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Oskarshamn site investigation

Pumping tests and hydraulic injection tests in borehole KLX19A, 2007

Subarea Laxemar

Cristian Enachescu, Jörg Böhner, Philipp Wolf Golder Associates GmbH

October 2007

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

This report concerns a study which was conducted for SKB. The conclusions and viewpoints presented in the report are those of the authors and do not necessarily coincide with those of the client.

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Abstract

Hydraulic injection tests have been performed in Borehole KLX19A at the Laxemar area, Oskarshamn. The tests are part of the general program for site investigations and specifically for the Laxemar 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 pumping tests for water sampling and of the hydraulic injection tests in borehole KLX19A performed between 27th of November 2006 and 2nd of February 2007.

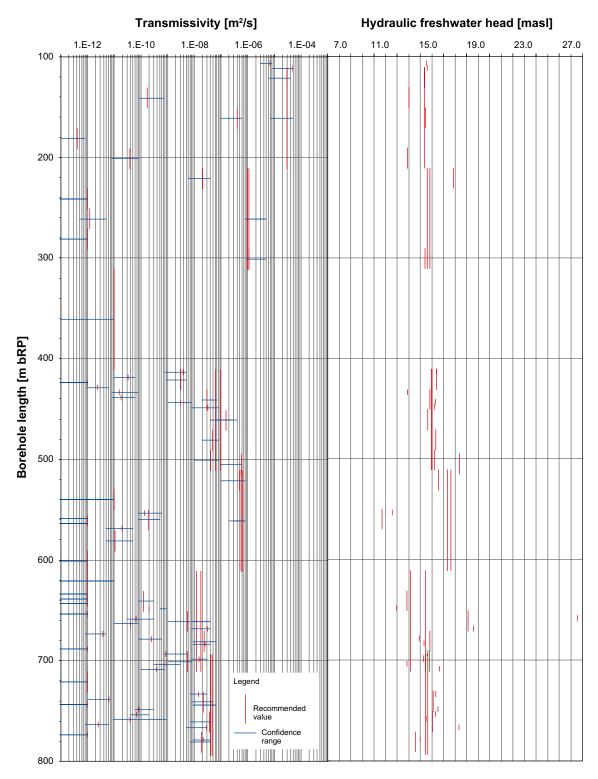
The objective of the hydrotests was to describe the rock around the borehole with respect of hydraulic parameters, mainly transmissivity (T) and hydraulic conductivity (K) at different measurement scales of 100 m, 20 m and 5 m sections. Transient evaluation during flow and recovery period provided additional information such as flow regimes, hydraulic boundaries and cross-over flows. Constant pressure injection tests were conducted between 104.00–794.00 m below ToC. The results of the test interpretation are presented as transmissivity, hydraulic conductivity and hydraulic freshwater head. The main objective of the pumping tests was to take water samples at certain depths for chemical analyses. However, the pumping test data were analysed to get hydraulic properties, as well.

Sammanfattning

Injektionstester har utförts i borrhål KLX19A i delområde Laxemar, Oskarshamn. Testerna är en del av SKB:s platsundersökningar. Hydraultestprogrammet där injektionstesterna 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 de hydrauliska injektionstesterna i borrhål KLX19A. Testerna utfördes mellan den 27 November 2006 till den 2 Februari 2007.

Syftet med hydraultesterna var framförallt att beskriva bergets hydrauliska egenskaper runt borrhålet med avseende på hydrauliska parametrar, i huvudsak transmissvitet (T) och hydraulisk konduktivitet (K) vid olika mätskalor av 100 m, 20 m och 5 m sektioner. Transient utvärdering under injektions- och återhämntningsfasen gav ytterligare information avseende flödesgeometri, hydrauliska gränser och sprickläckage. Injektionstester utfördes mellan 104,00–794,00 m borrhålslängd. Resultaten av testutvärderingen presenteras som transmissivitet, hydraulisk konduktivitet och grundvattennivå uttryckt i ekvivalent sötvattenpelare (fresh-water head).



Borehole KLX19A - Summary of results.

Contents

1	Introd	uction	9
2 2.1 2.2 2.3	Boreho Injectio	tive and scope ble on tests and water sampling l of equipment	11 11 13 15
3 3.1 3.2 3.3	Sensor	ption of equipment	17 17 21 22
4	Execu	tion	23
4.1	Prepar		23
4.2		correction	23
4.3		ion of field work	23
	4.3.1	Test principle	23 24
4.4		Test procedure andling/post processing	24 26
4.5		ses and interpretations	20 26
т.Ј	4.5.1	Analysis software	20 26
		Analysis approach	26
		Analysis methodology	26
		Correlation between storativity and skin factor	28
	4.5.5	Determination of the ri-index and calculation of the radius	29
	156	of influence (ri) Steady state analysis	29 30
		Flow models used for analysis	30
	4.5.8		30
	ч.5.0	freshwater head	30
	4.5.9	Derivation of the recommended transmissivity and the	50
	1.0.9	confidence range	31
4.6	Nonco	nformities	32
5	Result		33
5.1	5.1.1	single-hole injection tests Section 111.00–211.00 m, test no. 1, injection	33 33
	5.1.1	Section $111.00-211.00$ m, test no. 1, injection Section $211.00-311.00$ m, test no. 1 and 2, injection	33
	5.1.2	Section 211.00–311.00 m, test no. 3, injection	35
	5.1.4	Section 311.00–411.00 m, test no. 1, injection	35
	5.1.5	Section 411.00–511.00 m, test no. 1, injection	36
	5.1.6	Section 411.00–511.00 m, test no. 2, injection	36
	5.1.7	Section 511.00–611.00 m, test no. 1, injection	37
	5.1.8	Section 511.00–611.00 m, test no. 2, injection	38
	5.1.9	Section 611.00–711.00 m, test no. 1, injection	38
	5.1.10	Section 611.00–711.00 m, test no. 2, injection	39
	5.1.11	Section 694.00–794.00 m, test no. 1, injection	40
	5.1.12	Section 694.00–794.00 m, test no. 2, injection	40
5.2		ingle-hole injection tests	41
	5.2.1	Section 111.00–131.00 m, test no. 1, injection	41
	5.2.2	Section 131.00–151.00 m, test no. 1, injection	42
	5.2.3	Section 151.00–171.00 m, test no. 1, injection	42
	5.2.4	Section 171.00–191.00 m, test no. 1, injection	43

	5.2.5	Section 191.00–211.00 m, test no. 1, injection	44
	5.2.6	Section 211.00–231.00 m, test no. 1, injection	44
	5.2.7	Section 231.00–251.00 m, test no. 1, injection	45
	5.2.8	Section 251.00–271.00 m, test no. 1, injection	45
	5.2.9	Section 271.00–291.00 m, test no. 1, injection	46
			46
		Section 291.00–311.00 m, test no. 1, injection	
		Section 411.00–431.00 m, test no. 1, injection	47
	5.2.12	Section 431.00–451.00 m, test no. 1, injection	48
	5.2.13	Section 451.00–471.00 m, test no. 1, injection	48
	5.2.14	Section 471.00–491.00 m, test no. 1, injection	49
		Section 491.00–511.00 m, test no. 1, injection	50
		Section 511.00–531.00 m, test no. 1, injection	50
			50
		Section 530.00–550.00 m, test no. 1, injection	
		Section 550.00–570.00 m, test no. 1, injection	51
		Section 571.00–591.00 m, test no. 1, injection	52
	5.2.20	Section 591.00–611.00 m, test no. 1, injection	53
	5.2.21	Section 611.00–631.00 m, test no. 1, injection	53
	5.2.22	Section 631.00–651.00 m, test no. 1, injection	53
		Section 651.00–671.00 m, test no. 2, injection	54
		Section 671.00–691.00 m, test no. 1, injection	55
		Section 691.00–711.00 m, test no. 1, injection	55
		Section 711.00–731.00 m, test no. 1, injection	56
	5.2.27	Section 731.00–751.00 m, test no. 1, injection	57
	5.2.28	Section 751.00–771.00 m, test no. 1, injection	57
	5.2.29	Section 771.00–791.00 m, test no. 1, injection	58
5.3		ngle-hole injection tests	59
0.0	5.3.1	Section 104.00–109.00 m, test no. 1, injection	59
	5.3.2	Section 109.00–114.00 m, test no. 1, injection	59
	5.3.3	Section 411.00–416.00 m, test no. 1, injection	60
	5.3.4	Section 416.00–421.00 m, test no. 1, pulse injection	61
	5.3.5	Section 421.00–426.00 m, test no. 1, injection	61
	5.3.6	Section 426.00–431.00 m, test no. 1, pulse injection	62
	5.3.7	Section 431.00–436.00 m, test no. 1, injection	62
	5.3.8	Section 436.00–441.00 m, test no. 1, pulse injection	63
	5.3.9	Section 441.00–446.00 m, test no. 1, injection	64
		Section 446.00–451.00 m, test no. 1, injection	64
		Section 551.00–556.00 m, test no. 1, injection	65
		Section 556.00–561.00 m, test no. 1, injection	66
		Section 561.00–566.00 m, test no. 1, injection	66
	5.3.14	Section 566.00–571.00 m, test no. 1, pulse injection	66
	5.3.15	Section 631.00–636.00 m, test no. 1, injection	67
		Section 636.00–641.00 m, test no. 1, injection	67
		Section 641.00–646.00 m, test no. 1, injection	68
		Section 646.00–651.00 m, test no. 1, injection	68
			69
		Section 651.00–656.00 m, test no. 1, injection	
		Section 656.00–661.00 m, test no. 1, injection	69
		Section 661.00–666.00 m, test no. 1, pulse injection	70
		Section 666.00–671.00 m, test no. 1, injection	71
	5.3.23	Section 671.00–676.00 m, test no. 1, pulse injection	71
		Section 676.00–681.00 m, test no. 1, injection	72
		Section 681.00–686.00 m, test no. 1, injection	73
		Section 686.00–691.00 m, test no. 1, injection	73
		Section 691.00–696.00 m, test no. 1, injection	74
		Section 696.00–701.00 m, test no. 1, injection	74
		Section 701.00–706.00 m, test no. 1, injection	75
	5.3.30	Section 706.00–711.00 m, test no. 1, injection	76

7.1 7.2 7.3 8	Equivalent freshwater head Flow regimes encountered References	103 104 105
7.2		103 104
	Equivalent freshwater head	102
	1141151111551 v Ity	
7	Conclusions Transmissivity	103 103
7		
	6.2.2 Comparison between the matched and theoretical wellbore storage coefficient	99
	6.2.1 Comparison of steady state and transient analysis results	99
6.2	Correlation analysis	99
6.1	General test data and results	86
6	Summary of results	85
	5.4.2 Section 764.00–769.00 m, test no. 1, pumping	83
	5.4.1 Section 495.00–515.00 m, test no. 1, pumping	83
5.4	Single-hole pump tests	82
	5.3.40 Section 776.00–781.00 m, test no. 1, injection	82
	5.3.39 Section 771.00–776.00 m, test no. 1, injection	81
	5.3.38 Section 766.00–771.00 m, test no. 1, injection	81
	5.3.36 Section 756.00–761.00 m, test no. 1, injection 5.3.37 Section 761.00–766.00 m, test no. 1, pulse injection	79 80
	5.3.35 Section 751.00–756.00 m, test no. 1, injection	79 70
	5.3.34 Section 746.00–751.00 m, test no. 1, injection	78
	5.3.33 Section 741.00–746.00 m, test no. 1, injection	77
	5.3.32 Section 736.00–741.00 m, test no. 1, pulse injection	77
	5.3.31 Section 731.00–736.00 m, test no. 1, injection	76

Appendix 1 File description table

- Appendix 2 Test analyses diagrams
- Appendix 3 Test summary sheets
- Appendix 4 Nomenclature
- Appendix 5 SICADA data tables

1 Introduction

A general program for site investigations presenting survey methods has been prepared /SKB 2001/, as well as a site-specific program for the investigations in the Simpevarp area /SKB 2006/. 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/. Water sampling and hydraulic pump tests have been performed in KLX19A in two different sections. The selection of sampling sections and section length (20 m and 5 m) is based on preliminary results from the Difference flow logging and was made by SKB. The duration of pumping depended on the time for reaching acceptable uranine concentrations. Uranine is a conservative tracer used to tag the flush water utilised during drilling. 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/. These injection tests have been carried out after water sampling was finished.

Pumping tests and water sampling were carried out in borehole KLX19A during 27th November 2006 to 9th January 2007. Hydraulic injection tests were carried out between 9th of January and 2nd of February 2007 following the methodology described in SKB MD 323.001e and in the Activity Plan AP PS 400-06-144 (SKB controlling documents). Data and results were delivered to the SKB site characterization database SICADA and are traceable by the activity plan number.

The main objective of the pumping tests was to take water samples in certain depths for chemical analyses. 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. Additionally, the data of the pumping tests were analysed to characterize the rock respect to his hydraulic properties. This report describes the results and primary data evaluation of the hydraulic injection tests in borehole KLX19A. The commission was conducted by Golder Associates AB and Golder Associates GmbH.

Borehole KLX19A is situated in the Laxemar area approximately 3.0 km west of the nuclear power plant of Simpevarp, Figure 1-1. The borehole was drilled from May 2006 to September 2006 to a final depth of 800.07 m with an inner diameter of 76 mm and an inclination of -57.78°. The upper 6.30 m is cased with large diameter telescopic casing ranging from diameter 208–323 mm (OD).

The work was carried out in accordance with activity plan AP PS 400-06-144. In Table 1-1 controlling documents for performing this activity are listed. Activity plan and method descriptions are SKB's internal controlling documents. Measurements were conducted utilising SKB's custom made testing equipment PSS2.

Number	Version
AP PS 400-06-144	1.0
Number	Version
SKB MD 320.004e	1.0
SKB MD 323.001e	1.0
SKB MD 600.004	1.0
SKB MD 620.010	1.0
SKB SDPO-003	1.0
SKB SDP-301	1.0
SKB SDP-508	1.0
	AP PS 400-06-144 Number SKB MD 320.004e SKB MD 323.001e SKB MD 600.004 SKB MD 620.010 SKB SDPO-003 SKB SDP-301

Table 1-1. Controlling documents for the performance of the activity.

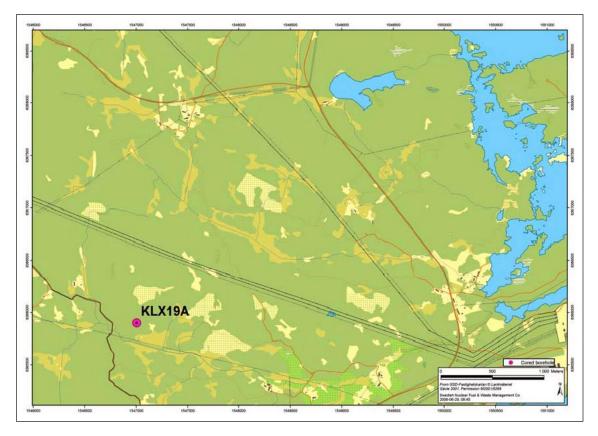


Figure 1-1. The investigation area Laxemar, Oskarshamn with location of borehole KLX19A.

2 Objective and scope

Two main tasks were carried out in borehole KLX19A. The first task was to conduct pumping tests in two different sections. The second task was to conduct constant head injection tests in different test sections with different length.

The main objective of the pumping tests in KLX19A was the sampling of water in two test sections for chemical analyses. Additionally, the pumping was conducted and analysed as constant rate pumping tests followed by a pressure recovery. The water sampling sections had a length of 20 m and 5 m and are selected based on the preliminary results of the Difference flow logging. The samples taken from section 495.00–515.00 m and 764.00–769.00 m were submitted for analysis according to SKB chemistry class 5.

The objective of the hydrotests in borehole KLX19A 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.

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, analyses 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.

From 27th November 2006 to 9th January 2007 two pumping tests with different section lengths (20 m and 5 m) were performed (Table 2-3).

The following hydraulic injection tests were performed between 09th January and 02nd February 2007.

2.1 Borehole

The borehole is telescope drilled with specifications on its construction according to Table 2-2. The reference point of the borehole is the centre of top of casing (ToC), given as elevation in the 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 2-2 refers to the final diameter of the drill bit after drilling to full depth.

No. of injection tests	Interval	Positions	Time/test	Total test time
12	100 m	111.00–794.00 m	125 min	25.0 hrs
29	20 m	111.00–791.00 m	90 min	43.5 hrs
40	5 m	104.00–781.00 m	90 min	60.0 hrs
Total:				128.5 hrs

Table 2-1. Performed injection tests at borehole KLX19A.

* Excluding repeated tests.

Title	Value							
Old idcode name(s):	KLX19A							
Comment:	No comment exists							
Borehole length (m):	800.07							
Reference level:	TOC							
Drilling period(s):	From date	To date	Secup (m)	Seclow (m)	Drilling type			
	2006-05-10	2006-05-22	0.20	99.33	Percussion drilling			
	2006-06-03	2006-09-20	99.33	800.07	Core drilling			
Starting point coordinate:	Length (m)	Northing (m)	Easting (m)	Elevation (m.a.s.l.)	Coord system			
(centerpoint of TOC)	0.00	6365901.42	1547004.62	16.87	RT90-RHB70			
	3.00	6365899.89	1547004.15	14.33	RT90-RHB70			
Angles:	Length (m)	Bearing	Inclination (-	= down)				
	0.000	197.13	-57.78		RT90-RHB70			
Borehole diameter:	Secup (m)	Seclow (m)	Hole diam (m)				
	0.20	6.30	0.339					
	6.30	70.00	0.254					
	70.00	99.33	0.253					
	99.33	100.73	0.086					
	100.23	800.07	0.076					
	520.30	522.50	0.084					
Core diameter:	Secup (m)	Seclow (m)	Core diam (m)				
	99.33	100.23	0.072					
	100.23	800.07	0.050					
Casing diameter:	Secup (m)	Seclow (m)	Case in (m)	Case out (m)				
-	0.00	92.75	0.200	0.208				
	0.20	6.20	0.310	0.323				
	6.20	6.30	0.280	0.323				
	92.75	98.70	0.200	0.210				
	98.70	98.75	0.170	0.210				
	520.40	522.40	0.076	0.082				
Cone dimensions:	Secup (m)	Seclow (m)	Cone in (m)	Cone out (m)				
	96.03	99.03	0.100	0.104				
	99.03	100.73	0.080	0.084				
Grove milling:	Length (m)	Trace detecta						
g.	110.000	YES						
	150.000	YES						
	200.000	YES						
	250.000	YES						
	303.000	YES						
	350.000	YES						
	403.000	YES						
	447.000	YES						
	507.000	YES						
	547.000	YES						
	547.000 597.000	YES						
	647.000	YES						
	647.000 697.000	YES						
	748.000	YES						
	778.000	YES						

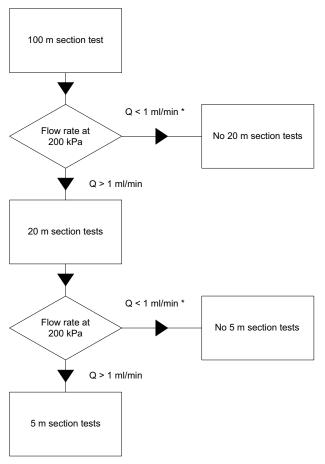
Table 2-2. Information about KLX19A (from SICADA 2006-11-23).

2.2 Injection tests and water sampling

Pumping tests and water sampling were conducted according to the Activity Plan AP PS 400-06-144. The intention was to conduct constant rate tests. The main goal of the pumping tests was to reach an acceptable uranine concentration as fast as possible to take water samples from the borehole. An acceptable uranine concentration is 5% of the concentration from the water used during the drilling campaign. After start of pumping the water sampling and measuring of uranine content was performed by SKB. The decision, when to abort pumping and take the final water chemistry sample, was made by SKB.

Injection tests were conducted according to the Activity Plan AP PS 400-06-144 and the method description for hydraulic injection tests, SKB MD 323.001e (SKB internal documents). Tests were done in 100 m test sections between 111.00–794.00 m below ToC, in 20 m test sections between 111.00–791.00 m below ToC and in 5 m test sections between 104.00–781.00 m below ToC (see Table 2-3). 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 in the previous measured 100 m tests covering the smaller test sections (see Figure 2-1). The measurements were performed with SKB's custom made equipment for hydraulic testing called PSS2.

No other additional measurements except the actual hydraulic tests and related measurements of packer position and water level in annulus of borehole KLX19A were conducted.



* eventually tests performed after specific discussion with SKB

Figure 2-1. Flow chart for test sections.

Table	2-3.	Tests	performed.	
-------	------	-------	------------	--

Bh ID	Test section (m bToC)	Test type ¹	Test no	Test start (date, time)	Test stop (date, time)
KLX19A	111.00-211.00	3	1	070111 08:17	070111 10:39
KLX19A	211.00-311.00	3	1	070111 12:03	070111 12:47
KLX19A	211.00-311.00	3	2	070112 09:13	070112 14:01
KLX19A	211.00-311.00	3	3	070112 14:06	070112 15:20
KLX19A	311.00-411.00	3	1	070112 16:54	070112 18:28
KLX19A	411.00-511.00	3	1	070113 09:30	070113 11:44
KLX19A	411.00-511.00	3	2	070113 11:46	070113 12:57
KLX19A	511.00-611.00	3	1	070113 14:17	070113 16:33
KLX19A	511.00-611.00	3	2	070113 16:35	070113 17:43
KLX19A	611.00-711.00	3	1	070114 08:48	070114 11:01
KLX19A	611.00-711.00	3	2	070114 11:03	070114 12:42
KLX19A	694.00-794.00	3	1	070115 15:33	070115 17:24
KLX19A	694.00-794.00	3	2	070115 17:27	070115 21:48
KLX19A	111.00-131.00	3	1	070117 11:33	070117 13:30
KLX19A	131.00-151.00	3	1	070117 14:04	070117 15:56
KLX19A	151.00-171.00	3	1	070117 16:30	070117 17:52
KLX19A	171.00–191.00	4B	1	070117 18:23	070118 00:17
KLX19A	191.00-211.00	3	1	070118 08:17	070118 10:20
KLX19A	211.00-231.00	3	1	070118 10:53	070118 12:18
KLX19A	231.00-251.00	3	1	070118 13:06	070118 14:00
KLX19A	251.00-271.00	4B	1	070118 14:30	070118 15:53
KLX19A	271.00-291.00	3	1	070118 16:24	070118 17:13
KLX19A	291.00-311.00	3	1	070118 17:44	070118 19:04
KLX19A	411.00-431.00	3	1	070119 09:23	070119 10:47
KLX19A	431.00-451.00	3	1	070119 11:20	070119 12:40
KLX19A	451.00-471.00	3	1	070119 13:38	070119 14:58
KLX19A	471.00-491.00	3	1	070119 15:30	070119 16:52
KLX19A	491.00-511.00	3	1	070119 17:26	070119 18:46
KLX19A	511.00-531.00	3	1	070120 08:21	070120 09:42
KLX19A	530.00-550.00	3	1	070120 10:18	070120 11:14
KLX19A	550.00-570.00	3	1	070120 11:45	070120 13:02
KLX19A	571.00-591.00	4B	1	070120 13:39	070120 15:40
KLX19A	591.00-611.00	3	1	070120 16:19	070120 17:09
KLX19A	611.00-631.00	3	1	070120 17:41	070120 18:38
KLX19A	631.00-651.00	3	1	070121 08:29	070121 10:11
KLX19A	651.00-671.00	3	1	070121 13:18	070121 14:22
KLX19A	671.00-691.00	3	1	070121 14:52	070121 16:23
KLX19A	691.00-711.00	3	1	070121 14:52	070121 19:26
KLX19A	711.00-731.00	3	1	070122 08:46	070122 09:58
KLX19A	731.00-751.00	3	1	070122 00:40	070122 09:38
KLX19A	751.00-771.00	3	1	070122 10:30	070122 15:00
KLX19A KLX19A	771.00–791.00	3	1	070122 15:43	070122 13:00
KLX19A	104.00-109.00	3	1	070124 09:08	070124 10:32
KLX19A	109.00-114.00	3	1	070124 10:57	070124 13:05
KLX19A	411.00-416.00	3 4 P	1	070124 17:05	070124 18:29
KLX19A	416.00-421.00	4B 2	1	070125 08:23	070125 09:40
KLX19A	421.00-426.00	3 4 P	1	070125 10:04	070125 10:52
KLX19A	426.00-431.00	4B	1	070125 11:16	070125 12:55
KLX19A	431.00-436.00	3	1	070125 13:20	070125 14:43
KLX19A	436.00-441.00	4B	1	070125 15:07	070125 16:20

Bh ID	Test section (m bToC)	Test type ¹	Test no	Test start (date, time)	Test stop (date, time)
KLX19A	441.00-446.00	3	1	070125 16:48	070125 18:12
KLX19A	446.00-451.00	3	1	070125 18:36	070125 19:58
KLX19A	551.00-556.00	3	1	070126 09:34	070126 11:08
KLX19A	556.00-561.00	4B	1	070126 11:34	070126 13:12
KLX19A	561.00-566.00	3	1	070126 13:58	070126 14:36
KLX19A	566.00-571.00	4B	1	070126 14:59	070126 16:39
KLX19A	631.00-636.00	4B	1	070126 17:42	070126 19:21
KLX19A	636.00-641.00	4B	1	070127 08:26	070127 09:20
KLX19A	641.00-646.00	4B	1	070127 09:47	070127 10:37
KLX19A	646.00-651.00	3	1	070127 11:03	070127 12:37
KLX19A	651.00-656.00	3	1	070127 13:03	070127 13:58
KLX19A	656.00-661.00	3	1	070127 14:22	070127 16:11
KLX19A	661.00-666.00	4B	1	070127 17:13	070127 19:22
KLX19A	666.00-671.00	3	1	070128 08:17	070128 09:42
KLX19A	671.00-676.00	4B	1	070128 10:07	070128 11:55
KLX19A	676.00-681.00	3	1	070128 12:22	070128 13:51
KLX19A	681.00-686.00	3	1	070128 14:19	070128 15:44
KLX19A	686.00-691.00	4B	1	070128 16:10	070128 17:06
KLX19A	691.00-696.00	3	1	070128 17:33	070128 18:59
KLX19A	696.00-701.00	3	1	070129 08:23	070129 09:47
KLX19A	701.00-706.00	3	1	070129 10:16	070129 11:59
KLX19A	706.00-711.00	3	1	070129 12:42	070129 14:12
KLX19A	731.00–736.00	3	1	070129 14:49	070129 16:18
KLX19A	736.00–741.00	4B	1	070129 16:43	070129 18:22
KLX19A	741.00–746.00	3	1	070129 18:54	070129 19:33
KLX19A	746.00–751.00	3	1	070130 08:14	070130 09:54
KLX19A	751.00-756.00	3	1	070130 10:20	070130 12:02
KLX19A	756.00–761.00	3	1	070130 12:47	070130 14:29
KLX19A	761.00–766.00	4B	1	070130 14:54	070130 16:35
KLX19A	766.00–771.00	3	1	070130 17:00	070130 18:21
KLX19A	771.00–776.00	4B	1	070131 08:08	070131 09:01
KLX19A	776.00–781.00	3	1	070131 09:28	070131 11:02
KLX 19A	495.00-515.00	1B	1	061128 19:53	061205 15:52
KLX 19A	764.00–769.00	1B	1	061207 15:07	070109 12:28

1) 1B: Pumping test (submersible pump); 3: Injection test; 4B Pulse injection test.

2.3 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 checks at joints in the pipe string were 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".

3 Equipment

3.1 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 1-8.

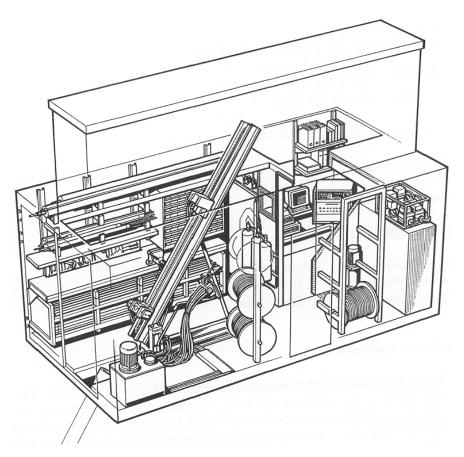


Figure 3-1. A view of the layout and equipment of PSS2.



Photo 1. Hydraulic rig.



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

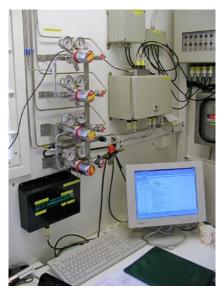


Photo 3. Computer room, displays and gas regulators.



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.





Photo 7. Top of test string with shunt valve and nylon line down to the pump basket.

Photo 8. Control board of the pump with remote control.

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
- Gauge carrier with breakpin SS 1.75 m carrying test section pressure transducer, temperature sensor and connections for sensors below. Breakpin with maximum load of 47.3 (\pm 1.0) kN. The gauge carrier is covered by split pipes and connected to a stone catcher on the top.
- 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 3kPa/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 3kPa/m at 50 L/min.
- Contact carrier SS 1.0 m carrying connections for sensors below and
- 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.
- Gauge carrier SS 1.5 m carrying top section pressure transducer, connections from sensors below. Flow pipe is double bent at both ends to give room for sensor equipment. The pipe gauge carrier is covered by split pipes.
- 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-50L/min). Working pressure 2.8–4.0 MPa. Breakpipe with maximum load of 47.3 (± 1.0) kN. The shut-in tool is covered by split pipes and connected to a stone catcher on the top.

For the two conducted pump tests a 3"-pump (Grundfos SQE 5-70) was placed in a pump basket and connected to the test string at about 50–90 m below ToC. The pumping frequency of the pump is set with a remote control on surface. The flow can be regulated additionally with a shunt-valve on top of the test string, a nylon line connects the valve with the pump basket, so that the water can circulate and the pump cannot run out of water (Photo 7 and Photo 8).

The tool scheme is presented in Figure 3-2.

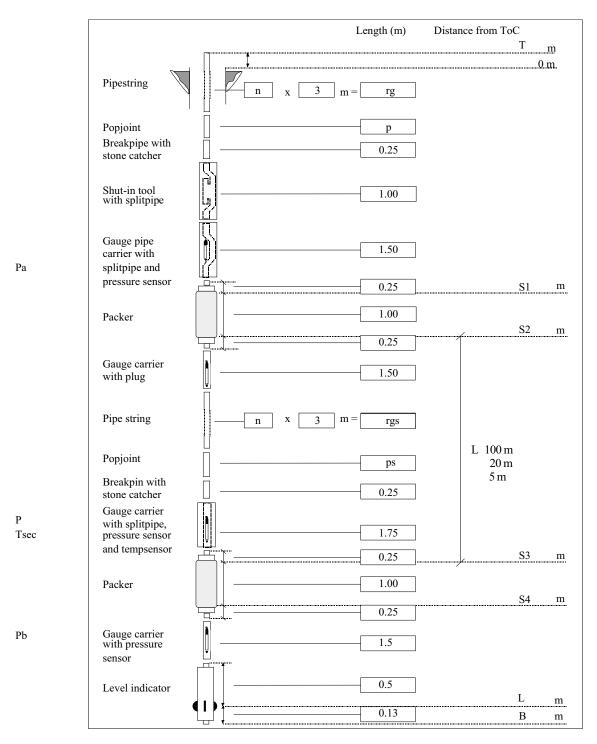


Figure 3-2. Schematic drawing of the down-hole equipment in the PSS2 system.

3.2 Sensors

Keyword	Sensor	Name	Value/Range	Unit	Comments
P _{sec,a,b}	Pressure	Druck PTX 162-1464abs	9–30 4–20 0–13.5 ± 0.1	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	0–1.8	kg/min	Massflow
		Elite sensor	± 0.1	%	
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 ± 0.15	VDC mA MPa % of FS	
L	Level Indicator				Length correction

Table 3-1. Technical specifications of sensors

Table 3-2. Sensor positions and wellbore storage (WBS) controlling factors.

Borehole i	nformation		Senso	rs	Equipment affecting WBS coefficient		
ID	Test section (m)	Volume in test section (m³)	Туре	Position (m fr ToC)	Position	Function	Outer diameter (mm)
KLX19A	111.00–211.00	0.454	p₂ p T p₅ L	109.11 210.37 210.20 213.01 213.25	Test section	Signal cable Pump string Packer line	9.1 33 6
KLX019A	111.00–131.00	0.091	pa p T p₅ L	109.11 130.37 130.20 133.01 133.25	Test section	Signal cable Pump string Packer line	9.1 33 6
KLX19A	104.00–109.00	0.023	p₂ p T p₅ L	102.11 108.37 108.20 111.01 111.25	Test section	Signal cable Pump string Packer line	9.1 33 6

3.3 Data acquisition system

The data acquisition system in the PSS2 container contains a stationary PC with the software Orchestrator, pump- and injection test 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 3-3.

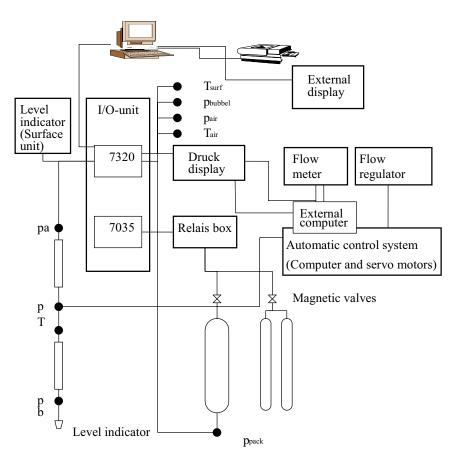


Figure 3-3. Schematic drawing of the data acquisition system and the flow regulation control system in PSS2.

4 Execution

4.1 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 disinfect of Multikabel and hoses for packer and test valve. Clean the tubings with hot steam.
- Filling injection tank with water out of the borehole HLX14.
- Filling buffer tank with water and tracer it with Uranin; take water sample.
- Filling 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 (where necessary).
- Filling packers with water and de-air.
- Measure and assemble test tool.

4.2 Length correction

By running in with the test tool, a level indicator is incorporated at the bottom of the tool. The level indicator is able to record groves milled into the borehole wall. The depths of these groves are given by SKB in the activity plan (see Table 2-2) and the measured depth is counter checked against the number/length of the tubes build in. The achieved correction value, based on linear interpolation between the reference marks, is used to adjust the location of the packers for the test sections to avoid wrong placements and minimize elongation effects of the test string.

4.3 Execution of field work

4.3.1 Test principle

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a shut-in pressure recovery (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively (Figure 4-1).

In addition to the above described constant head injection tests, pumping tests with the main objective of taking water samples were conducted in two sections. These tests were conducted as constant rate withdrawal phases (CRw) followed by a pressure recovery (CRwr).

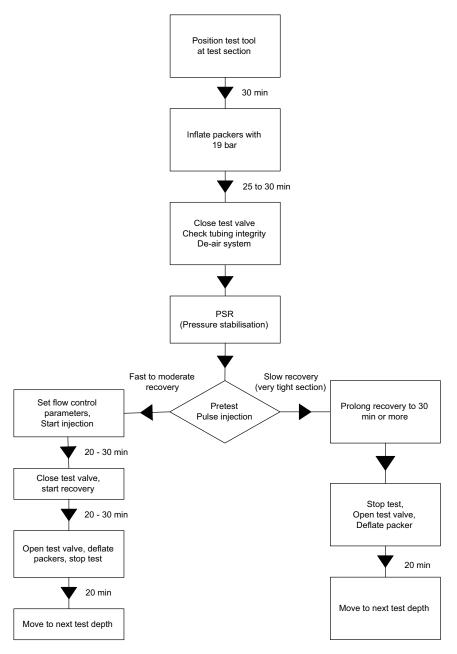


Figure 4-1. Flow chart for hydraulic injection test performance.

4.3.2 Test procedure

Injection tests

A typical constant head injection test cycle includes the following phases: 1) Transfer of downhole equipment to the next section. 2) Packer inflation. 3) Pressure stabilisation. 4) Preliminary Pulse injection. 5) Constant head injection. 6) Pressure recovery. 7) Packer deflation.

The preliminary pulse injection (Step 4) derives the first estimations of the formation transmissivity. It is conducted by applying a pressure difference of approx. 200 kPa to the static formation pressure. If the pulse recovery indicates a very low transmissivity (flow probably below 1 mL/min) the pulse recovery is prolonged and no constant head injection test is performed. The decision to continue the pulse or to conduct an injection tests is based on the pressure response of the pulse recovery. A pressure recovery less than 50% during the first ten minutes of the pulse indicates a low transmissivity. In such a case no injection test will be conducted.

The pressure static recovery (PSR) after packer inflation and before the pulse gives a direct measure of the magnitude of the packer compliance. A steep PSR indicates extremely low test section transmissivity. In such a case the packer compliance would influence the subsequent pulse test too much and introduce very large uncertainties. Therefore tests with this behaviour would be stopped after PSR phase.

If the preliminary pulse injection test indicates a formation transmissivity with a flow above 1 mL/min a constant head injection test (Step 5 and 6) is carried out. It is applied with a constant injection pressure of approx. 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 is measured. In cases, where small flow rates were expected, the automatic regulation unit was switched off and the test was performed manually (determined by the preliminary pulse injection). In those cases, the constant difference pressure was usually unequal to 200 kPa.

In cases when the derived transmissivity of a test section influences the subsequent test program the constant head injection was conducted even if the preliminary pulse indicates a very tight section (e.g. flow below 1 mL/min). The injection phase is then performed to verify the results of the pulse and a flow below 1 mL/min.

The duration for each phase is presented in Table 4-1.

Pump tests

To take water samples from two sections, pumping test were conducted. The selection of these sampling sections is based on Difference flow logging. The duration of pumping depended on the uranine concentration of the pumped water. After start of pumping, each day a water sample was taken by SKB and the uranine concentration was measured by SKB. After reaching a value of lower than 5% from starting concentration, a final water sample (class 5) was taken by SKB. This decision was made by the Hydrogeochemist and the activity leader.

A pump test cycle includes the following phases: 1) Transfer of down-hole equipment to the test section. 2) Packer inflation. 3) Pressure stabilisation. 4) Constant rate withdrawal. 5) Pressure recovery. 6) Packer deflation.

Step	Phase	Time
1	Position test tool to new test section (correct position using the borehole markers)	Approx. 30 min.
2	Inflate packers with appr. 1,900 kPa	25 min.
3	Close test valve	10 min.
	Check tubing integrity with appr. 800 kPa	5 min.
	De-air system	2 min.
4	Pretest, pulse injection (duration depends on the formation transmissivity)	
5*	Set automatic flow control parameters or setting for manual test	5 min.
	Start injection	20 to 45 min.
6*	Close test valve, start recovery	20 min. or more
	Open test valve	10 min.
7	Deflate packers	25 min.
	Move to next test depth	

 Table 4-1. Durations for packer inflation, pressure stabilisation, injection and recovery phase and packer deflation.

* Step 5 and 6 conducted if the preliminary pulse indicates a formation transmissivity with a sufficient flow.

The first pump section is located between 764.00 and 769.00 m bToC and the pumping took place from November 28th to December 5th 2006. A total of 160.7 hours pumping was followed by a recovery phase of 2.7 hours. The decision to stop the recovery was made by the activity leader. The second sampling section was from 495.00–515.00 m bToC. The pumping took place between December 7th 2006 and January 9th 2007 and lasted 785 hours. This pumping phase was followed by a 3.6 hours recovery period.

4.4 Data handling/post processing

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 analysis (field and final) of the injection phase (CHi). The synthesised data of the recovery phase (CHir) was used for the field analysis and to receive preliminary results for concistency reviews.

4.5 Analyses and interpretations

4.5.1 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.

4.5.2 Analysis approach

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

Constant rate and 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.

Pulse tests are analysed by using the pressure deconvolution method described by /Peres et al. 1989/ with improvements introduced by /Chakrabarty and Enachescu 1997/.

4.5.3 Analysis methodology

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

Injection tests/Pump 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/.

Pre-test for the injection tests

The test cycle always starts with a pulse injection phase with the aim of deriving a first estimation of the formation transmissivity. In cases when the pulse recovery is slow (indicating low transmissivity) the pulse phase is extended and analysed as the main phase of the test.

The transmissivity derived from a pulse test is strongly influenced by the wellbore storage coefficient used as an input in the analysis. The wellbore storage coefficient is calculated as C = dV/dP where dV is the volume difference injected during the brief flow period of the pulse and dP is the initial pressure difference of the pulse. dV is directly measured either by using the flowmeter readings or water level measurements in the injection vessel.

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 4-2 below show an example of a typical pressure versus time evolution for such a tight section.

- Calculation of initial estimates of the model parameters by using the Ramey Plot /Ramey et al. 1975/. This plot is typically not presented in the appendix.
- Flow model identification and type curve analysis in the deconvolution Peres Plot /Peres et al. 1989, Chakrabarty and Enachescu 1997/. A non-linear regression algorithm is used to provide optimized model parameters in the later stages. An example of type curves is presented in Figure 4-3.

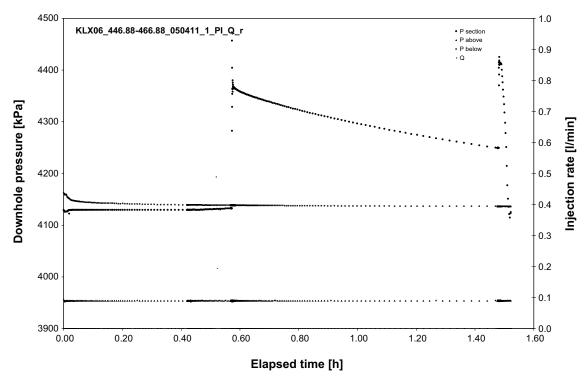


Figure 4-2. Typical pressure versus time plot of a Pulse injection test.

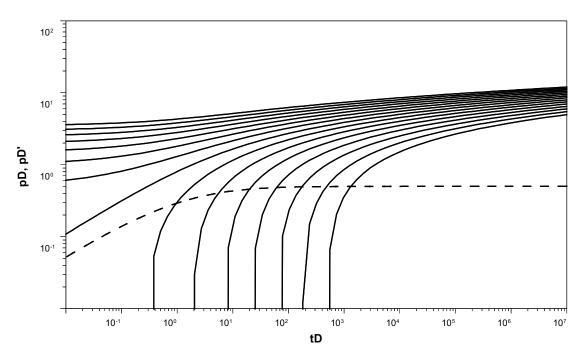


Figure 4-3. Deconvolution type curve set for pulse test analysis.

4.5.4 Correlation between storativity and skin factor

For the analysis of the conducted hydraulic tests below 100 m depth a storativity of $1\cdot 10^{-6}$ is assumed (SKB MD 320.004e). Based on this assumption the skin will be calculated. In the following the correlation between storativity and skin for the relevant test phases will be explained in greater detail.

Injection phase (CHi)/Pulse tests (Pi)

Due to the fact that the early time data of the CHi and Pi phases, respectively, is not available or too noisy (attributed to the automatic regulation system) the storativity and the skin factor become correlated. Consequently they cannot be solved independently any more. In this case as a result of the analysis one determines the correlation group $e^{2\xi}/S$. This means that in such cases the skin factor can only be calculated when assuming the storativity as known.

Recovery phase (CHir/CRwr)

The wellbore storage coefficient (C) is determined by matching the early time data with the corresponding type curve. The derived C-value is introduced in the equation of the type curve parameter:

$$(C_D e^{2\xi})_M = \frac{C \rho g}{2\pi r_w^2 S} e^{2\xi}$$

The equation above has two unknowns, the storativity (*S*) and the skin factor (ξ) which expresses the fact that for the case of constant rate and pressure recovery tests the storativity and the skin factor are 100% correlated. Therefore, the equation can only be either solved for skin by assuming that the storativity is known or solved for storativity by assuming the skin as known.

4.5.5 Determination of the ri-index and calculation of the radius of influence (ri)

The analysis provides also the radius of influence and the ri-index, which describes the late time behaviour of the derivative.

Ri-index

The determination of the ri-index is based on the shape of the derivative plotted in log-log coordinates and describes the behaviour of the derivative after the time t_2 , representing the end of the near wellbore response. The ri-index also describes the flow regime at the end of the test. Following ri-indices can be assigned:

- ri-index = 0: The middle and late time derivative shows a horizontal stabilization. This pressure response indicates that the size of the hydraulic feature is greater than the radius of influence. The calculated radius of influence is based on the entire test time t_P .
- ri-index = 1: The derivative shows an upward trend at late times, indicating a decrease of transmissivity or a barrier boundary at some distance from the borehole. The size of the hydraulic feature near the borehole is estimated as the radius of influence based on t_2 .
- ri-index = -1: The derivative shows a downward trend at late times, indicating an increase of transmissivity or a constant head boundary at some distance from the borehole. The size of the hydraulic feature near the borehole is estimated as the radius of influence based on t₂.

Figure 4-4 presents the relationship between the shape of derivative and the ri-index.

If no radial flow stabilization can be observed the ri-index is based on the flow regime at the end of the test: i.e. ri-index = 1 for tests with a derivative showing an upward trend at the end and a ri-index=-1 for tests with a derivative showing a downward trend. In such cases the calculated radius of influence is based on the entire test time t_{p} .

The assignment of the ri-index is based on /Rhen 2005/.

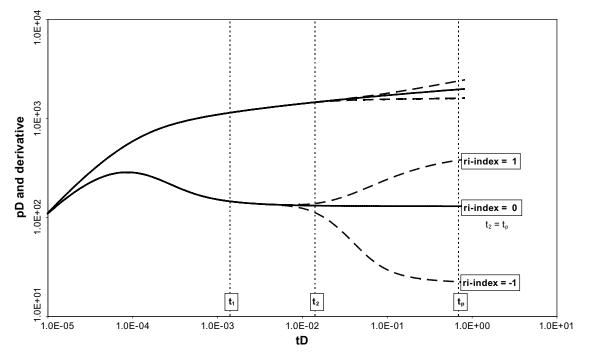


Figure 4-4. Schematic plot of the assignments for the ri-indices.

Calculation of the radius of influence

The radius of influence (ri) is calculated as follows:

$$ri = 1.89 \times \sqrt{\frac{T_T}{S_T} \times t_2} \quad [m]$$

- T_T recommended inner zone transmissivity $[m^2/s]$
- t₂ time when hydraulic formation properties changes (see previous chapter) [s]
- $S_{\scriptscriptstyle T}~$ for the calculation of the ri the storage coefficient (S) is estimated from the transmissivity /Rhen et al. 2006/:

 $S_T = 0.0007 \times T_T^{0.5}$ [-]

4.5.6 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/.

4.5.7 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 the most simple flow model available. The value of p* was then calculated according to this assumption.

In cases when the infinite acting radial flow (IARF) phase was not supported by the data the derivative was extrapolated using the most conservative assumption, which is that the derivative would stabilise short time after test end. In such cases the additional uncertainty was accounted for in the estimation of the transmissivity confidence ranges.

4.5.8 Calculation of the static formation pressure and equivalent freshwater head

The static formation pressure (p*) measured at transducer depth, was derived from the pressure recovery (CHir) following the constant pressure injection phase by using:

- (1) straight line extrapolation in cases infinite acting radial flow (IARF) occurred,
- (2) type curve extrapolation in cases infinite acting radial flow (IARF) is unclear or was not reached.

The equivalent freshwater head (expressed in meters above sea level) was calculated from the extrapolated static formation pressure (p^*), corrected for athmospheric pressure measured by the surface gauge and corrected for the vertical depth considering the inclination of the drill hole, by assuming a water density of 1,000 kg/m³ (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 4-4 shows the methodology schematically.

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

$$head = \frac{(p^* - p_{atm})}{\rho \cdot g}$$

which is the p* 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 h_{iwf} is:

$$h_{iwf} = RP_{elev} - Gd + \frac{(p^* - p_{alm})}{\rho \cdot g}.$$

4.5.9 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 the difference in results of the individual analyses was large (more than half order of magnitude) the test phases were compared and the phase showing the best derivative quality was selected.

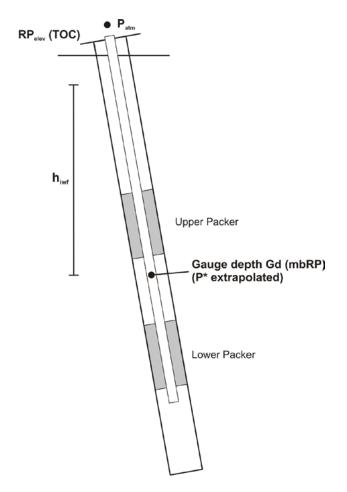


Figure 4-5. Schematic methodologies for calculation of the freshwater head.

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 cases when changing transmissivity with distance from the borehole (composite model) was diagnosted, the transmissivity of the zone, which was showing the better derivative quality, was recommended.

In cases when the infinite acting radial flow (IARF) phase was not supported by the data the additional uncertainty was accounted for in the estimation of the transmissivity confidence ranges.

4.6 Nonconformities

Deviating from the relating Activity Plan, the 20 m pumping section was shifted by 4 m due to difficulties finding appropriate packer positions. The interval was moved from 499.00 to 519.00 m bToC to 495.00–515.00 m after clearance with SKB.

All 100 m injection tests with a flow of more than 1 mL/min at a difference pressure of 200 kPa were repeated with a difference pressure as high as possible. The aim of these additional tests was to observe possible reactions in surrounding boreholes which were equipped with pressure transducers and packersystems by SKB. Measurements in the observation holes were done by SKB. These additional tests were performed in all 100 m test sections except 111.00–211.00 m and 311.00–411.00 m bToC.

5 Results

In the following, results of all tests are presented and analysed. Chapters 5.1 to 5.3 present the 100 m, 20 m and 5 m injection tests, respectively. The pump tests are presented in Chapter 5.4. The results are given as general comments to test performance, the identified flow regimes and calculated parameters and finally the parameters which are considered as most representative are chosen and justification is given. Similarly, the results of the analysis of both pumping tests are presented in Chapter 5.4. All results are also summarised in Table 6-1 and 6-2 of the Summary chapter. In addition, the results are presented in Appendices 3 and 5.

The results are stored in the primary data base (SICADA). The SICADA data base contains data that will be used for further interpretation (modelling). The data are traceable in SICADA by the Activity plan number (AP PS 400-06-144; SKB controlling document).

5.1 100 m single-hole injection tests

In the following, the 100 m section tests conducted in borehole KLX19A are presented and analysed. All 100 m section tests with a flow rate of more than 1 mL/min at a pressure difference of 200 kPa were repeated with a pressure difference as high as possible. That was done according to discussions with SKB to measure possible reaction in observation holes, which were equipped with a packer system and pressure gauges by SKB.

5.1.1 Section 111.00–211.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the very fast recovery of the pulse test indicated a high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. The automatic regulation system worked well. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 48.3 L/min at start of the CHi phase to 46.2 L/min at the end, indicating a very high interval transmissivity (consistent with the pulse recovery). The CHi phase is adequate for qualitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis, too.

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, indicating radial flow. Due to the high flow rate and the noisy data, the early time data are not representative for the formation. A two shell composite flow model was used for the analysis of the CHi phase. The CHir phase was analysed using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-1.

Selected representative parameters

The recommended transmissivity of $2.4 \cdot 10^{-4}$ m²/s was derived from the analysis of the CHir phase, which shows the better derivative quality. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-5}$ m²/s to $5.0 \cdot 10^{-4}$ 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 1,806.1 kPa.

The analyses of the CHi and CHir phases show some minor inconsistencies as far as the flow models concerned. This can be attributed to the high flow and the poor early time data quality. No further analysis is recommended.

5.1.2 Section 211.00–311.00 m, test no. 1 and 2, injection

Comments to test

The first test was aborted due to a technical problem with the Test valve. The test valve was not working properly due to two damaged o-rings inside the valve. The tool had to be pulled out and the test valve was replaced. Afterwards, a second test was conducted in this section.

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the fast recovery of the pulse test indicated a high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 204 kPa. A slight hydraulic connection to the adjacent zones was observed. The pressure above the interval increased during the injection by 3 kPa. The pressure increase in the bottom zone was time delayed and showed hydraulic communication via fractures. The pressure started to increase about 10 minutes after start of the injection and continued increasing during the remaining time of the test to a final value of +6 kPa compared to its starting pressure. The injection rate decreased from 41 L/min at start of the CHi phase to 27 L/min at the end, indicating a high interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of both phases show a horizontal stabilisation at middle times followed by a downward trend, indicating increasing transmissivity or a change in flow dimension away from the borehole. A two shell composite flow model with increasing transmissivity was used for the analysis of both phases. Both phases show no clear stabilisation at late times. The analysis is presented in Appendix 2-2.

Selected representative parameters

The recommended transmissivity of $1.1 \cdot 10^{-5}$ m²/s was derived from the analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-6}$ m²/s to $5.0 \cdot 10^{-5}$ 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 2,630.9 kPa.

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

5.1.3 Section 211.00-311.00 m, test no. 3, injection

Comments to test

The intention for this additional test was to conduct a constant head injection with a high pressure difference to observe potential reactions in observation holes. The test was conducted subsequently after the first test in this section. The packers were not deflated in between.

The test was composed of a constant pressure injection test phase with a pressure difference of 353 kPa, followed by a pressure recovery phase. A small hydraulic connection to both adjacent zones was observed. The pressure in the bottom zone rose with a delay of about 10 minutes by maximum 7 kPa. P above increased by 3 kPa during the injection phase. The injection rate control during the CHi phase was not very good. After 7 Minutes of injection the regulation unit opened an additional valve and the flow rate jumped from 39.7 to 42.7 L/min. From this point the regulation unit worked well and the rest of the injection phase is of good quality. The injection rate decreased from 45 L/min at start of the CHi phase to 38.6 L/min at the end, indicating a relatively high interval transmissivity (consistent with test 2 in this section). 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 derivative of the CHi phase shows a horizontal part at late times indicating a flow dimension of 2 (radial flow). A homogeneous radial flow model was chosen for the analysis of this phase. The derivative of the CHir phase shows a horizontal stabilisation at middle times followed by a downward trend, indicating an increase of transmissivity or a change in flow dimension at some distance from the borehole. A two shell composite flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-2a.

Selected representative parameters

The recommended transmissivity of $9.7 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-6}$ m²/s to $5.0 \cdot 10^{-5}$ 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 2,633.0 kPa.

The analyses of the CHi and CHir phases show inconsistency regarding the chosen flow models. This can be explained with the poor data quality of the first part of the CHi phase. The transmissivity of the CHi phase is equal to the transmissivity of the outer zone of the CHir phase. The analyses of both phases show good consistency with the analyses of the phases of test 2. No further analysis is recommended.

5.1.4 Section 311.00–411.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. The slow recovery is supported by the packer compliance. Based on this result a constant pressure test was performed manually without using the regulation unit. After only a few minutes, the flowrate dropped below the measurement limit of 1 mL/min and the injection phase was aborted after ten minutes. None of the test phases is analysable.

The measured data is presented in Appendix 2-3.

Selected representative parameters

Based on the test response the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m²/s.

No further analysis recommended.

5.1.5 Section 411.00–511.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a moderate to high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 204 kPa. A slight hydraulic connection to the bottom zone was observed. The pressure in the bottom zone increased during the injection by 10 kPa. The automatic regulation system worked well. However, the recorded early time data is noisy. The injection rate decreased from 3.4 L/min at start of the CHi phase to 1.6 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of both phases show a horizontal part at middle times and a downward trend at late times indicating a change in flow dimension or the transition to a zone of higher transmissivity. Both phases were analysed using a radial two shell composite flow model with increasing transmissivity at some distance from the borehole. The analysis is presented in Appendix 2-4.

Selected representative parameters

The recommended transmissivity of $9.5 \cdot 10^{-7}$ 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 $6.0 \cdot 10^{-7}$ m²/s to $3.0 \cdot 10^{-6}$ 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 4,274.7 kPa.

The analyses of the CHi and CHir phases show good consistency regarding the chosen flow models and the derived values for transmissivity and skin. No further analysis is recommended.

5.1.6 Section 411.00–511.00 m, test no. 2, injection

Comments to test

The intention for this additional test was to conduct a constant head injection with a high pressure difference to observe potential reactions in observation holes. The test was conducted subsequently after the first test in this section. The packers were not deflated in between.

The test was composed of a constant pressure injection test phase with a pressure difference of 353 kPa, followed by a pressure recovery phase. A small hydraulic connection to the bottom zone was observed. The bottom zone pressure did increase by 18 kPa during the CHi phase. The injection rate control during the CHi phase was good and it took less than 1 minute to get into the range of the target pressure $\pm/-10$ kPa. But it took nearly five minutes to get really stable conditions with a stable injection pressure. The injection rate decreased from 8.6 L/min

at start of the CHi phase to 3.0 L/min at the end, indicating a moderate to high interval transmissivity (consistent with test 1 in this section). 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 derivative of both phases show a horizontal stabilisation at middle times followed by a downward trend, indicating an increase of transmissivity or a change in flow dimension at some distance from the borehole. A two shell composite flow was chosen for the analysis of the CHI and CHir phase. The analysis is presented in Appendix 2-4a.

Selected representative parameters

The recommended transmissivity of $6.1 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase (inner zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $4.0 \cdot 10^{-7}$ m²/s to $2.0 \cdot 10^{-6}$ 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 type curve extrapolation in the Horner plot to a value of 4,275.4 kPa.

The analyses of the CHi and CHir phases show good consistency. The results of test 1 in this section are consistent with the results of this test. No further analysis is recommended.

5.1.7 Section 511.00–611.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a moderate to high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 202 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system worked well. The injection rate decreased from 6.6 L/min at start of the CHi phase to 3.5 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of both phases show a downward trend at middle times followed by a horizontal stabilisation at late times, indicating radial flow. This is characteristic for a transition to a zone of higher transmissivity. Both phases were analysed using a radial two shell composite flow model with increasing transmissivity at some distance from the borehole. The analysis is presented in Appendix 2-5.

Selected representative parameters

The recommended transmissivity of $5.5 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHir phase (outer zone), which shows the most reliable data and derivative quality. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-6}$ m²/s to $8.0 \cdot 10^{-6}$ 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 5,105.8 kPa.

The analyses of the CHi and CHir phases show good consistency regarding the chosen flow models and the derived values for transmissivity and skin. No further analysis is recommended.

5.1.8 Section 511.00-611.00 m, test no. 2, injection

Comments to test

The intention for this additional test was to conduct a constant head injection with a high pressure difference to observe potential reactions in observation holes. The test was conducted subsequently after the first test in this section. The packers were not deflated in between.

The test was composed of a constant pressure injection test phase with a pressure difference of 451 kPa, followed by a pressure recovery phase. No hydraulic connection to the adjacent zones was observed. The injection rate control during the CHi phase was good. However, the early time data of the CHi phase are noisy. The injection rate decreased from 10.9 L/min at start of the CHi phase to 6.1 L/min at the end, indicating a moderate to high interval transmissivity (consistent with test 1 in this section). 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 derivative of both phases show a downward trend at middle times and a horizontal stabilisation at late times, which is characteristic for a flow dimension of 2 (radial flow). The downward trend was interpreted as the transition to a zone of higher transmissivity at some distance to the borehole. A two shell composite flow model was chosen for the analysis of the CHI and CHir phase. The analysis is presented in Appendix 2-5a.

Selected representative parameters

The recommended transmissivity of $6.2 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHir phase (outer zone), which shows the most reliable and best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-6}$ m²/s to $8.0 \cdot 10^{-6}$ 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 5,108.4 kPa.

The analyses of the CHi and CHir phases show good consistency. The results of test 1 in this section are consistent with the results of this test. No further analysis is recommended.

5.1.9 Section 611.00-711.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a medium to low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 201 kPa. A hydraulic connection to the bottom zone was observed. The bottom zone pressure increased with a short time delay after start of the injection slowly to +35 kPa at the end of the injection. The recorded early time data of the CHi phase is noisy and of poor quality due to the time needed by the system to get stable conditions. The injection rate decreased from 0.74 L/min at start of the CHi phase to 0.46 L/min at the end, indicating a medium to low interval transmissivity (consistent with the pulse recovery). The CHir phase and the late time data of the CHi phase show no problems and are adequate for quantitative analysis.

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 shows an upward trend at middle times, which is most likely caused by the poor data quality for early and middle time data. The analysis was conducted using a radial two shell composite flow model. The derivative of the CHir phase shows a horizontal stabilisation at late times, indicating radial flow. A radial homogeneous flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-6.

Selected representative parameters

The recommended transmissivity of $1.2 \cdot 10^{-7}$ 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 $8.0 \cdot 10^{-8}$ m²/s to $4.0 \cdot 10^{-7}$ 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 5,902.9 kPa.

The analyses of the CHi and CHir phases show consistency regarding the derived transmissivity. No further analysis is recommended.

5.1.10 Section 611.00-711.00 m, test no. 2, injection

Comments to test

The intention for this additional test was to conduct a constant head injection with a high pressure difference to observe potential reactions in observation holes. The test was conducted subsequently after the first test in this section.

The test was composed of a constant pressure injection test phase with a pressure difference of 450 kPa, followed by a pressure recovery phase. A hydraulic communication to the bottom zone was observed. With a short time delay the bottom pressure increased during the injection phase to a maximum value of +76 kPa at the end of the perturbation phase. No communication to the upper zone was observed. The injection rate control during the CHi phase was good, but the system needed some time to get stable conditions. The injection rate decreased from 3.9 L/min at start of the CHi phase to 0.9 L/min at the end, indicating a moderate interval transmissivity (consistent with test 1 in this section). Both phases are of good quality and 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 derivative of the CHi phase shows a horizontal stabilisation at middle and late times, indicating a flow dimension of 2 (radial flow). The CHi phase was analysed using a radial homogeneous flow model. The CHir phase shows an upward trend at late times, indicating a change in flow dimension or the transition to a zone of lower transmissivity. This phase was analysed using a radial two shell composite flow model with wellbore storage and skin. The analysis is presented in Appendix 2-6a.

Selected representative parameters

The recommended transmissivity of $1.8 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase, which shows good data and derivative quality and a clear horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-8}$ m²/s to $4.0 \cdot 10^{-7}$ 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 5,889.9 kPa.

The analyses of the CHi and CHir phases show good consistency. The results of test 1 in this section are consistent with the results of this test. No further analysis is recommended.

5.1.11 Section 694.00-794.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a moderate to high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 205 kPa. A slight hydraulic connection to the bottom zone was observed and the pressure Pb inceased by about 10 kPa due to the injection. No hydraulic connection to the upper zone was observed. The automatic regulation system worked well. The injection rate decreased from 5.7 L/min at start of the CHi phase to 1.2 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of both phases show an upward trend at middle times followed by a horizontal stabilisation at late times, indicating radial flow. This stabilisation is ambiguous at the CHir phase. However, both phases were analysed using a radial two shell composite flow model with decreasing transmissivity at some distance from theborehole. The analysis is presented in Appendix 2-7.

Selected representative parameters

The recommended transmissivity of $4.6 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase, which shows the clearest horizontal stabilisation at late times. Due to the slight communication to the bottom zone, this value should be regarded on the upper limit of the confidence range. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-8}$ m²/s to $6.0 \cdot 10^{-7}$ 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 6,578.9 kPa.

The analyses of the CHi and CHir phases show good consistency regarding the chosen flow models and the derived values for transmissivity and skin. No further analysis is recommended.

5.1.12 Section 694.00-794.00 m, test no. 2, injection

Comments to test

The intention for this additional test was to conduct a constant head injection with a high pressure difference to observe potential reactions in observation holes. The test was conducted subsequently after the first test in this section.

The test was composed of a constant pressure injection test phase with a pressure difference of 453 kPa, followed by a pressure recovery phase. A hydraulic communication to the bottom zone was observed. The bottom pressure increased after start of the injection by about 60 kPa. No communication to the upper zone was observed. The injection rate control during the CHi phase was good, but the system needed some time to get stable conditions. The injection rate decreased from 6.8 L/min at start of the CHi phase to 2.3 L/min at the end, indicating a moderate to relatively high interval transmissivity (consistent with test 1 in this section). Both phases are of good quality and adequate for quantitative analysis.

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 shows a horizontal stabilisation at late times, indicating a flow dimension of 2 (radial flow). The CHi phase was analysed using a radial two shell composite flow model. The CHir phase shows an upward trend at middle times followed by a horizontal stabilisation and afterwards a downward trend. The CHir phase was analysed using a radial two shell composite flow model with wellbore storage and skin. The analysis is presented in Appendix 2-7a.

Selected representative parameters

The recommended transmissivity of $4.1 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase (outer zone), which shows good data and derivative quality and a clear horizontal stabilisation. Due to the hydraulic connection to the bottom zone the derived transmissivity should be regarded at the upper limit of the confidence range. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-8}$ m²/s to $6.0 \cdot 10^{-7}$ 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 6,577.0 kPa.

The analyses of the CHi and CHir phases show good consistency. The results of test 1 in this section are consistent with the results of this test. No further analysis is recommended.

5.2 20 m single-hole injection tests

In the following, the 20 m section tests conducted in borehole KLX19A are presented and analysed.

5.2.1 Section 111.00–131.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the fast recovery of the pulse test indicated a high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 205 kPa. Although it took some time for the regulation unit to get stable conditions, the regulation unit worked well. A hydraulic communication to the section above was observed. During the perturbation phase, the pressure in the section above increased by 6 kPa. The injection rate decreased from 48.5 L/min at start of the CHi phase to 45.4 L/min at the end, indicating a high interval transmissivity (consistent with the pulse recovery). Both phases are 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 horizontal stabilisation at middle and late times, indicating radial flow. A radial homogeneous flow model was chosen for the analysis of both phases. The analysis is presented in Appendix 2-8.

Selected representative parameters

The recommended transmissivity of $3.0 \cdot 10^{-4}$ m²/s was derived from the analysis of the CHi phase, which shows the best derivative quality. Due to the hydraulic communication, this value is at the upper limit of the confidence range for the interval, which is estimated to be $6.0 \cdot 10^{-5}$ m²/s to $4.0 \cdot 10^{-4}$ 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 1,145.8 kPa.

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

5.2.2 Section 131.00–151.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a relatively low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system worked well. The injection rate decreased from 70 mL/min at start of the CHi phase to 9.0 mL/min at the end, indicating a relatively low interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 an upward trend at middle times and a flat part at late time data, which is indicative for a flow dimension of 2 (radial flow). The CHi phase was analysed using a two shell composite flow model. The derivative of the CHir phase shows a unit slope in middle and late times, which is indicative for a transition to a zone with lower transmissivity at some distance to the borehole or it indicates a closed system. A two shell composite model with decreasing transmissivity away from the borehole was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-9.

Selected representative parameters

The recommended transmissivity of $1.7 \cdot 10^{-9}$ m²/s was derived from the analysis of the CHi phase (outer zone). The inner zone was interpreted as the skin zone. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-10}$ m²/s to $7.0 \cdot 10^{-9}$ 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 1,297.7 kPa.

The analyses of the CHi and CHir phases show consistency regarding the derived transmissivities. No further analysis is recommended.

5.2.3 Section 151.00-171.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a moderate formation transmissivity. Based on this result a sequence

consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 2.4 L/min at start of the CHi phase to 1.9 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases are of good quality and 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 derivative of both phases show a clear horizontal stabilisation at middle and late times, indicating a flow dimension of 2 (radial flow). An infinite acting radial homogeneous flow model was chosen for the analysis of both phases. The analysis is presented in Appendix 2-10.

Selected representative parameters

The recommended transmissivity of $4.1 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality and a clear horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-6}$ m²/s to $6.0 \cdot 10^{-6}$ 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 1,477.0 kPa.

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

5.2.4 Section 171.00–191.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was prolonged and analysed.

During the brief injection phase of the pulse injection a total volume of about 6.9 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 219 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $3.2 \cdot 10^{-11}$ m³/Pa. It should be noted though thatthere is uncertainty connected with the determination of the wellbore storage coefficient, which will implicitly translate into uncertainty in the derived transmissivity.

Flow regime and calculated parameters

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure derivative shows a continuing upward trend with a change in inclination at about half time on the log-log scale. This can be interpreted as the transition through the skin zone. The PI phase was analysed using a radial two shell composite flow model. The analysis is presented in Appendix 2-11.

Selected representative parameters

The recommended transmissivity of $4.2 \cdot 10^{-12}$ m²/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-12}$ to $8.0 \cdot 10^{-12}$ m²/s.

The analysis was conducted using a flow dimension of 2. The static pressure could not be extrapolated due to the very low transmissivity.

5.2.5 Section 191.00-211.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. Due to the low flow rate, close to the measurement limit, the CHi data quality is very poor. The injection rate decreased from about 2 mL/min at start of the CHi phase to around 1 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the low flow rate and the data quality the CHi phase could not be analysed. The 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. The response of the CHir phase indicates a transition from wellbore storage and skin dominated flow to pure formation flow. However, radial flow could not be reached. An infinite acting homogeneous radial flow model was used for the analysis. The analysis is presented in Appendix 2-12.

Selected representative parameters

The recommended transmissivity of $3.8 \cdot 10^{-10}$ m²/s was derived from the analysis of the CHir phase, which is the only analysable phase of this test. Due to the low interval transmissivity the confidence range is estimated to be $8.0 \cdot 10^{-11}$ m²/s to $8.0 \cdot 10^{-10}$ m²/s. The analysis was conducted assuming 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 1,791.3 kPa.

Although the transmissivity is very low, the data and derivative of the CHir phase are of good quality and give reliable results, even though they are within a range of about one order of magnitude for the transmissivity. The extrapolated static formation pressure is due to the short duration uncertain. No further analysis is recommended.

5.2.6 Section 211.00-231.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 199 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system worked well. The injection rate decreased from 0.20 L/min at start of the CHi phase to 0.08 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase and the CHi phase show no problems and are adequate for quantitative analysis.

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 relative flat derivative at middle times (radial flow) followed by an upward trend indicating a change in transmissivity or in flow dimension. The CHi phase was analysed using a two shell composite flow model. The derivative of the CHir phase shows a dip after wellbore storage and skin effects. At late times, the derivative shows an upward trend indicating the transition to a zone of lower transmissivity. A two shell composite model with decreasing transmissivity was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-13.

Selected representative parameters

The recommended transmissivity of $2.0 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHir phase (inner zone), which shows a horizontal stabilization. The confidence range for the interval transmissivity is estimated to be $6.0 \cdot 10^{-8}$ m²/s to $4.0 \cdot 10^{-7}$ 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 1,995.2 kPa.

The analyses of the CHi and CHir phases show good consistency regarding the chosen flow models and the derived transmissivities. No further analysis is recommended.

5.2.7 Section 231.00-251.00 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 approx. 50 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m²/s). However, to confirm a flow below 1 mL/min a manual injection without using the regulation unit was performed. After start of the injection, the flow rate dropped very quickly below the measurement limit of 1 mL/min and the test was stopped. None of the test phases is analysable.

The measured data is presented in Appendix 2-14.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m²/s.

No further analysis recommended.

5.2.8 Section 251.00–271.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

During the brief injection phase of the pulse injection a total volume of about 12 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 220 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $5.4 \cdot 10^{-11}$ m³/Pa. It should be noted though that there is uncertainty connected with the determination of the wellbore storage coefficient, which will implicitly translate into uncertainty in the derived transmissivity.

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure derivative shows a continuing upward trend which can be interpreted to the fact that the dimensionless test time is to small and semi-logarithmic asymptotic solution was not achieved (due to the relative small transmissivity). The PI phase was analysed using a radial homogeneous flow model. The analysis is presented in Appendix 2-15.

Selected representative parameters

The recommended transmissivity of $1.2 \cdot 10^{-11}$ m²/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-12}$ to $5.0 \cdot 10^{-11}$ m²/s. The analysis was conducted with a flow dimension of 2. The static pressure could not be extrapolated due to the very low transmissivity and the short duration of the test.

No further analysis is recommended.

5.2.9 Section 271.00-291.00 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 approx. 46 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m²/s). However, to confirm a flow below 1 mL/min a manual injection without using the regulation unit was performed. After start of the injection, the flow rate dropped very quickly below the measurement limit of 1 mL/min and the test was stopped. None of the test phases is analysable.

The measured data is presented in Appendix 2-16.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11} \text{ m}^2/\text{s}$.

No further analysis recommended.

5.2.10 Section 291.00-311.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the fast recovery of the pulse test indicated a high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 205 kPa. No hydraulic connection to the adjacent zones was observed. The regulation unit needed some time to get stable conditions, but the rate control was good. The injection rate decreased from 40.0 L/min at start of the CHi phase to 27.6 L/min at the end, indicating a high interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of both phases show a horizontal

stabilisation at middle times followed by a downward trend, indicating increasing transmissivity or a change in flow dimension away from the borehole. A two shell composite flow model with increasing transmissivity was used for the analysis of both phases. Both phases show no clear stabilisation at late times. The relatively high wellbore storage (C) is a result of an increased interval volume due to fractures at about 299 m below ToC. The analysis is presented in Appendix 2-17.

Selected representative parameters

The recommended transmissivity of $1.1 \cdot 10^{-5}$ m²/s was derived from the analysis of the CHir phase (inner zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-6}$ m²/s to $5.0 \cdot 10^{-5}$ 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 2,628.8 kPa.

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

5.2.11 Section 411.00-431.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a moderate to low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system worked well. The injection rate decreased from 34 mL/min at start of the CHi phase to 14 mL/min at the end, indicating a relatively low interval transmissivity (consistent with the pulse recovery). The data of both phases are of good quality and show no problems. They are both 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 middle times. At late times the derivative shows an upward trend. This was interpreted as the transition to a zone of lower transmissivity. The CHi phase was analysed using a two shell composite flow model. The derivative of the CHir phase is consistent with the CHi phase. It shows an upward trend after a stabilisation at middle times. A two shell composite model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-18.

Selected representative parameters

The recommended transmissivity of $3.2 \cdot 10^{-8}$ m²/s was derived from the analysis of the CHir phase (inner zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-9}$ m²/s to $5.0 \cdot 10^{-8}$ 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 3,623.9 kPa.

The analyses of the CHi and CHir phases show consistency regarding the chosen flow models and derived transmissivities. No further analysis is recommended.

5.2.12 Section 431.00-451.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. A slight hydraulic connection to the bottom zone was observed. The Pb pressure increased during the injection phase by 5 kPa. The rate control system worked well during the perturbation phase. The injection rate decreased from 0.69 L/min at start of the CHi phase to 0.33 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir and the CHi phase show no problems and are 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 part at middle and late times, indicating 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 2-19.

Selected representative parameters

The recommended transmissivity of $3.0 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase, which has a better derivative quality. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-7}$ m²/s to $7.0 \cdot 10^{-7}$ 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 3,782.2 kPa.

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

5.2.13 Section 451.00-471.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a medium to relatively high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 201 kPa. A slight hydraulic connection to the bottom zone was observed. The Pb pressure increased during the injection phase by 6 kPa. The rate control system worked well during the perturbation phase. The injection rate decreased from 2.98 L/min at start of the CHi phase to 1.49 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). The CHir and the CHi phase show no problems and are adequate for quantitative analysis.

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 part at middle times, followed by a downward trend at late times, which is characteristic for a transition to a higher permeable zone. The CHir phase shows a flat derivative at middle times and a downward trend at late times, as well. Both phases were analysed using a two shell composite flow model. The analysis is presented in Appendix 2-20.

Selected representative parameters

The recommended transmissivity of $1.5 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHir phase (outer zone); the inner zone was interpreted as skin effected. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-7}$ m²/s to $4.0 \cdot 10^{-6}$ 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 3,944.1 kPa.

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

5.2.14 Section 471.00-491.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a moderate to relatively high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system worked well. However, the recorded early time data of the CHi phase are noisy. The injection rate decreased from 0.37 L/min at start of the CHi phase to 0.28 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows relatively fast recovery but is still 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 derivative of the CHi phase is noisy but flat during the middle and late times. The derivative of the CHir phase shows a steep downward trend at middle times, which is consistent with a high positive skin. At late times the CHir derivative shows a horizontal stabilization. Both phases were analysed using an infinite acting homogeneous radial flow model. The analysis is presented in Appendix 2-21.

Selected representative parameters

The recommended transmissivity of $4.8 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase, which shows the best data quality. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-7}$ m²/s to $8.0 \cdot 10^{-7}$ 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 4,114.6 kPa.

The analyses of the CHi and CHir phases show inconsistency regarding the derived transmissivity. This can be attributed to the fast recovery of the CHir phase. No further analysis is recommended.

5.2.15 Section 491.00-511.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a moderate formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. A small hydraulic connection to the bottom zone was observed. During the injection phase the pressure below the bottom packer increased by 5 kPa. The automatic regulation system worked well. However, the recorded data of the CHi phase are noisy. The injection rate decreased from 0.32 L/min at start of the CHi phase to 0.19 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows relatively fast recovery but is still 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 derivative of the CHi phase is noisy. No clear flat part or slope could be distinguished. Radial flow was assumed. The derivative of the CHir phase shows a steep downward trend at middle times, which is consistent with a high positive skin. At late times the CHir derivative shows a horizontal stabilization, which is very sensitive to the derivative smoothing factor. Both phases were analysed using an infinite acting homogeneous radial flow model. The analysis is presented in Appendix 2-22.

Selected representative parameters

The recommended transmissivity of $4.8 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase, which shows the most stable derivative. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-7}$ m²/s to $8.0 \cdot 10^{-7}$ 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 4,277.7 kPa.

The analyses of the CHi and CHir phases show consistency regarding the derived transmissivity and the flow models. No further analysis is recommended.

5.2.16 Section 511.00-531.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the fast recovery of the pulse test indicated a relatively high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 6.8 L/min at start of the CHi phase to 3.7 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

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 shows a downward trend at late middle times and a horizontal stabilisation at late times. A two shell composite flow model was chosen for the analysis of the CHi phase. The derivative of the CHir phase shows a flat part at middle times followed by a downward trend and a second stabilisation at a lower level. This is indicative for the transition to a zone of higher transmissivity at some distance to the borehole. The CHir phase was analysed using a two shell composite flow model with wellbore storage and skin. The analysis is presented in Appendix 2-23.

Selected representative parameters

The recommended transmissivity of $4.9 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHi phase (outer zone), which shows a clear horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-6}$ m²/s to $8.0 \cdot 10^{-6}$ 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 4,444.2 kPa.

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

5.2.17 Section 530.00-550.00 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 increased by approx. 4 kPa in 20 minutes and stabilised. The very slow recovery of the preliminary pulse injection test indicated a very low formation transmissivity. To confirm a flow below 1 mL/min a manual injection without using the regulation unit was performed. The flow rate dropped quickly below the measurement limit of 1 mL/min and the test was stopped. None of the test phases is analysable.

The measured data is presented in Appendix 2-24.

Selected representative parameters

Based on the test response (very slow pulse recovery) the interval transmissivity is lower than $1.0 \cdot 10^{-10}$ m²/s. No static pressure could be derived.

No further analysis recommended.

5.2.18 Section 550.00-570.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery during the PSR phase (closed test valve) indicated a very low interval transmissivity. To verify a low flow, the Pulse injection test was skipped and the constant pressure injection phase (CHi) followed by a recovery phase (CHir) was conducted.

The CHi phase was conducted using a pressure difference of 251 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. No pressure loss occurred during the injection phase. The injection rate decreased from 4.5 mL/min at start of the CHi phase to 2.6 ml/min at the end, indicating a low interval

transmissivity. Due to the very low flow rate the recorded data of the flow rate is noisy and the results of the CHi phase should be regarded carefully. The 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. Due to the poor data quality the CHi phase is not very conclusive. However, in case of the present test an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The response of the CHir phase shows a very steep derivative at middle and late times, which is indicative for a high positive skin. Radial flow was not reached. An infinite acting homogeneous radial flow model was chosen for the analysis. The analysis is presented in Appendix 2-25.

Selected representative parameters

The recommended transmissivity of $2.0 \cdot 10^{-9}$ m²/s was derived from the analysis of the CHir phase, which is very noisy but shows a horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-10}$ m²/s to $5.0 \cdot 10^{-9}$ 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 4,715.0 kPa. Due to the short test duration and the uncertainness concerning the flow model, this value is uncertain.

The analyses of the CHi and CHir phases show some inconsistency regarding the derived transmissivity. This inconsistency is caused by the high skin of the CHir phase and the short test duration. No further analysis recommended.

5.2.19 Section 571.00-591.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection tests was analysed.

During the brief injection phase of the pulse injection a total volume of about 13 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 240 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $5.92 \cdot 10^{-11}$ m³/Pa. It should be noted though that there is uncertainty connected with the determination of the wellbore storage coefficient, which will implicitly translate into uncertainty in the derived transmissivity.

Flow regime and calculated parameters

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure derivative shows a continuing upward trend with a change in inclination at about half time and a horizontal stabilisation at end times on the log-log scale. This can be interpreted as the transition through the skin zone. The PI phase was analysed using a radial two shell composite flow model. The analysis is presented in Appendix 2-26.

Selected representative parameters

The recommended transmissivity of $1.1 \cdot 10^{-10}$ m²/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-11}$ to $5.0 \cdot 10^{-10}$ m²/s.

The analysis was conducted using a flow dimension of 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

5.2.20 Section 591.00-611.00 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 approx. 128 kPa in 16 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m²/s). However, to confirm a flow below 1 mL/min a manual injection without using the regulation unit was performed. After start of the injection, the flow rate dropped very quickly below the measurement limit of 1 mL/min and the test was stopped. None of the test phases is analysable.

The measured data is presented in Appendix 2-27.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11} \text{ m}^2/\text{s}$.

No further analysis is recommended.

5.2.21 Section 611.00-631.00 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 approx. 10 kPa in 12 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-10} \text{ m}^2/\text{s}$). However, to confirm a flow below 1 mL/min a pulse injection and a manual injection without using the regulation unit were performed. After start of injection, the flow rate dropped very quickly below 1 mL/min and the test was stopped. None of the test phases is analysable.

The measured data is presented in Appendix 2-28.

Selected representative parameters

Based on the test response the interval transmissivity is lower than $1.0 \cdot 10^{-10}$ m²/s.

No further analysis is recommended.

5.2.22 Section 631.00-651.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the slow recovery of the pulse test indicated a relatively low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 205 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 9.3 mL/min at start of the

CHi phase to 2.8 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the low flow rate the CHi data is noisy. The recovery 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 derivative of the CHi phase shows no clear horizontal stabilisation. A flow dimension of 2 was assumed and a homogenous flow model was chosen for the analysis of the CHi phase. The derivative of the CHir phase shows an upward trend during the entire test time. This is indicative for the transition to a zone of lower transmissivity at some distance to the borehole. The pressure response is dominated by wellbore and skin effects. No radial flow was reached. The CHir phase was analysed using a two shell composite flow model with wellbore storage and skin. The analysis is presented in Appendix 2-29.

Selected representative parameters

The recommended transmissivity of $1.2 \cdot 10^{-9}$ m²/s was derived from the analysis of the CHi phase, which is noisy but still of amenable quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-10}$ m²/s to $3.0 \cdot 10^{-9}$ 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 5,397.2 kPa.

The analyses of the CHi and CHir phases show some minor inconsistencies, mainly caused by the low interval transmissivity. No further analysis is recommended.

5.2.23 Section 651.00-671.00 m, test no. 2, injection

Comments to test

The first test (test no. 1) was disrupted during injection because of a power breakdown inside the testing container.

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response of the pulse test indicated a moderate to low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 0.39 L/min at start of the CHi phase to 0.06 L/min at the end, indicating a medium to low interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of the CHi phase shows a steep upward trend at middle and late times without a horizontal stabilisation. A two shell composite flow model was chosen for the analysis of the CHi phase. The derivative of the CHir phase shows a flat part at middle times followed by an upward trend. This is indicative for the transition to a zone of lower transmissivity at some distance to the borehole or a change in flow dimension. The CHir phase was analysed using a two shell composite flow model with wellbore storage and skin. The analysis is presented in Appendix 2-30.

Selected representative parameters

The recommended transmissivity of $5.4 \cdot 10^{-8}$ m²/s was derived from the analysis of the CHir phase (inner zone), which shows a clear horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-8}$ m²/s to $7.0 \cdot 10^{-8}$ 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 5,612.5 kPa.

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

5.2.24 Section 671.00-691.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 212 kPa. Hydraulic connection to the lower zone was observed where the pressure increased 28 kPa during injection and decreased 14 kPa during recovery. The upper zone showed no indication of a hydraulic connection. The injection rate decreased from 1.5 L/min at start of the CHi phase to 0.4 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of the CHi phase shows an upward trend at middle times with a horizontal stabilisation at late times. A two shell composite flow model was chosen for the analysis of the CHi phase. The derivative of the CHir phase shows a transition from wellbore storage and skin dominated flow to pure formation flow. The CHir phase was analysed using an infinte acting homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-31.

Selected representative parameters

The recommended transmissivity of $2.3 \cdot 10^{-7}$ 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 $9.0 \cdot 10^{-8}$ m²/s to $6.0 \cdot 10^{-7}$ 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 5,743.3 kPa.

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

5.2.25 Section 691.00-711.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 199 kPa. A small hydraulic connection for the section below was observed, the bottom pressure rose by 7 kPa during injection. The pressure in the section above was stable during the injection. The injection unit did not work very well and the pressure in the interval decreased by 6 kPa during the CHi phase. The injection rate decreased from 0.49 L/min at the start of the CHi phase to 0.13 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases are 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 derivative of the CHi phase shows a horizontal stabilisation at late times indicating radial flow. A two shell composite flow model was chosen for the analysis of the CHi phase. The derivative of the CHir phase shows a downward trend at late times. This is indicative for the transition to a zone of higher transmissivity at some distance to the borehole. The CHir phase was analysed using a two shell composite flow model with wellbore storage and skin. The analysis is presented in Appendix 2-32.

Selected representative parameters

The recommended transmissivity of $5.4 \cdot 10^{-8}$ m²/s was derived from the analysis of the CHi phase, which shows a horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-8}$ m²/s to $8.0 \cdot 10^{-8}$ 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 5,906.2 kPa.

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

5.2.26 Section 711.00-731.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The further intention was to conduct 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 approx. 17 kPa in 19 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m²/s). However, a pulse injection test was performed and the pressure response indicated a low formation transmissivity, as well. To confirm a flow below 1 mL/min a manual injection without using the regulation unit was performed. The flow rate dropped quickly below the measurement limit of 1 mL/min and the test was stopped. None of the test phases is analysable.

The measured data is presented in Appendix 2-33.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m²/s.

No further analysis is recommended.

5.2.27 Section 731.00-751.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 0.12 L/min at start of the CHi phase to 0.08 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of the CHi phase shows a horizontal stabilisation at middle to late times, indicating radial flow. A homogenous flow model was chosen for the analysis of the CHi phase. The derivative of the CHir phase shows a horizontal stabilisation at middle to late times. The CHir phase was analysed using a homogeneous flow model with wellbore storage and skin. The analysis is presented in Appendix 2-34.

Selected representative parameters

The recommended transmissivity of $2.3 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHir phase, which shows a clear horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-8}$ m²/s to $5.0 \cdot 10^{-7}$ 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 6,235.2 kPa.

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

5.2.28 Section 751.00-771.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the fast recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 204 kPa. The lower zone showed a hydraulic connection during injection with an increase of 56 kPa and a decrease during recovery of 30 kPa. The upper zone showed no indication of a hydraulic connection. The injection rate decreased from 2.9 L/min at start of the CHi phase to 1.1 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of the CHi phase shows an upward trend at late middle times with a horizontal stabilisation at late times, indicating radial flow. A two shell composite flow model was chosen for the analysis of the CHi phase. The derivative of the

CHir phase shows a continuous upward trend at middle and late times. This is indicative for the transition to a zone of lower transmissivity at some distance to the borehole or for a flow dimension lower than 2. The CHir phase was analysed using a two shell composite flow model with wellbore storage and skin. The analysis is presented in Appendix 2-35.

Selected representative parameters

The recommended transmissivity of $3.6 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase (outer zone), which shows a horizontal stabilisation. Due to hydraulic communication to the bottom zone, this value should be regarded as the upper limit for the interval transmissivity. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-8}$ m²/s to $4.0 \cdot 10^{-7}$ 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 6,397.8 kPa.

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

5.2.29 Section 771.00-791.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 204 kPa. The lower zone had a steadily increasing pressure. During injection this pressure increased additionally by about 10 kPa, indicating hydraulic communication. No communication to the upper zone was observed. The injection rate decreased from 1.8 L/min at start of the CHi phase to 0.3 L/min at the end, indicating a medium transmissivity (consistent with the pulse recovery). The regulation unit needed some time to regulate constant pressure. Only middle and late time data are sufficient 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 derivative of the CHi phase is noisy, but shows a horizontal stabilisation at middle to late times. A homogenous flow model was chosen for the analysis of the CHi phase. The derivative of the CHir phase shows an upward trend with a horizontal stabilisation at late times. This is indicative for the transition to a zone of lower transmissivity at some distance to the borehole. The CHir phase was analysed using a two shell composite flow model with wellbore storage and skin. The analysis is presented in Appendix 2-36.

Selected representative parameters

The recommended transmissivity of $1.8 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase, which shows a horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-8}$ m²/s to $4.0 \cdot 10^{-7}$ 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 6,546.2 kPa.

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

5.3 5 m single-hole injection tests

In the following, the 5 m section tests conducted in borehole KLX19A are presented and analysed.

5.3.1 Section 104.00–109.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the fast recovery of the pulse test indicated a very high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 50 L/min at start of the CHi phase to 40 L/min at the end, indicating a very high interval transmissivity (consistent with the pulse recovery). Due to the very high flow rate the derivative of the CHi phase is a little noisy. The derivative data of the CHir phase is a bit sparse as a result of a quick pressure recovery. Both phases are 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 derivative of the CHi phase shows a horizontal stabilization at middle and late times, indicating radial flow. The CHi phase was analysed using an infinite acting homogeneous radial flow model. The response of the CHir phase is similar to the response of the CHi phase and a homogeneous flow model was chosen for the analysis too. The analysis is presented in Appendix 2-37.

Selected representative parameters

The recommended transmissivity of $6.8 \cdot 10^{-5}$ m²/s was derived from the analysis of the CHi phase, which shows a horizontal stabilization and the best derivative quality. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-5}$ m²/s to $8.0 \cdot 10^{-5}$ 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 965.3 kPa.

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

5.3.2 Section 109.00–114.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the fast recovery of the pulse test indicated a very high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Due to a technical problem the injection was aborted and repeated. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 198 kPa. A slight hydraulic connection to the adjacent zones was observed. During the injection the pressure increased 2.2 kPa below, and 6.5 kPa above the interval. The injection rate decreased from 43 L/min at start of the CHi phase to 42 L/min at the end, indicating a very high interval transmissivity (consistent with the pulse recovery). The derivative of the CHir phase is a bit sparse as a result of a quick pressure recovery. Both phases are 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 derivative of the CHi phase shows a horizontal stabilisation at middle and late times, indicating radial flow. A two shell composite flow model with decreasing transmissivity away from the borehole was used for the analysis of the CHi phase. The derivative of the CHir phase shows a steep downward trend in late early times, indicating a high positive skin. At middle and late times it shows a horizontal stabilization, which is very sensitive to the derivative smoothing factor. The analysis is presented in Appendix 2-38.

Selected representative parameters

The recommended transmissivity of $4.9 \cdot 10^{-4}$ m²/s was derived from the analysis of the CHi phase (outer zone), which shows a clear horizontal stabilization and the better derivative quality. Due to the hydraulic connection to the sections above and below the interval, the derived transmissivity should be regarded as the upper limit of the confidence range. Thus the confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-5}$ m²/s to $5.0 \cdot 10^{-4}$ 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 1,007.1 kPa.

The analyses of the CHi and CHir phases show some inconsistencies regarding the chosen flow models. The derived transmissivity values are consistent. No further analysis is recommended.

5.3.3 Section 411.00-416.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a relatively low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 27 mL/min at start of the CHi phase to 17 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of the CHi phase shows an upward slope in middle times nearly reaching a horizontal stabilization at late times, indicating radial flow. A two shell composite radial flow model with decreasing transmissivity away from the borehole was used for the analysis of the CHi phase. The response of the CHir phase shows a short time of horizontal stabilization at middle times followed by an upward trend at late times, indicating the transition to a zone of lower transmissivity or a change in flow dimension at some distance to the borehole. A two shell composite model with wellbore storage, skin and a decreasing transmissivity was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-39.

Selected representative parameters

The recommended transmissivity of $3.9 \cdot 10^{-8}$ m²/s was derived from the analysis of the CHir phase (inner zone), which shows a horizontal stabilization and the better derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-9}$ m²/s to $5.0 \cdot 10^{-8}$ 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 3,500.9 kPa.

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

5.3.4 Section 416.00–421.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a very low formation transmissivity. To confirm a flow below the measurement limit a constant head injection was performed subsequently. The pulse injection test was analysed.

During the brief injection phase of the pulse injection a total volume of about 3.8 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 221 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.7 \cdot 10^{-11}$ m³/Pa. During the CHi phase the flow rate dropped quickly below 1 mL/min and the test was stopped.

Flow regime and calculated parameters

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure derivative shows a horizontal stabilization at middle and late times, indicating radial flow. The PI phase was analysed using a radial homogeneous flow model. The analysis is presented in Appendix 2-40.

Selected representative parameters

The recommended transmissivity of $3.2 \cdot 10^{-10}$ m²/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-10}$ to $6.0 \cdot 10^{-10}$ m²/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

5.3.5 Section 421.00-426.00 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 approx. 72 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m²/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-41.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m²/s.

No further analysis recommended.

5.3.6 Section 426.00–431.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

During the brief injection phase of the pulse injection a total volume of about 3.2 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 231 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.4 \cdot 10^{-11}$ m³/Pa.

Flow regime and calculated parameters

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure derivative shows a horizontal stabilization at middle and late times, indicating radial flow. The PI phase was analysed using a radial homogeneous flow model. The analysis is presented in Appendix 2-42.

Selected representative parameters

The recommended transmissivity of $2.3 \cdot 10^{-11}$ m²/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-12}$ to $6.0 \cdot 10^{-11}$ m²/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

5.3.7 Section 431.00-436.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test with the goal of deriving a first estimate of the formation transmissivity. Due to packer compliance the pressure in the interval during the PSR increased 50 kPa in 12 min first and decreased 2 kPa afterwards. Therefore it was decided to skip the pulse injection and to conduct a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) directly. The CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 180 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. The injection rate decreased from 2.5 mL/min at start of the CHi phase to 1 mL/min at the end, indicating a low interval transmissivity. Due to the low flow rate the recorded data of the flow rate is noisy and the results of the CHi phase should be regarded carefully. The CHir shows no problems and is adequate for quantitative analysis.

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. Data and derivative of the CHi phase are noisy due to the small flow rate. The derivative does not show horizontal stabilization clearly. Radial flow was assumed. The CHi phase was analysed using an infinite acting homogeneous flow model. The response of the CHir phase doesn't exceed the wellbore storage area. Similar to the CHi phase a homogeneous flow model was chosen for the analysis. The analysis is presented in Appendix 2-43.

Selected representative parameters

The recommended transmissivity of $1.6 \cdot 10^{-10}$ m²/s was derived from the analysis of the CHi phase, which is close to show a horizontal stabilization. The result is uncertain due to low transmissivity and the short test time causing a noisy pressure response and derivative data. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-11}$ m²/s to $8.0 \cdot 10^{-10}$ 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 3,640.3 kPa.

The analyses of the CHi and CHir phases show consistency. Due to the low transmissivity the derived values for Transmissivity and static pressure are uncertain. No further analysis is recommended.

5.3.8 Section 436.00–441.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. To confirm a flow below the measurement limit a constant head injection test was performed subsequently. The pulse injection test was analysed.

During the brief injection phase of the pulse injection a total volume of about 2.4 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 219 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.1 \cdot 10^{-11}$ m³/Pa. During the CHi phase the flow rate dropped quickly below 1 mL/min therefore the test was stopped.

Flow regime and calculated parameters

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure derivative shows a horizontal stabilization at middle time, indicating radial flow. The PI phase was analysed using a radial homogeneous flow model. The analysis is presented in Appendix 2-44.

Selected representative parameters

The recommended transmissivity of $1.8 \cdot 10^{-10}$ m²/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-11}$ to $6.0 \cdot 10^{-10}$ m²/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

5.3.9 Section 441.00-446.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a moderate formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 206 kPa. No hydraulic connection to the adjacent zones was observed. Due to the regulation unit needing some time to adjust the pressure properly the early time pressure data of the CHi phase is very noisy. The injection rate decreased from 30 mL/min at start of the CHi phase to 23 mL/min at the end, indicating a moderate interval transmissivity (consistent with the pulse recovery). The late time data of the CHi and the CHi phase are of good quality and 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 derivative of the CHi phase shows no clear horizontal stabilization at middle and late times due to the disturbances of the early time data. The CHi phase was analysed using an infinite acting homogeneous radial flow model. The response of the CHir phase shows a continuous downward slope at middle and late times, indicating a change in transmissivity or flow dimension at some distance to the borehole. A two shell composite flow model with wellbore storage and skin was chosen for the analysis. The analysis is presented in Appendix 2-45.

Selected representative parameters

The recommended transmissivity of $2.9 \cdot 10^{-8}$ m²/s was derived from the analysis of the CHi phase, which horizontal part is less sensitive to the derivative smoothing factor. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-8}$ m²/s to $8.0 \cdot 10^{-8}$ 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 3,745.9 kPa.

The analyses of the CHi and CHir phases show consistency in the resulting transmissivities. Inconsistencies concerning the flow model can be attributed to the poor data quality of the CHi phase. No further analysis is recommended.

5.3.10 Section 446.00-451.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. Due to a slight hydraulic connection the pressure in the zone below the interval increased 5.5 kPa during injection. No hydraulic connection to the zone above the interval was observed. The injection rate decreased from 0.49 L/min at start of the CHi phase to 0.31L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

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 is a bit noisy but shows horizontal stabilization at middle time followed by a downward slope at late time. The derivative of the CHir phase shows a similar behaviour. Both phases were analysed using a two shell composite radial flow model with increasing transmissivity at some distance from the borehole. The analysis is presented in Appendix 2-46.

Selected representative parameters

The recommended transmissivity of $3.2 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase (inner zone), which shows horizontal stabilization and a better derivative quality than the CHir phase. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-8}$ m²/s to $8.0 \cdot 10^{-7}$ 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 3,786.3 kPa.

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

5.3.11 Section 551.00-556.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 285 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. The injection rate decreased from 3.4 mL/min at start of the CHi phase to 2.5 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of the CHi phase is a bit noisy due to the small flow rate but shows horizontal stabilization at middle and late times. The CHi phase was analysed using an infinite acting homogeneous radial flow model. The pressure response of the CHir phase doesn't reach horizontal stabilization due to the given test time. The derivative shows the transition from wellbore storage and skin dominated flow to pure formation flow. Similar to the CHi phase a homogeneous radial flow model was chosen for the analysis. The analysis is presented in Appendix 2-47.

Selected representative parameters

The recommended transmissivity of $1.4 \cdot 10^{-9}$ m²/s was derived from the analysis of the CHi phase, which shows horizontal stabilization although the derivative data is a bit noisy. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-10}$ m²/s to $6.0 \cdot 10^{-9}$ m²/s. The analyses were 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 4,609.5 kPa.

The analyses of the CHi and CHir phases show consistency in the resulting transmissivities and flow models. No further analysis is recommended.

5.3.12 Section 556.00-561.00 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). A preliminary pulse injection test should have shown a first estimate of the formation transmissivity. However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 18 kPa in 10 minutes. Anyhow the pulse test was started and after closing the valve the pressure kept rising due to packer compliance. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m²/s). None of the test phases are analysable.

The measured data is presented in Appendix 2-48.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m²/s.

No further analysis recommended.

5.3.13 Section 561.00-566.00 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). A preliminary pulse injection test should have shown a first estimate of the formation transmissivity. However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 295 kPa in 10 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11} \text{ m}^2/\text{s}$). None of the test phases is analysable.

The measured data is presented in Appendix 2-49.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m²/s.

No further analysis recommended.

5.3.14 Section 566.00-571.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

During the brief injection phase of the pulse injection a total volume of about 3.7 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 225 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.6 \cdot 10^{-11}$ m³/Pa.

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure is noisy at early times and shows a linear upward slope at middle and late times. This is indicative for a flow dimension less than 2 or for the transition to a zone with lower transmissivity at some distance to the borehole. The PI phase was therefore analysed using a two shell composite flow model with wellbore storage and skin. The analysis is presented in Appendix 2-50.

Selected representative parameters

The recommended transmissivity of $2.0 \cdot 10^{-10}$ m²/s was derived from the analysis of the Pi phase (inner zone). The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-11}$ to $5.0 \cdot 10^{-10}$ m²/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

5.3.15 Section 631.00–636.00 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). A preliminary pulse injection test should have shown a first estimate of the formation transmissivity. However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 33 kPa in 10 minutes. Anyhow the pulse test was started and the pressure stabilized at constantly high values. After a while the pressure started to decrease slowly. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m²/s). Due to the overlapping of pressure response and packer compliance the test was skipped. The test phase is not analysable.

The measured data is presented in Appendix 2-51.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m²/s.

No further analysis recommended.

5.3.16 Section 636.00-641.00 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). A preliminary pulse injection test should have shown a first estimate of the formation transmissivity. After inflating the packers and closing the test valve, the pressure kept rising by approx. 20 kPa in 10 minutes. Anyhow the pulse test was started and at first the pressure stabilized at constantly high values and started to increase slowly later on. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1E-11 \text{ m}^2/\text{s}$). Due to covering of the pressure response by the packer compliance the test was skipped. The test phase is not analysable.

The measured data is presented in Appendix 2-52.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m²/s.

No further analysis recommended.

5.3.17 Section 641.00–646.00 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). A preliminary pulse injection test should have shown a first estimate of the formation transmissivity. After inflating the packers and closing the test valve, the pressure kept rising by approx. 17 kPa in 10 minutes. Anyhow the pulse test was started and at first the pressure stabilized at constantly high values and started to increase slowly later on. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m²/s). Due to covering of the pressure response by the packer compliance the test was skipped. The test phase is not analysable.

The measured data is presented in Appendix 2-53.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11} \text{ m}^2/\text{s}$.

No further analysis recommended.

5.3.18 Section 646.00-651.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 238 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 back-pressure. The injection rate decreased from 9.8 mL/min at start of the CHi phase to 4.6 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of the CHi phase is a bit noisy due to the small flow rate and shows an upward slope at middle time tending to horizontal stabilization at late time. A two shell composite radial flow model with decreasing transmissivity at some distance from the borehole was used for the analysis of the CHi phase. The pressure response of the CHir phase tends to horizontal stabilization at middle time and shows an upward trend at late time without reaching a final horizontal stabilization. The CHir phase was analysed with a two shell composite flow model similar to the CHi phase. The analysis is presented in Appendix 2-54.

Selected representative parameters

The recommended transmissivity of $2.0 \cdot 10^{-9}$ m²/s was derived from the analysis of the CHir phase (inner zone), which shows a horizontal stabilization and a good data quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-9}$ m²/s to $5.0 \cdot 10^{-9}$ 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 5,388.8 kPa.

The analyses of the CHi and CHir phases show consistency in the resulting transmissivities and flow models. No further analysis is recommended.

5.3.19 Section 651.00-656.00 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). After inflating the packers and closing the test valve, the pressure kept rising by approx. 15 kPa in 10 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m²/s). However, a pulse injection test was started and showed a very slow recovery, indicating a very small transmissivity. To confirm a flow below 1 mL/min a manual injection without using the regulation unit was performed. After start of the injection, the flow rate dropped very quickly below the measurement limit of 1 mL/min and the test was stopped. None of the test phases are analysable.

The measured data is presented in Appendix 2-55.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m²/s.

No further analysis recommended.

5.3.20 Section 656.00–661.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

After start of the injection, the regulation unit did not react. Therefore the test was continued manually with backpressure from the vessel. The pressure difference was 234 kPa. No hydraulic connection to the adjacent zones has been observed. The injection rate decreased from 38 mL/min at start of the CHi phase to 5 mL/min at the end, indicating a moderate to low interval transmissivity (consistent with the pulse recovery). Due to the time needed by the system to get stable pressure conditions the data quality of the CHi phase is quite poor. The CHir phase shows slow recovery. The CHir and the late time data of the CHi phase are sufficient 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 is noisy and shows an upward trend at late time. Early and middle time data are not available. The CHi phase was

analysed using a two shell composite radial flow model. The response of the CHir phase shows an upward trend at middle and late times with a slope of 1, which is characteristic for a closed system. A composite radial flow model with wellbore storage and skin was chosen for the analysis. The analysis is presented in Appendix 2-56.

Selected representative parameters

The recommended transmissivity of $6.5 \cdot 10^{-10}$ m²/s was derived from the analysis of the CHi phase (outer zone). The inner zones of both phases are interpreted as skin zones. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-10}$ m²/s to $3.0 \cdot 10^{-9}$ m²/s. A flow dimension of 2 was assumed. 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 5,623.5 kPa. Due to the low transmissivity and the short test time, the derived head is not representative for the formation.

The analyses of the CHi and CHir phases show some inconsistencies due to poor data quality and too short test duration. No further analysis is recommended.

5.3.21 Section 661.00-666.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was prolonged and analysed.

During the brief injection phase of the pulse injection a total volume of about 37.1 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 222 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.4 \cdot 10^{-10}$ m³/Pa. 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.

Flow regime and calculated parameters

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure response shows a linear upward slope at early and middle times followed by a horizontal stabilization. The downward trend at late times is due to uncertainties regarding the static pressure. This is indicative for the transition to a zone with lower transmissivity at some distance to the borehole. The PI phase was analysed using a two shell composite flow model with wellbore storage and skin. The analysis is presented in Appendix 2-57.

Selected representative parameters

The recommended transmissivity of $4.0 \cdot 10^{-10}$ m²/s was derived from the analysis of the Pi phase (outer zone). The inner zone is interpreted as skin. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-10}$ to $8.0 \cdot 10^{-10}$ m²/s. The flow dimension was assumed to be 2. The static pressure could not be extrapolated due to the low transmissivity.

No further analysis is recommended.

5.3.22 Section 666.00-671.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 198 kPa. No hydraulic connection to the adjacent zones has been observed. The injection rate decreased from 200 mL/min at start of the CHi phase to 60 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of the CHi phase shows a horizontal stabilization at early times followed by a continuous upward trend at middle time. The late time data tends to horizontal stabilization without reaching it during test time. Similar to the CHi phase the response of the CHir phase shows a trend to horizontal stabilization at early time with a subsequent upward slope at middle and late time, indicating a decrease in transmissivity at some distance from the borehole. The slope of 1 is indicative for a closed system. A two shell composite radial flow model was chosen for the analyses of both test phases. The analyses are presented in Appendix 2-58.

Selected representative parameters

The recommended transmissivity of $3.1 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHir phase (inner zone), which shows horizontal stabilization in a segment of the derivative. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-08}$ m²/s to $4.0 \cdot 10^{-7}$ 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 5,617.0 kPa. Due to the short test duration and the low transmissivity, the derived head is not representative for the formation.

The analyses of the CHi and CHir phases show consistency in the range of the resulting transmissivities and in the flow models. No further analysis is recommended.

5.3.23 Section 671.00–676.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

During the brief injection phase of the pulse injection a total volume of about 4.2 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 229 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.8 \cdot 10^{-11}$ m³/Pa.

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure response shows a linear upward slope at early time followed by a downward slope at middle time with a slight change of inclination at late time. The PI phase was therefore analysed using a two shell composite flow model with wellbore storage and skin and an increasing transmissivity at some distance to the borehole. The analysis is presented in Appendix 2-59.

Selected representative parameters

The recommended transmissivity of $3.7 \cdot 10^{-11}$ m²/s was derived from the analysis of the Pi phase (outer zone). The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-12}$ to $5.0 \cdot 10^{-11}$ m²/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the low transmissivity.

No further analysis is recommended.

5.3.24 Section 676.00-681.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 215 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 3.5 mL/min at start of the CHi phase to 2.6 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the flow rate the CHi phase is very noisy but still amenable for quantitative analysis. The CHir phase shows no problems for the 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 is a noisy due to the small flow rate and shows horizontal stabilization throughout test time, indicating radial flow. An infinite acting homogeneous radial flow model was used for the analysis of the CHi phase. The pressure response of the CHir phase shows a downward slope at middle to late times without reaching horizontal stabilization. This is indicative for the transition from wellbore storage and skin dominated flow to pure formation flow. The CHir phase was analysed with a homogeneous flow model similar to the CHi phase. The analysis is presented in Appendix 2-60.

Selected representative parameters

The recommended transmissivity of $2.4 \cdot 10^{-9}$ m²/s was derived from the analysis of the CHi phase, which shows a continuous horizontal stabilization although the derivative is noisy. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-10}$ m²/s to $6.0 \cdot 10^{-9}$ 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 5,652.7 kPa.

The analyses of the CHi and CHir phases show consistency in the resulting transmissivities and flow models. No further analysis is recommended.

5.3.25 Section 681.00-686.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 232 kPa. A hydraulic connection to the zone below the interval was observed. After the start of the injection the pressure increased by 30 kPa, indicating crossflow through fractures. No hydraulic connection to the zone above the interval was observed. The injection rate decreased from 1.8 L/min at start of the CHi phase to 0.4 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of the CHi phase is noisy due to the small flow rate. Although being noisy, the derivative shows horizontal stabilization at middle and late times, indicating radial flow. The pressure response of the CHir phase is noisy at early time and doesn't show horizontal stabilization at middle or late times. Both phases were analysed with an infinite acting homogeneous flow model. The analysis is presented in Appendix 2-61.

