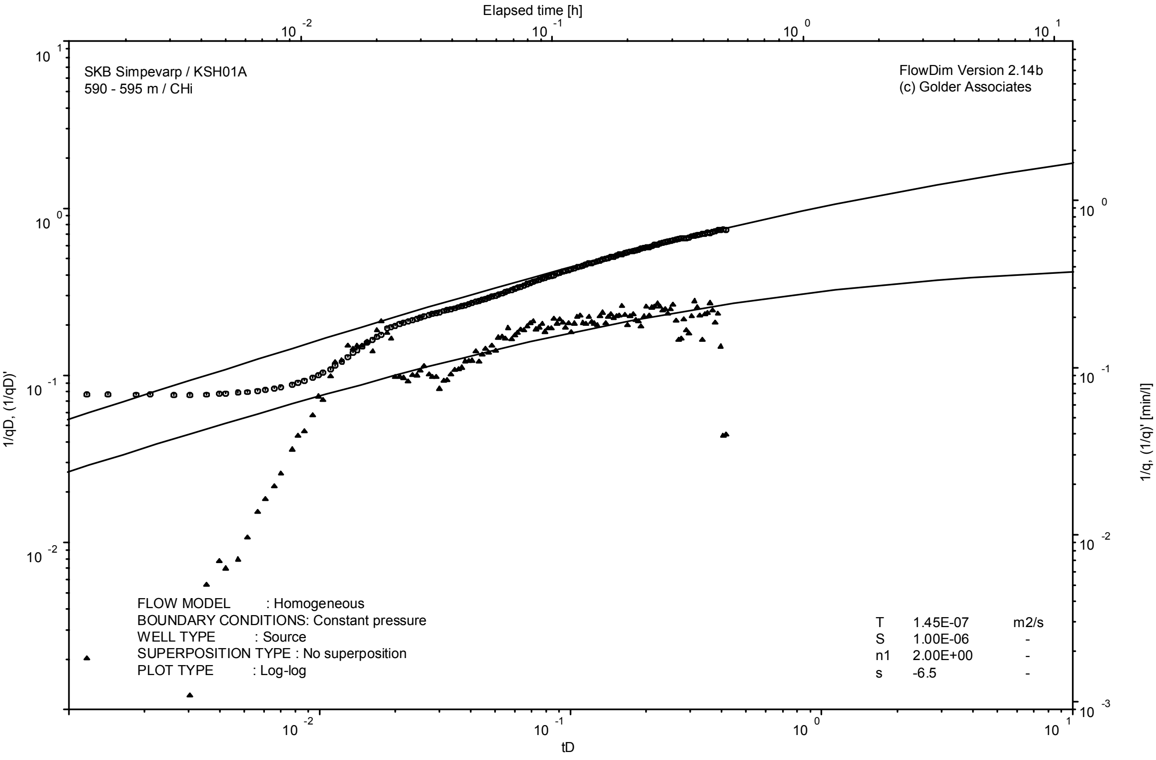
Analysis diagrams



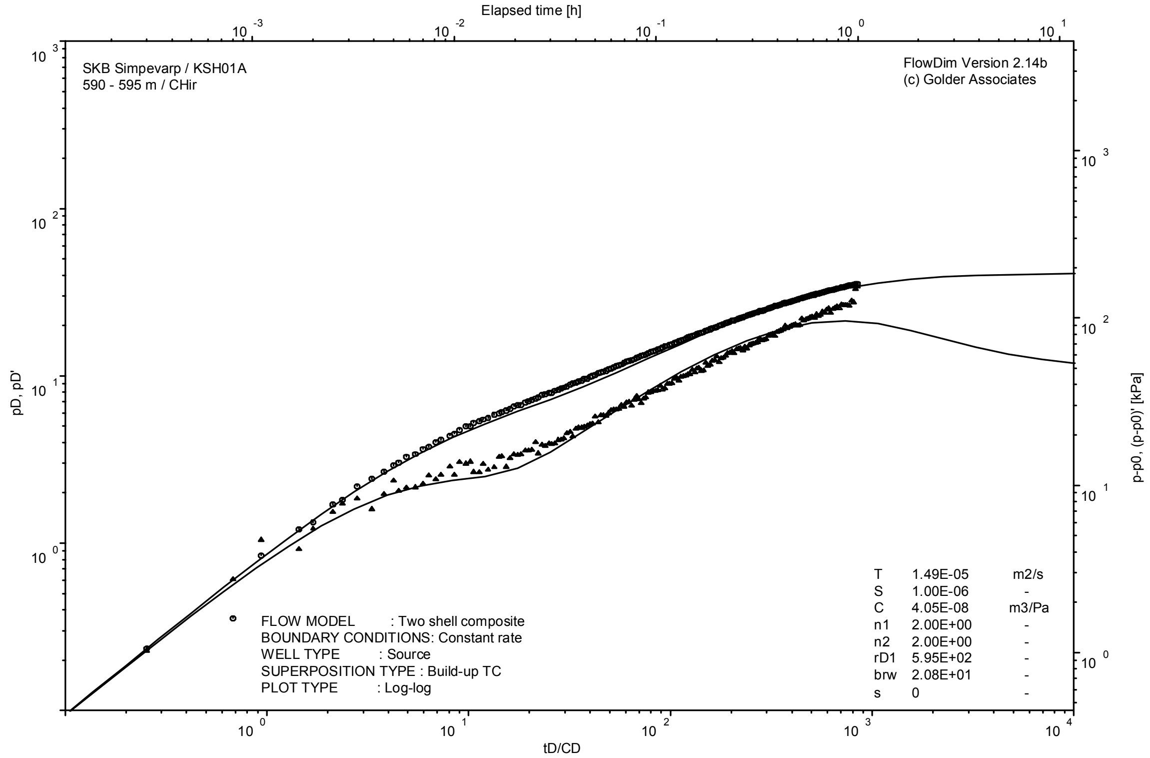
Pressure and flow rate vs. time; cartesian plot



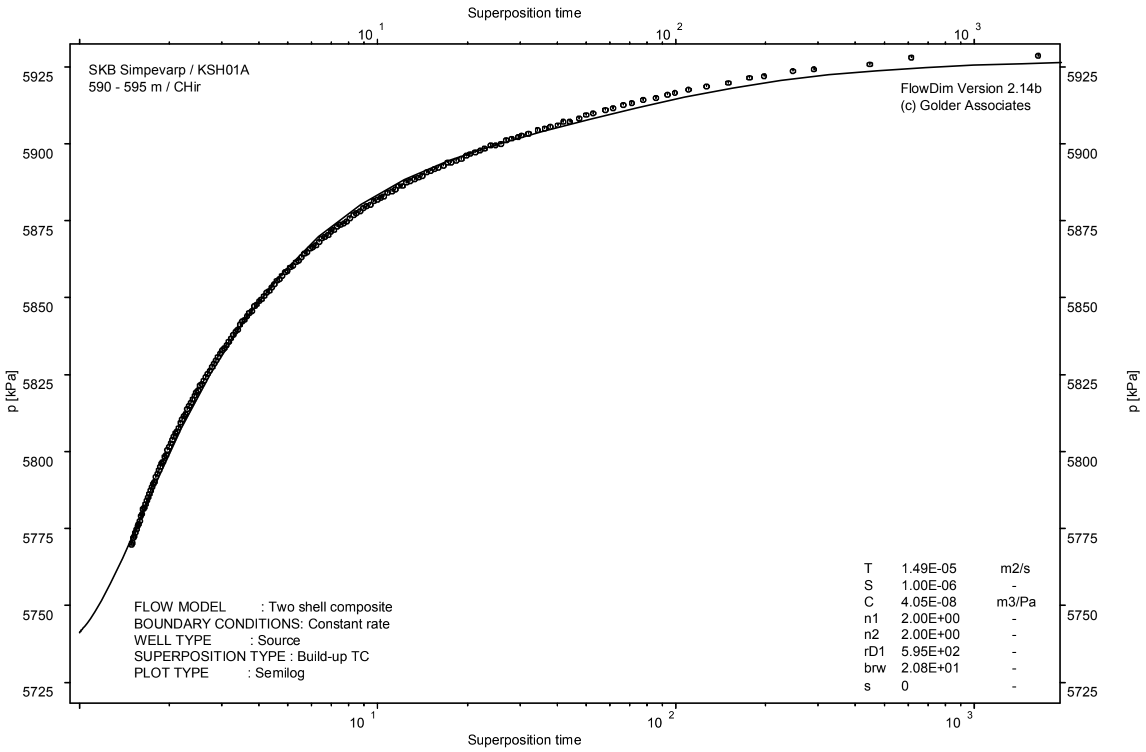
Interval pressure and temperature vs. time; cartesian plot



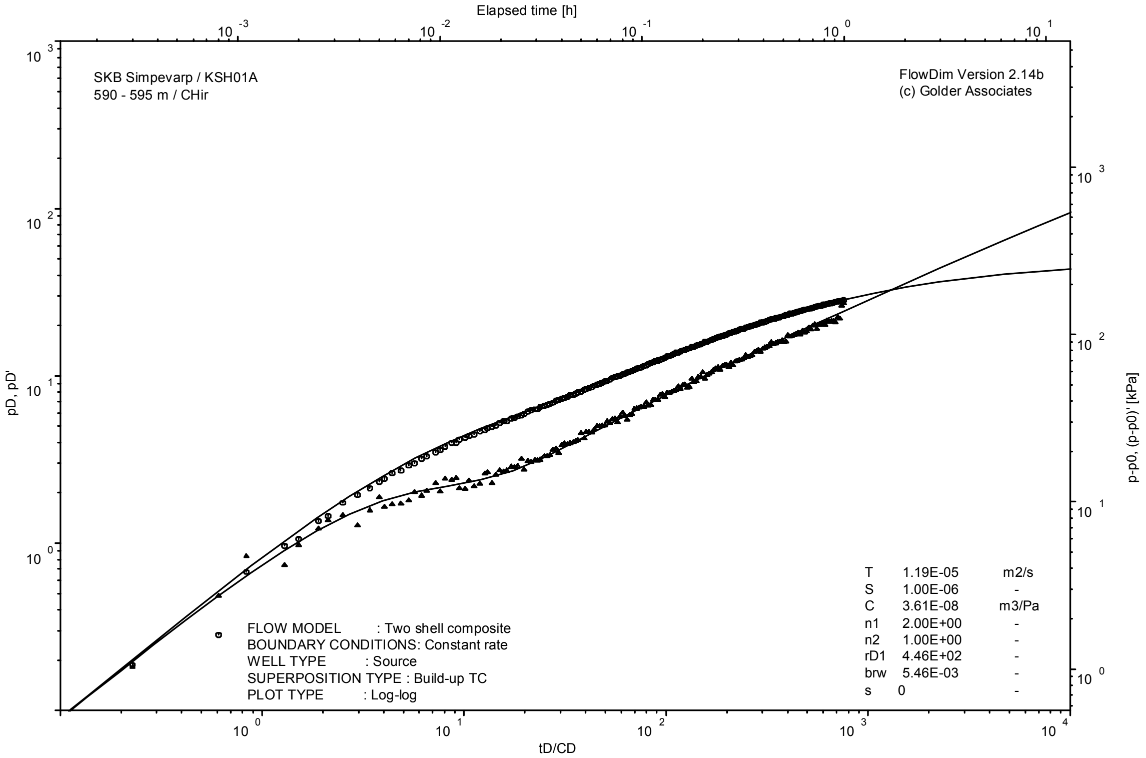
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

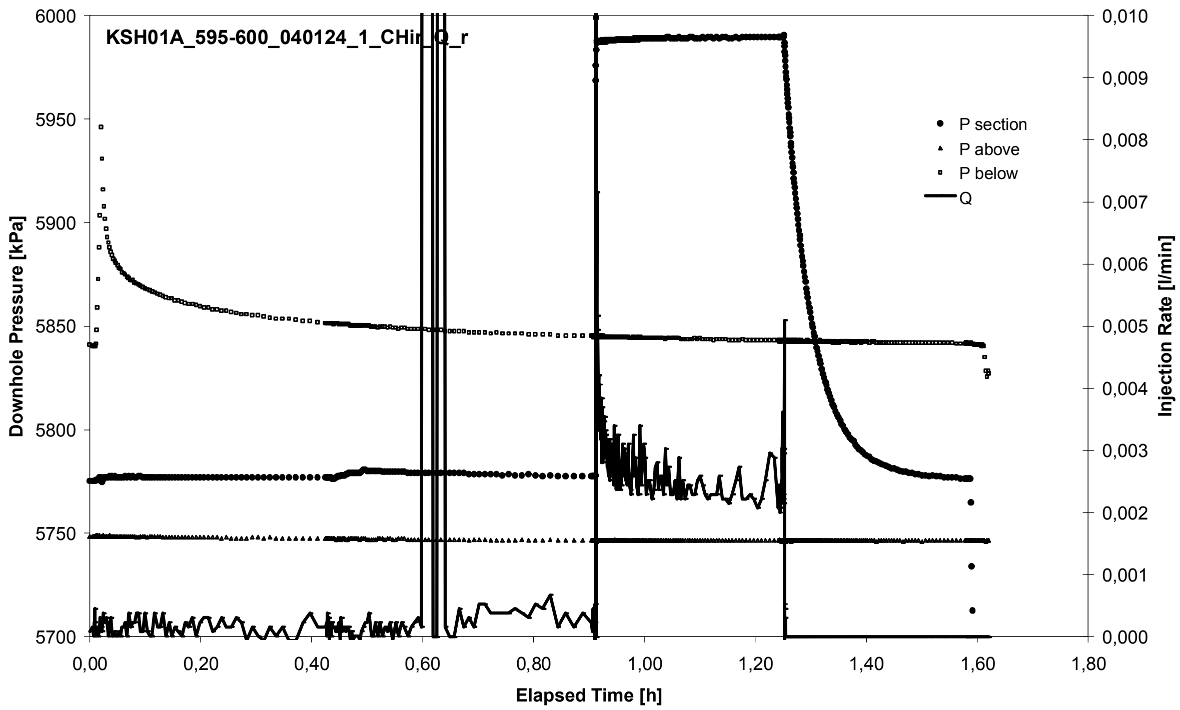


CHIR phase; alternative log-log match (n2=1, linear flow)

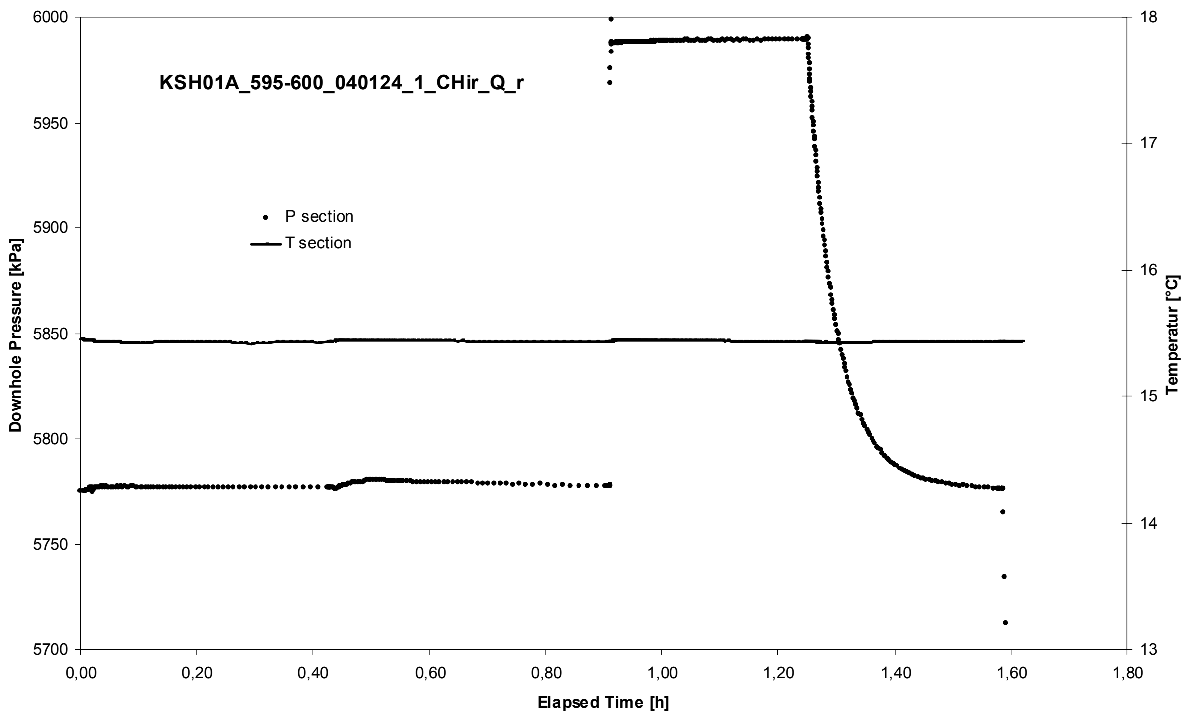
APPENDIX 2-114

Test 595 – 600 m

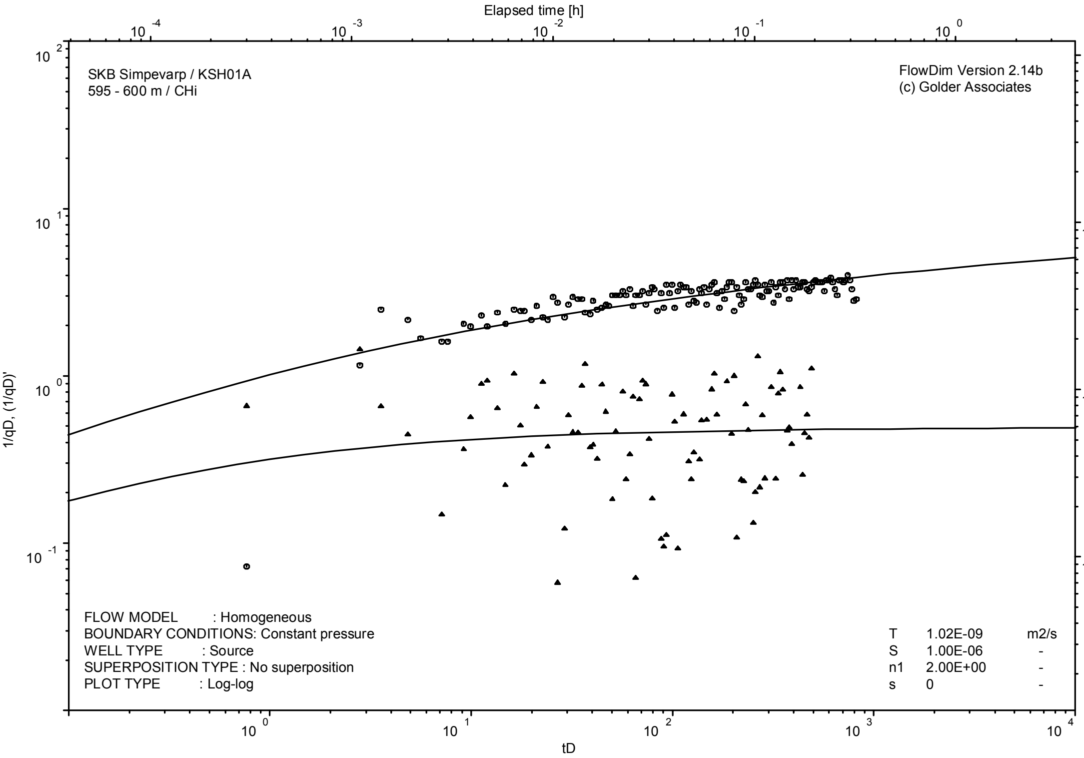
Analysis diagrams



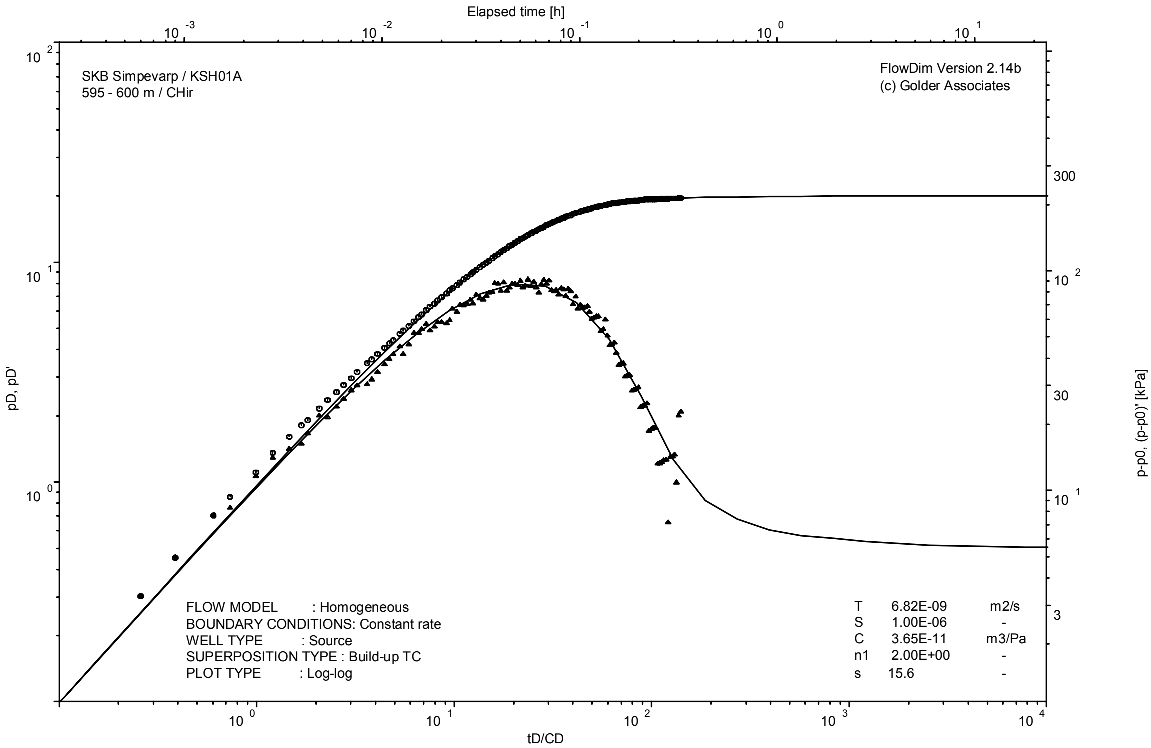
Pressure and flow rate vs. time; cartesian plot



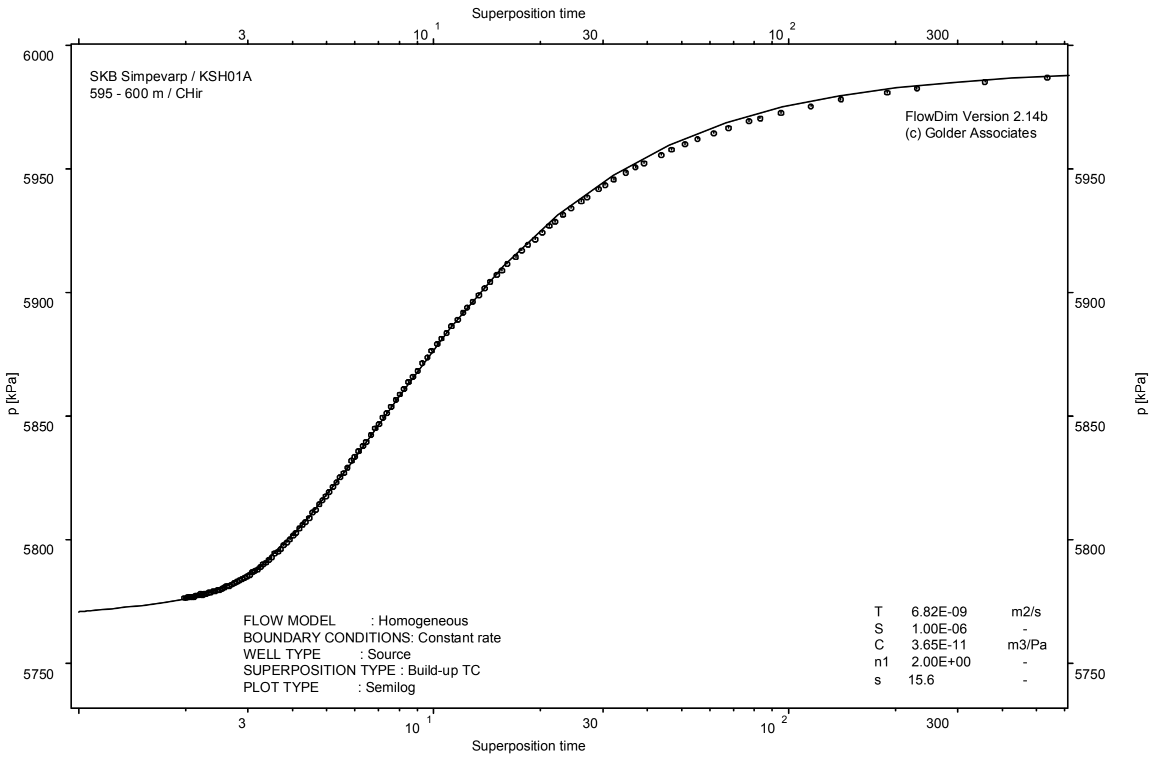
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

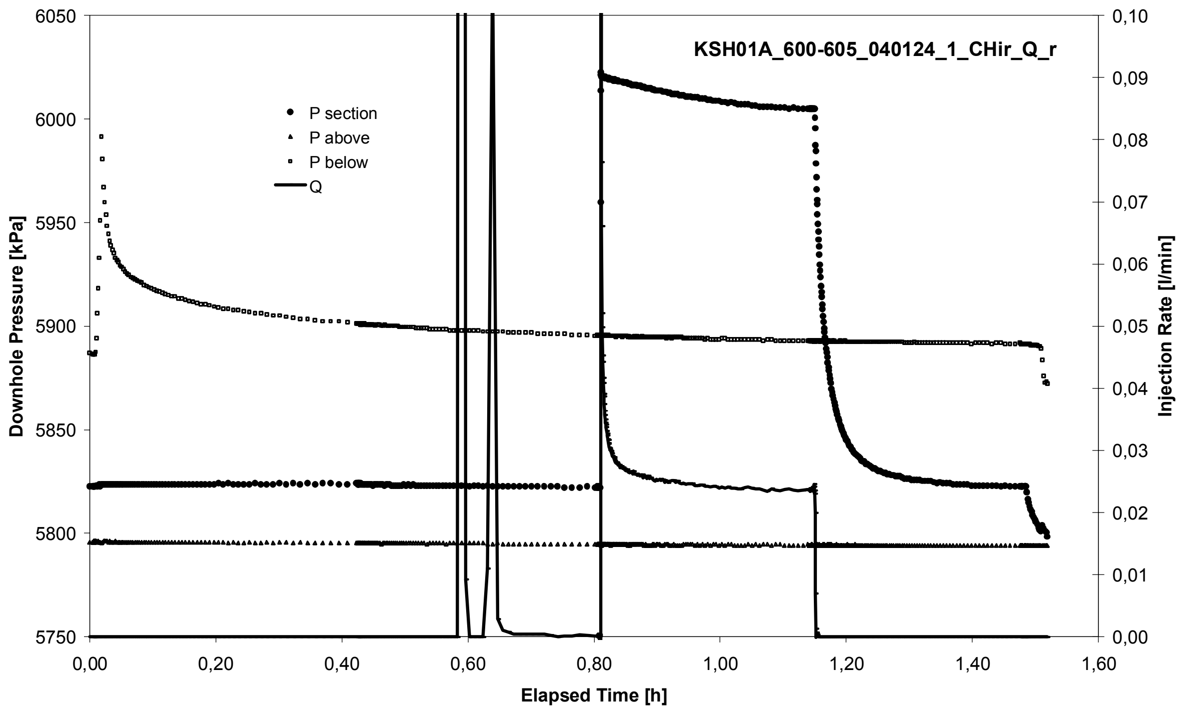


CHIR phase; HORNER match

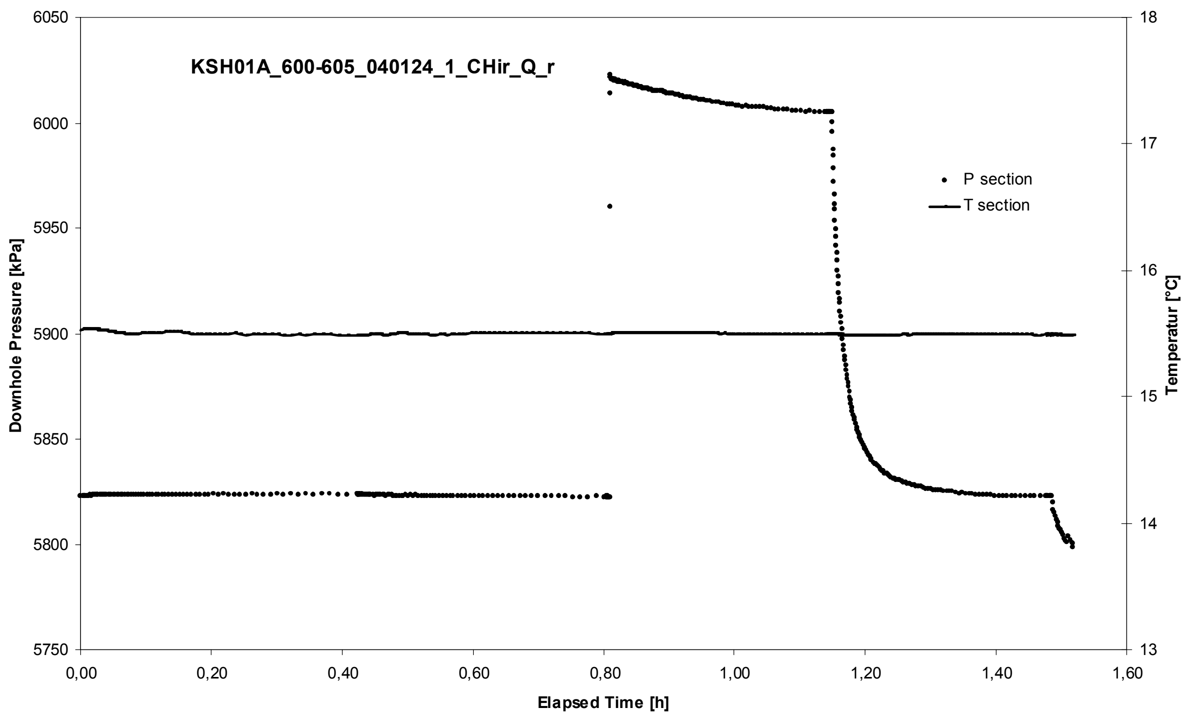
APPENDIX 2-115

Test 600 – 605 m

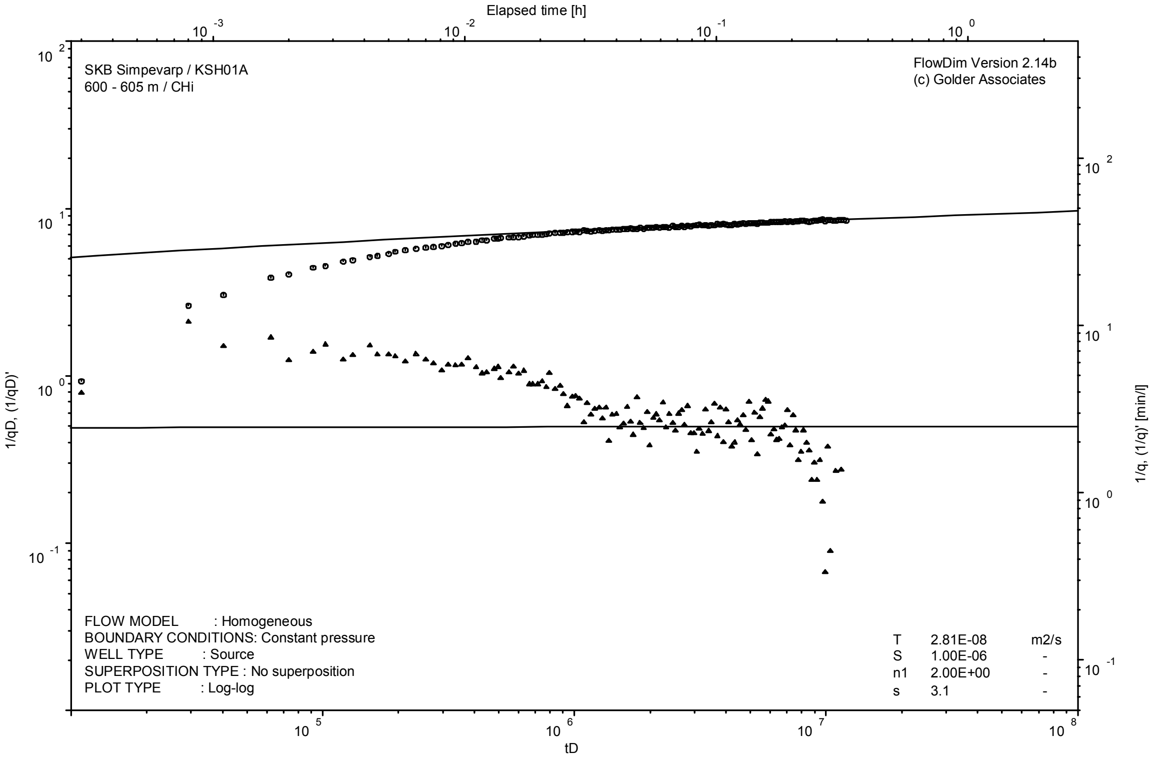
Analysis diagrams



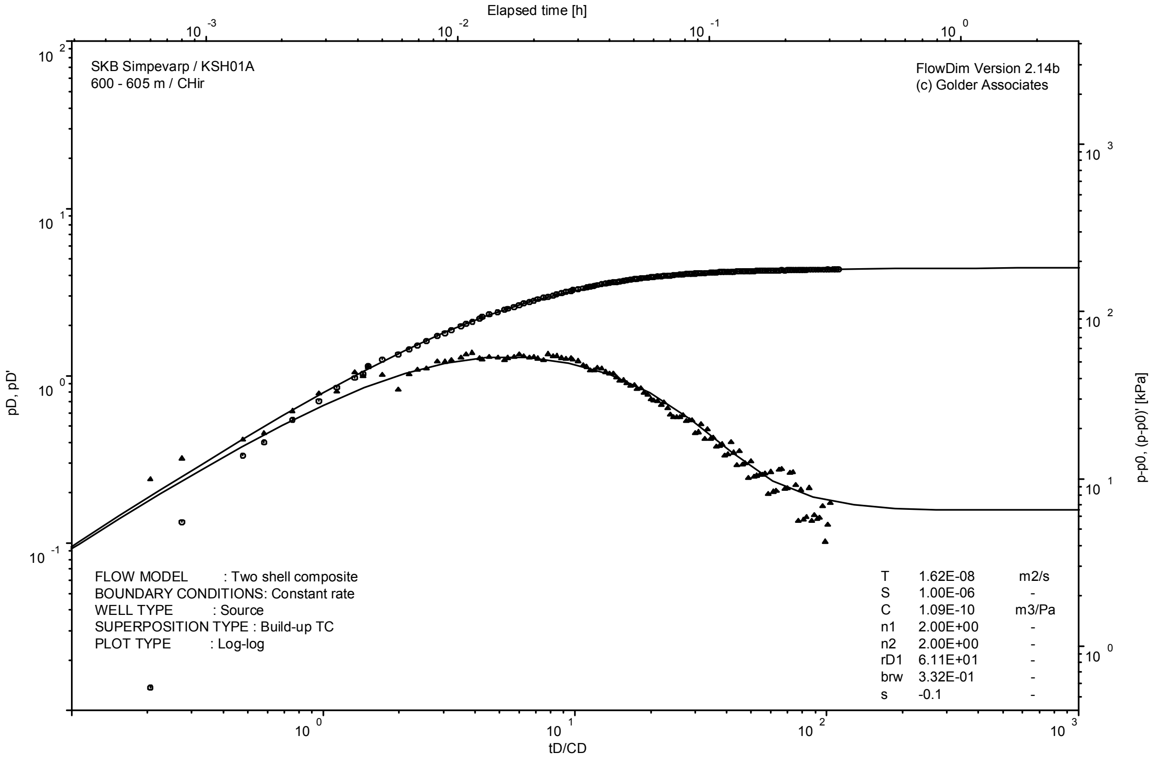
Pressure and flow rate vs. time; cartesian plot



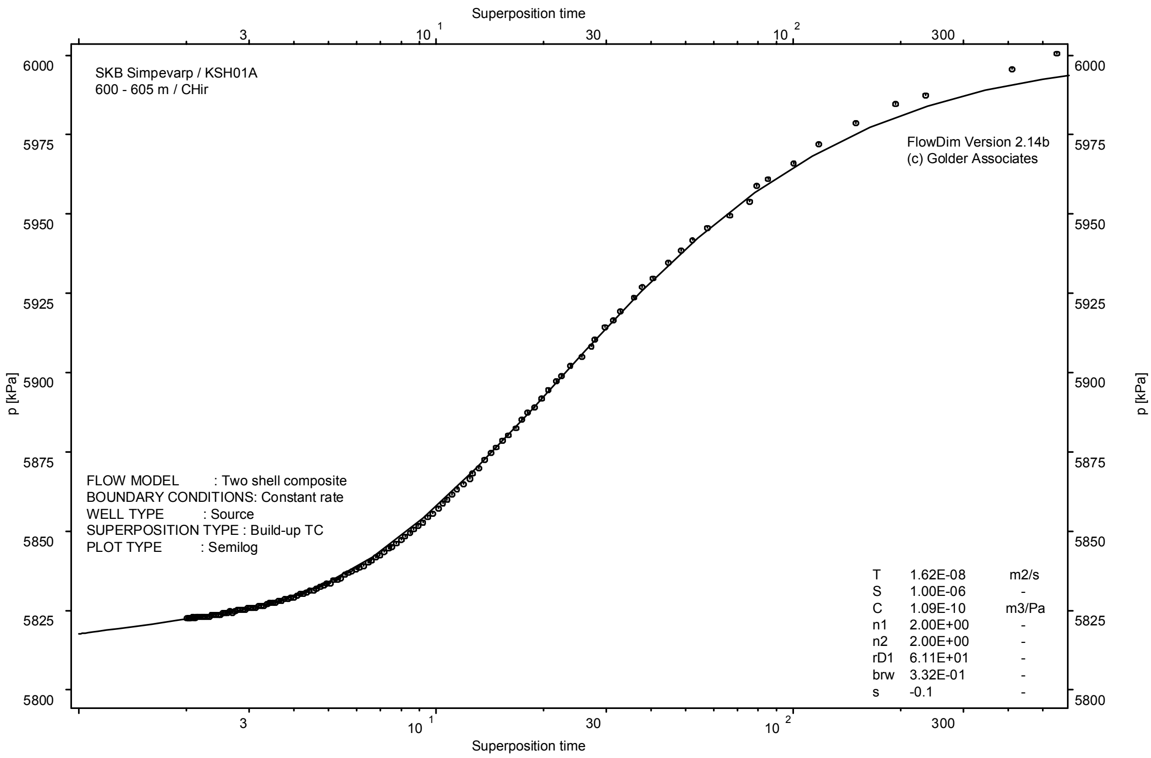
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

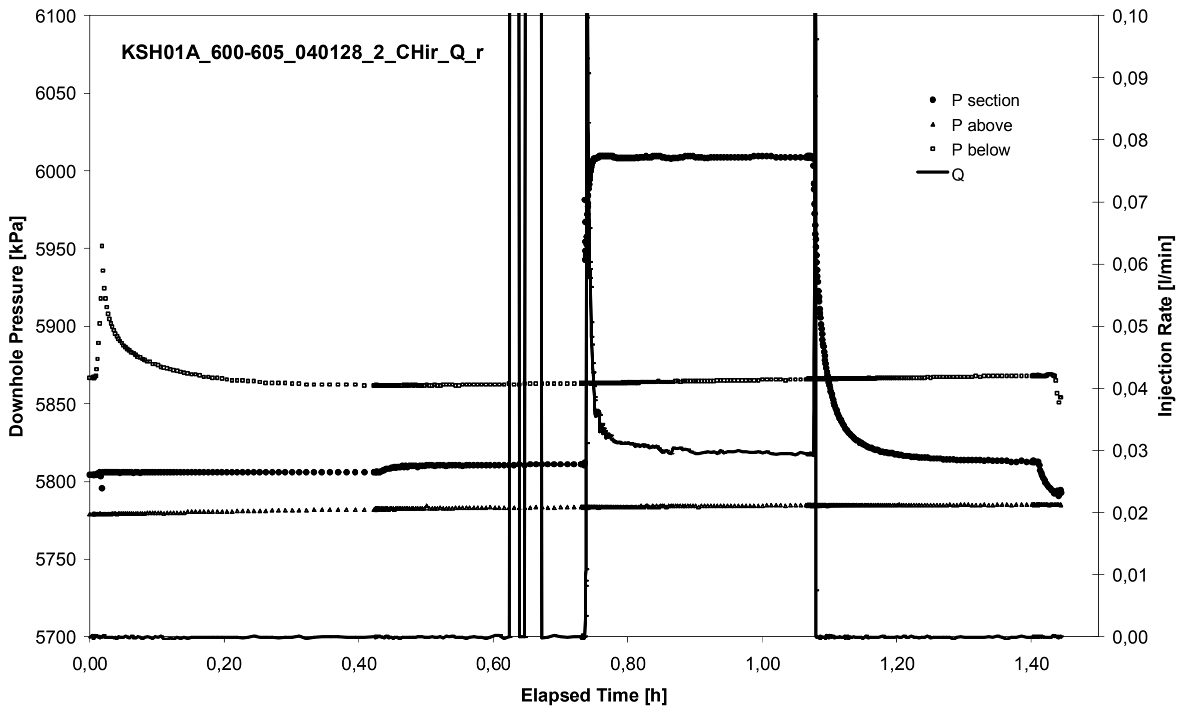


CHIR phase; HORNER match

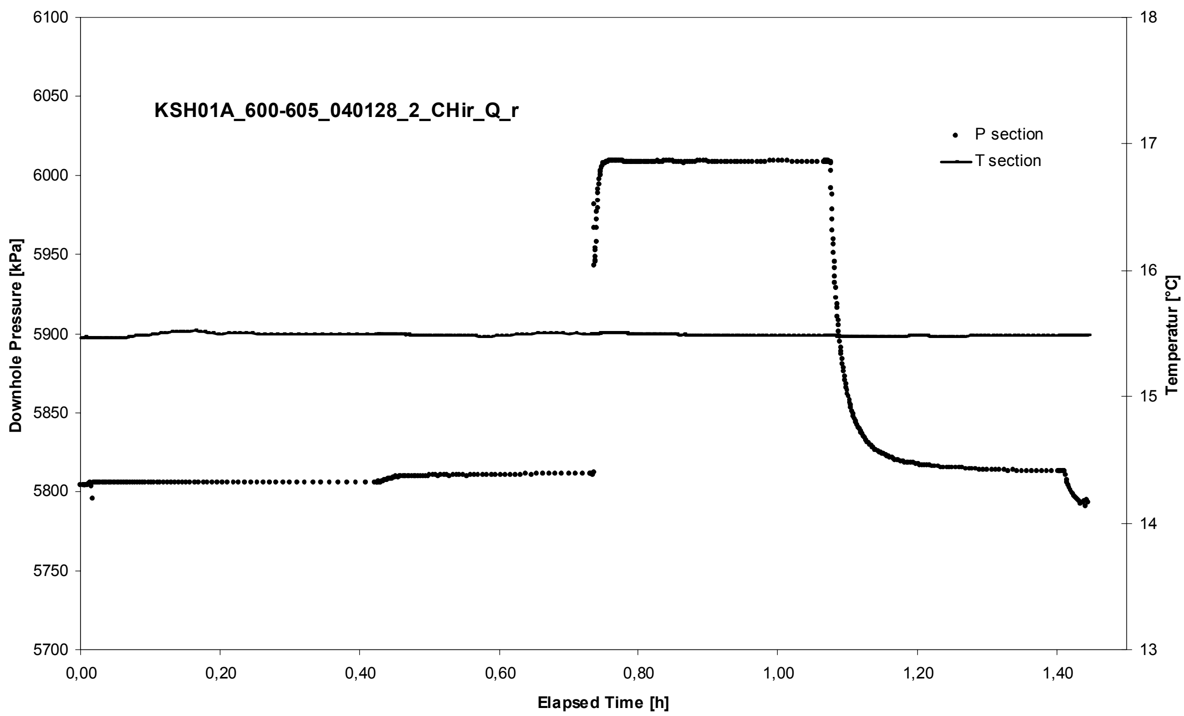
APPENDIX 2-116

Test 600 – 605 m

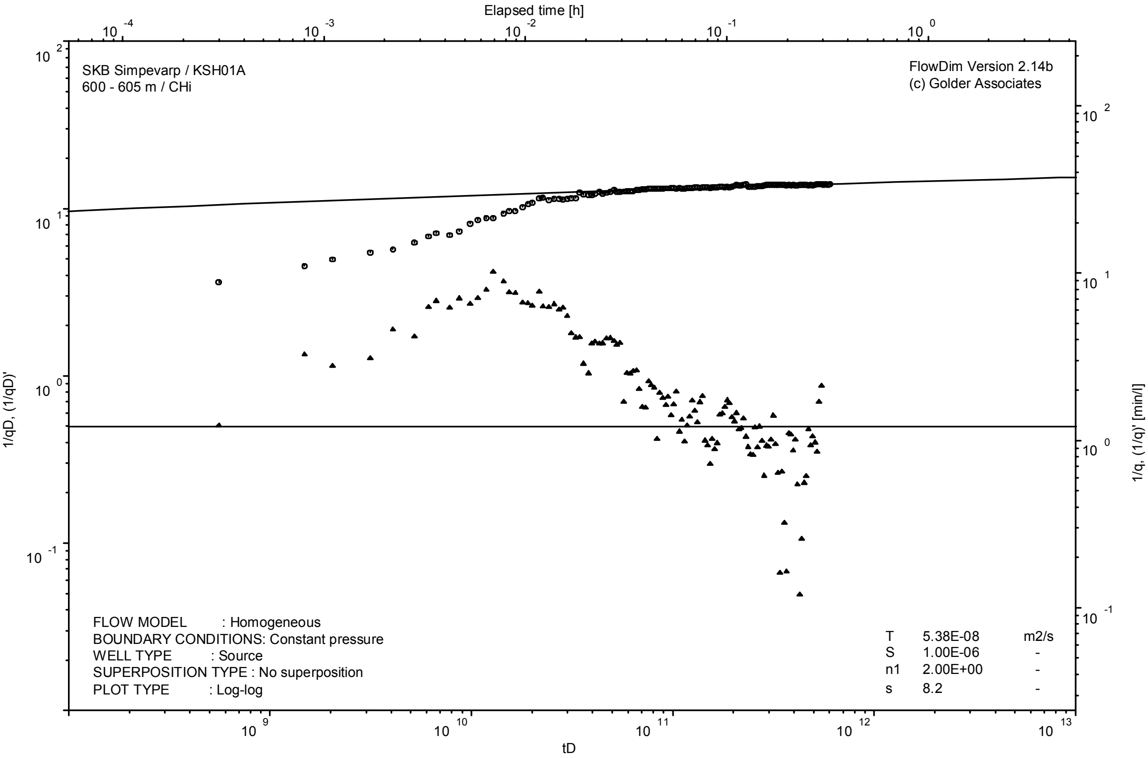
Analysis diagrams



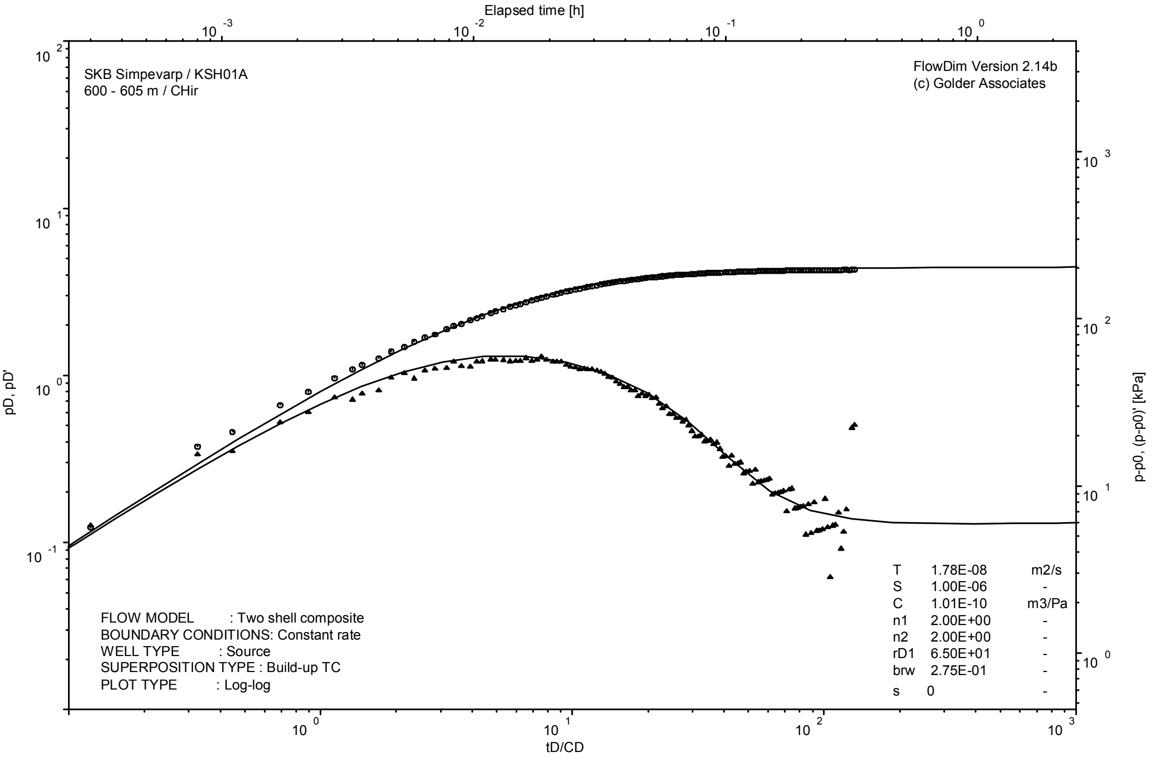
Pressure and flow rate vs. time; cartesian plot



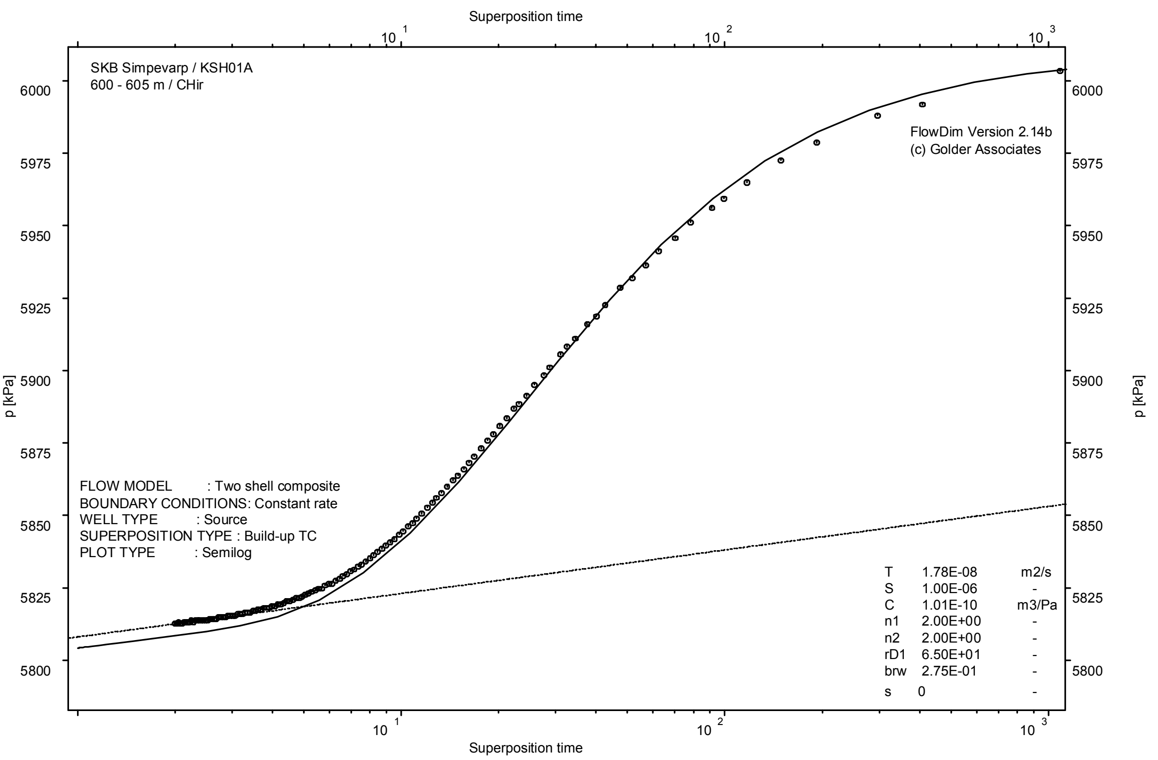
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

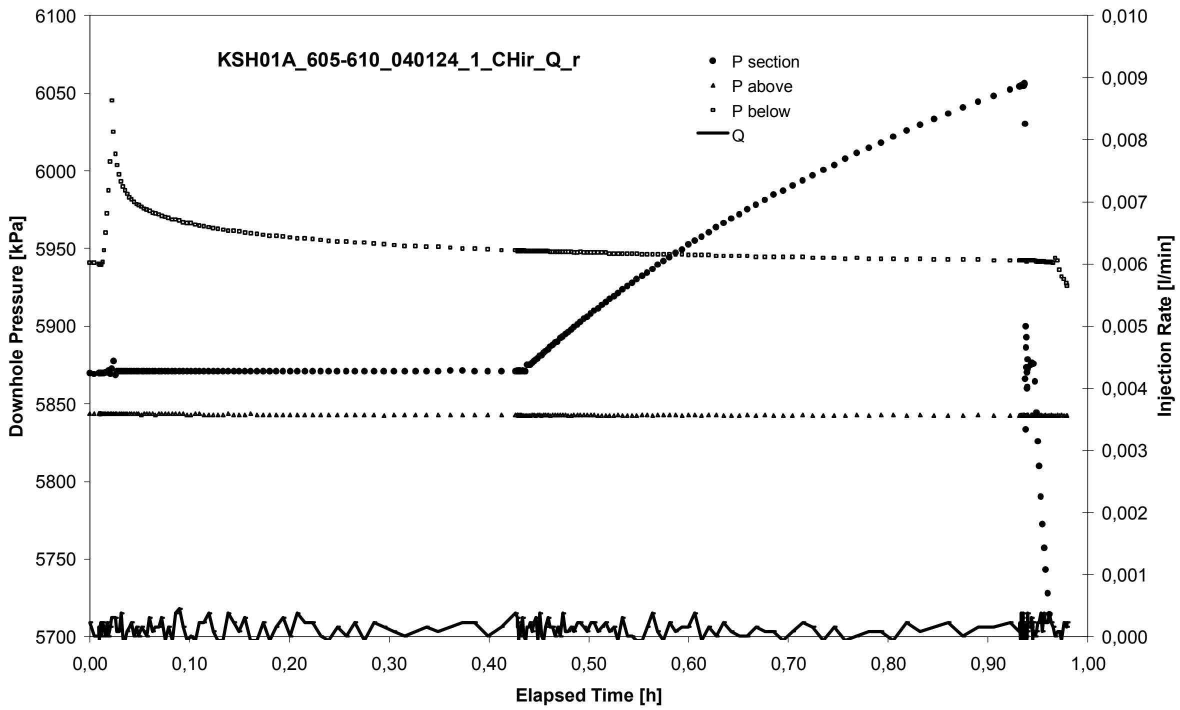


CHIR phase; HORNER match

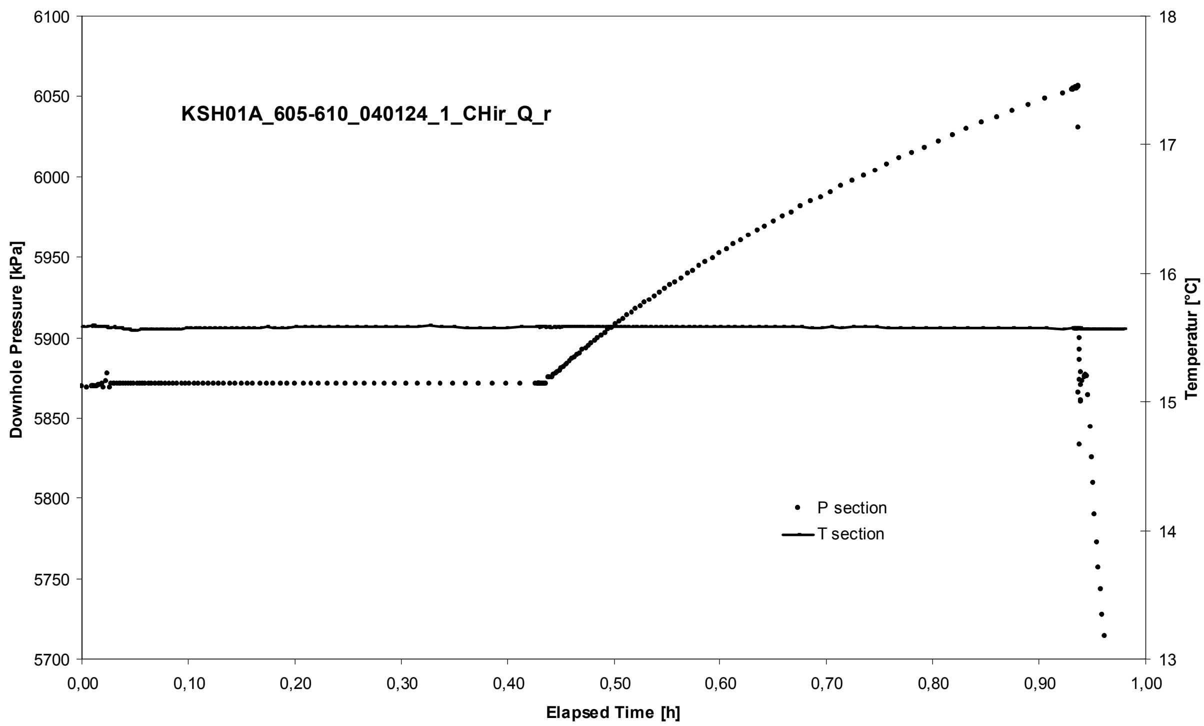
APPENDIX 2-117

Test 605 – 610 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

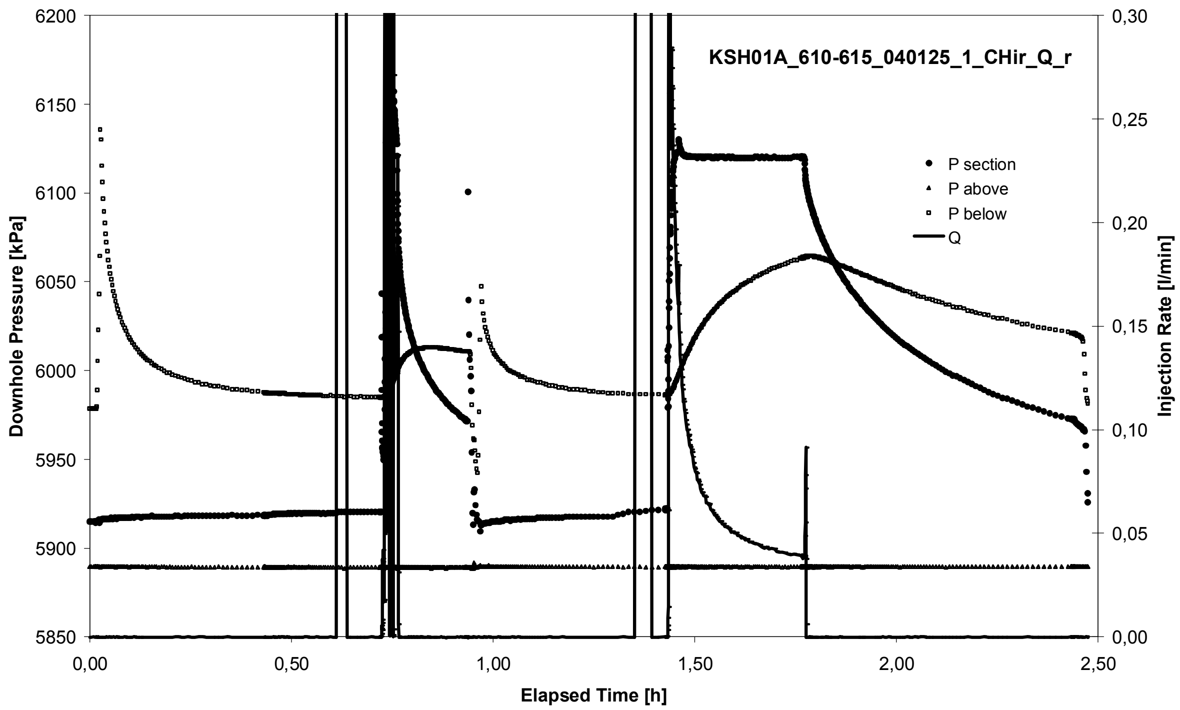
Not Analysed

CHIR phase; HORNER match

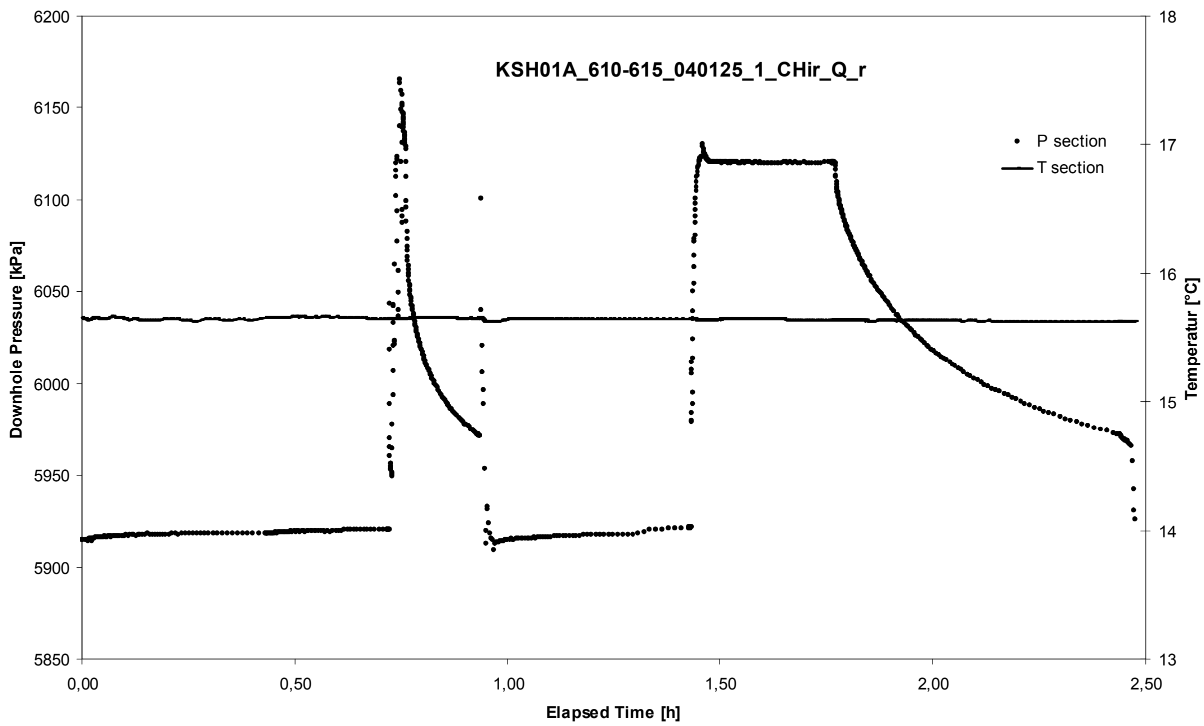
APPENDIX 2-118

Test 610 – 615 m

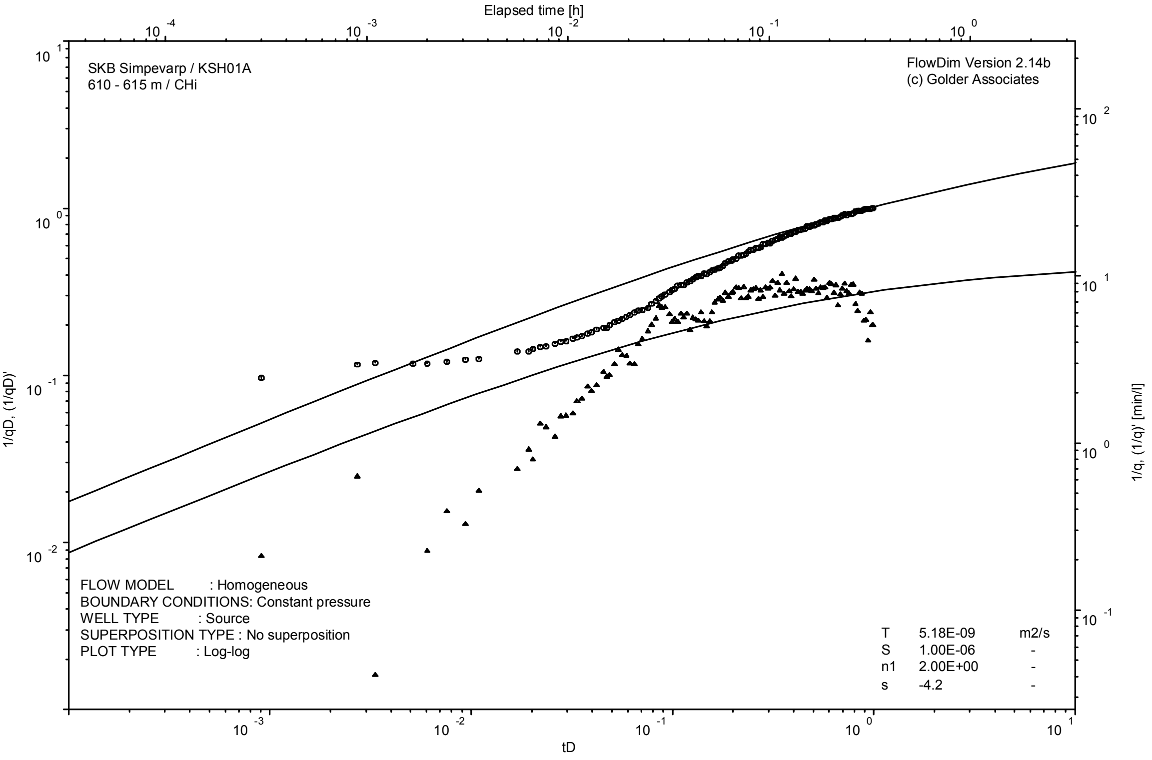
Analysis diagrams



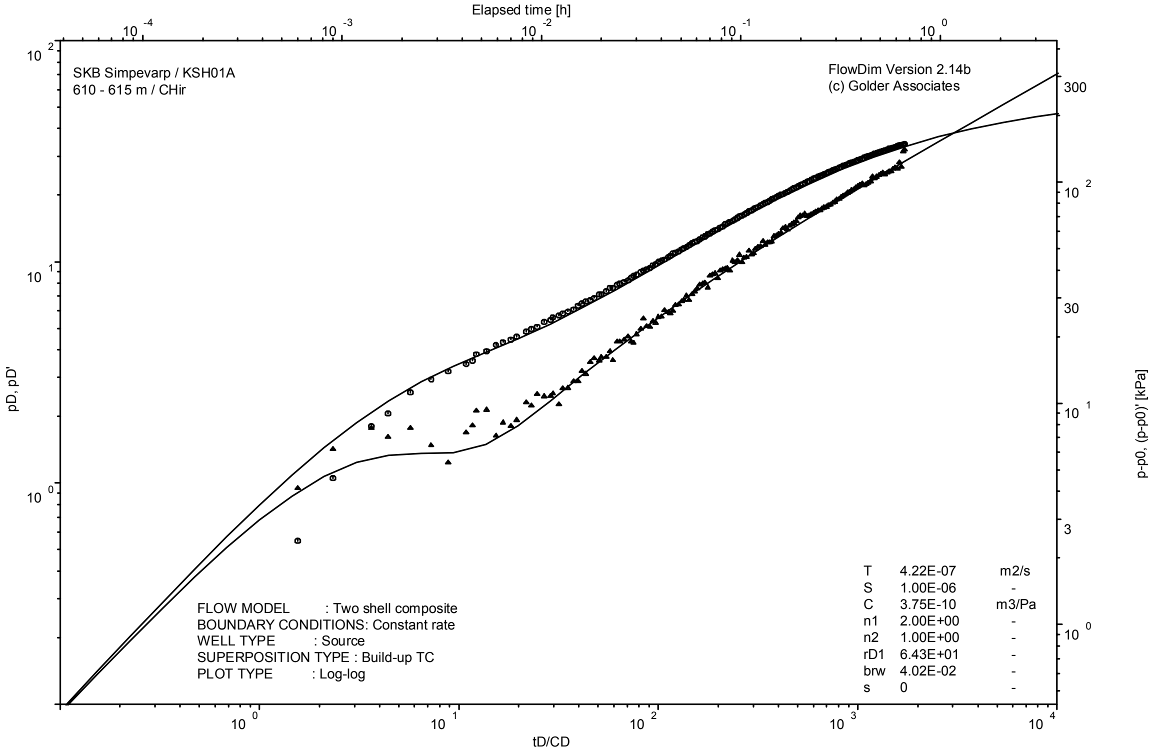
Pressure and flow rate vs. time; cartesian plot



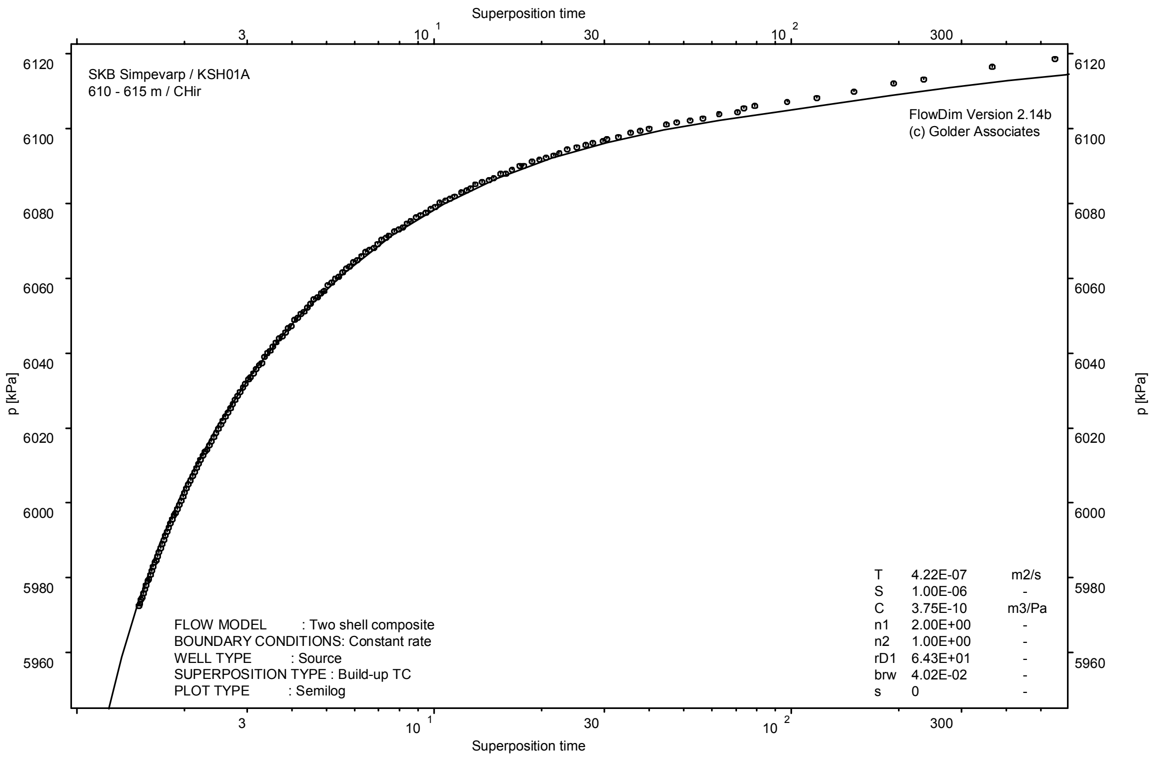
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

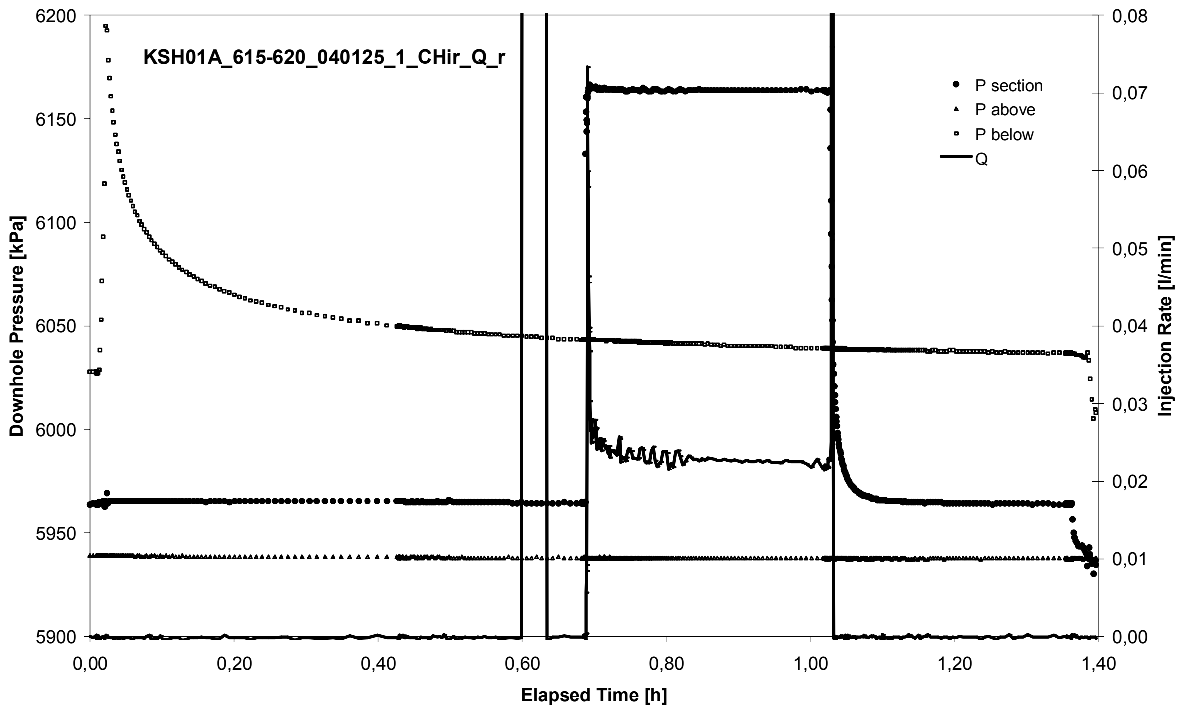


CHIR phase; HORNER match

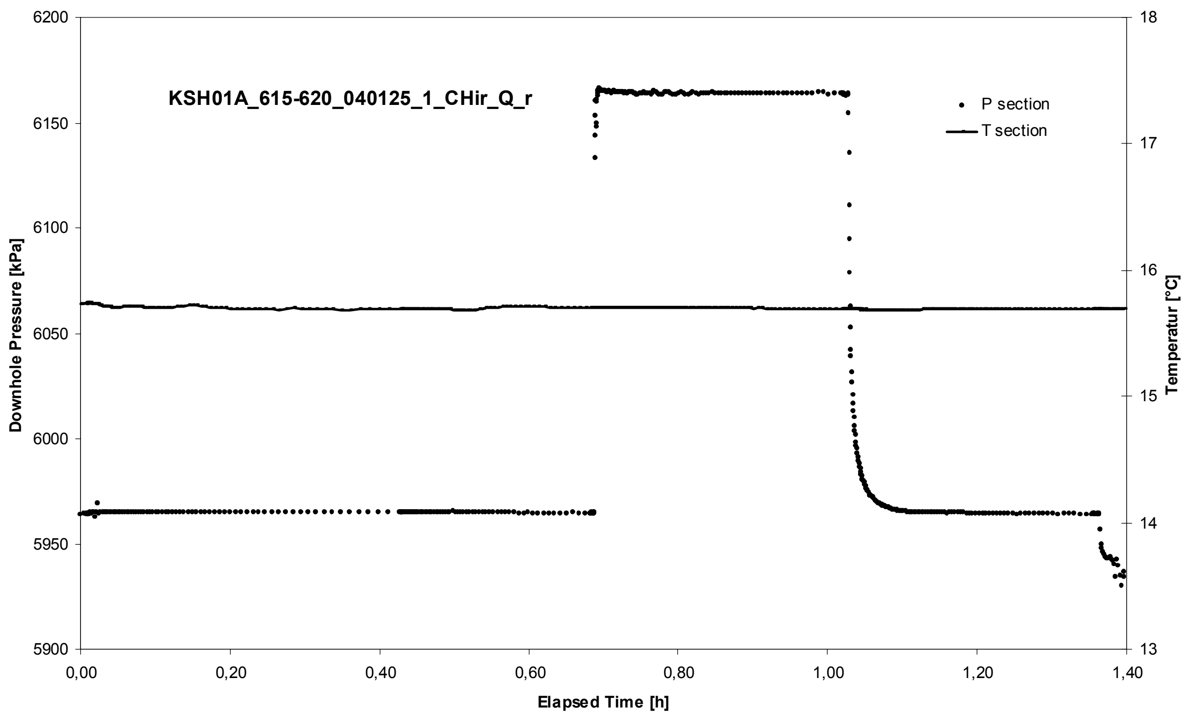
APPENDIX 2-119

Test 615 – 620 m

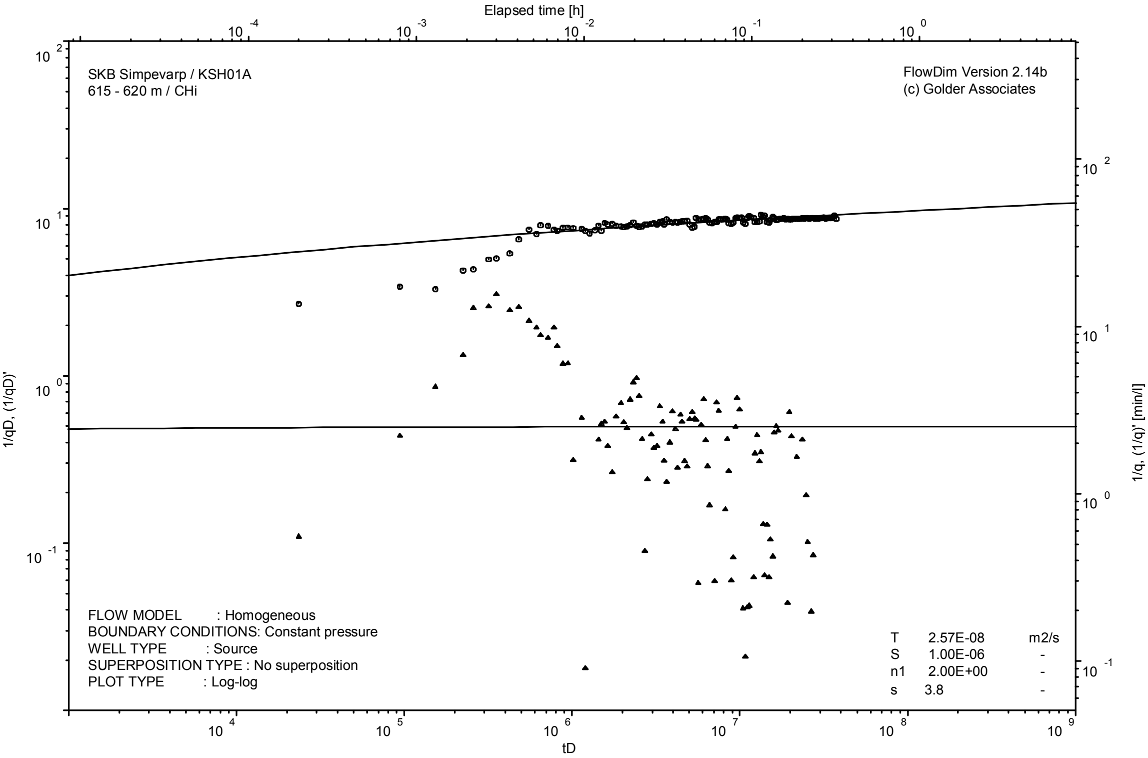
Analysis diagrams



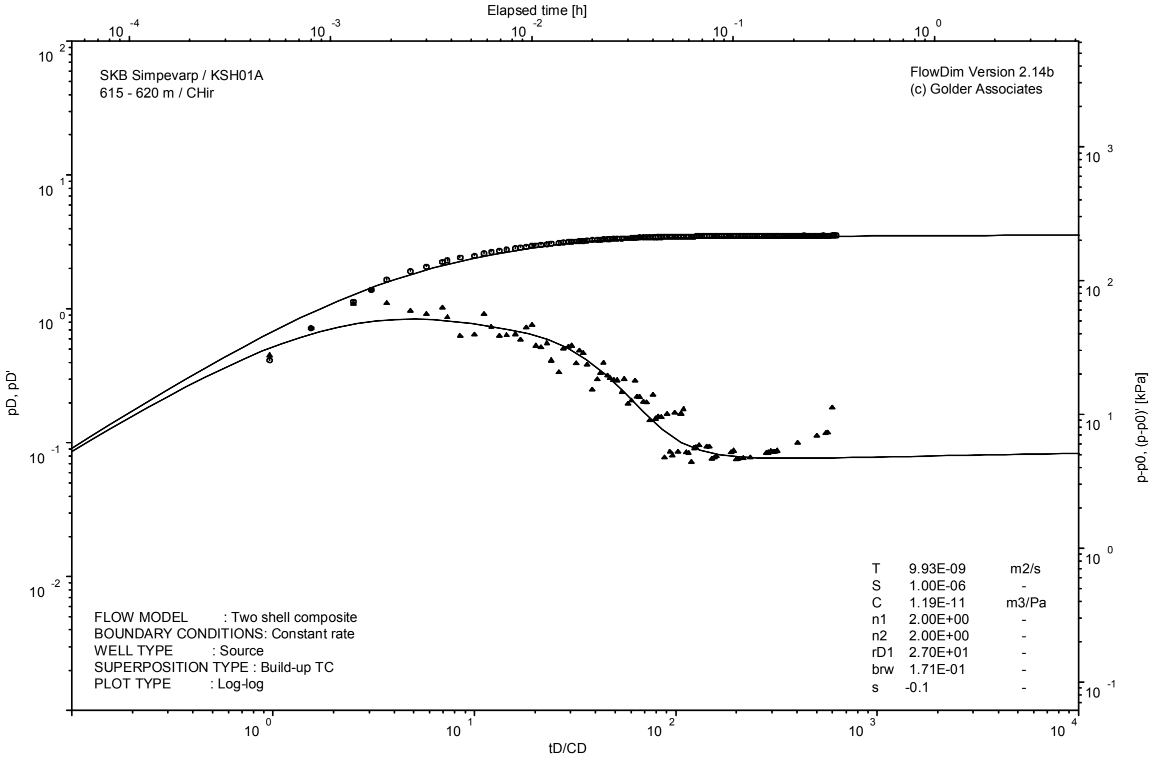
Pressure and flow rate vs. time; cartesian plot



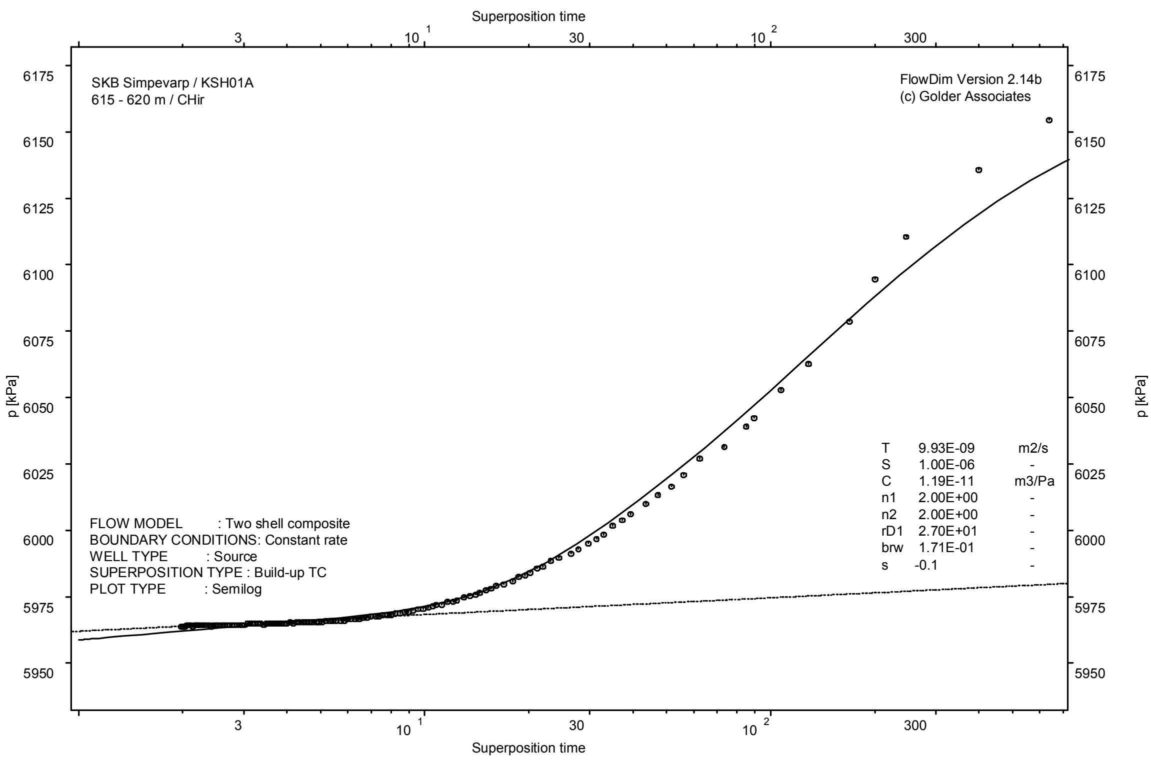
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

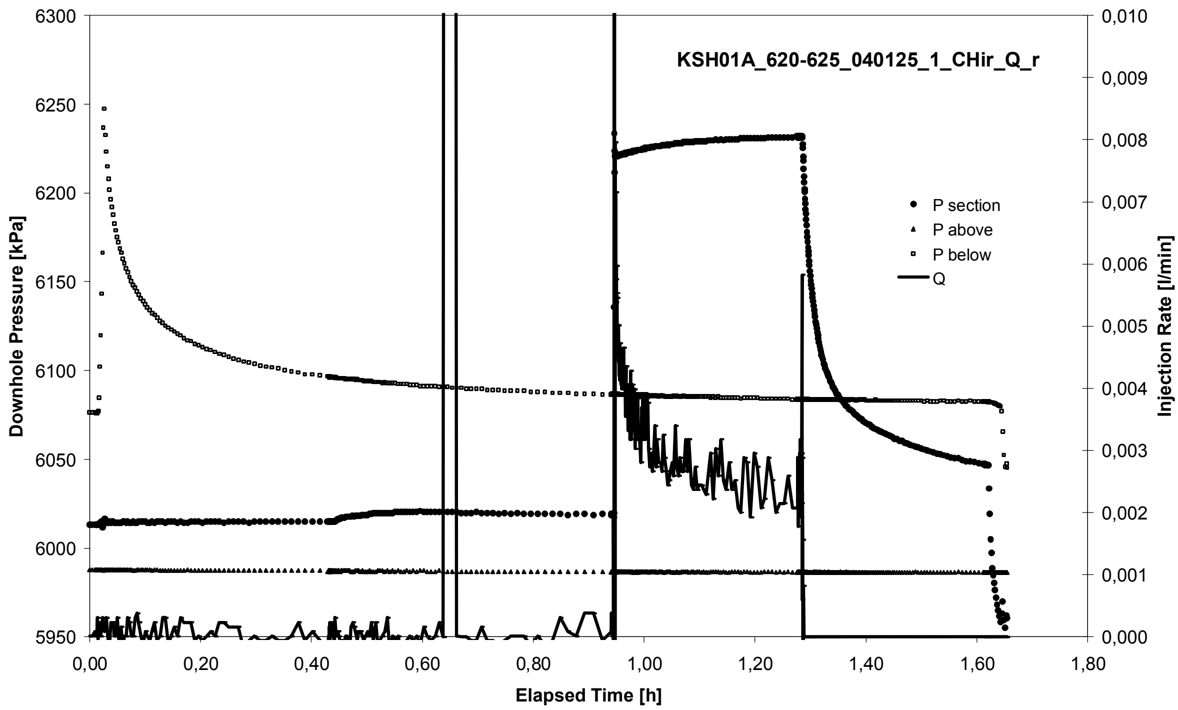


CHIR phase; HORNER match

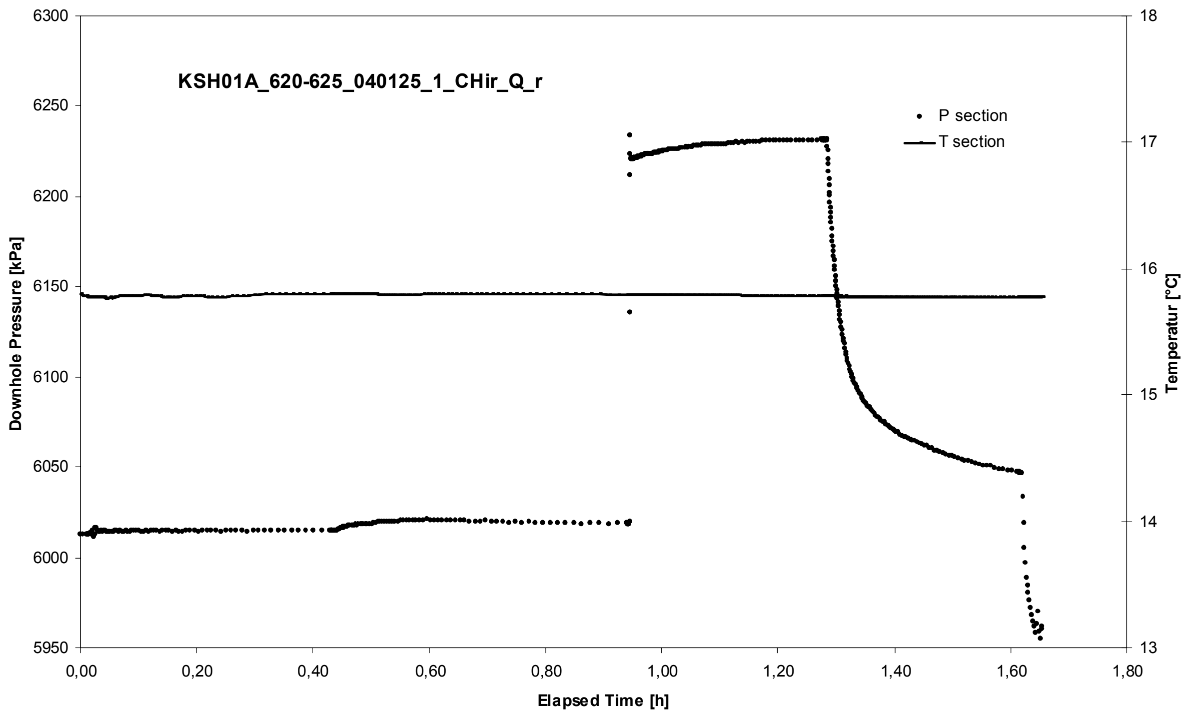
APPENDIX 2-120

Test 620 – 625 m

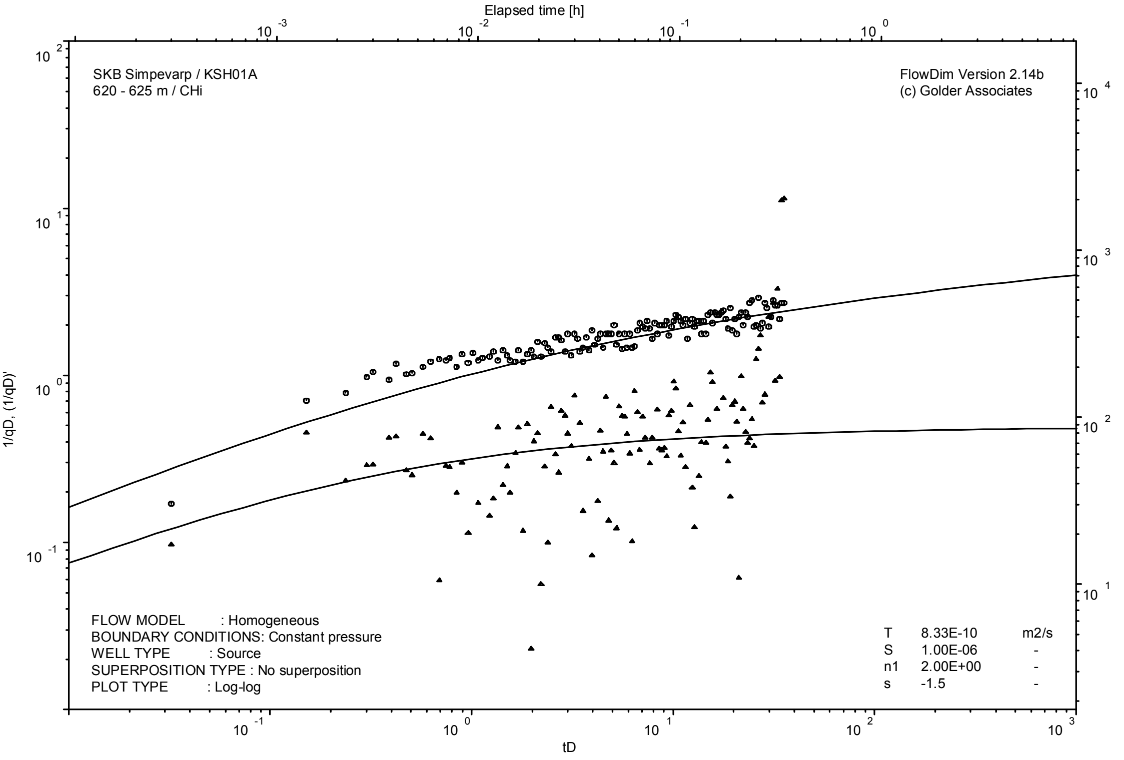
Analysis diagrams



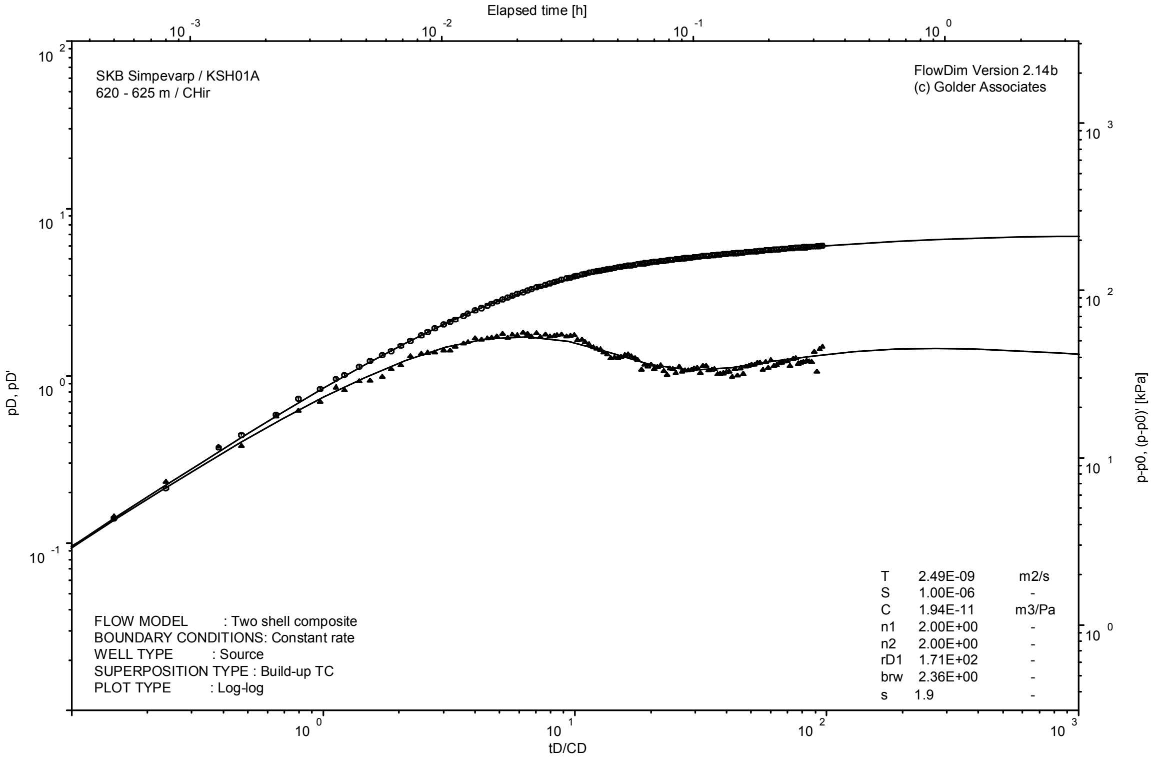
Pressure and flow rate vs. time; cartesian plot



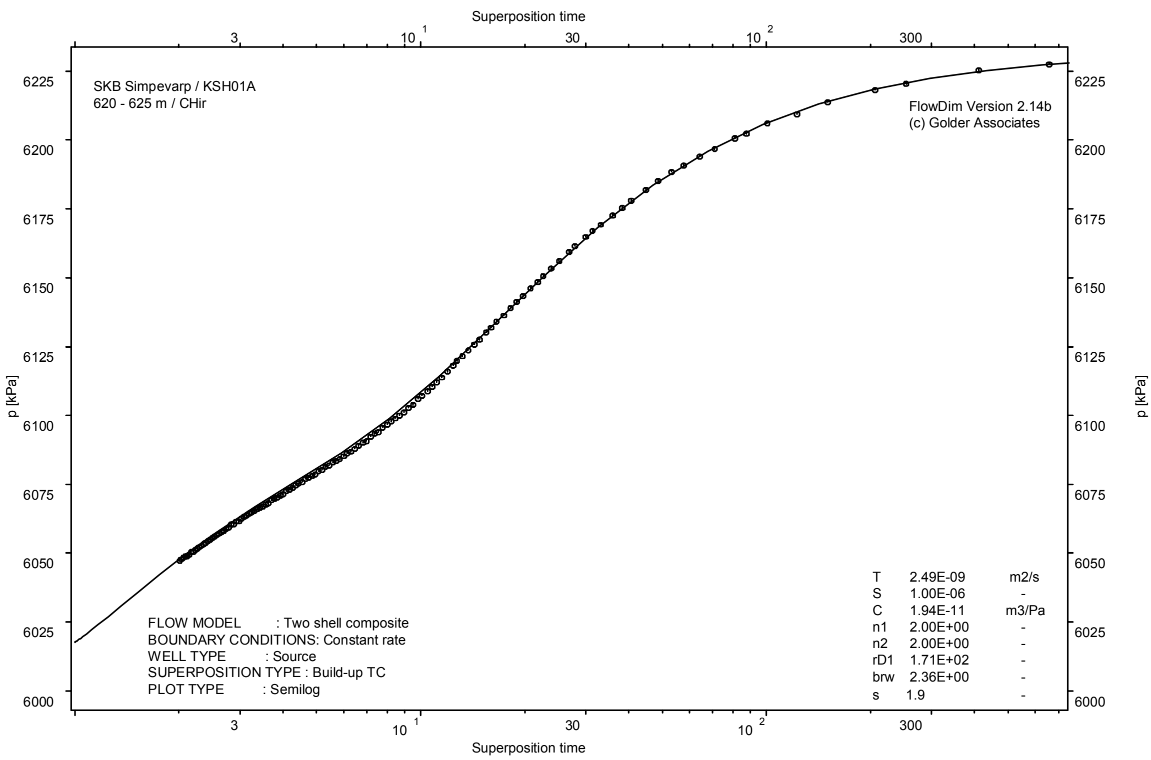
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

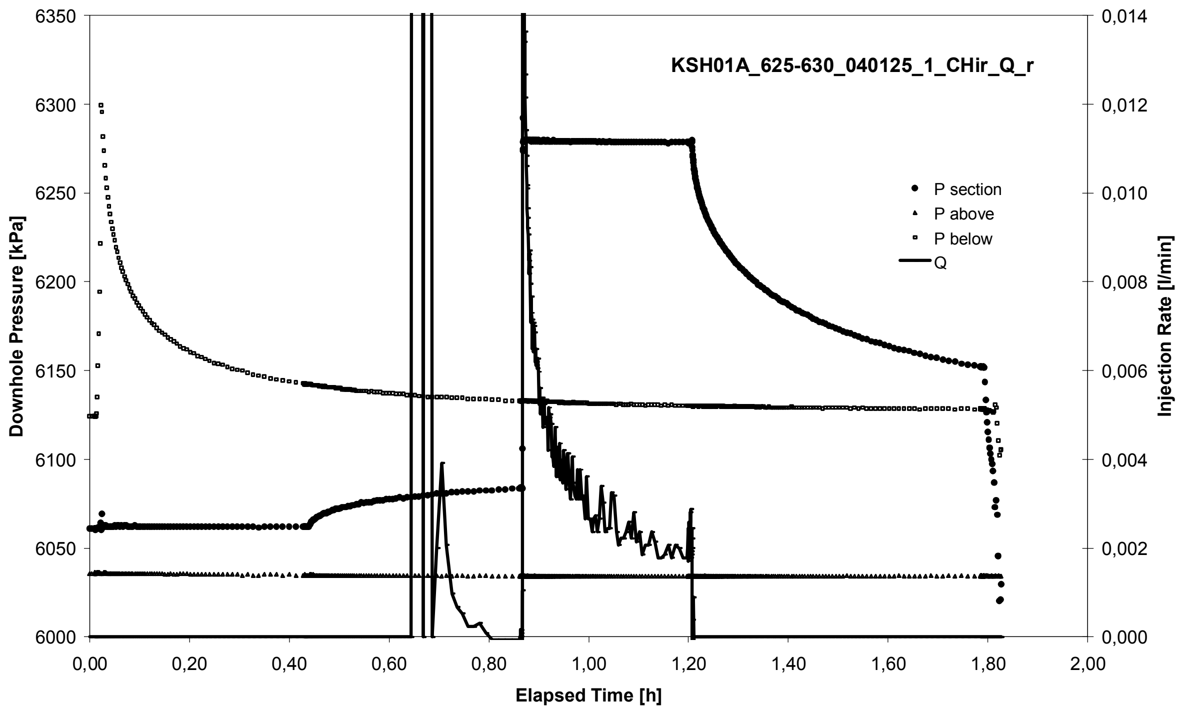


CHIR phase; HORNER match

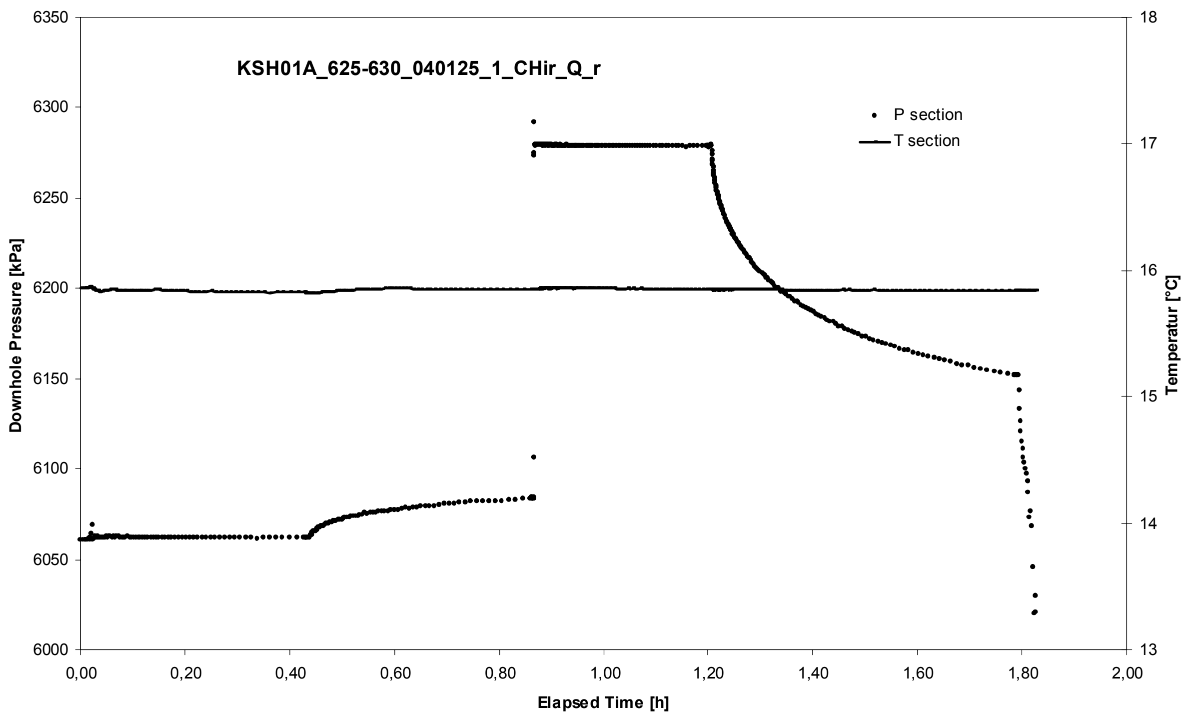
APPENDIX 2-121

Test 625 – 630 m

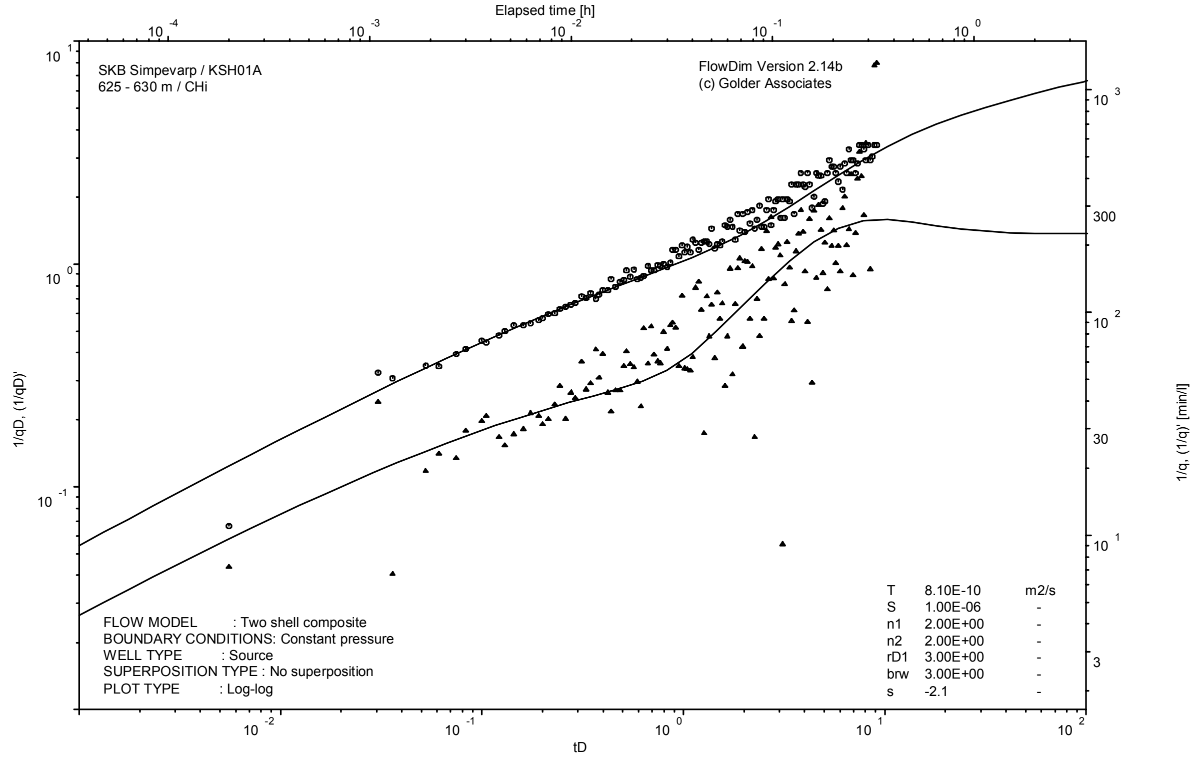
Analysis diagrams



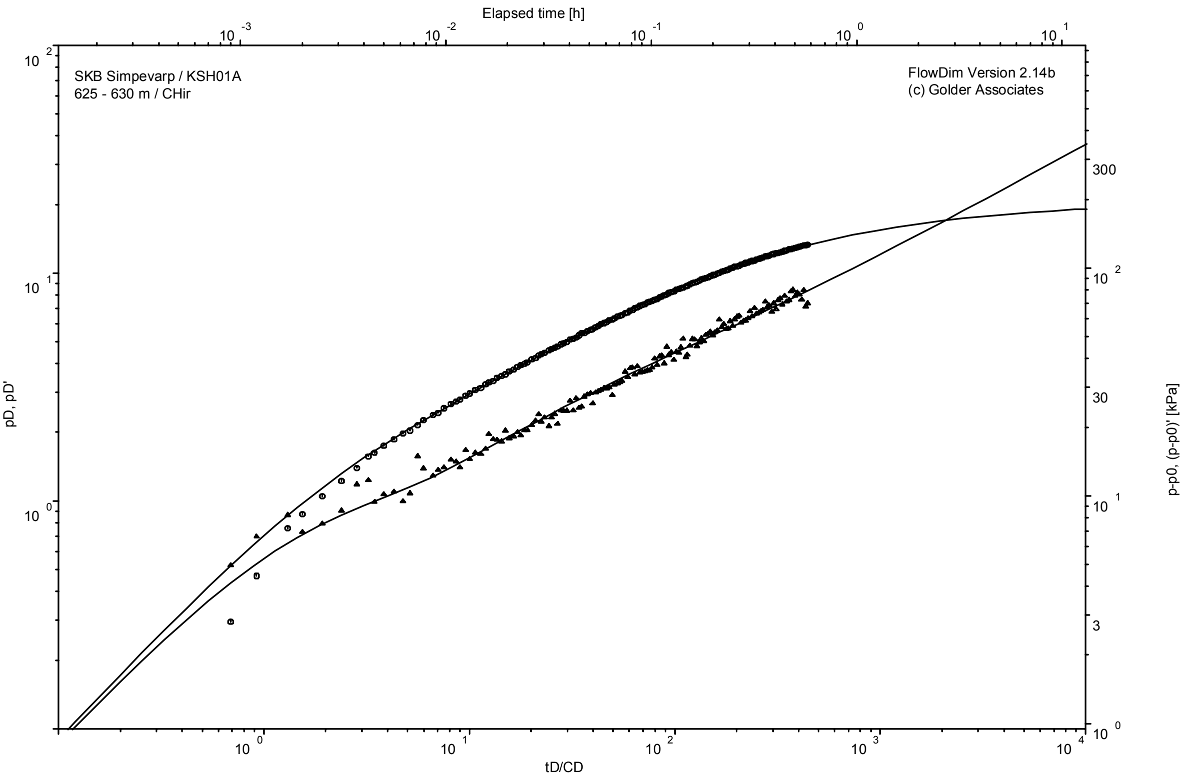
Pressure and flow rate vs. time; cartesian plot



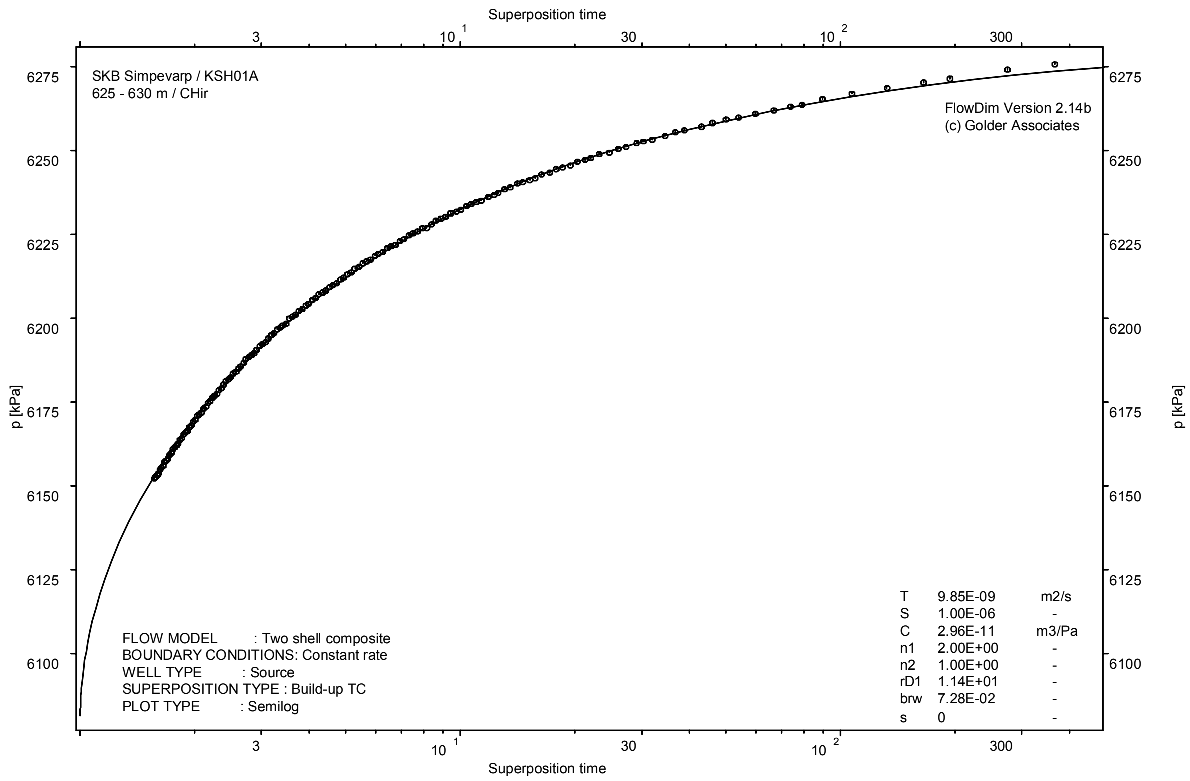
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

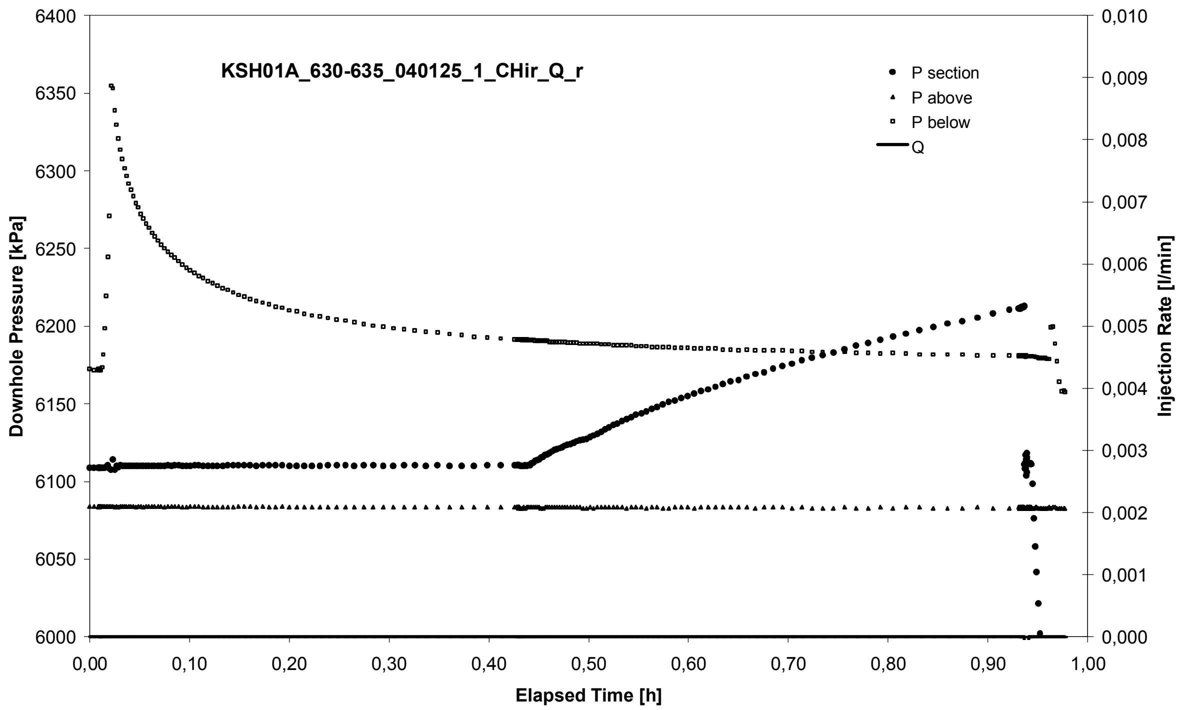


CHIR phase; HORNER match

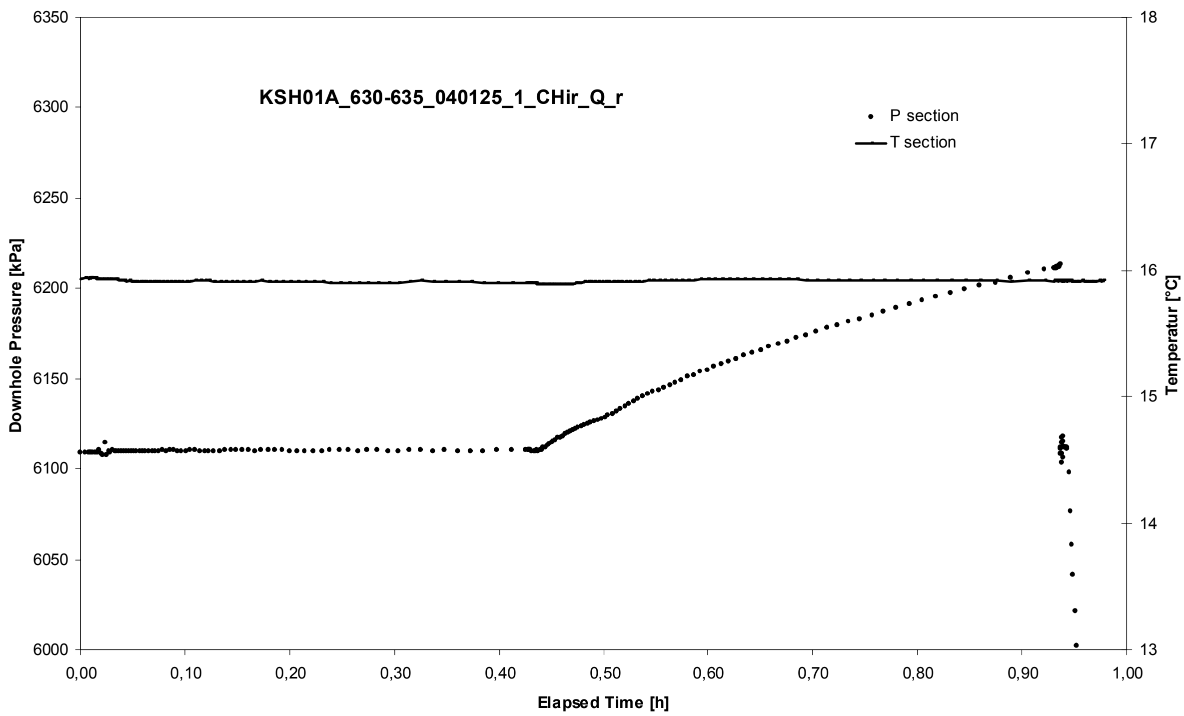
APPENDIX 2-122

Test 630 – 635 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

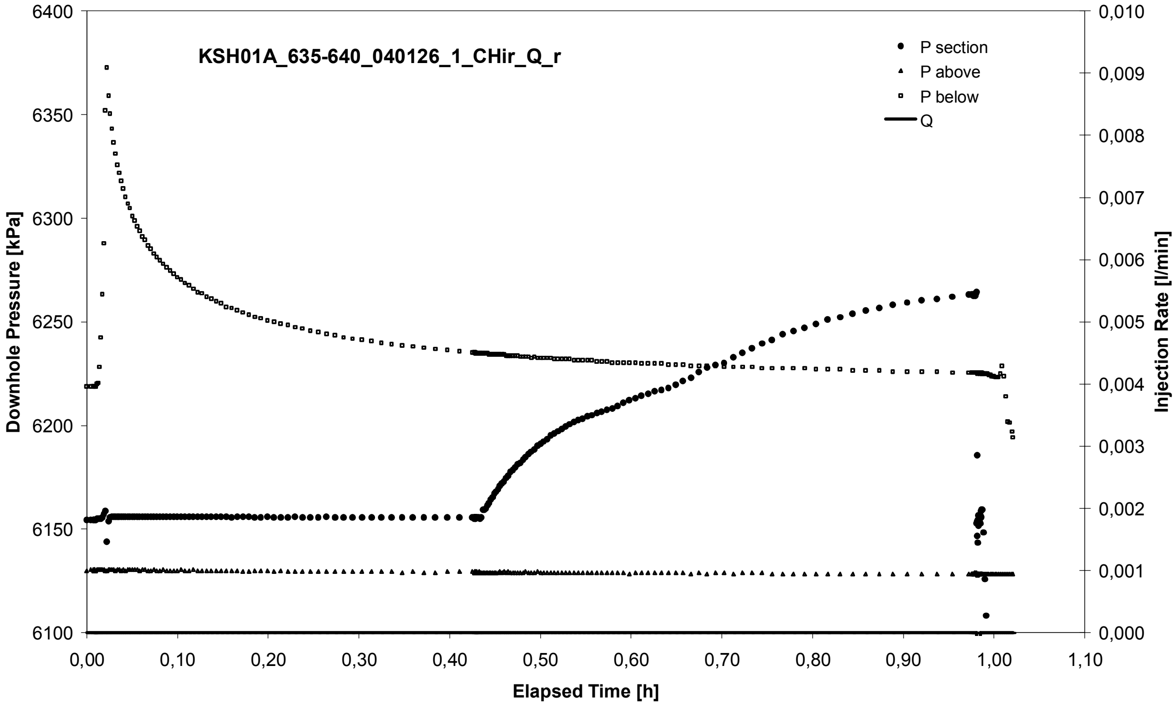
Not Analysed

CHIR phase; HORNER match

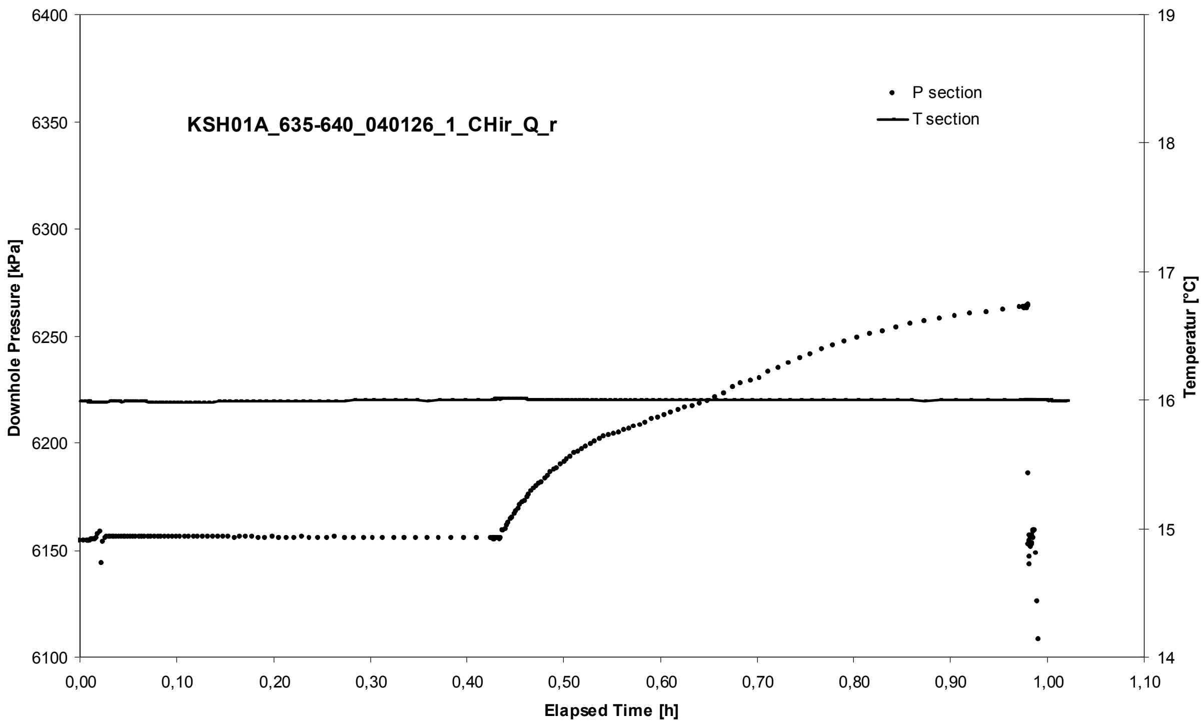
APPENDIX 2-123

Test 635 – 640 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

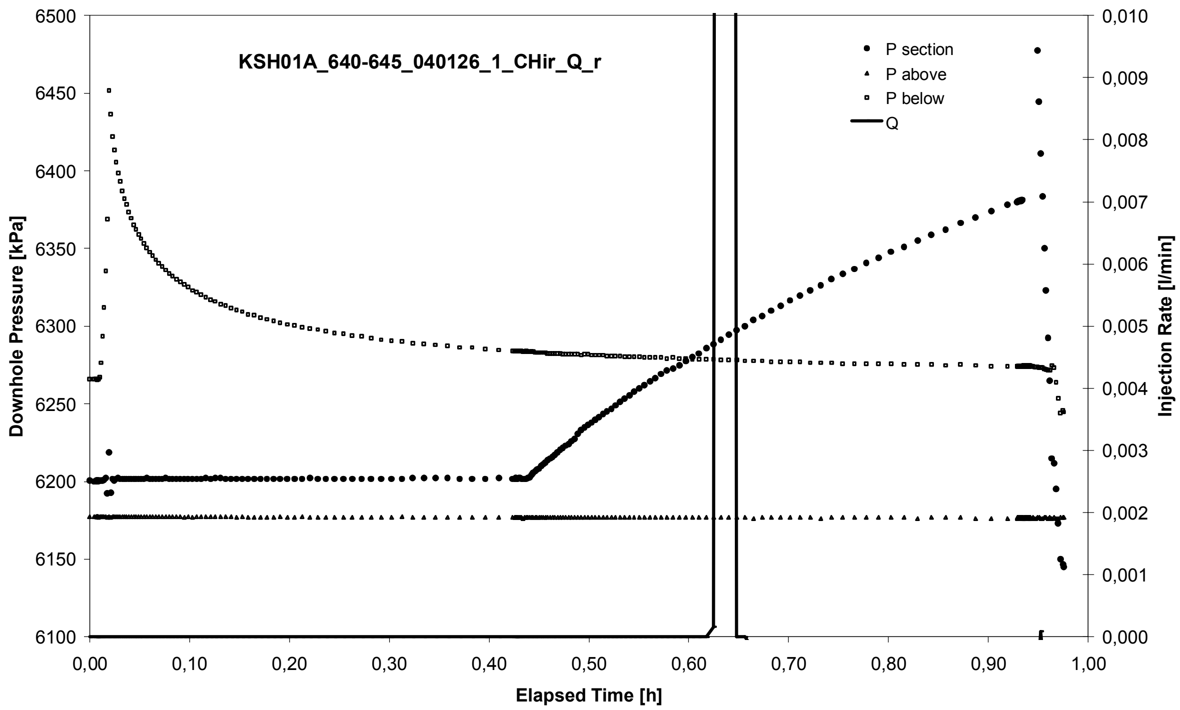
Not Analysed

CHIR phase; HORNER match

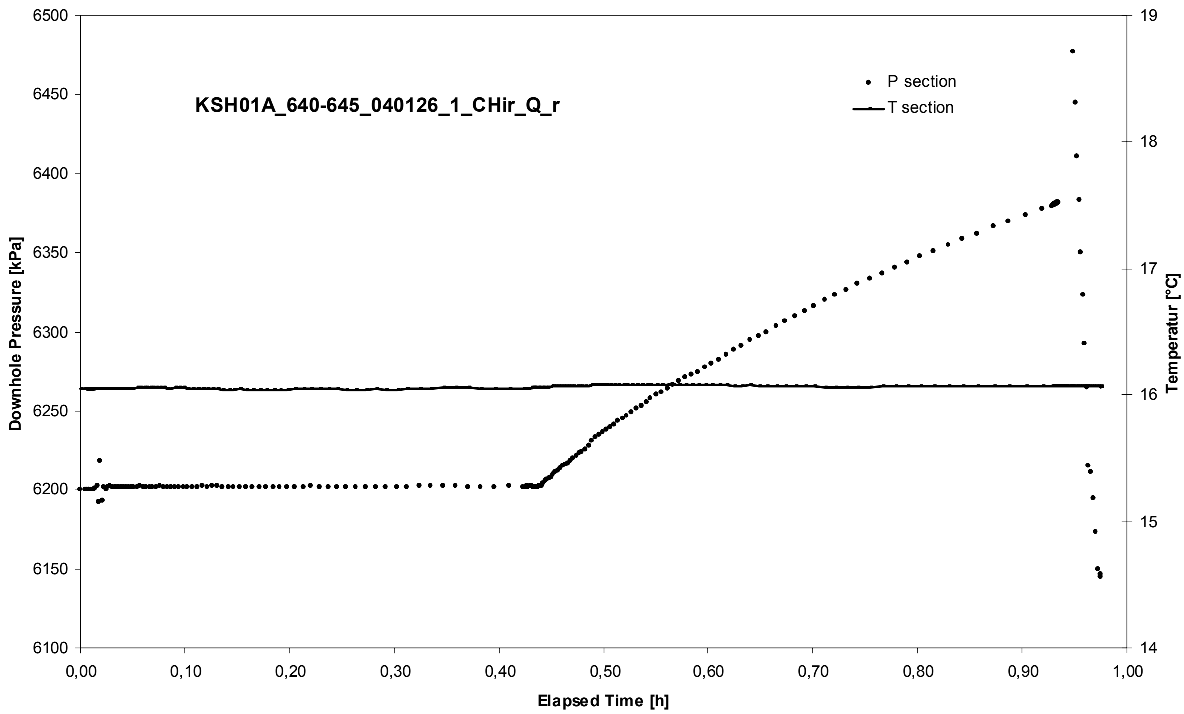
APPENDIX 2-124

Test 640 – 645 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

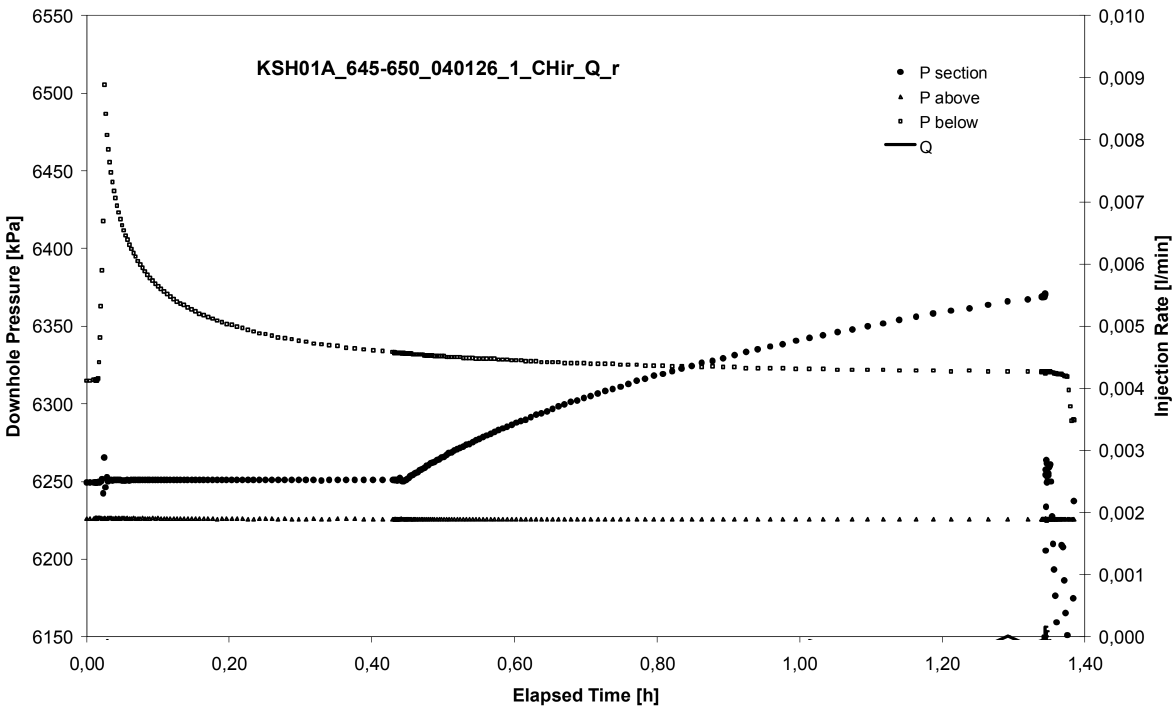
Not Analysed

CHIR phase; HORNER match

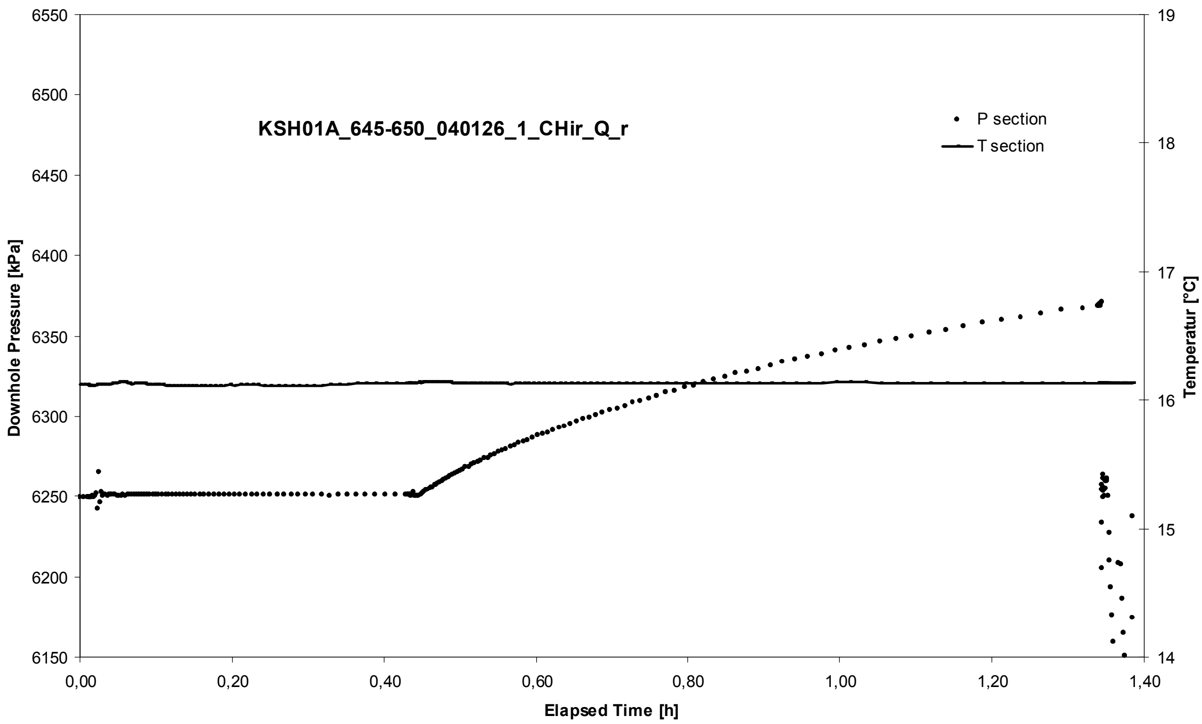
APPENDIX 2-125

Test 645 – 650 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

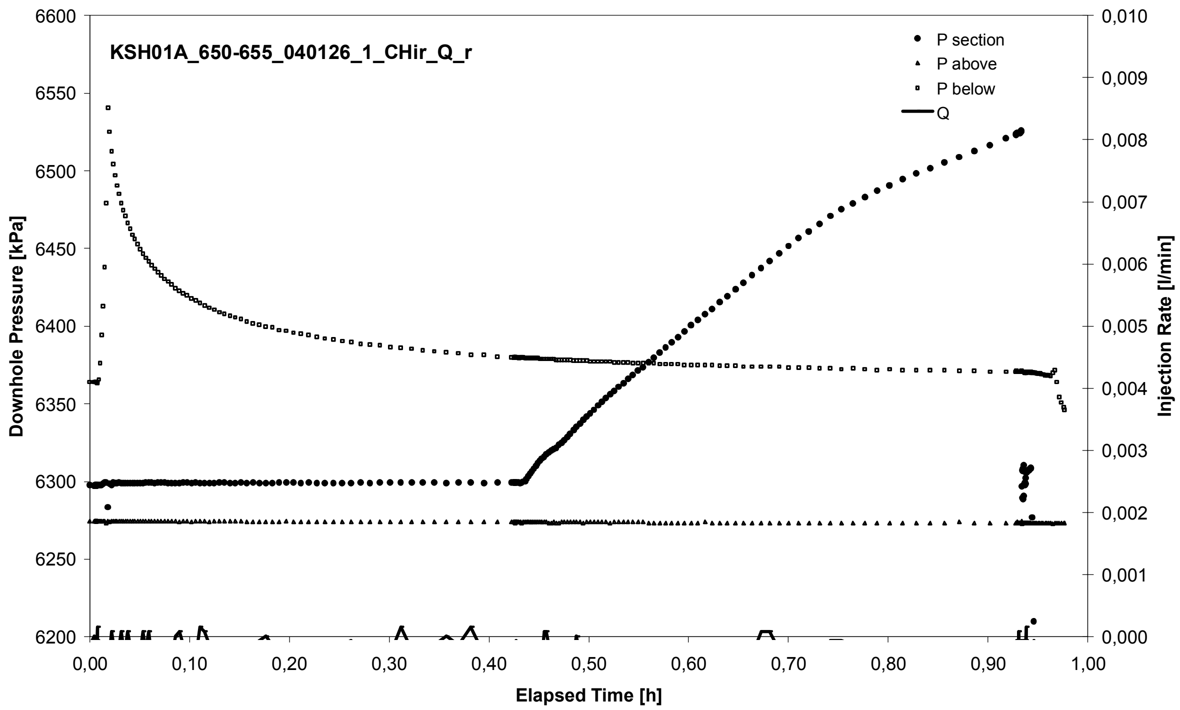
Not Analysed

CHIR phase; HORNER match

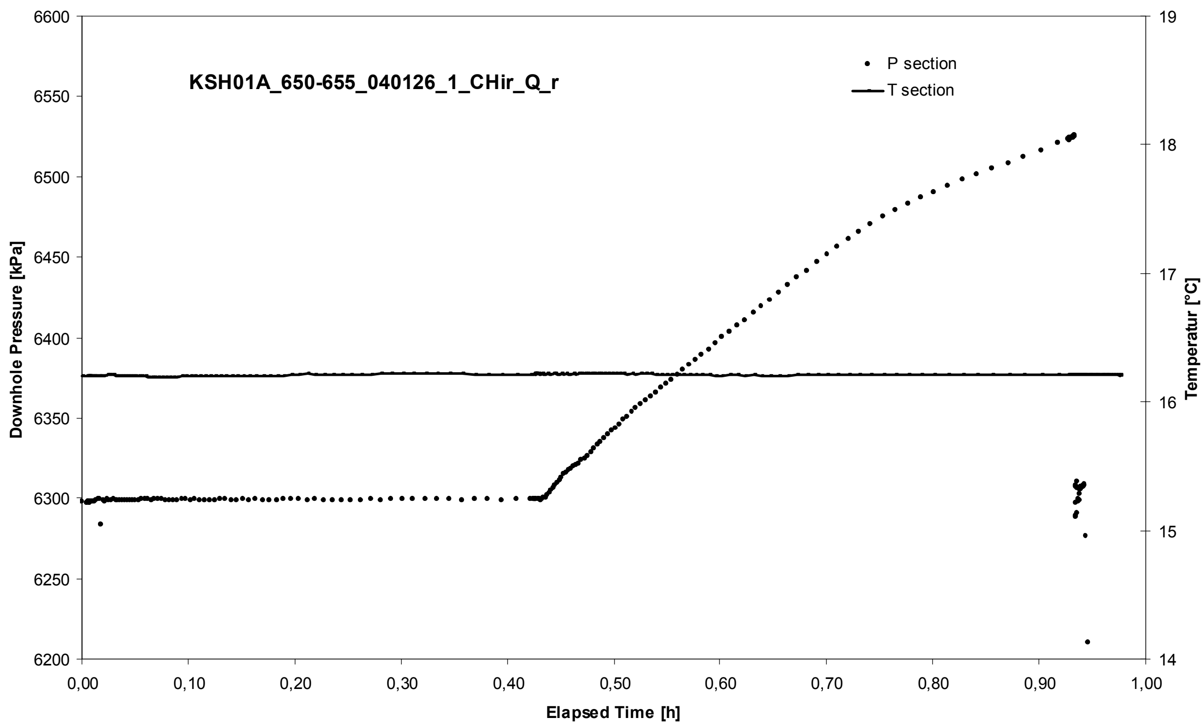
APPENDIX 2-126

Test 650 – 655 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

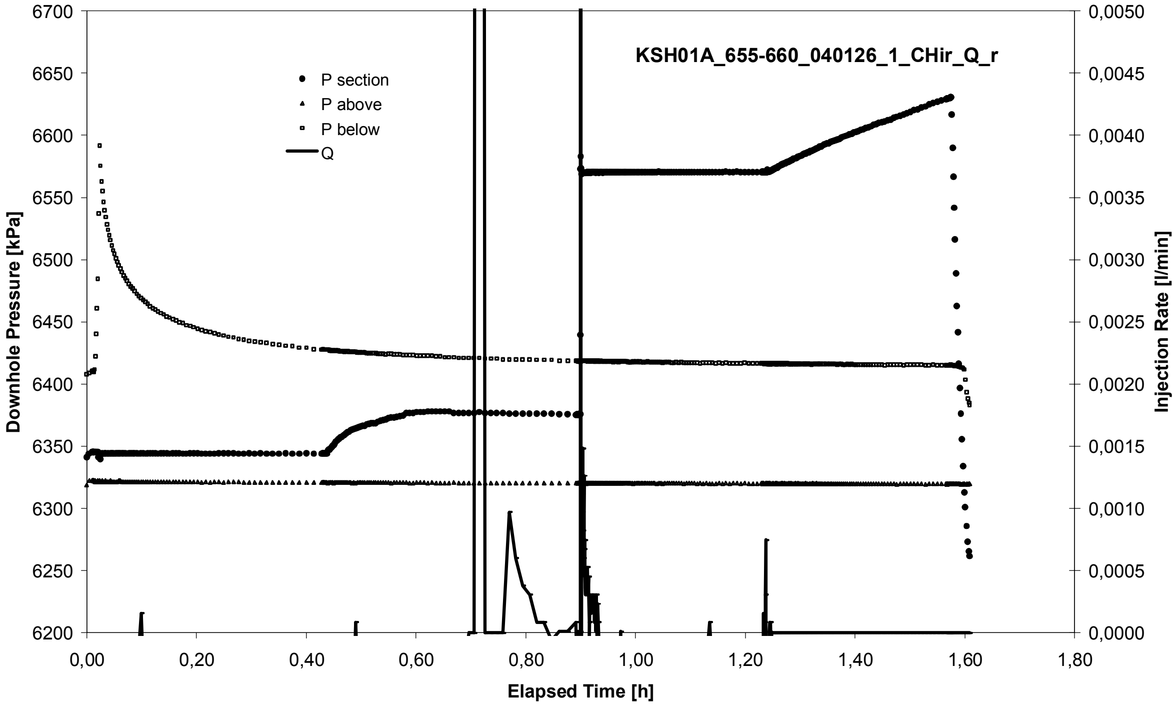
Not Analysed

CHIR phase; HORNER match

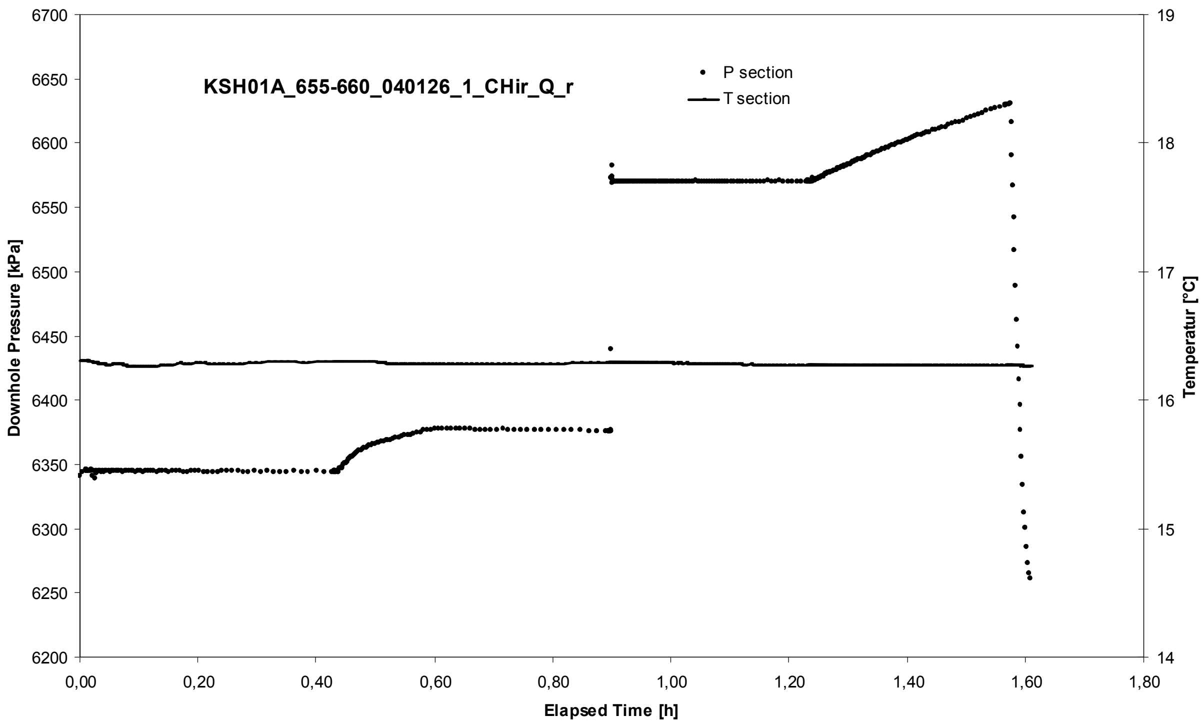
APPENDIX 2-127

Test 655 – 660 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

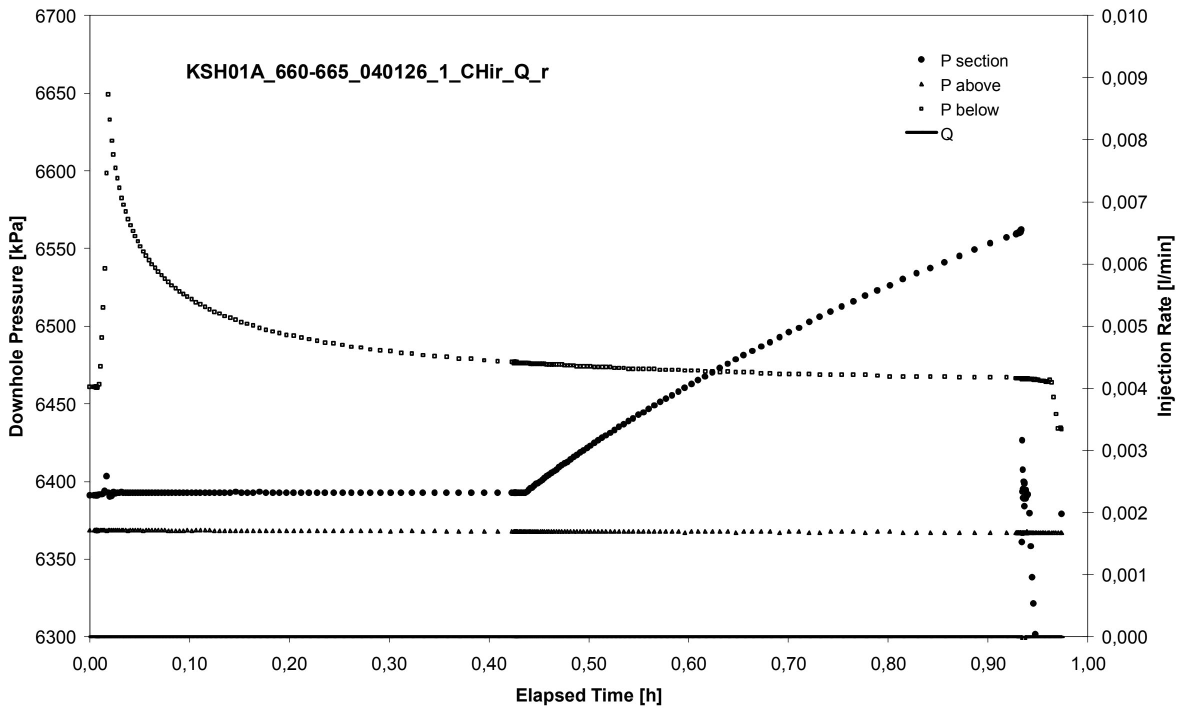
Not Analysed

CHIR phase; HORNER match

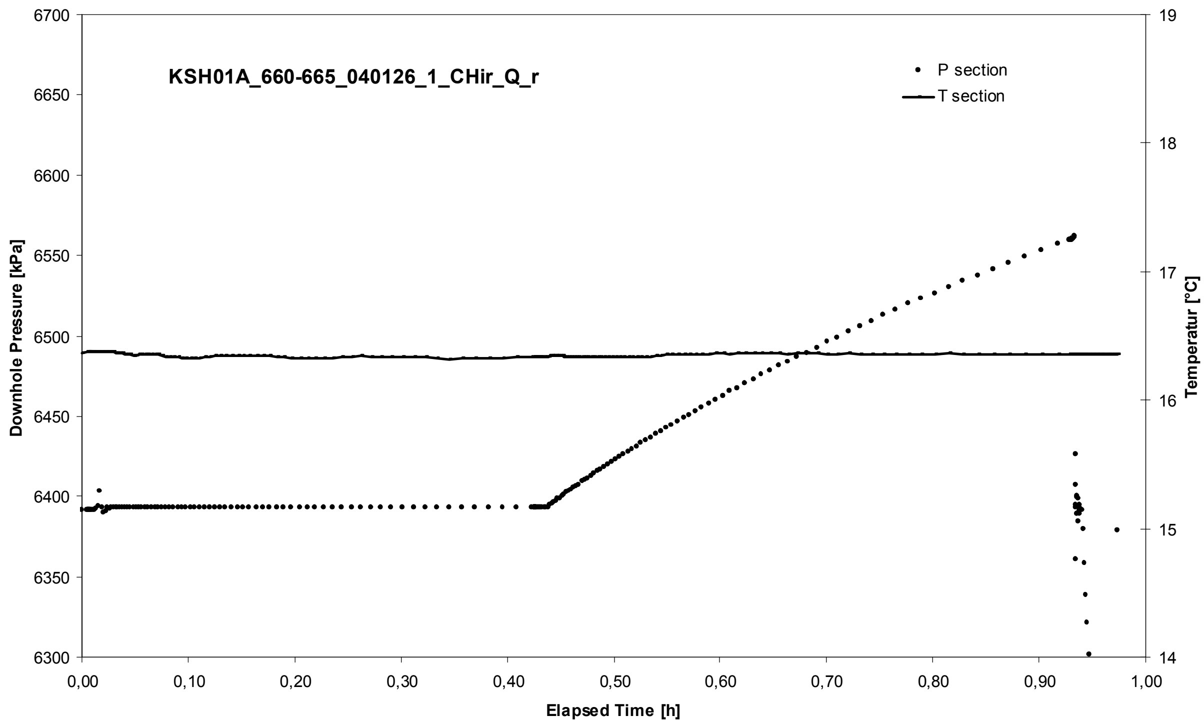
APPENDIX 2-128

Test 660 – 665 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

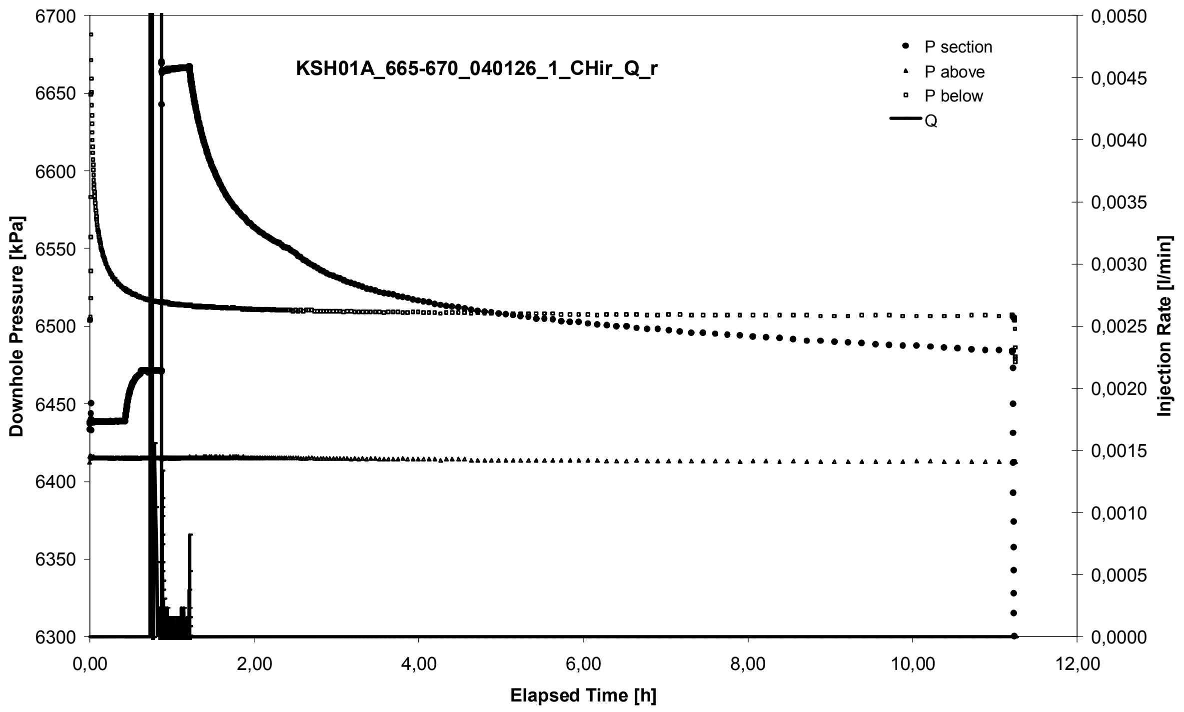
Not Analysed

CHIR phase; HORNER match

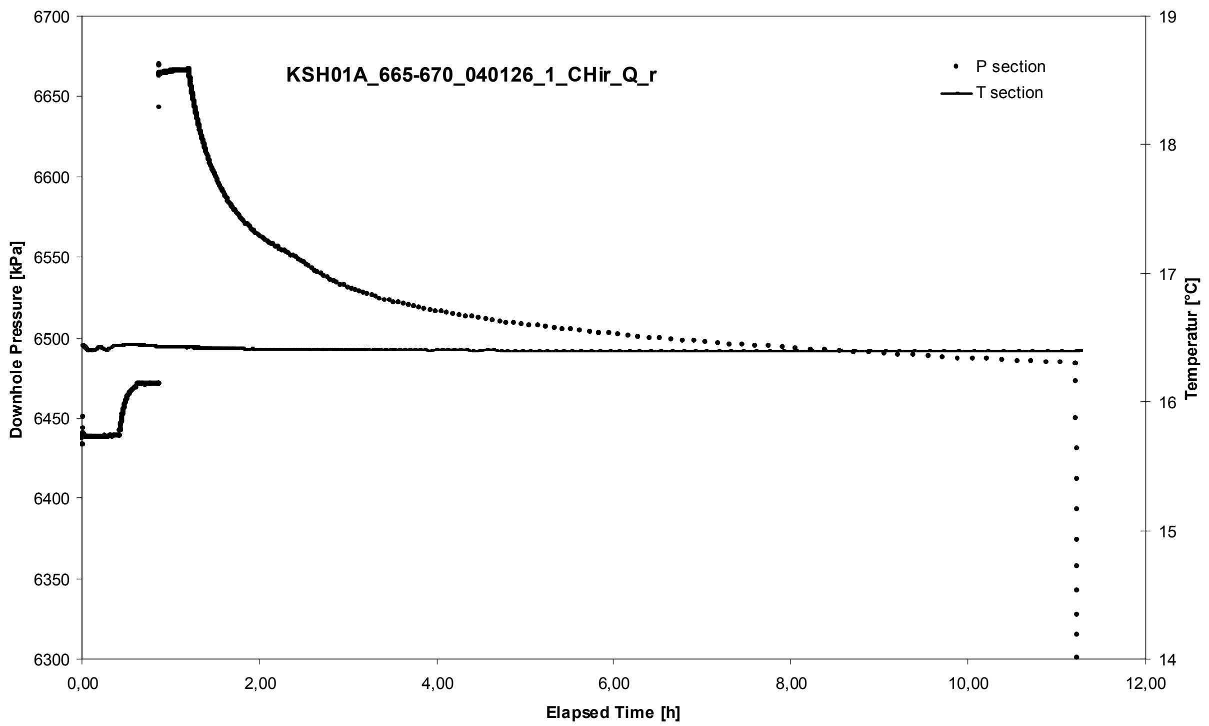
APPENDIX 2-129

Test 665 – 670 m

Analysis diagrams



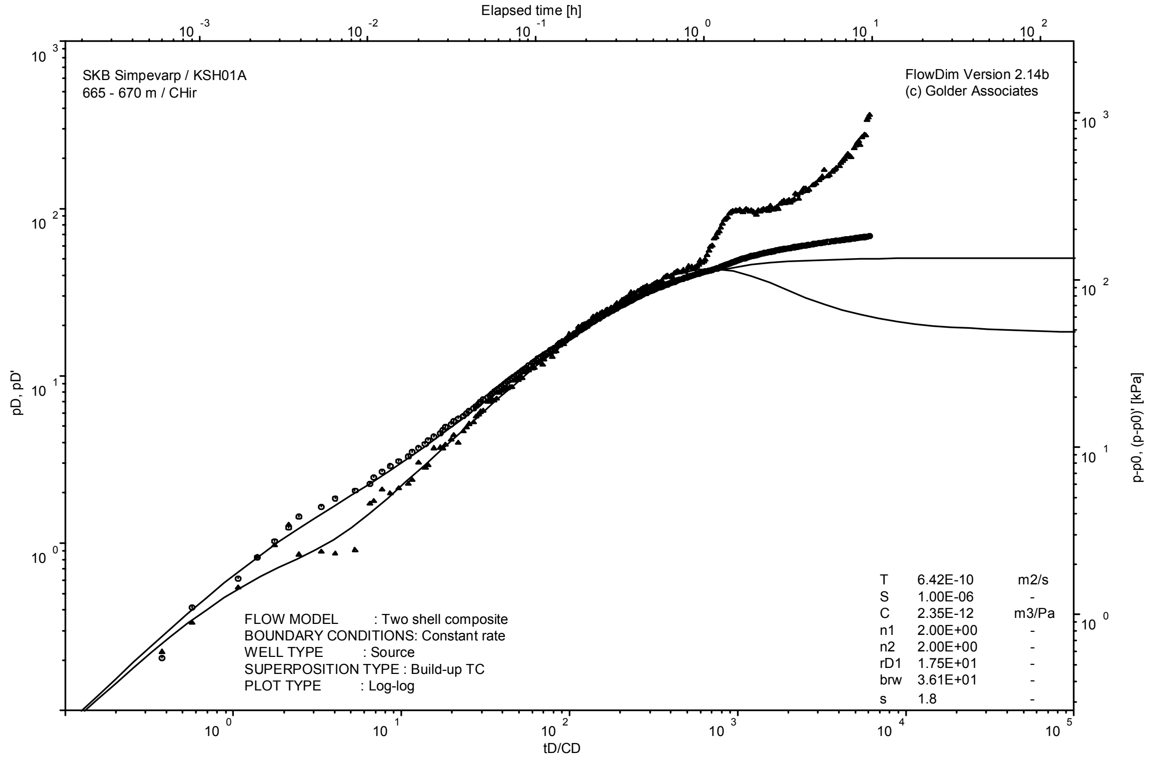
Pressure and flow rate vs. time; cartesian plot



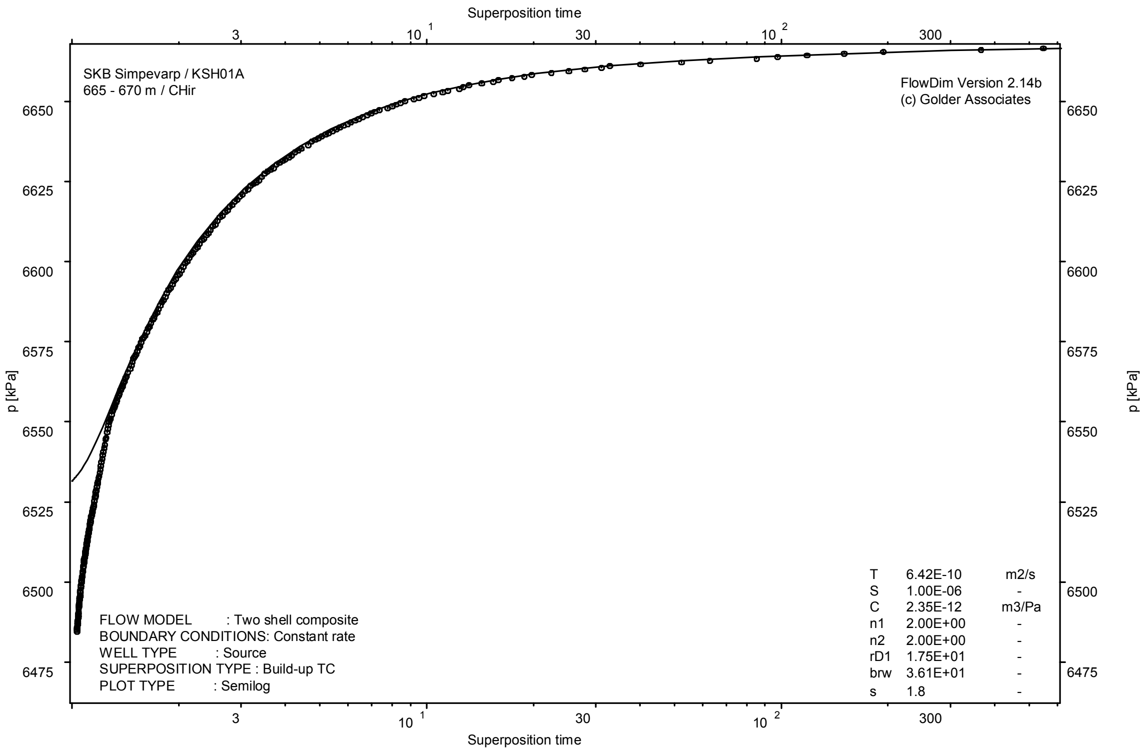
Interval pressure and temperature vs. time; cartesian plot

Not Analysed

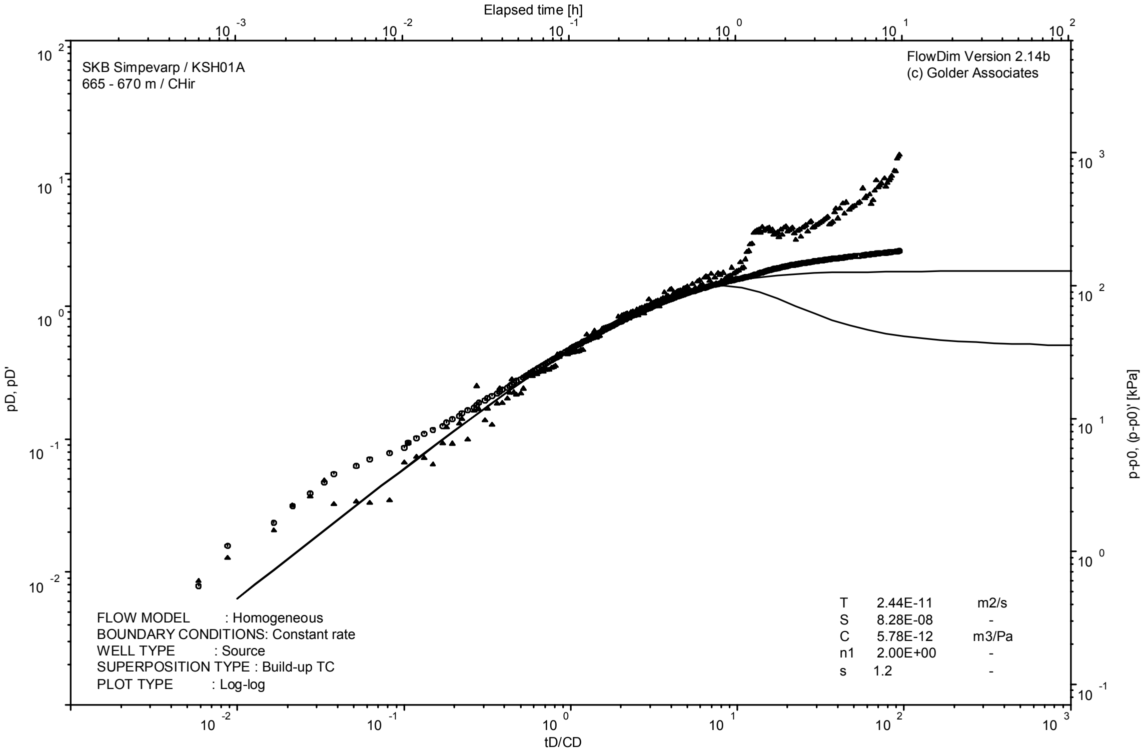
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

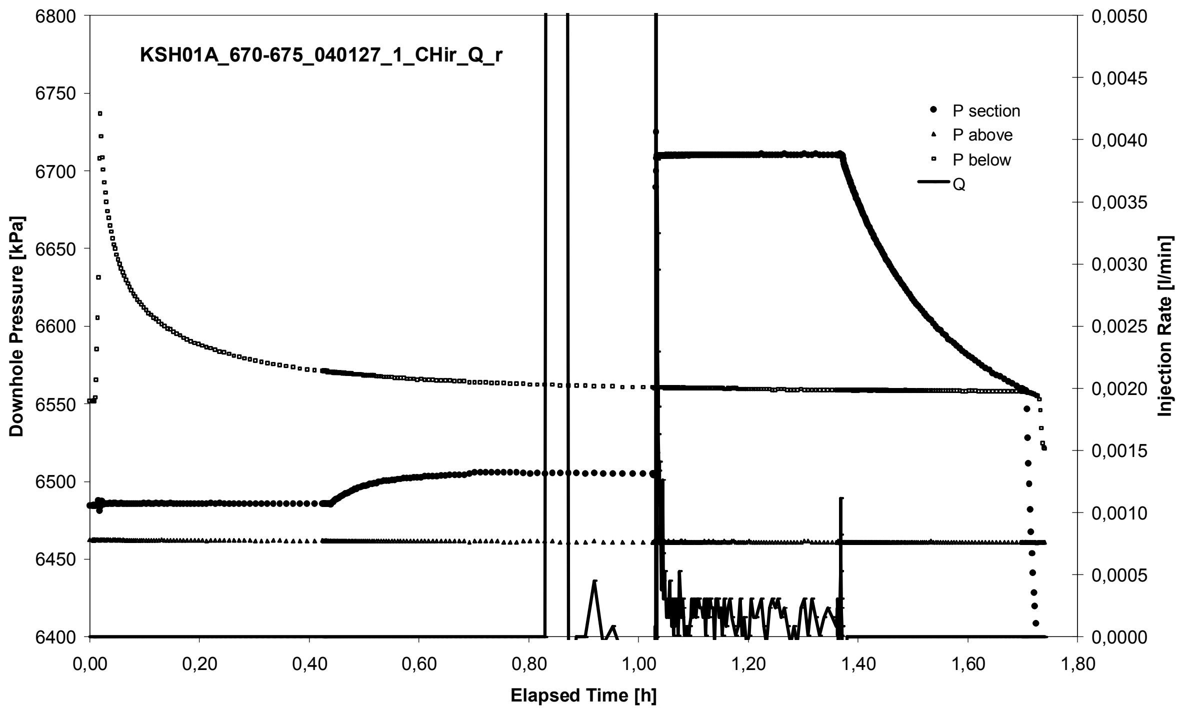


CHIR phase analysed with homogeneous flow model

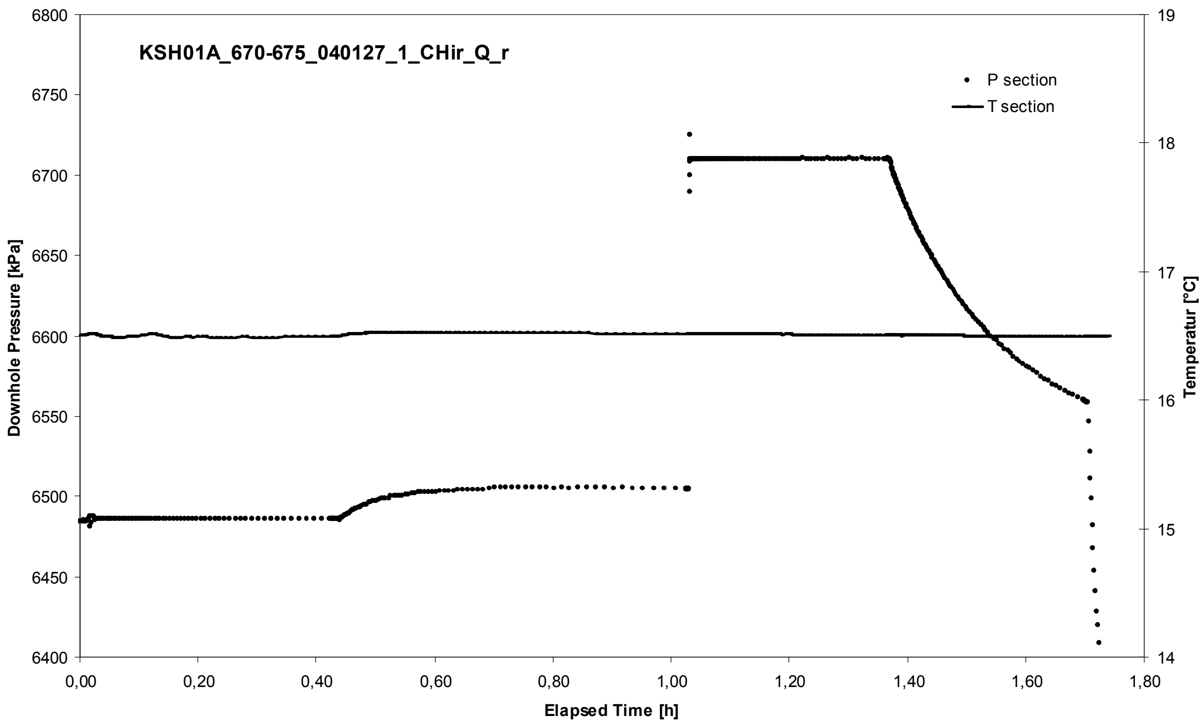
APPENDIX 2-130

Test 670 – 675 m

Analysis diagrams



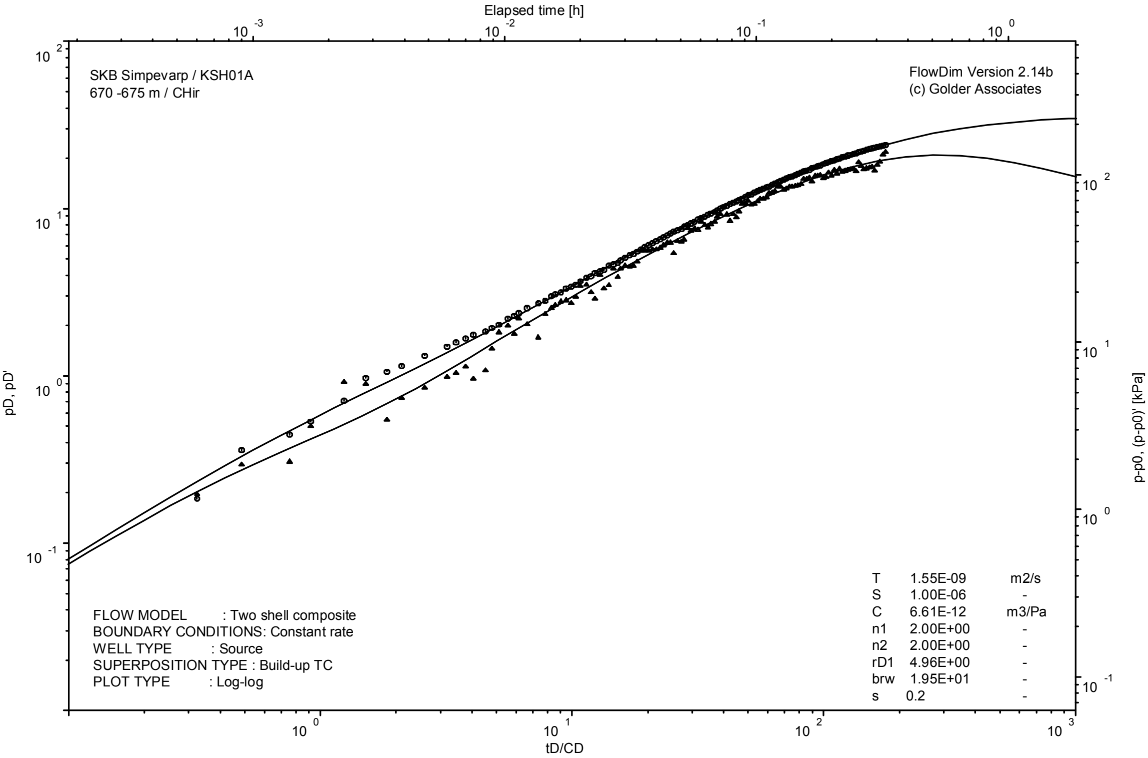
Pressure and flow rate vs. time; cartesian plot



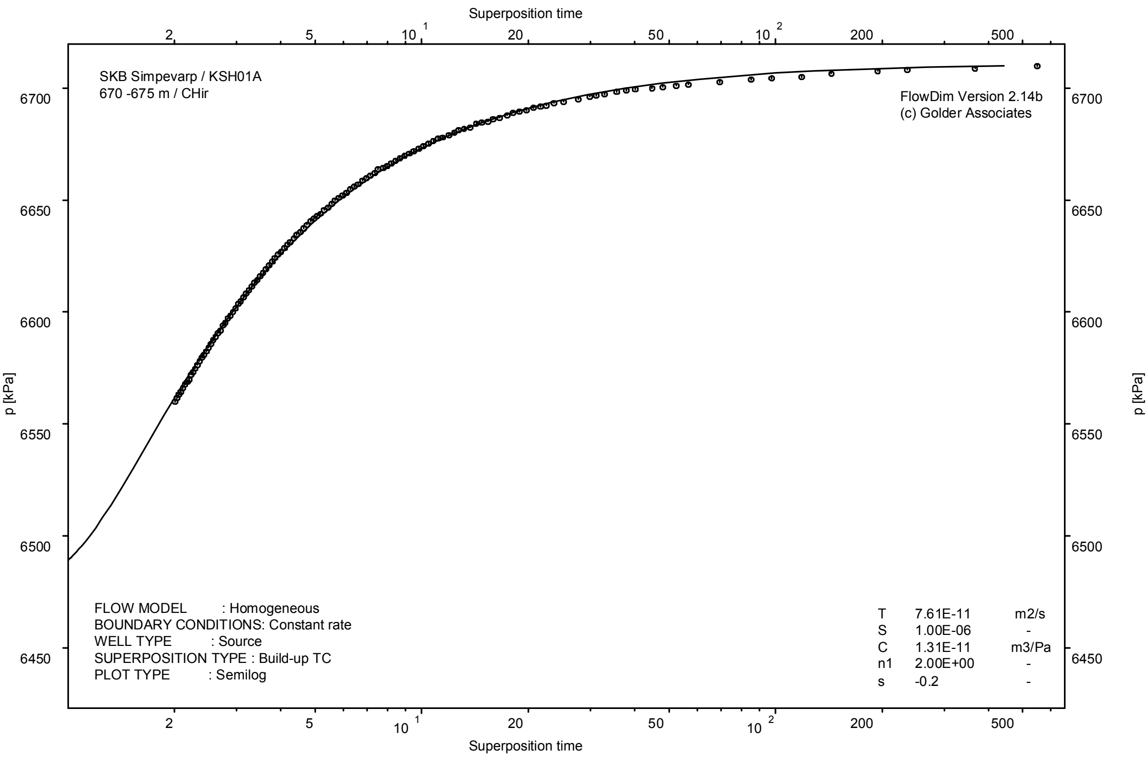
Interval pressure and temperature vs. time; cartesian plot

Not Analysed

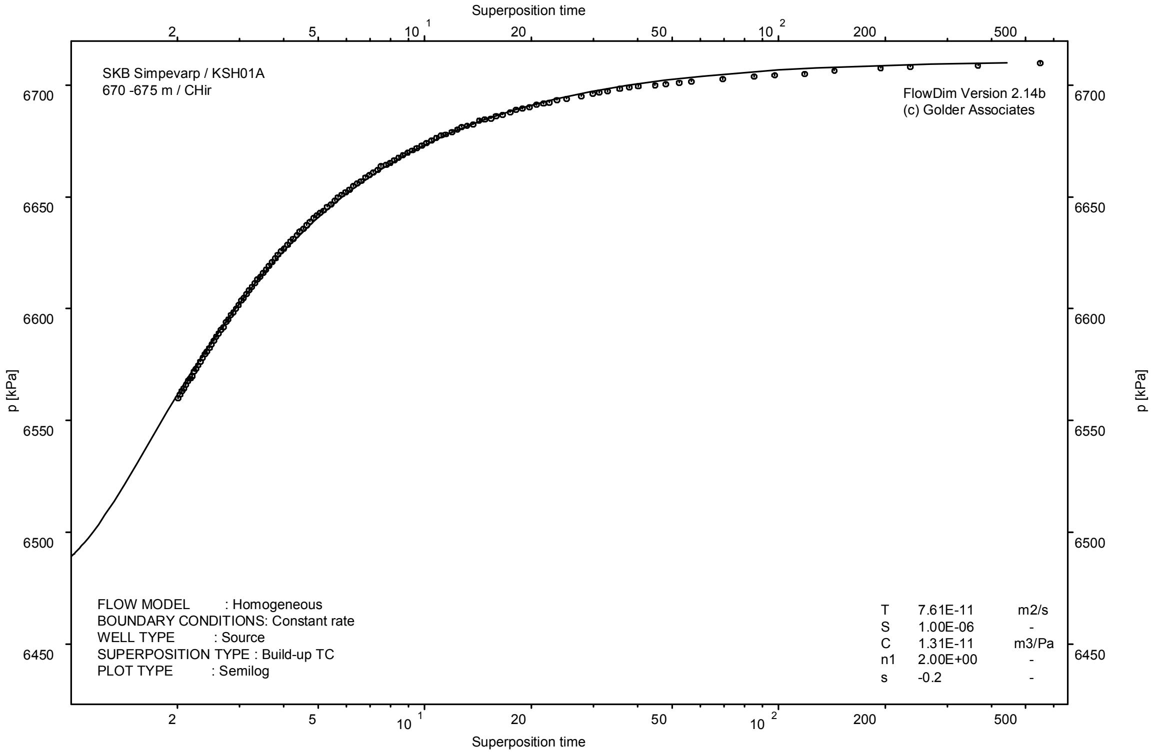
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