Selected representative parameters

The recommended transmissivity of $2.5 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase, which shows a continuous horizontal stabilization. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-8}$ m²/s to $4.0 \cdot 10^{-7}$ 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 5,697.2 kPa.

The analyses of the CHi and CHir phases show consistency in the resulting transmissivities and flow models. No further analysis is recommended.

5.3.26 Section 686.00-691.00 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). A preliminary pulse injection test should have shown a first estimate of the formation transmissivity. The pulse test was started but reached only a pressure difference of 82 kPa due to wrong settings for the injection pressure. After 2 minutes the injection was repeated with correct settings, but the interval pressure stabilized at constantly high values without any significant recovery. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m²/s). Due to covering of the pressure response by the packer compliance the test was skipped. The test phase is not analysable.

The measured data is presented in Appendix 2-62.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11} \text{ m}^2/\text{s}$.

No further analysis recommended.

5.3.27 Section 691.00-696.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 214 kPa. No hydraulic connection to the adjacent zones has been observed. The injection rate decreased from 100 mL/min at start of the CHi phase to 37 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of the CHi phase is noisy but the trend shows downward at late times. The CHi phase was analysed using a two shell composite radial flow model. The response of the CHir phase shows a horizontal stabilisation at middle times followed by a downward slope at late times indicating an increasing transmissivity at some distance from the borehole. A two shell composite radial flow model with wellbore storage and skin was chosen for the analysis. The analysis is presented in Appendix 2-63.

Selected representative parameters

The recommended transmissivity of $8.6 \cdot 10^{-9}$ m²/s was derived from the analysis of the CHir phase (inner zone), which shows horizontal stabilization. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-9}$ m²/s to $5.0 \cdot 10^{-8}$ 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 5,781.8 kPa.

The analyses of the CHi and CHir phases show consistency in the range of the resulting transmissivities and flow models. No further analysis is recommended.

5.3.28 Section 696.00-701.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 205 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 190 mL/min at start of the CHi phase to 92 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of the CHi phase is a bit noisy and shows an upward slope at middle times tending to horizontal stabilization at final late times. A two

shell composite radial flow model with decreasing transmissivity at some distance from the borehole was used for the analysis of the CHi phase. The pressure response of the CHir phase tends to horizontal stabilization at middle time and shows an upward trend at late time without reaching a final horizontal stabilization. The CHir phase was analysed with a two shell composite flow model similar to the CHi phase. The analysis is presented in Appendix 2-64.

Selected representative parameters

The recommended transmissivity of $1.5 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHir phase (inner zone), which shows a short sequence of horizontal stabilization and a good data quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-8}$ m²/s to $3.0 \cdot 10^{-7}$ 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 5,819.5 kPa.

The analyses of the CHi and CHir phases show consistency in the resulting transmissivities and flow models. No further analysis is recommended.

5.3.29 Section 701.00-706.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 210 kPa. No hydraulic connection to the adjacent zones has been observed. The injection rate decreased from 77 mL/min at start of the CHi phase to 17 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of the CHi phase shows a downward trend at middle times, probably caused by the time needed to get stable conditions during the injection. At late times the derivative shows horizontal stabilization, indicating radial flow. The CHi phase was analysed using an infinite acting homogeneous radial flow model. The response of the CHir phase shows an upward slope at middle times and the beginning of a horizontal stabilization at late times. This is characteristic for the transition to a zone of lower transmissivity at some distance from the borehole. Horizontal stabilisation was not reached during test time. A two shell composite radial flow model with wellbore storage and skin was chosen for the analysis. The analysis is presented in Appendix 2-65.

Selected representative parameters

The recommended transmissivity of $7.8 \cdot 10^{-9}$ m²/s was derived from the analysis of the CHi phase, which shows horizontal stabilization although being noisy. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-9}$ m²/s to $3.0 \cdot 10^{-8}$ 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 5,845.9 kPa.

The analyses of the CHi and CHir phases show consistency in the range of the resulting transmissivities. No further analysis is recommended.

5.3.30 Section 706.00-711.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 196 kPa. No hydraulic connection to the adjacent zones has been observed. The automatic regulation unit worked improperly. Constant pressure could not be kept up during injection and therefore the flow rate fluctuated between values from 4.0 to 6.0 mL/min roughly. As a general trend, the injection rate decreased from 5.4 mL/min at start of the CHi phase to 4.9 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). The data quality of the CHi phase is poor and the recovery of the CHir phase is relatively fast. Both phases are still amenable for qualitative and quantitative analyses, but the results should be regarded with respect to the above mentioned problems.

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 is very noisy. Radial flow was assumed. The pressure response of the CHir phase is less noisy but very sensitive to the smoothing factor. The fast recovery and the derivative are indicative for turbulent flow close to the borehole wall. Both phases were analysed with an infinite acting homogeneous flow model. The analysis is presented in Appendix 2-66.

Selected representative parameters

The recommended transmissivity of $3.8 \cdot 10^{-9}$ m²/s was derived from the analysis of the CHi phase. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-9}$ m²/s to $8.0 \cdot 10^{-9}$ m²/s. A flow dimension of 2 was assumed. 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 5,914.6 kPa.

The analyses of the CHi and CHir phases show consistency in the resulting transmissivities and flow models. No further analysis is recommended.

5.3.31 Section 731.00-736.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 196 kPa. The lower section (bottom zone) showed a pressure increase by 4 kPa during the injection and decrease by 4 kPa during the recovery. No hydraulic connection to the zone above the interval has been observed. The injection rate decreased from 92 mL/min at start of the CHi phase to 81 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of the CHi phase is noisy but shows horizontal stabilization at middle and late times, indicating radial flow. The pressure response of the CHir shows horizontal stabilization at middle and late times. Both phases were analysed with an infinite acting homogeneous flow model. The analysis is presented in Appendix 2-67.

Selected representative parameters

The recommended transmissivity of $1.4 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHir phase, which shows a clear horizontal stabilization. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-8}$ m²/s to $3.0 \cdot 10^{-7}$ 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 6,115.3 kPa.

The analyses of the CHi and CHir phases show consistency in the resulting transmissivities and flow models. No further analysis is recommended.

5.3.32 Section 736.00–741.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

The upper section showed a pressure increase by 10 kPa within 10 min prior the pulse injection. No hydraulic connection to the adjacent zones has been observed. During the brief injection phase of the pulse injection a total volume of about 3.4 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 208 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.8 \cdot 10^{-11}$ m³/Pa.

Flow regime and calculated parameters

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure response shows a linear upward slope at early time followed by a horizontal stabilization at middle and late times. The PI phase was therefore analysed using a homogeneous flow model. The analysis is presented in Appendix 2-68.

Selected representative parameters

The recommended transmissivity of $6.2 \cdot 10^{-11}$ m²/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-11}$ to $8.0 \cdot 10^{-11}$ m²/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the low transmissivity.

No further analysis is recommended.

5.3.33 Section 741.00-746.00 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 approx. 360 kPa in 10 minutes. This phenomenon is caused by

prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m²/s). The test was skipped. None of the test phases is analysable.

The measured data is presented in Appendix 2-69.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m²/s.

No further analysis recommended.

5.3.34 Section 746.00-751.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 210 kPa. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. No hydraulic connection to the adjacent zones has been observed. The injection rate decreased from 2.3 mL/min at start of the CHi phase to 1.4 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the small flow rate the data of the CHi phase is very noisy. The CHir phase shows no problems. Although the CHi phase being noisy, both phases are 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 derivative of the CHi phase is noisy but the trend shows horizontal stabilization at middle and late times. The CHi phase was analysed using an infinite acting homogeneous radial flow model. The derivative of the CHir phase shows the transition from wellbore storage and skin dominated flow to pure formation flow. Horizontal stabilisation was not reached during test time. A two shell composite radial flow model with wellbore storage and skin was chosen for the analysis. The analysis is presented in Appendix 2-70.

Selected representative parameters

The recommended transmissivity of $8.4 \cdot 10^{-10}$ m²/s was derived from the analysis of the CHi phase, which shows horizontal stabilization although being noisy. The confidence range for the interval transmissivity is estimated to be $6.0 \cdot 10^{-10}$ m²/s to $3.0 \cdot 10^{-9}$ 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 6,239.3 kPa.

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

5.3.35 Section 751.00-756.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 210 kPa. No hydraulic connection to the adjacent zones has been observed. The injection rate decreased from 5.0 mL/min at start of the CHi phase to 1.8 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the small flow rate, the data of the CHi phase is noisy. The CHir phase shows no problems. However, both phases are 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 derivative of the CHi phase is noisy but the trend shows horizontal stabilization at late times. The CHi phase was analysed using an infinite acting homogeneous radial flow model. The response of the CHir phase shows an upward slope with a slight change of inclination at middle times which indicates an increasing transmissivity at some distance from the borehole. At late time horizontal stabilization seems to be reached. A two shell composite radial flow model with wellbore storage and skin was chosen for the analysis. The analysis is presented in Appendix 2-71.

Selected representative parameters

The recommended transmissivity of $6.8 \cdot 10^{-10}$ m²/s was derived from the analysis of the CHi phase, which shows horizontal stabilization although being noisy. The confidence range for the interval transmissivity is estimated to be $4.0 \cdot 10^{-11}$ m²/s to $2.0 \cdot 10^{-9}$ 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 6,278.0 kPa.

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

5.3.36 Section 756.00-761.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 238 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 back-pressure. The injection rate decreased from 4.8 mL/min at start of the CHi phase to 1.8 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). The CHi phase is very noisy due to the low flow rate. However both phases are 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 derivative of the CHi phase is noisy due to the small flow rate. Assuming a flow dimension of 2, the derivative shows a downward slope at middle time without reaching a horizontal stabilization at late time. A two shell composite radial flow model with increasing transmissivity at some distance from the borehole was used for the analysis of the CHi phase. The CHir phase shows the transisition to pure formation flow with reaching a horizontal stabilization. The CHir phase was analysed with an infinite acting homogenous radial flow model. The analysis is presented in Appendix 2-72.

Selected representative parameters

The recommended transmissivity of $3.8 \cdot 10^{-10}$ m²/s was derived from the analysis of the CHir phase, which shows a horizontal stabilization and a good data quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-10}$ m²/s to $8.0 \cdot 10^{-10}$ 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 6,310.8 kPa.

The analyses of the CHi and CHir phases show consistency in the resulting transmissivities and flow models. No further analysis is recommended.

5.3.37 Section 761.00-766.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

The test section showed a pressure increase by 9 kPa within in 12 min prior the pulse injection. No hydraulic connection to the adjacent zones has been observed. During the brief injection phase of the pulse injection a total volume of about 4.7 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 228 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $2.1 \cdot 10^{-11}$ m³/Pa.

Flow regime and calculated parameters

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure response shows a linear upward slope at early time followed by a horizontal stabilization at middle and late times. The PI phase was therefore analysed using a homogeneous flow model. The analysis is presented in Appendix 2-73.

Selected representative parameters

The recommended transmissivity of $2.5 \cdot 10^{-11}$ m²/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-12}$ to $6.0 \cdot 10^{-11}$ m²/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the low transmissivity.

No further analysis is recommended.

5.3.38 Section 766.00-771.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the slow recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 211 kPa. The lower zone showed a pressure increase by 58 kPa during the injection and a pressure decrease by 32 kPa during the recovery, indicating hydraulic connection through fractures. No hydraulic connection to the zone above was observed. The injection rate decreased from 3.5 L/min at start of the CHi phase to 1.1 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are 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 derivative of the CHi phase shows an upward slope at middle time and a horizontal stabilization at late time. This is indicative for the transition to a zone of lower transmissivity or a change in flow dimension. A two shell composite radial flow model with decreasing transmissivity at some distance from the borehole was used for the analysis of the CHi phase. The pressure response of the CHir phase tends to horizontal stabilization at middle time and shows an upward trend at late time without reaching a final horizontal stabilization. The CHir phase was analysed with a two shell composite flow model similar to the CHi phase. The analysis is presented in Appendix 2-72.

Selected representative parameters

The recommended transmissivity of $4.1 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase (outer zone), which shows a horizontal stabilization and a good data quality. Due to the hydraulic communication with the bottom zone, the derived value for T should be regarded as the upper limit of the confidence range. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-8}$ m²/s to $5.0 \cdot 10^{-7}$ 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 6,397.2 kPa.

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

5.3.39 Section 771.00-776.00 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). A preliminary pulse injection test should have shown a first estimate of the formation transmissivity. However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 28 kPa in 10 minutes. Anyhow the pulse test was started and after closing the valve the pressure kept rising due to packer compliance. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m²/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-75.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m²/s.

No further analysis recommended.

5.3.40 Section 776.00-781.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The pressure response and the recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 197 kPa. The lower section shows an increasing pressure throughout the test from 6,522 kPa to 7,428 kPa. No hydraulic connection to the adjacent zones has been observed. The injection rate decreased from 1.7 L/min at start of the CHi phase to 0.3 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Although the regulation unit did not work properly at the beginning and at the end of the CHi phase, the data quality is still 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 derivative of the CHi phase is noisy but the trend shows horizontal stabilization at middle times. The CHi phase was analysed using an infinite acting homogeneous radial flow model. The response of the CHir phase shows a flat part at early and middle times followed by an upward slope and a final horizontal stabilisation at late times. This is characteristic for a change in flow dimension or change in transmissivity. A two shell composite radial flow model with wellbore storage and skin was chosen for the analysis. The analysis is presented in Appendix 2-76.

Selected representative parameters

The recommended transmissivity of $2.1 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase, which shows horizontal stabilization although being noisy. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-8}$ m²/s to $4.0 \cdot 10^{-7}$ 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 6,468.9 kPa.

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

5.4 Single-hole pump tests

In the following, the pump tests conducted in borehole KLX19A are presented and analysed.

5.4.1 Section 495.00–515.00 m, test no. 1, pumping

Comments to test

The test was conducted as a constant rate pump test phase with a flow rate of 2.1 L/min, followed by a pressure recovery phase. The maximum drawdown just before stop of flowing was about 120 kPa. All pressures are influenced by natural phenomena (e.g. tidal effects). A hydraulic connection between the test interval and the bottom zone was observed. The flow rate during the pumping phase of about 2.1 L/min and the resulting drawdown of about 120 kPa indicate a relatively moderate o high interval transmissivity. After approximate 786 hours of pumping, a water sample was taken. The CRw phase is noisy and unstable and therefore not analysable. The CRwR phase is very short compared to the perturbation phase. However, the recovery is of good quality and 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 CRwr phase shows a relatively long transition period from Wellbore storage and skin dominated flow to pure formation flow. This is probably caused by the hydraulic communication to the bottom section. At late middle times and late times the derivative is flat, which is indicative for radial flow (flow dimension of 2). A radial composite flow model with increasing transmissivity at some distance to the borehole was chosen for the analysis of the CRwr phase. The analysis is presented in Appendix 2-78.

Selected representative parameters

The recommended transmissivity of $5.8 \cdot 10^{-6}$ m²/s was derived from the analysis of the CRwr phase. Due to the hydraulic communication to the bottom zone, the derived value should be regarded as at the upper limit of the confidence range. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-6}$ to $6.0 \cdot 10^{-6}$ m²/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CRwr phase using type curve extrapolation in the Horner plot to a value of 4,331.2 kPa. Due to the short duration of the recovery compared to the pumping time, this value is slightly uncertain.

5.4.2 Section 764.00–769.00 m, test no. 1, pumping

Comments to test

The test was conducted as a constant rate pump test phase with a flow rate of 0.8 L/min, followed by a pressure recovery phase. The maximum drawdown just before stop of flowing was about 235 kPa. A hydraulic connection between the test interval and the bottom zone was observed. Between approximately 14 and 20.5 hours elapsed time, the flow rate and the pressure in the test section became very noisy. The reason for this is unknown. The flow rate during the pumping phase of about 0.8 L/min and the resulting drawdown of about 235 kPa indicate a relatively moderate to low interval transmissivity. Due to malfunction of the bottom transducer, the reaction in the bottom zone could not be observed earlier. After approximate 160 hours of pumping, a water sample was taken. The CRw phase is very noisy and unstable and not analysable. The CRwR phase is relatively short compared to the perturbation phase. However, the recovery is of good quality and 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 CRwr phase shows a gently inclined derivative at middle times, followed by a downward trend at late times, indicating either a change in flow

dimension or in transmissivity. A radial composite flow model with increasing transmissivity at some distance to the borehole was chosen for the analysis of the CRwr phase. The analysis is presented in Appendix 2-77.

Selected representative parameters

The recommended transmissivity of $2.9 \cdot 10^{-7}$ m²/s was derived from the analysis of the CRwr phase. Due to the hydraulic communication to the bottom zone, the derived value should be regarded as at the upper limit of the confidence range. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-8}$ to $3.0 \cdot 10^{-7}$ m²/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CRwr phase using type curve extrapolation in the Horner plot to a value of 6,404.6 kPa. Due to the short duration of the recovery compared to the pumping time, this value is slightly uncertain.

6 Summary of results

This 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.

6.1 General test data and results

Table 6-1. General test data from hydraulic tests in KLX19A (for nomenclature see Appendix 4 and below).

Borehole Sec up [m bToC]	Borehole Sec low [m bToC]	Date and time for test ttart YYMMDD hh:mm	Date and time for test stop YYMMDD hh:mm	Q _p (m³/s)	Q _m (m³/s)	t _p (s)	t _⊧ (s)	p₀ (kPa)	p _i (kPa)	p _p (kPa)	p _⊧ (kPa)	te _w (°C)	Test phases measured, Analysed test phases marked bold
111.00	211.00	070111 08:17	070111 10:39	7.77E–04	7.85E-04	1,800	1,800	1,801	1,804	2,004	1,806	9.5	CHi / CHir
211.00	311.00	070112 09:13	070112 14:01	4.50E-04	4.76E-04	1,800	1,800	2,632	2,630	2,834	2,637	10.8	CHi / CHir
211.00	311.00	070112 14:03	070112 15:20	6.43E-04	6.62E-04	1,800	1,800	2,637	2,636	2,989	2,643	10.8	CHi / CHir
311.00	411.00	070112 16:54	070112 18:28	#NV	#NV	#NV	#NV	3,459	#NV	#NV	#NV	12.0	-
411.00	511.00	070113 09:30	070113 11:44	2.68E-05	2.92E-05	1,800	1,800	4,275	4,275	4,479	4,281	13.2	CHi / CHir
411.00	511.00	070113 11:46	070113 12:57	5.00E-05	5.53E-05	1,800	1,800	4,280	4,280	4,723	4,288	13.2	CHi / CHir
511.00	611.00	070113 14:17	070113 16:33	5.85E-05	6.20E-05	1,800	1,800	5,102	5,102	5,304	5,110	14.6	CHi / CHir
511.00	611.00	070113 16:35	070113 17:43	1.01E-04	1.07E-04	1,800	1,800	5,110	5,110	5,561	5,118	14.6	CHi / CHir
611.00	711.00	070114 08:48	070114 11:01	7.67E-06	9.00E-06	1,800	2,700	5,926	5,911	6,112	5,938	16.0	CHi / CHir
611.00	711.00	070114 11:03	070114 12:42	1.55E–05	2.00E-05	1,800	1,800	5,926	5,915	6,365	5,986	16.0	CHi / CHir
694.00	794.00	070115 15:33	070115 17:24	1.93E-05	2.63E-05	1,800	1,800	6,596	6,578	6,783	6,619	17.0	CHi / CHir
694.00	794.00	070115 17:27	070115 21:48	3.80E-05	4.95E-05	1,800	1,800	6,598	6,594	7,047	6,598	17.0	CHi / CHir
111.00	131.00	070117 11:33	070117 13:30	7.50E-04	7.64E-04	1,200	1,200	1,142	1,143	1,348	1,146	8.5	CHi / CHir
131.00	151.00	070117 14:04	070117 15:56	1.33E-07	2.33E-07	1,200	1,200	1,312	1,317	1,517	1,381	8.8	CHi / CHir
151.00	171.00	070117 16:30	070117 17:52	3.17E–05	3.28E-05	1,200	1,200	1,479	1,479	1,679	1,481	9.0	CHi / CHir
171.00	191.00	070117 18:23	070118 08:17	#NV	#NV	10	18,000	1,646	1,651	1,870	1,716	9.2	Pi
191.00	211.00	070118 08:17	070118 10:20	2.00E-08	3.17E-08	1,200	1,200	1,808	1,819	2,024	1,861	9.5	CHi / CHir
211.00	231.00	070118 10:53	070118 12:18	1.33E-06	1.57E-06	1,200	1,200	1,972	1,973	2,172	2,002	9.7	CHi / CHir
231.00	251.00	070118 13:06	070118 14:00	#NV	#NV	#NV	#NV	2,137	#NV	#NV	#NV	9.9	-
251.00	271.00	070118 14:30	070118 15:53	#NV	#NV	10	2,700	2,301	2,306	2,526	2,468	10.2	Pi
271.00	291.00	070118 16:24	070118 17:13	#NV	#NV	#NV	#NV	2,468	#NV	#NV	#NV	10.4	-
291.00	311.00	070118 17:44	070118 19:04	4.60E-04	4.98E-04	1,200	1,200	2,632	2,629	2,834	2,636	10.7	CHi / CHir
411.00	431.00	070119 09:23	070119 10:47	2.33E-07	2.83E-07	1,200	1,200	3,621	3,622	3,822	3,639	12.2	CHi / CHir
431.00	451.00	070119 11:20	070119 12:40	5.50E-06	5.82E-06	1,200	1,200	3,785	3,783	3,983	3,783	12.5	CHi / CHir
451.00	471.00	070119 13:38	070119 14:58	2.50E-05	2.73E-05	1,200	1,200	3,951	3,950	4,151	3,954	12.8	CHi / CHir
471.00	491.00	070119 15:30	070119 16:52	4.67E-06	4.83E-06	1,200	1,200	4,117	4,114	4,314	4,114	13.0	CHi / CHir

Borehole Sec up [m bToC]	Borehole Sec low [m bToC]	Date and time for test ttart YYMMDD hh:mm	Date and time for test stop YYMMDD hh:mm	Q _p (m³/s)	Q _m (m³/s)	t _p (s)	t _⊦ (s)	p₀ (kPa)	p _i (kPa)	p₀ (kPa)	p _⊧ (kPa)	te _w (°C)	Test phases measured, Analysed test phases marked bold
491.00	511.00	070119 17:26	070119 18:46	3.17E-06	3.33E-06	1,200	1,200	4,281	4,277	4,477	4,278	13.3	CHi / CHir
511.00	531.00	070120 08:21	070120 09:42	6.13E-05	6.47E-05	1,200	1,200	4,446	4,444	4,644	4,449	13.5	CHi / CHir
530.00	550.00	070120 10:18	070120 11:14	#NV	#NV	#NV	#NV	4,600	#NV	#NV	#NV	13.8	-
550.00	570.00	070120 11:45	070120 13:02	5.00E-08	5.00E-08	1,200	1,200	4,764	4,730	4,981	4,733	14.0	CHi / CHir
571.00	591.00	070120 13:39	070120 15:40	#NV	#NV	10	4,560	4,938	4,942	5,180	5,026	14.3	Pi
591.00	611.00	070120 16:19	070120 17:09	#NV	#NV	#NV	#NV	5,103	#NV	#NV	#NV	14.6	-
611.00	631.00	070120 17:41	070120 18:38	#NV	#NV	#NV	#NV	5,268	#NV	#NV	#NV	14.9	-
631.00	651.00	070121 08:29	070121 10:11	4.67E-08	5.33E-08	1,200	1,200	5,435	5,441	5,646	5,459	15.2	CHi / CHir
651.00	671.00	070121 13:18	070121 14:22	1.00E-06	1.70E-06	1,200	1,200	5,592	5,588	5,788	5,673	15.4	CHi / CHir
671.00	691.00	070121 14:52	070121 16:23	6.30E-06	6.95E-06	1,200	1,200	5,756	5,743	5,955	5,761	15.7	CHi / CHir
691.00	711.00	070121 16:56	070121 19:26	2.17E-06	2.67E-06	1,200	3,600	5,924	5,920	6,121	5,915	16.0	CHi / CHir
711.00	731.00	070122 08:46	070122 09:58	#NV	#NV	#NV	#NV	6,085	#NV	#NV	#NV	16.2	_
731.00	751.00	070122 10:50	070122 12:17	1.33E-06	1.38E-06	1,200	1,200	6,245	6,235	6,435	6,238	16.5	CHi / CHir
751.00	771.00	070122 13:36	070122 15:00	1.83E-05	2.35E-05	1,200	1,200	6,414	6,405	6,608	6,434	16.7	CHi / CHir
771.00	791.00	070122 15:43	070122 17:52	5.83E-06	6.57E-06	1,200	1,200	6,578	6,571	6,776	6,588	17.0	CHi / CHir
104.00	109.00	070124 09:08	070124 10:32	6.52E-04	6.69E-04	1,200	1,200	964	964	1,164	965	8.8	CHi / CHir
109.00	114.00	070124 10:57	070124 13:05	6.98E-04	7.04E-04	1,200	1,200	1,007	1,006	1,204	1,007	8.8	CHi / CHir
411.00	416.00	070124 17:05	070124 18:29	2.83E-07	3.17E-07	1,200	1,200	3,497	3,500	3,700	3,513	12.0	CHi / CHir
416.00	421.00	070125 08:23	070125 09:40	#NV	#NV	10	1,680	3,548	3,553	3,774	3,554	12.1	Pi
421.00	426.00	070125 10:04	070125 10:52	#NV	#NV	#NV	#NV	6,085	#NV	#NV	#NV	12.2	-
426.00	431.00	070125 11:16	070125 12:55	#NV	#NV	10	3,600	3,629	3,636	3,867	3,712	12.3	Pi
431.00	436.00	070125 13:20	070125 14:43	1.67E–08	1.83E-08	1,200	1,200	3,671	3,722	3,902	3,793	12.3	CHi / CHir
436.00	441.00	070125 15:07	070125 16:20	#NV	#NV	10	1,620	3,712	3,725	3,944	3,722	12.4	Pi
441.00	446.00	070125 16:48	070125 18:12	4.00E-07	4.17E-07	1,200	1,200	3,752	3,749	3,955	3,749	12.5	CHi / CHir
446.00	451.00	070125 18:36	070125 19:58	5.17E–06	5.50E-06	1,200	1,200	3,792	3,789	3,989	3,789	12.5	CHi / CHir
551.00	556.00	070126 09:34	070126 11:08	4.17E–08	4.50E-08	1,200	1,200	4,650	4,613	4,898	4,612	13.9	CHi / CHir
556.00	561.00	070126 11:34	070126 13:12	#NV	#NV	#NV	#NV	4,694	#NV	#NV	#NV	14.0	-
561.00	566.00	070126 13:58	070126 14:36	#NV	#NV	#NV	#NV	4,738	#NV	#NV	#NV	14.0	-
566.00	571.00	070126 14:59	070126 16:39	#NV	#NV	10	3,600	4,779	4,797	5,022	4,862	14.1	Pi

Borehole Sec up [m bToC]	Borehole Sec low [m bToC]	Date and time for test ttart YYMMDD hh:mm	Date and time for test stop YYMMDD hh:mm	Q _p (m³/s)	Q _m (m³/s)	t _p (s)	t _⊧ (s)	p₀ (kPa)	p _i (kPa)	p₀ (kPa)	p _⊧ (kPa)	te _w (°C)	Test phases measured, Analysed test phases marked bold
631.00	636.00	070126 17:42	070126 19:21	#NV	#NV	#NV	#NV	5,309	#NV	#NV	#NV	15.0	_
636.00	641.00	070127 08:26	070127 09:20	#NV	#NV	#NV	#NV	5,353	#NV	#NV	#NV	15.0	-
641.00	646.00	070127 09:47	070127 10:37	#NV	#NV	#NV	#NV	5,393	#NV	#NV	#NV	15.1	-
646.00	651.00	070127 11:03	070127 12:37	7.67E-08	8.83E-08	1,200	1,200	5,434	5,418	5,656	5,443	15.2	CHi / CHir
651.00	656.00	070127 13:03	070127 13:58	#NV	#NV	#NV	#NV	5,475	#NV	#NV	#NV	15.2	-
656.00	661.00	070127 14:22	070127 16:11	8.33E-08	1.67E-07	1,200	1,200	5,516	5,536	5,770	5,686	15.3	CHi / CHir
661.00	666.00	070127 17:13	070127 19:22	#NV	#NV	10	5,400	5,557	5,560	5,782	5,557	15.4	Pi
666.00	671.00	070128 08:17	070128 09:42	1.00E-06	1.55E-06	1,200	1,200	5,598	5,595	5,793	5,671	15.4	CHi / CHir
671.00	676.00	070128 10:07	070128 11:55	#NV	#NV	10	3,600	5,638	5,642	5,871	5,695	15.5	Pi
676.00	681.00	070128 12:22	070128 13:51	4.33E-08	4.33E-08	1,200	1,200	5,679	5,664	5,879	5,661	15.6	CHi / CHir
681.00	686.00	070128 14:19	070128 15:44	6.95E-06	7.57E-06	1,200	1,200	5,720	5,706	5,938	5,724	15.6	CHi / CHir
686.00	691.00	070128 16:10	070128 17:06	#NV	#NV	#NV	#NV	5,761	#NV	#NV	#NV	15.7	-
691.00	696.00	070128 17:33	070128 18:59	6.17E-07	6.83E-07	1,200	1,200	5,802	5,792	6,006	5,792	15.8	CHi / CHir
696.00	701.00	070129 08:23	070129 09:47	1.55E-06	1.78E-06	1,200	1,200	5,846	5,838	6,043	5,852	15.8	CHi / CHir
701.00	706.00	070129 10:16	070129 11:59	2.67E-07	4.17E-07	1,200	1,200	5,885	5,886	6,095	5,993	15.9	CHi / CHir
706.00	711.00	070129 12:42	070129 14:12	8.33E-08	6.83E-08	1,200	1,200	5,927	5,923	6,118	5,916	16.0	CHi / CHir
731.00	736.00	070129 14:49	070129 16:18	1.33E-06	1.40E-06	1,200	1,200	6,131	6,118	6,321	6,118	16.3	CHi / CHir
736.00	741.00	070129 16:43	070129 18:22	#NV	#NV	10	3,600	6,171	6,183	6,396	6,211	16.3	Pi
741.00	746.00	070129 18:54	070129 19:33	#NV	#NV	#NV	#NV	6,212	#NV	#NV	#NV	16.4	-
746.00	751.00	070130 08:14	070130 09:54	1.67E–08	2.33E-08	1,200	1,200	6,256	6,262	6,483	6,273	16.5	CHi / CHir
751.00	756.00	070130 10:20	070130 12:02	2.67E-08	3.67E-08	1,200	1,200	6,296	6,307	6,527	6,340	16.6	CHi / CHir
756.00	761.00	070130 12:47	070130 14:29	2.83E-08	3.00E-08	1,200	1,200	6,338	6,347	6,568	6,365	16.6	CHi / CHir
761.00	766.00	070130 14:54	070130 16:35	#NV	#NV	10	3,600	6,377	6,388	6,616	6,468	16.7	Pi
766.00	771.00	070130 17:00	070130 18:21	1.91E–05	2.48E-05	1,200	1,200	6,417	6,409	6,620	6,441	16.8	CHi / CHir
771.00	776.00	070131 08:08	070131 09:01	#NV	#NV	#NV	#NV	6,460	#NV	#NV	#NV	16.8	-
776.00	781.00	070131 09:28	070131 11:02	5.67E-06	6.45E-06	1,200	1,200	6,500	6,492	6,691	6,508	16.9	CHi / CHir
495.00	515.00	20061128 19:53	20061205 15:52	3.50E-07	3.57E-07	2,827,044	12,780	4,316	4,311	4,186	4,306	13.3	CRw / CRwr
764.00	769.00	20061207 15:07	20070109 12:28	1.33E-05	1.33E-05	578,490	9,588	6,404	6,391	6,150	6,347	16.8	CRw / CRwr

Nomenclature	
Q _p	Flow in test section immediately before stop of flow [m³/s]
Q _m	Arithmetical mean flow during perturbation phase [m ³ /s]
t _p	Duration of perturbation phase [s]
t _f	Duration of recovery phase [s]
p ₀	Pressure in borehole before packer inflation [kPa]
p _i	Pressure in test section before start of flowing [kPa]
p _p	Pressure in test section before stop of flowing [kPa]
p _F	Pressure in test section at the end of the recovery [kPa]
Te _w	Temperature in test section
Test phases	CHi Constant Head injection phase
	CHir: Recovery phase following the constant head injection phase
	CRw: Constant rate withdrawal
	CRwr: Recovery phase following the constanrt rate phase
	Pi: Pulse injection phase
#NV	not analysed/no values

	oosition	Stationary f	low parameters	Transien Flow reg		Formation	n parameter	'S									Static co	nditions
up m btoc	low m btoc	Q/s m²/s	T _M m²/s	Perturb. phase	Recovery phase	T _{f1} m²/s	T _{f2} m²/s	T _{s1} m²/s	T _{s2} m²/s	T _⊤ m²/s	T _{TMIN} m²/s	T _{™AX} m²/s	C m³/Pa	ξ _	dt₁ min	dt₂ min	p* kPa	h _{wif} m.a.s.l.
111.00	211.00	3.8E-05	5.0E-05	22	WBS2	1.2E-04	3.0E-04	2.4E-04	#NV	3.0E-04	7.0E-05	5.0E-04	4.4E-09	30.3	0.4	16.7	1,806.1	13.39
211.00	311.00	2.2E-05	2.8E-05	22	WBS22	1.9E–05	4.9E–05	1.1E–05	3.6E–05	1.1E–05	9.0E-06	5.0E–05	1.7E–08	-4.9	0.9	2.7	2,630.9	13.61
211.00	311.00	1.8E–05	2.3E-05	2	WBS22	4.9E-05	#NV	9.7E-06	3.2E-05	9.7E-06	8.0E-06	5.0E-05	1.0E-08	-4.6	1.0	3.2	2,633.0	13.82
311.00	411.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–10	1.0E-12	1.0E-10	#NV	#NV	#NV	#NV	#NV	#NV
411.00	511.00	1.3E-06	1.7E-06	22	WBS22	6.8E-07	1.7E-06	2.8E-07	9.5E–07	9.5E-07	6.0E-07	3.0E-06	4.7E–10	-4.9	#NV	#NV	4,274.7	13.97
411.00	511.00	1.1E–06	1.4E-06	22	WBS22	6.1E–07	1.5E–06	3.9E-07	2.4E-06	6.1E–07	4.0E-07	2.0E-06	2.3E-10	-3.5	0.5	5.5	4,275.4	14.04
511.00	611.00	2.8E-06	3.7E-06	22	WBS22	2.2E-06	5.4E-06	1.2E-06	5.5E-06	5.5E-06	3.0E-06	8.0E-06	1.1E–09	-4.1	8.9	25.9	5,105.8	15.39
511.00	611.00	2.2E-06	2.9E-06	22	WBS22	1.5E-06	4.8E-06	1.9E–06	6.2E-06	6.2E-06	2.0E-06	8.0E-06	4.6E-09	-2.0	9.9	27.1	5,108.4	15.66
611.00	711.00	3.7E-07	4.9E-07	22	WBS2	8.2E-07	2.3E-07	1.2E–07	#NV	1.2E–07	8.0E-08	4.0E-07	1.3E–09	-4.8	#NV	#NV	5,902.9	13.47
611.00	711.00	3.4E-07	4.4E-07	2	WBS22	1.8E-07	#NV	1.5E–07	1.0E-07	1.8E–07	8.0E-08	4.0E-07	4.1E–09	-3.6	1.6	20.2	5,889.9	12.15
694.00	794.00	9.3E–07	1.2E-06	22	WBS22	2.3E-06	4.6E-07	5.2E–07	2.6E-07	4.6E-07	9.0E-08	6.0E-07	1.1E–09	-4.0	7.8	23.6	6,578.9	13.45
694.00	794.00	8.2E-07	1.1E–06	22	WBS22	1.4E-06	4.1E-07	1.3E–06	3.3E-07	4.1E-07	9.0E–08	6.0E-07	1.4E-09	-0.9	8.8	24.9	6,580.7	13.63
111.00	131.00	3.6E–05	3.8E-05	2	WBS2	3.0E-05	3.0E-04	1.6E-04	#NV	3.0E-04	6.0E-05	4.0E-04	3.7E-09	0.0	0.4	18.5	1,145.8	13.39
131.00	151.00	6.5E–09	6.8E-09	22	WBS22	6.8E-09	1.7E–09	2.7E-08	1.3E–09	1.7E–09	9.0E-10	7.0E-09	1.1E–10	-1.9	#NV	#NV	1,297.7	12.00
151.00	171.00	1.6E–06	1.6E-06	2	WBS2	4.3E-06	#NV	4.1E-06	#NV	4.1E-06	1.0E-06	6.0E-06	5.4E–10	8.3	1.0	15.9	1,477.0	13.45
171.00	191.00	#NV	#NV	#NV	22	#NV	#NV	1.1E–11	4.2E-12	4.2E-12	1.0E-12	8.0E-12	3.2E–11	-1.1	#NV	#NV	#NV	#NV
191.00	211.00	9.6E-10	1.0E–09	#NV	WBS2	#NV	#NV	3.8E-10	#NV	3.8E-10	8.0E-11	8.0E-10	6.2E–11	-1.0	#NV	#NV	1,791.3	11.88
211.00	231.00	6.6E-08	6.9E–08	22	WBS22	1.2E-07	4.1E-08	2.0E-07	8.1E–08	2.0E-07	6.0E-08	4.0E-07	8.6E–11	7.3	1.3	4.5	1,995.2	15.88
231.00	251.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
251.00	271.00	#NV	#NV	#NV	22	#NV	#NV	4.9E–11	1.2E–11	1.2E–11	5.0E-12	5.0E-11	5.4E–11	-0.3	#NV	#NV	#NV	#NV
271.00	291.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
291.00	311.00	2.2E-05	2.3E-05	22	WBS22	2.3E-05	4.5E-05	1.1E–05	3.8E-05	1.1E–05	9.0E-06	5.0E-05	1.5E–08	-4.8	0.8	6.0	2,628.8	13.40
411.00	431.00	1.1E–08	1.2E-08	22	WBS22	1.1E–08	4.4E-09	3.2E-08	1.1E–08	3.2E-08	9.0E-09	5.0E-08	5.7E–11	7.5	3.2	6.0	3,623.9	14.39
431.00	451.00	2.7E-07	2.8E-07	2	WBS2	3.0E-07	#NV	6.4E–07	#NV	3.0E-07	2.0E-07	7.0E-07	6.1E–11	0.4	0.6	11.5	3,782.2	13.84
451.00	471.00	1.2E-06	1.3E-06	22	WBS22	8.1E-07	1.4E–06	4.6E-07	1.5E-06	1.5E–06	7.0E-07	4.0E-06	1.1E–09	-4.1	#NV	#NV	3,944.1	13.66
471.00	491.00	2.3E-07	2.4E-07	2	WBS2	4.8E-07	#NV	1.5E–06	#NV	4.8E-07	2.0E-07	8.0E-07	8.3E–11	6.5	0.7	16.8	4,114.6	14.34
491.00	511.00	1.6E–07	1.6E–07	2	WBS2	4.1E-07	#NV	5.4E-07	#NV	4.1E–07	1.0E-07	8.0E-07	9.1E–11	9.2	0.5	16.2	4,277.7	14.28

Table 6-2. Results from analysis of hydraulic tests in KLX19A (for nomenclature see Appendix 4 and below).

Interval p	oosition	Stationary f	low parameters	Transier Flow reg	nt analysis jime	Formatior	n parameter	rs									Static co	nditions
up m btoc	low m btoc	Q/s m²/s	T _M m²/s	Perturb. phase	Recovery phase	T _{f1} m²/s	T _{f2} m²/s	T _{s1} m²/s	T _{s2} m²/s	Τ _τ m²/s	T _{™IN} m²/s	T _{™AX} m²/s	C m³/Pa	ξ _	dt₁ min	dt₂ min	p* kPa	h _{wif} m.a.s.l.
511.00	531.00	3.0E-06	3.2E-06	22	WBS22	2.5E-06	4.9E-06	1.2E-06	6.2E–06	4.9E-06	1.0E–06	8.0E-06	2.7E-09	-2.0	4.4	18.8	4,444.2	14.56
530.00	550.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-10	1.0E–13	1.0E-10	#NV	#NV	#NV	#NV	#NV	#NV
550.00	570.00	2.0E-09	2.0E-09	2	WBS2	2.0E-09	#NV	1.1E–08	#NV	2.0E-09	8.0E-10	5.0E-09	6.3E-11	2.5	0.3	13.9	4,715.0	9.68
571.00	591.00	#NV	#NV	#NV	22	#NV	#NV	6.5E-10	1.1E–10	1.1E–10	5.0E-11	5.0E-10	5.9E–11	2.14	21.4	69.8	#NV	#NV
591.00	611.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
611.00	631.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-10	#NV	#NV	#NV	#NV	#NV	#NV
631.00	651.00	2.2E-09	2.3E-09	2	WBS22	1.2E-09	#NV	2.7E-09	6.9E-10	1.2E-09	8.0E-10	3.0E-09	5.4E–11	-0.4	1.9	12.7	5,397.2	11.83
651.00	671.00	4.9E-08	5.1E–08	22	WBS22	5.0E-08	8.3E–09	5.4E-08	1.8E-08	5.4E-08	1.0E–08	7.0E–08	1.9E–10	-3.3	0.5	2.9	5,612.5	17.15
671.00	691.00	2.9E-07	3.1E–07	22	WBS22	5.0E-07	2.5E-07	2.3E-07	#NV	2.3E-07	9.0E-08	6.0E-07	4.5E-09	1.9	#NV	#NV	5,743.3	13.85
691.00	711.00	1.1E–07	1.1E–07	22	WBS22	5.4E-08	#NV	4.6E-08	3.8E-08	5.4E–08	1.0E–08	8.0E-08	4.6E-11	-2.8	0.7	17.1	5,906.2	13.81
711.00	731.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	#NV	#NV	#NV	#NV
731.00	751.00	6.5E-08	6.8E–08	2	WBS2	1.9E-07	#NV	2.3E-07	#NV	2.3E-07	8.0E-08	5.0E-07	5.5E-11	3.7	1.7	15.8	6,235	14.11
751.00	771.00	8.9E–07	9.3E-07	22	WBS22	9.0E-07	3.6E-07	4.5E-07	2.5E-07	3.6E-07	7.0E–08	4.0E-07	3.4E-10	-2.6	7.3	16.9	6,398	14.06
771.00	791.00	2.8E-07	2.9E-07	2	WBS22	1.8E–07	#NV	2.0E-06	1.1E–07	1.8E–07	7.0E-08	4.0E-07	4.9E-10	-2.4	1.2	10.8	6,546.2	12.59
104.00	109.00	3.2E-05	2.6E-05	2	WBS2	6.8E–05	#NV	7.7E–05	#NV	6.8E–05	3.0E-05	8.0E-05	5.0E-09	4.2	1.1	16.8	965.3	13.57
109.00	114.00	3.5E–05	2.9E-05	22	WBS2	9.9E-05	4.9E-04	2.2E-04	#NV	4.9E-04	8.0E-05	5.0E–04	3.6E–09	10.4	0.6	14.8	1,007.1	13.62
411.00	416.00	1.4E-08	1.2E–08	22	WBS22	3.2E-08	1.1E–08	3.9E-08	1.4E–08	3.9E-08	8.0E-09	5.0E-08	1.9E–11	8.1	1.0	2.3	3,500.9	14.38
416.00	421.00	#NV	#NV	#NV	2	#NV	#NV	3.2E-10	#NV	3.2E-10	1.0E–10	6.0E–10	1.7E–11	1.0	0.2	20.8	#NV	#NV
421.00	426.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
426.00	431.00	#NV	#NV	#NV	2	#NV	#NV	2.3E-11	#NV	2.3E-11	9.0E-12	6.0E–11	1.4E–11	1.1	3.3	57.8	#NV	#NV
431.00	436.00	9.1E–10	7.5E–10	2	WBS2	1.6E–10	#NV	2.0E-11	#NV	1.6E–10	8.0E-11	8.0E-10	4.1E–11	-1.5	#NV	#NV	3,640.3	11.90
436.00	441.00	#NV	#NV	#NV	2	#NV	#NV	1.8E–10	#NV	1.8E–10	8.0E-11	6.0E–10	1.1E–11	1.3	0.2	7.3	#NV	#NV
441.00	446.00	1.9E-08	1.6E–08	2	WBS22	2.9E-08	#NV	2.4E-08	4.4E08	2.9E-08	1.0E-08	8.0E-08	1.4E–11	4.5	2.0	13.5	3,745.9	14.31
446.00	451.00	2.5E-07	2.1E–07	22	WBS22	3.2E-07	6.1E–07	6.9E-07	1.2E-06	3.2E-07	8.0E-08	8.0E–07	3.9E–11	1.4	0.6	4.7	3,786.3	14.25
551.00	556.00	1.4E-09	1.2E–09	2	WBS2	1.4E-09	#NV	6.3E-09	#NV	1.4E-09	8.0E-10	6.0E-09	2.0E-11	2.0	0.7	16.6	4,609.5	10.59
556.00	561.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E–13	1.0E-11	#NV	#NV	#NV	#NV	#NV	#NV
561.00	566.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
566.00	571.00	#NV	#NV	#NV	22	#NV	#NV	2.0E-10	1.22E-11	2.0E-10	5.0E-11	5.0E-10	1.6E–11	0.6	0.3	14.1	#NV	#NV

Interval	position	Stationary fl	ow parameters	Transien Flow reg	t analysis ime	Formation	n parameters	S									Static co	nditions
up m btoc	low m btoc	Q/s m²/s	T _M m²/s	Perturb. phase	Recovery phase	T _{f1} m²/s	T _{f2} m²/s	T _{s1} m²/s	T _{s2} m²/s	Τ _τ m²/s	T _{TMIN} m²/s	T _{TMAX} m²/s	C m³/Pa	ξ _	dt₁ min	dt₂ min	p* kPa	h _{wif} m.a.s.l.
631.00	636.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	#NV	#NV	#NV	#NV
636.00	641.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	#NV	#NV	#NV	#NV
641.00	646.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E–13	1.0E-11	#NV	#NV	#NV	#NV	#NV	#NV
646.00	651.00	3.2E-09	2.6E-09	22	WBS22	3.5E-09	1.8E-09	2.0E-09	8.08E-10	2.0E-09	9.0E-09	5.0E-09	2.6E-11	-1.1	1.0	2.6	5,388.8	10.97
651.00	656.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	#NV	#NV	#NV	#NV
656.00	661.00	3.5E-09	2.9E-09	22	WBS22	3.9E-09	6.5E-10	3.4E-08	5.30E-10	6.5E-10	3.0E-10	3.0E-09	1.4E-10	-0.8	#NV	#NV	5,623.5	26.59
661.00	666.00	#NV	#NV	#NV	22	#NV	#NV	1.6E-09	4.00E-10	4.0E-10	1.0E-10	8.0E-10	1.4E-10	-3.1	#NV	#NV	#NV	#NV
666.00	671.00	5.0E-08	4.1E-08	22	WBS22	8.0E-08	1.15E–08	3.1E-07	2.1E-08	3.1E–07	8.0E-08	4.0E-07	6.4E-11	4.8	0.4	1.0	5,617.0	17.61
671.00	676.00	#NV	#NV	#NV	22	#NV	#NV	9.3E-12	3.70E-11	3.7E-11	8.0E-12	5.0E-11	1.8E–11	-0.9	#NV	#NV	#NV	#NV
676.00	681.00	2.0E-09	1.6E–09	2	WBS2	2.4E-09	#NV	4.3E-09	#NV	2.4E-09	8.0E-10	6.0E–09	2.3E-11	4.2	0.6	11.7	5,652.7	12.93
681.00	686.00	2.9E-07	2.4E-07	2	WBS2	2.5E-07	#NV	2.2E-07	#NV	2.5E-07	9.0E-08	4.0E-07	3.9E-09	-1.2	1.1	16.9	5,697.2	13.31
686.00	691.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E-11	1.0E-13	1.0E-11	#NV	#NV	#NV	#NV	#NV	#NV
691.00	696.00	2.8E-08	2.3E-08	2	WBS22	1.9E–08	4.8E-08	8.6E-09	3.4E-08	8.6E-09	7.0E-09	5.0E-08	4.7E-11	-2.6	#NV	#NV	5,781.8	13.61
696.00	701.00	7.4E-08	6.1E–08	22	WBS22	1.5E–07	4.9E-08	1.5E–07	3.4E08	1.5E-07	8.0E-08	3.0E-07	6.5E–11	2.5	0.5	1.2	5,819.5	13.30
701.00	706.00	1.3E–08	1.0E–08	2	WBS22	7.8E-09	#NV	8.3E-08	4.3E-09	7.8E-09	3.0E-09	3.0E-08	1.9E-11	-1.0	6.5	16.5	5,845.9	11.83
706.00	711.00	4.2E-09	3.5E-09	2	WBS2	3.8E-09	#NV	7.2E-09	#NV	3.8E-09	1.0E-09	8.0E-09	1.2E–11	2.5	0.9	12.5	5,914.6	14.66
731.00	736.00	6.4E-08	5.3E-08	2	WBS2	1.7E–07	#NV	1.4E-07	#NV	1.4E–07	7.0E-08	3.0E-07	2.6E-11	7.9	0.6	3.8	6,115.3	14.34
736.00	741.00	#NV	#NV	#NV	2	#NV	#NV	6.2E-11	#NV	6.2E-11	1.0E–11	7.0E–11	1.8E–11	0.6	1.3	37.8	#NV	#NV
741.00	746.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E-13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
746.00	751.00	7.4E–10	6.1E–10	2	WBS2	8.4E-10	#NV	7.1E-10	#NV	8.4E-10	6.0E-10	3.0E-09	3.1E–11	1.6	1.0	14.5	6,239.3	14.51
751.00	756.00	1.2E-09	9.8E-10	2	WBS22	6.8E-10	#NV	2.0E-09	4.5E-10	6.8E-10	4.0E-10	2.0E-09	1.8E–11	0.2	3.7	17.1	6,278.0	14.30
756.00	761.00	1.3E–09	1.0E-09	22	WBS22	4.3E-10	1.4E-09	3.8E-10	#NV	3.8E-10	9.0E-11	9.0E-09	2.4E–11	-1.1	10.0	14.0	6,311	13.50
761.00	766.00	#NV	#NV	#NV	2	#NV	#NV	2.5E-11	#NV	2.5E-11	8.0E-12	6.0E-11	2.1E–11	0.4	2.5	36.3	#NV	#NV
766.00	771.00	8.9E-07	7.3E-07	22	WBS22	8.3E-07	4.1E-07	4.7E-07	2.4E-07	4.13E–07	8.0E-08	5.0E-07	3.1E–10	-3.0	#NV	#NV	6,397	14.00
771.00	776.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E-11	#NV	#NV	#NV	#NV	#NV	#NV
776.00	781.00	2.8E-07	2.3E-07	2	WBS22	2.1E-07	#NV	3.0E-06	1.2E-07	2.1E-07	9.0E-08	4.0E-07	6.8E-10	-1.8	2.1	13.0	6,469	13.02
495.00	515.00	2.70E-06	2.90E-06	#NV	WBS22	#NV	#NV	2.6E-06	5.8E-06	5.8E-06	1.0E-06	6.0E-06	6.8E–09	-2.2	11.4	95.5	4,331	16.38
764.00	769.00	5.40E-07	4.50E-07	#NV	WBS22	#NV	#NV	2.9E-07	7.2E-07	2.9E-07	5.0E-08	3.0E-07	9.7E-10	-4.6	0.6	23.3	6,405	16.37

Nomenclature	
Q/s	Specific capacity.
T _M	Transmissivity according to /Moye 1967/.
Flow regime	The flow regime description refers to the recommended model used in the transient analysis. WBS denotes wellbore storage and skin and is followed by a set.
	of numbers describing the flow dimension used in the analysis (1 = linear flow, 2 = radial flow, 3 = spherical flow). If only one number is used (e.g. WBS2 or 2).
	a homogeneous flow model (1 composite zone) was used in the analysis, if two numbers are given (WBS22 or 22) a 2 zones composite model was used.
T _f	Transmissivity derived from the analysis of the perturbation phase (CHi). In case a homogeneous flow model was used only one T_f value is reported, in case a two zone composite flow model was used both T_{f1} (inner zone) and T_{f2} (outer zone) are given.
Ts	Transmissivity derived from the analysis of the recovery phase (CHir or Pi). In case a homogeneous flow model was used only one T_s value is reported, in case a two zone composite flow model was used both T_{s1} (inner zone) and T_{s2} (outer zone) are given.
Τ _τ	Recommended transmissivity.
T _{TMIN}	Confidence range lower limit.
T_{TMAX}	Confidence range upper limit.
С	Wellbore storage coefficient.
ξ	Skin factor (calculated based on a storativity of 1.10 ⁻⁶).
dt ₁	Estimated start time of evaluation.
dt ₂	Estimated stop time of evaluation.
p*	The parameter p* denoted the static formation pressure (measured at transducer depth) and was derived from the HORNER plot of the CHir phase using straight line or type-curve extrapolation.
h _{wif}	Fresh-water head (based on transducer depth and p*).
#NV	Not analysed/no values.

Borehole	Borehole	Recommended transmissivity	ri-index	Time t ₂ for radius of influence calculation	Radius of Influence
secup	seclow	Tt			ri
[m b ToC]	[m b ToC]	[m²/s]	[-]	[s]	[m]
111.00	211.00	3.0E-04	0	1,800	398.03
211.00	311.00	1.1E–05	-1	159	51.76
211.00	311.00	9.7E-06	-1	192	55.24
311.00	411.00	1.0E–10	#NV	#NV	#NV
411.00	511.00	9.5E-07	-1	1,800	94.54
411.00	511.00	6.1E–07	-1	332.4	36.43
511.00	611.00	5.5E-06	0	1,800	147.00
511.00	611.00	6.2E-06	0	1,800	151.23
611.00	711.00	1.2E–07	0	2,700	69.51
611.00	711.00	1.8E–07	0	1,800	62.16
694.00	794.00	4.6E-07	1	1,800	79.01
694.00	794.00	4.1E-07	1	1,800	76.76
111.00	131.00	3.0E-04	0	1,200	325.95
131.00	151.00	1.7E–09	1	#NV	#NV
151.00	171.00	4.1E-06	0	1,200	111.15
171.00	191.00	4.2E-12	1	#NV	#NV
191.00	211.00	3.8E-10	0	1,200	10.93
211.00	231.00	2.0E-07	1	271.8	25.00
231.00	251.00	1.0E–11	#NV	#NV	#NV
251.00	271.00	1.2E–11	1	#NV	#NV
271.00	291.00	1.0E–11	#NV	#NV	#NV
291.00	311.00	1.1E–05	-1	357	78.26
411.00	431.00	3.2E-08	1	357	18.00
431.00	451.00	3.0E-07	0	1,200	57.72
451.00	471.00	1.5E–06	0	#NV	#NV
471.00	491.00	4.8E-07	0	1,200	86.17
491.00	511.00	4.1E-07	0	1,200	62.73
511.00	531.00	4.9E-06	0	1,200	116.43
530.00	550.00	1.0E-10	#NV	#NV	#NV
550.00	570.00	2.0E-09	0	1,200	16.44
571.00	591.00	1.1E–10	#NV	#NV	#NV
591.00	611.00	1.0E–11	#NV	#NV	#NV
611.00	631.00	1.0E-11	#NV	#NV	#NV
631.00	651.00	1.2E-09	0	1,200	14.65
651.00	671.00	5.4E-08	1	175.8	14.41
671.00	691.00	2.3E-07	0	1,200	54.19
691.00	711.00	5.4E-08	0	1,200	37.65
711.00	731.00	1.0E-11	#NV	#NV	#NV
731.00	751.00	2.3E-07	0	1,200	54.07
751.00	771.00	3.6E–07	1	1,015.8	55.73
771.00	791.00	1.8E–07	0	1,200	50.97
104.00	109.00	6.8E-05	0	1,200	224.63
109.00	114.00	4.9E-04	0	888	257.77
411.00	416.00	3.9E-08	1	135.6	11.09
	-10.00	0.02-00	I	100.0	11.03

Table 6-3. Results from the ri-index calculation of hydraulic tests in KLX19A (see Section 4.5.5 for details and nomenclature).

Borehole	Borehole	Recommended transmissivity	ri-index	Time t₂ for radius of influence calculation	Radius of Influence
secup	seclow	Tt			ri
[m b ToC]	[m b ToC]	[m²/s]	[-]	[s]	[m]
416.00	421.00	3.2E-10	0	1,680	12.41
421.00	426.00	1.0E–11	#NV	#NV	#NV
426.00	431.00	2.3E–11	0	3,600	9.39
431.00	436.00	1.6E–10	0	1,200	8.75
436.00	441.00	1.8E–10	0	1,620	10.56
441.00	446.00	2.9E-08	0	1,200	32.38
446.00	451.00	3.2E-07	0	1,200	58.86
551.00	556.00	1.4E-09	0	1,200	15.00
556.00	561.00	1.0E-11	#NV	#NV	#NV
561.00	566.00	1.0E-11	#NV	#NV	#NV
566.00	571.00	2.0E-10	1	846	7.76
631.00	636.00	1.0E–11	#NV	#NV	#NV
636.00	641.00	1.0E–11	#NV	#NV	#NV
641.00	646.00	1.0E-11	#NV	#NV	#NV
646.00	651.00	2.0E-09	1	153	5.92
651.00	656.00	1.0E-11	#NV	#NV	#NV
656.00	661.00	6.5E-10	1	#NV	#NV
661.00	666.00	4.0E-10	1	#NV	#NV
666.00	671.00	3.1E-07	1	57.6	12.80
671.00	676.00	3.7E–11	0	3,600	10.57
676.00	681.00	2.4E-09	0	1,200	17.39
681.00	686.00	2.5E-07	0	1,200	55.28
686.00	691.00	1.0E–11	#NV	#NV	#NV
691.00	696.00	8.6E-09	0	1,200	23.83
696.00	701.00	1.5E–07	1	70.8	11.87
701.00	706.00	7.8E-09	1	1,200	23.23
706.00	711.00	3.8E-09	0	1,200	19.43
731.00	736.00	1.4E-07	0	1,200	48.21
736.00	741.00	6.2E-11	0	3,600	12.03
741.00	746.00	1.0E–11	#NV	#NV	#NV
746.00	751.00	8.4E–10	0	1,200	13.33
751.00	756.00	6.8E-10	0	1,200	12.64
756.00	761.00	3.8E-10	0	1,200	10.94
761.00	766.00	2.5E-11	0	3,600	9.60
766.00	771.00	4.1E–07	1	1,200	62.73
771.00	776.00	1.0E–11	#NV	#NV	#NV
776.00	781.00	2.1E-07	0	1,200	53.10
495.00	515.00	5.8E-06	-1	1,398	61.82
764.00	769.00	2.9E-07	0	12,780	397.07

The Figures 6-1 to 6-3 present the transmissivity, conductivity and hydraulic freshwater head profiles.

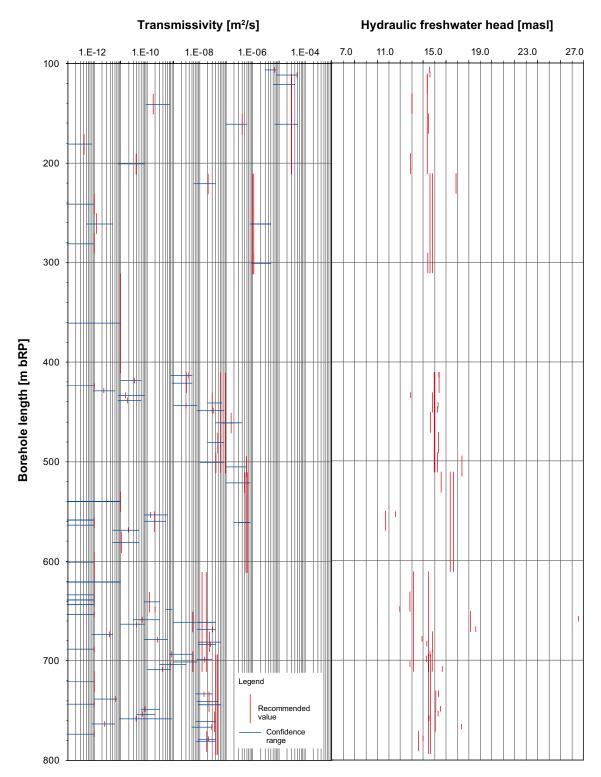


Figure 6-1. Results summary – profiles of transmissivity and equivalent freshwater head extrapolated.

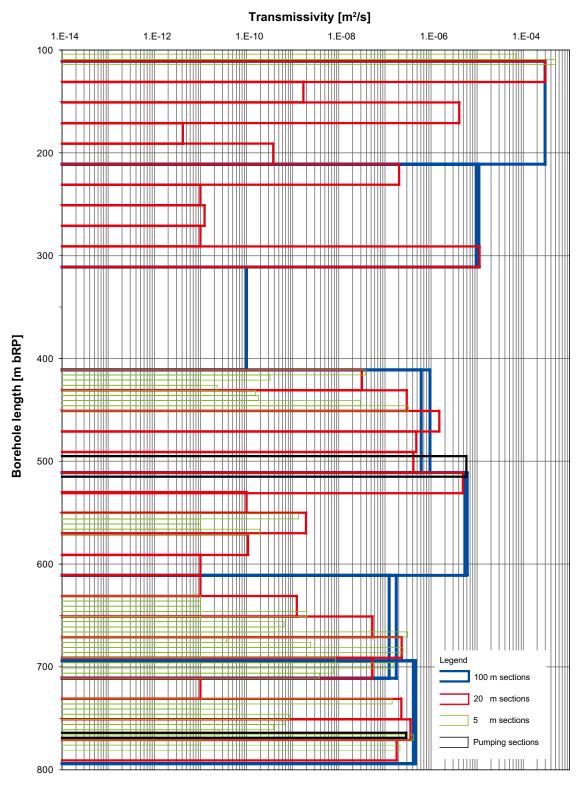


Figure 6-2. Results summary – profile of transmissivity.

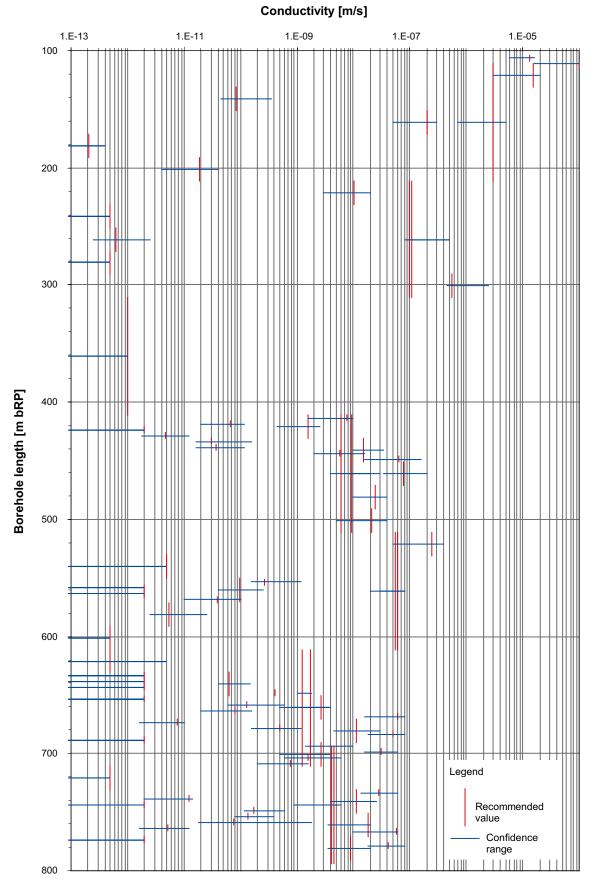


Figure 6-3. Results summary – profile of hydraulic conductivity.

6.2 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.

6.2.1 Comparison of steady state and transient analysis results

The steady state derived transmissivities (T_M) and specific capacities (Q/s) were compared in a cross-plot with the recommended transmissivity values derived from the transient analysis (see Figure 6-4).

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

6.2.2 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 an 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.

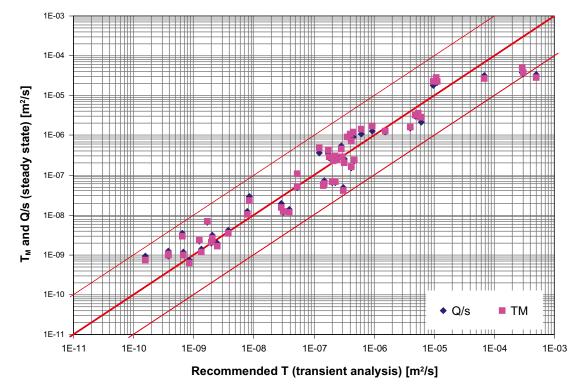


Figure 6-4. Correlation analysis of transmissivities derived by steady state and transient methods.

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). The water compressibility depends on the temperature and salinity. However, for temperature and salinity values as encountered at the Oskarshamn site the water compressibility varies only slightly between $4.5 \cdot 10^{-10}$ and $5.0 \cdot 10^{-10}$ 1/Pa.

A water compressibility of $5 \cdot 10^{-10}$ 1/Pa and a rock compressibility of $1 \cdot 10^{-10}$ 1/Pa was assumed for the analysis. In addition, the test zone compressibility is influenced by the test tool (packer compliance). The test tool compressibility was calculated as follow:

$$c = \frac{\Delta V}{\Delta p} \times \frac{1}{V} [1/Pa]$$

- ΔV Volume change of 2 Packers (The volume change was estimated at 7.10⁻⁷ m³/100 kPa based on the results of laboratory tests conducted by GEOSIGMA) [m³]
- Δp Pressure change in test section (usually 2.10⁵ Pa) [Pa]
- *V* Volume in test section [m³]

Table 6-4 presents the calculated compressibilities for each relevant section length. The average value for the test tool compressibility based on different section length is $1 \cdot 10^{-10}$ 1/Pa.

The sum of the compressibilities (water, rock, test tool) leads to a test zone compressibility with a value of $7 \cdot 10^{-10}$ 1/Pa. This value is used for the calculation of the theoretical wellbore storage coefficient.

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.

Figure 6-5 presents a cross-plot of the matched and theoretical wellbore storage coefficients.

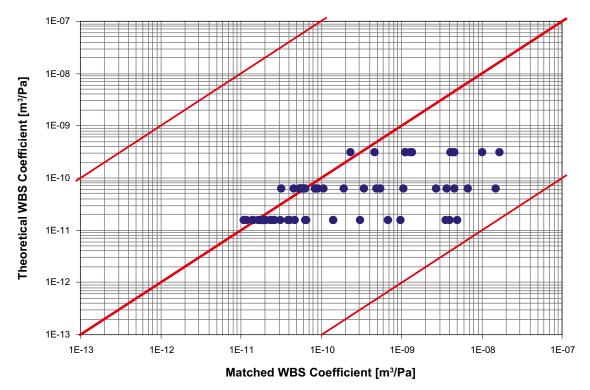


Figure 6-5. Correlation analysis of theoretical and matched wellbore storage coefficients.

Length of test section [m]	Volume in test section [m³]	Compressibility [1/Pa]
5	0.023	3·10 ⁻¹⁰
20	0.091	8·10 ⁻¹¹
100	0.454	2·10 ⁻¹¹
Average compressibility:		1·10 ⁻¹⁰

Table 6-4. Test tool compressibility values based on packer displacement.

It can be seen that the matched wellbore storage coefficients differ up to three orders of magnitude from the theoretical. This phenomenon was already observed at the previous boreholes. A two or 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 two orders of magnitude does not seem probable. This discrepancy is not fully understood, but following hypotheses may be formulated:

- · increased compressibility of the packer system,
- as shown by previous work conducted at site, the phenomenon of increased wellbore storage coefficients can be explained by turbulent flow induced by the test in the vicinity of the borehole. Considering the fact that deviations concerning the wellbore storage rather occur in test sections with a higher transmissivity (which can lead to turbulent flow) seems to rest upon this hypothesis.

7 Conclusions

7.1 Transmissivity

Figure 6-1 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 4.5.9.

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

In few cases the tests were not analysable because the compliance phase following the packer inflation was to long or because the conducted preliminary pulse did not recover. Both responses are indicative for a very low interval transmissivity and a transmissivity value of $1 \cdot 10^{-11}$ m²/s was recommended (regarded as the upper limit of the confidence range).

If the conducted preliminary pulse injection (PI) showed a slow recovery the pulse test was prolonged and no further injection test was performed. The pulse test was used for a quantitative analysis. In three cases of the 20 m sections, the preliminary pulse was prolonged and the recommended transmissivities range between $4.2 \cdot 10^{-12}$ m²/s and $1.1 \cdot 10^{-10}$ m²/s, respectively. Testing the 5 m sections, the pulse test was prolonged and analysed in eight cases. The derived transmissivities range from $2.3 \cdot 10^{-11}$ m²/s to $4.0 \cdot 10^{-10}$ m²/s

The recommended transmissivities derived from the conducted injection tests (CHi and CHir) range from $1.2 \cdot 10^{-7}$ m²/s to $3.0 \cdot 10^{-4}$ m²/s (100 m tests), $3.8 \cdot 10^{-10}$ m²/s to $3.0 \cdot 10^{-4}$ m²/s and $2.0 \cdot 10^{-10}$ m²/s to $5.0 \cdot 10^{-4}$ m²/s, respectively.

A few 5 and 20 m sections show larger transmissivities than the appropriate longer interval. The most of the differences are relatively small and are covered by the confidence range. Additionally, this can be explained by crossflow and connections to the adjacent zones.

7.2 Equivalent freshwater head

Figure 6-1 presents a profile of the derived equivalent freshwater head expressed in metres above sea level. The method used for deriving the equivalent freshwater head is described in Section 4.5.8.

The head profile shows the freshwater head ranges from 10.6 m to 17.2 m. The highest freshwater heads are measured between 500 m and 600 m. Test section 565.00-561.00 m shows a unrealistic high freshwater head (26.6 m asl). This value is a result of the very low transmissivity of this section ($6.5 \cdot 10^{-10}$ m²/s), the relatively short test duration and uncertainties concerning packer compliance.

In general, the uncertainty related to the derived freshwater heads is dependent on the test section transmissivity. Due to the relatively short pressure recovery phase, the static pressure extrapolation becomes increasingly uncertain at lower transmissivities.

7.3 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 some high skins were observed in sections with transmissivities as low as 1.10⁻⁸ m²/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 all of the cases it was possible to get a good match quality by using radial flow geometry. In no cases an alternative analysis with a flow dimension unequal to two was performed. The analyses are presented in Appendix 2.

8 References

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Borehole: KLX19 A

APPENDIX 1

File Description Table

HYDRO)TES	TING	WITH	I PSS	DRILLHOLE IDENTIFICATIO	N NO.: F	KLX19A		
TEST- A	AND	FILEP	ROTO	OCOL	Testorder dated : 2006-11-27				
Testatest		Interval		N.		Tractions	Conicilia	D1-44-1	C' an
Teststart		boundari			me of Datafiles	Testtype	Copied to	Plotted (date)	Sign.
Date 2007-01-11	Time 08:17	Upper 111.00	Lower 211.00	(*.HT2-file) KLX19A_0111.00_200701110817.ht2	(*.CSV-file) KLX19A_111.00-211.00_070111_1_CHir_Q_r.csv	Chir	disk/CD 2007-02-01	(date) 2007-01-11	
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2007-01-12	09:13	211.00	311.00	KLX19A_0211.00_200701120913.ht2	KLX19A_211.00-311.00_070112_2_CHir_Q_r.csv	Chir	2007-02-01	2007-01-12	
2007-01-12	14:03	211.00	311.00	KLX19A_0211.00_200701121403.ht2	KLX19A_211.00-311.00_070112_3_CHir_Q_r.csv	Chir	2007-02-01	2007-01-12	
2007-01-12	16:54	311.00	411.00	KLX19A_0311.00_200701121654.ht2	KLX19A_311.00-411.00_070112_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-13	
2007-01-13	09:30	411.00	511.00	KLX19A_0411.00_200701130930.ht2	KLX19A_411.00-511.00_070113_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-13	
2007-01-13	11:46	411.00	511.00	KLX19A_0411.00_200701131146.ht2	KLX19A_411.00-511.00_070113_2_CHir_Q_r.csv	Chir	2007-02-01	2007-01-13	
2007-01-13	14:17	511.00	611.00	KLX19A_0511.00_200701131417.ht2	KLX19A_511.00-611.00_070113_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-13	
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2007-01-14	08:48	611.00	711.00	KLX19A_0611.00_200701140848.ht2	KLX19A_611.00-711.00_070114_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-14	
2007-01-14	11:03	611.00	711.00	KLX19A_0611.00_200701141103.ht2	KLX19A_611.00-711.00_070114_2_CHir_Q_r.csv	Chir	2007-02-01	2007-01-14	
2007-01-15	15:33	694.00	794.00	KLX19A_0694.00_200701151533.ht2	KLX19A_694.00-794.00_070115_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-15	
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2007-01-17	11:33	111.00	131.00	KLX19A_0111.00_200701171133.ht2	KLX19A_111.00-131.00_070117_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-17	
2007-01-17	14:04	131.00	151.00	KLX19A_0131.00_200701171404.ht2	KLX19A_131.00-151.00_070117_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-17	
2007-01-17	16:30	151.00	171.00	KLX19A_0151.00_200701171630.ht2	KLX19A_151.00-171.00_070117_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-17	

HYDROTESTING WITH PSS				I PSS	DRILLHOLE IDENTIFICATION NO.: KLX19A						
TEST- AND FILEPROTOCOL					Testorder dated : 2006-11-27						
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2007-01-18	08:17	191.00	211.00	KLX19A_0191.00_200701180817.ht2	KLX19A_191.00-211.00_070118_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-18			
2007-01-18	10:53	211.00	231.00	KLX19A_0211.00_200701181053.ht2	KLX19A_211.00-231.00_070118_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-18			
2007-01-18	13:06	231.00	251.00	KLX19A_0231.00_200701181306.ht2	KLX19A_231.00-251.00_070118_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-18			
2007-01-18	14:30	251.00	271.00	KLX19A_0251.00_200701181430.ht2	KLX19A_251.00-271.00_070118_1_Pi_Q_r.csv	Pi	2007-02-01	2007-01-18			
2007-01-18	16:24	271.00	291.00	KLX19A_0271.00_200701181624.ht2	KLX19A_271.00-291.00_070118_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-18			
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2007-01-19	09:23	411.00	431.00	KLX19A_0411.00_200701190923.ht2	KLX19A_411.00-431.00_070119_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-19			
2007-01-19	11:20	431.00	451.00	KLX19A_0431.00_200701191120.ht2	KLX19A_431.00-451.00_070119_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-19			
2007-01-19	13:38	451.00	471.00	KLX19A_0451.00_200701191338.ht2	KLX19A_451.00-471.00_070119_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-19			
2007-01-19	15:30	471.00	491.00	KLX19A_0471.00_200701191530.ht2	KLX19A_471.00-491.00_070119_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-19			
2007-01-19	17:26	491.00	511.00	KLX19A_0491.00_200701191726.ht2	KLX19A_491.00-511.00_070119_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-20			
2007-01-20	08:21	511.00	531.00	KLX19A_0511.00_200701200821.ht2	KLX19A_511.00-531.00_070120_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-20			
2007-01-20	10:18	530.00	550.00	KLX19A_0530.00_200701201018.ht2	KLX19A_530.00-550.00_070120_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-20			
2007-01-20	11:45	550.00	570.00	KLX19A_0550.00_200701201145.ht2	KLX19A_550.00-570.00_070120_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-20			
2007-01-20	13:39	571.00	591.00	KLX19A_0571.00_200701201339.ht2	KLX19A_571.00-591.00_070120_1_Pi_Q_r.csv	Pi	2007-02-01	2007-01-20	<u> </u>		

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2007-01-20	17:41	611.00	631.00	KLX19A_0611.00_200701201741.ht2	KLX19A_611.00-631.00_070120_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-21			
2007-01-21	08:29	631.00	651.00	KLX19A_0631.00_200701210829.ht2	KLX19A_631.00-651.00_070121_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-21			
2007-01-21	10:45	651.00	671.00	KLX19A_0651.00_200701211045.ht2	KLX19A_651.00-671.00_070121_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-21			
2007-01-21	13:18	651.00	671.00	KLX19A_0651.00_200701211318.ht2	KLX19A_651.00-671.00_070121_2_CHir_Q_r.csv	CHir	2007-02-01	2007-01-21			
2007-01-21	14:52	671.00	691.00	KLX19A_0671.00_200701211452.ht2	KLX19A_671.00-691.00_070121_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-21	1		
2007-01-21	16:56	691.00	711.00	KLX19A_0691.00_200701211656.ht2	KLX19A_691.00-711.00_070121_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-22			
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2007-01-22	10:50	731.00	751.00	KLX19A_0731.00_200701221050.ht2	KLX19A_731.00-751.00_070122_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-22			
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2007-01-22	15:43	771.00	791.00	KLX19A_0771.00_200701221543.ht2	KLX19A_771.00-791.00_070122_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-22	1		
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2007-01-25	08:23	416.00	421.00	KLX19A_0416.00_200701250823.ht2	KLX19A_416.00-421.00_070125_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-25	1		

HYDROTESTING WITH PSS TEST- AND FILEPROTOCOL					DRILLHOLE IDENTIFICATION NO.: KLX19A Testorder dated : 2006-11-27						
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2007-01-25	11:16	426.00	431.00	KLX19A_0426.00_200701251116.ht2	KLX19A_426.00-431.00_070125_1_Pi_Q_r.csv	Pi	2007-02-01	2007-01-25			
2007-01-25	13:20	431.00	436.00	KLX19A_0431.00_200701251320.ht2	KLX19A_431.00-436.00_070125_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-25			
2007-01-25	15:07	436.00	441.00	KLX19A_0436.00_200701251507.ht2	KLX19A_436.00-441.00_070125_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-25			
2007-01-25	16:48	441.00	446.00	KLX19A_0441.00_200701251648.ht2	KLX19A_441.00-446.00_070125_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-25			
2007-01-25	18:36	446.00	451.00	KLX19A_0446.00_200701251836.ht2	KLX19A_446.00-451.00_070125_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-26			
2007-01-26	09:34	551.00	556.00	KLX19A_0551.00_200701260934.ht2	KLX19A_551.00-556.00_070126_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-26			
2007-01-26	11:34	556.00	561.00	KLX19A_0556.00_200701261134.ht2	KLX19A_556.00-561.00_070126_1_Pi_Q_r.csv	Pi	2007-02-01	2007-01-26			
2007-01-26	13:58	561.00	566.00	KLX19A_0561.00_200701261358.ht2	KLX19A_561.00-566.00_070126_1_CHir_Q_r.csv	CHir	2007-02-01	2007-01-26			
2007-01-26	15:02	566.00	571.00	KLX19A_0566.00_200701261459.ht2	KLX19A_566.00-571.00_070126_1_Pi_Q_r.csv	Pi	2007-02-01	2007-01-26			
2007-01-26	17:42	631.00	636.00	KLX19A_0631.00_200701261742.ht2	KLX19A_631.00-636.00_070126_1_Pi_Q_r.csv	Pi	2007-02-01	2007-01-27			
2007-01-27	08:26	636.00	641.00	KLX19A_0636.00_200701270826.ht2	KLX19A_636.00-641.00_070127_1_Pi_Q_r.csv	Pi	2007-02-01	2007-01-27			
2007-01-27	09:47	641.00	646.00	KLX19A_0641.00_200701270947.ht2	KLX19A_641.00-646.00_070127_1_Pi_Q_r.csv	Pi	2007-02-01	2007-01-27	+		
2007-01-27	11:03	646.00	651.00	KLX19A_0646.00_200701271103.ht2	KLX19A_646.00-651.00_070127_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-27	+		
2007-01-27	13:03	651.00	656.00	KLX19A_0651.00_200701271303.ht2	KLX19A_651.00-656.00_070127_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-27	<u> </u>		

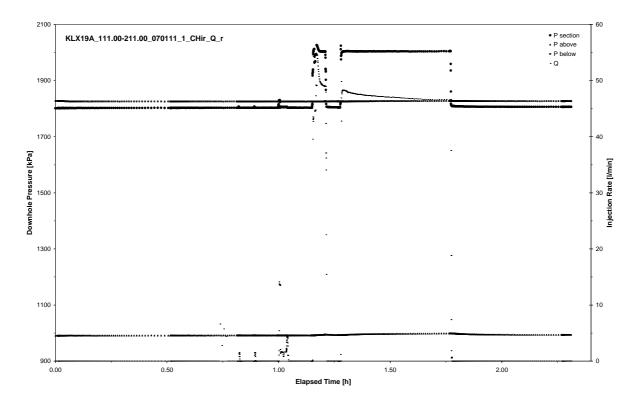
HYDROTESTING WITH PSS TEST- AND FILEPROTOCOL					DRILLHOLE IDENTIFICATION NO.: KLX19A Testorder dated : 2006-11-27						
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)			
2007-01-27	14:22	656.00	661.00	KLX19A_0656.00_200701271422.ht2	KLX19A_656.00-661.00_070127_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-27			
2007-01-27	17:13	661.00	666.00	KLX19A_0661.00_200701271713.ht2	KLX19A_661.00-666.00_070127_1_Pi_Q_r.csv	Pi	2007-02-01	2007-01-28			
2007-01-28	08:17	666.00	671.00	KLX19A_0666.00_200701280817.ht2	KLX19A_666.00-671.00_070128_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-28			
2007-01-28	10:07	671.00	676.00	KLX19A_0671.00_200701281007.ht2	KLX19A_671.00-676.00_070128_1_Pi_Q_r.csv	Pi	2007-02-01	2007-01-28	+		
2007-01-28	12:22	676.00	681.00	KLX19A_0676.00_200701281222.ht2	KLX19A_676.00-681.00_070128_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-28	<u> </u>		
2007-01-28	14:19	681.00	686.00	KLX19A_0681.00_200701281419.ht2	KLX19A_681.00-686.00_070128_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-28	-		
2007-01-28	16:10	686.00	691.00	KLX19A_0686.00_200701281610.ht2	KLX19A_686.00-691.00_070128_1_Pi_Q_r.csv	Pi	2007-02-01	2007-01-28	+		
2007-01-28	17:33	691.00	696.00	KLX19A_0691.00_200701281733.ht2	KLX19A_691.00-696.00_070128_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-29			
2007-01-29	08:23	696.00	701.00	KLX19A_0696.00_200701290823.ht2	KLX19A_696.00-701.00_070129_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-29	-		
2007-01-29	10:16	701.00	706.00	KLX19A_0701.00_200701291016.ht2	KLX19A_701.00-706.00_070129_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-29	<u> </u>		
2007-01-29	12:42	706.00	711.00	KLX19A_0706.00_200701291242.ht2	KLX19A_706.00-711.00_070129_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-29	<u> </u>		
2007-01-29	14:49	731.00	736.00	KLX19A_0731.00_200701291449.ht2	KLX19A_731.00-736.00_070129_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-29	<u> </u>		
2007-01-29	16:43	736.00	741.00	KLX19A_0736.00_200701291643.ht2	KLX19A_736.00-741.00_070129_1_Pi_Q_r.csv	Pi	2007-02-01	2007-01-29	+		
2007-01-29	18:54	741.00	746.00	KLX19A_0741.00_200701301854.ht2	KLX19A_741.00-746.00_070130_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-30	\vdash		
2007-01-30	08:14	746.00	751.00	KLX19A_0746.00_200701300814.ht2	KLX19A_746.00-751.00_070130_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-30	┢		

HYDROTESTING WITH PSS TEST- AND FILEPROTOCOL					DRILLHOLE IDENTIFICATION NO.: KLX19A Testorder dated : 2006-11-27				
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
2007-01-30	10:20	751.00	756.00	KLX19A_0751.00_200701301020.ht2	KLX19A_751.00-756.00_070130_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-30	
2007-01-30	12:48	756.00	761.00	KLX19A_0756.00_200701301248.ht2	KLX19A_756.00-761.00_070130_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-30	
2007-01-30	14:54	761.00	766.00	KLX19A_0761.00_200701301454.ht2	KLX19A_761.00-766.00_070130_1_Pi_Q_r.csv	Pi	2007-02-01	2007-01-30	
2007-01-30	17:00	766.00	771.00	KLX19A_0766.00_200701301700.ht2	KLX19A_766.00-771.00_070130_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-31	
2007-01-31	08:08	771.00	776.00	KLX19A_0771.00_200701310808.ht2	KLX19A_771.00-776.00_070131_1_Pi_Q_r.csv	Pi	2007-02-01	2007-01-31	
2007-01-31	09:28	776.00	781.00	KLX19A_0776.00_200701310928.ht2	KLX19A_776.00-781.00_070131_1_CHir_Q_r.csv	Chir	2007-02-01	2007-01-31	

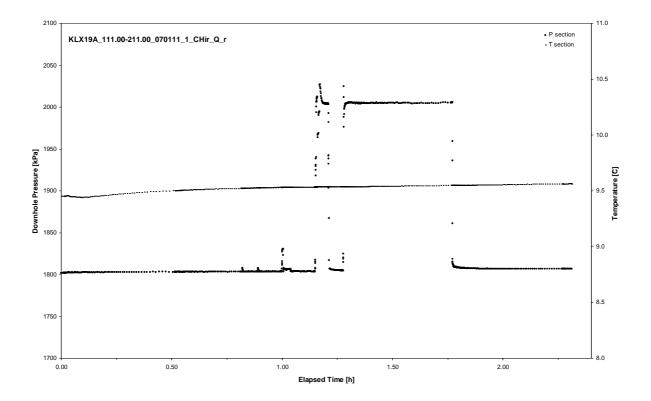
Borehole: KLX19A

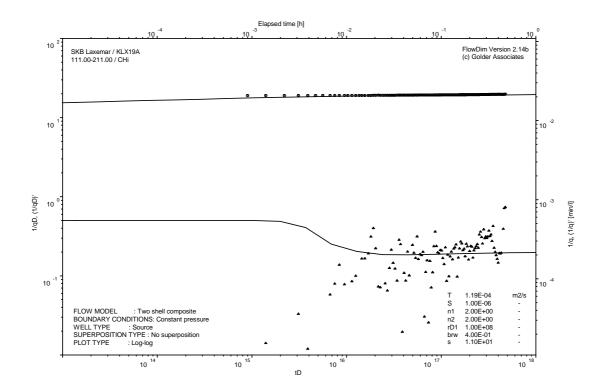
APPENDIX 2

Test 111.00 – 211.00 m

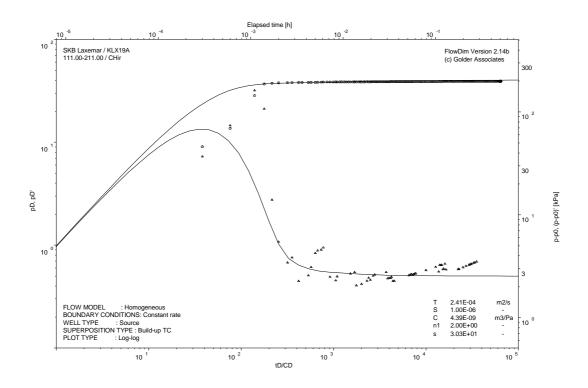


Pressure and flow rate vs. time; cartesian plot

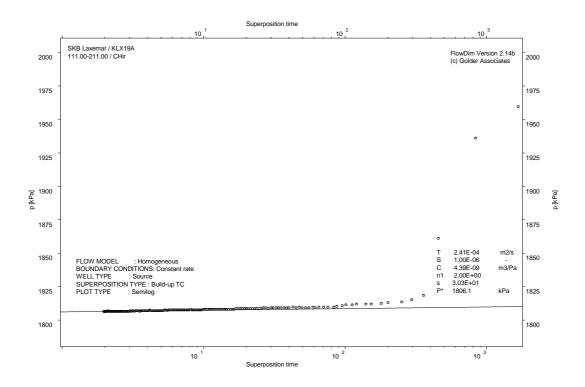




CHI phase; log-log match

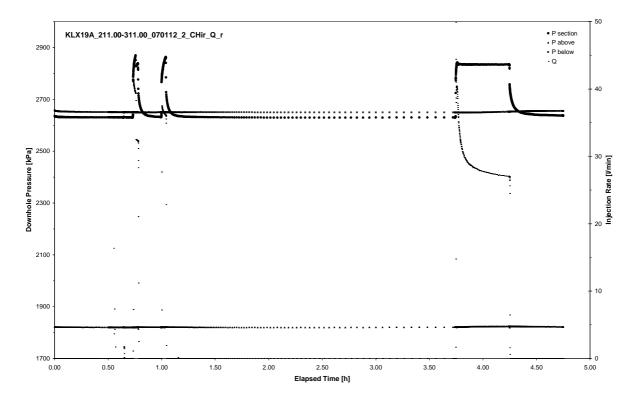


CHIR phase; log-log match

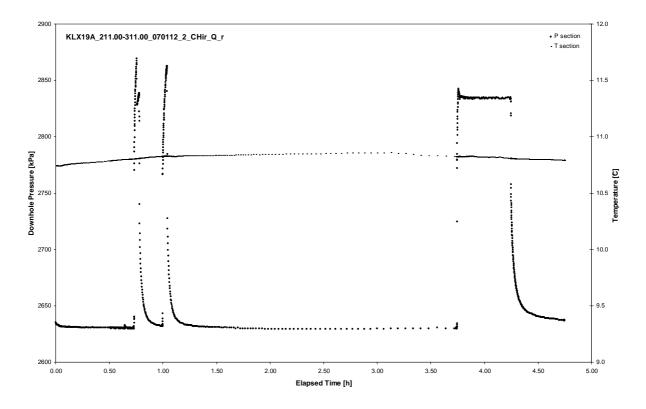


CHIR phase; HORNER match

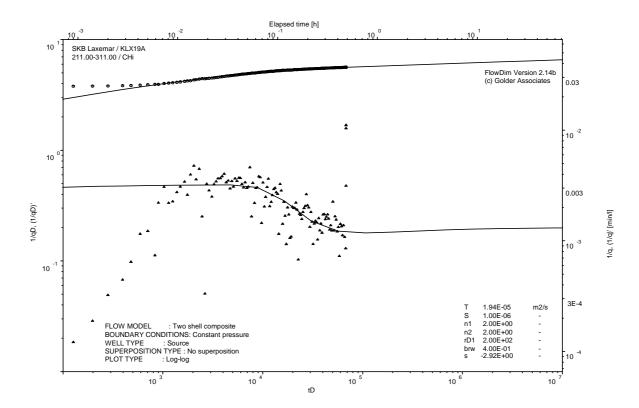
Test 211.00 – 311.00 m



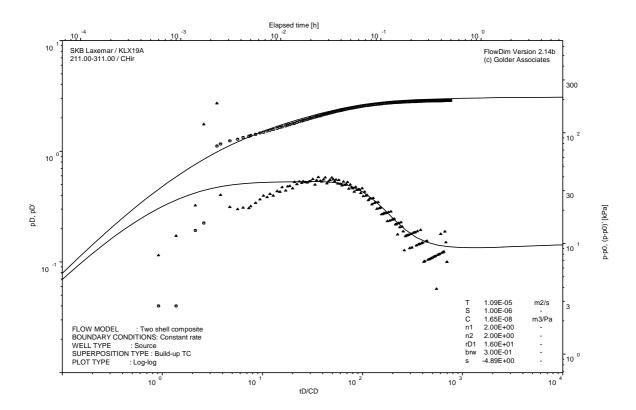
Pressure and flow rate vs. time; cartesian plot



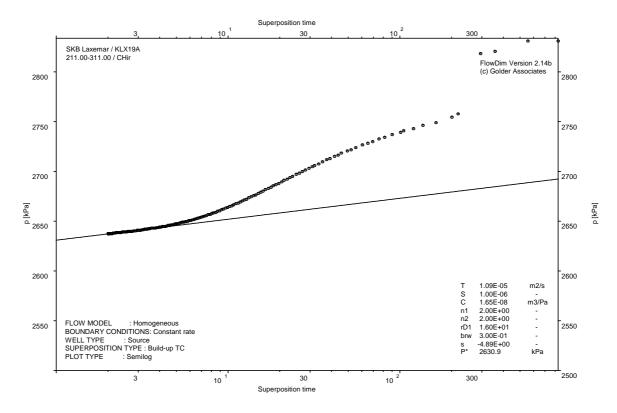
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

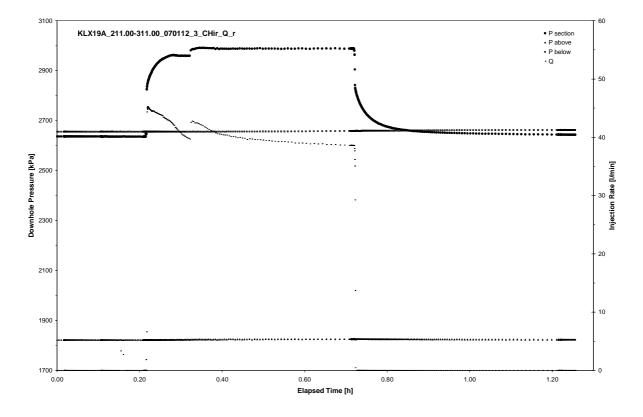


CHIR phase; log-log match

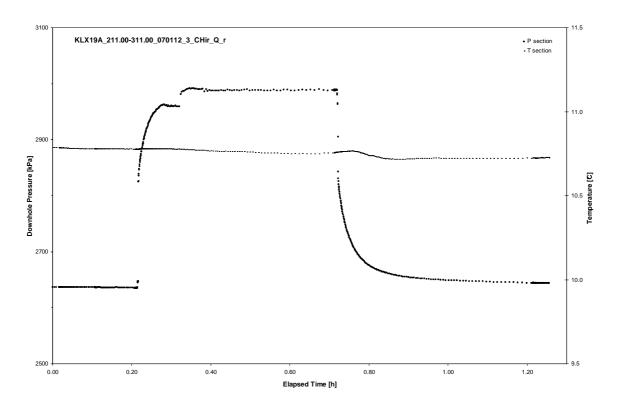


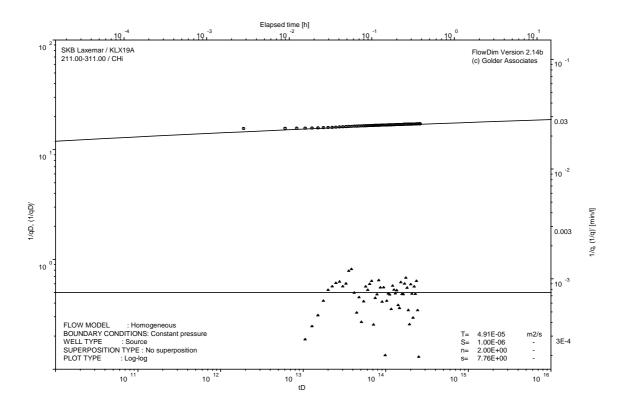
CHIR phase; HORNER match

Test 211.00 – 311.00 m

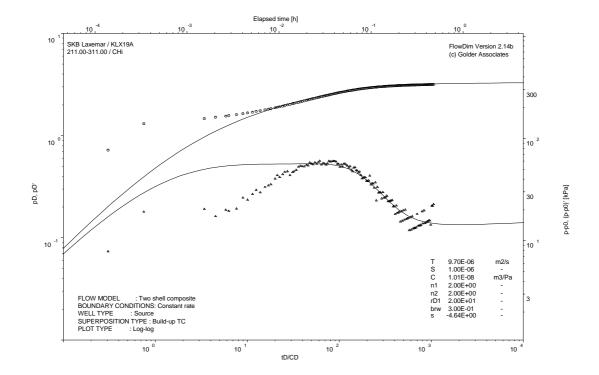


Pressure and flow rate vs. time; cartesian plot

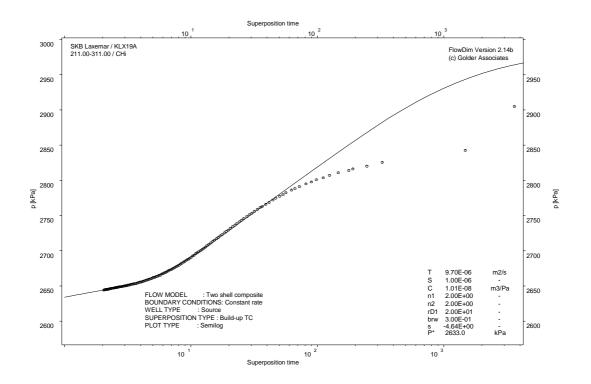




CHI phase; log-log match

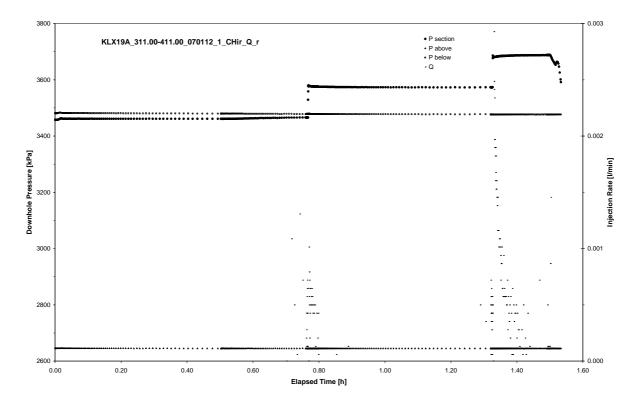


CHIR phase; log-log match

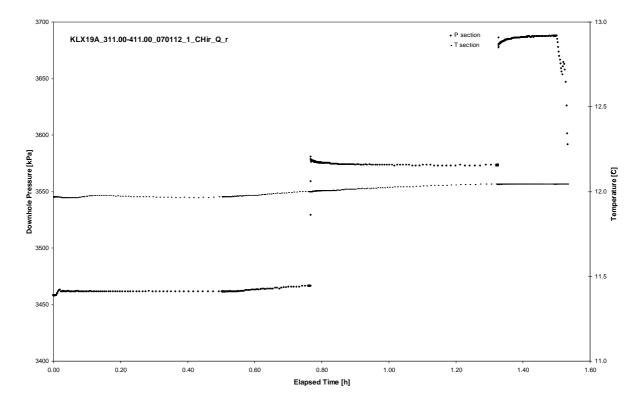


CHIR phase; HORNER match

Test 311.00 – 411.00 m



Pressure and flow rate vs. time; cartesian plot



Not Analysed

CHI phase; log-log match

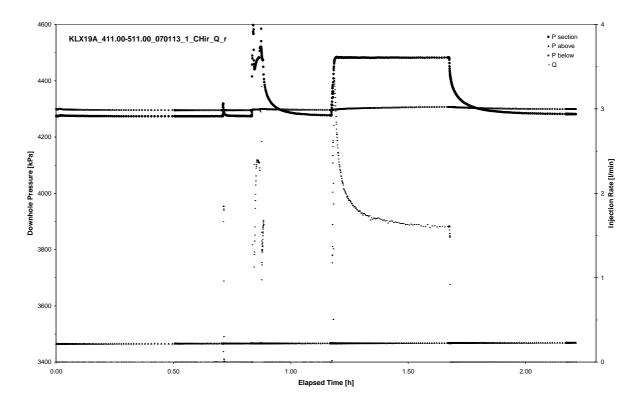
Not Analysed

CHIR phase; log-log match

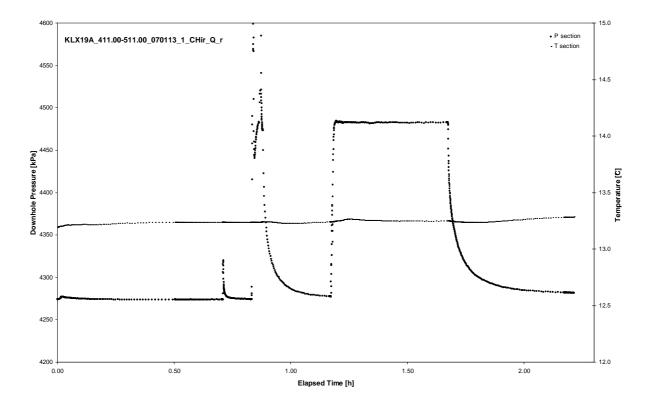
Not Analysed

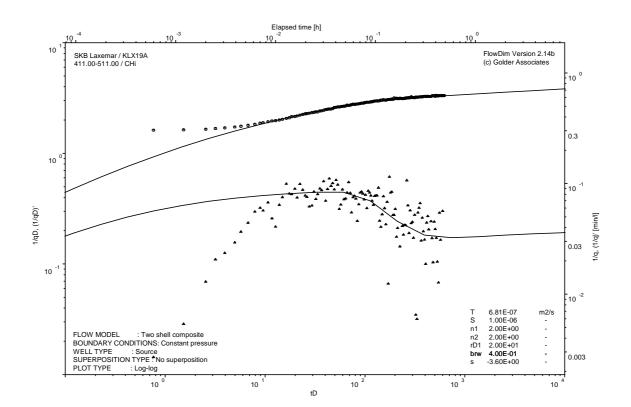
CHIR phase; HORNER match

Test 411.00 – 511.00 m

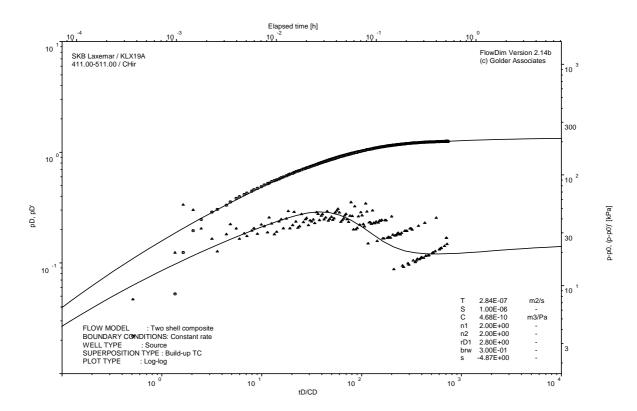


Pressure and flow rate vs. time; cartesian plot

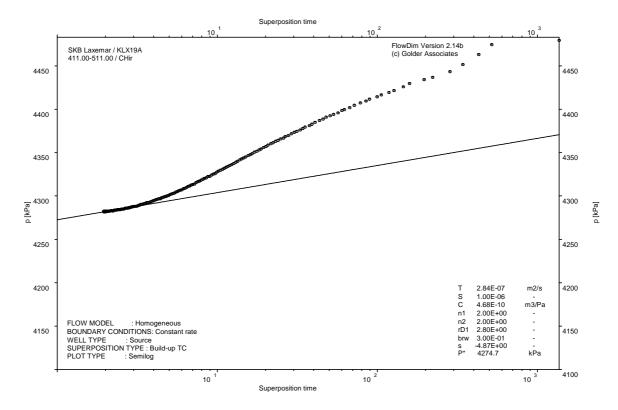




CHI phase; log-log match

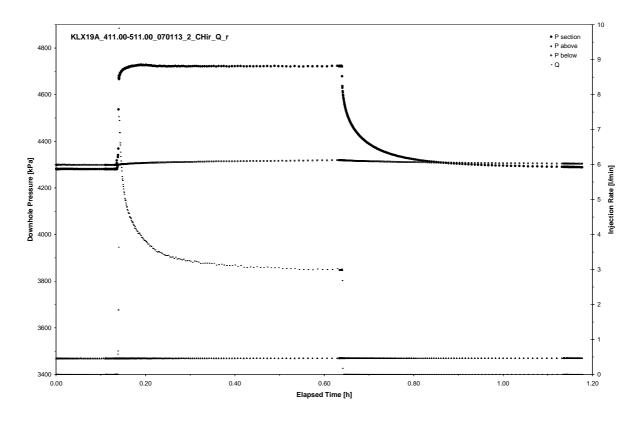


CHIR phase; log-log match

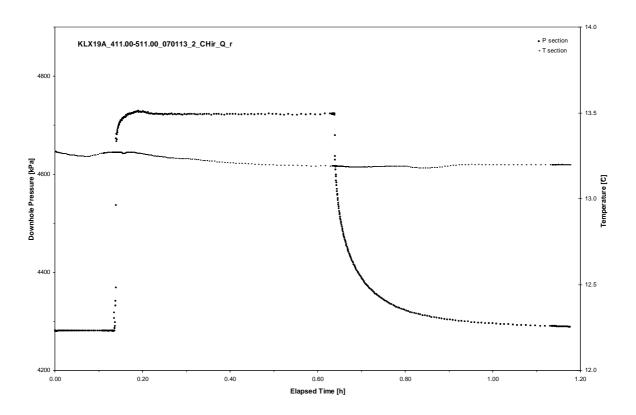


CHIR phase; HORNER match

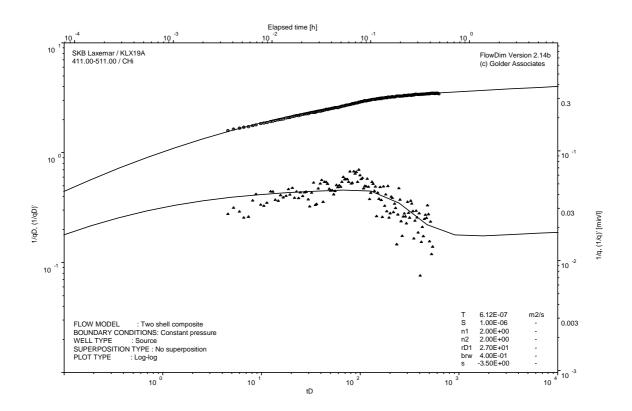
Test 411.00 – 511.00 m



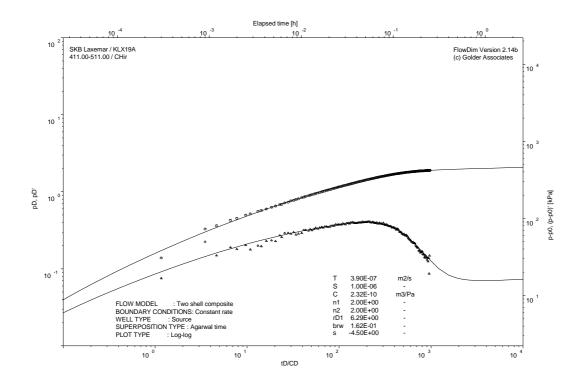
Pressure and flow rate vs. time; cartesian plot



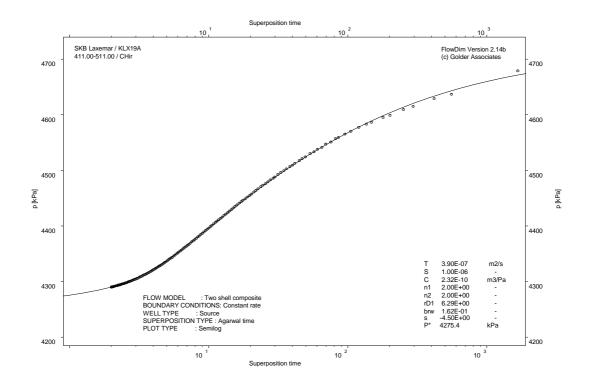
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

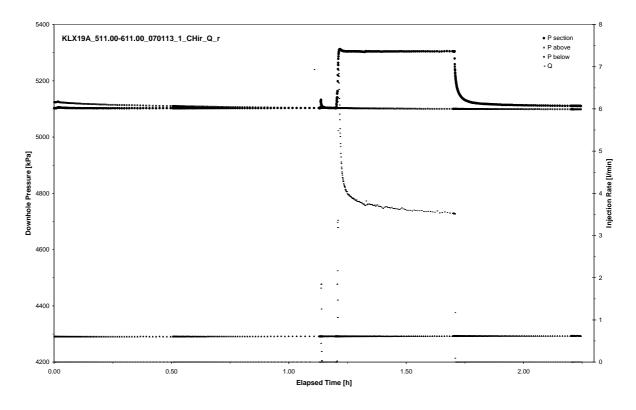


CHIR phase; log-log match

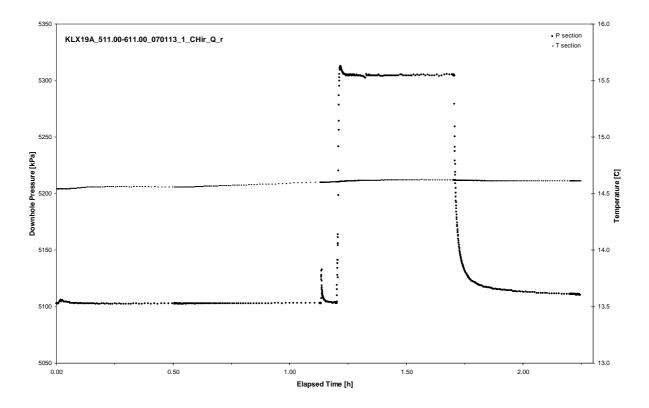


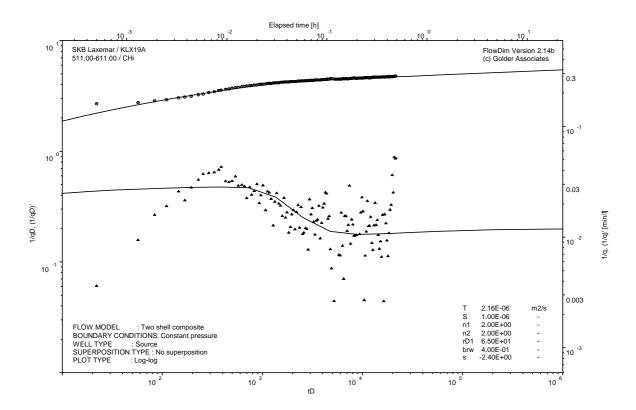
CHIR phase; HORNER match

Test 511.00 – 611.00 m

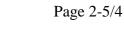


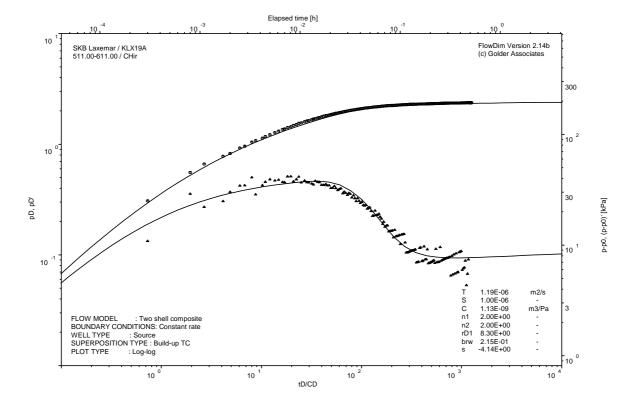
Pressure and flow rate vs. time; cartesian plot