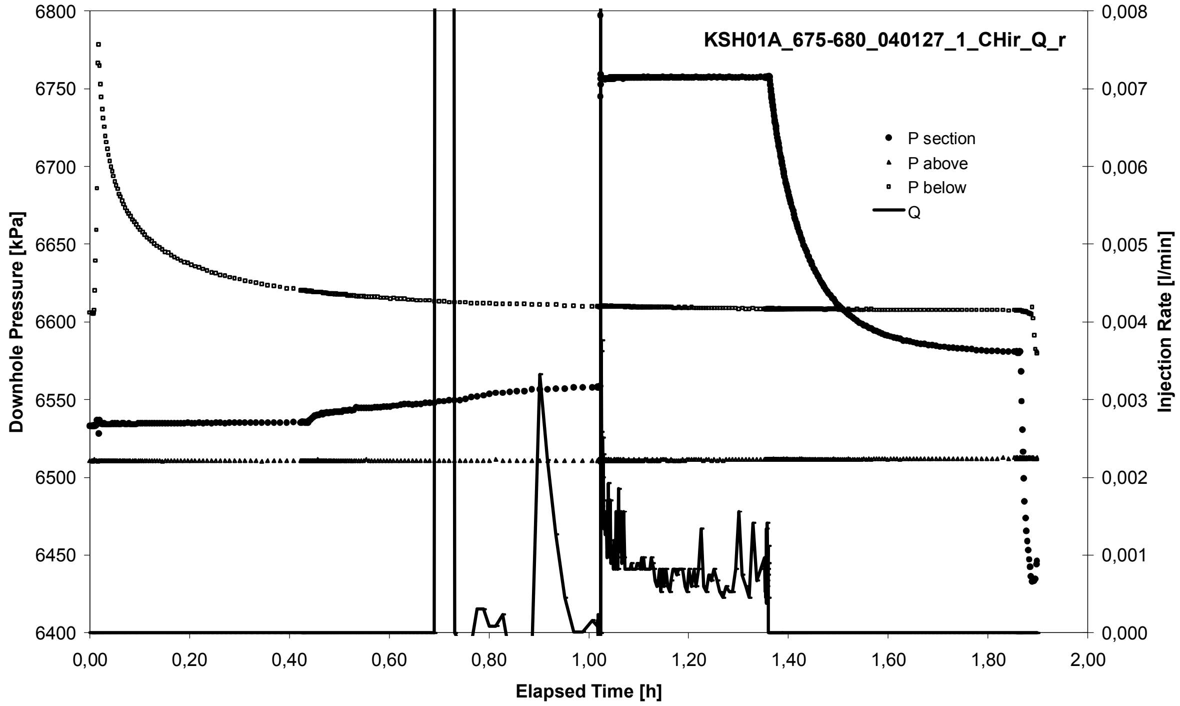


CHIR phase analysed with homogeneous flow model

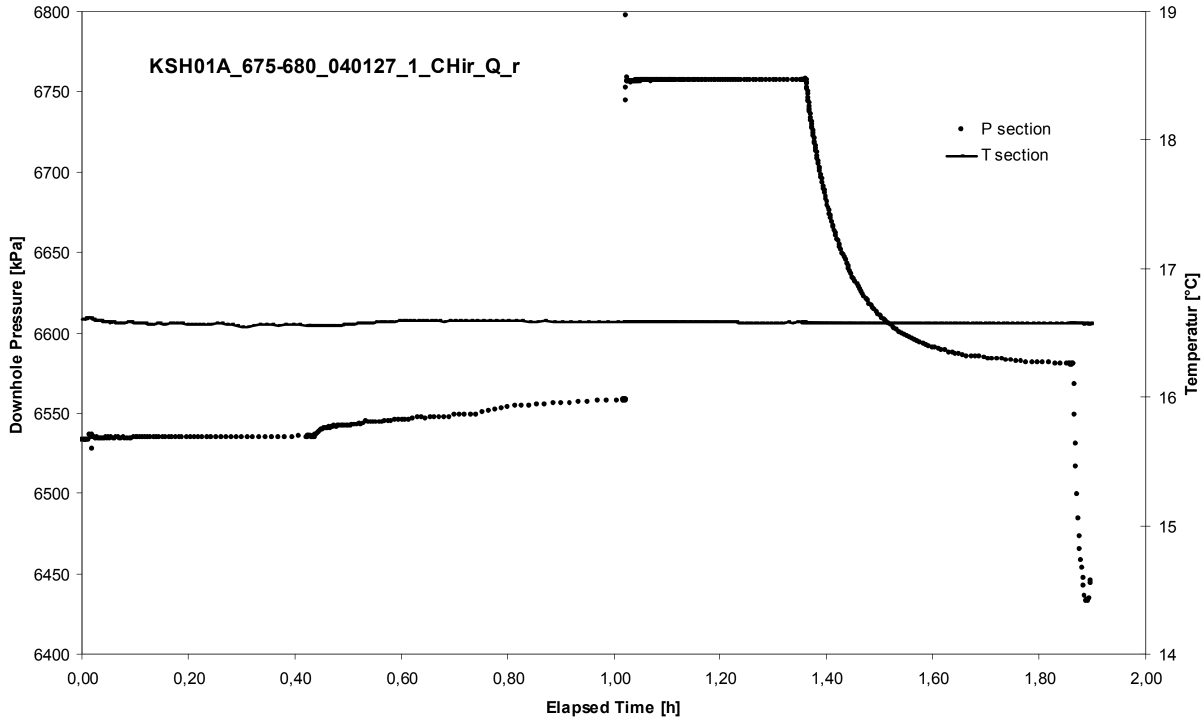
APPENDIX 2-131

Test 675 – 680 m

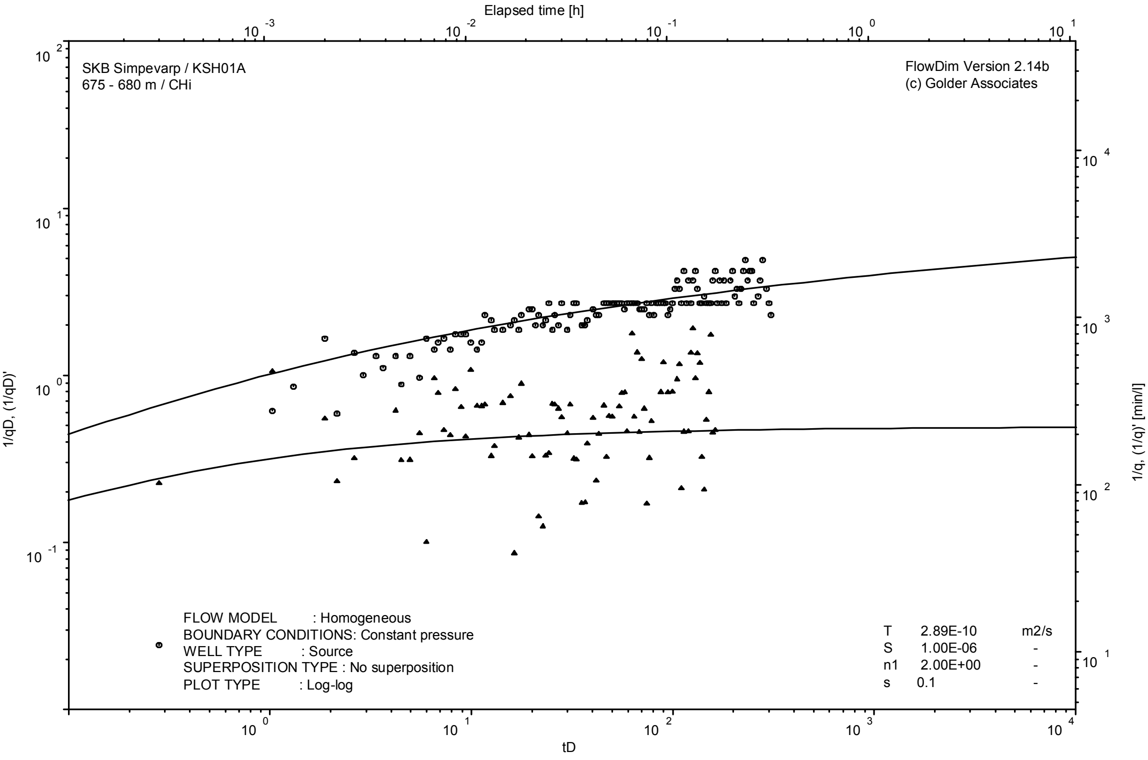
Analysis diagrams



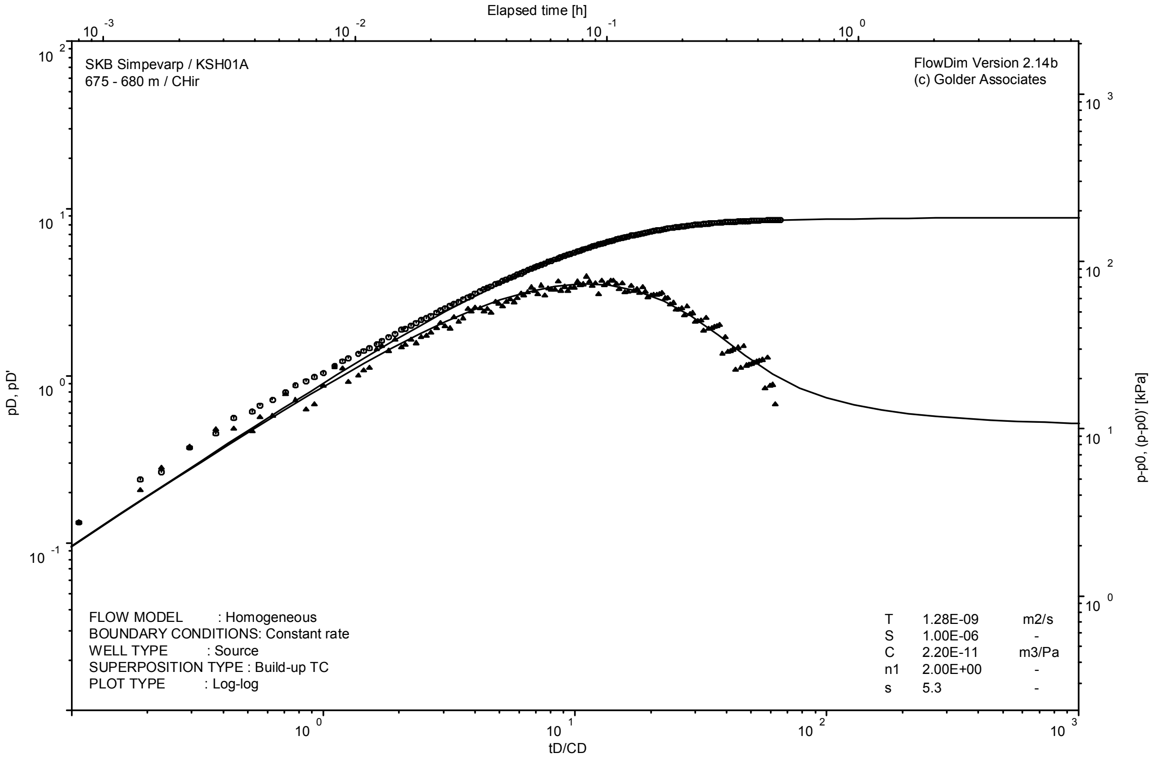
Pressure and flow rate vs. time; cartesian plot



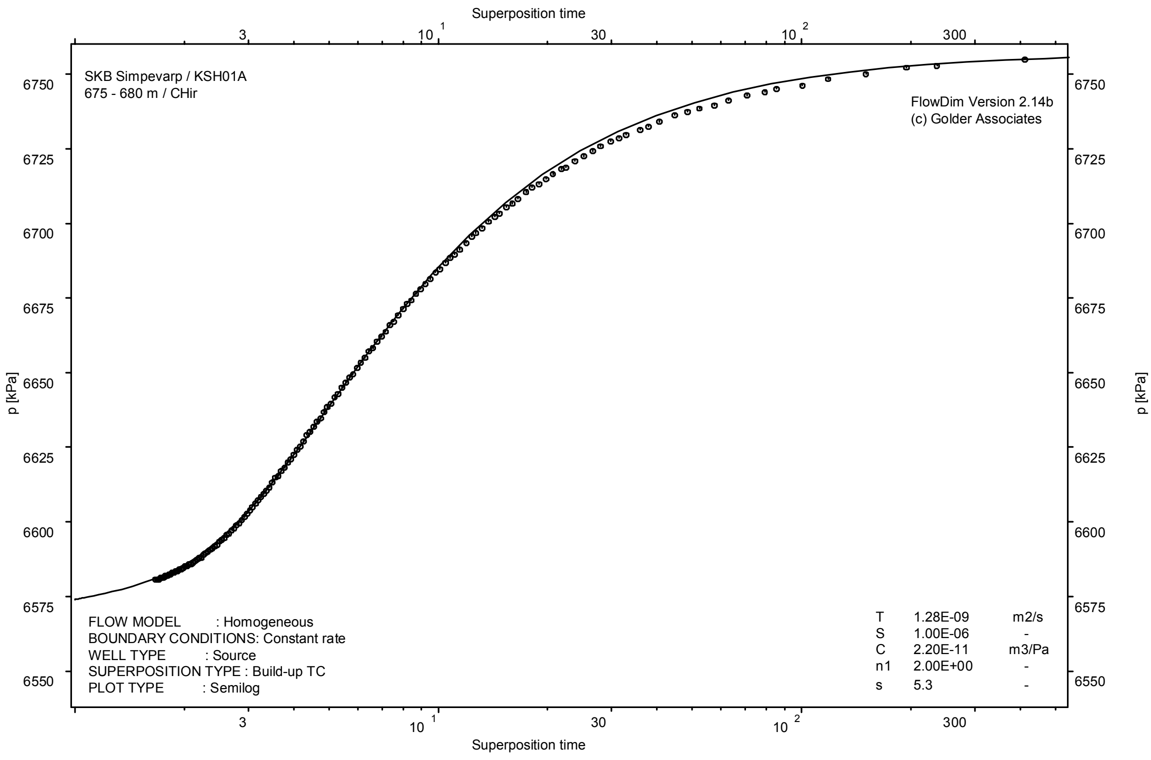
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

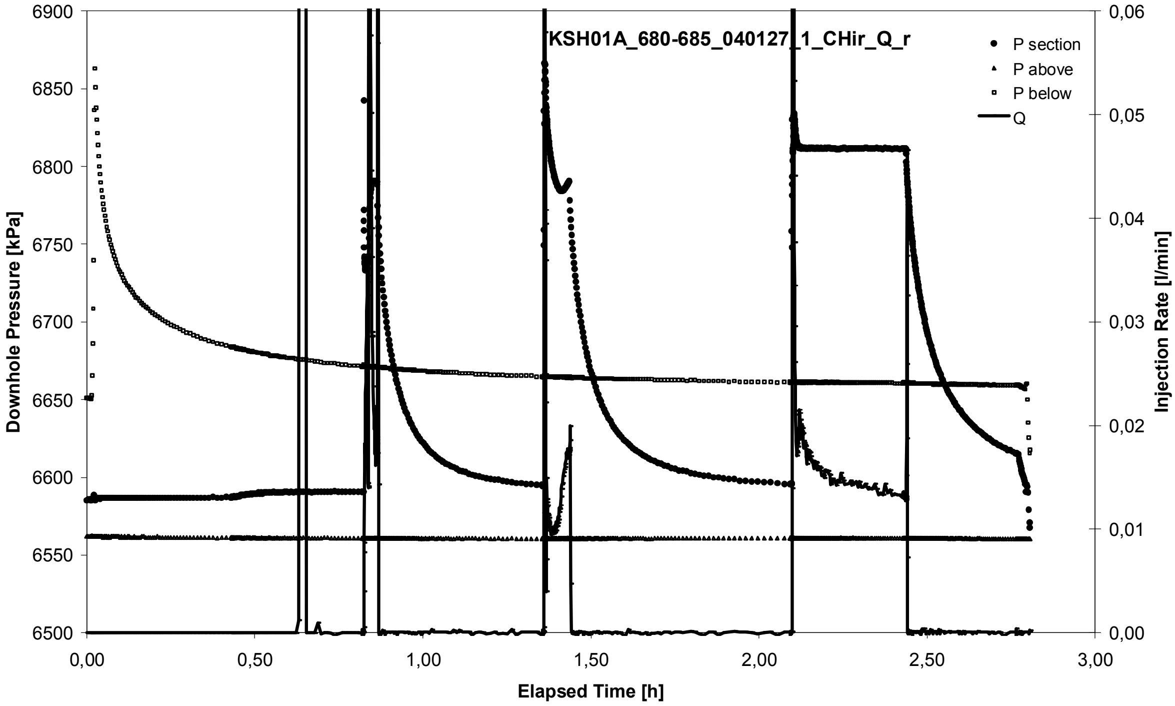


CHIR phase; HORNER match

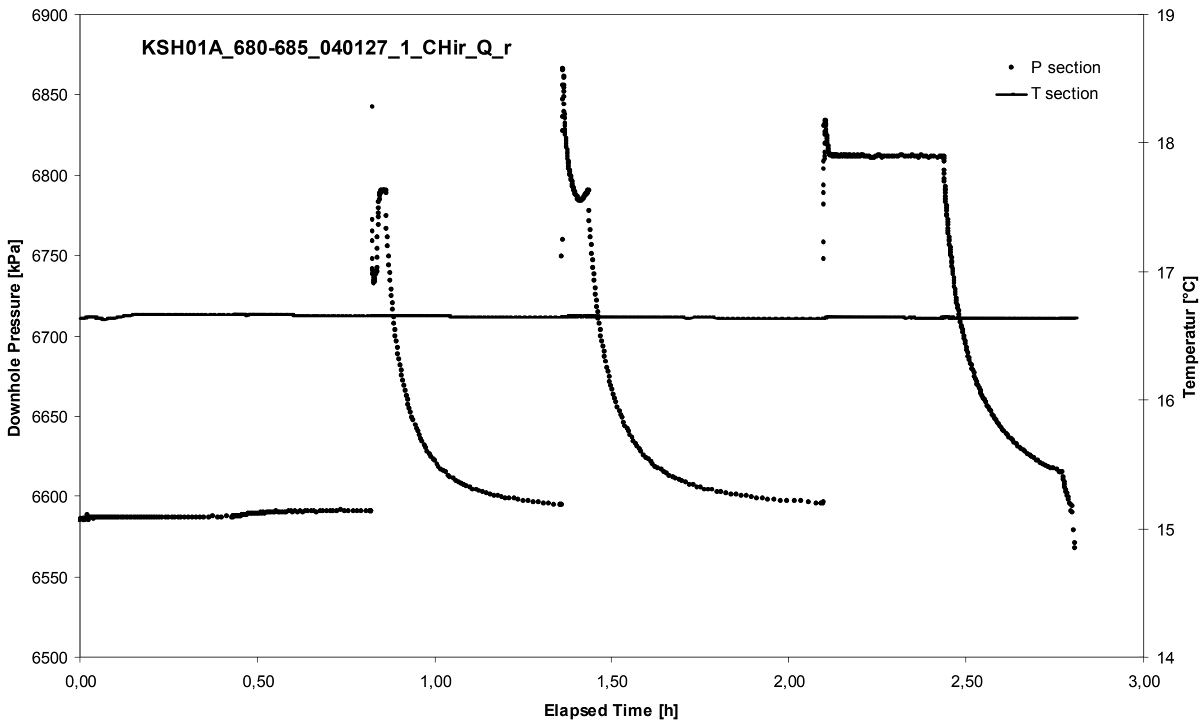
APPENDIX 2-132

Test 680 – 685 m

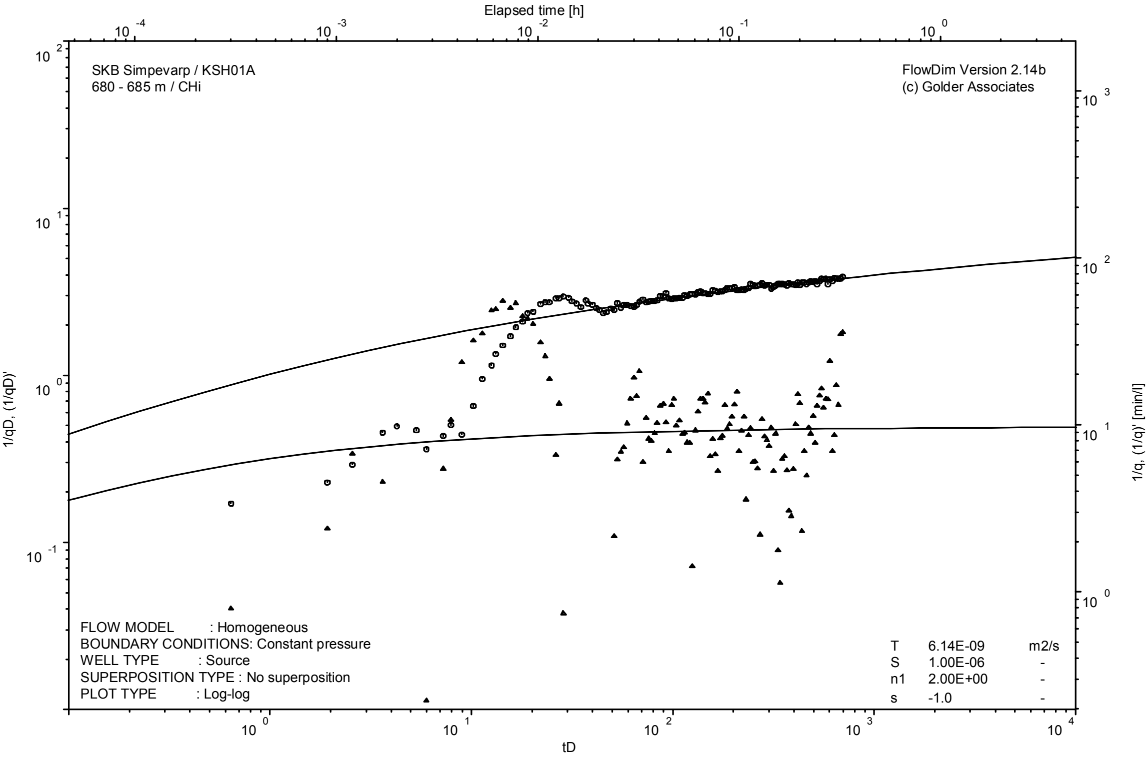
Analysis diagrams



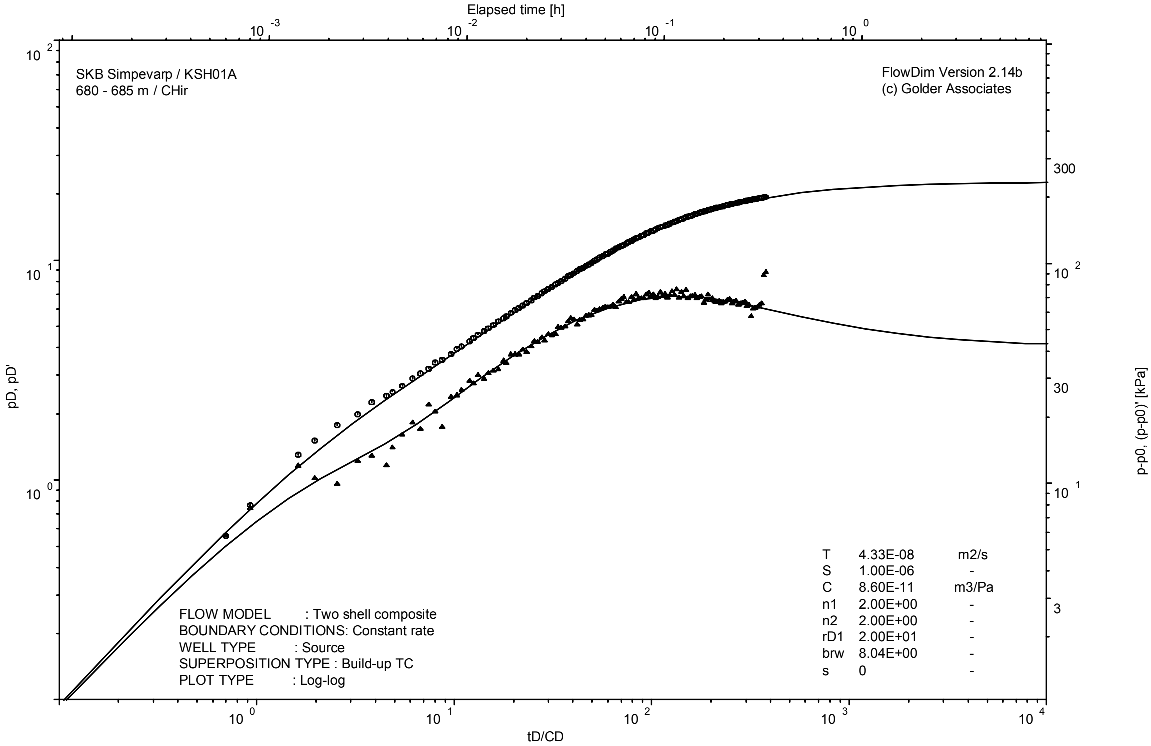
Pressure and flow rate vs. time; cartesian plot



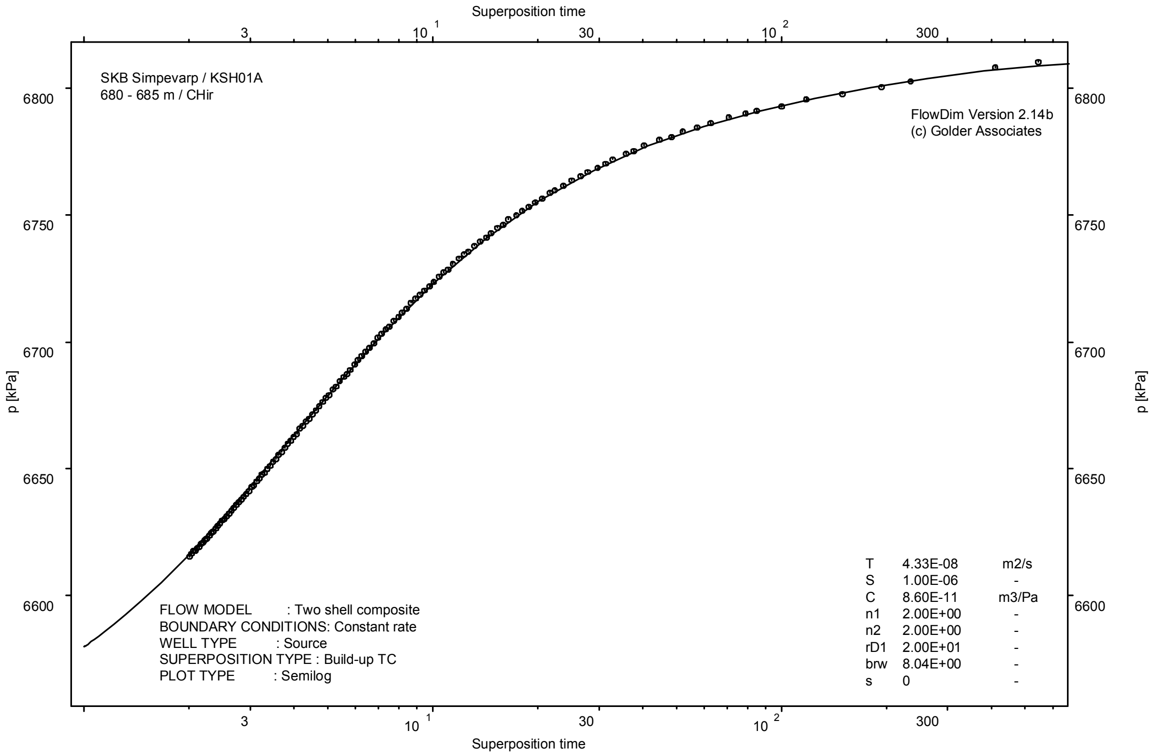
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

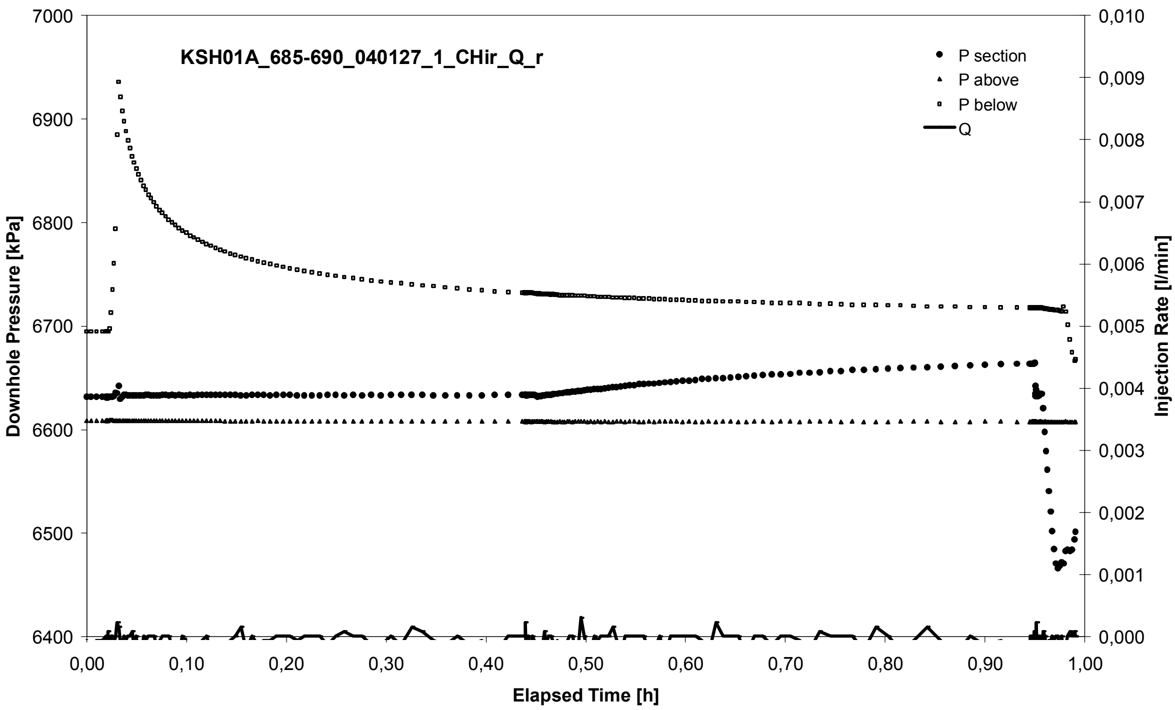


CHIR phase; HORNER match

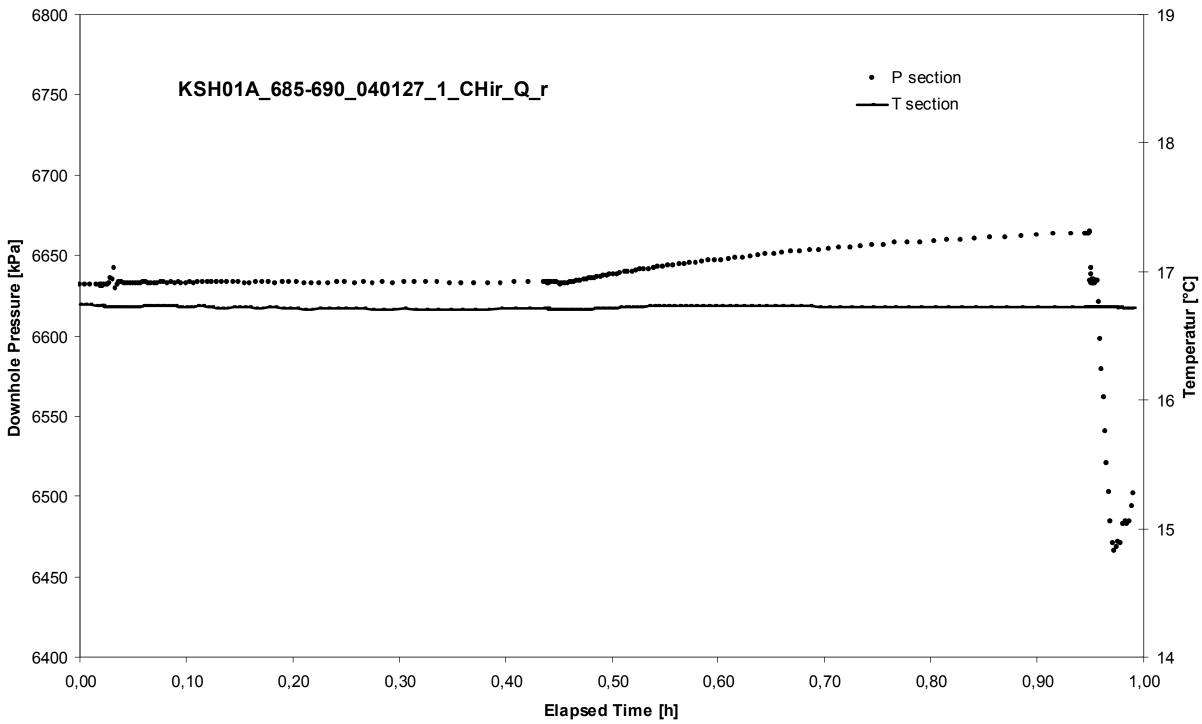
APPENDIX 2-133

Test 685 – 690 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

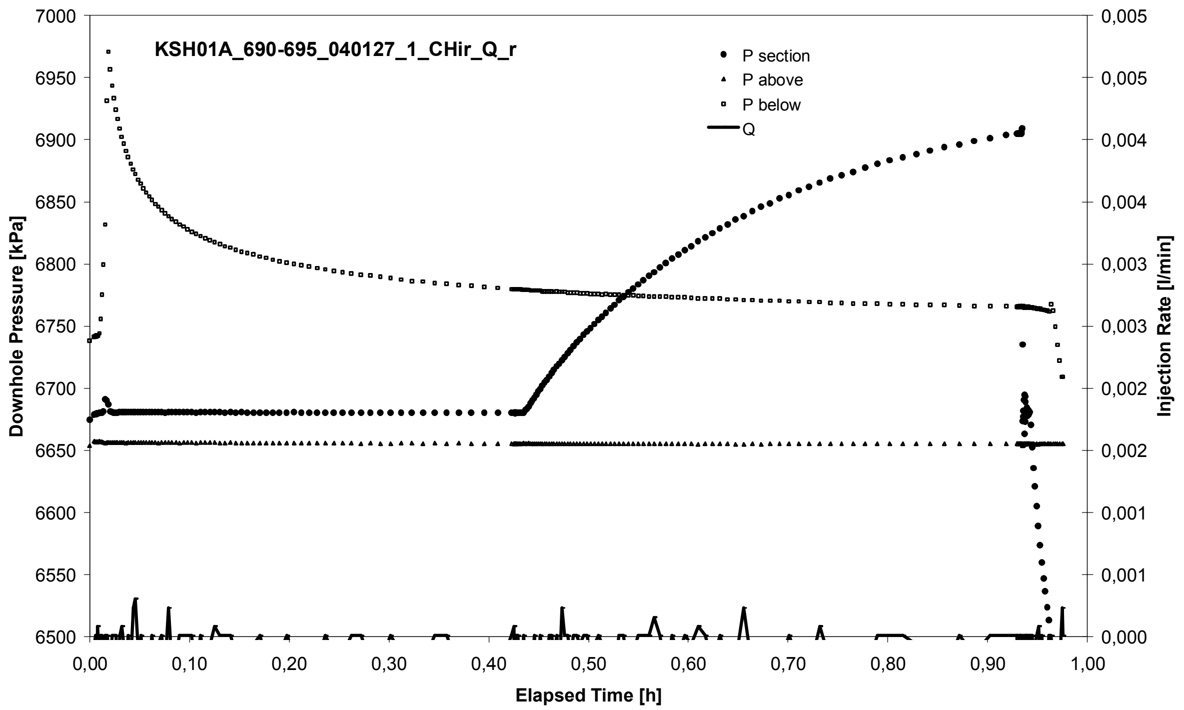
Not Analysed

CHIR phase; HORNER match

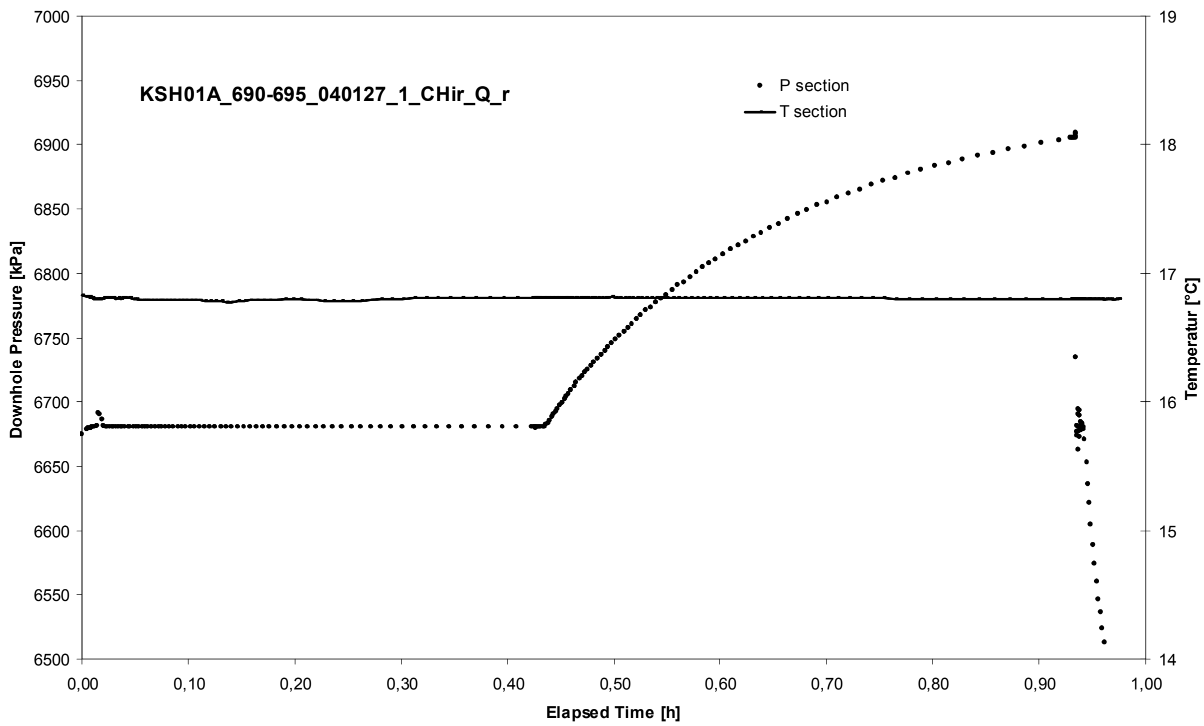
APPENDIX 2-134

Test 690 – 695 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

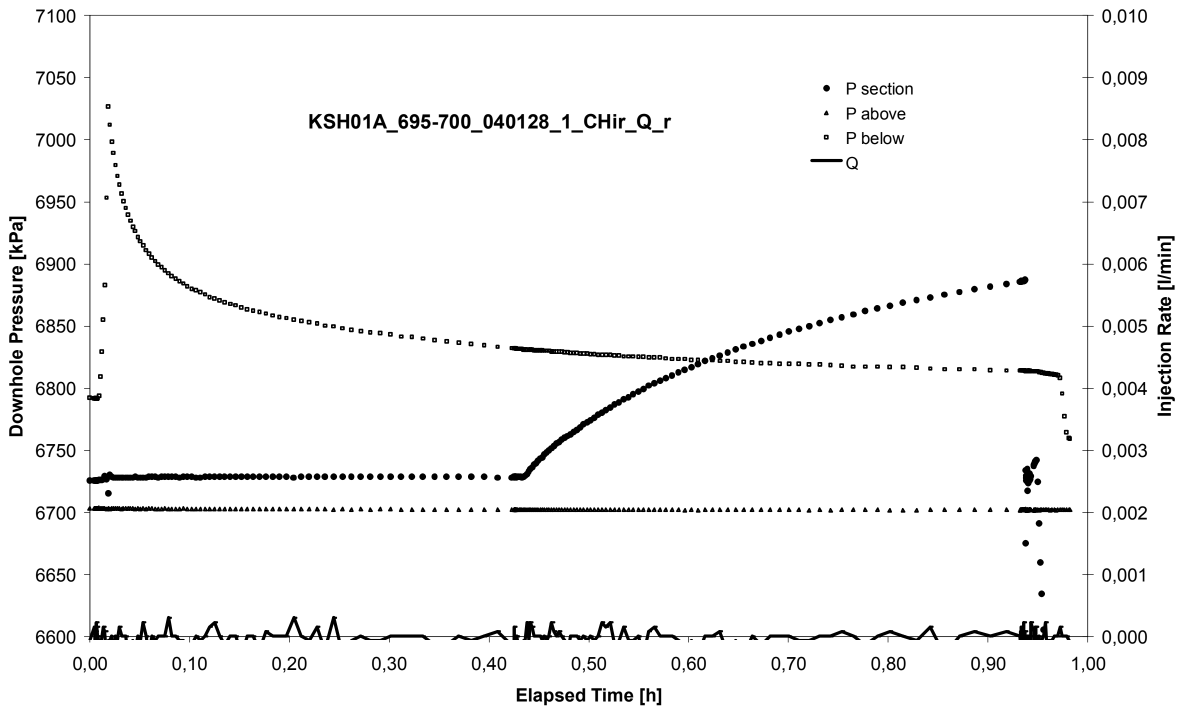
Not Analysed

CHIR phase; HORNER match

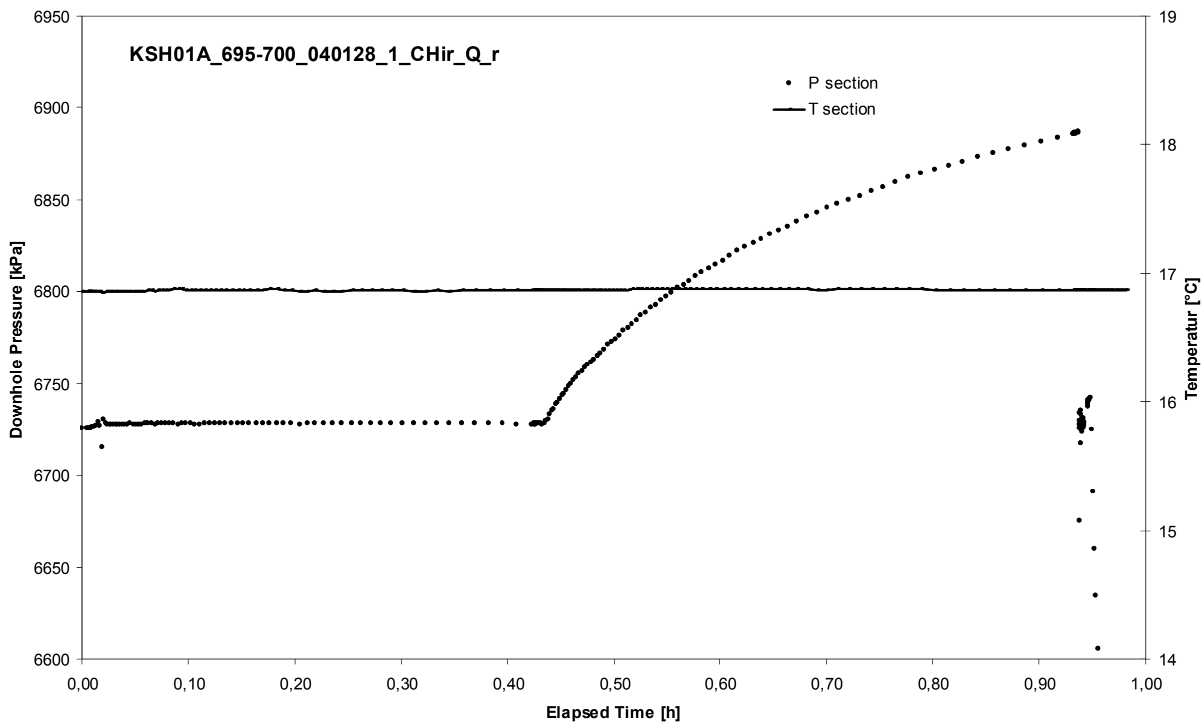
APPENDIX 2-135

Test 695 – 700 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

Not Analysed

CHIR phase; log-log match

Not Analysed

CHIR phase; HORNER match

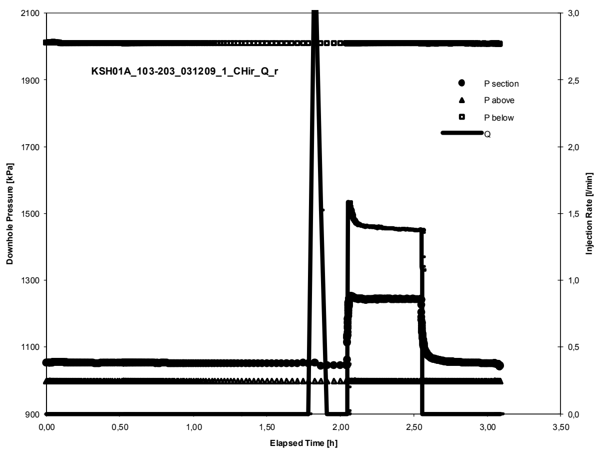
APPENDIX 3

Test Summary Sheets

Test Summary Sheet

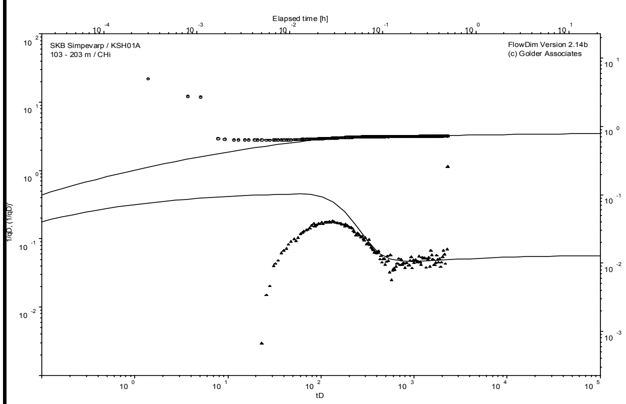
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031209 11:00
Test section from - to (m):	103 - 203 m	Responsible for test execution:	Nils Rahm
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

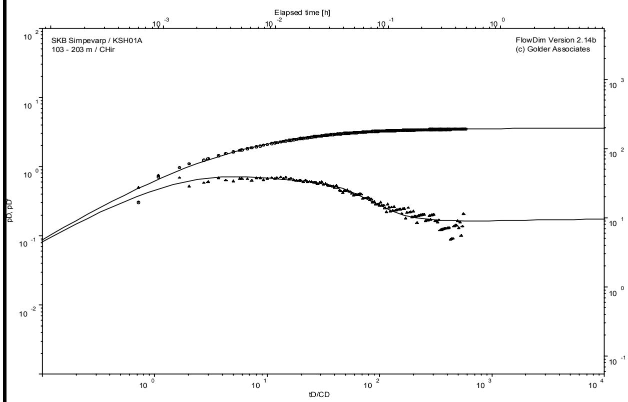


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1053		
p_i (kPa) =	1045		
p_p(kPa) =	1242	p_F (kPa) =	1051
Q_p (m^3/s)=	2,28E-05		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1,00E-04	S el S^* (-)=	1,00E-04
EC_w (mS/m)=			
$Temp_w$(gr C)=	8,9		
Derivative fact.=	0,23	Derivative fact.=	0,07
Results		**Results**	
Q/s (m^2/s)=	1,12E-06		
T_M (m^2/s)=	1,46E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	6,05	dt_1 (min) =	*
dt_2 (min) =	26,90	dt_2 (min) =	*
T (m^2/s) =	5,00E-06	T (m^2/s) =	1,84E-06
S (-) =	1,00E-04	S (-) =	1,00E-04
K_s (m/s) =	5,00E-08	K_s (m/s) =	1,84E-08
S_s (1/m) =	1,00E-06	S_s (1/m) =	1,00E-06
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,27E-09
C_D (-) =	NA	C_D (-) =	1,40E-03
ξ (-) =	-0,6	ξ (-) =	-0,5
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	6,05	C (m^3/Pa) =	1,27E-09
dt_2 (min) =	26,90	C_D (-) =	1,40E-03
T_T (m^2/s) =	5,00E-06	ξ (-) =	-0,6
S (-) =	1,00E-04		
K_s (m/s) =	5,00E-08		
S_s (1/m) =	1,00E-06		

Comments:

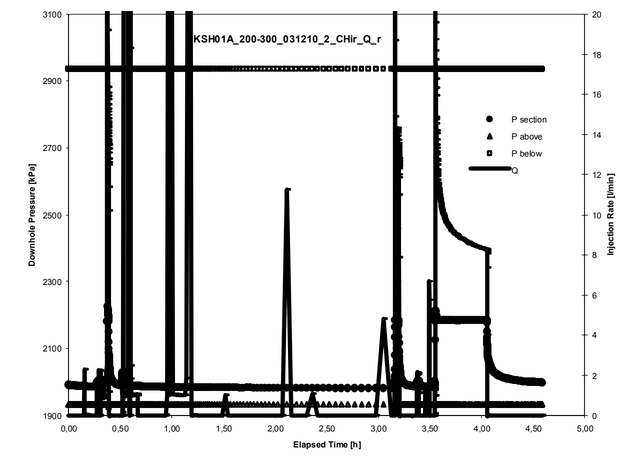
* : IARF not measured

The recommended transmissivity of 5.0E-6 m2/s was derived from the analysis of the CHi phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3.0E-6to 1.0E-5 m2/s (the inner zone composite transmissivity is regarded as a local skin effect). The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1046.2 kPa.

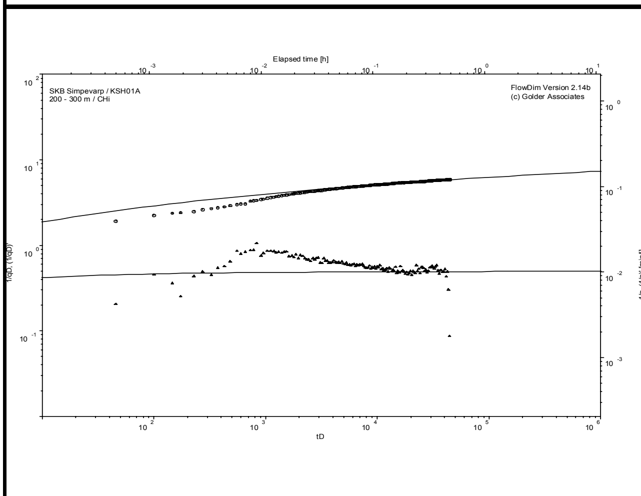
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	2
Borehole ID:	KSH01A	Test start:	031210 10:20
Test section from - to (m):	200 - 300 m	Responsible for test execution:	Nils Rahm
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

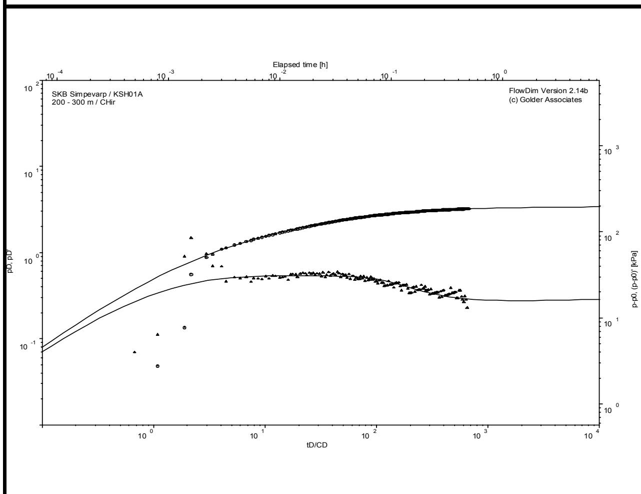
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	1982		
p_i (kPa) =	1985		
p_p(kPa) =	2184	p_F (kPa) =	1997
Q_p (m^3/s)=	1,37E-04		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	9,8		
Derivative fact.=	0,1	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	6,72E-06		
T_M (m^2/s)=	8,75E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	9,10	dt_1 (min) =	*
dt_2 (min) =	27,25	dt_2 (min) =	*
T (m^2/s) =	6,34E-06	T (m^2/s) =	7,15E-06
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	6,34E-08	K_s (m/s) =	7,15E-08
S_s (1/m) =	1,00E-08	S_s (1/m) =	1,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	7,14E-09
C_D (-) =	NA	C_D (-) =	7,87E-01
ξ (-) =	-2,6	ξ (-) =	-4,4
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	9,10	C (m^3/Pa) =	7,14E-09
dt_2 (min) =	27,25	C_D (-) =	7,87E-01
T_T (m^2/s) =	6,34E-06	ξ (-) =	-2,6
S (-) =	1,00E-06		
K_s (m/s) =	6,34E-08		
S_s (1/m) =	1,00E-08		

Comments:

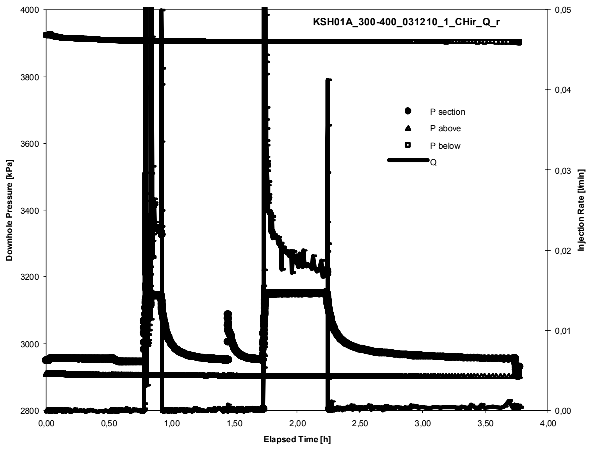
* : IARF not measured

The recommended transmissivity of 6.3E-6 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2.0E-6 to 1.0E-5 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1985.2 kPa.

Test Summary Sheet

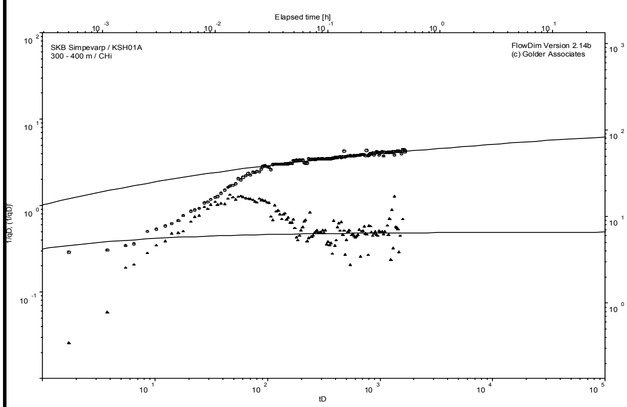
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031210 16:33
Test section from - to (m):	300 - 400 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

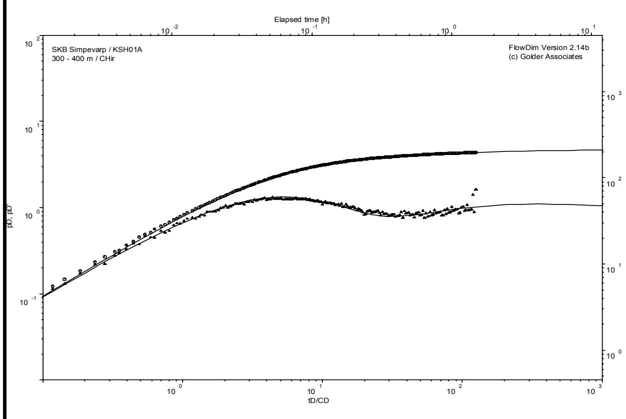


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2950		
p_i (kPa) =	2951		
p_p(kPa) =	3152	p_F (kPa) =	2954
Q_p (m^3/s)=	2,90E-07		
tp (s) =	1800	t_F (s) =	5400
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,3		
Derivative fact.=	0,29	Derivative fact.=	0,06
Results		**Results**	
Q/s (m^2/s)=	1,42E-08		
T_M (m^2/s)=	1,85E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	3,38	dt_1 (min) =	11,75
dt_2 (min) =	26,60	dt_2 (min) =	15,60
T (m^2/s) =	9,71E-09	T (m^2/s) =	6,61E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	9,71E-11	K_s (m/s) =	6,61E-11
S_s (1/m) =	1,00E-08	S_s (1/m) =	1,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3,44E-10
C_D (-) =	NA	C_D (-) =	3,79E-02
ξ (-) =	-1,0	ξ (-) =	-0,6
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	11,75	C (m^3/Pa) =	3,44E-10
dt_2 (min) =	15,60	C_D (-) =	3,79E-02
T_T (m^2/s) =	6,61E-09	ξ (-) =	-0,6
S (-) =	1,00E-06		
K_s (m/s) =	6,61E-11		
S_s (1/m) =	1,00E-08		

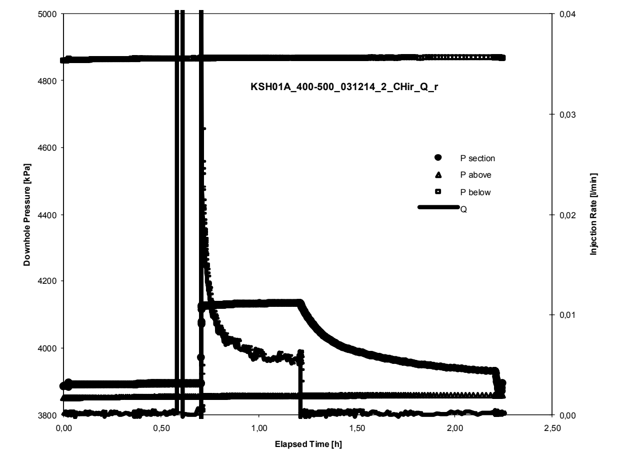
Comments:

The recommended transmissivity of 6.6E-9 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5.0E-9 to 2.0E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2943.2 kPa.

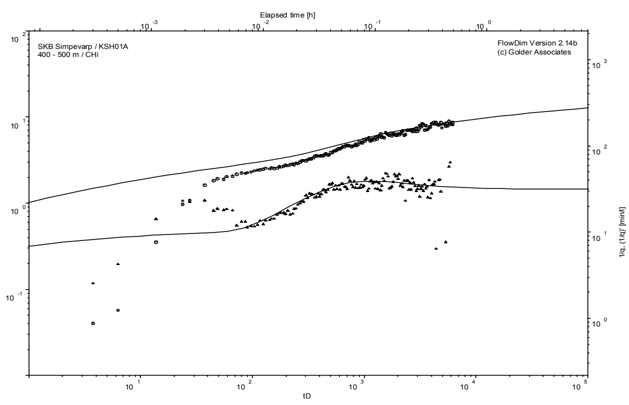
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	2
Borehole ID:	KSH01A	Test start:	031214 09:18
Test section from - to (m):	400 - 500 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

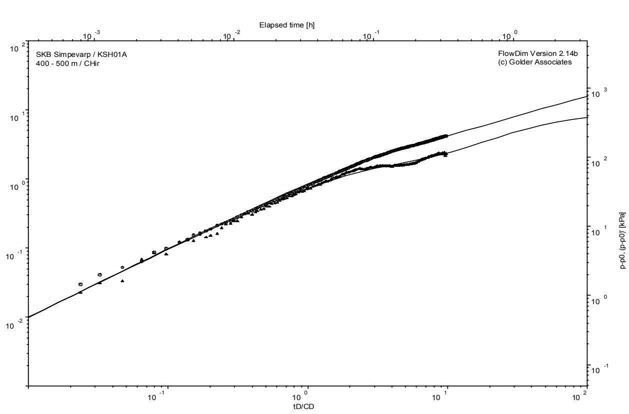
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3887		
p_i (kPa) =	3894		
p_p(kPa) =	4134	p_F (kPa) =	3930
Q_p (m^3/s)=	8,97E-08		
tp (s) =	1800	t_F (s) =	3600
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,7		
Derivative fact.=	0,32	Derivative fact.=	0,1
Results		**Results**	
Q/s (m^2/s)=	3,67E-09		
T_M (m^2/s)=	4,78E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2,42	dt_1 (min) =	*
dt_2 (min) =	22,76	dt_2 (min) =	*
T (m^2/s) =	1,70E-09	T (m^2/s) =	4,92E-10
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,70E-11	K_s (m/s) =	4,92E-12
S_s (1/m) =	1,00E-08	S_s (1/m) =	1,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3,84E-10
C_D (-) =	NA	C_D (-) =	4,23E-02
ξ (-) =	0	ξ (-) =	0,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	2,42	C (m^3/Pa) =	3,84E-10
dt_2 (min) =	22,76	C_D (-) =	4,23E-02
T_T (m^2/s) =	1,70E-09	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	1,70E-11		
S_s (1/m) =	1,00E-08		

Comments:

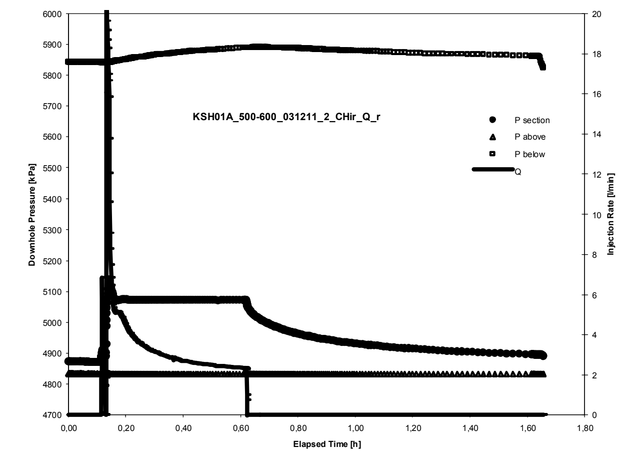
*: IARF not measured

The recommended transmissivity of 1.7E-9 m2/s was derived from the analysis of the CHi phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3.0E-10 to 6E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3883.7 kPa.

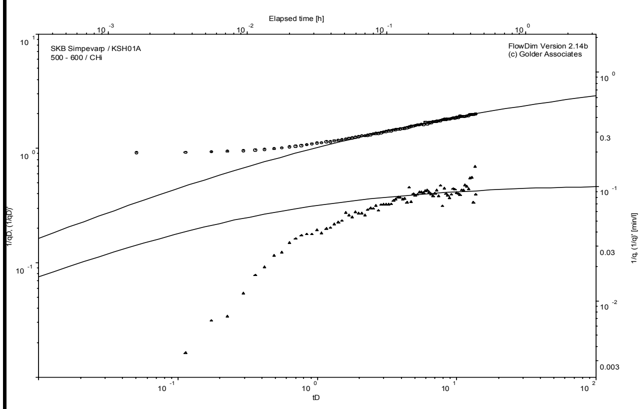
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	2
Borehole ID:	KSH01A	Test start:	031211 14:57
Test section from - to (m):	500 - 600 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

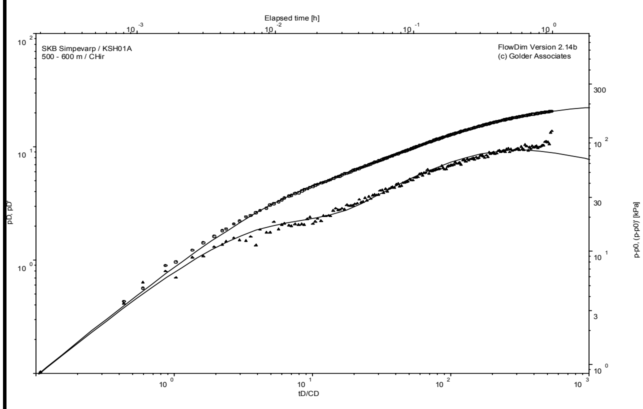
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4874		
p_i (kPa) =	4870		
p_p(kPa) =	5071	p_F (kPa) =	4895
Q_p (m^3/s)=	3,78E-05		
tp (s) =	1800	t_F (s) =	3600
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,0		
Derivative fact.=	0,11	Derivative fact.=	0,06
Results		**Results**	
Q/s (m^2/s)=	1,8E-06		
T_M (m^2/s)=	2,4E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	8,10	dt_1 (min) =	*
dt_2 (min) =	23,21	dt_2 (min) =	*
T (m^2/s) =	6,04E-07	T (m^2/s) =	1,03E-06
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	6,04E-09	K_s (m/s) =	1,03E-08
S_s (1/m) =	1,00E-08	S_s (1/m) =	1,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4,44E-08
C_D (-) =	NA	C_D (-) =	4,89E+00
ξ (-) =	-5,4	ξ (-) =	-0,8
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	4,44E-08
dt_2 (min) =	*	C_D (-) =	4,89E+00
T_T (m^2/s) =	1,03E-06	ξ (-) =	-0,8
S (-) =	1,00E-06		
K_s (m/s) =	1,03E-08		
S_s (1/m) =	1,00E-08		

Comments:

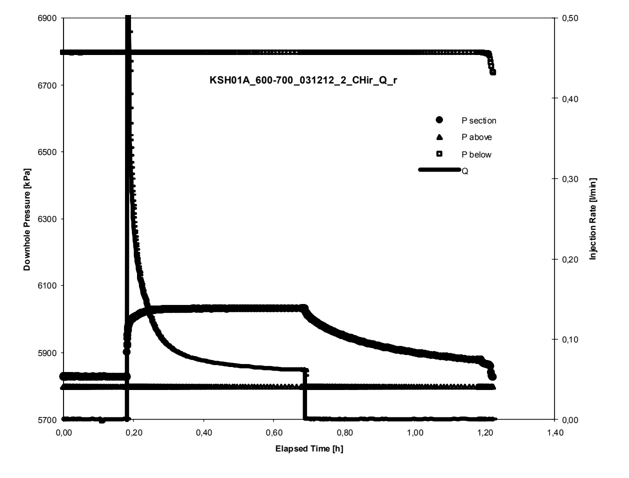
*: IARF not measured

The recommended transmissivity of 1.0E-6 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 4E-7 to 2E-5 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4861.6 kPa.

Test Summary Sheet

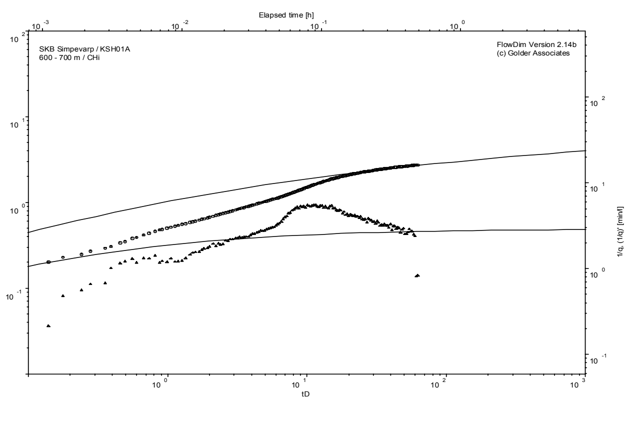
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	2
Borehole ID:	KSH01A	Test start:	031212 07:06
Test section from - to (m):	600 - 700 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

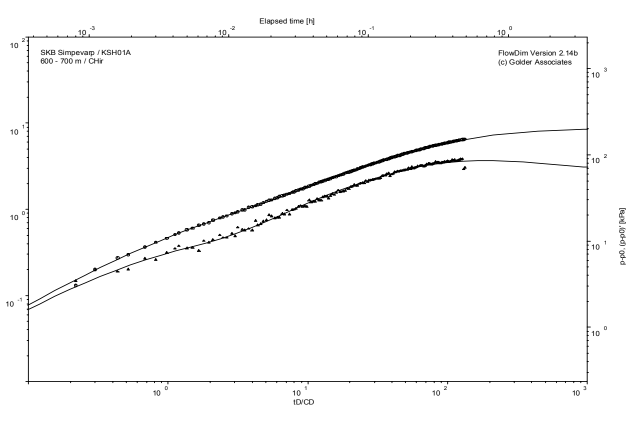


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5841		
p_i (kPa) =	5828		
p_p(kPa) =	6031	p_F (kPa) =	5878
Q_p (m^3/s)=	1,00E-06		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,5		
Derivative fact.=	0,03	Derivative fact.=	0,06
Results		**Results**	
Q/s (m^2/s)=	4,8E-08		
T_M (m^2/s)=	6,3E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	2,19E-08	T (m^2/s) =	2,03E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,19E-10	K_s (m/s) =	2,03E-10
S_s (1/m) =	1,00E-08	S_s (1/m) =	1,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	8,95E-10
C_D (-) =	NA	C_D (-) =	9,86E-02
ξ (-) =	-3,0	ξ (-) =	-3,3
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	8,95E-10
dt_2 (min) =	*	C_D (-) =	9,86E-02
T_T (m^2/s) =	2,0E-08	ξ (-) =	-3,3
S (-) =	1,0E-06		
K_s (m/s) =	2,0E-10		
S_s (1/m) =	1,0E-08		

Comments:

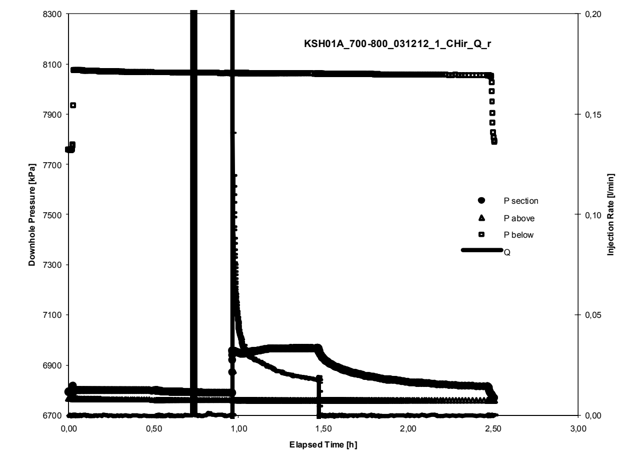
*: IARF not measured

The recommended transmissivity of 2.0E-8 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E-8 to 6E-7 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5818.2 kPa.

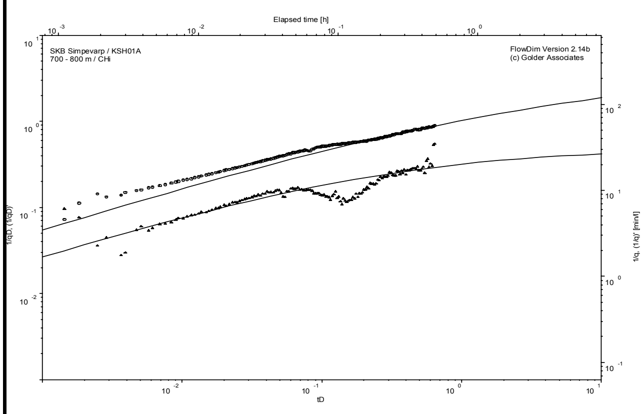
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031212 10:02
Test section from - to (m):	700 - 800 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

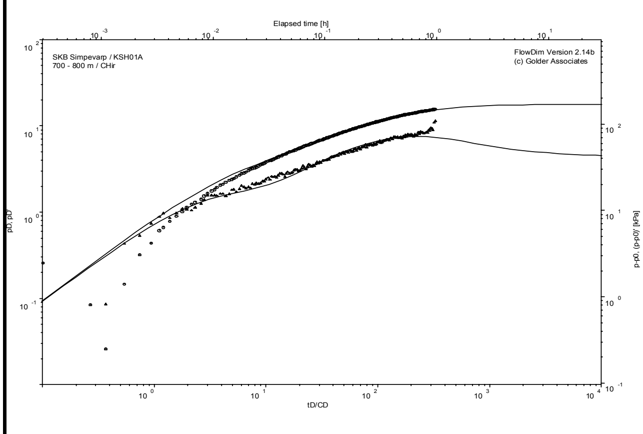
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6793		
p_i (kPa) =	6788		
p_p(kPa) =	6966	p_F (kPa) =	6813
Q_p (m^3/s)=	2,92E-07		
tp (s) =	1800	t_F (s) =	3600
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	17,0		
Derivative fact.=	0,18	Derivative fact.=	0,07
Results		**Results**	
Q/s (m^2/s)=	1,6E-08		
T_M (m^2/s)=	2,1E-08		
Flow regime:	IARF	Flow regime:	IARF
dt_1 (min) =	14,36	dt_1 (min) =	*
dt_2 (min) =	28,23	dt_2 (min) =	*
T (m^2/s) =	2,32E-09	T (m^2/s) =	8,72E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,32E-11	K_s (m/s) =	8,72E-11
S_s (1/m) =	1,00E-08	S_s (1/m) =	1,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5,18E-10
C_D (-) =	NA	C_D (-) =	5,71E-02
ξ (-) =	-4,2	ξ (-) =	0,3
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	5,18E-10
dt_2 (min) =	*	C_D (-) =	5,71E-02
T_T (m^2/s) =	8,7E-09	ξ (-) =	0,3
S (-) =	1,0E-06		
K_s (m/s) =	8,7E-11		
S_s (1/m) =	1,0E-08		

Comments:

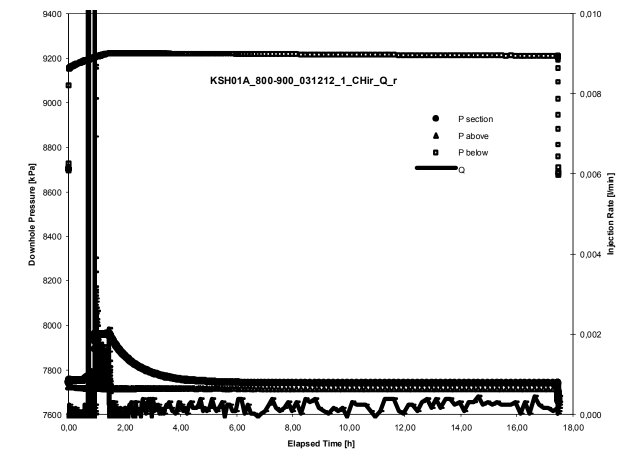
*: IARF not measured

The recommended transmissivity of 8.7E-9 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2E-9 to 8E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6790.7 kPa.

Test Summary Sheet

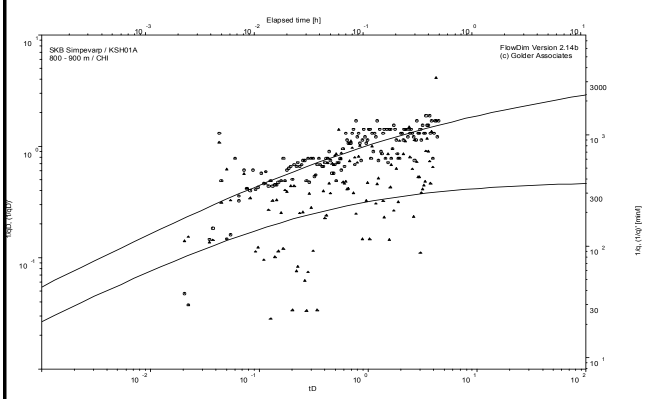
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031212 13:59
Test section from - to (m):	800 - 900 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

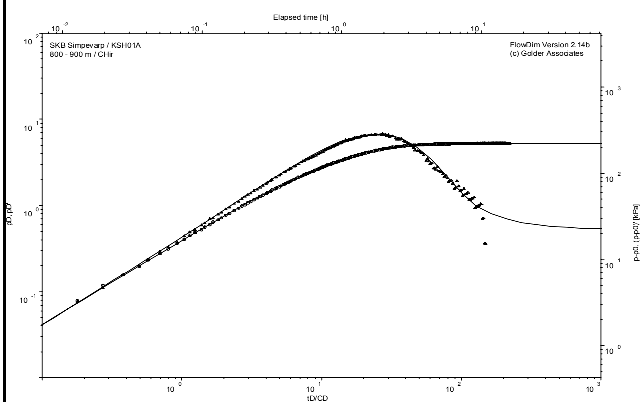


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	7746		
p_i (kPa) =	7780		
p_p(kPa) =	7962	p_F (kPa) =	7741
Q_p (m^3/s)=	1,45E-08		
tp (s) =	1800	t_F (s) =	57600
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	18,5		
Derivative fact.=	0,15	Derivative fact.=	0,17
Results		**Results**	
Q/s (m^2/s)=	7,8E-10		
T_M (m^2/s)=	1,0E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	2,17E-10	T (m^2/s) =	9,40E-10
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,17E-12	K_s (m/s) =	9,40E-12
S_s (1/m) =	1,00E-08	S_s (1/m) =	1,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,55E-10
C_D (-) =	NA	C_D (-) =	1,71E-02
ξ (-) =	-2,1	ξ (-) =	9,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	1,55E-10
dt_2 (min) =	*	C_D (-) =	1,71E-02
T_T (m^2/s) =	9,40E-10	ξ (-) =	9,1
S (-) =	1,00E-06		
K_s (m/s) =	9,40E-12		
S_s (1/m) =	1,00E-08		

Comments:

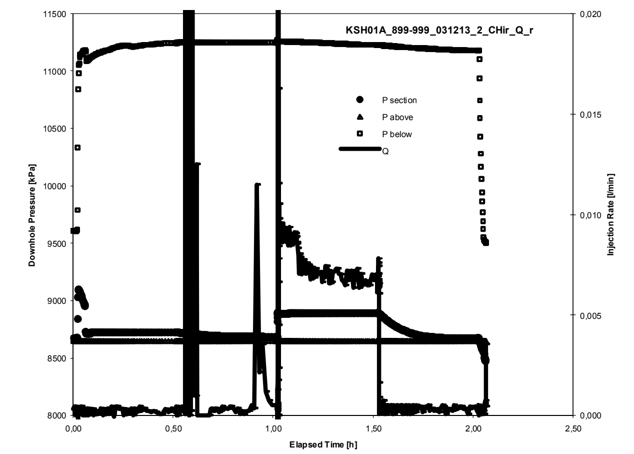
*: IARF not measured

The recommended transmissivity of 9.4E-10 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-10 to 3.0E-9 m2/s. Due to the low transmissivity of the test section the flow dimension could not be diagnosed. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 7737.7 kPa.

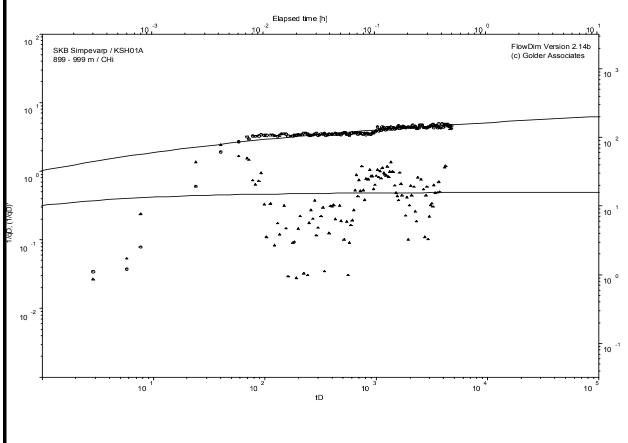
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	2
Borehole ID:	KSH01A	Test start:	031213 13:28
Test section from - to (m):	899 - 999 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

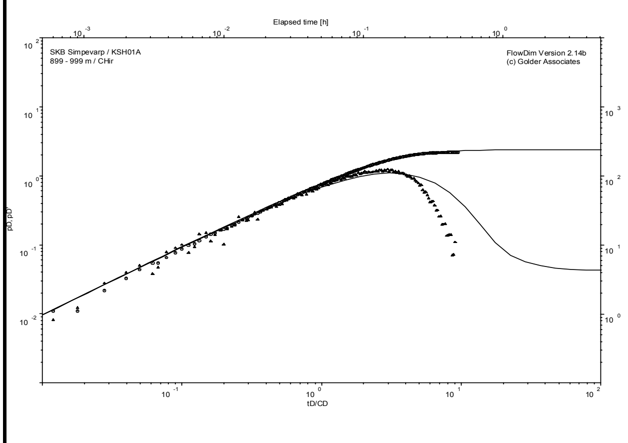
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	8668		
p_i (kPa) =	8682		
p_p(kPa) =	8890	p_F (kPa) =	8670
Q_p (m^3/s)=	1,12E-07		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	20,0		
Derivative fact.=	0,19	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	5,3E-09		
T_M (m^2/s)=	6,9E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	4,52	dt_1 (min) =	*
dt_2 (min) =	23,33	dt_2 (min) =	*
T (m^2/s) =	3,9E-09	T (m^2/s) =	3,01E-08
S (-) =	1,0E-06	S (-) =	1,00E-06
K_s (m/s) =	3,9E-11	K_s (m/s) =	3,01E-10
S_s (1/m) =	1,0E-08	S_s (1/m) =	1,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,79E-10
C_D (-) =	NA	C_D (-) =	3,08E-02
ξ (-) =	0	ξ (-) =	-0,5
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	4,52	C (m^3/Pa) =	2,79E-10
dt_2 (min) =	23,33	C_D (-) =	3,08E-02
T_T (m^2/s) =	3,9E-09	ξ (-) =	0
S (-) =	1,0E-06		
K_s (m/s) =	3,9E-11		
S_s (1/m) =	1,0E-08		

Comments:

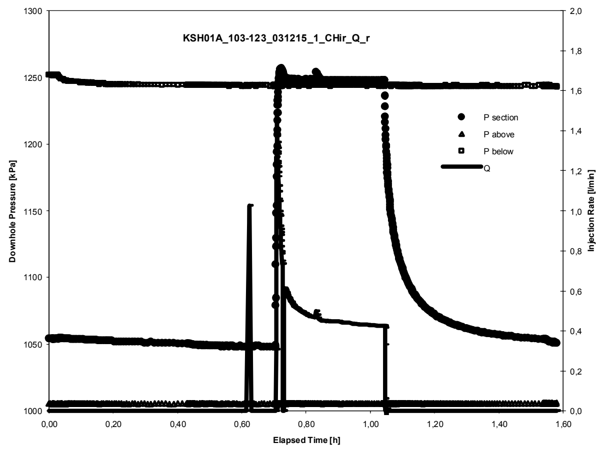
*: IARF not measured

The recommended transmissivity of 3.9E-9 m2/s was derived from the analysis of the CHi phase, which although noisy, shows a flat derivative at late times. The confidence range for the interval transmissivity is estimated to be 1E-9 to 5E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 8659.8 kPa.

Test Summary Sheet

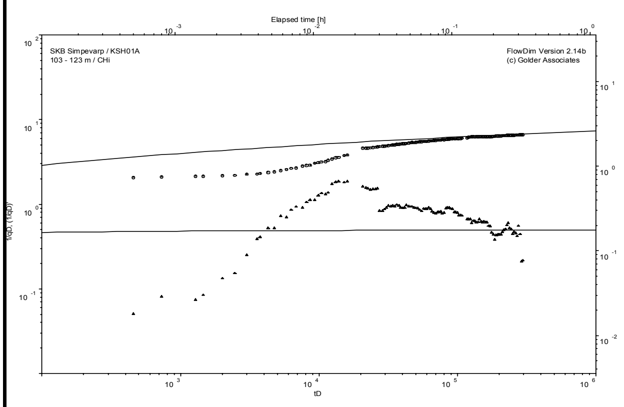
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031215 11:03
Test section from - to (m):	103 - 123 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

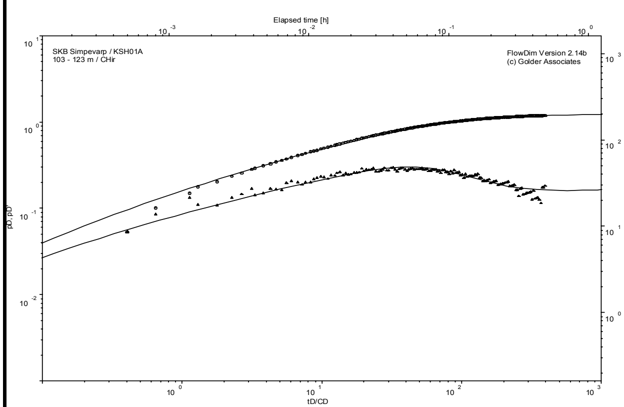


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1054		
p_i (kPa) =	1048		
p_p(kPa) =	1248	p_F (kPa) =	1054
Q_p (m^3/s)=	6,94E-06		
tp (s) =	1200	t_F (s) =	1800
S el S^* (-)=	1,00E-04	S el S^* (-)=	1,00E-04
EC_w (mS/m)=			
$Temp_w$(gr C)=	8,8		
Derivative fact.=	0,16	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	3,40E-07		
T_M (m^2/s)=	3,56E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	11,62	dt_1 (min) =	21,52
dt_2 (min) =	18,60	dt_2 (min) =	29,42
T (m^2/s) =	3,67E-07	T (m^2/s) =	2,03E-07
S (-) =	1,00E-04	S (-) =	1,00E-04
K_s (m/s) =	1,84E-08	K_s (m/s) =	1,02E-08
S_s (1/m) =	5,00E-06	S_s (1/m) =	5,00E-06
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,29E-10
C_D (-) =	NA	C_D (-) =	2,52E-04
ξ (-) =	2,3	ξ (-) =	-2,2
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	2,15E+01	C (m^3/Pa) =	2,29E-10
dt_2 (min) =	2,94E+01	C_D (-) =	2,52E-04
T_T (m^2/s) =	2,03E-07	ξ (-) =	-2,2
S (-) =	1,00E-04		
K_s (m/s) =	1,02E-08		
S_s (1/m) =	5,00E-06		

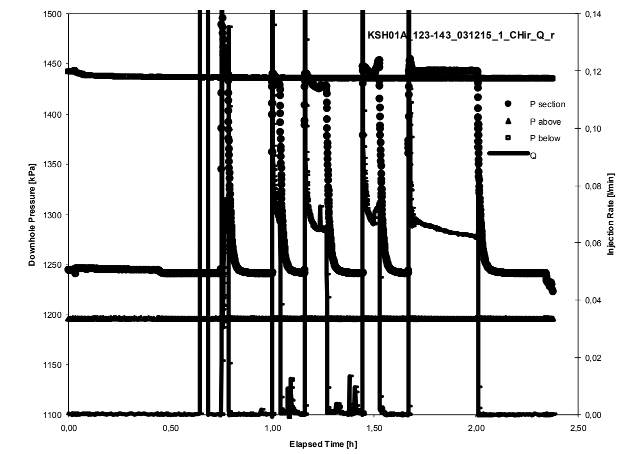
Comments:

The recommended transmissivity of 2.0E-7 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E-8 to 5E-7 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 1040.4 kPa.

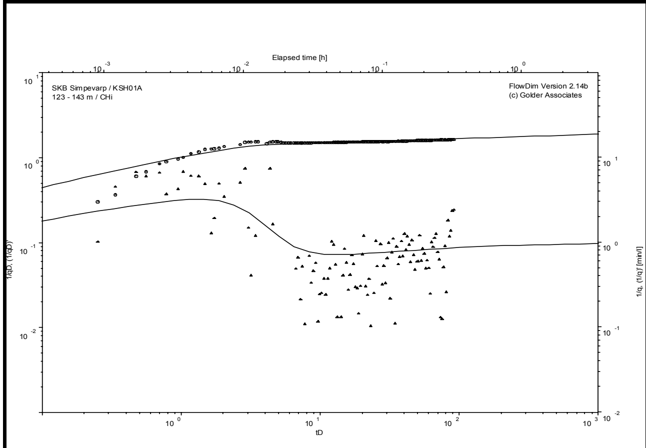
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031215 13:10
Test section from - to (m):	123 - 143 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

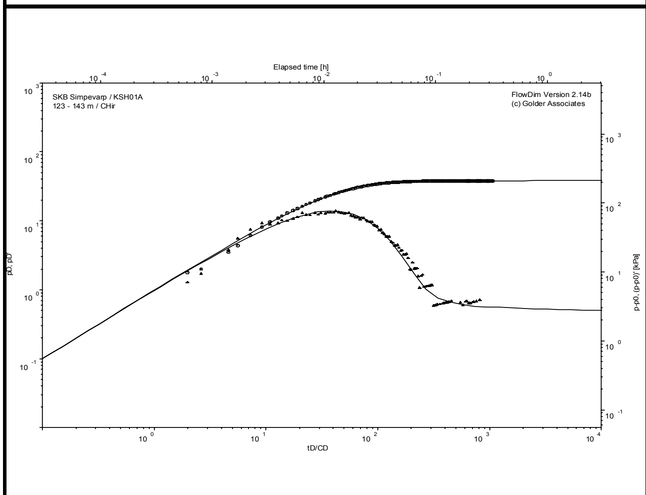
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	1245		
p_i (kPa) =	1241		
p_p(kPa) =	1441	p_F (kPa) =	1240
Q_p (m^3/s)=	1,03E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-04	S el S^* (-)=	1,00E-04
EC_w (mS/m)=			
$Temp_w$(gr C)=	9,1		
Derivative fact.=	0,02	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	5,05E-08		
T_M (m^2/s)=	5,28E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1,80	dt_1 (min) =	*
dt_2 (min) =	18,00	dt_2 (min) =	*
T (m^2/s) =	6,60E-08	T (m^2/s) =	3,15E-07
S (-) =	1,00E-04	S (-) =	1,00E-04
K_s (m/s) =	3,30E-09	K_s (m/s) =	1,58E-08
S_s (1/m) =	5,00E-06	S_s (1/m) =	5,00E-06
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,20E-10
C_D (-) =	NA	C_D (-) =	2,42E-04
ξ (-) =	-0,08	ξ (-) =	34,2
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	2,20E-10
dt_2 (min) =	*	C_D (-) =	2,42E-04
T_T (m^2/s) =	3,15E-07	ξ (-) =	34,2
S (-) =	1,00E-04		
K_s (m/s) =	1,58E-08		
S_s (1/m) =	5,00E-06		

Comments:

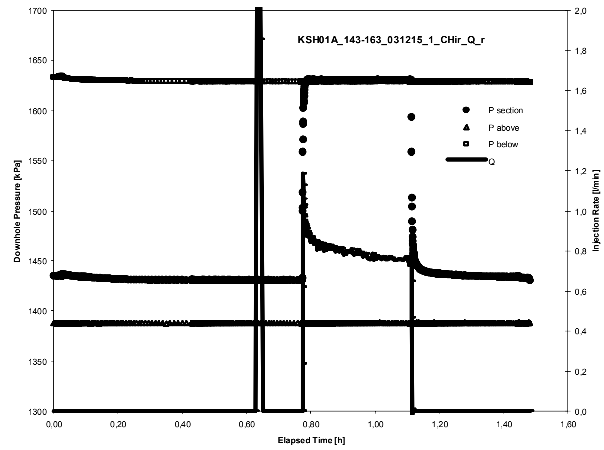
*: IARF not measured

The recommended transmissivity of 6.6E-8 m2/s was derived from the analysis of the CHi phase (outer zone), which although noisy, shows a flat derivative at late times . The confidence range for the interval transmissivity is estimated to be 1E-8 to 3E-7 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1239.5 kPa.

Test Summary Sheet

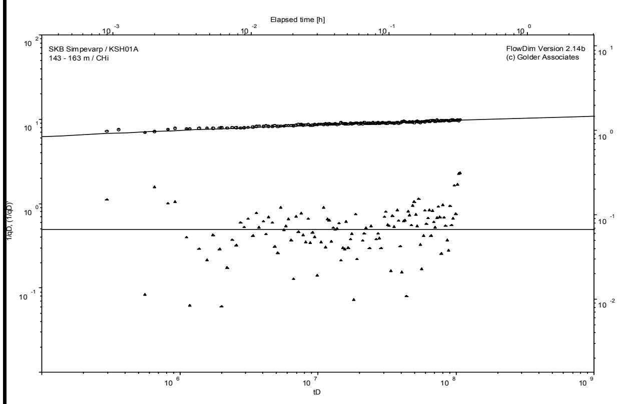
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031215 16:09
Test section from - to (m):	143 - 163 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

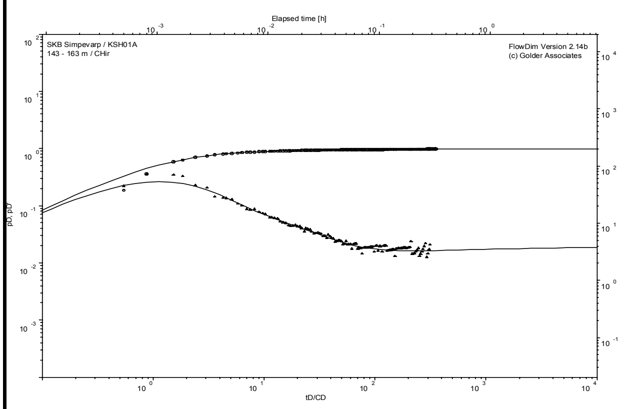


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1435		
p_i (kPa) =	1430		
p_p(kPa) =	1630	p_F (kPa) =	1432
Q_p (m^3/s)=	1,28E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	9,4		
Derivative fact.=	0,12	Derivative fact.=	0,19
Results		**Results**	
Q/s (m^2/s)=	6,27E-07		
T_M (m^2/s)=	6,56E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,53	dt_1 (min) =	2,54
dt_2 (min) =	16,99	dt_2 (min) =	9,08
T (m^2/s) =	9,58E-07	T (m^2/s) =	2,69E-06
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	4,79E-08	K_s (m/s) =	1,35E-07
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,17E-10
C_D (-) =	NA	C_D (-) =	2,39E-02
ξ (-) =	2,5	ξ (-) =	-1,8
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	0,53	C (m^3/Pa) =	2,17E-10
dt_2 (min) =	16,99	C_D (-) =	2,39E-02
T_T (m^2/s) =	9,58E-07	ξ (-) =	2,5
S (-) =	1,00E-06		
K_s (m/s) =	4,79E-08		
S_s (1/m) =	5,00E-08		

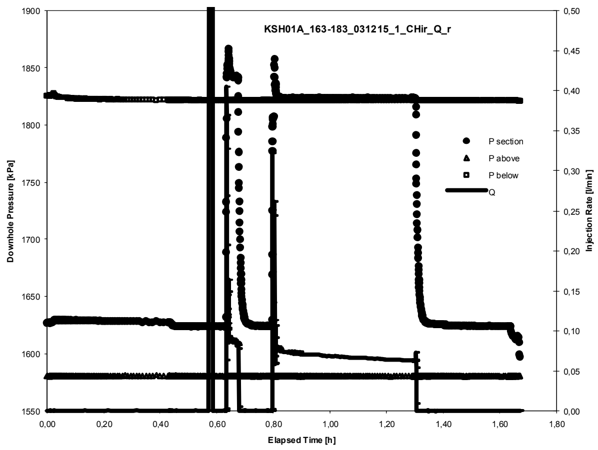
Comments:

The recommended transmissivity of 9.6E-7 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. It should be noted, that the results of both test phases can not be compared directly, because different flow dimensions were used. The confidence range for the interval transmissivity is estimated to be 4E-7 to 2E-6 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1431.3 kPa.

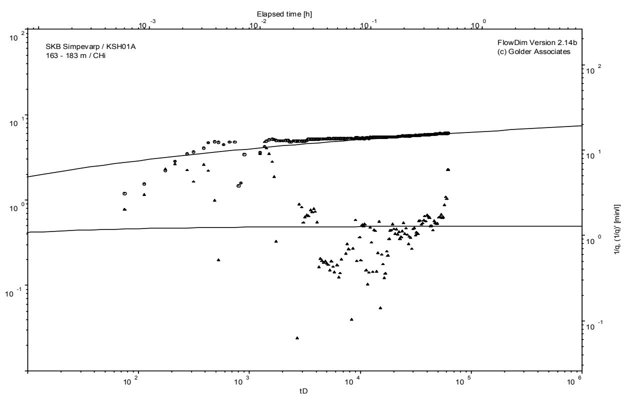
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031215 18:09
Test section from - to (m):	163 - 183 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

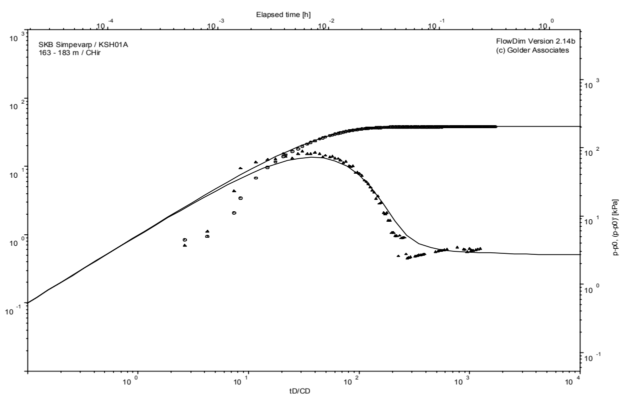
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	1628		
p_i (kPa) =	1624		
p_p(kPa) =	1823	p_F (kPa) =	1623
Q_p (m^3/s)=	1,06E-06		
tp (s) =	1800	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	9,6		
Derivative fact.=	0,08	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	5,20E-08		
T_M (m^2/s)=	5,44E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	5,14	dt_1 (min) =	*
dt_2 (min) =	21,17	dt_2 (min) =	*
T (m^2/s) =	5,02E-08	T (m^2/s) =	3,41E-07
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,51E-09	K_s (m/s) =	1,71E-08
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,49E-10
C_D (-) =	NA	C_D (-) =	1,64E-02
ξ (-) =	0	ξ (-) =	32,0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	5,14	C (m^3/Pa) =	1,49E-10
dt_2 (min) =	21,17	C_D (-) =	1,64E-02
T_T (m^2/s) =	5,02E-08	ξ (-) =	32
S (-) =	1,00E-06		
K_s (m/s) =	2,51E-09		
S_s (1/m) =	5,00E-08		

Comments:

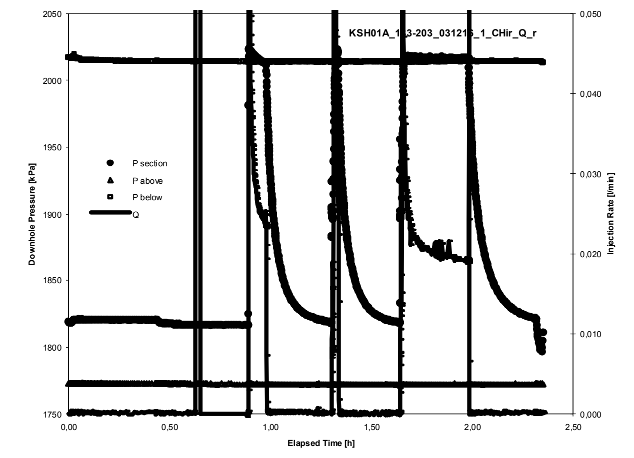
*: IARF not measured

The recommended transmissivity of 5.0E-8 m2/s was derived from the analysis of the CHi phase, which although noisy, shows the more reliable data and derivative. The confidence range for the interval transmissivity is estimated to be 4E-8 to 4E-7 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1623.1 kPa.

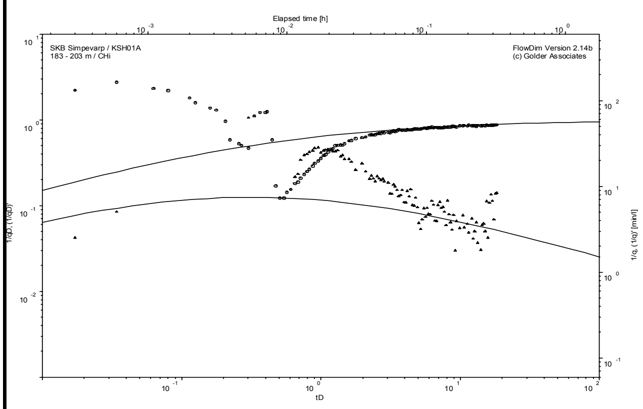
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031216 08:19
Test section from - to (m):	183 - 203 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

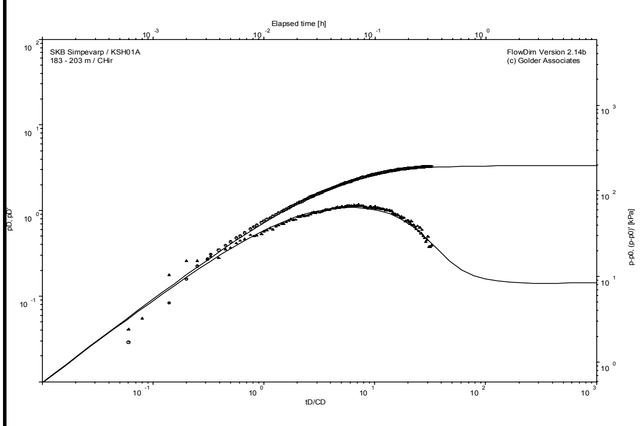
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	1819		
p_i (kPa) =	1819		
p_p(kPa) =	2017	p_F (kPa) =	1821
Q_p (m^3/s)=	3,19E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	9,9		
Derivative fact.=	0,16	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	1,58E-08		
T_M (m^2/s)=	1,65E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	11,62	dt_1 (min) =	*
dt_2 (min) =	18,60	dt_2 (min) =	*
T (m^2/s) =	1,09E-09	T (m^2/s) =	1,01E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	5,45E-11	K_s (m/s) =	5,05E-10
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,32E-10
C_D (-) =	NA	C_D (-) =	2,56E-02
ξ (-) =	-1,9	ξ (-) =	-1,2
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	2,32E-10
dt_2 (min) =	*	C_D (-) =	2,56E-02
T_T (m^2/s) =	1,01E-08	ξ (-) =	-1,2
S (-) =	1,00E-06		
K_s (m/s) =	5,05E-10		
S_s (1/m) =	5,00E-08		

Comments:

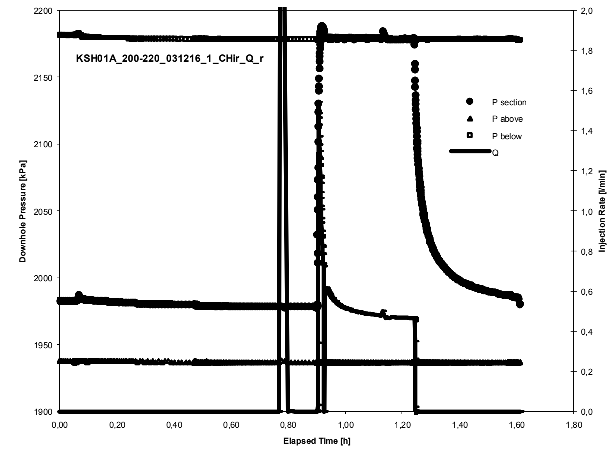
*: IARF not measured

The recommended transmissivity of 3.4E-8 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality, although no infinite acting radial flow was measured The confidence range for the interval transmissivity is estimated to be 8E-9 to 6E-8 m2/s. The flow dimension displayed during the test is not unambiguous. The static pressure measured at transducer depth was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 1817.0 kPa

Test Summary Sheet

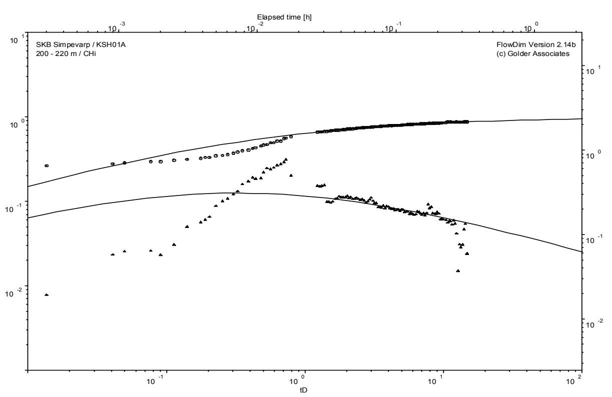
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031216 11:13
Test section from - to (m):	200 - 220 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

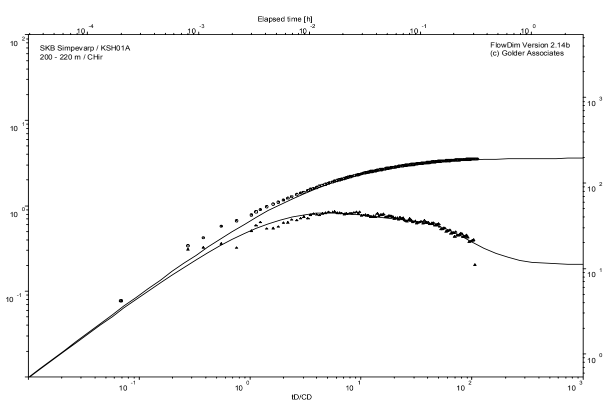


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1982		
p_i (kPa) =	1979		
p_p(kPa) =	2179	p_F (kPa) =	1987
Q_p (m^3/s)=	6,94E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	10,0		
Derivative fact.=	0,13	Derivative fact.=	0,06
Results		**Results**	
Q/s (m^2/s)=	3,40E-07		
T_M (m^2/s)=	3,56E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1,97	dt_1 (min) =	*
dt_2 (min) =	16,07	dt_2 (min) =	*
T (m^2/s) =	2,64E-08	T (m^2/s) =	5,73E-07
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,32E-09	K_s (m/s) =	2,87E-08
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,71E-09
C_D (-) =	NA	C_D (-) =	1,88E-01
ξ (-) =	-3,6	ξ (-) =	-2,7
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	1,71E-09
dt_2 (min) =	*	C_D (-) =	1,88E-01
T_T (m^2/s) =	5,73E-07	ξ (-) =	-2,7
S (-) =	1,00E-06		
K_s (m/s) =	2,87E-08		
S_s (1/m) =	5,00E-08		

Comments:

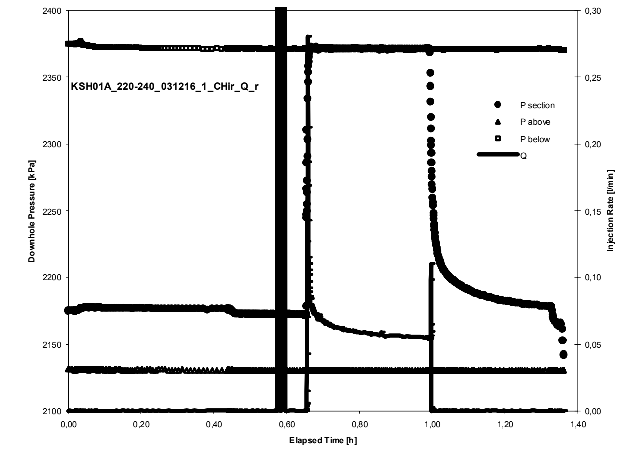
*: IARF not measured

The recommended transmissivity of 5.7E-7 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E-7 to 9E-7 m2/s. The flow dimension displayed during the test is not unambiguous. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1978.6 kPa.

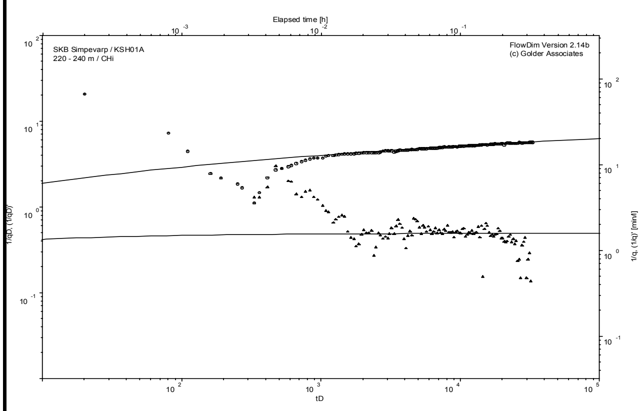
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031216 13:37
Test section from - to (m):	220 - 240 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

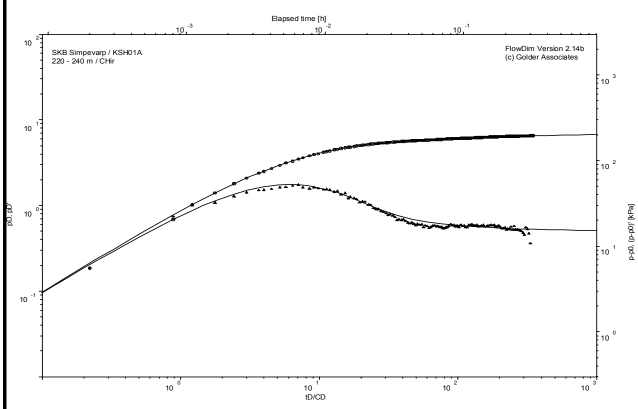
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2175		
p_i (kPa) =	2172		
p_p(kPa) =	2371	p_F (kPa) =	2178
Q_p (m^3/s)=	9,10E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	10,3		
Derivative fact.=	0,14	Derivative fact.=	0,19
Results		**Results**	
Q/s (m^2/s)=	4,49E-08		
T_M (m^2/s)=	4,69E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,93	dt_1 (min) =	3,26
dt_2 (min) =	13,61	dt_2 (min) =	16,01
T (m^2/s) =	4,04E-08	T (m^2/s) =	5,37E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,02E-09	K_s (m/s) =	2,69E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,12E-10
C_D (-) =	NA	C_D (-) =	1,23E-02
ξ (-) =	0	ξ (-) =	1,2
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	0,93	C (m^3/Pa) =	1,12E-10
dt_2 (min) =	13,61	C_D (-) =	1,23E-02
T_T (m^2/s) =	4,04E-08	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	2,02E-09		
S_s (1/m) =	5,00E-08		

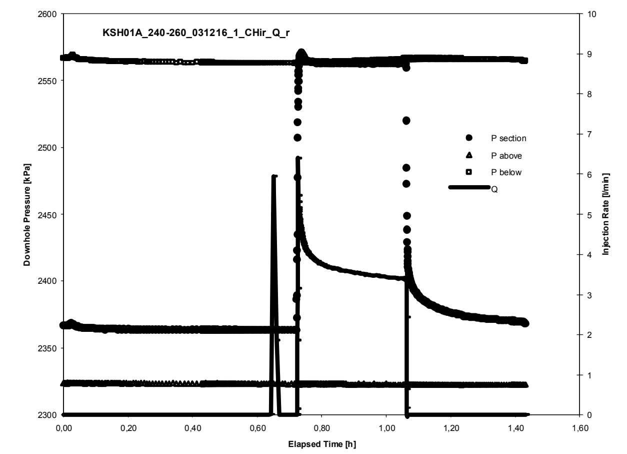
Comments:

The recommended transmissivity of 4.0E-8 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2E-8 to 7E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2166.7 kPa.

Test Summary Sheet

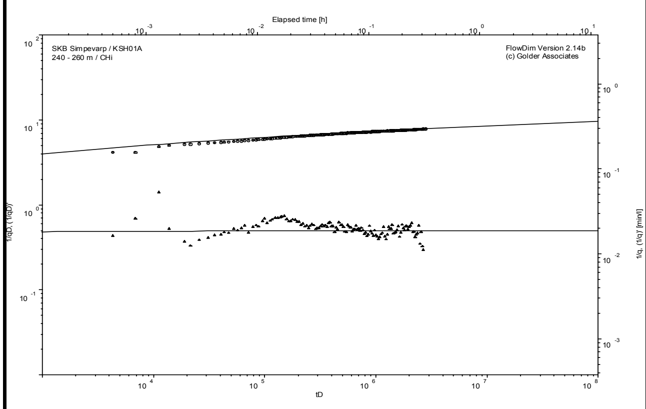
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031216 15:34
Test section from - to (m):	240 - 260 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

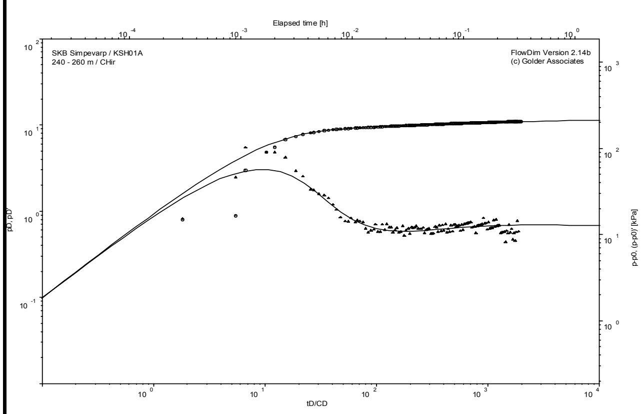


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2367		
p_i (kPa) =	2363		
p_p(kPa) =	2562	p_F (kPa) =	2369
Q_p (m^3/s)=	5,61E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	10,5		
Derivative fact.=	0,1	Derivative fact.=	0,07
Results		**Results**	
Q/s (m^2/s)=	2,77E-06		
T_M (m^2/s)=	2,90E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1,66	dt_1 (min) =	1,39
dt_2 (min) =	17,77	dt_2 (min) =	17,74
T (m^2/s) =	3,46E-06	T (m^2/s) =	5,18E-06
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,73E-07	K_s (m/s) =	2,59E-07
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,97E-09
C_D (-) =	NA	C_D (-) =	2,17E-01
ξ (-) =	0	ξ (-) =	3,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	1,39	C (m^3/Pa) =	1,97E-09
dt_2 (min) =	17,74	C_D (-) =	2,17E-01
T_T (m^2/s) =	5,18E-06	ξ (-) =	3,1
S (-) =	1,00E-06		
K_s (m/s) =	2,59E-07		
S_s (1/m) =	5,00E-08		

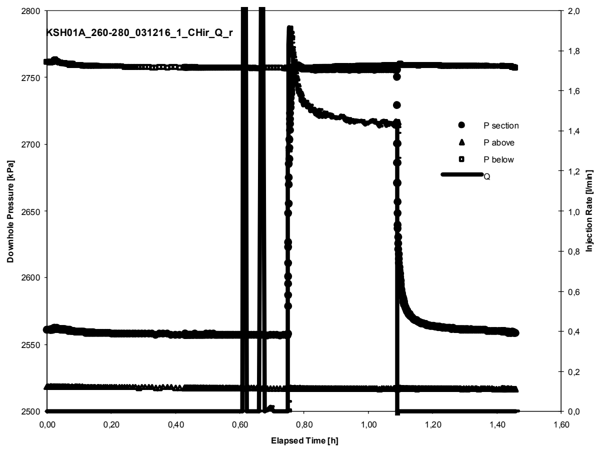
Comments:

The recommended transmissivity of 3.5E-6 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E-6 to 6E-6 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2361.8 kPa.

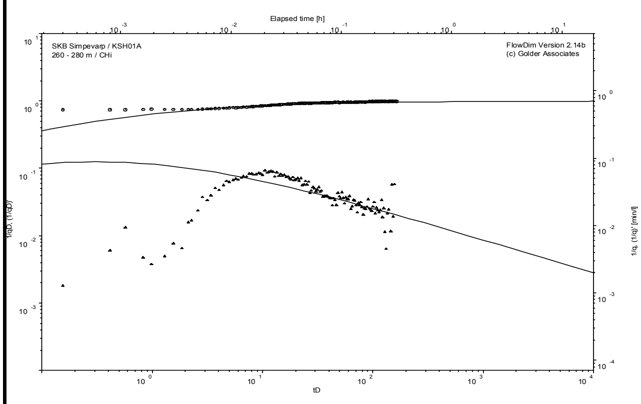
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031216 17:29
Test section from - to (m):	260 - 280 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

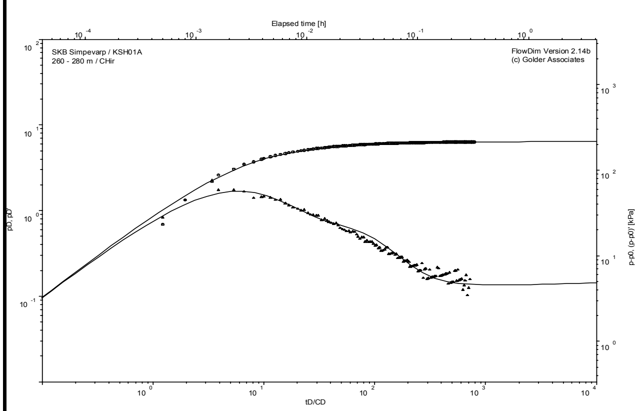
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2561		
p_i (kPa) =	2558		
p_p(kPa) =	2756	p_F (kPa) =	2559
Q_p (m^3/s)=	2,40E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	10,8		
Derivative fact.=	0,27	Derivative fact.=	0,11
Results		**Results**	
Q/s (m^2/s)=	1,19E-06		
T_M (m^2/s)=	1,24E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	4,46	dt_1 (min) =	12,53
dt_2 (min) =	17,73	dt_2 (min) =	17,28
T (m^2/s) =	9,22E-08	T (m^2/s) =	3,88E-06
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	4,61E-09	K_s (m/s) =	1,94E-07
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,09E-09
C_D (-) =	NA	C_D (-) =	1,20E-01
ξ (-) =	-3,0	ξ (-) =	-0,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	12,53	C (m^3/Pa) =	1,09E-09
dt_2 (min) =	17,28	C_D (-) =	1,20E-01
T_T (m^2/s) =	3,88E-06	ξ (-) =	-0,1
S (-) =	1,00E-06		
K_s (m/s) =	1,94E-07		
S_s (1/m) =	5,00E-08		

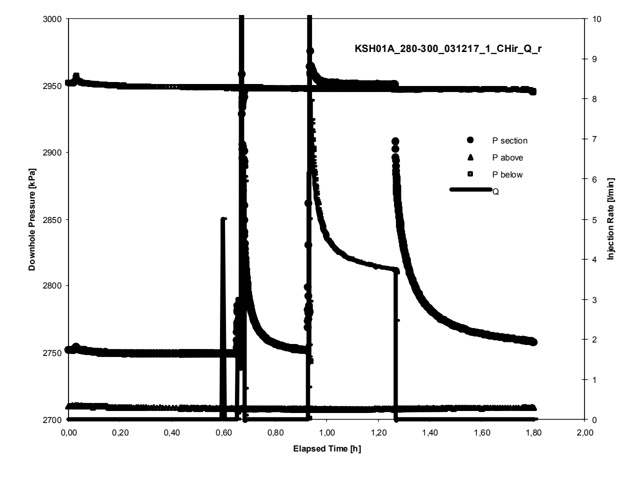
Comments:

The recommended transmissivity of 3.9E-6 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E-6 to 5E-6 m2/s. The flow dimension displayed during the test is not unambiguous. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2556.7 kPa.

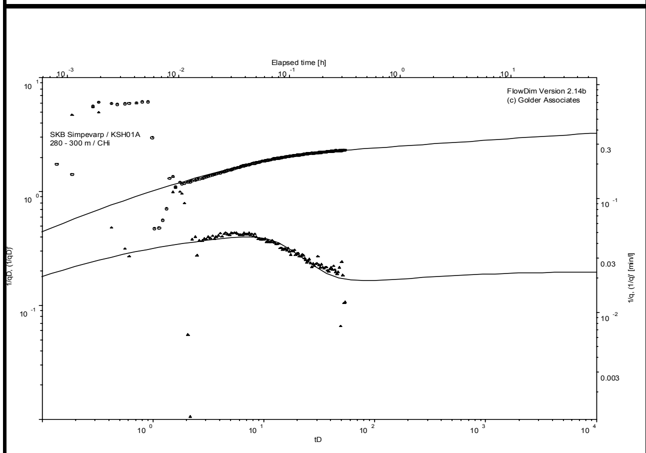
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031217 08:16
Test section from - to (m):	280 - 300 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

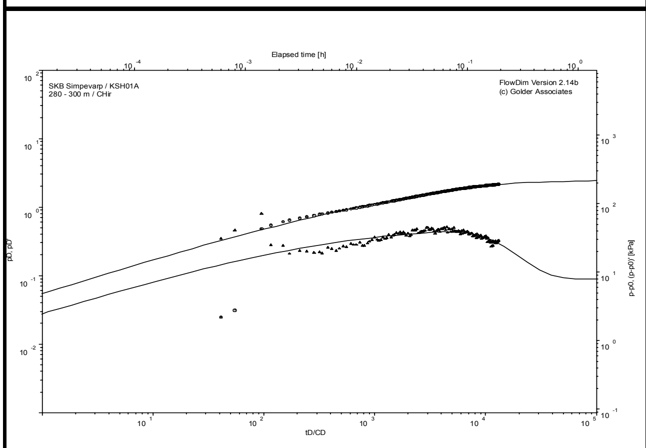
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	2752		
p_i (kPa) =	2752		
p_p(kPa) =	2951	p_F (kPa) =	2759
Q_p (m^3/s)=	6,20E-05		
tp (s) =	1800	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,1		
Derivative fact.=	0,15	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	3,06E-06		
T_M (m^2/s)=	3,20E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	2,85E-06	T (m^2/s) =	6,30E-06
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,43E-07	K_s (m/s) =	3,15E-07
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4,24E-11
C_D (-) =	NA	C_D (-) =	4,67E-03
ξ (-) =	-4,8	ξ (-) =	-4,9
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	4,24E-11
dt_2 (min) =	*	C_D (-) =	4,67E-03
T_T (m^2/s) =	6,30E-06	ξ (-) =	-4,9
S (-) =	1,00E-06		
K_s (m/s) =	3,15E-07		
S_s (1/m) =	5,00E-08		

Comments:

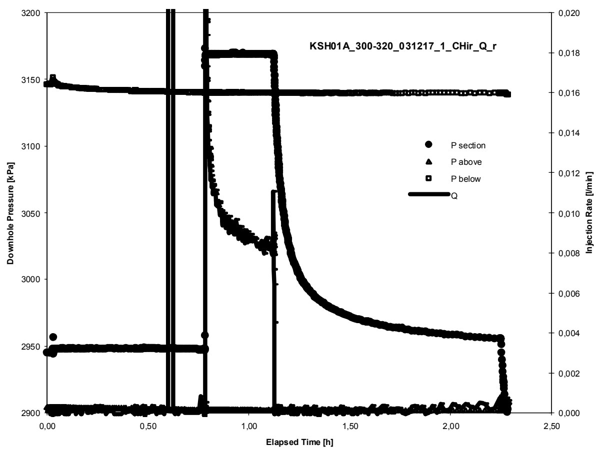
*: IARF not measured

The recommended transmissivity of 2.9E-6 m2/s was derived from the analysis of the CHi phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E-7 to 6E-6 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 2749.3 kPa.

Test Summary Sheet

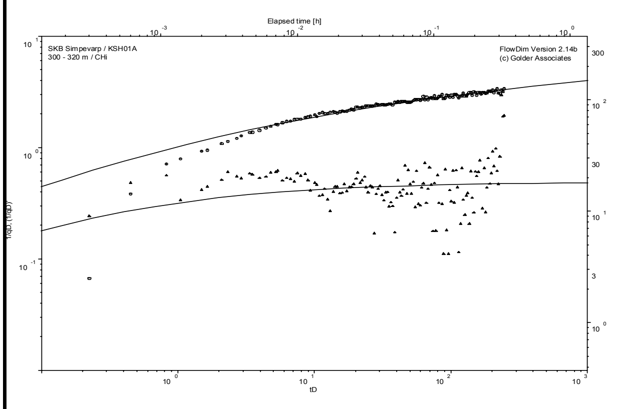
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031217 10:41
Test section from - to (m):	300 - 320 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

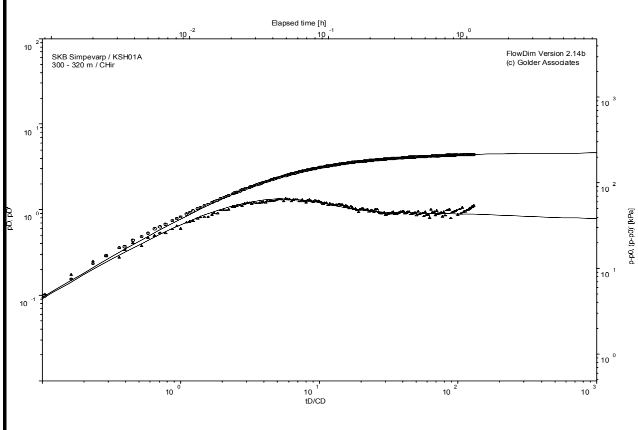


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2945		
p_i (kPa) =	2947		
p_p(kPa) =	3169	p_F (kPa) =	2956
Q_p (m^3/s)=	1,36E-07		
tp (s) =	1200	t_F (s) =	4080
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,3		
Derivative fact.=	0,12	Derivative fact.=	0,06
Results		**Results**	
Q/s (m^2/s)=	6,03E-09		
T_M (m^2/s)=	6,30E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,83	dt_1 (min) =	12,80
dt_2 (min) =	17,90	dt_2 (min) =	58,36
T (m^2/s) =	3,17E-09	T (m^2/s) =	5,60E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,59E-10	K_s (m/s) =	2,80E-10
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,11E-10
C_D (-) =	NA	C_D (-) =	1,22E-02
ξ (-) =	-1,2	ξ (-) =	0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	12,80	C (m^3/Pa) =	1,11E-10
dt_2 (min) =	58,36	C_D (-) =	1,22E-02
T_T (m^2/s) =	5,60E-09	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	2,80E-10		
S_s (1/m) =	5,00E-08		

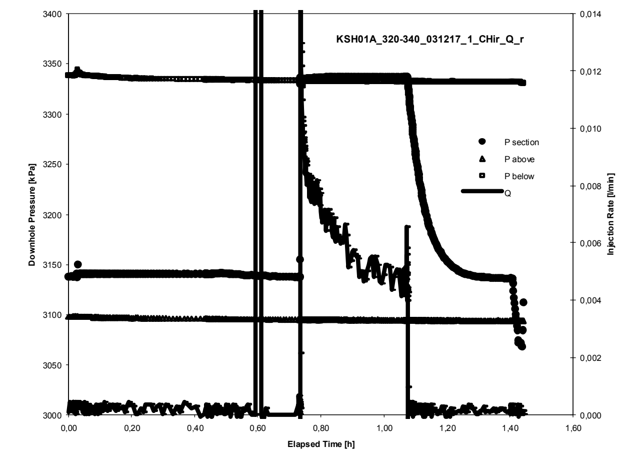
Comments:

The recommended transmissivity of 3.2E-9 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E-9 to 7E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2943.7 kPa.

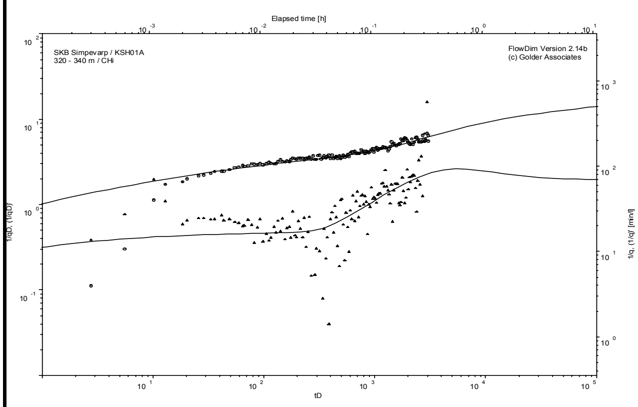
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031217 13:27
Test section from - to (m):	320 - 340 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

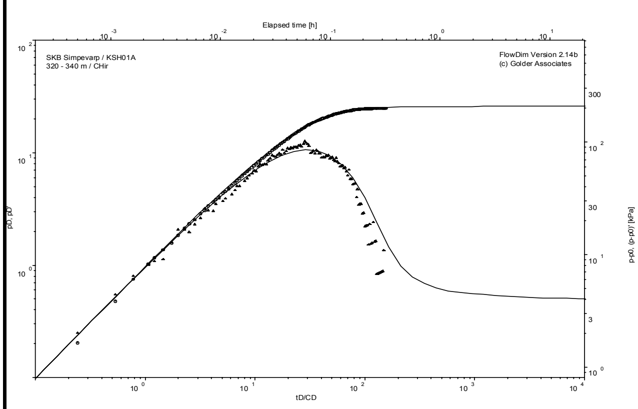
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3138		
p_i (kPa) =	3137		
p_p(kPa) =	3336	p_F (kPa) =	3136
Q_p (m^3/s)=	7,26E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,6		
Derivative fact.=	0,17	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	3,58E-09		
T_M (m^2/s)=	3,74E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,57	dt_1 (min) =	*
dt_2 (min) =	1,62	dt_2 (min) =	*
T (m^2/s) =	3,71E-09	T (m^2/s) =	2,10E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,86E-10	K_s (m/s) =	1,05E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,00E-10
C_D (-) =	NA	C_D (-) =	1,10E-02
ξ (-) =	0	ξ (-) =	20,8
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	0,57	C (m^3/Pa) =	1,00E-10
dt_2 (min) =	1,62	C_D (-) =	1,10E-02
T_T (m^2/s) =	3,71E-09	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	1,86E-10		
S_s (1/m) =	5,00E-08		

Comments:

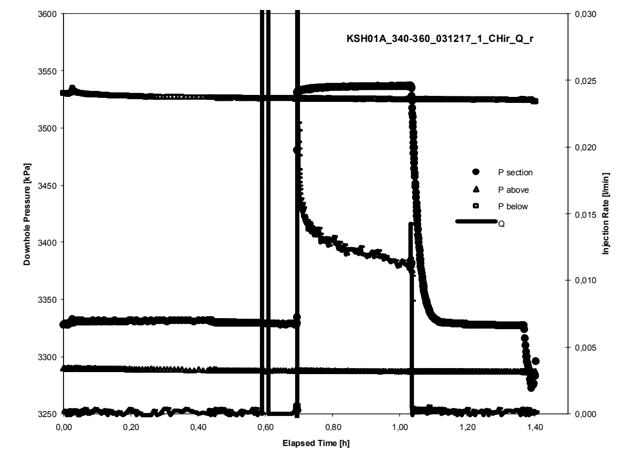
*: IARF not measured

The recommended transmissivity of 9.3E-10 m2/s was derived from the analysis of the CHi phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E-10 to 1E-8 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3127.8 kPa.

Test Summary Sheet

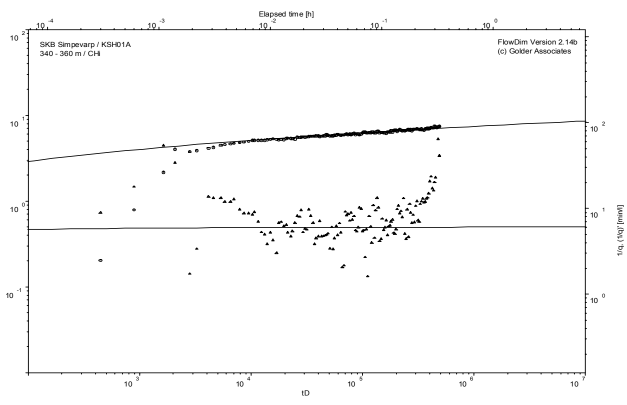
Project:	Hydraulic Injection Tests	<u>Test type:[1]</u>	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031217 15:37
Test section from - to (m):	340 - 360 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

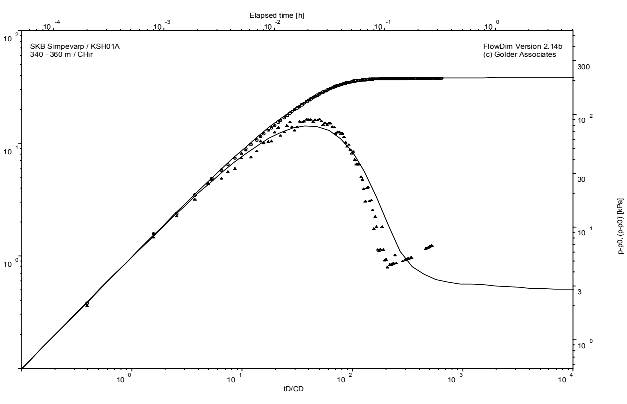


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3329		
p_i (kPa) =	3328		
p_p(kPa) =	3537	p_F (kPa) =	3328
Q_p (m^3/s)=	1,88E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,9		
Derivative fact.=	0,15	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	8,82E-09		
T_M (m^2/s)=	9,22E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,47	dt_1 (min) =	*
dt_2 (min) =	11,23	dt_2 (min) =	*
T (m^2/s) =	1,02E-08	T (m^2/s) =	6,18E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	5,10E-10	K_s (m/s) =	3,09E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	7,26E-11
C_D (-) =	NA	C_D (-) =	8,00E-03
ξ (-) =	2,0	ξ (-) =	32,7
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	0,47	C (m^3/Pa) =	7,26E-11
dt_2 (min) =	11,23	C_D (-) =	8,00E-03
T_T (m^2/s) =	1,02E-08	ξ (-) =	2,0
S (-) =	1,00E-06		
K_s (m/s) =	5,10E-10		
S_s (1/m) =	5,00E-08		

Comments:

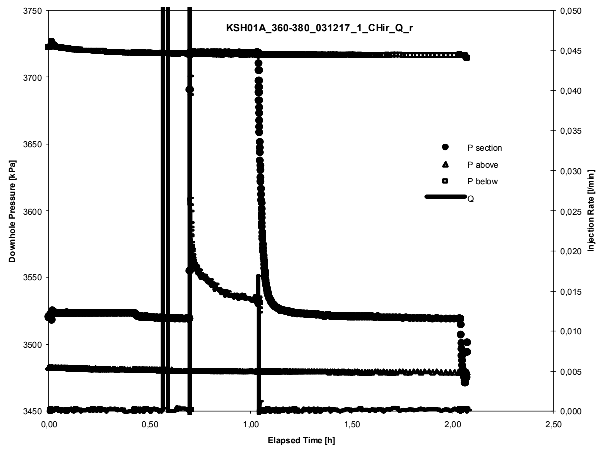
*: IARF not measured

TThe recommended transmissivity of 1.0E-8 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E-9 to 7E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3325.8 kPa.

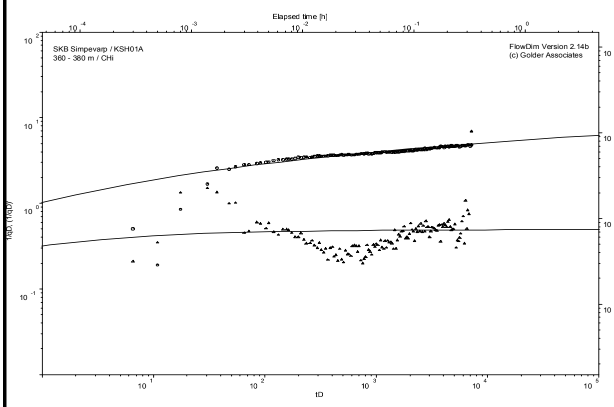
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031217 17:31
Test section from - to (m):	360 - 380 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

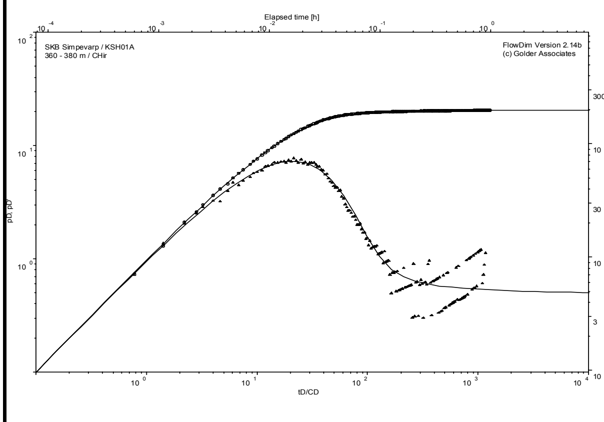
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3521		
p_i (kPa) =	3519		
p_p(kPa) =	3718	p_F (kPa) =	3519
Q_p (m^3/s)=	2,28E-07		
tp (s) =	1200	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,1		
Derivative fact.=	0,15	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	1,13E-08		
T_M (m^2/s)=	1,18E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	4,91	dt_1 (min) =	*
dt_2 (min) =	17,92	dt_2 (min) =	*
T (m^2/s) =	8,74E-09	T (m^2/s) =	4,29E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	4,37E-10	K_s (m/s) =	2,15E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	7,66E-11
C_D (-) =	NA	C_D (-) =	8,44E-03
ξ (-) =	0	ξ (-) =	15,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	4,91	C (m^3/Pa) =	7,66E-11
dt_2 (min) =	17,92	C_D (-) =	8,44E-03
T_T (m^2/s) =	8,74E-09	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	4,37E-10		
S_s (1/m) =	5,00E-08		

Comments:

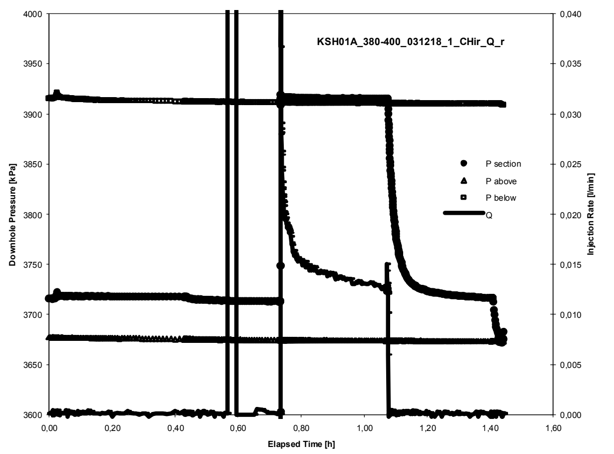
*: IARF not measured

The recommended transmissivity of 8.7E-9 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 6E-9 to 5E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3517.8 kPa.

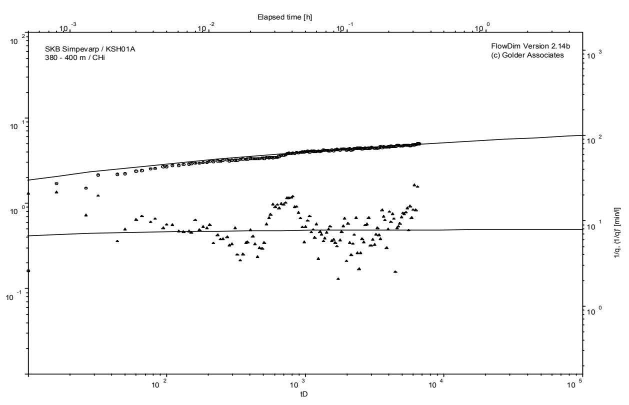
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031218 08:09
Test section from - to (m):	380 - 400 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

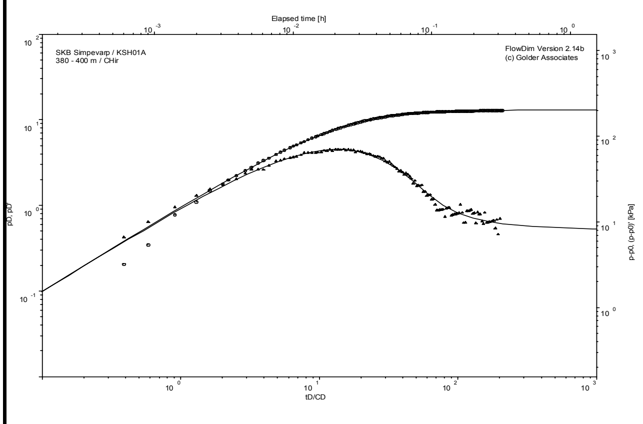
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3715		
p_i (kPa) =	3713		
p_p(kPa) =	3915	p_F (kPa) =	3716
Q_p (m^3/s)=	2,10E-07		
tp (s) =	1200	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,4		
Derivative fact.=	0,10	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	1,02E-08		
T_M (m^2/s)=	1,07E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	3,41	dt_1 (min) =	14,14
dt_2 (min) =	14,38	dt_2 (min) =	18,55
T (m^2/s) =	8,05E-09	T (m^2/s) =	2,55E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	4,03E-10	K_s (m/s) =	1,28E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	9,04E-11
C_D (-) =	NA	C_D (-) =	9,96E-03
ξ (-) =	0	ξ (-) =	7,9
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	14,14	C (m^3/Pa) =	9,04E-11
dt_2 (min) =	18,55	C_D (-) =	9,96E-03
T_T (m^2/s) =	2,55E-08	ξ (-) =	7,9
S (-) =	1,00E-06		
K_s (m/s) =	1,28E-09		
S_s (1/m) =	5,00E-08		

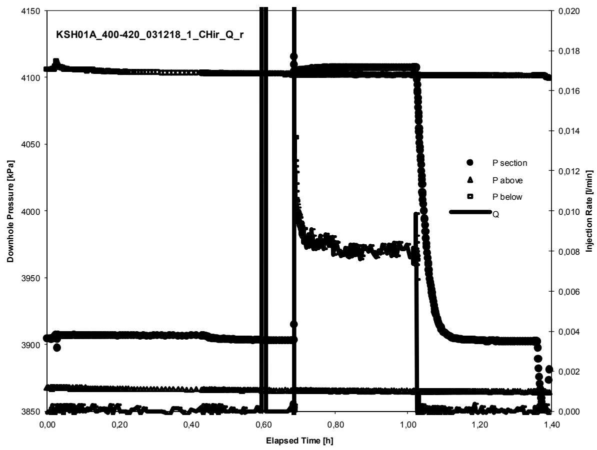
Comments:

The recommended transmissivity of 2.6E-8 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E-9 to 4E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3710.6 kPa.

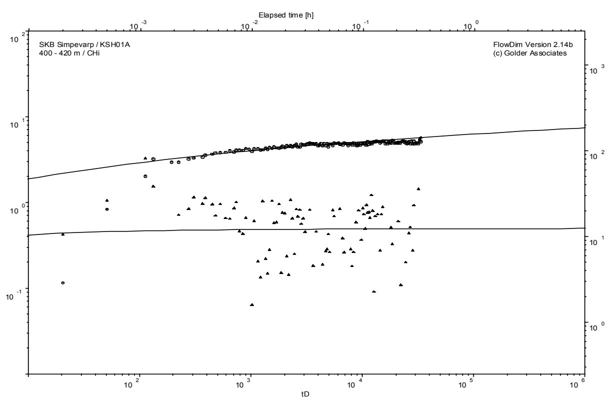
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031218 14:53
Test section from - to (m):	400 - 420 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

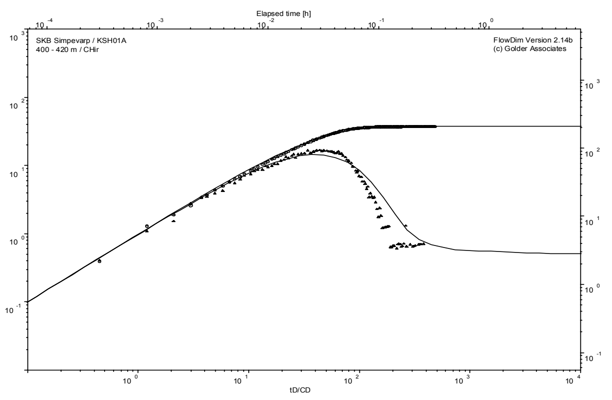
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3905		
p_i (kPa) =	3903		
p_p(kPa) =	4107	p_F (kPa) =	3902
Q_p (m^3/s)=	1,30E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,7		
Derivative fact.=	0,25	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	6,26E-09		
T_M (m^2/s)=	6,55E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1,98	dt_1 (min) =	*
dt_2 (min) =	16,63	dt_2 (min) =	*
T (m^2/s) =	5,11E-09	T (m^2/s) =	4,05E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,56E-10	K_s (m/s) =	2,03E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6,26E-11
C_D (-) =	NA	C_D (-) =	6,90E-03
ξ (-) =	1,0	ξ (-) =	32,4
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	1,98	C (m^3/Pa) =	6,26E-11
dt_2 (min) =	16,63	C_D (-) =	6,90E-03
T_T (m^2/s) =	5,11E-09	ξ (-) =	1,0
S (-) =	1,00E-06		
K_s (m/s) =	2,56E-10		
S_s (1/m) =	5,00E-08		

Comments:

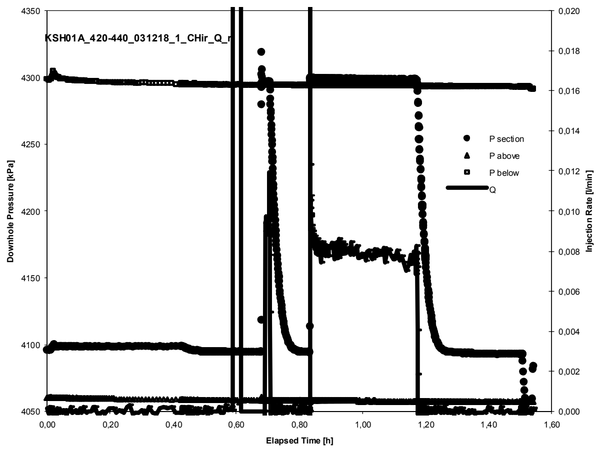
*: IARF not measured

The recommended transmissivity of 5.1E-9 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2E-9 to 1E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3900.4 kPa.

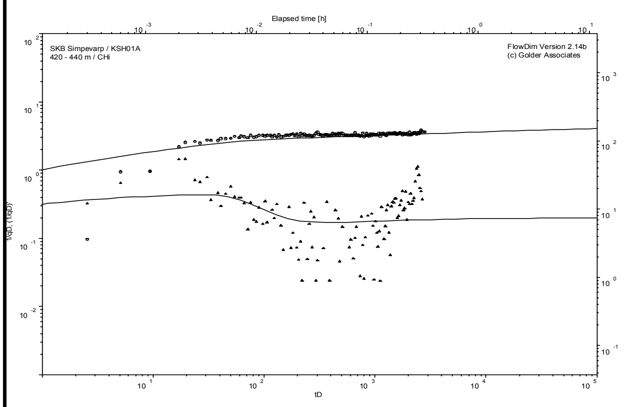
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031218 16:45
Test section from - to (m):	420 - 440 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2\cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

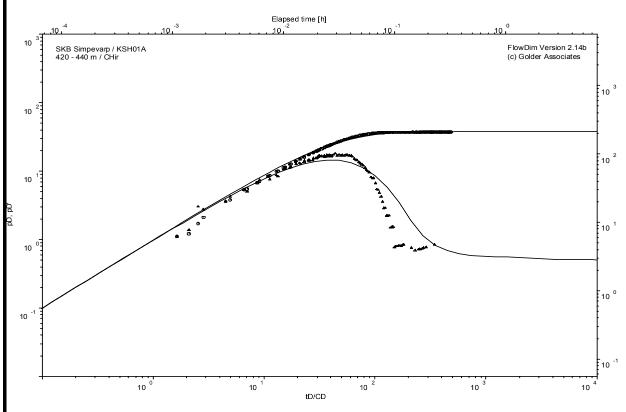
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4096		
p_i (kPa) =	4094		
p_p(kPa) =	4299	p_F (kPa) =	4093
Q_p (m^3/s)=	1,23E-07		
tp (s) =	1200	t_F (s) =	1200
S el S* (-)=	1,00E-06	S el S* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,9		
Derivative fact.=	0,25	Derivative fact.=	0,03
Results		**Results**	
Q/s (m^2/s)=	5,88E-09		
T_M (m^2/s)=	6,15E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,23	dt_1 (min) =	*
dt_2 (min) =	13,70	dt_2 (min) =	*
T (m^2/s) =	8,53E-09	T (m^2/s) =	3,95E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	4,27E-10	K_s (m/s) =	1,98E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6,08E-11
C_D (-) =	NA	C_D (-) =	6,70E-03
ξ (-) =	0	ξ (-) =	32,6
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	0,23	C (m^3/Pa) =	6,08E-11
dt_2 (min) =	13,70	C_D (-) =	6,70E-03
T_T (m^2/s) =	8,53E-09	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	4,27E-10		
S_s (1/m) =	5,00E-08		

Comments:

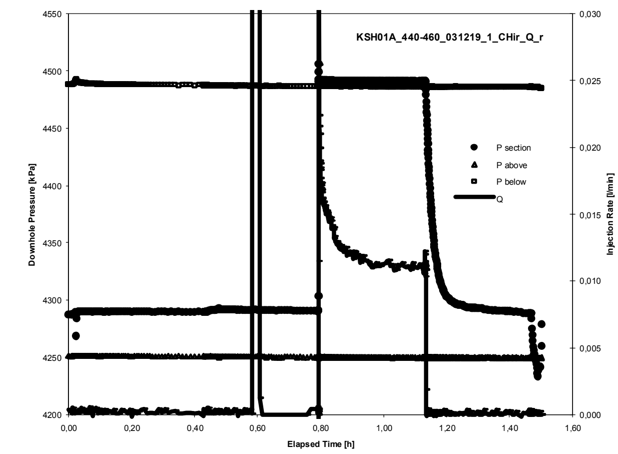
*: IARF not measured

The recommended transmissivity of 8.5E-9 m2/s was derived from the analysis of the CHi phase (outer zone), which shows the best data and derivative quality. The inner zone transmissivity is regarded as a local skin effect. The confidence range for the interval transmissivity is estimated to be 2E-9 to 1E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4092.5 kPa.

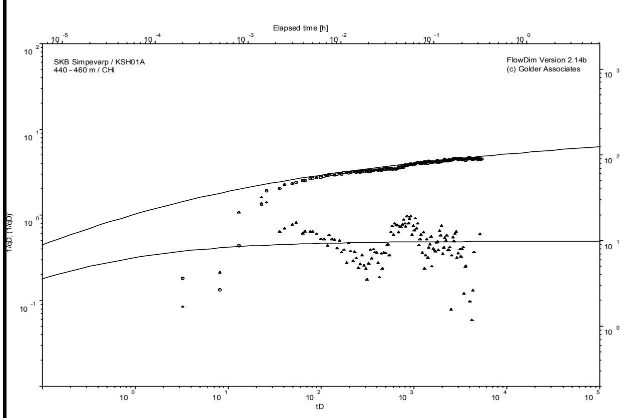
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031219 08:00
Test section from - to (m):	440 - 460 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

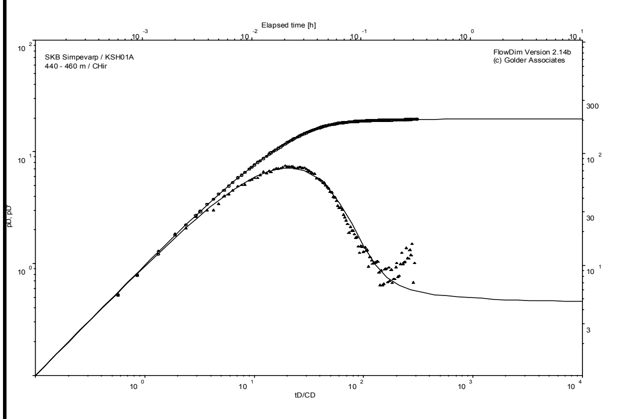
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4287		
p_i (kPa) =	4291		
p_p(kPa) =	4491	p_F (kPa) =	4289
Q_p (m^3/s)=	1,83E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,2		
Derivative fact.=	0,14	Derivative fact.=	0,07
Results		**Results**	
Q/s (m^2/s)=	8,97E-09		
T_M (m^2/s)=	9,39E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	4,15	dt_1 (min) =	*
dt_2 (min) =	9,91	dt_2 (min) =	*
T (m^2/s) =	6,52E-09	T (m^2/s) =	3,21E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	3,26E-10	K_s (m/s) =	1,61E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	7,84E-11
C_D (-) =	NA	C_D (-) =	8,64E-03
ξ (-) =	0	ξ (-) =	15,3
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	4,15	C (m^3/Pa) =	7,84E-11
dt_2 (min) =	9,91	C_D (-) =	8,64E-03
T_T (m^2/s) =	6,52E-09	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	3,26E-10		
S_s (1/m) =	5,00E-08		

Comments:

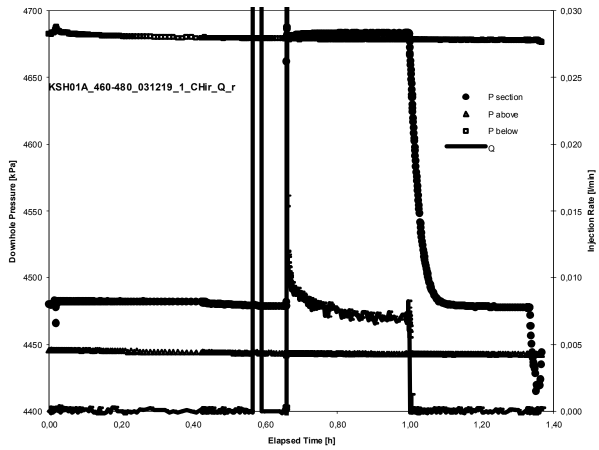
*: IARF not measured

The recommended transmissivity of 6.5E-9 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E-9 to 4E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4286.1 kPa.

Test Summary Sheet

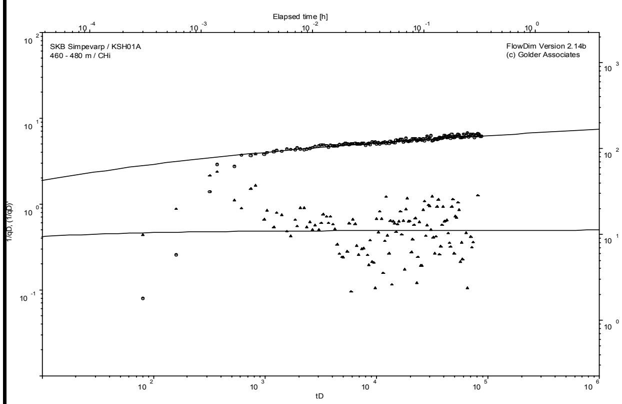
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031219 10:00
Test section from - to (m):	460 - 480 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

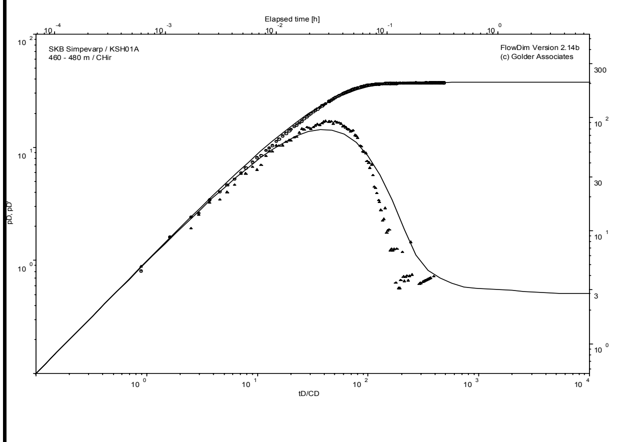


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4480		
p_i (kPa) =	4478		
p_p(kPa) =	4683	p_F (kPa) =	4478
Q_p (m^3/s)=	1,14E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,5		
Derivative fact.=	0,17	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	5,47E-09		
T_M (m^2/s)=	5,72E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,27	dt_1 (min) =	*
dt_2 (min) =	14,37	dt_2 (min) =	*
T (m^2/s) =	5,64E-09	T (m^2/s) =	4,01E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,82E-10	K_s (m/s) =	2,01E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6,25E-11
C_D (-) =	NA	C_D (-) =	6,89E-03
ξ (-) =	1,5	ξ (-) =	32,3
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0,27	C (m^3/Pa) =	6,25E-11
dt_2 (min) =	14,37	C_D (-) =	6,89E-03
T_T (m^2/s) =	5,64E-09	ξ (-) =	1,5
S (-) =	1,00E-06		
K_s (m/s) =	2,82E-10		
S_s (1/m) =	5,00E-08		

Comments:

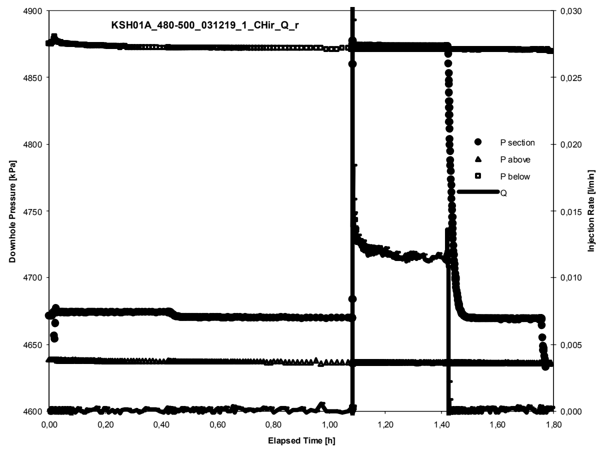
*: IARF not measured

The recommended transmissivity of 5.6E-9 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 4E-9 to 4E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4476.3 kPa.

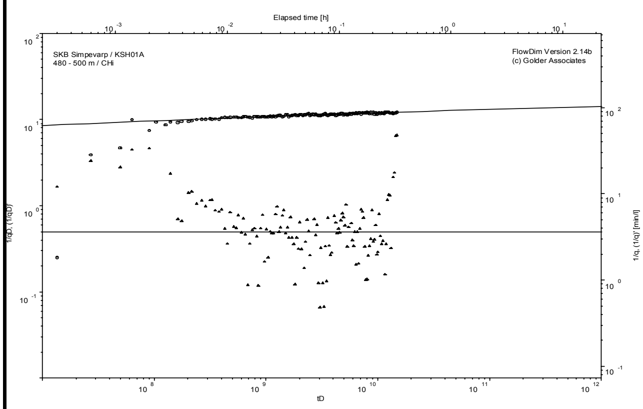
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031219 11:53
Test section from - to (m):	480 - 500 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

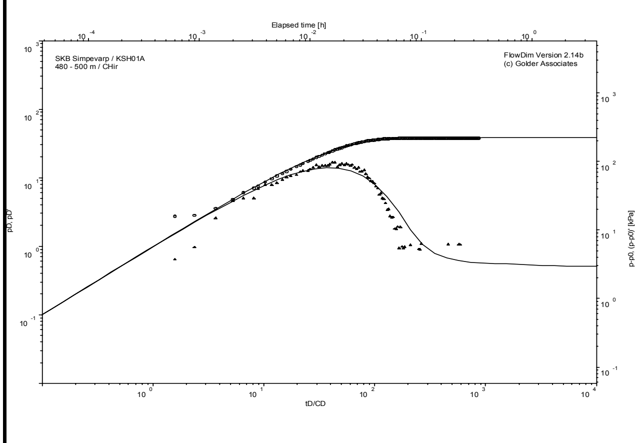
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4672		
p_i (kPa) =	4670		
p_p(kPa) =	4873	p_F (kPa) =	4669
Q_p (m^3/s)=	1,92E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,8		
Derivative fact.=	0,22	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	9,26E-09		
T_M (m^2/s)=	9,68E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,57	dt_1 (min) =	*
dt_2 (min) =	14,03	dt_2 (min) =	*
T (m^2/s) =	1,76E-08	T (m^2/s) =	5,55E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	8,80E-10	K_s (m/s) =	2,78E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4,88E-11
C_D (-) =	NA	C_D (-) =	5,38E-03
ξ (-) =	6,9	ξ (-) =	32,7
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	0,57	C (m^3/Pa) =	4,88E-11
dt_2 (min) =	14,03	C_D (-) =	5,38E-03
T_T (m^2/s) =	1,76E-08	ξ (-) =	6,9
S (-) =	1,00E-06		
K_s (m/s) =	8,80E-10		
S_s (1/m) =	5,00E-08		

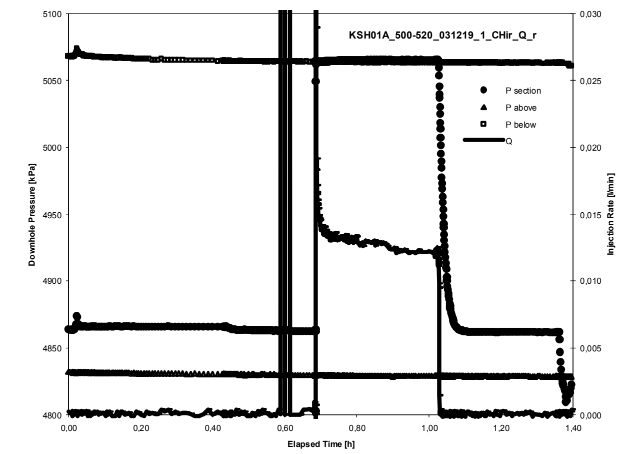
Comments:

*: IARF not measured
The recommended transmissivity of 1.8E-8 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E-9 to 6E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4668.7 kPa.

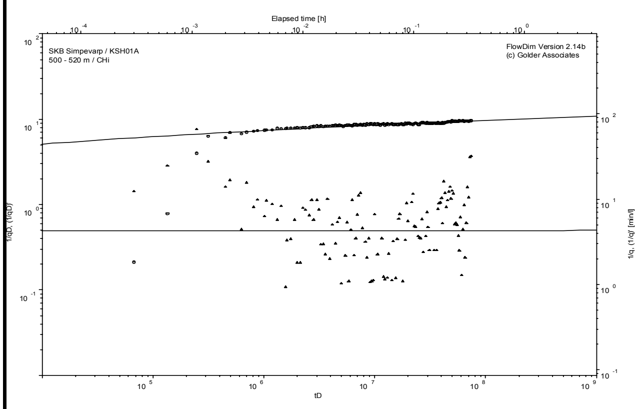
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031219 14:13
Test section from - to (m):	500 - 520 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

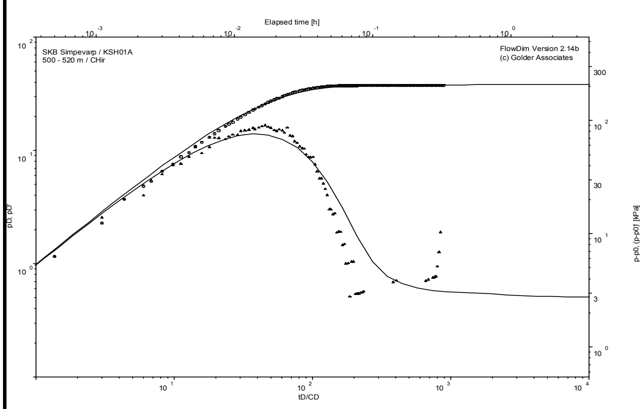
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4864		
p_i (kPa) =	4863		
p_p(kPa) =	5065	p_F (kPa) =	4861
Q_p (m^3/s)=	2,00E-07		
tp (s) =	1200	t_F (s) =	1200
S el S* (-)=	1,00E-06	S el S* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,1		
Derivative fact.=	0,07	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	9,72E-09		
T_M (m^2/s)=	1,02E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,35	dt_1 (min) =	*
dt_2 (min) =	17,90	dt_2 (min) =	*
T (m^2/s) =	1,49E-08	T (m^2/s) =	6,49E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	7,45E-10	K_s (m/s) =	3,25E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5,48E-11
C_D (-) =	NA	C_D (-) =	6,04E-03
ξ (-) =	4,4	ξ (-) =	32,5
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	0,35	C (m^3/Pa) =	5,48E-11
dt_2 (min) =	17,90	C_D (-) =	6,04E-03
T_T (m^2/s) =	1,49E-08	ξ (-) =	4,4
S (-) =	1,00E-06		
K_s (m/s) =	7,45E-10		
S_s (1/m) =	5,00E-08		

Comments:

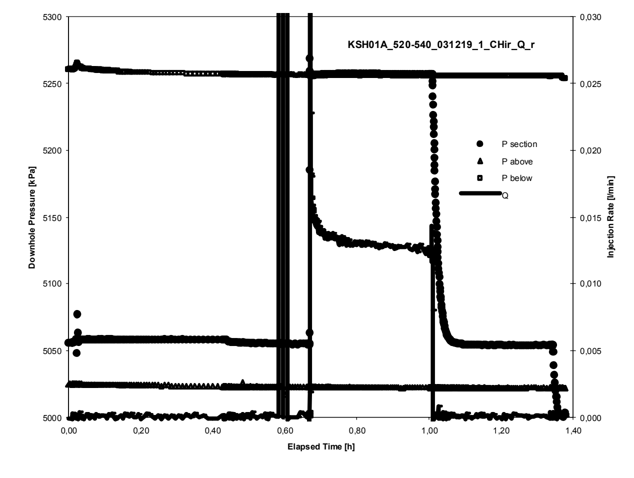
*: IARF not measured

The recommended transmissivity of 1.5E-8 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality, although it is noisy. The confidence range for the interval transmissivity is estimated to be 8E-9 to 5E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4861.4 kPa.

Test Summary Sheet

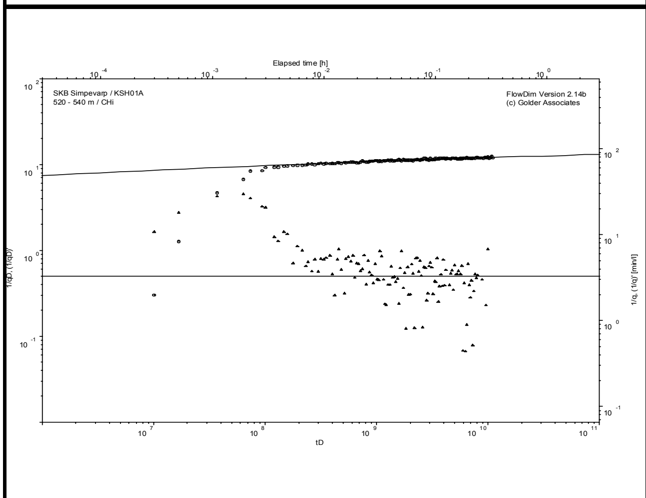
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031219 16:11
Test section from - to (m):	520 - 540 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

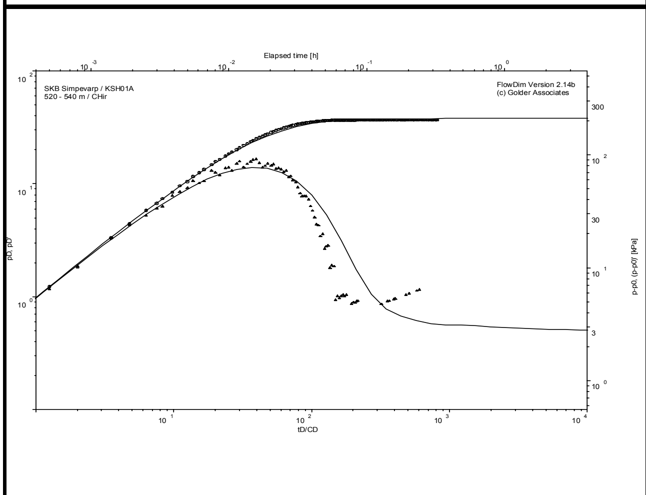


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5056		
p_i (kPa) =	5055		
p_p(kPa) =	5257	p_F (kPa) =	5054
Q_p (m^3/s)=	2,04E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,3		
Derivative fact.=	0,21	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	9,90E-09		
T_M (m^2/s)=	1,04E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,53	dt_1 (min) =	*
dt_2 (min) =	15,85	dt_2 (min) =	*
T (m^2/s) =	1,96E-08	T (m^2/s) =	6,44E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	9,80E-10	K_s (m/s) =	3,22E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5,91E-11
C_D (-) =	NA	C_D (-) =	6,51E-03
ξ (-) =	6,7	ξ (-) =	32,5
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0,53	C (m^3/Pa) =	5,91E-11
dt_2 (min) =	15,85	C_D (-) =	6,51E-03
T_T (m^2/s) =	1,96E-08	ξ (-) =	6,7
S (-) =	1,00E-06		
K_s (m/s) =	9,80E-10		
S_s (1/m) =	5,00E-08		

Comments:

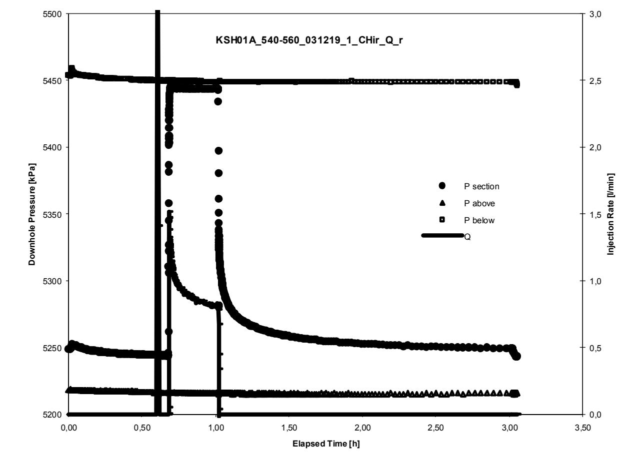
*: IARF not measured

The recommended transmissivity of 2.0E-8 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality, although it is noisy. The confidence range for the interval transmissivity is estimated to be 8E-9 to 6E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5053.4 kPa.

Test Summary Sheet

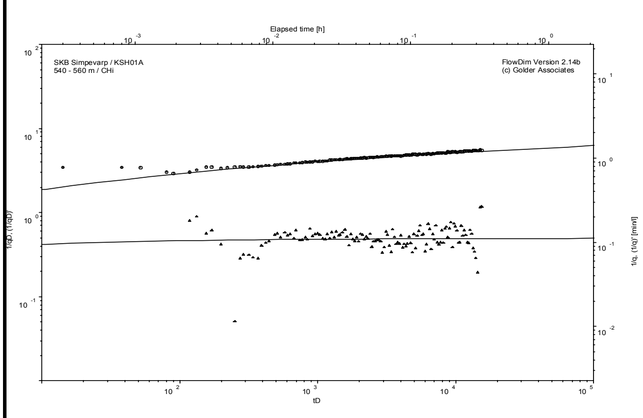
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031219 18:09
Test section from - to (m):	540 - 560 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

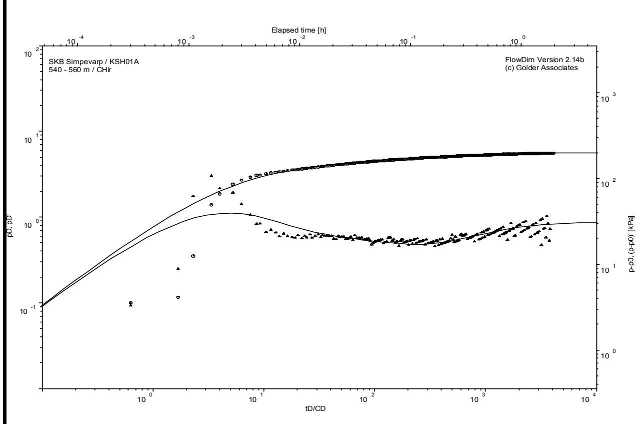


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5249		
p_i (kPa) =	5244		
p_p(kPa) =	5444	p_F (kPa) =	5249
Q_p (m^3/s)=	1,33E-05		
tp (s) =	1200	t_F (s) =	7200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,6		
Derivative fact.=	0,13	Derivative fact.=	0,07
Results		**Results**	
Q/s (m^2/s)=	6,54E-07		
T_M (m^2/s)=	6,84E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,65	dt_1 (min) =	1,16
dt_2 (min) =	15,04	dt_2 (min) =	9,52
T (m^2/s) =	5,77E-07	T (m^2/s) =	6,63E-07
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,89E-08	K_s (m/s) =	3,32E-08
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	7,29E-10
C_D (-) =	NA	C_D (-) =	8,03E-02
ξ (-) =	-1,7	ξ (-) =	-1,4
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	0,65	C (m^3/Pa) =	7,29E-10
dt_2 (min) =	15,04	C_D (-) =	8,03E-02
T_T (m^2/s) =	5,77E-07	ξ (-) =	-1,7
S (-) =	1,00E-06		
K_s (m/s) =	2,89E-08		
S_s (1/m) =	5,00E-08		

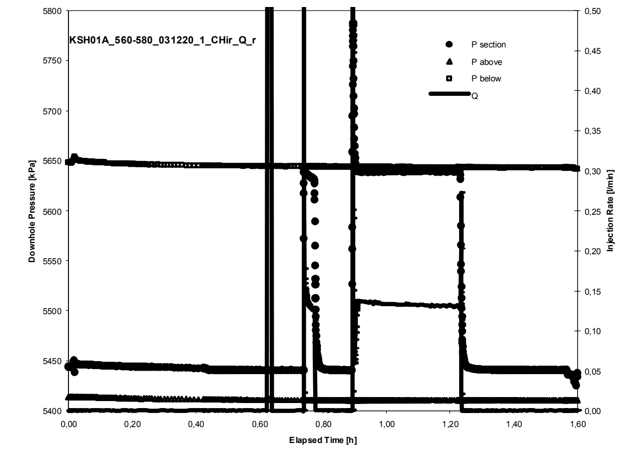
Comments:

The recommended transmissivity of 5.8E-7 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 4E-7 to 8E-7 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5244.9 kPa.

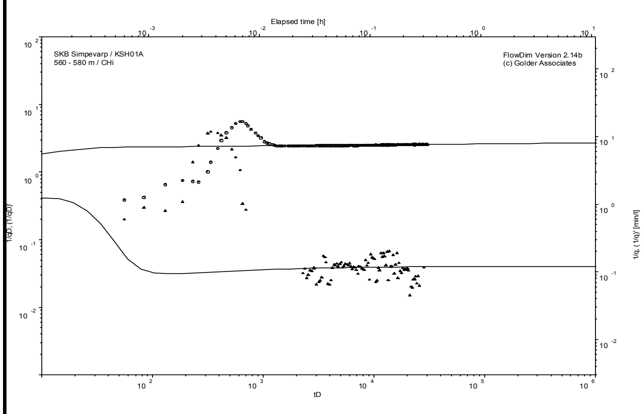
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031220 08:13
Test section from - to (m):	560 - 580 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

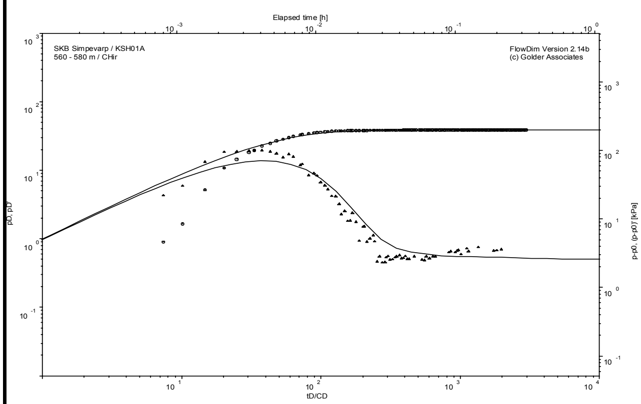
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5445		
p_i (kPa) =	5440		
p_p(kPa) =	5640	p_F (kPa) =	5440
Q_p (m^3/s)=	2,17E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,9		
Derivative fact.=	0,24	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	1,07E-07		
T_M (m^2/s)=	1,11E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1,54	dt_1 (min) =	*
dt_2 (min) =	12,70	dt_2 (min) =	*
T (m^2/s) =	5,44E-07	T (m^2/s) =	6,89E-07
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,72E-08	K_s (m/s) =	3,45E-08
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,73E-10
C_D (-) =	NA	C_D (-) =	1,91E-02
ξ (-) =	0	ξ (-) =	32,2
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	1,54	C (m^3/Pa) =	1,73E-10
dt_2 (min) =	12,70	C_D (-) =	1,91E-02
T_T (m^2/s) =	5,44E-07	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	2,72E-08		
S_s (1/m) =	5,00E-08		

Comments:

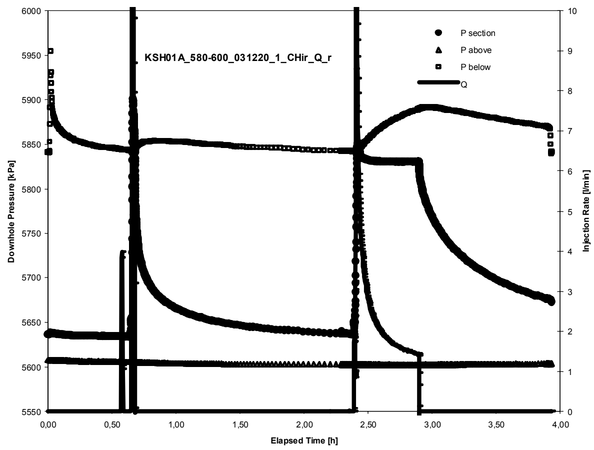
*: IARF not measured

The recommended transmissivity of 5.4E-7 m2/s was derived from the analysis of the CHi phase (outer zone), which shows the best data and derivative quality. The inner zone transmissivity is regarded as a local skin effect. The confidence range for the interval transmissivity is estimated to be 9E-8 to 8E-7 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5439.9 kPa.

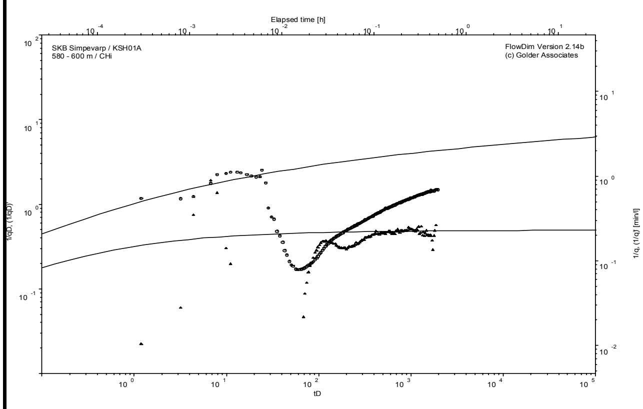
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031220 10:22
Test section from - to (m):	580 - 600 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

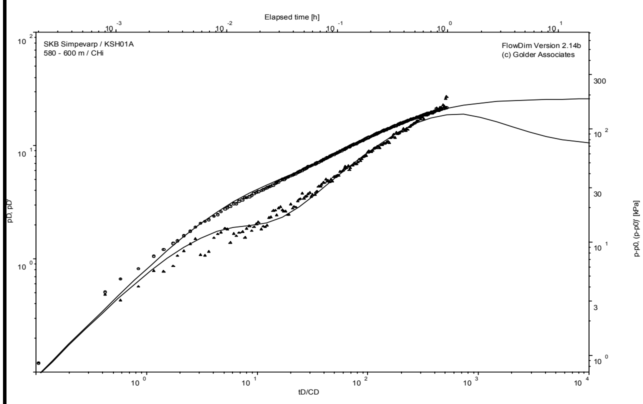
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5637		
p_i (kPa) =	5637		
p_p(kPa) =	5831	p_F (kPa) =	5677
Q_p (m^3/s)=	2,37E-05		
tp (s) =	1800	t_F (s) =	3600
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,2		
Derivative fact.=	0,09	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	1,20E-06		
T_M (m^2/s)=	1,25E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	6,70	dt_1 (min) =	*
dt_2 (min) =	19,67	dt_2 (min) =	*
T (m^2/s) =	2,80E-07	T (m^2/s) =	4,68E-07
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,40E-08	K_s (m/s) =	2,34E-08
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3,84E-08
C_D (-) =	NA	C_D (-) =	4,23E+00
ξ (-) =	-2,6	ξ (-) =	-0,5
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	6,70	C (m^3/Pa) =	3,84E-08
dt_2 (min) =	19,67	C_D (-) =	4,23E+00
T_T (m^2/s) =	2,80E-07	ξ (-) =	-2,6
S (-) =	1,00E-06		
K_s (m/s) =	1,40E-08		
S_s (1/m) =	5,00E-08		

Comments:

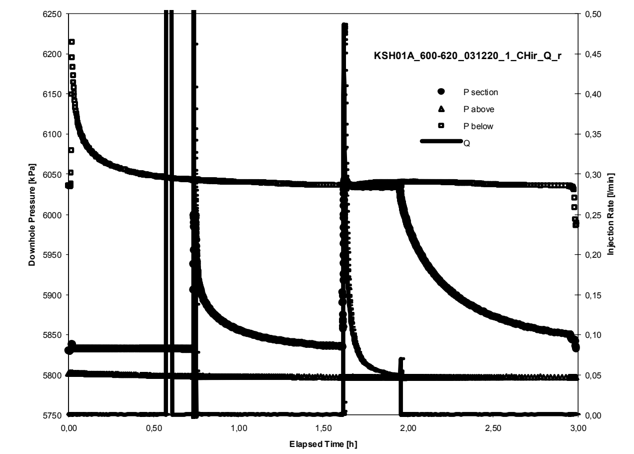
*: IARF not measured

The recommended transmissivity of 2.8E-7 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E-8 to 8E-7 m2/s due to the connection to the section below. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5646.1 kPa.

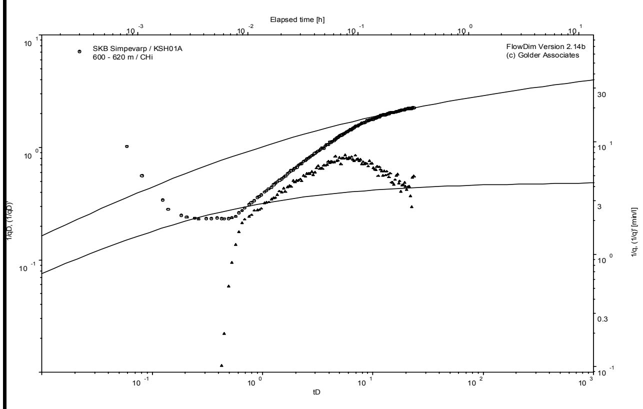
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	031220 14:47
Test section from - to (m):	600 - 620 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

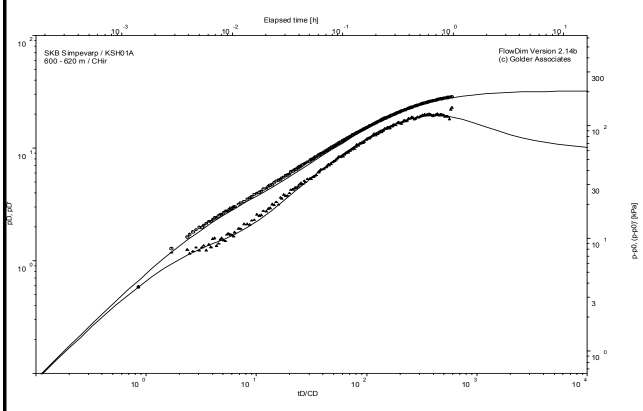
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5830		
p_i (kPa) =	5835		
p_p(kPa) =	6035	p_F (kPa) =	5850
Q_p (m^3/s)=	8,26E-07		
tp (s) =	1200	t_F (s) =	3600
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,5		
Derivative fact.=	0,09	Derivative fact.=	0,09
Results		**Results**	
Q/s (m^2/s)=	4,05E-08		
T_M (m^2/s)=	4,24E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	1,46E-08	T (m^2/s) =	2,29E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	7,30E-10	K_s (m/s) =	1,15E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,36E-09
C_D (-) =	NA	C_D (-) =	1,50E-01
ξ (-) =	-3,1	ξ (-) =	-0,4
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	1,36E-09
dt_2 (min) =	*	C_D (-) =	1,50E-01
T_T (m^2/s) =	2,29E-08	ξ (-) =	-0,4
S (-) =	1,00E-06		
K_s (m/s) =	1,15E-09		
S_s (1/m) =	5,00E-08		

Comments:

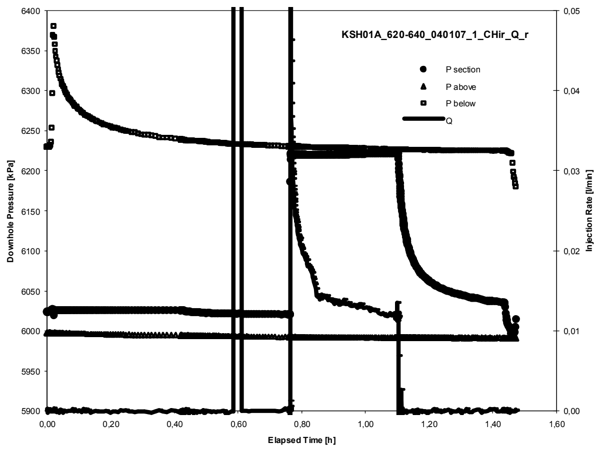
*: IARF not measured

The recommended transmissivity of 2.3E-8 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E-9 to 4E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5824.1 kPa.