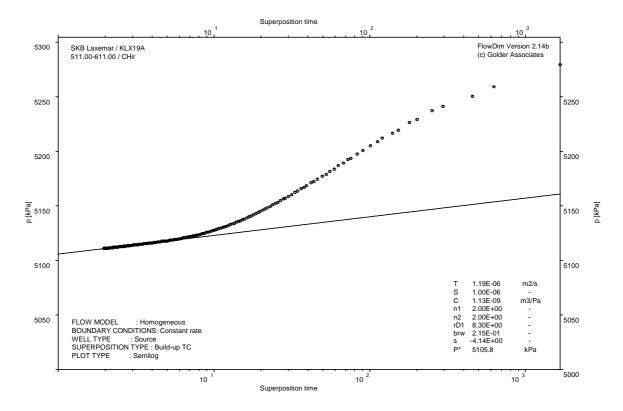


CHI phase; log-log match



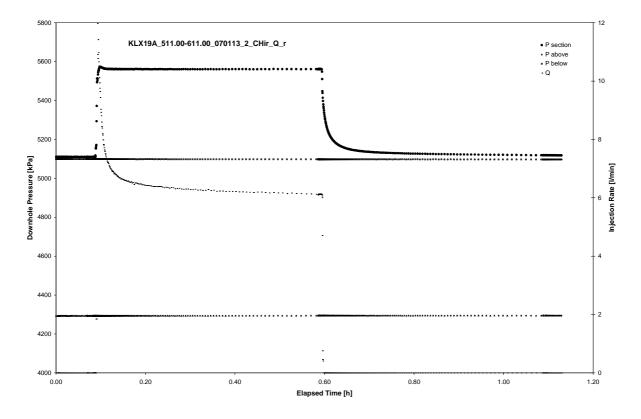


CHIR phase; log-log match

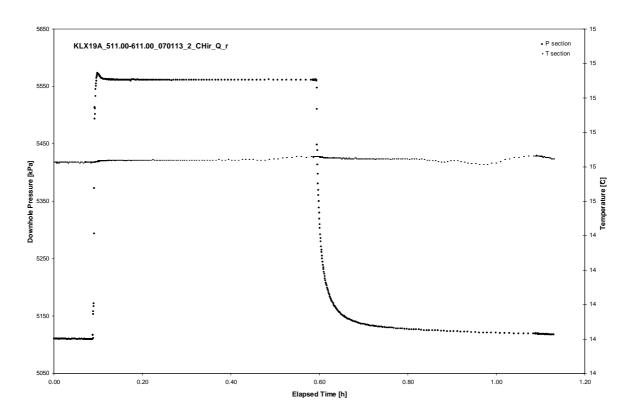


CHIR phase; HORNER match

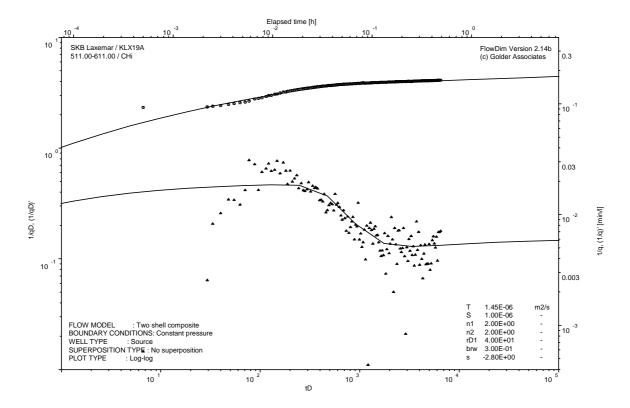
Test 511.00 – 611.00 m



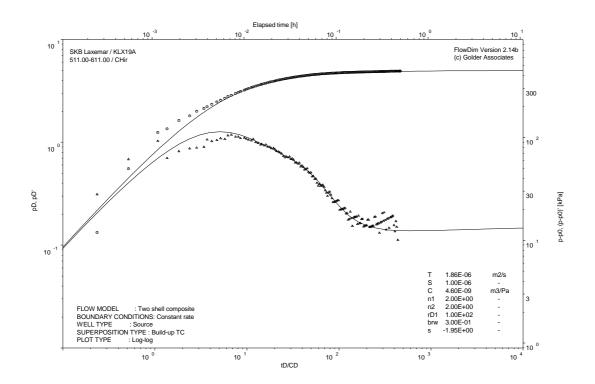
Pressure and flow rate vs. time; cartesian plot



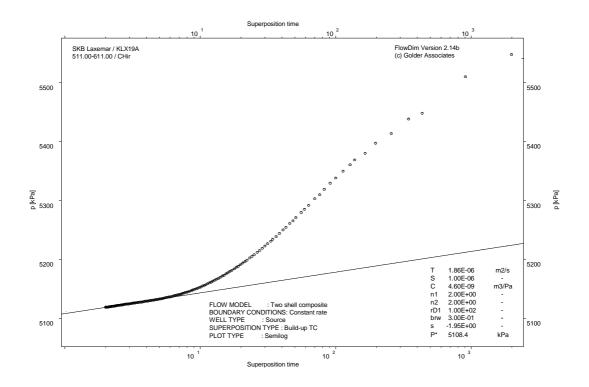
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

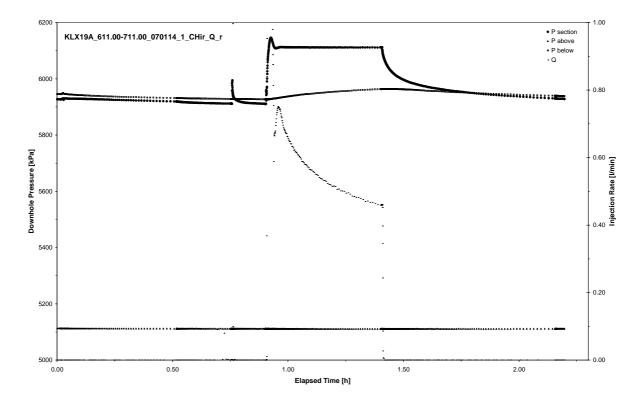


CHIR phase; log-log match

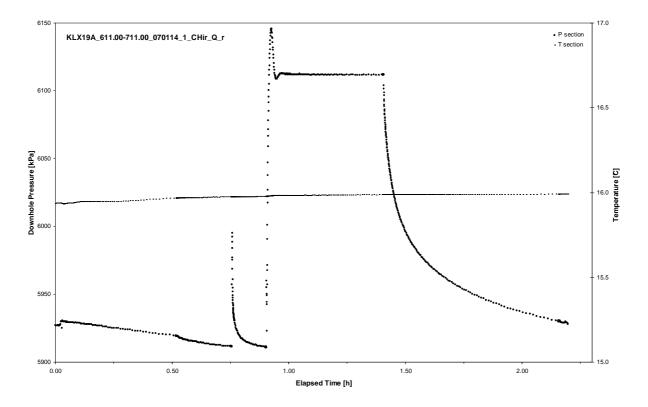


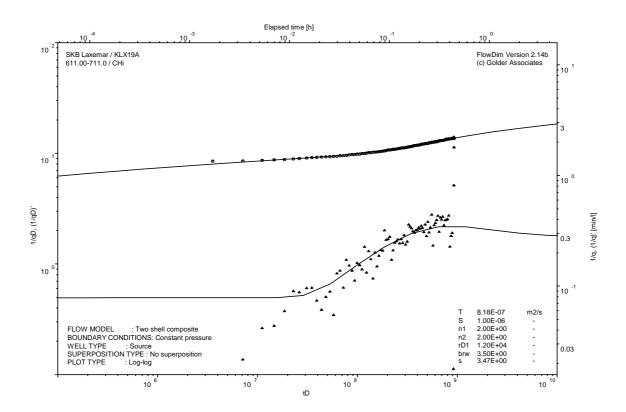
CHIR phase; HORNER match

Test 611.00 – 711.00 m

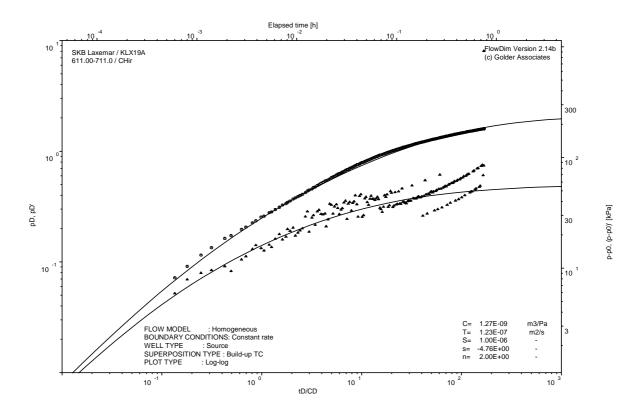


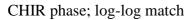
Pressure and flow rate vs. time; cartesian plot

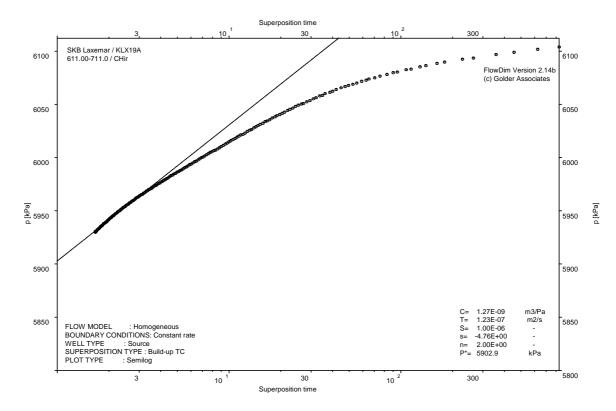




CHI phase; log-log match

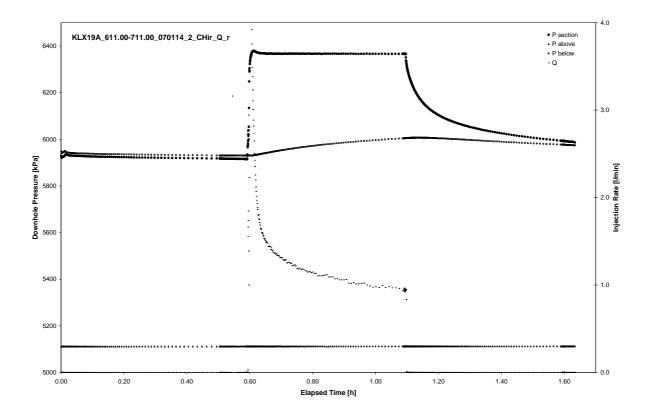




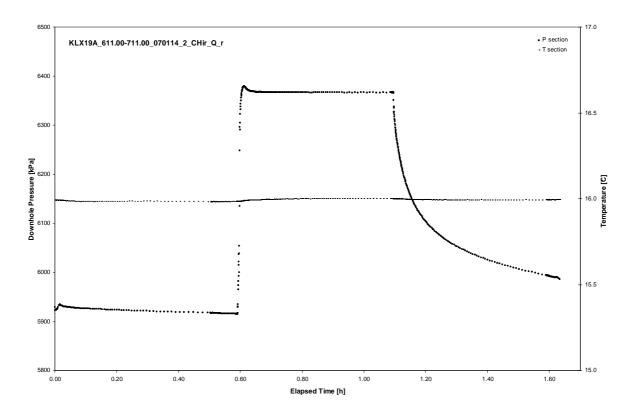


CHIR phase; HORNER match

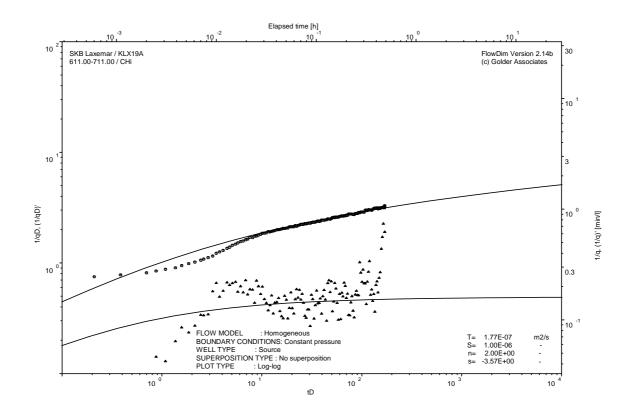
Test 611.00 – 711.00 m



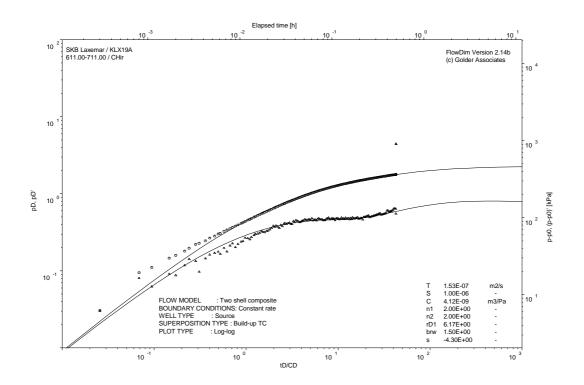
Pressure and flow rate vs. time; cartesian plot



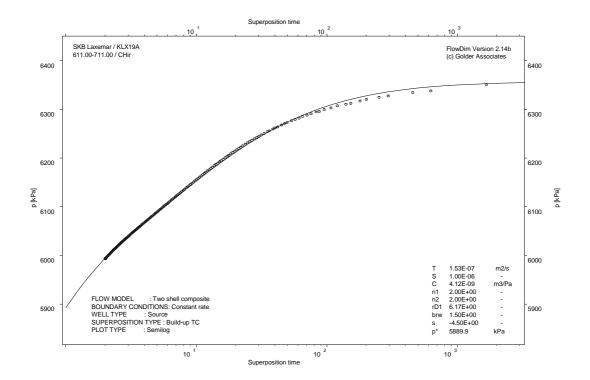
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

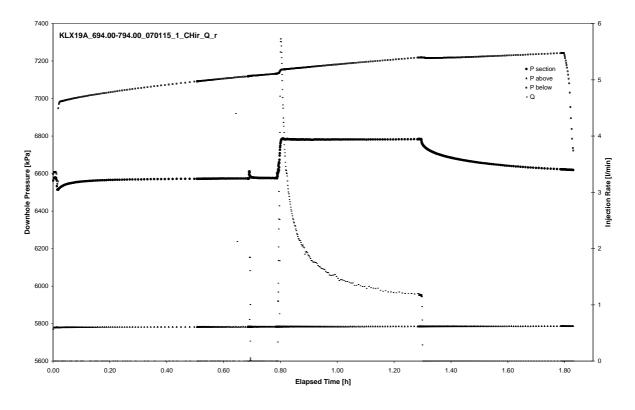


CHIR phase; log-log match

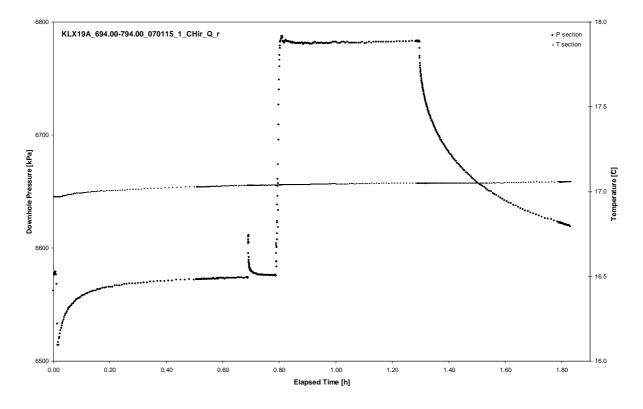


CHIR phase; HORNER match

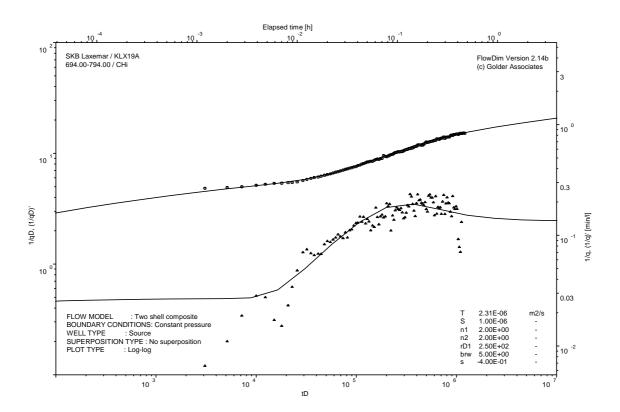
Test 694.00 – 794.00 m



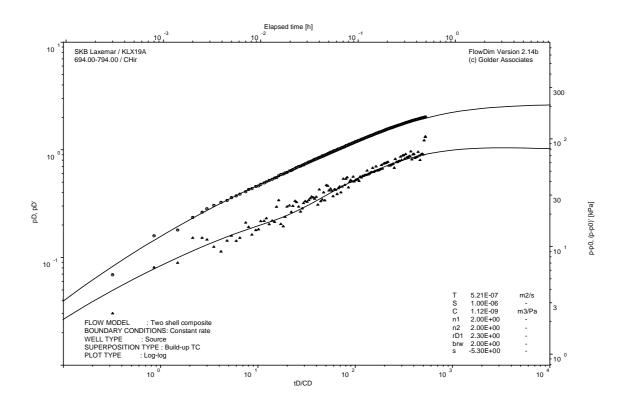
Pressure and flow rate vs. time; cartesian plot



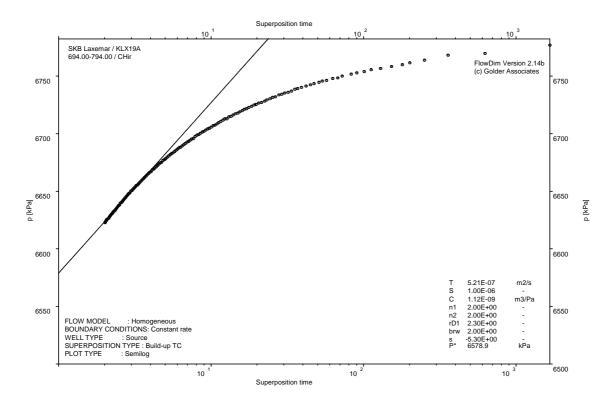
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

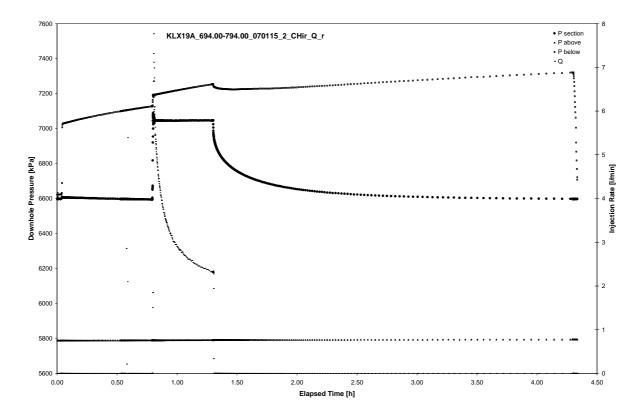


CHIR phase; log-log match

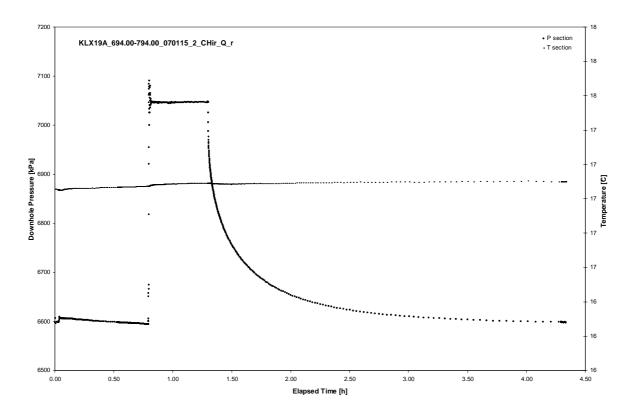


CHIR phase; HORNER match

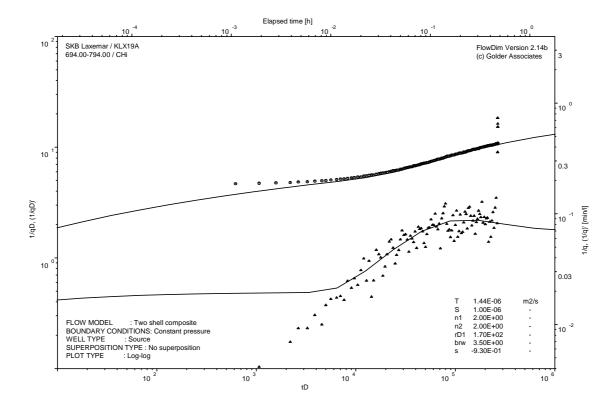
Test 694.00 – 794.00 m



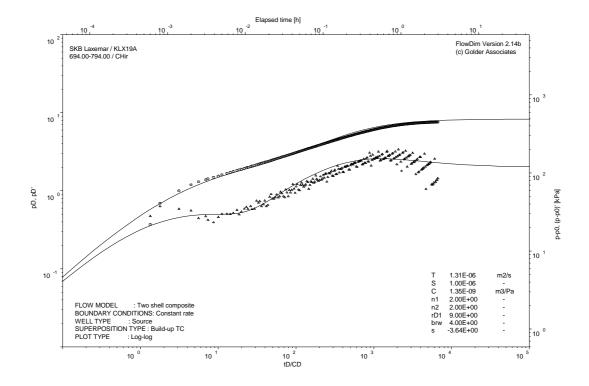
Pressure and flow rate vs. time; cartesian plot



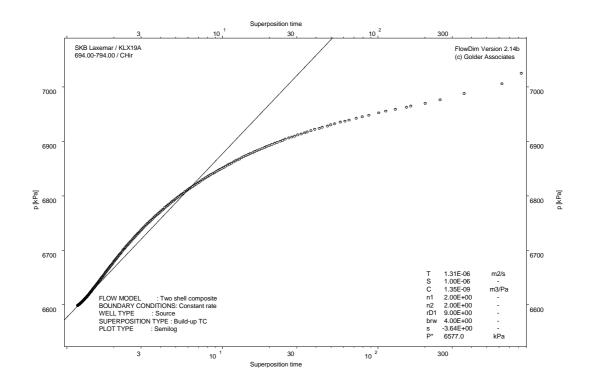
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

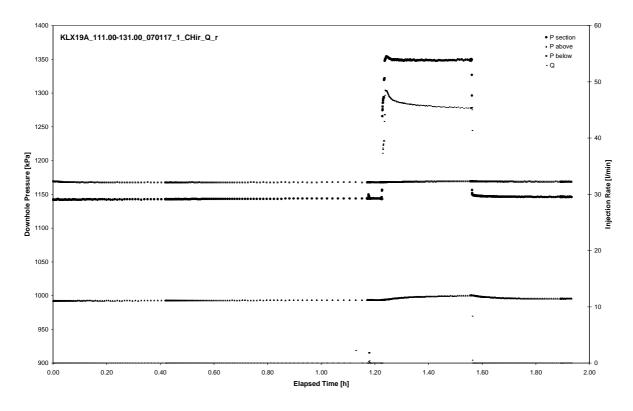


CHIR phase; log-log match

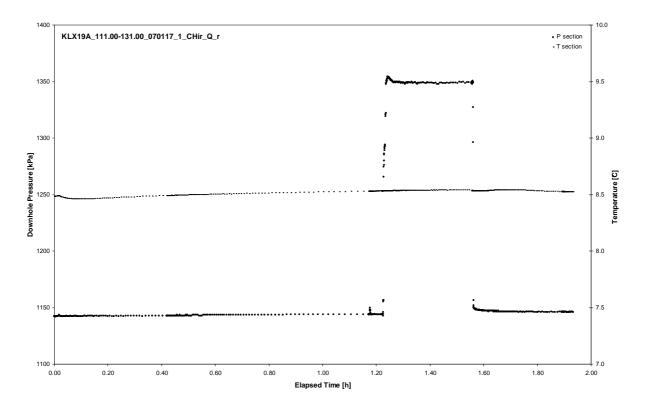


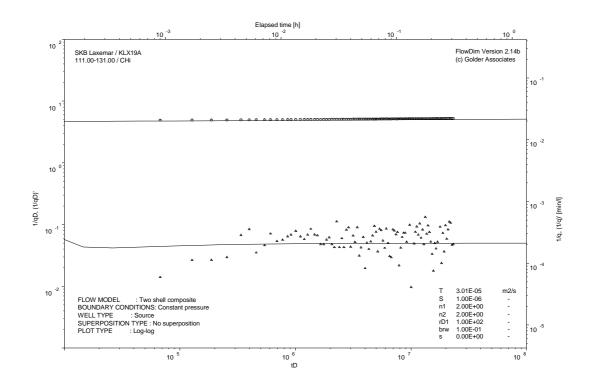
CHIR phase; HORNER match

Test 111.00 – 131.00 m

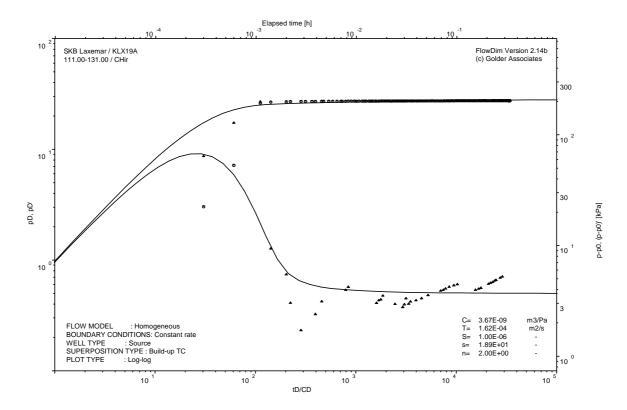


Pressure and flow rate vs. time; cartesian plot

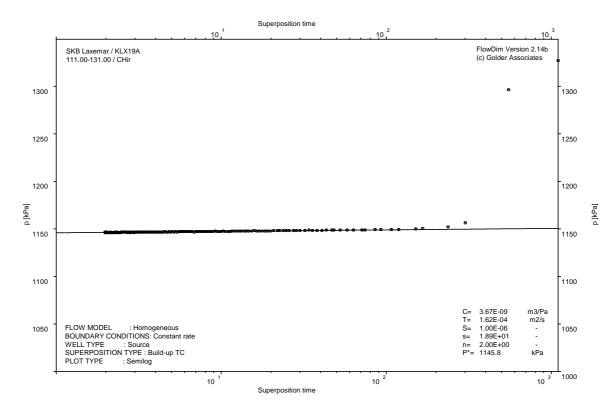




CHI phase; log-log match

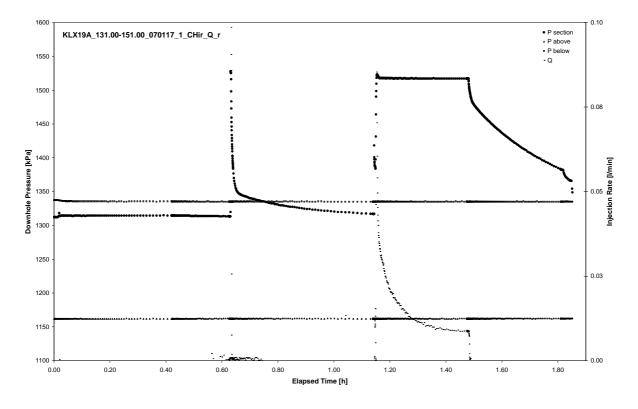


CHIR phase; log-log match

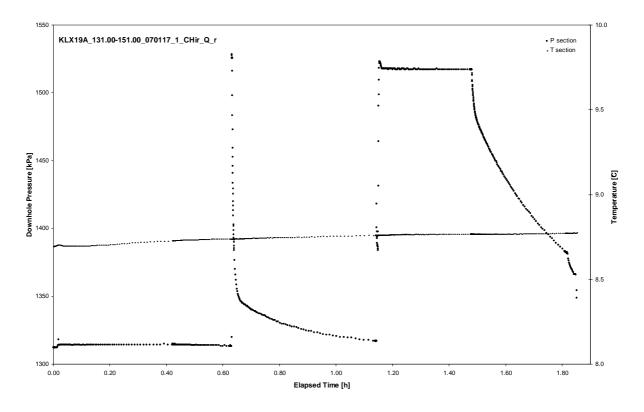


CHIR phase; HORNER match

Test 131.00 – 151.00 m

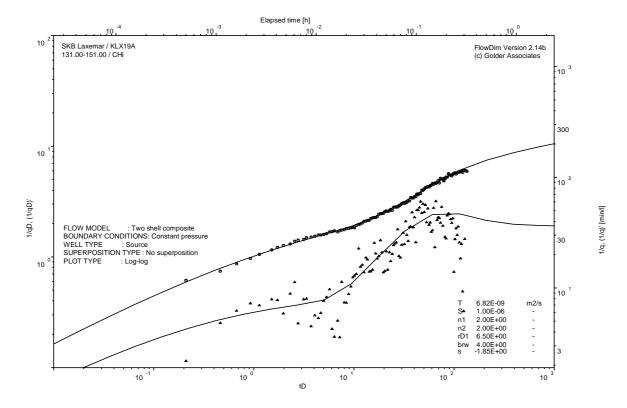


Pressure and flow rate vs. time; cartesian plot

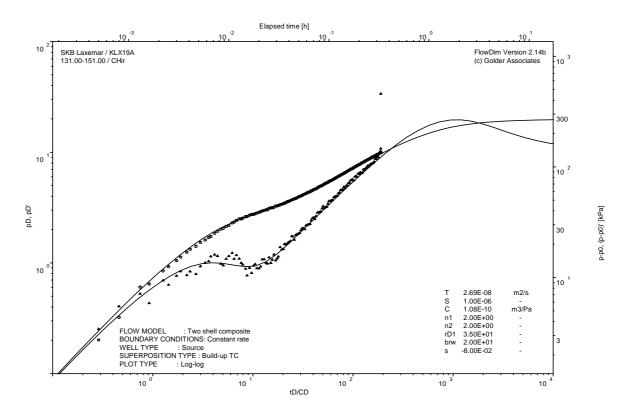


Interval pressure and temperature vs. time; cartesian plot

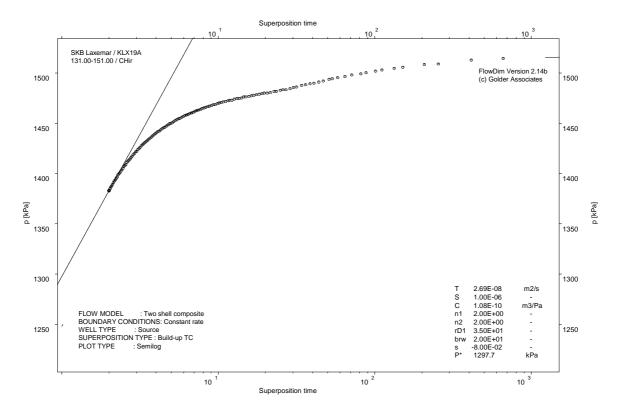




CHI phase; log-log match

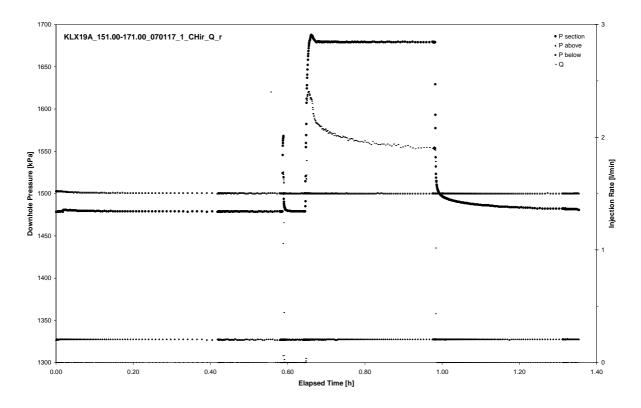


CHIR phase; log-log match

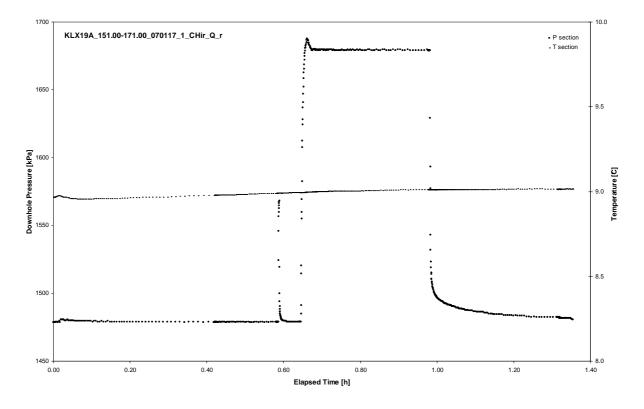


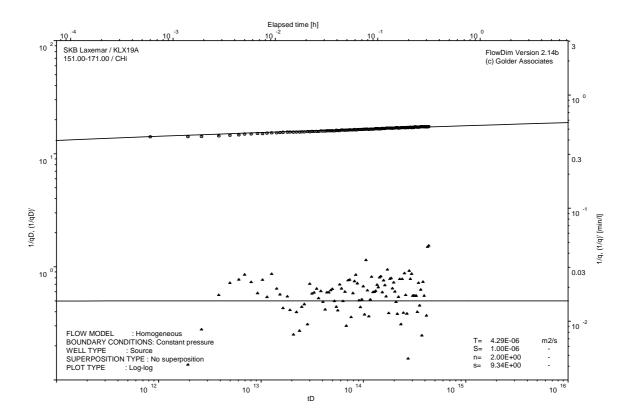
CHIR phase; HORNER match

Test 151.00 – 171.00 m

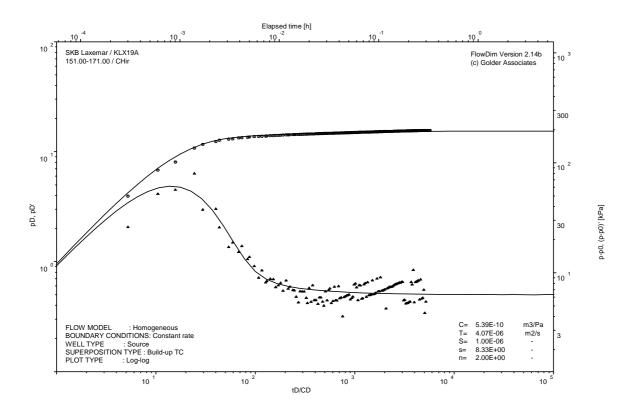


Pressure and flow rate vs. time; cartesian plot

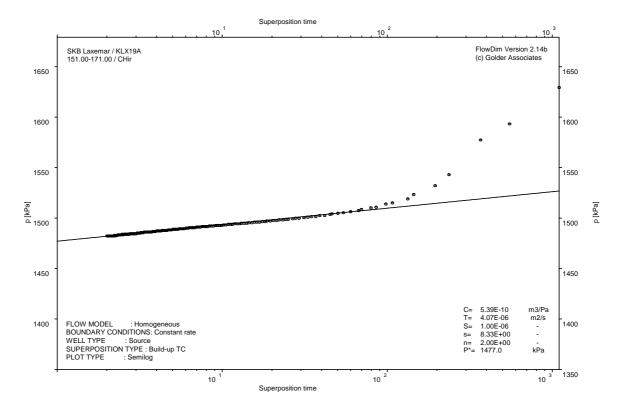




CHI phase; log-log match

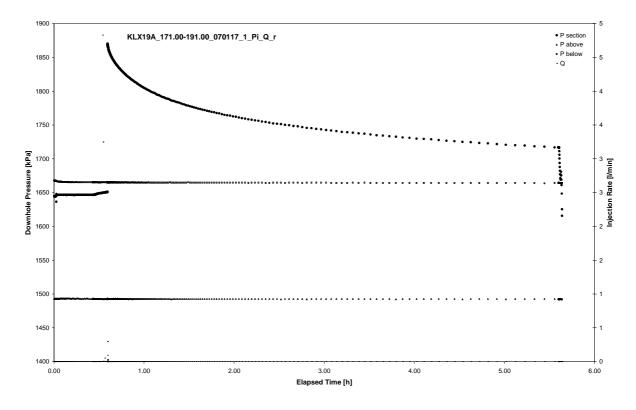


CHIR phase; log-log match

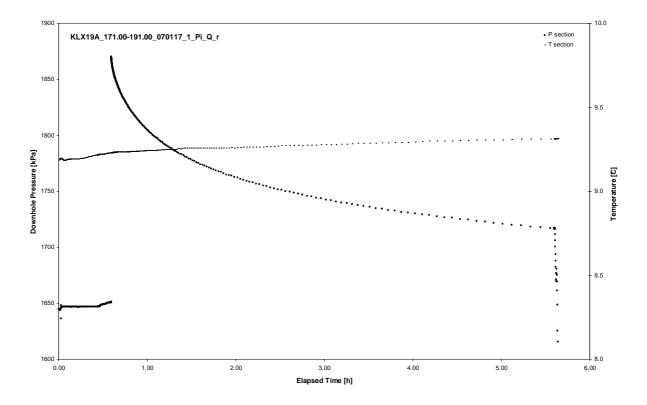


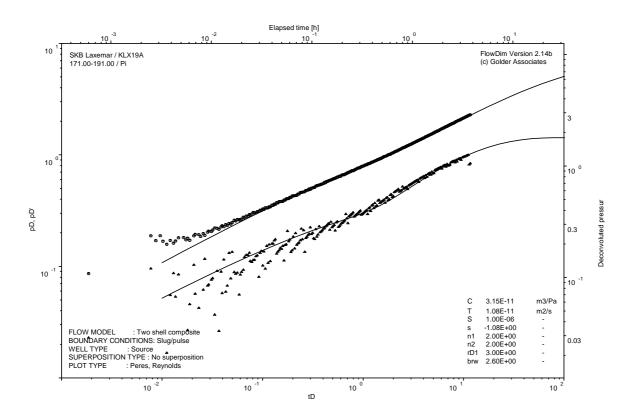
CHIR phase; HORNER match

Test 171.00 – 191.00 m



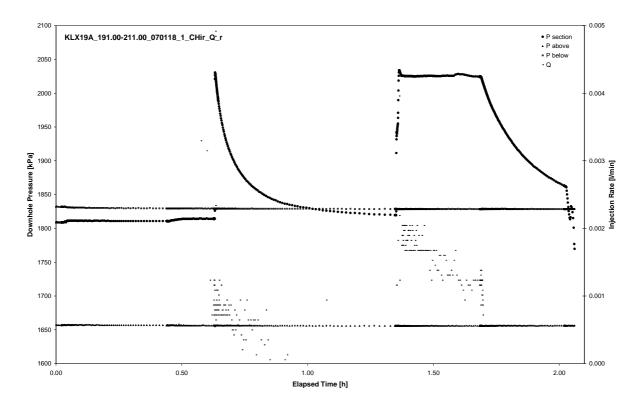
Pressure and flow rate vs. time; cartesian plot



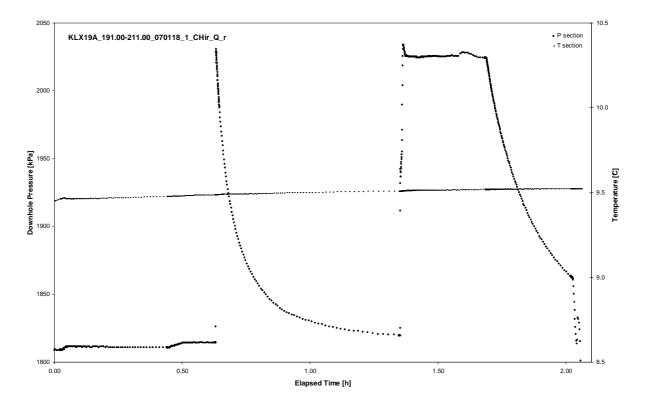


Pulse injection; deconvolution match

Test 191.00 – 211.00 m

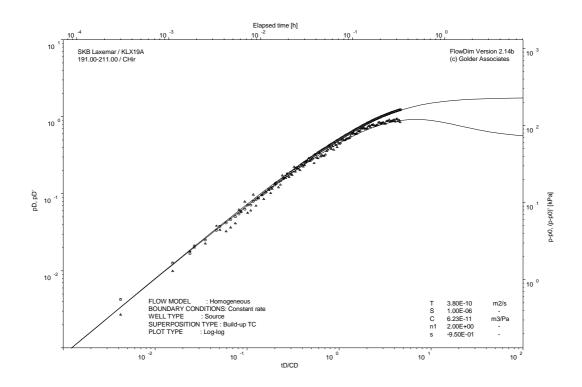


Pressure and flow rate vs. time; cartesian plot

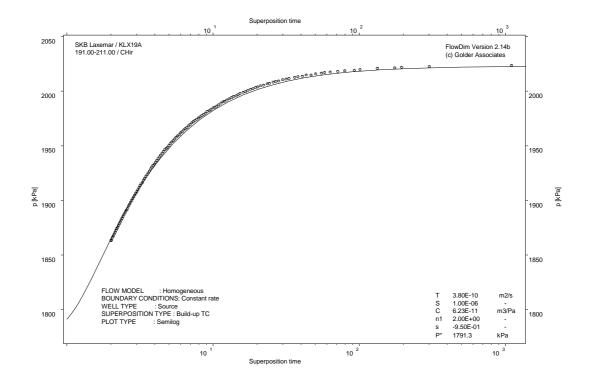


Not analysed

CHI phase; log-log match

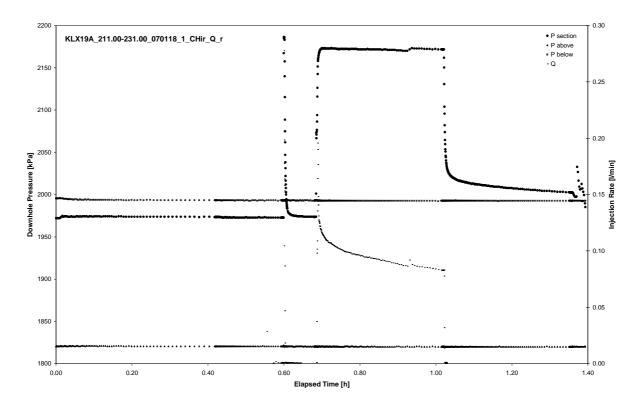


CHIR phase; log-log match

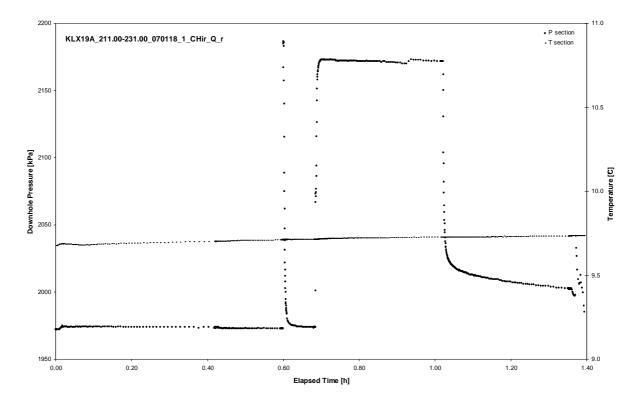


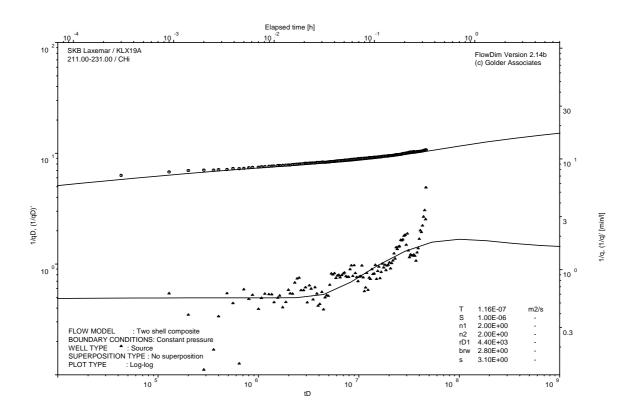
CHIR phase; HORNER match

Test 211.00 – 231.00 m



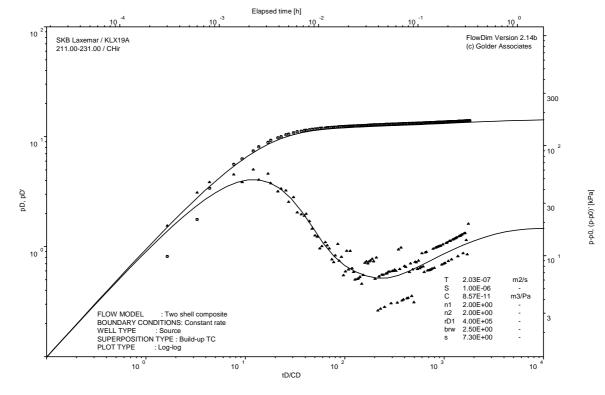
Pressure and flow rate vs. time; cartesian plot



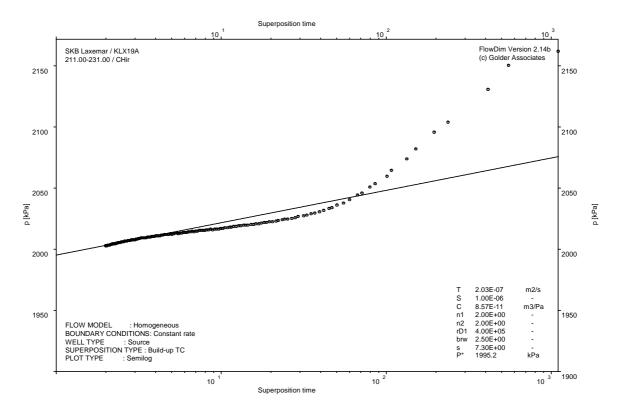


CHI phase; log-log match



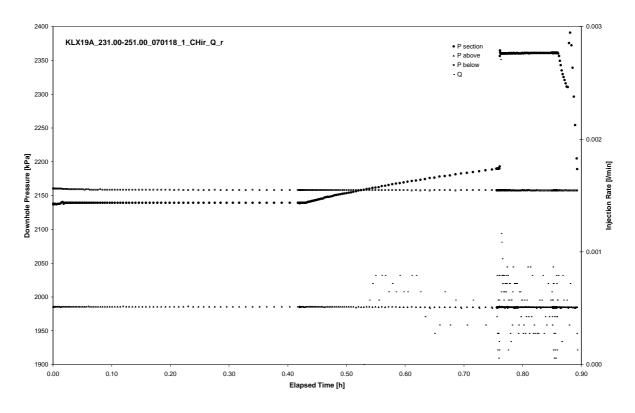


CHIR phase; log-log match

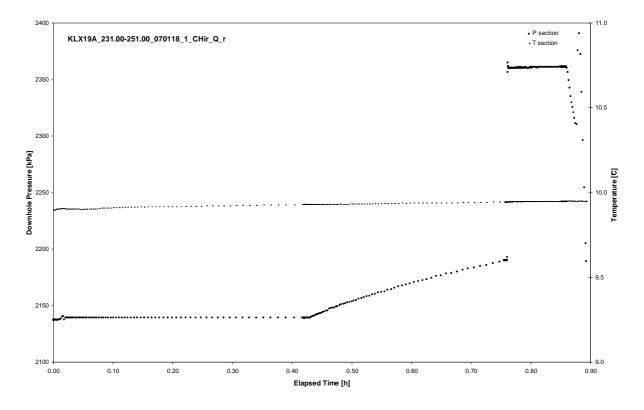


CHIR phase; HORNER match

Test 231.00 – 251.00 m



Pressure and flow rate vs. time; cartesian plot



Not Analysed

CHI phase; log-log match

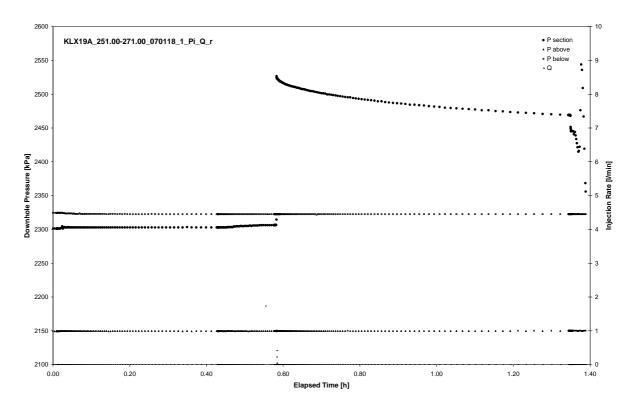
Not Analysed

CHIR phase; log-log match

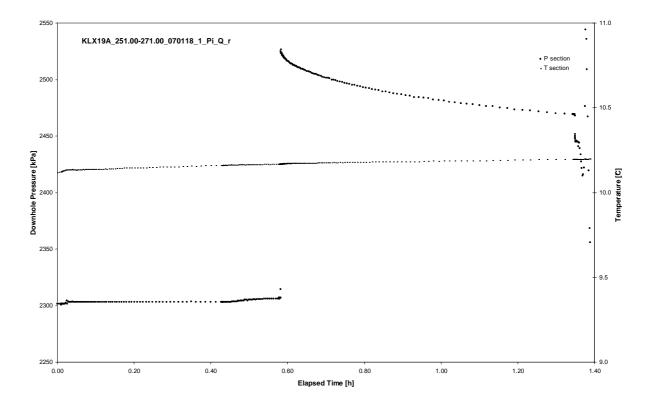
Not Analysed

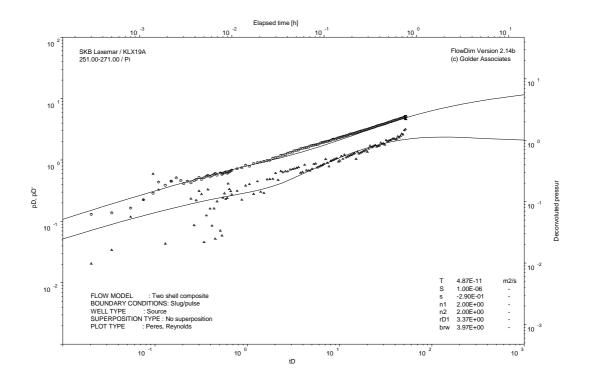
CHIR phase; HORNER match

Test 251.00 – 271.00 m



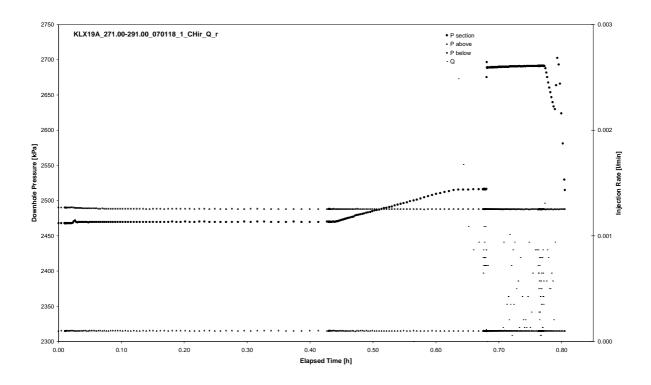
Pressure and flow rate vs. time; cartesian plot



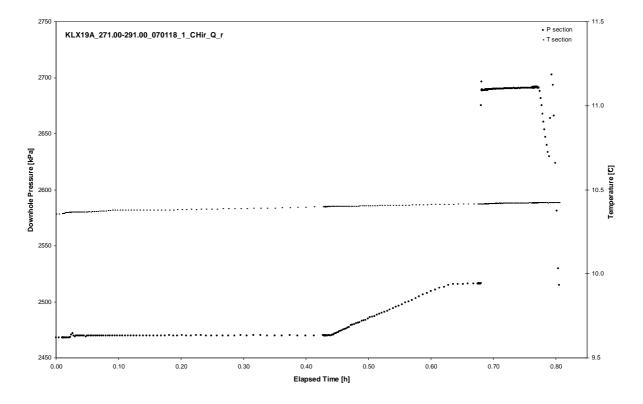


Pulse injection; deconvolution match

Test 271.00 – 291.00 m



Pressure and flow rate vs. time; cartesian plot



Not Analysed

CHI phase; log-log match

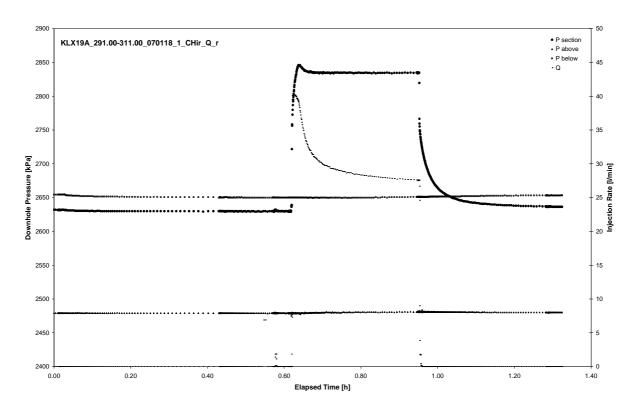
Not Analysed

CHIR phase; log-log match

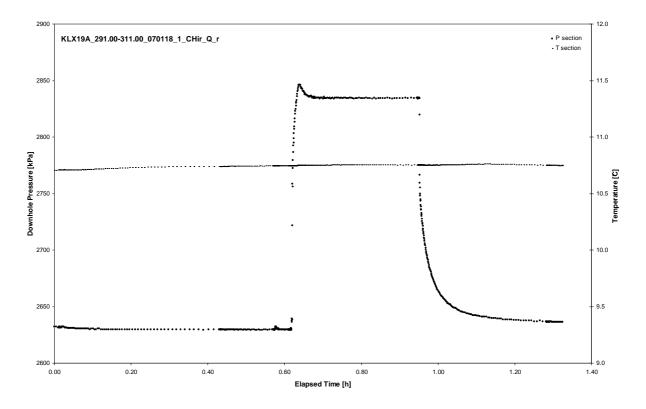
Not Analysed

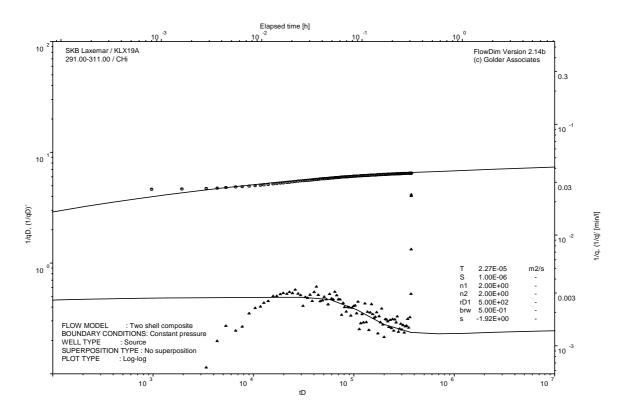
CHIR phase; HORNER match

Test 291.00 – 311.00 m

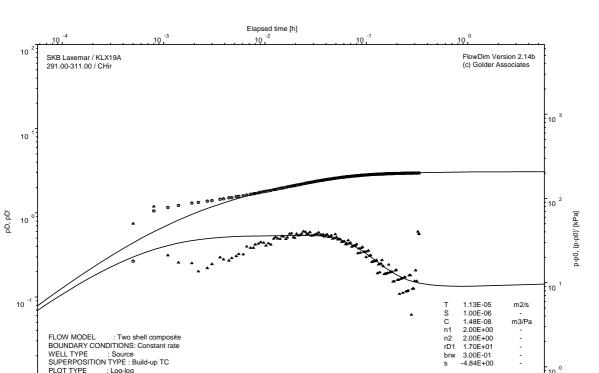


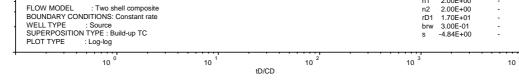
Pressure and flow rate vs. time; cartesian plot



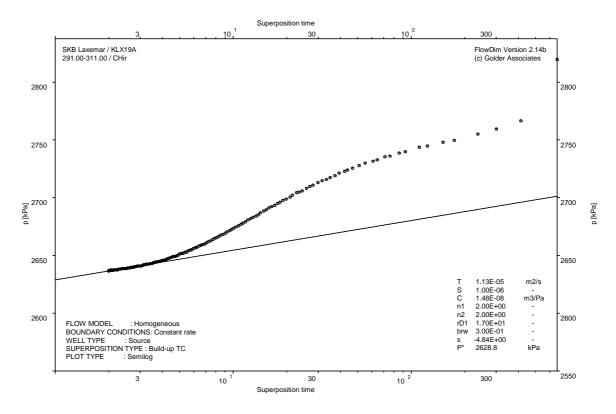


CHI phase; log-log match





CHIR phase; log-log match

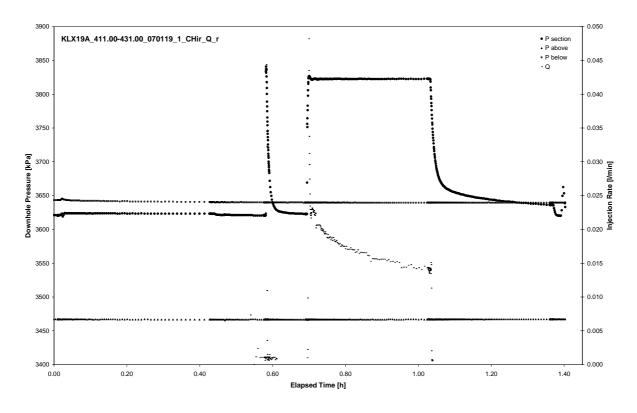


CHIR phase; HORNER match

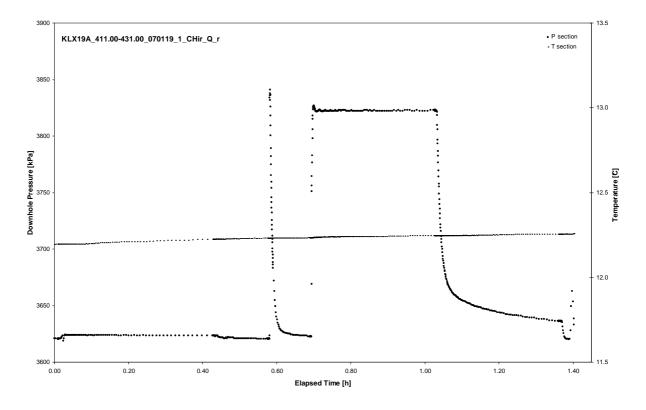
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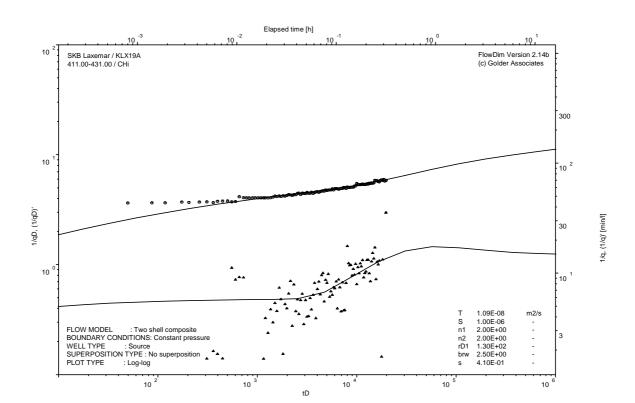
10

Test 411.00 – 431.00 m

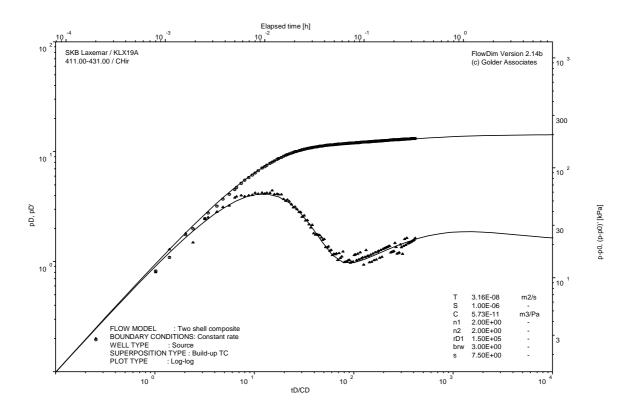


Pressure and flow rate vs. time; cartesian plot

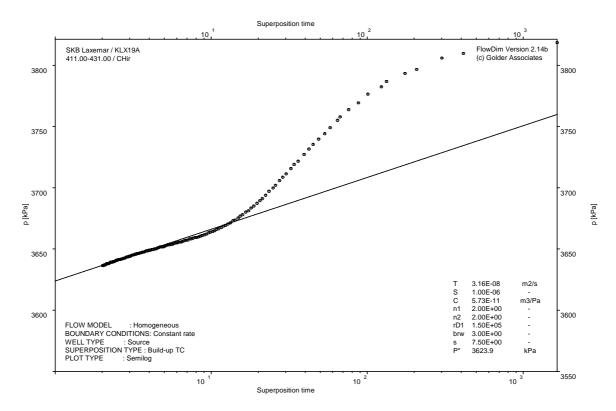




CHI phase; log-log match

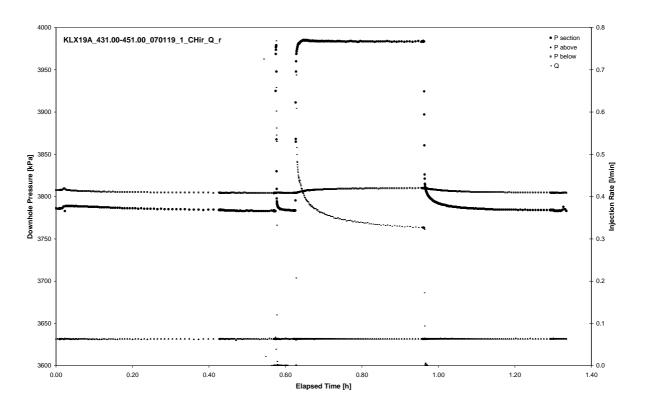


CHIR phase; log-log match

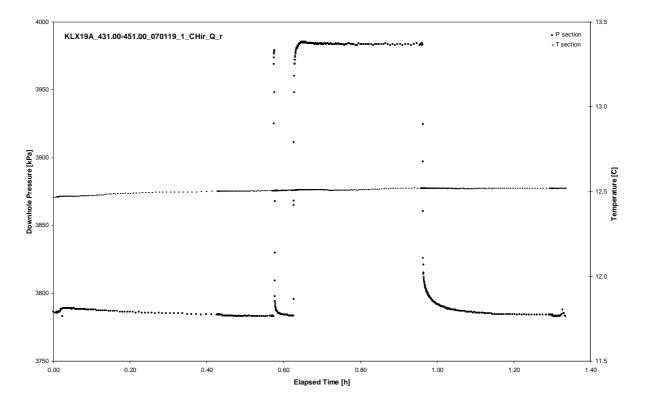


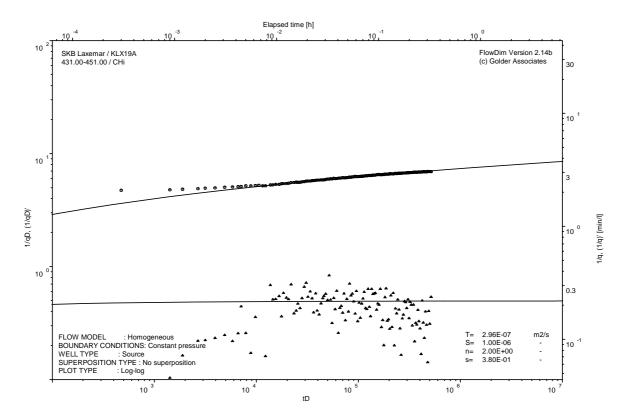
CHIR phase; HORNER match

Test 431.00 – 451.00 m

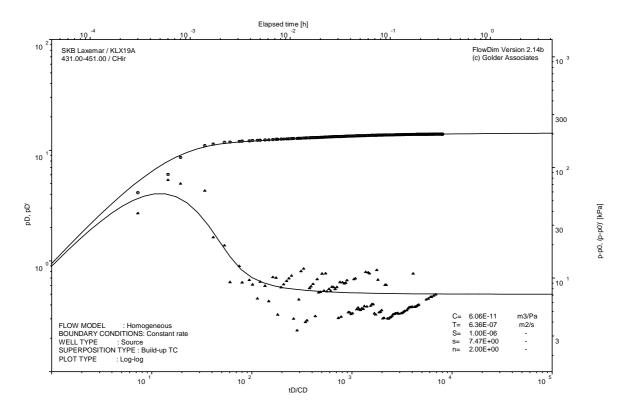


Pressure and flow rate vs. time; cartesian plot

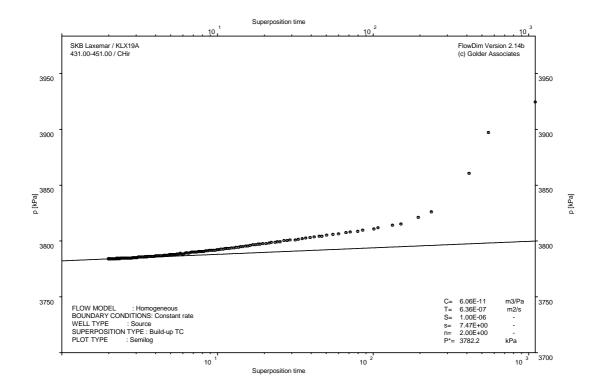




CHI phase; log-log match

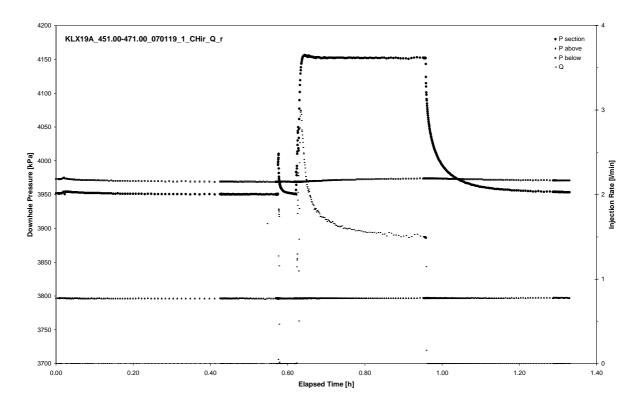


CHIR phase; log-log match

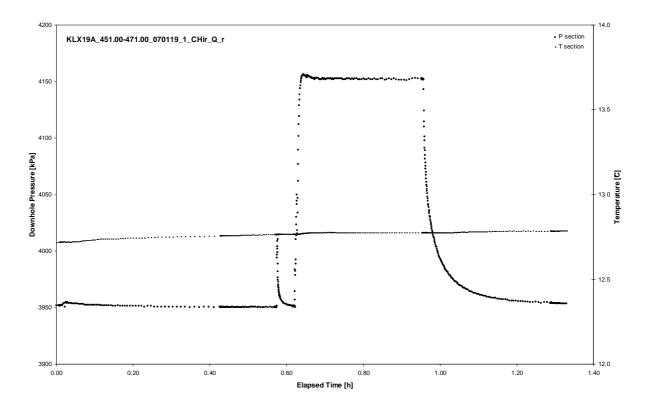


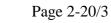
CHIR phase; HORNER match

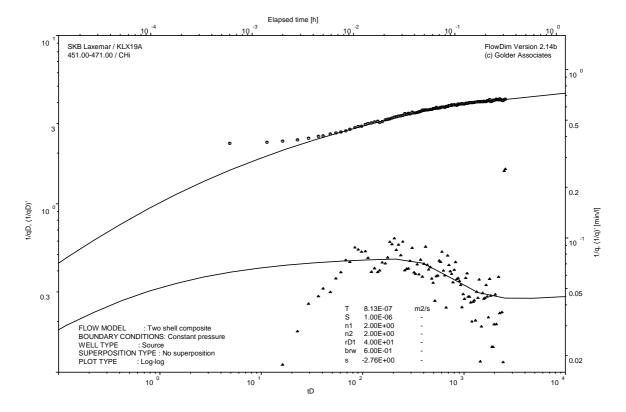
Test 451.00 – 471.00 m



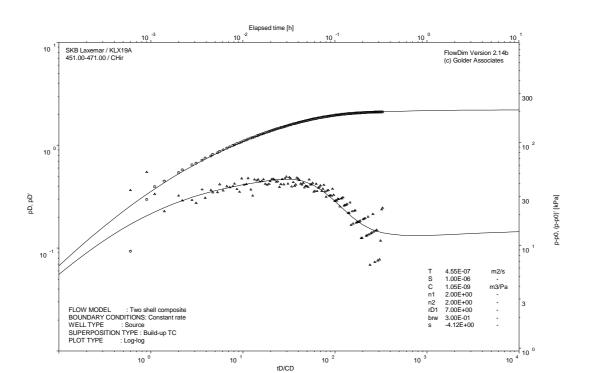
Pressure and flow rate vs. time; cartesian plot



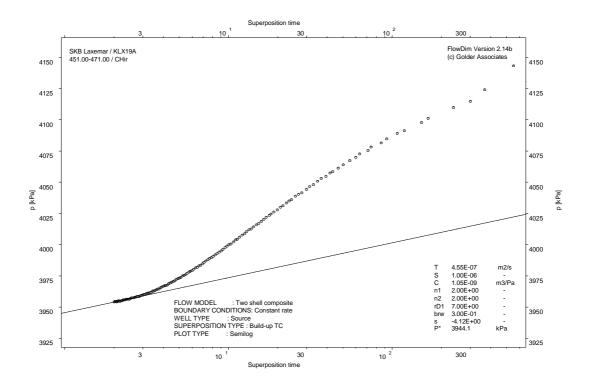




CHI phase; log-log match

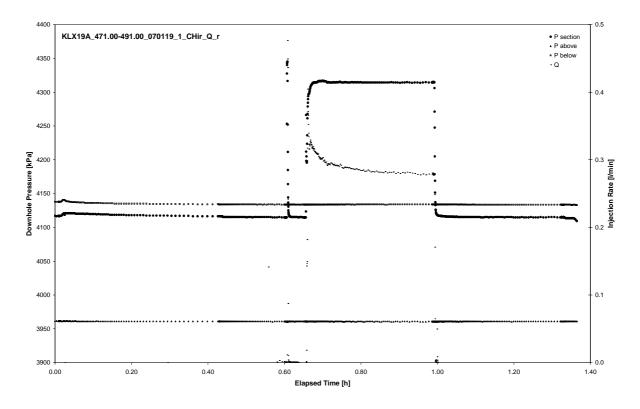


CHIR phase; log-log match

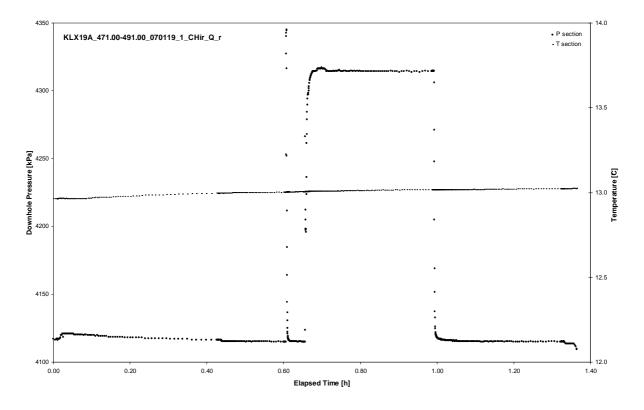


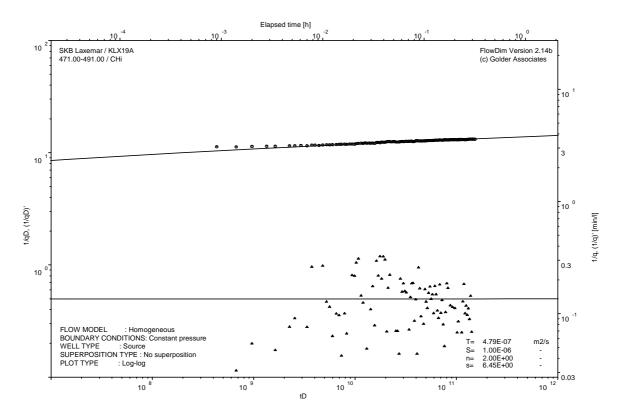
CHIR phase; HORNER match

Test 471.00 – 491.00 m

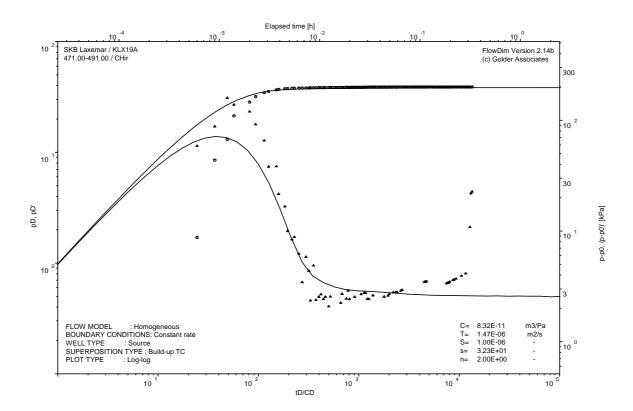


Pressure and flow rate vs. time; cartesian plot

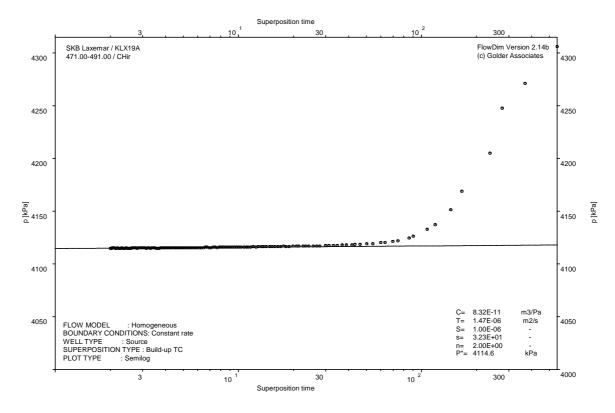




CHI phase; log-log match

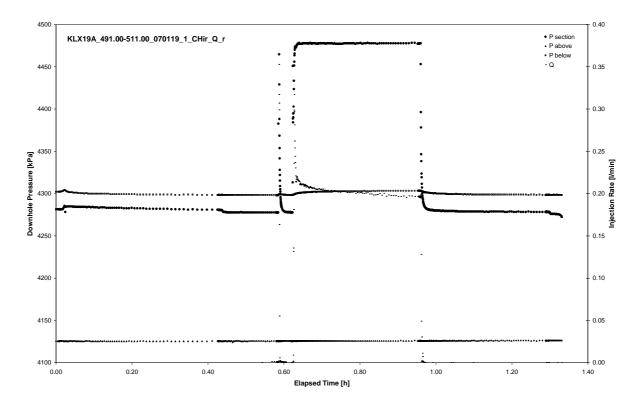


CHIR phase; log-log match

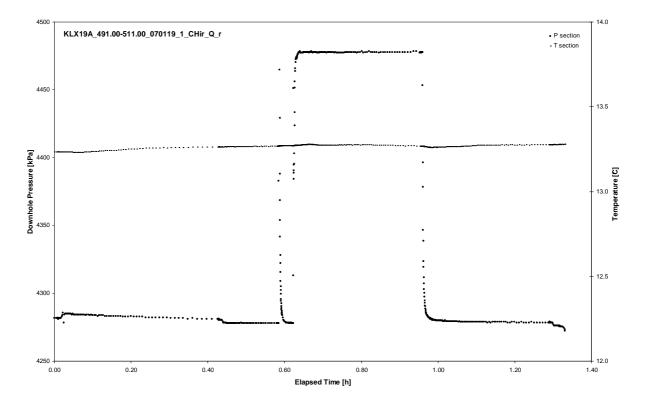


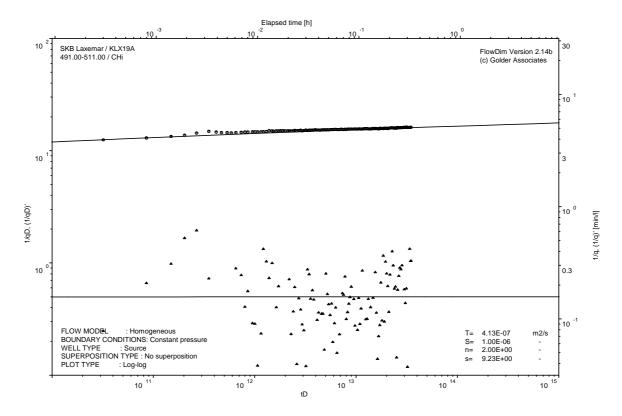
CHIR phase; HORNER match

Test 491.00 – 511.00 m

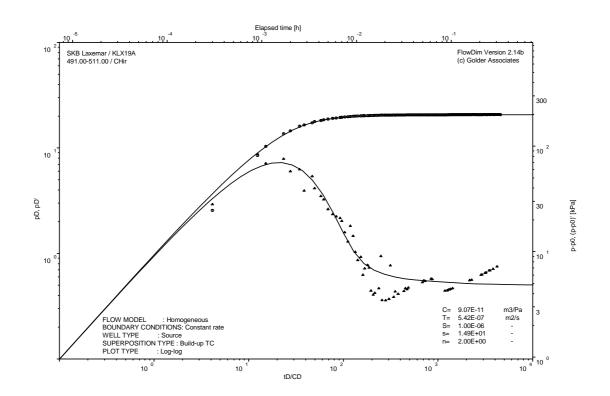


Pressure and flow rate vs. time; cartesian plot

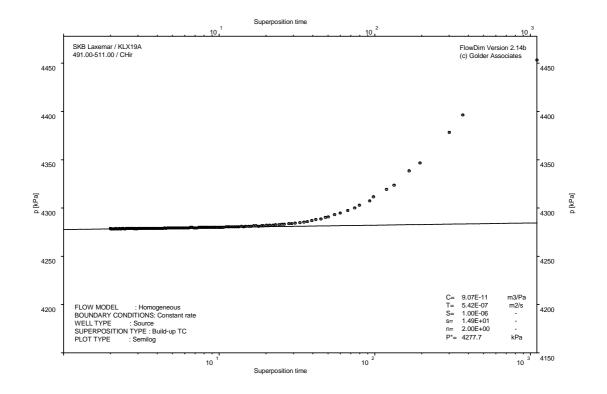




CHI phase; log-log match

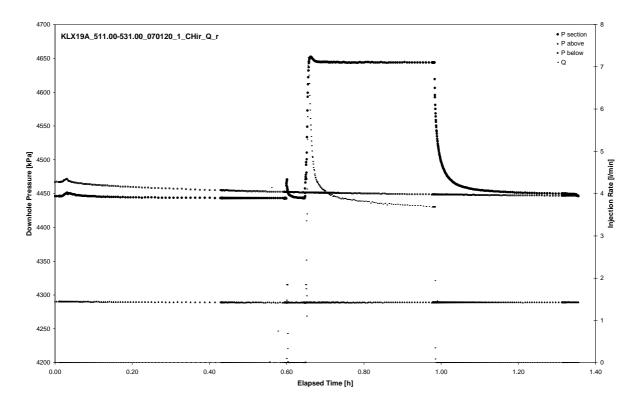


CHIR phase; log-log match

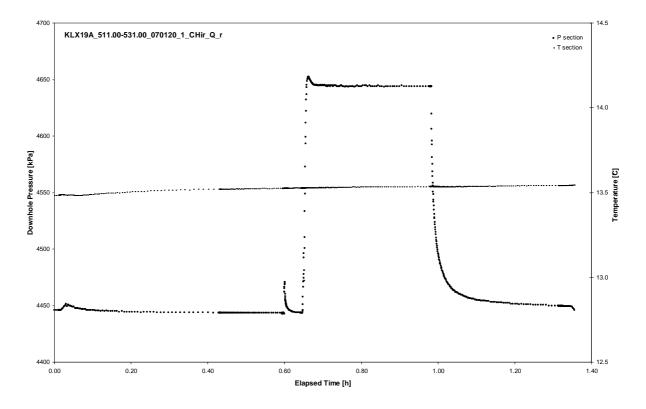


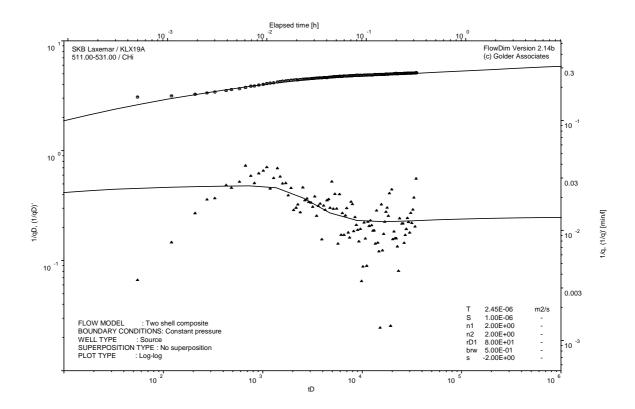
CHIR phase; HORNER match

Test 511.00 – 531.00 m

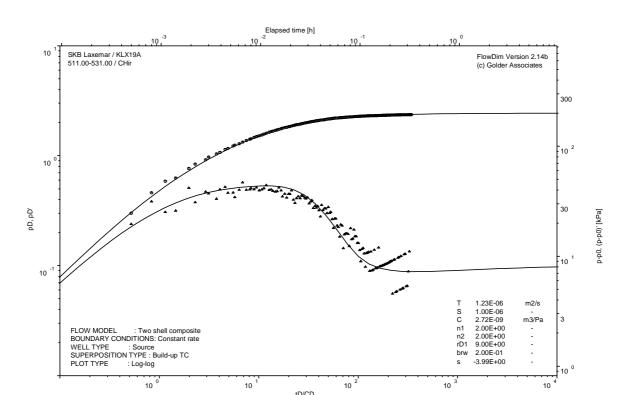


Pressure and flow rate vs. time; cartesian plot





CHI phase; log-log match



10

tD/CD

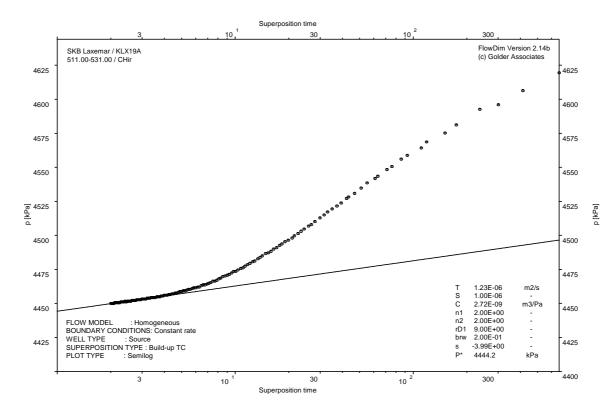
3

10

CHIR phase; log-log match

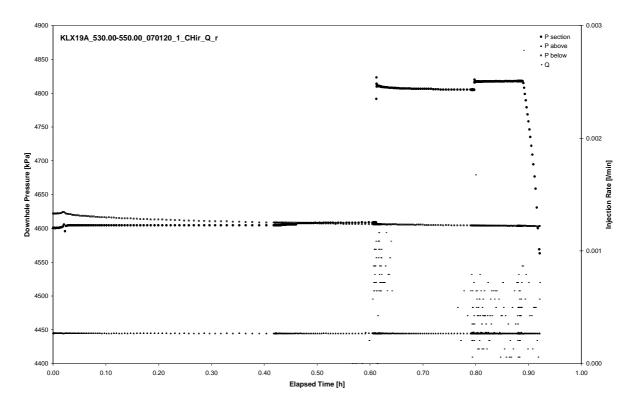
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10

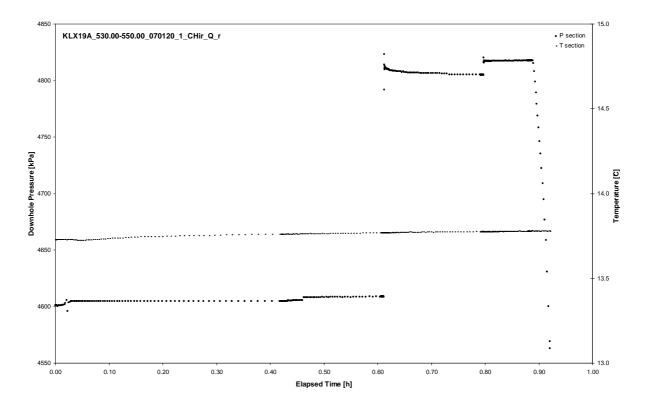


CHIR phase; HORNER match

Test 530.00 – 550.00 m



Pressure and flow rate vs. time; cartesian plot



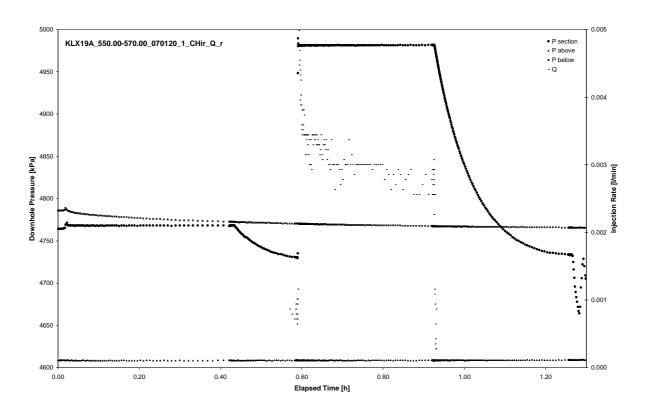
CHI phase; log-log match

CHIR phase; log-log match

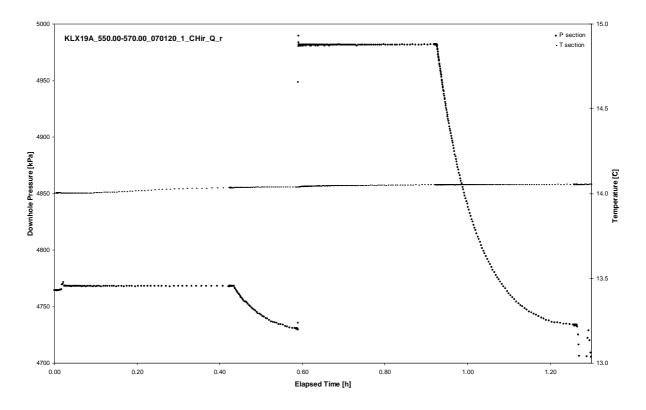
Not Analysed

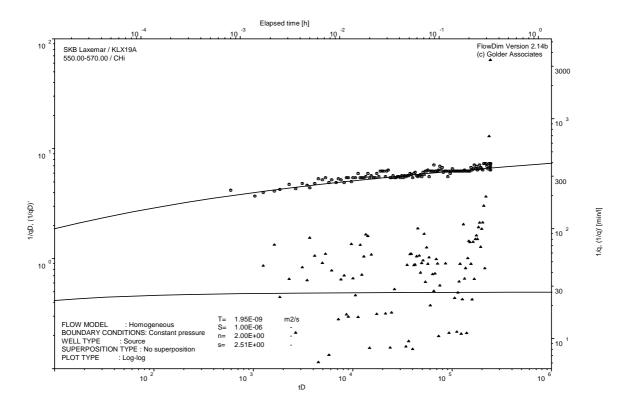
CHIR phase; HORNER match

Test 550.00 – 570.00 m

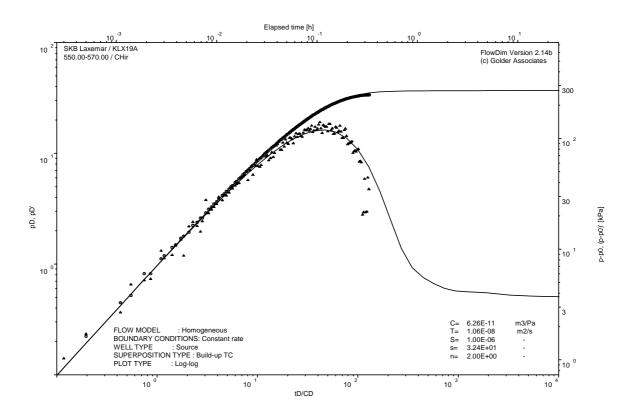


Pressure and flow rate vs. time; cartesian plot

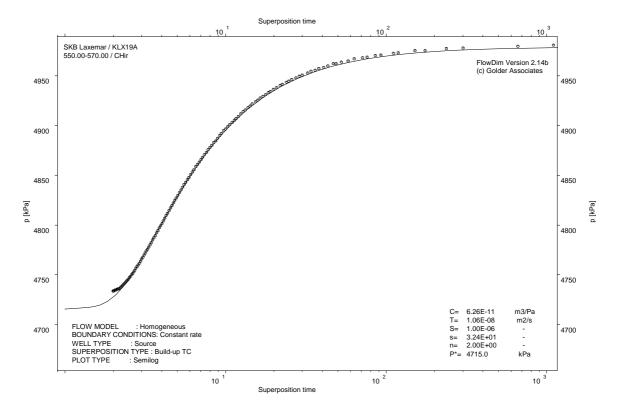




CHI phase; log-log match

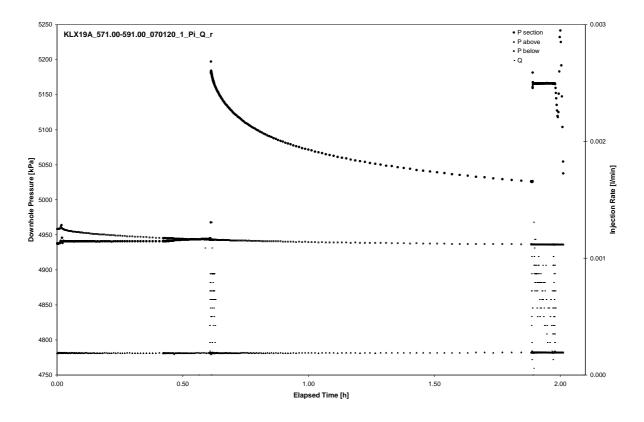


CHIR phase; log-log match

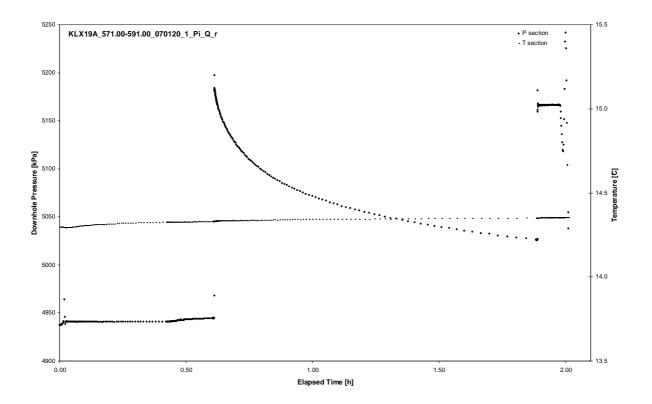


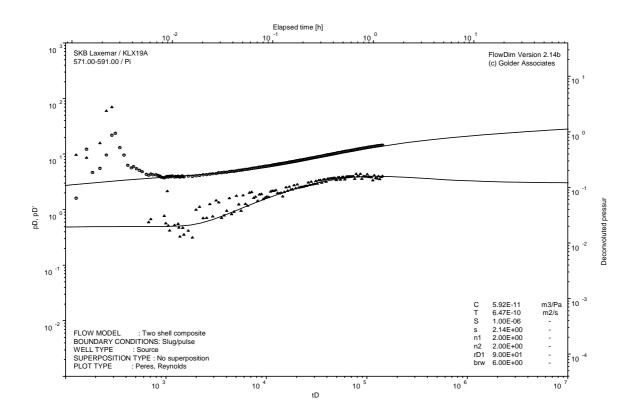
CHIR phase; HORNER match

Test 571.00 – 591.00 m



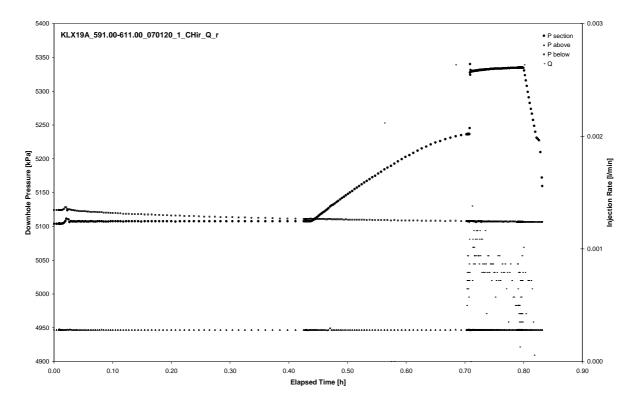
Pressure and flow rate vs. time; cartesian plot



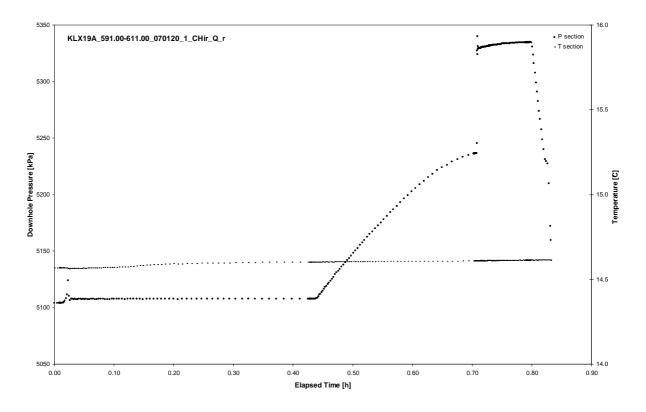


Pulse injection; deconvolution match

Test 591.00 – 611.00 m



Pressure and flow rate vs. time; cartesian plot



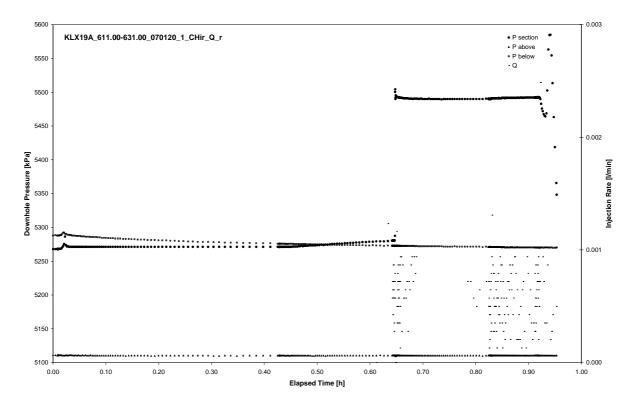
CHI phase; log-log match

CHIR phase; log-log match

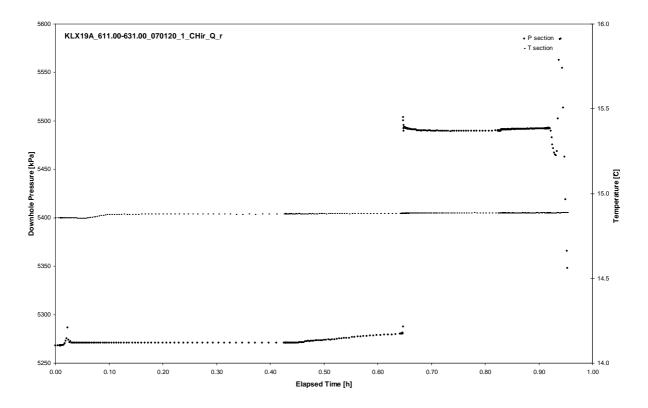
Not Analysed

CHIR phase; HORNER match

Test 611.00 – 631.00 m



Pressure and flow rate vs. time; cartesian plot



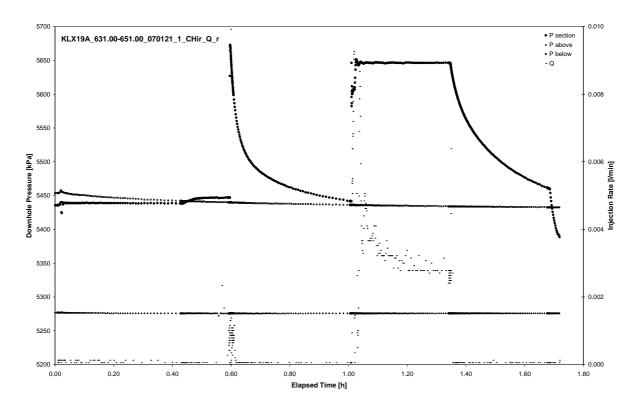
CHI phase; log-log match

CHIR phase; log-log match

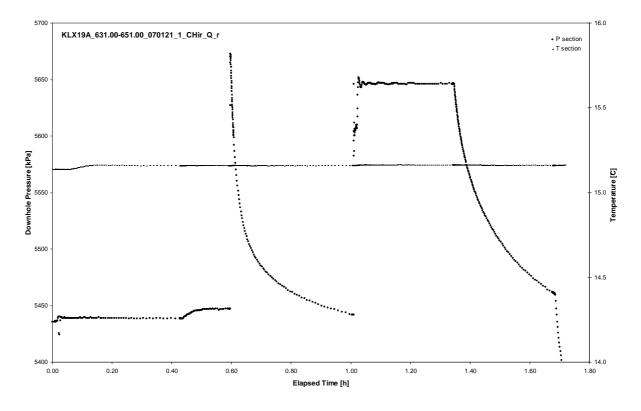
Not Analysed

CHIR phase; HORNER match

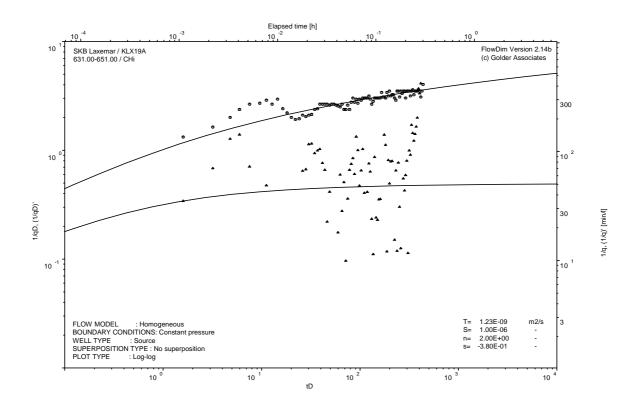
Test 631.00 – 651.00 m



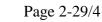
Pressure and flow rate vs. time; cartesian plot

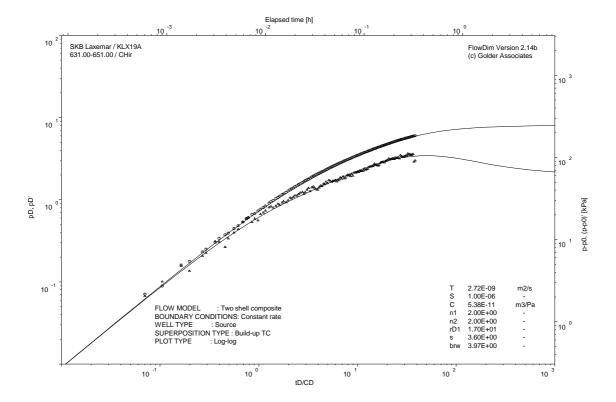


Interval pressure and temperature vs. time; cartesian plot

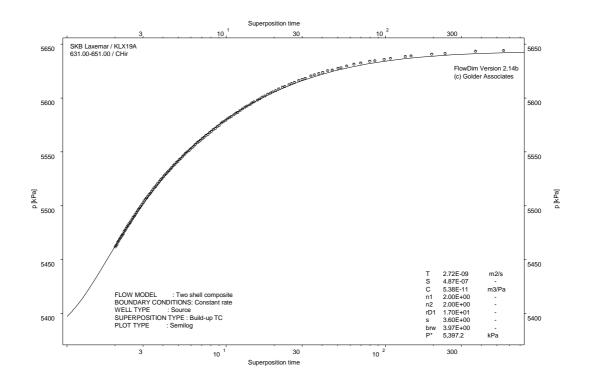


CHI phase; log-log match



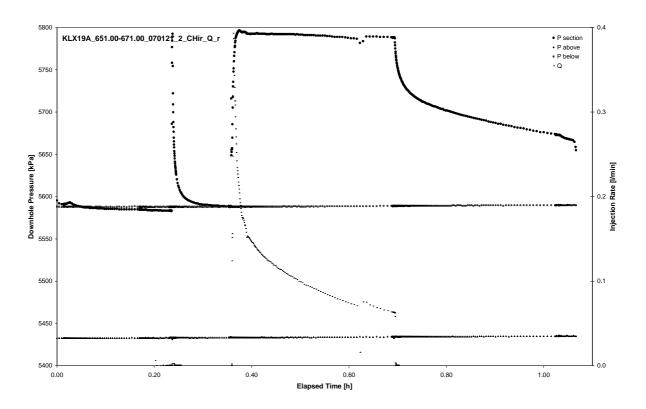


CHIR phase; log-log match

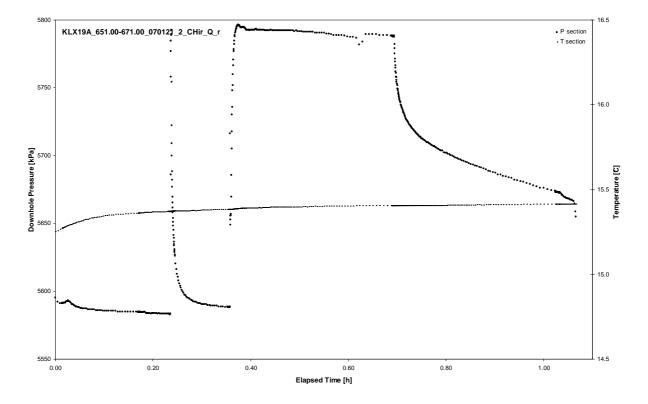


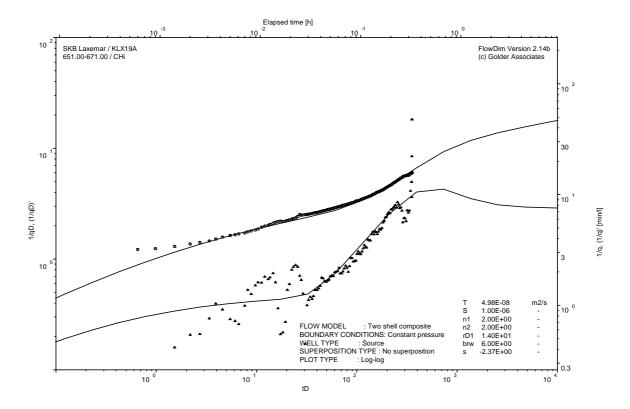
CHIR phase; HORNER match

Test 651.00 – 671.00 m



Pressure and flow rate vs. time; cartesian plot



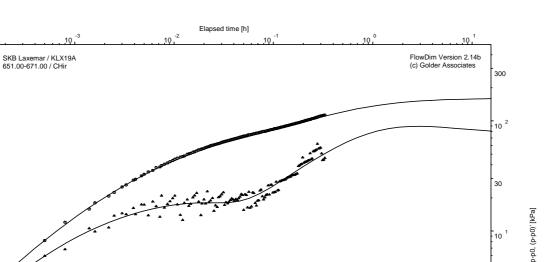


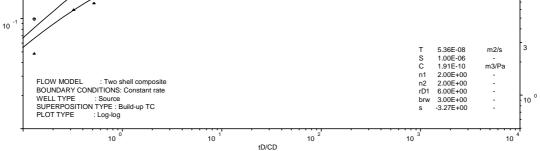
CHI phase; log-log match

10

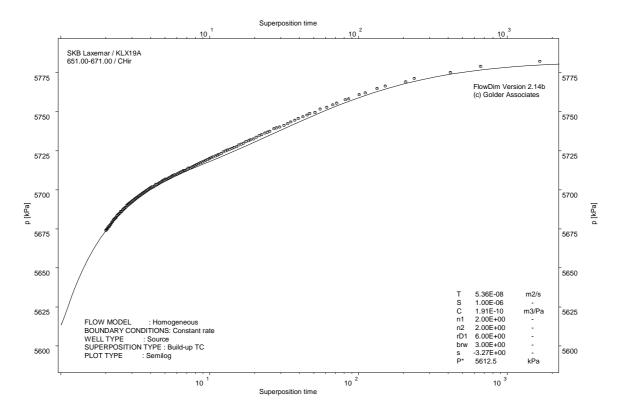
10

pD, pD'



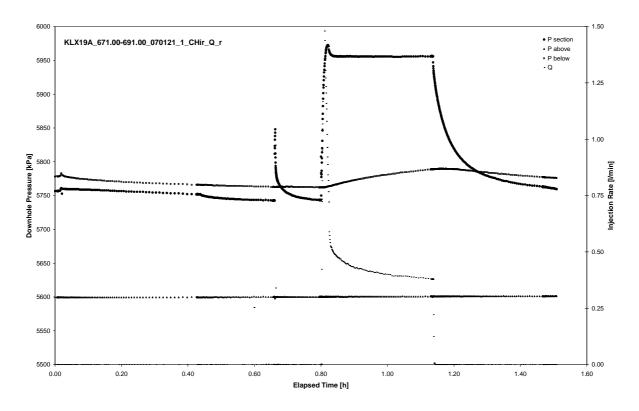


CHIR phase; log-log match

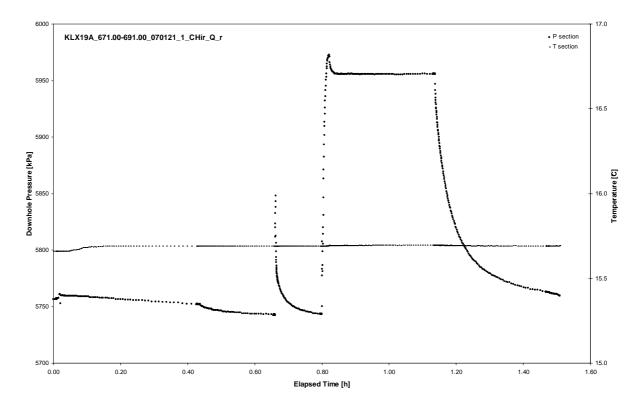


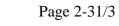
CHIR phase; HORNER match

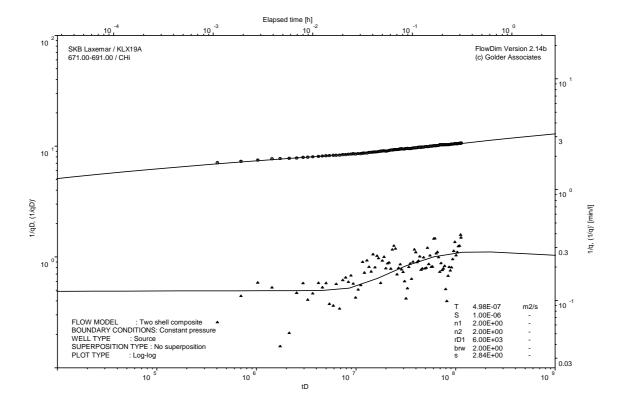
Test 671.00 – 691.00 m



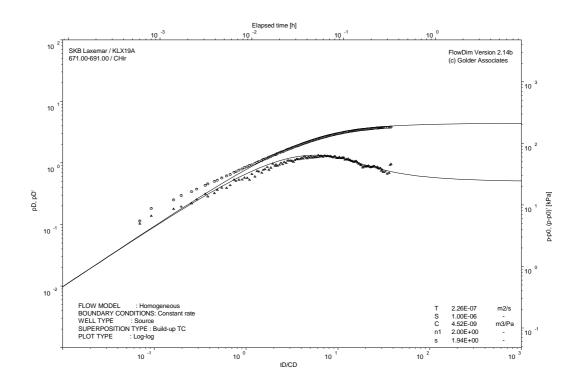
Pressure and flow rate vs. time; cartesian plot