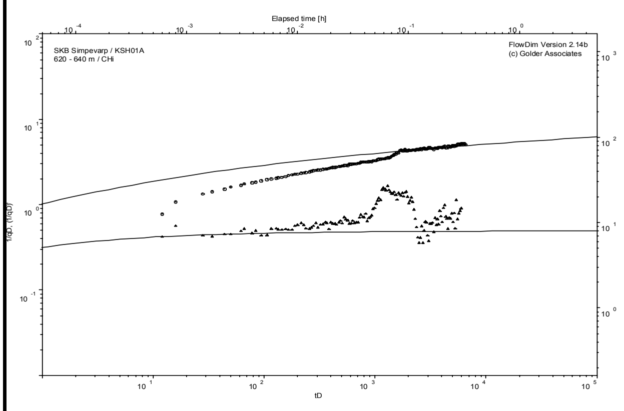
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040107 11:00
Test section from - to (m):	620 - 640 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

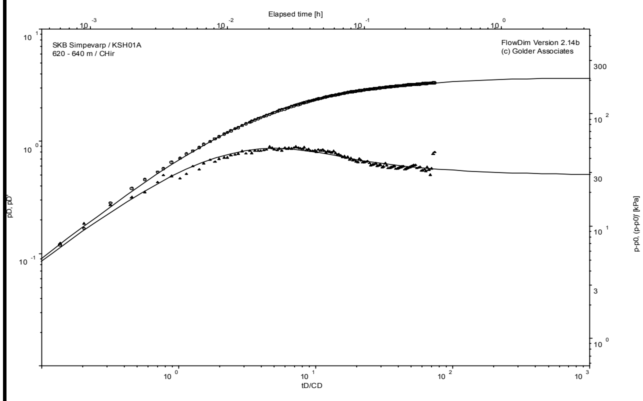
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6024		
p_i (kPa) =	6020		
p_p(kPa) =	6221	p_F (kPa) =	6035
Q_p (m^3/s)=	2,01E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,8		
Derivative fact.=	0,11	Derivative fact.=	0,07
Results		**Results**	
Q/s (m^2/s)=	9,88E-09		
T_M (m^2/s)=	1,03E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	9,67
dt_2 (min) =	*	dt_2 (min) =	18,55
T (m^2/s) =	8,04E-09	T (m^2/s) =	7,16E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	4,02E-10	K_s (m/s) =	3,58E-10
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	7,27E-11
C_D (-) =	NA	C_D (-) =	8,01E-03
ξ (-) =	0	ξ (-) =	-1,0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	9,67	C (m^3/Pa) =	7,27E-11
dt_2 (min) =	18,55	C_D (-) =	8,01E-03
T_T (m^2/s) =	7,16E-09	ξ (-) =	-1,0
S (-) =	1,00E-06		
K_s (m/s) =	3,58E-10		
S_s (1/m) =	5,00E-08		

Comments:

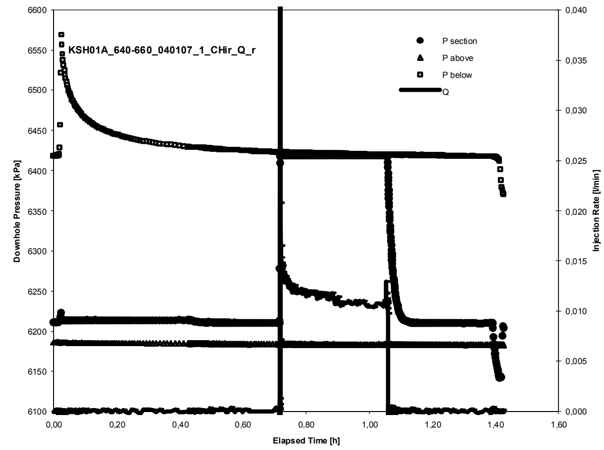
*: IARF not measured

The recommended transmissivity of 7.2E-9 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E-9 to 2E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 6012.7 kPa

Test Summary Sheet

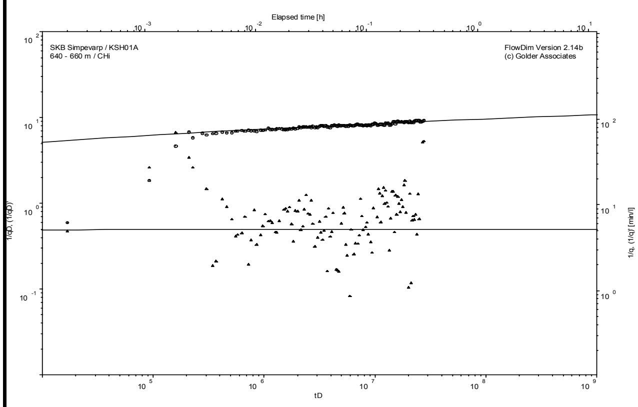
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040107 15:44
Test section from - to (m):	640 - 660 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

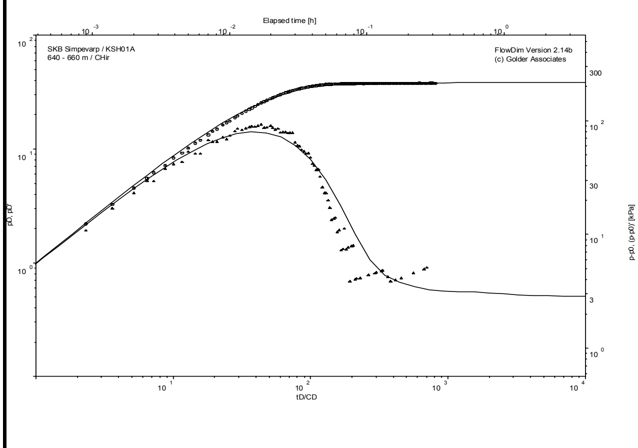


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6211		
p_i (kPa) =	6210		
p_p(kPa) =	6418	p_F (kPa) =	6209
Q_p (m^3/s)=	1,76E-07		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,1		
Derivative fact.=	0,12	Derivative fact.=	0,03
Results		**Results**	
Q/s (m^2/s)=	8,24E-09		
T_M (m^2/s)=	8,62E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,45	dt_1 (min) =	*
dt_2 (min) =	8,06	dt_2 (min) =	*
T (m^2/s) =	1,20E-08	T (m^2/s) =	5,44E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	6,00E-10	K_s (m/s) =	2,72E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4,87E-11
C_D (-) =	NA	C_D (-) =	5,37E-03
ξ (-) =	4,0	ξ (-) =	32,8
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0,45	C (m^3/Pa) =	4,87E-11
dt_2 (min) =	8,06	C_D (-) =	5,37E-03
T_T (m^2/s) =	1,20E-08	ξ (-) =	4,0
S (-) =	1,00E-06		
K_s (m/s) =	6,00E-10		
S_s (1/m) =	5,00E-08		

Comments:

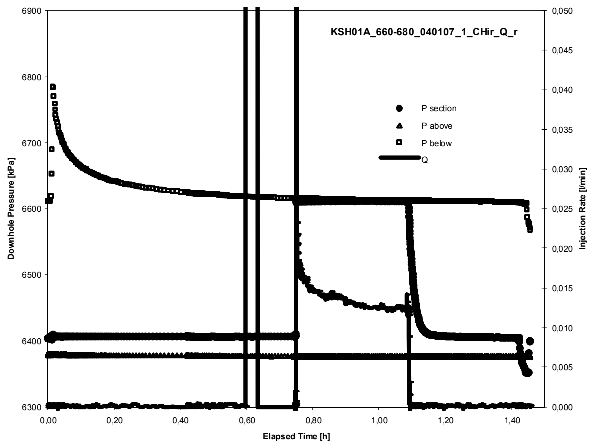
*: IARF not measured

The recommended transmissivity of 1.2E-8 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality, although it is noisy. The confidence range for the interval transmissivity is estimated to be 7E-9 to 4E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 6208.4 kPa.

Test Summary Sheet

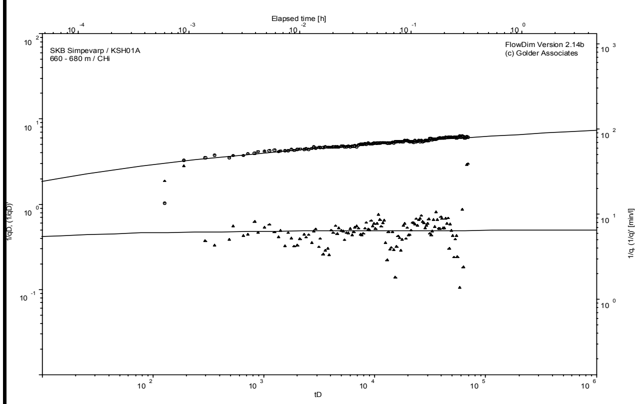
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040107 17:43
Test section from - to (m):	660 - 680 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

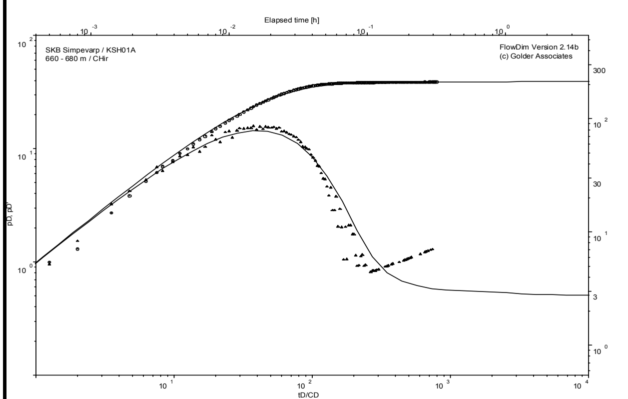


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6404		
p_i (kPa) =	6407		
p_p(kPa) =	6612	p_F (kPa) =	6404
Q_p (m^3/s)=	2,08E-07		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,4		
Derivative fact.=	0,24	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	9,93E-09		
T_M (m^2/s)=	1,04E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,20	dt_1 (min) =	*
dt_2 (min) =	14,00	dt_2 (min) =	*
T (m^2/s) =	9,70E-09	T (m^2/s) =	6,63E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	4,85E-10	K_s (m/s) =	3,32E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6,10E-11
C_D (-) =	NA	C_D (-) =	6,72E-03
ξ (-) =	1,1	ξ (-) =	33,4
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	0,20	C (m^3/Pa) =	6,10E-11
dt_2 (min) =	14,00	C_D (-) =	6,72E-03
T_T (m^2/s) =	9,70E-09	ξ (-) =	1,1
S (-) =	1,00E-06		
K_s (m/s) =	4,85E-10		
S_s (1/m) =	5,00E-08		

Comments:

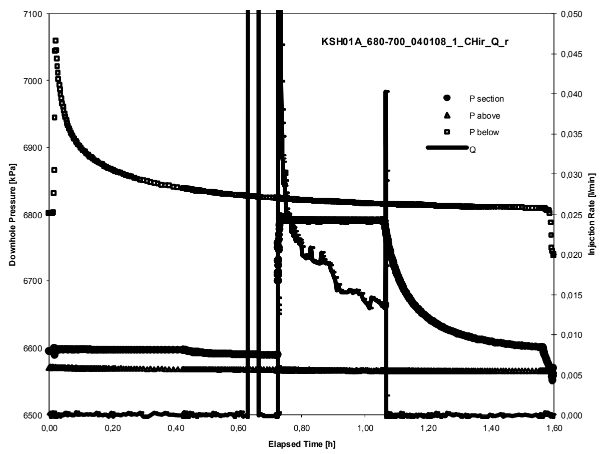
*: IARF not measured

The recommended transmissivity of 9.7E-9 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E-9 to 3E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 6402.2 kPa.

Test Summary Sheet

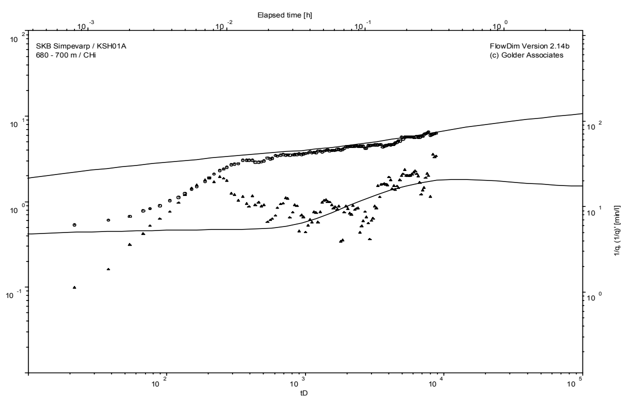
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040108 08:27
Test section from - to (m):	680 - 700 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

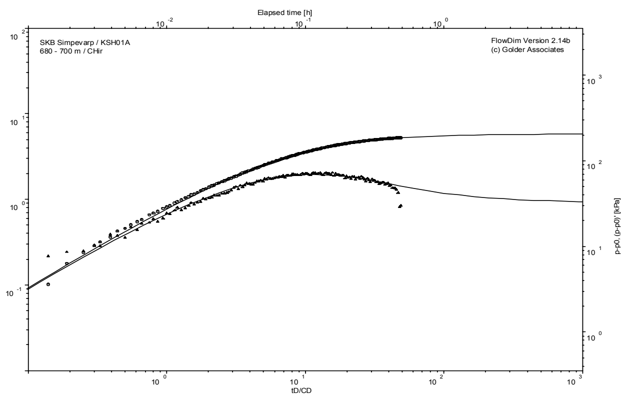


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6595		
p_i (kPa) =	6591		
p_p(kPa) =	6791	p_F (kPa) =	6601
Q_p (m^3/s)=	2,31E-07		
tp (s) =	1200	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,7		
Derivative fact.=	0,17	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	1,13E-08		
T_M (m^2/s)=	1,18E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	3,80E-09	T (m^2/s) =	8,22E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,90E-10	K_s (m/s) =	4,11E-10
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3,41E-10
C_D (-) =	NA	C_D (-) =	3,76E-02
ξ (-) =	0	ξ (-) =	-0,4
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	3,41E-10
dt_2 (min) =	*	C_D (-) =	3,76E-02
T_T (m^2/s) =	8,22E-09	ξ (-) =	-0,4
S (-) =	1,00E-06		
K_s (m/s) =	4,11E-10		
S_s (1/m) =	5,00E-08		

Comments:

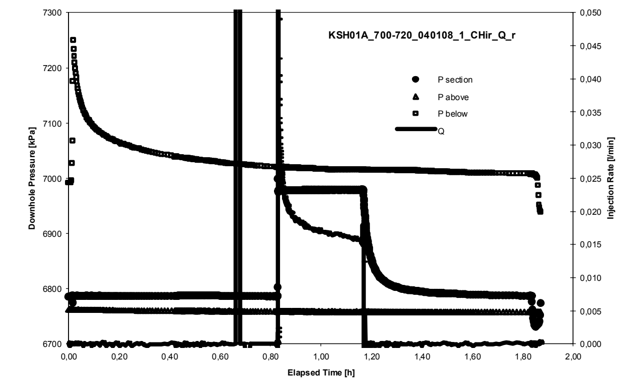
*: IARF not measured

The recommended transmissivity of 8.2E-9 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E-9 to 2E-8 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6581.4 kPa

Test Summary Sheet

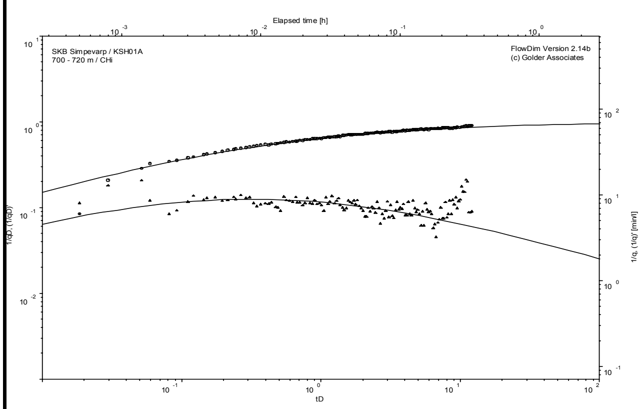
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040108 10:36
Test section from - to (m):	700 - 720 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

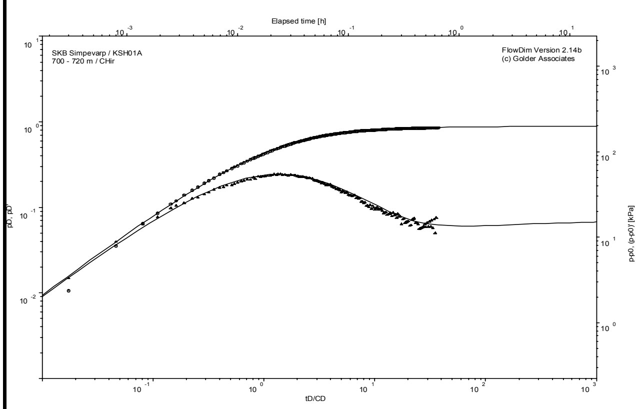


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6786		
p_i (kPa) =	6786		
p_p(kPa) =	6978	p_F (kPa) =	6787
Q_p (m^3/s)=	2,55E-07		
tp (s) =	1200	t_F (s) =	2400
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	17,0		
Derivative fact.=	0,11	Derivative fact.=	0,12
Results		**Results**	
Q/s (m^2/s)=	1,30E-08		
T_M (m^2/s)=	1,36E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,18	dt_1 (min) =	25,40
dt_2 (min) =	11,48	dt_2 (min) =	34,67
T (m^2/s) =	9,50E-10	T (m^2/s) =	1,53E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	4,75E-11	K_s (m/s) =	7,65E-10
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	8,51E-11
C_D (-) =	NA	C_D (-) =	9,38E-03
ξ (-) =	-2,1	ξ (-) =	-1,8
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	25,40	C (m^3/Pa) =	8,51E-11
dt_2 (min) =	34,67	C_D (-) =	9,38E-03
T_T (m^2/s) =	1,53E-08	ξ (-) =	-1,8
S (-) =	1,00E-06		
K_s (m/s) =	7,65E-10		
S_s (1/m) =	5,00E-08		

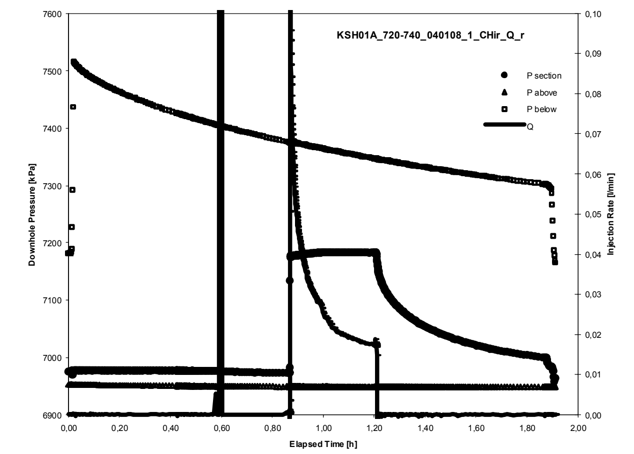
Comments:

The recommended transmissivity of 1.5E-8 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E-9 to 3E-8 m2/s. It should be noted that the transmissivities derived from the CHi and the CHir phase are not directly comparable, because different flow dimensions were used. The flow dimension displayed during the test is not unambiguous. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6778.7 kPa.

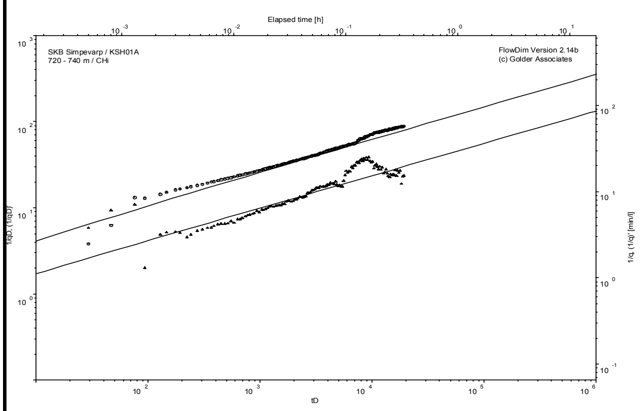
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040108 12:59
Test section from - to (m):	720 - 740 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

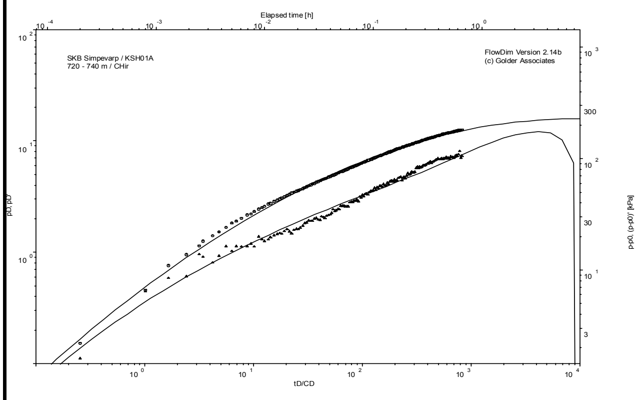
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6975		
p_i (kPa) =	6974		
p_p(kPa) =	7182	p_F (kPa) =	7001
Q_p (m^3/s)=	2,84E-07		
tp (s) =	1200	t_F (s) =	2400
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	17,3		
Derivative fact.=	0,11	Derivative fact.=	0,06
Results		**Results**	
Q/s (m^2/s)=	1,34E-08		
T_M (m^2/s)=	1,40E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	4,25E-07	T (m^2/s) =	1,62E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,13E-08	K_s (m/s) =	8,10E-11
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,23E-10
C_D (-) =	NA	C_D (-) =	1,36E-02
ξ (-) =	-1,5	ξ (-) =	-3,0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	1,23E-10
dt_2 (min) =	*	C_D (-) =	1,36E-02
T_T (m^2/s) =	1,00E-08	ξ (-) =	-3,0
S (-) =	1,00E-06		
K_s (m/s) =	5,00E-10		
S_s (1/m) =	5,00E-08		

Comments:

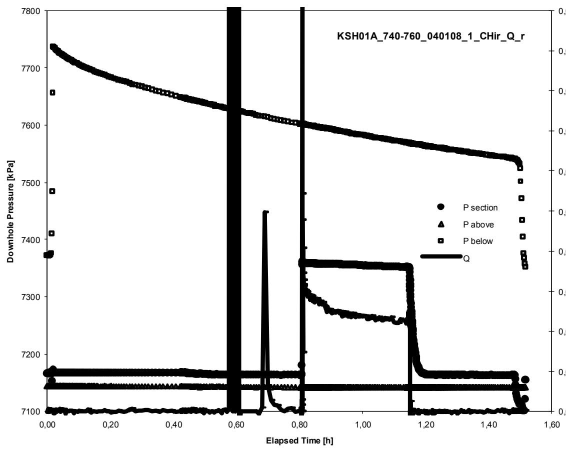
*: IARF not measured

The recommended transmissivity for this test section is 1E-8 m2/s. It was derived from the analysis of the CHir phase (mean value of both zones), which shows the best data and derivative quality and it is consistent to the results of the steady state analysis. The confidence range for the interval transmissivity is estimated to be 5E-9 to 5E-8 m2/s. The flow dimension displayed during the test is not clear. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6916.0 kPa.

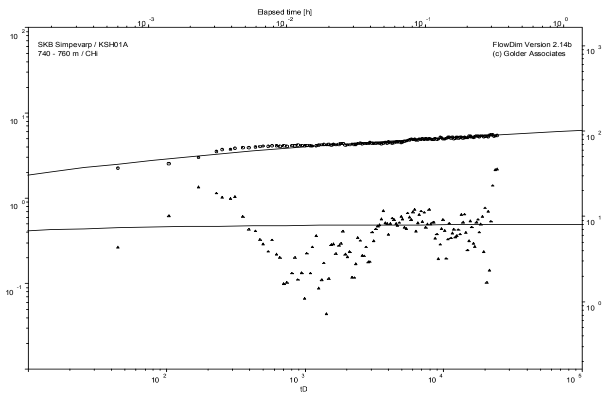
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040108 15:31
Test section from - to (m):	740 - 760 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

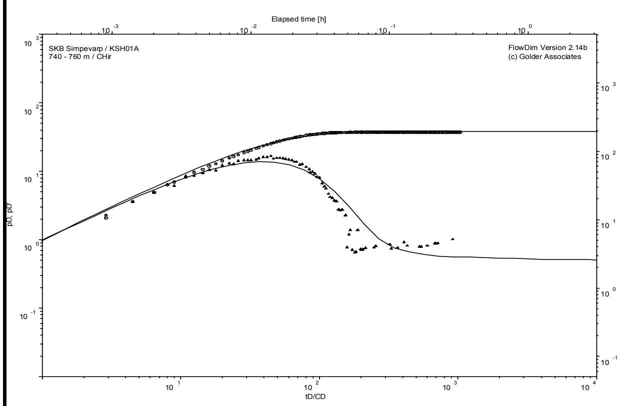
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	7166		
p_i (kPa) =	7165		
p_p(kPa) =	7352	p_F (kPa) =	7163
Q_p (m^3/s)=	1,89E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	17,6		
Derivative fact.=	0,2	Derivative fact.=	0,03
Results		**Results**	
Q/s (m^2/s)=	9,92E-09		
T_M (m^2/s)=	1,04E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2,80	dt_1 (min) =	*
dt_2 (min) =	15,07	dt_2 (min) =	*
T (m^2/s) =	8,30E-09	T (m^2/s) =	6,37E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	4,15E-10	K_s (m/s) =	3,19E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4,57E-11
C_D (-) =	NA	C_D (-) =	5,04E-03
ξ (-) =	0,6	ξ (-) =	32,6
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	2,80	C (m^3/Pa) =	4,57E-11
dt_2 (min) =	15,07	C_D (-) =	5,04E-03
T_T (m^2/s) =	8,30E-09	ξ (-) =	0,6
S (-) =	1,00E-06		
K_s (m/s) =	4,15E-10		
S_s (1/m) =	5,00E-08		

Comments:

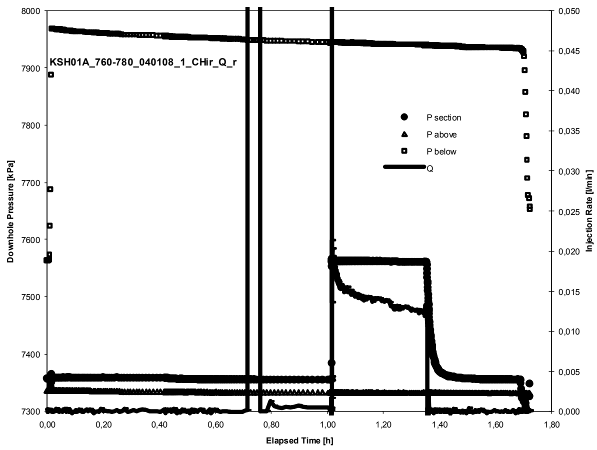
*: IARF not measured

The recommended transmissivity of 8.3E-9 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 6E-9 to 3E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 7163.0 kPa.

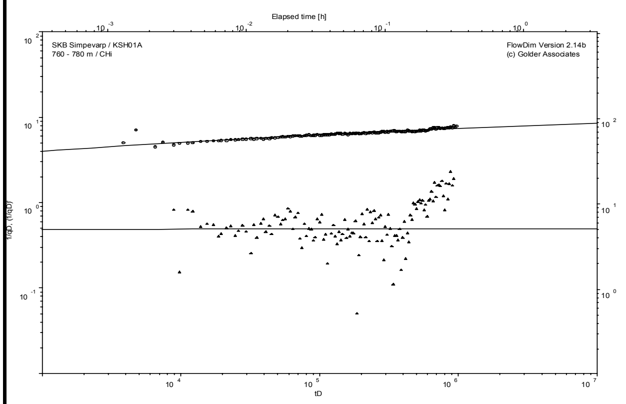
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040108 17:34
Test section from - to (m):	760 - 780 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2\cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

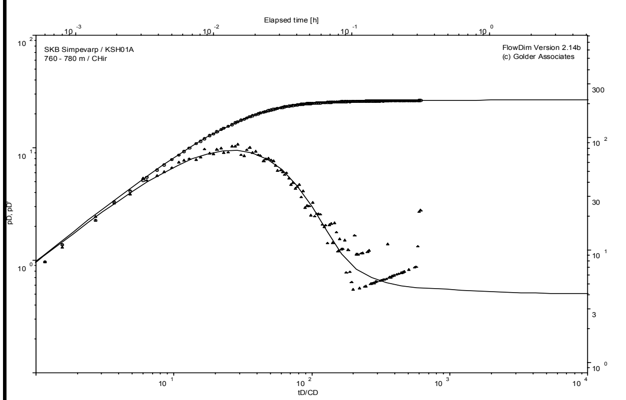
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	7358		
p_i (kPa) =	7355		
p_p(kPa) =	7560	p_F (kPa) =	7355
Q_p (m^3/s)=	2,01E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	17,9		
Derivative fact.=	0,13	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	9,59E-09		
T_M (m^2/s)=	1,00E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,35	dt_1 (min) =	*
dt_2 (min) =	8,70	dt_2 (min) =	*
T (m^2/s) =	1,22E-08	T (m^2/s) =	4,56E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	6,10E-10	K_s (m/s) =	2,28E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5,43E-11
C_D (-) =	NA	C_D (-) =	5,98E-03
ξ (-) =	2,3	ξ (-) =	21,0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	0,35	C (m^3/Pa) =	5,43E-11
dt_2 (min) =	8,70	C_D (-) =	5,98E-03
T_T (m^2/s) =	1,22E-08	ξ (-) =	2,3
S (-) =	1,00E-06		
K_s (m/s) =	6,10E-10		
S_s (1/m) =	5,00E-08		

Comments:

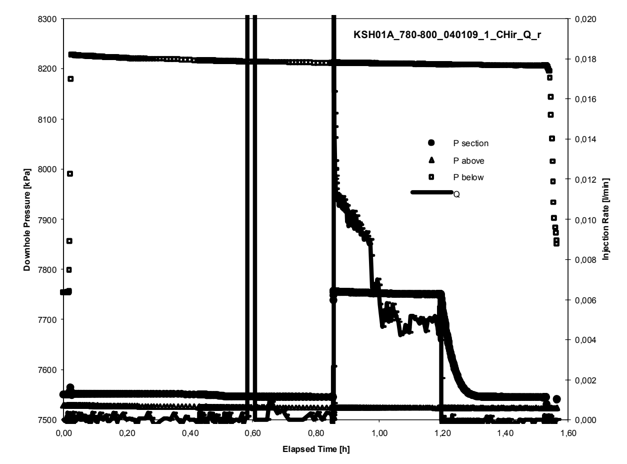
*: IARF not measured

The recommended transmissivity of 1.2E-8 m2/s was derived from the analysis of the CHi phase which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E-9 to 5E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 7352.1 kPa.

Test Summary Sheet

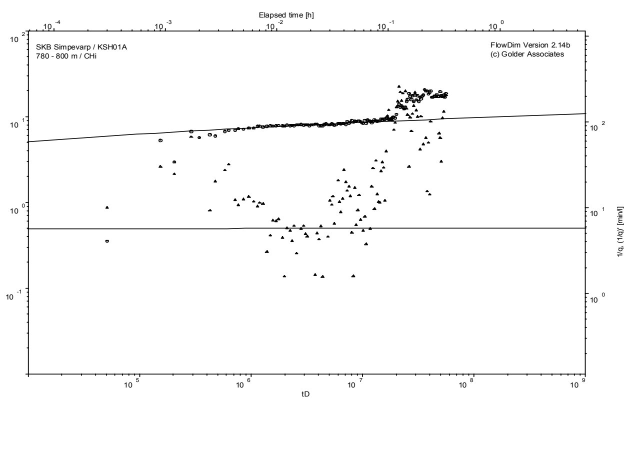
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040109 08:24
Test section from - to (m):	780 - 800 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

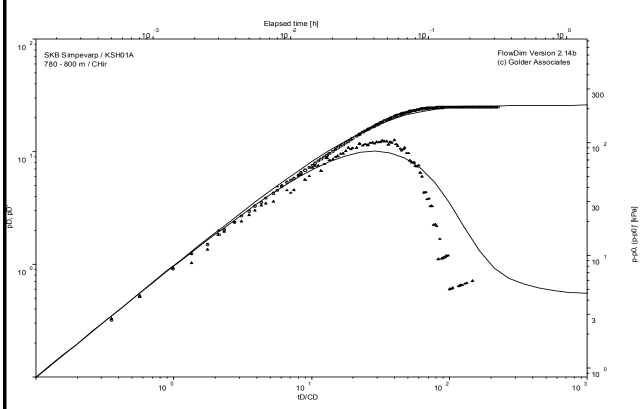


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	7550		
p_i (kPa) =	7544		
p_p(kPa) =	7750	p_F (kPa) =	7544
Q_p (m^3/s)=	7,99E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	18,2		
Derivative fact.=	0,08	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	3,81E-09		
T_M (m^2/s)=	3,98E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,52	dt_1 (min) =	*
dt_2 (min) =	3,57	dt_2 (min) =	*
T (m^2/s) =	1,09E-08	T (m^2/s) =	2,35E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	5,45E-10	K_s (m/s) =	1,18E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	7,68E-11
C_D (-) =	NA	C_D (-) =	8,46E-03
ξ (-) =	4,4	ξ (-) =	20,8
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	0,52	C (m^3/Pa) =	7,68E-11
dt_2 (min) =	3,57	C_D (-) =	8,46E-03
T_T (m^2/s) =	1,09E-08	ξ (-) =	4,4
S (-) =	1,00E-06		
K_s (m/s) =	5,45E-10		
S_s (1/m) =	5,00E-08		

Comments:

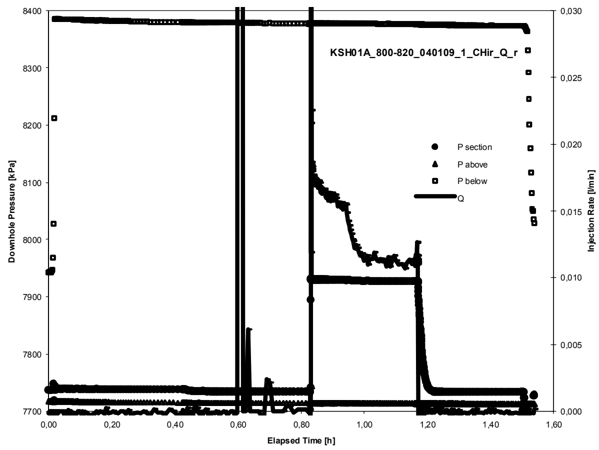
*: IARF not measured

The recommended transmissivity of 1.1E-8 m2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E-9 to 3E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 7543.2 kPa.

Test Summary Sheet

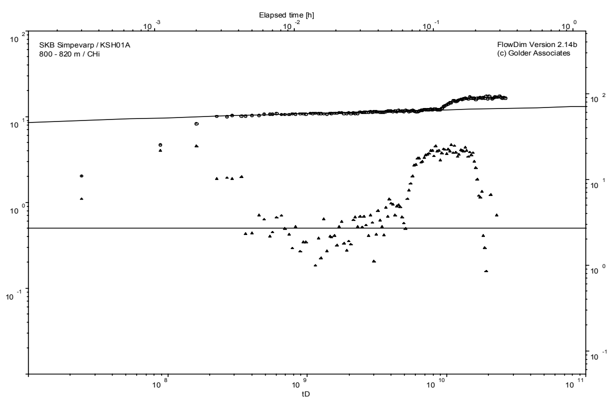
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040109 10:29
Test section from - to (m):	800 - 820 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

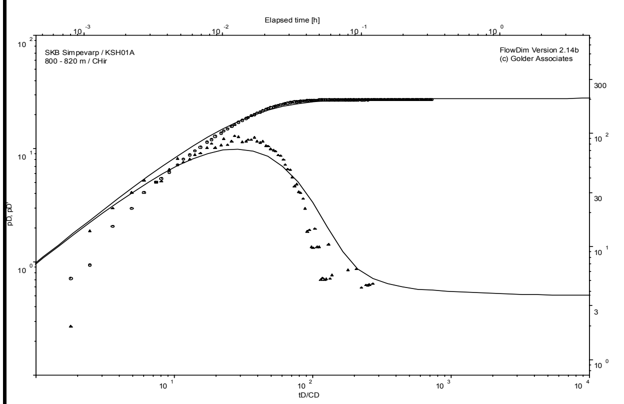


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	7737		
p_i (kPa) =	7734		
p_p(kPa) =	7927	p_F (kPa) =	7733
Q_p (m^3/s)=	1,85E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	18,5		
Derivative fact.=	0,25	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	9,38E-09		
T_M (m^2/s)=	9,81E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,30	dt_1 (min) =	*
dt_2 (min) =	3,79	dt_2 (min) =	*
T (m^2/s) =	2,49E-08	T (m^2/s) =	4,85E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,25E-09	K_s (m/s) =	2,43E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5,00E-11
C_D (-) =	NA	C_D (-) =	5,51E-03
ξ (-) =	7,0	ξ (-) =	22,2
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	0,30	C (m^3/Pa) =	5,00E-11
dt_2 (min) =	3,79	C_D (-) =	5,51E-03
T_T (m^2/s) =	2,49E-08	ξ (-) =	7,0
S (-) =	1,00E-06		
K_s (m/s) =	1,25E-09		
S_s (1/m) =	5,00E-08		

Comments:

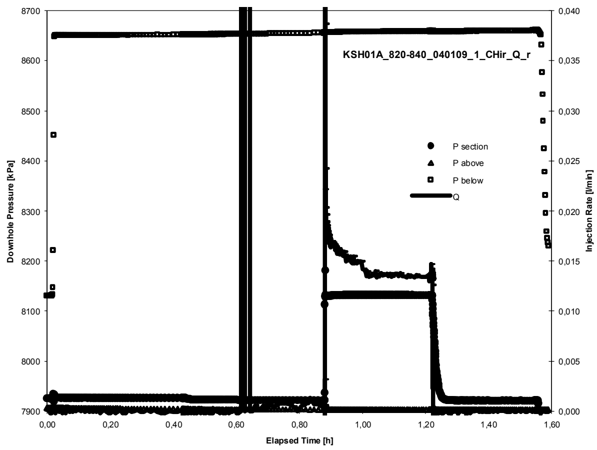
*: IARF not measured

The recommended transmissivity of 2.5E-8 m2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E-9 to 5E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 7732.3 kPa.

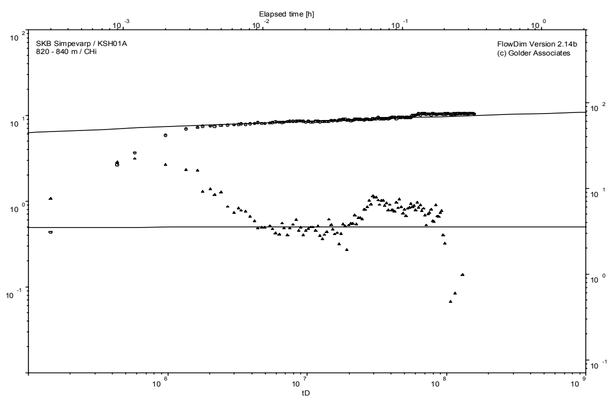
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040109 12:51
Test section from - to (m):	820 - 840 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

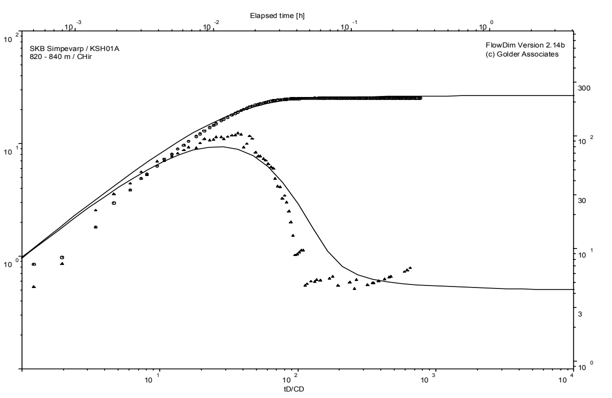
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	7925		
p_i (kPa) =	7922		
p_p(kPa) =	8132	p_F (kPa) =	7921
Q_p (m^3/s)=	2,25E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	18,8		
Derivative fact.=	0,34	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	1,05E-08		
T_M (m^2/s)=	1,10E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,55	dt_1 (min) =	*
dt_2 (min) =	2,82	dt_2 (min) =	*
T (m^2/s) =	1,74E-08	T (m^2/s) =	4,60E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	8,70E-10	K_s (m/s) =	2,30E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4,34E-11
C_D (-) =	NA	C_D (-) =	4,78E-03
ξ (-) =	4,7	ξ (-) =	21,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	0,55	C (m^3/Pa) =	4,34E-11
dt_2 (min) =	2,82	C_D (-) =	4,78E-03
T_T (m^2/s) =	1,74E-08	ξ (-) =	4,7
S (-) =	1,00E-06		
K_s (m/s) =	8,70E-10		
S_s (1/m) =	5,00E-08		

Comments:

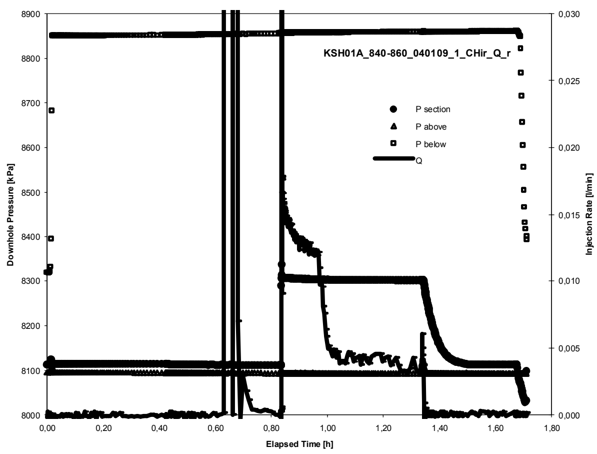
*: IARF not measured

The recommended transmissivity of 1.7E-8 m2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E-9 to 5E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line curve extrapolation in the Horner plot to a value of 7921.2 kPa.

Test Summary Sheet

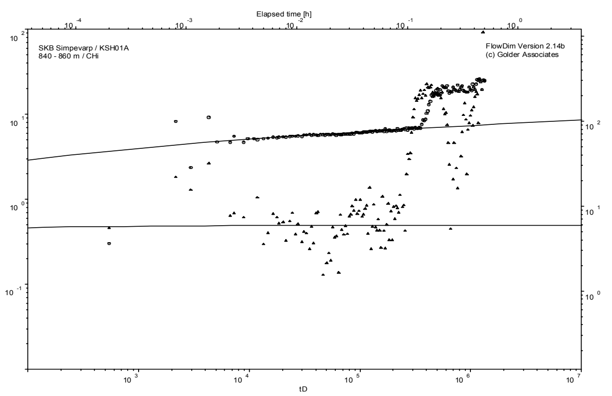
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040109 15:30
Test section from - to (m):	840 - 860 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

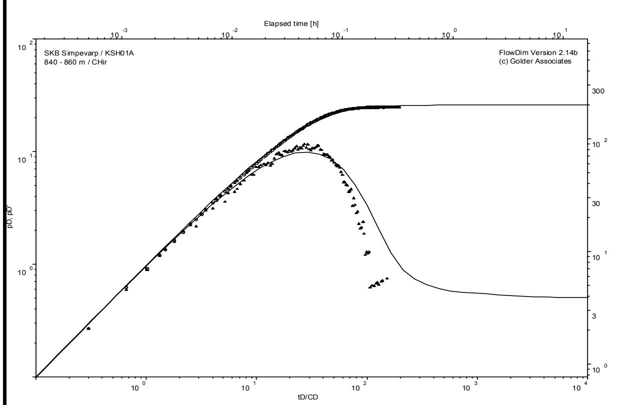


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	8113		
p_i (kPa) =	8110		
p_p(kPa) =	8302	p_F (kPa) =	8112
Q_p (m^3/s)=	5,91E-08		
tp (s) =	1800	t_F (s) =	1200
S el S* (-)=	1,00E-06	S el S* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	19,1		
Derivative fact.=	0,13	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	3,00E-09		
T_M (m^2/s)=	3,14E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,33	dt_1 (min) =	*
dt_2 (min) =	4,61	dt_2 (min) =	*
T (m^2/s) =	1,12E-08	T (m^2/s) =	2,42E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	5,60E-10	K_s (m/s) =	1,21E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	9,31E-11
C_D (-) =	NA	C_D (-) =	1,03E-02
ξ (-) =	2,3	ξ (-) =	20,7
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0,33	C (m^3/Pa) =	9,31E-11
dt_2 (min) =	4,61	C_D (-) =	1,03E-02
T_T (m^2/s) =	1,12E-08	ξ (-) =	2,3
S (-) =	1,00E-06		
K_s (m/s) =	5,60E-10		
S_s (1/m) =	5,00E-08		

Comments:

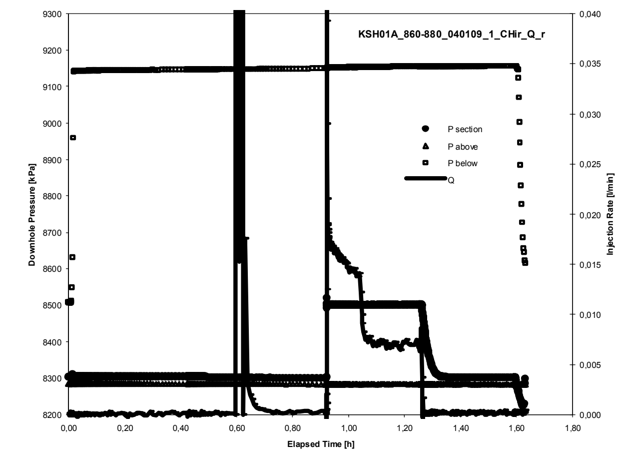
*: IARF not measured

The recommended transmissivity of 1.1E-8 m2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E-9 to 4E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 8109.7 kPa.

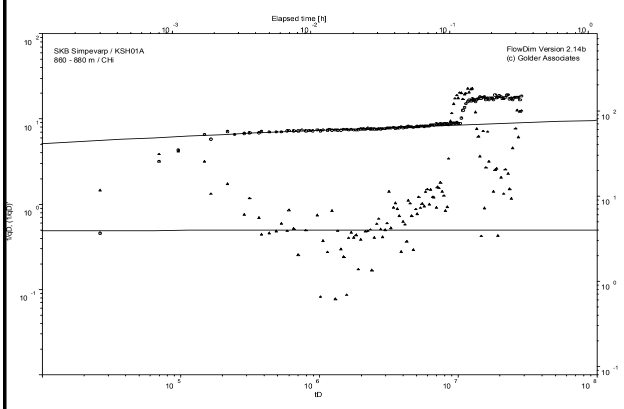
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040109 17:43
Test section from - to (m):	860 - 880 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

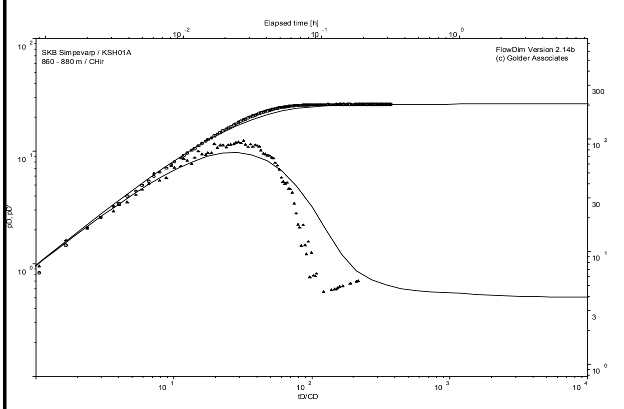
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	8303		
p_i (kPa) =	8301		
p_p(kPa) =	8501	p_F (kPa) =	8302
Q_p (m^3/s)=	1,13E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	19,4		
Derivative fact.=	0,08	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	5,54E-09		
T_M (m^2/s)=	5,80E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,26	dt_1 (min) =	*
dt_2 (min) =	2,25	dt_2 (min) =	*
T (m^2/s) =	1,63E-08	T (m^2/s) =	3,60E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	8,15E-10	K_s (m/s) =	1,80E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	7,04E-11
C_D (-) =	NA	C_D (-) =	7,76E-03
ξ (-) =	3,8	ξ (-) =	20,9
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	0,26	C (m^3/Pa) =	7,04E-11
dt_2 (min) =	2,25	C_D (-) =	7,76E-03
T_T (m^2/s) =	1,63E-08	ξ (-) =	3,80
S (-) =	1,00E-06		
K_s (m/s) =	8,15E-10		
S_s (1/m) =	5,00E-08		

Comments:

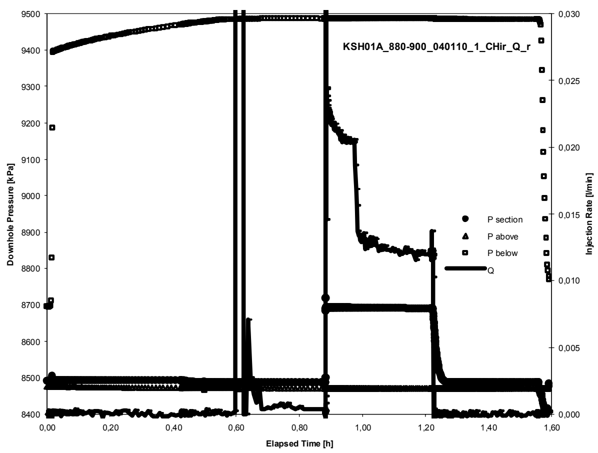
*: IARF not measured

The recommended transmissivity of 1.6E-8 m2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E-9 to 4E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 8301.2 kPa.

Test Summary Sheet

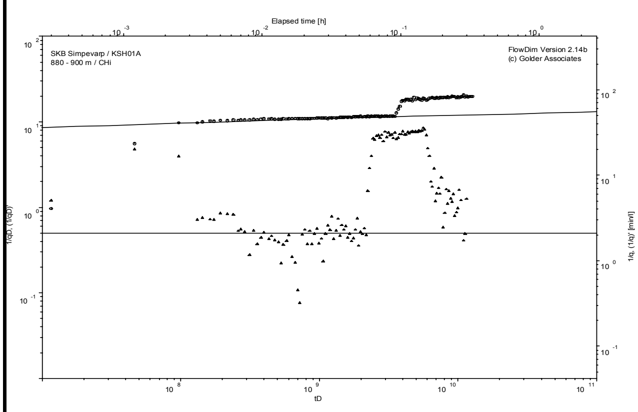
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040110 08:30
Test section from - to (m):	880 - 900 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

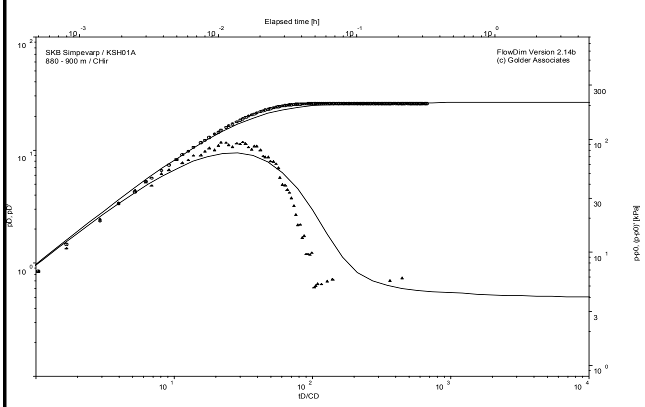


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	8492		
p_i (kPa) =	8487		
p_p(kPa) =	8690	p_F (kPa) =	8487
Q_p (m^3/s)=	1,99E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	19,7		
Derivative fact.=	0,21	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	9,61E-09		
T_M (m^2/s)=	1,01E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,40	dt_1 (min) =	*
dt_2 (min) =	3,19	dt_2 (min) =	*
T (m^2/s) =	3,05E-08	T (m^2/s) =	5,10E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,53E-09	K_s (m/s) =	2,55E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5,65E-11
C_D (-) =	NA	C_D (-) =	6,23E-03
ξ (-) =	6,6	ξ (-) =	21,0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	0,40	C (m^3/Pa) =	5,65E-11
dt_2 (min) =	3,19	C_D (-) =	6,23E-03
T_T (m^2/s) =	3,05E-08	ξ (-) =	6,6
S (-) =	1,00E-06		
K_s (m/s) =	1,53E-09		
S_s (1/m) =	5,00E-08		

Comments:

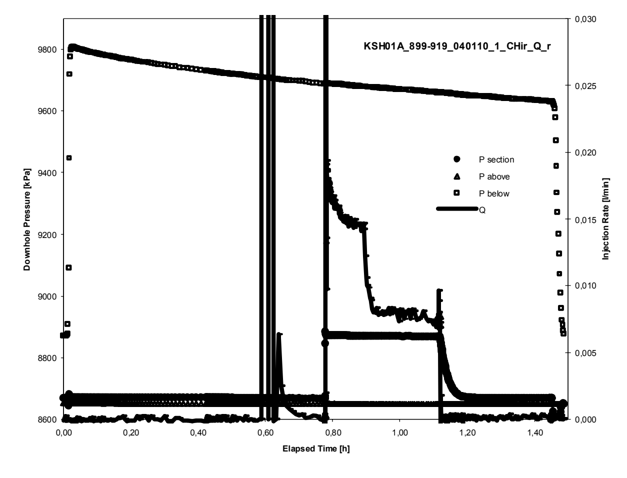
*: IARF not measured

The recommended transmissivity of 3.1E-8 m2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E-9 to 6E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 8487.1 kPa.

Test Summary Sheet

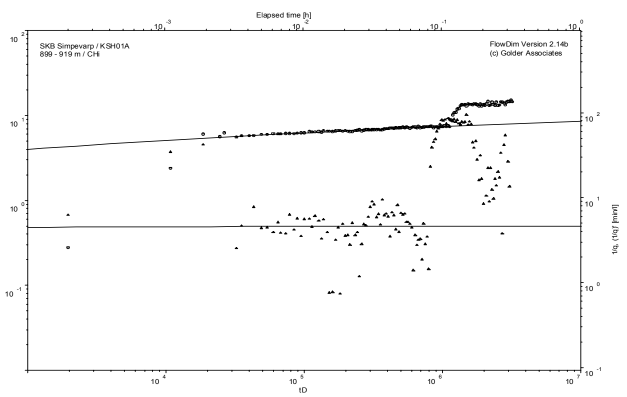
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040110 10:38
Test section from - to (m):	899 - 919 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



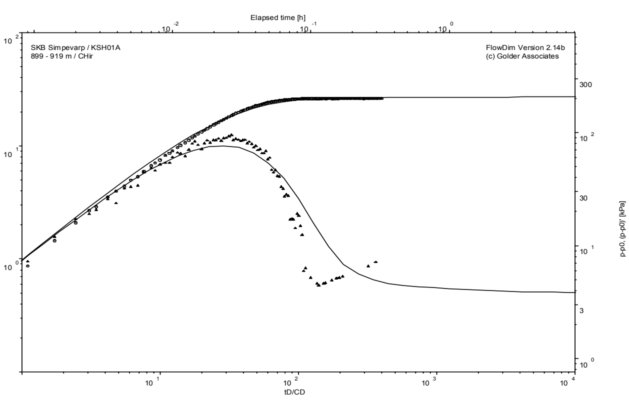
Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	8668		
p_i (kPa) =	8668		
p_p(kPa) =	8869	p_F (kPa) =	8669
Q_p (m^3/s)=	1,25E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	20,0		
Derivative fact.=	0,14	Derivative fact.=	0,02

Log-Log plot incl. derivates- flow period



Results		**Results**	
Q/s (m^2/s)=	6,08E-09		
T_M (m^2/s)=	6,36E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,22	dt_1 (min) =	*
dt_2 (min) =	4,48	dt_2 (min) =	*
T (m^2/s) =	1,39E-08	T (m^2/s) =	3,92E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	6,95E-10	K_s (m/s) =	1,96E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	7,35E-11
C_D (-) =	NA	C_D (-) =	8,10E-03
ξ (-) =	2,8	ξ (-) =	21,5
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	0,22	C (m^3/Pa) =	7,35E-11
dt_2 (min) =	4,48	C_D (-) =	8,10E-03
T_T (m^2/s) =	1,39E-08	ξ (-) =	2,8
S (-) =	1,00E-06		
K_s (m/s) =	6,95E-10		
S_s (1/m) =	5,00E-08		

Comments:

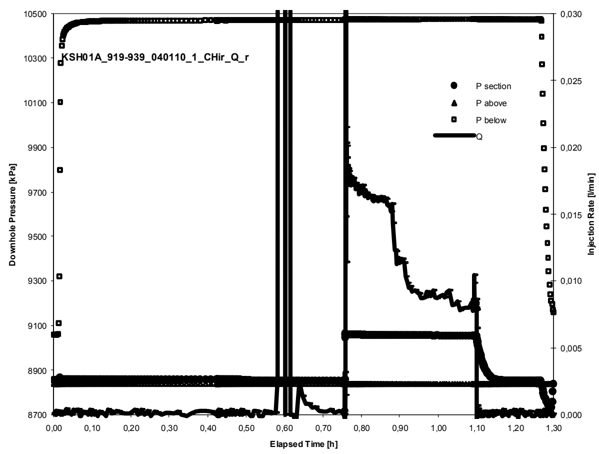
*: IARF not measured

The recommended transmissivity of 1.4E-8 m2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E-9 to 4E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 8668.0 kPa.

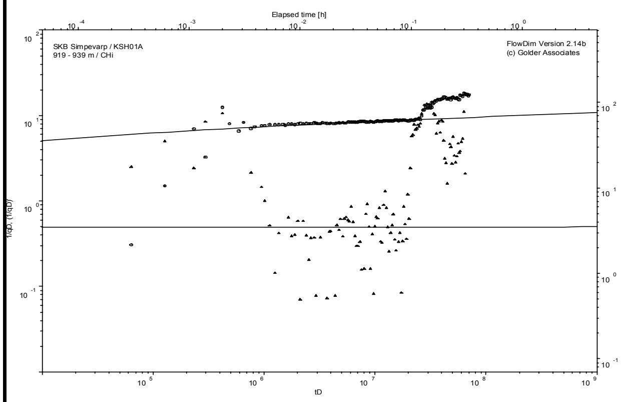
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040110 13:13
Test section from - to (m):	919 - 939 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

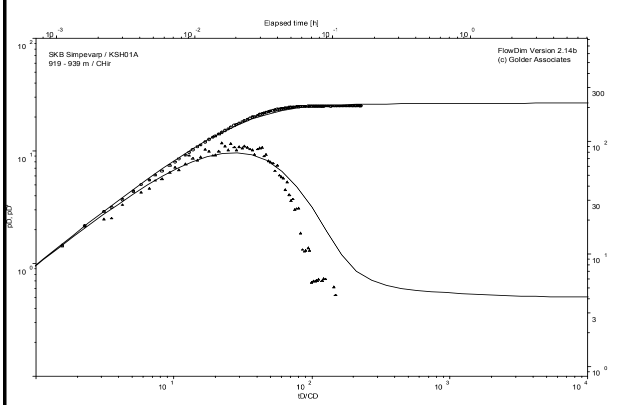
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	8855		
p_i (kPa) =	8852		
p_p(kPa) =	9056	p_F (kPa) =	8852
Q_p (m^3/s)=	1,34E-07		
tp (s) =	1200	t_F (s) =	600
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	20,3		
Derivative fact.=	0,09	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	6,44E-09		
T_M (m^2/s)=	6,74E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,32	dt_1 (min) =	*
dt_2 (min) =	5,30	dt_2 (min) =	*
T (m^2/s) =	1,81E-08	T (m^2/s) =	3,97E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	9,05E-10	K_s (m/s) =	1,99E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6,47E-11
C_D (-) =	NA	C_D (-) =	7,13E-03
ξ (-) =	4,2	ξ (-) =	21,0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	0,32	C (m^3/Pa) =	6,47E-11
dt_2 (min) =	5,30	C_D (-) =	7,13E-03
T_T (m^2/s) =	1,81E-08	ξ (-) =	4,2
S (-) =	1,00E-06		
K_s (m/s) =	9,05E-10		
S_s (1/m) =	5,00E-08		

Comments:

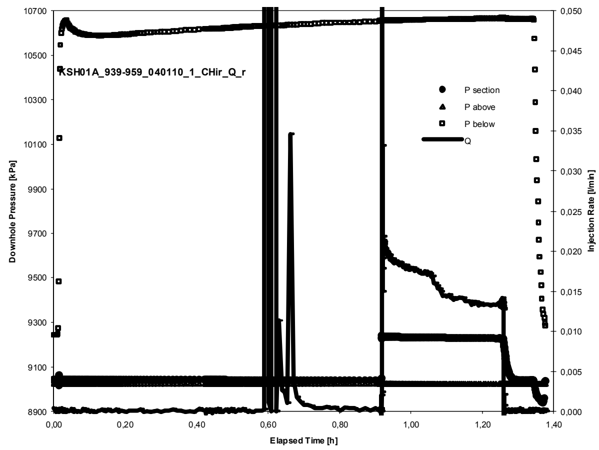
*: IARF not measured

The recommended transmissivity of 1.8E-8 m2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E-9 to 4E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 8850.5 kPa.

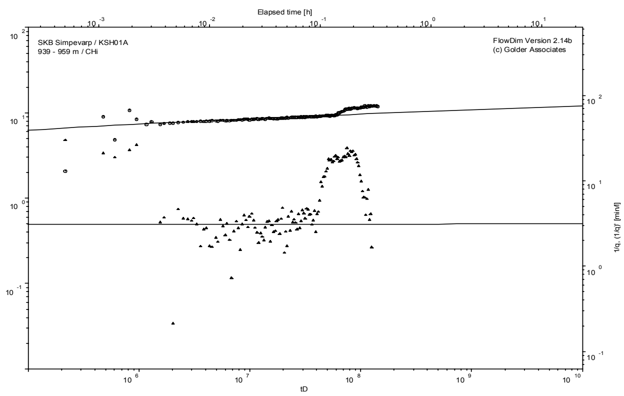
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040110 15:06
Test section from - to (m):	939 - 959 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

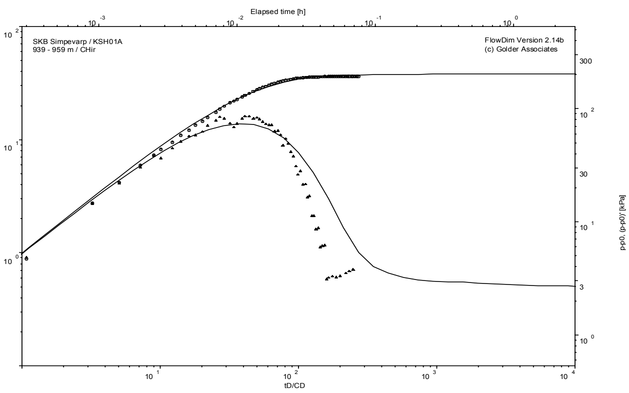
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	9041		
p_i (kPa) =	9037		
p_p(kPa) =	9228	p_F (kPa) =	9037
Q_p (m^3/s)=	2,26E-07		
tp (s) =	1200	t_F (s) =	300
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	20,6		
Derivative fact.=	0,15	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	1,15E-08		
T_M (m^2/s)=	1,20E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,35	dt_1 (min) =	*
dt_2 (min) =	5,03	dt_2 (min) =	*
T (m^2/s) =	2,16E-08	T (m^2/s) =	7,95E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,08E-09	K_s (m/s) =	3,98E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5,09E-11
C_D (-) =	NA	C_D (-) =	5,61E-03
ξ (-) =	4,5	ξ (-) =	32,5
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	0,35	C (m^3/Pa) =	5,09E-11
dt_2 (min) =	5,03	C_D (-) =	5,61E-03
T_T (m^2/s) =	2,16E-08	ξ (-) =	4,5
S (-) =	1,00E-06		
K_s (m/s) =	1,08E-09		
S_s (1/m) =	5,00E-08		

Comments:

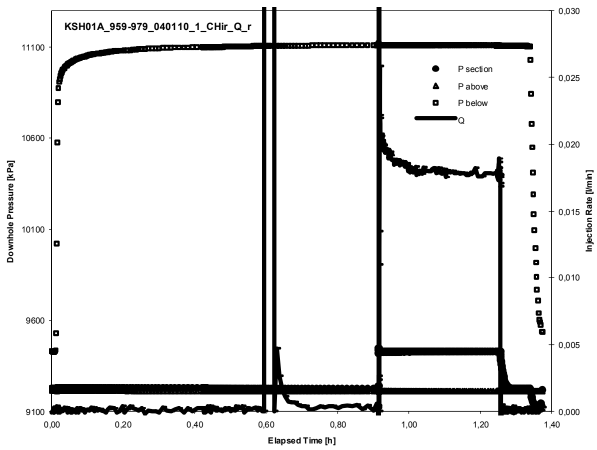
*: IARF not measured

The recommended transmissivity of 2.2E-8 m2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E-9 to 4E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 9033.7 kPa.

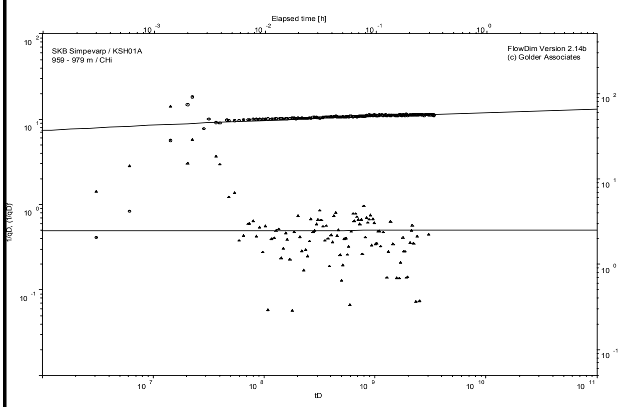
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	CHir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040110 16:59
Test section from - to (m):	959 - 979 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

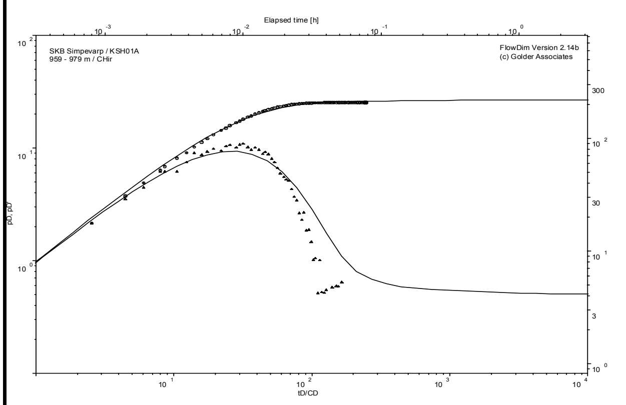
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	9225		
p_i (kPa) =	9223		
p_p(kPa) =	9428	p_F (kPa) =	9223
Q_p (m^3/s)=	2,96E-07		
tp (s) =	1200	t_F (s) =	300
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	20,9		
Derivative fact.=	0,13	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	1,42E-08		
T_M (m^2/s)=	1,48E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,38	dt_1 (min) =	*
dt_2 (min) =	10,15	dt_2 (min) =	*
T (m^2/s) =	2,54E-08	T (m^2/s) =	6,05E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,27E-09	K_s (m/s) =	3,03E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4,39E-11
C_D (-) =	NA	C_D (-) =	4,84E-03
ξ (-) =	6,0	ξ (-) =	21,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	0,38	C (m^3/Pa) =	4,39E-11
dt_2 (min) =	10,15	C_D (-) =	4,84E-03
T_T (m^2/s) =	2,54E-08	ξ (-) =	6,0
S (-) =	1,00E-06		
K_s (m/s) =	1,27E-09		
S_s (1/m) =	5,00E-08		

Comments:

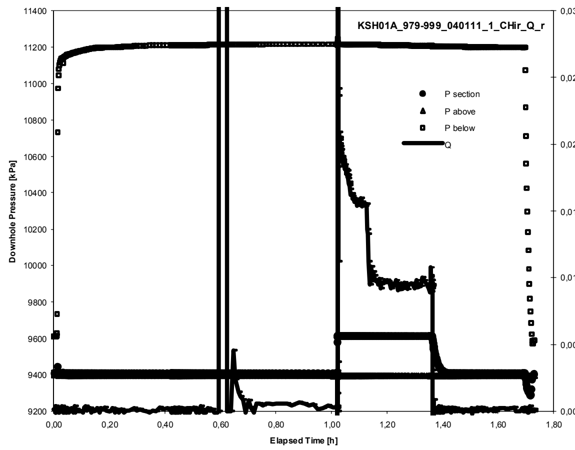
*: IARF not measured

The recommended transmissivity of 2.5E-8 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E-9 to 5E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 9221.1 kPa.

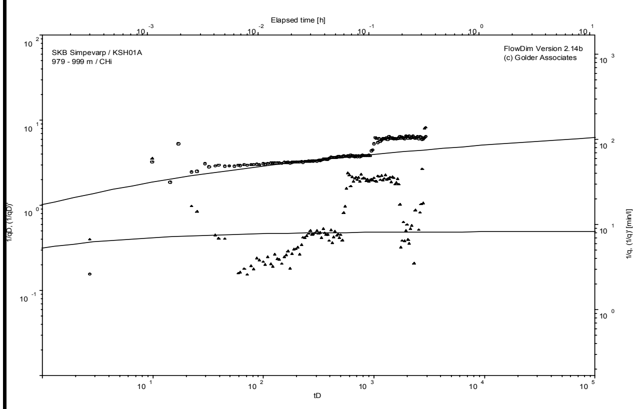
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040111 08:23
Test section from - to (m):	979 - 999 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

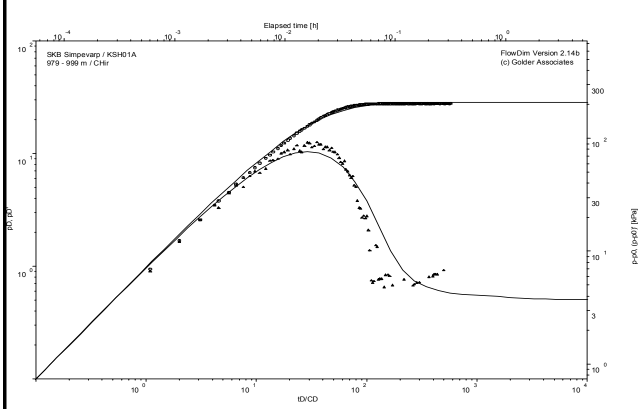
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	9409		
p_i (kPa) =	9406		
p_p(kPa) =	9610	p_F (kPa) =	9407
Q_p (m^3/s)=	1,61E-07		
tp (s) =	1200	t_F (s) =	1200
S el S* (-)=	1,00E-06	S el S* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	21,2		
Derivative fact.=	0,25	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	7,74E-09		
T_M (m^2/s)=	8,09E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1,72	dt_1 (min) =	*
dt_2 (min) =	3,37	dt_2 (min) =	*
T (m^2/s) =	7,59E-09	T (m^2/s) =	4,51E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	3,80E-10	K_s (m/s) =	2,26E-09
S_s (1/m) =	5,00E-08	S_s (1/m) =	5,00E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5,72E-11
C_D (-) =	NA	C_D (-) =	6,30E-03
ξ (-) =	-0,4	ξ (-) =	23,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	1,72	C (m^3/Pa) =	5,72E-11
dt_2 (min) =	3,37	C_D (-) =	6,30E-03
T_T (m^2/s) =	7,59E-09	ξ (-) =	-0,4
S (-) =	1,00E-06		
K_s (m/s) =	3,80E-10		
S_s (1/m) =	5,00E-08		

Comments:

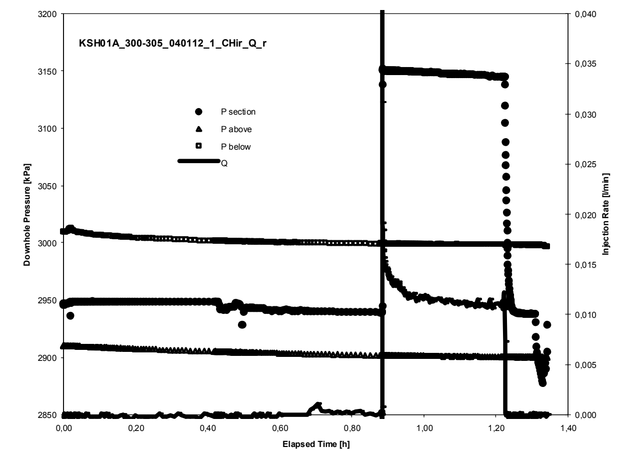
*: IARF not measured

The recommended transmissivity of 7.6E-9 m2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. It should be noted, that there are uncertainties for both analyses. The confidence range for the interval transmissivity is estimated to be 4E-9 to 4E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 9406.8 kPa.

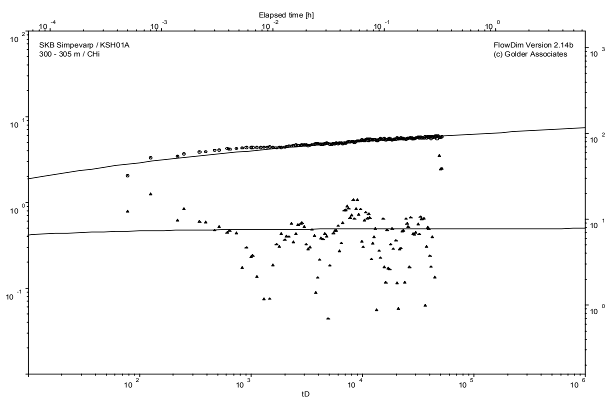
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040112 16:06
Test section from - to (m):	300 - 305 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

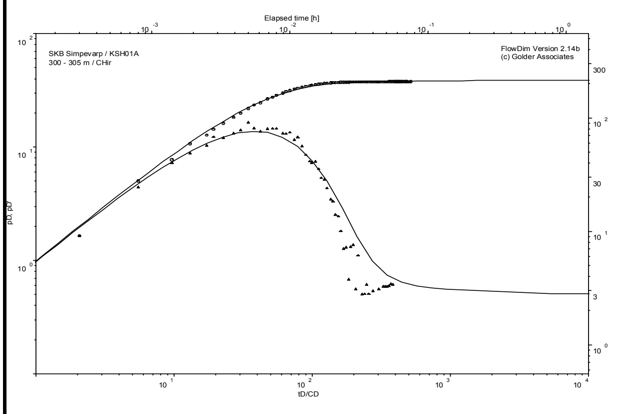
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2947		
p_i (kPa) =	2939		
p_p(kPa) =	3145	p_F (kPa) =	2938
Q_p (m^3/s)=	1,79E-07		
tp (s) =	1200	t_F (s) =	300
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,4		
Derivative fact.=	0,12	Derivative fact.=	0,03
Results		**Results**	
Q/s (m^2/s)=	8,50E-09		
T_M (m^2/s)=	7,01E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,80	dt_1 (min) =	*
dt_2 (min) =	15,07	dt_2 (min) =	*
T (m^2/s) =	7,96E-09	T (m^2/s) =	5,60E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,59E-09	K_s (m/s) =	1,12E-08
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,87E-11
C_D (-) =	NA	C_D (-) =	2,06E-03
ξ (-) =	1,0	ξ (-) =	33,3
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	0,80	C (m^3/Pa) =	1,87E-11
dt_2 (min) =	15,07	C_D (-) =	2,06E-03
T_T (m^2/s) =	7,96E-09	ξ (-) =	1,0
S (-) =	1,00E-06		
K_s (m/s) =	1,59E-09		
S_s (1/m) =	2,00E-07		

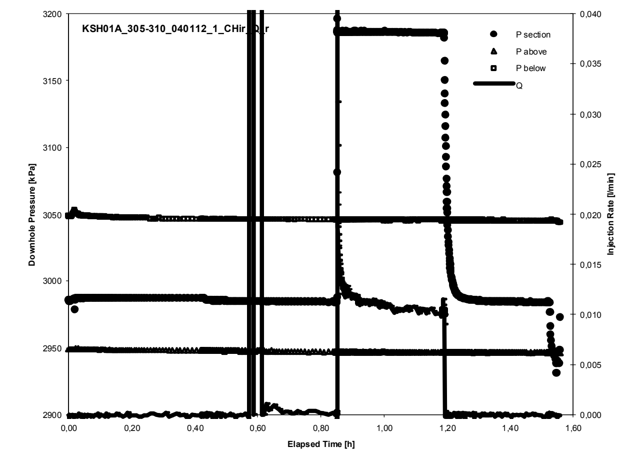
Comments:

*: IARF not measured
The recommended transmissivity of 8.0E-9 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E-9 to 2E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2935.9 kPa.

Test Summary Sheet

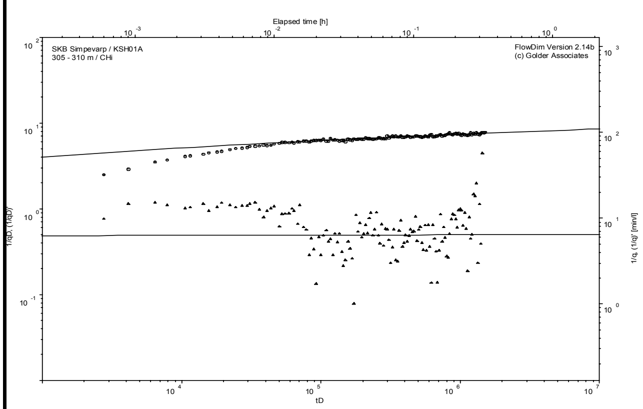
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040112 17:53
Test section from - to (m):	305 - 310 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

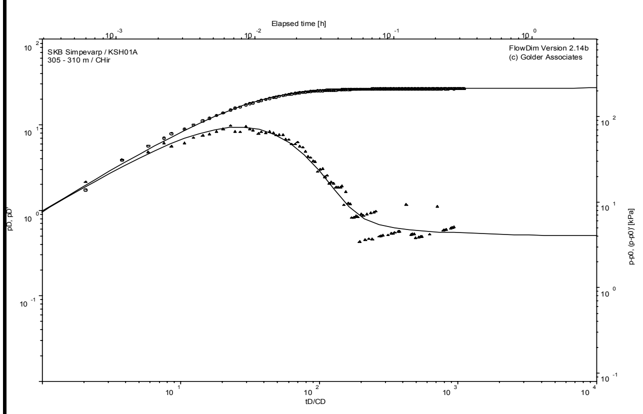


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	2986		
p_i (kPa) =	2984		
p_p(kPa) =	3185	p_F (kPa) =	2984
Q_p (m^3/s)=	1,69E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,5		
Derivative fact.=	0,22	Derivative fact.=	0,03
Results		**Results**	
Q/s (m^2/s)=	8,27E-09		
T_M (m^2/s)=	6,83E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1,10	dt_1 (min) =	*
dt_2 (min) =	12,37	dt_2 (min) =	*
T (m^2/s) =	1,00E-08	T (m^2/s) =	3,67E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,00E-09	K_s (m/s) =	7,34E-09
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,46E-11
C_D (-) =	NA	C_D (-) =	2,71E-03
ξ (-) =	2,6	ξ (-) =	21,5
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	1,10	C (m^3/Pa) =	2,46E-11
dt_2 (min) =	12,37	C_D (-) =	2,71E-03
T_T (m^2/s) =	1,00E-08	ξ (-) =	2,6
S (-) =	1,00E-06		
K_s (m/s) =	2,00E-09		
S_s (1/m) =	2,00E-07		

Comments:

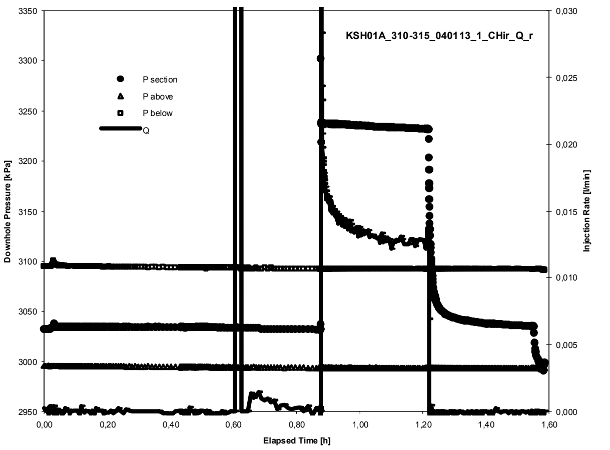
*: IARF not measured

The recommended transmissivity of 1.0E-8 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E-9 to 4E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2982.8 kPa

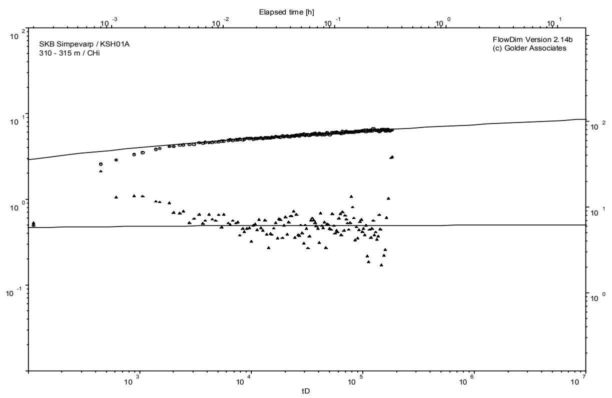
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040113 08:36
Test section from - to (m):	310 - 315 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

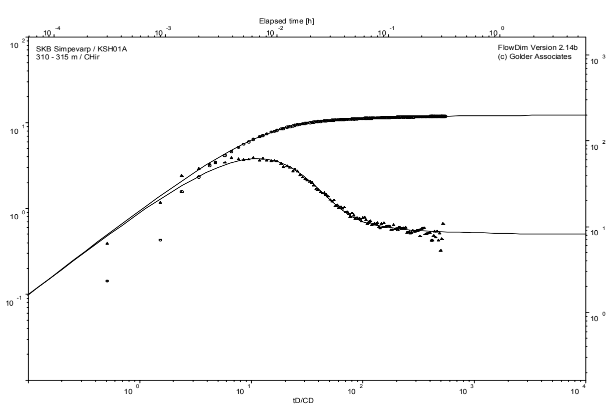
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3032		
p_i (kPa) =	3032		
p_p(kPa) =	3232	p_F (kPa) =	3035
Q_p (m^3/s)=	2,09E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,5		
Derivative fact.=	0,2	Derivative fact.=	0,11
Results		**Results**	
Q/s (m^2/s)=	1,02E-08		
T_M (m^2/s)=	8,41E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,58	dt_1 (min) =	7,27
dt_2 (min) =	15,45	dt_2 (min) =	17,20
T (m^2/s) =	1,05E-08	T (m^2/s) =	2,21E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,10E-09	K_s (m/s) =	4,42E-09
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3,00E-11
C_D (-) =	NA	C_D (-) =	3,31E-03
ξ (-) =	1,5	ξ (-) =	7,0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	7,27	C (m^3/Pa) =	3,00E-11
dt_2 (min) =	17,20	C_D (-) =	3,31E-03
T_T (m^2/s) =	2,21E-08	ξ (-) =	7,0
S (-) =	1,00E-06		
K_s (m/s) =	4,42E-09		
S_s (1/m) =	2,00E-07		

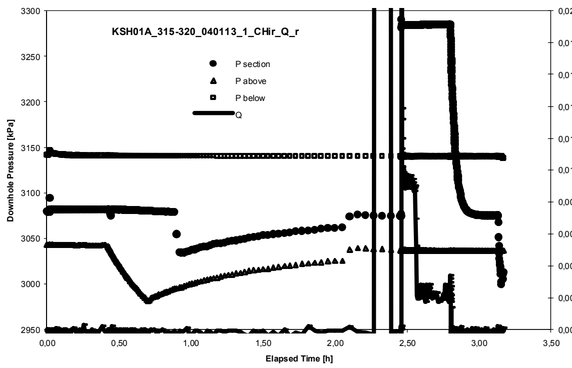
Comments:

The recommended transmissivity of 2.2E-8 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. Due to the low flow rate, the data of the Chi phase are a bit noisy. The confidence range for the interval transmissivity is estimated to be 8E-9 to 4E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3029.1 kPa

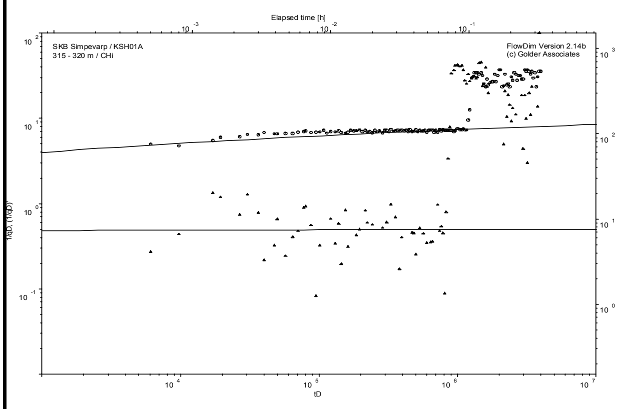
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040113 10:36
Test section from - to (m):	315 - 320 m	Responsible for test execution:	Reinder van der Wall
Section diameter, 2·r_w (m):	0,076	Responsible for test evaluation:	C. Enachescu

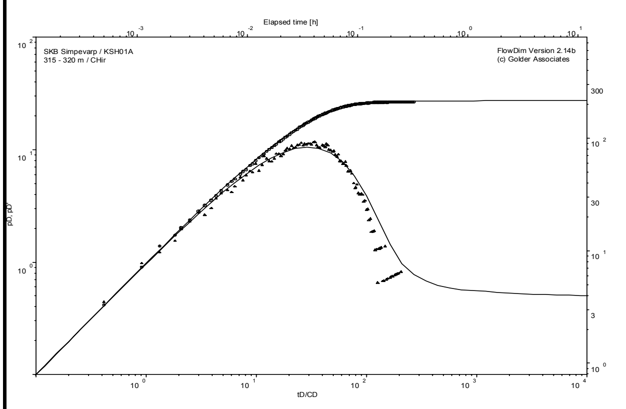
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3080		
p_i (kPa) =	3074		
p_p(kPa) =	3285	p_F (kPa) =	3075
Q_p (m^3/s)=	3,58E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,5		
Derivative fact.=	0,13	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	1,66E-09		
T_M (m^2/s)=	1,37E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,25	dt_1 (min) =	*
dt_2 (min) =	3,67	dt_2 (min) =	*
T (m^2/s) =	8,15E-09	T (m^2/s) =	1,47E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,63E-09	K_s (m/s) =	2,94E-09
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	4,07E-11
C_D (-) =	NA	C_D (-) =	4,49E-03
ξ (-) =	3,2	ξ (-) =	22,3
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	0,25	C (m^3/Pa) =	4,07E-11
dt_2 (min) =	3,67	C_D (-) =	4,49E-03
T_T (m^2/s) =	8,15E-09	ξ (-) =	3,2
S (-) =	1,00E-06		
K_s (m/s) =	1,63E-09		
S_s (1/m) =	2,00E-07		

Comments:

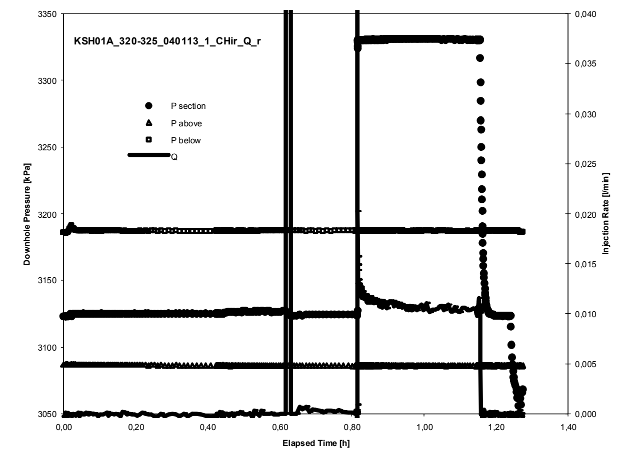
*: IARF not measured

The recommended transmissivity of 8.2E-9 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality, although there are uncertainties due to the low flow rate and the remarkable drop down after 6 minutes of the injection phase. Therefore the confidence range for the interval transmissivity is estimated to be 2E-9 to 2E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3075.1 kPa

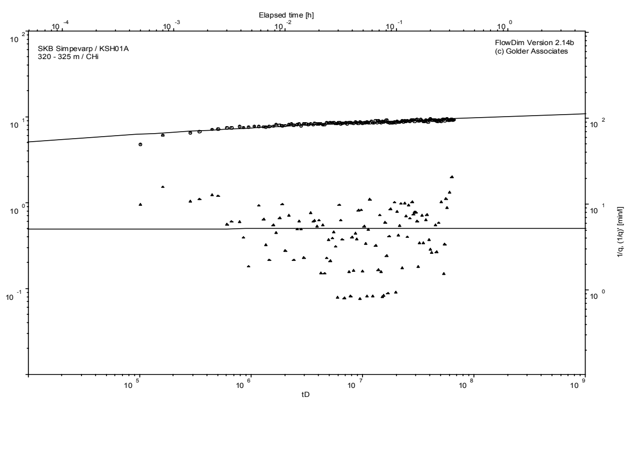
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	CHir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040113 14:11
Test section from - to (m):	320 - 325 m	Responsible for test execution:	Reinder van der Wall
Section diameter, 2·r_w (m):	0,076	Responsible for test evaluation:	C. Enachescu

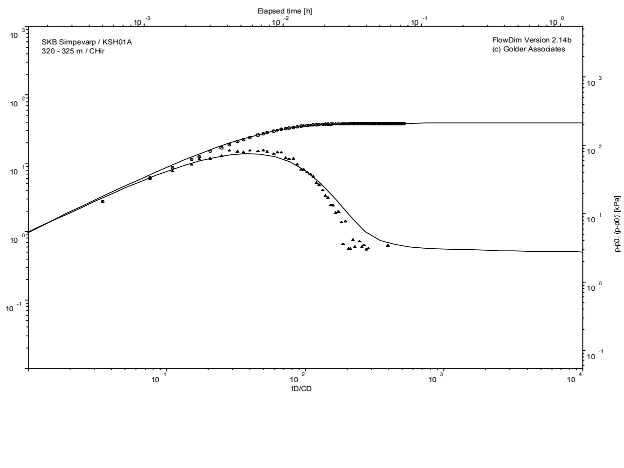
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3123		
p_i (kPa) =	3124		
p_p(kPa) =	3330	p_F (kPa) =	3124
Q_p (m^3/s)=	1,72E-07		
tp (s) =	1200	t_F (s) =	300
S el S* (-)=	1,00E-06	S el S* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,6		
Derivative fact.=	0,14	Derivative fact.=	0,03
Results		**Results**	
Q/s (m^2/s)=	8,19E-09		
T_M (m^2/s)=	6,76E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,18	dt_1 (min) =	*
dt_2 (min) =	13,31	dt_2 (min) =	*
T (m^2/s) =	1,21E-08	T (m^2/s) =	5,25E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,42E-09	K_s (m/s) =	1,05E-08
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,76E-11
C_D (-) =	NA	C_D (-) =	1,94E-03
ξ (-) =	4,4	ξ (-) =	33,7
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	0,18	C (m^3/Pa) =	1,76E-11
dt_2 (min) =	13,31	C_D (-) =	1,94E-03
T_T (m^2/s) =	1,21E-08	ξ (-) =	4,4
S (-) =	1,00E-06		
K_s (m/s) =	2,42E-09		
S_s (1/m) =	2,00E-07		

Comments:

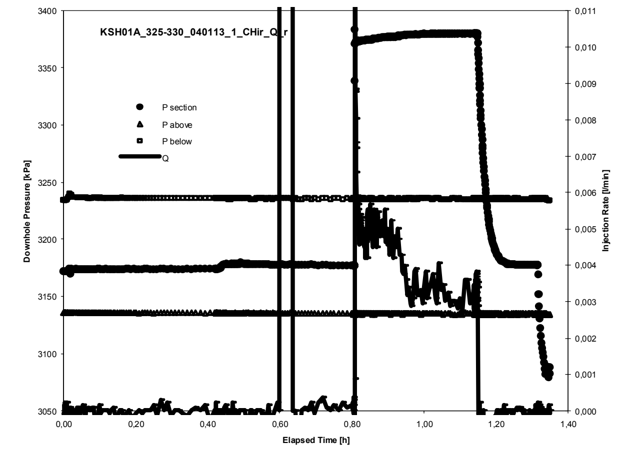
*: IARF not measured

The recommended transmissivity of 1.2E-8 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality, although there are uncertainties due to the low flow rate and the noise. Therefore the confidence range for the interval transmissivity is estimated to be 7E-9 to 6E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3123.8 kPa

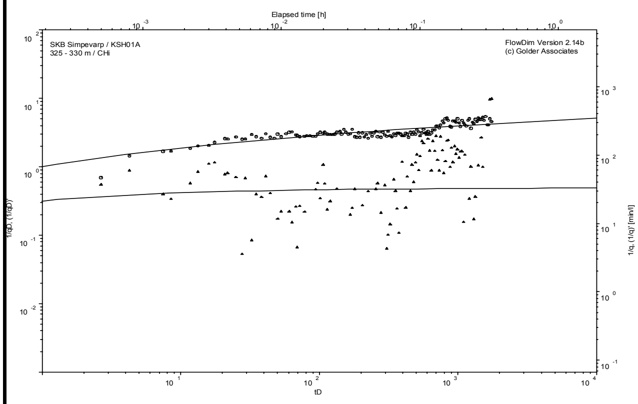
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040113 15:57
Test section from - to (m):	325 - 330 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

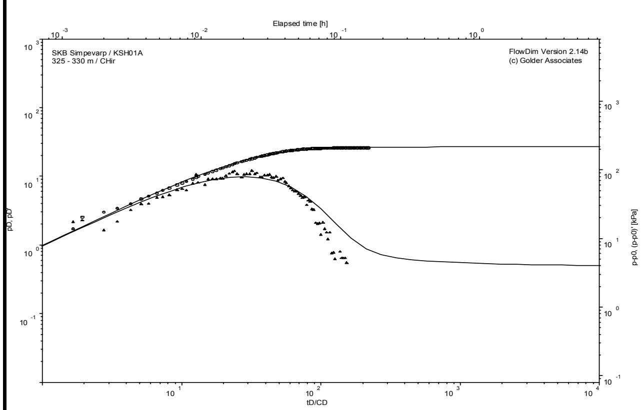
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3172		
p_i (kPa) =	3177		
p_p(kPa) =	3380	p_F (kPa) =	3177
Q_p (m^3/s)=	5,05E-08		
tp (s) =	1200	t_F (s) =	600
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,7		
Derivative fact.=	0,14	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	2,45E-09		
T_M (m^2/s)=	2,02E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,50	dt_1 (min) =	*
dt_2 (min) =	5,13	dt_2 (min) =	*
T (m^2/s) =	1,92E-09	T (m^2/s) =	1,34E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	3,84E-10	K_s (m/s) =	2,68E-09
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,23E-11
C_D (-) =	NA	C_D (-) =	2,46E-03
ξ (-) =	0,1	ξ (-) =	22,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	0,50	C (m^3/Pa) =	2,23E-11
dt_2 (min) =	5,13	C_D (-) =	2,46E-03
T_T (m^2/s) =	1,92E-09	ξ (-) =	0,1
S (-) =	1,00E-06		
K_s (m/s) =	3,84E-10		
S_s (1/m) =	2,00E-07		

Comments:

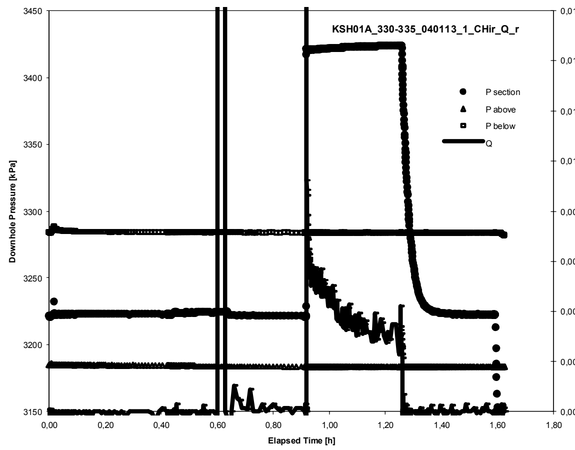
*: IARF not measured

The recommended transmissivity of 1.9E-9 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality, although there are some uncertainties due to the low flow rate and the noisy data. The confidence range for the interval transmissivity is estimated to be 9E-10 to 7E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3177.4 kPa

Test Summary Sheet

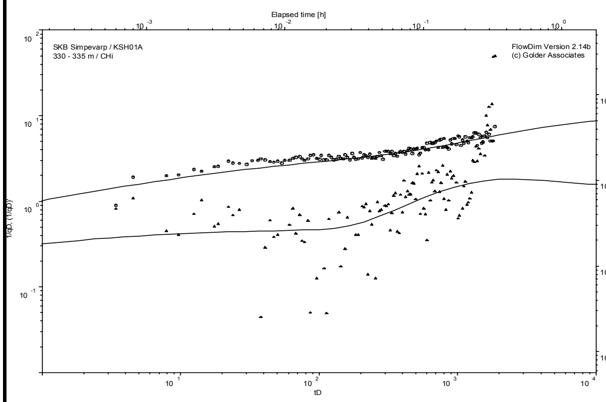
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040113 17:41
Test section from - to (m):	330 - 335 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

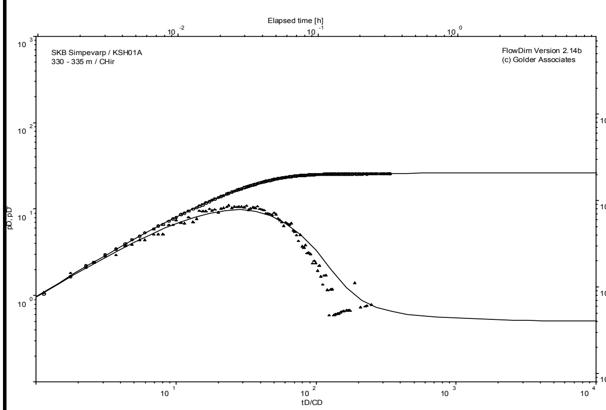


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3221		
p_i (kPa) =	3222		
p_p(kPa) =	3424	p_F (kPa) =	3222
Q_p (m^3/s)=	4,80E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,7		
Derivative fact.=	0,15	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	2,34E-09		
T_M (m^2/s)=	1,93E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	7,57E-10	T (m^2/s) =	1,33E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,51E-10	K_s (m/s) =	2,66E-09
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,96E-11
C_D (-) =	NA	C_D (-) =	3,26E-03
ξ (-) =	0	ξ (-) =	21,4
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	2,96E-11
dt_2 (min) =	*	C_D (-) =	3,26E-03
T_T (m^2/s) =	7,57E-10	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	1,51E-10		
S_s (1/m) =	2,00E-07		

Comments:

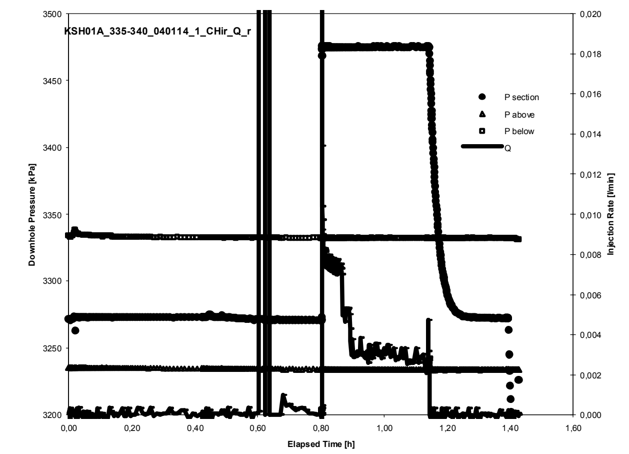
*: IARF not measured

The recommended transmissivity of 7.6E-10 m2/s was derived from the analysis of the CHi phase (outer zone). The confidence range for the interval transmissivity is estimated to be 7E-10 to 4E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3220.7 kPa.