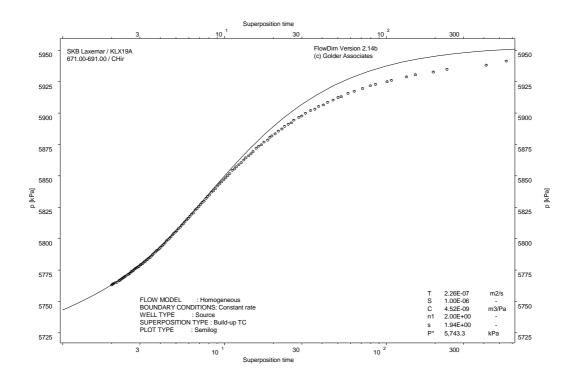




CHI phase; log-log match

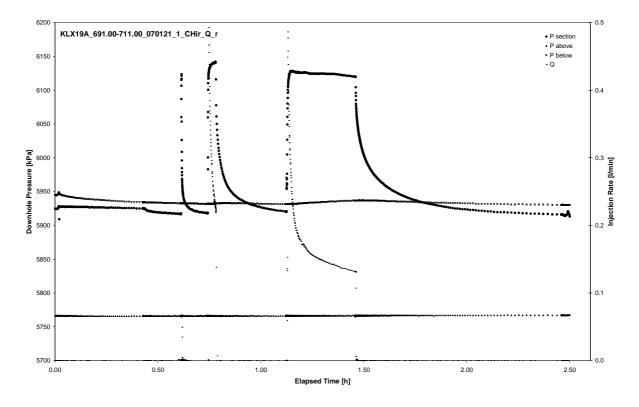


CHIR phase; log-log match

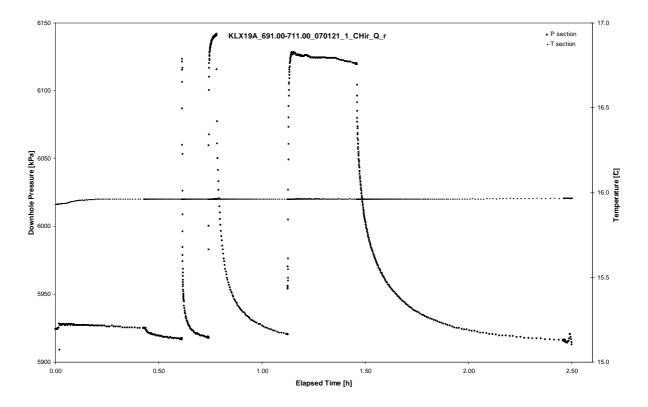


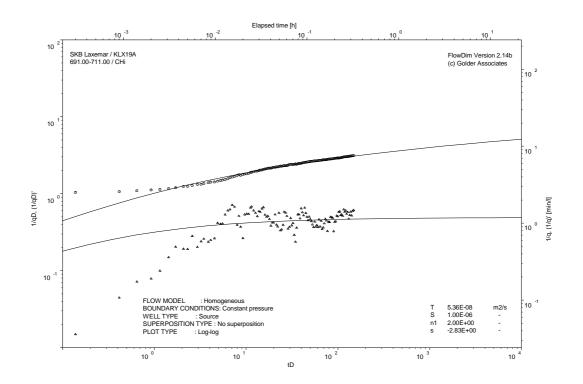
CHIR phase; HORNER match

Test 691.00 – 711.00 m

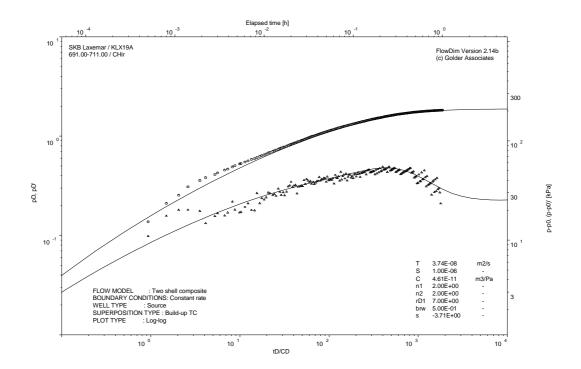


Pressure and flow rate vs. time; cartesian plot

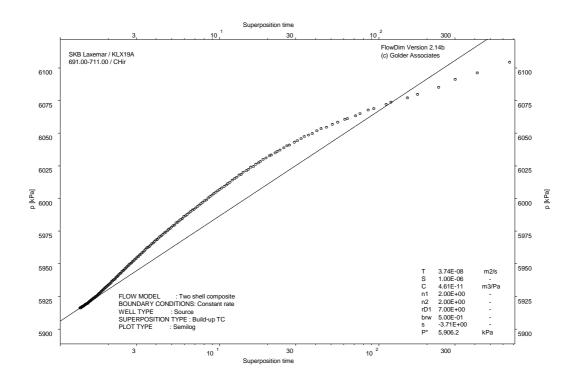




CHI phase; log-log match

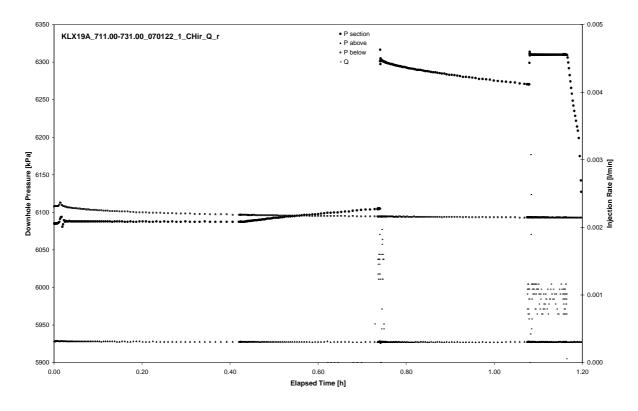


CHIR phase; log-log match

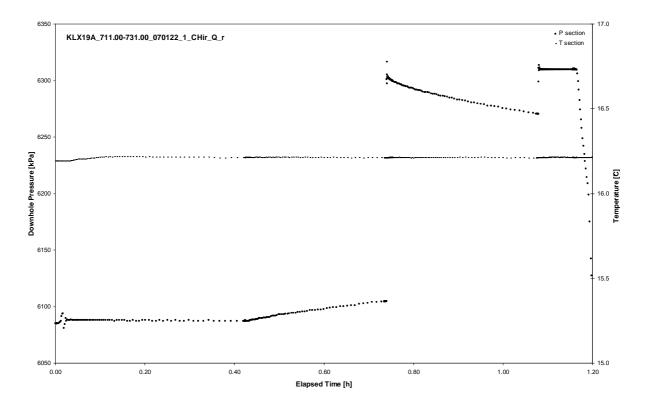


CHIR phase; HORNER match

Test 711.00 – 731.00 m



Pressure and flow rate vs. time; cartesian plot



Not Analysed

CHI phase; log-log match

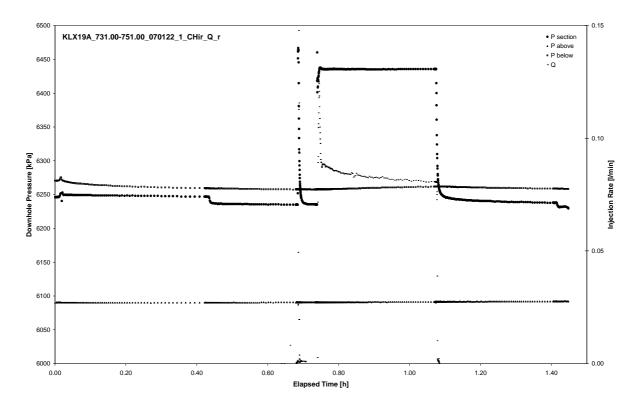
Not Analysed

CHIR phase; log-log match

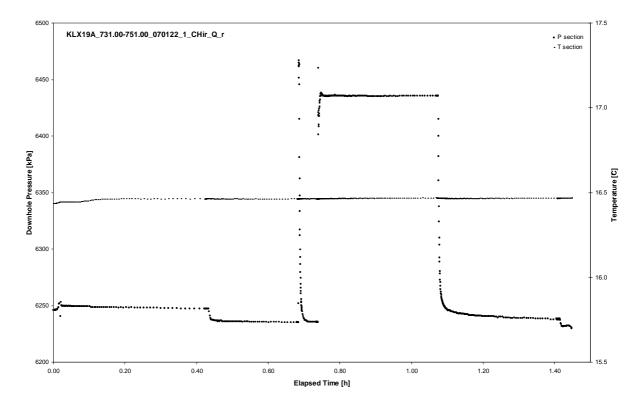
Not Analysed

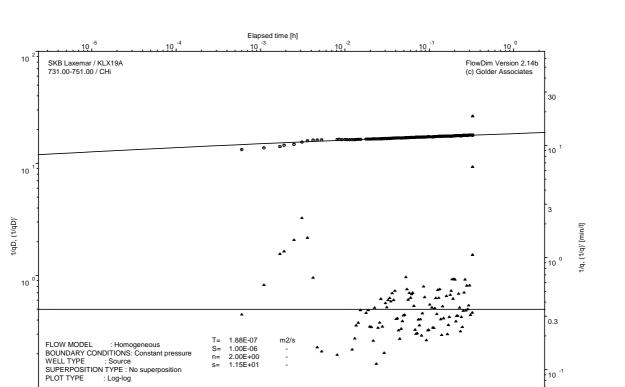
CHIR phase; HORNER match

Test 731.00 – 751.00 m



Pressure and flow rate vs. time; cartesian plot





10¹³

tD

10 14

10¹⁵

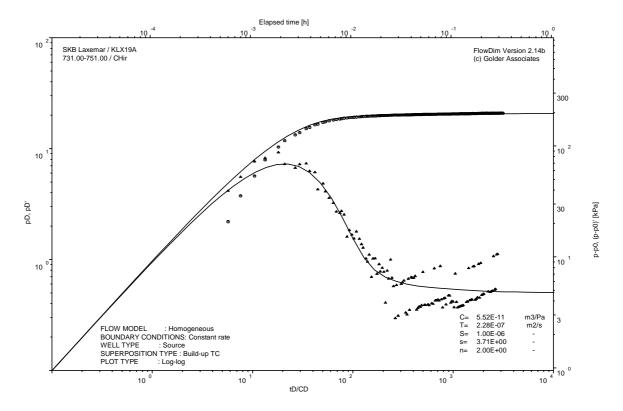
CHI phase; log-log match

10 11

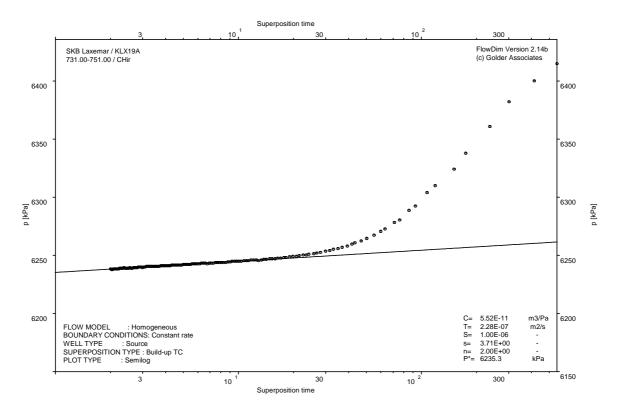
10¹²

10 -1

10 ¹⁶

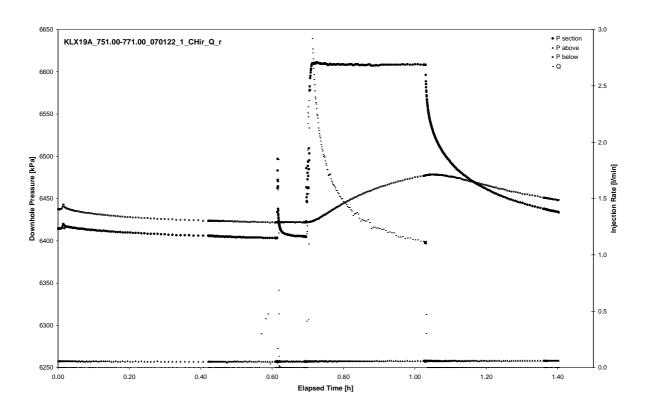


CHIR phase; log-log match

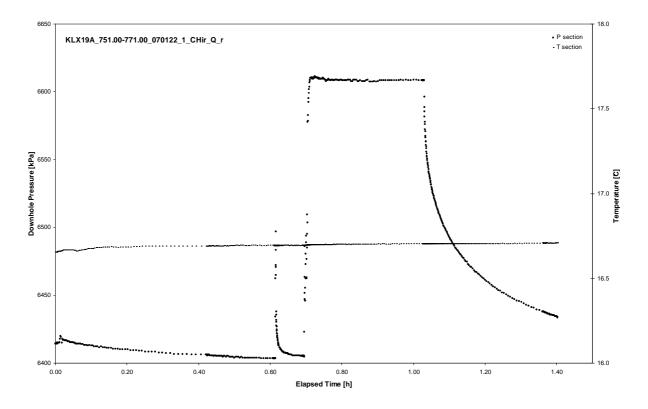


CHIR phase; HORNER match

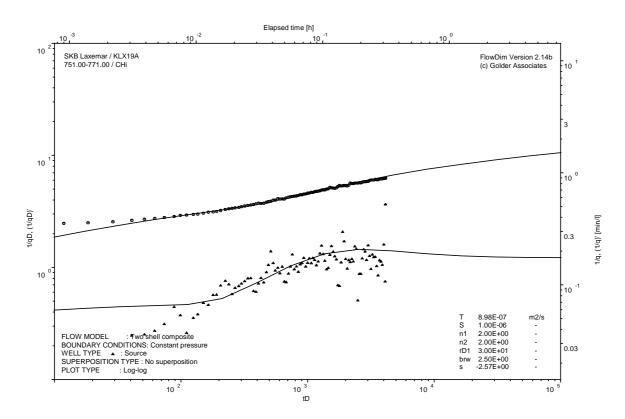
Test 751.00 – 771.00 m



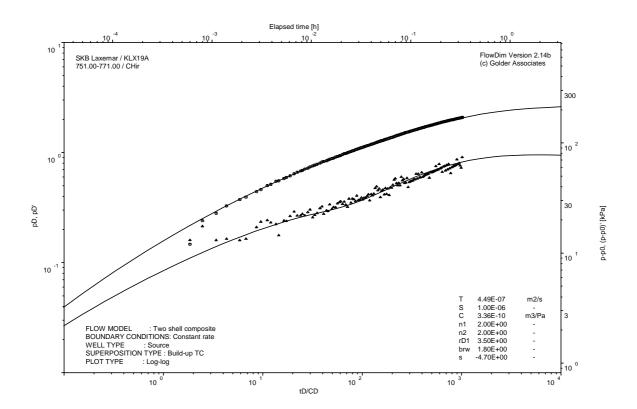
Pressure and flow rate vs. time; cartesian plot



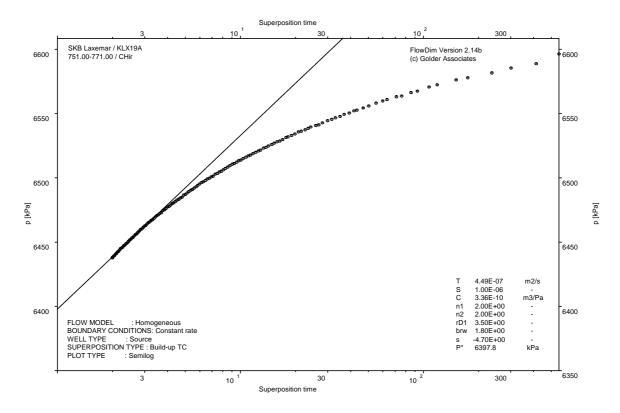
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

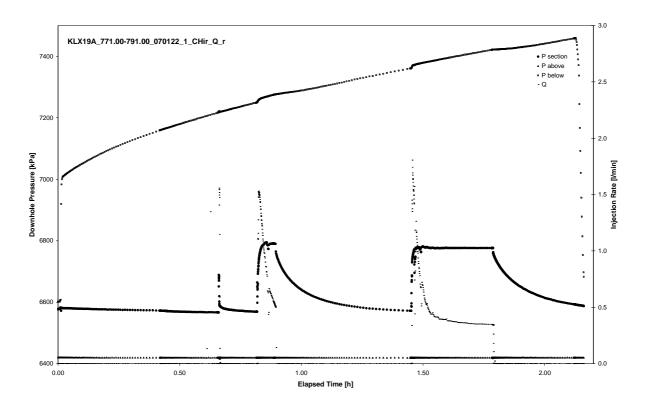


CHIR phase; log-log match

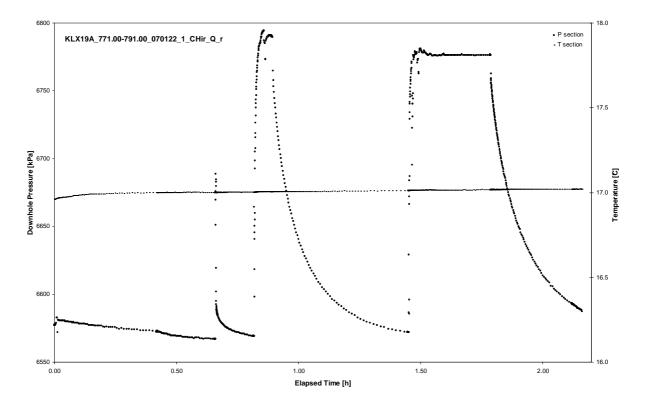


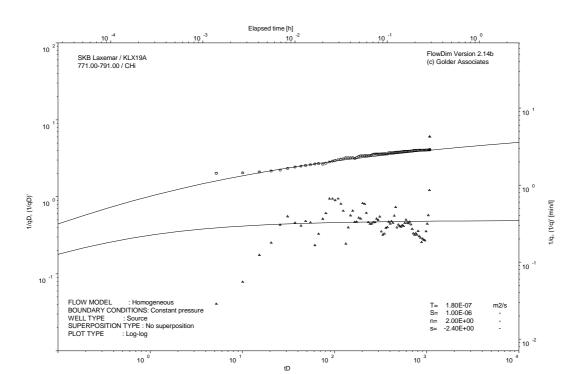
CHIR phase; HORNER match

Test 771.00 – 791.00 m

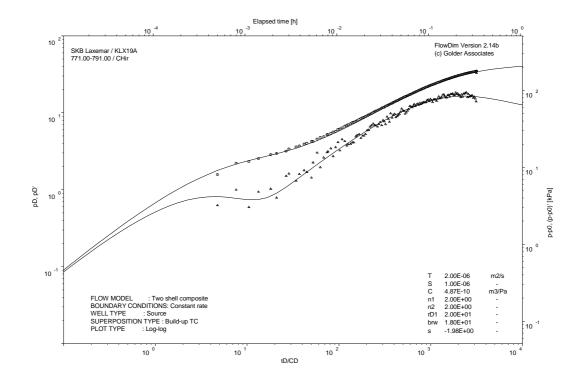


Pressure and flow rate vs. time; cartesian plot

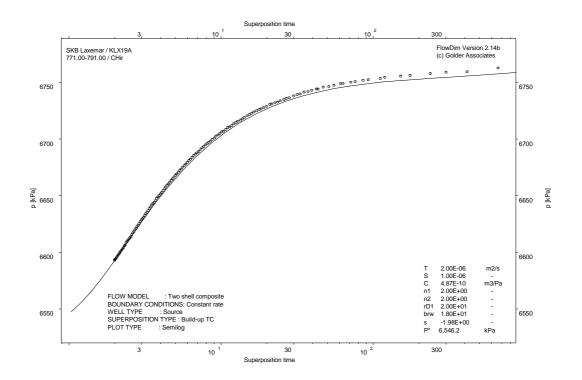




CHI phase; log-log match

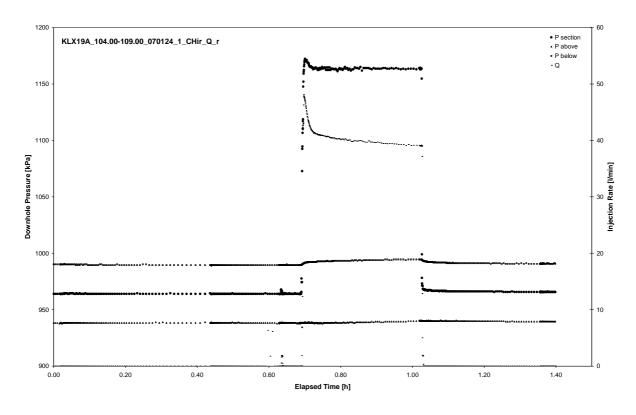


CHIR phase; log-log match

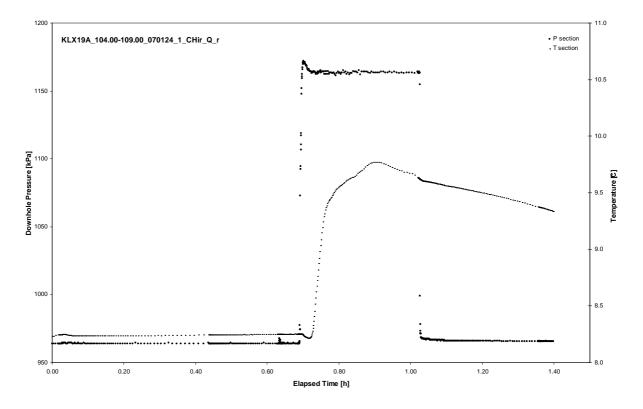


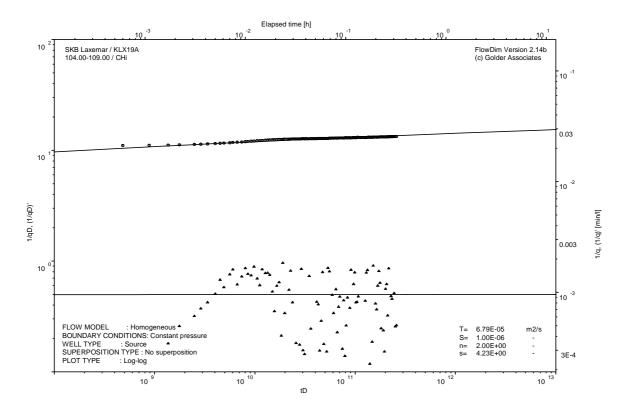
CHIR phase; HORNER match

Test 104.00 - 109.00 m

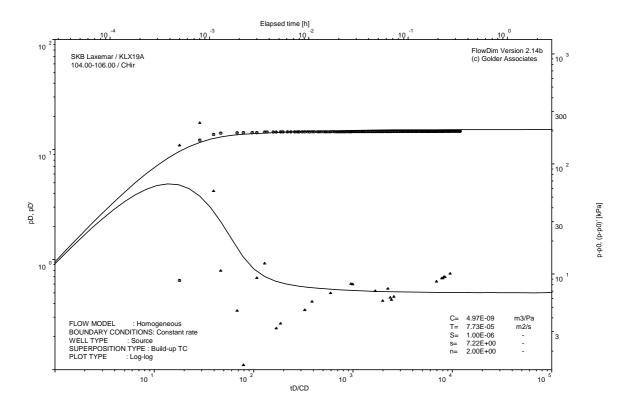


Pressure and flow rate vs. time; cartesian plot

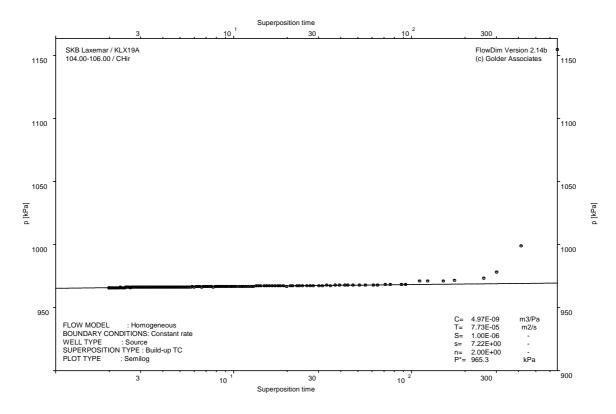




CHI phase; log-log match

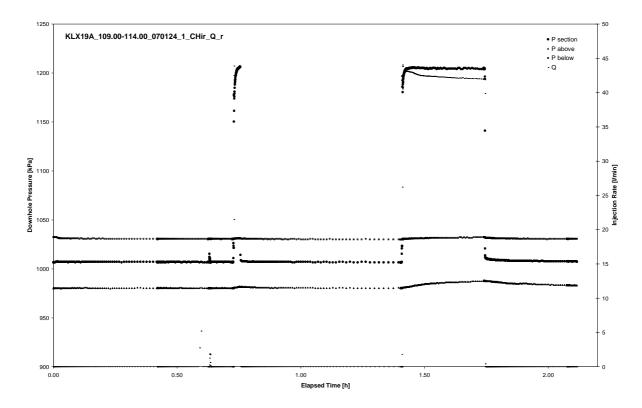


CHIR phase; log-log match

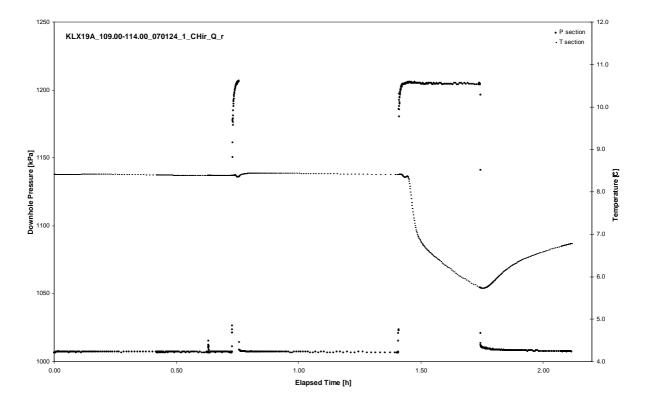


CHIR phase; HORNER match

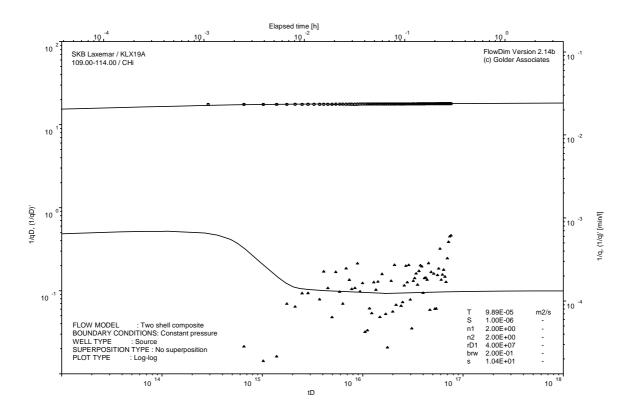
Test 109.00 – 114.00 m



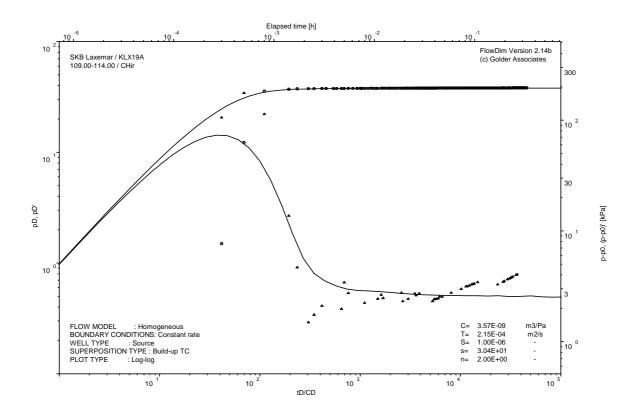
Pressure and flow rate vs. time; cartesian plot



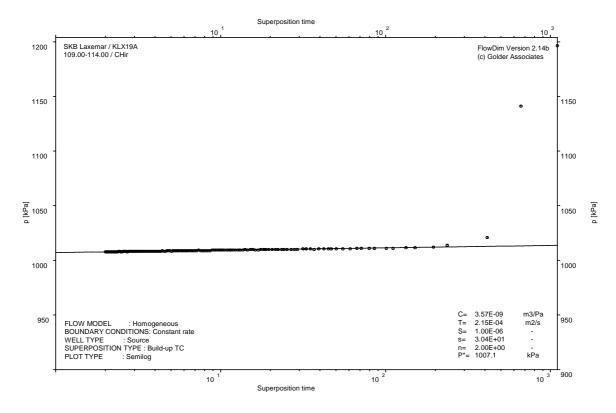
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

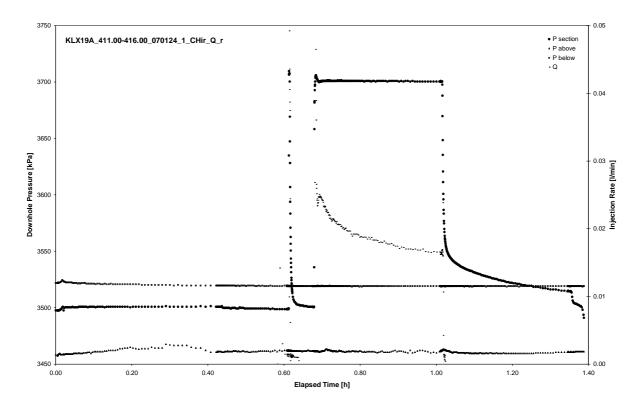


CHIR phase; log-log match

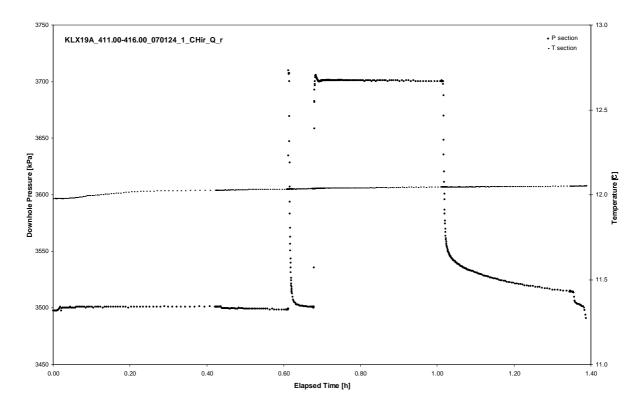


CHIR phase; HORNER match

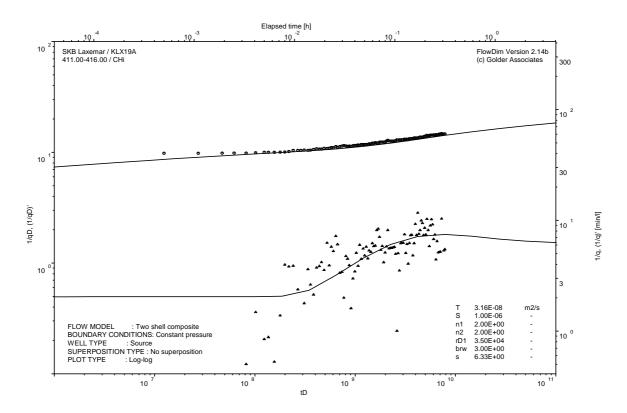
Test 411.00 – 416.00 m



Pressure and flow rate vs. time; cartesian plot

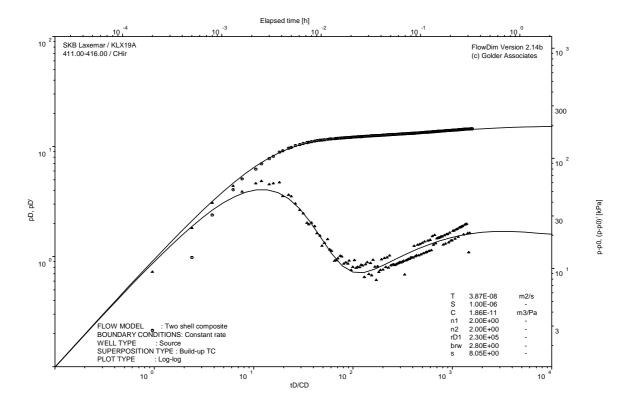


Interval pressure and temperature vs. time; cartesian plot

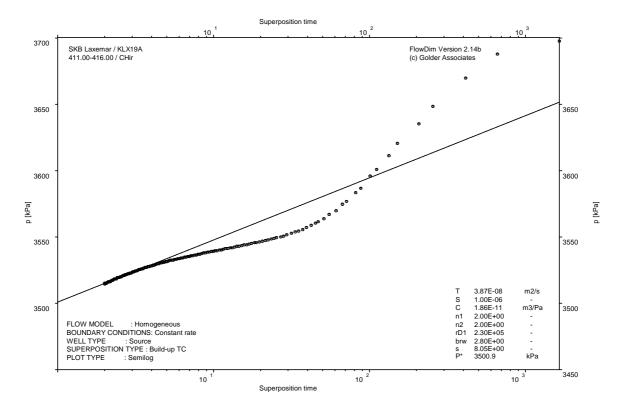


CHI phase; log-log match



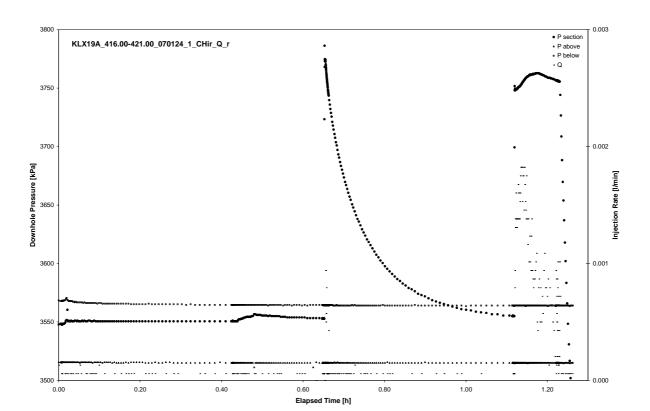


CHIR phase; log-log match

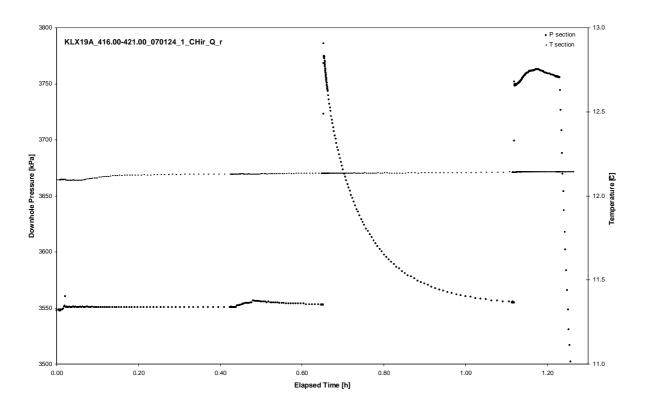


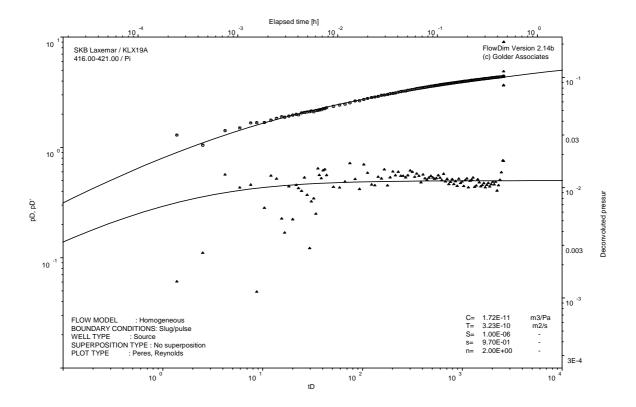
CHIR phase; HORNER match

Test 416.00 – 421.00 m



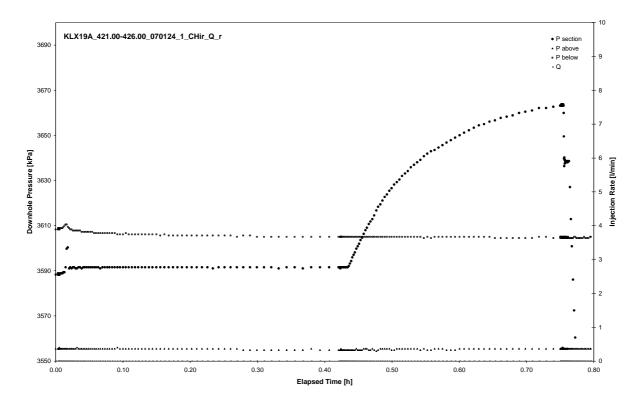
Pressure and flow rate vs. time; cartesian plot



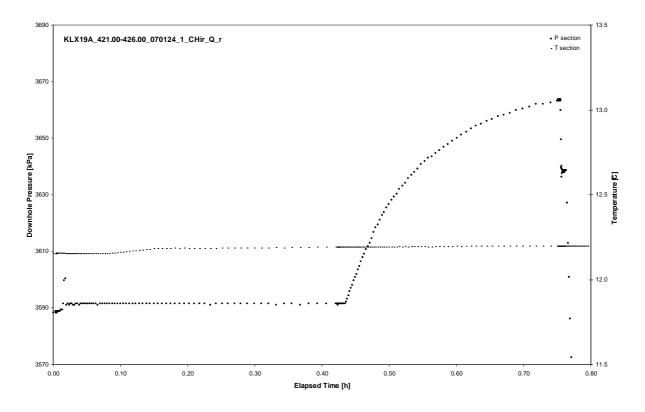


Pulse injection; deconvolution match

Test 421.00 – 426.00 m



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

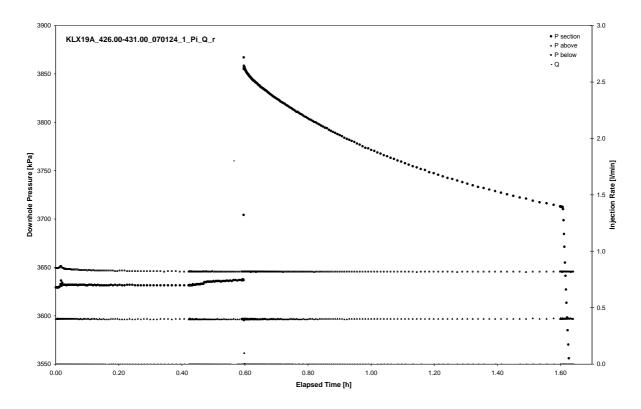
CHI phase; log-log match

CHIR phase; log-log match

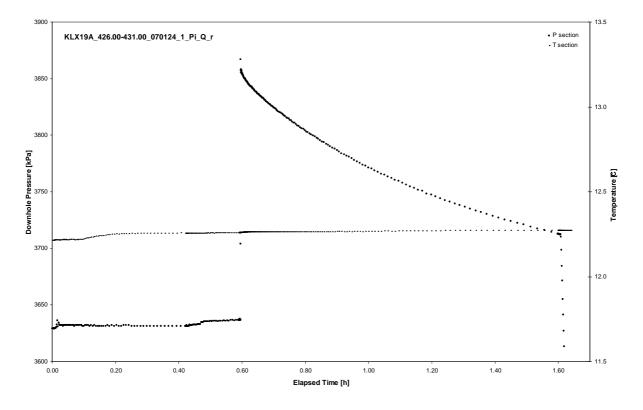
Not Analysed

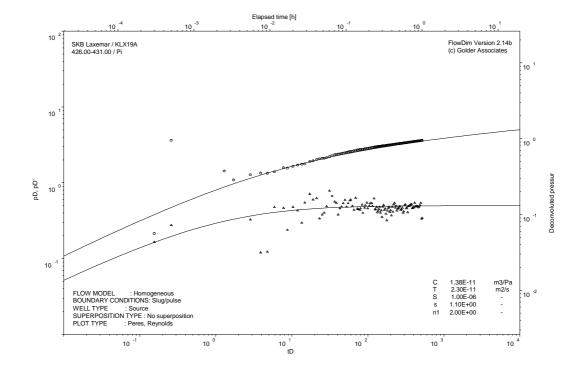
CHIR phase; HORNER match

Test 426.00 – 431.00 m



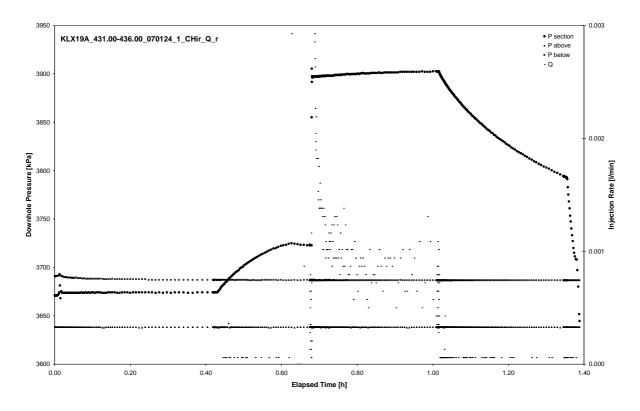
Pressure and flow rate vs. time; cartesian plot



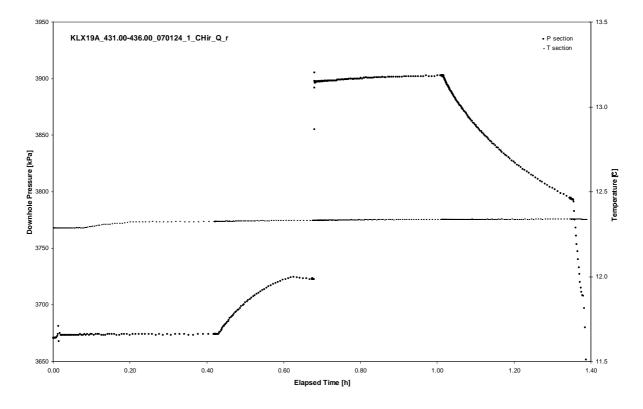


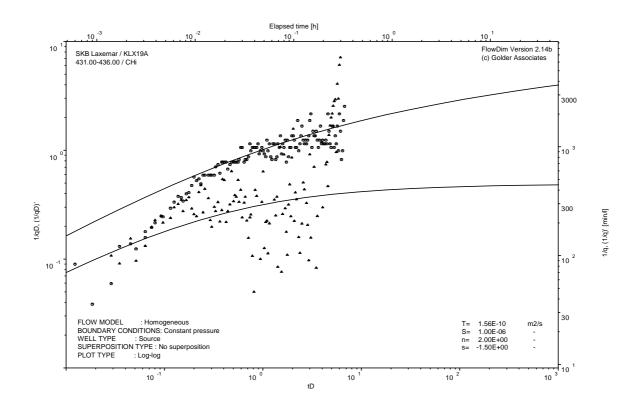
Pulse injection; deconvolution match

Test 431.00 – 436.00 m

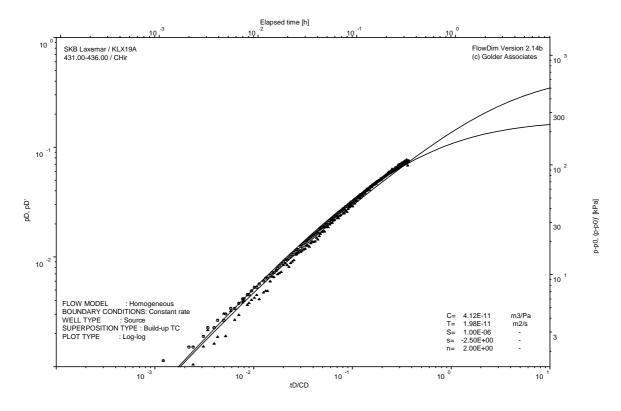


Pressure and flow rate vs. time; cartesian plot

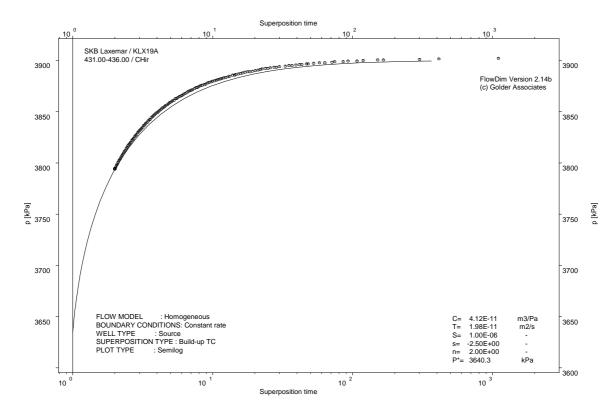




CHI phase; log-log match

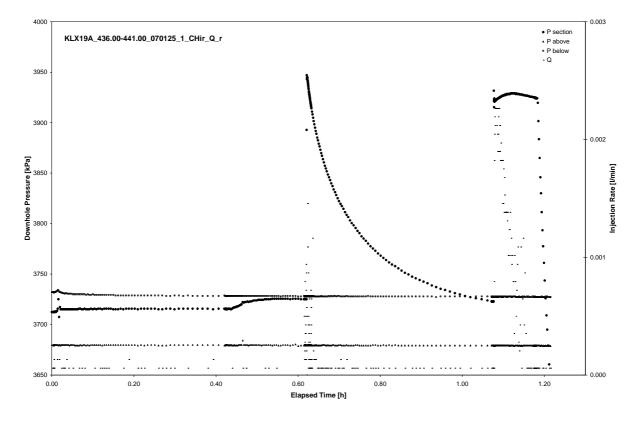


CHIR phase; log-log match

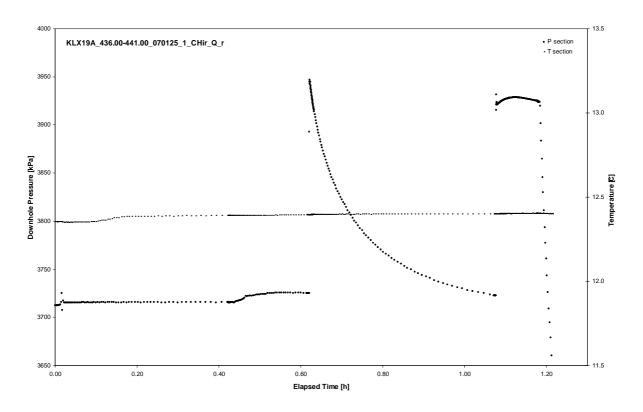


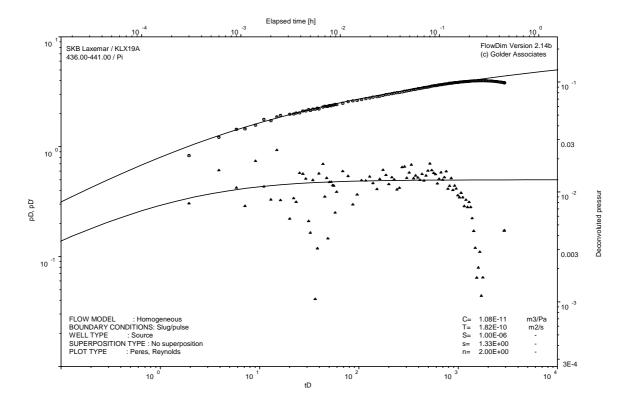
CHIR phase; HORNER match

Test 436.00 – 441.00 m



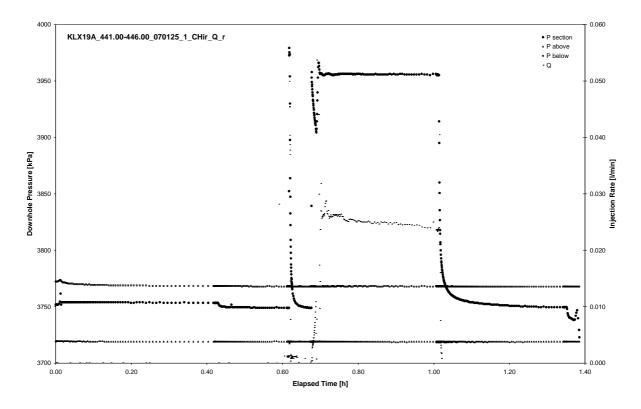
Pressure and flow rate vs. time; cartesian plot



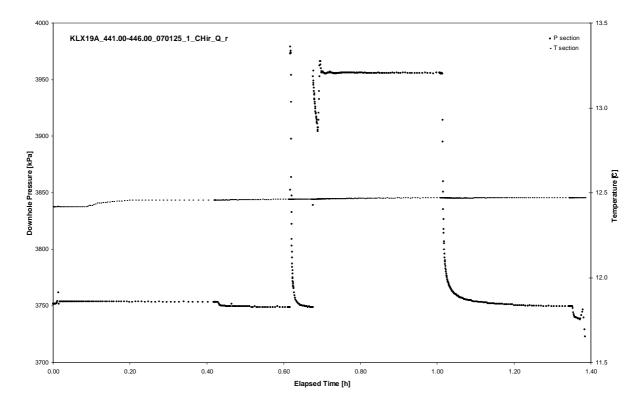


Pulse injection; deconvolution match

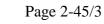
Test 441.00 – 446.00 m

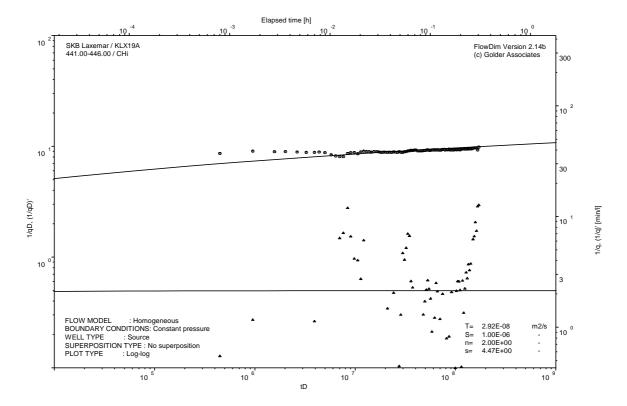


Pressure and flow rate vs. time; cartesian plot

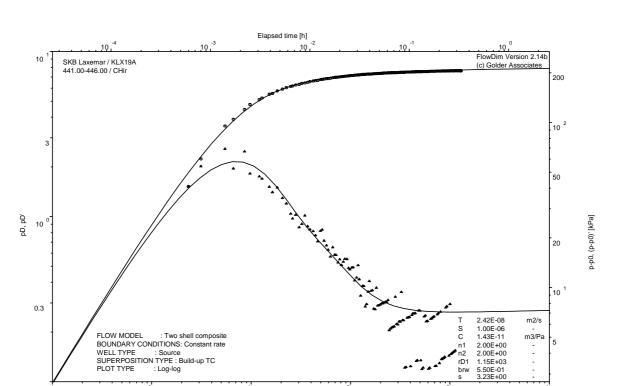


Interval pressure and temperature vs. time; cartesian plot





CHI phase; log-log match

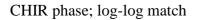


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tD/CD

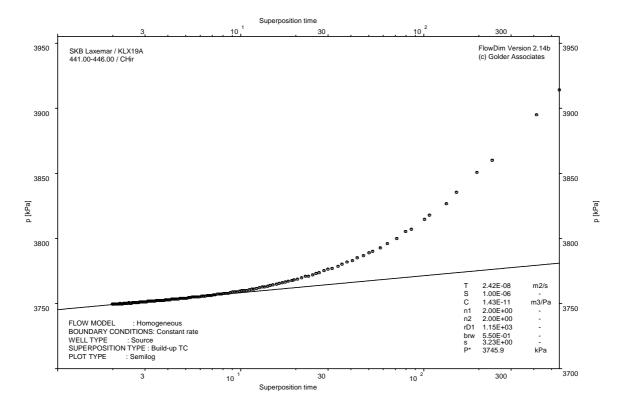
10

10



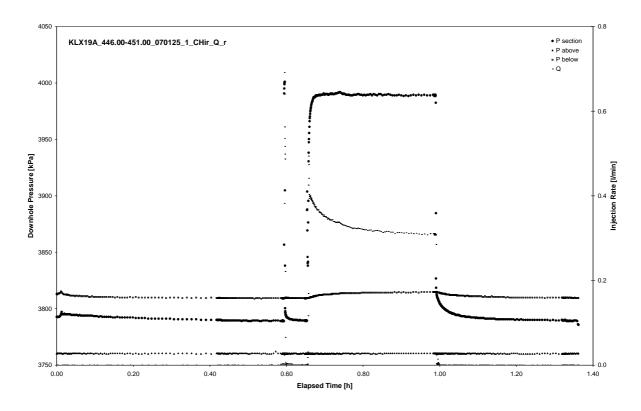
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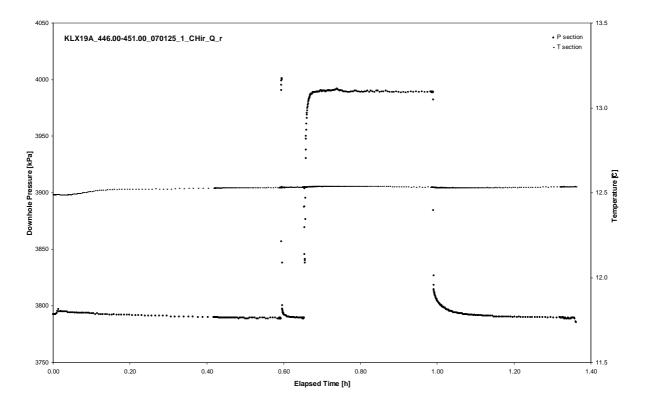


CHIR phase; HORNER match

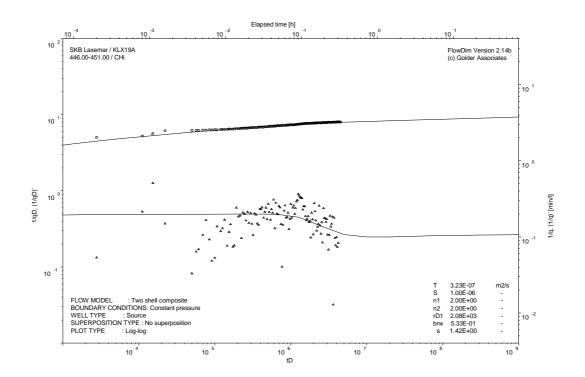
Test 446.00 – 451.00 m



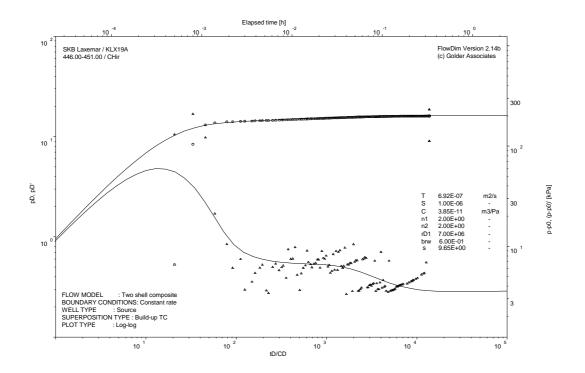
Pressure and flow rate vs. time; cartesian plot



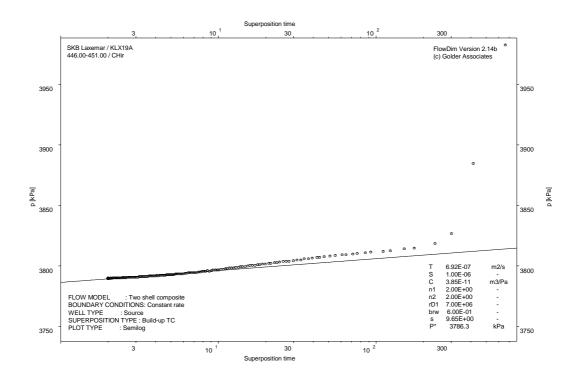
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

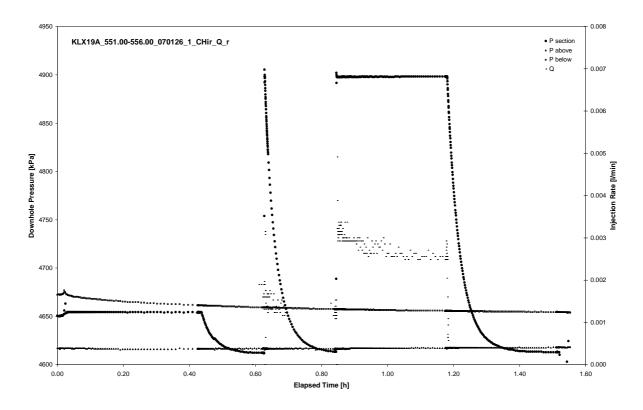


CHIR phase; log-log match

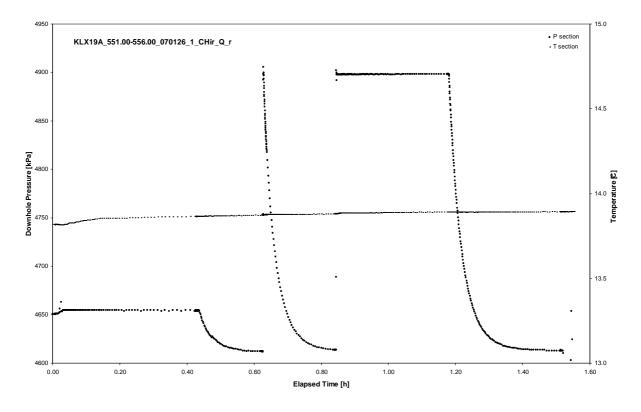


CHIR phase; HORNER match

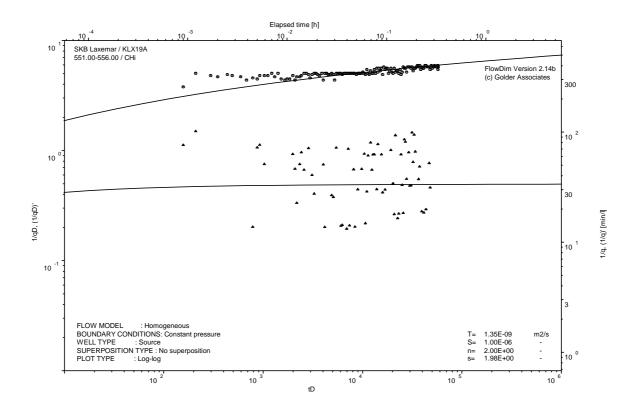
Test 551.00 – 556.00 m



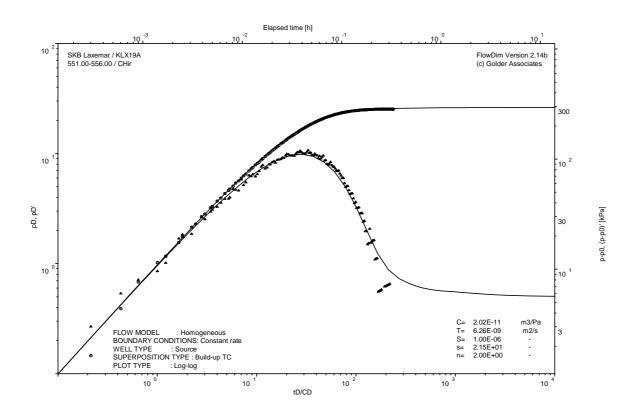
Pressure and flow rate vs. time; cartesian plot



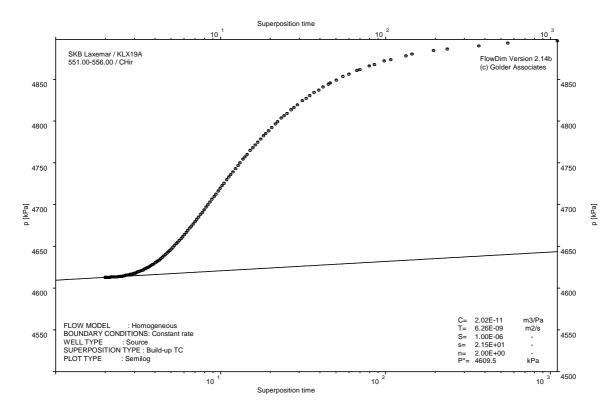
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

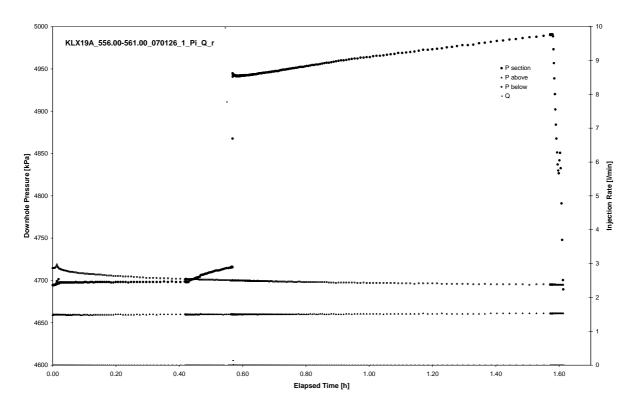


CHIR phase; log-log match

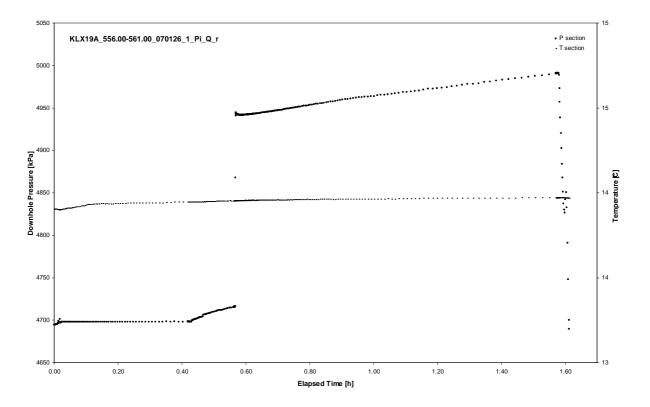


CHIR phase; HORNER match

Test 556.00 – 561.00 m



Pressure and flow rate vs. time; cartesian plot



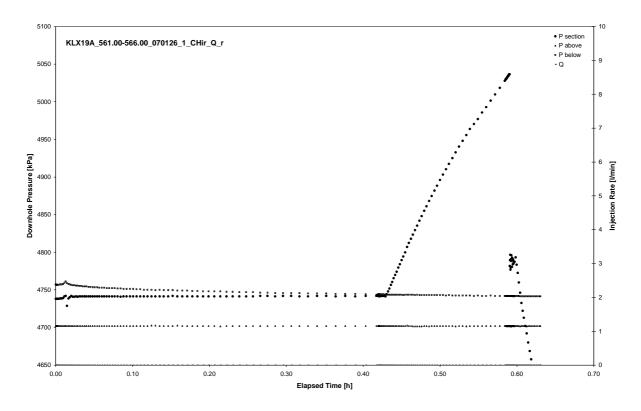
CHI phase; log-log match

CHIR phase; log-log match

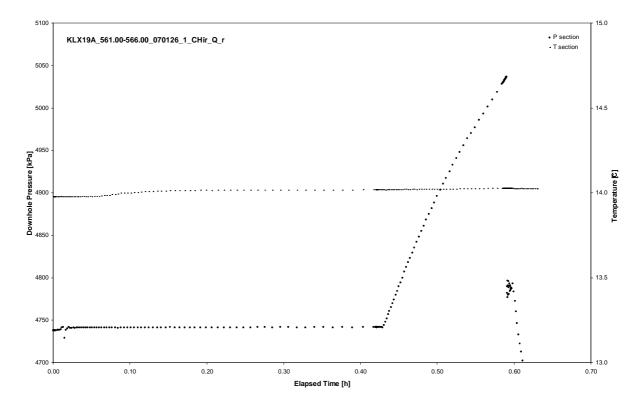
Not Analysed

CHIR phase; HORNER match

Test 561.00 – 566.00 m



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

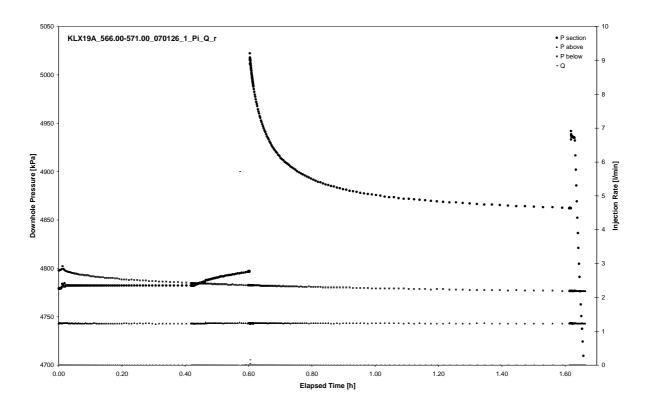
CHI phase; log-log match

CHIR phase; log-log match

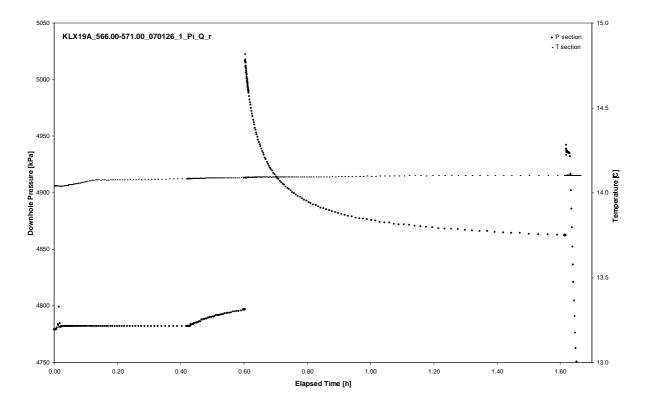
Not Analysed

CHIR phase; HORNER match

Test 566.00 – 571.00 m

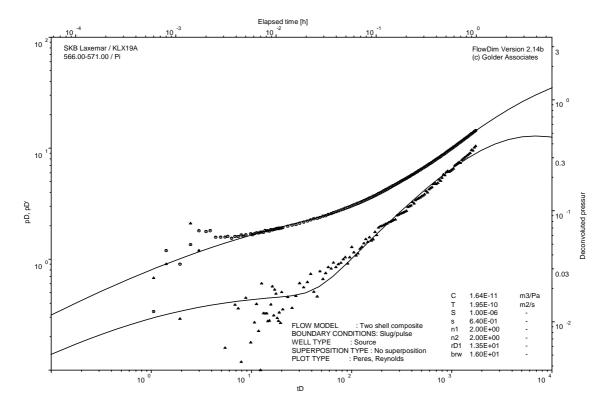


Pressure and flow rate vs. time; cartesian plot



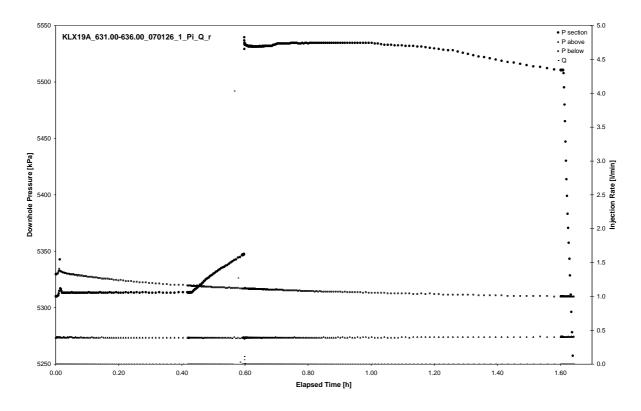


Page 2-50/3

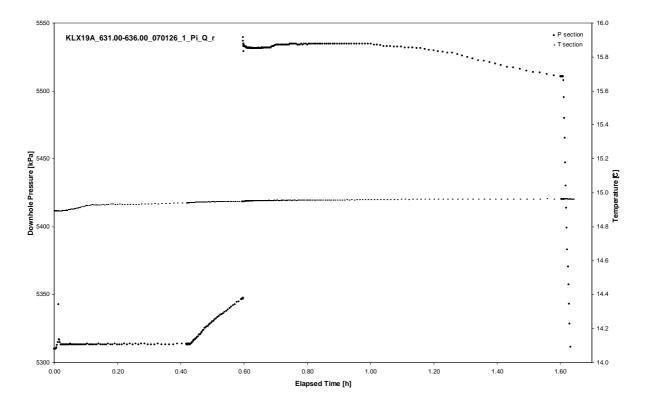


Pulse injection; deconvolution match

Test 631.00 – 636.00 m



Pressure and flow rate vs. time; cartesian plot



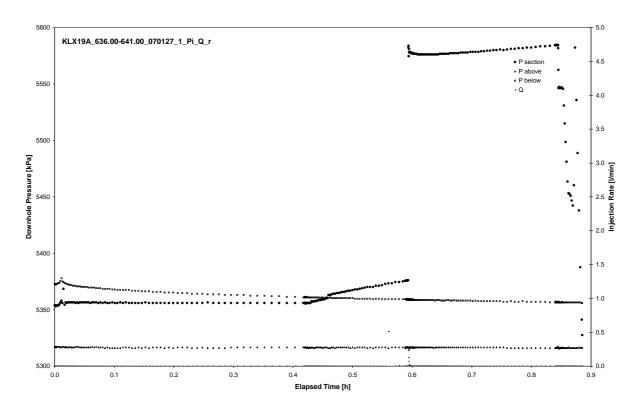
CHI phase; log-log match

CHIR phase; log-log match

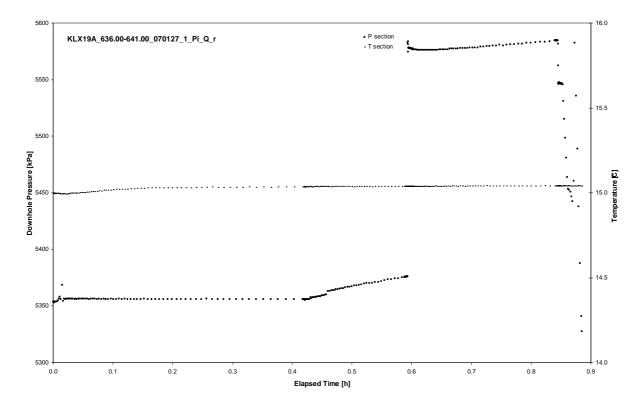
Not Analysed

CHIR phase; HORNER match

Test 636.00 – 641.00 m



Pressure and flow rate vs. time; cartesian plot



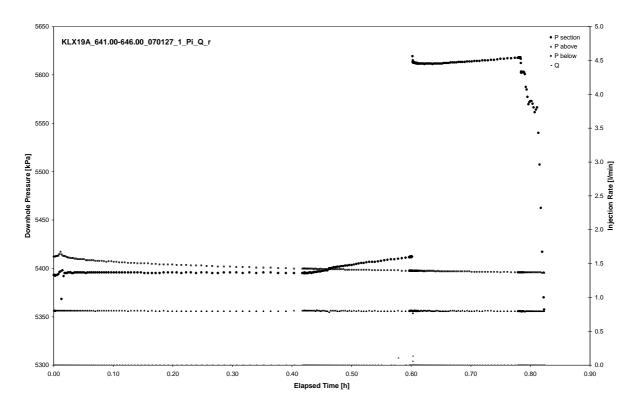
CHI phase; log-log match

CHIR phase; log-log match

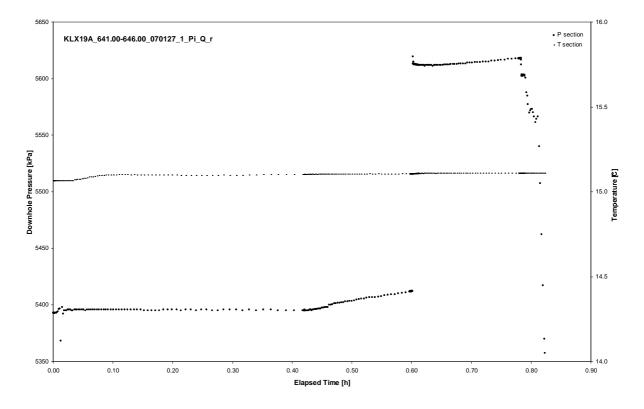
Not Analysed

CHIR phase; HORNER match

Test 641.00 – 646.00 m



Pressure and flow rate vs. time; cartesian plot



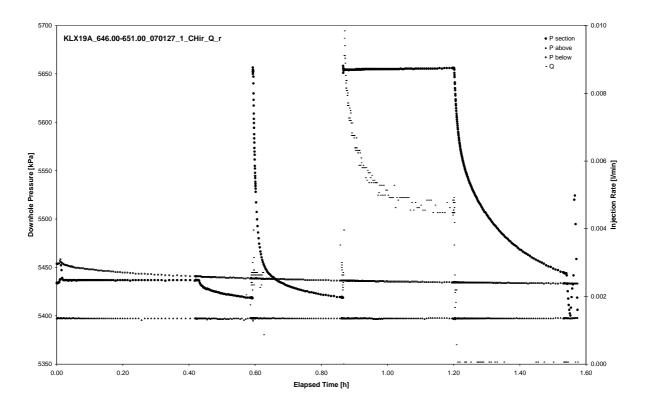
CHI phase; log-log match

CHIR phase; log-log match

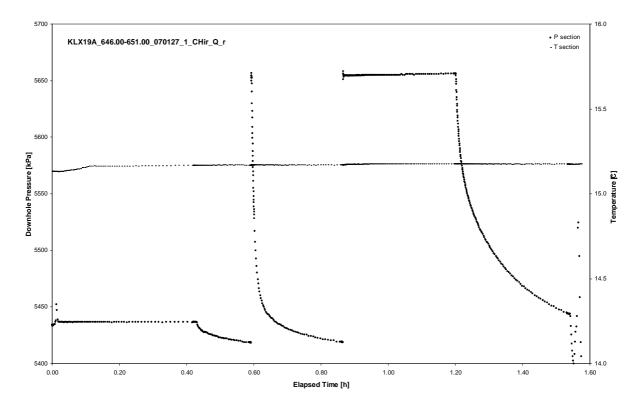
Not Analysed

CHIR phase; HORNER match

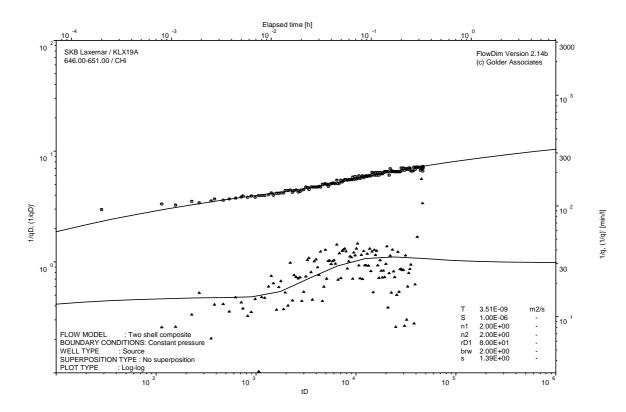
Test 646.00 – 651.00 m



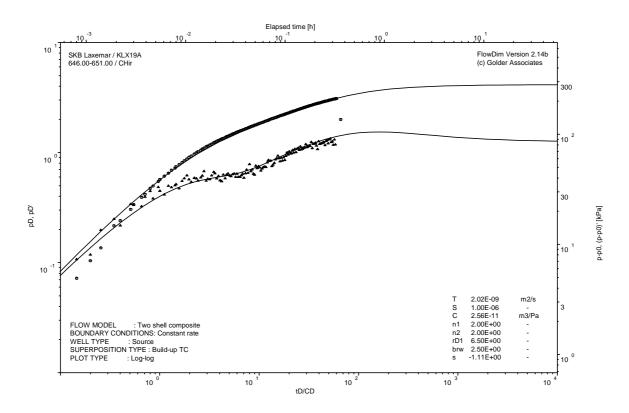
Pressure and flow rate vs. time; cartesian plot



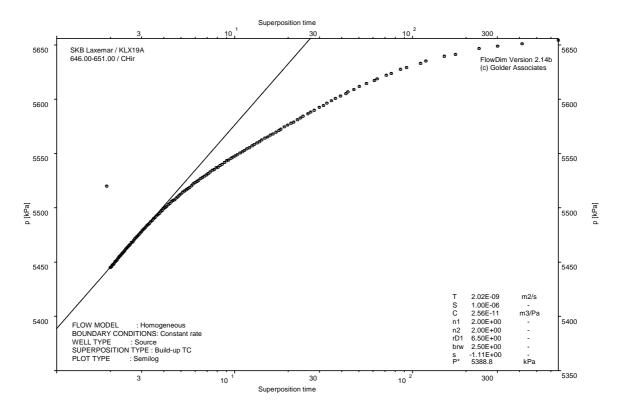
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

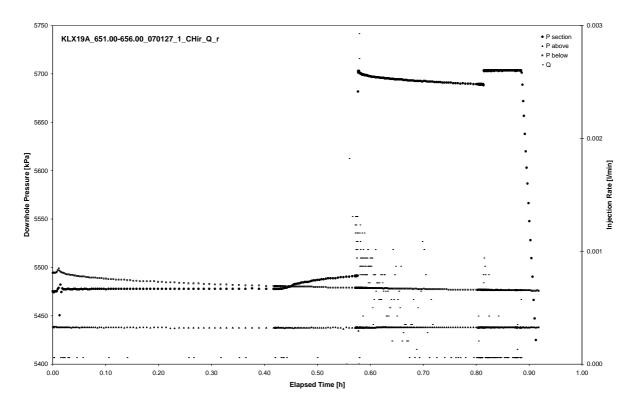


CHIR phase; log-log match

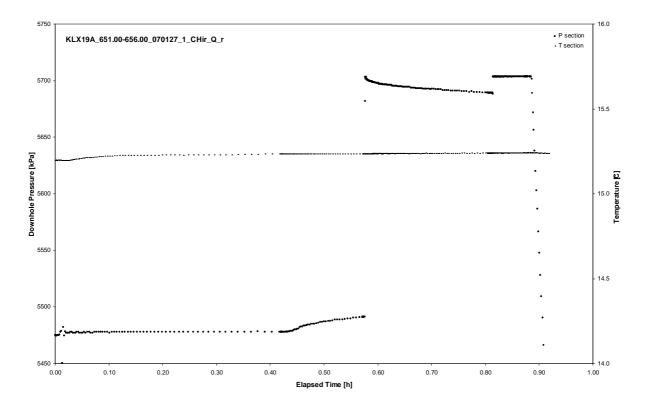


CHIR phase; HORNER match

Test 651.00 – 656.00 m



Pressure and flow rate vs. time; cartesian plot



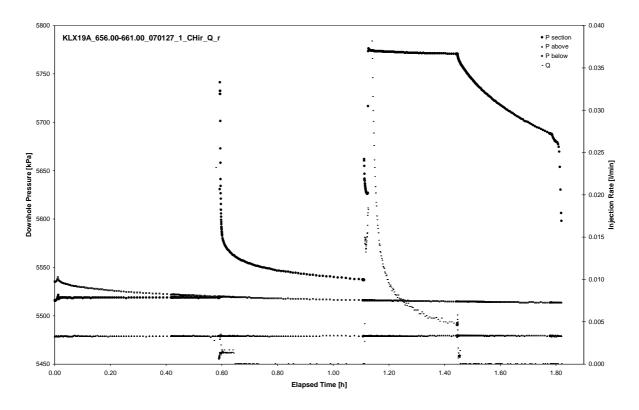
CHI phase; log-log match

CHIR phase; log-log match

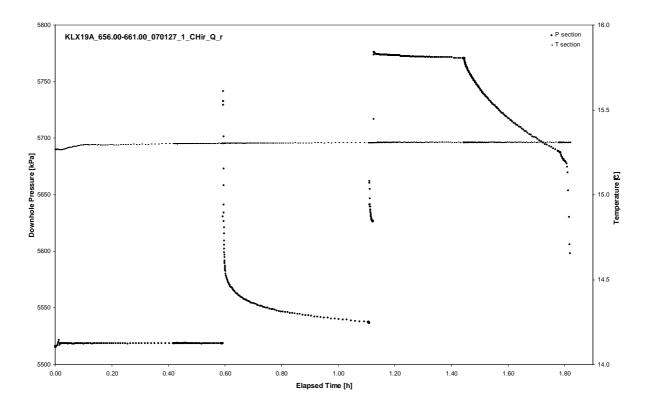
Not Analysed

CHIR phase; HORNER match

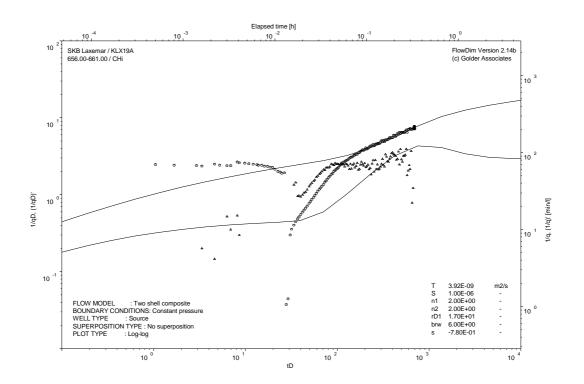
Test 656.00 – 661.00 m



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

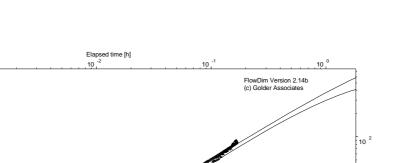


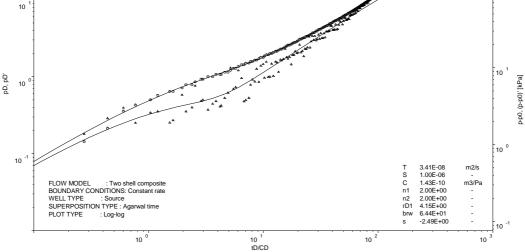
CHI phase; log-log match

SKB Laxemar / KLX19A 656.00-661.00 / CHir

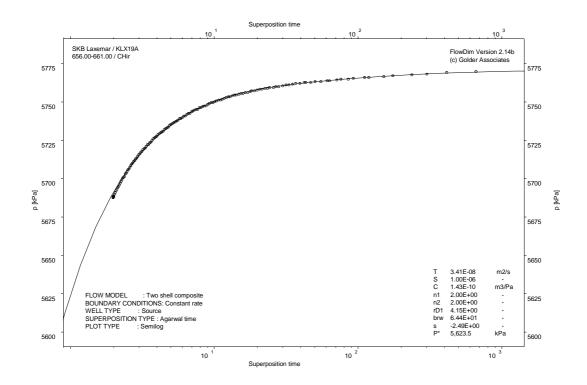
10

10 -3



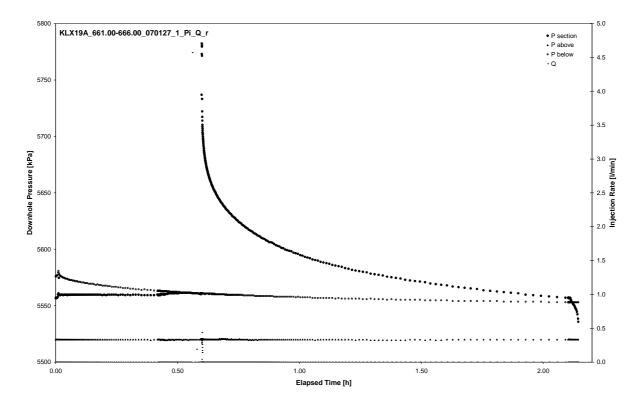


CHIR phase; log-log match

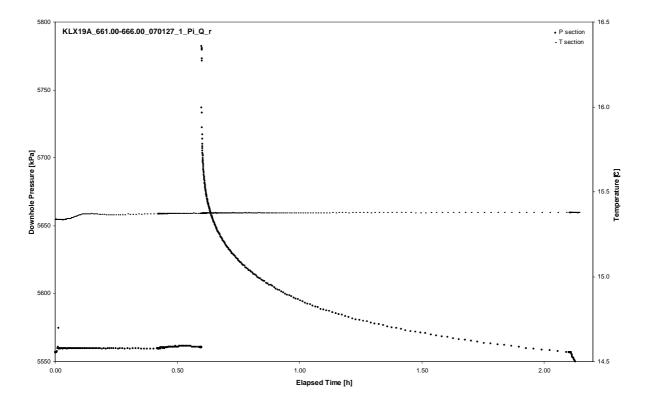


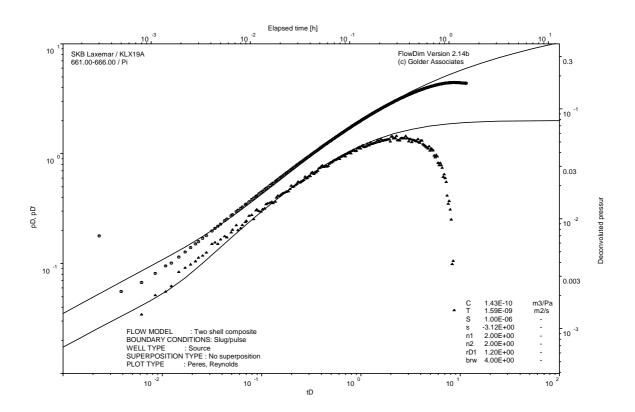
CHIR phase; HORNER match

Test 661.00 – 666.00 m



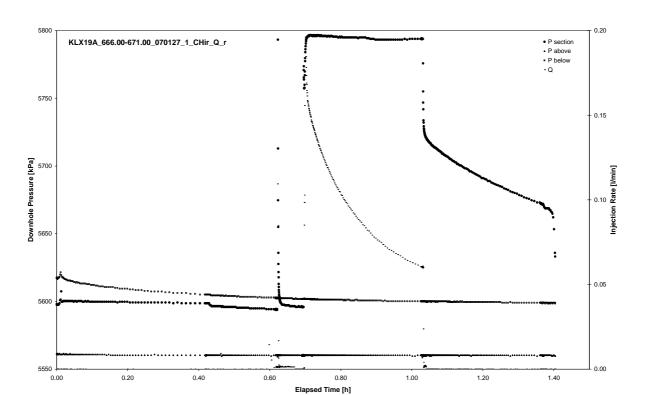
Pressure and flow rate vs. time; cartesian plot



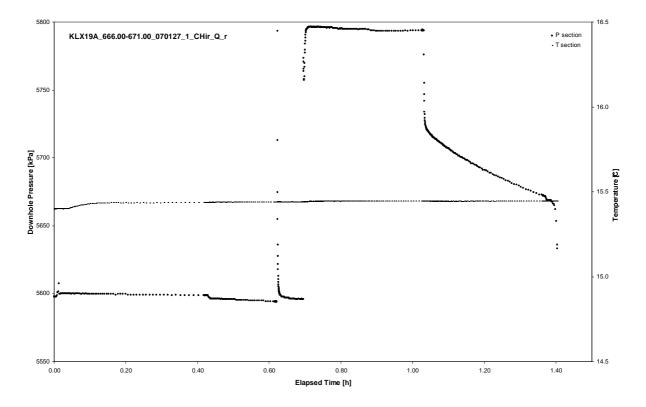


Pulse injection; deconvolution match

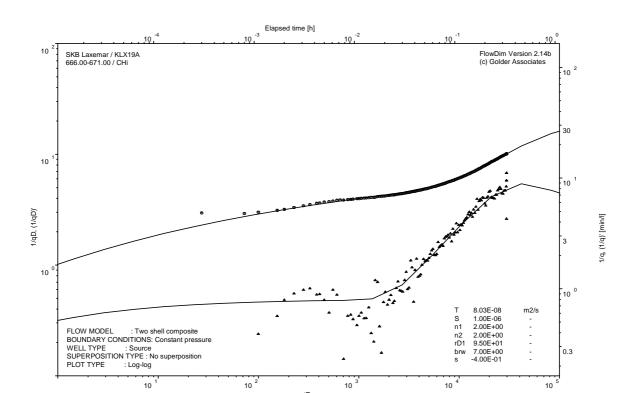
Test 666.00 – 671.00 m



Pressure and flow rate vs. time; cartesian plot

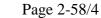


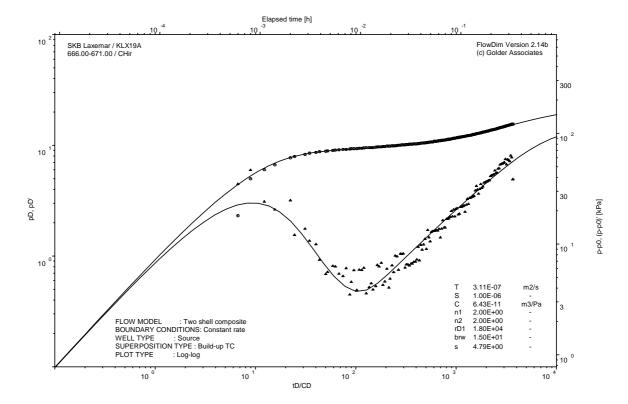
Interval pressure and temperature vs. time; cartesian plot



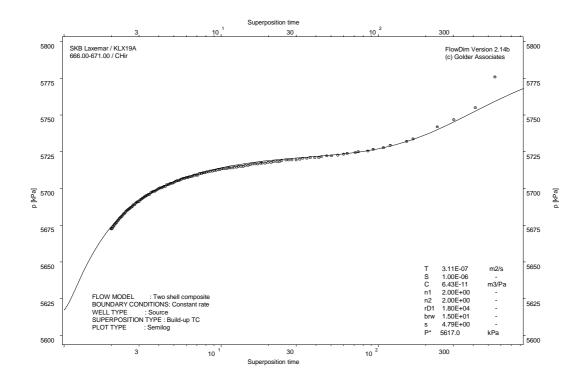
tD

CHI phase; log-log match



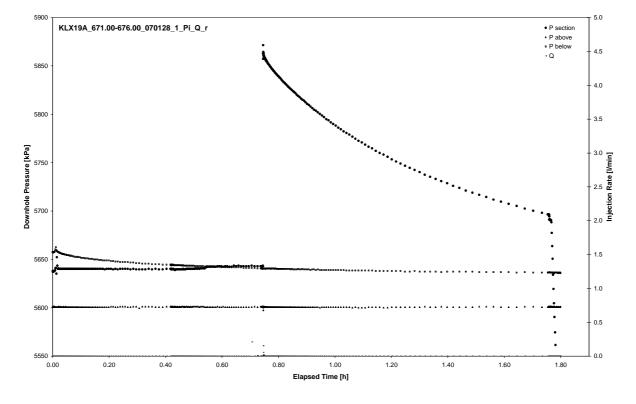


CHIR phase; log-log match

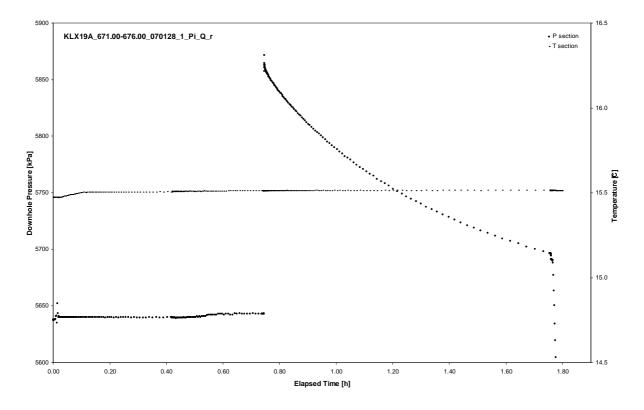


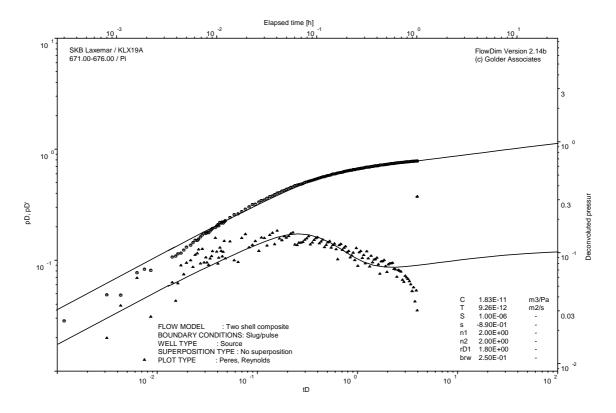
CHIR phase; HORNER match

Test 671.00 – 676.00 m



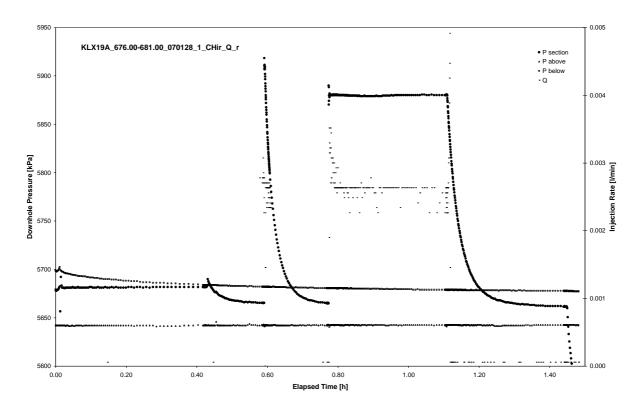
Pressure and flow rate vs. time; cartesian plot



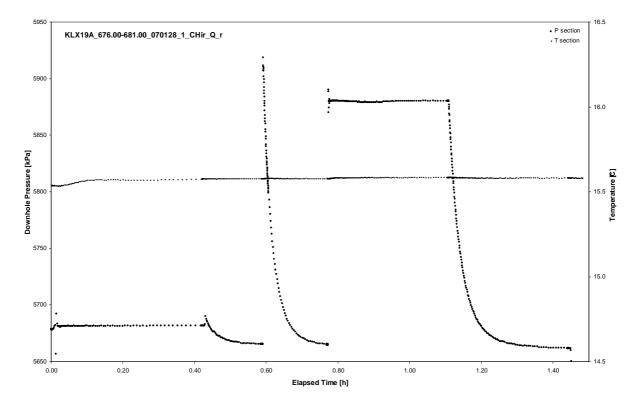


Pulse injection; deconvolution match

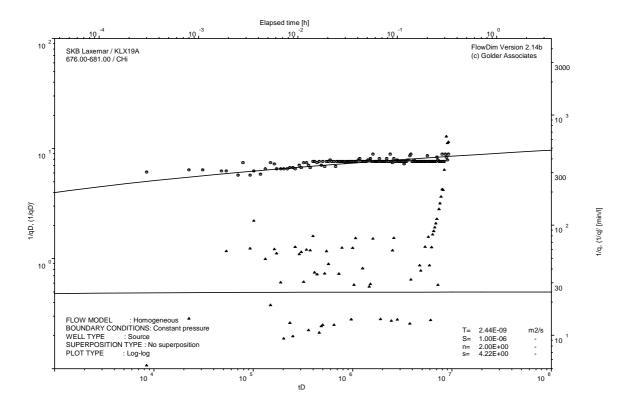
Test 676.00 – 681.00 m



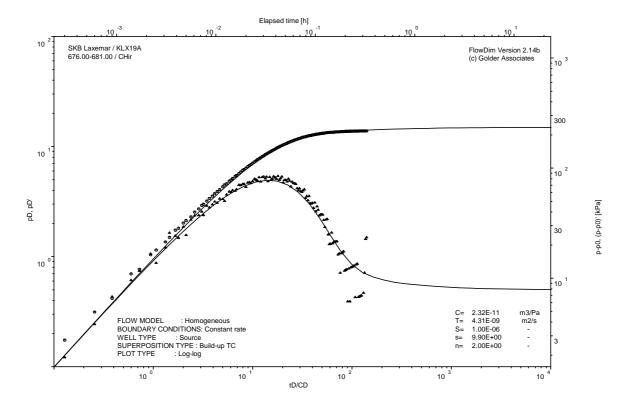
Pressure and flow rate vs. time; cartesian plot



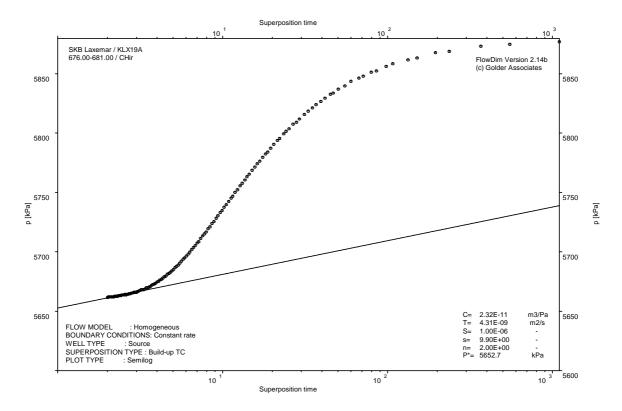
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

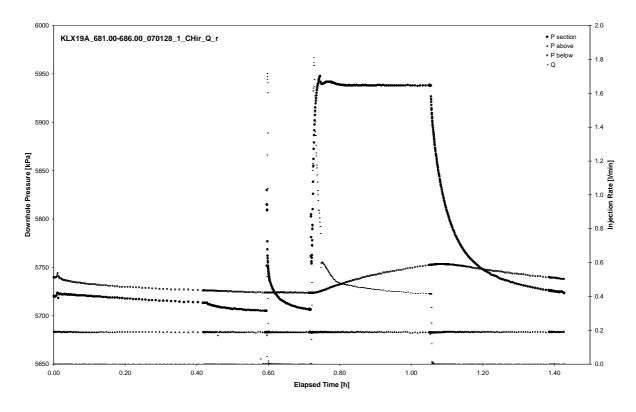


CHIR phase; log-log match

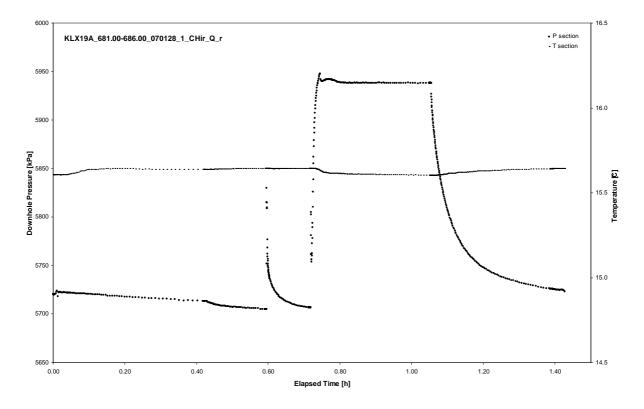


CHIR phase; HORNER match

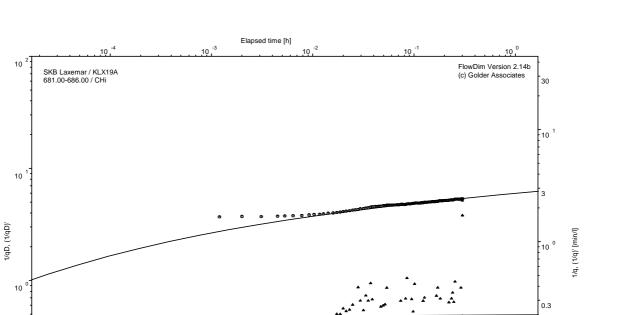
Test 681.00 – 686.00 m



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



T= 2.49E-07 S= 1.00E-06 n= 2.00E+00 s= -1.17E+00

10²

m2/s

-

tD

10 3

CHI phase; log-log match

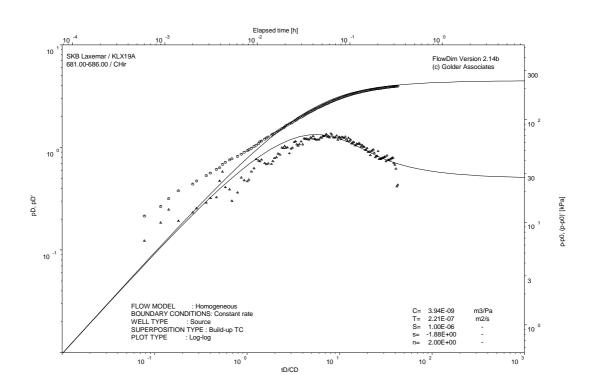
FLOW MODEL : Homogeneous BOUNDARY CONDITIONS: Constant press WELL TYPE : Source SUPERPOSITION TYPE : No superposition PLOT TYPE : Log-log

10

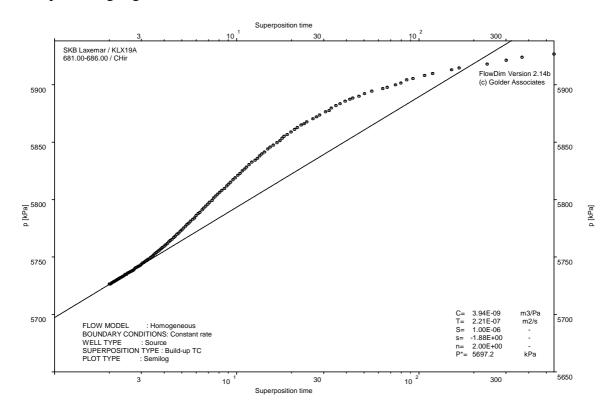
10 -1

10 ⁵

10 4

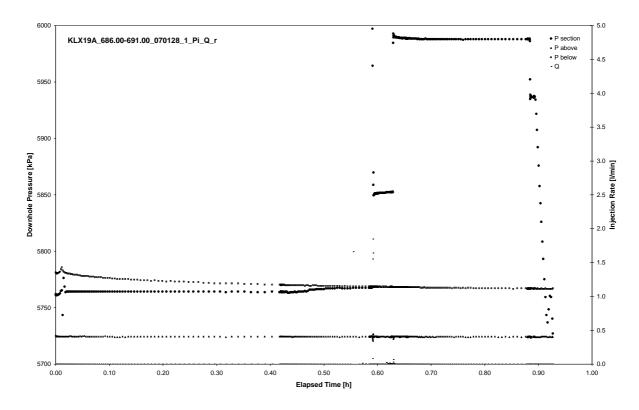


CHIR phase; log-log match

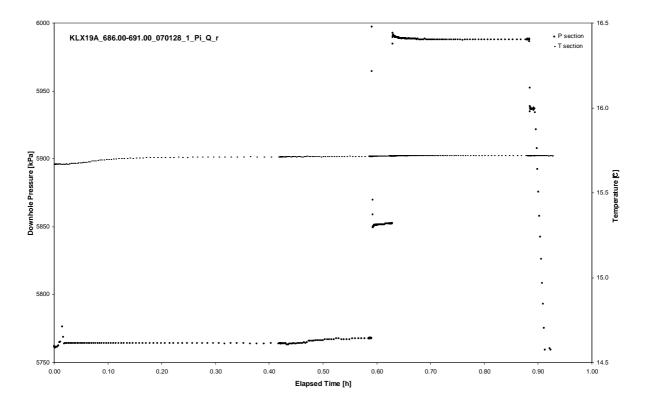


CHIR phase; HORNER match

Test 686.00 – 691.00 m



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

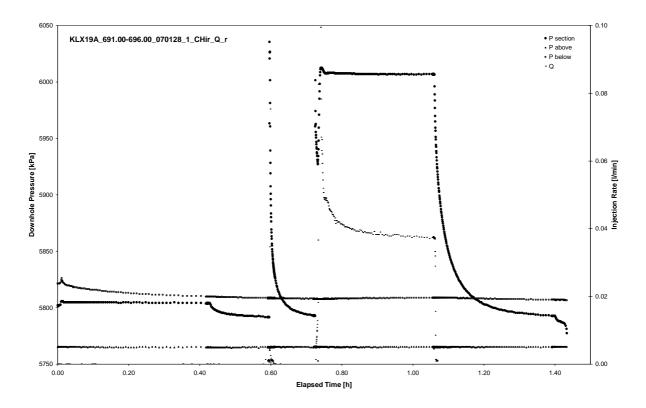
CHI phase; log-log match

CHIR phase; log-log match

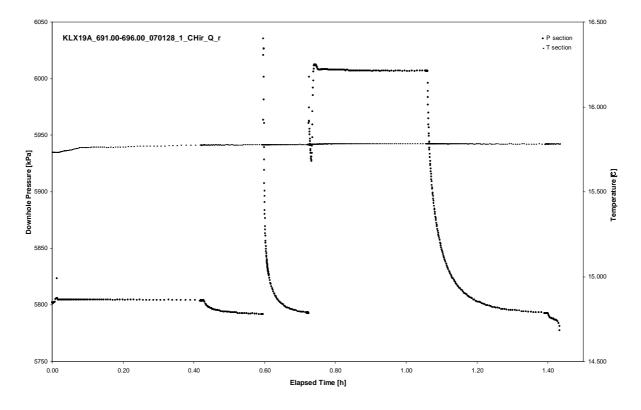
Not Analysed

CHIR phase; HORNER match

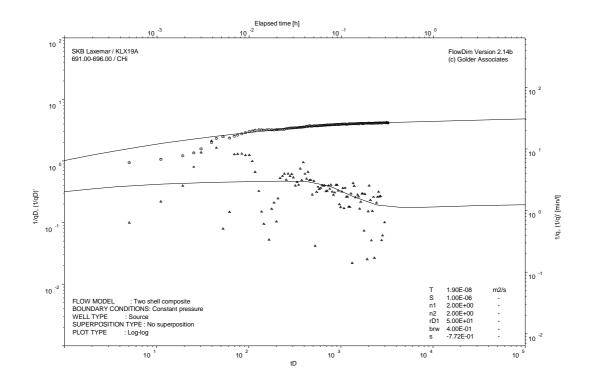
Test 691.00 – 696.00 m



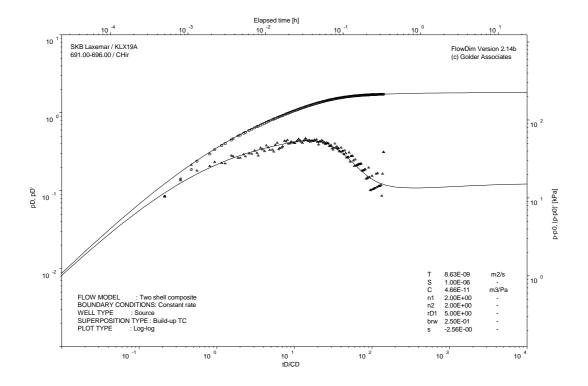
Pressure and flow rate vs. time; cartesian plot



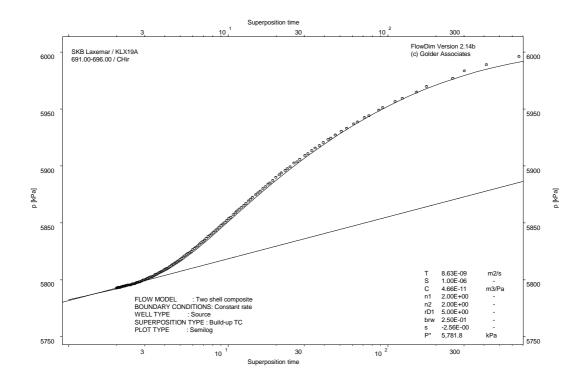
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

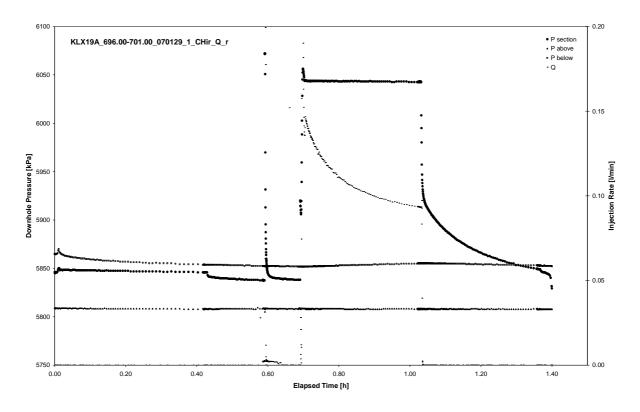


CHIR phase; log-log match

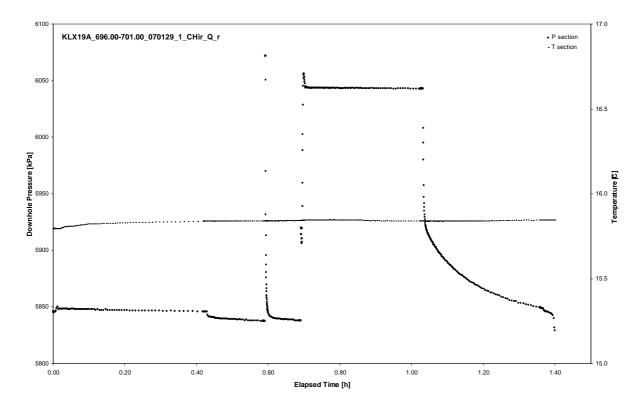


CHIR phase; HORNER match

Test 696.00 – 701.00 m



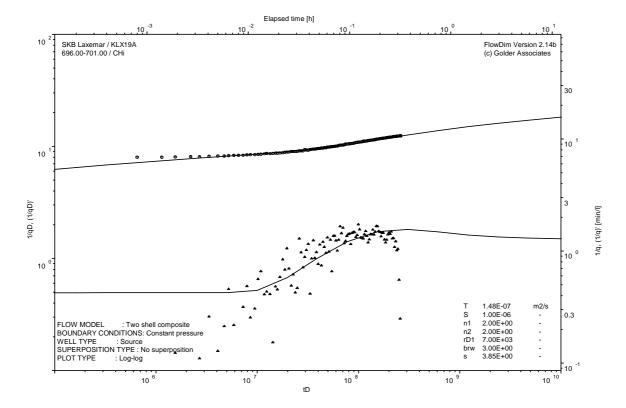
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

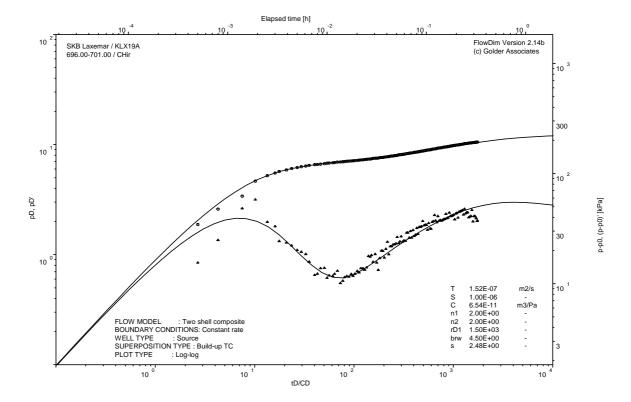


Page 2-64/3

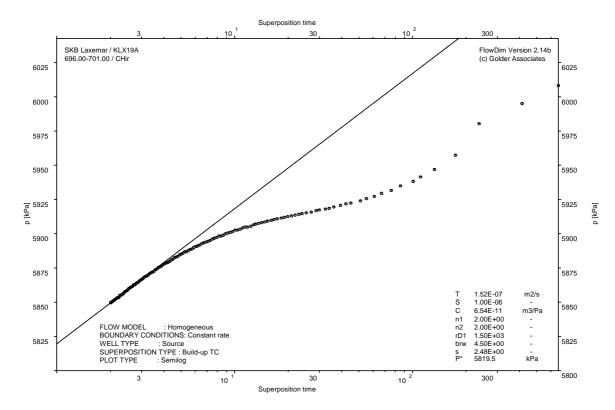


CHI phase; log-log match



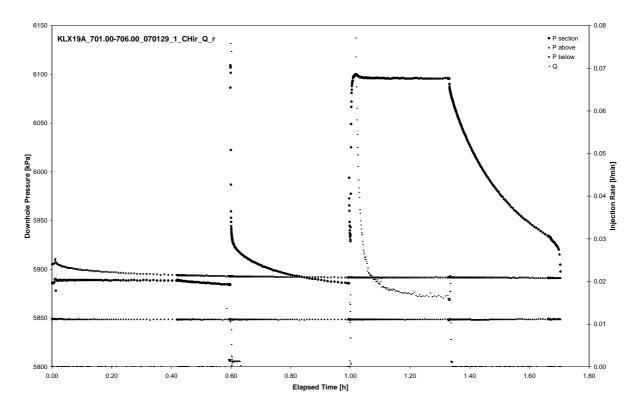


CHIR phase; log-log match

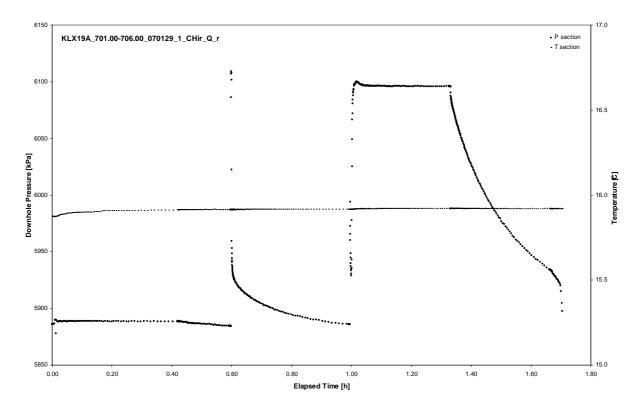


CHIR phase; HORNER match

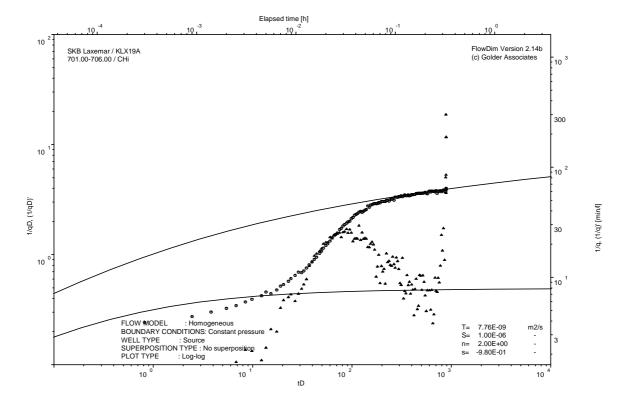
Test 701.00 – 706.00 m



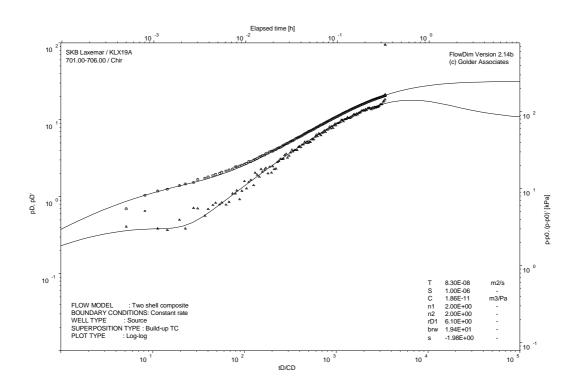
Pressure and flow rate vs. time; cartesian plot