Test Summary Sheet

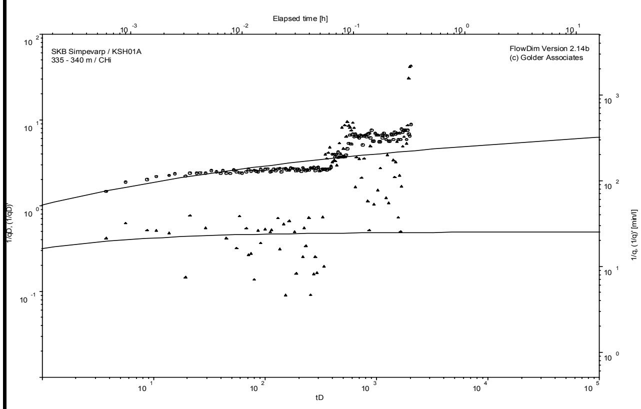
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040114 08:15
Test section from - to (m):	335 - 340 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

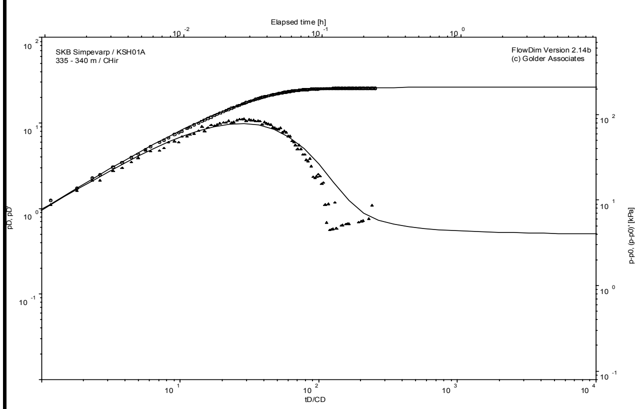


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3272		
p_i (kPa) =	3271		
p_p(kPa) =	3475	p_F (kPa) =	3272
Q_p (m^3/s)=	4,56E-08		
tp (s) =	1200	t_F (s) =	900
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,8		
Derivative fact.=	0,06	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	2,20E-09		
T_M (m^2/s)=	1,82E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,08	dt_1 (min) =	*
dt_2 (min) =	2,17	dt_2 (min) =	*
T (m^2/s) =	2,51E-09	T (m^2/s) =	1,39E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	5,02E-10	K_s (m/s) =	2,78E-09
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3,03E-11
C_D (-) =	NA	C_D (-) =	3,34E-03
ξ (-) =	0	ξ (-) =	21,4
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0,08	C (m^3/Pa) =	3,03E-11
dt_2 (min) =	2,17	C_D (-) =	3,34E-03
T_T (m^2/s) =	2,51E-09	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	5,02E-10		
S_s (1/m) =	2,00E-07		

Comments:

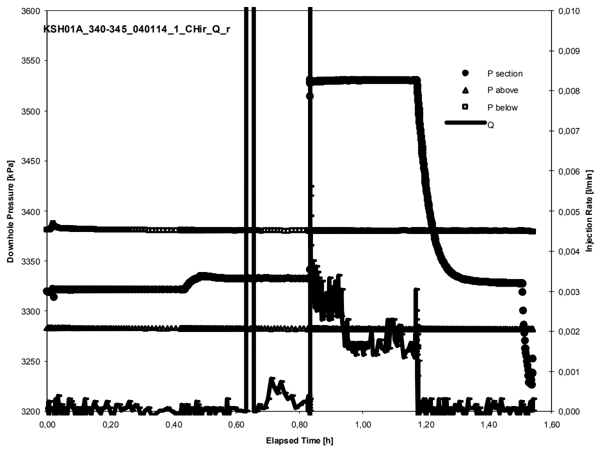
*: IARF not measured

The recommended transmissivity of 2.5E-9 m2/s was derived from the analysis of the CHi phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E-10 to 5E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3270.2 kPa.

Test Summary Sheet

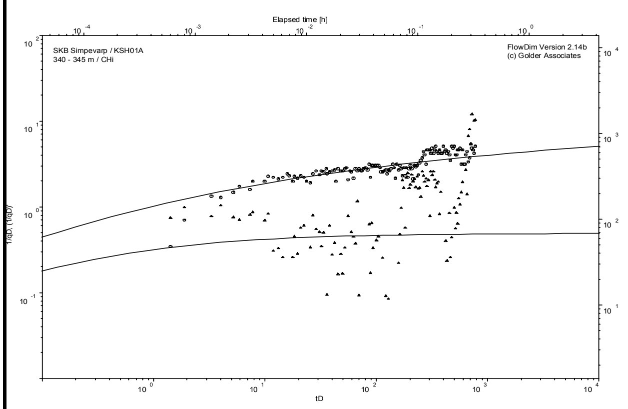
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040114 10:08
Test section from - to (m):	340 - 345 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

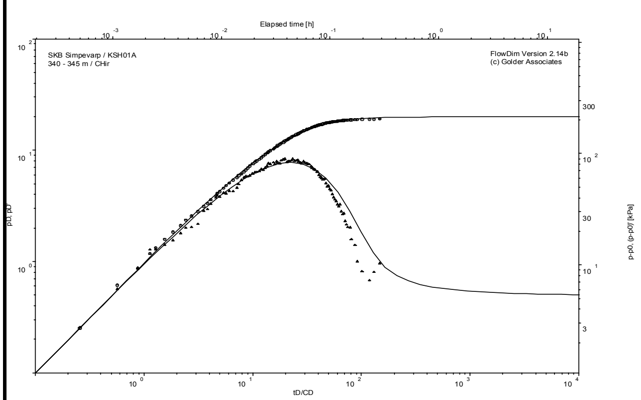


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3320		
p_i (kPa) =	3333		
p_p(kPa) =	3530	p_F (kPa) =	3327
Q_p (m^3/s)=	2,60E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,9		
Derivative fact.=	0,19	Derivative fact.=	0,07
Results		**Results**	
Q/s (m^2/s)=	1,29E-09		
T_M (m^2/s)=	1,07E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,34	dt_1 (min) =	*
dt_2 (min) =	4,12	dt_2 (min) =	*
T (m^2/s) =	9,48E-10	T (m^2/s) =	5,45E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,90E-10	K_s (m/s) =	1,09E-09
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,44E-11
C_D (-) =	NA	C_D (-) =	2,69E-03
ξ (-) =	0	ξ (-) =	15,6
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0,34	C (m^3/Pa) =	2,44E-11
dt_2 (min) =	4,12	C_D (-) =	2,69E-03
T_T (m^2/s) =	9,48E-10	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	1,90E-10		
S_s (1/m) =	2,00E-07		

Comments:

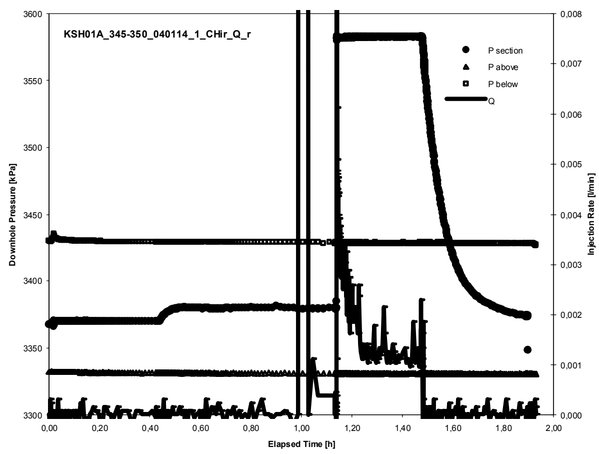
*: IARF nor measured

The recommended transmissivity of 9.5E-10 m2/s was derived from the analysis of the CHi phase. The confidence range for the interval transmissivity is estimated to be 5E-10 to 5E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3316.6 kPa.

Test Summary Sheet

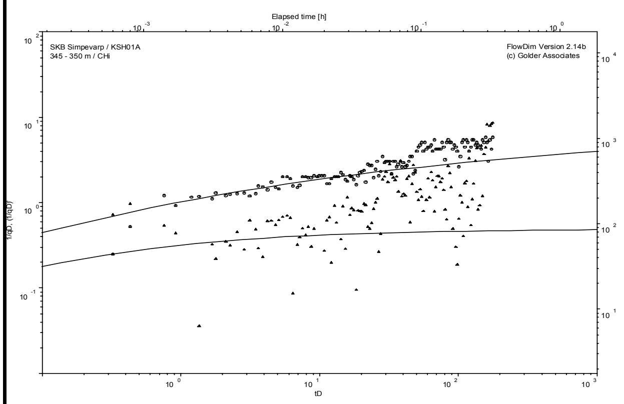
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040114 12:09
Test section from - to (m):	345 - 350 m	Responsible for test execution:	Reinder van der Wall
Section diameter, 2·r_w (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

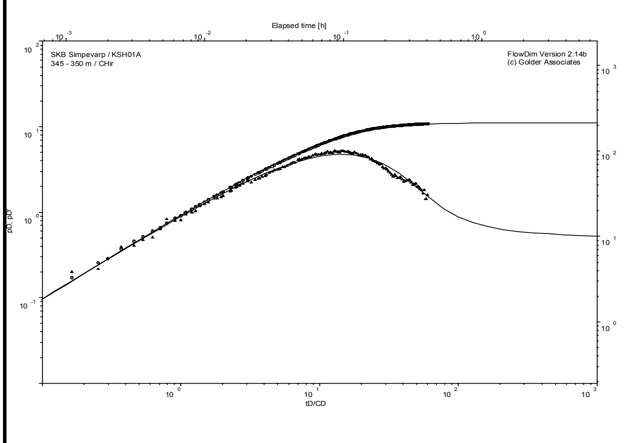


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3368		
p_i (kPa) =	3380		
p_p(kPa) =	3582	p_F (kPa) =	3374
Q_p (m^3/s)=	1,86E-08		
tp (s) =	1200	t_F (s) =	1500
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11,9		
Derivative fact.=	0,25	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	9,02E-10		
T_M (m^2/s)=	7,45E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	7,29E-10	T (m^2/s) =	2,56E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,46E-10	K_s (m/s) =	5,12E-10
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3,98E-11
C_D (-) =	NA	C_D (-) =	4,39E-03
ξ (-) =	-0,6	ξ (-) =	7,4
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	3,98E-11
dt_2 (min) =	*	C_D (-) =	4,39E-03
T_T (m^2/s) =	2,56E-09	ξ (-) =	7,4
S (-) =	1,00E-06		
K_s (m/s) =	5,12E-10		
S_s (1/m) =	2,00E-07		

Comments:

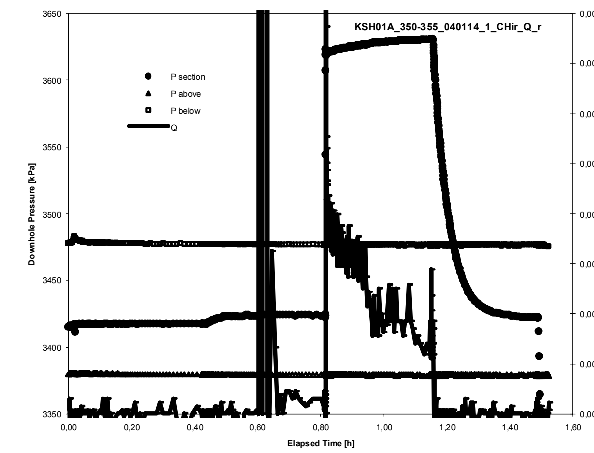
*: IARF not measured

The recommended transmissivity of 2.6E-9 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E-10 to 7E-9 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3366.9 kPa

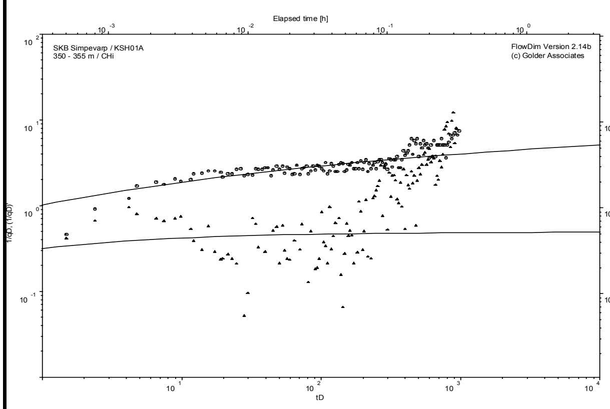
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040114 14:28
Test section from - to (m):	350 - 355 m	Responsible for test execution:	Reinder van der Wall
Section diameter, 2·r_w (m):	0,076	Responsible for test evaluation:	C. Enachescu

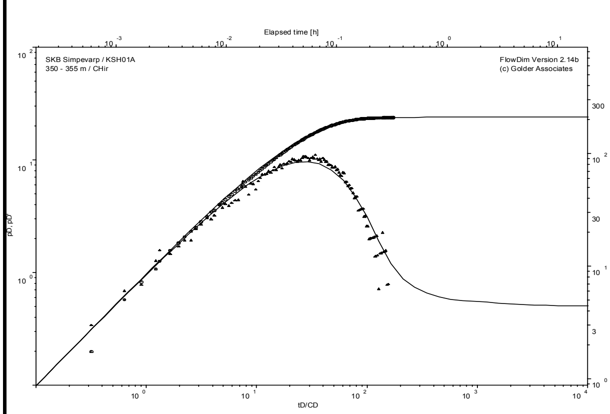
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3416		
p_i (kPa) =	3424		
p_p(kPa) =	3631	p_F (kPa) =	3423
Q_p (m^3/s)=	2,35E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,0		
Derivative fact.=	0,22	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	1,11E-09		
T_M (m^2/s)=	9,19E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,25	dt_1 (min) =	*
dt_2 (min) =	4,10	dt_2 (min) =	*
T (m^2/s) =	1,19E-09	T (m^2/s) =	7,65E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,38E-10	K_s (m/s) =	1,53E-09
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3,32E-11
C_D (-) =	NA	C_D (-) =	3,66E-03
ξ (-) =	0	ξ (-) =	19,6
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	0,25	C (m^3/Pa) =	3,32E-11
dt_2 (min) =	4,10	C_D (-) =	3,66E-03
T_T (m^2/s) =	1,19E-09	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	2,38E-10		
S_s (1/m) =	2,00E-07		

Comments:

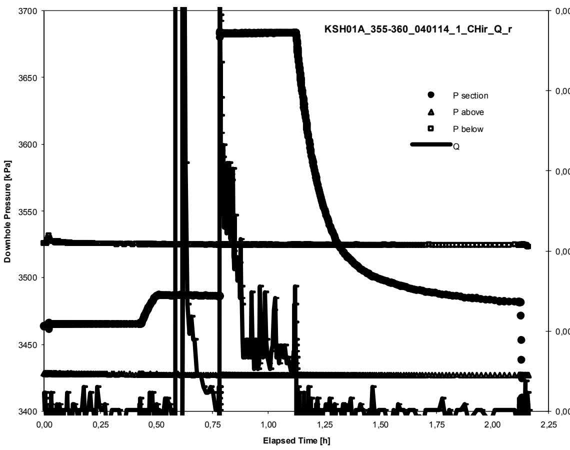
*: IARF not measured

The recommended transmissivity of 1.2E-9 m2/s was derived from the analysis of the CHi phase (first part), which is quite noisy, but showing the most reliable results. The confidence range for the interval transmissivity is estimated to be 7E-10 to 7E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3422.8 kPa

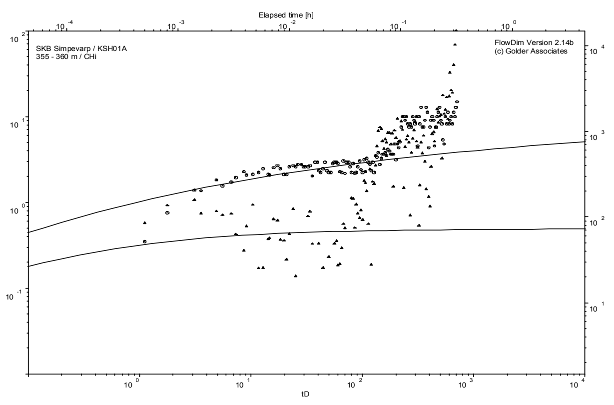
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040114 16:25
Test section from - to (m):	355 - 360 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

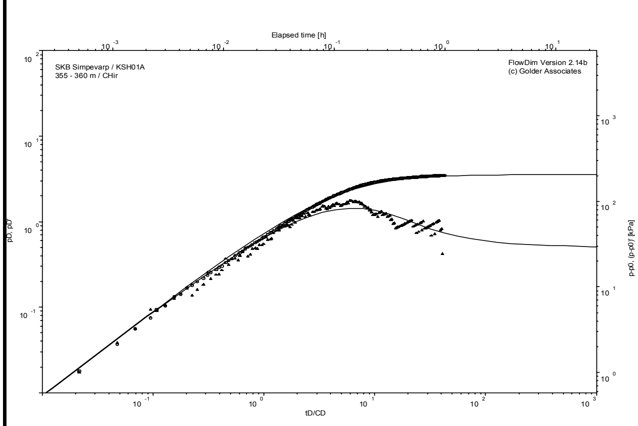
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3464		
p_i (kPa) =	3486		
p_p(kPa) =	3682	p_F (kPa) =	3482
Q_p (m^3/s)=	9,98E-09		
tp (s) =	1200	t_F (s) =	3600
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,1		
Derivative fact.=	0,22	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	5,00E-10		
T_M (m^2/s)=	4,12E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,20	dt_1 (min) =	*
dt_2 (min) =	2,32	dt_2 (min) =	*
T (m^2/s) =	8,90E-10	T (m^2/s) =	5,92E-10
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,78E-10	K_s (m/s) =	1,18E-10
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3,16E-11
C_D (-) =	NA	C_D (-) =	3,48E-03
ξ (-) =	0	ξ (-) =	0,5
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	3,16E-11
dt_2 (min) =	*	C_D (-) =	3,48E-03
T_T (m^2/s) =	5,92E-10	ξ (-) =	0,5
S (-) =	1,00E-06		
K_s (m/s) =	1,18E-10		
S_s (1/m) =	2,00E-07		

Comments:

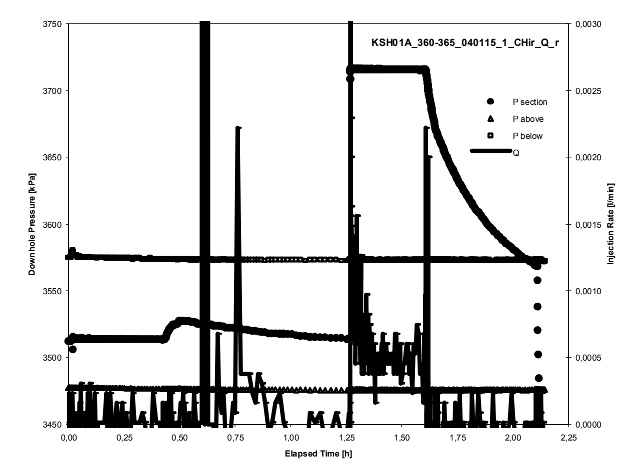
*: IARF not measured

The recommended transmissivity of 5.9E-10 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E-10 to 1E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3467.0 kPa.

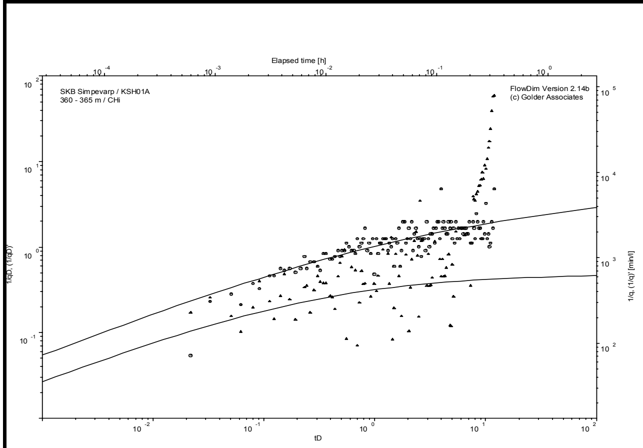
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040115 08:27
Test section from - to (m):	360 - 365 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

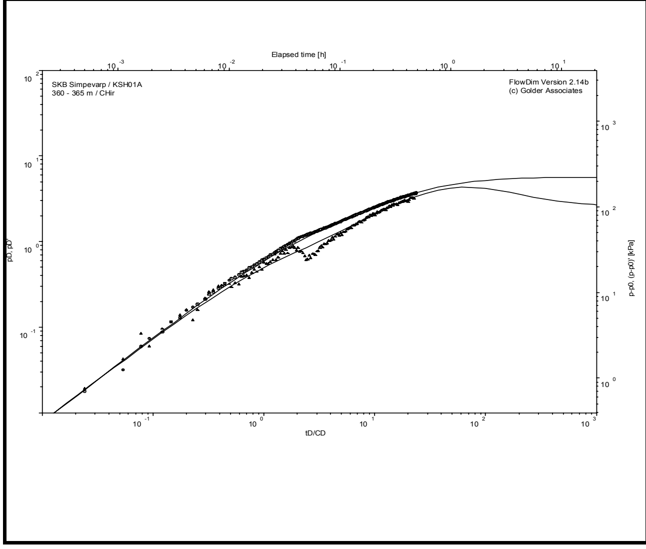
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3512		
p_i (kPa) =	3514		
p_p(kPa) =	3715	p_F (kPa) =	3569
Q_p (m^3/s)=	7,53E-09		
tp (s) =	1200	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,1		
Derivative fact.=	0,19	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	3,68E-10		
T_M (m^2/s)=	3,03E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	9,73E-11	T (m^2/s) =	1,05E-10
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,95E-11	K_s (m/s) =	2,10E-11
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,39E-11
C_D (-) =	NA	C_D (-) =	2,63E-03
ξ (-) =	-0,9	ξ (-) =	0,6
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	
Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	2,39E-11
dt_2 (min) =	*	C_D (-) =	2,63E-03
T_T (m^2/s) =	9,73E-11	ξ (-) =	-0,9
S (-) =	1,00E-06		
K_s (m/s) =	1,95E-11		
S_s (1/m) =	2,00E-07		

Comments:

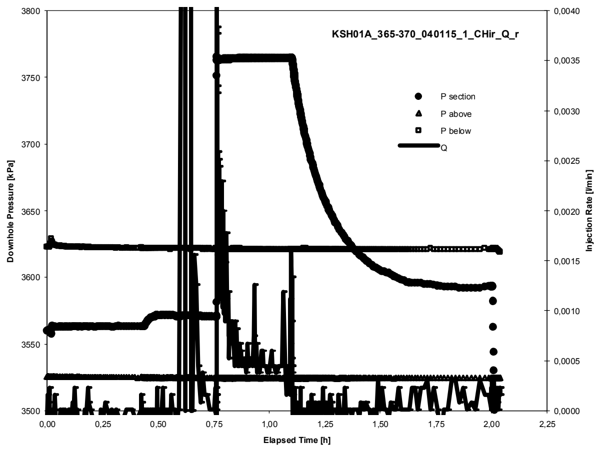
*: IARF not measured

The recommended transmissivity of 1.0E-10 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. It should be noted, that due to the very low flow rate, the results have some uncertainties. The confidence range for the interval transmissivity is estimated to be 8E-11 to 7E-10 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3491.1 kPa.

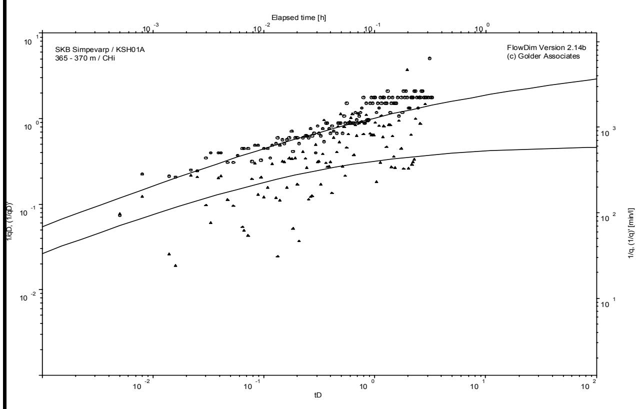
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040115 11:01
Test section from - to (m):	365 - 370 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

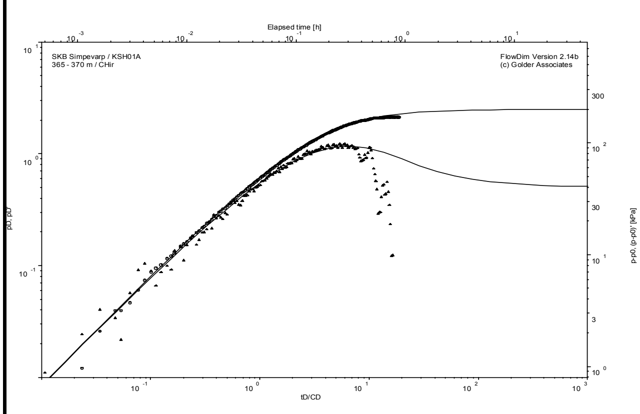
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3561		
p_i (kPa) =	3570		
p_p(kPa) =	3764	p_F (kPa) =	3593
Q_p (m^3/s)=	7,53E-09		
tp (s) =	1200	t_F (s) =	3240
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,2		
Derivative fact.=	0,2	Derivative fact.=	0,03
Results		**Results**	
Q/s (m^2/s)=	3,83E-10		
T_M (m^2/s)=	3,16E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	1,07E-10	T (m^2/s) =	2,66E-10
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,14E-11	K_s (m/s) =	5,32E-11
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,86E-11
C_D (-) =	NA	C_D (-) =	3,15E-03
ξ (-) =	-1,6	ξ (-) =	0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	
Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	2,86E-11
dt_2 (min) =	*	C_D (-) =	3,15E-03
T_T (m^2/s) =	2,66E-10	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	5,32E-11		
S_s (1/m) =	2,00E-07		

Comments:

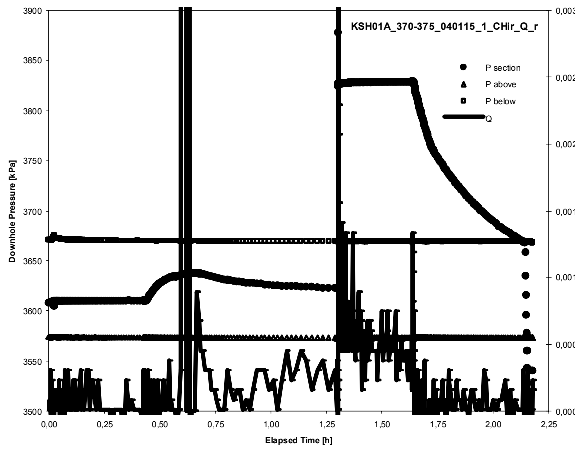
*: IARF not measured

The recommended transmissivity of 2.7E-10 m2/s was derived from the analysis of the CHir phase (first part), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E-11 to 8E-10 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3563.3 kPa.

Test Summary Sheet

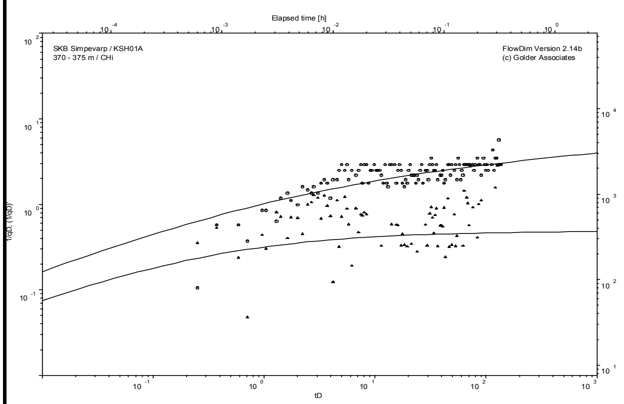
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040115 13:29
Test section from - to (m):	370 - 375 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

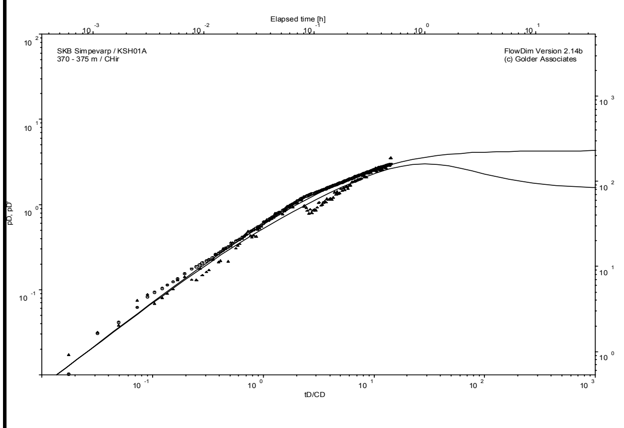


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3609		
p_i (kPa) =	3623		
p_p(kPa) =	3829	p_F (kPa) =	3668
Q_p (m^3/s)=	6,32E-09		
tp (s) =	1200	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,3		
Derivative fact.=	0,26	Derivative fact.=	
Results		**Results**	
Q/s (m^2/s)=	3,02E-10		
T_M (m^2/s)=	2,50E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	1,67E-10	T (m^2/s) =	9,39E-11
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	3,34E-11	K_s (m/s) =	1,88E-11
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,21E-11
C_D (-) =	NA	C_D (-) =	2,44E-03
ξ (-) =	0	ξ (-) =	1,2
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	2,21E-11
dt_2 (min) =	*	C_D (-) =	2,44E-03
T_T (m^2/s) =	9,39E-11	ξ (-) =	1,2
S (-) =	1,00E-06		
K_s (m/s) =	1,88E-11		
S_s (1/m) =	2,00E-07		

Comments:

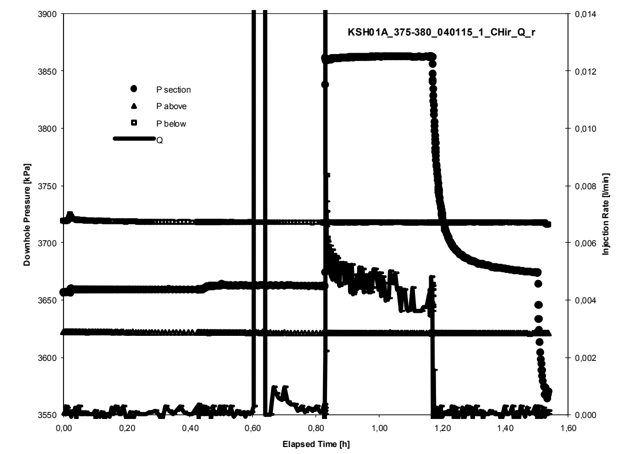
*: IARF not measured

The recommended transmissivity of 9.4E-11 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. It should be noted, that due to the very low interval transmissivity, the results are uncertain. The confidence range for the interval transmissivity is estimated to be 7E-11 to 4E-10 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3599.1 kPa.

Test Summary Sheet

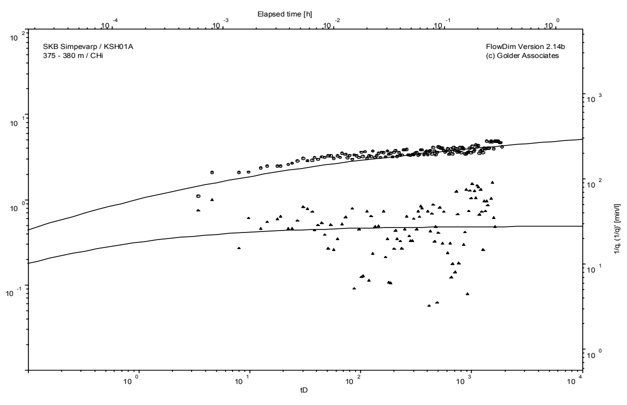
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040115 16:10
Test section from - to (m):	375 - 380 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

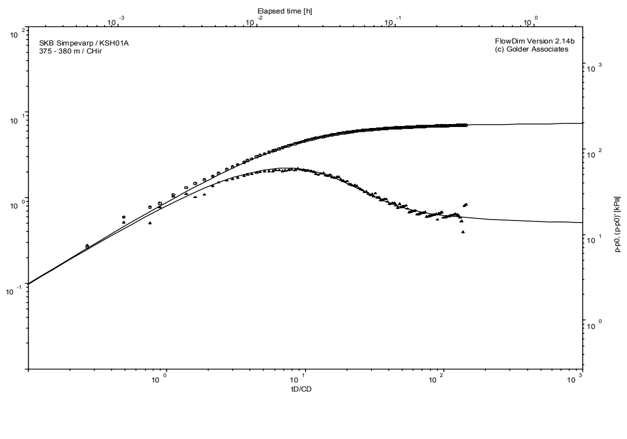


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3657		
p_i (kPa) =	3662		
p_p(kPa) =	3863	p_F (kPa) =	3674
Q_p (m^3/s)=	6,77E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,3		
Derivative fact.=	0,18	Derivative fact.=	0,07
Results		**Results**	
Q/s (m^2/s)=	3,32E-09		
T_M (m^2/s)=	2,74E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,13	dt_1 (min) =	12,40
dt_2 (min) =	5,00	dt_2 (min) =	18,02
T (m^2/s) =	2,29E-09	T (m^2/s) =	4,55E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	4,58E-10	K_s (m/s) =	9,10E-10
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,35E-11
C_D (-) =	NA	C_D (-) =	2,59E-03
ξ (-) =	0	ξ (-) =	2,9
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	12,40	C (m^3/Pa) =	2,35E-11
dt_2 (min) =	18,02	C_D (-) =	2,59E-03
T_T (m^2/s) =	4,55E-09	ξ (-) =	2,9
S (-) =	1,00E-06		
K_s (m/s) =	9,10E-10		
S_s (1/m) =	2,00E-07		

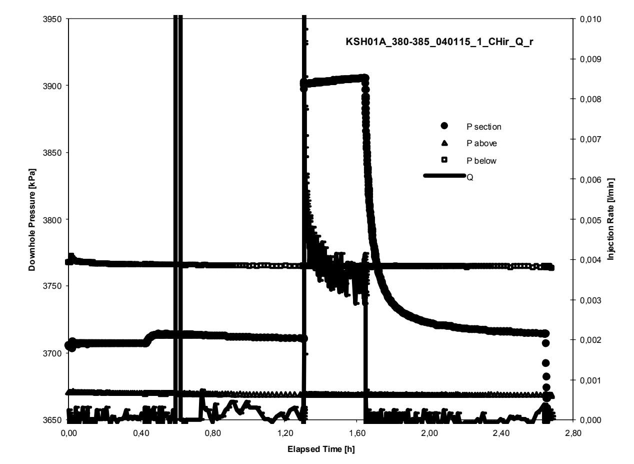
Comments:

The recommended transmissivity of 4.6E-9 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2E-9 to 8E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3662.6 kPa.

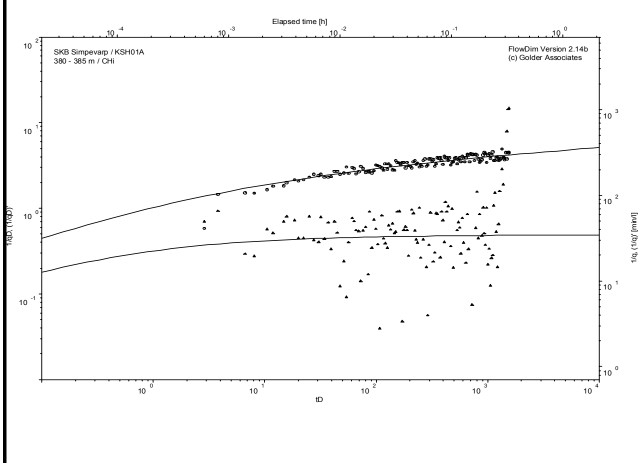
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040115 18:06
Test section from - to (m):	380 - 385 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

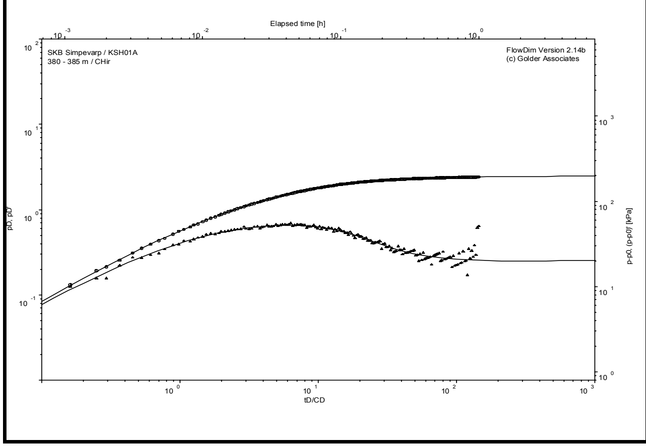
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3705		
p_i (kPa) =	3711		
p_p(kPa) =	3905	p_F (kPa) =	3714
Q_p (m^3/s)=	5,29E-08		
tp (s) =	1200	t_F (s) =	3600
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,4		
Derivative fact.=	0,23	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	2,68E-09		
T_M (m^2/s)=	2,21E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,25	dt_1 (min) =	28,60
dt_2 (min) =	11,77	dt_2 (min) =	51,82
T (m^2/s) =	1,91E-09	T (m^2/s) =	2,58E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	3,82E-10	K_s (m/s) =	5,16E-10
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,11E-11
C_D (-) =	NA	C_D (-) =	2,33E-03
ξ (-) =	0	ξ (-) =	-1,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	28,60	C (m^3/Pa) =	2,11E-11
dt_2 (min) =	51,82	C_D (-) =	2,33E-03
T_T (m^2/s) =	2,58E-09	ξ (-) =	-1,1
S (-) =	1,00E-06		
K_s (m/s) =	5,16E-10		
S_s (1/m) =	2,00E-07		

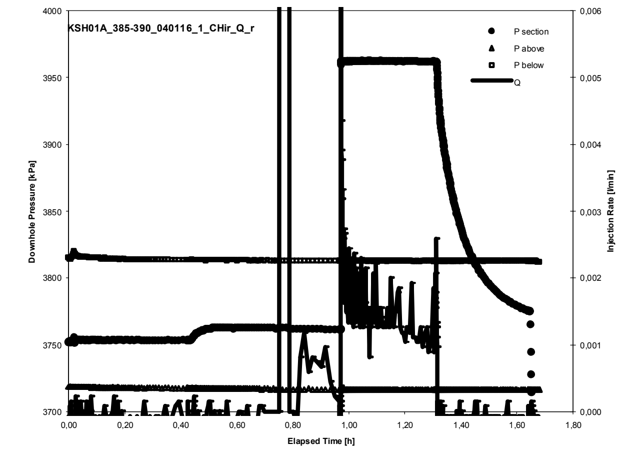
Comments:

The recommended transmissivity of 2.6E-9 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E-10 to 4E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3708.5 kPa.

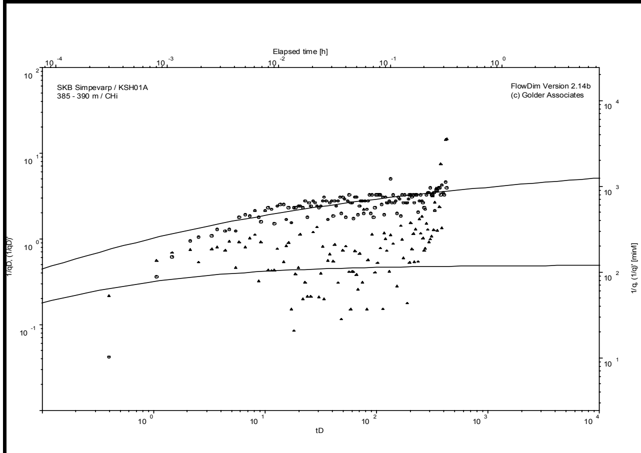
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040116 08:24
Test section from - to (m):	385 - 390 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

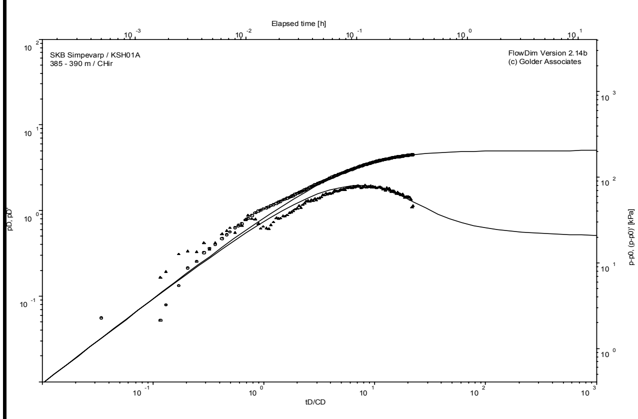
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3752		
p_i (kPa) =	3762		
p_p(kPa) =	3962	p_F (kPa) =	3775
Q_p (m^3/s)=	1,98E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,5		
Derivative fact.=	0,24	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	9,71E-10		
T_M (m^2/s)=	8,02E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,55	dt_1 (min) =	*
dt_2 (min) =	4,61	dt_2 (min) =	*
T (m^2/s) =	5,32E-10	T (m^2/s) =	1,03E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,06E-10	K_s (m/s) =	2,06E-10
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3,46E-11
C_D (-) =	NA	C_D (-) =	3,81E-03
ξ (-) =	0	ξ (-) =	1,6
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	3,46E-11
dt_2 (min) =	*	C_D (-) =	3,81E-03
T_T (m^2/s) =	1,03E-09	ξ (-) =	1,6
S (-) =	1,00E-06		
K_s (m/s) =	2,06E-10		
S_s (1/m) =	2,00E-07		

Comments:

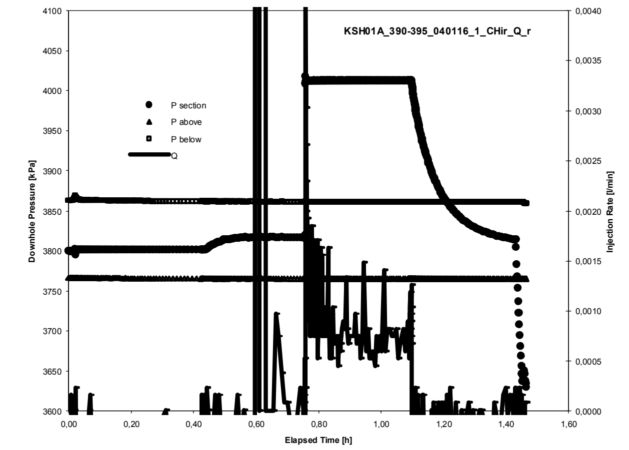
*: IARF not measured

The recommended transmissivity of 1.0E-9 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E-10 to 3E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3753.3 kPa.

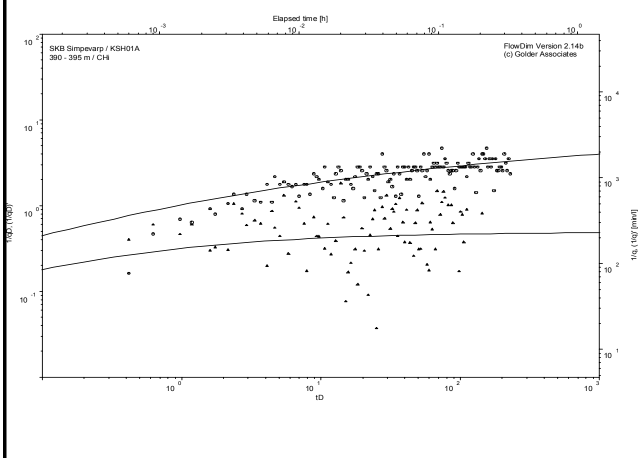
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040116 10:32
Test section from - to (m):	390 - 395 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

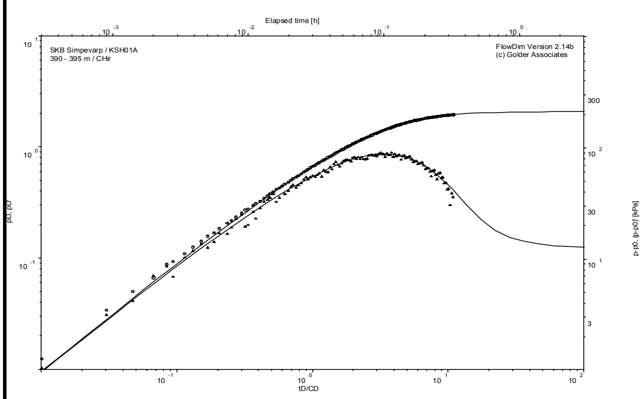
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3800		
p_i (kPa) =	3816		
p_p(kPa) =	4013	p_F (kPa) =	3815
Q_p (m^3/s)=	1,12E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,5		
Derivative fact.=	0,29	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	5,62E-10		
T_M (m^2/s)=	4,64E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1,95	dt_1 (min) =	*
dt_2 (min) =	5,42	dt_2 (min) =	*
T (m^2/s) =	2,79E-10	T (m^2/s) =	9,72E-10
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	5,58E-11	K_s (m/s) =	1,94E-10
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,67E-11
C_D (-) =	NA	C_D (-) =	1,84E-03
ξ (-) =	0	ξ (-) =	-0,3
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	1,67E-11
dt_2 (min) =	*	C_D (-) =	1,84E-03
T_T (m^2/s) =	9,72E-10	ξ (-) =	-0,3
S (-) =	1,00E-06		
K_s (m/s) =	1,94E-10		
S_s (1/m) =	2,00E-07		

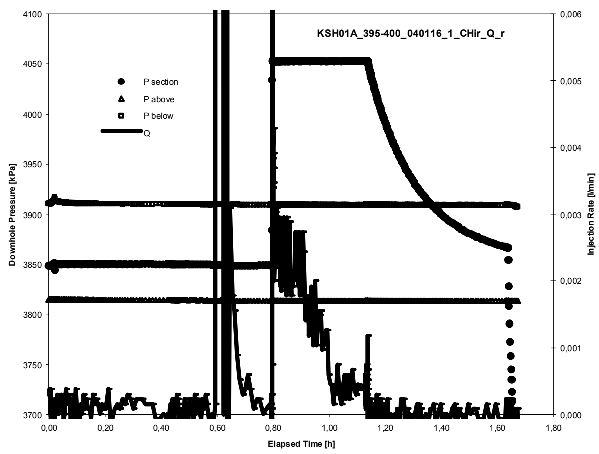
Comments:

*: IARF not measured
The recommended transmissivity of 9.7E-10 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E-10 to 3E-9 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3799.4 kPa.

Test Summary Sheet

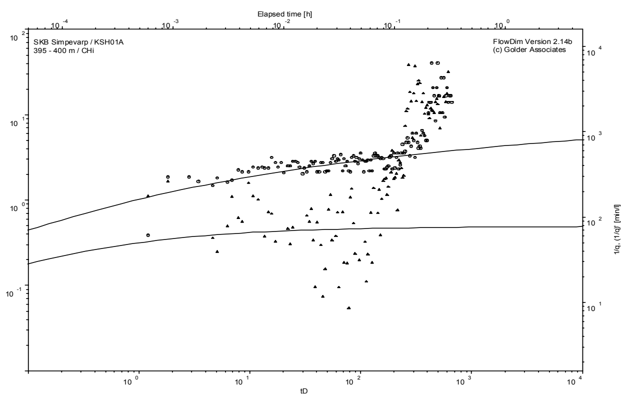
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040116 13:04
Test section from - to (m):	395 - 400 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

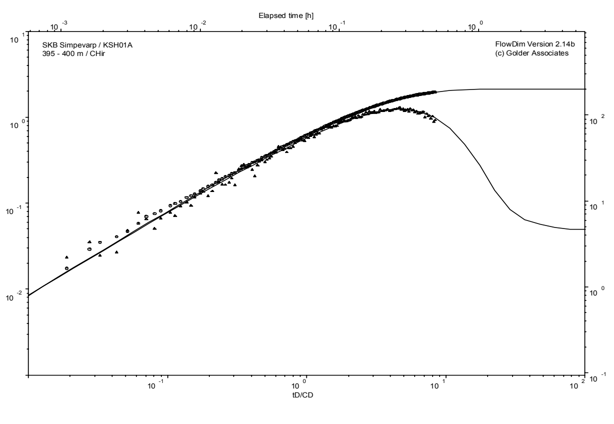


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3848		
p_i (kPa) =	3849		
p_p(kPa) =	4053	p_F (kPa) =	3868
Q_p (m^3/s)=	7,53E-09		
tp (s) =	1200	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,6		
Derivative fact.=	0,21	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	3,62E-10		
T_M (m^2/s)=	2,99E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,14	dt_1 (min) =	*
dt_2 (min) =	4,47	dt_2 (min) =	*
T (m^2/s) =	8,11E-10	T (m^2/s) =	4,20E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,62E-10	K_s (m/s) =	8,40E-10
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	5,62E-11
C_D (-) =	NA	C_D (-) =	6,19E-03
ξ (-) =	0	ξ (-) =	-0,4
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	5,62E-11
dt_2 (min) =	*	C_D (-) =	6,19E-03
T_T (m^2/s) =	4,20E-09	ξ (-) =	-0,4
S (-) =	1,00E-06		
K_s (m/s) =	8,40E-10		
S_s (1/m) =	2,00E-07		

Comments:

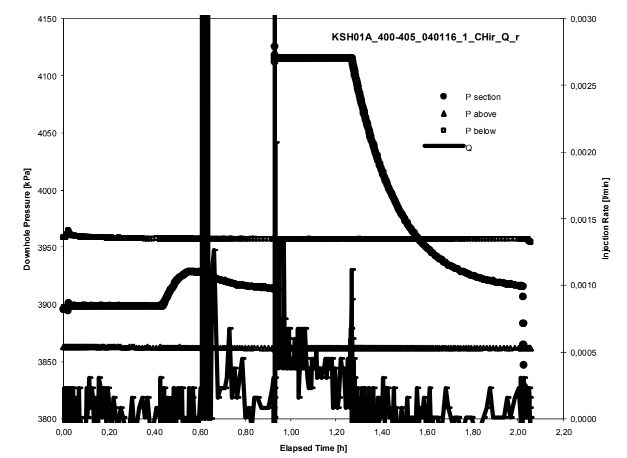
*: IARF not measured

The recommended transmissivity of 4.2E-9 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E-10 to 5E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3851.4 kPa

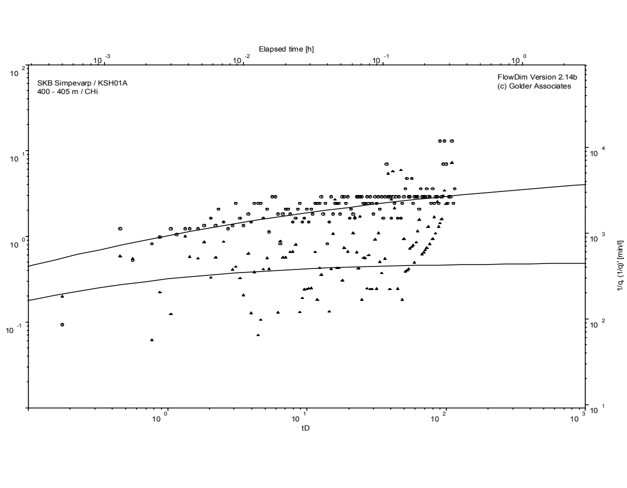
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040116 15:09
Test section from - to (m):	400 - 405 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

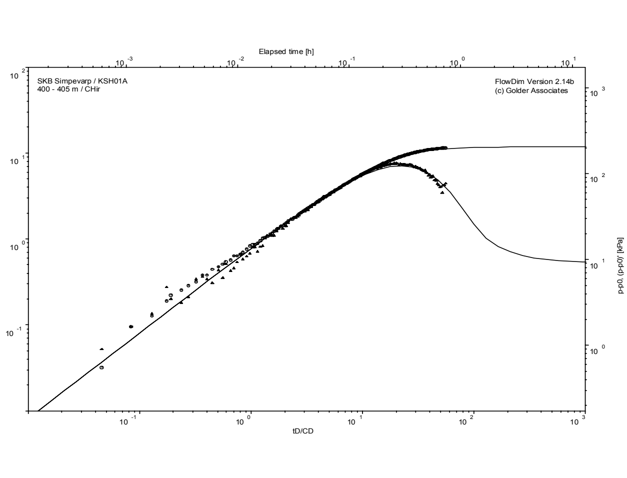
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3896		
p_i (kPa) =	3914		
p_p(kPa) =	4115	p_F (kPa) =	3916
Q_p (m^3/s)=	6,32E-09		
tp (s) =	1200	t_F (s) =	2700
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,7		
Derivative fact.=	0,36	Derivative fact.=	0,07
Results		**Results**	
Q/s (m^2/s)=	3,08E-10		
T_M (m^2/s)=	2,54E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,32	dt_1 (min) =	*
dt_2 (min) =	9,15	dt_2 (min) =	*
T (m^2/s) =	1,41E-10	T (m^2/s) =	9,03E-10
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,82E-11	K_s (m/s) =	1,81E-10
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,74E-11
C_D (-) =	NA	C_D (-) =	3,02E-03
ξ (-) =	0	ξ (-) =	11,2
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	2,74E-11
dt_2 (min) =	*	C_D (-) =	3,02E-03
T_T (m^2/s) =	9,03E-10	ξ (-) =	11,2
S (-) =	1,00E-06		
K_s (m/s) =	1,81E-10		
S_s (1/m) =	2,00E-07		

Comments:

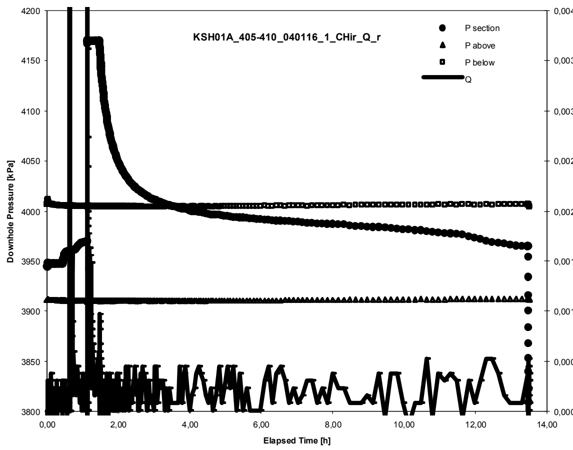
*: IARF not measured

The recommended transmissivity of 9.0E-10 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E-10 to 1E-9 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3910.8 kPa

Test Summary Sheet

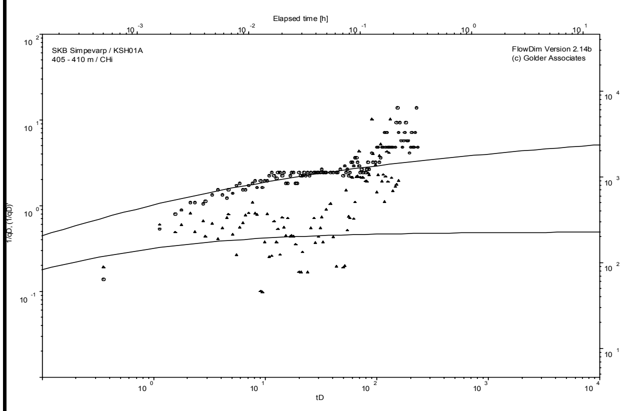
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040116 17:37
Test section from - to (m):	405 - 410 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

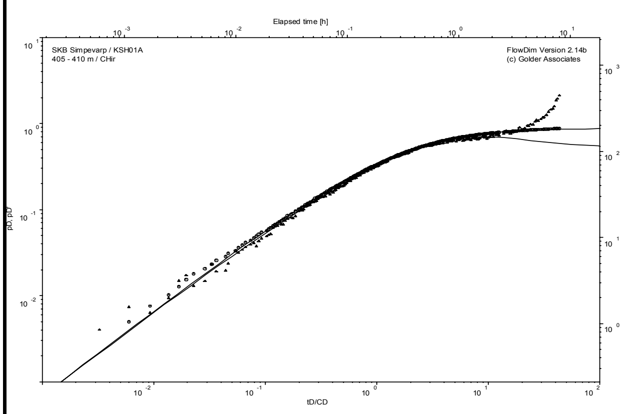


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3944		
p_i (kPa) =	3970		
p_p(kPa) =	4170	p_F (kPa) =	3965
Q_p (m^3/s)=	2,62E-09		
tp (s) =	1200	t_F (s) =	43200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,7		
Derivative fact.=	0,23	Derivative fact.=	0,07
Results		**Results**	
Q/s (m^2/s)=	1,28E-10		
T_M (m^2/s)=	1,06E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1,46	dt_1 (min) =	*
dt_2 (min) =	3,45	dt_2 (min) =	*
T (m^2/s) =	2,84E-10	T (m^2/s) =	9,66E-11
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	5,68E-11	K_s (m/s) =	1,93E-11
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	4,11E-11
C_D (-) =	NA	C_D (-) =	4,53E-03
ξ (-) =	0	ξ (-) =	-1,3
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	4,11E-11
dt_2 (min) =	*	C_D (-) =	4,53E-03
T_T (m^2/s) =	9,66E-11	ξ (-) =	-1,3
S (-) =	1,00E-06		
K_s (m/s) =	1,93E-11		
S_s (1/m) =	2,00E-07		

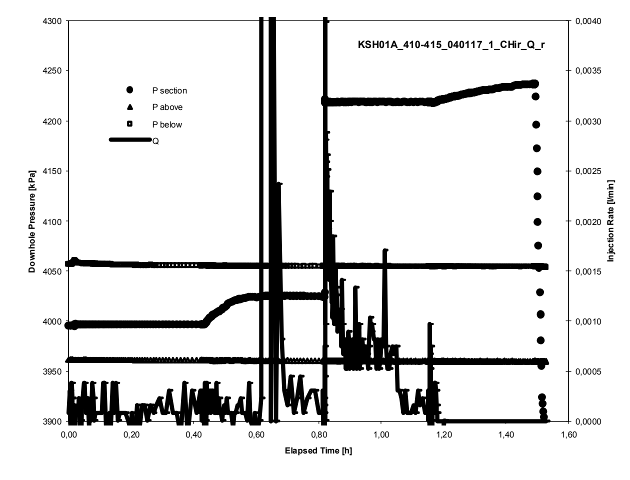
Comments:

*: IARF not measured
The recommended transmissivity of 9.7E-11 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E-11 to 5E-10 m2/s. This analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3984.1 kPa.

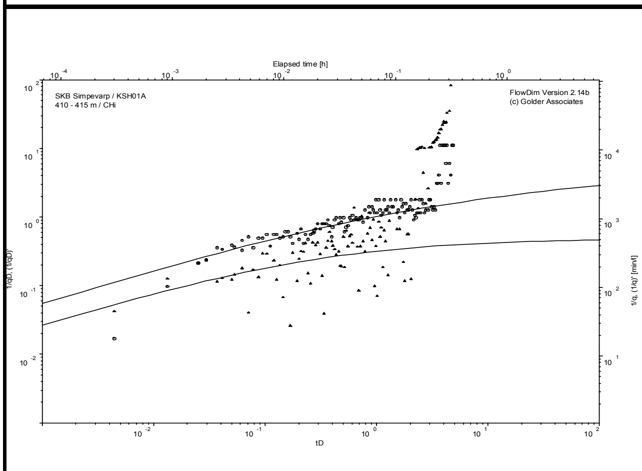
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040117 08:24
Test section from - to (m):	410 - 415 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period

Not Analysed

Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3996		
p_i (kPa) =	4024		
p_p(kPa) =	4219	p_F (kPa) =	4236
Q_p (m^3/s)=	9,98E-09		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,8		
Derivative fact.=	0,2	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	5,02E-10		
T_M (m^2/s)=	4,15E-10		
Flow regime:	transient	Flow regime:	-
dt_1 (min) =	*	dt_1 (min) =	-
dt_2 (min) =	*	dt_2 (min) =	-
T (m^2/s) =	1,27E-10	T (m^2/s) =	NA
S (-) =	1,00E-06	S (-) =	NA
K_s (m/s) =	2,54E-11	K_s (m/s) =	NA
S_s (1/m) =	2,00E-07	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	-1,5	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	NA
dt_2 (min) =	*	C_D (-) =	NA
T_T (m^2/s) =	1,27E-10	ξ (-) =	-1,5
S (-) =	1,00E-06		
K_s (m/s) =	2,54E-11		
S_s (1/m) =	2,00E-07		

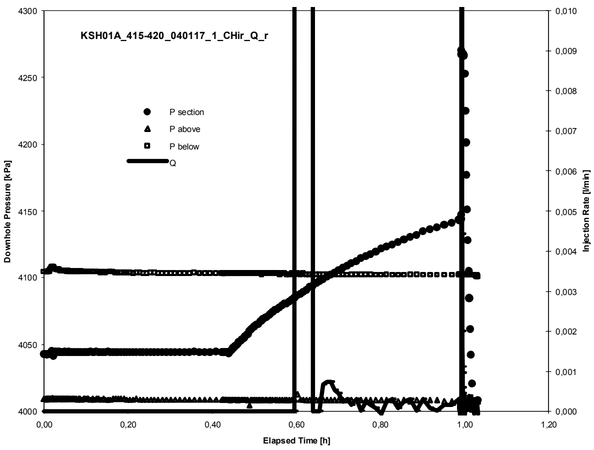
Comments:

*: IARF not measured
The recommended transmissivity of 1.3E-10 m2/s was derived from the analysis of the CHi phase, which is the only analysable phase. Due to the very low flow rate and the noisy data, the results are uncertain. The confidence range for the interval transmissivity is estimated to be 5E-11 to 5E-10 m2/s. The analysis was conducted using a flow dimension of 2.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040117 10:22
Test section from - to (m):	415 - 420 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4043		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	12,9		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

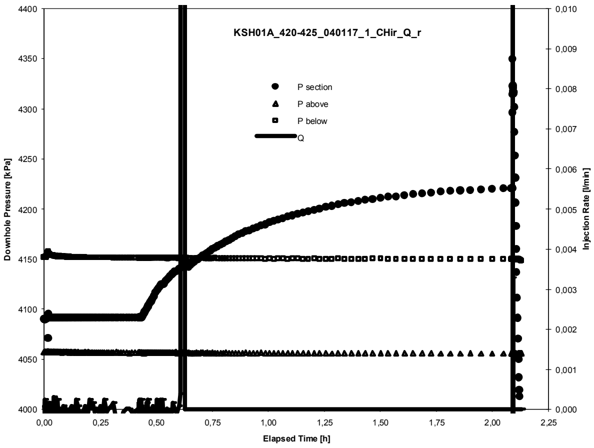
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040117 11:49
Test section from - to (m):	420 - 425 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4090		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,0		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

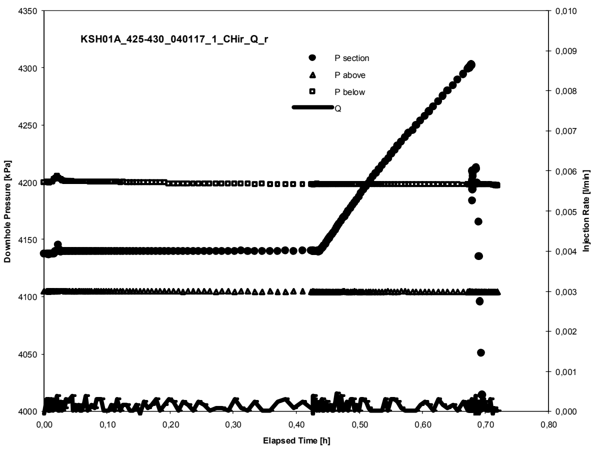
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040117 14:25
Test section from - to (m):	425 - 430 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4138		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,0		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

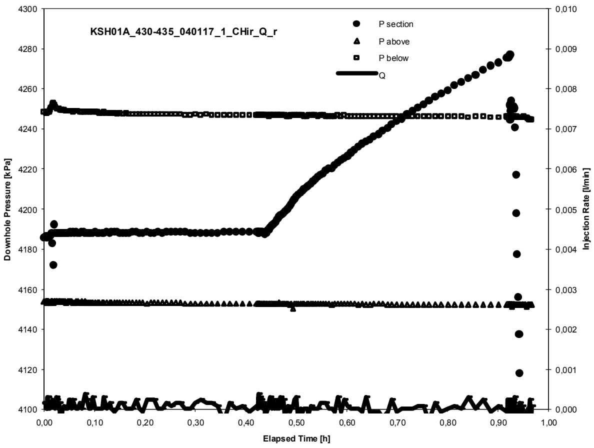
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040117 15:36
Test section from - to (m):	430 - 435 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2\cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4186		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,1		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

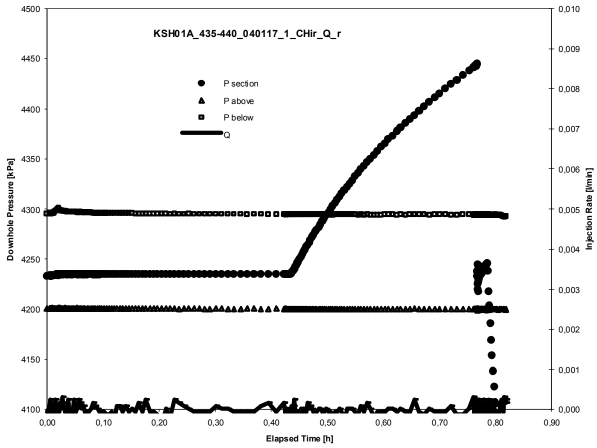
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040117 17:01
Test section from - to (m):	435 - 440 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4233		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,2		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

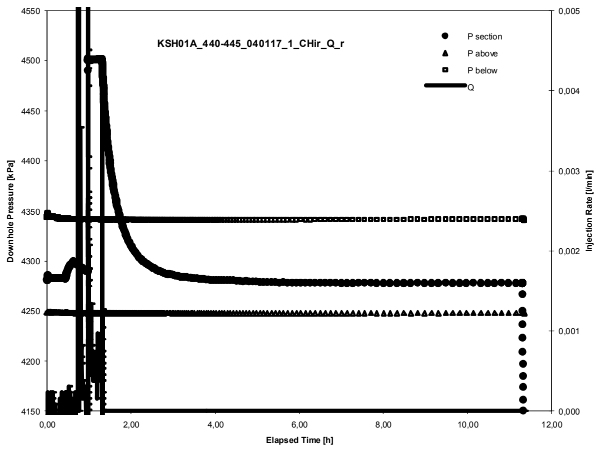
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

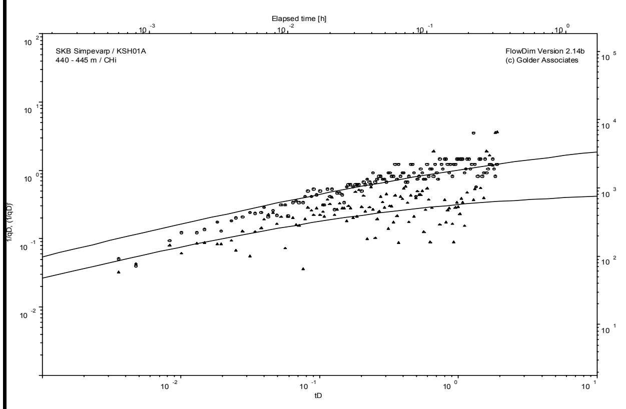
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040117 18:14
Test section from - to (m):	440 - 445 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

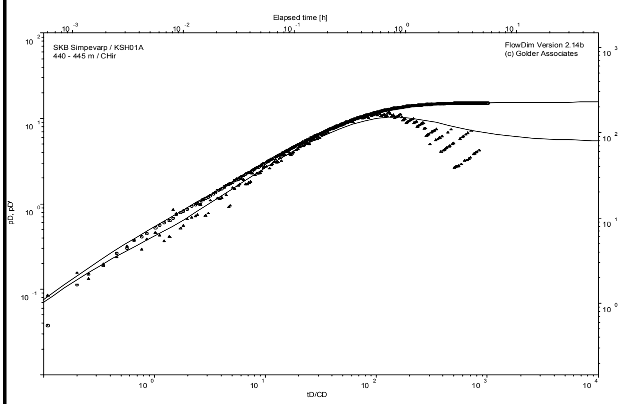
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4281		
p_i (kPa) =	4290		
p_p(kPa) =	4501	p_F (kPa) =	4277
Q_p (m^3/s)=	6,32E-09		
tp (s) =	1200	t_F (s) =	36000
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,3		
Derivative fact.=	0,28	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	2,94E-10		
T_M (m^2/s)=	2,42E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	6,84E-11	T (m^2/s) =	1,17E-10
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,37E-11	K_s (m/s) =	2,34E-11
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,57E-11
C_D (-) =	NA	C_D (-) =	1,73E-03
ξ (-) =	-1,7	ξ (-) =	-0,3
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	1,57E-11
dt_2 (min) =	*	C_D (-) =	1,73E-03
T_T (m^2/s) =	1,17E-10	ξ (-) =	-0,3
S (-) =	1,00E-06		
K_s (m/s) =	2,34E-11		
S_s (1/m) =	2,00E-07		

Comments:

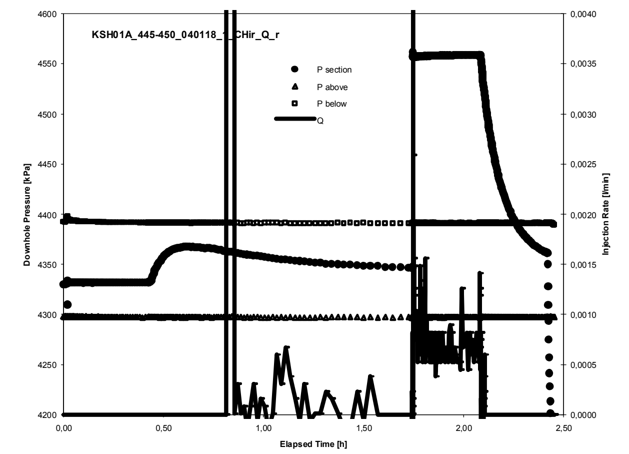
*: IARF not measured

The recommended transmissivity of 1.2E-10 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. It should be noted that due to the very low flow rate the results are uncertain. The confidence range for the interval transmissivity is estimated to be 5E-11 to 5E-10 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4272.7 kPa.

Test Summary Sheet

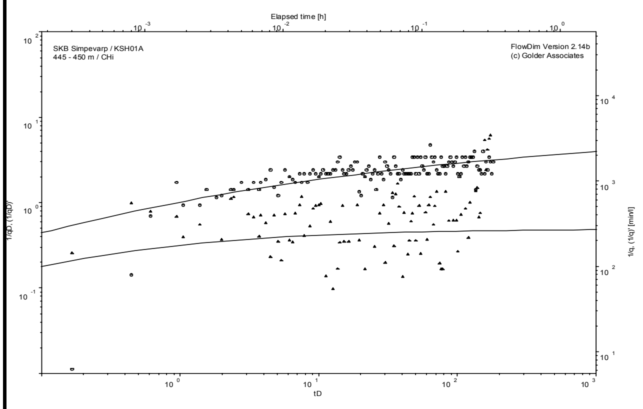
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040118 08:55
Test section from - to (m):	445 - 450 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

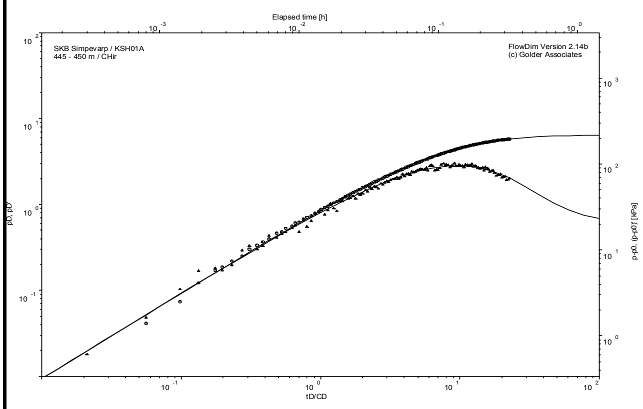


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4330		
p_i (kPa) =	4346		
p_p(kPa) =	4556	p_F (kPa) =	4361
Q_p (m^3/s)=	9,98E-09		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,3		
Derivative fact.=	0,27	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	4,66E-10		
T_M (m^2/s)=	3,85E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1,54	dt_1 (min) =	*
dt_2 (min) =	10,13	dt_2 (min) =	*
T (m^2/s) =	2,22E-10	T (m^2/s) =	7,24E-10
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	4,44E-11	K_s (m/s) =	1,45E-10
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,38E-11
C_D (-) =	NA	C_D (-) =	2,62E-03
ξ (-) =	0	ξ (-) =	3,5
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	2,38E-11
dt_2 (min) =	*	C_D (-) =	2,62E-03
T_T (m^2/s) =	7,24E-10	ξ (-) =	3,5
S (-) =	1,00E-06		
K_s (m/s) =	1,45E-10		
S_s (1/m) =	2,00E-07		

Comments:

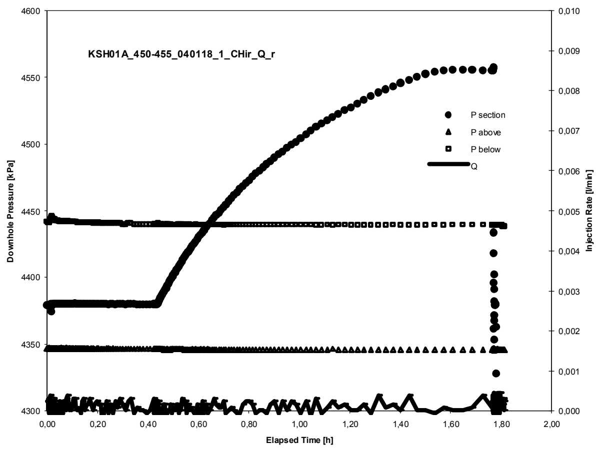
*: IARF not measured

The recommended transmissivity of 7.2E-10 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E-10 to 9E-10 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4336.8 kPa

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040118 11:46
Test section from - to (m):	450 - 455 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4379		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,4		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

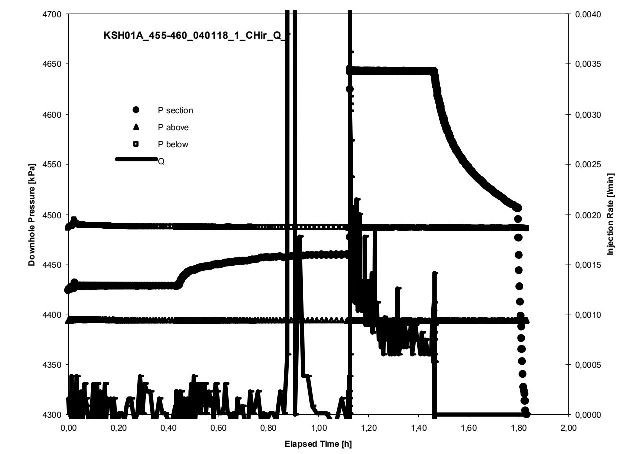
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

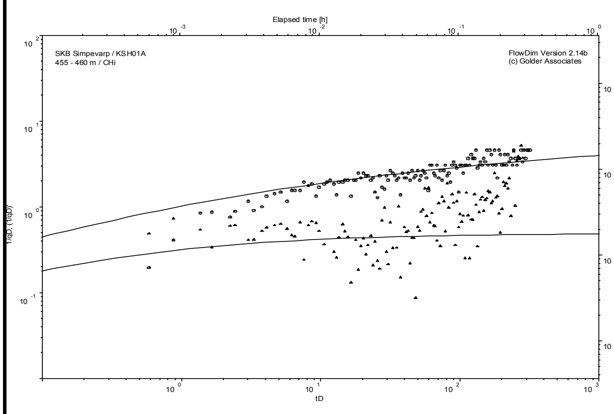
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040118 13:58
Test section from - to (m):	455 - 460 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

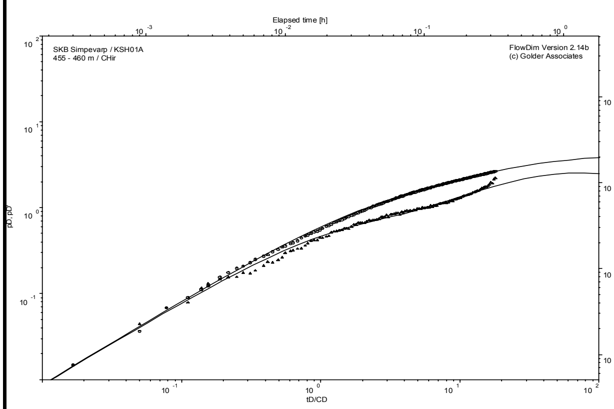
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4426		
p_i (kPa) =	4459		
p_p(kPa) =	4642	p_F (kPa) =	4506
Q_p (m^3/s)=	1,12E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,5		
Derivative fact.=	0,33	Derivative fact.=	0,1
Results		**Results**	
Q/s (m^2/s)=	6,02E-10		
T_M (m^2/s)=	4,97E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,53	dt_1 (min) =	*
dt_2 (min) =	6,72	dt_2 (min) =	*
T (m^2/s) =	3,90E-10	T (m^2/s) =	1,64E-10
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	7,80E-11	K_s (m/s) =	3,28E-11
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,36E-11
C_D (-) =	NA	C_D (-) =	2,60E-03
ξ (-) =	0	ξ (-) =	-0,3
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	2,36E-11
dt_2 (min) =	*	C_D (-) =	2,60E-03
T_T (m^2/s) =	1,64E-10	ξ (-) =	-0,3
S (-) =	1,00E-06		
K_s (m/s) =	3,28E-11		
S_s (1/m) =	2,00E-07		

Comments:

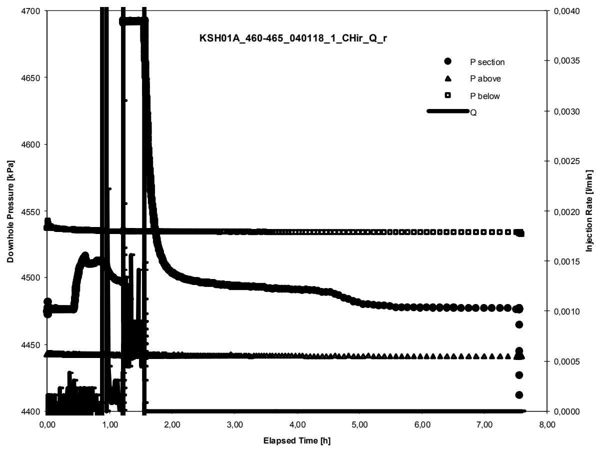
*: IARF not measured

The recommended transmissivity of 1.6E-10 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E-10 to 8E-10 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4427.4 kPa.

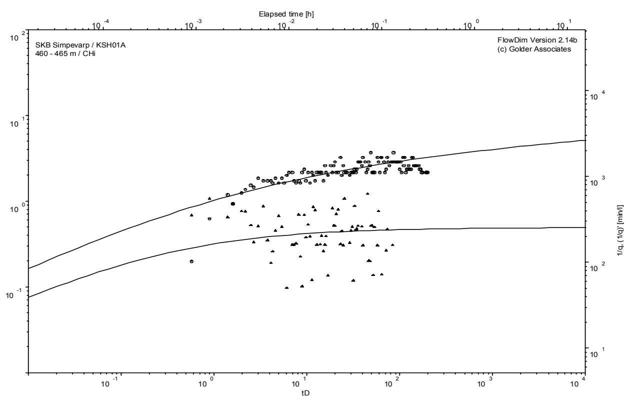
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040118 16:13
Test section from - to (m):	460 - 465 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

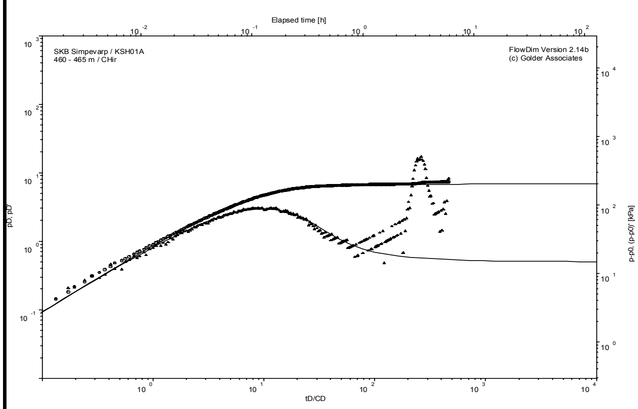
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4475		
p_i (kPa) =	4496		
p_p(kPa) =	4691	p_F (kPa) =	4477
Q_p (m^3/s)=	1,12E-08		
tp (s) =	1200	t_F (s) =	21600
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,5		
Derivative fact.=	0,28	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	5,65E-10		
T_M (m^2/s)=	4,66E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,25	dt_1 (min) =	*
dt_2 (min) =	6,88	dt_2 (min) =	*
T (m^2/s) =	2,57E-10	T (m^2/s) =	8,08E-10
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	5,14E-11	K_s (m/s) =	1,62E-10
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,38E-11
C_D (-) =	NA	C_D (-) =	2,62E-03
ξ (-) =	0	ξ (-) =	3,8
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	2,38E-11
dt_2 (min) =	*	C_D (-) =	2,62E-03
T_T (m^2/s) =	8,08E-10	ξ (-) =	3,8
S (-) =	1,00E-06		
K_s (m/s) =	1,62E-10		
S_s (1/m) =	2,00E-07		

Comments:

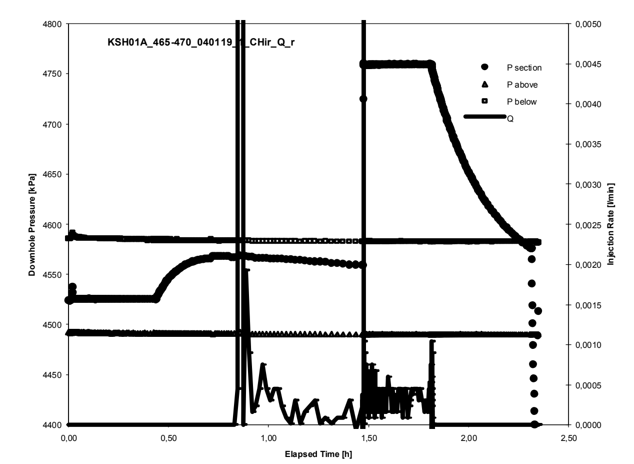
*: IARF not measured

The recommended transmissivity of 8.1E-10 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E-10 to 1E-9 m2/s. The analysis was performed using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4491.1 kPa.