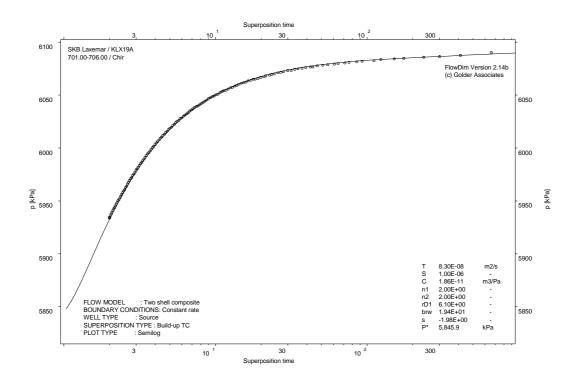
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

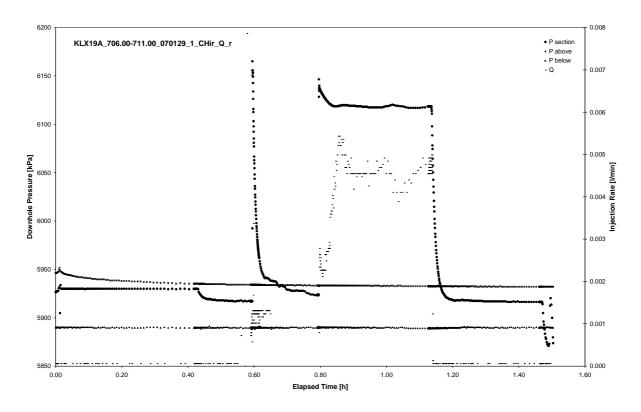


CHIR phase; log-log match

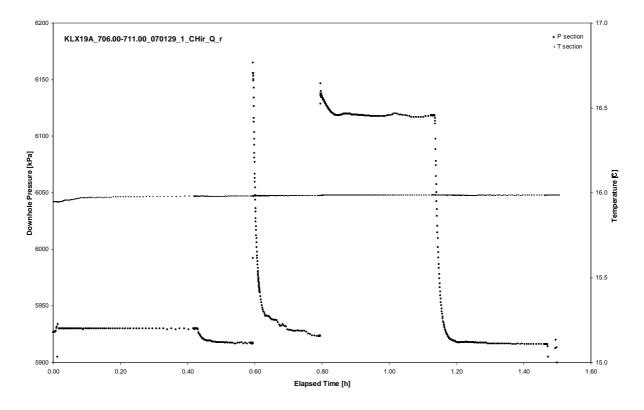


CHIR phase; HORNER match

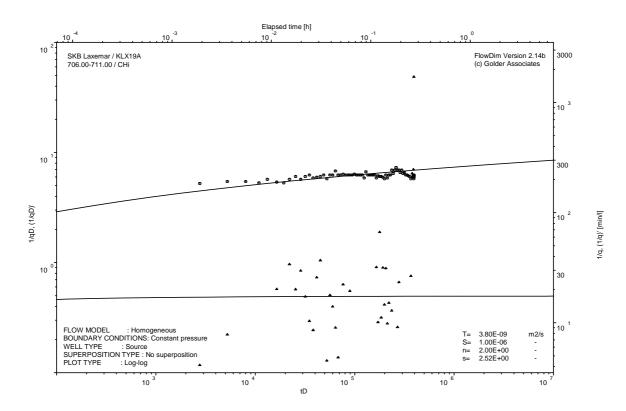
Test 706.00 – 711.00 m



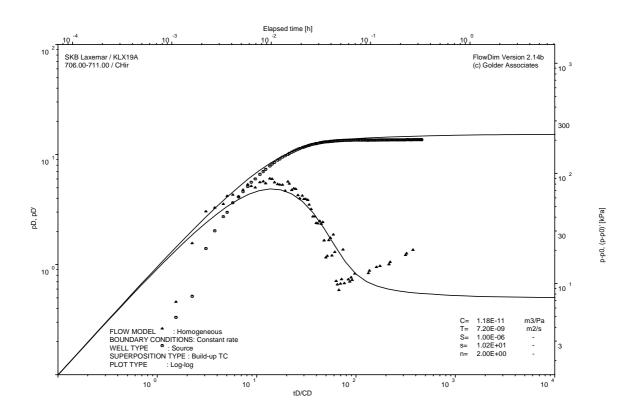
Pressure and flow rate vs. time; cartesian plot



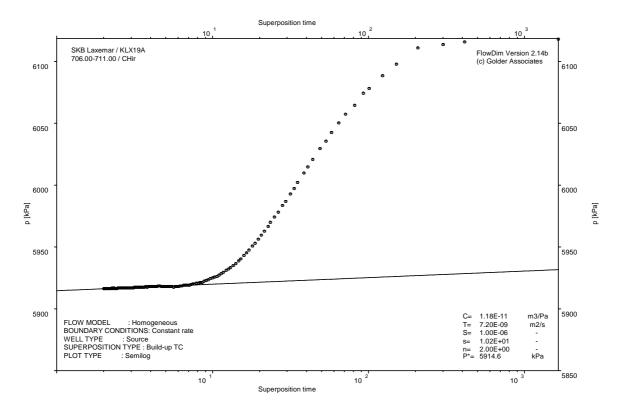
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

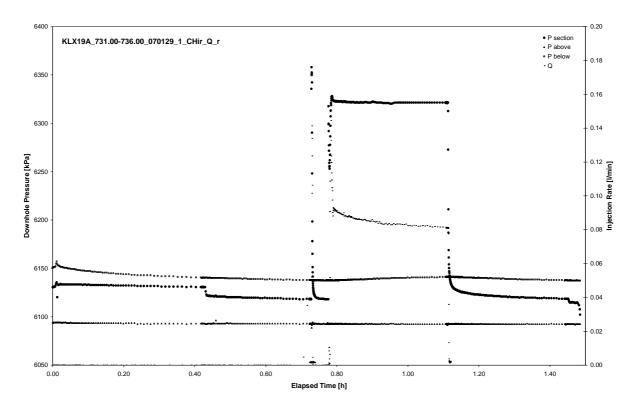


CHIR phase; log-log match

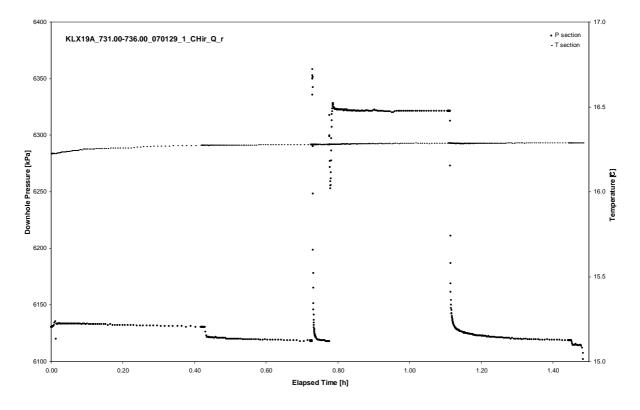


CHIR phase; HORNER match

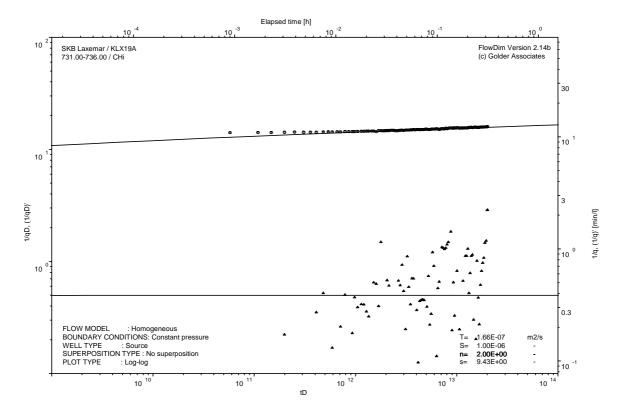
Test 731.00 – 736.00 m



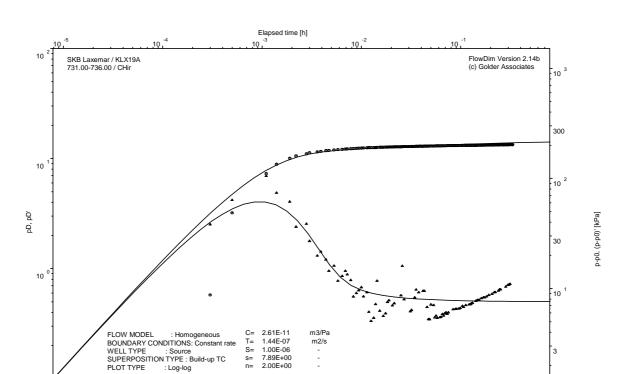
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

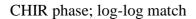


10

tD/CD

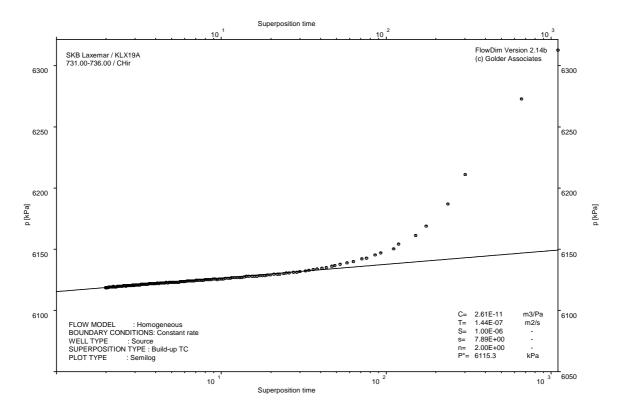
10³

10



10

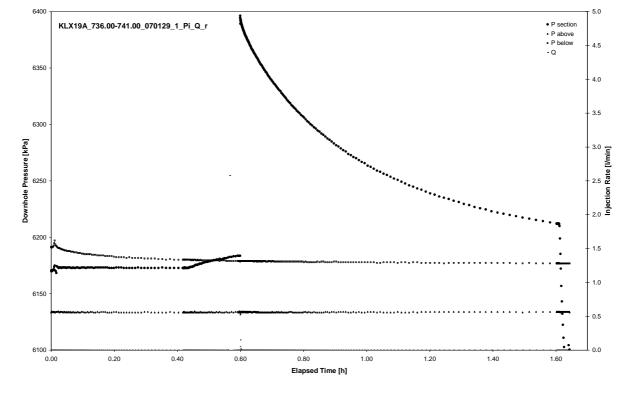
10



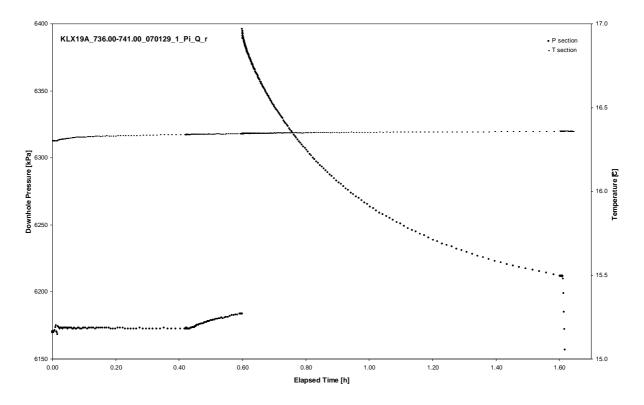
CHIR phase; HORNER match

Test 736.00 – 741.00 m

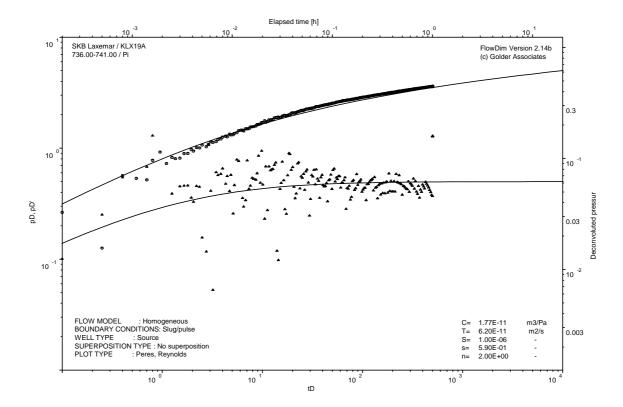




Pressure and flow rate vs. time; cartesian plot

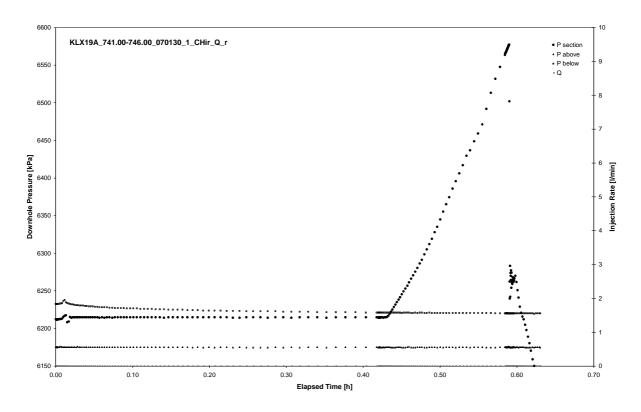


Interval pressure and temperature vs. time; cartesian plot

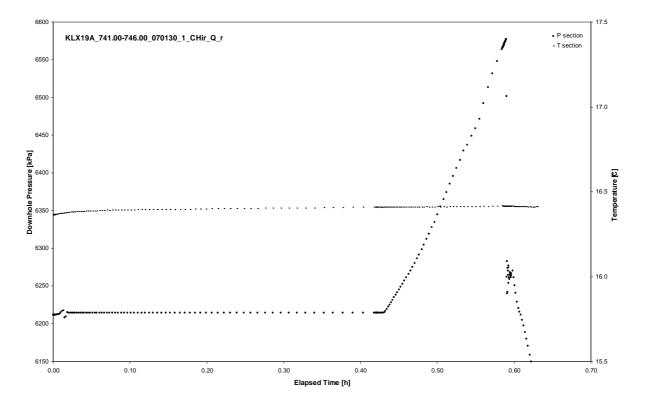


Pulse injection; deconvolution match

Test 741.00 – 746.00 m



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

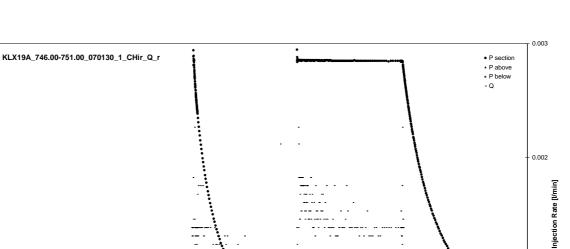
Not Analysed

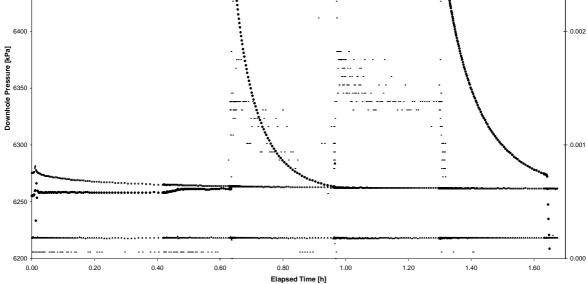
CHIR phase; HORNER match

Test 746.00 – 751.00 m

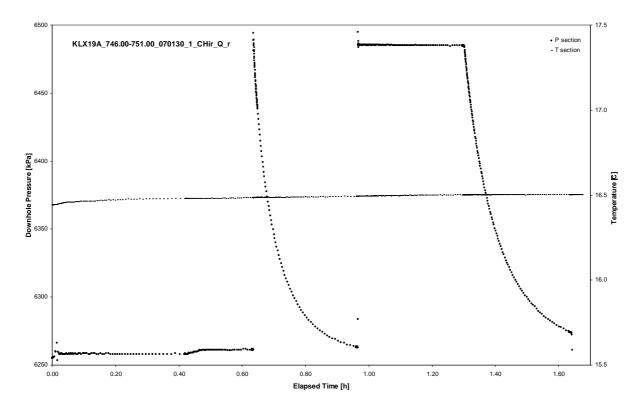
6500

6450

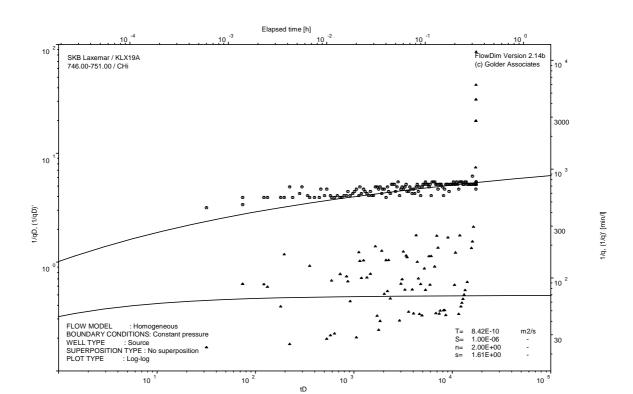




Pressure and flow rate vs. time; cartesian plot

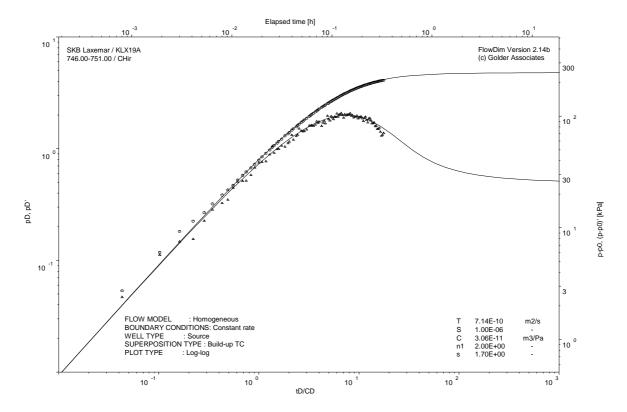


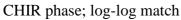
Interval pressure and temperature vs. time; cartesian plot

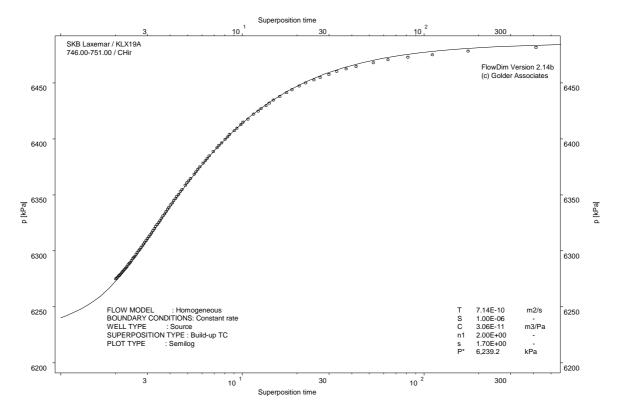


CHI phase; log-log match



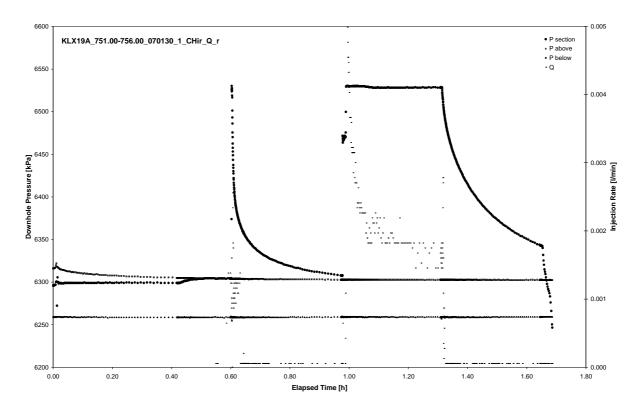




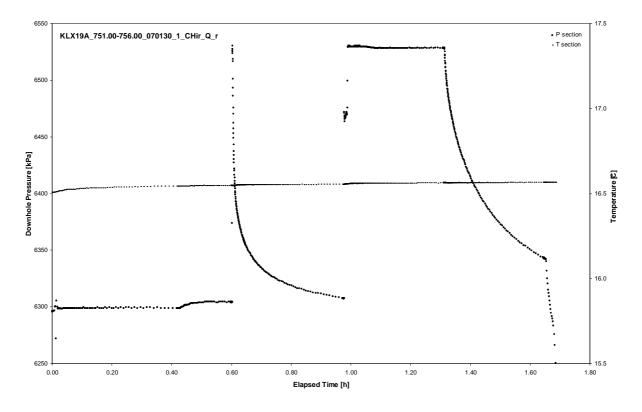


CHIR phase; HORNER match

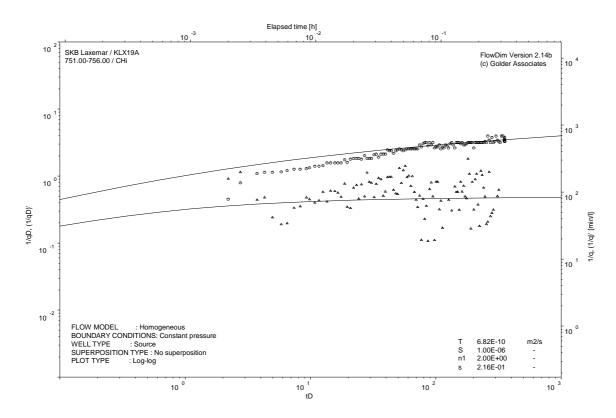
Test 751.00 – 756.00 m



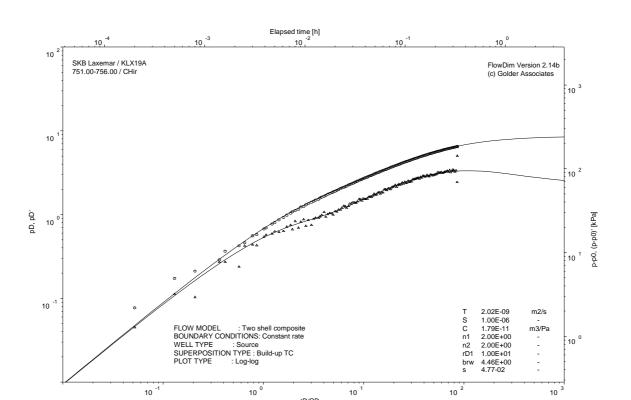
Pressure and flow rate vs. time; cartesian plot



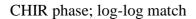
Interval pressure and temperature vs. time; cartesian plot

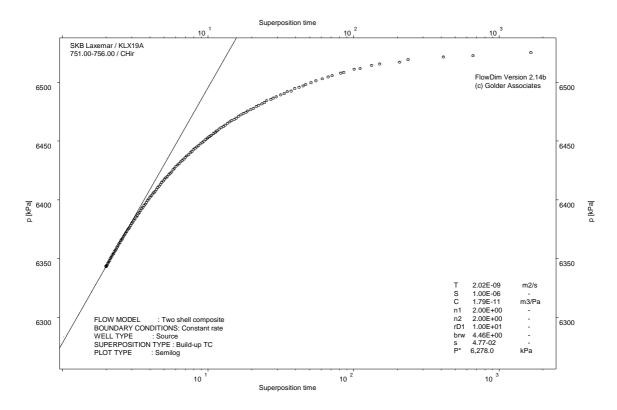


CHI phase; log-log match



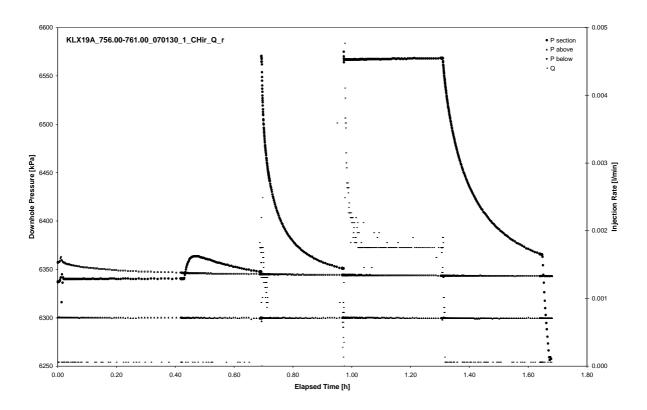
tD/CD



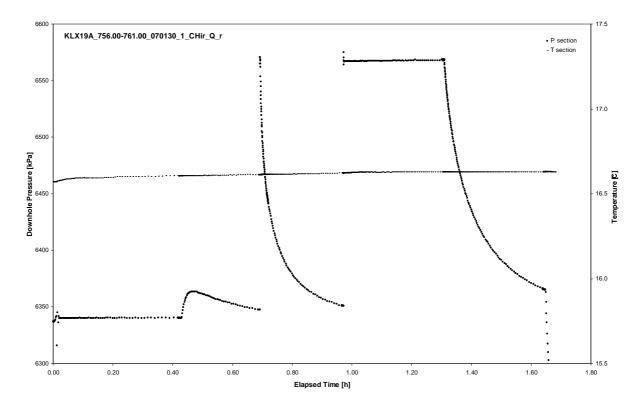


CHIR phase; HORNER match

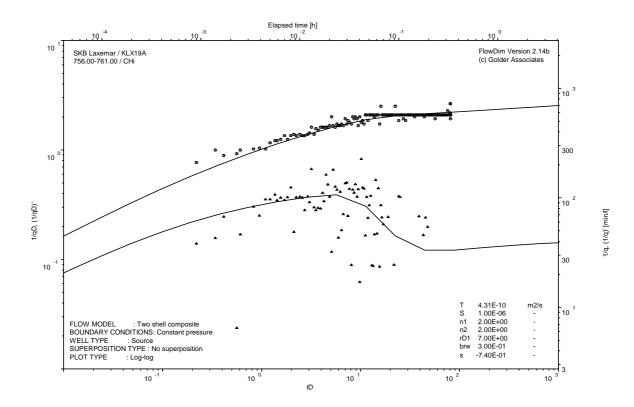
Test 756.00 – 761.00 m



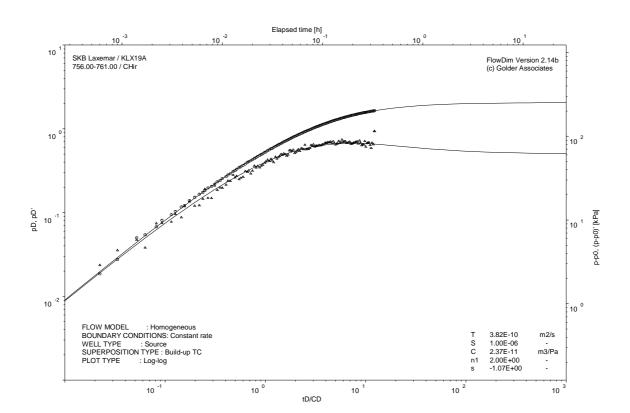
Pressure and flow rate vs. time; cartesian plot



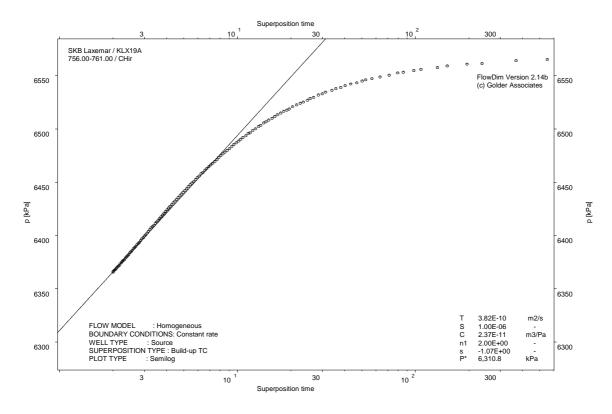
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

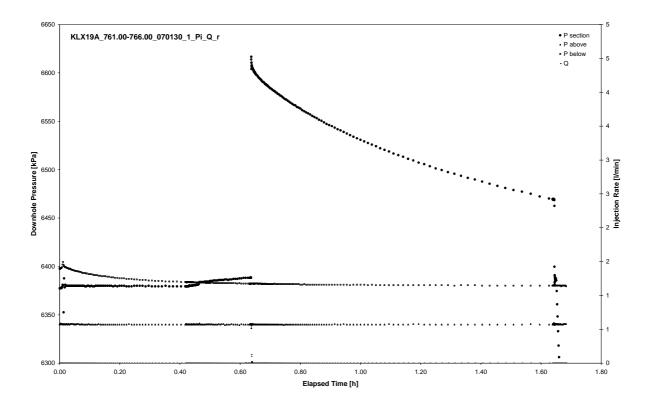


CHIR phase; log-log match

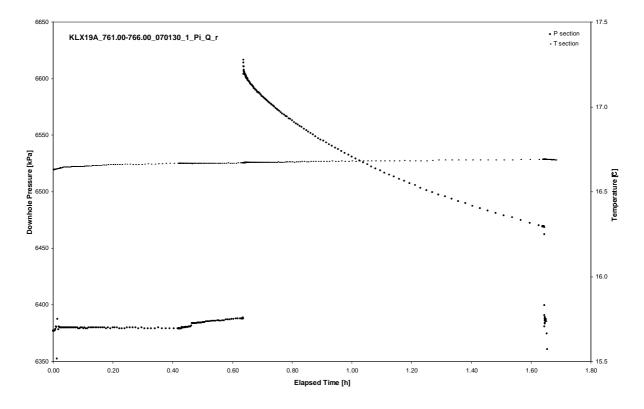


CHIR phase; HORNER match

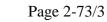
Test 761.00 – 766.00 m

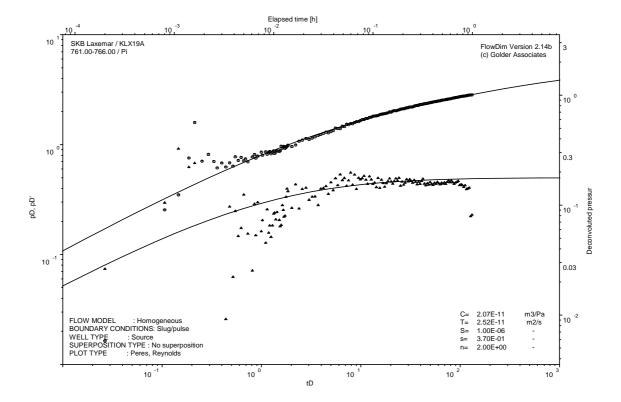


Pressure and flow rate vs. time; cartesian plot



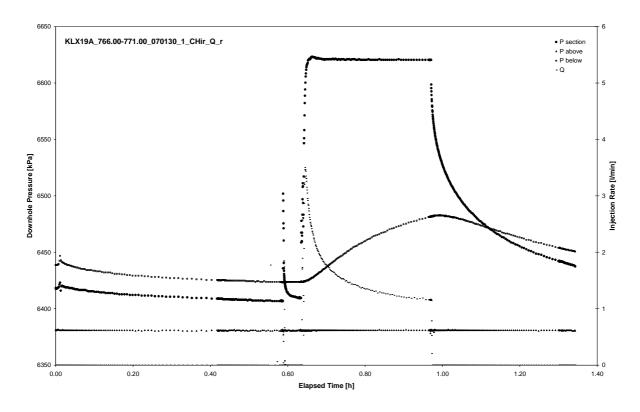
Interval pressure and temperature vs. time; cartesian plot



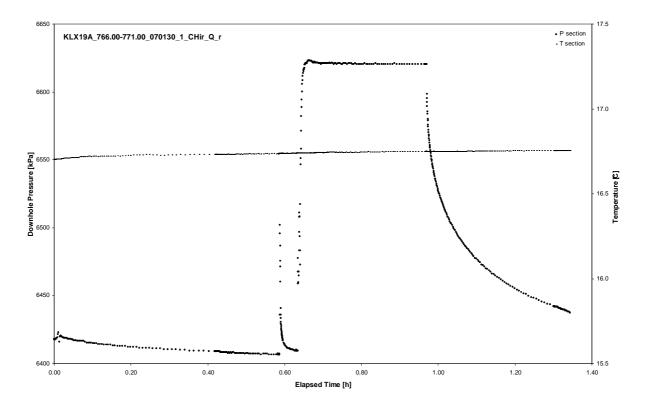


Pulse injection; deconvolution match

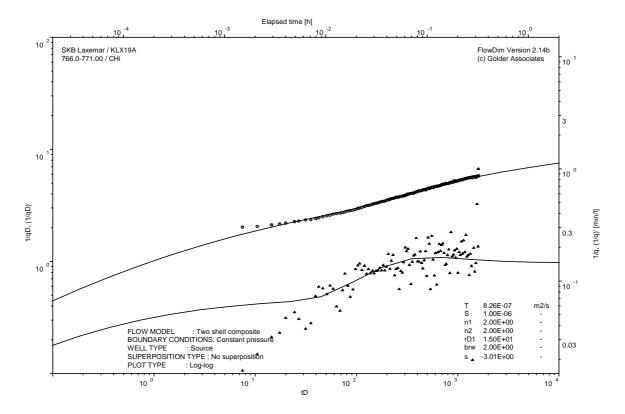
Test 766.00 – 771.00 m



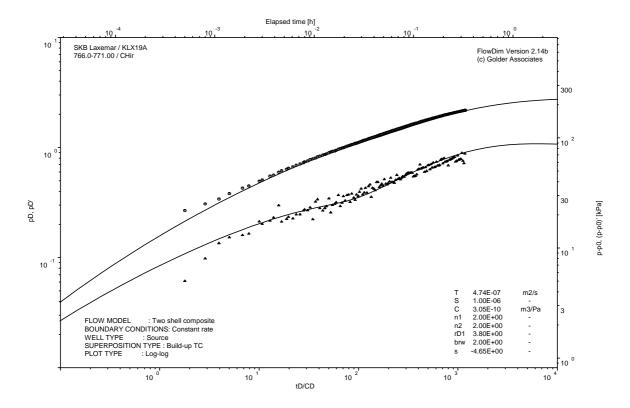
Pressure and flow rate vs. time; cartesian plot



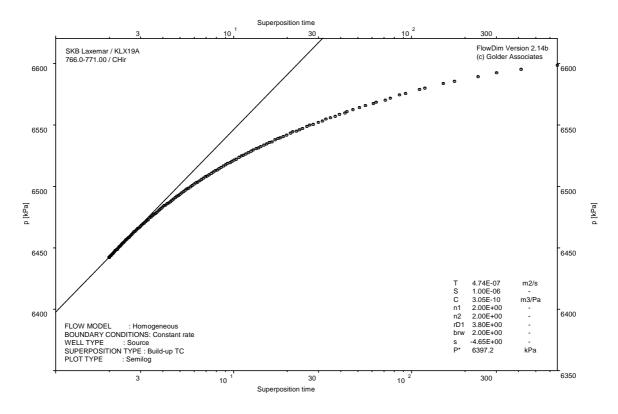
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match

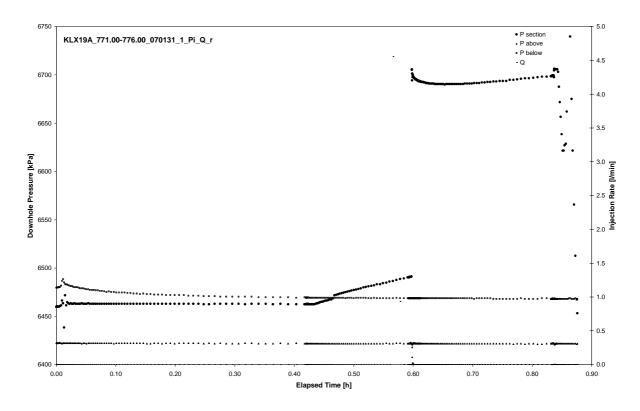


CHIR phase; log-log match

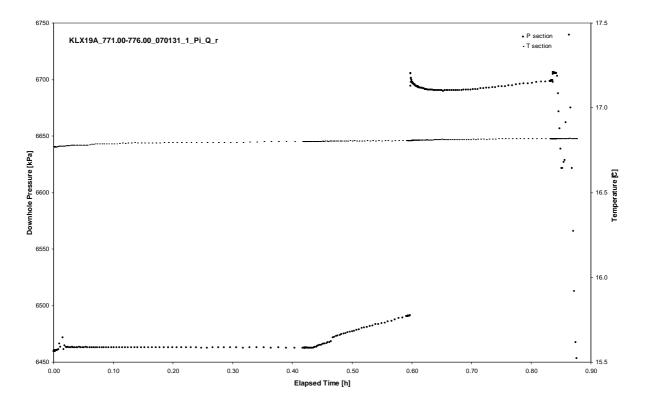


CHIR phase; HORNER match

Test 771.00 – 776.00 m



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match

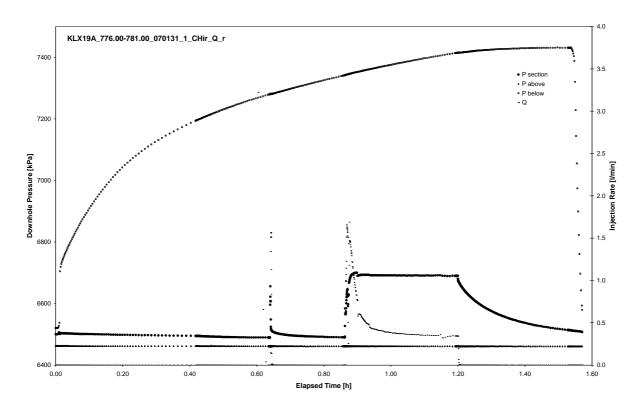
Not Analysed

CHIR phase; log-log match

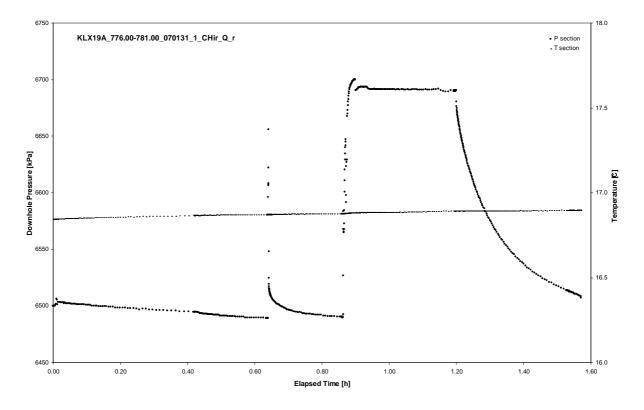
Not Analysed

CHIR phase; HORNER match

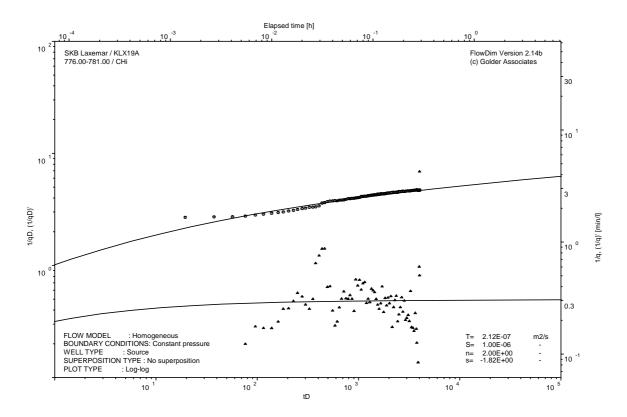
Test 776.00 – 781.00 m



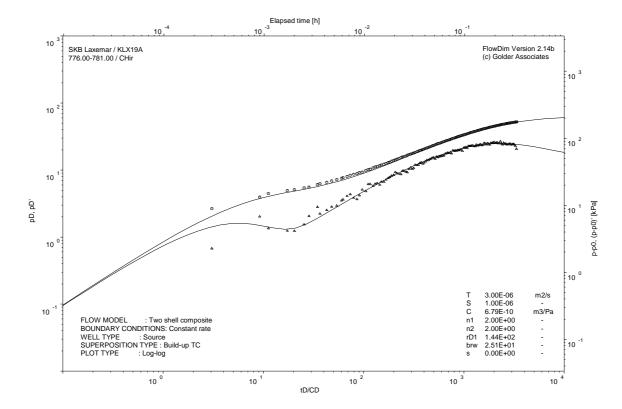
Pressure and flow rate vs. time; cartesian plot



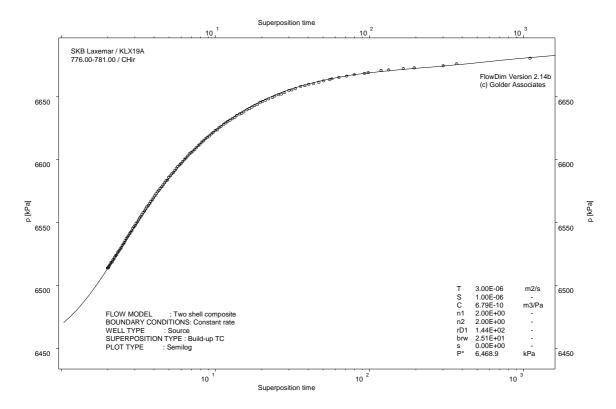
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



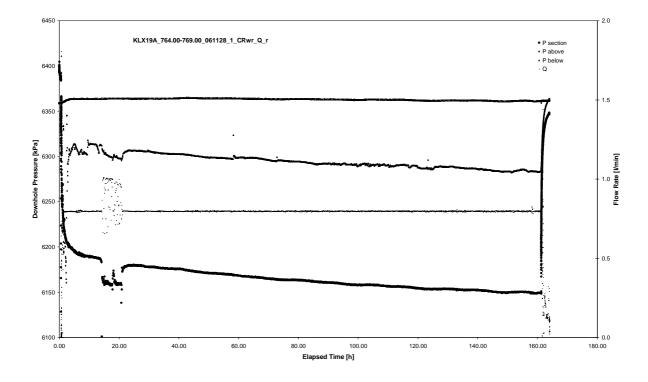
CHIR phase; log-log match



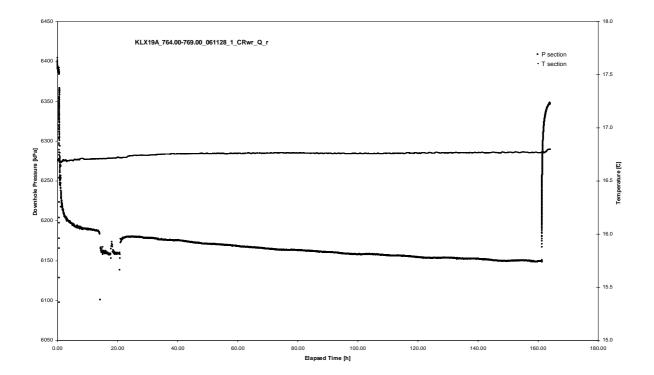
CHIR phase; HORNER match

Test 764.00 - 769.00 m

Pump Test Analysis diagrams



Pressure and flow rate vs. time; cartesian plot

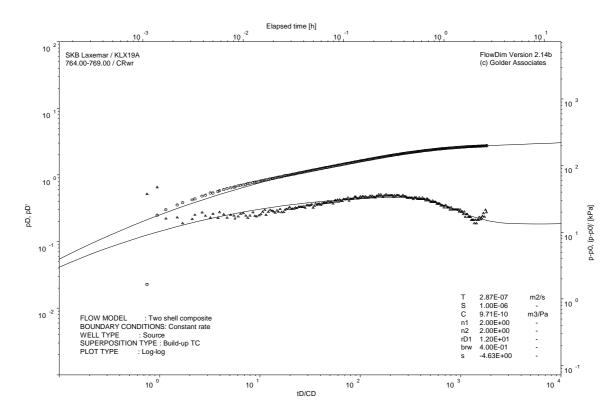


Pressure and Temperature vs. time; cartesian plot

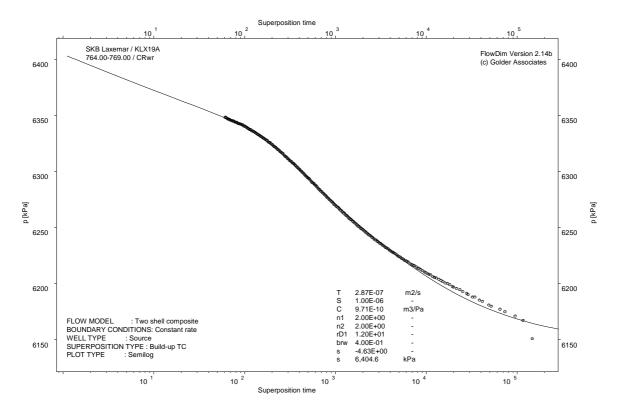
Not analysed

CRw phase; log-log match

Borehole: KLX19A Test: 764.00 – 769.00 m



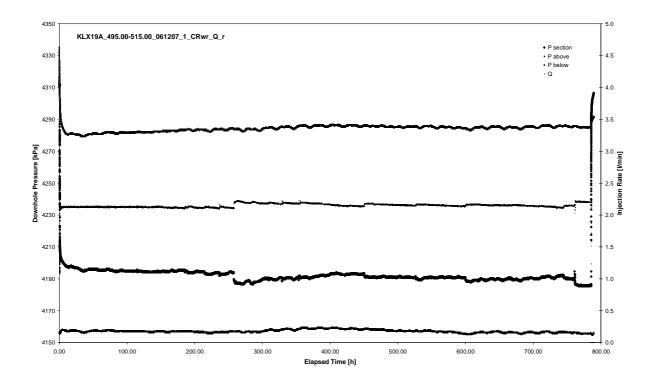
CRwr phase; log-log match



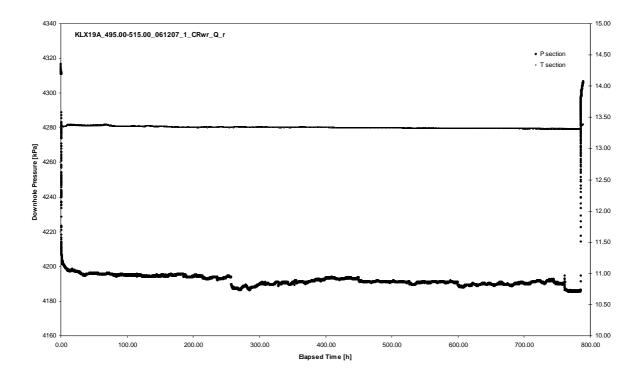
CRwr phase; HORNER match

Test 495.00 – 515.00 m

Pump Test Analysis diagrams



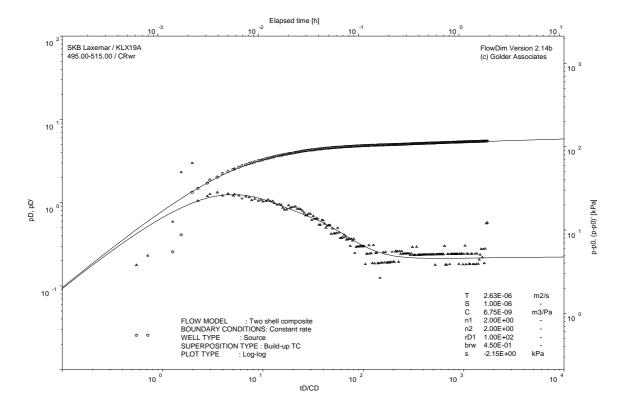
Pressure and flow rate vs. time; cartesian plot



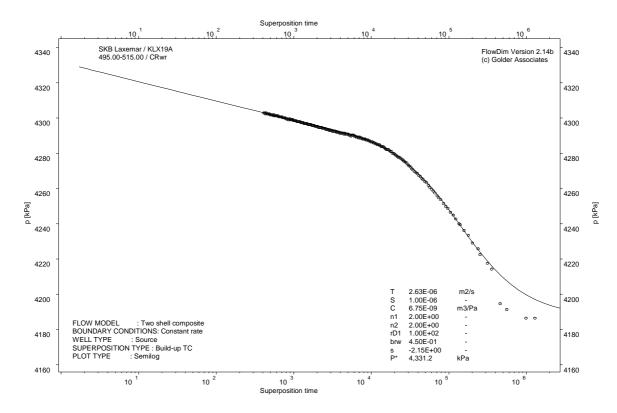
Pressure and Temperature vs. time; cartesian plot

Not analysed

CRw phase; log-log match



CRwr phase; log-log match



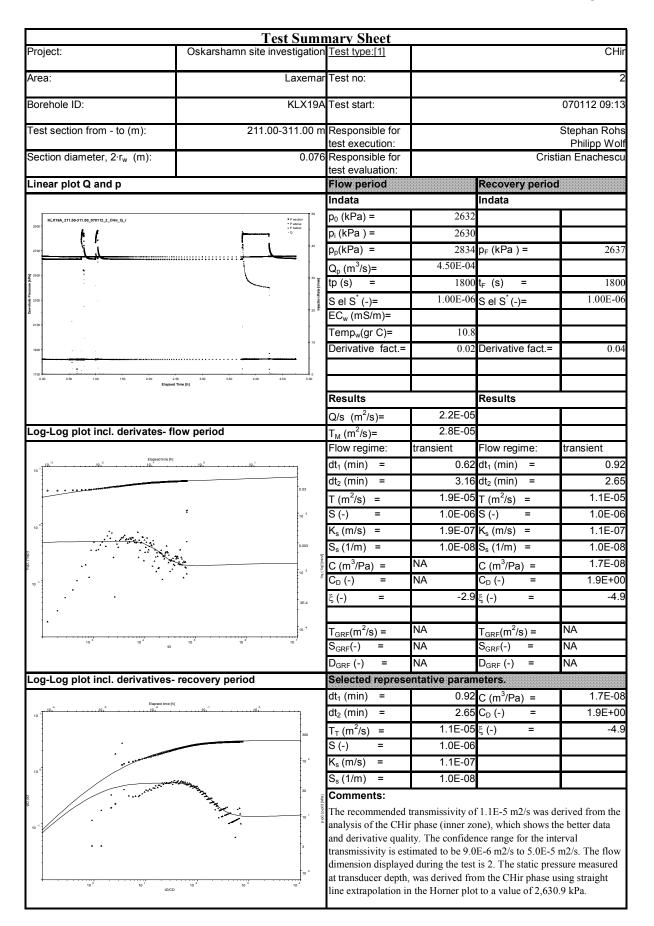
CRwr phase; HORNER match

Borehole: KLX19A

APPENDIX 3

Test Summary Sheets

			nary Sheet			
Project:	Oskarshamn site investiga	ation	Test type:[1]			CH
Area:	Laxe	mar	Test no:			
Borehole ID:	KLX	19A	Test start:			070111 08:1
Test section from - to (m):	111.00.211.0	10 m	Responsible for			Stephan Roh
			test execution:			Philipp Wo
Section diameter, 2·r _w (m):	0	.076	Responsible for		Crist	ian Enachesc
Linear plot Q and p			test evaluation: Flow period		Recovery period	
Inear plot & and p			Indata		Indata	
			p₀ (kPa) =	1801	indata	1
2100 KLX19A_111.00-211.00_070111_1_CHir_Q_r	P section P above P below O		p _i (kPa) =	1804		
1900 -		50	$p_p(kPa) =$		p _F (kPa) =	180
		ŀ	$Q_p (m^3/s) =$	7.77E-04		100
1700	· . ·	40	$\frac{Q_p(m/s)}{tp(s)} =$		t _F (s) =	180
1500 -		00 Rate [Mmin]	S el S [*] (-)=		s el S [*] (-)=	1.00E-0
		Injection	$EC_w (mS/m)=$	1.002.00	3 el 3 (-)-	1.002
1300	•	• 20	Temp _w (gr C)=	9.5		
		ŀ	Derivative fact.=		Derivative fact.=	0.0
1100		10		0.00	20111011011001	0
900 0.00 0.50 1.00	1.50 2.00					
Elap	sed Time [h]		Results		Results	
			Q/s (m^{2}/s)=	3.8E-05		
og-Log plot incl. derivates-	flow period		$T_{\rm M} (m^2/s) =$	5.0E-05		
0 01	•		Flow regime:	transient	Flow regime:	transient
Elapsed fir	e[h] 10 ⁻² 10 ⁻¹ 10 ⁻⁰		dt_1 (min) =		dt_1 (min) =	0.4
10 2			dt_2 (min) =		dt_2 (min) =	16.7
	• • • • • • • • • • • • • • • • • • •		$T(m^2/s) =$		$T(m^2/s) =$	2.4E-0
10 1		10 -2	S (-) =	1.0E-06	· · /	1.0E-0
			$K_s(m/s) =$		$K_s (m/s) =$	2.4E-0
	-		$S_{s}(1/m) =$	1.0E-08	S _s (1/m) =	1.0E-0
10 0	•	io , lining	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	4.4E-0
		1/4, (1/4	C _D (-) =	NA	C _D (-) =	1.2E-0
10 -1		a -4	ξ(-) =	11.0	ξ(-) =	30.
		-				
			$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA
10 ¹⁴ 10 ¹⁵	10 ¹⁶ 10 ¹⁷ 10 ¹⁸ tD		S _{GRF} (-) =	NA	S _{GRF} (-) =	NA
			D _{GRF} (-) =	NA	D _{GRF} (-) =	NA
.og-Log plot incl. derivatives	- recovery period		Selected represe	entative paran	neters.	
			dt ₁ (min) =	0.43	e (iii /i u)	4.4E-0
Bapsed time	[h]		dt ₂ (min) =	16.72		1.2E-0
	30	0	$T_{T} (m^{2}/s) =$	2.4E-04	ξ(-) =	30
			S (-) =	1.0E-06		
	10	2	$K_s (m/s) =$	2.4E-06		
	30		$S_{s}(1/m) =$	1.0E-08		
	30	8	Comments:			
	10	- -	The recommended			
10 °	مد	0d-d	analysis of the CHin			
	3		The confidence range $7.0E_5 m^{2/s}$ to $5.0E$			
	-		7.0E-5 m2/s to 5.0E test is 2. The static			
1	10	0				
	E		from the CHir phase	e using straight	ine extrapolation in	the Horner pla



		mary Sheet			
Project:	Oskarshamn site investigatio	n <u>Test type:[1]</u>			CHi
Area:	Laxema	r Test no:			:
Borehole ID:	KLX19	A Test start:	070112 14:0		
Test section from - to (m):	211.00-311.00 r	n Responsible for			Stephan Roh
		test execution:			Philipp Wo
Section diameter, 2 r _w (m):	0.07	6 Responsible for test evaluation:		Crist	ian Enachesc
Linear plot Q and p		Flow period		Recovery period	
F F		Indata		Indata	
3100 KLX19A_211.00-311.00_070112_3_CHir_Q_r	e0	p ₀ (kPa) =	2637		
	P saction P above P below O	p _i (kPa) =	2636		
2000		$p_p(kPa) =$		p _F (kPa) =	264
2700		$Q_p (m^3/s) =$	6.43E-04		20
		$\frac{Q_p (M/s)}{tp (s)} =$		t _F (s) =	180
2500	500 Burning			ι⊭ (3) = S el S [*] (-)=	1.00E-0
2300	nijet nijet	S el S [*] (-)= EC _w (mS/m)=	1.00E-00	Sel S (-)=	1.00E-0
	- 20		10.8		
21.00		Temp _w (gr C)= Derivative fact.=			0.(
1900 -	10	Derivative fact.=	0.03	Derivative fact.=	0.0
1700 0.00 0.20 0.40 0.60 Elaps	0.80 1.00 1.20	Results		Desults	
			1.8E-05	Results	I
and an plating devivation	flow ported	$Q/s (m^2/s) =$	2.3E-05		
.og-Log plot incl. derivates-	now period	$T_{\rm M} (m^2/s) =$			4
Elapsed time (51	Flow regime:	transient	Flow regime:	transient
10 ²	10, ⁻¹ _10, ⁻¹ _	dt_1 (min) =		dt_1 (min) =	1.0
	10 ⁻¹	dt_2 (min) =		dt_2 (min) =	3.2
		$T(m^{2}/s) =$		$T(m^{2}/s) =$	9.7E-0
• • •		S (-) =	1.0E-06		1.0E-0
10	10 -2	$K_s(m/s) =$		$K_s (m/s) =$	9.7E-0
		$S_{s}(1/m) =$		$S_{s}(1/m) =$	1.0E-0
	0.003	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	1.0E-0
10 0	· · · · · · · · · · · · · · · · · · ·	$c^{2} C_{D}(-) =$	NA	$C_D(-) =$	1.1E+0
	10 ⁻³	ξ(-) =	7.8	ξ(-) =	-4
	36-4	- 200	NA	2. \	NA
		$T_{GRF}(m^2/s) =$	NA	$T_{GRF}(m^2/s) =$	NA
10 ¹¹ 10 ¹² 10 ¹³ 10 ¹⁴	, 10 10 10	$S_{GRF}(-) =$		$S_{GRF}(-) =$	
and an electional electrosticas		$D_{GRF}(-) =$	NA	D _{GRF} (-) =	NA
.og-Log plot incl. derivatives	- recovery period	Selected represe			4 05 0
Elapsed tim	ie fhi	dt_1 (min) =		C (m ³ /Pa) =	1.0E-0
10 10 10 10 10 10 10 10 10 10 10 10 10 1	10 ⁻¹ 10 ⁰	dt_2 (min) =		C _D (-) =	1.1E+0
		$T_T(m^2/s) =$	9.7E-06		-4.
	300	S (-) =	1.0E-06		
10 °	10 ²	$K_{s}(m/s) =$	9.7E-08		
		$S_{s}(1/m) =$	1.0E-08		
·	30	Comments:			
	×			f 9.7E-6 m2/s was d	
10 ⁻¹]//	10 1			one), which shows the nce range for the int	
~ ·		and derivative qual			
~ .	E Contraction of the second	transmissivity is est	imated to be 8.0	$E-6 m^2/s$ to 5 $0E-5$	m_2/s . The flow
~ .	3	transmissivity is est dimension displaye		E-6 m2/s to 5.0E-5 is 2. The static pres	
· · · · · · · · · · · · · · · · · · ·	3 200 10 ² 10 ² 10 ² 10 ²	dimension displaye at transducer depth,	d during the test was derived fro		sure measured sing straight

roject:	Test S	umr	nary Sheet			
	Oskarshamn site investig	gation	Test type:[1]			CH
rea:	Lax	emar	Test no:			
						070440 40 5
orehole ID:	KL.	X19A	Test start:			070112 16:5
est section from - to (m):	311.00-411.	.00 m	Responsible for			Stephan Roh
ection diameter, 2·r _w (m):		0.076	test execution: Responsible for		Criet	Philipp Wo ian Enachesc
Section diameter, $2^{-1}w$ (iii).		0.070	test evaluation:		Clist	
inear plot Q and p			Flow period		Recovery period	I
			Indata		Indata	
38.00		0.003	p ₀ (kPa) =	3459		
KLX19A_311.00-411.00_070112_1_CHir_Q_r	P section P above P below O		p _i (kPa) =	NA		
3600		•	p _p (kPa) =		p _F (kPa) =	NA
200		• 0.002	Q _p (m ³ /s)=	NA		
	:		tp (s) =		t _F (s) =	
200 -		njection Rate [l/min]	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0
•	:	Injecti	EC _w (mS/m)=			
3000	. .	0.001	Temp _w (gr C)=	12.0		
2800	· · · · · · · · · · · · · · · · · · ·		Derivative fact.=	NA	Derivative fact.=	NA
2600 0.00 0.20 0.40 0.80 0.80		0.000	Results		Results	
Elapsed Ti	me (h)		$Q/s (m^2/s)=$	NA	Results	
og-Log plot incl. derivates- flo	ow period		$Q/s (m/s) = T_M (m^2/s) =$	NA		
			Flow regime:	transient	Flow regime:	transient
			dt_1 (min) =		dt_1 (min) =	NA
			dt_2 (min) =		dt_2 (min) =	NA
			$T(m^2/s) =$		$T(m^2/s) =$	NA
			S (-) =	NA	S (-) =	NA
			$K_s (m/s) =$	NA	K _s (m/s) =	NA
	1 1		$S_{s}(1/m) =$	NA	S _s (1/m) =	NA
Not An	aiysed		C (m ³ /Pa) =	NA	C (m³/Pa) =	NA
					a ()	
			C _D (-) =	NA	C _D (-) =	NA
			$C_{D}(-) = \xi(-) =$	NA NA	$C_D(-) = \xi(-) =$	NA NA
			ξ(-) =	NA	ξ(-) =	NA
			$ξ(-) = T_{GRF}(m^2/s) =$	NA NA	$ξ(-) = T_{GRF}(m^2/s) =$	NA NA
			$\xi(-) =$ $T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$	NA NA NA	ξ(-) = T _{GRF} (m ² /s) = S _{GRF} (-) =	NA NA NA
			$\xi(-) =$ $T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$ $D_{GRF}(-) =$	NA NA NA NA	$\xi(-) =$ $T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$ $D_{GRF}(-) =$	NA NA
og-Log plot incl. derivatives-	recovery period		$ \xi (-) = $ $ T_{GRF}(m^2/s) = $ $ S_{GRF}(-) = $ $ D_{GRF} (-) = $ $ Selected represe $	NA NA NA NA ntative param	ξ (-) = T _{GRF} (m ² /s) = S _{GRF} (-) = D _{GRF} (-) = neters.	NA NA NA NA
og-Log plot incl. derivatives-	recovery period		$ \xi (-) = $ $ T_{GRF}(m^2/s) = $ $ S_{GRF}(-) = $ $ D_{GRF} (-) = $ $ Selected represe $ $ dt_1 (min) = $	NA NA NA NA entative paran	$\xi(-) =$ $T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$ $D_{GRF}(-) =$ neters. $C (m^3/Pa) =$	NA NA NA NA
og-Log plot incl. derivatives-	recovery period		$\xi(-) =$ $T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$ $D_{GRF}(-) =$ Selected represe $dt_1 (min) =$ $dt_2 (min) =$	NA NA NA NA entative paran NA NA	$\xi(-) =$ $T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$ $D_{GRF}(-) =$ neters. $C (m^3/Pa) =$ $C_D (-) =$	NA NA NA NA NA
og-Log plot incl. derivatives-	recovery period		ξ (-) = $T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$ $D_{GRF}(-) =$ Selected represe dt_1 (min) = dt_2 (min) = T_T (m ² /s) =	NA NA NA ntative param NA NA 1.00E-11	$\xi(-) =$ $T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$ $D_{GRF}(-) =$ neters. $C (m^3/Pa) =$ $C_D (-) =$	NA NA NA NA
og-Log plot incl. derivatives-	recovery period		$\begin{array}{l} \xi \left(- \right) & = \\ \\ T_{GRF}(m^{2}/s) = \\ S_{GRF}(-) & = \\ \\ \hline D_{GRF} \left(- \right) & = \\ \\ \hline Selected represend \\ dt_{1} \left(min \right) & = \\ \\ dt_{2} \left(min \right) & = \\ \\ \hline T_{T} \left(m^{2}/s \right) & = \\ \\ S \left(- \right) & = \\ \end{array}$	NA NA NA ntative param NA NA 1.00E-11 NA	$\xi(-) =$ $T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$ $D_{GRF}(-) =$ neters. $C (m^3/Pa) =$ $C_D (-) =$	NA NA NA NA NA
og-Log plot incl. derivatives-	recovery period		$\begin{array}{l} \xi \left(- \right) & = \\ \\ T_{GRF}(m^{2}/s) = \\ S_{GRF}(-) & = \\ \\ D_{GRF} \left(- \right) & = \\ \end{array} \\ \begin{array}{l} \textbf{Selected represe} \\ \textbf{dt}_{1} \left(min \right) & = \\ \\ \textbf{dt}_{2} \left(min \right) & = \\ \\ T_{T} \left(m^{2}/s \right) & = \\ \\ \hline \textbf{S} \left(- \right) & = \\ \\ \textbf{K}_{s} \left(m/s \right) & = \\ \end{array} \end{array}$	NA NA NA NA Intative param NA NA NA NA	$\xi(-) =$ $T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$ $D_{GRF}(-) =$ neters. $C (m^3/Pa) =$ $C_D (-) =$	NA NA NA NA NA
og-Log plot incl. derivatives-			$\begin{array}{l} \xi \left(- \right) & = \\ \\ T_{GRF}(m^{2}/s) = \\ S_{GRF}(-) & = \\ \\ \hline D_{GRF} \left(- \right) & = \\ \\ \hline Selected represend \\ dt_{1} \left(min \right) & = \\ \\ dt_{2} \left(min \right) & = \\ \\ \hline T_{T} \left(m^{2}/s \right) & = \\ \\ S \left(- \right) & = \\ \end{array}$	NA NA NA ntative param NA NA 1.00E-11 NA	$\xi(-) =$ $T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$ $D_{GRF}(-) =$ neters. $C (m^3/Pa) =$ $C_D (-) =$	NA NA NA NA NA

	Test Sum	mary Sheet			
Project:	Oskarshamn site investigatio	n <u>Test type:[1]</u>			CH
Area:	Laxema	ar Test no:			
Borehole ID:	KLX19	A Test start:			070113 09:3
Fest section from - to (m):	411.00-511.00 r	n Responsible for			Stephan Roh
		test execution:			Philipp Wo
Section diameter, 2·r _w (m):	0.07	6 Responsible for test evaluation:		Crist	ian Enachesc
-inear plot Q and p		Flow period		Recovery period	
		Indata		Indata	
		p ₀ (kPa) =	4275		1
4600 KLX19A_411.00-511.00_070113_1_CHir_Q_r	4 P section P above P balow	$p_0 (kPa) =$	4275		
	P billow Q				101
		p _p (kPa) =		p _F (kPa) =	423
4200		$Q_p (m^3/s) =$	2.68E-05		
	- [um	tp (s) =		t _F (s) =	180
4000	A Reset for the second se	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0
	inpeti	EC _w (mS/m)=			
3800		Temp _w (gr C)=	13.2		
3800	. 1	Derivative fact.=	0.04	Derivative fact.=	0.0
0.00 0.50 1.00 Elapsed	1.50 2.00 Time [h]	Results		Results	
		Q/s (m ² /s)=	1.3E-06		
og-Log plot incl. derivates- f	ow period	T _M (m ² /s)=	1.7E-06		
		Flow regime:	transient	Flow regime:	transient
Bapsed time) • • • • • • • • • • • • • • • • • • •	dt ₁ (min) =	0.79	dt ₁ (min) =	NA
	- 10 °	dt_2 (min) =	3.32	dt_2 (min) =	NA
		$T(m^2/s) =$		$T(m^2/s) =$	9.5E-0
· · · · · · · · · · · · · · · · · · ·	03	S (-) =	1.0E-06	· · ·	1.0E-(
10 0		$K_s(m/s) =$		$K_s (m/s) =$	9.5E-0
	10 -1	$S_{s}(1/m) =$		$S_{s}(1/m) =$	1.0E-0
			NA		4.7E-1
	0.03	C (m ³ /Pa) = C _D (-) =	NA	C (m ³ /Pa) = C _D (-) =	5.2E-0
10 -1					
	10 -2	ξ(-) =	-3.0	ξ(-) =	-4
•		$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA
•	0.003	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
10 ⁻ 10 ⁻ ±C	10 ² 10 ³ 10 ⁴	$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA
.og-Log plot incl. derivatives-	recovery period	Selected represe		= 81(1 ()	I
	recovery period	dt_1 (min) =	NA	C (m ³ /Pa) =	4.7E-1
Elapsed time [h]		., ,	NA		4.7 L-
	- 10 ³			-0()	
1		$T_{T}(m^{2}/s) =$	9.5E-07		-4
	300	S (-) =	1.0E-06		
10 °		$K_{s}(m/s) =$	9.5E-09		
	10 ²	$S_{s}(1/m) =$	1.0E-08		
ومنتشب المعمد		Comments:			
	and a second and and and and and and and and and a			f 9.5E-7 m2/s was d	
10-1	. server	analysis of the CHi			
//. •	10	derivative quality.			
Υ.		is estimated to be 6 displayed during th			
		and prayed unning th		une pressure medst	u cu ui
	3			the CHir phase usir	

Dreiget	l est Sumr	nary Sheet			<u></u>	
Project:	Oskarshamn site investigation	lest type:[1]			CHi	
Area:	Laxemar	Test no:				
Borehole ID:	KLX19A Test start:	Test start:			070113 11:40	
Test section from - to (m):	411.00-511.00 m				Stephan Roh	
Section diameter, 2·r _w (m):	0.076	test execution: Responsible for		Criat	Philipp Wol ian Enachescu	
Section diameter, $2 r_w$ (m).	0.078	test evaluation:		Clist	ian Enachesci	
Linear plot Q and p		Flow period	1	Recovery period		
• •		Indata		Indata		
KLX19A_411.00-511.00_070113_2_CHir_Q_r	• P section 10	p₀ (kPa) =	4280			
****	• Paton • Paton • Pbelow • Q	p _i (kPa) =	4280			
4600 -		$p_p(kPa) =$		p _F (kPa) =	428	
		$Q_p (m^3/s) =$	5.00E-05		120	
*****		$\frac{Q_p(\Pi/S)}{tp(s)} =$		t _F (s) =	180	
4200					1.00E-0	
400	linger tim	S el S [*] (-)= EC _w (mS/m)=	1.00E-00	S el S [*] (-)=	1.00E-0	
			13.2			
3800 -	····	Temp _w (gr C)= Derivative fact.=		Derivative fact.=	0.0	
3600	2		0.04	Derivative lact	0.0	
					<u> </u>	
0.00 0.20 0.40 0. Elapsed		Results		Results		
		Q/s (m²/s)=	1.1E-06			
og-Log plot incl. derivates- fl	ow period	$T{M} (m^{2}/s) =$	1.4E-06			
		Flow regime:	transient	Flow regime:	transient	
Elapsed time [h]		dt ₁ (min) =	0.54	dt ₁ (min) =	1.9	
10		dt_2 (min) =	5.54	dt_2 (min) =	4.4	
	0.3	$T(m^2/s) =$		$T(m^2/s) =$	3.9E-0	
A Sector Management		S (-) =	1.0E-06	· · ·	1.0E-0	
10 0	10 -1	$K_s(m/s) =$		$K_s (m/s) =$	3.9E-0	
		$S_{s}(1/m) =$		$S_{s}(1/m) =$	1.0E-0	
	0.03 [uu	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	2.3E-1	
ſ	144-1 the	$C_{D}(-) =$	NA	$C_{D}(-) =$	2.6E-0	
10 -1	• ¹⁰			ξ(-) =	-4.	
	0.003	ξ(-) =	-0.0	ς(-) –	-4.	
	-	T _{GRF} (m ² /s) =	NA	T _{GRF} (m²/s) =	NA	
10 [°] 10 [°] tD	10 ² 10 ³ 10 ⁴ 10 ³	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA	
Log-Log plot incl. derivatives-	recovery period	Selected represe	ntative param			
Elapsed time (h)		dt ₁ (min) =		C (m³/Pa) =	2.3E-1	
10 10 10 10 10	<u>~</u>	dt_2 (min) =		$C_{D}(-) =$	2.6E-0	
	10 3	$T_T (m^2/s) =$	6.1E-07		-3.	
1		S(-) =	1.0E-06	/	.	
	300	K _s (m/s) =	6.1E-09		 	
		$S_{s}(1/m) =$	1.0E-08			
000	10 ²	Comments:	1.02 00			
	1044 °C		transmissivity of	$6.1E.7 m^{2/a} was d$	arized from the	
10-4		The recommended analysis of the CHi		ne), which shows the		
	10 1	derivative quality. 7				
		is estimated to be 4.	0E-7 m2/s to 2.	0E-6 m2/s. The flow	dimension	
	3			tatic pressure measu		
10 [°] 10 ¹	10 ² 10 ³ 10 ⁴	transducer depth, w		the CHir phase usin		
tD/CD		extrapolation in the	Homen -1-++	walno of 4 071 717) a	

			nary Sheet	•		
Project:	Oskarshamn site investiga	ation	Test type:[1]			C
Area:	Laxe	mar	Test no:			
Borehole ID:	KLX	19A	Test start:	070113 14:1		
Test section from - to (m):	511.00-611.0	0 m	Responsible for			Stephan R
		070	test execution:		0.51	Philipp V
Section diameter, 2·r _w (m):	0.	.076	Responsible for test evaluation:		Crist	ian Enache
_inear plot Q and p			Flow period		Recovery period	1
• •			Indata		Indata	
5400 KLX19A_511.00-611.00_070113_1_CHir_Q_r	P section	8	p ₀ (kPa) =	5102		
	P above P below • Q	7	p _i (kPa) =	5102		
5200			p _p (kPa) =	5304	p _F (kPa) =	5
		6	$Q_{p} (m^{3}/s) =$	5.85E-05		
5000		- 5 E	$\frac{d_p(m/s)}{tp(s)} =$		t _F (s) =	1
400	ĺ	Rate [Im]	S el S [*] (-)=		⊈ (3) S el S [*] (-)=	1.00E
		njection	SerS (-)= EC _w (mS/m)=	1.002-00	5 el 5 (-)=	1.001
4600 -		3		14.6		
		2	Temp _w (gr C)= Derivative fact.=		Derivative fact.=	
4400	•	- 1	Derivative lact	0.04	Derivative lact	(
2000						
0.00 0.50 1.00 Elapsed Tim	1.50 2.00 w [h]	-	Results		Results	8
			Q/s (m²/s)=	2.8E-06		
og-Log plot incl. derivates- flo	w period		T _M (m ² /s)=	3.7E-06		
			Flow regime:	transient	Flow regime:	transient
Elapsed time [h]	40 ⁰ 40 ¹		dt ₁ (min) =	7.69	dt ₁ (min) =	8
10 1			dt ₂ (min) =	24.53	dt ₂ (min) =	25
	0.	3	T (m²/s) =	5.4E-06	T (m²/s) =	5.5E
····		. л	S (-) =	1.0E-06	()	1.0E
10 0	•	,	$K_s(m/s) =$	5.4E-08	K _s (m/s) =	5.5E
·····	0.	03	$S_{s}(1/m) =$		$S_{s}(1/m) =$	1.0E
		linin	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	1.1E
	10	, (140).	$C_{D}(-) =$	NA	$C_{D}(-) =$	1.2E
10 -1			ξ(-) =		ξ(-) =	
	• • •	003	()		()	
-	10	, -a	T _{GRF} (m ² /s) =	NA	T _{GRF} (m ² /s) =	NA
10 ² 10 ³	10 ⁴ 10 ⁵ 10 ⁶		$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
_			$D_{GRF}(-) =$	NA	D _{GRF} (-) =	NA
.og-Log plot incl. derivatives- r	ecovery period		Selected represe	entative paran		
			dt ₁ (min) =	8.87	C (m ³ /Pa) =	1.1E
Elapsed time [h]	101101		dt_2 (min) =	25.91	· · ·	1.2E
			$T_{T} (m^{2}/s) =$	5.5E-06		
	30	00	S (-) =	1.0E-06	2.1	
		, ²	$K_s (m/s) =$	5.5E-08		
10 °	10	,	$S_{s}(1/m) =$	1.0E-08		
· · ··································	A AND	_	Comments:	1.02 00		
	******	, 8-34] [0d-		teo e ancienti a situa a s	5 5E 6 m 2/a waa d	animad frame
10 ⁻¹		, 0d	The recommended analysis of the CHin	-		
	المعر				fidence range for th	
10	•					
10	•		transmissivity is est	imated to be 3.0	E-6 m2/s to 8.0E-6	m2/s. The fl
	. 3		transmissivity is est dimension displaye	d during the test	is 2. The static pres	sure measure
10 10 ² 10 ² 10 ² 10 ² 10 ²	• 	,°	transmissivity is est	d during the test , was derived fro	is 2. The static pres om the CHir phase u	ssure measure sing straight

			nary Sheet	-			
Project:	Oskarshamn site investig	ation	Test type:[1]			CHi	
Area:	Laxe	emar	Test no:			2	
Borehole ID:	KL>	<19A	Test start:	070113 16:3			
Test section from - to (m):	511.00-611.0	00 m	Responsible for		Stephan Ro		
		070	test execution:		Quiet	Philipp Wol	
Section diameter, 2·r _w (m):	L	0.076	Responsible for test evaluation:		Crist	ian Enachescu	
Linear plot Q and p			Flow period		Recovery period	1	
• •			Indata		Indata		
500 KLX19A_511.00-611.00_070113_2_CHir_Q_r		12	p ₀ (kPa) =	5110			
560	 P section P showe P below O 		p _i (kPa) =	5110			
5400	-	10	p _p (kPa) =	5561	p _F (kPa) =	511	
5200			$Q_{p} (m^{3}/s) =$	1.01E-04	F1 (- 7	-	
		Î	$\frac{d_p(m/s)}{tp(s)} =$		t _F (s) =	180	
800		ه Rate[l/mh]			⊊ (0) S el S [*] (-)=	1.00E-0	
4800 -		Injection	S el S (-)= EC _w (mS/m)=	1.002-00	Sel S (-)=	1.00E-0	
4600 -		4	Temp _w (gr C)=	14.6			
4400 -			Derivative fact.=		Derivative fact.=	0.0	
4200		2		0.04		0.0	
4000							
0.00 0.20 0.40 0.80 Elapsed Time	0.80 1.00 [ħ]	1.20	Results		Results		
			Q/s (m ² /s)=	2.2E-06			
.og-Log plot incl. derivates- flov	w period		T _M (m ² /s)=	2.9E-06			
			Flow regime:	transient	Flow regime:	transient	
10 ⁻⁴ 10 ⁻³ Elapsed time [h]	10 ⁻¹ 10 ⁰		dt ₁ (min) =	7.93	dt ₁ (min) =	9.9	
10	a	3	dt_2 (min) =	25.31	dt ₂ (min) =	27.0	
			$T(m^{2}/s) =$	4.8E-06	T (m ² /s) =	6.2E-0	
	10	o ⁻¹	S (-) =	1.0E-06	S (-) =	1.0E-0	
10 °			$K_s(m/s) =$	4.8E-08	$K_s (m/s) =$	6.2E-0	
		03	$S_{s}(1/m) =$	1.0E-08	$S_{s}(1/m) =$	1.0E-0	
	· · · · ·	-2 [Film	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	4.6E-0	
		1,(0)(1)(0)(1	$\frac{C_{D}(-)}{C_{D}(-)} =$	NA	$C_{\rm D}(-) =$	5.1E-0	
10 -1	0.	003	ξ(-) =	-2.8	ξ(-) =	-2.	
	•		()		()		
	-	p -3	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA	
10 ¹ 10 ²	10 ³ 10 ⁴ 10 ⁵		$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
Ð			$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA	
_og-Log plot incl. derivatives- re	ecovery period		Selected represe			<u> </u>	
			dt ₁ (min) =	9.91	C (m ³ /Pa) =	4.6E-0	
			dt_2 (min) =		$C_{D}(-) =$	5.1E-0	
10 ¹	. 10,		$T_T (m^2/s) =$	6.2E-06		-2.	
			S(-) =	1.0E-06	ς(-) –	-2.	
· ·	30	00	$S(-) = K_s(m/s) =$	6.2E-08			
······································	10	2	$\frac{K_{s}(\Pi/S)}{S_{s}(1/m)} =$	0.2E-08 1.0E-08			
			., ,	1.0E-00			
·//	and a second sec	t bead	Comments:			aniana de la d	
		- -	The recommended analysis of the CHi				
10 -1	10	, –	and best data and d				
	3		interval transmissiv	rity is estimated	to be 2.0E-6 m2/s to	8.0E-6 m2/s.	
			The flow dimension	n displayed duri	ng the test is 2. The	static pressure	
10 [°] 10 [°]	10 ² 10 ³ 10 ⁴	° (measured at transdu straight line extrapo				

	Test S	<u>umr</u>	nary Sheet	Ĩ		
Project:	Oskarshamn site investig	jation	Test type:[1]			CHi
Area:	Lax	æmar	Test no:			,
Borehole ID:	KL	X19A	Test start:			070114 08:48
Test section from - to (m):	611.00-711	.00 m	Responsible for	Stephan Ro		
		0.070	test execution:			Philipp Wol
Section diameter, 2·r _w (m):		0.076	Responsible for test evaluation:		Crist	ian Enachesci
Linear plot Q and p			Flow period		Recovery period	
P P			Indata		Indata	
6200 KLX19A_611.00-711.00_070114_1_CHir_Q_r	• P section	n 1.00	p ₀ (kPa) =	5926		
KLX194_611.00-/11.00_0/0114_1_CHIF_Q_F	P above P bove P below • Q		p _i (kPa) =	5911		
8000		0.80	$p_p(kPa) =$		p _F (kPa) =	593
				7.67E-06		595
5800		100 -	$\frac{Q_p (m^3/s)}{tp (s)} =$		t _F (s) =	270
	<u>_</u>	tate [fmin]	··· (·)		,	
	and the second sec	Injection R	S el S'(-)=	1.00E-06	S el S [*] (-)=	1.00E-0
5400		0.40 2	EC _w (mS/m)=			
			Temp _w (gr C)=	16.0		
5200		0.20	Derivative fact.=	0.03	Derivative fact.=	0.0
5000 0.50 1.00	150 2.00	0.00				
Elapsed Time [h]			Results		Results	
			Q/s $(m^{2}/s)=$	3.7E-07		
.og-Log plot incl. derivates- f	ow period		T _M (m²/s)=	4.9E-07		
			Flow regime:	transient	Flow regime:	transient
Eapsed time [h]	10 ⁻¹	_	dt ₁ (min) =	NA	dt ₁ (min) =	NA
10 2		F 10 1	dt_2 (min) =	NA	dt ₂ (min) =	NA
			T (m ² /s) =	2.3E-07	T (m²/s) =	1.2E-0
		3	S (-) =	1.0E-06		1.0E-0
10 5	*****************	ł	$K_s (m/s) =$		$K_s (m/s) =$	1.2E-0
	•	10 °	$S_{s}(1/m) =$		$S_{s}(1/m) =$	1.0E-0
		(u)	$C (m^{3}/Pa) =$	NA	C (m ³ /Pa) =	1.3E-0
	and the second sec	0.3 (b) t	$C_{D}(-) =$	NA	$C_{D}(-) =$	1.4E-0
10 0		14	ξ(-) =		ξ(-) =	-4.
·····		10 -1	ς(-) –	0.0	ς(-) –	-4.
		0.03	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m²/s) =	NA
10 ⁶ 10 ⁷	10 ⁶ 10 ⁹ 10 ¹⁶		$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
C	10 10 10		$D_{GRF}(-) =$	NA	D _{GRF} (-) =	NA
.og-Log plot incl. derivatives-	recovery period		Selected represe	entative paran		I
			dt_1 (min) =	NA	C (m ³ /Pa) =	1.3E-0
Elapsed time [h]			dt_2 (min) =	NA	$C_{D}(-) =$	1.4E-0
10			$T_T (m^2/s) =$	1.2E-07		-4.
			S(-) =	1.0E-06		
	3	000	$K_{s}(m/s) =$	1.0E-00 1.2E-09		
10 *		10 ²				
			$S_s(1/m) =$	1.0E-08		
a second s	and the second sec	leaval J.C.	Comments:			
· · · · · · · · · · · · · · · · · · ·	•	pp0.(ppt	The recommended			
1	1	10 1	analysis of the CHin quality. The confide			
10 "						
10 ⁻¹			estimated to be 8 01	$E-8 \text{ m}^{2/s}$ to 4.04	$-/m_2/s$ The now c	limension
•••		3	estimated to be 8.01 displayed during the			
***	10 ¹ 10 ² 10 ²	3	estimated to be 8.01 displayed during the transducer depth, w	e test is 2. The s	tatic pressure measu	ired at

	Test Summ	nary Sheet			
Project:	Oskarshamn site investigation	Test type:[1]			CHi
Area:	Laxemar	Test no:			2
Borehole ID:	KLX19A	Test start:	070114 11:03:0		
Test section from - to (m):	611.00-711.00 m	Responsible for			Stephan Rohs
		test execution:			Philipp Wol
Section diameter, 2·r _w (m):	0.076	Responsible for		Crist	ian Enachescu
Linear plot Q and p		test evaluation: Flow period		Recovery period	
		Indata		Recovery period	
			5926	inuala	1
KLX19A_611.00-711.00_070114_2_CHir_Q_r	P andian P andian P andron P above P below	p ₀ (kPa) =			
	··	p _i (kPa) =	5915		500
6.00 ·	- 30	p _p (kPa) =		p _F (kPa) =	598
		$Q_p (m^3/s) =$	1.55E-05		
8 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	- 70 M	tp (s) =		t _F (s) =	180
5000	lije con	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0
		EC _w (mS/m)=			
5400	10	Temp _w (gr C)=	16.0		
5200		Derivative fact.=	0.04	Derivative fact.=	0.0
5000 0.00 0.00 0.00 0.00 Elapsed T	1.00 1.20 1.40 1.60				
		Results		Results	
		Q/s (m²/s)=	3.4E-07		
.og-Log plot incl. derivates- fl	ow period	T _M (m²/s)=	4.4E-07		
		Flow regime:	transient	Flow regime:	transient
Bapsed time (h)	'	dt ₁ (min) =	1.55	dt ₁ (min) =	2.4
10	30	dt ₂ (min) =	20.24	dt ₂ (min) =	13.5
	F 10 '	$T(m^{2}/s) =$	1.8E-07	$T(m^{2}/s) =$	1.7E-0
		S (-) =	1.0E-06	· /	1.0E-0
10 1	3	$K_s(m/s) =$		$K_s (m/s) =$	1.7E-0
		$S_{s}(1/m) =$		$S_{s}(1/m) =$	1.0E-0
	10 ° 11 m	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	4.1E-0
11100 000000000000000000000000000000000	10 Final Control of Co	$C_{D}(-) =$	NA	$C_{D}(-) =$	4.5E-0
10 [°]	0.3	ξ(-) =		ξ(-) =	-4.
	2	ς(-) –	-0.0	ς(-) –	-7.
	10	T _{GRF} (m ² /s) =	NA	T _{GRF} (m ² /s) =	NA
10 ° 10 '	10 ² 10 ³ 10 ⁴	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
tD		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA
.og-Log plot incl. derivatives-	recovery period	Selected represe			
		dt ₁ (min) =		C (m ³ /Pa) =	4.1E-0
10 ⁻³ Elapsed time (h)	10 ⁻¹ vo ⁰ vo ¹	$dt_2 (min) =$		$C_{D}(-) =$	4.5E-0
10 2	· · · · · · · · · · · · · · · · · · ·	$T_T (m^2/s) =$	1.8E-07		4.5Ľ-0 -3.
	10	$I_{T} (m / s) =$ S (-) =	1.0E-07		-3.
10 1		S (-) = K _s (m/s) =	1.0E-06 1.8E-09		───
	• 10 ³	$S_{s}(1/m) =$	1.0E-09		
			1.0E-00		
10 *	10 ² 10 ²	Comments:	,		· 10 /
· ·· ·································	20044			f 1.8E-7 m2/s was do ows good data and o	
10-1				isation. The confide	
	10			ted to be 8.0E-8 m2/	
		m2/s. The flow dim	ension displaye	d during the test is 2	. The static
10 ⁻¹ 10 ⁻⁰ IDICD	10 ⁻¹ 10 ² 10 ²			oth, was derived from	
			rve extrapolatio	n in the Horner plot	to a value of
		5,889.9 kPa.			

	Test Sun	nmary Sheet			
Project:	Oskarshamn site investigati	on Test type:[1]			CHir
Area:	Laxem	ar Test no:			1
Borehole ID:	KLX1	9A Test start:			070115 15:33
Test section from - to (m):	694.00-794.00	m Responsible for			Stephan Rohs
ζ, γ		test execution:	Philipp Wo		
Section diameter, 2·r _w (m):	0.0	76 Responsible for test evaluation:		Crist	ian Enachescu
Linear plot Q and p		Flow period		Recovery period	
		Indata		Indata	
7400		p ₀ (kPa) =	6596		
KLX19A_694.00-794.00_070115_1_CHir_Q_r		p _i (kPa) =	6578		
	P section P above P below	p _p (kPa) =	6783	p _F (kPa) =	6619
7000	· •	$Q_{p} (m^{3}/s) =$	1.93E-05		
8800 ·		$\frac{dp(m, b)}{dp(s)} =$	1800	t _F (s) =	180
		S el S [*] (-)=		S el S [*] (-)=	1.00E-00
8400	·	EC _w (mS/m)=		00.0()	
8200	• :	Temp _w (gr C)=	17.0		
6000	North Contraction of the Contrac	Derivative fact.=	0.07	Derivative fact.=	0.0
5800	· · · · · · · · · · · · · · · · · · ·				
	·				
5600 020 0.40 0.60 0.80 Elapsed	1.00 1.20 1.40 1.60 1.80 Time [h]	Results		Results	
		Q/s (m ² /s)=	9.3E-07		
.og-Log plot incl. derivates- fl	ow period	$T_{M} (m^{2}/s) =$	1.2E-06		
		Flow regime:	transient	Flow regime:	transient
Elapsed time (······································	dt_1 (min) =	7.80	dt ₁ (min) =	NA
	3	dt_2 (min) =	23.60	dt ₂ (min) =	NA
		$T(m^{2}/s) =$	4.6E-07	T (m ² /s) =	5.2E-0
	10	° S (-) =	1.0E-06	S (-) =	1.0E-0
10 1		$K_s(m/s) =$	4.6E-09	K _s (m/s) =	5.2E-0
0 0 0 0 0 0 000000	0.3	$S_{s}(1/m) =$	1.0E-08	S _s (1/m) =	1.0E-0
		C (m ³ /Pa) =	NA	C (m ³ /Pa) =	1.1E-0
10 [°] .	······································	$C_{\rm D}(-) =$	NA	$C_{D}(-) =$	1.2E-0
		ξ(-) =	-4.0	ξ(-) =	-5.
•••					
•	10	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA
10 ³ 10 ⁴	10 ⁵ 10 ⁶ 10 ⁷	$S_{GRF}(-) =$	NA	S _{GRF} (-) =	NA
-		$D_{GRF}(-) =$	NA	D _{GRF} (-) =	NA
.og-Log plot incl. derivatives-	recovery period	Selected repres	entative paran	neters.	
		dt ₁ (min) =	7.80	C (m³/Pa) =	1.1E-0
Elapsed time (h	10 ⁻¹ 10 ⁻⁰	dt_2 (min) =	23.60	C _D (-) =	1.2E-0
10		$T_{T} (m^{2}/s) =$	4.6E-07	ξ(-) =	-4.
	300	S (-) =	1.0E-06		
		$K_s (m/s) =$	4.6E-09		
10 0	10 ²	$S_{s}(1/m) =$	1.0E-08		
	20 30	Comments:			
and the second sec		The recommended	transmissivity o	f 4.6E-7 m2/s was d	erived from the
10-1	10 5			ne), which shows the	
				. Due to the slight c	
	3			d be regarded on the ce range for the inte	
				E-8 m2/s to 6.0E-7	
10 ⁰ 10 ¹ KINCE	10 ² 10 ² 10 ⁴	dimension displaye	ed during the test	is 2. The static pres	sure measured
				om the CHir phase u	
		line extrapolation i	n the Horner plo	t to a value of 6,578	.9 kPa.

	Test Sum	mary Sheet				
Project:	Oskarshamn site investigatio	n <u>Test type:[1]</u>			CHir	
Area:	Laxema	r Test no:			2	
Borehole ID:	KLX19.	A Test start:			070115 17:27	
Test section from - to (m):	694.00-794.00 r	n Responsible for			Stephan Rohs	
Caption diamotor 0 r (m):	0.07	test execution:		C rio	Philipp Wolf	
Section diameter, 2·r _w (m):	0.07	6 Responsible for test evaluation:		Cris	tian Enachescu	
Linear plot Q and p	•	Flow period		Recovery perio	d	
		Indata		Indata		
7800 KLX19A_694.00-794.00_070115_2_CHir_Q	r ● P section ● P below ● P below	p ₀ (kPa) =	6598			
7400	P balow Q 7	p _i (kPa) =	6594			
7200	6	p _p (kPa) =		p _F (kPa) =	6598	
7000		$Q_{p} (m^{3}/s) =$	3.80E-05			
	° (The second se	tp (s) =		t _F (s) =	10800	
600		S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-06	
6400	± 1 1 1	EC _w (mS/m)=				
eco -		Temp _w (gr C)=	17.0			
eoco -		Derivative fact.=	0.02	Derivative fact.=	0.02	
58:00	······································					
0.00 0.50 1.00 1.50 2.00 Elaps	2.50 3.00 3.50 4.00 4.50 ad Time [h]	Results		Results		
		Q/s (m ² /s)=	8.2E-07			
.og-Log plot incl. derivates- f	low period	T _M (m ² /s)=	1.1E-06			
		Flow regime:	transient	Flow regime:	transient	
Lapsed time	[0]	dt ₁ (min) =	8.77	dt ₁ (min) =	0.14	
	3	dt_2 (min) =		dt_2 (min) =	0.50	
	10 0	$T(m^{2}/s) =$		T (m²/s) =	1.3E-06	
	1	S (-) =	1.0E-06		1.0E-06	
10 1	0.3	$K_{s}(m/s) =$	4.1E-09	$K_s (m/s) =$	1.3E-08	
	· · · ·	$S_{s}(1/m) =$	1.0E-08	$S_{s}(1/m) =$	1.0E-08	
	10 1	^w C (m ³ /Pa) =	NA	C (m ³ /Pa) =	1.4E-09	
10 *	003	[∉] C _D (-) =	NA	C _D (-) =	1.5E-01	
	0.03	ξ(-) =	-0.9	ξ(-) =	-3.6	
	• •	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m²/s) =	NA	
10 ² 10 ³	10 ⁴ 10 ⁵ 10 ⁶	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA	
Log-Log plot incl. derivatives	- recovery period	Selected represe				
		dt_1 (min) =	8.77	C (m ³ /Pa) =	1.4E-09	
		dt_2 (min) =	24.90	$C_{D}(-) =$	1.5E-01	
Elapsedtime	N	$T_{T}(m^{2}/s) =$	4.1E-07	ξ(-) =	-0.9	
10 2 10 2	⁹ 10 ¹ 10 ⁰ 10 ¹	S (-) =	1.0E-06			
		$K_s (m/s) =$	4.1E-09			
	10 3	$S_{s}(1/m) =$	1.0E-08			
10		Comments:				
1.ELMONTON	10 ²	The recommended	transmissivity o	f 4.1E-7 m2/s was d	lerived from the	
10 °	or peak	analysis of the CHi	phase (outer zo	ne), which shows g	ood data and	
		derivative quality a				
10 4	10 ¹	hydraulic connection should be regarded				
		confidence range for				
	10 °	8 m2/s to 6.0E-7 m	2/s. The flow di	mension displayed	during the test is	
	10 ⁻³ 10 ⁻⁴ 10 ⁻⁶	2. The static pressu				
		the CHir phase usin	ig type curve ext	trapolation in the H	orner plot to a	
		value of 6,577.0 kP				

		mary Sheet				
Project:	Oskarshamn site investigatio				CHi	
Area:	Laxema	ar Test no:			1	
Borehole ID:	KLX19	A Test start:		070117 11:3		
Test section from - to (m):	111.00-131.00	m Responsible for			Stephan Rohs	
	0.07	test execution:		0.51	Philipp Wol	
Section diameter, 2·r _w (m):	0.07	6 Responsible for test evaluation:		Crist	ian Enachescu	
Linear plot Q and p		Flow period		Recovery period	l	
		Indata		Indata	•	
		p ₀ (kPa) =	1142	indata	1	
KLX19A_111.00-131.00_070117_1_CHir_Q_r	Paccion Pabore					
1350 -	P above P bolow Q	p _i (kPa) =	1143		11.4	
1300 -		p _p (kPa) =		p _F (kPa) =	114	
1250 -	÷	$Q_{p} (m^{3}/s) =$	7.50E-04			
g 1200 ·	i i	tp (s) =		t _F (s) =	120	
1150		S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0	
1100		EC _w (mS/m)=				
1050	20	Temp _w (gr C)=	8.5			
1000		Derivative fact.=	0.01	Derivative fact.=	0.0	
950 -	- 10					
	1.00 1.20 1.40 1.60 1.80 2.00 d Time (h)	Results		Results		
		Q/s (m ² /s)=	3.6E-05			
.og-Log plot incl. derivates- f	low period	T _M (m ² /s)=	3.8E-05			
		Flow regime:	transient	Flow regime:	transient	
Elapsed time (h	2	dt_1 (min) =	0.43	dt ₁ (min) =	0.4	
10 ²	10 [°]	dt_2 (min) =	18.53	dt_2 (min) =	10.1	
	10 4	$T(m^2/s) =$		$T(m^2/s) =$	1.6E-0	
10 1		S (-) =	1.0E-06	、、、	1.0E-0	
	10 4	$K_s(m/s) =$		K _s (m/s) =	8.0E-0	
10 0		$S_{s}(1/m) =$		$S_{s}(1/m) =$	5.0E-0	
	10 4	7				
10-1		$\frac{1}{\frac{1}{2}} C (m^3/Pa) =$	NA	C (m ³ /Pa) =	3.7E-0	
	10 4	[*] C _D (-) =	NA	C _D (-) =	4.1E-0	
10 ⁻²	•	ξ(-) =	0.0	ξ(-) =	18.	
1	10 4	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m²/s) =	NA	
10 ⁶ 10 ⁶ tD		$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA	
.og-Log plot incl. derivatives-	- recovery period	Selected represe	entative param			
U .U.F	· · · · · · ·	dt_1 (min) =		C (m ³ /Pa) =	3.7E-0	
Elapsed time [h]	ij	$dt_2 (min) =$		$C_{D}(-) =$	4.1E-0	
10 2		$T_{T} (m^2/s) =$	3.0E-04		4.1Ľ=0 0.	
	300	$I_{T} (m / s) =$ S (-) =	1.0E-04	י _ש (⁻) –	0.	
					Į	
10 1	10 2	$K_s(m/s) =$	1.5E-05			
		$S_{s}(1/m) =$	5.0E-08			
. \	30	Comments:				
	10 1			f 3.0E-4 m2/s was do ows the best derivat		
10				insmissivity is estim		
	3			nension displayed d		
		2. The static pressu	re measured at the	ransducer depth, wa	s derived from	
10 ¹ 10 ² IDCD	10 [°]		ig straight line ex	ransducer depth, wa strapolation in the H		

	Test Sur	nmary Sheet			
Project:	Oskarshamn site investigat	on Test type:[1]			CHir
Area:	Laxen	nar Test no:			1
Borehole ID:	KI X1	9A Test start:	070117 14:0		
Test section from - to (m):	131.00-151.00	m Responsible for			Stephan Rohs
Section diameter, 2·r _w (m):	0.0	test execution: 76 Responsible for		Crist	Philipp Wolf ian Enachescu
	0.0	test evaluation:		Chat	
Linear plot Q and p		Flow period		Recovery period	I
· · ·		Indata		Indata	
1600 KLX19A_131.00-151.00_070117_1_CHir_Q_r	• P section 0.	° p ₀ (kPa) =	1312		
1550	• P section • P above • P below • Q	p _i (kPa) =	1317		
1500	1	$p_p(kPa) =$	1517	p _F (kPa) =	1381
1450	:	$\frac{Q_p (m^3/s)}{Q_p (m^3/s)} =$	1.33E-07	p _F (∝)	1201
g. 1400 -		<pre></pre>		t _F (s) =	1200
		But			1.00E-06
	******	§ 3 el 3 (-)-	1.00E-00	S el S [*] (-)=	1.00E-00
5 1900 -		20 ₀ (110/11)	0.0		
1250 -	(Temp _w (gr C)=	8.8		
1200 -		Derivative fact.=	0.04	Derivative fact.=	0.06
1150					
1100		Results		Results	
		Q/s $(m^{2}/s)=$	6.5E-09		
Log-Log plot incl. derivates- flo	w period	$T_{M} (m^{2}/s) =$	6.8E-09		
	-	Flow regime:	transient	Flow regime:	transient
Elapsed time [h]	· · · · · ·	dt_1 (min) =	8.26	dt_1 (min) =	NA
10	- ,	dt_2 (min) =		dt_2 (min) =	NA
	10 3	$T(m^2/s) =$		$T(m^2/s) =$	1.3E-09
-		S(-) =	1.0E-06	· · /	1.0E-06
10 1	300	$K_{s}(m/s) =$		K _s (m/s) =	6.5E-11
	10 ²				
		$S_{s}(1/m) =$		$S_{s}(1/m) =$	5.0E-08
	30	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	1.1E-10
10 0		^g C _D (-) =	NA	$C_D(-) =$	1.2E-02
10 10 10 10 10 10 10 10 10 10 10 10 10 1	10 '	ξ(-) =	-1.9	ξ(-) =	-0.1
		$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m²/s) =	NA
· · · · · · · · · · · · · · · · · · ·	3	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
10 ⁻¹ 10 ⁻⁰ 1D	10 ¹ 10 ² 10 ³				
		= GRF ()	NA	= GRF ()	NA
Log-Log plot incl. derivatives- r	ecovery period	Selected represe			T 44= 46
Elapsed time [b]	1 10, ⁰	dt_1 (min) =	8.26	C (m ³ /Pa) =	1.1E-10
	10 3	dt_2 (min) =		C _D (-) =	1.2E-02
	•	$T_T (m^2/s) =$	1.7E-09		-1.9
1	300	S (-) =	1.0E-06		
10		$K_{s}(m/s) =$	8.5E-11		
	1	$S_{s}(1/m) =$	5.0E-08		
		Comments:			
the of the second second	30	The recommended	transmissivity of	f 1.7E-9 m2/s was d	erived from the
10 °	F 10 ¹	analysis of the CHi	phase (outer zon	ne). The inner zone	was interpreted
				nge for the interval	
	3			E-9 m2/s. The analy	
				of 2. The static press the CHir phase usir	
10 ° 10 ¹ IDICD	10 ² 10 ³ 10 ⁴			a value of 1,297.7 kl	
		sincepolation in the	- ionio più io i		

	Test Sur	nr	nary Sheet			
Project:	Oskarshamn site investigat	ion	Test type:[1]			СН
Area:	Laxen	nar	Test no:			
Borehole ID:	KLX1	9A	Test start:	070117 16:		
Test section from - to (m):	m - to (m): 151.00-171.00 m					Stephan Roh
			test execution:			Philipp Wo
Section diameter, 2·r _w (m):	0.0)/6	Responsible for test evaluation:		Crist	ian Enachesc
Linear plot Q and p			Flow period		Recovery period	l
• •			Indata		Indata	
1700 KLX19A_151.00-171.00_070117_1_CHir_Q_r	1	3	p ₀ (kPa) =	1479		
REX194_151.00-1/1.00_0/011/_1_CHIF_Q_F	P above P below O		p _i (kPa) =	1479		
- 1	•		$p_p(kPa) =$		p _F (kPa) =	148
1600	:		$Q_p (m^3/s) =$	3.17E-05		
1550	and the second	2	$\frac{Q_p (m/s)}{tp (s)} =$		t _F (s) =	120
50	i i	ate [l/min)			⊈ (3) S el S [*] (-)=	1.00E-0
		yection R	S el S [*] (-)= EC _w (mS/m)=	1.002-00	Sel S (-)=	1.00L-0
1450 ·		-	Temp _w (gr C)=	9.0		
1400 -			Derivative fact.=		Derivative fact.=	0.0
			Denvalive laci	0.09		0.0
	الجهي الاستان الشريفة المسترفة المسترفين والمسترفين والمسترف المتشرقين					
1900	0.80 1.00 1.20 1.4 me[h]	• 0	Results		Results	
			Q/s (m ² /s)=	1.6E-06		
.og-Log plot incl. derivates- flo	w period		$T_{\rm M} (m^2/s) =$	1.6E-06		
0 01	•		Flow regime:	transient	Flow regime:	transient
10 ⁻⁴ Elapsed time [h]	10 ⁻¹ 10 ⁰		dt_1 (min) =		dt_1 (min) =	0.9
	3		dt_2 (min) =		dt_2 (min) =	15.8
	10	. 0	$T(m^2/s) =$		$T(m^2/s) =$	4.1E-0
			S (-) =	1.0E-06	· · ·	1.0E-0
10 ⁻¹	0.3	3	$K_s(m/s) =$		$K_s (m/s) =$	2.1E-0
			$S_{s}(1/m) =$		$S_{s}(1/m) =$	5.0E-0
	10	.1 []u	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	5.4E-1
	•	a. (Liq) (m	$C_{D}(-) =$	NA	$C_{D}(-) =$	6.0E-0
10 [°]	0.0	23 23			ξ(-) =	0.02-0
· · · · · · · · · · · · · · · · · · ·			ξ(-) =	0.0	ς(-) –	0
· · · ·	10	-2	$T_{GRF}(m^2/s) =$	NA	T (22/2)	NA
•	· · · · · · · · · · · · · · · · · · ·			NA	$T_{GRF}(m^2/s) = S_{GRF}(-) =$	NA
10 ¹² 10 ¹³ tD	10 ¹⁴ 10 ¹⁵ 10 ¹⁶		$S_{GRF}(-) =$ $D_{GRF}(-) =$	NA		NA
.og-Log plot incl. derivatives-	receiver naried		D _{GRF} (-) = Selected represe			
.og-Log plot filet. derivatives-	ecovery period					5.4E-1
Elapsed time (h)	1 A		$dt_1 (min) =$ $dt_2 (min) =$	0.97	C (m ³ /Pa) = C _D (-) =	5.4E- 6.0E-0
10 ²	10 ^{°°}			4.1E-06		0.0E-0
			$T_T (m^2/s) =$ S(-) =		ξ(-) =	8
	300		- ()	1.0E-06		
0	10 2		$K_{s}(m/s) = S_{s}(1/m) =$	2.1E-07		
	10		3()	5.0E-08		
	30	Hood (MP-a)	Comments:		A 1E 6 24 1	mirrod for a
·····		0,04d			4.1E-6 m2/s was do nows the best data a	
· · · · · · · · · · · · · · · · · · ·	10 ⁻¹				sation. The confider	
	• • •		the interval transmis	sivity is estimat	ed to be 1.0E-6 m2/	/s to 6.0E-6
1	3		m2/s. The flow dim	ension displayed	d during the test is 2	. The static
10 ¹ 10 ² 10/CD	10 ⁻² 10 ⁻⁴ 10 ⁻⁵		pressure measured a		oth, was derived from on in the Horner plo	

	Test Sum	mary Sheet					
Project:	Oskarshamn site investigation				Р		
Area:	Laxema	Test no:			1		
Borehole ID:	KLX19A	Test start:		070117 18:2			
Test section from - to (m):	171 00-191 00 m	Responsible for		Stephan Roh			
	171.00-191.00 1	test execution:			Philipp Wol		
Section diameter, 2·r _w (m):	0.076	Responsible for		Crist	ian Enachescu		
		test evaluation:					
Linear plot Q and p		Flow period		Recovery period	1		
		Indata		Indata			
1900 KLX19A_171.00-191.00_070117_1_Pi_Q_r	P section	p ₀ (kPa) =	1646				
1850 ·	• Pabove ● Pbolow 5 -0	p _i (kPa) =	1651				
		$p_p(kPa) =$	1870	p _F (kPa) =	171		
		$Q_{p} (m^{3}/s) =$	#NV	F1 (•)			
1750	4	$\frac{Q_p (m/s)}{tp (s)} =$		t _F (s) =	1800		
1700 ·	3 <u>G</u> WB						
1650	a for the second s	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0		
1600 -	12 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -	EC _w (mS/m)=					
1550	2	Temp _w (gr C)=	9.2				
		Derivative fact.=	NA	Derivative fact.=	0.0		
1500	1						
1400	3.00 4.00 5.00 6.00	Results		Results			
Elapse	ed Time [h]	Q/s (m ² /s)=	NA				
.og-Log plot incl. derivates- f	low period	$T_{M} (m^{2}/s) =$	NA				
		Flow regime:	transient	Flow regime:	transient		
		-		-			
		dt_1 (min) =	NA	dt_1 (min) =	NA		
		dt_2 (min) =	NA	dt_2 (min) =	NA		
		T (m²/s) =	NA	T (m²/s) =	4.2E-1		
		S (-) =	NA	S (-) =	1.0E-0		
		$K_{s}(m/s) =$	NA	K _s (m/s) =	2.1E-1		
NT-4-	u alava d	$S_{s}(1/m) =$	NA	S _s (1/m) =	5.0E-0		
Not al	nalysed	C (m ³ /Pa) =	NA	C (m³/Pa) =	3.2E-1		
		$C_{D}(-) =$	NA	C _D (-) =	3.5E-0		
		ξ(-) =	NA	ξ(-) =	-1.1		
		5()		5()			
		T _{GRF} (m ² /s) =	NA	T _{GRF} (m ² /s) =	NA		
		$S_{GRF}(-) =$	NA	$S_{GRF}(m/s) =$ $S_{GRF}(-) =$	NA		
			NA		NA		
		= GRF ()		GRF ()	INA		
.og-Log plot incl. derivatives-	- recovery period	Selected represe			1 • •= •		
Elapsed time [[b]	dt_1 (min) =	NA	C (m ³ /Pa) =	3.2E-1		
10		$dt_2 (min) =$	NA	C _D (-) =	3.5E-0		
		$T_{T} (m^{2}/s) =$	4.2E-12		-1.1		
+	3	S (-) =	1.0E-06				
10 -		K _s (m/s) =	2.1E-13				
	10 °	$S_{s}(1/m) =$	5.0E-08		Ī		
	Martin Martin	Comments:					
فتستعتر والمستعصفة والمحادث والمستعد المستعد ال	0.3		transmissivity	f 4.2E-12 m2/s was	derived from th		
				ence range for the i			
10 ⁻¹ · · · · · · · · · · · · · · · · · · ·	10 -1						
10 ⁻¹	10 -1		timated to be 1.0	E-12 to 8.0E-12 m2	2/s. The analysis		
	10 ⁻¹ 0.03	transmissivity is est was conducted usin	ng a flow dimens	ion of 2. The static			
		transmissivity is est	ng a flow dimens	ion of 2. The static			

	Test Sum	mary Sheet				
Project:	Oskarshamn site investigatio	n Test type:[1]			CHi	
Area:	Laxema	r Test no:			ſ	
Borehole ID:	KLX19	A Test start:		070118 08:1		
Test section from - to (m):	191.00-211.00 r	n Responsible for			Stephan Rohs	
Continu diameter 2 r (m):	0.07	test execution:		Crie	Philipp Wol tian Enachescu	
Section diameter, 2·r _w (m):	0.07	6 Responsible for test evaluation:		Clis	lian Enachescu	
Linear plot Q and p		Flow period		Recovery period	ł	
· ·		Indata		Indata		
2100 KLX19A_191.00-211.00_070118_1_CHir_Q_r	• P section	p ₀ (kPa) =	1808			
2050	P section P above P bilow Q	p _i (kPa) =	1819			
2000 -	0.004	$p_p(kPa) =$	2024	p _F (kPa) =	186	
1950 -	i 🔪	$Q_{p} (m^{3}/s) =$	2.00E-08			
. 1900 -	:		1200	t _F (s) =	120	
1850		S el S [*] (-)=		S el S [*] (-)=	1.00E-0	
1800		$EC_w (mS/m) =$				
1750 -		Temp _w (gr C)=	9.5			
1700	0.001	Derivative fact.=	NA	Derivative fact.=	0.0	
1650	-	2011/01/07/0201			0.0	
1800	0.000					
0.50 0.50 1.00 Elapsed 1	150 2.00 ime [h]	Results		Results		
		Q/s $(m^{2}/s)=$	9.6E-10			
.og-Log plot incl. derivates- fl	ow period	$T_{M} (m^{2}/s) =$	1.0E-09			
5 51		Flow regime:	transient	Flow regime:	transient	
		dt_1 (min) =	NA	dt_1 (min) =	NA	
		dt_2 (min) =	NA	dt_2 (min) =	NA	
		$T(m^2/s) =$	NA	$T(m^2/s) =$	3.8E-1	
		S (-) =	NA	S (-) =	1.0E-0	
		$K_s(m/s) =$	NA	$K_{s} (m/s) =$	1.9E-1	
		$S_{s}(1/m) =$	NA	$S_{s}(1/m) =$	5.0E-0	
Not Ar	nalysed	$C_{s}(m^{3}/Pa) =$	NA	C (m ³ /Pa) =	6.2E-1	
		$C_{D}(-) =$	NA	$C_{D}(-) =$	6.9E-0	
		ξ(-) =	NA	ξ(-) =	-0.9	
		ς (-) –		ς (-)	0.0	
		$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA	
		$I_{GRF}(m / s) =$ $S_{GRF}(-) =$	NA	$I_{GRF}(m / s) =$ $S_{GRF}(-) =$	NA	
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA	
.og-Log plot incl. derivatives-	recovery period	Selected represe				
		dt_1 (min) =	NA	C (m ³ /Pa) =	6.2E-1	
10 ⁻⁴ 10 ⁻³ Elapsed time (h)	40 ⁻⁴ +0 ⁰	$dt_2 (min) =$	NA	$C_{D}(-) =$	6.9E-0	
10 1	10 [°]	$T_{T} (m^{2}/s) =$	3.8E-10		-0.9 -0.9	
		S(-) =	1.0E-06		-0.9	
10 °		$K_{s}(m/s) =$	1.6E-11			
	North Contraction of the Contrac	$S_{s}(1/m) =$	5.0E-08			
		Comments:	0.0∟-00			
10 ⁻¹	10 ¹ 20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		tranomiogizity	f 3.8E-10 m2/s was	derived from 4	
A A A				s the only analysable		
10 4	10 *			issivity the confider		
1		estimated to be 1.0	E-10 m2/s to 1.0	E-9 m2/s. The anal	ysis was	
				ion of 2. The static j		
10 ⁻² 10 ⁻¹ ID/CD	10 ⁰ 10 ¹ 10 ²			derived from the CH ner plot to a value o		
		type our ve extrapol	ation in the HOI		1,771.3 KI d.	