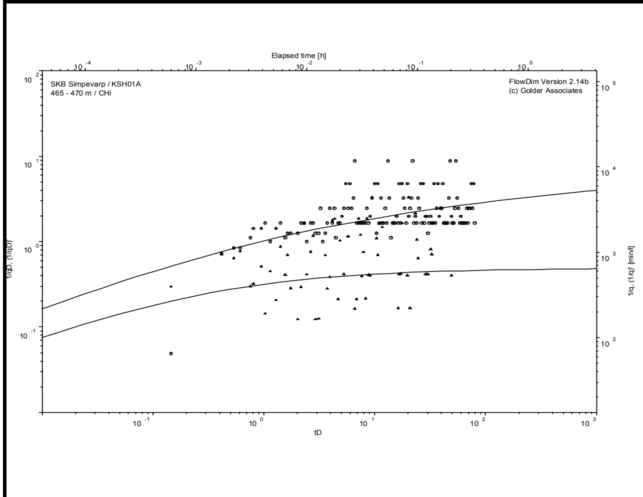
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040119 08:26
Test section from - to (m):	465 - 470 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

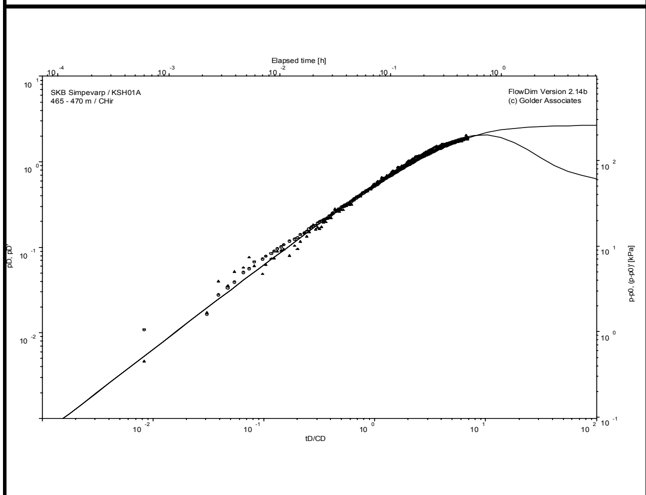
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4524		
p_i (kPa) =	4559		
p_p(kPa) =	4759	p_F (kPa) =	4576
Q_p (m^3/s)=	2,62E-09		
tp (s) =	1200	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,6		
Derivative fact.=	0,36	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	1,28E-10		
T_M (m^2/s)=	1,06E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	9,77E-11	T (m^2/s) =	1,56E-10
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,95E-11	K_s (m/s) =	3,12E-11
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,59E-11
C_D (-) =	NA	C_D (-) =	2,85E-03
ξ (-) =	0	ξ (-) =	1,7
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	2,59E-11
dt_2 (min) =	*	C_D (-) =	2,85E-03
T_T (m^2/s) =	1,56E-10	ξ (-) =	1,7
S (-) =	1,00E-06		
K_s (m/s) =	3,12E-11		
S_s (1/m) =	2,00E-07		

Comments:

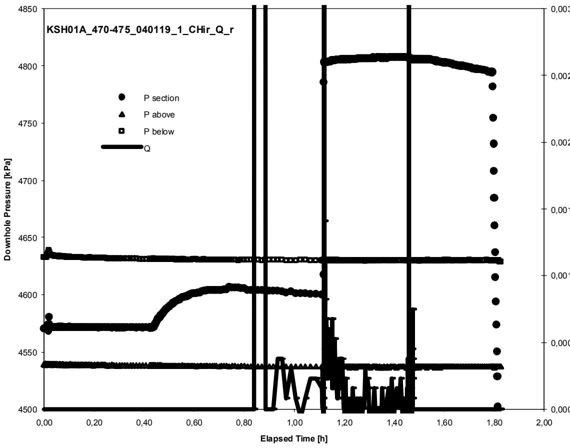
*: IARF not measured

The recommended transmissivity of 1.6E-10 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 6E-11 to 3E-10 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4498.2 kPa.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040119 11:10
Test section from - to (m):	470 - 475 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4571		
p_i (kPa) =	4600		
p_p(kPa) =	4806	p_F (kPa) =	4794
Q_p (m^3/s)=	3,33E-09		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,7		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	1,59E-10		
T_M (m^2/s)=	1,31E-10		

Log-Log plot incl. derivates- flow period

Not Analysed

Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

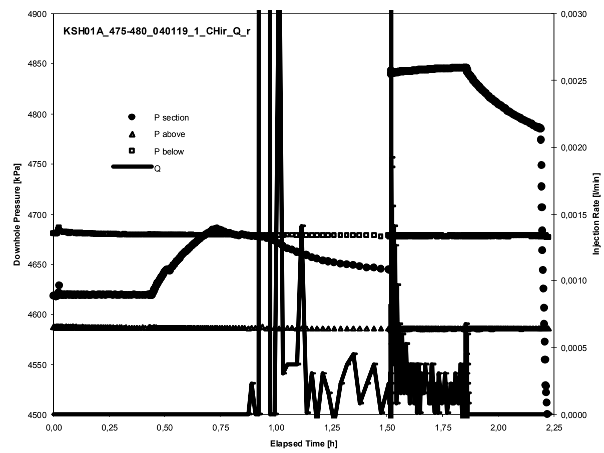
Comments:

Based on the very low injection rates, the interval transmissivity is lower than 1E-10 m2/s.

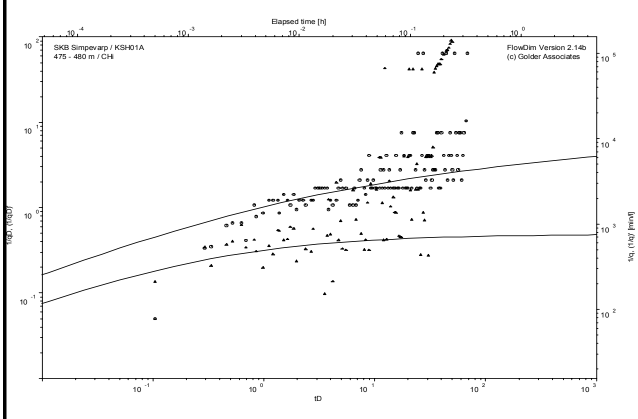
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040119 13:25
Test section from - to (m):	475 - 480 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

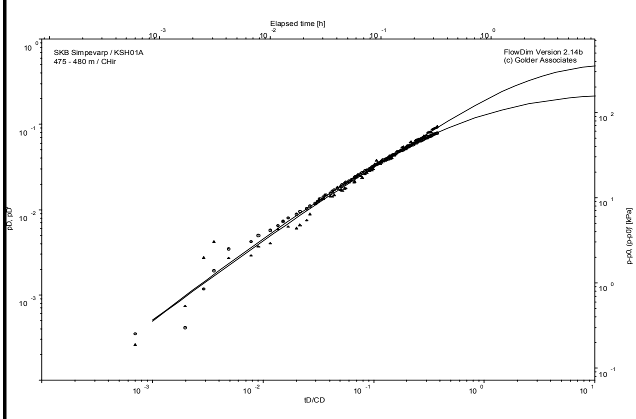
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4618		
p_i (kPa) =	4644		
p_p(kPa) =	4844	p_F (kPa) =	4785
Q_p (m^3/s)=	2,50E-09		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,7		
Derivative fact.=	0,29	Derivative fact.=	0,06
Results		**Results**	
Q/s (m^2/s)=	1,23E-10		
T_M (m^2/s)=	1,01E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	8,38E-11	T (m^2/s) =	1,40E-11
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,68E-11	K_s (m/s) =	2,80E-12
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,79E-11
C_D (-) =	NA	C_D (-) =	3,08E-03
ξ (-) =	0	ξ (-) =	-1,8
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	2,79E-11
dt_2 (min) =	*	C_D (-) =	3,08E-03
T_T (m^2/s) =	1,40E-11	ξ (-) =	-1,8
S (-) =	1,00E-06		
K_s (m/s) =	2,80E-12		
S_s (1/m) =	2,00E-07		

Comments:

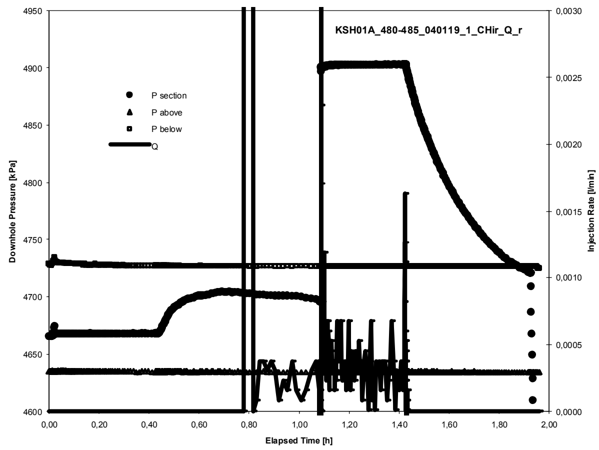
*: IARF not measured

The recommended transmissivity of 1.4E-10 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 6E-11 to 3E-10 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve line extrapolation in the Horner plot to a value of 4674.3 kPa.

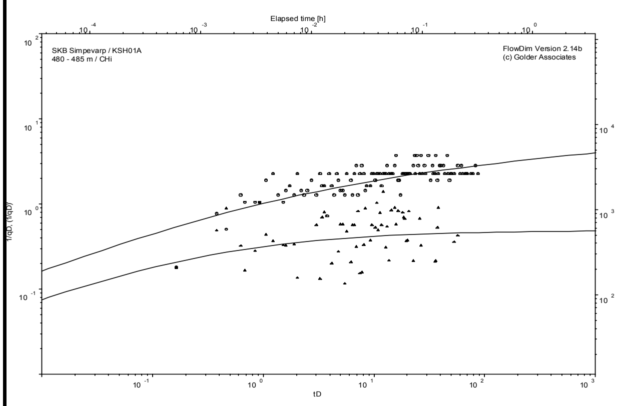
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040119 16:02
Test section from - to (m):	480 - 485 m	Responsible for test execution:	Reinder van der Wall
Section diameter, 2·r_w (m):	0,076	Responsible for test evaluation:	C. Enachescu

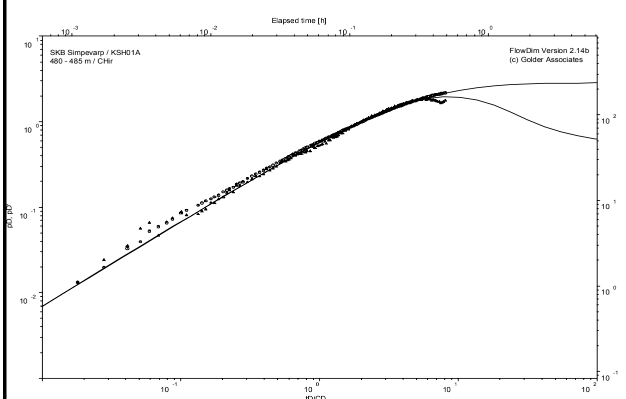
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4666		
p_i (kPa) =	4696		
p_p(kPa) =	4903	p_F (kPa) =	4721
Q_p (m^3/s)=	2,50E-09		
tp (s) =	1200	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,8		
Derivative fact.=	0,33	Derivative fact.=	0,07
Results		**Results**	
Q/s (m^2/s)=	1,18E-10		
T_M (m^2/s)=	9,78E-11		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2,42	dt_1 (min) =	*
dt_2 (min) =	12,67	dt_2 (min) =	*
T (m^2/s) =	1,09E-10	T (m^2/s) =	1,25E-10
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,18E-11	K_s (m/s) =	2,50E-11
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,75E-11
C_D (-) =	NA	C_D (-) =	1,93E-03
ξ (-) =	0	ξ (-) =	1,7
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	1,75E-11
dt_2 (min) =	*	C_D (-) =	1,93E-03
T_T (m^2/s) =	1,25E-10	ξ (-) =	1,7
S (-) =	1,00E-06		
K_s (m/s) =	2,50E-11		
S_s (1/m) =	2,00E-07		

Comments:

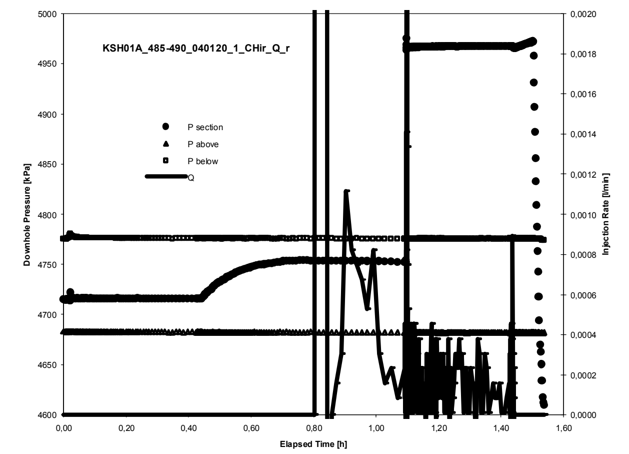
*: IARF not measured

The recommended transmissivity of 1.3E-10 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E-11 to 3E-10 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4663.6 kPa.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040120 08:19
Test section from - to (m):	485 - 490 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4714		
p_i (kPa) =	4752		
p_p(kPa) =	4967	p_F (kPa) =	4972
Q_p (m^3/s)=	2,62E-09		
tp (s) =	1200	t_F (s) =	240
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,9		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	1,20E-10		
T_M (m^2/s)=	9,90E-11		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

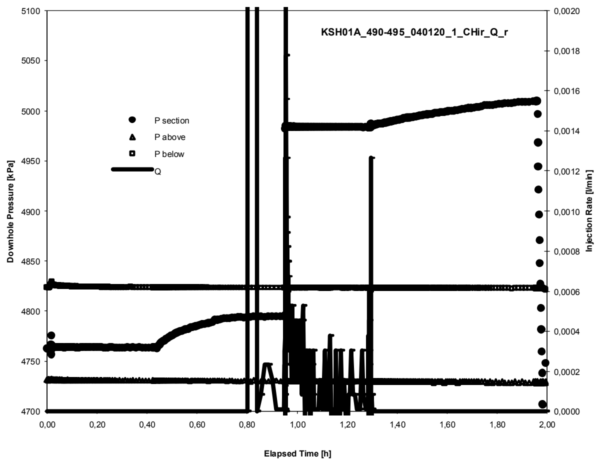
Comments:

Based on the very low flow rate, the interval transmissivity is lower than 1E-10 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040120 10:17
Test section from - to (m):	490 - 495 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4763		
p_i (kPa) =	4796		
p_p(kPa) =	4983	p_F (kPa) =	5009
Q_p (m^3/s)=	1,42E-09		
tp (s) =	1200	t_F (s) =	2400
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13,9		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	7,39E-11		
T_M (m^2/s)=	6,10E-11		

Log-Log plot incl. derivates- flow period

Not Analysed

Flow period		Recovery period	
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	
dt_2 (min) =	-	C_D (-) =	
T_T (m^2/s) =	NA	ξ (-) =	
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

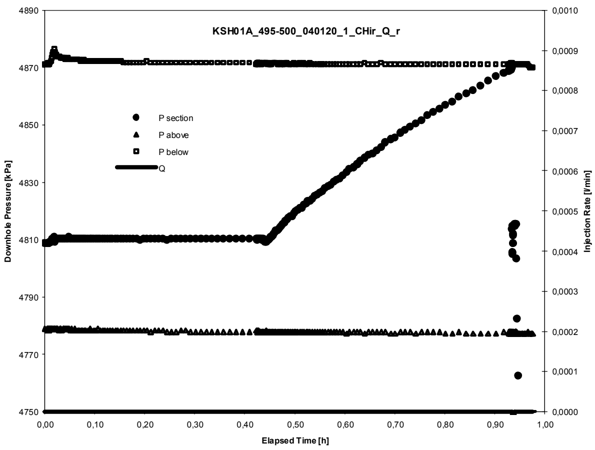
Comments:

Based on the very low flow rate, the interval transmissivity is lower than 1E-10 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040120 12:56
Test section from - to (m):	495 - 500 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4809		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,0		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

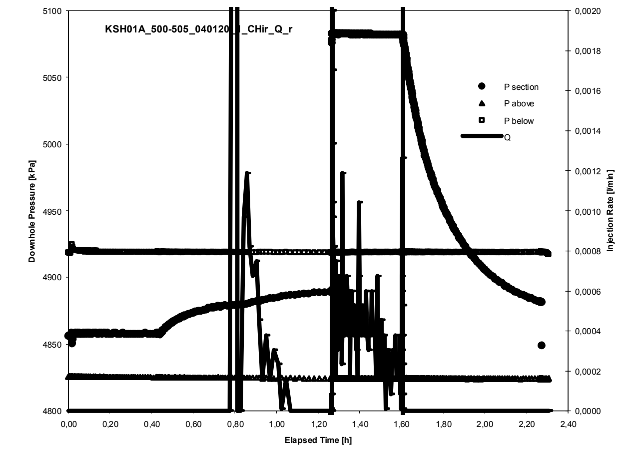
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040120 14:24
Test section from - to (m):	500 - 505 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

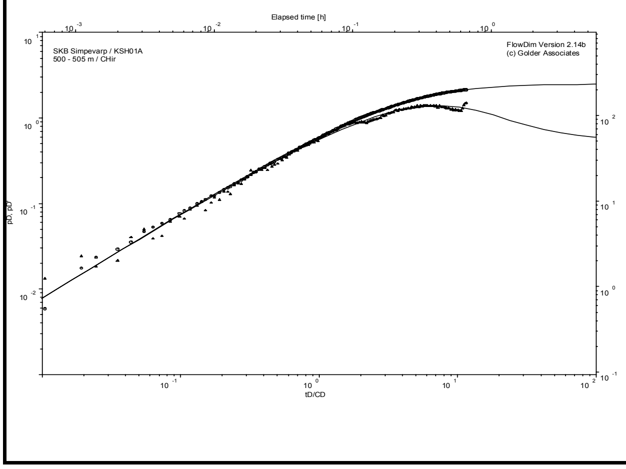


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4856		
p_i (kPa) =	4889		
p_p(kPa) =	5082	p_F (kPa) =	4881
Q_p (m^3/s)=	3,87E-09		
tp (s) =	1200	t_F (s) =	2400
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,1		
Derivative fact.=	-	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	1,97E-10		
T_M (m^2/s)=	1,62E-10		
Flow regime:	-	Flow regime:	transient
dt_1 (min) =	-	dt_1 (min) =	*
dt_2 (min) =	-	dt_2 (min) =	*
T (m^2/s) =	NA	T (m^2/s) =	1,15E-10
S (-) =	NA	S (-) =	1,00E-06
K_s (m/s) =	NA	K_s (m/s) =	2,30E-11
S_s (1/m) =	NA	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,51E-11
C_D (-) =	NA	C_D (-) =	1,66E-03
ξ (-) =	NA	ξ (-) =	0,7
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	1,51E-11
dt_2 (min) =	*	C_D (-) =	1,66E-03
T_T (m^2/s) =	1,15E-10	ξ (-) =	0,7
S (-) =	1,00E-06		
K_s (m/s) =	2,30E-11		
S_s (1/m) =	2,00E-07		

Comments:

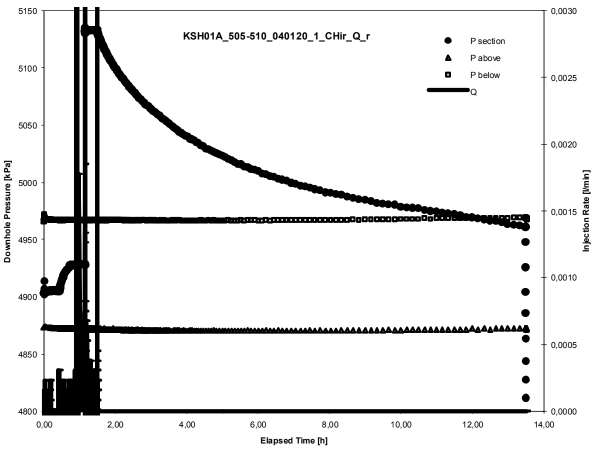
*: IARF not measured

The recommended transmissivity of 1.2E-10 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E-11 to 6E-10 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4845.8 kPa.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040120 17:10
Test section from - to (m):	505 - 510 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

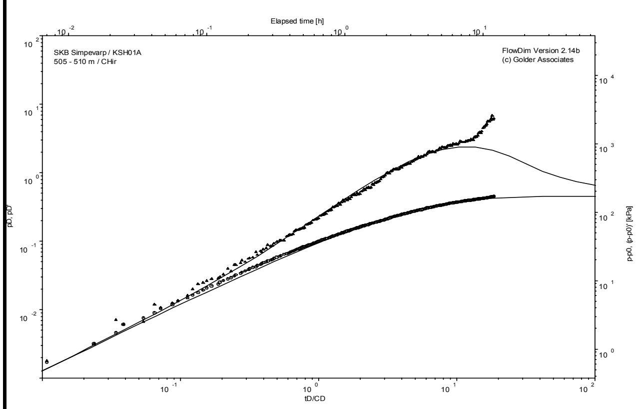


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4903		
p_i (kPa) =	4928		
p_p(kPa) =	5133	p_F (kPa) =	4961
Q_p (m^3/s)=	2,62E-09		
tp (s) =	1200	t_F (s) =	43200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,1		
Derivative fact.=	-	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	1,25E-10		
T_M (m^2/s)=	1,03E-10		
Flow regime:	-	Flow regime:	transient
dt_1 (min) =	-	dt_1 (min) =	*
dt_2 (min) =	-	dt_2 (min) =	*
T (m^2/s) =	NA	T (m^2/s) =	1,89E-11
S (-) =	NA	S (-) =	1,00E-06
K_s (m/s) =	NA	K_s (m/s) =	3,78E-12
S_s (1/m) =	NA	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,82E-11
C_D (-) =	NA	C_D (-) =	3,11E-03
ξ (-) =	NA	ξ (-) =	2,2
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	2,82E-11
dt_2 (min) =	*	C_D (-) =	3,11E-03
T_T (m^2/s) =	1,89E-11	ξ (-) =	2,2
S (-) =	1,00E-06		
K_s (m/s) =	3,78E-12		
S_s (1/m) =	2,00E-07		

Comments:

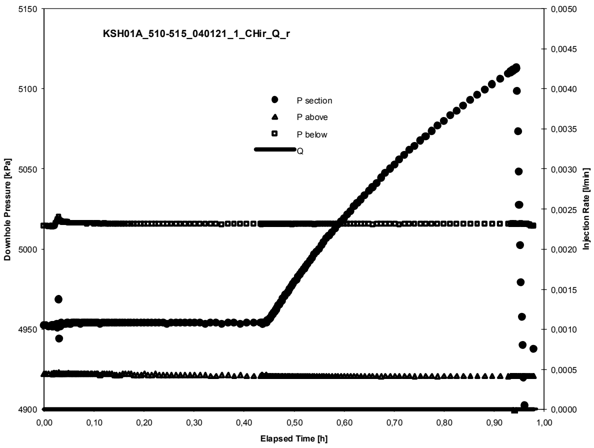
*: IARF not measured

The recommended transmissivity of 1.9E-11 m2/s was derived from the analysis of the CHir phase. Based on the very low injection rates, the confidence range for the interval transmissivity is estimated to be 1E-10 m2/s or lower. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4958.9 kPa.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040121 08:16
Test section from - to (m):	510 - 515 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4952		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,2		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	
Selected representative parameters.			
dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

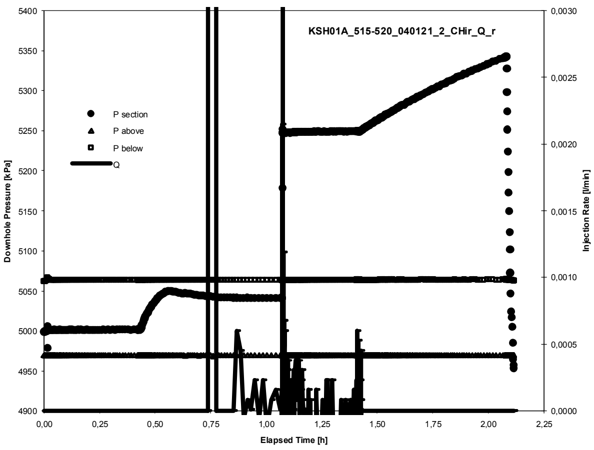
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	2
Borehole ID:	KSH01A	Test start:	040121 09:58
Test section from - to (m):	515 - 520 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4999		
p_i (kPa) =	5041		
p_p(kPa) =	5249	p_F (kPa) =	5342
Q_p (m^3/s)=	1,42E-09		
tp (s) =	1200	t_F (s) =	2400
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,3		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	6,68E-11		
T_M (m^2/s)=	5,52E-11		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

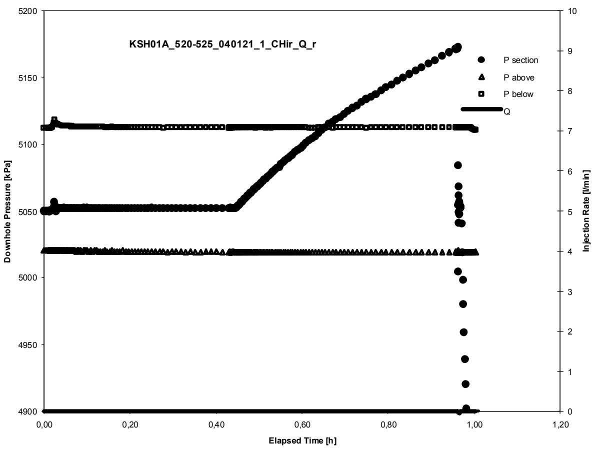
Comments:

Based on the very low flow rate, the interval transmissivity is lower than 1E-10 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040121 13:01
Test section from - to (m):	520 - 525 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5050		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,4		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

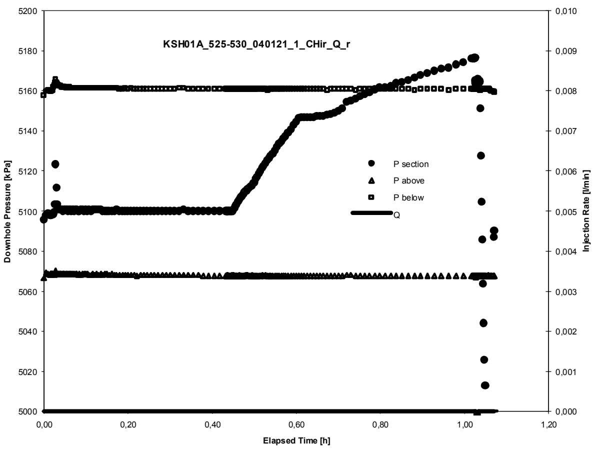
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040121 14:25
Test section from - to (m):	525 - 530 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5098		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,4		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

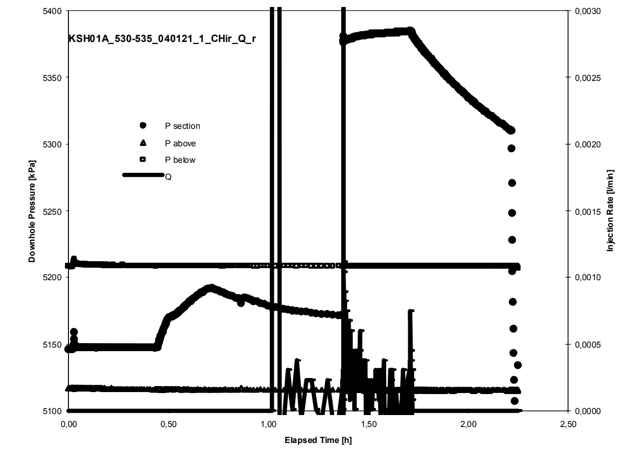
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040121 15:54
Test section from - to (m):	530 - 535 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

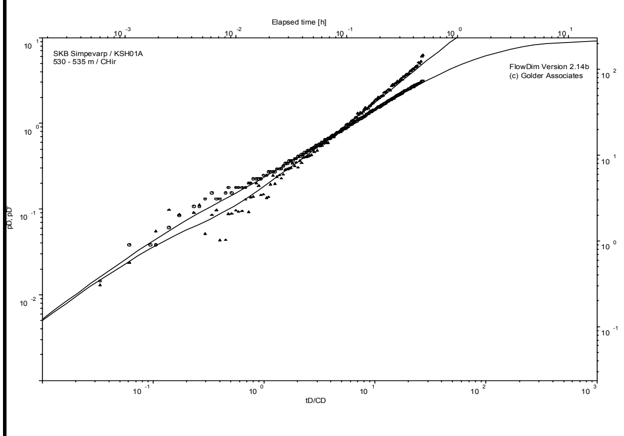


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5147		
p_i (kPa) =	5172		
p_p(kPa) =	5384	p_F (kPa) =	5310
Q_p (m^3/s)=	2,62E-09		
tp (s) =	1200	t_F (s) =	1800
S el S* (-)=	1,00E-06	S el S* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,5		
Derivative fact.=	-	Derivative fact.=	
Results		**Results**	
Q/s (m^2/s)=	1,21E-10		
T_M (m^2/s)=	9,99E-11		
Flow regime:	-	Flow regime:	transient
dt_1 (min) =	-	dt_1 (min) =	*
dt_2 (min) =	-	dt_2 (min) =	*
T (m^2/s) =	NA	T (m^2/s) =	1,33E-11
S (-) =	NA	S (-) =	1,00E-06
K_s (m/s) =	NA	K_s (m/s) =	2,66E-12
S_s (1/m) =	NA	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	9,24E-12
C_D (-) =	NA	C_D (-) =	1,02E-03
ξ (-) =	NA	ξ (-) =	-0,4
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	9,24E-12
dt_2 (min) =	*	C_D (-) =	1,02E-03
T_T (m^2/s) =	1,33E-11	ξ (-) =	-0,4
S (-) =	1,00E-06		
K_s (m/s) =	2,66E-12		
S_s (1/m) =	2,00E-07		

Comments:

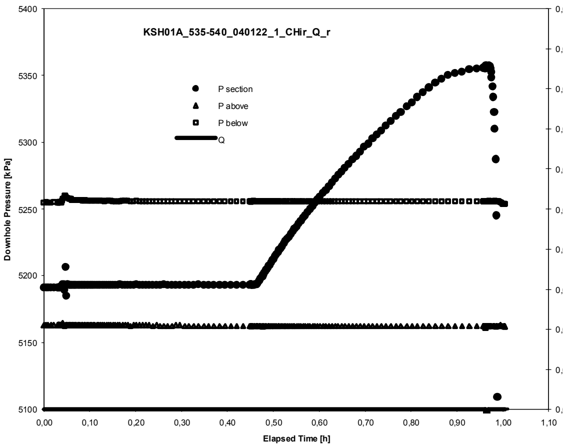
*: IARF not measured

The recommended transmissivity of 1.3E-11 m2/s was derived from the analysis of the CHir phase (outer zone). Based on the very low injection rates, the confidence range for the interval transmissivity is estimated to be 1E-10 m2/s or lower. The analysis was conducted using a flow dimension of 2. . The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5168.9 kPa.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040122 08:13
Test section from - to (m):	535 - 540 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5191		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,6		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

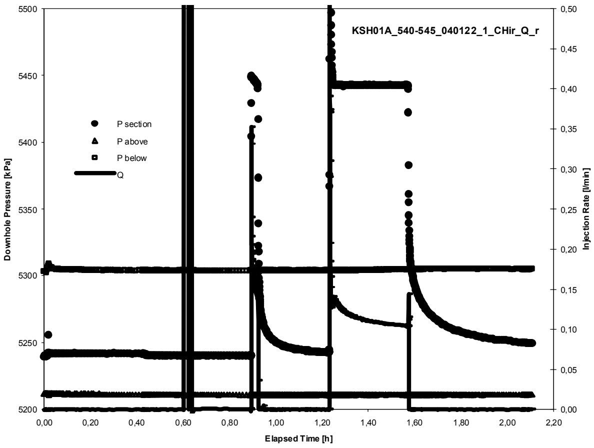
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

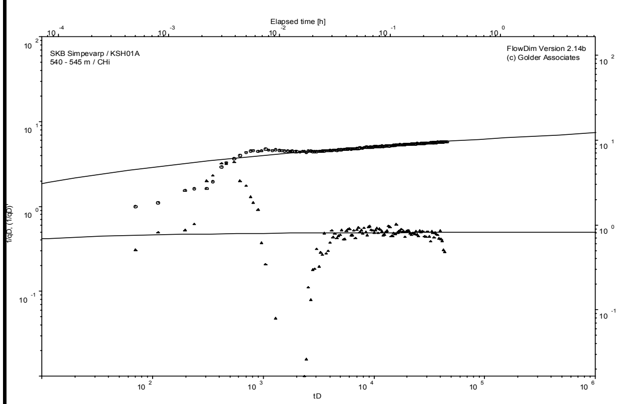
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040122 09:36
Test section from - to (m):	540 - 545 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

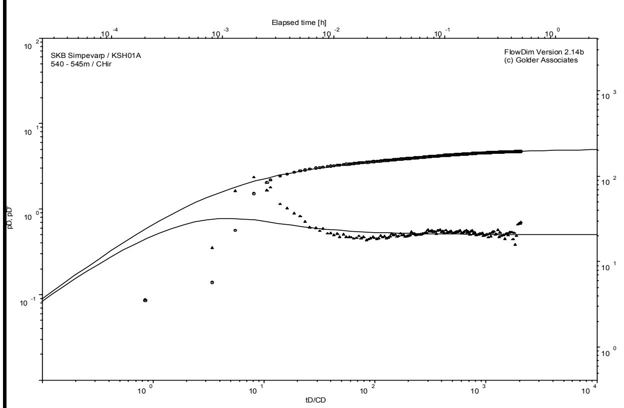


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5240		
p_i (kPa) =	5243		
p_p(kPa) =	5443	p_F (kPa) =	5250
Q_p (m^3/s)=	1,73E-06		
tp (s) =	1200	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,6		
Derivative fact.=	0,15	Derivative fact.=	0,1
Results		**Results**	
Q/s (m^2/s)=	8,48E-08		
T_M (m^2/s)=	7,00E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2,05	dt_1 (min) =	3,65
dt_2 (min) =	16,15	dt_2 (min) =	25,40
T (m^2/s) =	7,86E-08	T (m^2/s) =	7,37E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,57E-08	K_s (m/s) =	1,47E-08
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	4,01E-11
C_D (-) =	NA	C_D (-) =	4,42E-03
ξ (-) =	-0,2	ξ (-) =	-0,9
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	3,65	C (m^3/Pa) =	4,01E-11
dt_2 (min) =	25,40	C_D (-) =	4,42E-03
T_T (m^2/s) =	7,37E-08	ξ (-) =	-0,9
S (-) =	1,00E-06		
K_s (m/s) =	1,47E-08		
S_s (1/m) =	2,00E-07		

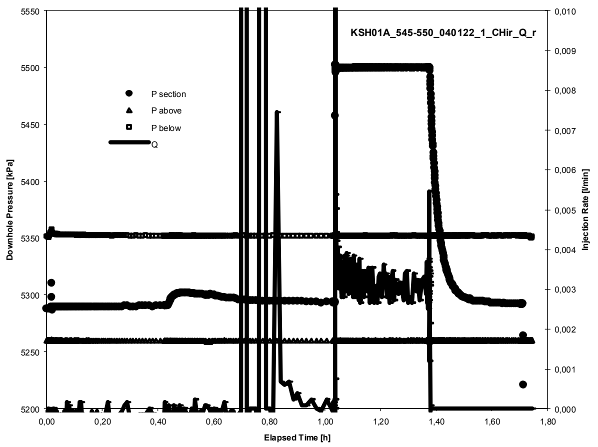
Comments:

The recommended transmissivity of 7.4E-8 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E-8 to 9E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5239.3 kPa

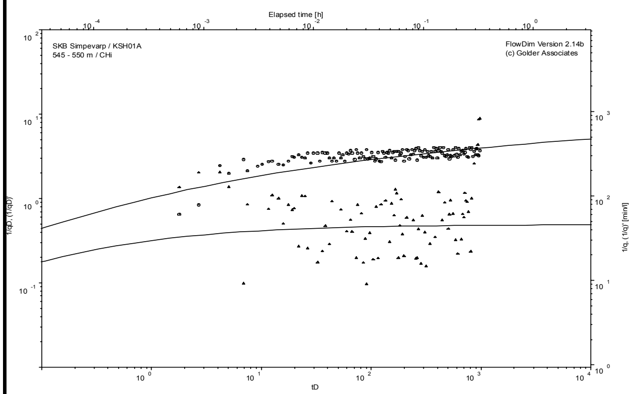
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040122 13:10
Test section from - to (m):	545 - 550 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

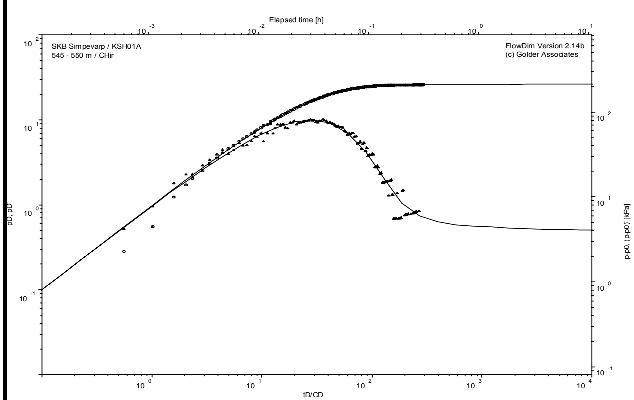
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5288		
p_i (kPa) =	5294		
p_p(kPa) =	5499	p_F (kPa) =	5293
Q_p (m^3/s)=	5,05E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,7		
Derivative fact.=	0,18	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	2,42E-09		
T_M (m^2/s)=	1,99E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,77	dt_1 (min) =	*
dt_2 (min) =	10,12	dt_2 (min) =	*
T (m^2/s) =	1,35E-09	T (m^2/s) =	1,07E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,70E-10	K_s (m/s) =	2,14E-09
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =		C (m^3/Pa) =	2,66E-11
C_D (-) =	0,0E+00	C_D (-) =	2,93E-03
ξ (-) =	-0,1	ξ (-) =	21,4
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	0,77	C (m^3/Pa) =	2,66E-11
dt_2 (min) =	10,12	C_D (-) =	2,93E-03
T_T (m^2/s) =	1,35E-09	ξ (-) =	-0,1
S (-) =	1,00E-06		
K_s (m/s) =	2,70E-10		
S_s (1/m) =	2,00E-07		

Comments:

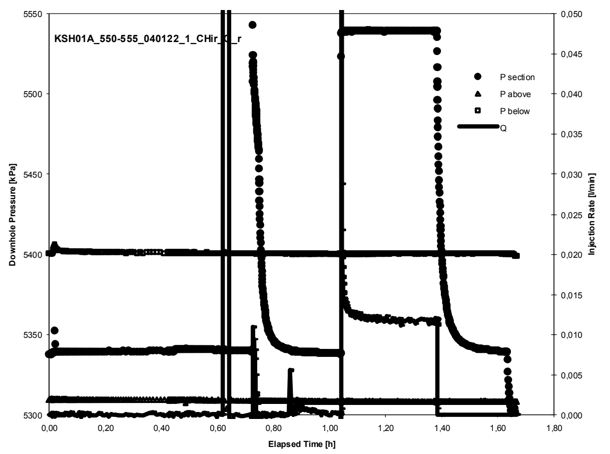
*: IARF not measured

The recommended transmissivity of 1.4E-9 m2/s was derived from the analysis of the CHi phase. Although it is very noisy, it shows the more reliable results. But it should be noted, that due to the very noisy data of the CHi phase and the fast recovery of the CHir phase the results of both analysis are very uncertain. The confidence range for the interval transmissivity is estimated to be 1E-9 to 1E-8 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5292.4 kPa.

Test Summary Sheet

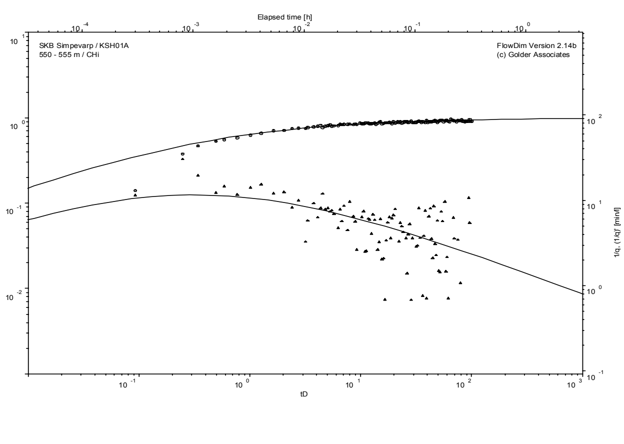
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040122 15:20
Test section from - to (m):	550 - 555 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

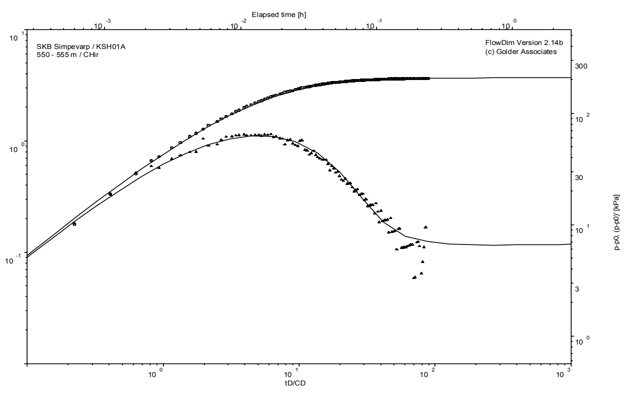


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5338		
p_i (kPa) =	5338		
p_p(kPa) =	5539	p_F (kPa) =	5339
Q_p (m^3/s)=	2,00E-07		
tp (s) =	1200	t_F (s) =	900
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,8		
Derivative fact.=	0,14	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	9,77E-09		
T_M (m^2/s)=	8,06E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,53	dt_1 (min) =	*
dt_2 (min) =	9,11	dt_2 (min) =	*
T (m^2/s) =	7,03E-10	T (m^2/s) =	2,32E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,41E-10	K_s (m/s) =	4,64E-09
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3,50E-11
C_D (-) =	NA	C_D (-) =	3,86E-03
ξ (-) =	-0,9	ξ (-) =	0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	3,50E-11
dt_2 (min) =	*	C_D (-) =	3,86E-03
T_T (m^2/s) =	2,32E-08	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	4,64E-09		
S_s (1/m) =	2,00E-07		

Comments:

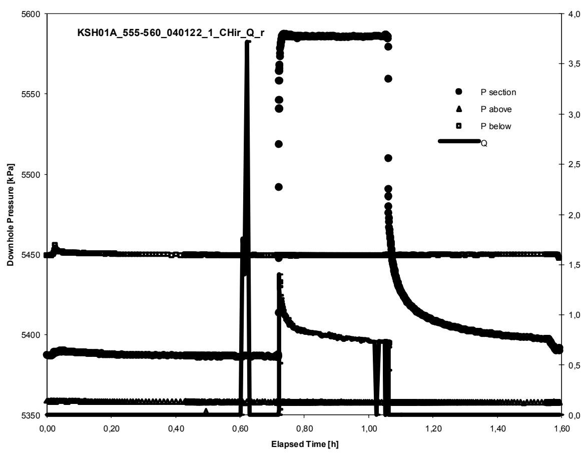
*: IARF not measured

The recommended transmissivity of 2.3E-8 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. It should be noted, that the results of both test phases can not be compared directly due to the fact, that they were analysed using different flow dimensions. The confidence range for the interval transmissivity is estimated to be 7E-9 to 5E-8 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5334.8 kPa.

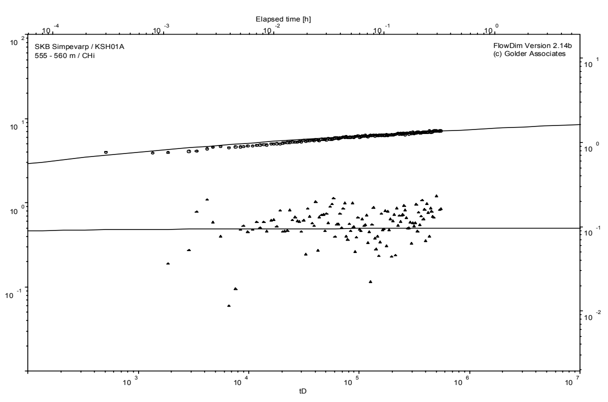
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040122 17:25
Test section from - to (m):	555 - 560 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

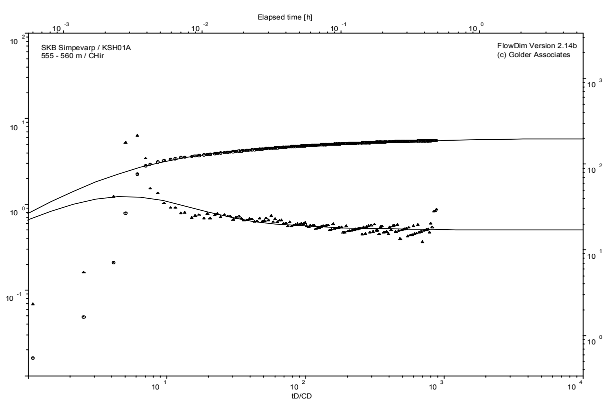
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5387		
p_i (kPa) =	5386		
p_p(kPa) =	5586	p_F (kPa) =	5397
Q_p (m^3/s)=	1,21E-05		
tp (s) =	1200	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,9		
Derivative fact.=	0,11	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	5,93E-07		
T_M (m^2/s)=	4,89E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,30	dt_1 (min) =	1,62
dt_2 (min) =	12,60	dt_2 (min) =	27,38
T (m^2/s) =	6,77E-07	T (m^2/s) =	6,19E-07
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,35E-07	K_s (m/s) =	1,24E-07
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	7,93E-10
C_D (-) =	NA	C_D (-) =	8,74E-02
ξ (-) =	0	ξ (-) =	-1,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	1,62	C (m^3/Pa) =	7,93E-10
dt_2 (min) =	27,38	C_D (-) =	8,74E-02
T_T (m^2/s) =	6,19E-07	ξ (-) =	-1,1
S (-) =	1,00E-06		
K_s (m/s) =	1,24E-07		
S_s (1/m) =	2,00E-07		

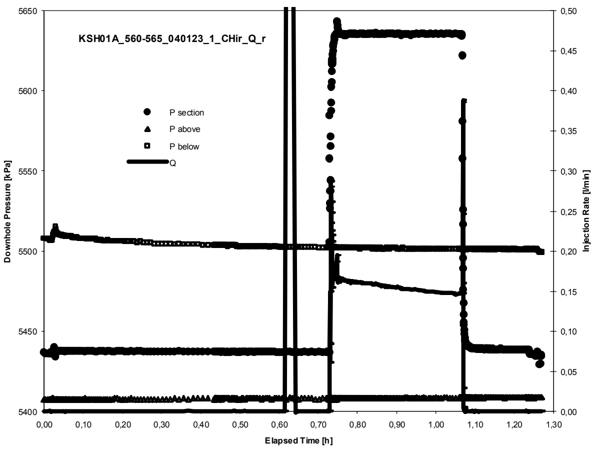
Comments:

The recommended transmissivity of 6.2E-7 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E-7 to 8E-7 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5388.9 kPa.

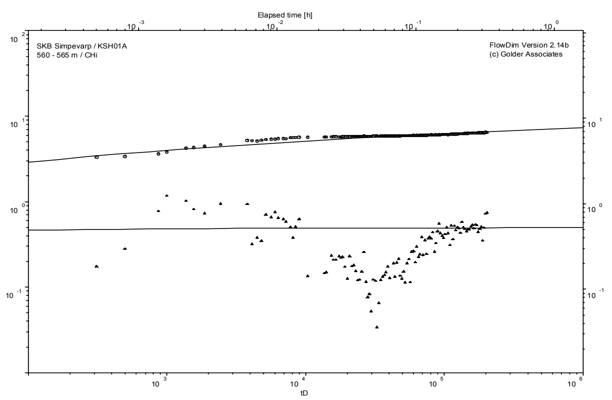
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040123 08:19
Test section from - to (m):	560 - 565 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

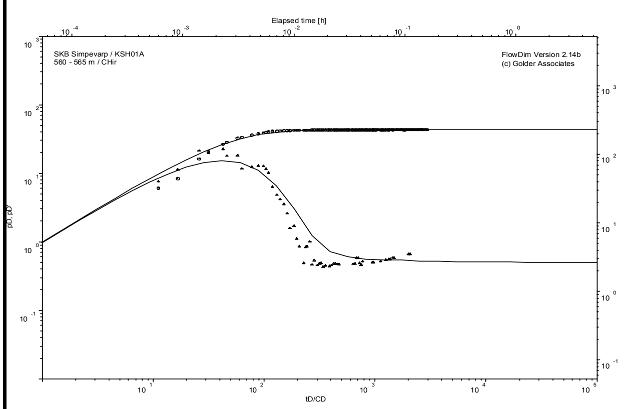
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5436		
p_i (kPa) =	5437		
p_p(kPa) =	5635	p_F (kPa) =	5438
Q_p (m^3/s)=	2,44E-06		
tp (s) =	1200	t_F (s) =	600
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14,9		
Derivative fact.=	0,09	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	1,21E-07		
T_M (m^2/s)=	9,95E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	8,60	dt_1 (min) =	*
dt_2 (min) =	18,65	dt_2 (min) =	*
T (m^2/s) =	1,24E-07	T (m^2/s) =	7,71E-07
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,48E-08	K_s (m/s) =	1,54E-07
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	9,56E-11
C_D (-) =	NA	C_D (-) =	1,05E-02
ξ (-) =	0,4	ξ (-) =	36,9
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	8,60	C (m^3/Pa) =	9,56E-11
dt_2 (min) =	18,65	C_D (-) =	1,05E-02
T_T (m^2/s) =	1,24E-07	ξ (-) =	36,9
S (-) =	1,00E-06		
K_s (m/s) =	2,48E-08		
S_s (1/m) =	2,00E-07		

Comments:

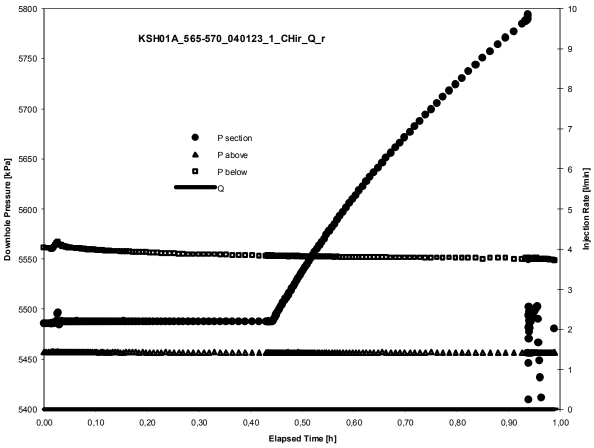
*: IARF not measured

The recommended transmissivity of 1.2E-7 m2/s was derived from the analysis of the CHi phase, which shows at late times the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E-8 to 4E-7 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5437.6 kPa.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040123 10:01
Test section from - to (m):	565 - 570 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5486		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,0		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

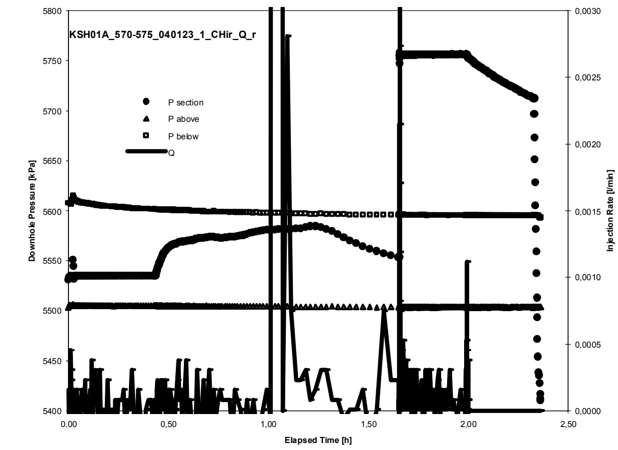
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040123 11:27
Test section from - to (m):	570 - 575 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

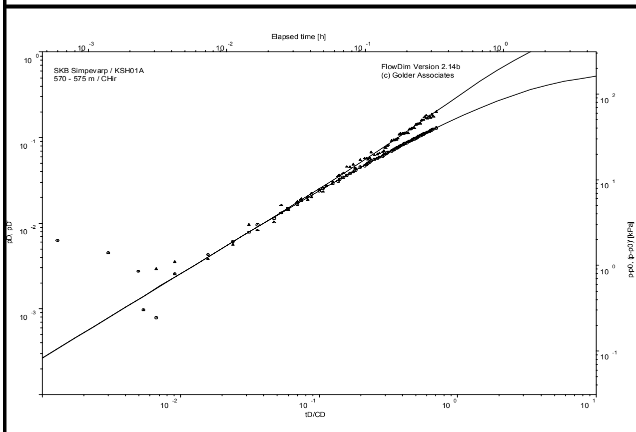


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5533		
p_i (kPa) =	5554		
p_p(kPa) =	5756	p_F (kPa) =	5712
Q_p (m^3/s)=	1,42E-09		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,1		
Derivative fact.=	-	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	6,88E-11		
T_M (m^2/s)=	5,68E-11		
Flow regime:	-	Flow regime:	transient
dt_1 (min) =	-	dt_1 (min) =	*
dt_2 (min) =	-	dt_2 (min) =	*
T (m^2/s) =	NA	T (m^2/s) =	1,93E-11
S (-) =	NA	S (-) =	1,00E-06
K_s (m/s) =	NA	K_s (m/s) =	3,86E-12
S_s (1/m) =	NA	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,06E-11
C_D (-) =	NA	C_D (-) =	2,27E-03
ξ (-) =	NA	ξ (-) =	0,8
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	2,06E-11
dt_2 (min) =	*	C_D (-) =	2,27E-03
T_T (m^2/s) =	1,93E-11	ξ (-) =	0,8
S (-) =	1,00E-06		
K_s (m/s) =	3,86E-12		
S_s (1/m) =	2,00E-07		

Comments:

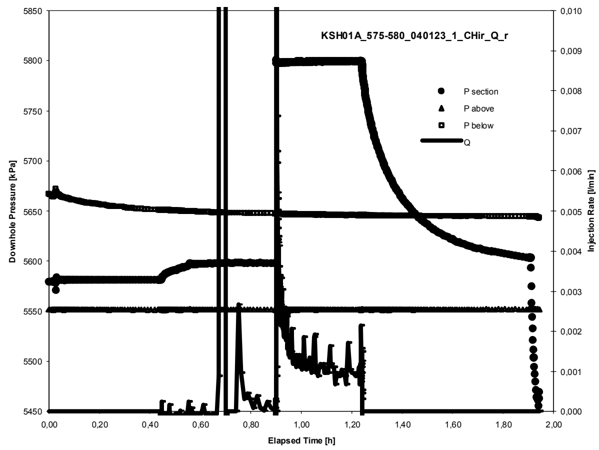
*: IARF not measured

The recommended transmissivity of 1.9E-11 m2/s was derived from the analysis of the CHir phase, which is the only analysable phase. The confidence range for the interval transmissivity is estimated to be 8E-12 to 8E-11 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5568.5 kPa.

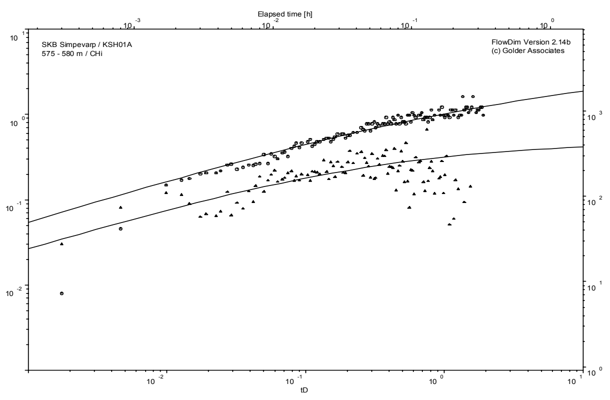
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040123 14:12
Test section from - to (m):	575 - 580 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

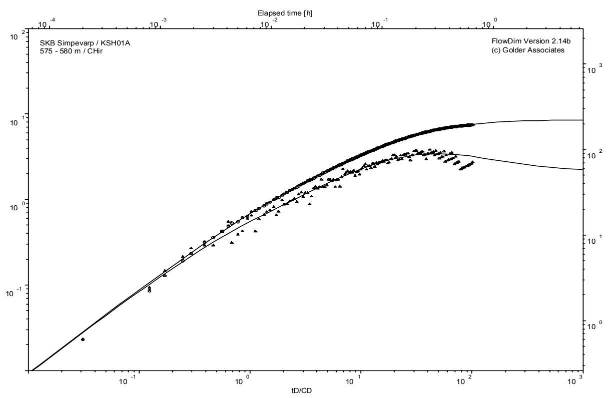
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5580		
p_i (kPa) =	5598		
p_p(kPa) =	5799	p_F (kPa) =	5604
Q_p (m^3/s)=	1,61E-08		
tp (s) =	1200	t_F (s) =	2400
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,1		
Derivative fact.=	0,26	Derivative fact.=	0,01
Results		**Results**	
Q/s (m^2/s)=	7,87E-10		
T_M (m^2/s)=	6,50E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	1,70E-10	T (m^2/s) =	3,77E-10
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	3,40E-11	K_s (m/s) =	7,54E-11
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,29E-11
C_D (-) =	NA	C_D (-) =	2,52E-03
ξ (-) =	-2,1	ξ (-) =	0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	2,29E-11
dt_2 (min) =	*	C_D (-) =	2,52E-03
T_T (m^2/s) =	3,77E-10	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	7,54E-11		
S_s (1/m) =	2,00E-07		

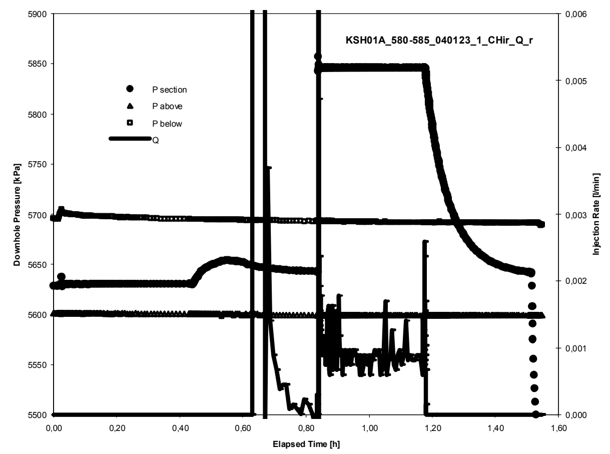
Comments:

*: IARF not measured
The recommended transmissivity of 3.8E-10 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E-10 to 8E-10 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5572.6 kPa.

Test Summary Sheet

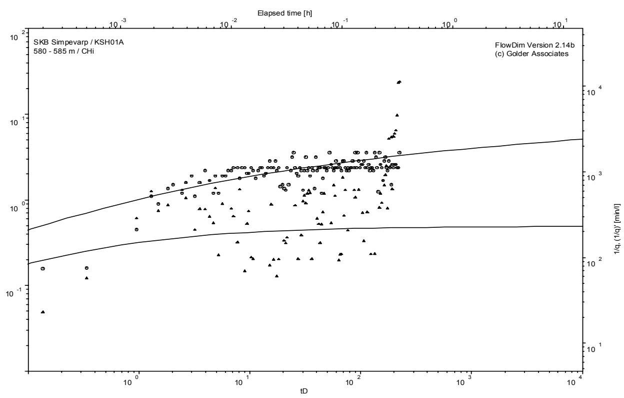
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040123 16:33
Test section from - to (m):	580 - 585 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

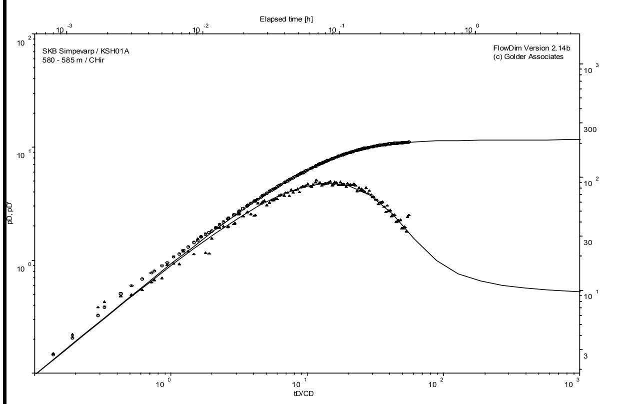


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5629		
p_i (kPa) =	5642		
p_p(kPa) =	5846	p_F (kPa) =	5642
Q_p (m^3/s)=	1,37E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,2		
Derivative fact.=	0,19	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	6,58E-10		
T_M (m^2/s)=	5,43E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2,58	dt_1 (min) =	*
dt_2 (min) =	6,75	dt_2 (min) =	*
T (m^2/s) =	2,72E-10	T (m^2/s) =	1,44E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	5,44E-11	K_s (m/s) =	2,88E-10
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,94E-11
C_D (-) =	NA	C_D (-) =	2,14E-03
ξ (-) =	0	ξ (-) =	8,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	1,94E-11
dt_2 (min) =	*	C_D (-) =	2,14E-03
T_T (m^2/s) =	1,44E-09	ξ (-) =	8,1
S (-) =	1,00E-06		
K_s (m/s) =	2,88E-10		
S_s (1/m) =	2,00E-07		

Comments:

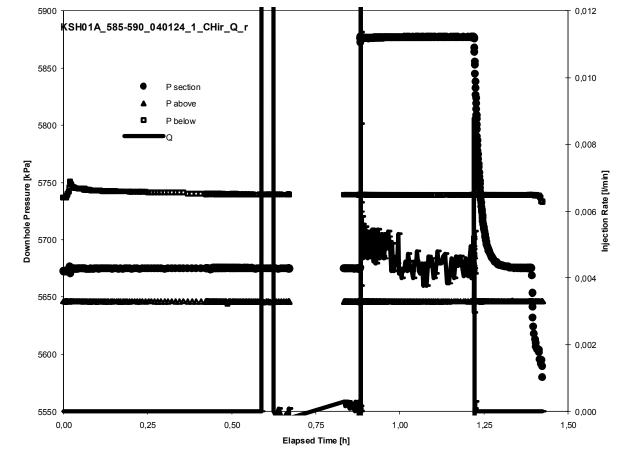
*: IARF not measured

The recommended transmissivity of 1.4E-9 m2/s was derived from the analysis of the CHir phase, which is less noisy and shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E-10 to 3E-9 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5630.6 kPa.

Test Summary Sheet

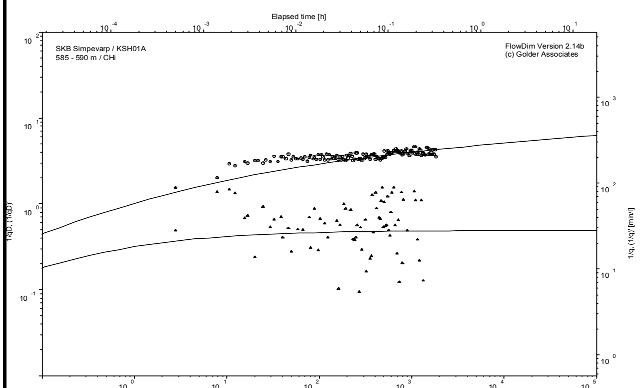
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040124 08:15
Test section from - to (m):	585 - 590 m	Responsible for test execution:	Reinder van der Wall
Section diameter, 2·r_w (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

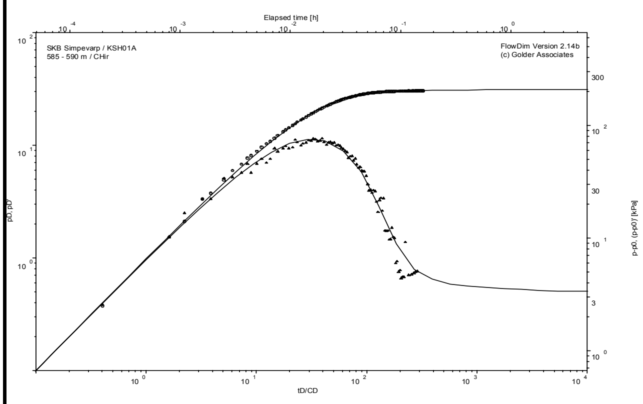


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5673		
p_i (kPa) =	5676		
p_p(kPa) =	5876	p_F (kPa) =	5675
Q_p (m^3/s)=	7,38E-08		
tp (s) =	1200	t_F (s) =	600
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,3		
Derivative fact.=	0,12	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	3,62E-09		
T_M (m^2/s)=	2,99E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	3,00	dt_1 (min) =	*
dt_2 (min) =	9,67	dt_2 (min) =	*
T (m^2/s) =	2,24E-09	T (m^2/s) =	1,85E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	4,48E-10	K_s (m/s) =	3,70E-09
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,10E-11
C_D (-) =	NA	C_D (-) =	2,31E-03
ξ (-) =	0	ξ (-) =	26,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	3,00	C (m^3/Pa) =	2,10E-11
dt_2 (min) =	9,67	C_D (-) =	2,31E-03
T_T (m^2/s) =	2,24E-09	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	4,48E-10		
S_s (1/m) =	2,00E-07		

Comments:

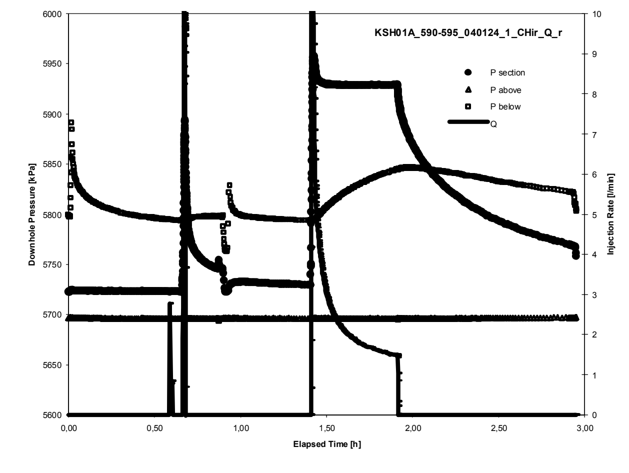
*: IARF not measured

The recommended transmissivity of 2.2E-9 m2/s was derived from the analysis of the CHi phase, which shows the more reliable results. The confidence range for the interval transmissivity is estimated to be 1E-9 to 1E-8 m2/s. The flow dimension displayed during the testis 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5674.3 kPa.

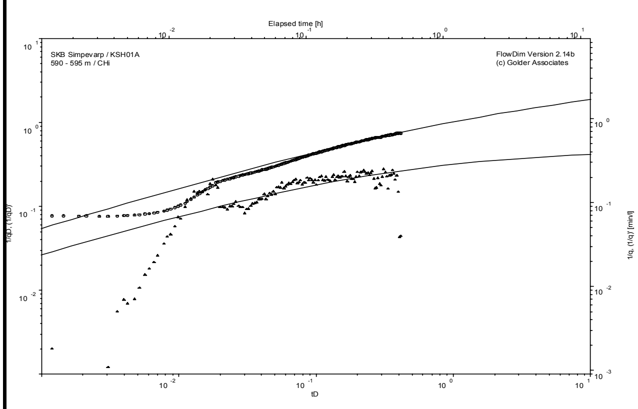
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040124 10:05
Test section from - to (m):	590 - 595 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

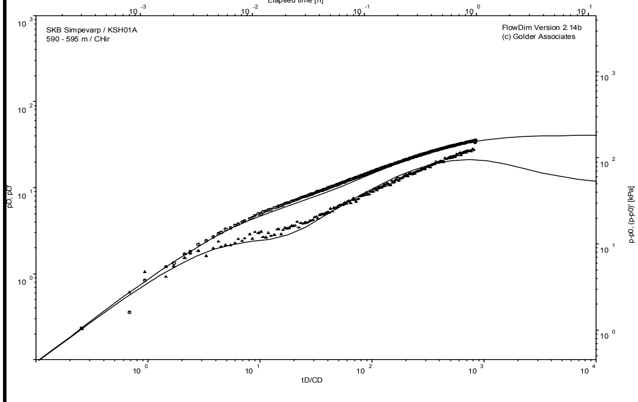
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5724		
p_i (kPa) =	5729		
p_p(kPa) =	5929	p_F (kPa) =	5768
Q_p (m^3/s)=	2,39E-05		
tp (s) =	1800	t_F (s) =	3600
S el S* (-)=	1,00E-06	S el S* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,4		
Derivative fact.=	0,02	Derivative fact.=	0,06
Results		**Results**	
Q/s (m^2/s)=	1,17E-06		
T_M (m^2/s)=	9,68E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	7,95	dt_1 (min) =	*
dt_2 (min) =	26,27	dt_2 (min) =	*
T (m^2/s) =	1,45E-07	T (m^2/s) =	7,16E-07
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,90E-08	K_s (m/s) =	1,43E-07
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	4,05E-08
C_D (-) =	NA	C_D (-) =	4,46E+00
ξ (-) =	-6,5	ξ (-) =	0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	4,05E-08
dt_2 (min) =	*	C_D (-) =	4,46E+00
T_T (m^2/s) =	7,16E-07	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	1,43E-07		
S_s (1/m) =	2,00E-07		

Comments:

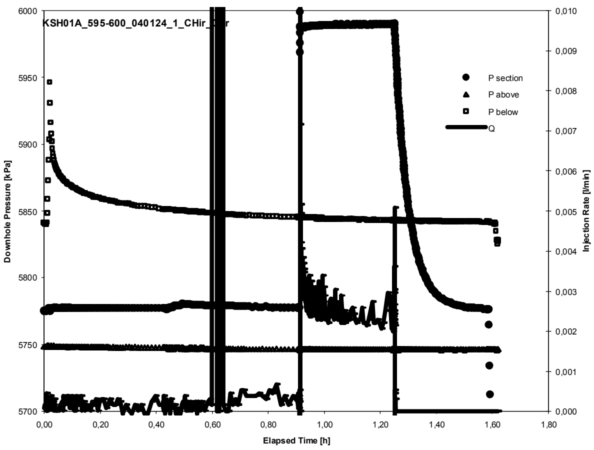
*: IARF not measured

The recommended transmissivity of 7.2E-7 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. It should be noted, that the results of both analysis of the CHir phase can not be compared directly due to the fact, that they were analysed using different flow dimensions. The confidence range for the interval transmissivity is estimated to be 1E-7 to 1E-6 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5741.2 kPa.

Test Summary Sheet

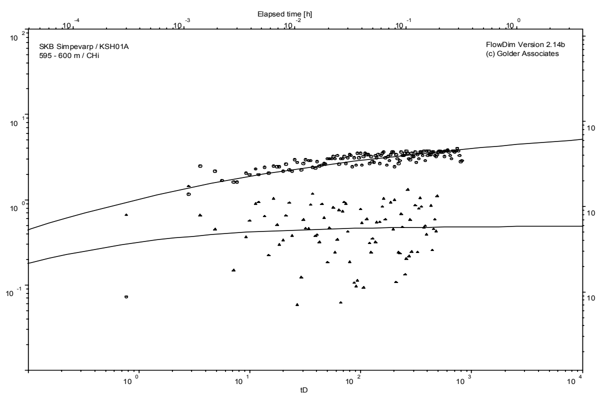
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040124 13:30
Test section from - to (m):	595 - 600 m	Responsible for test execution:	Reinder van der Wall
Section diameter, 2·r_w (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

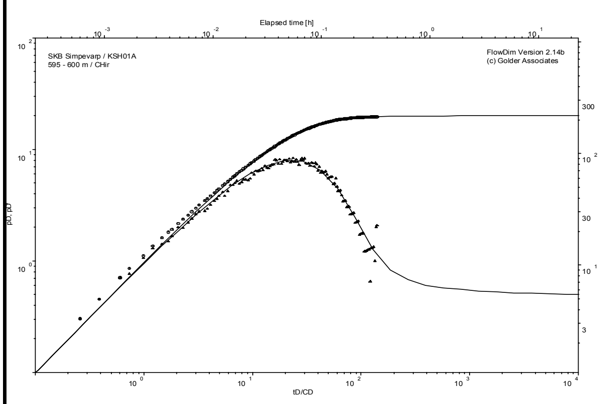


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5775		
p_i (kPa) =	5777		
p_p(kPa) =	5990	p_F (kPa) =	5776
Q_p (m^3/s)=	3,70E-08		
tp (s) =	1200	t_F (s) =	1200
S el S* (-)=	1,00E-06	S el S* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,4		
Derivative fact.=	0,19	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	1,70E-09		
T_M (m^2/s)=	1,41E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,41	dt_1 (min) =	*
dt_2 (min) =	10,68	dt_2 (min) =	*
T (m^2/s) =	1,02E-09	T (m^2/s) =	6,82E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	2,04E-10	K_s (m/s) =	1,36E-09
S_s (1/m) =	1,89E-08	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3,65E-11
C_D (-) =	NA	C_D (-) =	4,02E-03
ξ (-) =	0	ξ (-) =	15,6
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0,41	C (m^3/Pa) =	3,65E-11
dt_2 (min) =	10,68	C_D (-) =	4,02E-03
T_T (m^2/s) =	1,02E-09	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	2,04E-10		
S_s (1/m) =	1,89E-08		

Comments:

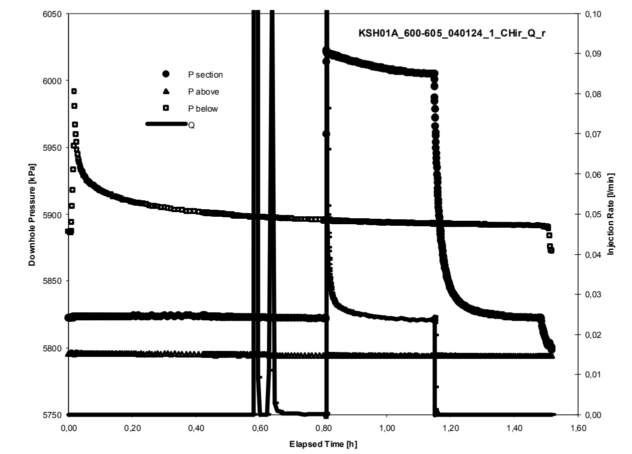
*: IARF not measured

The recommended transmissivity of 1.0E-9 m2/s was derived from the analysis of the CHi phase, which shows the more reliable results. The confidence range for the interval transmissivity is estimated to be 5E-10 to 5E-9 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5770.8 kPa.

Test Summary Sheet

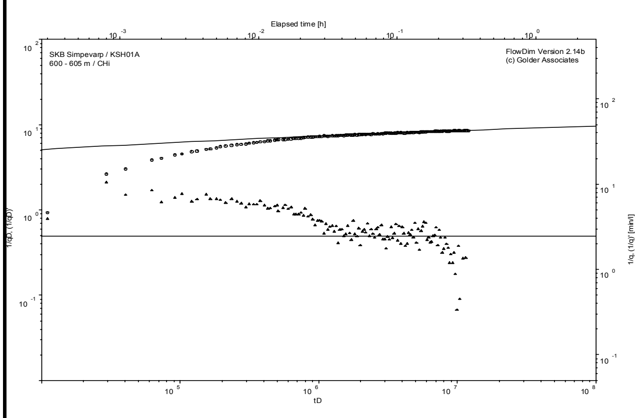
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040124 15:31
Test section from - to (m):	600 - 605 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

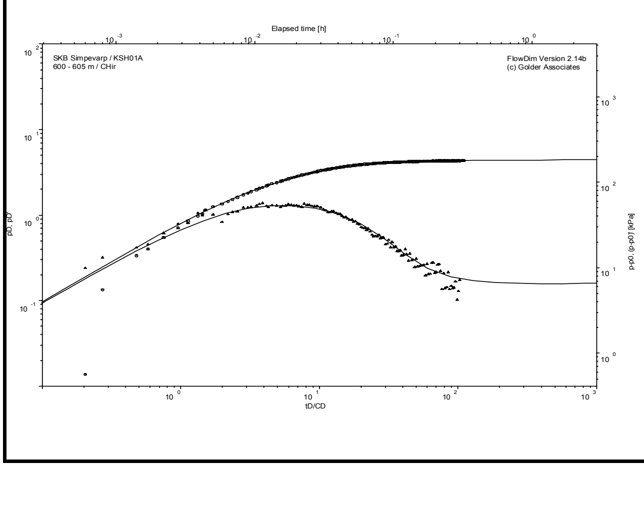


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5823		
p_i (kPa) =	5822		
p_p(kPa) =	6005	p_F (kPa) =	5823
Q_p (m^3/s)=	3,98E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,5		
Derivative fact.=	0,13	Derivative fact.=	0,06
Results		**Results**	
Q/s (m^2/s)=	2,13E-08		
T_M (m^2/s)=	1,76E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	3,68	dt_1 (min) =	*
dt_2 (min) =	13,33	dt_2 (min) =	*
T (m^2/s) =	2,81E-08	T (m^2/s) =	4,88E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	5,62E-09	K_s (m/s) =	9,76E-09
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,09E-10
C_D (-) =	NA	C_D (-) =	1,20E-02
ξ (-) =	3,1	ξ (-) =	-0,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	3,68	C (m^3/Pa) =	1,09E-10
dt_2 (min) =	13,33	C_D (-) =	1,20E-02
T_T (m^2/s) =	2,81E-08	ξ (-) =	3,1
S (-) =	1,00E-06		
K_s (m/s) =	5,62E-09		
S_s (1/m) =	2,00E-07		

Comments:

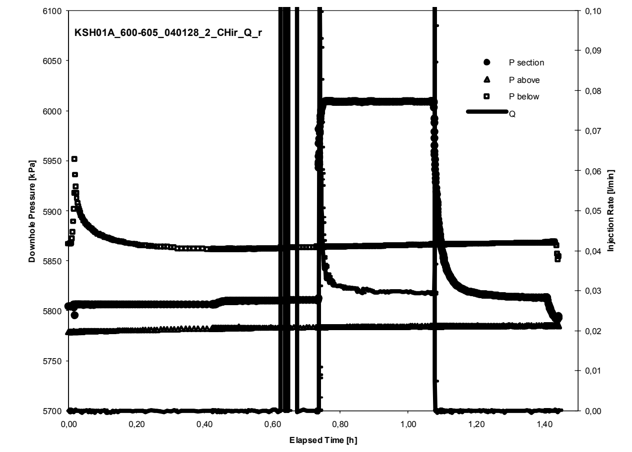
*: IARF not measured

The recommended transmissivity of 2.8E-8 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E-9 to 5E-8 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5817.6 kPa.

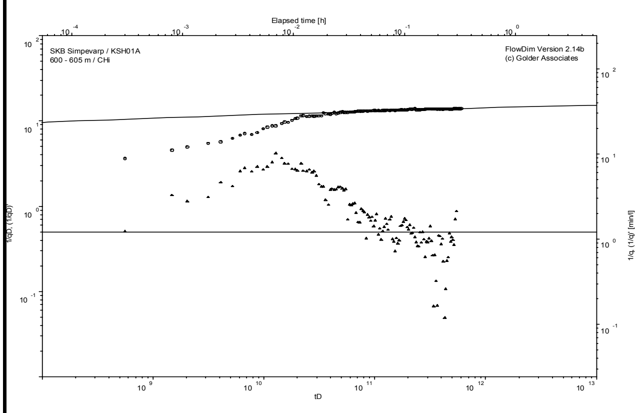
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	2
Borehole ID:	KSH01A	Test start:	040128 10:41
Test section from - to (m):	600 - 605 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

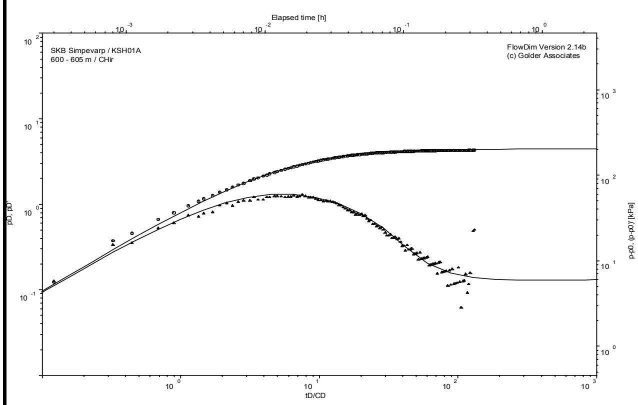
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5804		
p_i (kPa) =	5811		
p_p(kPa) =	6009	p_F (kPa) =	5813
Q_p (m^3/s)=	4,86E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,5		
Derivative fact.=	0,22	Derivative fact.=	0,07
Results		**Results**	
Q/s (m^2/s)=	2,41E-08		
T_M (m^2/s)=	1,99E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	3,49	dt_1 (min) =	*
dt_2 (min) =	15,25	dt_2 (min) =	*
T (m^2/s) =	5,38E-08	T (m^2/s) =	6,47E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,08E-08	K_s (m/s) =	1,29E-08
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,01E-10
C_D (-) =	NA	C_D (-) =	1,11E-02
ξ (-) =	8,2	ξ (-) =	0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	1,01E-10
dt_2 (min) =	*	C_D (-) =	1,11E-02
T_T (m^2/s) =	6,47E-08	ξ (-) =	0
S (-) =	1,00E-06		
K_s (m/s) =	1,29E-08		
S_s (1/m) =	2,00E-07		

Comments:

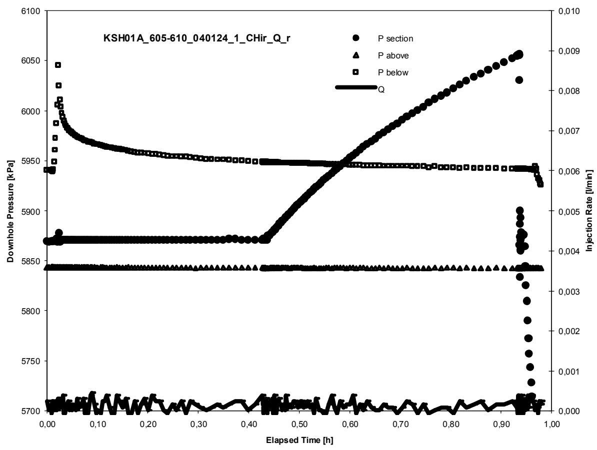
*: IARF not measured

The recommended transmissivity of 6.5E-8 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E-8 to 9E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5808.1 kPa.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040124 17:26
Test section from - to (m):	605 - 610 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5869		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,6		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

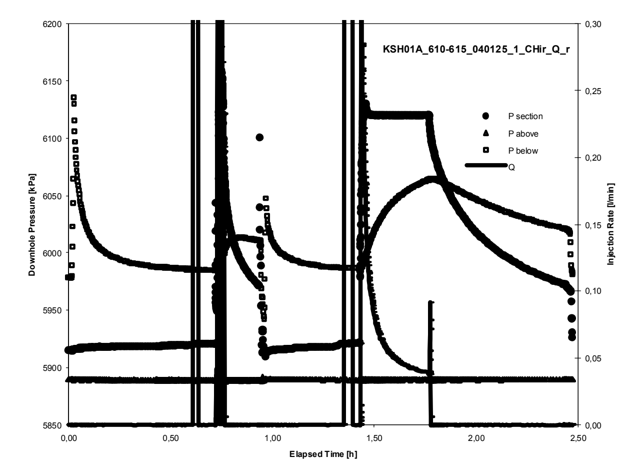
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

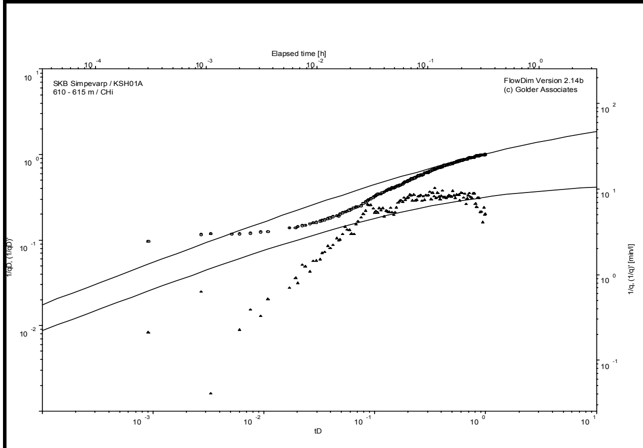
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040125 08:23
Test section from - to (m):	610 - 615 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

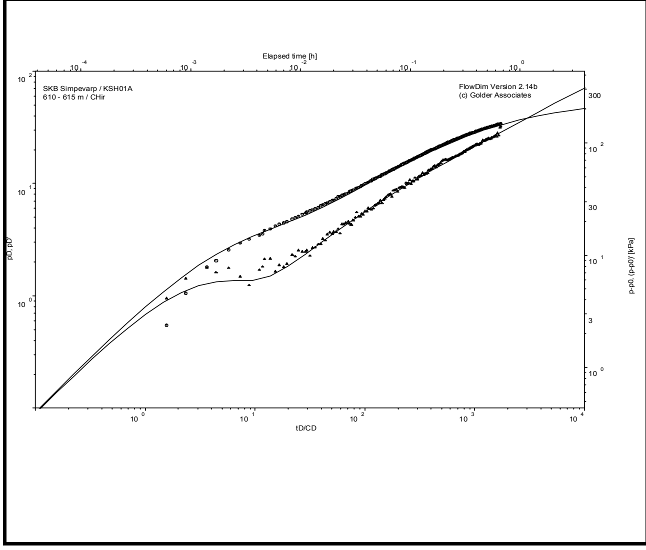


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5915		
p_i (kPa) =	5922		
p_p(kPa) =	6120	p_F (kPa) =	5973
Q_p (m^3/s)=	6,50E-07		
tp (s) =	1200	t_F (s) =	2400
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,6		
Derivative fact.=	0,05	Derivative fact.=	0,07
Results		**Results**	
Q/s (m^2/s)=	3,22E-08		
T_M (m^2/s)=	2,66E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	11,35	dt_1 (min) =	*
dt_2 (min) =	19,10	dt_2 (min) =	*
T (m^2/s) =	5,18E-09	T (m^2/s) =	1,05E-05
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,04E-09	K_s (m/s) =	2,10E-06
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3,75E-10
C_D (-) =	NA	C_D (-) =	4,13E-02
ξ (-) =	-4,2	ξ (-) =	0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	11,35	C (m^3/Pa) =	3,75E-10
dt_2 (min) =	19,10	C_D (-) =	4,13E-02
T_T (m^2/s) =	5,18E-09	ξ (-) =	-4,2
S (-) =	1,00E-06		
K_s (m/s) =	1,04E-09		
S_s (1/m) =	2,00E-07		

Comments:

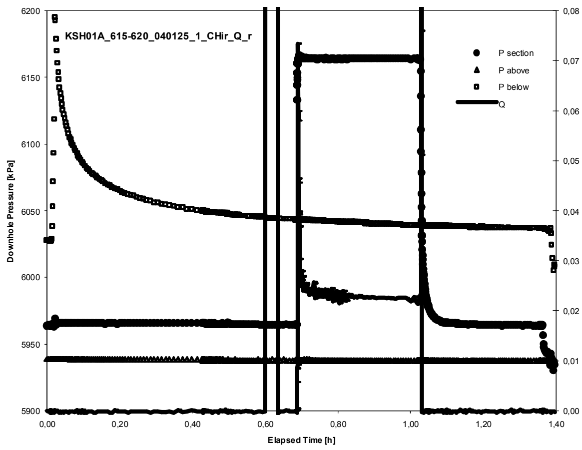
*: IARF not measured

The recommended transmissivity of 5.2E-9 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. It should be noted, that the results of both phases can not be compared directly due to the fact, that they were analysed using different flow dimensions. The confidence range for the interval transmissivity is estimated to be 3E-9 to 1E-8 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5871.6 kPa.

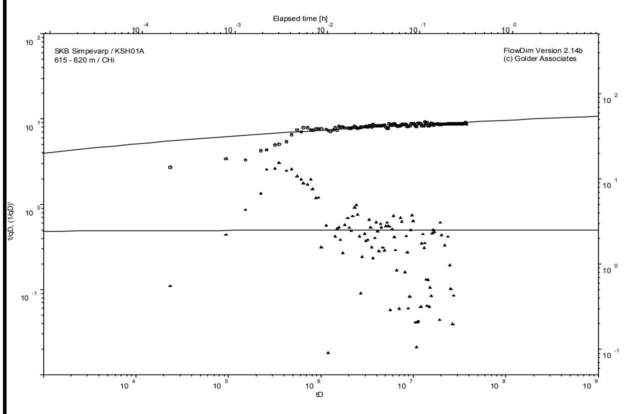
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040125 11:16
Test section from - to (m):	615 - 620 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

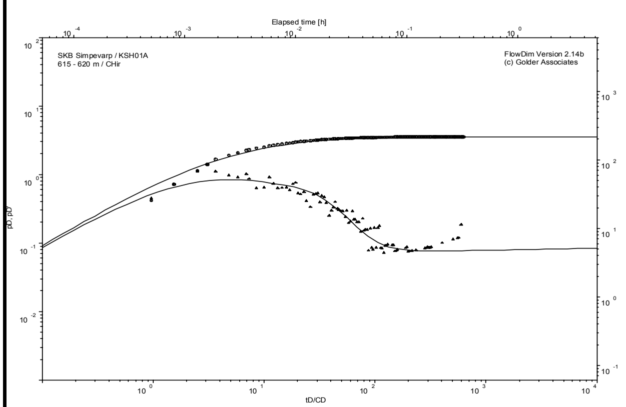
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5964		
p_i (kPa) =	5964		
p_p(kPa) =	6164	p_F (kPa) =	5964
Q_p (m^3/s)=	3,77E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,7		
Derivative fact.=	0,27	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	1,85E-08		
T_M (m^2/s)=	1,53E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0,76	dt_1 (min) =	*
dt_2 (min) =	8,62	dt_2 (min) =	*
T (m^2/s) =	2,57E-08	T (m^2/s) =	5,81E-08
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	5,14E-09	K_s (m/s) =	1,16E-08
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,19E-11
C_D (-) =	NA	C_D (-) =	1,31E-03
ξ (-) =	3,8	ξ (-) =	-0,1
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	0,76	C (m^3/Pa) =	1,19E-11
dt_2 (min) =	8,62	C_D (-) =	1,31E-03
T_T (m^2/s) =	2,57E-08	ξ (-) =	3,8
S (-) =	1,00E-06		
K_s (m/s) =	5,14E-09		
S_s (1/m) =	2,00E-07		

Comments:

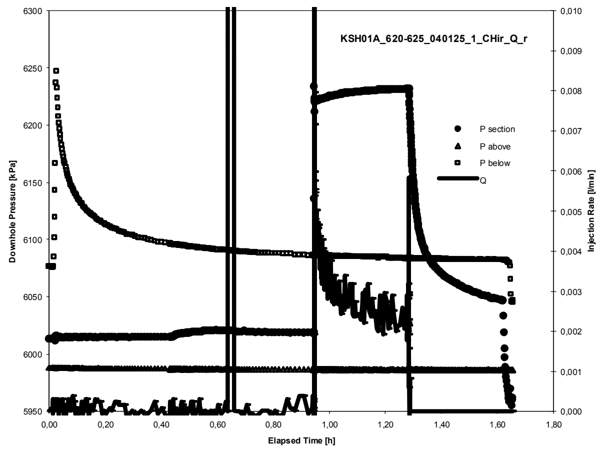
*: IARF not measured

The recommended transmissivity of 2.6E-8 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9E-9 to 6E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5962.0 kPa.

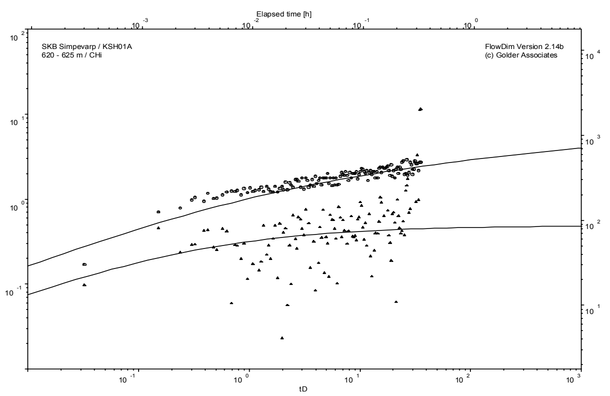
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040125 13:40
Test section from - to (m):	620 - 625 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

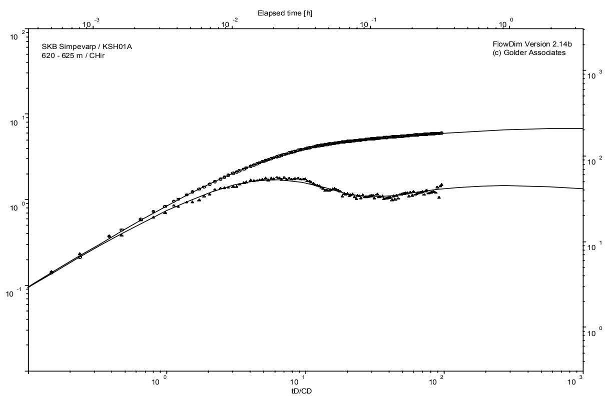
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6013		
p_i (kPa) =	6019		
p_p(kPa) =	6231	p_F (kPa) =	6047
Q_p (m^3/s)=	3,45E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,8		
Derivative fact.=	0,2	Derivative fact.=	0,05
Results		**Results**	
Q/s (m^2/s)=	1,60E-09		
T_M (m^2/s)=	1,32E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	8,50	dt_1 (min) =	6,38
dt_2 (min) =	26,27	dt_2 (min) =	17,71
T (m^2/s) =	8,33E-10	T (m^2/s) =	1,06E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,67E-10	K_s (m/s) =	2,12E-10
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,94E-11
C_D (-) =	NA	C_D (-) =	2,14E-03
ξ (-) =	-1,5	ξ (-) =	1,9
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	6,38	C (m^3/Pa) =	1,94E-11
dt_2 (min) =	17,71	C_D (-) =	2,14E-03
T_T (m^2/s) =	1,06E-09	ξ (-) =	1,9
S (-) =	1,00E-06		
K_s (m/s) =	2,12E-10		
S_s (1/m) =	2,00E-07		

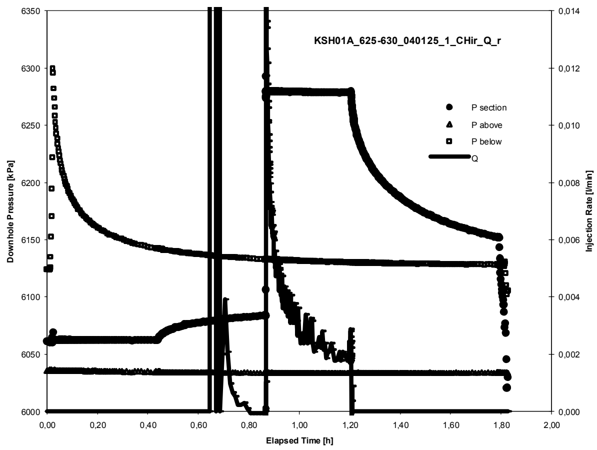
Comments:

The recommended transmissivity of 1.1E-9 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8E-10 to 5E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6017.7 kPa.

Test Summary Sheet

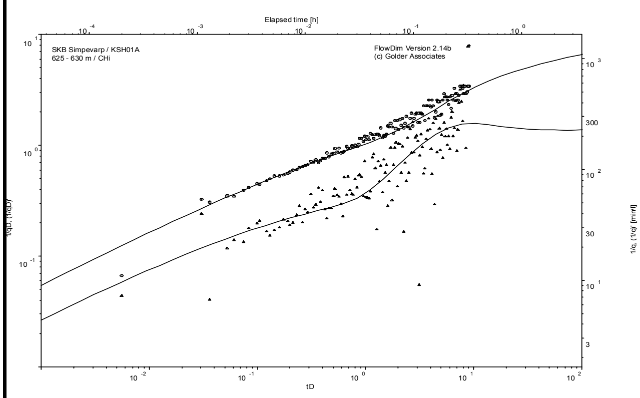
Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040125 15:45
Test section from - to (m):	625 - 630 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

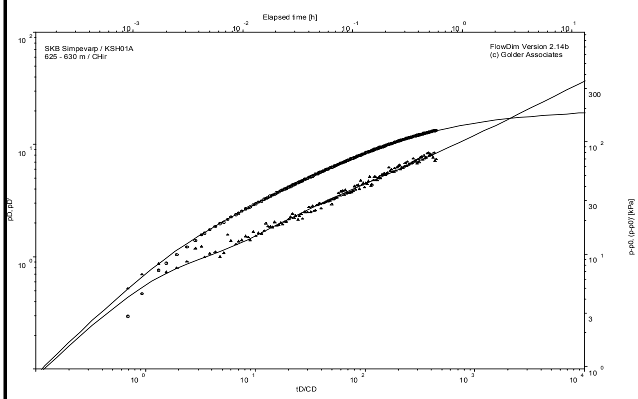


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6061		
p_i (kPa) =	6084		
p_p(kPa) =	6279	p_F (kPa) =	6152
Q_p (m^3/s)=	2,96E-08		
tp (s) =	1200	t_F (s) =	2100
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,8		
Derivative fact.=	0,14	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	1,49E-09		
T_M (m^2/s)=	1,23E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	*	dt_1 (min) =	*
dt_2 (min) =	*	dt_2 (min) =	*
T (m^2/s) =	2,70E-10	T (m^2/s) =	1,35E-07
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	5,40E-11	K_s (m/s) =	2,70E-08
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,96E-11
C_D (-) =	NA	C_D (-) =	3,26E-03
ξ (-) =	-2,1	ξ (-) =	0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	2,96E-11
dt_2 (min) =	*	C_D (-) =	3,26E-03
T_T (m^2/s) =	2,70E-10	ξ (-) =	-2,1
S (-) =	1,00E-06		
K_s (m/s) =	5,40E-11		
S_s (1/m) =	2,00E-07		

Comments:

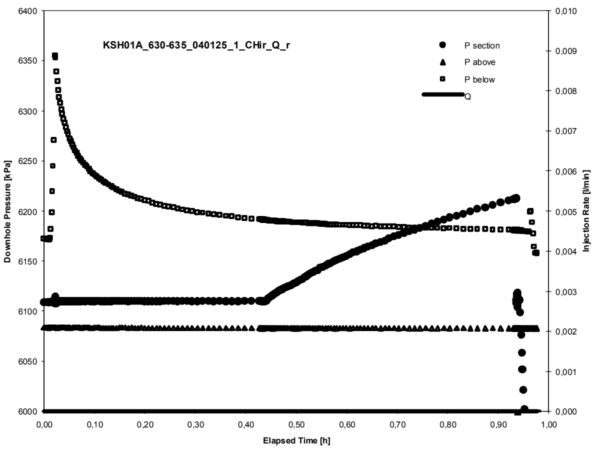
*: IARF not measured

The recommended transmissivity of 2.7E-10 m2/s was derived from the analysis of the CHi phase. It should be noted, that the results of both phases can not be compared directly, because different flow dimension were used. The confidence range for the interval transmissivity is estimated to be 2E-10 to 2E-9 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6081.5 kPa.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040125 17:56
Test section from - to (m):	630 - 635 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6109		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	15,9		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

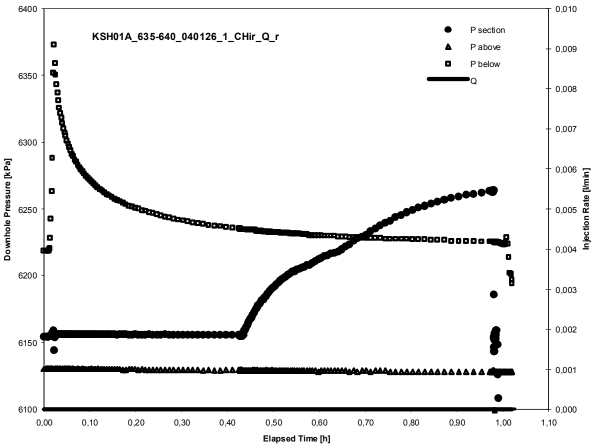
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040126 08:16
Test section from - to (m):	635 - 640 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6154		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,0		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

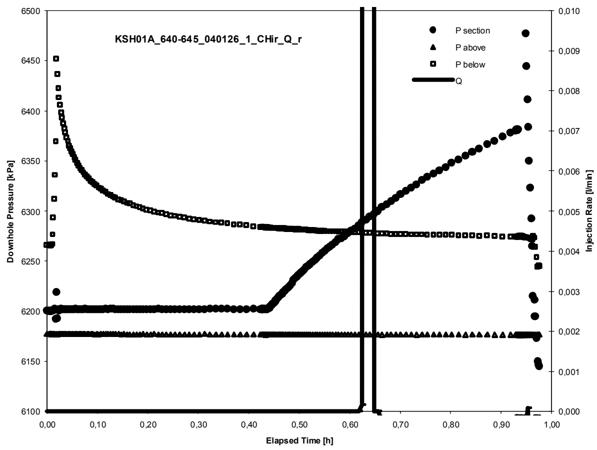
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040126 09:48
Test section from - to (m):	640 - 645 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6200		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,1		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

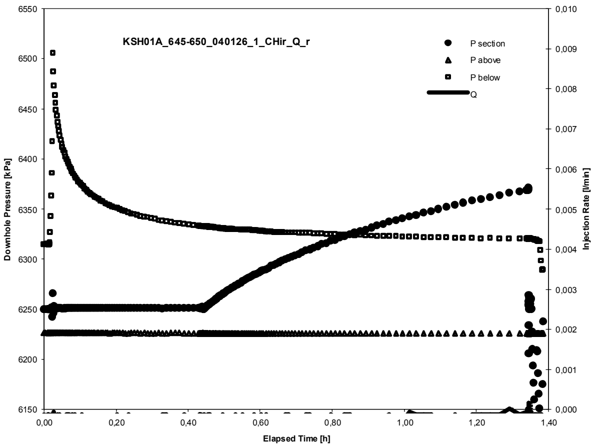
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040126 11:16
Test section from - to (m):	645 - 650 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6249		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,1		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

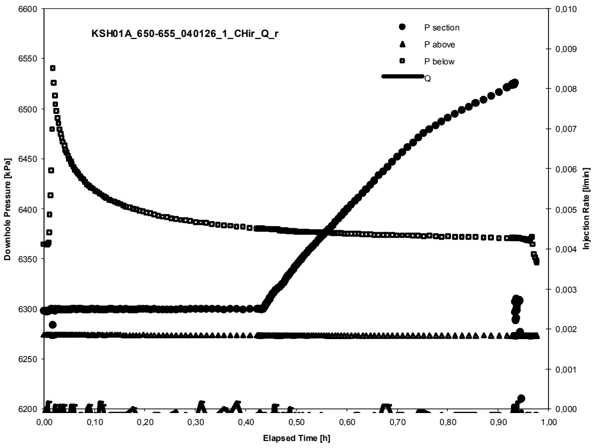
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040126 13:04
Test section from - to (m):	650 - 655 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6298		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,2		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

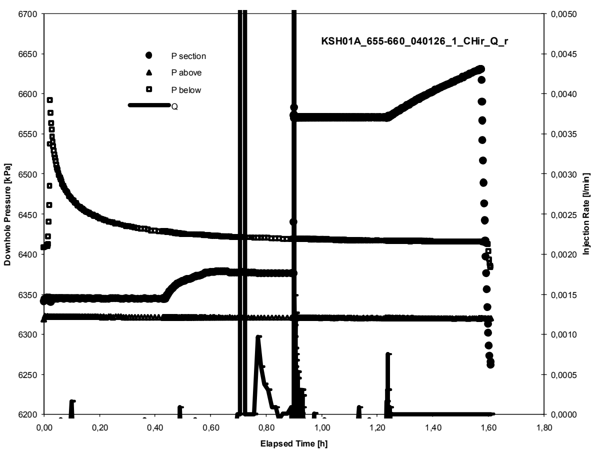
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040126 14:32
Test section from - to (m):	655 - 660 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6345		
p_i (kPa) =	6376		
p_p(kPa) =	6570	p_F (kPa) =	6631
Q_p (m^3/s)=	1,67E-09		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,3		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	8,43E-11		
T_M (m^2/s)=	6,96E-11		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

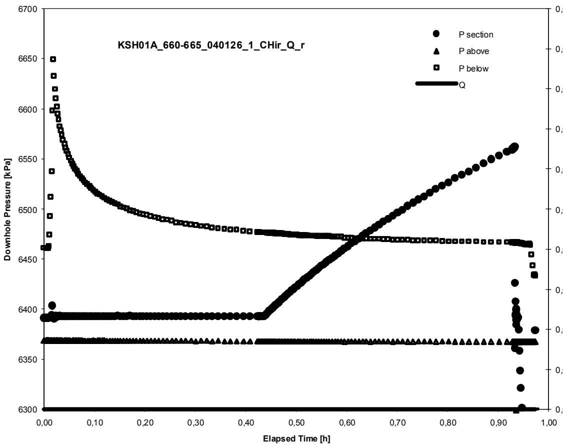
Comments:

The steady state analysis was conducted using a flow rate of 0.1 ml/min. The results of this calculations should be seen as maximum values for the transmissivity of this section.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040126 16:36
Test section from - to (m):	660 - 665 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6391		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,4		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

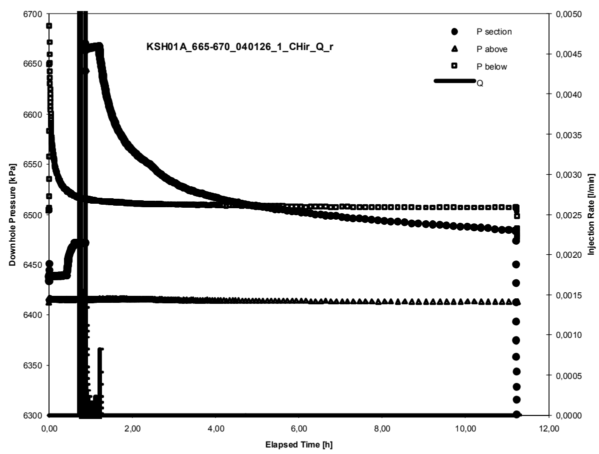
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040126 18:01
Test section from - to (m):	665 - 670 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

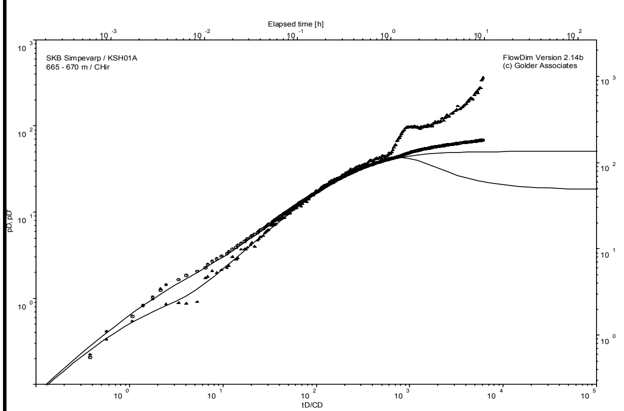


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6439		
p_i (kPa) =	6471		
p_p(kPa) =	6666	p_F (kPa) =	6486
Q_p (m^3/s)=	1,10E-09		
tp (s) =	1200	t_F (s) =	36000
S el S* (-)=	1,00E-06	S el S* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,4		
Derivative fact.=	-	Derivative fact.=	0,07
Results		**Results**	
Q/s (m^2/s)=	5,51E-11		
T_M (m^2/s)=	4,55E-11		
Flow regime:	-	Flow regime:	transient
dt_1 (min) =	-	dt_1 (min) =	*
dt_2 (min) =	-	dt_2 (min) =	*
T (m^2/s) =	NA	T (m^2/s) =	1,78E-11
S (-) =	NA	S (-) =	1,00E-06
K_s (m/s) =	NA	K_s (m/s) =	3,56E-12
S_s (1/m) =	NA	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,35E-12
C_D (-) =	NA	C_D (-) =	2,59E-04
ξ (-) =	NA	ξ (-) =	1,8
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	2,35E-12
dt_2 (min) =	*	C_D (-) =	2,59E-04
T_T (m^2/s) =	1,78E-11	ξ (-) =	1,8
S (-) =	1,00E-06		
K_s (m/s) =	3,56E-12		
S_s (1/m) =	2,00E-07		

Comments:

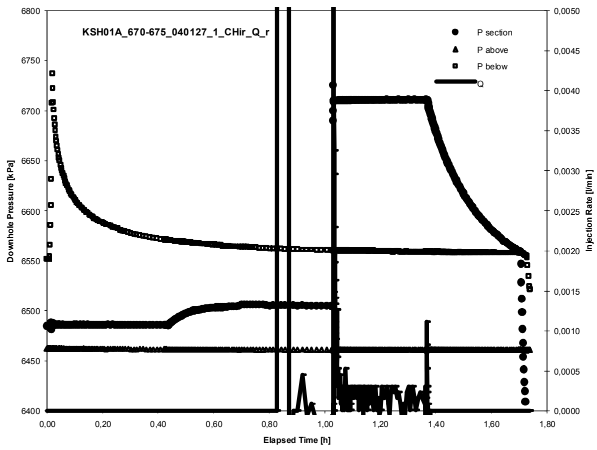
*: IARF not measured

The recommended transmissivity of 1.8E-11 m2/s was derived from the analysis of the CHir phase using the composite flow model (outer zone), which shows the best data and derivative quality. Based on this analysis and the very low injection rates (below measurement range of flowmeter), the interval transmissivity is lower than 5E-11 m2/s. The flow dimension used for this analysis is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6463.9 kPa

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040127 08:15
Test section from - to (m):	670 - 675 m	Responsible for test execution:	Reinder van der Wall
Section diameter, 2·r_w (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p

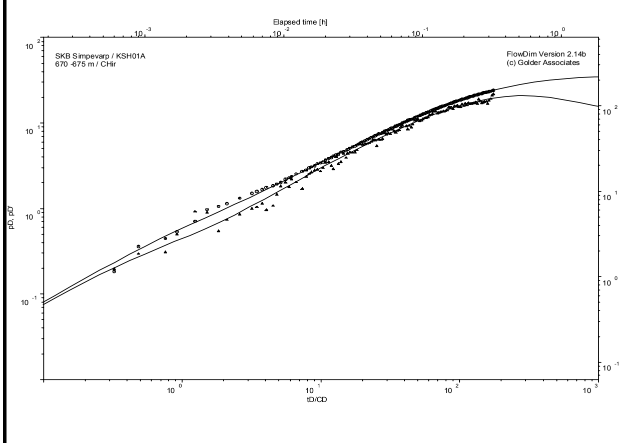


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6485		
p_i (kPa) =	6505		
p_p(kPa) =	6710	p_F (kPa) =	6558
Q_p (m^3/s)=	2,62E-09		
tp (s) =	1200	t_F (s) =	1200
S el S* (-)=	1,00E-06	S el S* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,5		
Derivative fact.=	-	Derivative fact.=	0,02
Results		**Results**	
Q/s (m^2/s)=	1,25E-10		
T_M (m^2/s)=	1,03E-10		
Flow regime:	-	Flow regime:	transient
dt_1 (min) =	-	dt_1 (min) =	*
dt_2 (min) =	-	dt_2 (min) =	*
T (m^2/s) =	NA	T (m^2/s) =	7,61E-11
S (-) =	NA	S (-) =	1,00E-06
K_s (m/s) =	NA	K_s (m/s) =	1,52E-11
S_s (1/m) =	NA	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1,31E-11
C_D (-) =	NA	C_D (-) =	1,44E-03
ξ (-) =	NA	ξ (-) =	-0,2
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	*	C (m^3/Pa) =	1,31E-11
dt_2 (min) =	*	C_D (-) =	1,44E-03
T_T (m^2/s) =	7,61E-11	ξ (-) =	-0,2
S (-) =	1,00E-06		
K_s (m/s) =	1,52E-11		
S_s (1/m) =	2,00E-07		

Comments:

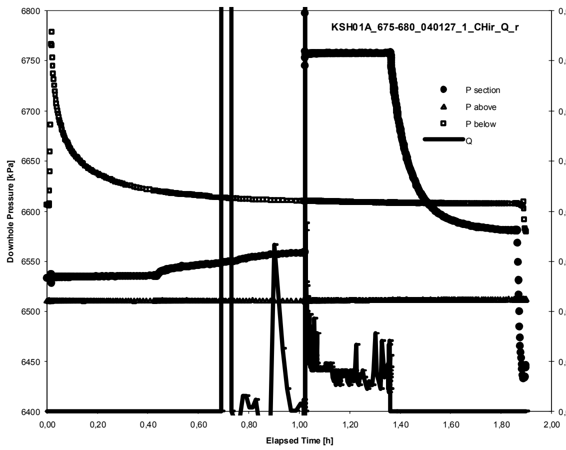
*: IARF not measured

The recommended transmissivity of 7.6E-11 m2/s was derived from the analysis of the CHir phase using the homogeneous flow model. Based on this analysis and the very low injection rates (below measurement range of flowmeter), the interval transmissivity is lower than 1E-10 m2/s. A flow dimension of 2 was used for the analysis. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6489.1 kPa.

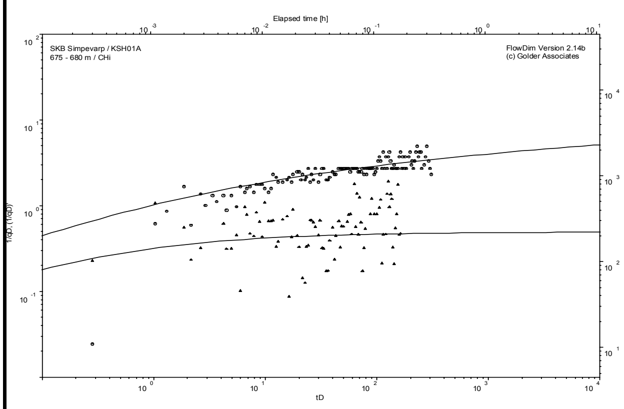
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040127 10:26
Test section from - to (m):	675 - 680 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

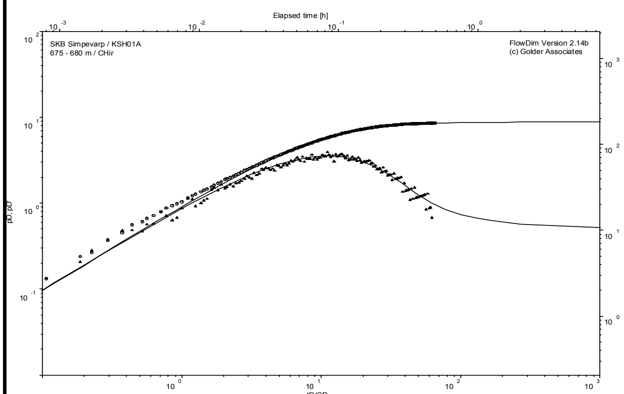
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6533		
p_i (kPa) =	6558		
p_p(kPa) =	6758	p_F (kPa) =	6581
Q_p (m^3/s)=	1,37E-08		
tp (s) =	1200	t_F (s) =	1800
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,6		
Derivative fact.=	0,26	Derivative fact.=	
Results		**Results**	
Q/s (m^2/s)=	6,71E-10		
T_M (m^2/s)=	5,54E-10		
Flow regime:	transient	Flow regime:	IARF
dt_1 (min) =	0,00	dt_1 (min) =	*
dt_2 (min) =	0,00	dt_2 (min) =	*
T (m^2/s) =	2,89E-10	T (m^2/s) =	1,28E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	5,78E-11	K_s (m/s) =	2,56E-10
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2,20E-11
C_D (-) =	NA	C_D (-) =	2,42E-03
ξ (-) =	0,1	ξ (-) =	5,3
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.

dt_1 (min) =	*	C (m^3/Pa) =	2,20E-11
dt_2 (min) =	*	C_D (-) =	2,42E-03
T_T (m^2/s) =	1,28E-09	ξ (-) =	5,3
S (-) =	1,00E-06		
K_s (m/s) =	2,56E-10		
S_s (1/m) =	2,00E-07		

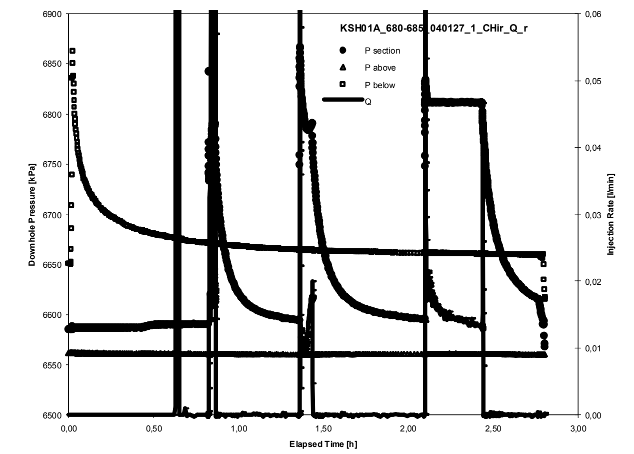
Comments:

*: IARF not measured
The recommended transmissivity of 1.3E-9 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E-10 to 3E-9 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6573.9 kPa.

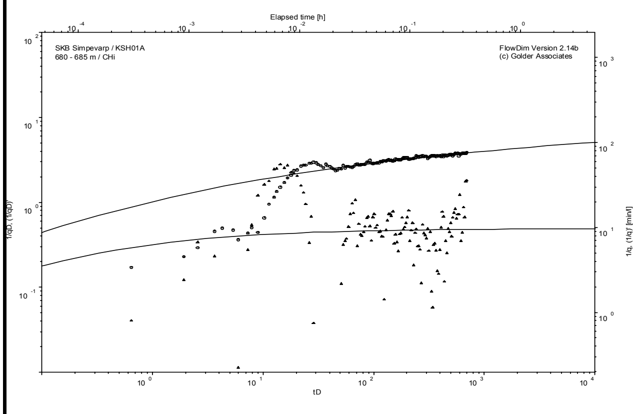
Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040127 12:50
Test section from - to (m):	680 - 685 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

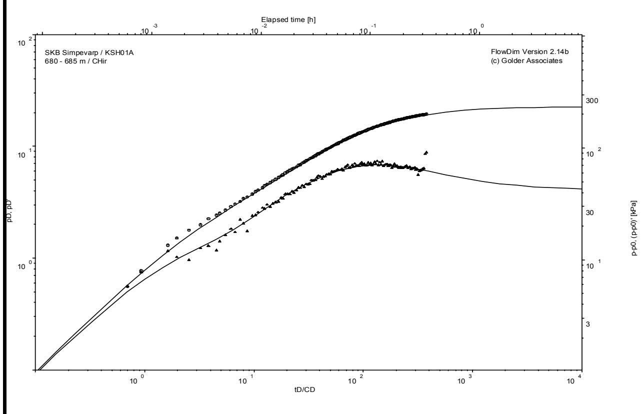
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6586		
p_i (kPa) =	6596		
p_p(kPa) =	6812	p_F (kPa) =	6615
Q_p (m^3/s)=	2,19E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1,00E-06	S el S^* (-)=	1,00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,7		
Derivative fact.=	0,12	Derivative fact.=	0,04
Results		**Results**	
Q/s (m^2/s)=	9,97E-09		
T_M (m^2/s)=	8,23E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2,29	dt_1 (min) =	*
dt_2 (min) =	13,62	dt_2 (min) =	*
T (m^2/s) =	6,14E-09	T (m^2/s) =	5,39E-09
S (-) =	1,00E-06	S (-) =	1,00E-06
K_s (m/s) =	1,23E-09	K_s (m/s) =	1,08E-09
S_s (1/m) =	2,00E-07	S_s (1/m) =	2,00E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	8,60E-11
C_D (-) =	NA	C_D (-) =	9,48E-03
ξ (-) =	-1	ξ (-) =	0
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	2,29	C (m^3/Pa) =	8,60E-11
dt_2 (min) =	13,62	C_D (-) =	9,48E-03
T_T (m^2/s) =	6,14E-09	ξ (-) =	-1
S (-) =	1,00E-06		
K_s (m/s) =	1,23E-09		
S_s (1/m) =	2,00E-07		

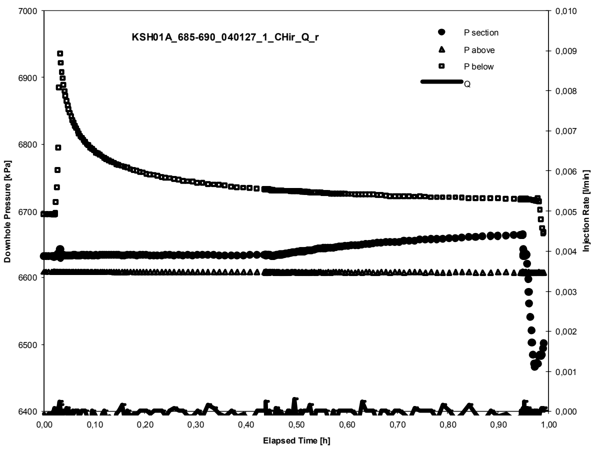
Comments:

The recommended transmissivity of 6.1E-9 m2/s was derived from the analysis of the CHi phase. The confidence range for the interval transmissivity is estimated to be 4E-9 to 9E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6579.8 kPa.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040127 16:07
Test section from - to (m):	685 - 690 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6632		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,7		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

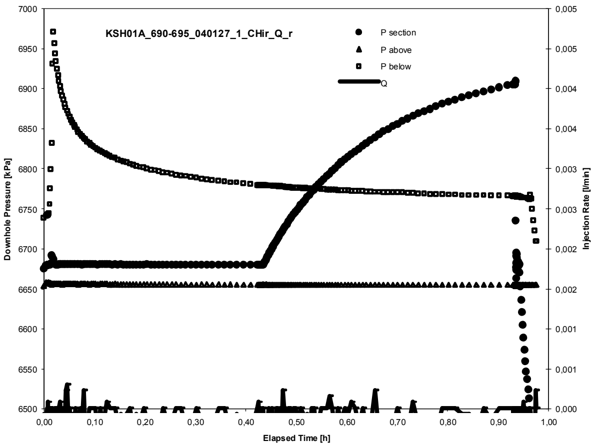
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040127 17:33
Test section from - to (m):	690 - 695 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6680		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,8		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Selected representative parameters.			
dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

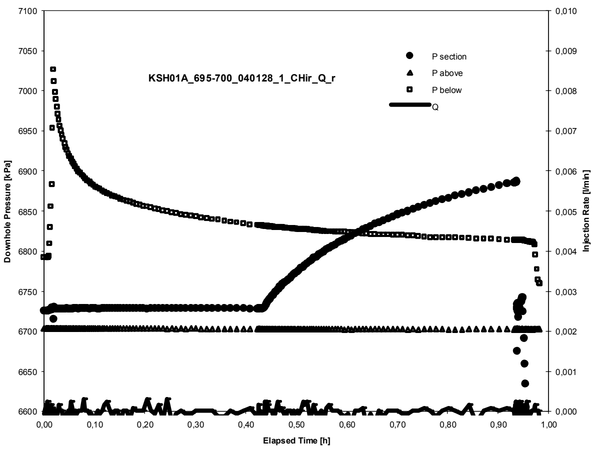
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Hydraulic Injection Tests	Test type:[1]	Chir
Area:	Simpevarp	Test no:	1
Borehole ID:	KSH01A	Test start:	040128 08:14
Test section from - to (m):	695 - 700 m	Responsible for test execution:	Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0,076	Responsible for test evaluation:	C. Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6726		
p_i (kPa) =	-		
p_p(kPa) =	-	p_F (kPa) =	-
Q_p (m^3/s)=	-		
tp (s) =	-	t_F (s) =	-
S el S^* (-)=	-	S el S^* (-)=	-
EC_w (mS/m)=			
$Temp_w$(gr C)=	16,9		
Derivative fact.=	-	Derivative fact.=	-
Results		**Results**	
Q/s (m^2/s)=	-		
T_M (m^2/s)=	-		
Flow regime:	-	Flow regime:	-
dt_1 (min) =	-	dt_1 (min) =	-
dt_2 (min) =	-	dt_2 (min) =	-
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =		T_{GRF}(m^2/s) =	
S_{GRF}(-) =		S_{GRF}(-) =	
D_{GRF} (-) =		D_{GRF} (-) =	

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	-	C (m^3/Pa) =	NA
dt_2 (min) =	-	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

APPENDIX 4

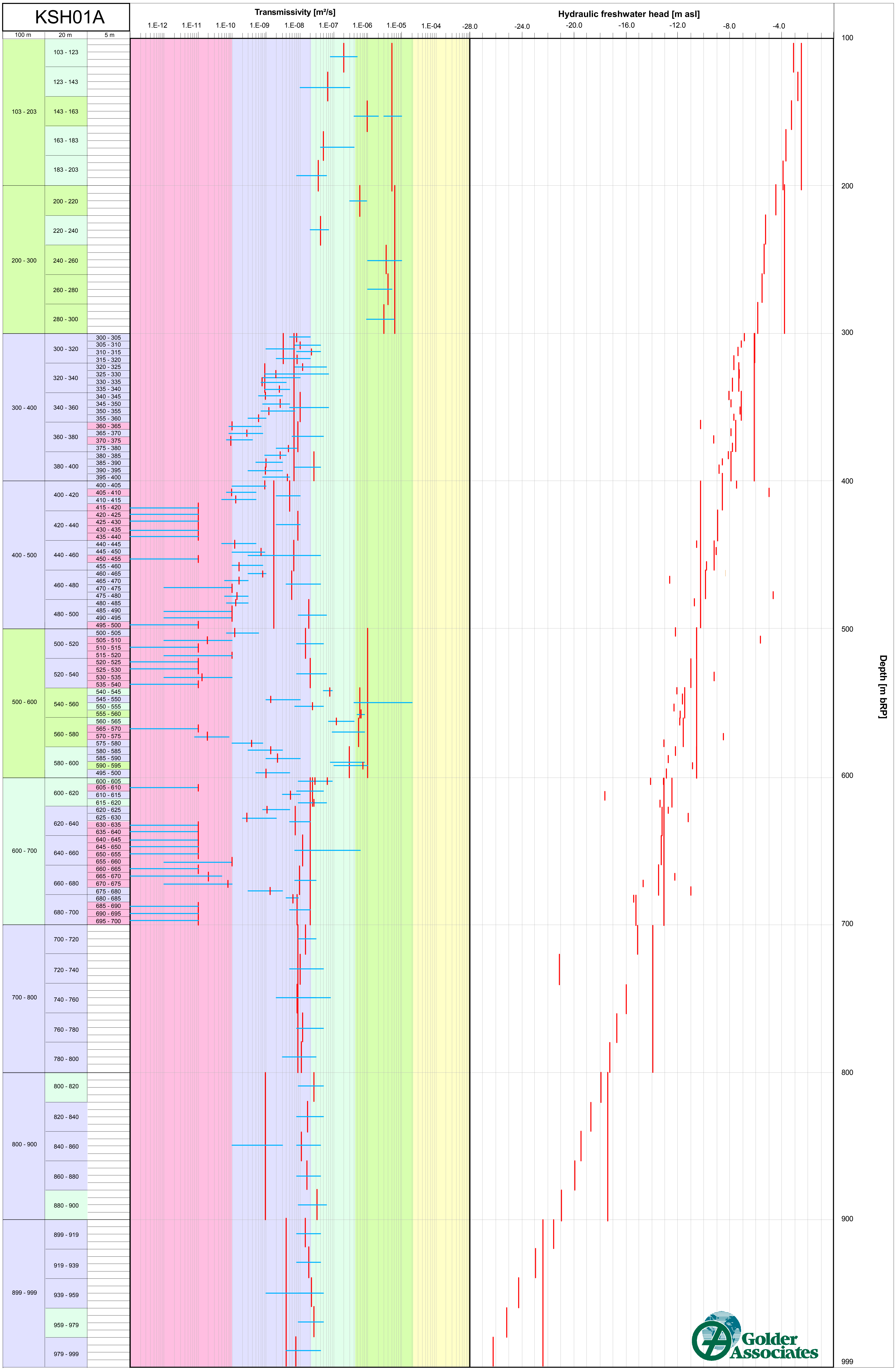
Nomenclature

The following symbols are extracted from the more comprehensive list of symbols provided by SKB. Only the symbols that were used or deemed to be used in the future in the context of test analysis are presented.

Character	Explanation	Dimension	Unit
b	Aquifer thickness (Thickness of 2D formation)	[L]	m
L_w	Test section length.	[L]	m
r_w	Borehole, well or soil pipe radius in test section.	[L]	m
r_D	Dimensionless radius, $r_D=r/r_w$	-	-
Q_p	Flow in test section immediately before stop of flow. Stabilised pump flow in flow logging.	$[L^3/T]$	m^3/s
Q_m	Arithmetical mean flow during perturbation phase.	$[L^3/T]$	m^3/s
V	Volume	$[L^3]$	m^3
V_w	Water volume in test section.	$[L^3]$	m^3
V_p	Total water volume injected/pumped during perturbation phase.	$[L^3]$	m^3
t	Time	[T]	hour,min,s
t_0	Duration of rest phase before perturbation phase.	[T]	s
t_p	Duration of perturbation phase. (from flow start as far as p_p).	[T]	s
t_F	Duration of recovery phase (from p_p to p_F).	[T]	s
t_1, t_2 etc	Times for various phases during a hydro test.	[T]	hour,min,s
dt	Running time from start of flow phase and recovery phase respectively.	[T]	s
dt_e	$dt_e = (dt \cdot tp) / (dt + tp)$ Agarwal equivalent time with dt as running time for recovery phase.	[T]	s
t_D	$t_D = T \cdot t / (S \cdot r_w^2)$. Dimensionless time	-	-
p	Static pressure; including non-dynamic pressure which depends on water velocity. Dynamic pressure is normally ignored in estimating the potential in groundwater flow relations.	$[M/(LT)^2]$	kPa
p_a	Atmospheric pressure	$[M/(LT)^2]$	kPa
p_t	Absolute pressure; $p_t=p_a+p_g$	$[M/(LT)^2]$	kPa
p_g	Gauge pressure; Difference between absolute pressure and atmospheric pressure.	$[M/(LT)^2]$	kPa
p_0	Initial pressure before test begins, prior to packer expansion.	$[M/(LT)^2]$	kPa
p_i	Pressure in measuring section before start of flow.	$[M/(LT)^2]$	kPa
p_f	Pressure during perturbation phase.	$[M/(LT)^2]$	kPa
p_s	Pressure during recovery.	$[M/(LT)^2]$	kPa
p_p	Pressure in measuring section before flow stop.	$[M/(LT)^2]$	kPa
p_F	Pressure in measuring section at end of recovery.	$[M/(LT)^2]$	kPa
p_D	$p_D=2\pi \cdot T \cdot p/(Q \cdot \rho_w g)$, Dimensionless pressure	-	-
dp	Pressure difference, drawdown of pressure surface between two points of time.	$[M/(LT)^2]$	kPa
dp_f	$dp_f = p_i - p_f$ or $= p_f - p_i$, drawdown/pressure increase of pressure surface between two points of time during perturbation phase. dp_f usually expressed positive.	$[M/(LT)^2]$	kPa
dp_s	$dp_s = p_s - p_p$ or $= p_p - p_s$, pressure increase/drawdown of pressure surface between two points of time during recovery phase. dp_s usually expressed positive.	$[M/(LT)^2]$	kPa
dp_p	$dp_p = p_i - p_p$ or $= p_p - p_i$, **maximal** pressure increase/drawdown of pressure surface between two points of time during perturbation phase. dp_p expressed positive.	$[M/(LT)^2]$	kPa
dp_F	$dp_F = p_p - p_F$ or $= p_F - p_p$, **maximal** pressure increase/drawdown of pressure surface between two points of time during recovery phase. dp_F expressed positive.	$[M/(LT)^2]$	kPa

H	Total head; (potential relative a reference level) (indication of h for phase as for p). $H=h_e+h_p+h_v$	[L]	m
h	Groundwater pressure level (hydraulic head (piezometric head; possible to use for level observations in boreholes, static head)); (indication of h for phase as for p). $h=h_e+h_p$	[L]	m
h_e	Height of measuring point (Elevation head); Level above reference level for measuring point.	[L]	m
s_p	Drawdown in measuring section before flow stop.	[L]	m
h_0	Initial above reference level before test begins, prior to packer expansion.	[L]	m
h_i	Level above reference level in measuring section before start of flow.	[L]	m
h_f	Level above reference level during perturbation phase.	[L]	m
h_s	Level above reference level during recovery phase.	[L]	m
h_p	Level above reference level in measuring section before flow stop.	[L]	m
h_F	Level above reference level in measuring section at end of recovery.	[L]	m
dh	Level difference, drawdown of water level between two points of time.	[L]	m
dh_f	$dh_f = h_i - h_f$ or $= h_f - h_i$, drawdown/pressure increase of pressure surface between two points of time during perturbation phase. dh_f usually expressed positive.	[L]	m
dh_s	$dh_s = h_s - h_p$ or $= h_p - h_s$, pressure increase/drawdown of pressure surface between two points of time during recovery phase. dh_s usually expressed positive.	[L]	m
dh_p	$dh_p = h_i - h_p$ or $= h_p - h_i$, maximal pressure increase/drawdown of pressure surface between two points of time during perturbation phase. dh_p expressed positive.	[L]	m
dh_F	$dh_F = h_p - h_F$ or $= h_F - h_p$, maximal pressure increase/drawdown of pressure surface between two points of time during perturbation phase. dh_F expressed positive.	[L]	m
Te_w	Temperature in the test section (taken from temperature logging). Temperature		^oC
Te_{w0}	Temperature in the test section during undisturbed conditions (taken from temperature logging). Temperature		^oC
g	Constant of gravitation (9.81 $m*s^{-2}$) (Acceleration due to gravity)	$[L/T^2]$	m/s^2
π	Constant (approx 3.1416).	[-]	
r	Residual. $r= p_c-p_m$, $r= h_c-h_m$, etc. Difference between measured data (p_m, h_m, etc) and estimated data (p_c, h_c, etc)		
Q/s	Specific capacity $s=dp_p$ or $s=s_p=h_0-h_p$ (open borehole)	$[L^2/T]$	m^2/s
D	Interpreted flow dimension according to Barker, 1988.	[-]	-
dt_1	Time of starting for semi-log or log-log evaluated characteristic counted from start of flow phase and recovery phase respectively.	[T]	s
dt_2	End of time for semi-log or log-log evaluated characteristic counted from start of flow phase and recovery phase respectively.	[T]	s
T	Transmissivity	$[L^2/T]$	m^2/s
T_M	Transmissivity according to Moye (1967)	$[L^2/T]$	m^2/s
T_S	Transmissivity evaluated from slug test	$[L^2/T]$	m^2/s
T_{Sf}, T_{Lf}	Transient evaluation based on semi-log or log-log diagram for perturbation phase in injection or pumping.	$[L^2/T]$	m^2/s
T_{Ss}, T_{Ls}	Transient evaluation based on semi-log or log-log diagram for recovery phase in injection or pumping.	$[L^2/T]$	m^2/s

T_T	Transient evaluation (log-log or lin-log). Judged best evaluation of T_{Sf}, T_{Lf}, T_{Ss}, T_{Ls}	$[L^2/T]$	m^2/s
T_{NLR}	Evaluation based on non-linear regression.	$[L^2/T]$	m^2/s
S	Storage coefficient, (Storativity)	[-]	-
S*	Assumed storage coefficient	[-]	-
S_f	Fracture storage coefficient	[-]	-
S_m	Matrix storage coefficient	[-]	-
S_{NLR}	Storage coefficient, evaluation based on non-linear regression	[-]	-
S_s	Specific storage coefficient; confined storage.	[1/L]	1/m
S_s*	Assumed specific storage coefficient; confined storage.	[1/L]	1/m
ξ	Skin factor	[-]	-
ξ*	Assumed skin factor	[-]	-
C	Wellbore storage coefficient	$[(LT^2)\cdot M^2]$	m^3/Pa
C_D	$C_D = C\cdot\rho_w g /(2\pi\cdot S\cdot r_w^2)$, Dimensionless wellbore storage coefficient	[-]	-
ω	$\omega = S_f /(S_f + S_m)$, storage ratio (Storativity ratio); the ratio of storage coefficient between that of the fracture and total storage.	[-]	-
λ	$\lambda = \alpha\cdot (K_m / K_f) \cdot r_w^2$ interporosity flow coefficient.	[-]	-
T_{GRF}	Transmissivity interpreted using the GRF method	$[L^2/T]$	m^2/s
S_{GRF}	Storage coefficient interpreted using the GRF method	[1/L]	1/m
D_{GRF}	Flow dimension interpreted using the GRF method	[-]	-
c_w	Water compressibility; corresponding to β in hydrogeological literature.	$[(LT^2)/M]$	1/Pa
c_r	Pore-volume compressibility, (rock compressibility); Corresponding to α/n in hydrogeological literature.	$[(LT^2)/M]$	1/Pa
c_t	$c_t = c_r + c_w$, total compressibility; compressibility per volumetric unit of rock obtained through multiplying by the total porosity, n. (Presence of gas or other fluids can be included in c_t if the degree of saturation (volume of respective fluid divided by n) of the pore system of respective fluid is also included)	$[(LT^2)/M]$	1/Pa
n	Total porosity	-	-
ρ	Density	$[M/L^3]$	$kg/(m^3)$
ρ_w	Fluid density in measurement section during pumping/injection	$[M/L^3]$	$kg/(m^3)$
μ	Dynamic viscosity	[M/LT]	Pa s
μ_w	Dynamic viscosity (Fluid density in measurement section during pumping/injection)	[M/LT]	Pa s



KSH01A
100 m
20 m
5 m
Transmissivity [m²/s]
1.E-12
1.E-11
1.E-10
1.E-09
1.E-08
1.E-07
1.E-06
1.E-05
1.E-04
Hydraulic freshwater head [m asl]
-28.0
-24.0
-20.0
-16.0
-12.0
-8.0
-4.0
Depth [m bRP]
100
200
300
400
500
600
700
800
900
999
103 - 203
200 - 300
300 - 400
400 - 500
500 - 600
600 - 700
700 - 800
800 - 900
899 - 999
103 - 123
123 - 143
143 - 163
163 - 183
183 - 203
200 - 220
220 - 240
240 - 260
260 - 280
280 - 300
300 - 320
320 - 340
340 - 360
360 - 380
380 - 400
400 - 420
420 - 440
440 - 460
460 - 480
480 - 500
500 - 520
520 - 540
540 - 560
560 - 580
580 - 600
600 - 620
620 - 640
640 - 660
660 - 680
680 - 700
700 - 720
720 - 740
740 - 760
760 - 780
780 - 800
800 - 820
820 - 840
840 - 860
860 - 880
880 - 900
899 - 919
919 - 939
939 - 959
959 - 979
979 - 999
Golder Associates

APPENDIX 6

SICADA data tables

General Information

Borehole	Borehole secup (m)	Borehole seclow (m)	Test type (1-6)	Formation type (-)	Date for test, start YYYYMMDD	Start flow/ injection hhmmss	Qp (m^3/s)	tp (s)	t_F (s)	h_i (m)	h_p (m)	h_F (m)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	EC_w (mS/m)	TDS_w (mg/ L)	TDS_{wm} (mg/ L)	Reference	Comments (-)
KSH01A	103	203	1	1	20031209	130300	2,28E-05	1800	1800				1045	1242	1051	8,9					
KSH01A	200	300	1	1	20031210	135100	1,37E-04	1800	1800				1985	2184	1997	9,8					
KSH01A	300	400	1	1	20031210	181800	2,90E-07	1800	5400				2951	3152	2954	11,3					
KSH01A	400	500	1	1	20031214	100100	8,97E-08	1800	3600				3894	4134	3930	12,7					
KSH01A	500	600	1	1	20031211	150500	3,78E-05	1800	3600				4870	5071	4895	14,0					
KSH01A	600	700	1	1	20031212	071700	1,00E-06	1800	1800				5828	6031	5878	15,5					
KSH01A	700	800	1	1	20031212	110100	2,92E-07	1800	3600				6788	6966	6813	17,0					
KSH01A	800	900	1	1	20031212	145600	1,45E-08	1800	57600				7780	7962	7741	18,5					
KSH01A	899	999	1	1	20031213	143000	1,12E-07	1800	1800				8682	8890	8670	20,0					
KSH01A	103	123	1	1	20031215	114500	6,94E-06	1200	1800				1048	1248	1054	8,8					
KSH01A	123	143	1	1	20031215	145100	1,03E-06	1200	1200				1241	1441	1240	9,1					
KSH01A	143	163	1	1	20031215	165600	1,28E-05	1200	1200				1430	1630	1432	9,4					
KSH01A	163	183	1	1	20031215	185800	1,06E-06	1800	1200				1624	1823	1623	9,6					
KSH01A	183	203	1	1	20031216	091200	3,19E-07	1200	1200				1819	2017	1821	9,9					
KSH01A	200	220	1	1	20031216	120700	6,94E-06	1200	1200				1979	2179	1987	10,0					
KSH01A	220	240	1	1	20031216	141600	9,10E-07	1200	1200				2172	2371	2178	10,3					
KSH01A	240	260	1	1	20031216	161800	5,61E-05	1200	1200				2363	2562	2369	10,5					
KSH01A	260	280	1	1	20031216	181500	2,40E-05	1200	1200				2558	2756	2559	10,8					
KSH01A	280	300	1	1	20031217	091200	6,20E-05	1800	1200				2752	2951	2759	11,1					
KSH01A	300	320	1	1	20031217	112800	1,36E-07	1200	4080				2947	3169	2956	11,3					
KSH01A	320	340	1	1	20031217	141100	7,26E-08	1200	1200				3137	3336	3136	11,6					
KSH01A	340	360	1	1	20031217	162000	1,88E-07	1200	1200				3328	3537	3328	11,9					
KSH01A	360	380	1	1	20031217	181400	2,28E-07	1200	1800				3519	3718	3519	12,1					
KSH01A	380	400	1	1	20031218	085400	2,10E-07	1200	1800				3713	3915	3716	12,4					
KSH01A	400	420	1	1	20031218	153400	1,30E-07	1200	1200				3903	4107	3902	12,7					
KSH01A	420	440	1	1	20031218	173600	1,23E-07	1200	1200				4094	4299	4093	12,9					
KSH01A	440	460	1	1	20031219	084800	1,83E-07	1200	1200				4291	4491	4289	13,2					
KSH01A	460	480	1	1	20031219	104000	1,14E-07	1200	1200				4478	4683	4478	13,5					
KSH01A	480	500	1	1	20031219	125900	1,92E-07	1200	1200				4670	4873	4669	13,8					

Borehole	Borehole secup (m)	Borehole seclow (m)	Test type (1-6)	Formation type (-)	Date for test, start YYYYMMDD	Start flow/ injection hhmmss	Qp (m^3/s)	tp (s)	t_F (s)	h_i (m)	h_p (m)	h_F (m)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	EC_w (mS/m)	TDS_w (mg/ L)	TDS_{wm} (mg/ L)	Reference	Comments (-)
KSH01A	500	520	1	1	20031219	145500	2,00E-07	1200	1200				4863	5065	4861	14,1					
KSH01A	520	540	1	1	20031219	165100	2,04E-07	1200	1200				5055	5257	5054	14,3					
KSH01A	540	560	1	1	20031219	185000	1,33E-05	1200	7200				5244	5444	5249	14,6					
KSH01A	560	580	1	1	20031220	085700	2,17E-06	1200	1200				5440	5640	5440	14,9					
KSH01A	580	600	1	1	20031220	110200	2,37E-05	1800	3600				5637	5831	5677	15,2					
KSH01A	600	620	1	1	20031220	162400	8,26E-07	1200	3600				5835	6035	5850	15,5					
KSH01A	620	640	1	1	20040107	142600	2,01E-07	1200	1200				6020	6221	6035	15,8					
KSH01A	640	660	1	1	20040107	162800	1,76E-07	1800	1800				6210	6418	6209	16,1					
KSH01A	660	680	1	1	20040107	182900	2,08E-07	1800	1800				6407	6612	6404	16,4					
KSH01A	680	700	1	1	20040108	091100	2,31E-07	1200	1800				6591	6791	6601	16,7					
KSH01A	700	720	1	1	20040108	112600	2,55E-07	1200	2400				6786	6978	6787	17,0					
KSH01A	720	740	1	1	20040108	135200	2,84E-07	1200	2400				6974	7182	7001	17,3					
KSH01A	740	760	1	1	20040108	152900	1,89E-07	1200	1200				7165	7352	7163	17,6					
KSH01A	760	780	1	1	20040108	183500	2,01E-07	1200	1200				7355	7560	7355	17,9					
KSH01A	780	800	1	1	20040109	091600	7,99E-08	1200	1200				7544	7750	7544	18,2					
KSH01A	800	820	1	1	20040109	111900	1,85E-07	1200	1200				7734	7927	7733	18,5					
KSH01A	820	840	1	1	20040109	134400	2,25E-07	1200	1200				7922	8132	7921	18,8					
KSH01A	840	860	1	1	20040109	162100	5,91E-08	1800	1200				8110	8302	8112	19,1					
KSH01A	860	880	1	1	20040109	183900	1,13E-07	1200	1200				8301	8501	8302	19,4					
KSH01A	880	900	1	1	20040110	092400	1,99E-07	1200	1200				8487	8690	8487	19,7					
KSH01A	899	919	1	1	20040110	112600	1,25E-07	1200	1200				8668	8869	8669	20,0					
KSH01A	919	939	1	1	20040110	135900	1,34E-07	1200	600				8852	9056	8852	20,3					
KSH01A	939	959	1	1	20040110	160200	2,26E-07	1200	300				9037	9228	9037	20,6					
KSH01A	959	979	1	1	20040110	175500	2,96E-07	1200	300				9223	9428	9223	20,9					
KSH01A	979	999	1	1	20040111	092500	1,61E-07	1200	1200				9406	9610	9407	21,2					
KSH01A	300	305	1	1	20040112	170000	1,79E-07	1200	300				2939	3145	2938	11,4					
KSH01A	305	310	1	1	20040112	184400	1,69E-07	1200	1200				2984	3185	2984	11,5					
KSH01A	310	315	1	1	20040113	083600	2,09E-07	1200	1200				3032	3232	3035	11,5					
KSH01A	315	320	1	1	20040113	130500	3,58E-08	1200	1200				3074	3285	3075	11,5					
KSH01A	320	325	1	1	20040113	150100	1,72E-07	1200	300				3124	3330	3124	11,6					
KSH01A	325	330	1	1	20040113	164600	5,05E-08	1200	600				3177	3380	3177	11,7					
KSH01A	330	335	1	1	20040113	183700	4,80E-07	1200	1200				3222	3424	3222	11,7					

Borehole	Borehole secup (m)	Borehole seclow (m)	Test type (1-6)	Formation type (-)	Date for test, start YYYYMMDD	Start flow/ injection hhmmss	Qp (m^3/s)	tp (s)	t_F (s)	h_i (m)	h_p (m)	h_F (m)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	EC_w (mS/m)	TDS_w (mg/ L)	TDS_{wm} (mg/ L)	Reference	Comments (-)
KSH01A	335	340	1	1	20040114	090300	4,56E-08	1200	900				3271	3475	3272	11,8					
KSH01A	340	345	1	1	20040114	105900	2,60E-08	1200	1200				3333	3530	3327	11,9					
KSH01A	345	350	1	1	20040114	131800	1,86E-08	1200	1500				3380	3582	3374	11,9					
KSH01A	350	355	1	1	20040114	151800	2,35E-08	1200	1200				3424	3631	3423	12,0					
KSH01A	355	360	1	1	20040114	171300	9,98E-09	1200	3600				3486	3682	3482	12,1					
KSH01A	360	365	1	1	20040115	094400	7,53E-09	1200	1800				3514	3715	3569	12,1					
KSH01A	365	370	1	1	20040115	114800	7,53E-09	1200	3240				3570	3764	3593	12,2					
KSH01A	370	375	1	1	20040115	144800	6,32E-09	1200	1800				3623	3829	3668	12,3					
KSH01A	375	380	1	1	20040115	170000	6,77E-08	1200	1200				3662	3863	3674	12,3					
KSH01A	380	385	1	1	20040115	192500	5,29E-08	1200	3600				3711	3905	3714	12,4					
KSH01A	385	390	1	1	20040116	092300	1,98E-08	1200	1200				3762	3962	3775	12,5					
KSH01A	390	395	1	1	20040116	111800	1,12E-08	1200	1200				3816	4013	3815	12,5					
KSH01A	395	400	1	1	20040116	135200	7,53E-09	1200	1800				3849	4053	3868	12,6					
KSH01A	400	405	1	1	20040116	160600	6,32E-09	1200	2700				3914	4115	3916	12,7					
KSH01A	405	410	1	1	20040116	184500	2,62E-07	1200	43200				3970	4170	3965	12,7					
KSH01A	410	415	1	1	20040117	091400	9,98E-09	1200	1200				4024	4219	4236	12,8					
KSH01A	415	420	1	1	20040117	-	-	-	-				-	-	-	12,9					
KSH01A	420	425	1	1	20040117	-	-	-	-				-	-	-	13,0					
KSH01A	425	430	1	1	20040117	-	-	-	-				-	-	-	13,0					
KSH01A	430	435	1	1	20040117	-	-	-	-				-	-	-	13,1					
KSH01A	435	440	1	1	20040117	-	-	-	-				-	-	-	13,2					
KSH01A	440	445	1	1	20040117	191300	6,32E-09	1200	36000				4290	4501	4277	13,3					
KSH01A	445	450	1	1	20040118	104000	9,98E-09	1200	1200				4346	4556	4361	13,3					
KSH01A	450	455	1	1	20040118	-	-	-	-				-	-	-	13,4					
KSH01A	455	460	1	1	20040118	150600	1,12E-08	1200	1200				4459	4642	4506	13,5					
KSH01A	460	465	1	1	20040118	172700	1,12E-08	1200	21600				4496	4691	4477	13,5					
KSH01A	465	470	1	1	20040119	095500	2,62E-09	1200	1800				4559	4759	4576	13,6					
KSH01A	470	475	1	1	20040119	121800	3,33E-06	1200	1200				4600	4806	4794	13,7					
KSH01A	475	480	1	1	20040119	145700	2,50E-09	1200	1200				4644	4844	4785	13,7					
KSH01A	480	485	1	1	20040119	170800	2,50E-09	1200	1800				4696	4903	4721	13,8					
KSH01A	485	490	1	1	20040120	092500	2,62E-09	1200	240				4752	4967	4972	13,9					
KSH01A	490	495	1	1	20040120	111500	1,42E-09	1200	2400				4796	4983	5009	13,9					

Borehole	Borehole secup (m)	Borehole seclow (m)	Test type (1-6)	Formation type (-)	Date for test, start YYYYMMDD	Start flow/ injection hhmmss	Qp (m^3/s)	tp (s)	t_F (s)	h_i (m)	h_p (m)	h_F (m)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	EC_w (mS/m)	TDS_w (mg/ L)	TDS_{wm} (mg/ L)	Reference	Comments (-)
KSH01A	495	500	1	1	20040120	-	-	-	-				-	-	-	14,0					
KSH01A	500	505	1	1	20040120	154100	3,87E-09	1200	2400				4889	5082	4881	14,1					
KSH01A	505	510	1	1	20040120	182000	2,62E-09	1200	43200				4928	5133	4961	14,1					
KSH01A	510	515	1	1	20040121	-	-	-	-				-	-	-	14,2					
KSH01A	515	520	1	1	20040121	110300	1,42E-09	1200	2400				5041	5249	5342	14,3					
KSH01A	520	525	1	1	20040121	-	-	-	-				-	-	-	14,4					
KSH01A	525	530	1	1	20040121	-	-	-	-				-	-	-	14,4					
KSH01A	530	535	1	1	20040121	171700	2,62E-09	1200	1800				5172	5384	5310	14,5					
KSH01A	535	540	1	1	20040122	-	-	-	-				-	-	-	14,6					
KSH01A	540	545	1	1	20040122	103000	1,73E-06	1200	1800				5243	5443	5250	14,6					
KSH01A	545	550	1	1	20040122	141300	5,05E-08	1200	1200				5294	5499	5293	14,7					
KSH01A	550	555	1	1	20040122	160400	2,00E-07	1200	900				5338	5539	5339	14,8					
KSH01A	555	560	1	1	20040122	180800	1,21E-05	1200	1800				5386	5586	5397	14,9					
KSH01A	560	565	1	1	20040123	090400	2,44E-06	1200	600				5437	5635	5438	14,9					
KSH01A	565	570	1	1	20040123	-	-	-	-				-	-	-	15,0					
KSH01A	570	575	1	1	20040123	130700	1,42E-09	1200	1200				5554	5756	5712	15,1					
KSH01A	575	580	1	1	20040123	150700	1,61E-08	1200	2400				5598	5799	5604	15,1					
KSH01A	580	585	1	1	20040123	172400	1,37E-08	1200	1200				5642	5846	5642	15,2					
KSH01A	585	590	1	1	20040124	090900	7,38E-08	1200	600				5676	5876	5675	15,3					
KSH01A	590	595	1	1	20010124	113000	2,39E-05	1800	3600				5729	5929	5768	15,4					
KSH01A	595	600	1	1	20040124	142500	3,70E-08	1200	1200				5777	5990	5776	15,4					
KSH01A	600	605	1	1	20040124	162000	3,98E-07	1200	1200				5822	6005	5823	15,5					
KSH01A	600	605	1	1	20040128	112600	4,86E-07	1200	1200				5811	6009	5813	15,5					
KSH01A	605	610	1	1	20040124	-	-	-	-				-	-	-	15,6					
KSH01A	610	615	1	1	20040125	094900	6,50E-07	1200	2400				5922	6120	5973	15,6					
KSH01A	615	620	1	1	20040125	115700	3,77E-07	1200	1200				5964	6164	5964	15,7					
KSH01A	620	625	1	1	20040125	143700	3,45E-08	1200	1200				6019	6231	6047	15,8					
KSH01A	625	630	1	1	20040125	163600	2,96E-08	1200	2100				6084	6279	6152	15,8					
KSH01A	630	635	1	1	20040125	-	-	-	-				-	-	-	15,9					
KSH01A	635	640	1	1	20040126	-	-	-	-				-	-	-	16,0					
KSH01A	640	645	1	1	20040126	-	-	-	-				-	-	-	16,1					
KSH01A	645	650	1	1	20040126	-	-	-	-				-	-	-	16,1					

Borehole	Borehole secup (m)	Borehole seclow (m)	Test type (1-6)	Formation type (-)	Date for test, start YYYYMMDD	Start flow/ injection hhmmss	Qp (m^3/s)	tp (s)	t_F (s)	h_i (m)	h_p (m)	h_F (m)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	EC_w (mS/m)	TDS_w (mg/ L)	TDS_{wm} (mg/ L)	Reference	Comments (-)
KSH01A	650	655	1	1	20040126	-	-	-	-				-	-	-	16,2					
KSH01A	655	660	1	1	20040126	152600	1,67E-09	1200	1200				6376	6570	6631	16,3					
KSH01A	660	665	1	1	20040126	-	-	-	-				-	-	-	16,4					
KSH01A	665	670	1	1	20040126	-	-	-	-				-	-	-	16,4					
KSH01A	670	675	1	1	20040127	091700	2,62E-09	1200	1200				6505	6710	6558	16,5					
KSH01A	675	680	1	1	20040127	112800	1,37E-08	1200	1800				6558	6758	6581	16,6					
KSH01A	680	685	1	1	20040127	145700	2,19E-07	1200	1200				6596	6812	6615	16,7					
KSH01A	685	690	1	1	20040127	-	-	-	-				-	-	-	16,7					
KSH01A	690	695	1	1	20040127	-	-	-	-				-	-	-	16,8					
KSH01A	695	700	1	1	20040128	-	-	-	-				-	-	-	16,9					

Basic Evaluation

Borehole	Borehole secup (m)	Borehole seclow (m)	Date for test, start YYYYMMDD	Q/s (m^2/s)	T_Q (m^2/s)	T_M (m^2/s)	b (m)	B (m)	TB (1D) (m^3/s)	TB-measl-L (1D) (m^3/s)	TB-measl-U (1D) (m^3/s)	SB (1D) (m)	SB* (1D) (m)	L (1D) (m)	T_T (2D) (m^2/s)	T-measl-L (2D) (m^2/s)	T-measl-U (2D) (m^2/s)	S (2D) (-)	S* (2D) (-)	K´/b´ (2D) (1/s)	K_S (3D) (m/s)	K_S-measl-L (3D) (m/s)	K_S-measl-U (3D) (m/s)	S_S (3D) (1/m)	S_S* (3D) (1/m)	C (m**3/Pa)	C_D (-)	ξ (1,2 or 3D) (-)	w (-)	l (-)	dt_1 (min)	dt_2 (min)	Comments (-)
KSH01A	103	203	20031209	1,12E-06		1,46E-06	100								5,0E-06	3,0E-06	1,0E-05		1,00E-06							1,27E-09		-0,6			6,1	26,9	
KSH01A	200	300	20031210	6,72E-06		8,75E-06	100								6,3E-06	2,0E-06	1,0E-05		1,00E-06							7,14E-09		-2,6			9,1	27,3	
KSH01A	300	400	20031210	1,42E-08		1,85E-08	100								6,6E-09	5,0E-09	2,0E-08		1,00E-06							3,44E-10		-0,6			11,8	15,6	
KSH01A	400	500	20031214	3,67E-09		4,78E-09	100								1,7E-09	3,0E-10	6,0E-09		1,00E-06							3,84E-10		0,0			2,4	22,8	
KSH01A	500	600	20031211	1,84E-06		2,40E-06	100								1,0E-06	4,0E-07	2,0E-05		1,00E-06							4,58E-08		-0,8			-	-	
KSH01A	600	700	20031212	4,85E-08		6,32E-08	100								2,0E-08	1,0E-08	6,0E-07		1,00E-06							8,95E-10		-3,3			-	-	
KSH01A	700	800	20031212	1,61E-08		2,10E-08	100								8,7E-09	2,0E-09	8,0E-08		1,00E-06							5,18E-10		0,3			-	-	
KSH01A	800	900	20031212	7,82E-10		1,02E-09	100								9,4E-10	1,0E-10	3,0E-09		1,00E-06							1,55E-10		9,1			-	-	
KSH01A	899	999	20031213	5,27E-09		6,87E-09	100								3,9E-09	1,0E-09	5,0E-08		1,00E-06							2,79E-10		0,0			4,5	23,3	
KSH01A	103	123	20031215	3,40E-07		3,56E-07	20								2,0E-07	8,0E-08	5,0E-07		1,00E-06							2,29E-10		-2,2			21,5	29,4	
KSH01A	123	143	20031215	5,05E-08		5,28E-08	20								6,6E-08	1,0E-08	3,0E-07		1,00E-06							2,20E-10		-0,1			1,8	18,0	
KSH01A	143	163	20031215	6,27E-07		6,56E-07	20								9,6E-07	4,0E-07	2,0E-06		1,00E-06							2,17E-11		2,5			0,5	17,0	
KSH01A	163	183	20031215	5,20E-08		5,44E-08	20								5,0E-08	4,0E-08	4,0E-07		1,00E-06							1,49E-10		0,0			5,1	21,2	
KSH01A	183	203	20031216	1,58E-08		1,65E-08	20								3,4E-08	8,0E-09	6,0E-08		1,00E-06							2,32E-10		-1,2			-	-	
KSH01A	200	220	20031216	3,40E-07		3,56E-07	20								5,7E-07	3,0E-07	9,0E-07		1,00E-06							1,71E-09		-2,7			-	-	
KSH01A	220	240	20031216	4,49E-08		4,69E-08	20								4,0E-08	2,0E-08	7,0E-08		1,00E-06							1,12E-10		0,0			0,9	13,6	
KSH01A	240	260	20031216	2,77E-06		2,90E-06	20								3,5E-06	1,0E-06	6,0E-06		1,00E-06							1,97E-09		0,0			1,7	17,8	
KSH01A	260	280	20031216	1,19E-06		1,24E-06	20								3,9E-06	1,0E-06	5,0E-06		1,00E-06							1,09E-09		-0,1			12,5	17,3	
KSH01A	280	300	20031217	3,06E-06		3,20E-06	20								2,9E-06	9,0E-07	6,0E-06		1,00E-06							4,24E-11		-4,8			-	-	
KSH01A	300	320	20031217	6,03E-09		6,30E-09	20								3,2E-09	1,0E-09	7,0E-09		1,00E-06							1,11E-10		-1,2			0,8	17,9	
KSH01A	320	340	20031217	3,58E-09		3,74E-09	20								9,3E-10	8,0E-10	1,0E-08		1,00E-06							1,00E-10		0,0			0,6	1,6	
KSH01A	340	360	20031217	8,82E-09		9,22E-09	20								1,0E-08	8,0E-09	7,0E-08		1,00E-06							7,26E-11		2,0			0,5	11,2	
KSH01A	360	380	20031217	1,13E-08		1,18E-08	20								8,7E-09	6,0E-09	5,0E-08		1,00E-06							7,66E-11		0,0			4,9	17,9	
KSH01A	380	400	20031218	1,02E-08		1,07E-08	20								2,6E-08	7,0E-09	4,0E-08		1,00E-06							9,04E-11		7,9			14,1	18,6	
KSH01A	400	420	20031218	6,26E-09		6,55E-09	20								5,1E-09	2,0E-09	1,0E-08		1,00E-06							6,26E-11		1,0			2,0	16,6	
KSH01A	420	440	20031218	5,88E-09		6,15E-09	20								8,5E-09	2,0E-09	1,0E-08		1,00E-06							6,08E-11		0,0			0,2	13,7	
KSH01A	440	460	20031219	8,97E-09		9,39E-09	20								6,5E-09	5,0E-09	4,0E-08		1,00E-06							7,84E-11		0,0			4,2	9,9	
KSH01A	460	480	20031219	5,47E-09		5,72E-09	20								5,6E-09	4,0E-09	4,0E-08		1,00E-06							6,25E-11		1,5			0,3	14,4	
KSH01A	480	500	20031219	9,26E-09		9,68E-09	20								1,8E-08	9,0E-09	6,0E-08		1,00E-06							4,88E-11		6,9			0,6	14,0	
KSH01A	500	520	20031219	9,79E-09		1,02E-08	20								1,5E-08	8,0E-09	5,0E-08		1,00E-06							5,48E-11		4,4			0,4	17,9	
KSH01A	520	540	20031219	9,90E-09		1,04E-08	20								2,0E-08	8,0E-09	6,0E-08		1,00E-06							5,91E-11		6,7			0,5	15,9	
KSH01A	540	560	20031219	6,54E-07		6,84E-07	20								5,8E-07	4,0E-07	8,0E-07		1,00E-06							7,29E-10		-1,7			0,7	15,0	
KSH01A	560	580	20031220	1,07E-07		1,11E-07	20								5,4E-07	9,0E-08	8,0E-07		1,00E-06							1,73E-10		0,0			1,5	12,7	
KSH01A	580	600	20031220	1,20E-06		1,25E-06	20								2,8E-07	8,0E-08	8,0E-07		1,00E-06							3,84E-08		-2,6			6,7	19,7	
KSH01A	600	620	20031220	4,05E-08		4,24E-08	20								2,3E-08	8,0E-09	5,0E-08		1,00E-06							1,36E-09		-0,4			-	-	
KSH01A	620	640	20040107	9,88E-09		1,03E-08	20								7,2E-09	5,0E-09	2,0E-08		1,00E-06							7,27E-11		-1,0			9,7	18,6	
KSH01A	640	660	20040107	8,24E-09		8,62E-09	20								1,2E-08	7,0E-09	4,0E-08		1,00E-06							4,87E-11		4,0			0,5	8,1	
KSH01A	660	680	20040107	9,93E-09		1,04E-08	20								9,7E-09	7,0E-09	3,0E-08		1,00E-06							6,10E-11		1,1			0,2	14,0	
KSH01A	680	700	20040108	1,13E-08		1,18E-08	20								8,2E-09	5,0E-09	2,0E-08		1,00E-06							3,41E-10		-0,4			-	-	
KSH01A	700	720	20040108	1,30E-08		1,36E-08	20								1,5E-08	9,0E-09	3,0E-08		1,00E-06							8,51E-11		-1,8			25,4	34,7	
KSH01A	720	740	20040108	1,34E-08		1,40E-08	20								1,0E-08	5,0E-09	5,0E-08		1,00E-06							1,23E-10		-3,0			-	-	
KSH01A	740	760	20040108	9,92E-09		1,04E-08	20								8,3E-09	6,0E-09	3,0E-08		1,00E-06							4,57E-11		0,6			2,8	15,1	
KSH01A	760	780	20040108	9,59E-09		1,00E-08	20								1,2E-08	8,0E-09	5,0E-08		1,00E-06							5,43E-11		2,3			0,4	8,7	
KSH01A	780	800	20040109	3,81E-09		3,98E-09	20								1,1E-08	3,0E-09	3,0E-08		1,00E-06							7,68E-11		4,4			0,5	3,6	
KSH01A	800	820	20040109	9,38E-09		9,81E-09	20								2,5E-08	9,0E-09	5,0E-08		1,00E-06							5,00E-11		7,0			0,3	3,8	
KSH01A	820	840	20040109	1,05E-08		1,10E-08	20								1,7E-08	8,0E-09	5,0E-08		1,00E-06							4,34E-11		4,7			0,6	2,8	
KSH01A	840	860	20040109	3,00E-09		3,14E-09	20								1,1E-08	8,0E-09	4,0E-08		1,00E-06							9,31E-11		2,3			0,3	4,6	
KSH01A	860	880	20040109	5,54E-09		5,80E-09	20								1,6E-08	8,0E-09	4,0E-08		1,00E-06							7,04E-11		3,8			0,3	2,3	
KSH01A	880	900	20040110	9,61E-09		1,01E-08	20								3,1E-08	9,0E-09	6,0E-08		1,00E-06							5,65E-11		6,6			0,4	3,2	
KSH01A	899	919	20040110	6,08E-09		6,36E-09	20								1,4E-08	8,0E-09	4,0E-08		1,00E-06							7,35E-11		2,8			0,2	4,5	

Borehole	Borehole secup (m)	Borehole seclow (m)	Date for test, start YYYYMMDD	Q/s (m^2/ s)	T_Q (m^2/ s)	T_M (m^2/ s)	b (m)	B (m)	TB (1D) (m^3/ s)	TB-measl-L (1D) (m^3/ s)	TB-measl-U (1D) (m^3/ s)	SB (1D) (m)	SB* (1D) (m)	L (1D) (m)	T_T (2D) (m^2/ s)	T-measl-L (2D) (m^2/ s)	T-measl-U (2D) (m^2/ s)	S (2D) (-)	S* (2D) (-)	K´/b´ (2D) (1/s)	K_S (3D) (m/s)	K_S-measl-L (3D) (m/s)	K_S-measl-U (3D) (m/s)	S_S (3D) (1/m)	S_S* (3D) (1/m)	C (m**3/Pa)	C_D (-)	ξ (1,2 or 3D) (-)	w (-)	l (-)	dt_1 (min)	dt_2 (min)	Comments (-)
KSH01A	919	939	20040110	6,44E-09		6,74E-09	20								1,8E-08	8,0E-09	4,0E-08		1,00E-06							6,47E-11		4,2			0,3	5,3	
KSH01A	939	959	20040110	1,15E-08		1,20E-08	20								2,2E-08	9,0E-09	4,0E-08		1,00E-06							5,09E-11		4,5			0,4	5,0	
KSH01A	959	979	20040110	1,42E-08		1,48E-08	20								2,5E-08	9,0E-09	5,0E-08		1,00E-06							4,39E-11		6,0			0,4	10,2	
KSH01A	979	999	20040111	7,74E-09		8,09E-09	20								7,6E-09	4,0E-09	4,0E-08		1,00E-06							5,72E-11		-0,4			1,7	3,4	
KSH01A	300	305	20040112	8,50E-09		7,01E-09	5								8,0E-09	5,0E-09	2,0E-08		1,00E-06							1,87E-11		1,0			0,8	15,1	
KSH01A	305	310	20040112	8,27E-09		6,83E-09	5								1,0E-08	7,0E-09	4,0E-08		1,00E-06							2,46E-11		2,6			1,1	12,4	
KSH01A	310	315	20040113	1,02E-08		8,41E-09	5								2,2E-08	8,0E-09	4,0E-08		1,00E-06							3,00E-11		7,0			7,3	17,2	
KSH01A	315	320	20040113	1,66E-09		1,37E-09	5								8,2E-09	2,0E-09	2,0E-08		1,00E-06							4,07E-11		3,2			0,3	3,7	
KSH01A	320	325	20040113	8,19E-09		6,76E-09	5								1,2E-08	7,0E-09	6,0E-08		1,00E-06							1,76E-11		4,4			0,2	13,3	
KSH01A	325	330	20040113	2,45E-09		2,02E-09	5								1,9E-09	9,0E-10	7,0E-08		1,00E-06							2,23E-11		0,1			0,5	5,1	
KSH01A	330	335	20040113	2,34E-09		1,93E-09	5								7,6E-10	7,0E-10	4,0E-09		1,00E-06							2,96E-11		0,0			-	-	
KSH01A	335	340	20040114	2,20E-09		1,82E-09	5								2,5E-09	9,0E-10	5,0E-09		1,00E-06							3,03E-11		0,0			0,1	2,2	
KSH01A	340	345	20040114	1,29E-09		1,07E-09	5								9,5E-10	6,0E-10	3,0E-09		1,00E-06							2,44E-11		0,0			0,3	4,1	
KSH01A	345	350	20040114	9,02E-10		7,45E-10	5								2,6E-09	8,0E-10	5,0E-09		1,00E-06							3,98E-11		7,4			-	-	
KSH01A	350	355	20040114	1,11E-09		9,19E-10	5								1,2E-09	7,0E-10	7,0E-09		1,00E-06							3,32E-11		0,0			0,3	4,1	
KSH01A	355	360	20040114	5,00E-10		4,12E-10	5								5,9E-10	3,0E-10	1,0E-09		1,00E-06							3,16E-11		0,5			-	-	
KSH01A	360	365	20040115	3,68E-10		3,03E-10	5								1,0E-10	8,0E-11	7,0E-10		1,00E-06							2,39E-11		0,6			-	-	
KSH01A	365	370	20040115	3,83E-10		3,16E-10	5								2,7E-10	8,0E-11	8,0E-10		1,00E-06							2,86E-11		0,0			-	-	
KSH01A	370	375	20040115	3,02E-10		2,50E-10	5								9,4E-11	7,0E-11	4,0E-10		1,00E-06							2,21E-11		1,2			-	-	
KSH01A	375	380	20040115	3,32E-09		2,74E-09	5								4,6E-09	2,0E-09	8,0E-09		1,00E-06							2,35E-11		2,9			12,4	18,0	
KSH01A	380	385	20040115	2,68E-09		2,21E-09	5								2,6E-09	9,0E-10	4,0E-09		1,00E-06							2,11E-11		-1,1			28,6	51,8	
KSH01A	385	390	20040116	9,71E-10		8,02E-10	5								1,0E-09	5,0E-10	3,0E-09		1,00E-06							3,46E-11		1,6			-	-	
KSH01A	390	395	20040116	5,62E-10		4,64E-10	5								9,7E-10	3,0E-10	3,0E-09		1,00E-06							1,67E-11		-0,3			-	-	
KSH01A	395	400	20040116	3,62E-10		2,99E-10	5								4,2E-09	8,0E-10	5,0E-09		1,00E-06							5,62E-11		-0,4			-	-	
KSH01A	400	405	20040116	3,08E-10		2,54E-10	5								9,0E-10	1,0E-10	1,0E-09		1,00E-06							2,74E-11		11,2			-	-	
KSH01A	405	410	20040116	1,28E-10		1,06E-10	5								9,7E-11	7,0E-11	5,0E-10		1,00E-06							4,11E-11		-1,3			-	-	
KSH01A	410	415	20040117	5,02E-10		4,15E-10	5								1,3E-10	5,0E-11	5,0E-10		1,00E-06							#NV		-1,5			-	-	
KSH01A	415	420	20040117	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	420	425	20040117	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	425	430	20040117	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	430	435	20040117	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	435	440	20040117	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	440	445	20040117	2,94E-10		2,42E-10	5								1,2E-10	5,0E-11	5,0E-10		1,00E-06							1,57E-11		-0,3			-	-	
KSH01A	445	450	20040118	4,66E-10		3,85E-10	5								7,2E-10	1,0E-10	9,0E-10		1,00E-06							2,38E-11		3,5			-	-	
KSH01A	450	455	20040118	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	455	460	20040118	6,02E-10		4,97E-10	5								1,6E-10	1,0E-10	8,0E-10		1,00E-06							2,36E-11		-0,3			-	-	
KSH01A	460	465	20040118	5,65E-10		4,66E-10	5								8,1E-10	3,0E-10	1,0E-09		1,00E-06							2,38E-11		3,8			-	-	
KSH01A	465	470	20040119	1,28E-10		1,06E-10	5								1,6E-10	6,0E-11	3,0E-10		1,00E-06							2,59E-11		1,7			-	-	
KSH01A	470	475	20040119	1,59E-10		1,31E-10	5								1,0E-10	1,0E-12	1,0E-10		1,00E-06							#NV		#NV			-	-	
KSH01A	475	480	20040119	1,23E-10		1,01E-10	5								1,4E-10	6,0E-11	3,0E-10		1,00E-06							2,79E-11		-1,8			-	-	
KSH01A	480	485	20040119	1,18E-10		9,78E-11	5								1,3E-10	7,0E-11	3,0E-10		1,00E-06							1,75E-11		1,7			-	-	
KSH01A	485	490	20040120	1,20E-10		9,90E-11	5								1,0E-10	1,0E-12	1,0E-10		1,00E-06							#NV		#NV			-	-	
KSH01A	490	495	20040120	7,39E-11		6,10E-11	5								1,0E-10	1,0E-12	1,0E-10		1,00E-06							#NV		#NV			-	-	
KSH01A	495	500	20040120	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	500	505	20040120	6,02E-10		4,97E-10	5								1,2E-10	7,0E-11	6,0E-10		1,00E-06							1,51E-11		0,7			-	-	
KSH01A	505	510	20040120	1,25E-10		1,03E-10	5								1,9E-11	1,0E-12	1,0E-10		1,00E-06							2,82E-11		2,2			-	-	
KSH01A	510	515	20040121	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	515	520	20040121	6,68E-11		5,52E-11	5								1,0E-10	1,0E-12	1,0E-10		1,00E-06							#NV		#NV			-	-	
KSH01A	520	525	20040121	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	525	530	20040121	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	530	535	20040121	1,21E-10		9,99E-11	5								1,3E-11	1,0E-12	1,0E-10		1,00E-06							9,24E-12		-0,4			-	-	
KSH01A	535	540	20040122	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	540	545	20040122	8,48E-08		7,00E-08	5								7,4E-08	5,0E-08	9,0E-08		1,00E-06							4,01E-11		-0,9			3,7	25,4	

Borehole	Borehole secup (m)	Borehole seclow (m)	Date for test, start YYYYMMDD	Q/s (m^2/ s)	T_Q (m^2/ s)	T_M (m^2/ s)	b (m)	B (m)	TB (1D) (m^3/ s)	TB-measl-L (1D) (m^3/ s)	TB-measl-U (1D) (m^3/ s)	SB (1D) (m)	SB* (1D) (m)	L (1D) (m)	T_T (2D) (m^2/ s)	T-measl-L (2D) (m^2/ s)	T-measl-U (2D) (m^2/ s)	S (2D) (-)	S* (2D) (-)	K′/b′ (2D) (1/s)	K_S (3D) (m/s)	K_S-measl-L (3D) (m/s)	K_S-measl-U (3D) (m/s)	S_S (3D) (1/m)	S_S* (3D) (1/m)	C (m**3/Pa)	C_D (-)	ξ (1,2 or 3D) (-)	w (-)	l (-)	dt_1 (min)	dt_2 (min)	Comments (-)
KSH01A	545	550	20040122	2,42E-09		1,99E-09	5								1,4E-09	1,0E-09	1,0E-08		1,00E-06							2,66E-11		-0,1			0,8	10,1	
KSH01A	550	555	20040122	9,77E-09		8,06E-09	5								2,3E-08	7,0E-09	5,0E-08		1,00E-06							3,50E-11		0,0			-	-	
KSH01A	555	560	20040122	5,93E-07		4,89E-07	5								6,2E-07	5,0E-07	8,0E-07		1,00E-06							7,93E-10		-1,1			1,6	27,4	
KSH01A	560	565	20040123	1,21E-07		9,95E-08	5								1,2E-07	7,0E-08	4,0E-07		1,00E-06							9,56E-11		0,4			8,6	18,7	
KSH01A	565	570	20040123	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	570	575	20040123	6,88E-11		5,68E-11	5								1,9E-11	8,0E-12	8,0E-11		1,00E-06							2,06E-11		0,8			-	-	
KSH01A	575	580	20040123	7,87E-10		6,50E-10	5								3,8E-10	1,0E-10	8,0E-10		1,00E-06							2,29E-11		0,0			-	-	
KSH01A	580	585	20040123	6,58E-10		5,43E-10	5								1,4E-09	3,0E-10	3,0E-09		1,00E-06							1,94E-11		8,1			-	-	
KSH01A	585	590	20040124	3,62E-09		2,99E-09	5								2,2E-09	1,0E-09	1,0E-08		1,00E-06							2,10E-11		0,0			3,0	9,7	
KSH01A	590	595	20010124	1,17E-06		9,68E-07	5								7,2E-07	1,0E-07	1,0E-06		1,00E-06							4,05E-08		0,0			-	-	
KSH01A	595	600	20040124	1,70E-09		1,41E-09	5								1,0E-09	5,0E-10	5,0E-09		1,00E-06							3,65E-11		0,0			0,4	10,7	
KSH01A	600	605	20040124	2,13E-08		1,76E-08	5								2,8E-08	9,0E-09	5,0E-08		1,00E-06							1,09E-10		3,1			3,7	13,3	
KSH01A	600	605	20040128	2,41E-08		1,99E-08	5								6,5E-08	3,0E-08	9,0E-08		1,00E-06							1,01E-10		0,0			-	-	
KSH01A	605	610	20040124	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	610	615	20040125	3,22E-08		2,66E-08	5								5,2E-09	3,0E-09	1,0E-08		1,00E-06							3,75E-10		-4,2			11,4	19,1	
KSH01A	615	620	20040125	1,85E-08		1,53E-08	5								2,6E-08	9,0E-09	6,0E-08		1,00E-06							1,19E-11		3,8			0,8	8,6	
KSH01A	620	625	20040125	1,60E-09		1,32E-09	5								1,1E-09	8,0E-10	5,0E-09		1,00E-06							1,94E-11		1,9			6,4	17,7	
KSH01A	625	630	20040125	1,49E-09		1,23E-09	5								2,7E-10	2,0E-10	2,0E-09		1,00E-06							2,96E-11		-2,1			-	-	
KSH01A	630	635	20040125	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	635	640	20040126	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	640	645	20040126	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	645	650	20040126	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	650	655	20040126	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	655	660	20040126	8,34E-11		6,96E-11	5								1,0E-10	1,0E-12	1,0E-10		1,00E-06							#NV		#NV			-	-	
KSH01A	660	665	20040126	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	665	670	20040126	5,51E-11		4,55E-11	5								1,8E-11	1,0E-13	5,0E-11		1,00E-06							2,35E-12		1,8			-	-	
KSH01A	670	675	20040127	1,25E-10		1,03E-10	5								7,6E-11	1,0E-12	1,0E-10		1,00E-06							1,31E-11		-0,2			-	-	
KSH01A	675	680	20040127	6,71E-10		5,54E-10	5								1,3E-09	3,0E-10	3,0E-09		1,00E-06							2,20E-11		5,3			-	-	
KSH01A	680	685	20040127	9,97E-09		8,23E-09	5								6,1E-09	4,0E-09	9,0E-09		1,00E-06							8,60E-11		-1,0			2,3	13,6	
KSH01A	685	690	20040127	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	690	695	20040127	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	
KSH01A	695	700	20040128	#NV		#NV	5								1,0E-11	1,0E-13	1,0E-11		1,00E-06							#NV		#NV			-	-	