	Test Summ	nary Sheet				
Project:	Oskarshamn site investigation				CHir	
Area:	Laxemar	Test no:			1	
Borehole ID:	KLX19A	Test start:		070118 10:53		
Test section from - to (m):	on from - to (m): 211.00-231.00 m F					
	211.00-201.00 m	test execution:			Stephan Rohs Philipp Wol	
Section diameter, 2·r _w (m):	0.076	Responsible for		Crist	ian Enachescu	
		test evaluation:				
Linear plot Q and p		Flow period		Recovery period	I	
		Indata		Indata		
2200 KLX19A_211.00-231.00_070118_1_CHir_Q_r	Psection Data	p ₀ (kPa) =	1972			
2150	P above P below Q	p _i (kPa) =	1973			
	•	p _p (kPa) =	2172	p _F (kPa) =	2002	
2100		$Q_{p} (m^{3}/s) =$	1.33E-06			
2050	0.20	$\frac{d_p(m/s)}{tp(s)} =$		t _F (s) =	1200	
	Cirimi a				1.00E-06	
200	0.15 2	S el S [*] (-)= EC _w (mS/m)=	1.00E-00	S el S [*] (-)=	1.00E-00	
1950			<u> </u>		 	
	0.10	Temp _w (gr C)=	9.7			
	0.06	Derivative fact.=	0.06	Derivative fact.=	0.03	
1800	0.80 1.00 1.20 1.40	Results		Results		
		Q/s (m²/s)=	6.6E-08			
_og-Log plot incl. derivates- flo	w period	T _M (m²/s)=	6.9E-08			
		Flow regime:	transient	Flow regime:	transient	
Elapsed time (h)		dt ₁ (min) =	0.16	dt ₁ (min) =	1.30	
10		dt_2 (min) =		dt_2 (min) =	4.53	
	l l	$T(m^2/s) =$		$T(m^2/s) =$	2.0E-07	
	30		1.0E-06	、 、	1.0E-06	
10 1		5()				
		$K_s(m/s) =$		$K_s (m/s) =$	1.0E-08	
		$S_{s}(1/m) =$		$S_{s}(1/m) =$	5.0E-08	
	۲۰۰۲ (۱۹۵۱) المار الم	C (m³/Pa) =	NA	C (m³/Pa) =	8.6E-1	
10 ⁻	₫ 10 [°]	C _D (-) =	NA	C _D (-) =	9.5E-03	
	A	ξ(-) =	3.1	ξ(-) =	7.3	
	0.3					
· · .		T _{GRF} (m²/s) =	NA	T _{GRF} (m ² /s) =	NA	
10 [°] 10 [°]	10 ⁷ 10 ⁸ 10 ⁹	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA	
Log-Log plot incl. derivatives- r	ecovery period	Selected represe				
<u> </u>		dt_1 (min) =		C (m ³ /Pa) =	8.6E-11	
Elapsed time [h]	² 10, ⁻¹ 10, ⁰	$dt_1(min) = dt_2(min) =$		$C_{D}(-) =$	9.5E-03	
10						
		$T_{T}(m^{2}/s) =$	2.0E-07	2.1.7	7.3	
	300	S (-) =	1.0E-06			
10	10 ²	$K_{s}(m/s) =$	1.0E-08			
· · · · · · · · · · · · · · · · · · ·	10	S _s (1/m) =	5.0E-08			
	्रा 30 है	Comments:				
· ***				f 2.0E-7 m2/s was d		
10 *				one), which shows a		
				for the interval tran		
	a ⁴ * * * * 3			2-7 m2/s. The flow d		
V				tatic pressure measu the CHir phase usin		
10 ° 10 1 10 CD	10 ² 10 ³ 10 ⁴			value of 1,995.2 kl		
			pict to t			

	Test Sumi	nary Sheet				
Project:	Oskarshamn site investigation	Test type:[1]			CH	
Area:	Laxema	Test no:				
Borehole ID:	KLX19A	Test start:	070118 13:			
Fest section from - to (m):	231.00-251.00 m	Responsible for		Stephan Ro		
	201.00 201.00 1	test execution:			Philipp Wo	
Section diameter, 2·r _w (m):	0.076	Responsible for		Crist	ian Enacheso	
		test evaluation:		6		
inear plot Q and p		Flow period		Recovery period		
		Indata	0107	Indata	1	
2400 KLX19A_231.00-251.00_070118_1_CHir_Q_r	Pisection 0.003	p ₀ (kPa) =	2137			
2350 -	P section P above P below O	p _i (kPa) =	#NV			
2300 -	٠.	p _p (kPa) =	#NV	p _F (kPa) =	#NV	
2250 -	• • 0.002	Q _p (m ³ /s)=	#NV			
2200 -	- Interview	tp (s) =		t _F (s) =		
2150		S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-	
2100 -	o go ogi e gi	EC _w (mS/m)=				
2050 -	0.001	Temp _w (gr C)=	9.9			
2000		Derivative fact.=	NA	Derivative fact.=	NA	
1950 -						
1900	0.00					
0.00 0.10 0.20 0.30 0.40 Elapsed T	0.50 0.60 0.70 0.80 0.90	Results		Results		
		Q/s $(m^2/s)=$	NA			
og-Log plot incl. derivates- fl	ow period	$T_{M} (m^{2}/s) =$	NA			
	·	Flow regime:	transient	Flow regime:	transient	
		dt_1 (min) =	NA	dt_1 (min) =	NA	
		dt_2 (min) =	NA	dt_2 (min) =	NA	
		$T(m^2/s) =$		$T(m^2/s) =$	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	
Not Ar	nalysed		NA		NA	
		$C (m^{3}/Pa) =$		C (m ³ /Pa) =		
		$C_{D}(-) =$	NA	$C_{D}(-) =$	NA	
		ξ(-) =	NA	ξ(-) =	NA	
		$T_{GRF}(m^2/s) =$	NA	$T_{GRF}(m^2/s) =$	NA	
		S _{GRF} (-) =	NA	S _{GRF} (-) =	NA	
		D _{GRF} (-) =	NA	D _{GRF} (-) =	NA	
.og-Log plot incl. derivatives-	recovery period	Selected represe			-	
		dt ₁ (min) =	NA	C (m³/Pa) =	NA	
		dt_2 (min) =	NA	C _D (-) =	NA	
		$T_{T} (m^{2}/s) =$	1.0E-11	ξ(-) =	NA	
		S (-) =	NA			
		$K_s (m/s) =$	NA			
		$S_{s}(1/m) =$	NA			
Not Ar	nalysed	Comments:	•	-	-	
		Based on the test re transmissivity is low		ed packer complian m2/s.	ce) the interva	

	Test Sum	mary Sheet				
Project:	Oskarshamn site investigation				F	
Area:	Laxema	r Test no:				
Borehole ID:	KLX19A	Test start:		070118 14:3		
est section from - to (m):	251.00-271.00 m	Responsible for		Stephan Ro		
Castion diameter 0 r (m);	0.076	test execution: Responsible for		Cried	Philipp Wo tian Enachesc	
Section diameter, $2 \cdot r_w$ (m):	0.078	test evaluation:		Crist	lian Enachesc	
inear plot Q and p		Flow period		Recovery period	1	
		Indata		Indata		
2600	10	p ₀ (kPa) =	2301			
KLX19A_251.00-271.00_070118_1_Pi_Q_r 2550 -	Paecian Paboxe Pbelow 9	p _i (kPa) =	2306			
2500	• • • •	$p_p(kPa) =$	2526	p _F (kPa) =	246	
2450		$Q_{p} (m^{3}/s) =$	#NV	F1 X - 7		
	1	$\frac{d_p (m/s)^2}{tp (s)} =$		t _F (s) =	270	
2400 - 2350 -	a literation of the second sec	S el S [*] (-)=		⊊ (e) S el S [*] (-)=	1.00E-0	
		EC _w (mS/m)=	1.001 00	3 el 3 (-)-	1.001	
2300	4 ^E	Temp _w (gr C)=	10.2			
2250 -	- 3	Derivative fact.=		Derivative fact.=	0.0	
	- 2		na –	Derivative lact	0.0	
2150						
2100 0.00 0.20 0.40 0.60 Elapse	0.80 1.00 1.20 1.40 d Time (h)	Results		Results		
		Q/s (m²/s)=	NA			
.og-Log plot incl. derivates- f	low period	$T_{\rm M} (m^2/s) =$	NA			
5 51 5	- P	Flow regime:	transient	Flow regime:	transient	
		dt_1 (min) =	NA	dt_1 (min) =	NA	
		$dt_2 (min) =$	NA	dt_2 (min) =	NA	
		$T(m^2/s) =$	NA	$T(m^2/s) =$	1.2E-1	
		S (-) =	NA	S (-) =	1.0E-0	
		$K_s (m/s) =$	NA	K _s (m/s) =	6.0E-1	
		$S_{s}(1/m) =$	NA	$S_{s}(1/m) =$	5.0E-0	
Not an	nalysed		NA	C (m ³ /Pa) =	5.4E-1	
		C (m ³ /Pa) = C _D (-) =	NA	$C(m/Pa) = C_{D}(-) =$	6.0E-0	
			NA	.,	-0	
		ξ(-) =	INA	ξ(-) =	-0	
		T _{GRF} (m ² /s) =	NA	T _{GRF} (m ² /s) =	NA	
		$S_{GRF}(-) =$	NA	$S_{GRF}(m/s) =$ $S_{GRF}(-) =$	NA	
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA	
.og-Log plot incl. derivatives-	recovery period	Selected represe			NA .	
.og-Log plot mol. derivatives-		dt_1 (min) =	NA		5.4E-1	
		$dt_1(min) =$ $dt_2(min) =$	NA	C (m ³ /Pa) = C _D (-) =	5.4E- 6.0E-0	
Elapsed Sme (1	······································			e D()		
	1	$T_{T}(m^{2}/s) =$	1.2E-11		-0	
10 1		$S(-) = K_{s}(m/s) =$	1.0E-06		<u> </u>	
1	and the second s		6.0E-13 5.0E-08			
10 °	- interior and the second	$S_s(1/m) =$	0.0E-08			
	10 ⁻¹	Comments:	tuon au-11 **	£1.0E 11 2/	domina 1 C - 4	
	n n n n n n n n n n n n n n n n n n n			f 1.2E-11 m2/s was ence range for the i		
10 ⁻¹	ŝ	analysis of the Pin			incer vui	
10 ⁻¹	10 °	analysis of the Pi p transmissivity is es			2/s. The analysi	
	8 10 ²	transmissivity is es was conducted with	timated to be 5.0 h a flow dimension	E-12 to 5.0E-11 m2 on of 2. The static p	ressure could	
	10 ⁴	transmissivity is es was conducted with	timated to be 5.0 h a flow dimensional due to the very	E-12 to 5.0E-11 m2	ressure could	

	Test Su	mmary Sheet				
Project:	Oskarshamn site investigat	ion Test type:[1]			CHi	
Area:	Laxer	nar Test no:				
					070440 40 0	
Borehole ID:	KLX1	9A Test start:		070118 16:2		
Test section from - to (m):	271.00-291.00) m Responsible for			Stephan Rohs	
		test execution:		0.51	Philipp Wol	
Section diameter, 2 r _w (m):	0.0	076 Responsible for test evaluation:		Crist	ian Enachescu	
Linear plot Q and p		Flow period		Recovery period	1	
		Indata		Indata		
		p ₀ (kPa) =	2468			
2750 KLX19A_271.00-291.00_070118_1_CHir_Q_r	• P section 0.003	p _i (kPa) =	#NV			
2700 -	A P above P balow Q	p _p (kPa) =	#NV	p _F (kPa) =	#NV	
2650 -		Q _p (m ³ /s)=	#NV			
2000-	• 0.022	tp(s) =	0	t _F (s) =	(
2250 °		S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-00	
2200		¹ EC _w (mS/m)=				
2450	0.001	Temp _w (gr C)=	10.2		1	
2400 -		Derivative fact.=	NA	Derivative fact.=	NA	
000 0.10 0.20 0.30 0.40 Elapsed Time	0.00 0.00 0.00 0.00 0.00 (€)					
		Results		Results		
		Q/s $(m^{2}/s)=$	#NV			
Log-Log plot incl. derivates- flo	ow period	$T_{M} (m^{2}/s) =$	#NV			
		Flow regime:	transient	Flow regime:	transient	
		dt ₁ (min) =	NA	dt ₁ (min) =	NA	
		dt_2 (min) =	NA	dt ₂ (min) =	NA	
		$T(m^{2}/s) =$		T (m²/s) =	NA	
		S (-) =	NA	S (-) =	NA	
		$K_s (m/s) =$	NA	K _s (m/s) =	NA	
Not An	alvsed	$S_{s}(1/m) =$	NA	S _s (1/m) =	NA	
		C (m ³ /Pa) =	NA	C (m³/Pa) =	NA	
		$C_D(-) =$	NA	C _D (-) =	NA	
		ξ(-) =	NA	ξ(-) =	NA	
				0		
		$T_{GRF}(m^2/s) =$	NA	$T_{GRF}(m^2/s) =$	NA	
		$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
		D _{GRF} (-) =	NA	D _{GRF} (-) =	NA	
Log-Log plot incl. derivatives-	recovery period	Selected repres	entative paran		NA	
		$dt_1 (min) = dt_2 (min) =$	NA NA	C (m ³ /Pa) = C _D (-) =		
		- 2 ()	NA 1.00E-11	-0()	NA NA	
		$T_T (m^2/s) =$ S (-) =	1.00E-11 NA	ς(-) =	INA	
		$S(-) = K_{s}(m/s) =$	NA			
		$S_{s}(1/m) =$	NA			
		Comments:	na		<u> </u>	
Not An	arysed		esnanse (pralana	ed packer complian	ce) the interval	
		transmissivity is lo	wer than 1.0E-11	m2/s.		

	Test Sum	mary Sheet			
Project:	Oskarshamn site investigation	n <u>Test type:[1]</u>			CHi
Area:	Laxema	ar Test no:			1
Borehole ID:	KLX19/	A Test start:			070118 17:44
Test section from - to (m):	291.00-311.00 r	n Responsible for			Stephan Rohs
	0.07	test execution:		Oriet	Philipp Wol
Section diameter, 2·r _w (m):	0.07	6 Responsible for test evaluation:		Crist	ian Enachescu
Linear plot Q and p		Flow period		Recovery period	
		Indata		Indata	
200 1	T 50	p ₀ (kPa) =	2632		
KLX19A_291.00-311.00_070118_1_CHir_Q_r	P section P above P below 45	p _i (kPa) =	2629		
200	•	$p_p(kPa) =$		p _F (kPa) =	2630
2750	:	$Q_p (m^3/s) =$	4.60E-04		203
_ · \	35	$\frac{d_p (m/s)}{tp (s)} =$		t _F (s) =	1200
270				年 (0) S el S [*] (-)=	1.00E-00
	25 Z	S el S [*] (-)= EC _w (mS/m)=	1.001-00	ਤ ਦਾ ਤ (-)=	1.001-00
5 4800 ·	1 20 ^g	$Temp_w(gr C)=$	10.7		
2550	- 15	Derivative fact.=		Derivative fact.=	0.04
2500	- 10	Derivative lact	0.05	Derivative lact	0.0
24.50					
2400 0.20 0.40 0.80 Elapsed	0 0.80 1.00 1.20 1.40 Time [b]	Results		Results	
		$Q/s (m^2/s) =$	2.2E-05		
.og-Log plot incl. derivates- fl	ow period	$T_{M} (m^{2}/s) =$	2.3E-05		
	Po	Flow regime:	transient	Flow regime:	transient
Elapsed time [h]	10, ⁻¹	dt_1 (min) =		dt_1 (min) =	0.7
10 2		dt_2 (min) =		dt_2 (min) =	5.9
	0.3	$T (m^2/s) =$		$T(m^2/s) =$	1.1E-0
	10 -1	S(-) =	1.0E-06	· · /	1.0E-0
10 1		$K_{s}(m/s) =$		K _s (m/s) =	5.5E-0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.03	$S_{s}(1/m) =$		$S_{s}(1/m) =$	5.0E-0
		F	0.0L-00		1.5E-0
	- 10 ⁻²	^{dia} C (m ³ /Pa) = ^{dia} C _D (-) =	NA	C (m ³ /Pa) = C _D (-) =	1.7E+0
10 ⁰		.,		.,	-4.5
	0.003	ξ(-) =	-1.9	ξ(-) =	-4.0
	10 3	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m²/s) =	NA
10 ³ 10 ⁴	10 ⁵ 10 ⁶ 10 ⁷	$\frac{I_{GRF}(III / S)}{S_{GRF}(-)} =$	NA	$S_{GRF}(-) =$	NA
10		$D_{\text{GRF}}(-) =$	NA	$D_{GRF}(-) =$	NA
_og-Log plot incl. derivatives-	recovery period	Selected represe			
Based time in		dt_1 (min) =	0.77	_	1.5E-08
Bapsed time (h	· · · · · · · · · · · · · · · · · · ·	$dt_1 (min) =$ $dt_2 (min) =$		$C_{D}(-) =$	1.7E+0
		- 、 ,	1.1E-05		-4.5
	- 10 ³	T _T (m²/s) = S (-) =	1.1E-05		-4.
10 1		$K_{s}(m/s) =$	5.5E-07		
		$S_{s}(1/m) =$	5.0E-08		
: • • • • • • • • • • • • • • • • • • •	10 ²	Comments:	0.0∟-00		
10 ⁻⁰		The recommended analysis of the CHi derivative quality. T is estimated to be 9 displayed during the	r phase (inner zo The confidence r .0E-6 m2/s to 5. e test is 2. The s	f 1.1E-5 m2/s was do one), which shows the range for the interva 0E-5 m2/s. The flow tatic pressure measu	e best data and l transmissivity v dimension red at
10 ^{°°} 10 ^{°°}	10 ² 10 ² 10 ³			the CHir phase usin a value of 2,628.8 kl	

	Test Sum	mary Sheet			
Project:	Oskarshamn site investigation				CHi
Area:	Laxema	r Test no:			
Borehole ID:	KLX194	Test start:	070119 09::		
Test section from - to (m):	411 00-431 00 n	Responsible for			Stephan Rohs
	411.00 401.00 1	test execution:			Philipp Wol
Section diameter, 2·r _w (m):	0.076	Responsible for		Crist	ian Enachescu
Lincon alot O and a		test evaluation:			
Linear plot Q and p		Flow period Indata		Recovery period	
			2621	Indata	
³⁹⁰⁰ KLX19A_411.00-431.00_070119_1_CHir_Q_r ·	P section Patrone	p ₀ (kPa) =	3621		
3850	P Palove P Palove P Palove Q Q	p _i (kPa) =	3622		2(2)
3800	0.040	p _p (kPa) =		p _F (kPa) =	363
3750	0.035	$Q_{p} (m^{3}/s) =$	2.33E-07		
3700	0.030	tp (s) =		t _F (s) =	120
9650		S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0
360	بر مربع	EC _w (mS/m)=			
3650 -	0.015	Temp _w (gr C)=	12.2		
3600	-	Derivative fact.=	0.08	Derivative fact.=	0.0
3450	• 0.005				
3400					
0.00 0.20 0.40 0.60 Elapsed Tin	0.80 1.00 1.20 1.40	Results		Results	1
		Q/s (m^{2}/s)=	1.1E-08		
.og-Log plot incl. derivates- flo	ow period	T _M (m ² /s)=	1.2E-08		
Elapsed time [h]		Flow regime:	transient	Flow regime:	transient
10 ²	10 ⁻¹	$dt_1 (min) =$		dt ₁ (min) =	3.1
		dt_2 (min) =		dt_2 (min) =	5.9
	300	T (m²/s) =		T (m²/s) =	3.2E-0
		S (-) =	1.0E-06		1.0E-0
10	10 ²	$K_s (m/s) =$		K _s (m/s) =	1.6E-0
• • • • • • • • • • • • • • • • • • •		$S_{s}(1/m) =$	5.0E-08	S _s (1/m) =	5.0E-0
	30	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	5.7E-1
10 0	10 ¹	$^{t} C_{D}(-) =$	NA	C _D (-) =	6.3E-0
		ξ(-) =	0.4	ξ(-) =	7.
	3				
.* *	•	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA
10 ² 10 ³ tD	10 ⁴ 10 ⁵ 10 ⁶	S _{GRF} (-) =	NA	S _{GRF} (-) =	NA
		$D_{GRF}(-) =$	NA	D _{GRF} (-) =	NA
.og-Log plot incl. derivatives-	recovery period	Selected represe	entative param	neters.	
Elapsed time [h]	40	dt ₁ (min) =		C (m³/Pa) =	5.7E-1
0 ²	· · · · 20, · · · · · · · · · · · · · · · · · · ·	dt ₂ (min) =	5.95	C _D (-) =	6.3E-0
		$T_{T} (m^{2}/s) =$	3.2E-08	ξ(-) =	7.
	300	S (-) =	1.0E-06		
10 1		K _s (m/s) =	1.6E-09		
	10 2	S _s (1/m) =	5.0E-08		Ī
Jack Contraction of the second		Comments:	J.		8
		analysis of the CHir derivative quality. T is estimated to be 9 displayed during the	r phase (inner zo The confidence r .0E-9 m2/s to 5. e test is 2. The s as derived from	f 3.2E-8 m2/s was d- nne), which shows the ange for the interva 0E-8 m2/s. The flow tatic pressure measure the CHir phase usin value of 3 623 9 kl	he best data and l transmissivity v dimension med at ng straight line

	Test S	umr	nary Sheet				
Project:	Oskarshamn site investig	ation	Test type:[1]			CHir	
Area:	Lax	emar	Test no:			1	
Borehole ID:	KL	X19A	Test start:	070119 11:			
Test section from - to (m):			Responsible for test execution:			Stephan Rohs Philipp Wolf	
Section diameter, 2·rw (m):	(0.076	Responsible for		Crist	ian Enachescu	
			test evaluation:				
Linear plot Q and p			Flow period		Recovery period		
			Indata		Indata		
40:00		0.8	p ₀ (kPa) =	3785			
KLX19A_431.00-451.00_070119_1_CHir_Q_r	► P section - P above ■ P below	1	p _i (kPa) =	3783			
3950 · · ·		- 0.7	p _p (kPa) =	3983	p _F (kPa) =	3783	
3000	•	- 0.8	$Q_{p} (m^{3}/s) =$	5.50E-06			
· •	•	0.5	tp (s) =	1200	t _F (s) =	1200	
- al ansa		te [I/min]	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-06	
		ection Ra	$EC_w (mS/m) =$				
3750 -		- 0.3	Temp _w (gr C)=	12.5			
s700 ·		0.2	Derivative fact.=	0.04	Derivative fact.=	0.02	
3650		0.1					
3600 0.00 0.20 0.40 0.60	0.80 1.00 1.20	0.0	Results		Results		
сырзео т	une (r)		$Q/s (m^2/s)=$	2.7E-07			
Log-Log plot incl. derivates- flo	ow period		$T_{M} (m^2/s) =$	2.8E-07			
			Flow regime:	transient	Flow regime:	transient	
10_1 ⁻⁴ Elapsed time [h]			dt_1 (min) =		dt_1 (min) =	0.48	
10		30	$dt_1(min) =$ $dt_2(min) =$		$dt_1(min) = dt_2(min) =$	12.76	
			- 、 ,		3		
		10 1	$T(m^2/s) =$ S(-) =			6.4E-07	
10 1			0()	1.0E-06		1.0E-06	
• • • <u>• • • • • • • • • • • • • • • • </u>		3	$K_s(m/s) =$		$K_s (m/s) =$	3.2E-08	
		. 19	$S_{s}(1/m) =$		$S_{s}(1/m) =$	5.0E-08	
		10° 4)(by)-r	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	6.1E-11	
10 0	•	ž	C _D (-) =	NA	C _D (-) =	6.7E-03	
<u>.</u>		0.3	ξ(-) =	0.4	ξ(-) =	7.5	
· · · · ·	· · · · ·	10 -1	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA	
10 ³ 10 ⁴ tD	10 ⁵ 10 ⁶ 10 ⁷		$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
			D _{GRF} (-) =	NA	D _{GRF} (-) =	NA	
Log-Log plot incl. derivatives-	recovery period		Selected represe	entative paran			
			dt ₁ (min) =		C (m³/Pa) =	6.1E-11	
Elapsed time [h]	· · · · · · · · · · · · · · · · · · ·		dt_2 (min) =		$C_D(-) =$	6.7E-03	
	10	3	$T_T (m^2/s) =$	3.0E-07		0.4	
			S (-) =	1.0E-06	<u>ر ۲ د</u>		
	300	0	$K_s (m/s) =$	1.5E-08			
10 1	10	2	$S_{s}(1/m) =$	5.0E-08			
		-	Comments:	5.0E-00			
	10 10 10 10 10 10 10 10 10 10 10 10 10 1	- 100 (bb0) (B	The recommended analysis of the CHi confidence range fo 7 m2/s to 7.0E-7 m2 2. The static pressure	phase, which has or the interval tra 2/s. The flow din	s a better derivative nsmissivity is estim nension displayed d	quality. The ated to be 2.0E- uring the test is	
10 ² ECD	10 ⁻³ 10 ⁻⁴ 10 ⁻²		the CHir phase usin value of 3,782.2 kP	ig straight line e			

	l est Su	mn	nary Sheet				
Project:	Oskarshamn site investigat	tion	Test type:[1]			CHir	
Area:	Laxer	nar	Test no:				
Borehole ID:	KLX1	19A	Test start:		070119 13:3		
Test section from - to (m):	451.00-471.00	451.00-471.00 m R				Stephan Rohs	
	•		test execution:			Philipp Wolf	
Section diameter, 2·r _w (m):	0.0		Responsible for test evaluation:		Crist	ian Enachescu	
Linear plot Q and p			Flow period		Recovery period	1	
			Indata		Indata		
4200 KLX19A_451.00-471.00_070119_1_CHir_Q_r	• Durder	T⁴	p ₀ (kPa) =	3951			
RL X19A_451.00-4/1.00_0/0119_1_CHIP_0_F	Pacton Patow Pbolow O		p _i (kPa) =	3950			
4100			$p_p(kPa) =$		p _F (kPa) =	3954	
4050		3	$Q_p (m^3/s) =$	2.50E-05	ρ _Γ (α)	5,50	
₹ 400-			$\frac{Q_p (M/S)}{tp (s)} =$		t _F (s) =	1200	
		-			⊈ (3) = S el S [*] (-)=	1.00E-06	
9000 ·			S el S [*] (-)= EC _w (mS/m)=	1.002-00	Sel S (-)=	1.002-00	
380	and the second		$EC_w (IIIS/III) =$ Temp _w (gr C)=	12.8			
39.0		1	Derivative fact.=		Derivative fact.=	0.02	
3750			Derivative lact	0.09		0.02	
3700	0.80 1.00 1.20 1. Time [h]		Desults		Results		
			Results		Results		
			Q/s (m ² /s)=	1.2E-06			
Log-Log plot incl. derivates- fl	ow period		T _M (m ² /s)=	1.3E-06			
Elapsed time [1]		Flow regime:	transient	Flow regime:	transient	
10 10			dt_1 (min) =	NA	dt_1 (min) =	NA	
		0	dt_2 (min) =	NA	dt_2 (min) =	NA	
1			T (m²/s) =		T (m²/s) =	1.5E-06	
³ • • • • • • • • • • • • • • • • • • •	0.		S (-) =	1.0E-06		1.0E-06	
			$K_{s}(m/s) =$		K _s (m/s) =	7.5E-08	
ê 10 ⁴	0.	2	$S_{s}(1/m) =$	5.0E-08	S _s (1/m) =	5.0E-08	
	**	- - (1/q)'(min	C (m³/Pa) =	NA	C (m³/Pa) =	1.1E-09	
		ţ,	C _D (-) =	NA	C _D (-) =	1.2E-01	
0.3	•••	.05	ξ(-) =	-2.8	ξ(-) =	-4.1	
	•	.02	T _{GRF} (m ² /s) =	NA	T _{GRF} (m ² /s) =	NA	
10 [°] 10 ¹	10 ² 10 ³ 10 ⁴		S _{GRF} (-) =	NA	S _{GRF} (-) =	NA	
		ľ	D _{GRF} (-) =	NA	D _{GRF} (-) =	NA	
Log-Log plot incl. derivatives-	recovery period		Selected represe	ntative param	neters.	-	
			dt ₁ (min) =	NA	C (m ³ /Pa) =	1.1E-09	
Elapsed time (h)	· · · · · · · · · · · · · · · · · · ·	ľ	dt_2 (min) =	NA	C _D (-) =	1.2E-01	
10			$T_T (m^2/s) =$	1.5E-06		-4.1	
	300		S (-) =	1.0E-06			
		L	$K_s (m/s) =$	7.5E-08			
10 °	10 '	·	$S_{s}(1/m) =$	5.0E-08			
and the second	30		Comments:				
1 0 ⁻¹ .			The recommended analysis of the CHi as the skin. The cor estimated to be 7.01 displayed during the transducer depth, w	r phase (outer zc afidence range fc E-7 m2/s to 4.0E e test is 2. The s as derived from	T1.5E-6 m2/s was do one); the inner zone or the interval transm -6 m2/s. The flow d tatic pressure measus the CHir phase usin a value of 3,944.1 kl	was interpreted nissivity is limension rred at ng straight line	

	Test Su	mr	nary Sheet			
Project:	Oskarshamn site investiga	ation	Test type:[1]			CHi
Area:	Laxe	mar	Test no:			1
Borehole ID:	KLX	19A	Test start:	070119		
Test section from - to (m):	471.00-491.0)0 m	Responsible for			Stephan Rohs
			test execution:			Philipp Wol
Section diameter, 2·r _w (m):	0.	.076	Responsible for		Crist	ian Enachescı
incer plot Q and p			test evaluation:		.	
Linear plot Q and p			Flow period Indata		Recovery period Indata	
			p ₀ (kPa) =	4117	inuala	T
4400 KLX19A_471.00-491.00_070119_1_CHir_Q_r .	P section P blove P blove O	0.5	p ₀ (kPa) = p _i (kPa) =	4117		
4350	• P bilow • Q				n (kDa) -	411
4300	•	0.4	p _p (kPa) =		p _F (kPa) =	411-
-420	•		$Q_p (m^3/s) =$	4.67E-06		100
2200	•	• [min]	tp (s) =		t _F (s) =	120
4150	·	Indian Rate	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0
4100	·	- 0.2 Ē	EC _w (mS/m)=			
4050 · · · · · · · ·			Temp _w (gr C)=	13.0		
4000	می در می سود. می می م	+ 0.1	Derivative fact.=	0.04	Derivative fact.=	0.04
9930	÷ ,	0.0				
0.00 0.20 0.40 0.60 Elapsed Tim	080 1.00 1.20 1 ≎∯]	1.40	Results		Results	
			Q/s $(m^{2}/s)=$	2.3E-07		
og-Log plot incl. derivates- flo	w period		$T{M} (m^{2}/s) =$	2.4E-07		
			Flow regime:	transient	Flow regime:	transient
Elapsed time [h]	······································		dt ₁ (min) =	0.68	dt ₁ (min) =	0.64
			dt_2 (min) =		dt_2 (min) =	10.30
	1	10 1	$T(m^{2}/s) =$	4.8E-07	$T(m^{2}/s) =$	1.5E-0
			S (-) =	1.0E-06	· · ·	1.0E-0
10 7	3	8	$K_s (m/s) =$		$K_s (m/s) =$	7.5E-0
	-		$S_{s}(1/m) =$		$S_{s}(1/m) =$	5.0E-0
		io [iuim] i	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	8.3E-1
		10.(1	$C_{D}(-) =$	NA	$C_{D}(-) =$	9.1E-0
10 0			ξ(-) =		ξ(-) =	32.
· .		10 -1			5()	
	. • • • •		$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m²/s) =	NA
10 ^{°°} 10 ^{°°} tD	10 ¹⁰ 10 ¹¹ 10 ¹²	0.03	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
			D _{GRF} (-) =	NA	D _{GRF} (-) =	NA
_og-Log plot incl. derivatives- r	ecovery period		Selected represe	ntative param		
Plane			dt ₁ (min) =		C (m³/Pa) =	8.3E-1
Bapsed time (h) 10 2	• • • • • • • • • • • • • • • • • • •		dt_2 (min) =		$\frac{C_{D}(-)}{C_{D}(-)} =$	9.1E-0
	300	D	$T_{T} (m^{2}/s) =$	4.8E-07		6.
		2	S (-) =	1.0E-06		
	10		$K_s (m/s) =$	2.4E-08		<u> </u>
• • •			$S_{s}(1/m) =$	5.0E-08		
	۵۵ ۱۵	8	Comments:	1.52 30		I
	-	9(),((pd-d) '.		ransmissivity	4.8E-7 m2/s was do	erived from the
10 °		064	analysis of the CHi			
	3		confidence range fo	r the interval tra	nsmissivity is estim	ated to be 2.0E
			7 m2/s to 8.0E-7 m2			
	10	a a	2. The static pressure the CHir phage using			
10 ¹ 10 ² tDICD	10 ³ 10 ⁴ 10 ⁵		the CHir phase usin value of 4,114.6 kP		ktrapolation in the H	iorner plot to a
			value 01 +,114.0 KF	u.		

	Test Sum	nary Sheet				
Project:	Oskarshamn site investigation				CHir	
Area:	Laxema	Test no:				
Borehole ID:	KLX19A	Test start:			070119 17:26	
Test section from - to (m):	491.00-511.00 m			Stephar		
Section diameter, 2·r _w (m):	0.076	test execution: Responsible for		Criat	Philipp Wolf ian Enachescu	
Section diameter, 2^{4} w (iii).	0.070	test evaluation:		Clist		
Linear plot Q and p		Flow period	8	Recovery period		
-		Indata		Indata		
		p ₀ (kPa) =	4281			
4610 KLX19A_491.00-511.00_070119_1_CHir_Q_r	0.40 • P sector • P setor • P setor • P setor	p _i (kPa) =	4277			
4450	• 0.35	$p_p(kPa) =$	4477	p _F (kPa) =	4278	
4400	. 0.30	$Q_{p} (m^{3}/s) =$	3.17E-06			
- 4391	•	$\frac{d_p (m/s)}{tp (s)} =$		t _F (s) =	1200	
50 mm	• (Merica)	S el S [*] (-)=		⊊ (e) S el S [*] (-)=	1.00E-06	
4000		S er S (-)= $EC_w (mS/m)=$	1.002-00	5 el 5 (-)=	1.002-00	
4250 -	- 0.15		12.2		 	
4200		Temp _w (gr C)= Derivative fact.=	13.3	Desiration feat -	0.02	
4190		Derivative lact	0.04	Derivative fact.=	0.02	
0.00 0.20 0.40 0.60 Elapsed Tin	0.80 1.00 1.20 1.40 me[h]	Results		Results		
		Q/s (m ² /s)=	1.6E-07			
Log-Log plot incl. derivates- flo	ow period	T _M (m ² /s)=	1.6E-07			
		Flow regime:	transient	Flow regime:	transient	
Elapsed time [h]	10, ⁻¹ 10, ⁰ 130	dt_1 (min) =	0.47	dt ₁ (min) =	0.12	
		dt_2 (min) =		dt_2 (min) =	11.42	
	10 ¹	$T(m^2/s) =$		$T(m^2/s) =$	5.4E-07	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		S (-) =	1.0E-06	· · ·	1.0E-06	
10 1	3	$K_s(m/s) =$		$K_s (m/s) =$	2.7E-08	
		$S_{s}(1/m) =$		$S_{s}(1/m) =$	5.0E-08	
	10 [°]		NA	C (m ³ /Pa) =	9.1E-11	
		C (m ³ /Pa) = C _D (-) =	NA		1.0E-02	
10 0	0.3	- 0 ()		- 0 ()		
	10 -1	ξ(-) =	9.2	ξ(-) =	14.9	
		$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m²/s) =	NA	
10 ¹¹ 10 ¹²	10 ¹³ 10 ¹⁴ 10 ¹⁵	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
υ υ		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA	
Log-Log plot incl. derivatives-	recovery period	Selected represe			1	
		dt_1 (min) =	0.47		9.1E-11	
10, ⁻⁵ Elapsed time [h]	10, ² 10, ⁴	dt_2 (min) =		$C (m /Pa) = C_D (-) =$	1.0E-02	
			4.1E-07		9.2	
	300	$T_T (m^2/s) =$ S (-) =	4.1E-07 1.0E-06	چ(-) =	9.2	
La						
10 1	10 ²	$K_{s}(m/s) =$	2.1E-08		<u> </u>	
	× .	$S_s(1/m) =$	5.0E-08			
		Comments:				
		analysis of the CHi confidence range fo 7 m2/s to 8.0E-7 m 2. The static pressu	phase, which sh or the interval tra 2/s. The flow din re measured at th	f 4.8E-7 m2/s was do ows the most stable unsmissivity is estim nension displayed d ransducer depth, wa xtrapolation in the H	derivative. The ated to be 1.0E- uring the test is s derived from	
10 [°] 10 ¹ 10 CD	10 ² 10 ³ 10 ⁴ ¹⁰	value of 4,277.7 kP		-r	pierto u	

	Test Sumr	nary Sheet			
Project:	Oskarshamn site investigation				CHir
Area:	Laxemar	Test no:			1
Borehole ID:	KI X19A	Test start:			070120 08:21
Test section from - to (m):	511.00-531.00 m	Responsible for test execution:			Stephan Rohs Philipp Wolf
Section diameter, 2·r _w (m):	0.076	Responsible for		Crist	ian Enachescu
		test evaluation:			
Linear plot Q and p		Flow period		Recovery period	l
		Indata		Indata	
4700 KLX19A_511.00-531.00_070120_1_CHir_Q_r	• P section	p ₀ (kPa) =	4446		
450	P section P bolow P bolow P bolow Q 7	p _i (kPa) =	4444		
4800		p _p (kPa) =	4644	p _F (kPa) =	4449
4850	6	Q _p (m ³ /s)=	6.13E-05		
a 4600	5	tp (s) =	1200	t _F (s) =	1200
410	Level Direction	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-06
		EC _w (mS/m)=		\/	1
4350	3	Temp _w (gr C)=	13.5		1
4300	. 2	Derivative fact.=	0.04	Derivative fact.=	0.0
4250	1				
4200 0.00 0.20 0.40 0.60 Elapsed	0.80 1.00 1.20 1.40 Time [h]	Desults		De sulte	
		Results	0.05.00	Results	
	<u> </u>	Q/s (m^{2}/s)=	3.0E-06		
Log-Log plot incl. derivates- fl	ow period	$T_{\rm M} (m^2/s) =$	3.1E-06		
Elapsed time [h]		Flow regime:	transient	Flow regime:	transient
10 10 10 10 10 10 10 10 10 10 10 10 10 1	10, ⁴ 10, ⁰	dt ₁ (min) =		dt ₁ (min) =	8.30
	0.3	dt ₂ (min) =	18.80	dt ₂ (min) =	18.53
• • • • • • • • • • • • • • • • • • • •		T (m²/s) =		T (m²/s) =	6.2E-06
	10 -1	S (-) =	1.0E-06	S (-) =	1.0E-0
10 [°]		$K_s (m/s) =$	2.5E-07	K _s (m/s) =	3.1E-07
	0.03	S _s (1/m) =	5.0E-08	S _s (1/m) =	5.0E-0
· · · ·		C (m ³ /Pa) =	NA	C (m ³ /Pa) =	2.7E-0
- •		C _D (-) =	NA	C _D (-) =	3.0E-0
•	• 0.003	ξ(-) =	-2.0	ξ(-) =	-4.(
	10 3	T _{GRF} (m ² /s) =	NA	$T_{GRF}(m^2/s) =$	NA
10 ² 10 ³ tD	10 4 10 5 10 6	S _{GRF} (-) =	NA	S _{GRF} (-) =	NA
		D _{GRF} (-) =	NA	D _{GRF} (-) =	NA
Log-Log plot incl. derivatives-	recovery period	Selected represe			
Elapsed time [h]	10 -1	dt ₁ (min) =		C (m³/Pa) =	2.7E-09
10 1	······	dt ₂ (min) =	18.80	C _D (-) =	3.0E-0
	300	$T_{T} (m^{2}/s) =$	4.9E-06	ξ(-) =	-2.0
		S (-) =	1.0E-06		
10 °C	10 2	$K_s (m/s) =$	2.5E-07		l –
10 a contraction of the second		$S_{s}(1/m) =$	5.0E-08		
	30 R	Comments:	1		
10 ⁻¹ 10 ⁻¹ 10 ⁻¹		analysis of the CHi stabilisation. The co estimated to be 1.01 displayed during the transducer depth, w	phase (outer zon onfidence range E-6 m2/s to 8.0E e test is 2. The s ras derived from	f 4.9E-6 m2/s was do ne), which shows a co for the interval trans -6 m2/s. The flow do tatic pressure measu the CHir phase usin a value of 4.444.2 k	clear horizontal smissivity is limension ared at ag straight line
10 [°] 19 [°] 10 ^{°CD}		displayed during the transducer depth, w	e test is 2. The s as derived from	tatic pressure measu	ired at ig straight lii

	1 est Su	mmary S	meet				
Project:	Oskarshamn site investiga	tion <u>Test typ</u>	be:[1]			CH	
Area:	Lava	mar Test no					
Alea.	Laxe	inal restric					
Borehole ID:	KLX	19A Test sta	art:		070120 1		
Fact a action from to (m):	E20.00 EE0.0	0 m Deener	aible for		Ota da a l		
Test section from - to (m):	530.00-550.0	test exe				Stephan Roh Philipp Wo	
Section diameter, 2·r _w (m):	0.	076 Respor			Crist	ian Enacheso	
			aluation:				
inear plot Q and p.		Flow p	eriod		Recovery period		
		Indata		-	Indata		
4000 KLX19A_530.00-650.00_070120_1_CHir_Q_r	● P section ● P above ● P below	∞ p₀ (kPa		4600			
4850	P below Q	p _i (kPa		#NV			
-800 -	·	p _p (kPa)	=	#NV	p _F (kPa) =	#NV	
4750 -		∞∞ Q _p (m ³ /	s)=	#NV			
4700 -		tp (s)	=	0	t _F (s) =		
48.50	· .	S el S	(-)=	1.00E-06	S el S [*] (-)=	1.00E-	
.400		[≝] EC _w (m				İ 👘	
4650 -		Tempw		13.8		İ	
4500 -			ive fact.=	NA	Derivative fact.=	NA	
4450							
4400 0.00 0.10 0.20 0.30 0.40 0.50	0.80 0.70 0.80 0.90 1.00	0.000					
0.00 0.10 0.20 0.30 0.40 0.50 Elapsed Ti		Result	S		Results		
		Q/s (m	$^{2}/s) =$	#NV			
og-Log plot incl. derivates- flo	ow period	T _M (m ² /		#NV			
5 51	• • • • •	Flow re		transient	Flow regime:	transient	
		dt ₁ (mir	-	NA	dt_1 (min) =	NA	
		dt ₂ (mir	•	NA	dt_2 (min) =	NA	
					$T(m^2/s) =$	NA	
		T (m²/s) =	NA		NA	
		S (-)			5()		
		K _s (m/s	-	NA	$K_s (m/s) =$	NA	
Not An	alysed	S _s (1/m		NA	$S_{s}(1/m) =$	NA	
		C (m ³ /F		NA	C (m ³ /Pa) =	NA	
		C _D (-)	=	NA	C _D (-) =	NA	
		ξ(-)	=	NA	ξ(-) =	NA	
		T _{GRF} (m		NA	$T_{GRF}(m^2/s) =$	NA	
		S _{GRF} (-)		NA	S _{GRF} (-) =	NA	
		D _{GRF} (-		NA	D _{GRF} (-) =	NA	
og-Log plot incl. derivatives-	recovery period			entative paran			
		dt₁ (mir	,	NA	C (m³/Pa) =	NA	
		dt ₂ (mir	ı) =	NA	C _D (-) =	NA	
		$T_T (m^2/s^2)$	s) =	1.00E-10	ξ(-) =	NA	
		S (-)	=	NA			
		K _s (m/s) =	NA		1	
		S _s (1/m) =	NA			
Not An	alvsed	Comm					
			sivity is lo		w pulse recovery) ti 0 m2/s. No static pre		

	Test Sı	ımn	nary Sheet				
Project:	Oskarshamn site investig	ation	Test type:[1]			CHi	
Area:	Laxe	emar	Test no:			1	
Borehole ID:	KL〉	(19A	Test start:		070120 11:		
Test section from - to (m):	550.00-570.	00 m	Responsible for		Stephan R		
Section diameter, 2·r _w (m):	ſ	076	test execution: Responsible for		Crist	Philipp Wol tian Enachescu	
			test evaluation:				
Linear plot Q and p			Flow period		Recovery period	J	
			Indata		Indata		
5000 KLX19A_550.00-570.00_070120_1_CHir_Q_r	P section A P above P below	0.005	p ₀ (kPa) =	4764			
4050	• P below • Q		p _i (kPa) =	4730			
4000		0.004	p _p (kPa) =	4981	p _F (kPa) =	4733	
	$\sum_{i=1}^{n} \sum_{j=1}^{n} \sum_{i=1}^{n} \sum_{i$		Q _p (m ³ /s)=	5.00E-08			
- 480		0.003 [Himi	tp (s) =	1200	t _F (s) =	1200	
4800 -		tion Rate	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-06	
410		10.002	EC _w (mS/m)=				
1			Temp _w (gr C)=	14.0			
400		0.001	Derivative fact.=	0.15	Derivative fact.=	0.00	
400 0 00 0 020 0.40 0.60 EBased T	0.80 1.00 1.20	0.000					
	une fut		Results	-	Results		
			Q/s (m²/s)=	2.0E-09			
Log-Log plot incl. derivates- flo	ow period		T _M (m²/s)=	2.0E-09			
Elapsed time [h]	10 ⁻² 10 ⁻¹ 10 ⁰		Flow regime:	transient	Flow regime:	transient	
10 2	•		dt ₁ (min) =		dt ₁ (min) =	NA	
1	30	00	dt ₂ (min) =		dt ₂ (min) =	NA	
	10	3	T (m²/s) =		T (m²/s) =	1.1E-08	
10	•		S (-) =	1.0E-06		1.0E-06	
·	اللا ن بالمنبع بعد المعاد ال	0	$K_s (m/s) =$	1.0E-10	K _s (m/s) =	5.5E-10	
		Print	S _s (1/m) =	5.0E-08	S _s (1/m) =	5.0E-08	
· · · ·	10	, 1/a. (1/aľ	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	6.3E-1	
10 ⁴			C _D (-) =	NA	C _D (-) =	6.9E-03	
	· · · · · · · · · · · · · · · · · · ·	1	ξ(-) =	2.5	ξ(-) =	32.4	
· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		T _{GRF} (m ² /s) =	NA	T _{GRF} (m ² /s) =	NA	
10 ⁻ 10 ⁻ 10	υ 10 ⁻ 10 [°]		$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
			$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA	
_og-Log plot incl. derivatives-	recovery period		Selected represe	entative paran			
Elansed time (h)			dt ₁ (min) =	0.27	C (m ³ /Pa) =	6.3E-1 ²	
10 ² Expsection (1)	·		dt_2 (min) =		$C_{D}(-) =$	6.9E-03	
		100	$T_{T} (m^{2}/s) =$	2.0E-09		2.	
			S (-) =	1.0E-06		1	
and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se	restry	10 2	$K_s(m/s) =$	1.0E-10			
10 Fr			$S_{s}(1/m) =$	5.0E-08			
	- \	a) 00	Comments:				
□ ²		a Peol. (p-pol	The recommended analysis of the CHii stabilisation. The co estimated to be 9.01 conducted using a f	r phase, which is onfidence range E-10 m2/s to 5.0	very noisy but sho for the interval tran E-9 m2/s. The analy	ws a horizontal smissivity is ysis was	
10 ^{°°} 10 [°]	10 ² 10 ² 10 ⁴	10 0	transducer depth, w extrapolation in the short test duration a	as derived from Horner plot to a	the CHir phase usin value of 4,715.0 k	ng straight line Pa. Due to the	

	Test S	<u>um</u> r	nary Sheet				
Project:	Oskarshamn site investig	ation	Test type:[1]			Pi	
Area:	Lax	emar	Test no:			1	
Borehole ID:	KL	X19A	Test start:		070120 13:		
Test section from - to (m):	571.00-591.	571.00-591.00 m			Stephan R		
Section diameter, 2·r _w (m):		076	test execution: Responsible for		Crist	Philipp Wolf tian Enachescu	
Section diameter, 2^{-1} w (11).		5.070	test evaluation:		Clis		
Linear plot Q and p			Flow period		Recovery period	ł	
			Indata		Indata		
5250 KLX19A_571.00-591.00_070120_1_PI_Q_r	P section	T ^{0.003}	p ₀ (kPa) =	4938			
5200	P above P balow Q		p _i (kPa) =	4942			
5150	μ.		$p_p(kPa) =$	5180	p _F (kPa) =	5026	
5100	i.		$Q_p (m^3/s) =$	NA	F1 (=)		
§ 000	*****	0.002 E	$\frac{d_p (m/s)}{tp (s)} =$		t _F (s) =	4560	
2 5000 -	••••••	Rate [fm			ç⊧ (c) S el S [*] (-)=	1.00E-06	
4/50		Injection	S el S [*] (-)= EC _w (mS/m)=	1.001-00	ง ei ง (-)=	1.001-00	
400.		• 0.001	$EC_w (IIIS/III) =$ Temp _w (gr C)=	14.3			
			Derivative fact.=		Derivative fact.=	0.02	
			Derivative lact	NA	Derivative lact	0.02	
4750	150 2.00	0.000					
Elapsed 1	Time (h)		Results		Results		
			Q/s (m ² /s)=	NA			
Log-Log plot incl. derivates- fl	ow period		T _M (m ² /s)=	NA			
			Flow regime:	transient	Flow regime:	transient	
			dt_1 (min) =	NA	dt ₁ (min) =	21.38	
			dt_2 (min) =	NA	dt ₂ (min) =	69.76	
			$T(m^{2}/s) =$	NA	T (m²/s) =	1.1E-10	
			S (-) =	NA	S (-) =	1.0E-06	
			$K_s (m/s) =$	NA	$K_s (m/s) =$	5.5E-12	
			$S_{s}(1/m) =$	NA	$S_{s}(1/m) =$	5.0E-08	
Not Ar	nalysed		$C (m^{3}/Pa) =$	NA	C (m ³ /Pa) =	5.9E-11	
			$C_{D}(-) =$	NA	$C_{D}(-) =$	6.5E-03	
			$\xi(-) =$	NA	ξ(-) =	2.1	
			ς(-) –	1171	ς(-) –	2.1	
			$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m²/s) =	NA	
			$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
			$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA	
Log-Log plot incl. derivatives-	recovery period		Selected represe				
			dt_1 (min) =		C (m ³ /Pa) =	5.9E-11	
Elapsed time (h)	l		dt_2 (min) =		$C_{D}(-) =$	6.5E-03	
			$T_T (m^2/s) =$	1.10E-10		2.1	
10 2		10 1	S(-) =	1.10E-10 1.00E-06		2.1	
		10 0	$S(-) = K_s(m/s) =$	5.50E-12			
10 1			$S_{s}(11/s) = S_{s}(1/m) =$	5.50E-12			
	and the second second second second second second second second second second second second second second second	10 ⁻¹ 5	Comments:				
10 °		nssaud por		transmissi	F1 1E 10	daring d for 1	
		10 ⁻²	The recommended analysis of the Pi pi		f 1.1E-10 m2/s was ence range for the i		
10 -1		٥			E-11 to 5.0E-10 m2		
1		10 -3					
		10	was conducted usin			pressure could	
w *		10 -4	was conducted usin not be extrapolated			pressure could	

	Test St	umi	mary Sheet				
Project:	Oskarshamn site investig	atior	Test type:[1]			CHir	
Area:	Lax	ema	Test no:			1	
Borehole ID:	KLX	X19A	Test start:		070120 16:1		
Test section from - to (m):	591.00-611.	00 m	Responsible for		Stephan Ro		
			test execution:			Philipp Wolf	
Section diameter, 2·r _w (m):	(0.076	Responsible for		Crist	ian Enachescu	
Linear plot Q and p			test evaluation: Flow period		Recovery period		
			Indata		Indata		
5400 T		0.003	p ₀ (kPa) =	5103	indutu		
KLX19A_591.00-611.00_070120_1_CHir_Q_r	Pacton Patove Pbilow O		p _i (kPa) =	NA			
5300 -			$p_p(kPa) =$	NA	p _F (kPa) =	#NV	
52.50 -			$Q_{p} (m^{3}/s) =$	NA	F 1 X - 7		
5 200 ·	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second	- 0.002 E	tp(s) =	0	t _F (s) =	(
5150 -		Rate [l/mi	S el S [*] (-)=		S el S [*] (-)=	1.00E-0	
	<u> </u>	Injection	$EC_w (mS/m) =$		()	1	
5050 -	•	- 0.001	Temp _w (gr C)=	14.6		1	
5000 -	· ······		Derivative fact.=	NA	Derivative fact.=	NA	
40.50	·						
4000	<u> </u>	0.000					
0.00 0.10 0.20 0.30 0.40 Elapsed 1		0.90	Results		Results		
			Q/s (m ² /s)=	NA			
Log-Log plot incl. derivates- fl	ow period		$T_{M} (m^{2}/s) =$	NA			
			Flow regime:	transient	Flow regime:	transient	
			dt ₁ (min) =	NA	dt ₁ (min) =	NA	
			dt ₂ (min) =	NA	dt ₂ (min) =	NA	
			T (m²/s) =	1.00E-11	T (m²/s) =	NA	
			S (-) =	NA	S (-) =	NA	
			$K_s (m/s) =$	NA	K _s (m/s) =	NA	
Not Ar	nalvsed		S _s (1/m) =	NA	S _s (1/m) =	NA	
10071	larysea		C (m³/Pa) =	NA	C (m³/Pa) =	NA	
			C _D (-) =	NA	C _D (-) =	NA	
			ξ(-) =	NA	ξ(-) =	NA	
			$T_{GRF}(m^2/s) =$	NA	$T_{GRF}(m^2/s) =$	NA	
			S _{GRF} (-) =	NA	S _{GRF} (-) =	NA	
			$D_{GRF}(-) =$	NA	D _{GRF} (-) =	NA	
Log-Log plot incl. derivatives-	recovery period		Selected represe			T ••••	
			dt_1 (min) =	NA	C (m ³ /Pa) =	NA	
			dt_2 (min) =	NA	C _D (-) =	NA	
			$T_{T}(m^{2}/s) =$	1.00E-11	ξ(-) =	NA	
			S (-) =	NA			
			$K_s(m/s) =$	NA			
			S _s (1/m) =	NA			
Not Ar	nalysed		Comments: Based on the test re	an an a- (1	ad maaleer ee t	an) the int 1	
			transmissivity is low	ver than 1.0E-11	m2/s.		

	Test S	um	mary Sheet				
Project:	Oskarshamn site investig	atior	Test type:[1]			CHi	
Area:	lax	ema	r Test no:				
, 100.	247	onna					
Borehole ID:	KL	X19/	Test start:		070120 17:4		
Test section from - to (m):	611.00-631.	.00 n	Responsible for		Stephan Ro		
			test execution:			Philipp Wol	
Section diameter, 2·r _w (m):		0.076	Responsible for		Crist	ian Enachescu	
Linear plot Q and p			test evaluation: Flow period		Recovery period		
			Indata		Indata		
5600		- 1 0.003	p ₀ (kPa) =	5268	indutu		
KLX19A_611.00-631.00_070120_1_CHir_Q_r	P section P above P below		p _i (kPa) =	NA			
5500 -	· · ·		$p_p(kPa) =$		p _F (kPa) =	#NV	
5450	¥.		$Q_{p} (m^{3}/s) =$	NA	F1 (- 7		
ब्र <u>ि</u> 5400-		0.002	tp(s) =	0	t _F (s) =	(
9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	:	Rate [Imin]	S el S [*] (-)=		S el S [*] (-)=	1.00E-00	
1000 C C C C C C C C C C C C C C C C C C	•	Injection	EC _w (mS/m)=		00.0()		
200		0.001	Temp _w (gr C)=	14.9		1	
s200 -			Derivative fact.=	NA	Derivative fact.=	NA	
5150 -							
5100		0.000					
0.00 0.10 0.20 0.30 0.40 0.5 Elapsed 1	0 0.60 0.70 0.80 0.90 Time [h]	1.00	Results		Results		
			Q/s (m ² /s)=	NA			
Log-Log plot incl. derivates- fl	ow period		T _M (m²/s)=	NA			
			Flow regime:	transient	Flow regime:	transient	
			dt ₁ (min) =	NA	dt ₁ (min) =	NA	
			dt_2 (min) =		dt ₂ (min) =	NA	
			$T(m^{2}/s) =$	1.00E-10	T (m²/s) =	NA	
			S (-) =	NA	S (-) =	NA	
			$K_{s}(m/s) =$	NA	K _s (m/s) =	NA	
Not Aı	nalvsed		$S_{s}(1/m) =$	NA	$S_{s}(1/m) =$	NA	
	2		C (m ³ /Pa) =		C (m ³ /Pa) =	NA	
			C _D (-) =		C _D (-) =	NA	
			ξ(-) =	NA	ξ(-) =	NA	
			2	NA	2. \	NA	
			$T_{GRF}(m^2/s) = S_{GRF}(-) =$	NA	$T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$	NA	
			$D_{GRF}(-) =$		$D_{GRF}(-) =$	NA	
_og-Log plot incl. derivatives-	recovery period		Selected represe				
5 - 5 F 2 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -			dt_1 (min) =		C (m ³ /Pa) =	NA	
			dt_2 (min) =		$C_{D}(-) =$	NA	
			$T_{T} (m^{2}/s) =$	1.0E-10		NA	
			S (-) =	NA	/		
			$K_s (m/s) =$	NA			
			$S_{s}(1/m) =$	NA		1	
Not Aı	nalysed		Comments:	-	-	-	
			Based on the test re transmissivity is low		ed packer complian) m2/s.	ce) the interval	

	Test	Sumn	nary Sheet			
Project:	Oskarshamn site inves	stigation	Test type:[1]			CHi
Area:	L	.axemar	Test no:			
Borehole ID:	ŀ	KLX19A	Test start:			070121 08:29
Test section from - to (m):	631.00-65	51.00 m	Responsible for			Stephan Roh
Section diameter, 2·r _w (m):		0.076	test execution: Responsible for		Crist	Philipp Wol ian Enachescu
		0.070	test evaluation:		Olist	
Linear plot Q and p			Flow period		Recovery period	I.
			Indata		Indata	
5700 KLX19A_631.00-651.00_070121_1_CHir_Q_r	• P	section 0.010	p₀ (kPa) =	5435		
5650	· · · · · · · · · · · · · · · · · · ·	section above below	p _i (kPa) =	5441		
9600		0.008	p _p (kPa) =	5646	p _F (kPa) =	545
550			$Q_{p} (m^{3}/s) =$	4.67E-08	F 1 (- 7	
		0.006 -	$\frac{d_p(m/s)}{tp(s)} =$		t _F (s) =	120
		ate [l/min]	s el S [*] (-)=		⊈ (0) S el S [*] (-)=	1.00E-0
5450		Jection R.	EC _w (mS/m)=	1.002-00	5 el 5 (-)=	1.001-0
5400		• • • • • •	Temp _w (gr C)=	15.2		<u> </u>
5050			Derivative fact.=		Derivative fact.=	0.1
soo		- 0.002		0.12		0.1
	1.00 1.20 1.40 1.60	1.80	-			
Elapsed T	ime [h]		Results		Results	
			Q/s (m ² /s)=	2.2E-09		
og-Log plot incl. derivates- fl	ow period		T _M (m²/s)=	2.3E-09		
			Flow regime:	transient	Flow regime:	transient
10 ¹ , 10 ¹ , 10 ³ Eugeotime (n)			$dt_1 (min) =$		dt ₁ (min) =	NA
	•	-	dt ₂ (min) =	12.71	dt ₂ (min) =	NA
· · · · · ·	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second	300	T (m²/s) =	1.2E-09	T (m²/s) =	2.7E-0
•••••	· · ·		S (-) =	1.0E-06	S (-) =	1.0E-0
10		10 2	$K_s(m/s) =$	6.0E-11	K _s (m/s) =	1.4E-1
	· · · · ·		S _s (1/m) =	5.0E-08	S _s (1/m) =	5.0E-0
	· · · ·	Nq)*(mint)	C (m³/Pa) =	NA	C (m ³ /Pa) =	5.4E-1
10 -1	· · · · · ·	10	$C_{D}(-) =$	NA	$C_{D}(-) =$	5.9E-0
			ξ(-) =	-0.4	ξ(-) =	3.
		3			,	
			T _{GRF} (m ² /s) =	NA	$T_{GRF}(m^2/s) =$	NA
10 ° 10 ¹ 10	10 ² 10 ³	10 4	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
			$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA
.og-Log plot incl. derivatives-	recovery period		Selected represe	ntative paran		
			dt ₁ (min) =	1.91	C (m ³ /Pa) =	5.4E-1
Elapsed time (n 10 2 1	,	<u>r</u>	dt_2 (min) =		$C_{D}(-) =$	5.9E-0
		F 10 3	$T_{T} (m^2/s) =$	1.2E-09		-0
			S(-) =	1.0E-06		, , , , , , , , , , , , , , , , , , ,
10 1			S (-) = K _s (m/s) =	6.0E-11		
	/	10 2	$S_{s}(1/m) =$	5.0E-08		
	And a state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the	- [P	Comments:	0.02 00		
10 °		p-p01 M		tuo u anni a aivita y a i	51 2E 00 m2/a waa	dominuo di funomo til
a second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s		10 ¹ ⁰ d	The recommended t analysis of the CHi			
10 1		ł			al transmissivity is e	
		10 °	8.0E-10 m2/s to 3.0	E-9 m2/s. The a	nalysis was conduct	ted using a flow
					1	1 /1
			dimension of 2. The			
10 ⁻¹ 10 ⁻⁸ ID/C	10 ¹ 10 ²	10 3	dimension of 2. The derived from the CI Horner plot to a val	Hir phase using	type curve extrapola	

	Test Sum	mary Sheet			
Project:	Oskarshamn site investigation	n Test type:[1]			CHir
Area:	Laxema	r Test no:			2
Borehole ID:	KI X19	A Test start:			070121 13:18
Test section from - to (m):	651.00-671.00 r	n Responsible for test execution:			Stephan Rohs Philipp Wolf
Section diameter, 2·r _w (m):	0.07	6 Responsible for		Crist	ian Enachescu
		test evaluation:			
Linear plot Q and p		Flow period		Recovery period	
		Indata		Indata	
5800 KLX19A_661.00-671.00_07012L2_CHir_Q_r	• P sacion • P balow • P balow	p ₀ (kPa) =	5592		
5750	• P balow • Q	p _i (kPa) =	5588		
5700		p _p (kPa) =	5788	p _F (kPa) =	5673
anu	u.5	$Q_{p} (m^{3}/s) =$	1.00E-06		
8950 L	1	tp (s) =	1200	t _F (s) =	1200
5500	10.2 #	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-06
9 5500	1 Theory	$EC_w (mS/m) =$			
		Temp _w (gr C)=	15.4		<u> </u>
500	a.	Derivative fact.=	0.04	Derivative fact.=	0.02
5450					
5400 0.00 0.40	0.60 0.80 1.00				
	Time [h]	Results		Results	
		Q/s $(m^2/s)=$	4.9E-08		
Log-Log plot incl. derivates- flo	ow period	$T_{M} (m^{2}/s) =$	5.1E-08		
		Flow regime:	transient	Flow regime:	transient
Elapsed time (b)		dt ₁ (min) =	NA	dt ₁ (min) =	0.48
10 2	· · · · · ·	dt_2 (min) =	NA	dt_2 (min) =	2.39
	10 ²	$T(m^2/s) =$		$T(m^2/s) =$	5.4E-08
		S (-) =	1.0E-06		1.0E-06
10 1	30	$K_s (m/s) =$		K _s (m/s) =	2.7E-09
		$S_{s}(1/m) =$		$S_{s}(1/m) =$	5.0E-08
		$C_{s}(1/11)$	NA	C (m ³ /Pa) =	1.9E-10
A A Contraction of the second second	And I	$C_{\rm D}(-) =$	NA	$C_{D}(-) =$	2.1E-02
10.0	3 ·	,			-3.3
	۳ 10 °	ξ(-) =	-2.4	ξ(-) =	-3.3
		$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA
•	0.3	$I_{GRF}(M/S) =$ $S_{GRF}(-) =$	NA	$S_{GRF}(m/s) =$	NA
10 ¹⁰ 10 ¹	10 ² 10 ³ 10 ⁴		NA		
	ve e cue mu me vie d	D _{GRF} (-) = Selected represe			NA
Log-Log plot incl. derivatives-	recovery period				
Elapsed time (h)		dt_1 (min) =		C (m ³ /Pa) =	1.9E-10
	300	dt_2 (min) =		$C_{D}(-) =$	2.1E-02
		$T_T(m^2/s) =$	5.4E-08	ξ(-) =	-3.3
	10 ²	S (-) =	1.0E-06		
10 °	in the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se	$K_{s}(m/s) =$	2.7E-09		
and and and and and and and and and and	30 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	$S_{s}(1/m) =$	5.0E-08		
	I	Comments:			
	10			5.4E-8 m2/s was d	
10 -1				ne), which shows a	
1.				for the interval trans E-8 m2/s. The flow	
	1				
	10 °				
10 ⁹ 10 ¹ IDCD	10 ² 10 ² 10 ⁴	displayed during th	e test is 2. The s	tatic pressure measu the CHir phase usin	red at

			nary Sheet				
Project:	Oskarshamn site investiga	ation	Test type:[1]			CH	
Area:	Laxe	emar	Test no:				
Borehole ID:	KLX19A T		Test start:			070121 14:5	
Test section from - to (m):	671.00-691.00 m F					Stephan Roh	
Contian diamator 2 r (m):			test execution: Responsible for		Criet	Philipp Wo ian Enachesc	
Section diameter, $2 \cdot r_w$ (m):	0	.076	test evaluation:		Crist	ian Enachesc	
_inear plot Q and p			Flow period		Recovery period		
£	•	T 1.50	Indata		Indata		
KLX19A_671.00-691.00_070121_1_CHir_Q_r	Paction Patore Pbalow O		p ₀ (kPa) =	5756			
5900 -		1.25	p _i (kPa) =	5743			
58.50		1.00	$p_p(kPa) =$	5955	p _F (kPa) =	576	
5800		luiud	$Q_{p} (m^{3}/s) =$	6.30E-06			
5750		0.75 Upp	$\frac{dp}{dp}$ (m / s) =	1200	t _F (s) =	120	
5700 -		, nini	S el S [*] (-)=		S el S [*] (-)=	1.00E-(
50.00 -		0.50	$EC_{w} (mS/m) =$				
5500		0.25	Temp _w (gr C)=	15.7			
28.90			Derivative fact.=		Derivative fact.=	0.0	
2500 0.20 0.40 0.50 0. Elapsed	no 1.00 1.20 1.40 Time [h]	0.00					
			Results		Results		
			Q/s (m ² /s)=	2.9E-07			
.og-Log plot incl. derivates- fl	ow period		T _M (m ² /s)=	3.0E-07			
			Flow regime:	transient	Flow regime:	transient	
Eapsed time (h)	-2		dt ₁ (min) =	7.67	dt ₁ (min) =	NA	
			dt ₂ (min) =	17.14	dt ₂ (min) =	NA	
		10 '	T (m²/s) =	2.5E-07	T (m²/s) =	2.3E-0	
		3	S (-) =	1.0E-06	S (-) =	1.0E-0	
10	5 - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 1		$K_s(m/s) =$	1.3E-08	K _s (m/s) =	1.2E-(
		10 °	S _s (1/m) =	5.0E-08	S _s (1/m) =	5.0E-0	
		(1b) fimir	C (m ³ /Pa) =	NA	C (m³/Pa) =	4.5E-0	
10 0	et any the second second	0.3 \$	C _D (-) =	NA	C _D (-) =	5.0E-0	
		10 -1	ξ(-) =	2.8	ξ(-) =	1.	
· ·							
10 ^d 10 ^d	10 ⁷ 10 ⁸ 10 ⁹	0.03	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA	
ťD			$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
			$D_{GRF}(-) =$	NA	D _{GRF} (-) =	NA	
.og-Log plot incl. derivatives-	recovery period		Selected represe	ntative paran	eters.	-	
			dt ₁ (min) =	NA	C (m³/Pa) =	4.5E-0	
Elapsed time	[h] 	ጉ	dt ₂ (min) =	NA	C _D (-) =	5.0E-0	
		ł	$T_{T}(m^{2}/s) =$	2.3E-07	ξ(-) =	1	
10 1		10 2	S (-) =	1.0E-06		1	
		ł	$K_s (m/s) =$	1.2E-08			
10.0	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	10 2	$S_{s}(1/m) =$	5.0E-08			
······································		æ	Comments:				
10-1		10 10	The recommended	ransmissivity of	2.3E-7 m2/s was d	erived from the	
~		84	analysis of the CHi	phase, which sh	ows the best data ar	d derivative	
10 ⁴		10 0	quality. The confide				
~		ł	estimated to be 9.01 displayed during the				
		1	International and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	∋ iest is ∠. The S	and pressure measu	icuat	
10 ⁻¹ 10 ⁰		10 -1	transducer depth, w				

		mary Sheet	•		
Project:	Oskarshamn site investigation	n Test type:[1]			CHi
Area:	Laxema	ar Test no:			1
Borehole ID:	KLX19	A Test start:			070121 16:56
Test section from - to (m):	691.00-711.00	m Responsible for			Stephan Rohs
Soction diamotor 2.r. (m):	0.07	test execution: 6 Responsible for		Criet	Philipp Wol ian Enachescu
Section diameter, 2·r _w (m):	0.07	test evaluation:		Clist	ian Enachescu
Linear plot Q and p		Flow period		Recovery period	l
		Indata		Indata	
exo	0.5	p ₀ (kPa) =	5924		
KLX19A_691.00-711.00_070121_1_CHir_Q_r	P section Patrove Pbelow	p _i (kPa) =	5920		
stop		$p_p(kPa) =$		p _F (kPa) =	591
	0.4	$Q_{p} (m^{3}/s) =$	2.17E-06	,	
		$\frac{d_p(m/s)}{tp(s)} =$		t _F (s) =	3600
		S el S [*] (-)=		⊊ (0) S el S [*] (-)=	1.00E-06
		EC _w (mS/m)=	1.002-00	5 el 5 (-)=	1.002-00
a	02	Temp _w (gr C)=	16.0		
8820		Derivative fact.=		Derivative fact.=	0.0
5600	0.1	Derivative lact	0.04	Derivative lact	0.0.
5700	·				
000 0.50 1.00 1.50 2.00 2.50 Elapsed Time (h)		Results		Results	
		Q/s (m ² /s)=	1.1E-07		
Log-Log plot incl. derivates- fle	ow period	T _M (m ² /s)=	1.1E-07		
		Flow regime:	transient	Flow regime:	transient
10 ² Elapsed time (r	10. ⁻¹ 10. ⁰ 10. ¹	dt ₁ (min) =		dt ₁ (min) =	2.27
	10 2	dt ₂ (min) =	17.05	dt ₂ (min) =	14.10
		$T(m^{2}/s) =$	5.4E-08	T (m²/s) =	3.7E-08
10 1		S (-) =	1.0E-06	S (-) =	1.0E-0
	10 1	$K_s(m/s) =$	2.7E-09	K _s (m/s) =	1.9E-09
10 °		$_{\rm s} S_{\rm s} (1/m) =$	5.0E-08	S _s (1/m) =	5.0E-08
	10 °	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	4.6E-1
· · · · · · ·		$C_{\rm D}(-) =$	NA	$C_{D}(-) =$	5.1E-03
10 -1		ξ(-) =	-2.8	ξ(-) =	-3.7
·	10 -1	5(7		5()	
·		$T_{GRF}(m^2/s) =$	NA	$T_{GRF}(m^2/s) =$	NA
U U U	טר טר	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA
Log-Log plot incl. derivatives-	recovery period	Selected represe			I
0.01		dt_1 (min) =		C (m³/Pa) =	4.6E-1
Elapsed time [h]		$dt_2 (min) =$		$C_{D}(-) =$	5.1E-03
10 1		$T_{T} (m^2/s) =$	5.4E-08		-2.8
		$I_{T} (m / s) =$ S (-) =	1.0E-06		-2.0
	300		2.7E-09		
10 0	10 ²	$K_{s}(m/s) = S_{s}(1/m) =$	2.7E-09 5.0E-08		
	in the second state		5.0E-06		
· · · · · · · · · · · · · · · · · · ·	30	Comments:			
10 4	F 1			f 3.7E-8 m2/s was d	
	10			ows a horizontal sta insmissivity is estim	
	3			mension displayed d	
		2. The static pressu	re measured at t	ransducer depth, wa	s derived from
10 ⁰ 10 ¹	10 ² 10 ³ 10 ⁴	the CHir phase usin value of 5,906.2 kP		xtrapolation in the H	Iorner plot to a

	Test Sumr	nary Sheet			
Project:	Oskarshamn site investigation	Test type:[1]			CHi
Area:	Laxemar	Test no:			
Borehole ID:	KLX19A	Test start:			070122 08:46
Test section from - to (m):	711.00-731.00 m				Stephan Rohs
Section diameter, 2·r _w (m):		test execution: Responsible for		Crief	Philipp Wol ian Enachescu
	0.070	test evaluation:		Clisi	
Linear plot Q and p		Flow period	-	Recovery period	I
		Indata		Indata	
512 <u>-</u>		p₀ (kPa) =	6085		
KLX19A_711.00-731.00_070122_1_CHir_Q_r	P section P show P below	p _i (kPa) =	NA		
a.o	••	$p_p(kPa) =$	NA	p _F (kPa) =	NA
62.50 -	0.004	$Q_{p} (m^{3}/s) =$	NA	F 1 X - 7	
eza -		$\frac{d_p(m/s)}{tp(s)} =$		t _F (s) =	
e150 -	0.003 <u>F</u>	S el S [*] (-)=		⊊ (e) S el S [*] (-)=	1.00E-0
5100 A	minti	$EC_w (mS/m) =$	1.001 00	Sei S (-)-	1.001-0
era 1	0.002	Temp _w (gr C)=	16.2		
	÷ .	Derivative fact.=	NA	Derivative fact.=	NA
8000 -	••••••••••••••••••••••••••••••••••••••	Derivative lact	IN/A	Derivative lact	INA
- 02 CO					
5000 0.20 0.40 0.60		Results		Deculto	
Elapsed Time (h)				Results	
		Q/s (m^{2}/s)=			
og-Log plot incl. derivates- fl	ow period	$T_{\rm M} (m^2/s) =$	NA		
		Flow regime:	transient	Flow regime:	transient
		dt_1 (min) =	NA	dt_1 (min) =	NA
		dt_2 (min) =	NA	dt_2 (min) =	NA
		T (m²/s) =	1.00E-11	T (m²/s) =	NA
		S (-) =	NA	S (-) =	NA
		$K_s (m/s) =$	NA	$K_s (m/s) =$	NA
Not Ar	nalvsed	$S_{s}(1/m) =$	NA	S _s (1/m) =	NA
100111	ary sea	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) =	NA	T _{GRF} (m ² /s) =	NA
		S _{GRF} (-) =	NA	S _{GRF} (-) =	NA
		D _{GRF} (-) =	NA	D _{GRF} (-) =	NA
og-Log plot incl. derivatives-	recovery period	Selected represe	entative param	neters.	
		dt ₁ (min) =	NA	C (m ³ /Pa) =	NA
		dt_2 (min) =	NA	$C_{D}(-) =$	NA
		$T_{T} (m^{2}/s) =$	1.0E-11		NA
		S (-) =	NA		
		$K_s (m/s) =$	NA		
		$S_{s}(1/m) =$	NA		1
Not Ar	nalvced	Comments:			I
	,	Based on the test re transmissivity is low			ce) the interval

		nmary Sheet			
Project:	Oskarshamn site investigat				CHi
Area:	Laxen	nar Test no:	+		1
Borehole ID:	KLX1	9A Test start:			070122 10:50
Test section from - to (m):	731.00-751.00	m Responsible for test execution:			Stephan Rohs
Soction diamotor 2 r (m):				Crief	Philipp Wol
Section diameter, 2·r _w (m):	0.0	76 Responsible for test evaluation:		Chs	
Linear plot Q and p		Flow period		Recovery period	1
		Indata		Indata	
65m	-	p ₀ (kPa) =	6245		
KLX19A_731.00-751.00_070122_1_CHir_Q_r	P section P above P balow	p _i (kPa) =	6235		
6450	°°	p _p (kPa) =	6435	p _F (kPa) =	623
6400		$Q_{p} (m^{3}/s) =$	1.33E-06		
6350			1200	t _F (s) =	120
a 800 ·		S el S [*] (-)=		♀ (-)= S el S [*] (-)=	1.00E-0
220 		EC _w (mS/m)=			
§ 200 ·		Temp (ar C)=	16.5		
e150 -	- ar	Derivative fact.=		Derivative fact.=	0.0
e100			0.00	Bonnativo laot.	0.0.
e050 -					
6000 0.00 0.20 0.40 0.60		Results		Results	
Ea	ssed Time [b]	$Q/s (m^2/s) =$	6.5E-08		
Log-Log plot incl. derivates-	flow period	$T_{M} (m^{2}/s) =$	6.8E-08		
		Flow regime:	transient	Flow regime:	transient
Elapsed tir	se [h]	dt_1 (min) =		dt_1 (min) =	1.69
10 2		dt_1 (min) = dt_2 (min) =		$dt_1 (min) =$ $dt_2 (min) =$	15.80
	30	- 、 ,		2	2.3E-0
		$T(m^2/s) =$	1.9E-07 1.0E-06		2.3E-0
10 1	• • • •	$S(-) = K_{s}(m/s) =$		$S(-) = K_s(m/s) =$	1.0E-00
		$R_{s}(11/s) =$ S _s (1/m) =		$S_{s}(1/m) =$	5.0E-0
	• •	E.	5.0E-00		5.5E-1
	• • • • • •	$\sum_{n=1}^{m} C(m^{3}/Pa) =$	NA	C (m ³ /Pa) = C _D (-) =	6.1E-0
10 *		C D()		C D()	
•	0.3	ξ(-) =	11.5	ξ(-) =	3.
	10	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA
10 ¹¹ 10 ¹² 10	10 10 ⁵⁴ 10 ¹⁵ 10 ¹⁶ 10	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
		$D_{GRF}(-) =$	NA	D _{GRF} (-) =	NA
Log-Log plot incl. derivative	s- recovery period	Selected repres	entative paran		
		dt ₁ (min) =		C (m ³ /Pa) =	5.5E-1
Elapsed tin	e [h]	dt_2 (min) =		$C_{\rm D}(-) =$	6.1E-0
~		$T_{T}(m^{2}/s) =$	2.3E-07		3.1
1	300	S (-) =	1.0E-06		
	5 W W W	$K_{s} (m/s) =$	1.2E-08		
10 ¹	 10² 	$S_{s}(1/m) =$	5.0E-08		
	· **	Comments:			1
	30	d X	transmissivity	f 2.3E-7 m2/s was d	erived from the
	**************************************			hows a clear horizon	
	A second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se	stabilisation. The c	onfidence range	for the interval tran	smissivity is
	s at sources and a set of a			E-7 m2/s. The flow c	
				tatic pressure measu	
10 0 10 1	10 ² 10 ³ 10 ⁴			the CHir phase usin a value of 6,235.2 k	
		example and in the	piot to a		· ···

	Test Si	umi	nary Sheet			
roject:	Oskarshamn site investig					CHi
rea:	Lax	emar	Test no:			1
orehole ID:	KL)	X19A	Test start:			070122 13:36
est section from - to (m):	751.00-771.	00 m	Responsible for			Stephan Rohs
ection diameter, 2·r _w (m):	().076	test execution: Responsible for		Crist	Philipp Wol ian Enachescu
			test evaluation:			
inear plot Q and p			Flow period		Recovery period	
			Indata		Indata	
KLX19A_761.00-771.00_070122_1_CHir_Q_r	Psection Pabove Pabove Pbelow	3.0	p ₀ (kPa) =	6414		L
eeco -	· · · ·	2.5	p _i (kPa) =	6405		
650			p _p (kPa) =		p _F (kPa) =	643
		- 2.0	$Q_{p} (m^{3}/s) =$	1.83E-05		
6600		[Nmin]	tp (s) =		t _F (s) =	120
6450	\times	- 1.5 uoga	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0
6400	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	luje	EC _w (mS/m)=			
8350 -		1.0	Temp _w (gr C)=	16.7		
8990		• 0.5	Derivative fact.=	0.05	Derivative fact.=	0.0
820		0.0				
0.00 0.20 0.40 0.60 Elapse	0.80 1.00 1.20 1.40 Time [h]		Results		Results	
			Q/s $(m^{2}/s)=$	8.9E-07		
og-Log plot incl. derivates- f	ow period		$T_{M} (m^{2}/s) =$	9.3E-07		
			Flow regime:	transient	Flow regime:	transient
Elapsed time (r] 19. ⁻¹	1	dt ₁ (min) =	7.25	dt ₁ (min) =	NA
		10 1	dt_2 (min) =	16.93	dt ₂ (min) =	NA
		-	$T(m^2/s) =$		$T(m^{2}/s) =$	4.5E-0
		3	S (-) =	1.0E-06	· · ·	1.0E-0
0 1		10 °	$K_s (m/s) =$		$K_s (m/s) =$	2.3E-0
			$S_{s}(1/m) =$		$S_{s}(1/m) =$	5.0E-0
· · · · · · · · · · · · · · · · · · ·		0.3 (mim)	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	3.4E-1
بغبيبينون		1/0.(1	$C_{D}(-) =$	NA	$C_{\rm D}(-) =$	3.7E-0
	•	10 ⁻¹	$\xi(-) =$		$\xi(-) =$	-4.
· · · ·		-	,		()	
•		0.03	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m²/s) =	NA
10 ² 10 ³	10 ⁴ 10 ⁵	ł	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
			$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA
og-Log plot incl. derivatives-	recovery period		Selected represe			
	locoroly polica		dt_1 (min) =		C (m ³ /Pa) =	3.4E-1
Elapsed time (t			dt_2 (min) =		$C_{D}(-) =$	3.7E-0
10 ¹			2	3.6E-07		-2
			T _⊤ (m²/s) = S (-) =	1.0E-06	چ (⁻) –	-2
		300	$S(-) = K_s(m/s) =$	1.0E-00 1.8E-08		
		10 ²	$S_{s}(1/m) =$	5.0E-08		
10 °	in the second second		Comments:	5.0L-00		
	C MAR HAR MAR HAR HAR HAR HAR HAR HAR HAR HAR HAR H	30 -			62 (E 7	
بتعنيب م		-p0)'[kPa	analysis of the CHi		f 3.6E-7 m2/s was dense which shows a l	
;	Ē	10 ¹	stabilisation. This v			
0-1			interval transmissiv			
		3	zone. The confiden	ce range for the	interval transmissiv	ity is estimated
ĺ	ŀ				The flow dimension	
L,		10 0	during the test is 2.			
10 ⁰ 10 ¹ tDict	10 ² 10 ³ 10 ⁴		was derived from the Horner plot to a val			apolation in th
			rionier plot to a val	01 0, <i>3 7</i> 7.0 KI	· · · ·	

	Test Summ	nary Sheet			
Project:	Oskarshamn site investigation	Test type:[1]			CHi
Area:	Laxemar	Test no:			
Borehole ID:	KLX19A	Test start:			070122 15:43
Test section from - to (m):	771.00-791.00 m				Stephan Roh
Section diameter 2.r. (m):	0.076	test execution: Responsible for		Criet	Philipp Wol ian Enachescu
Section diameter, $2 \cdot r_w$ (m):	0.078	test evaluation:		Clist	
inear plot Q and p		Flow period	1	Recovery period	l
•		Indata		Indata	
	- 30	p ₀ (kPa) =	6578		
KLX19A_771.00-791.00_070122_1_CHir_Q_r 7400	• Pisecion • Piblow • Piblow	p _i (kPa) =	6571		
	P bidow Q 25	$p_p(kPa) =$	6776	p _F (kPa) =	658
7200	· · · · · · · · · · · · · · · · · · ·	$Q_{p} (m^{3}/s) =$	5.83E-06		
		$\frac{d_p(m/s)}{tp(s)} =$		t _F (s) =	120
7000	[] [] [] [] [] [] [] [] [] [] [] [] [] [S el S [*] (-)=		⊊ (0) S el S [*] (-)=	1.00E-0
	litije	EC _w (mS/m)=	1.002-00	5 el 5 (-)=	1.00L-0
****	1.0	$EC_w (IIIS/III) =$ Temp _w (gr C)=	17.0		
		Derivative fact.=		Derivative fact.=	0.0
	05	Denvalive laci	0.09		0.0
6400 0.50 1.00 Elapsed	1.50 2.00	Desults		Desults	
		Results	0.05.07	Results	
		Q/s (m^{2}/s)=	2.8E-07		
og-Log plot incl. derivates- flo	ow period	$T_{\rm M} (m^2/s) =$	2.9E-07	— .	
		Flow regime:	transient	Flow regime:	transient
Elacsed time in	ň	dt ₁ (min) =		dt ₁ (min) =	NA
10 2 10 -4	10 ⁻¹	dt_2 (min) =		dt ₂ (min) =	NA
		T (m²/s) =		T (m²/s) =	1.1E-0
10 '	10 '	S (-) =	1.0E-06		1.0E-0
		$K_s (m/s) =$		$K_s (m/s) =$	5.6E-0
• • • • • •	10°	$S_{s}(1/m) =$	5.0E-08	S _s (1/m) =	5.0E-0
10 ¹⁰ ¹⁰	[unit] Brit	C (m³/Pa) =	NA	C (m³/Pa) =	4.9E-1
· · ·	10 CL	C _D (-) =	NA	C _D (-) =	5.4E-0
10 -1	10 1	ξ(-) =	-2.4	ξ(-) =	-2.
	10 °	T _{GRF} (m ² /s) =	NA	T _{GRF} (m ² /s) =	NA
10 [°] 10 [°] 1D	10 ⁴ 10 ⁵	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA
.og-Log plot incl. derivatives-	recovery period	Selected represe	ntative paran		
		dt ₁ (min) =		C (m ³ /Pa) =	4.9E-1
Elapsed time (h	1	dt_2 (min) =		$C_{D}(-) =$	5.4E-0
10 2		$T_T (m^2/s) =$	1.8E-07		-2
		S(-) =	1.0E-06	י א כ	<u> </u>
10 1	10 III	$S(-) = K_s(m/s) =$	9.0E-09		
	and a state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the	$S_{s}(1/m) =$	5.0E-09		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10 ¹	Comments:	J.UE-00		
10 ¹		The recommended the analysis of the CHi confidence range for 08 m2/s to 4.0E-7 m is 2. The static press	phase, which sh r the interval tra n2/s. The flow d sure measured a	f 1.8E-7 m2/s was do ows a horizontal sta unsmissivity is estim imension displayed t transducer depth, v	bilisation. The ated to be 7.0E during the test was derived
10.0	10 ² 10 ³ 10 ⁴			ve extrapolation in t	ne Horner plot
10 [°] 10 ¹	10 ² 10 ³ 10 ⁴	from the CHir phase to a value of 6,546.		ve extrapolation in t	he Horner pl

	Test Si	ımr	nary Sheet			
Project:	Oskarshamn site investig					CHir
Area:	Laxe	emar	Test no:			
Borehole ID:	KL>	(19A	Test start:			070124 09:08
Test section from - to (m):	104.00-109.0	00 m	Responsible for			Stephan Rohs
			test execution:			Philipp Wolf
Section diameter, 2·r _w (m):	C	.076	Responsible for		Crist	ian Enachescu
			test evaluation:			
Linear plot Q and p			Flow period		Recovery period	
			Indata		Indata	
1200 KLX19A_104.00-109.00_070124_1_CHir_Q_r	P section P above P below	60	p ₀ (kPa) =	964		L
1190	· · · · · · · · · · · · · · · · · · ·	50	p _i (kPa) =	964		
			p _p (kPa) =		p _F (kPa) =	965
1100.		40	Q _p (m ³ /s)=	6.52E-04		
1 1 2 9		[nim/l]	tp (s) =		t _F (s) =	1200
1050		30 Bate	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-06
		Injec	EC _w (mS/m)=			
1000	-	20	Temp _w (gr C)=	8.8		
950		10	Derivative fact.=	0.01	Derivative fact.=	0.0
000 020 0.40 0.60 Elapsed T	0.60 1.00 1.20 1.40 ime [ħ]	1.	Results		Results	
				3.2E-05	Results	r
_og-Log plot incl. derivates- flo	aw pariod		Q/s $(m^{2}/s)=$	2.6E-05		
Log-Log plot lifel. derivates- in	ow period		$T_{\rm M} (m^2/s) =$			transiant
Elapsed time (h)			Flow regime: dt ₁ (min) =	transient	Flow regime: dt ₁ (min) =	transient
10 2 10 2						0.28
	10	-1	dt_2 (min) =			12.29
			$T(m^{2}/s) =$		$T(m^2/s) =$	7.7E-0
	0.	13	S (-) =	1.0E-06		1.0E-06
10		-2	$K_s (m/s) =$		$K_s (m/s) =$	1.5E-05
	10	ş	$S_{s}(1/m) =$		$S_s(1/m) =$	2.0E-07
		. (1/q) [mir	C (m³/Pa) =	NA	C (m³/Pa) =	5.0E-09
10 *	a she	14	C _D (-) =	NA	C _D (-) =	5.5E-01
	10	-3	ξ(-) =	4.2	ξ(-) =	7.2
Ā ·	3	E-4	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA
10 " 10 ^{~~} 10	10 ¹¹ , 10 ¹² , 10 ¹³		S _{GRF} (-) =	NA	S _{GRF} (-) =	NA
			D _{GRF} (-) =	NA	D _{GRF} (-) =	NA
Log-Log plot incl. derivatives-	recovery period		Selected represe			T
	10. ⁻¹ ***		dt_1 (min) =		C (m³/Pa) =	5.0E-09
10 2	10	3	dt_2 (min) =		C _D (-) =	5.5E-01
			$T_{T} (m^{2}/s) =$	6.8E-05	ξ(-) =	4.2
	300		S (-) =	1.0E-06		
10			$K_s (m/s) =$	1.4E-05		
	10	2	$S_{s}(1/m) =$	2.0E-07		
		y (kPa)	Comments:			
	30	0d-d) (0d-d)	The recommended			
10 ⁴	10	1	analysis of the CHi			
· · ·	.*		confidence range for 05 m2/s to 8.0E-5 m			
· · ·	l.					
	3		is 2. The static pres	sure measured a	t transducer denth x	vas derived
10 10 2	10 ³ 10 ⁴ 10 ⁵		is 2. The static pres from the CHir phas			

	Test Sum	mary Sheet			
Project:	Oskarshamn site investigation	Test type:[1]			CHi
Area:	Laxema	r Test no:			1
Borehole ID:	KLX19/	Test start:			070124 10:57
Test section from - to (m):	109.00-114.00 n	Responsible for			Stephan Rohs
Section diameter, 2·r _w (m):	0.07	test execution: Responsible for		Crist	Philipp Woli ian Enachescu
		test evaluation:			
Linear plot Q and p		Flow period		Recovery period	Í
		Indata		Indata	
1250 KLX19A_109.00-114.00_070124_1_CHir_Q_r	● Pserfin	p ₀ (kPa) =	1007		
1200	Patove Połow 45 Q	p _i (kPa) =	1006		
	40	p _p (kPa) =	1204	p _F (kPa) =	1007
• •		$Q_{p} (m^{3}/s) =$	6.98E-04		
2	- x	tp(s) =	1200	t _F (s) =	1200
; 1100	• 13 R.ao. 1 [imite	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-06
1050	- Inde tion	EC _w (mS/m)=		\/	1
		Temp _w (gr C)=	8.8		İ
1000		Derivative fact.=	0.03	Derivative fact.=	0.04
950 -	- 5				
0.00 0.00 1.00 Elapsed 7	1.50 2.00	Results		Results	
		$Q/s (m^2/s) =$	3.5E-05		1
Log-Log plot incl. derivates- flo	ow period	$T_{M} (m^{2}/s) =$	2.9E-05		
	en ponou	Flow regime:	transient	Flow regime:	transient
Elapsed time (h)		dt_1 (min) =		dt_1 (min) =	0.23
10 10 10		dt_2 (min) =		$dt_2 (min) =$	7.10
		-, ,		2	2.2E-04
• • • • • • • • • • • • • • • • • • • •		$T (m^2/s) =$ S (-) =	4.9E-04 1.0E-06	· · /	2.2E-04 1.0E-06
10 1	10 -2				
				K _s (m/s) = S _s (1/m) =	4.4E-05 2.0E-07
10 0		$S_{s}(1/m) =$	2.0E-07		
	.*	C (m ³ /Pa) =		C (m ³ /Pa) =	3.6E-09
		\tilde{E} C _D (-) =	NA	C _D (-) =	4.0E-01
10 -1	10 ⁻⁴	ξ(-) =	10.4	ξ(-) =	30.4
•		T _{GRF} (m ² /s) =	NA	T _{GRF} (m ² /s) =	NA
10 ¹⁴ 10 ¹⁵	10 ¹⁶ 10 ¹⁷ 10 ¹⁶	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
۳D		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA
Log-Log plot incl. derivatives-	recovery period	Selected represe	ntative paran		
	· • • • • •	dt_1 (min) =	0.55		3.6E-09
Elapsed time [h]		$dt_2 (min) =$		$C_{D}(-) =$	4.0E-0
	300	$T_{T} (m^2/s) =$	4.9E-04		10.4
		S(-) =	1.0E-06	יא <i>ו</i>	10
	10 2	$K_s (m/s) =$	9.8E-05		<u> </u>
10 1		$S_{s}(1/m) =$	2.0E-03		
	30	Comments:	2.00-01		
	10 1	The recommended	transmissivity of	f 4.9E-04 m2/s was	derived from the
10 0		Ś	2	ne), which shows a o	
	· · · · · · · · · · · · · · · · · · ·			e quality. The confi	
· · · · · · · · · · · · · · · · · · ·				ted to be 8.0E-05 m	
	10 °			d during the test is 2 oth, was derived from	
10 ¹ 10 ² tDICD	10 ⁻³ 10 ⁻⁴ 10 ⁻⁵			on in the Horner plo	
		1,007.1 kPa.		pic pic	

	Test Sur	nmary Sheet				
Project:	Oskarshamn site investigati	on Test type:[1]			CHi	
Area:	Laxen	nar Test no:				
Borehole ID:	: KLX19A				070124 17:05	
Test section from - to (m):	411.00-416.00	m Responsible for			Stephan Rohs	
Continu diameter 2 r (m):	0.0	test execution:		Crief	Philipp Wol ian Enachescu	
Section diameter, $2 \cdot r_w$ (m):	0.0	76 Responsible for test evaluation:		Clist	Ian Enachescu	
Linear plot Q and p		Flow period		Recovery period	l	
• •		Indata		Indata		
3750 KLX19A_411.00-416.00_070124_1_CHir_Q_r	Psecton	p ₀ (kPa) =	3497			
	P section P adous Policy Policy Q	p _i (kPa) =	3500			
3700	. 00	$p_p(kPa) =$		p _F (kPa) =	351	
	•	$\frac{Q_p (m^3/s)}{Q_p (m^3/s)} =$	2.83E-07	Pr (∝)		
	•	$\frac{Q_p (\Pi / S)}{tp (s)} =$		t _F (s) =	120	
3800		*		s el S [*] (-)=	1.00E-0	
	~	$S el S^{*}(-)=$	1.00L-00	Sel S (-)=	1.00L-0	
3550	A Constrained and a constrained and a constrained as	$EC_w (mS/m) =$	12			
		Temp _w (gr C)=	12		0.0	
300		Derivative fact.=	0.08	Derivative fact.=	0.0	
3450 0.00 0.20 0.40 0.60 EBased Th	0.80 1.00 1.20 1.40					
		Results		Results		
		Q/s (m ² /s)=	1.4E-08			
.og-Log plot incl. derivates- flo	ow period	T _M (m ² /s)=	1.1E-08			
		Flow regime:	transient	Flow regime:	transient	
Elapsed time [h]		dt ₁ (min) =	NA	dt ₁ (min) =	1.0	
	300	dt ₂ (min) =	NA	dt ₂ (min) =	2.2	
	. 2	$T(m^{2}/s) =$	3.2E-08	T (m²/s) =	3.9E-0	
	10	S (-) =	1.0E-06	、 、	1.0E-0	
10 1	30	$K_s(m/s) =$	6.3E-09	K _s (m/s) =	7.8E-0	
		$S_{s}(1/m) =$		$S_{s}(1/m) =$	2.0E-0	
	10 1	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	1.9E-1	
		$C_D(-) =$	NA	$C_{\rm D}(-) =$	2.1E-0	
10	3	$\xi(-) =$		ξ(-) =	8.	
· . ·	·.	ς (-)	0.0	יש (⁻) –	0.	
	• 10 °	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m²/s) =	NA	
10 ⁷ 10 ⁸	10 ⁹ 10 ¹⁰ 10 ¹¹	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
Ct		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA	
.og-Log plot incl. derivatives-	receivery period	Selected represe				
Log-Log plot incl. derivatives-	recovery period					
Elapsed time (h)	⁻² 10 . ⁻¹	dt_1 (min) =		C (m ³ /Pa) =	1.9E-1	
UI	10 3	dt_2 (min) =		$C_{D}(-) =$	2.1E-0	
		$T_{T}(m^{2}/s) =$	3.9E-08	ξ(-) =	8.	
	300	S (-) =	1.0E-06		<u> </u>	
10 ¹	10 2	$K_{s}(m/s) =$	7.8E-09			
· · · · · ·	UT	$S_{s}(1/m) =$	2.0E-07			
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	N			f 3.9E-08 m2/s was		
10 ⁻¹	10 '	-	1 (one), which shows a		
				e quality. The confi		
/ .	3			ted to be 8.0E-09 m d during the test is 2		
V				oth, was derived from		
10 [°] 10 ¹	10 ² 10 ³ 10 ⁴	pressure measured				
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Test section from - to (m): 416.00-421.00 m Responsible for test execution: Steph Phil Section diameter, 2·rw (m): 0.076 Responsible for test evaluation: Cristian Entest evaluation: Linear plot Q and p Flow period Recovery period Indata Indata p_0 (kPa) = 3548 p_0 (kPa) = 3553 p_p (kPa) = 3774 p_F (kPa) = Q_p (m ³ /s) = p_0 (s) = 10.2 t _F (s) = p_0 (kPa) = p_0 (kPa) =	F 25 08:2 an Roh lipp Wo achesc 355 168 1.00E-0 0.0
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Not Analysed $S_s(1/m) = NA = S_s(1/m) =$	1.0E-0
Not Analysed	6.5E-1
$O(m^3/D_2) = NA$	2.0E-0
C(m/Pa) = C(m/Pa) =	1.7E-1
$C_{D}(-)$ = NA $C_{D}(-)$ =	1.9E-0
$\xi(-) = NA \xi(-) =$	1.
$T_{GRF}(m^2/s) = NA$ $T_{GRF}(m^2/s) = NA$	
$S_{GRF}(-) = NA$ $S_{GRF}(-) = NA$	
$D_{GRF}(-) = NA$ $D_{GRF}(-) = NA$	
Log-Log plot incl. derivatives- recovery period Selected representative parameters.	
$\frac{dt_1 (min)}{dt_1 (min)} = \frac{0.22 C (m^3/Pa)}{dt_1 (min)} = \frac{0.22 C (min)}{dt_1 (min)} = \frac{0.22 C (min)}{dt_1 (min)} = \frac{0.22 C (min)}{dt_1 (min)} = 0.22 C (mi$	1.7E-1
$dt_2 (min) = 20.84 C_D (-) =$	1.9E-0
$T_{T}(m^{2}/s) = 3.2E-10\xi(-) =$	1.
S (-) = 1.0E-06	
$K_{\rm s} ({\rm m/s}) = 6.5E-11$	
$S_{s}(1/m) = 2.0E-07$	
Comments:	
The recommended transmissivity of 3.2E-10 m2/s was derived analysis of the Pi phase. The confidence range for the interval	
transmissivity is estimated to be 1.0E-10 to 6.0E-10 m2/s. The	l from th
$\frac{1}{100}$ dimension displayed during the test is 2. The static pressure co	
be extrapolated due to the very low transmissivity.	flow
36.4	flow
10 ⁶ 10 ¹ 10 ⁷ 10 ² 10 ⁴ 10 10 10 10 10 10 10 10 10 10 10 10 10 1	flow

			<u>nary Sheet</u>	-		
Project:	Oskarshamn site investigation		Test type:[1]			CH
Area:	Laxe	emar	Test no:			
Borehole ID:	KLX19A		Test start:			070125 10:0
Test section from - to (m):	421.00-426.0)0 m	Responsible for			Stephan Roh
		070	test execution:		0.51	Philipp Wo
Section diameter, 2·r _w (m):	0.	.076	Responsible for test evaluation:		Crist	ian Enacheso
_inear plot Q and p			Flow period		Recovery period	
F			Indata		Indata	
		T 10	p ₀ (kPa) =	3588		
3500 KLX19A_421.00-426.00_070124_1_CHir_Q_r	P section P above P above Pabove Q		p _i (kPa) =	NA		
900	·0		$p_p(kPa) =$	NA	p _F (kPa) =	NA
		ľ		NA	p _F (ki u)	1424
3850 -		ľ	$Q_p (m^3/s) =$ tp (s) =		t _F (s) =	
3830	×.	Rate [/min]				1.00E-
		ection Ra	S el S [*] (-)= EC _w (mS/m)=	1.00E-00	S el S [*] (-)=	1.00E-
****	· -/	•		10.0		───
3500	. J	3	Temp _w (gr C)= Derivative fact.=	12.2	Dorivativa fact -	NIA
- ²		Derivative fact.=	NA	Derivative fact.=	NA	
	•	1				
	40 0.50 0.60 0.70	1 0.80	Desults		De evilte	
Elapsed Time [h]		Results	NA	Results	1	
and the state of the state of the state of the state of the state of the state of the state of the state of the		Q/s (m²/s)=				
.og-Log plot incl. derivates- fl	ow period		$T_{\rm M} (m^2/s) =$	NA		
			Flow regime:	transient	Flow regime:	transient
			dt_1 (min) =	NA	dt_1 (min) =	NA
			dt_2 (min) =	NA	$dt_2 (min) =$	NA
			$T(m^{2}/s) =$		$T(m^{2}/s) =$	NA
			S (-) =	NA	S (-) =	NA
			K _s (m/s) =	NA	$K_s (m/s) =$	NA
Not A	nalysed		$S_{s}(1/m) =$	NA	$S_s(1/m) =$	NA
			C (m ³ /Pa) =	NA	C (m³/Pa) =	NA
			C _D (-) =	NA	C _D (-) =	NA
			ξ(-) =	NA	ξ(-) =	NA
			$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA
			S _{GRF} (-) =	NA	S _{GRF} (-) =	NA
			$D_{GRF}(-) =$	NA	D _{GRF} (-) =	NA
.og-Log plot incl. derivatives-	recovery period		Selected represe	entative param	neters.	
			dt ₁ (min) =	NA	C (m³/Pa) =	NA
			dt ₂ (min) =	NA	C _D (-) =	NA
			$T_{T} (m^{2}/s) =$	1.0E-11	ξ(-) =	NA
			S (-) =	NA		
			$K_s (m/s) =$	NA		1
			$S_{s}(1/m) =$	NA		
Not A	nalvsed		Comments:			
	Not Analysed		Based on the test re transmissivity is low		ed packer complian m2/s.	ce) the interva

	Test Su	ımı	<u>nary Sheet</u>			
Project:	Oskarshamn site investiga	atior	Test type:[1]			F
Area:	Laxe	emai	Test no:			
Borehole ID:	KLX19A		Test start:			070125 11:1
Fest section from - to (m):	426 00-431 ()0 m	Responsible for			Stephan Roh
	420.00 401.0		test execution:			Philipp Wo
Section diameter, 2·r _w (m):	0	.076	Responsible for		Crist	ian Enachesc
			test evaluation:			
inear plot Q and p			Flow period		Recovery period	I
300		1 30	Indata		Indata	ī
KLX19A_426.00-431.00_070124_1_Pi_Q_r	P section Pabove Pelow		p ₀ (kPa) =	3629		
	۵.	25	p _i (kPa) =	3636		
300			p _p (kPa) =	3867	p _F (kPa) =	371
		2.0	Q _p (m ³ /s)=	NA		
		o [I/min]	tp (s) =	10.2	t _F (s) =	360
3700.		رت Injection Rate [السام	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0
3700 -		linje	EC _w (mS/m)=			
989 	· · · · · · · · · · · · · · · · · · ·	1.0	Temp _w (gr C)=	12.3		
·····	:		Derivative fact.=	NA	Derivative fact.=	0.0
300						
3550	• •	0.0				
0.00 0.20 0.40 0.60 0.80 Elaps	1.00 1.20 1.40 1.60 ed Time [h]		Results		Results	
				NA	Results	
og-Log plot incl. derivates- f	low pariod		Q/s (m ² /s)=	NA		
.og-Log plot incl. derivates- i	low period		$T_{\rm M}$ (m ² /s)=		F 1	1
			Flow regime:	transient	Flow regime:	transient
			dt ₁ (min) =	NA	dt ₁ (min) =	3.2
			dt_2 (min) =	NA	dt_2 (min) =	57.7
			$T(m^{2}/s) =$	NA	T (m²/s) =	2.3E-1
			S (-) =	NA	S (-) =	1.0E-0
			$K_s (m/s) =$	NA	K _s (m/s) =	4.6E-7
			$S_{s}(1/m) =$	NA	S _s (1/m) =	2.0E-0
			C (m ³ /Pa) =	NA	C (m³/Pa) =	1.4E-1
			$C_{D}(-) =$	NA	$C_{D}(-) =$	1.5E-0
			ξ(-) =	NA	ξ(-) =	1
			5.()			
			$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA
			$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
			$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA
og-Log plot incl. derivatives	- recovery period		Selected represe			I ^{. •} `
			dt_1 (min) =	3.29	_	1.4E-1
Elapsed time	[h] 10, ⁻¹ 10, ⁰ 10, ¹		$dt_1 (min) =$ $dt_2 (min) =$		$C (m^{2}/Pa) = C_{D} (-) =$	1.4E-
10 2		. ,				
		10	$T_{T}(m^{2}/s) =$	2.3E-11	ξ(-) =	1
10 1			S (-) =	1.0E-06		
•		10 0	$K_s (m/s) =$	4.6E-12		
مسمعين أ	A. M. M. M. M. M. M. M. M. M. M. M. M. M.	s.	$S_{s}(1/m) =$	2.0E-07		
10 *	. And the second	Anted Dress	Comments:			
· / ·	- States and a second	10 ⁻¹ 000			f 2.3E-11 m2/s was	
			analysis of the Pi pl			
				imated to be 0.0	F_{-12} to 6 0 F_{-11} m ²	l/s The flow
10 ⁻¹			transmissivity is est			
10 ⁻⁷ · · ·		10 -2	dimension displaye	d during the test	is 2. The static pres	
0 -1 · · · · · · · · · · · · · · · · · ·		10 2		d during the test	is 2. The static pres	

	Test S	umn	nary Sheet			
Project:	Oskarshamn site investig	gation	Test type:[1]			CHir
Area:	La>	xemar	Test no:			1
Borehole ID:	KLX19A		Test start:			070125 13:20
Test section from - to (m):	431.00-436.00 m					Stephan Rohs
Section diameter, 2·r _w (m):	+	0.076	test execution: Responsible for		Crist	Philipp Wolf ian Enachescu
		0.010	test evaluation:		Chot	
Linear plot Q and p	-		Flow period	•	Recovery period	l
			Indata		Indata	
3950		0.003	p ₀ (kPa) =	3671		
KLX19A_431.00-436.00_070124_1_CHir_Q_r	P sector Patove Potove O	in i	p _i (kPa) =	3722		
3900			p _p (kPa) =	3902	p _F (kPa) =	3793
3850			$Q_{p} (m^{3}/s) =$	1.67E-08	F1 (- 7	
		0.002	$\frac{d_p(m/s)}{tp(s)} =$		t _F (s) =	1200
3800		tade (litmin	s el S [*] (-)=		⊊ (0) S el S [*] (-)=	1.00E-06
3750		njection R	S el S (-)= EC _w (mS/m)=	1.001-00	ง⊌ง(-)=	1.001-00
	••• ••••••	0.001	Temp _w (gr C)=	12.3		
300		-	Derivative fact.=		Derivative fact.=	0.03
3650	• • • •	:	Denvalive laci	0.18	Derivative lact	0.00
-		_				
3000 0.20 0.40 0.60 Elapse	0.80 1.00 1.20 d Time [h]	1.40	Populto		Results	
			Results	0.45.40		1
			Q/s (m ² /s)=	9.1E-10		
.og-Log plot incl. derivates- f	low period		$T_{\rm M} (m^2/s) =$	7.5E-10		
Elapsed time (?	0]		Flow regime:	transient	Flow regime:	transient
10	· · · · · · · · · · · · · · · · · · ·		dt ₁ (min) =	NA	dt ₁ (min) =	NA
			dt_2 (min) =	NA	dt_2 (min) =	NA
	***	3000	T (m²/s) =		T (m²/s) =	2.0E-11
		3	S (-) =	1.0E-06	,,	1.0E-06
	. • •	10	$K_{s}(m/s) =$	3.2E-11	$K_s (m/s) =$	4.0E-12
		300 g	$S_{s}(1/m) =$	2.0E-07	S _s (1/m) =	2.0E-0
		(1/d) (min	C (m³/Pa) =	NA	C (m³/Pa) =	4.1E-1
10-1		10 ²	C _D (-) =	NA	C _D (-) =	4.5E-03
•	-		ξ(-) =	-1.5	ξ(-) =	-2.8
	3	30				
			T _{GRF} (m ² /s) =	NA	T _{GRF} (m ² /s) =	NA
10 ⁻¹ 10 ⁰ 10	10 ¹ 10 ² 10 ³	10	S _{GRF} (-) =	NA	S _{GRF} (-) =	NA
			D _{GRF} (-) =	NA	D _{GRF} (-) =	NA
_og-Log plot incl. derivatives	 recovery period 		Selected represe	ntative paran	eters.	-
	ime Bil		dt ₁ (min) =	NA	C (m³/Pa) =	4.1E-1
Elapsed ti	······ ['9]	•••••]	dt_2 (min) =	NA	$C_{D}(-) =$	4.5E-03
		10 3	$T_{T} (m^{2}/s) =$	1.6E-10		-1.5
	/	-	S (-) =	1.0E-06		1
		300	$K_s (m/s) =$	3.2E-11		<u> </u>
		10.2	$S_{s}(1/m) =$	2.0E-07		
10 -1			Comments:	I		
10 ⁻⁴						
10 ⁻¹¹				tranemicaivity	$1.6E_{10} m^{2/2} m^{2/2}$	derived from the
10 ⁻⁴		30	The recommended		1.6E-10 m2/s was close to show a hori	
8 ³		30 10 ¹	The recommended	phase, which is	close to show a hori	zontal
5°		30 10 ¹	The recommended analysis of the CHi stabilization. The co estimated to be 8.01	phase, which is onfidence range E-11 m2/s to 8.0	close to show a hori for the interval tran E-10 m2/s. The flow	zontal smissivity is v dimension
10 ⁻¹	, and the second second second second second second second second second second second second second second se	30 10 ¹	The recommended analysis of the CHi stabilization. The constitution of the solution of the sol	phase, which is onfidence range E-11 m2/s to 8.0 e test is 2. The s	close to show a hori for the interval tran E-10 m2/s. The flow tatic pressure measu	zontal smissivity is v dimension red at
80 ⁻¹		30 10 ¹	The recommended analysis of the CHi stabilization. The crestimated to be 8.01 displayed during the transducer depth, w	phase, which is onfidence range E-11 m2/s to 8.0 e test is 2. The s as derived from	close to show a hori for the interval tran E-10 m2/s. The flow	zontal smissivity is v dimension red at g straight line

Des. 1 1		mmary Sheet				
Project:	Oskarshamn site investiga	ion lest type:[1]			F	
Area:	Laxer	nar Test no:				
Borehole ID:	KLX	9A Test start:		070125 15:0		
Test section from - to (m):	436.00-441.00) m Responsible for			Stephan Roh	
		test execution:			Philipp Wo	
Section diameter, 2·r _w (m):	0.	076 Responsible for		Crist	tian Enachesc	
₋inear plot Q and p		test evaluation: Flow period		Recovery period	4	
linear plot & and p		Indata		Indata		
4000			3712	inuata	T	
KLX19A_436.00-441.00_070125_1_CHir_Q_r	P section Patrove Politove	$p_0 (kPa) =$				
3250	· _	p _i (kPa) =	3725		27	
300		p _p (kPa) =		p _F (kPa) =	372	
		$\mathbb{Q}_p(m^3/s) =$	NA	1 (-)	1.0	
3350		$\frac{\text{tp}(s)}{\text{sp}(s)} = \frac{1}{s} \frac{s}{s} \frac{s}$		t _F (s) =	162	
	$\langle \cdot \cdot \cdot \rangle$	§ 3 el 3 (-)-	1.00E-06	S el S [*] (-)=	1.00E-0	
		[*] EC _w (mS/m)=				
3750 -		™ Temp _w (gr C)=	12.4			
	· · · · · · · · · · · · · · · · · · ·	Derivative fact.=	= NA	Derivative fact.=	0.0	
3700						
2050 0.00 0.20 0.40 0.60 Elapsed	0.80 1.00 1.20	[∞] Results		Results		
		$Q/s (m^2/s) =$	NA	Results		
_og-Log plot incl. derivates- fl	ow pariod		NA			
Log-Log plot men derivates- n		T _M (m²/s)= Flow regime:	transient	Flow regime:	transient	
		dt_1 (min) =	NA	-	0.2	
		$dt_2 (min) =$	NA	±11 ()	7.2	
		- ()		at ₂ ()		
		$T(m^2/s) =$	NA	$T(m^2/s) =$	1.8E-1	
		Ξ()	NA	S (-) =	1.0E-0	
		$K_s(m/s) =$	NA	$K_s (m/s) =$	3.6E-1	
		$S_{s}(1/m) =$	NA	$S_{s}(1/m) =$	2.0E-0	
		C (m ³ /Pa) =	NA	C (m ³ /Pa) =	1.1E-1	
		$C_D(-) =$	NA	C _D (-) =	1.2E-0	
		ξ(-) =	NA	ξ(-) =	1	
		$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m²/s) =	NA	
		$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA	
_og-Log plot incl. derivatives-	recovery period	Selected repres				
	· · · · / /	dt_1 (min) =	0.20		1.1E-1	
10 ⁻⁴ 10 ⁻³ Linearce units (1)	10, ²	dt_2 (min) =		$C_{D}(-) =$	1.2E-0	
		$T_{T}(m^{2}/s) =$	1.8E-10		1.	
	10	S(-) =	1.0E-06		1.	
	0.03	$\frac{S(-)}{K_{s}(m/s)} =$	3.6E-11			
	<u></u>	$R_{s}(11/s) = S_{s}(1/m) =$	2.0E-07			
	10	Comments:	2.00-07			
·:			tronomissivite -	F1 8E 10	dominad from 4	
10 -1	•			f 1.8E-10 m2/s was ence range for the i		
		······································		E-11 to 6.0E-10 m2		
1	10					
	ł	dimension display	ed during the test	is 2. The static pres	ssure could not	
		be extrapolated du			ssure could not	

	Test Sum	mary Sheet				
Project:	Oskarshamn site investigation				CHi	
Area:	Laxema	r Test no:			ŕ	
Borehole ID:	KLX194	Test start:		070125 16:48		
Test section from - to (m):	441.00-446.00 n	n Responsible for		Stephan Roh		
		test execution:			Philipp Wol	
Section diameter, 2·r _w (m):	0.076	Responsible for test evaluation:		Crist	ian Enachescu	
Linear plot Q and p		Flow period		Recovery period		
		Indata		Indata	•	
4000	• 0.050	p ₀ (kPa) =	3752			
KLX19A_441.00-446.00_070125_1_CHir_Q_r	● P section ● P above ● P below	p ₀ (kPa) = p _i (kPa) =	3732			
3950	· o				274	
		p _p (kPa) =		p _F (kPa) =	374	
9900		Q _p (m ³ /s)=	4.00E-07			
•		tp (s) =		t _F (s) =	120	
3850	0.030 Å	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0	
		EC _w (mS/m)=				
3800	0.020	Temp _w (gr C)=	12.5		1	
		Derivative fact.=	0.05	Derivative fact.=	0.0	
3750						
3700	a 000					
0.00 0.20 0.40 0.60 Elapsed	0.80 1.00 1.20 1.40 d Time [h]	Results		Results		
			1.9E-08		1	
		Q/s (m ² /s)=				
.og-Log plot incl. derivates- f	low period	$T_{M} (m^{2}/s) =$	1.6E-08			
Excertise D		Flow regime:		Flow regime:	transient	
10 ²	. 10 ¹² 10 ¹⁴ 10 ⁹	dt_1 (min) =		dt_1 (min) =	NA	
	300	dt_2 (min) =	13.45	dt ₂ (min) =	NA	
		$T(m^{2}/s) =$	2.9E-08	T (m²/s) =	2.4E-0	
	10	S (-) =	1.0E-06	S (-) =	1.0E-0	
10	40.0	$K_s (m/s) =$		$K_s (m/s) =$	4.8E-0	
	30	$S_{s}(1/m) =$		$S_{s}(1/m) =$	2.0E-0	
	10, 10		NA		1.4E-1	
		C (m ³ /Pa) =		C (m ³ /Pa) =		
10		$C_{\rm D}(-) =$	NA	$C_D(-) =$	1.5E-0	
		ξ(-) =	4.5	ξ(-) =	3.	
	10 °	T _{GRF} (m ² /s) =	NA	T _{GRF} (m²/s) =	NA	
10 [°] 10 [°]	10 ⁷ 10 ⁸ 10 ⁹	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
			NA		NA	
		- GRF ()		= GRF ()	INA	
.og-Log plot incl. derivatives	· recovery period	Selected represe			I · ·= ·	
Elapsed time [1	1) -2 0 10 -1	dt_1 (min) =		C (m ³ /Pa) =	1.4E-1	
10 1		dt_2 (min) =		C _D (-) =	1.5E-0	
3. Martine and a second	200	$T_{T} (m^{2}/s) =$	2.9E-08	ξ(-) =	4.	
244	10 2	S (-) =	1.0E-06			
		$K_s (m/s) =$	5.8E-09			
	50	$S_{s}(1/m) =$	2.0E-07			
10 ⁻¹		Comments:		8		
	20		transmissivity	f 2.9E-08 m2/s was	derived from th	
				prizontal part is less		
	10 1			onfidence range for t		
0.3						
0.3	and the second second		imated to be 1.0	E-08 m2/s to 8.0E-0	08 m2/s. The	
0.3	and a second and a second and a second	transmissivity is est		E-08 m2/s to 8.0E-0 e test is 2. The statio		
0.3 10 ⁻¹ 10 ⁻¹ 10 ⁻¹ 10 ⁻¹		transmissivity is est flow dimension disp measured at transdu	played during th icer depth, was o		c pressure lir phase using	

	Test Sumr	nary Sheet			
Project:	Oskarshamn site investigation	Test type:[1]			CHi
Area:	Laxemar	Test no:			1
Borehole ID:	KLX19A	Test start:	070125 18:36		
Test section from - to (m):	446.00-451.00 m	Responsible for			Stephan Rohs
		test execution:			Philipp Wol
Section diameter, 2·r _w (m):	0.076	Responsible for test evaluation:		Crist	ian Enachescu
Linear plot Q and p		Flow period		Recovery period	
		Indata		Indata	•
		p ₀ (kPa) =	3792		
4050 KLX19A_446.00-451.00_070125_1_CHir_Q_r	● P section ● P sectore ● P below	p _i (kPa) =	3789		
4000	• P below • Q	$p_p(kPa) =$		p _F (kPa) =	3789
· r	0.8	$Q_p (m^3/s) =$	5.17E-06	. , ,	210.
3950		$\frac{d_p(m/s)}{tp(s)} =$		t _F (s) =	1200
	[ci uu] ee	S el S [*] (-)=		⊈ (3) S el S [*] (-)=	1.00E-06
- · · · ·	· 0.4 ar	EC _w (mS/m)=	1.001 00		1.501 00
3350		Temp _w (gr C)=	12.5		
·	0.2	Derivative fact.=		Derivative fact.=	0.03
300					
37-50 0.00 0.20 0.40 0.50 Elapsed	0.80 1.00 1.20 1.40	Results		Results	
		$Q/s (m^2/s)=$	2.5E-07	Results	
.og-Log plot incl. derivates- fl	ow period	$T_{M} (m^{2}/s) =$	2.1E-07		
0 01	•	Flow regime:	transient	Flow regime:	transient
Elapsed time (h		dt_1 (min) =	0.57	dt_1 (min) =	0.4
10 ²	10,	dt_2 (min) =		dt_2 (min) =	1.5
	10 1	$T(m^2/s) =$		$T(m^{2}/s) =$	9.3E-0
10 ¹		S (-) =	1.0E-06	· · ·	1.0E-0
• • • • • • • • • • • • • • • • • • •		$K_s(m/s) =$	6.5E-08	K _s (m/s) =	1.9E-0
	10 [°]	$S_{s}(1/m) =$	2.0E-07	S _s (1/m) =	2.0E-0
10 °		C (m ³ /Pa) =	NA	C (m ³ /Pa) =	3.9E-1
	10 ⁻⁴	$C_{D}(-) =$	NA	$C_{D}(-) =$	4.2E-0
10 -1		ξ(-) =	1.4	ξ(-) =	9.
	10 -	$T_{GRF}(m^2/s) =$	NA	$T_{GRF}(m^2/s) =$	NA
10 ⁴ 10 ⁶ 10 ⁶ 1D	10 ⁷ 10 ⁸ 10 ⁹	S _{GRF} (-) =	NA	S _{GRF} (-) =	NA
		D _{GRF} (-) =	NA	D _{GRF} (-) =	NA
.og-Log plot incl. derivatives-	recovery period	Selected represe	ntative paran	neters.	
		dt ₁ (min) =	0.57	C (m³/Pa) =	3.9E-1
Elapsed time (h)	°.01	dt ₂ (min) =	4.69	C _D (-) =	4.2E-0
		$T_{T} (m^{2}/s) =$	3.2E-07	ξ(-) =	1.4
	300	S (-) =	1.0E-06		
		$K_s (m/s) =$	6.5E-08		
	10 [°]	$S_{s}(1/m) =$	2.0E-07		
	30 b	Comments:			
×	8			f 3.2E-07 m2/s was	
10 °	10 ¹	2	1 \	ne), which shows ho quality than the CH	
				quality than the CH ansmissivity is estim	1
	3	08 m2/s to 8.0E-07	m2/s. The flow	dimension displaye	d during the test
10 ¹ 10 ²	10 ⁻² 10 ⁻⁴ 10 ⁻⁵	is 2. The static pres	sure measured a	t transducer depth, y	was derived
				line extrapolation in	the Horner plot
		to a value of 3,786.	з кРа.		

	Test Su	mmary Sheet				
Project:	Oskarshamn site investigat	ion Test type:[1]			CHir	
Area:	Laxer	nar Test no:			1	
Borehole ID:	KLX1	9A Test start:		070126 09:34		
Test section from - to (m):	551.00-556.00) m Responsible for			Stephan Rohs	
		test execution:			Philipp Wolf	
Section diameter, 2·r _w (m):	0.0	076 Responsible for test evaluation:		Crist	tian Enachescu	
Linear plot Q and p		Flow period		Recovery period	1	
F F		Indata		Indata		
4050 1		∞ p ₀ (kPa) =	4650			
KLX19A_551.00-556.00_070126_1_CHir_Q_r	P section P below P below O	p_i (kPa) =	4613			
40.00	·•••••••••••••••••••••••••••••••••••••	$p_p(kPa) =$		p _F (kPa) =	4612	
4650	0		4.17E-08			
7		m_{g} tp (s) =		t _F (s) =	1200	
- 400 -		sel S [*] (-)=		s el S [*] (-)=	1.00E-06	
4 4750		EC _w (mS/m)=		3 6 3 (-)-		
<u>8</u>		Temp _w (gr C)=	13.9			
4700	• •	Derivative fact.=		Derivative fact.=	0.02	
*	.		0.12		0.02	
4800	0 1.00 1.20 1.40 1.60 Time [h]	[∞] Results	I	Results		
		$Q/s (m^2/s)=$	1.4E-09		1	
Log-Log plot incl. derivates- fl	ow period	$T_{M} (m^2/s) =$	1.4E-09			
Log-Log plot mei. denvates- n		Flow regime:	transient	Flow regime:	transient	
Elapsed time [h	10 ⁻¹	dt_1 (min) =		dt_1 (min) =	NA	
10 '	A REPORT OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PA	dt_2 (min) =		$dt_1 (min) =$ $dt_2 (min) =$	NA	
· · · · · · · · · · · · · · · · · · ·	300	- 、 ,		2	6.3E-09	
	10 2	$T (m^2/s) =$ S (-) =	1.4E-09 1.0E-06	· · ·	0.3E-09 1.0E-06	
10 °	10	$(-) = K_{s}(m/s) =$		$K_{s} (m/s) =$	1.0E-00 1.3E-09	
	30	$S_{s}(11/s) = S_{s}(1/m) =$		$S_{s}(11/s) = S_{s}(1/m) =$	2.0E-07	
		Nut I	2.0E-07		2.0E-07 2.0E-11	
4	10 1	$C (m^3/Pa) = C_{D} (-) =$	NA	$C (m^{3}/Pa) = C_{D} (-) =$	2.0E-11 2.2E-03	
10 -1		C D()		S D()		
	3	ξ(-) =	2.0	ξ(-) =	21.5	
	10 °	$T_{GRF}(m^2/s) =$	NA	$T_{GRF}(m^2/s) =$	NA	
10 ² 10 ³	10 ⁴ 10 ⁵ 10 ⁶	$S_{GRF}(-) =$	NA	$S_{GRF}(m/s) =$	NA	
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA	
Log-Log plot incl. derivatives-	recovery period	Selected repres				
Log-Log plot men derivatives	recovery period	dt_1 (min) =		C (m ³ /Pa) =	2.0E-11	
Elapsed time [h]	· · · 10, ⁻¹ · · · · · · · 10, ⁰ · · · · · · · · 10, ¹	$dt_1 (min) =$ $dt_2 (min) =$		$C_{D}(-) =$	2.0E-11 2.2E-03	
		. ,	1.4E-09		2.2E-03	
	300	$T_T (m^2/s) =$ S (-) =	1.4E-09 1.0E-06		2.0	
	-	$(-) = K_{s}(m/s) =$	2.8E-10			
10 Jacobson	10 ²	$S_{s}(1/m) =$	2.8E-10 2.0E-07			
	The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon	S _s (1/m) = ፪Comments :	2.0⊏-07			
a ya	30 30	lot	tranomicaivity	f 1.4E-09 m2/s was	derived from the	
10 "	10 '			iows horizontal stab		
		~	1 /	noisy. The confider		
./	3	interval transmissi	vity is estimated	to be 8.0E-10 m2/s	to 6.0E-09 m2/s.	
/.				a flow dimension o		
			of transdugar da	nth wood dorived fro	m the ('Hir	
10 ⁰ 10 ¹ tD/CD	10 ² 10 ³ 10 ⁴	pressure measured		ion in the Horner pla		

	Test Su	ımr	nary Sheet				
Project:	Oskarshamn site investiga	ation	Test type:[1]			F	
Area:	lave	mar	Test no:				
Alea.	Laxe	inai	rest no.				
Borehole ID:	KLX	(19A	.Test start:		070126 11:34		
Test section from - to (m):	556.00-561.0)0 m	Responsible for			Stephan Roh	
			test execution:			Philipp Wo	
Section diameter, 2·r _w (m):	0	.076	Responsible for test evaluation:		Crist	ian Enachesc	
Linear plot Q and p			Flow period		Recovery period	4	
			Indata		Indata		
			p ₀ (kPa) =	4694	indutu		
5000 KLX19A_556.00-561.00_070126_1_PI_Q_r		10	p _i (kPa) =	NA			
4950	● P section ● P sector ● P telow	9	$p_{p}(kPa) =$	NA	p _F (kPa) =	#NV	
	• P below • Q	8		NA	р _F (кга) -	#1 N V	
	•	7	$Q_{p} (m^{3}/s) =$		t (a) -		
- 4850 -	ì	o [um	tp (s) =		t _F (s) =	1.000	
48.00 -		h oction Rate [1	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0	
4750		1 oct	EC _w (mS/m)=				
		3	Temp _w (gr C)=	14.0			
400		2	Derivative fact.=	NA	Derivative fact.=	NA	
4850		1					
****		_					
0.00 0.20 0.40 0.60 0.80 Elapsed T	1.00 1.20 1.40 1.80 Fime [h]		Results		Results		
			Q/s $(m^{2}/s)=$	NA			
.og-Log plot incl. derivates- flo	ow period		$T_{M} (m^{2}/s) =$	NA			
			Flow regime:	transient	Flow regime:	transient	
			dt_1 (min) =	NA	dt_1 (min) =	NA	
			dt_2 (min) =	NA	dt_2 (min) =	NA	
			$T(m^2/s) =$	1.0E-11		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	
Not An	nalysed			NA		NA	
			C (m ³ /Pa) =		C (m ³ /Pa) =		
			C _D (-) =	NA	C _D (-) =	NA	
			ξ(-) =	NA	ξ(-) =	NA	
			$T_{GRF}(m^2/s) =$	NA	$T_{GRF}(m^2/s) =$	NA	
			S _{GRF} (-) =	NA	S _{GRF} (-) =	NA	
			D _{GRF} (-) =	NA	D _{GRF} (-) =	NA	
og-Log plot incl. derivatives-	recovery period		Selected represe			_	
			dt ₁ (min) =	NA	C (m³/Pa) =	NA	
			dt ₂ (min) =	NA	C _D (-) =	NA	
			$T_{T} (m^{2}/s) =$	1.0E-11	ξ(-) =	NA	
		S (-) =	NA				
			$K_s (m/s) =$	NA		1	
			$S_{s}(1/m) =$	NA		1	
Not An	alvsed		Comments:				
i vot z marysod		Based on the test re transmissivity is low			ce) the interva		

	<u> </u>	mmary Sheet					
Project:	Oskarshamn site investiga	tion Test type:[1]			CH		
Area:	Laxei	mar Test no:					
Borehole ID:	KLX ²	19A Test start:		070126 13:58			
Test section from - to (m):	561.00-566.0	0 m Responsible for			Stephan Roh		
		test execution:			Philipp Wo		
Section diameter, 2·r _w (m):	0.	076 Responsible for		Crist	ian Enachesc		
Linear plot Q and p		test evaluation: Flow period		Recovery period			
		Indata		Indata			
5100		p ₀ (kPa) =	4738				
KLX19A_561.00-566.00_070126_1_CHir_Q_r	P section P above P balow Q	p _i (kPa) =	NA				
		$p_p(kPa) =$	NA	p _F (kPa) =	NA		
5000		$\frac{1}{Q_{p}} (m^{3}/s) =$	NA	F1 (- 7			
-4950	, · · · · · · · · · · · · · · · · · · ·	$t_{n}(c) =$	0	t _F (s) =			
400		sel S [*] (-)=		S el S [*] (-)=	1.00E-0		
480		EC _w (mS/m)=		\/	1		
4800	× ·	. Temp _w (gr C)=	14		1		
4750		Derivative fact.=	NA	Derivative fact.=	NA		
4700		- 1					
4550		• 0					
0.00 0.10 0.20 0.30 Elapsed	0.40 0.50 0.60 0 Time [h]	Results		Results			
		Q/s (m^{2}/s)=	NA				
.og-Log plot incl. derivates- fl	ow period	$T_{M} (m^{2}/s) =$	NA				
		Flow regime:	transient	Flow regime:	transient		
		dt_1 (min) =	NA	dt ₁ (min) =	NA		
		dt_2 (min) =	NA	dt_2 (min) =	NA		
		T (m²/s) =		T (m²/s) =	NA		
		S (-) =	NA	S (-) =	NA		
		$K_s (m/s) =$	NA	$K_s (m/s) =$	NA		
Not Ar	nalysed	$S_{s}(1/m) =$	NA	$S_{s}(1/m) =$	NA		
		C (m ³ /Pa) =	NA	C (m³/Pa) =	NA		
		$C_D(-) =$	NA	$C_{D}(-) =$	NA		
		ξ(-) =	NA	ξ(-) =	NA		
		T (2)	NA	T (, ² ())	NA		
		$T_{GRF}(m^2/s) = S_{GRF}(-) =$	NA NA	$T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$	NA NA		
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA		
.og-Log plot incl. derivatives-	recovery period	Selected repres					
		dt_1 (min) =	NA	C (m ³ /Pa) =	NA		
		$dt_2 (min) =$	NA	$C(III /Pa) = C_D(-) =$	NA		
		$T_{T} (m^2/s) =$		ξ(-) =	NA		
		S(-) =	NA	، ۲			
		$K_s (m/s) =$	NA		<u> </u>		
		$S_{s}(1/m) =$	NA				
Not Ar	nalvsed	Comments:	1				
		Based on the test r transmissivity is lo		ed packer complian m2/s.	ce) the interva		

	Test Sumr	nary Sheet	-			
Project:	Oskarshamn site investigation	Test type:[1]			Р	
Area:	Laxemar	Test no:			1	
Borehole ID:	KLX19A	Test start:		070126 14:59		
Test section from - to (m):	566.00-571.00 m				Stephan Rohs	
		test execution:			Philipp Wol	
Section diameter, 2 r _w (m):	0.076	Responsible for test evaluation:		Crist	ian Enachescu	
Linear plot Q and p		Flow period		Recovery period	1	
		Indata		Indata	-	
80.60 x		p ₀ (kPa) =	4779			
KLX19A_566.00-571.00_070126_1_Pi_Q_r	P section Patow Phatow Phatow	p _i (kPa) =	4797			
50.00	·	$p_p(kPa) =$		p _F (kPa) =	4862	
	t a		NA	р _F (кга) -	400.	
489	i	$Q_{p} (m^{3}/s) =$		t (a) -	2(0)	
400	o e	tp (s) =		t _F (s) =	3600	
	5	S el S [°] (-)=	1.00E-06	S el S [*] (-)=	1.00E-06	
4850	- 4 ⁸ 4	EC _w (mS/m)=				
400	• 3	Temp _w (gr C)=	14.1			
	• 2	Derivative fact.=	NA	Derivative fact.=	0.02	
4750						
4700	i 1.00 1.20 1.40 1.60 ed Time [h]	Results		Results		
		Q/s (m²/s)=	NA			
og-Log plot incl. derivates-	flow period	$T{\rm M} (m^2/s) =$	NA			
		Flow regime:	transient	Flow regime:	transient	
		dt_1 (min) =	NA	dt_1 (min) =	0.29	
		dt_2 (min) =	NA	dt_2 (min) =	14.10	
		$T(m^2/s) =$	NA	$T (m^2/s) =$	2.0E-10	
		S(-) =	NA	S(-) =	1.0E-06	
		$K_{s}(m/s) =$	NA	K _s (m/s) =	4.0E-1	
		$S_{s}(1/m) =$	NA		4.0E-1 2.0E-07	
Not a	nalysed		NA	$S_{s}(1/m) =$	2.0E-07 1.6E-17	
		$C (m^{3}/Pa) =$		C (m ³ /Pa) =		
		C _D (-) =	NA	C _D (-) =	1.8E-03	
		ξ(-) =	NA	ξ(-) =	0.6	
		T _{GRF} (m ² /s) =	NA	T _{GRF} (m²/s) =	NA	
		S _{GRF} (-) =	NA	S _{GRF} (-) =	NA	
		D _{GRF} (-) =	NA	D _{GRF} (-) =	NA	
Log-Log plot incl. derivatives	- recovery period	Selected represe	ntative param	neters.		
Elapsed time		dt ₁ (min) =		C (m³/Pa) =	1.6E-1 ⁻	
10 ²	10, ¯10, ¯3	dt_2 (min) =		$C_{D}(-) =$	1.8E-03	
		$T_{T} (m^{2}/s) =$	2.0E-10		0.6	
	10 °	S (-) =	1.0E-06	3 ()		
		$K_s (m/s) =$	4.0E-11			
10	0.3	$S_{s}(1/m) =$	2.0E-07			
		Comments:	2.32 37		1	
0 00 0 0 00 00 000 000 000 000	10 - 1 person		transmissivity of	$20E 10 m^{2}/s was$	derived from the	
10 0		The recommended analysis of the Pi pl				
		interval transmissiv				
	10 -2	flow dimension disp	played during th	e test is 2. The station		
		not be extrapolated	due to the very	low transmissivity.		

	Test Sun	mary Sheet			
Project:	Oskarshamn site investigation	on Test type:[1]			Р
Area:	lavem	ar Test no:			1
Alca.	Laxen				
Borehole ID:	KLX19	A Test start:			070126 17:42
Test section from - to (m):	631 00-636 00	m Responsible for			Stephan Rohs
	001.00 000.00	test execution:			Philipp Wol
Section diameter, 2·r _w (m):	0.0	6 Responsible for		Crist	ian Enachescu
Linear plot Q and p		test evaluation: Flow period		Recovery period	1
Linear plot & and p		Indata		Indata	
6590	• P settin	p ₀ (kPa) =	5309	indutu	I
KLX19A_631.00-636.00_070126_1_PI_Q_r	P section P above P babave Q 42		NA		
5500			NA	p _F (kPa) =	#NV
	•	$Q_{p} (m^{3}/s) =$	NA	F1 ()	
5480 - [6 43]	•	$\frac{d_p(m/s)}{tp(s)} =$	0	t _F (s) =	(
5400 ·		¹ S el S [*] (-)=		S el S [*] (-)=	1.00E-06
D own those	•	EC _w (mS/m)=			
S150-	•	- ()	15.0		
	• •		NA	Derivative fact.=	NA
5300 -					
5250 ·····	1.00 1.20 1.40 1.80				
0.00 0.20 0.40 0.60 0.80 Elapsed		Results		Results	
		Q/s $(m^{2}/s)=$	NA		
Log-Log plot incl. derivates- fl	ow period	T _M (m ² /s)=	NA		
		Flow regime:	transient	Flow regime:	transient
		dt ₁ (min) =	NA	dt ₁ (min) =	NA
		dt_2 (min) =	NA	dt ₂ (min) =	NA
		$T(m^{2}/s) =$	1.00E-11	T (m²/s) =	NA
		S (-) =	NA	S (-) =	NA
		$K_{s}(m/s) =$	NA	$K_s (m/s) =$	NA
Not Ar	nalvsed	$S_{s}(1/m) =$	NA	S _s (1/m) =	NA
10071	ury sou	C (m ³ /Pa) =	NA	C (m³/Pa) =	NA
		C _D (-) =	NA	$C_D(-) =$	NA
		ξ(-) =	NA	ξ(-) =	NA
		$T_{GRF}(m^2/s) =$	NA	$T_{GRF}(m^2/s) =$	NA
		$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
		$D_{GRF}(-) =$	NA	D _{GRF} (-) =	NA
Log-Log plot incl. derivatives-	recovery period	Selected repres			DA A
		$dt_1 (min) = dt_2 (min) =$	NA NA	C (m ³ /Pa) = C _D (-) =	NA NA
		±12 (·····)		O ()	
		$T_T (m^2/s) =$ S (-) =	1.0E-11 NA	ξ(-) =	NA
		$S(-) = K_s(m/s) =$	NA		
		$R_{s}(11/s) =$ $S_{s}(1/m) =$	NA		
a.		Comments:	11/1		I
Not Ar	larysed			ed packer complian m2/s.	ce) the interval

	Test Sum	mary Sheet			
Project:	Oskarshamn site investigatio	n Test type:[1]			F
Area:	lavom	ar Test no:			
Alca.	Lavenia	a restric.			
Borehole ID:	KLX19	A Test start:			070127 08:2
Test section from - to (m):	636.00-641.00 r	n Responsible for			Stephan Roh
		test execution:			Philipp Wo
Section diameter, 2·r _w (m):	0.07	6 Responsible for		Crist	tian Enachesc
Linear plot Q and p		test evaluation: Flow period		Recovery period	4
Linear plot & and p		Indata		Indata	
9600	τ 50	p ₀ (kPa) =	5353		
KLX19A_636.00-641.00_070127_1_Pi_Q_r	Psetion 45	p ₀ (kPa) =	NA		
5550 ·	Pabove P below Q 4.0	$p_p(kPa) =$	NA	p _F (kPa) =	NA
	• •	$Q_p (m^3/s) =$	NA	ρ _F (Ki α) –	INA.
5500	• .	$\frac{Q_p (M/S)}{tp (s)} =$		t _F (s) =	
				⊈ (3) S el S [*] (-)=	1.00E-0
2920.	2 5 0 2 5 0 2 6 0	S el S [*] (-)= EC _w (mS/m)=	1.002-00	Sel S (-)=	1.00L-0
5400	* 20 =	Temp _w (gr C)=	15.0		
·	• 15	Derivative fact.=		Derivative fact.=	NA
5350	· · · · · · · · · · · · · · · · · · ·	Derivative lact	INA	Derivative lact	INA.
	0.5 • • • • • • • • • • • • • • • • • • •				
5300 0.0 0.1 0.2 0.3 0.4 Elapsed	0.5 0.8 0.7 0.8 0.9 Time [h]	Results		Results	
		$Q/s (m^2/s)=$	NA	Results	
.og-Log plot incl. derivates- fl	ow period	$T_{M} (m^{2}/s) =$	NA		
Log-Log plot men. derivates- m		Flow regime:	transient	Flow regime:	transient
		dt_1 (min) =	NA	dt_1 (min) =	NA
		dt_2 (min) =	NA	$dt_2 (min) =$	NA
		$T (m^2/s) =$		$T (m^2/s) =$	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
Not Ar	nalysed	$C_{s}(1/11)$ C (m ³ /Pa) =	NA	C (m ³ /Pa) =	NA
		$C_{D}(-) =$	NA	$C(m/Pa) = C_{D}(-) =$	NA
		$\xi(-) =$	NA	ξ(-) =	NA
		ς(-) –		ς (-)	
		$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA
		$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA
.og-Log plot incl. derivatives-	recovery period	Selected repres			1
U - U F	· · · · · · · ·	dt_1 (min) =	NA	C (m ³ /Pa) =	NA
		$dt_2 (min) =$	NA	$C_{D}(-) =$	NA
		$T_T (m^2/s) =$	1.0E-11		NA
		S (-) =	NA	21/	1
		$K_s (m/s) =$	NA		
		$S_{s}(1/m) =$	NA		1
NT 4 A	nalvead	Comments:	1		<u> </u>
		Based on the test re transmissivity is lo		ed packer compliant m2/s.	tee) the interval

	Test Su	ımr	nary Sheet					
Project:	Oskarshamn site investiga	ation	Test type:[1]			P		
Area:		mor	Test no:					
Alea.	Laxe	mai	rest no.					
Borehole ID:	KLX	(19A	Test start:		070127 09:4			
Test section from - to (m):	641.00-646.0)0 m	Responsible for			Stephan Roh		
			test execution:			Philipp Wol		
Section diameter, 2·r _w (m):	0.	.076	Responsible for		Crist	ian Enachescu		
Linear plot Q and p			test evaluation: Flow period		Recovery period	4		
			Indata		Indata			
			p ₀ (kPa) =	5393				
KLX19A_641.00-646.00_070127_1_Pi_Q_r	P section P above P below	5.0	p _i (kPa) =	NA				
9600		4.5	$p_p(kPa) =$	NA	p _F (kPa) =	NA		
5550 1	' 'Ay	4.0	$Q_p (m^3/s) =$	NA	pr (a)			
		• 3.5	$\frac{d_p(m/s)}{tp(s)} =$		t _F (s) =			
5500		3.0 [ujuv] e	S el S [*] (-)=		⊊ (e) S el S [*] (-)=	1.00E-0		
5430 -		2.5 2 0000	$EC_w (mS/m) =$	1.002.00	3 el 3 (-)-	1.001 0		
		2.0 ਵੈ	Temp _w (gr C)=	15.1				
5400	· · · ·	1.5	Derivative fact.=		Derivative fact.=	NA		
530	•	1.0	Derivative lact	INA	Derivative lact	INA		
23-90		0.5						
5300 0.10 0.20 0.30 0.40	0.50 0.60 0.70 0.80 Time [b]	0.0	Results		Results			
Elapsed	ume (nj		$Q/s (m^2/s)=$	NA	Results			
Log-Log plot incl. derivates- fl	ow period		$T_{\rm M} (m^2/s) =$	NA				
			Flow regime:	transient	Flow regime:	transient		
			dt_1 (min) =	NA	dt_1 (min) =	NA		
			$dt_1(min) =$ $dt_2(min) =$	NA	$dt_1(min) =$ $dt_2(min) =$	NA		
				1.0E-11		NA		
			$T (m^2/s) =$ S (-) =	NA NA	T (m /s) = S (-) =	NA		
				NA		NA		
			$K_{s}(m/s) = S_{s}(1/m) =$	NA	$K_{s} (m/s) = S_{s} (1/m) =$	NA		
Not Ar	nalysed			NA		NA		
			C (m ³ /Pa) =		C (m ³ /Pa) =			
			$C_{D}(-) =$	NA	$C_{D}(-) =$	NA		
			ξ(-) =	NA	ξ(-) =	NA		
			2	NT A	2	NT A		
			$T_{GRF}(m^2/s) = S_{CRF}(-) =$	NA NA	$T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$	NA NA		
			- GRF()	NA				
on Lon plot incl. derivatives	racovary pariod		D _{GRF} (-) = Selected represe		D _{GRF} (-) =	NA		
_og-Log plot incl. derivatives-	recovery period		dt ₁ (min) =	NA		NA		
				NA NA	C (m ³ /Pa) = C _D (-) =	NA		
			- 2 ()		-0()	NA		
			$T_T (m^2/s) =$ S (-) =	1.0E-11 NA	چ(-) =	INA		
			$S(-) = K_{s}(m/s) =$	NA				
				NA NA				
			$S_s(1/m) =$ Comments:	INA				
Not Analysed		Based on the test re transmissivity is low			ce) the interval			

	Test Sur	<u>nmary Sheet</u>	-		
Project:	Oskarshamn site investigat	ion Test type:[1]			CHi
Area:	Laxen	nar Test no:			1
Borehole ID:	KLX1	9A Test start:	070127 11:03		
Test section from - to (m):	646.00-651.00) m Responsible for			Stephan Rohs
Desting disperture 0 g (m)	0.0	test execution:		Oriot	Philipp Wol
Section diameter, $2 \cdot r_w$ (m):	0.0	076 Responsible for test evaluation:		Crist	ian Enachescu
Linear plot Q and p		Flow period		Recovery period	1
•		Indata		Indata	
5700 KLX19A_646.00-651.00_070127_1_CHir_Q_r		[∞] p ₀ (kPa) =	5434		
NLX 154_046.00461.00_0/012/_1_C/III_4_1	P section P above P below Q	p _i (kPa) =	5418		
9850	0.00			p _F (kPa) =	544
9000 -		$\frac{Q_{p} (m^{3}/s)}{Q_{p} (m^{3}/s)} =$	7.67E-08	. , ,	
		$\frac{d_p(m/s)}{tp(s)} =$		t _F (s) =	120
3350		S el S [*] (-)=		⊊ (e) S el S [*] (-)=	1.00E-00
5500	· · · · · · · · · · · · · · · · · · ·	<u>.</u>	1.002.00	S el S (-)-	1.002 0
5450		Temp _w (gr C)=	15.2		
				Derivative fact.=	0.02
5400	<u></u>	Derivative lact	0.15		0.0.
5350 0.00 0.20 0.40 0.60 0.80 Elapsed Tim	1.00 1.20 1.40 1.60	Results		Results	
			3.2E-09		
and an ulatinal derivates fl		$Q/s (m^2/s) =$	3.2E-09 2.6E-09		
.og-Log plot incl. derivates- flo	ow period	$T_{\rm M} (m^2/s) =$			
4 3 Bapsed time [h]	-1 0	Flow regime:	transient	Flow regime:	transient
10 2		dt_1 (min) =		dt_1 (min) =	1.04
		$dt_2 (min) =$		$dt_2 (min) =$	2.5
	10 3	$T(m^{2}/s) =$		$T(m^{2}/s) =$	2.0E-0
10 E	200	S (-) =	1.0E-06		1.0E-0
	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	$K_s (m/s) =$		$K_s (m/s) =$	4.0E-1
• • • • • • • • • • • • • • • • • • •	▲ 10 ²	$S_{s}(1/m) =$		$S_{s}(1/m) =$	2.0E-0
	· A harm too	^b C (m ³ /Pa) =	NA	C (m ³ /Pa) =	2.6E-1
10 °	30	${}^{3}C_{D}(-) =$	NA	$C_D(-) =$	2.9E-0
		ξ(-) =	1.4	ξ(-) =	-1.1
	10 1				
		$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA
dt 01 01	U U U	S _{GRF} (-) =	NA	S _{GRF} (-) =	NA
		$D_{GRF}(-) =$	NA	D _{GRF} (-) =	NA
.og-Log plot incl. derivatives-	recovery period	Selected represe	entative paran	neters.	
Elapsed time [h]	10 ⁰ 10 ¹	dt_1 (min) =		C (m³/Pa) =	2.6E-1
10 1		dt_2 (min) =	2.55	C _D (-) =	2.9E-0
-	300	$T_{T} (m^{2}/s) =$	2.0E-09	ξ(-) =	-1.1
	0	S (-) =	1.0E-06		
10.°	10 2	$K_{s}(m/s) =$	4.0E-10		Ī
and the state of the state of the state of the state of the state of the state of the state of the state of the		$S_{s}(1/m) =$	2.0E-07		
at the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se	30	Comments:			
	10 1	(ode	transmissivity of	f 2.0E-09 m2/s was	derived from the
10 -1				one), which shows a	
	3			y. The confidence ra	
				to be 9.0E-09 m2/s	
L	10 °			ng the test is 2. The	
10 ⁰ 10 ¹ 10/10/10	10 ² 10 ³ 10 ⁴			derived from the CH rner plot to a value	

	Test Si	ımr	nary Sheet				
Project:	Oskarshamn site investig	ation	Test type:[1]			CH	
Area:	Laxe	emar	Test no:				
Borehole ID:	KL>	(19A	Test start:	070127 13:03			
Test section from - to (m):	651.00-656.0	00 m	Responsible for test execution:			Stephan Roh Philipp Wo	
Section diameter, 2·r _w (m):	C	.076	Responsible for		Crist	ian Enachesc	
			test evaluation:				
Linear plot Q and p			Flow period		Recovery period	1	
			Indata		Indata		
5750		0.003	p ₀ (kPa) =	5475			
KLX19A_651.00-656.00_070127_1_CHir_Q_r	P section P above P below		p _i (kPa) =	NA			
57.00			p _p (kPa) =	NA	p _F (kPa) =	NA	
9850	•		$Q_{p} (m^{3}/s) =$	NA			
	•	0.002	tp (s) =	0	t _F (s) =		
· 98.00 ·	•	Rate [I/min]	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0	
5550	· ·	jection R	$EC_w (mS/m) =$				
	······································	£ 0.001	Temp _w (gr C)=	15.2			
5500				NA	Derivative fact.=	NA	
5430	· · · · · · · ·						
5400 0.00 0.10 0.20 0.30 0.40 0.50 Elapsed		0.000	Results		Results		
Lapace -	rua fud		$Q/s (m^2/s)=$	NA	Results		
.og-Log plot incl. derivates- fl	ow pariod			NA			
Log-Log plot mel. derivates- n	ow period		T _M (m²/s)= Flow regime:		Elow rogimo:	transiont	
			-	transient	Flow regime:	transient	
			dt_1 (min) =		dt_1 (min) =	NA	
			dt_2 (min) =		$dt_2 (min) =$	NA	
			$T(m^{2}/s) =$		$T(m^{2}/s) =$	NA	
			S (-) =	NA	S (-) =	NA	
			$K_s (m/s) =$		K _s (m/s) =	NA	
Not Ar	nalvsed		$S_{s}(1/m) =$	NA	S _s (1/m) =	NA	
			C (m³/Pa) =	NA	C (m³/Pa) =	NA	
			C _D (-) =	NA	C _D (-) =	NA	
			ξ(-) =	NA	ξ(-) =	NA	
			$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA	
			S _{GRF} (-) =	NA	S _{GRF} (-) =	NA	
			D _{GRF} (-) =	NA	D _{GRF} (-) =	NA	
.og-Log plot incl. derivatives-	recovery period		Selected represe			-	
			dt ₁ (min) =		C (m ³ /Pa) =	NA	
			dt_2 (min) =		$C_{D}(-) =$	NA	
			$T_{T} (m^{2}/s) =$	1.00E-11		NA	
			S (-) =	NA			
			$K_s (m/s) =$	NA			
			$S_{s}(1/m) =$	NA			
Not Ar	alused		Comments:			<u> </u>	
			Based on the test re transmissivity is low	esponse (prolong wer than 1.0E-11	ed packer complian m2/s.	ce) the interval	

	Test Sur	nmary Sheet			
Project:	Oskarshamn site investigati	on Test type:[1]			CHir
Area:	Laxem	ar Test no:			1
Borehole ID:	KLX1	9A Test start:			070127 14:22
Test section from - to (m):	656.00-661.00	m Responsible for			Stephan Rohs
		test execution:			Philipp Wolf
Section diameter, 2·r _w (m):	0.0	76 Responsible for test evaluation:		Crist	tian Enachescu
Linear plot Q and p		Flow period		Recovery period	4
		Indata		Indata	•
		$p_0 (kPa) =$	5516		1
5800 KLX19A_656.00-661.00_070127_1_CHir_Q_r	Pacton Patow Pbalow Pbalow	p _i (kPa) =	5536		
5750	P bilow Q 0.0	$p_p(kPa) =$		p _F (kPa) =	5686
•		$Q_{p} (m^{3}/s) =$	8.33E-08	,	5000
5700		tp(c) =		t _F (s) =	1200
7	0.00	Sel S [*] (-)=		s el S [*] (-)=	1.00E-06
Die Press	0.00	15 er S (-)= 10 €C _w (mS/m)=	1.001-00	5 el 5 (-)=	1.002-00
500 ·	0.0	Temp _w (gr C)=	15.3		
5590		5		Derivative fact.=	0.02
500			0.03		0.02
5420 0.00 0.20 0.40 0.60 0.60	100 120 140 160 180	0			
0.00 0.20 0.40 0.80 0.80 Elapsed		Results	•	Results	
		Q/s (m^{2}/s)=	3.5E-09		
Log-Log plot incl. derivates- fl	ow period	$T_{M} (m^{2}/s) =$	2.9E-09		
		Flow regime:	transient	Flow regime:	transient
Elapsed time	[h]10, -1	dt_1 (min) =	#NV	dt_1 (min) =	#NV
	10	dt_2 (min) =	#NV	$dt_2 (min) =$	#NV
		T (m²/s) =		$T(m^{2}/s) =$	5.3E-10
10 1	-	S (-) =	1.0E-06		1.0E-06
A 0 00 00 AA D 00 BERNAN	10 Mar 10 Mar 10	$K_{s}(m/s) =$		$K_s (m/s) =$	1.1E-10
2 10 °		$S_{s}(1/m) =$		$S_{s}(1/m) =$	2.0E-07
••	110	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	1.4E-10
· .		$C_{\rm D}(-) =$	NA	C _D (-) =	1.6E-02
10 4		ξ(-) =	-0.8	ξ(-) =	-2.5
	10	$T_{GRF}(m^2/s) =$	NA	$T_{GRF}(m^2/s) =$	NA
10 [°] 10 ¹	10 ² 10 ³ 10 ⁴	$I_{GRF}(m/s) =$ $S_{GRF}(-) =$	NA	$I_{GRF}(m / s) =$ $S_{GRF}(-) =$	NA
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA
Log-Log plot incl. derivatives-	recovery period	Selected represe			112
Log-Log plot mel. denvatives-	recovery period	dt_1 (min) =	#NV	C (m ³ /Pa) =	1.4E-10
10. ⁻³ Elapsed time	[h] 10 ⁻¹ 10 ⁰	$dt_2 (min) =$	#NV	$C_{D}(-) =$	1.6E-02
10 2		$T_{T} (m^2/s) =$	6.5E-10		-2.5
		S(-) =	1.0E-06		-2.0
10 1	10	$K_{s}(m/s) =$	1.3E-10		
	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se	$S_{s}(1/m) =$	2.0E-07		
	10 III		2.0E-07		
10 °	A A A			66 5E 10 2/	de niene d'Orenne de s
A A A A A A A A A A A A A A A A A A A				f 6.5E-10 m2/s was ne). The inner zones	
10 4	10			onfidence range for	
		transmissivity is est	timated to be 3.0)E-10 m2/s to 3.0E-	09 m2/s. A flow
				tatic pressure measu	
10 ⁰ 10 10 10 10 10 10 10 10 10 10 10 10 10	10 ² 10 ³			the CHir phase usin a value of 5,623.5 k	
				t time, the derived h	
		representative for the			

			nary Sheet			
Project:	Oskarshamn site investiga	tion	Test type:[1]			F
Area:	Laxe	mar	Test no:			
Borehole ID:	KLX	19A	Test start:			070127 17:13
Fest section from - to (m):	661.00-666.0	0 m	Responsible for			Stephan Roh
		·	test execution:			Philipp Wo
Section diameter, 2·r _w (m):	0.		Responsible for		Crist	ian Enachesc
_inear plot Q and p			test evaluation: Flow period		Recovery period	1
			Indata		Indata	
		L.	p ₀ (kPa) =	5557	indata	
SICO KLX19A_661.00-666.00_070127_1_Pi_Q_r	● P section ● P above ● P balow		$p_0(kr a) =$ $p_i(kPa) =$	5560		
5750	P balow · Q		$p_i(kPa) =$ $p_p(kPa) =$		p _F (kPa) =	555
:					р _Е (кга) –	33.
5700			$Q_p (m^3/s) =$	NA 10.2	1 (1) -	5.44
		- Maria	tp (s) =		t _F (s) =	540
***			S el S [°] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0
			EC _w (mS/m)=			
800	*****	L L	Temp _w (gr C)=	15.4		
550	•••••••••••••••••••••••••••••••••••••••	1.0	Derivative fact.=	NA	Derivative fact.=	0.0
······	۲	0.5				
5000 0.50 1.00 0.00 0.50 Elaps	1.50 2.00 ed Time [h]	0.0	Results		Results	
		L.		NA	Results	
.og-Log plot incl. derivates-1	flow pariod		$Q/s (m^2/s) =$	NA		
.og-Log plot incl. derivates-	now period		T _M (m ² /s)=			transiant
			Flow regime:	transient	Flow regime:	transient
			$dt_1 (min) =$	NA	dt_1 (min) =	NA
			$dt_2 (min) =$	NA	$dt_2 (min) =$	NA
			$T(m^2/s) =$	NA	$T(m^2/s) =$	4.0E-1
			S (-) =	NA	S (-) =	1.0E-0
			$K_s(m/s) =$	NA	$K_s (m/s) =$	8.0E-1
Not a	inalysed		$S_{s}(1/m) =$	NA	$S_{s}(1/m) =$	2.0E-0
			C (m ³ /Pa) =	NA	C (m ³ /Pa) =	1.4E-1
			C _D (-) =	NA	$C_{D}(-) =$	1.5E-0
			ξ(-) =	NA	ξ(-) =	-3.
			T _{GRF} (m ² /s) =	NA	T _{GRF} (m²/s) =	NA
			$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
			D _{GRF} (-) =	NA	D _{GRF} (-) =	NA
.og-Log plot incl. derivatives	- recovery period		Selected represe	entative param		
			dt_1 (min) =	NA	C (m³/Pa) =	1.4E-1
Elapsed time	[N]10, ⁻¹		dt_2 (min) =	NA	$C_{D}(-) =$	1.5E-0
	0.3		$T_T (m^2/s) =$	4.0E-10		-3
	10		S (-) =	1.0E-06		
			K _s (m/s) =	8.0E-11		
•	0.0		$S_{s}(1/m) =$	2.0E-07		
	110	1000	Comments:			
· · ··································	10	aub b	The recommended	transmissivity	$4.0E-10 m^{2/s} was$	derived from t
10 -1	£ 0.0		analysis of the Pi pl			
			skin. The confidence			
	10				flow dimension wa	
	1.0					
10 ⁻² 10 ⁻¹	10 ^{°°} 10 [°] 10 [°]		2. The static pressu transmissivity.			

	Test Sum	nary Sheet				
Project:	Oskarshamn site investigation				CHir	
Area:	Laxema	Test no:			1	
Borehole ID:	KLX19A	Test start:			070128 18:17	
Test section from - to (m):	666.00-671.00 m	Responsible for test execution:		Stephan Roh Philipp Wo		
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:		Crist	ian Enachescu	
Linear plot Q and p		Flow period		Recovery period		
		Indata		Indata		
		p ₀ (kPa) =	5598			
5800 KLX19A_666.00-671.00_070127_1_CHir_Q_r	P section P below	p _i (kPa) =	5595			
	• P balow • Q	$p_p(kPa) =$		p _F (kPa) =	5671	
5750	0.15	$Q_p (m^3/s) =$	1.00E-06	p _F (ki u)	5071	
. \		$\frac{Q_p (M/S)}{tp (s)} =$		t _F (s) =	1200	
हु जळ- इ				u⊧ (3) = S el S [*] (-)=	1.00E-06	
n sezu	our and a second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	S el S [*] (-)= EC _w (mS/m)=	1.002-00	Sel S (-)=	1.00L-00	
5 880 ·	· *	$Temp_w(gr C)=$	15.4			
	· · · ·	Derivative fact.=		Dorivativa fact -	0.05	
500	0.05	Derivative fact.=	0.01	Derivative fact.=	0.05	
550	•					
0.00 0.20 0.40 0.60 Elapsed T	0.80 1.00 1.20 1.40 0.00 Ime[h]	Results		Results		
		Q/s (m²/s)=	5.0E-08			
Log-Log plot incl. derivates- fle	ow period	T _M (m ² /s)=	4.1E-08			
		Flow regime:	transient	Flow regime:	transient	
Elapsed time (h)		$dt_1 (min) =$		dt ₁ (min) =	0.43	
10 2	F10 ²	dt_2 (min) =		dt ₂ (min) =	0.96	
		T (m²/s) =		T (m²/s) =	3.1E-07	
1	30	S (-) =	1.0E-06		1.0E-06	
10 1		K _s (m/s) =		$K_s (m/s) =$	6.2E-08	
	10 To	S _s (1/m) =	2.0E-07	S _s (1/m) =	2.0E-07	
••••	i manageri i se se se se se se se se se se se se se	C (m³/Pa) =	NA	C (m³/Pa) =	6.4E-11	
10 °	المكتمين.	C _D (-) =	NA	C _D (-) =	7.1E-03	
· · · · .	10 °	ξ(-) =	-0.4	ξ(-) =	4.8	
· ·						
	03	$T_{GRF}(m^2/s) =$	NA	$T_{GRF}(m^2/s) =$	NA	
	10 ³ 10 ⁴ 10 ⁵	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
		D _{GRF} (-) =	NA	D _{GRF} (-) =	NA	
Log-Log plot incl. derivatives-	recovery period	Selected represe	entative paran			
		dt ₁ (min) =	0.43	C (m³/Pa) =	6.4E-11	
Elapsed time [h]	· · · · 10, ⁻² · · · · · · · 10, ⁻¹ · · · · · · · · · · · · ·	dt_2 (min) =	0.96	$C_{D}(-) =$	7.1E-03	
10		$T_{T} (m^{2}/s) =$	3.1E-07		4.8	
-	300	S (-) =	1.0E-06			
1	10 2	$K_s (m/s) =$	6.2E-08			
10 °	at the second second	$S_{s}(1/m) =$	2.0E-07			
	· · · · · · · · · · · · · · · · · · ·	Comments:				
	in the second second second second second second second second second second second second second second second		transmissivity of	f 3.1E-07 m2/s was o	derived from the	
10 *	10 ' 8			one), which shows he		
		stabilization in a se	gment of the der	ivative. The confide	nce range for	
	3	the interval transmi	ssivity is estimation	ted to be 8.0E-08 m2	2/s to 4.0E-07	
L	10 °			d during the test is 2		
10 ⁰ 10 ¹ tD/CD	10 ^{°2} 10 ^{°3} 10 ^{°4}			oth, was derived from in the Horner plot		
				n in the Horner plot uration and the low		
				ve for the formation.		
			- r			

			<u>nary Sheet</u>	-		
Project:	Oskarshamn site investiga	ation	Test type:[1]			P
Area:	Laxe	emar	Test no:			1
Borehole ID:	KLX	(19A	Test start:			070128 10:07
Test section from - to (m):	671.00-676.0	00 m	Responsible for			Stephan Rohs
			test execution:			Philipp Wol
Section diameter, 2·r _w (m):	0	.076	Responsible for		Crist	ian Enachescu
_inear plot Q and p			test evaluation: Flow period		Recovery period	1
			Indata		Indata	
90 1		- 5.0	p ₀ (kPa) =	5638	indutu	
KLX19A_671.00-676.00_070128_1_Pi_Q_r	P section P above P below	45	p _i (kPa) =	5642		
950	.o	4.0	$p_p(kPa) =$		p _F (kPa) =	569
900	\ \ \ \	35	$Q_p (m^3/s) =$	NA		507
			$\frac{Q_p(\Pi/s)}{tp(s)} =$		t _F (s) =	360
5750	*****	3.0 [Junin] 2.5 B	S el S [*] (-)=		s el S [*] (-)=	1.00E-0
5700 -		25 ujection B	EC _w (mS/m)=	1.002.00	Sel S (-)-	1.001 0
		20 =	Temp _w (gr C)=	15.5		
950	•	1.5	Derivative fact.=		Derivative fact.=	0.0
960)	• 	1.0		1111		0.0
· · · · ·	:	0.5				
6550	1.00 1.20 1.40 1.60 1.80 d Time [h]	0.0	Results		Results	
			$Q/s (m^2/s)=$	NA		
.og-Log plot incl. derivates- f	low period		$T_{\rm M} (m^2/s) =$	NA		
			Flow regime:	transient	Flow regime:	transient
			dt_1 (min) =	NA	dt_1 (min) =	NA
			dt_2 (min) =	NA	$dt_2 (min) =$	NA
			$T(m^2/s) =$	NA	$T(m^2/s) =$	3.7E-1
			S (-) =	NA	S (-) =	1.0E-0
			$K_s (m/s) =$	NA	K _s (m/s) =	7.4E-1
			$S_{s}(1/m) =$	NA	$S_{s}(1/m) =$	2.0E-0
			C (m ³ /Pa) =	NA	C (m ³ /Pa) =	1.8E-1
			$C(m/Pa) = C_D(-) =$	NA	$C_{D}(-) =$	2.0E-0
			ξ(-) =	NA	ξ(-) =	-0.
			ς (-)		ς(-) -	0.
			T _{GRF} (m ² /s) =	NA	T _{GRF} (m ² /s) =	NA
			$I_{GRF}(m / s) =$ $S_{GRF}(-) =$	NA	$I_{GRF}(m / s) =$ $S_{GRF}(-) =$	NA
			$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA
.og-Log plot incl. derivatives	- recovery period		Selected represe			1
			dt_1 (min) =	NA	C (m³/Pa) =	1.8E-1
Elapsed time	[h] 10 ⁻¹ 10 ⁰ 10 ¹ .	1	dt_2 (min) =	NA	$C_{D}(-) =$	2.0E-0
			$T_T (m^2/s) =$	3.7E-11		-0.
		з	S(-) =	1.0E-06	- יוו כי	0.
	-		$K_{s}(m/s) =$	7.4E-12		
10 [°]		10	$S_{s}(1/m) =$	2.0E-07		
		0.3 20	Comments:	2.02 07		
and the second second	75.	of petholo	The recommended	transmissivity of	$3.7E_{-11} m^{2}/s was$	derived from th
and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec	10 ⁻¹ 0	analysis of the Pi pl			
10-1	· · · · · · · · · · · · · · · · · · ·	ł			o be 8.0E-12 to 5.0	
10 ⁻¹	- A-	ł				
10 ⁻¹	**************************************	0.03	flow dimension disp	played during the	e test is 2. The statio	
10		0.03		played during the	e test is 2. The statio	

	Test Sum	mary Sheet				
Project:	Oskarshamn site investigation	on Test type:[1]			CHi	
Area:	Laxem	ar Test no:			1	
Borehole ID:	KLX19	A Test start:		070128 12:2		
est section from - to (m):	676.00-681.00	m Responsible for			Stephan Rohs	
Caption diameter 2 r (m);	0.07	test execution:		Cried	Philipp Wol	
Section diameter, 2·r _w (m):	0.07	'6 Responsible for test evaluation:		Clis	ian Enachescu	
_inear plot Q and p		Flow period		Recovery period	1	
· ·		Indata		Indata		
990	· 0.005	p ₀ (kPa) =	5679			
KLX19A_676.00-681.00_070128_1_CHir_Q_r	Psection Pabove Pbelow Q	p _i (kPa) =	5664			
500	· · · · · · · · · · · · · · · · · · ·	$p_p(kPa) =$	5879	p _F (kPa) =	566	
5850 ·		$Q_{p} (m^{3}/s) =$	4.33E-08	,		
	0.003			t _F (s) =	120	
5800		S el S [*] (-)=		c⊧ (0) S el S [*] (-)=	1.00E-0	
5750	······································		1.002-00	5 el 5 (-)=	1.00E-0	
	0.002	Temp _w (gr C)=	15.6			
5700	· \	Derivative fact.=		Derivative fact.=	0.0	
	0.001	Derivative lact	0.17	Derivative lact	0.0	
5600 0.20 0.40 0.60 0.80 0.00 0.20 0.40 Elapsed Time [Results		Results		
		Q/s $(m^{2}/s)=$	2.0E-09			
og-Log plot incl. derivates- flov	w period	$T_{\rm M} (m^2/s) =$	1.6E-09			
	•	Flow regime:	transient	Flow regime:	transient	
Eupsed time [n]	0,0,0,0,0,0,0,0,0,0,0,0,	dt_1 (min) =		dt_1 (min) =	NA	
	3000	dt_2 (min) =		dt_2 (min) =	NA	
1		$T (m^2/s) =$		$T(m^2/s) =$	4.3E-0	
	10 3	S (-) =	1.0E-06	. ,	1.0E-0	
		$K_s (m/s) =$		K _s (m/s) =	8.6E-1	
	300	$S_{s}(1/m) =$		$S_{s}(1/m) =$	2.0E-0	
	10 2	4 · · · ·	NA	C (m ³ /Pa) =	2.3E-1	
		$\frac{1}{2} C (m^3/Pa) = C_{D} (-) =$	NA	· · ·	2.5E-0	
	30	- 0 ()		-0()	2.5⊑-0 9.	
	· · · · ·	ξ(-) =	4.2	ξ(-) =	9.	
<u>.</u>		$T_{GRF}(m^2/s) =$	NA	$T_{GRF}(m^2/s) =$	NA	
10 ⁴ 10 ⁵ 10	10 ⁶ 10 ⁷ 10 ⁸	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA	
.og-Log plot incl. derivatives- re	ecovery period	Selected represe	entative paran			
Elapsed time [h]		dt_1 (min) =		C (m ³ /Pa) =	2.3E-1	
0 ²		dt_2 (min) =		$C_{D}(-) =$	2.5E-0	
	10 3	$T_{T} (m^{2}/s) =$	2.4E-09		4.	
		S (-) =	1.0E-06			
	300	$K_s (m/s) =$	4.8E-10			
	10 2	$S_{s}(1/m) =$	2.0E-07			
		Comments:	2.02 01			
: Reset	. 30	The recommended	trancmissivity	$f_{2} 4F_{00} m_{2/c} was$	derived from th	
	×.	analysis of the CHi				
, je	10 ¹	stabilization althou				
	•	the interval transmi	ssivity is estimat	ted to be 8.0E-10 m	2/s to 6.0E-09	
·/	3	m2/s. The flow dim				
10° 10'		pressure measured				
10 10 tD/CD	10 ² 10 ³ 10 ⁴	phase using straight	t line anter - 1 .	on in the Hammen 1	at to a realizer - C	

Oskarshamn site investiga						
Oskalshanni sile investiga	ation <u>T</u>	est type:[1]			СН	
Laxe	emar T	est no:				
KLX	(19A T	est start:	070128 14:1			
681.00-686.0	00 m R	esponsible for		Stephan Rol		
					Philipp Wo	
0.				Cris	tian Enachesc	
				Recovery perio	d	
	5,5,5					
			5720	indutu		
P section P above Delow						
· 0	2			n- (kPa) =	572	
				ρ _F (κι α) –	512	
				t (c) -	120	
	1				1.00E-0	
			1.00E-00	୦ ୧୮୦ (-)=	1.00E-0	
λ	0.0		15.0		┥───	
	0.4	envalive lact.=	0.01	Derivative lact.=	0.0	
	1 ^{0.2}					
0.80 1.00 1.20 1.40 Time [h]			8	Results		
ow period			2.4E-07			
1		-	transient	•	transient	
<u>10</u> , ⁻²	d	t ₁ (min) =			NA	
30	30 d	t ₂ (min) =	16.88	dt ₂ (min) =	NA	
	Т	$(m^2/s) =$	2.5E-07	T (m²/s) =	2.2E-0	
1	" S	(-) =	1.0E-06	S (-) =	1.0E-0	
3	, K	s (m/s) =	5.0E-08	K _s (m/s) =	4.4E-0	
• • • • • •	S	s (1/m) =	2.0E-07	S _s (1/m) =	2.0E-0	
11	10° [[uum] []	; (m³/Pa) =	NA	C (m³/Pa) =	3.9E-0	
	5) ⁴⁵	G _D (-) =	NA	C _D (-) =	4.3E-0	
0	ω ξ	(-) =	-1.2	ξ(-) =	-1.	
10	^{10 -1} T	_{GRF} (m ² /s) =	NA	T _{GRF} (m²/s) =	NA	
10 ³ 10 ⁴ 10 ⁵			NA	S _{GRF} (-) =	NA	
	D	_{GRF} (-) =	NA	D _{GRF} (-) =	NA	
recovery period	S	elected represe	ntative param	ieters.	-	
	d	t ₁ (min) =	1.10	C (m ³ /Pa) =	3.9E-0	
· · · · · 10 / ⁻¹ · · · · · · . 10 / ⁰ · · · · · · · · · · · · ·	ď	t ₂ (min) =			4.3E-0	
300	т	$T(m^2/s) =$			-1.	
			1.0E-06		T	
10 ²	2		5.0E-08			
and the second second			2.0E-07			
\$						
10 '	8		transmissivity of	2.5E-07 m2/s was	derived from th	
3	st	abilization. The co	onfidence range	for the interval tran	nsmissivity is	
0	0					
			a test is 7. The s	otto precure meno	urad at	
10 ¹		isplayed during the		the CHir phase usi		
	KLX 681.00-686.0	KLX19A T 681.00-686.00 m 0.076 R te 0.076 R te 10 0 m period 6 10 10 10 10 10 10 10 10 10 10 10 10 10	$\frac{p_{p}(kPa) =}{Q_{p}(m^{3}/s)=} \text{tp }(s) =}{S \text{ el } S (-)=} \text{ Ec}_{w}(mS/m)=} \text{ Temp}_{w}(\text{gr } C)=} \text{ Derivative fact.}=}$ $\frac{p_{p}(kPa) =}{Q_{p}(m^{3}/s)=} \text{ tp }(s) =} \text{ Sel } S (-)= \text{ Ec}_{w}(mS/m)=} \text{ Temp}_{w}(\text{gr } C)=} \text{ Derivative fact.}=}$ $\frac{p_{p}(kPa) =}{Q_{p}(m^{3}/s)=} \text{ tp }(s) =} \text{ Sel }(s) (-)= \text{ Derivative fact.}=}$ $\frac{p_{p}(kPa) =}{Q_{p}(m^{3}/s)=} \text{ Selected regress}$ $\frac{p_{p}(kPa) =}{Q_{p}(m^{3}/s)=} \text{ Selected repress}$	KLX19A Test start: 681.00-686.00 m Responsible for test execution: 0.076 Responsible for test evaluation: Flow period Indata p_0 (kPa) = 5720 p_0 (kPa) = 5720 p_0 (kPa) = 5738 Q_p (m ³ /s)= 6.95E-06 p_0 (kPa) = 5738 Q_p (m ³ /s)= 6.95E-06 p_0 (kPa) = 5738 Q_p (m ³ /s)= 6.95E-06 p_0 (kPa) = 5738 Q_p (m ³ /s)= 6.95E-06 p_0 (kPa) = 5720 p_0 (kPa) = 5938 Q_p (m ³ /s)= 6.95E-06 p_0 (kPa) = 100E-06 EC. (mS/m)= Tempw(gr C)= Termpw(gr C)= 15.6 Derivative fact:= 0.01 M_1 M_2 Q_1 (m ³ /s) = 2.4E-07 Flow regime: transient M_1 (min) = 1.00E-06 S_0 () = 1.0E-06 S_0 () = 1.0E-06	KLX19A Test start: 681.00-686.00 m Responsible for test evacution: O.076 Recovery perio Indata Indata Indata	

	Test Su	Im	mary Sheet				
Project:	Oskarshamn site investiga	atior	Test type:[1]			F	
Area:	Laxe	ma	Test no:				
	Euxe	ina	reacha.				
Borehole ID:	KLX	(19A	Test start:		070128 16:1		
Test section from - to (m):	686 00-691 ()0 m	Responsible for			Stephan Roh	
	000.00 001.0		test execution:			Philipp Wo	
Section diameter, 2·r _w (m):	0	.076	Responsible for		Crist	ian Enachesc	
incer plat 0 and p			test evaluation:				
₋inear plot Q and p			Flow period Indata		Recovery period Indata		
6000		1 50	p ₀ (kPa) =	5761	inuala		
KLX19A_686.00-691.00_070128_1_Pi_Q_r	P section P above P below Q	4.5	p _i (kPa) =	NA			
59.50	 N	4.0	$p_p(kPa) =$		p _F (kPa) =	NA	
	:	3.5	$\frac{Q_{p}(m^{3}/s)}{Q_{p}(m^{3}/s)} =$	NA	p _F (Ki a) −		
900 ·	:	3.0 -	$\frac{Q_p (M/S)}{tp (s)} =$		t _F (s) =		
5850 -	· · · ·	25 B	s el S [*] (-)=		⊊ (0) S el S [*] (-)=	1.00E-	
	•	ule ction 2.0	$EC_w (mS/m) =$		5 el 5 (-)-		
5800		15	Temp _w (gr C)=	15.7		1	
		1.0	Derivative fact.=	NA	Derivative fact.=	NA	
5750 .	÷	0.5					
······································							
	50 0.60 0.70 0.80 0.90	1.00	Results		Results		
			Q/s (m ² /s)=	NA			
.og-Log plot incl. derivates- f	low period		$T_{M} (m^{2}/s) =$	NA		1	
			Flow regime:	transient	Flow regime:	transient	
			dt ₁ (min) =	NA	dt ₁ (min) =	NA	
			dt ₂ (min) =	NA	dt ₂ (min) =	NA	
			$T(m^{2}/s) =$	1.00E-11	T (m²/s) =	NA	
			S (-) =	NA	S (-) =	NA	
			K _s (m/s) =	NA	K _s (m/s) =	NA	
Not A	nalysed		S _s (1/m) =	NA	S _s (1/m) =	NA	
NOTA	harysed		C (m ³ /Pa) =	NA	C (m³/Pa) =	NA	
			C _D (-) =	NA	C _D (-) =	NA	
			ξ(-) =	NA	ξ(-) =	NA	
			$T_{GRF}(m^2/s) =$	NA	$T_{GRF}(m^2/s) =$	NA	
			S _{GRF} (-) =	NA	S _{GRF} (-) =	NA	
			D _{GRF} (-) =		D _{GRF} (-) =	NA	
.og-Log plot incl. derivatives-	recovery period		Selected represe			b 1 4	
			dt_1 (min) =		C (m ³ /Pa) =	NA	
			dt_2 (min) =		$C_{D}(-) =$	NA	
			$T_{T}(m^{2}/s) =$	1.0E-11	ξ(-) =	NA	
			S(-) =	NA		<u> </u>	
			$K_{s}(m/s) =$	NA		 	
			$S_s(1/m) =$ Comments:	NA			
	nalysed		Based on the test re transmissivity is low			ce) the interva	

	Test Sumn	nary Sheet			
Project:	Oskarshamn site investigation				CHi
Area:	Laxemar	Test no:			1
Borehole ID:	KLX19A	Test start:			070128 17:33
Test section from - to (m):	691.00-696.00 m		Stephan Rol		
Section diameter, 2·r _w (m):	0.076	test execution: Responsible for	Philipp W Cristian Enaches		
	0.078	test evaluation:		Chisi	
Linear plot Q and p		Flow period	1	Recovery period	ł
		Indata		Indata	
000	0.10	p₀ (kPa) =	5802		
KLX19A_691.00-696.00_070128_1_CHir_Q_r	P section P above P balow O	p _i (kPa) =	5792		
8000	0.08	p _p (kPa) =	6006	p _F (kPa) =	5792
· · · ·		$Q_{p} (m^{3}/s) =$	6.17E-07	F1 (- 7	
9960	1	$\frac{d_p(m/s)}{tp(s)} =$		t _F (s) =	1200
		S el S [*] (-)=		s el S [*] (-)=	1.00E-00
and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se	all and a second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	EC _w (mS/m)=	1.002.00	Sel S (-)-	1.002 0
5850		Temp _w (gr C)=	15.8	L	
	$1 \leq 1 \leq 1 \leq n \leq n \leq n \leq n \leq n \leq n \leq n \leq $	Derivative fact.=		Derivative fact.=	0.02
900	0.02		0.00		0.0.
5750 • • • • • • • • • • • • • • • • • • •	0.80 1.00 1.20 1.40 0.00 dTime [N]	Results		Results	
		$Q/s (m^2/s) =$	2.8E-08		
og-Log plot incl. derivates- f	low period	$T{M} (m^2/s) =$	2.3E-08		
		Flow regime:	transient	Flow regime:	transient
Elapsed time	(h) 10 ⁻¹ 10. ⁰	dt_1 (min) =		dt_1 (min) =	NA
10 2		$dt_2 (min) =$		$dt_1(min) = dt_2(min) =$	NA
	10 2			2	8.6E-0
10 1		T (m ² /s) = S (-) =	1.9E-08	· · ·	1.0E-0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		()			
10 °	A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT OF A CONTRACT.	5 (-)			1.7E-0
	10° 110°	$S_{s}(1/m) =$		$S_{s}(1/m) =$	2.0E-0
10-1	• • • • • • • • • • • • • • • • • • •	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	4.7E-1
	10 ⁻¹	C _D (-) =	NA	C _D (-) =	5.1E-0
10 -4		ξ(-) =	0.8	ξ(-) =	-2.0
10 ¹ 10 ²	10 ⁻²	T _{GRF} (m ² /s) =	NA	T _{GRF} (m ² /s) =	NA
	U	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA
_og-Log plot incl. derivatives	- recovery period	Selected represe			1
		dt_1 (min) =	NA	C (m ³ /Pa) =	4.7E-1
10 ⁻⁴ 10 ⁻³ Elapsed time	a [h] 10, ¹¹ 10, ⁰ 10, ¹	$dt_1(min) =$ $dt_2(min) =$	NA	$C (m /Pa) = C_D (-) =$	4.7E-1
10		,	8.6E-09		-2.0
		$T_T (m^2/s) =$ S (-) =	1.0E-09	<u>∽(⁻) −</u>	-2.
10 0		S (-) = K _s (m/s) =	1.0E-06 1.7E-09		
and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec			2.0E-07		
2 is shown	Alter to the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec	S _s (1/m) = Comments:	2.0E-07		
	- 60 ° 60 ° 60 ° 60 ° 60 ° 60 ° 60 ° 60	The recommended analysis of the CHin stabilization. The co estimated to be 7.01 displayed during the	r phase (inner zo onfidence range E-09 m2/s to 5.0 e test is 2. The s	ne), which shows h for the interval tran E-8 m2/s. The flow tatic pressure measu	orizontal smissivity is dimension ured at
10 ⁻⁴ 10 ⁻⁶ 10	1 10 10 10 10 10 10		e test is 2. The s as derived from	tatic pressure measu the CHir phase usir	nred at ng straight lin

	Test Sum				
Project:	Oskarshamn site investigation				CHir
Area:	Laxemar	Test no:			
Borehole ID:	KLX19A	Test start:			070129 08:23
Test section from - to (m):	696.00-701.00 m	Responsible for			Stephan Rohs
		test execution:			Philipp Wolf
Section diameter, 2·r _w (m):	0.076	Responsible for		Crist	ian Enachescu
		test evaluation:			-
Linear plot Q and p		Flow period		Recovery period	
		Indata		Indata	
ê100	0.20	p ₀ (kPa) =	5846		
KLX19A_696.00-701.00_070129_1_CHir_Q_r	P section Pabove P balow Double	p _i (kPa) =	5838		
8050		p _p (kPa) =	6043	p _F (kPa) =	5852
aoo	0.15	Q _p (m ³ /s)=	1.55E-06		
	:	tp(s) =	1200	t _F (s) =	1200
9 90				S el S [*] (-)=	1.00E-06
	tion Rase	S el S [*] (-)= EC _w (mS/m)=	1.002-00	Sel S (-)=	1.002-00
5 5 5 5 5 5 5 5 5 5 5 5 5 5			15.0		
999		Temp _w (gr C)=	15.8		
500	0.05	Derivative fact.=	0.04	Derivative fact.=	0.03
	0.00 0.80 1.00 1.20 1.40 me[h]	Results		Results	
		Q/s (m²/s)=	7.4E-08		
Log-Log plot incl. derivates- flo	ow period	$T_{M} (m^{2}/s) =$	6.1E-08		
	-	Flow regime:	transient	Flow regime:	transient
Elapsed time [h]		dt_1 (min) =	NA	dt_1 (min) =	0.52
10 2		$dt_2 (min) =$	NA	dt_2 (min) =	1.18
	30				1.5E-07
		$T(m^2/s) =$		$T(m^2/s) =$	
10 1	10 1	S (-) =	1.0E-06		1.0E-06
		$K_s (m/s) =$		K _s (m/s) =	3.0E-08
	3 8	S _s (1/m) =	2.0E-07	S _s (1/m) =	2.0E-07
C 102	Juni Dou)	C (m³/Pa) =	NA	C (m³/Pa) =	6.5E-11
10 °	10 ° ^d	C _D (-) =	NA	C _D (-) =	7.2E-03
· · · · · · · · · · · · · · · · · · ·	·	ξ(-) =	3.9	ξ(-) =	2.5
	-				
· · · ·		T _{GRF} (m ² /s) =	NA	T _{GRF} (m ² /s) =	NA
10 ⁶ 10 ⁷	10 ⁻⁸ 10 ⁻⁹ 10 ⁻¹	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
			NA		NA
Log-Log plot incl. derivatives-	recovery period	Selected represe			I <u> </u>
4 -3 Elapsed time [h]	.a4 0	dt_1 (min) =		C (m ³ /Pa) =	6.5E-11
10 2 10 2	, , , , , , , , , , , , , , , , , , ,	dt_2 (min) =		C _D (-) =	7.2E-03
	10 ³	$T_{T} (m^{2}/s) =$	1.5E-07	ξ(-) =	2.5
1		S (-) =	1.0E-06		
	300	K _s (m/s) =	3.0E-08		
10	10 ²	$S_{s}(1/m) =$	2.0E-07		
	10 -	Comments:			
	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s		transmissivity	1.5E-07 m2/s was	derived from the
10 ⁰	30 g	analysis of the CHin	r phase (inner zo	ne), which shows a	short sequence
	F10 1			d data quality. The	
	10			is estimated to be 8	
		3.0E-07 m2/s. The	flow dimension	displayed during the	e test is 2. The
10 [°] 10 ¹	10 ² 10 ³ 10 ⁴			er depth, was derive	
10 10 10	. 10	CHir phase using st	raight line extra	polation in the Horn	er plot to a
		value of 5,819.5 kP			

	Test Sum	mary Sheet				
d	Oskarshamn site investigation	n Test type:[1]			CHi	
Area:	Laxema	r Test no:				
Borehole ID:	KI X19/	A Test start:			070129 10:16	
Test section from - to (m):	701.00-706.00 r	n Responsible for test execution:			Stephan Rohs Philipp Wol	
Section diameter, 2·r _w (m):	0.07	8 Responsible for		Crist	ian Enachescu	
Linear plot Q and p		test evaluation: Flow period		Recovery period		
		Indata		Indata		
6150	0.08	p ₀ (kPa) =	5885			
KLX19A_701.00-706.00_070129_1_CHir_Q_r	P section P above P below Q = 0.02	p_0 (kPa) =	5886			
6100	· · · · · · · · · · · · · · · · · · ·	$p_i(kPa) =$		p _F (kPa) =	599	
8050 -	0.06		2.67E-07		399.	
•	•	$\frac{Q_p (m^3/s)}{tp (s)} =$			120	
• • •		4- (-)		t _F (s) =	120	
5950		S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0	
		EC _w (mS/m)=				
5000	0.02	Temp _w (gr C)=	15.9			
5850 1977 - 1979 - 1979 - 1979 - 1979 - 1979	0.01	Derivative fact.=	0.08	Derivative fact.=	0.0	
5800 0.00 0.20 0.40 0.60 0.80	1.00 1.20 1.40 1.80 1.80					
	me [h]	Results		Results		
		Q/s (m ² /s)=	1.3E-08			
_og-Log plot incl. derivates- flo	ow period	T _M (m ² /s)=	1.0E-08			
		Flow regime:	transient	Flow regime:	transient	
10 2 Elapsed time [h]	· · · · · · · 10; ⁻¹ · · · · · · · 10, ⁰	dt_1 (min) =	6.47	dt ₁ (min) =	NA	
	10 3	dt_2 (min) =	16.54	dt_2 (min) =	NA	
		T (m²/s) =	7.8E-09	T (m ² /s) =	4.3E-0	
	300	S (-) =	1.0E-06	· · ·	1.0E-0	
10 1		$K_s (m/s) =$		$K_s (m/s) =$	8.6E-1	
1	* 10	$S_{s}(1/m) =$		$S_{s}(1/m) =$	2.0E-0	
	1 10 10	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	1.9E-1	
1		$C(m/Fa) = C_D(-) =$	NA	$C_{D}(-) =$	2.1E-0	
10	10	$\frac{\xi(-)}{\xi(-)} =$		ξ(-) =	-2.	
		ς(-) –	1.0	ς (-)	2.	
	3	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA	
10 [°] 10 [°] 10	10 ² 10 ³ 10 ⁴	S _{GRF} (-) =	NA	S _{GRF} (-) =	NA	
		$D_{GRF}(-) =$	NA	D _{GRF} (-) =	NA	
.og-Log plot incl. derivatives-	recovery period	Selected represe	entative paran	neters.		
		dt ₁ (min) =	6.474	C (m ³ /Pa) =	1.9E-1	
Elapsed time [h]		dt_2 (min) =	16.536	,	2.1E-0	
		$T_{T}(m^{2}/s) =$	7.8E-09		-1.	
		S (-) =	1.0E-06			
10 1		K_{s} (m/s) =	1.6E-09			
		$S_{s}(1/m) =$	2.0E-07		1	
in the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second seco	10 ¹	Comments:				
		The recommended	transmissivity	f 7.8E-09 m2/s was	derived from th	
		analysis of the CHi				
10 -1	10 °	although being nois	y. The confiden	ce range for the inte	rval	
		transmissivity is est				
	Į.	flow dimension disp				
10 ¹ 10 ²	10 ⁻³ 10 ⁻⁴ 10 ⁻¹	measured at transdu type curve extrapol				
		ivpe cuive exuapol	анон ш ше поп	ner prot to a value o	1 J,04J.9 KFd.	

	Test	Sumn	nary Sheet			
Project:	Oskarshamn site inves					CHi
Area:	La	axemar	Test no:			
Borehole ID:	к	LX19A	Test start:			070129 12:42
Test section from - to (m):	706.00-71	1.00 m	Responsible for			Stephan Roh
Section diamotor 2 r (m):		0.076	test execution: Responsible for		Crio	Philipp Wol tian Enachescu
Section diameter, 2·r _w (m):		0.076	test evaluation:		Clis	lian Enachesci
Linear plot Q and p			Flow period		Recovery period	ł
• •			Indata		Indata	
KLX19A_706.00-711.00_070129_1_CHir_Q_r	• Ps	ection 0.008	p₀ (kPa) =	5927		
6150	- P# • P# • Pb • Q	elow 0.007	p _i (kPa) =	5923		
			$p_p(kPa) =$	6118	p _F (kPa) =	591
e100 -	* *	0.006	$Q_{p} (m^{3}/s) =$	8.33E-08		
		0.005 물	tp(s) =		t _F (s) =	120
		0.004 U	S el S [*] (-)=		S el S [*] (-)=	1.00E-0
eoo -		ulloctio 0.003	EC _w (mS/m)=		Sei S (-)-	
990		0.003	Temp _w (gr C)=	16.0		+
	<u> </u>	0.002	Derivative fact.=		Derivative fact.=	0.0
900		- 0.001		0.15	Derivative laot.	0.0
	······································	0.000				
0.00 0.20 0.40 0.60 0.80 Elapsed Time	1.00 1.20 1.40 a [h]	1.60	Results		Results	
			$Q/s (m^2/s)=$	4.2E-09		
og-Log plot incl. derivates- flo	wperiod		$T_{\rm M} (m^2/s) =$	3.5E-09		
			Flow regime:	transient	Flow regime:	transient
21.0.4 Elapsed time [b]			dt_1 (min) =		dt_1 (min) =	NA
10		3000	dt_2 (min) =		dt_2 (min) =	NA
		10 3	$T(m^2/s) =$		$T(m^2/s) =$	7.2E-0
			S (-) =	1.0E-06	、 ,	1.0E-0
10 1		300	K _s (m/s) =		$K_s (m/s) =$	1.4E-0
• • • • • • • • • • • • • • • • • • •	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec		$S_{s}(1/m) =$		$S_{s}(1/m) =$	1.4Ľ-0 2.0E-0
		10 ² [vuju]		NA	C (m ³ /Pa) =	1.2E-1
		1/4, (1/4	C (m ³ /Pa) = C _D (-) =	NA	$C (m /Pa) = C_D (-) =$	1.3E-0
10 °	·**	30	.,		.,	1.3Ľ-0 10.
	· · · · · · · · · · · · · · · · · · ·	10 1	ξ(-) =	2.0	ξ(-) =	10.
	•		T _{GRF} (m²/s) =	NA	T _{GRF} (m²/s) =	NA
10 ² 10 ⁴ 1D	10 ⁵ 10 ⁶ 10	7	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA
			D _{GRF} (-) =	NA	D _{GRF} (-) =	NA
.og-Log plot incl. derivatives- r	ecovery period		Selected represe	ntative paran		
Elapsed time [h]			dt ₁ (min) =	0.93	C (m ³ /Pa) =	1.2E-1
10 ²		٦.,	dt ₂ (min) =		$C_{D}(-) =$	1.3E-0
		10	$T_{T}(m^{2}/s) =$	3.8E-09		2.
1		300	S (-) =	1.0E-06		1
			$K_s (m/s) =$	7.6E-10		1
		10 2	$S_{s}(1/m) =$	2.0E-07		1
1/200		(Pa)	Comments:			
		8 1004-01-10	The recommended t	transmissivity of	f 3.8E-09 m2/s was	derived from th
10 °	11 × ··· *	, ye	analysis of the CHi			
		10 1	transmissivity is est			
1 / .*		-	dimension of 2 was			
			the manday			
		3	transducer depth, w extrapolation in the			

	Test Sum	nary Sheet				
Project:	Oskarshamn site investigation		СН			
Area:	Laxemar	Test no:			1	
Borehole ID:	KLX19A	Test start:		070129 14:4		
Test section from - to (m):	731.00-736.00 m		Stephan Rol			
Castion diameter 2 r (m):	0.076	test execution:		Criet	Philipp Wol ian Enachescu	
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:		Clist	ian Enachescu	
Linear plot Q and p		Flow period	1	Recovery period		
		Indata		Indata		
6400 KLX19A_731.00-736.00_070129_1_CHir_Q_r	• P tection 0.20	p ₀ (kPa) =	6131			
	P saction P above P below O.18	p _i (kPa) =	6118			
8350	0.16	$p_p(kPa) =$		p _F (kPa) =	611	
6300	0.14	$Q_p (m^3/s) =$	1.33E-06		011	
	0.12 [9990	$\frac{Q_p (\Pi / S)}{tp (s)} =$		t _F (s) =	120	
. (23)	1000 1000 1000 1000 1000 1000 1000 100				1.00E-0	
£200 ·	The second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon	$S el S^{*}(-)=$	1.00E-00	S el S [*] (-)=	1.00E-0	
	0.06	EC _w (mS/m)=	17.2		<u> </u>	
6150		Temp _w (gr C)=	16.3		0.0	
6100	0.04	Derivative fact.=	0.03	Derivative fact.=	0.0	
0.00 0.20 0.40 0.60 Elapse	0.80 1.00 1.20 1.40 dTime [h]	Results		Results		
		$Q/s (m^2/s)=$	6.4E-08		I	
.og-Log plot incl. derivates- f	low pariod		5.3E-08			
Log-Log plot met. derivates- i		T _M (m²/s)= Flow regime:	transient	Flow regime:	transient	
Elapsed time	[h]	-		dt_1 (min) =		
10 2		ati ()			0.5	
	30	dt_2 (min) =		at ₂ (11111)	3.7	
		$T(m^{2}/s) =$		$T(m^2/s) =$	1.4E-0	
10 1	10	S (-) =	1.0E-06		1.0E-0	
		$K_s (m/s) =$		K _s (m/s) =	2.8E-0	
	3 5	$S_{s}(1/m) =$		S _s (1/m) =	2.0E-0	
		C (m ³ /Pa) =	NA	C (m³/Pa) =	2.6E-1	
10 "	10 [°] 4	C _D (-) =	NA	$C_D(-) =$	2.9E-0	
	0.3	ξ(-) =	9.4	ξ(-) =	7.9	
•		T _{GRF} (m ² /s) =	NA	T (² ()	NA	
10, 10, 10, 11, 11, 11, 11, 11, 11, 11,	10 ⁻¹	$S_{GRF}(-) =$	NA	$T_{GRF}(m^2/s) = S_{GRF}(-) =$	NA	
			NA	GRF()	NA	
og Log plot incl. dorivativos	recovery period	D _{GRF} (-) = Selected represe		= GRF ()	INA	
.og-Log plot incl. derivatives	- recovery period				2.6E-1	
Elapsed time (*	ı] 	±••• ()		$C(m^{3}/Pa) =$		
10	10 3	$dt_2 (min) =$		$C_{D}(-) =$	2.9E-0	
		$T_{T}(m^{2}/s) =$	1.4E-07	ξ(-) =	7.	
	300	S (-) =	1.0E-06		 	
10	and a second second second second second second second second second second second second second second second	$K_s(m/s) =$	2.8E-08		ļ	
	10 2	$S_{s}(1/m) =$	2.0E-07			
	•	Comments:				
	30			f 1.4E-07 m2/s was		
10 °	· · · · · · · · · · · · · · · · · · ·			hows a clear horizon for the interval tran		
	i i i i i i i i i i i i i i i i i i i			E-07 m2/s. The flow		
	3			tatic pressure measu		
				1 011 1		
10 10 10		transducer depth, w		the CHIr phase usin value of 6,115.3 kl		

	Test Summ	nary Sheet			
Project:	Oskarshamn site investigation				Р
Area:	Laxemar	Test no:			1
Aica.	Laxema				
Borehole ID:	KLX19A	Test start:			070129 16:43
Test section from - to (m):	736.00-741.00 m	Responsible for			Stephan Rohs
		test execution:			Philipp Wol
Section diameter, 2·r _w (m):	0.076	Responsible for		Crist	ian Enachescu
		test evaluation:			
Linear plot Q and p		Flow period		Recovery period	I
		Indata		Indata	
KLX19A_736.00-741.00_070129_1_Pi_Q_r	• P sector • P above • P below • 4.5	p ₀ (kPa) =	6171		
	-0	p _i (kPa) =	6183		
	+ 4.0	p _p (kPa) =		p _F (kPa) =	621
800	35	Q _p (m ³ /s)=	NA		
	²⁰ [fermine]	tp (s) =		t _F (s) =	360
	2.5 gg	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0
	20 ^g	EC _w (mS/m)=			
~~~~~	1.5	Temp _w (gr C)=	16.3		
6150	• _ 1.0	Derivative fact.=	NA	Derivative fact.=	0.0
e100 020 0.40 0.60 0.86					
Elaps		Results		Results	
		Q/s (m²/s)=	NA		
_og-Log plot incl. derivates-	flow period	T _M (m ² /s)=	NA		
	-	Flow regime:	transient	Flow regime:	transient
		$dt_1$ (min) =	NA	$dt_1$ (min) =	1.33
		$dt_2$ (min) =	NA	$dt_2$ (min) =	37.7
		$T(m^2/s) =$	NA	$T(m^2/s) =$	6.2E-1
		S (-) =	NA	S (-) =	1.0E-06
		K _s (m/s) =	NA	K _s (m/s) =	1.0E 0
		$S_{s}(1/m) =$	NA	$S_{s}(1/m) =$	2.0E-0
			NA		1.8E-1
		C (m ³ /Pa) = C _D (-) =	NA	C (m ³ /Pa) = C _D (-) =	2.0E-0
		- ( )			
		ξ(-) =	NA	ξ(-) =	0.
		- <i>2</i> 2 ( )	NA	- (2)	NA
		$T_{GRF}(m^2/s) =$	NA	$T_{GRF}(m^2/s) = S_{GRF}(-) =$	NA
		$S_{GRF}(-) =$		GRF( )	
		$D_{GRF}(-) =$	NA	D _{GRF} (-) =	NA
Log-Log plot incl. derivatives	- recovery period	Selected represe			
10. ⁻³ Eapsed tin	te (h) 10. ⁻¹ 10. ⁰ 10. ¹	$dt_1$ (min) =		C (m ³ /Pa) =	1.8E-1
10 1	······································	$dt_2 (min) =$		C _D (-) =	2.0E-0
		$T_{T}(m^{2}/s) =$	6.2E-11	ξ(-) =	0.0
	0.3	S (-) =	1.0E-06		
10 °	•	$K_s (m/s) =$	1.2E-11		
	Televin and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se	$S_{s}(1/m) =$	2.0E-07		
		Comments:			
	- 0.03 g 8			6.2E-11 m2/s was	
10 ⁻¹	8 10 ²			ence range for the in $E_{11}$ to $R_{0}E_{11}$ m ²	
•				E-11 to 8.0E-11 m2 is 2. The static pres	
4					sare could not
	0.003	be extrapolated due	to the low trans	missivity.	
	10 ² 10 ² 10 ⁴	be extrapolated due	to the low trans	missivity.	

	Test Sur	nmary Sheet			
Project:	Oskarshamn site investigat	ion Test type:[1]			CHi
Area:	Laxen	nar Test no:			
Borehole ID:	KLX1	9A Test start:			070129 18:54
Test section from - to (m):	741.00-746.00	m Responsible for			Stephan Roh
		test execution:	Philipp		
Section diameter, 2·r _w (m):	0.0	76 Responsible for		Crist	ian Enachesc
Linear plot Q and p		test evaluation: Flow period		Recovery period	
		Indata		Indata	
~~~		₀ p₀ (kPa) =	6212	indutu	
KLX19A_741.00-746.00_070130_1_CHir_Q_r	P section Patove	p _i (kPa) =	NA		
6550 -	Pabove Pbelow Q	$p_p(kPa) =$	NA	p _F (kPa) =	NA
6500 -	•	$\frac{Q_{p}(m^{3}/s)}{Q_{p}(m^{3}/s)} =$	NA	F1 ()	
6430 ·		tn(s) =	0	t _F (s) =	
6400 ·		S el S [*] (-)=		S el S [*] (-)=	1.00E-0
5 6 039 -		EC _w (mS/m)=			
8 800 ·		Temp _w (gr C)=	16.4		1
820		Derivative fact.=	NA	Derivative fact.=	NA
200	····· +				
0.00 0.10 0.20 0.30 Elapse	0.40 0.50 0.60 0.70 d Time [h]	Results	-	Results	
		Q/s (m²/s)=	NA		
Log-Log plot incl. derivates- f	low period	T _M (m ² /s)=	NA		
		Flow regime:	transient	Flow regime:	transient
		dt_1 (min) =	NA	dt ₁ (min) =	NA
		dt_2 (min) =	NA	dt_2 (min) =	NA
		T (m²/s) =	1.00E-11	T (m²/s) =	NA
		S (-) =	NA	S (-) =	NA
		$K_s (m/s) =$	NA	$K_s (m/s) =$	NA
Not A	nalysed	$S_{s}(1/m) =$	NA	$S_s(1/m) =$	NA
	2	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	NA
		C _D (-) =	NA	C _D (-) =	NA
		ξ(-) =	NA	ξ(-) =	NA
		- , 2, ,	NA	- , 2, ,	NA
		$T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$	NA NA	$T_{GRF}(m^2/s) =$ $S_{GRF}(-) =$	NA NA
		$S_{GRF}(-) =$ $D_{GRF}(-) =$	NA NA	$S_{GRF}(-) = D_{GRF}(-) =$	NA NA
_og-Log plot incl. derivatives	recovery period	Selected repres			INA
-og-Log plot men derivatives.		dt ₁ (min) =	NA	C (m ³ /Pa) =	NA
		$dt_2 (min) =$	NA	$C (m /Pa) = C_D (-) =$	NA
		$T_T (m^2/s) =$	1.0E-11	ξ(-) =	NA
		S (-) =	NA	ə (/	
		$K_s (m/s) =$	NA		1
		$S_{s}(1/m) =$	NA		
Not A	nalysed	Comments:	1		
1007				ed packer complian	ce) the interval
		transmissivity is lo			
		1			

Test	<u>: Sumn</u>	<u>nary Sheet</u>					
Oskarshamn site inves	stigation	Test type:[1]			CH		
L	_axemar	Test no:					
	KLX19A	Test start:			070130 08:1		
746.00-7	′51.00 m	Responsible for			Stephan Roh		
		test execution:			Philipp Wo		
	0.076	•		Crist	ian Enachesc		
				Recovery period			
	0.003		6256		1		
	P section P above P below	,					
···	٩			n-(kPa) =	627		
					02		
					120		
	te [limin]				1.00E-0		
	ection Rat		1.00E-06	S el S (-)=	1.00E-		
	Ê 0001		16.5		───		
	-				0		
	- <u>-</u>	Derivative fact.=	0.17	Derivative fact.=	0.0		
	•						
1.00 1.20 1.40	0.000	Results		Results			
		Ω/s (m ² /s)=	7.4E-10				
ow period			6.1E-10				
			transient	Flow regime:	transient		
0 ⁻²		•		-	NA		
•	10 4				NA		
•				, ,	7.1E-1		
•	3000			· · ·	1.0E-0		
					1.4E-1		
and the second second second second second second second second second second second second second second second	10				2.0E-0		
	300				3.1E-1		
	14, (10)	· · ·			3.1E-		
	10 2						
· · · · · · · · · · · · · · · · · · ·		ς(-) =	1.0	ς(-) =	1.		
•** •	30	$T_{(m^{2}/2)} =$	NA	$T_{(m^{2}/2)} =$	NA		
10 ⁻³ 10 ⁻⁴ 1	10 5				NA		
				-GRF()	NA		
recovery period					1		
					3.1E-1		
. 10, ⁻¹	1	., ,			3.4E-0		
					1		
No. 1 Martin Martin	10 2						
	30	5()	2.0E-07				
	(e.,), (odc		tuo u anni a-i-it	89 4E 10 2/	dominand from 1		
		The recommended analysis of the CHi					
	t t						
	з	although being nois	sy. The confiden	ce range for the inte	rvai		
	3	although being nois transmissivity is est	imated to be 6.0	E-10 m2/s to 3.0E-9	9 m2/s. The		
	3 10 ⁰		imated to be 6.0 played during th	E-10 m2/s to 3.0E-9 e test is 2. The statio	9 m2/s. The c pressure		
	Oskarshamn site inve	Oskarshamn site investigation Laxemar KLX19A 746.00-751.00 m 0.076	$0.076 Responsible for test evaluation: Flow period Indata p_0 (kPa) = p_{p}(kPa) = p_{p}(kPa) = p_{p}(kPa) = p_{p}(kPa) = p_{p}(kPa) = p_{p}(kPa) = Q_{p} (m^{3}/s) = test (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Derivative fact. = C_{w} (ms/m) = Temp_{w}(gr C) = Temp_{w}(gr C) = Temp_{w}(gr C) = Temp_{w}(gr C) = Temp_{w}(gr C) = Temp_{w}(gr C) = Temp_{w}(gr C) = Temp_{w}(gr C) = Temp_{w}(gr C) = Temp_{w}(gr C) = Temp_{w}(gr C) = Temp_{w}(gr C) = Temp_{w}(gr C) = Temp_{w}(gr C) = Temp_{w}(gr C) = Temp_{w}($	Oskarshamn site investigation Test type:[1] Laxemar Test no: KLX19A Test start: 746.00-751.00 m Responsible for test exaluation: Flow period Indata p ₀ (kPa) = 6256 p ₀ (kPa) = 62626 p ₀ (kPa) = 64833 Q ₀ (m ³ /s)= 1.67E-08 tp (s) = 1.00E-06 EC _w (mS/m)= Tempw(gr C)= 1.6.5 Derivative fact.= 0.17 Ow period Tempw(gr C)= 1.6.5 Mesults Q/s (m ² /s)= 7.4E-10 Tempw(gr C)= 1.6.5 Derivative fact.= 0.17 O/s (m ² /s)= 7.4E-10 Tempw(gr C)= 1.6.5 Derivative fact.= 0.17 Colspan="2" Colspan="2" Colspan="2" Colspan="2"	Oskarshamn site investigation Test type:[1] Laxemar Test tor: Test tor: Test tor: Test tor: Coskarshamn site investigation Test type:[1] Test execution: Test execution: Test execution: Indata Indata <th <="" colspan="2" td=""></th>		

	Test S	umr	nary Sheet				
Project:	Oskarshamn site investig					CHi	
Area:	Lax	emar	Test no:				
Borehole ID:	KI	X19A	Test start:		070130 10:2		
Test section from - to (m):	751.00-756	.00 m	Responsible for test execution:			Stephan Roh	
Section diameter, 2·r _w (m):		0.076	Responsible for		Crist	ian Enachesci	
			test evaluation:				
Linear plot Q and p			Flow period		Recovery period	1	
			Indata		Indata		
6000 KLX19A_751.00-756.00_070130_1_CHir_Q_r	• P sector	0.005	p ₀ (kPa) =	6296			
6650	P sector P bobe P bobe P bobe Q		p _i (kPa) =	6307			
	······	0.004	p _p (kPa) =	6527	p _F (kPa) =	634	
6600			Q _p (m ³ /s)=	2.67E-08			
8450 -		0.003 g	tp (s) =	1200	t _F (s) =	120	
6400 -		n Rate (lin	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0	
· · · · · · · · · · · · · · · · · · ·		u.uo2	EC _w (mS/m)=				
6550 E			Temp _w (gr C)=	16.6			
6000	<u> </u>	0.001	Derivative fact.=	0.09	Derivative fact.=		
esso		0.001					
6200 0.00 0.20 0.40 0.80 0.80	1.00 1.20 1.40 1.60	0.000	-				
Elapsed	Time (h)		Results		Results	1	
			$Q/s (m^2/s) =$	1.2E-09			
.og-Log plot incl. derivates- f	low period		T _M (m²/s)=	9.8E-10			
			Flow regime:	transient	Flow regime:	transient	
Elapsed time	[h] 19 ⁻²		dt ₁ (min) =		dt ₁ (min) =	NA	
10 2		10 4	dt_2 (min) =	17.07	dt_2 (min) =	NA	
			$T(m^{2}/s) =$	6.8E-10	T (m²/s) =	4.5E-1	
10 1		10 3	S (-) =	1.0E-06	S (-) =	1.0E-0	
	a cos or one to any to any to any to any to any to any to any to any to any to any to any to any to any to any		$K_s (m/s) =$	1.4E-10	K _s (m/s) =	9.0E-1	
10 °		10 2	$S_{s}(1/m) =$	2.0E-07	S _s (1/m) =	2.0E-0	
·		[luim].(b	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	1.8E-1	
10 4		10 1	$C_{D}(-) =$	NA	$C_{D}(-) =$	2.0E-0	
			ξ(-) =	0.2	ξ(-) =	4.8E-0	
10 "		10 °					
		_	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m²/s) =	NA	
10 ⁰ 10	1 10 ²	10 "	S _{GRF} (-) =	NA	S _{GRF} (-) =	NA	
			D _{GRF} (-) =	NA	D _{GRF} (-) =	NA	
.og-Log plot incl. derivatives-	 recovery period 		Selected represe	ntative paran	neters.		
			dt ₁ (min) =	3.68	C (m³/Pa) =	1.8E-1	
Elapsed time	[h]		dt_2 (min) =		$C_{D}(-) =$	2.0E-0	
10			$T_{T} (m^{2}/s) =$	6.8E-10		0.	
		10 3	S (-) =	1.0E-06		1	
10 1		-	$K_s (m/s) =$	1.4E-10		1	
		10 2	$S_{s}(1/m) =$	2.0E-07			
			Comments:				
10 °		(page), (pd-4	The recommended t	transmissivity of	6 8E-10 m ² /s was	derived from th	
· · ·		10 1 04	analysis of the CHi				
10 ⁻¹			although being nois				
			transmissivity is est	imated to be 4.0	E-11 m2/s to 2.0E-	09 m2/s. The	
		10 0	flow dimension disp				
		1	measured at transdu	icer denth was a	lerived from the CH	Iir phase using	
10 ⁻¹ 10 ⁰ tD/	10 ¹ 10 ²	10 3	straight line extrapo				

	Test Su	ımn	nary Sheet					
Project:	Oskarshamn site investiga	ation	Test type:[1]			CHi		
Area:	Laxe	emar	Test no:					
Borehole ID:	KLX	(19A	Test start:	070130 12:4				
Test section from - to (m):	section from - to (m): 756.00-761.00 m					Stephan Rohs		
Section diameter 2.r., (m):	0	076	test execution: Responsible for		Crist	Philipp Wol ian Enachescu		
	Ū	.070	test evaluation:		Olist			
Linear plot Q and p	Coskarshamn site invest Coskarshamn site invest La De ID: K Ection from - to (m): 756.00-76 In diameter, 2·r _w (m): Plot Q and p				Recovery period	I		
	Oskarshamn site investi La: La: ction from - to (m): 756.00-761 diameter, 2-rw (m): 756.00-761 JMAAPHEND_PENDL_ONE_A.r Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2" JMAAPHEND_PENDL_ONE_A.r Image: Colspan="2">Image: Colspan="2" JMAAPHEND_PENDL_ONE_A.r Image: Colspan="2">Image: Colspan="2" JMAAPHEND_PENDL_ONE_A.r Image: Colspan="2" Image: Colspan="2" Image: Colspan="2" JMAAPHEND_PENDL_ONE_A.r Image: Colspan="2" Image: Colspan="2" Image: Colspan="2" Image: Colspan="2" Image: Colspan="2" JMAAPHEND_PENDL_ONE_A.r Image: Colspan="2" Ima				Indata			
0600 KLX19A_756.00-761.00_070130_1_CHir_Q_r	. • P section	0.005	p ₀ (kPa) =	6338				
050	P above P balow Q		p _i (kPa) =	6347				
		0.004	p _p (kPa) =	6568	p _F (kPa) =	636		
e500 ·			Q _p (m ³ /s)=	2.83E-08				
6450	- \	0.003 j	tp (s) =	1200	t _F (s) =	1200		
		on Rate [l/	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-00		
6400		u.002	EC _w (mS/m)=					
			Temp _w (gr C)=	16.6				
		0.001	Derivative fact.=	0.2	Derivative fact.=	0.02		
800 								
		0.000 80	Results		Results			
			Q/s $(m^{2}/s)=$	1.3E-09				
og-Log plot incl. derivates- fl	ow period		$T{M} (m^{2}/s) =$	1.0E-09				
			Flow regime:	transient	Flow regime:	transient		
10, ⁻⁴ Elapsed time [h]			dt_1 (min) =	NA	dt_1 (min) =	10.0		
10			dt_2 (min) =	NA	dt_2 (min) =	14.04		
	10 3		$T(m^2/s) =$		$T(m^2/s) =$	3.8E-0		
			S (-) =	1.0E-06	· · /	1.0E-0		
10 °.	- 300		K _s (m/s) =		K _s (m/s) =	1.9E-0		
			$S_{s}(1/m) =$		$S_{s}(1/m) =$	5.0E-0		
	10 ²	(min/)	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	2.4E-1		
		1/q. (1/q]	$C_{D}(-) =$	NA	$C(m/Pa) = C_D(-) =$	2.4E 1		
10 -1	* * * ³⁰		ξ(-) =		ξ(-) =	<u>o</u> _ 0		
	10 1		ς(-) -	-0.7	ς(-) –	-1.		
			T _{GRF} (m ² /s) =	NA	T _{GRF} (m ² /s) =	NA		
10 ⁻¹ 10 ⁰ 1D	10 ¹ 10 ² 10 ³		S _{GRF} (-) =	NA	S _{GRF} (-) =	NA		
			D _{GRF} (-) =	NA	D _{GRF} (-) =	NA		
_og-Log plot incl. derivatives-	recovery period		Selected represe	entative param	neters.			
			dt ₁ (min) =	10.02	C (m³/Pa) =	2.4E-1		
Elapsed time	(m) 10 1	Ţ	dt_2 (min) =		C _D (-) =	2.6E-0		
			$T_{T} (m^{2}/s) =$	3.8E-08	ξ(-) =	-1.1		
			S (-) =	1.0E-06				
10 °		10 2	K _s (m/s) =	1.9E-09				
and the second second		-	S _s (1/m) =	5.0E-08				
10 ⁻¹		10 1	Comments:	•				
· ····			The recommended					
		1	analysis of the CHi	r phase, which sl	hows a horizontal st	abilization and		
10 -2		10 0	a good data quality.					
		1	transmissivity is est flow dimension disp					
l			measured at transdu					
10 ⁻¹ 10 ⁻⁰	10 ¹ 10 ² 1	o 3						

	Test S	umr	nary Sheet				
Project:	Oskarshamn site investig	ation	Test type:[1]			P	
Area:	Lax	emar	Test no:			1	
Borehole ID:	KL	X19A	Test start:		070130 14:		
Test section from - to (m):	761.00-766.	00 m	Responsible for			Stephan Rohs	
			test execution:			Philipp Woli	
Section diameter, 2·r _w (m):).076	Responsible for test evaluation:		Crist	ian Enachescu	
Linear plot Q and p			Flow period		Recovery period		
F F			Indata		Indata		
6650	P sectio	- T 5	p ₀ (kPa) =	6377			
KLX19A_761.00-766.00_070130_1_Pi_Q_r	• Pacito • Pabow • Pbalow • O	n - 5	p _i (kPa) =	6388		<u> </u>	
800		4	$p_p(kPa) =$		p _F (kPa) =	646	
		4	$Q_p (m^3/s) =$	NA		010	
,	********		$\frac{Q_p(M/S)}{tp(s)} =$		t _F (s) =	360	
6600	******	, limin) of			⊈ (3) = S el S [*] (-)=	1.00E-00	
6450 -	· · · · ·	njection Rate [l/min]	S el S [*] (-)= EC _w (mS/m)=	1.00E-00	Sel S (-)=	1.00L-0	
		2 E	EC_w (ms/m)= Temp _w (gr C)=	16.7		l	
6400		- 2	Derivative fact.=		Derivative fact.=	0.1	
8350 -	•	- 1	Denvalive laci	NA	Derivative lact	0.1	
· · · · · · · · · · · · · · · · · · ·		- 1					
6000 020 0.40 0.60 0.60 Elaps4	1.00 1.20 1.40 1.60 ed Time [h]	1.80	Results		Results		
			Q/s (m²/s)=	NA			
.og-Log plot incl. derivates- f	low period		$T_{\rm M} (m^2/s) =$	NA			
			Flow regime:	transient	Flow regime:	transient	
			dt_1 (min) =	NA	dt_1 (min) =	2.5	
			$dt_2 (min) =$	NA	dt_2 (min) =	36.2	
			$T(m^2/s) =$	NA	$T(m^2/s) =$	2.5E-1	
			S (-) =	NA	S (-) =	1.0E-0	
			K _s (m/s) =	NA	K _s (m/s) =	5.0E-1	
			$S_{s}(1/m) =$	NA	$S_{s}(1/m) =$	2.0E-0	
			- ()	NA		2.0E-0 2.1E-1	
			C (m ³ /Pa) = C _D (-) =	NA	C (m ³ /Pa) = C _D (-) =	2.1L-1 2.3E-0	
			- 0 ()	NA	- 6 ()	2.3E-0	
			ξ(-) =	INA	ξ(-) =	0.	
			T _{GRF} (m ² /s) =	NA	T _{GRF} (m²/s) =	NA	
			$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA	
			D _{GRF} (-) =	NA	D _{GRF} (-) =	NA	
.og-Log plot incl. derivatives	- recovery period		Selected represe	entative paran	ieters.	-	
d Elapsed time	(b)		dt ₁ (min) =	2.50	C (m³/Pa) =	2.1E-1	
10 10 10 10 10 10 10 10 10 10 10 10 10 1		3	dt ₂ (min) =		C _D (-) =	2.3E-0	
		-	$T_{T} (m^{2}/s) =$	2.5E-11	ξ(-) =	0.4	
		10 0	S (-) =	1.0E-06		l –	
10 °			$K_s (m/s) =$	5.0E-12		1	
10		0.3	$S_{s}(1/m) =$	2.0E-07			
	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	10 ⁻¹	Comments:				
	*	convoluted	The recommended	transmissivity of	2.5E-11 m2/s was	derived from th	
10-1		0.03	analysis of the Pi pl	hase. The confid	ence range for the in	nterval	
¥ ·		ł	transmissivity is est				
		1	dimonstration dismlaria	d during the test	is ? The static pres	sure could not	
		10 -2	dimension displayed			sure could not	
•		10-2	be extrapolated due				

Project: Area:	Oskarshamn site investigation	mary Sheet Test type:[1]					
Area:					CHir		
	Laxema	Test no:	1				
Borehole ID:	KLX19A	Test start:	070130 17:0				
Test section from - to (m):	766.00-771.00 m	Responsible for			Stephan Rohs		
	700.00-77 1.00 11	test execution:			Philipp Wolf		
Section diameter, 2·r _w (m):	0.076	Responsible for		Crist	ian Enachescu		
		test evaluation:					
Linear plot Q and p		Flow period		Recovery period			
		Indata		Indata			
6850 KLX19A_766.00-771.00_070130_1_CHir_Q_r	6 • P section • P above • P badow	p ₀ (kPa) =	6417				
	P below Q 5	p _i (kPa) =	6409				
		p _p (kPa) =	6620	p _F (kPa) =	6441		
6530		$Q_{p} (m^{3}/s) =$	1.91E-05				
		tp (s) =	1200	t _F (s) =	1200		
8500 ·		S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-06		
		EC _w (mS/m)=					
6450		Temp _w (gr C)=	16.8				
	And the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec	Derivative fact.=	0.02	Derivative fact.=	0.02		
8400	* 1						
6330	0.80 1.00 1.20 1.40 Imme [h]	Results		Results			
		$Q/s (m^2/s)=$	8.9E-07	lioounio			
Log-Log plot incl. derivates- flo	aw pariod		7.3E-07				
Log-Log plot mel. derivates- m	Sw period	T _M (m²/s)= Flow regime:	transient	Flow regime:	transient		
Elapsed time [h]	10 ⁻²	dt_1 (min) =	NA	$dt_1 (min) =$	0.44		
10	10 1	$dt_1(min) =$ $dt_2(min) =$	NA		1.84		
		= 、 ,		at ₂ ()			
	.3	$T(m^2/s) =$		$T(m^2/s) =$	4.7E-07		
10 1		S (-) =	1.0E-06		1.0E-00		
	10 °	$K_s(m/s) =$		$K_s (m/s) =$	9.5E-08		
· · · · · · · · · · · · · · · · · · ·	· ·	$S_{s}(1/m) =$		$S_{s}(1/m) =$	2.0E-07		
	0.3 2	C (m³/Pa) =	NA	C (m³/Pa) =	3.1E-10		
10 0	10.1	C _D (-) =	NA	C _D (-) =	3.4E-02		
		ξ(-) =	-3.0	ξ(-) =	-4.7		
	• • • • • • • • • • • • • • • • • • • •	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA		
. 10 [°] 10 [°] tD	10 ² 10 ³ 10 ⁴	$S_{GRF}(-) =$	NA	$S_{GRF}(-) =$	NA		
		$D_{GRF}(-) =$	NA	$D_{GRF}(-) =$	NA		
Log-Log plot incl. derivatives-	recovery period	Selected represe			I		
		dt_1 (min) =	NA	C (m ³ /Pa) =	3.1E-10		
Elapsed time [h]		dt_2 (min) =	NA	$C(III /Pa) = C_D(-) =$	3.4E-02		
10			4.1E-07		-3.0		
	300	$T_{T}(m^{2}/s) =$		ς(-) =	-3.0		
		S (-) =	1.0E-06				
10.0	10 ²	$K_s(m/s) =$	8.3E-08				
· ss manage	1 1 m Statistic and a state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of	$S_{s}(1/m) =$	2.0E-07				
· · · · · ·	30 g	Comments:					
10		analysis of the CHi interval transmissiv The flow dimension measured at transdu	phase (outer zon ity is estimated to displayed durin acer depth, was o	² 4.1E-07 m2/s was ne). The confidence to be 8.0E-08 m2/s the ng the test is 2. The derived from the CH rner plot to a value	range for the to 5.0E-07 m2/s static pressure fir phase using		

	Test Sumr	nary Sheet			
Project:	Oskarshamn site investigation	Test type:[1]			ŀ
A		T 1			
Area:	Laxemar	Test no:			
Borehole ID:	KLX19A	Test start:			070131 08:0
Fest section from - to (m):	771.00-776.00 m	Responsible for test execution:			Stephan Roh
Desting discretes 0 g (m);				Oriet	Philipp Wo
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:		Crist	ian Enacheso
inear plot Q and p		Flow period		Recovery period	l
		Indata		Indata	
6750 KLX19A_771.00-776.00_070131_1_Pi_Q_r	• Piseton •	p₀ (kPa) =	6460		
6700 -	• P action • P above • P below • Q 4.5	p _i (kPa) =	NA		
	4.0	$p_p(kPa) =$	NA	p _F (kPa) =	NA
6650 -	• 35	$Q_p (m^3/s) =$	NA	P1 (=)	
	* . 10 5	$\frac{d_p(m/s)}{tp(s)} =$		t _F (s) =	
6600 -	• 2.5 u c	S el S [*] (-)=		⊊ (0) S el S [*] (-)=	1.00E-
6650 -		EC _w (mS/m)=	1.002 00	3 el 3 (-)-	1.001
	• 1.5	Temp _w (gr C)=	16.8		
6500		Derivative fact.=	NA 10.8	Derivative fact.=	NA
•••••	• 1.0	Derivative lact	INA	Derivative lact	INA
•					
6400 Δ.10 0.20 0.30 0.40 Elapsed	0.0 0.50 0.80 0.70 0.80 0.90 Time [h]	Results		Results	
		Q/s $(m^{2}/s)=$	NA		
.og-Log plot incl. derivates- fl	ow period	$T_{\rm M} (m^2/s) =$	NA		
		Flow regime:	transient	Flow regime:	transient
		dt_1 (min) =	NA	dt_1 (min) =	NA
		dt_2 (min) =	NA	dt_2 (min) =	NA
		$T (m^2/s) =$		$T(m^2/s) =$	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
Not Ar	nalysed	., ,	NA		NA
		C (m ³ /Pa) = C _D (-) =	NA	C (m ³ /Pa) = C _D (-) =	NA
		- 0 ()		- 、 ,	
		ξ(-) =	NA	ξ(-) =	NA
		2	NA		NI A
		$T_{GRF}(m^2/s) =$	NA NA	$T_{GRF}(m^2/s) =$	NA NA
		$S_{GRF}(-) =$		$S_{GRF}(-) =$	
		$D_{GRF}(-) =$	NA	D _{GRF} (-) =	NA
.og-Log plot incl. derivatives-	recovery period	Selected represe			Тала
		dt_1 (min) =	NA	C (m ³ /Pa) =	NA
		$dt_2 (min) =$	NA	$C_{D}(-) =$	NA
		$T_{T}(m^2/s) =$	1.0E-11	ξ(-) =	NA
		S (-) =	NA		
		K _s (m/s) =	NA		
		$S_{s}(1/m) =$	NA		
Not Ar	nalysed	Comments:			
		transmissivity is low		ed packer complian m2/s.	ee, me muerva

		nary Sheet			
Project:	Oskarshamn site investigation				CHir
Area:	Laxemar	Test no:			1
Borehole ID:	KLX19A	Test start:			070131 09:28
Test section from - to (m):	776.00-781.00 m				Stephan Rohs
		test execution:			Philipp Wolf
Section diameter, 2·r _w (m):	0.076	Responsible for test evaluation:		Crist	ian Enachescu
Linear plot Q and p		Flow period		Recovery period	
		Indata	(500	Indata	
6750 KLX19A_771.00-776.00_070131_1_Pi_Q_r	• P section • 5.0	p ₀ (kPa) =	6500		
erco -	P balow Q 4.5	p _i (kPa) =	6492		
eroo -	4.0	p _p (kPa) =	6691	p _F (kPa) =	650
e850 -	• 35	$Q_{p} (m^{3}/s) =$	5.67E-06		
	· .	tp(s) =	1200	t _F (s) =	1200
9600 ·	144 2.5 M 4	S el S [*] (-)=		S el S [*] (-)=	1.00E-06
6550	• T 23 8	$EC_w (mS/m) =$	1.002.00	3 6 3 (-)-	1.001 0
	- 20 5		16.0		
600 x	15	Temp _w (gr C)=	16.9		
	1.0	Derivative fact.=	0.05	Derivative fact.=	0.04
6400	0.0				
0.00 0.10 0.20 0.30 0.40 Elapsed	0.50 0.60 0.70 0.80 0.90 Time [h]	Results		Results	
		Q/s (m ² /s)=	2.8E-07		
.og-Log plot incl. derivates- fl	ow period	T _M (m ² /s)=	2.3E-07		
		Flow regime:	transient	Flow regime:	transient
Elapsed time (h)		dt_1 (min) =		dt_1 (min) =	NA
10 ⁻¹		dt_2 (min) =		dt_2 (min) =	NA
	30	- 、 ,			
		$T(m^{2}/s) =$		T (m²/s) =	1.2E-0
	10 1	S (-) =	1.0E-06		1.0E-06
10 1		$K_s(m/s) =$	4.2E-08	$K_s (m/s) =$	2.4E-08
	3	$S_{s}(1/m) =$	2.0E-07	$S_{s}(1/m) =$	2.0E-0
••••••		C (m³/Pa) =	NA	C (m ³ /Pa) =	6.8E-10
	10 ° 5	$C_{D}(-) =$	NA	$C_{D}(-) =$	7.5E-0
10 A A	0.3	ξ(-) =	-1.8	ξ(-) =	0.0
····					
10 ¹ 10 ²	10 10	$T_{GRF}(m^2/s) =$	NA	T _{GRF} (m ² /s) =	NA
to to to	10 10 10	S _{GRF} (-) =	NA	S _{GRF} (-) =	NA
		D _{GRF} (-) =	NA	D _{GRF} (-) =	NA
.og-Log plot incl. derivatives-	recovery period	Selected represe	ntative paran	neters.	
		dt ₁ (min) =		C (m ³ /Pa) =	6.8E-10
Elapsed time (h]	dt_2 (min) =		$C_{D}(-) =$	7.5E-02
10 3		$T_T (m^2/s) =$	2.1E-07		-1.8
	10 ³				-1.0
10 2		0()	1.0E-06		ļ
	10 ²	$K_s (m/s) =$	4.2E-08		
10 1	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	$S_{s}(1/m) =$	2.0E-07		
	الم الم الم الم الم الم الم الم الم الم	Comments:			
10 0				f 2.1E-07 m2/s was	
	10 °	analysis of the CHi	phase, which sh	ows horizontal stab	ilization
	10	although being nois			
	The second second second second second second second second second second second second second second second se	transmissivity is est	imated to be 9.0	E-08 m2/s to 4.0E-7	7 m2/s. The
10 1	ł				
10 ⁴	10 -1	flow dimension disp	played during th	e test is 2. The statio	
10 ⁻¹	10 ² 10 ³ 10 ⁴	flow dimension disp measured at transdu	blayed during th cer depth, was d	e test is 2. The statio	lir phase using

	Test Sumr	nary Sheet				
Project:	Oskarshamn site investigation	Test type:[1]			Crwi	
Area:	Laxemar	Test no:			1	
Borehole ID:	KLX19A	Test start:	061207 15			
Test section from - to (m):	495.00-515.00 m	Responsible for			Stephan Rohs	
		test execution:			Philipp Wol	
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:		Cris	tian Enachescu	
Linear plot Q and p		Flow period		Recovery perio	d	
		Indata		Indata		
		p ₀ (kPa) =	4316			
4350 KLX19A_495.00-515.00_061207_1_CRwr_Q_r	• P section	p _i (kPa) =	4311			
4330	* P section A P abox * P bebox * Q * Q * 4.0	p _p (kPa) =	4186	p _F (kPa) =	430	
4330		$Q_{p} (m^{3}/s) =$	3.50E-05			
4270	* ac -	tp (s) =	2827044		1278	
4250	2.5 gg	S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-0	
4210	20 #	EC _w (mS/m)=				
		Temp _w (gr C)=	13.3			
4170	0.5	Derivative fact.=	NA	Derivative fact.=	0.0	
4150 0.00 100.00 200.00 200.00 400. Elapsed	0.0 00 500.00 600.00 700.00 800.00 Firme [M]					
		Results		Results		
		$Q/s (m^2/s)=$	2.7E-06			
Log-Log plot incl. derivates- f	low period	$T_{M} (m^{2}/s) =$	2.9E-06			
		Flow regime:	NA	Flow regime:	transient	
		dt_1 (min) =	NA	dt_1 (min) =	11.4	
		dt_2 (min) =	NA	dt_2 (min) =	95.5	
		$T(m^2/s) =$	NA	$T(m^2/s) =$	5.8E-06	
		S (-) =	NA	S (-) =	1.0E-0	
		$K_s (m/s) =$	NA	$K_s (m/s) =$	2.9E-07	
		$S_{s}(1/m) =$	NA	S _s (1/m) =	5.0E-0	
not a	nalysed	C (m ³ /Pa) =	NA	C (m ³ /Pa) =	6.8E-0	
		C _D (-) =	NA	C _D (-) =	7.4E-0	
		ξ(-) =	NA	ξ(-) =	-2.1	
		2		2		
		$T_{GRF}(m^2/s) =$		$T_{GRF}(m^2/s) =$	<u> </u>	
		$S_{GRF}(-) =$		S _{GRF} (-) =		
		D _{GRF} (-) =		D _{GRF} (-) =		
_og-Log plot incl. derivatives	- recovery period	Selected repres dt ₁ (min) =			6.8E-0	
Elancert time	[h] .	$dt_1(min) =$ $dt_2(min) =$		C (m ³ /Pa) = C _D (-) =	0.8E-0	
10 2 10,2	10, ⁻¹	= 、 ,	5.8E-06		-2.1	
	10 2	$T_T (m^2/s) =$ S (-) =	1.0E-06		-2.1	
10 1		$K_{s}(m/s) =$	2.9E-07		+	
	10 2	$S_{s}(1/m) =$	5.0E-08			
and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	-	Comments:				
	10 ⁻¹		transmissivity of	f 5.8•10-6 m2/s was	s derived from	
	· · · · · · · · · · · · · · · · · · ·	the analysis of the	CRwr phase. Du	e to the hydraulic c	ommunication to	
10 -1		the bottom zone, the				
••	10 °	limit of the confide transmissivity is es				
10 ⁰ 40 ¹	10 ² 10 ² 10 ⁴	dimension displaye				
יוסו טי	2D 10 10	at transducer depth	, was derived fro	om the CRwr phase	using type curve	
		extrapolation in the	1	,		
		short duration of the value is slightly un		pared to the pumpin	ig time, this	
		. and is singhtly un				

			nary Sheet			
Project:	Oskarshamn site investiga	ation	Test type:[1]			CRwr
Area:	Laxe	emar	Test no:			1
Borehole ID:	KLX19A Test start:		061128 19:53			
Test section from - to (m):	764.00-769.00 R		Responsible for	Stephan Rol		
		070	test execution:		0.11	Philipp Wolf
Section diameter, 2·r _w (m):	0	0.076	Responsible for test evaluation:		Crist	ian Enachescu
Linear plot Q and p			Flow period		Recovery period	
· ·			Indata		Indata	
			p ₀ (kPa) =	6404		
6400 NLX19A_764.00-769.00_061128_1_CRwr_Q_F	2.0		p _i (kPa) =	6391		
RLX19A_764.00-768.00_061128_1_CRwr_Q_r 6400	● P taction ● P above ● P balove ● Q		p _p (kPa) =	6150	p _F (kPa) =	6347
8350			Q _p (m ³ /s)=	1.33E-05		
i Auto			tp (s) =	578490	t _F (s) =	9588
			S el S [*] (-)=	1.00E-06	S el S [*] (-)=	1.00E-06
0200		ē.	EC _w (mS/m)=			
	05		Temp _w (gr C)=	16.8		
6120			Derivative fact.=	NA	Derivative fact.=	0.06
6100 0.00 20.00 40.00 80.00 80.00	100.00 120.00 140.00 160.00 180.00					
сарые тля	μη Ι		Results		Results	
			Q/s (m²/s)=	5.4E-07		
Log-Log plot incl. derivates- fl	ow period		$T_{M} (m^{2}/s) =$	4.5E-07		
• • •	<u> </u>		Flow regime:	transient	Flow regime:	transient
			dt_1 (min) =	NA	dt_1 (min) =	0.60
			dt_2 (min) =	NA	dt_2 (min) =	23.34
			$T(m^2/s) =$	NA	$T(m^2/s) =$	2.9E-07
			S (-) =	NA	S (-) =	1.0E-06
			$K_s(m/s) =$	NA	$K_s (m/s) =$	5.7E-08
			$S_{s}(1/m) =$	NA	S _s (1/m) =	2.0E-07
Not an	nalysed		C (m ³ /Pa) =	NA	C (m³/Pa) =	9.7E-10
			C _D (-) =	NA	C _D (-) =	1.1E-01
			ξ(-) =	NA	ξ(-) =	-4.6
			$T_{GRF}(m^2/s) =$		T _{GRF} (m²/s) =	
			S _{GRF} (-) =		S _{GRF} (-) =	
			D _{GRF} (-) =		D _{GRF} (-) =	
Log-Log plot incl. derivatives-	recovery period		Selected represe	intative param	ieters.	
			dt ₁ (min) =	0.60	C (m³/Pa) =	9.7E-10
Elapsed time (h)	<u>. 10, ¹ 10, ⁰</u>		dt ₂ (min) =	23.34	- 0 ()	1.1E-01
			$T_{T} (m^{2}/s) =$	2.9E-07	ξ(-) =	-4.6
10 1	10 3		S (-) =	1.0E-06		
			$K_{s}(m/s) =$	5.7E-08		
10 0	10 2		$S_{s}(1/m) =$	2.0E-07		
and the second statements		or kPa	Comments:			
10 1	10 1	p-p0. (p-p0f. (kPu)	The recommended t			
	F 10 °		analysis of the CRw bottom zone, the de			
10 4	10 [°]		of the confidence ra		U	11
			transmissivity is est	imated to be 5.0	E-8 to 3.0E-7 m2/s.	The flow
10 ⁰ 10 ¹ ID/CD	10 ² 10 ³ 10 ⁴		dimension displayed			
			at transducer depth, extrapolation in the			
			short duration of the			
			value is slightly unc		1 ··· F ···· 5	

Borehole: KLX19 A

APPENDIX 4

Nomenclature

Character	SICADA designation	Explanation	Dimension	Unit
Variables,	constants			_
A _w		Horizontal area of water surface in open borehole, not including area of signal cables, etc.	[L ²]	m ²
b		Aquifer thickness (Thickness of 2D formation)	[L]	m
B		Width of channel	[L]	m
		Corrected borehole length	[L]	m
<u> </u>		Uncorrected borehole length	[L]	m
Lo		Point of application for a measuring section based on its		-
L _p		centre point or centre of gravity for distribution of transmissivity in the measuring section.	[L]	m
L _w		Test section length.	[L]	m
dL		Step length, Positive Flow Log - overlapping flow logging. (step length, PFL)	[L]	m
r		Radius	[L]	m
		Borehole, well or soil pipe radius in test section.	[L]	
r _w		Effective borehole, well or soil pipe radius in test section.		m
r _{we}			[L]	m
		(Consideration taken to skin factor)	1 1 1	
r _s		Distance from test section to observation section, the shortest distance.	[L]	m
r _t		Distance from test section to observation section, the interpreted shortest distance via conductive structures.	[L]	m
r _D		Dimensionless radius, r _D =r/r _w	-	-
Z		Level above reference point	[L]	m
Z _r		Level for reference point on borehole	[L]	m
Z _{wu}		Level for test section (section that is being flowed), upper limitation	[L]	m
Z _{wl}		Level for test section (section that is being flowed), lower limitation	[L]	m
Z _{WS}		Level for sensor that measures response in test section (section that is flowed)	[L]	m
Z _{ou}		Level for observation section, upper limitation	[L]	m
Z _{ol}		Level for observation section, lower limitation	ÎLÎ	m
Z _{os}		Level for sensor that measures response in observation section	[L]	m
E		Evaporation:	[L ³ /(T L ²)]	mm/y, mm/d,
		hydrological budget:	[L ³ /T]	m ³ /s
ET		Evapotranspiration	$[L^{3}/(T L^{2})]$	mm/y, mm/y,
		hudeala sizal hudeati	[L ³ /T]	m^3/s
P		hydrological budget: Precipitation	$[L^{7}]$	m /s mm/y,
F			[L ³ /T]	mm/d, m ³ /s
R		hydrological budget: Groundwater recharge	$[L^{7}]$	mm/y,
ĸ			[L ³ /T]	mm/d, m ³ /s
		hydrological budget:		
D		Groundwater discharge	[L ³ /(T L ²)]	mm/y, mm/d,
-		hydrological budget:	[L ³ /T]	m ³ /s
Q _R		Run-off rate	$[L^3/T]$	m ³ /s
Q _p		Pumping rate	[L ³ /T]	m³/s
Q		Infiltration rate	[L ³ /T]	m³/s
Q		Volumetric flow. Corrected flow in flow logging $(Q_1 - Q_0)$ (Flow rate)	[L ³ /T]	m³/s
Q ₀		Flow in test section during undisturbed conditions (flow logging).	[L ³ /T]	m³/s
Q _p		Flow in test section immediately before stop of flow.	[L ³ /T]	m ³ /s
⊶р		Stabilised pump flow in flow logging.	[[[]]]	1173

Character	SICADA designation	Explanation	Dimension	Unit	
Q _m		Arithmetical mean flow during perturbation phase.	[L ³ /T]	m³/s	
Q ₁		Flow in test section during pumping with pump flow Q_{p1} , (flow logging).	[L ³ /T]	m³/s	
Q ₂		Flow in test section during pumping with pump flow Q _{p1} , (flow logging).	[L ³ /T]	m ³ /s	
ΣQ	SumQ	Cumulative volumetric flow along borehole	[L ³ /T]	m ³ /s	
ΣQ_0	SumQ0	Cumulative volumetric flow along borehole, undisturbed conditions (ie, not pumped)	[L ³ /T]	m ³ /s	
ΣQ_1	SumQ1	Cumulative volumetric flow along borehole, with pump flow Q_{p1}	[L ³ /T]	m ³ /s	
ΣQ_2	SumQ2	Cumulative volumetric flow along borehole, with pump flow Q_{p2}	[L ³ /T]	m ³ /s	
ΣQ_{C1}	SumQC1	Corrected cumulative volumetric flow along borehole, $\Sigma Q_1 - \Sigma Q_0$	[L ³ /T]	m³/s	
ΣQ_{C2}	SumQC2	Corrected cumulative volumetric flow along borehole, $\Sigma Q_2 - \Sigma Q_0$	[L ³ /T]	m³/s	
q		Volumetric flow per flow passage area (Specific discharge (Darcy velocity, Darcy flux, Filtration velocity)).	([L ³ /T*L ²]	m/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	
V		Velocity	$([L^{3}/T^{*}L^{2}])$	m/s	
Va		Mean transport velocity (Average linear velocity (Average linear groundwater velocity, Mean microscopic velocity)); $v_a=q/n_e$	([L ³ /T*L ²]	m/s	
		-			
t		Time	[T]	hour,mi n,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,mi n,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	
n		Atmospheric pressure	$[M/(LT)^2]$	kPa	
p _a p _t		Autosphene pressure; $p_t=p_a+p_d$	$[M/(LT)^{2}]$	kPa	
pg		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	

Character	SICADA designation	Explanation	Dimension	Unit	
dp _f		$dp_f = p_i - p_f$ or $p_f = p_f - p_i$, 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 $p_p = p_p - p_s$, pressure increase/drawdown of pressure surface between two points of time during recovery phase. dp_s usually expressed positive.	[M/(LT) ²]	kPa	
dpp		$dp_p = p_i - p_p$ 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	
Η		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	
h _p		Pressure head; Level above reference level for height of measuring point of stationary column of water giving corresponding static pressure at measuring point	[L]	m	
h _v		Velocity head; height corresponding to the lifting for which the kinetic energy is capable (usually neglected in hydrogeology)	[L]	m	
S		Drawdown; Drawdown from undisturbed level (same as dh_p , positive)	[L]	m	
Sp		Drawdown in measuring section before flow stop.	[L] [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.	ilij	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		$dh_F = h_p - h_F \text{ or } = h_F - h_p$, 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		°C	
Te _{w0}			°C		

Character	SICADA designation	Explanation	Dimension	Unit
Te _o		Temperature in the observation section (taken from temperature logging). Temperature		°C
ECw		Electrical conductivity of water in test section.		mS/m
ECw0		Electrical conductivity of water in test section during		mS/m
		undisturbed conditions.		
ECo		Electrical conductivity of water in observation section		mS/m
TDŠ _w		Total salinity of water in the test section.	$[M/L^3]$	mg/L
TDS _{w0}		Total salinity of water in the test section during	[M/L ³] [M/L ³]	mg/L
		undisturbed conditions.		Ũ
TDS _o		Total salinity of water in the observation section.	$[M/L^3]$	mg/L
g		Constant of gravitation (9.81 m*s ⁻²) (Acceleration due to gravity)	[L/T ²]	m/s ²
π	pi	Constant (approx 3.1416).	[-]	
<u>π</u> 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)		
ME		· ·		
		Mean error in residuals. $ME = \frac{1}{n} \sum_{i=1}^{n} r_i$		
NME		Normalized ME. NME=ME/(x _{MAX} -x _{MIN}), x: measured variable considered.		
MAE		Mean absolute error. $MAE = \frac{1}{n} \sum_{i=1}^{n} r_i $		
NMAE		Normalized MAE. NMAE=MAE/(x _{MAX} -x _{MIN}), x: measured variable considered.		
RMS		Root mean squared error. $RMS = \left(\frac{1}{n}\sum_{i=1}^{n}r_{i}^{2}\right)^{0.5}$		
NRMS		Normalized RMR. NRMR=RMR/(x _{MAX} -x _{MIN}), x: measured variable considered.		
SDR		Standard deviation of residual.		
		$SDR = \left(\frac{1}{n-1}\sum_{i=1}^{n} (r_i - ME)^2\right)^{0.5}$		
SEMR		Standard error of mean residual. $SEMR = \left(\frac{1}{n(n-1)}\sum_{i=1}^{n} (r_i - ME)^2\right)^{0.5}$		
Parameter	s			
Q/s		Specific capacity $s=dp_p$ or $s=s_p=h_0-h_p$ (open borehole)	$[L^2/T]$	m²/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.	[ד]	S
dt _L		Response time to obtain 0.1 m (or 1 kPa) drawdown in observation section counted from start of recovery phase.	[T]	S
ТВ		Flow capacity in a one-dimensional structure of width B and transmissivity T. Transient evaluation of one- dimensional structure	[L ³ /T]	m ³ /s
Т		Transmissivity	$[L^2/T]$	m²/s
T _M		Transmissivity according to Moye (1967)	$[L^2/T]$	m²/s
T _Q		Evaluation based on Q/s and regression curve between Q/s and T, as example see Rhén et al (1997) p. 190.	[L ² /T]	m²/s
Ts		Transmissivity evaluated from slug test	$[L^2/T]$	m²/s

Character	SICADA designation	Explanation	Dimension	Unit
T _D		Transmissivity evaluated from PFL-Difference Flow Meter	[L ² /T]	m²/s
Ti		Transmissivity evaluated from Impeller flow log	$[L^2/T]$	m²/s
T _{Sf} , T _{Lf}		Transient evaluation based on semi-log or log-log	$[L^2/T]$	m²/s
		diagram for perturbation phase in injection or pumping.		
T _{Ss} , T _{Ls}		Transient evaluation based on semi-log or log-log diagram for recovery phase in injection or pumping.	[L ² /T]	m²/s
Τ _Τ		Transient evaluation (log-log or lin-log). Judged best evaluation of T_{Sf} , T_{Lf} , T_{Ss} , T_{Ls}	[L ² /T]	m²/s
T _{NLR}		Evaluation based on non-linear regression.	[L ² /T]	m²/s
T _{Tot}		Judged most representative transmissivity for particular	$[L^2/T]$	m²/s
lot		test section and (in certain cases) evaluation time with respect to available data (made by SKB at a later stage).		111 / 3
ĸ		Hydraulic conductivity	[L/T]	m/s
Ks	1	Hydraulic conductivity based on spherical flow model	[L/T]	m/s
K _m		Hydraulic conductivity matrix, intact rock	[L/T]	m/s
k		Intrinsic permeability	$[L^{7}]$	m ²
kb		Permeability-thickness product: kb=k·b	[L ³]	m ³
SB		Storage capacity in a one-dimensional structure of width B and storage coefficient S. Transient evaluation of one- dimensional structure	[L]	m
SB*		Assumed storage capacity in a one-dimensional structure of width B and storage coefficient S. Transient evaluation of one-dimensional structure	[L]	m
S S*		Storage coefficient, (Storativity)	[-]	-
S*		Assumed storage coefficient	[-]	-
S _y		Theoretical specific yield of water (Specific yield; unconfined storage. Defined as total porosity (n) minus retention capacity (S _r)	[-]	-
S _{ya}		Specific yield of water (Apparent specific yield); unconfined storage, field measuring. Corresponds to volume of water achieved on draining saturated soil or rock in free draining of a volumetric unit. $S_{ya} = S_y$ (often called S_y in literature)	[-]	-
Sr		Specific retention capacity, (specific retention of water, field capacity) (Specific retention); unconfined storage. Corresponds to water volume that the soil or rock has left after free draining of saturated soil or rock.	[-]	-
S _f		Fracture storage coefficient	[-]	-
S _m		Matrix storage coefficient	[-]	-
S _{NLR}		Storage coefficient, evaluation based on non-linear regression	[-]	-
S _{Tot}		Judged most representative storage coefficient for particular test section and (in certain cases) evaluation time with respect to available data (made by SKB at a later stage).	[-]	-
c		Specific storage coefficient: confined storage	[1/[]	1/~
S _s		Specific storage coefficient; confined storage.	[1/L]	1/m
S _s *		Assumed specific storage coefficient; confined storage.	[1/L]	1/m
Cf		Hydraulic resistance: The hydraulic resistance is an aquitard with a flow vertical to a two-dimensional formation. The inverse of c is also called Leakage coefficient. $c_f=b'/K'$ where b' is thickness of the aquitard and K' its hydraulic conductivity across the aquitard.	[T]	S
1		Leakage factor: $L_f = (K \cdot b \cdot c_f)^{0.5}$ where K represents	[L]	m
L _f		characteristics of the aquifer.		

Character	SICADA designation	Explanation	Dimension	Unit	
٤*	Skin	Assumed skin factor	[-]	-	
<u>ξ*</u> C		Wellbore storage coefficient	$[(LT^2) \cdot M^2]$	m³/Pa	
C _D		$C_D = C \cdot \rho_w g / (2\pi \cdot S \cdot r_w^2)$, Dimensionless wellbore storage coefficient	[-]	-	
ω	Stor-ratio	$\omega = S_f / (S_f + S_m)$, storage ratio (Storativity ratio); the ratio of storage coefficient between that of the fracture and total storage.	[-]	-	
λ	Interflow-coeff	$\lambda = \alpha \cdot (K_m / K_f) \cdot r_w^2$ interporosity flow coefficient.	[-]	-	
T _{GRF}		Transmissivity interpreted using the GRF method	[L ² /T]	m²/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	
Cr		Pore-volume compressibility, (rock compressibility); Corresponding to α/n in hydrogeological literature.	[(LT ²)/M]	1/Pa	
Ct		$c_t = c_r + c_w$, 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	
nc _t		Porosity-compressibility factor: $nc_t = n \cdot c_t$	[(LT ²)/M]	1/Pa	
nc _t b		Porosity-compressibility-thickness product: $nc_tb = n \cdot c_t.b$	$[(L^2T^2)/M]$	m/Pa	
n		Total porosity		-	
n _e		Kinematic porosity, (Effective porosity)	-	-	
e		Transport aperture. $e = n_e \cdot b$	[L]	m	
ρ	Density	Density	$[M/L^3]$	$kg/(m^3)$	
ρ_{w}	Density-w	Fluid density in measurement section during pumping/injection	[M/L ³]	kg/(m ³)	
ρο	Density-o	Fluid density in observation section	[M/L ³]	kg/(m ³)	
$ ho_{sp}$	Density-sp	Fluid density in standpipes from measurement section	[M/L ³]	kg/(m ³)	
μ	my	Dynamic viscosity	[M/LT]	Pas	
μ _w	my	Dynamic viscosity (Fluid density in measurement section during pumping/injection)	[M/LT]	Pas	
FC _T		Fluid coefficient for intrinsic permeability, transference of k to K; K=FC _T -k; FC _T = $\rho_w \cdot g/\mu_w$	[1/LT]	1/(ms)	
FCs		Fluid coefficient for porosity-compressibility, transference of c_t to S_s ; S_s =FC _S ·n·c _t ; FC _S = ρ_w ·g	[M/T ² L ²]	Pa/m	
Index on K	C, T and S				
S		S: semi-log			
L		L: log-log			
f		Pump phase or injection phase, designation following S or L (withdrawal)			
s NLR		Recovery phase, designation following S or L (recovery) NLR: Non-linear regression. Performed on the entire test sequence, perturbation and recovery			
M		Моуе			
GRF		Generalised Radial Flow according to Barker (1988)			
m		Matrix			
f Ŧ		Fracture			
Т		Judged best evaluation based on transient evaluation.			

Character	SICADA designation	Explanation	Dimension	Unit
Tot		Judged most representative parameter for particular test section and (in certain cases) evaluation time with respect to available data (made by SKB at a later stage).		
b		Bloch property in a numerical groundwater flow model		
e		Effective property (constant) within a domain in a numerical groundwater flow model.		
Index on p	and Q			
0		Initial condition, undisturbed condition in open holes		
i		Natural, "undisturbed" condition of formation parameter		
f		Pump phase or injection phase (withdrawal, flowing phase)		
S		Recovery, shut-in phase		
р		Pressure or flow in measuring section at end of perturbation period		
F		Pressure in measuring section at end of recovery period.		
m		Arithmetical mean value		
С		Estimated value. The index is placed last if index for "where" and "what" are used. Simulated value		
m		Measured value. The index is placed last if index for "where" and "what" are used. Measured value		
Some misc	ellaneous inde	exes on p and h		
W		Test section (final difference pressure during flow phase in test section can be expressed dp _{wp} ; First index shows "where" and second index shows "what")		
0		Observation section (final difference pressure during flow phase in observation section can be expressed dp _{op} ; First index shows "where" and second index shows "what")		
f		Fresh-water head. Water is normally pumped up from section to measuring hoses where pressure and level are observed. Density of the water is therefore approximately the same as that of the measuring section. Measured groundwater level is therefore normally represented by what is defined as point-water head. If pressure at the measuring level is recalculated to a level for a column of water with density of fresh water above the measuring point it is referred to as fresh-water head and h is indicated last by an f. Observation section (final level during flow phase in observation section can be expressed h_{opf} ; the first index shows "where" and the second index shows "what" and the last one "recalculation")		

Borehole: KLX20A

APPENDIX 5

SICADA data tables

Borehole: KLX19A

APPENDIX 5-1

SICADA data tables (Injection tests)

SKB		SIC	CADA	/Data	Impo	rt Temp	late			plified version v1.4 Ergodata AB 2004		
										-		
File Identity							Compiled By					
Created By						Quality Check						
Created							very Approval					
			•									
Activity Type		KLX 19A	- 44		Project		AP PS 4	00-06-144				
		KLX 19A - Injectio	ntest									
	41						Data					
Activity Informa	ition					Additional Activity Data						
						C10		P200	P220	R25		
ldcode	Start Date	Stop Date	Secup (m)	Seclow (m)	Section No		Field crew manager	Field crew	evaluating data	Report		
KLX 19A	2007-01-11 08:17	2007-01-31 11:02	111.00	781.00		Golder Associates		Philipp Wolf, Thomas Cronquist, Mesgena Gebrezghi, Daniel Nordbörg	Reinder van der Wall, Philipp Wolf, Stephan Rohs	Stephan Rohs		

Table	

plu_s_hole_test_d

PLU Injection and pumping, General information

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

KLX	19A
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						section n		formation_ty					mean flow rate			
	idcode	start_date	stop_date	secup	seclow	o	test_type		start_flow_period	stop_flow_period	flow_rate_end_qp	value_type_qp			_measlu	tot_volume_vp
	KLX 19A	070111 08:17	070111 10:39	111.00	211.00		3	3 1	2007-01-11 09:37:07	2007-01-11 10:07:17	7.77E-04		0 7.85E-0	4 1.67E-08	8.33E-04	1.41E+00
Clips Dirit Gold Unit Gold U	KLX 19A	070112 09:13	070112 14:01	211.00	311.00		3	3 1	2007-01-12 13:00:58	2007-01-12 13:31:08	4.50E-04		0 4.76E-0	4 1.67E-08	8.33E-04	8.57E-01
SCIMA OTH 1846 OT	KLX 19A	070112 14:03	070112 15:20	211.00			3	3 1	2007-01-12 14:17:58	2007-01-12 14:48:08			0 6.62E-0	4 1.67E-08	8.33E-04	
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KLX 19A 070129 14:49 070129 16:18 731.00 736.00 3 1 2007-01-29 15:6:25 1.33E-06 0 1.40E-06 1.67E-08 8.33E-04 1.68E-03 KLX 19A 070129 18:54 070129 19:33 741.00 746.00 3 1 #N/A #N/A #N/A 1 #N/A 1.67E-08 8.33E-04 #M/A KLX 19A 070130 09:54 746.00 751.00 3 1 2007-01-30 09:23:45 1.67E-08 0 2.33E-08 1.67E-08 8.33E-04 #M/A KLX 19A 070130 09:54 760.00 756.00 3 1 2007-01-30 09:23:45 1.67E-08 0 2.33E-08 1.67E-08 8.33E-04 2.80E-05 KLX 19A 070130 12:02 751.00 756.00 3 1 2007-01-30 11:20:05 2007-01-30 11:40:15 2.67E-08 0 3.67E-08 8.33E-04 4.40E-05 KLX 19A 070130 12:47 070130 14:29 756.00 761.00 3 1 2007-01-30 17:07:16 2.83E-08 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>3</td><td>·</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>							3	·								
KLX 19A 070129 18:54 070129 19:33 741.00 746.00 3 1 #N/A #N/A #N/A -1 #N/A 1.67E-08 8.33E-04 #M/A KLX 19A 070130 09:54 740.00 751.00 3 1 2007-01-30 09:32:45 1.67E-08 0 2.33E-08 1.67E-08 8.33E-04 2.80E-05 KLX 19A 070130 10:20 070130 12:02 751.00 756.00 3 1 2007-01-30 11:20:5 2007-01-30 11:40:15 2.67E-08 0 3.67E-08 8.33E-04 4.40E-05 KLX 19A 070130 12:47 070130 12:47 070130 12:47 756.00 761.00 3 1 2007-01-30 11:20:05 2007-01-30 11:40:15 2.83E-08 0 3.06E-08 8.33E-04 4.40E-05 KLX 19A 070130 12:47 070130 14:29 756.00 761.00 3 1 2007-01-30 17:59:37 1.91E-05 0 3.00E-08 8.33E-04 4.40E-05 KLX 19A 070130 17:00 070130 18:21 766.00 771.00 3																
KLX 19A 070130 08:14 070130 09:54 746.00 751.00 3 1 2007-01-30 09:12:35 2007-01-30 09:32:45 1.67E-08 0 2.38E-08 8.33E-04 2.80E-05 KLX 19A 070130 10:20 070130 12:02 751.00 756.00 3 1 2007-01-30 11:20:05 2007-01-30 11:40:15 2.67E-08 0 3.67E-08 1.67E-08 8.33E-04 4.40E-05 KLX 19A 070130 12:47 070130 14:29 756.00 761.00 3 1 2007-01-30 11:40:15 2.67E-08 0 3.67E-08 8.33E-04 4.40E-05 KLX 19A 070130 12:47 070130 14:29 756.00 761.00 3 1 2007-01-30 17:30E 2.83E-08 0 3.00E-08 8.33E-04 3.60E-05 KLX 19A 070130 17:00 766.00 771.00 3 1 2007-01-30 17:39E7 2.007-01-30 11:40:75:87 1.91E-05 0 2.48E-05 1.67E-08 8.33E-04 2.97E-05																
KLX 19A 070130 10:20 070130 12:02 751.00 756.00 3 1 2007-01-30 11:20:05 2007-01-30 11:40:15 2.67E-08 0 3.67E-08 1.67E-08 8.33E-04 4.40E-05 KLX 19A 070130 12:47 070130 14:29 756.00 761.00 3 1 2007-01-30 11:20:05 2007-01-30 14:07:16 2.83E-08 0 3.00E-08 1.67E-08 8.33E-04 3.60E-05 KLX 19A 070130 17:00 070130 18:21 766.00 771.00 3 1 2007-01-30 17:39:27 2007-01-30 17:59:37 1.91E-05 0 2.48E-05 8.33E-04 2.97E-02																
KLX 19A 070130 12:47 070130 14:29 756.00 761.00 3 1 2007-01-30 13:47:06 2007-01-30 14:07:16 2.83E-08 0 3.00E-08 1.67E-08 8.33E-04 3.60E-05 KLX 19A 070130 17:00 070130 18:21 766.00 771.00 3 1 2007-01-30 17:39:27 2007-01-30 17:59:37 1.91E-05 0 2.48E-05 1.67E-08 8.33E-04 2.97E-02																
KLX 19A 070130 17:00 070130 18:21 766.00 771.00 3 1 2007-01-30 17:39:27 2007-01-30 17:59:37 1.91E-05 0 2.48E-05 1.67E-08 8.33E-04 2.97E-02																
								3 1								
	KLX 19A							3 1								

			dur_flow_ph	dur_rec_pha		head_at_flow_end			press_at_flow_en	final_press_p	fluid_temp_te	fluid_elcond_ec	fluid_salinity_td	fluid_salinity_td			
idcode		seclow		se_tf	initial_head_hi	_hp		initial_press_pi		f	w	w	sw	swm	reference	comments	lp
KLX 19A	111.00			1800			13.39			1806							161.00
KLX 19A KLX 19A	211.00 211.00	311.00 311.00		1800 1800			13.61 13.82	2630 2636		2637 2643							261.00 261.00
KLX 19A	311.00	411.00		#N/A			13.82 #N/A			2043 #N/A							361.00
KLX 19A	411.00	511.00		1800			13.97	4275		4281	13.2					-	461.00
KLX 19A	411.00	511.00		1800			14.04	4280		4288							461.00
KLX 19A	511.00	611.00		1800			15.39			5110							561.00
KLX 19A	511.00	611.00		1800	Į		15.66	5110		5118						-	561.00
KLX 19A KLX 19A	611.00 611.00	711.00		2700 1800			13.47 12.15			5938 5986						-	661.00 661.00
KLX 19A	694.00	794.00		1800			13.45			6619							744.00
KLX 19A	694.00	794.00		1800			13.63			6598					1		744.00
KLX 19A	111.00	131.00		1200			13.39			1146							121.00
KLX 19A	131.00	151.00		1200 1200		· · · · · · · · · · · · · · · · · · ·	12.00			1381	8.8						141.00
KLX 19A KLX 19A	151.00 191.00	171.00		1200			13.45 11.88	1479		1481 1861	9.0 9.5						161.00 201.00
KLX 19A	211.00	231.00		1200			15.88	1973		2002							221.00
KLX 19A	231.00	251.00		#N/A			#N/A			#N/A					1		241.00
KLX 19A	271.00	291.00		#N/A			#N/A	#N/A		#N/A							281.00
KLX 19A	291.00	311.00		1200			13.40	2629		2636							301.00
KLX 19A KLX 19A	411.00 431.00	431.00		1200 1200			14.39 13.84	3622		3639 3783							421.00 441.00
KLX 19A	451.00	451.00		1200			13.64			3954							441.00
KLX 19A	471.00	491.00		1200			14.34	4114		4114					+		481.00
KLX 19A	491.00	511.00		1200			14.28			4278						-	501.00
KLX 19A	511.00	531.00		1200			14.56			4449							521.00
KLX 19A	530.00	550.00		#N/A	ļ		#N/A	#N/A		#N/A							540.00
KLX 19A	550.00	570.00		1200 #N/A	[9.68 #N/A	4730		4733							560.00 601.00
KLX 19A KLX 19A	591.00 611.00	611.00 631.00		#N/A #N/A			#N/A #N/A	#N/A #N/A		#N/A #N/A	14.6 14.9					-	621.00
KLX 19A	631.00	651.00		1200			11.83			5459						+	641.00
KLX 19A	651.00	671.00	1200	1200			17.15			5673					1		661.00
KLX 19A	671.00	691.00		1200			13.85			5761	15.7						681.00
KLX 19A	691.00	711.00		3600			13.81	5920		5915							701.00
KLX 19A KLX 19A	711.00 731.00	731.00		#N/A 1200	ļ		#N/A 14.11	#N/A 6235		#N/A 6238							721.00 741.00
KLX 19A	751.00	771.00		1200			14.11			6434							761.00
KLX 19A	771.00	791.00		1200			12.59			6588							781.00
KLX 19A	104.00	109.00	1200	1200			13.57			965							106.50
KLX 19A	109.00	114.00		1200			13.62			1007							111.50
KLX 19A	411.00	416.00		1200			14.38			3513							413.50
KLX 19A KLX 19A	421.00 431.00	426.00		#N/A 1200			#N/A 11.90	#N/A 3722		#N/A 3793							423.50 433.50
KLX 19A	441.00	446.00		1200			14.31	3749		3749					1		443.50
KLX 19A	446.00	451.00		1200			14.25			3789					1	-	448.50
KLX 19A	551.00	556.00		1200			10.59			4612							553.50
KLX 19A	561.00	566.00		#N/A	ļ		#N/A	#N/A		#N/A						-	563.50
KLX 19A KLX 19A	646.00 651.00	651.00		1200 #N/A		+	10.97 #N/A	5418 #N/A		5443 #N/A						+	648.50 653.50
KLX 19A KLX 19A	656.00	661.00		#N/A 1200			#N/A 26.59			#N/A 5686			1		+	-	658.50
KLX 19A	666.00	671.00		1200		1	17.61	5595		5671			1			1	668.50
KLX 19A	676.00	681.00	1200	1200			12.93	5664	5879	5661	15.6						678.50
KLX 19A	681.00	686.00		1200			13.31	5706		5724							683.50
KLX 19A	691.00	696.00		1200			13.61	5792		5792					· · · · · ·		693.50
KLX 19A KLX 19A	696.00 701.00	701.00		1200 1200			13.30 11.83			5852 5993							698.50 703.50
KLX 19A	701.00	708.00		1200			11.65			5993							703.50
KLX 19A	731.00	736.00		1200			14.34			6118			1	1	1	1	733.50
KLX 19A	741.00	746.00	#N/A	#N/A			#N/A	#N/A	#N/A	#N/A	16.4						743.50
KLX 19A	746.00	751.00		1200			14.51	6262		6273							748.50
KLX 19A	751.00	756.00		1200			14.30	6307		6340						-	753.50
KLX 19A KLX 19A	756.00 766.00	761.00		1200 1200			13.50 14.00			6365 6441							758.50 768.50
KLX 19A	766.00	781.00		1200			14.00			6508			1				768.50
INEA 13A	110.00	101.00	1200	1200	1	1	13.02	0492	0091	0000	10.9	1	5	1	1		110.00

Table

plu_s_hole_test_ed1

PLU Single hole tests, pumping/injection. Basic evaluation

Column	Datatype	Unit Columr	Description
site	CHAR		on site name
activity_type	CHAR	Activity ty	
start_date	DATE	Date (yym	mdd hh:mm:ss)
stop_date	DATE		mdd hh:mm:ss)
project	CHAR	project co	
idcode	CHAR		porehole identification code
secup	FLOAT	m Upper sec	
seclow	FLOAT	m Lower sec	
section_no	INTEGER	number Section n	
test_type	CHAR		code (1-7), see table description!
formation_type	CHAR	Formation	type code. 1: Rock, 2: Soil (superficial deposits)
lp	FLOAT		point of application for test section, see descr.
seclen class	FLOAT	,	dinary test interval during test campaign.
spec_capacity_c	FLOAT		pacity (Q/s) of test section, see table descript.
value_type_q_s	CHAR		e,-1:Q/s <lower meas.limit,1:q="" s="">upper meas.limit</lower>
transmissivity_tc	FLOAT		ity based on Q/s, see table description
value_type_tq	CHAR		e,-1:TQ <lower meas.limit,1:tq="">upper meas.limit.</lower>
bc_tq	CHAR		e code. 1 means TQ is best choice of T, else 0
transmissivity_rr	FLOAT		ivity,TM, based on Moye (1967)
bc_tm	CHAR		e code. 1 means Tmoye is best choice of T, else 0
value_type_tm	CHAR		e,-1:TM <lower meas.limit,1:tm="">upper meas.limit.</lower>
hydr_cond_moy	FLOAT		aulic conductivity based on Moye (1967)
formation width	FLOAT		hickness repr. for T(generally b=Lw) ,see descr.
width_of_channe	FLOAT		width of formation for evaluated TB
tb	FLOAT		apacity in 1D formation of T & width B, see descr.
L_measl_tb	FLOAT		lower meas. limit for evaluated TB,see description
u_measl_tb	FLOAT		upper meas. limit of evaluated TB,see description
sb	FLOAT		ativity,B=width of formation,1D model,see descript.
assumed_sb	FLOAT		med SB,S=storativity,B=width of formation,see
leakage_factor_	FLOAT		el for evaluation of Leakage factor
transmissivity tt	FLOAT		issivity of formation, 2D radial flow model,see
value_type_tt	CHAR		e,-1:TT <lower meas.limit,1:tt="">upper meas.limit,</lower>
bc_tt	CHAR		e code. 1 means TT is best choice of T, else 0
l_measl_q_s	FLOAT		lower meas. limit for evaluated TT,see table descr
u_measl_q_s	FLOAT		upper meas. limit for evaluated TT,see description
storativity s	FLOAT		ty of formation based on 2D rad flow,see descr.
assumed s	FLOAT		Storativity,2D model evaluation,see table descr.
bc_s	FLOAT		e of S (Storativity), see descr.
ri	FLOAT	m Radius of	
ri index	CHAR		dex of radius of influence :-1,0 or 1, see descr.
-	FLOAT		d flow model evaluation of leakage coeff.see desc
leakage_coeff hydr_cond_ksf	FLOAT		del evaluation of hydraulic conductivity,see desc.
value_type_ksf	CHAR		e,-1:Ksf <lower meas.limit,1:ksf="">upper meas.limit,</lower>
	FLOAT		lower meas.limit for evaluated Ksf.see table desc.
l_measl_ksf u_measl_ksf	FLOAT		upper meas limit for evaluated Ksf,see table descr
spec_storage_s	FLOAT		c storage,3D model evaluation,see table descr.
assumed_ssf	FLOAT		ned Spec.storage,3D model evaluation,see table desi.
C	FLOAT		e storage coefficient; flow or recovery period
c cd	FLOAT	•	isionless wellbore storage coefficient
			0
skin dt1	FLOAT		;best estimate of flow/recovery period,see descr.
dt1 dt2	FLOAT FLOAT		start time of evaluation, see table description
t1	FLOAT		stop time of evaluation. see table description for evaluated parameter from start flow period
t2	FLOAT		
tz dte1	FLOAT		or evaluated parameter from start of flow period for evaluated parameter from start of recovery
dte2			
	FLOAT FLOAT		or evaluated parameter from start of recovery extrapolated pressure, see table description
p_horner transmissivity t	FLOAT		
			ansmissivity based on None Linear Regression
storativity_s_nlr	FLOAT CHAR	_	orativity based on None Linear Regression,see e1:T NLR <lower meas.limit,1:="">upper meas.limit</lower>
value_type_t_nli			
bc_t_nir c_nir	CHAR		e code. 1 means T_NLR is best choice of T, else 0
c_nir cd_pir	FLOAT	•	torage coefficient, based on NLR, see descr.
cd_nlr skip_plr	FLOAT		less wellbore storage constant, see table descrip.
skin_nlr transmissivity_t	FLOAT		based on Non Linear Regression, see desc.
transmissivity_t_	FLOAT	—	ansmissivity based on Genelized Radial Flow, see
value_type_t_gr	CHAR		e,-1:T_GRF <lower meas.limit,1:="">upper meas.limit</lower>
bc_t_grf	CHAR		e code. 1 means T_GRF is best choice of T, else 0
storativity_s_grf	FLOAT	-	prativity based on Generalized Radial Flow, see des.
flow_dim_grf	FLOAT		w dimesion based on Generalized Rad. Flow model
comment	VARCHAR		ment to the evaluated parameters
error_flag	CHAR	-	g = "*" then an error occured and an error
in_use	CHAR	_	**" then the activity has been selected as
sign	CHAR	Signature	for QA data accknowledge (QA - OK)

							formation_t	_		spec_capacity_	value_type_	transmissivity_t	value_type_		transmissivity_
idcode KLX 19A	start_date 070111 08:17	stop_date 070111 10:39		seclow 211.00	section_no	test_type	100	lp 161.00		q_s 3.81E-05	q_s	q	tq	bc_tq	4.96E-05
KLX 19A KLX 19A	070112 09:13	070112 14:01	211.00				3 <u>1</u> 3 1	261.00							4.96E-05 2.82E-05
KLX 19A	070112 03:13	070112 15:20					3 1	261.00						1	2.33E-05
KLX 19A	070112 16:54	070112 18:28	311.00			1	3 1	361.00	1	÷					±.002 00
KLX 19A	070113 09:30	070113 11:44	411.00	511.00			3 1	461.00	100)			1.68E-06
KLX 19A	070113 11:46	070113 12:57	411.00	511.00			3 1	461.00	100)			1.44E-06
KLX 19A	070113 14:17	070113 16:33	511.00	611.00			3 1	561.00	100	2.84E-06	C)			3.70E-06
KLX 19A	070113 16:35	070113 17:43	511.00	611.00			3 1	561.00	100	2.20E-06	C)			2.86E-06
KLX 19A	070114 08:48	070114 11:01	611.00			4	3 1	661.00				· .			4.87E-07
KLX 19A	070114 11:03	070114 12:42	611.00					661.00	100			2			4.40E-07
KLX 19A	070115 15:33	070115 17:24	694.00			1	3 1	744.00	100			· .			1.20E-06
KLX 19A	070115 17:27	070115 21:48	694.00				3 1	744.00	100						1.07E-06
KLX 19A	070117 11:33	070117 13:30					3 1	121.00							3.75E-05
KLX 19A	070117 14:04	070117 15:56					3 1	141.00							6.84E-09
KLX 19A	070117 16:30	070117 17:52					3 1								1.62E-06
KLX 19A	070118 08:17	070118 10:20	191.00			1	3 1 3 1	201.00				<u></u>			1.00E-09
KLX 19A	070118 10:53 070118 13:06	070118 12:18 070118 14:00					3 1	221.00							6.88E-08 #N/A
KLX 19A KLX 19A	070118 13:06	070118 14:00	231.00				3 <u>1</u>	241.00 281.00							#N/A #N/A
KLX 19A KLX 19A	070118 17:44	070118 17:13	271.00				3 1	301.00							2.30E-05
KLX 19A KLX 19A	070118 17.44	070118 19.04	411.00				3 1	421.00						+	1.20E-08
KLX 19A	070119 11:20	070119 12:40					3 1	441.00	20						2.82E-07
KLX 19A	070119 13:38	070119 12:40	451.00			1	3 1	461.00	20						1.28E-06
KLX 19A	070119 15:30	070119 16:52	471.00	÷		1	3 1	481.00	4	÷		· .			2.39E-07
KLX 19A	070119 17:26	070119 18:46	491.00				3 1	501.00							1.62E-07
KLX 19A	070120 08:21	070120 09:42					3 1	521.00)			3.15E-06
KLX 19A	070120 10:18	070120 11:14					3 1	540.00							#N/A
KLX 19A	070120 11:45	070120 13:02		570.00			3 1	560.00)			2.04E-09
KLX 19A	070120 16:19	070120 17:09	591.00	611.00			3 1	601.00	20	#N/A	1				#N/A
KLX 19A	070120 17:41	070120 18:38	611.00	631.00			3 1	621.00	20	#N/A	. -1				#N/A
KLX 19A	070121 08:29	070121 10:11	631.00				3 1	641.00	20)			2.34E-09
KLX 19A	070121 13:18	070121 14:22					3 1	661.00							5.13E-08
KLX 19A	070121 14:52	070121 16:23	671.00				3 1	681.00							3.05E-07
KLX 19A	070121 16:56	070121 19:26					3 1	701.00							1.11E-07
KLX 19A	070122 08:46	070122 09:58	711.00			1	3 1	721.00							#N/A
KLX 19A	070122 10:50	070122 12:17				1	3 1	741.00							6.84E-08
KLX 19A	070122 13:36	070122 15:00				1	3 1	761.00				·			9.27E-07
KLX 19A	070122 15:43	070122 17:52					3 1	781.00							2.92E-07
KLX 19A	070124 09:08	070124 10:32 070124 13:05	104.00 109.00				3 1	106.50							2.64E-05
KLX 19A KLX 19A	070124 10:57 070124 17:05	070124 13:05	411.00				3 1 3 1	111.50 413.50	5						2.86E-05 1.15E-08
KLX 19A	070124 17:03	070124 10:29					3 1	413.50	5			<u></u>			1.13L-08 #N/A
KLX 19A	070125 13:20	070125 14:43	431.00				-	433.50	5			. (7.50E-10
KLX 19A	070125 16:48	070125 18:12						443.50				4			1.57E-08
KLX 19A	070125 18:36	070125 19:58	446.00				3 1	448.50						1	2.09E-07
KLX 19A	070126 09:34	070126 11:08	551.00				3 1	553.50					1		1.18E-09
KLX 19A	070126 13:58	070126 14:36	561.00				3 1	563.50					1	1	#N/A
KLX 19A	070127 11:03	070127 12:37	646.00				3 1	648.50							2.61E-09
KLX 19A	070127 13:03	070127 13:58	651.00				3 1	653.50	5	#N/A	1				#N/A
KLX 19A	070127 14:22	070127 16:11	656.00	661.00			3 1	658.50	5	3.49E-09	C)			2.88E-09
KLX 19A	070128 08:17	070128 09:42	666.00				3 1	668.50	5						4.09E-08
KLX 19A	070128 12:22	070128 13:51	676.00				3 1	678.50						1	1.63E-09
KLX 19A	070128 14:19	070128 15:44					3 1	683.50							2.43E-07
KLX 19A	070128 17:33	070128 18:59				1	3 1	693.50				·		ļ	2.33E-08
KLX 19A	070129 08:23	070129 09:47	696.00				3 1	698.50	5			·		1	6.12E-08
KLX 19A	070129 10:16	070129 11:59	701.00				3 1	703.50	5			·			1.03E-08
KLX 19A	070129 12:42	070129 14:12					3 1	708.50							3.46E-09
KLX 19A	070129 14:49	070129 16:18					3 1	733.50							5.32E-08
KLX 19A	070129 18:54	070129 19:33	741.00				3 1	743.50							#N/A
KLX 19A	070130 08:14	070130 09:54	746.00 751.00				3 1 3 1	748.50							6.11E-10
KLX 19A KLX 19A	070130 10:20 070130 12:47	070130 12:02 070130 14:29	751.00				- {	753.50 758.50	5			·			9.82E-10 1.04E-09
KLX 19A KLX 19A	070130 12.47	070130 14:29	756.00			1	3 1	758.50	5						7.33E-07
KLX 19A KLX 19A	070130 17.00	070130 18.21					3 1					· .		1	2.31E-07
INLA 18A	010131 09.20	010131 11.02	110.00	101.00		1	0 ₁ I	110.00	5	2.195-07	. U	1	1	1	2.31E-07

						formed to provide	width of chompal						laskans fast		value hune	1 1		
idcode se	ecup	seclow b	oc tm	value_type_tm		formation_wid	width_of_channel_	tb	I measl tb	u moast th	sh	assumed sb	leakage_fact	transmissivity tt	value_type_ #	bc tt	_measl_q_s	u measl a s
KLX 19A	111.00	211.00	0_00				u	10		u_measi_tb	30	assumed_sp	01_11	2.98E-04	0		_iiieasi_q_s 7.00E-05	5.00E-04
KLX 19A	211.00	311.00	0		1.000 01			-						1.09E-05	0	1	9.00E-06	5.00E-04
KLX 19A	211.00	311.00	0								1			9.70E-06	0	1	8.00E-06	5.00E-05
KLX 19A	311.00	411.00	0	0	#N/A									1.00E-10	0	1	1.00E-12	1.00E-10
KLX 19A	411.00	511.00	0	0	1.68E-08									9.47E-07	0	1	6.00E-07	3.00E-06
KLX 19A	411.00	511.00	0											6.12E-07	0		4.00E-07	2.00E-06
KLX 19A	511.00	611.00	0											5.53E-06	0		3.00E-06	8.00E-06
KLX 19A	511.00	611.00	0											6.20E-06	0	1	2.00E-06	8.00E-06
KLX 19A	611.00	711.00	0	÷										1.23E-07	0	·	8.00E-08	4.00E-07
KLX 19A KLX 19A	611.00 694.00	711.00 794.00	0	· · · · · · · · · · · · · · · · · · ·										1.77E-07 4.62E-07	0	1	8.00E-08 9.00E-08	4.00E-07 6.00E-07
KLX 19A	694.00	794.00	0		1									4.02E-07 4.11E-07	-1	1	9.00E-08	6.00E-07
KLX 19A	111.00	131.00	0											3.01E-04	-1	1	6.00E-05	4.00E-04
KLX 19A	131.00	151.00	0											1.71E-09	0		9.00E-00	7.00E-04
KLX 19A	151.00	171.00	0											4.07E-06	0		1.00E-06	6.00E-06
KLX 19A	191.00	211.00	0											3.80E-10	0	1	8.00E-11	8.00E-10
KLX 19A	211.00	231.00	0											2.03E-07	0	1	6.00E-08	4.00E-07
KLX 19A	231.00	251.00	0											1.00E-11	0	· · · · · ·	1.00E-13	1.00E-11
KLX 19A	271.00	291.00	0]			ļ]			1.00E-11	0		1.00E-13	1.00E-11
KLX 19A	291.00	311.00	0								+			1.13E-05	0	1	9.00E-06	5.00E-05
KLX 19A	411.00	431.00	0											3.16E-08	0		9.00E-09	5.00E-08
KLX 19A KLX 19A	431.00 451.00	451.00 471.00	0											2.96E-07 1.52E-06	0	1	2.00E-07 7.00E-07	7.00E-07 4.00E-06
KLX 19A	431.00	471.00	0											4.79E-07	0	1	2.00E-07	8.00E-07
KLX 19A	491.00	511.00	0								+			4.13E-07	0	J	1.00E-07	8.00E-07
KLX 19A	511.00	531.00	0								+			4.90E-06	0		1.00E-06	8.00E-06
KLX 19A	530.00	550.00	0											1.00E-10	0	·······	1.00E-13	1.00E-10
KLX 19A	550.00	570.00	0	0	1.02E-10									1.95E-09	0	1	8.00E-10	5.00E-09
KLX 19A	591.00	611.00	0	-1	#N/A									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 19A	611.00	631.00	0											1.00E-11	0	1	1.00E-13	1.00E-10
KLX 19A	631.00	651.00	0											1.23E-09	-1	1	8.00E-10	3.00E-09
KLX 19A	651.00	671.00	0											5.36E-08	0	1	1.00E-08	7.00E-08
KLX 19A	671.00	691.00	0											2.30E-07	-1		9.00E-08	6.00E-07
KLX 19A KLX 19A	691.00 711.00	711.00	0											5.36E-08 1.00E-11	0		1.00E-08 1.00E-13	8.00E-08 1.00E-11
KLX 19A	731.00	751.00	0											2.28E-07	0	1	8.00E-08	5.00E-07
KLX 19A	751.00	771.00	0											3.59E-07	ő	1	7.00E-08	4.00E-07
KLX 19A	771.00	791.00	0	0							++			1.80E-07	0	1	7.00E-08	4.00E-07
KLX 19A	104.00	109.00	0	-1	5.28E-06									6.79E-05	-1	1	3.00E-05	8.00E-05
KLX 19A	109.00	114.00	0		5.72E-06									4.95E-04	0	1	8.00E-05	5.00E-04
KLX 19A	411.00	416.00	0											3.87E-08	0	1	8.00E-09	5.00E-08
KLX 19A	421.00	426.00	0								-			1.00E-11	0	1	1.00E-13	1.00E-11
KLX 19A	431.00	436.00	0											1.56E-10	0	1	8.00E-11	8.00E-10
KLX 19A	441.00 446.00	446.00 451.00	0								+			2.93E-08	0	1	1.00E-08 8.00E-08	8.00E-08 8.00E-07
KLX 19A KLX 19A	446.00 551.00	451.00 556.00	0								+			3.20E-07 1.35E-09	0	1	8.00E-08 8.00E-10	8.00E-07 6.00E-09
KLX 19A	561.00	566.00	0								+			1.00E-11	0		1.00E-10	1.00E-11
KLX 19A	646.00	651.00	0								+			2.02E-09	-1	4	9.00E-09	5.00E-09
KLX 19A	651.00	656.00	0								1			1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 19A	656.00	661.00	0	0										6.53E-10	0	1	3.00E-10	3.00E-09
KLX 19A	666.00	671.00	0											3.11E-07	0	1	8.00E-08	4.00E-07
KLX 19A	676.00	681.00	0											2.44E-09	0	1	8.00E-10	6.00E-09
KLX 19A	681.00	686.00	0											2.49E-07	0	1	9.00E-08	4.00E-07
KLX 19A	691.00	696.00	0											8.60E-09	0	1	7.00E-09	5.00E-08
KLX 19A KLX 19A	696.00 701.00	701.00 706.00	0		1.222 00									1.52E-07 7.76E-09	0	1	8.00E-08 3.00E-09	3.00E-07 3.00E-08
KLX 19A KLX 19A	701.00	706.00	0								+			7.76E-09 3.80E-09	0		3.00E-09 1.00E-09	3.00E-08 8.00E-09
KLX 19A	706.00	711.00 736.00	0								+			3.80E-09 1.44E-07	-1	4	7.00E-09	3.00E-09
KLX 19A	731.00	746.00	0								+			1.00E-11	-1		1.00E-08	1.00E-11
KLX 19A	746.00	751.00	0								+			8.42E-10	-1		6.00E-10	3.00E-09
KLX 19A	751.00	756.00	Ő											6.80E-10	0	1	4.00E-10	2.00E-09
KLX 19A	756.00	761.00	0											3.82E-10	-1	1	9.00E-11	9.00E-09
KLX 19A	766.00	771.00	0											4.13E-07	0	1	8.00E-08	5.00E-07
KLX 19A	776.00	781.00	0	0	4.62E-08									2.12E-07	0	1	9.00E-08	4.00E-07

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idcode	secup	seclow	storativity_s	assumed_s	bc_s ri	ri_index	coeff	ksf	ksf	ksf	ksf	sf	ssf	C	cd	skin		dt2
KLX 19A	111.00						· · · · · · · · · · · · · · · · · · ·			<u> </u>				4.39E-09				
KLX 19A KLX 19A	211.00 211.00				51.76 55.24	-1								1.65E-08 1.01E-08	1.8E+00 1.1E+00	-4.89 -4.64		
KLX 19A KLX 19A	311.00				55.24 #N/A	- 1 #N/A								1.01E-06 #N/A	1.1E+00 #N/A	-4.64 #N/A		
KLX 19A	411.00				94.54	-1		-						4.68E-10	5.2E-02			#N/A #N/A
KLX 19A	411.00				36.43	-1			1	1				2.32E-10				
KLX 19A	511.00				147.00	0								1.13E-09	1.2E-01			
KLX 19A	511.00				151.23	0	4	1						4.60E-09	5.1E-01	-1.95		
KLX 19A	611.00	711.00	1.00E-06	6 1.00E-06	69.51	0			1	1				1.27E-09	1.4E-01	-4.76	#N/A	#N/A
KLX 19A	611.00	711.00	1.00E-06	6 1.00E-06	62.16	0								4.12E-09	4.5E-01	-3.57	1.6	20.2
KLX 19A	694.00				79.01	1								1.12E-09	1.2E-01	-4.00		
KLX 19A	694.00				76.76	1	ļ							1.35E-09	1.5E-01	-0.90		
KLX 19A	111.00					0	÷							3.67E-09	4.0E-01	0.00		
KLX 19A	131.00					1				ļ				1.08E-10	1.2E-02			
KLX 19A	151.00				111.15	0								5.39E-10				
KLX 19A	191.00				10.93	0	ļ			<u> </u>				6.23E-11	6.9E-03			
KLX 19A KLX 19A	211.00 231.00				25.00 #N/A	1 #N/A			+	<u> </u>				8.57E-11 #N/A	9.4E-03 #N/A	7.30 #N/A		
KLX 19A KLX 19A	231.00				#N/A #N/A	#N/A #N/A								#N/A #N/A	#N/A #N/A	#N/A #N/A		
KLX 19A KLX 19A	291.00					#IN/A -1		+					+	#N/A 1.48E-08	1.6E+00	-4.84		
KLX 19A	411.00				18.00	-1		+		+				5.73E-11	6.3E-03			
KLX 19A	431.00				57.72	0	Ś							6.06E-11	6.7E-03			
KLX 19A	451.00				#N/A	0								1.05E-09	1.2E-01	-4.10		
KLX 19A	471.00				86.17	0			1					8.32E-11	9.2E-03			
KLX 19A	491.00				62.73	0		1	1				1	9.07E-11	1.0E-02			
KLX 19A	511.00	531.00	1.00E-06	6 1.00E-06	116.43	0				1				2.72E-09	3.0E-01	-2.00	4.4	18.8
KLX 19A	530.00	550.00	1.00E-06		#N/A	#N/A				1				#N/A	#N/A	#N/A	#N/A	#N/A
KLX 19A	550.00	570.00	1.00E-06	6 1.00E-06	16.44	0								6.26E-11	6.9E-03	2.50	0.3	
KLX 19A	591.00				#N/A	#N/A								#N/A	#N/A	#N/A		#N/A
KLX 19A	611.00				#N/A	#N/A								#N/A	#N/A	#N/A	2	
KLX 19A	631.00				14.65	0	ļ			ļ				5.40E-11	6.0E-03			
KLX 19A	651.00	2				1								1.91E-10	÷			
KLX 19A	671.00					0	÷							4.52E-09	5.0E-01			
KLX 19A	691.00				37.65	0 #N/A	<u>}</u>							4.61E-11	5.1E-03	-2.80 #N/A		
KLX 19A KLX 19A	711.00 731.00				#N/A 54.07	#IN/A 0								#N/A 5.52E-11	#N/A 6.1E-03	#IN/A 3.71		
KLX 19A	751.00				55.73	1		-						3.40E-10	3.7E-02			
KLX 19A	771.00				50.97	0	}			+				4.87E-10	5.4E-02			
KLX 19A	104.00				224.63	0								4.97E-09	5.5E-01			
KLX 19A	109.00				257.77	0	h	1						3.57E-09	3.9E-01			
KLX 19A	411.00					1		1		1			1	1.86E-11	2.1E-03			
KLX 19A	421.00	426.00	1.00E-06	6 1.00E-06	#N/A	#N/A								#N/A	#N/A	#N/A	#N/A	#N/A
KLX 19A	431.00				8.75	0								4.12E-11	4.5E-03	-1.50		#N/A
KLX 19A	441.00				32.38	0								1.43E-11	1.6E-03	4.47		
KLX 19A	446.00				58.86	0								3.90E-11	4.3E-03			
KLX 19A	551.00				15.00	0								2.02E-11	2.2E-03			
KLX 19A	561.00				#N/A	#N/A	ļ			<u> </u>				#N/A	#N/A	#N/A		
KLX 19A	646.00				5.92	1 #N/A	 							2.56E-11	2.8E-03		1.0	
KLX 19A	651.00				#N/A #N/A	#IN/A		+						#N/A	#N/A	#N/A		
KLX 19A KLX 19A	656.00 666.00				#N/A 12.80	1		+						1.43E-10 6.43E-11	1.6E-02 7.1E-03			#N/A 1.0
KLX 19A KLX 19A	676.00				12.80	0		1				1		2.32E-11	2.6E-03			
KLX 19A	681.00				55.28	0		+	+	+			+	3.94E-09	4.3E-01			
KLX 19A	691.00				23.83	0		1		+			+	4.66E-11	5.1E-03			
KLX 19A	696.00				11.87	1	1	1	1	1				6.54E-11	7.2E-03	2.48		
KLX 19A	701.00				23.23	1		1		1				1.86E-11	2.1E-03			
KLX 19A	706.00				19.43	0				1				1.18E-11	1.3E-03			
KLX 19A	731.00	736.00	1.00E-06	6 1.00E-06	48.21	0	[2.61E-11	2.9E-03	7.89	0.6	
KLX 19A	741.00			6 1.00E-06	#N/A	#N/A								#N/A	#N/A	#N/A		#N/A
KLX 19A	746.00				13.33	0	Į	1		ļ				3.06E-11	3.4E-03			
KLX 19A	751.00				12.64	0	l			ļ			ļ	1.79E-11	2.0E-03			
KLX 19A	756.00				10.94	0	ļ	ļ	l	<u> </u>				2.37E-11	2.6E-03	-1.07		
KLX 19A	766.00				62.73	1	Į			<u> </u>				3.05E-10	3.4E-02	-3.00		
KLX 19A	776.00	781.00	1.00E-06	6 1.00E-06	53.10	0			1	1				6.79E-10	7.5E-02	-1.82	2.1	13.0

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idcode	secup	seclow	t1	t2	dte1	dte2	p horner	transmissivity_t_nlr		value_type_t_nl r	bc_t_nlr	c nlr	cd nlr	skin nlr	transmissivity_t grf		bc_t_grf	storativity_	flow_dim_gr f	comment
KLX 19A	111.00	211.00		12		diez	1806.1	transmissivity_t_m				c_ iiii	cu_iiii	Jakin_ini	_9"		bc_t_gn	lo_gn		comment
KLX 19A	211.00	311.00		1		1	2630.9													
KLX 19A	211.00	311.00					2633.0								į					
KLX 19A	311.00	411.00		ļ	ļ	ļ	#N/A					ļ							[
KLX 19A	411.00	511.00		 			4274.7													
KLX 19A	411.00	511.00					4275.4								1				ļ	
KLX 19A KLX 19A	511.00 511.00	611.00					5105.8 5108.4													
KLX 19A	611.00	711.00					5902.9							+						
KLX 19A	611.00	711.00		1			5889.9													
KLX 19A	694.00	794.00		1			6578.9													
KLX 19A	694.00	794.00					6580.7									l				
KLX 19A	111.00	131.00		ļ		ļ	1145.8									ļ			Į	
KLX 19A	131.00	151.00				ļ	1297.7													
KLX 19A KLX 19A	151.00 191.00	171.00 211.00					1477.0 1791.3												<u> </u>	
KLX 19A KLX 19A	211.00	211.00					1995.2													
KLX 19A	231.00	251.00				1	1995.2 #N/A								<u> </u>			<u> </u>	<u> </u>	
KLX 19A	271.00	291.00		1		1	#N/A							1						
KLX 19A	291.00	311.00				1	2628.8								[
KLX 19A	411.00	431.00		Ĭ			3623.9													
KLX 19A	431.00	451.00					3782.2												ļ	
KLX 19A	451.00	471.00		 		ļ	3944.1					ļ			ļ				ļ	
KLX 19A KLX 19A	471.00 491.00	491.00 511.00					4114.6 4277.7													
KLX 19A KLX 19A	491.00	531.00					4277.7													
KLX 19A	530.00	550.00					#N/A													
KLX 19A	550.00	570.00		+		1	4715.0													
KLX 19A	591.00	611.00				1	#N/A													
KLX 19A	611.00	631.00					#N/A													
KLX 19A	631.00	651.00		ļ		ļ	5397.2												ļ	
KLX 19A	651.00	671.00		ļ	ļ	ļ	5612.5								ļ				ļ	
KLX 19A	671.00	691.00					5743.3 5906.2							1						
KLX 19A KLX 19A	691.00 711.00	711.00					5906.2 #N/A													
KLX 19A	731.00	751.00					6235.3													
KLX 19A	751.00	771.00				1	6397.8								1					
KLX 19A	771.00	791.00)			1	6546.2													
KLX 19A	104.00	109.00					965.3													
KLX 19A	109.00	114.00		ļ		ļ	1007.1												ļ	
KLX 19A	411.00	416.00				Į	3500.9													
KLX 19A KLX 19A	421.00 431.00	426.00		ļ			#N/A 3640.3													
KLX 19A KLX 19A	431.00	436.00					3745.9													
KLX 19A	446.00	451.00		\mathbf{h}		1	3786.3					<u> </u>			1				İ	
KLX 19A	551.00	556.00		1	1	1	4609.5								1					
KLX 19A	561.00	566.00)				#N/A													
KLX 19A	646.00	651.00					5388.8													
KLX 19A	651.00	656.00		ļ			#N/A											[
KLX 19A	656.00	661.00					5623.5													
KLX 19A KLX 19A	666.00 676.00	671.00					5617.0 5652.7											ļ		
KLX 19A KLX 19A	681.00	686.00		+			5697.2													
KLX 19A	691.00	696.00		\mathbf{h}		1	5781.8					<u> </u>			1			<u> </u>	İ	
KLX 19A	696.00	701.00		1		1	5819.5													
KLX 19A	701.00	706.00)			1	5845.9													
KLX 19A	706.00	711.00]	5914.6								ļ				L	
KLX 19A	731.00	736.00		ļ			6115.3													
KLX 19A	741.00	746.00		 			#N/A													
KLX 19A	746.00	751.00					6239.3					ļ				ļ				
KLX 19A KLX 19A	751.00 756.00	756.00 761.00		<u> </u>			6278.0 6310.8								l				Į	
KLX 19A KLX 19A	756.00	761.00					6310.8													
KLX 19A	776.00	771.00		+			6468.9													
INCA 10A	1 110.00	701.00	1			1	0400.9		1			1	1	1	1			ş	ş	

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

1		L			<u> </u>		1	<u> </u>						
idcode	start_date	stop_date	secup	seclow	section_no	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KLX 19A	070111 08:17	070111 10:39	111.00	211.00		212.00	800.07	993	998		1826	1827	1827	
KLX 19A	070112 09:13	070112 14:01	211.00	311.00		312.00			1823		2649	2653	2655	
KLX 19A	070112 14:03	070112 15:20	211.00	311.00		312.00	800.07		1823		2649	2653	2655	
KLX 19A	070112 16:54	070112 18:28	311.00	411.00		412.00	800.07		2646		3478	3478	3478	
KLX 19A	070113 09:30	070113 11:44 070113 12:57	411.00 411.00	511.00 511.00		512.00 512.00	800.07 800.07		3468 3468		4296 4296	4306 4306	4300 4300	
KLX 19A KLX 19A	070113 14:17	070113 12:57	511.00	611.00		612.00	800.07		4293		4296	4306	4300 5099	
KLX 19A	070113 16:35	070113 17:43	511.00	611.00		612.00	800.07		4293		5102		5099	
KLX 19A	070114 08:48	070114 11:01	611.00	711.00		712.00	800.07		5111		5927	5964	5939	
KLX 19A	070114 11:03	070114 12:42	611.00	711.00		712.00	800.07		5111	5111	5927	5964	5939	
KLX 19A	070115 15:33	070115 17:24	694.00	794.00		795.00	800.07		5786		7135	7218	7243	
KLX 19A	070115 17:27	070115 21:48	694.00	794.00		795.00	800.07	5784	5786	5787	7135	7218	7243	
KLX 19A	070117 11:33	070117 13:30	111.00	131.00		132.00	800.07	993	999	996	1168	1169	1169	
KLX 19A	070117 14:04	070117 15:56	131.00	151.00		152.00	800.07	1162	1162	1163	1335	1336	1335	
KLX 19A	070117 16:30	070117 17:52	151.00	171.00		172.00	800.07		1328		1500	1500	1500	
KLX 19A	070118 08:17	070118 10:20	191.00	211.00		212.00	800.07		1656		1829	1829	1829	
KLX 19A	070118 10:53	070118 12:18	211.00	231.00		232.00	800.07		1820		1993	1993	1993	
KLX 19A	070118 13:06	070118 14:00	231.00	251.00		252.00	800.07		1985		2158	2158	2158	
KLX 19A	070118 16:24	070118 17:13	271.00	291.00		292.00	800.07		2315		2488	2487	2488	
KLX 19A	070118 17:44	070118 19:04	291.00	311.00		312.00	800.07		2481	2480	2650	2651	2653 3640	
KLX 19A KLX 19A	070119 09:23 070119 11:20	070119 10:47 070119 12:40	411.00 431.00	431.00 451.00		432.00 452.00	800.07 800.07		3467 3632		3640 3804	3640 3809	3640	
KLX 19A	070119 13:38	070119 12:40	451.00	431.00		432.00	800.07		3032	3032	3969	3974	3971	
KLX 19A	070119 15:30	070119 16:52	471.00	491.00		492.00	800.07		3961	3961	4134	4134	4133	
KLX 19A	070119 17:26	070119 18:46	491.00	511.00		512.00	800.07		4126		4300	4302	4298	
KLX 19A	070120 08:21	070120 09:42	511.00	531.00		532.00	800.07		4289		4452	4449	4447	
KLX 19A	070120 10:18	070120 11:14	530.00	550.00		551.00	800.07		4445		4606	4603	4603	
KLX 19A	070120 11:45	070120 13:02	550.00	570.00		571.00	800.07		4609		4771	4767	4766	
KLX 19A	070120 16:19	070120 17:09	591.00	611.00		612.00	800.07	4947	4947	4947	5108	5107	5107	
KLX 19A	070120 17:41	070120 18:38	611.00	631.00		632.00	800.07	5111	5111	5111	5273	5271	5271	
KLX 19A	070121 08:29	070121 10:11	631.00	651.00		652.00	800.07		5276		5436	5434	5433	
KLX 19A	070121 13:18	070121 14:22	651.00	671.00		672.00	800.07		5434		5588	5589	5590	
KLX 19A	070121 14:52	070121 16:23	671.00	691.00		692.00	800.07		5601		5763	5790	5776	
KLX 19A	070121 16:56	070121 19:26	691.00	711.00		712.00	800.07		5766		5932	5937	5930	
KLX 19A KLX 19A	070122 08:46 070122 10:50	070122 09:58 070122 12:17	711.00 731.00	731.00 751.00		732.00 752.00	800.07 800.07		5928 6092		6095 6258	6093 6262	6093 6258	
KLX 19A KLX 19A	070122 10:50	070122 12:17	751.00	751.00		752.00	800.07		6258		6422	6478	6448	
KLX 19A	070122 15:30	070122 15:00	731.00	791.00		792.00	800.07		6420		7371	7423	7459	
KLX 19A	070124 09:08	070124 10:32	104.00	109.00		110.00	800.07		940		991	993	991	
KLX 19A	070124 10:57	070124 13:05	109.00	114.00		115.00	800.07		987		1030	1032	1031	
KLX 19A	070124 17:05	070124 18:29	411.00	416.00		417.00	800.07		3462		3519	3519	3519	
KLX 19A	070125 10:04	070125 10:52	421.00	426.00		427.00	800.07		3556		3605	3605	3605	
KLX 19A	070125 13:20	070125 14:43	431.00	436.00		437.00	800.07	3638	3638	3638	3687	3687	3687	
KLX 19A	070125 16:48	070125 18:12	441.00	446.00		447.00	800.07		3719		3768	3768	3768	
KLX 19A	070125 18:36	070125 19:58	446.00	451.00		452.00	800.07		3761	3761	3810	3814	3809	
KLX 19A	070126 09:34	070126 11:08	551.00	556.00		557.00	800.07		4618		4658	4655	4654	
KLX 19A	070126 13:58	070126 14:36	561.00	566.00		567.00	800.07		4702		4744	4742	4741	
KLX 19A	070127 11:03	070127 12:37	646.00	651.00		652.00	800.07		5397	5398	5436	5434	5433	
KLX 19A	070127 13:03	070127 13:58	651.00	656.00		657.00	800.07		5438		5479	5476	5476	
KLX 19A	070127 14:22	070127 16:11	656.00	661.00		662.00	800.07		5480		5516	5515	5514	
KLX 19A KLX 19A	070128 08:17 070128 12:22	070128 09:42	666.00 676.00	671.00		672.00 682.00	800.07 800.07		5560 5643		5602 5681	5600 5679	5599 5677	
KLX 19A KLX 19A	070128 12:22	070128 13:51 070128 15:44	681.00	681.00 686.00		682.00	800.07		5684		5081		5677	
KLX 19A	070128 17:33	070128 18:59	691.00	696.00		697.00	800.07		5765		5808	5809	5807	
KLX 19A	070129 08:23	070129 09:47	696.00	701.00		702.00	800.07		5808		5852	5855	5852	
KLX 19A	070129 10:16	070129 11:59	701.00	706.00		702.00	800.07		5849		5892	5892	5891	
KLX 19A	070129 12:42	070129 14:12	706.00	711.00		712.00	800.07		5889		5933	5933	5932	
KLX 19A	070129 14:49	070129 16:18	731.00	736.00		737.00	800.07		6093		6138	6141	6137	
KLX 19A	070129 18:54	070129 19:33	741.00	746.00		747.00	800.07		6175		6221	6220	6220	
KLX 19A	070130 08:14	070130 09:54	746.00	751.00		752.00	800.07		6219		6263	6262	6261	
KLX 19A	070130 10:20	070130 12:02	751.00	756.00		757.00	800.07	6259	6259	6259	6303	6303	6302	
KLX 19A	070130 12:47	070130 14:29	756.00	761.00	·	762.00	800.07		6300		6344	6343	6343	
KLX 19A	070130 17:00	070130 18:21	766.00	771.00		772.00	800.07		6381	6380	6424	6482	6451	
KLX 19A	070131 09:28	070131 11:02	776.00	781.00		782.00	800.07	6462	6461	6461	7332	7427	7432	

Borehole: KLX19A

APPENDIX 5-2

SICADA data tables (Pump tests)

SKB		SIC	CADA	/Data	Impo	rt Temp	late			olified version v1.4
									SKB &	Ergodata AB 2004
			_							
File Identity							Compiled By			
Created By						Quality Check				
Created						Deliv	very Approval			
Activity Type		KLX 19A				Project		AP PS 40	00-06-144	
		KLX 19A - pump	test							
					-					
Activity Informa	ation					Additional Activity	Data			
						C10	P20	P200	P220	R25
ldcode	Start Date	Stop Date	Secup (m)	Seclow (m)	Section No	Company	Field crew manager		evaluating data	Report
KLX 19A	2006-11-28 19:53	2007-01-09 12:28	495.00	769.00		Golder Associates	Stephan Rohs	Stephan Rohs, Philipp Wolf		Stephan Rohs

Table	

plu_s_hole_test_d

PLU Injection and pumping, General information

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

					section_		formation_			flow_rate_end_q	value_type_q	mean_flow_r			
idcode	start_date	stop_date	secup	seclow	no	test_type	type	start_flow_period	stop_flow_period	р	р	ate_qm	q_measll	q_measlu	tot_volume_vp
KLX 19A	061128 19:53	061205 15:52	764.00	769.00		1B	1	2006-11-28 20:28:47	2006-12-05 13:10:14	1.33E-05	i 0	1.33E-05	1.67E-08	8.33E-04	7.71E+00
KLX 19A	061207 15:07	070109 12:28	495.00	515.00		1B	1	2006-12-07 15:38:40	2007-01-09 08:56:49	3.50E-05	0	3.57E-05	1.67E-08	8.33E-04	1.01E+02

			dur_flow_p	dur_rec_ph	initial_head_	ow_end_h	final_head_	initial_press_	press_at_flow_e	final_press_p	fluid_temp_t	fluid_elcond_e	fluid_salinity_t	fluid_salinity_t			
idcode	secup	seclow	hase_tp	ase_tf	hi	р	hf	pi	nd_pp	f	ew	cw	dsw	dswm	reference	comments	lp
KLX 19A	764.00	769.00	578490	9588			16.37	6391	6150	6347	16.8						766.50
KLX 19A	495.00	515.00	2827044	12780			16.38	4311	4186	4306	13.3						505.00

Table plu_s_hole_test_ed1 PLU Single hole tests, pumping/injection. Basic evaluation

she CHAR Investigation she mane Schly, Upe CHAR Active yound hhmm:so) Sop, date DATE Date (yymnd hhmm:so) Sop, date DATE Date (yymnd hhmm:so) Sop, date CHAR Project code Scope CHAR Project code Scope CHAR Disper section limit (m) section NEGGR Tumber section Scope code 1: flock 7: sec table description! section CHAR Formation types code. 1: flock 7: soc (superficial descats) section Scope code. 1: flock 7: sec table description! Scope code 1: flock 7: sec table description! section Scope code 1: flock 7: sec table description Scope code 1: flock 7: sec table description section Scope code 1: flock 7: sec table description Scope code 1: flock 7: sec table description section Scope code 1: flock 7: sec table description Scope code 1: flock 7: sec table description section Scope code 1: flock 7: sec table description Scope code 1: flock 7: sec table description section Scope code 1: flock 7: sec table description Scope code 1: flock 7: sec table	
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Imp. data DATE Date (yymad htmmss) original CHAR Object or borthole identification code coup FLOAT m Upper section limit (m) acdor_no NINEGER number Section number section_no NINEGER mumber Section number section_no NINEGER mumber Section number section_no NINEGER Test type code (17.1) sole table description! number Specific capably (120, Fest sections, sections for test sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sections, sect	
project code project code code CHAR Opport of borbhol identification code icode FLOAT m Upper section limit (m) icode FLOAT m Lower section limit (m) icode FLOAT m Lower section limit (m) icode FLOAT m Exection conde icode CHAR Forthal projection of the section, see desc. icode CHAR Forthal projection of the section, see desc. icode CHAR Forthal projection of the section, see desc. icode CHAR Forthal projection of the section, see desc. icode CHAR Speedic capacity (24) of test section, see desc. icode CHAR Transmissity in the section is set the description icode CHAR Best choice ode (17) see table description icode CHAR Best choice ode (17) see table description icode CHAR Best choice ode (17) see table description icode CHAR Best choice ode (17) see table description icode CHAR Bestchoice ode (17) see tabl	
Incode CHAR Object or borble identification code scup FLOAT m Lover section limit (m) acdom_no INTEGER number Section number acdpp CHAR Test type code (17, see table description) Crimation Type CHAR Formation type code. 1: Rock. 2: Soil (superficial deposits) p FLOAT m Planned criminary itsel interval cuing test campaign. sede_capacity_crip FLOAT m ²¹ /2 Specific capacit (Op) of test section. see table description ransmissivy_pact_a FLOAT m ²² /2 Transmissivy_table cold (2) sets section. See table description ransmissivy_move_tl FLOAT m ²² /2 Transmissivy_table cold cold (2) sets of the cold cold (2) sets of the cold cold (2) sets of the cold cold (2) sets of the cold cold (2) sets of the cold cold (2) sets of the cold cold (2) sets of the cold cold (2) sets of the cold cold (2) sets of the cold cold (2) sets of the cold (2) sets of the cold cold (2) sets of the cold (2) sets of the cold cold (2) sets of the cold cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the cold (2) sets of the c	
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Noming Nype CHAR Formation type code: 1: Rock 2: Soil (superficial departin) p FLOAT m Hydraulic point of application for test section, see descrit. psec_capacity_Q_S FLOAT m Specific capacity (Qis) of test section, see table description. psec_capacity_Q_S FLOAT m ⁻¹² /s Specific capacity (Qis) of test section, see table description. psec_capacity_Q_S FLOAT m ⁻¹² /s Transmissivity based on Oky, see table description. psec_inp CHAR Best choice code. 1 means To is best choice of T, else 0 psec_inp FLOAT m ⁻¹² /s Transmissivity. Tow (1967) psec_inp CHAR Drive value, -170-lower measi.imit. 170-upper measi.imit. psec_inp CHAR Drive value, -170-lower measi.imit. psec_inp. CHAR Drive value, -170-lower measi.imit. psec_inp. FLOAT m Standard Charmesis met. for T (generally be-lwy, see descr. psec_inp. FLOAT m Standard Oper measi.imit. Drive value.1 psec_inp. FLOAT m ⁻³ /s Estimated Oper measi.imit. Drive value.1 psecontrol <t< td=""><td></td></t<>	
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chale Upper, La Chark Chark value, -1:03-stower meas limit, 1:03-upper meas.limit transmissivity log FLOAT m**2/s Transmissivity based on O(s, see table description wile, type, lg CHAR Best choice code. 1 means TQ is best choice of T, else 0 transmissivity mow FLOAT m**2/s Best choice code. 1 means TQ is best choice of T, else 0 transmissivity, mow FLOAT m**2/s Best choice code. 1 means TM by else (best choice of T, else 0 transmissivity, mow FLOAT m**2/s Charke and the means TM by else (best choice of T, else 0 value_type, lim CHAR Best choice code. 1 means TM by else (best choice of T, else 0 value_type, lim CHAR Not walue, 1:TM-dower meas.limit, 1:TM-upper meas.limit, 1:TM by else (best choice code.1 means TM by else (best choice code.1 means TM by else (best choice code.1 means TM by else (best choice code.1 means, TM by else (best choice code.1 means, TM by else (best choice code.1 means, TM by else (best choice code.1 means, TM by else (best choice code.1 means, TM by else (best choice code.1 means, TM by else (best choice code.1 means, TM by else (best choice code.1 means, TM by else (best choice code.1 means, TM by else (best choice code.1 means, TM by else (best choice code.1 means, TM by else (best choice code.1 means, TM by else (best choice code.1 means, TM by else (best choice code.1 means, TM by else (best choice choice choice choice choice choice choice choice choice choice choice choice choic	
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bc_tq CHAR Best choice code. 1 means To is best choice of T, else 0 transmissivily_moye FLOAT m*2/s Transmissivily_TM, based on Moye (1967) value_type_tm CHAR 0:true value1:TM-lower meas.limit.1:Mupuper meas.limit. value_type_tm CHAR 0:true value1:M-lower meas.limit.1:Mupuper meas.limit. for_d_channel_b FLOAT m b.Aquifer thickness repr. for T(generally b=Lw), see descr. width_d_t_channel_b FLOAT m*3/s Estimated lower meas.limit.1 for evaluated TB, see description b FLOAT m*3/s Estimated lower meas. limit for evaluated TB, see description u_measl_tb FLOAT m*3/s Estimated lower meas. limit for evaluated TB, see description sasumed_sb FLOAT m SB:-storability, B-width of formation, 1D model, see description sasumed_sb FLOAT m SB:-storability, B-width of formation, 2D radia flow model, see eakage_factor FLOAT m SB:-storability, B-width of formation, 2D radia flow model, see value_type_tt CHAR Ctrue value1:TT-fower meas.limit, 1:TT-typer meas.limit, 1:TT-typer meas.limit, 1:TT-typer meas.limit, 1:TT-typer meas.limit, 1:TT-typer meas.limit, 1:TT-typer meas.limit, 1:TT-typer meas.limit, 1:TT-typer meas.limit, 1:TT-typer meas.limit, 1:TT-typer meas.limit, 1:TT-typer meas.limit, 1:TT-typer meas.limit, 1:TT-typer meas.limit, 1:TT-typer meas.limit, 1:TT-typer meas.limit, 1:TT-typer m	
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c FLOAT m**3/pa C: Wellbore storage coefficient; flow or recovery period cd FLOAT CD: Dimensionless wellbore storage coefficient skin FLOAT Skin factor;best estimate of flow/recovery period,see descr. dt1 FLOAT s Estimated start time of evaluation, see table description dt2 FLOAT s Estimated stop time of evaluation. see table description t1 FLOAT s Start time for evaluated parameter from start flow period t2 FLOAT s Stop time for evaluated parameter from start of flow period t2 FLOAT s Stop time for evaluated parameter from start of flow period t2 FLOAT s Stop time for evaluated parameter from start of recovery dte1 FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT KPa p*:Horner extrapolated pressure, see table	
cFLOATm**3/paC: Wellbore storage coefficient; flow or recovery periodcdFLOATCD: Dimensionless wellbore storage coefficientskinFLOATSkin factor;best estimate of flow/recovery period,see descr.dt1FLOATsdt2FLOATst1FLOATst2FLOATst2FLOATsdt2FLOATst2FLOATst2FLOATst4t2FLOATst4t2FLOATst4t2FLOATst4t2FLOATst6t2FLOATst6t2FLOATst6t2FLOATst6t3Stop time for evaluated parameter from start of recoveryp_hornerFLOATstransmissivity_t_nlrFLOATtransmissivity_nlrFLOATstorativity_s_nlrFLOATstorativity_s_nlrFLOATstorativity_s_nlrFLOATstorativity_s_nlrFLOATstorativity_s_nlrFLOATstorativity_s_nlrFLOATstorativity_s_nlrFLOATstorativity_s_nlrFLOATstorativity_s_nlrFLOATstorativity_s_nlrFLOATstorativity_s_nlrFLOATstorativity_s_nlrFLOATstorativity_s_nlrFLOATstorativity_s_nlrFLOATstorativity_s_nlrS_NLR=storativity based on None Linear Regressionstorativity_s_nlr <t< td=""><td></td></t<>	
cd FLOAT CD: Dimensionless wellbore storage coefficient skin FLOAT Skin factor;best estimate of flow/recovery period,see descr. dt1 FLOAT s Estimated start time of evaluation, see table description dt2 FLOAT s Estimated stop time of evaluation. see table description t1 FLOAT s Start time for evaluated parameter from start flow period t2 FLOAT s Stop time for evaluated parameter from start of flow period t2 FLOAT s Stop time for evaluated parameter from start of flow period t2 FLOAT s Stop time for evaluated parameter from start of recovery dte1 FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT kPa p*:Horner extrapolated pressure, see table description transmissivity_t_nir FLOAT m**2/s T_NLR Transmissivity based	
skin FLOAT Skin factor;best estimate of flow/recovery period,see descr. dt1 FLOAT s Estimated start time of evaluation, see table description dt2 FLOAT s Estimated stop time of evaluation, see table description t1 FLOAT s Start time for evaluation see table description t1 FLOAT s Start time for evaluated parameter from start flow period t2 FLOAT s Stop time for evaluated parameter from start of flow period te1 FLOAT s Stop time for evaluated parameter from start of recovery dte1 FLOAT s Stop time for evaluated parameter from start of recovery dte2 FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT kPa p*:Horner extrapolated pressure, see table description transmissivity_t_nlr FLOAT m**2/s T_NLR Transmissivity based on None Linear Regression storativity_s_nlr FLOAT S_NLR=storativity based on None Linear Regression.see	
dt1 FLOAT s Estimated start time of evaluation, see table description dt2 FLOAT s Estimated stop time of evaluation. see table description t1 FLOAT s Start time for evaluated parameter from start flow period t2 FLOAT s Stop time for evaluated parameter from start of flow period te1 FLOAT s Stop time for evaluated parameter from start of flow period dte1 FLOAT s Start time for evaluated parameter from start of recovery dte2 FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT kPa p*:Horner extrapolated pressure, see table description transmissivity_t_nlr FLOAT m**2/s T_NLR Transmissivity based on None Linear Regression storativity_s_nlr FLOAT S_NLR=storativity based on None Linear Regression, see	
dt2 FLOAT s Estimated stop time of evaluation. see table description t1 FLOAT s Start time for evaluated parameter from start flow period t2 FLOAT s Stop time for evaluated parameter from start of flow period dte1 FLOAT s Start time for evaluated parameter from start of flow period dte2 FLOAT s Start time for evaluated parameter from start of recovery dte2 FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT s Stop time for evaluated parameter from start of recovery ransmissivity_t_nlr FLOAT s Stop time for evaluated parameter from start of recovery ransmissivity_t_nlr FLOAT wPa p*:Horner extrapolated pressure, see table description transmissivity_t_nlr FLOAT m**2/s T_NLR Transmissivity based on None Linear Regression storativity_s_nlr FLOAT S_NLR=storativity based on None Linear Regression.see	
t1 FLOAT s Start time for evaluated parameter from start flow period t2 FLOAT s Stop time for evaluated parameter from start of flow period dte1 FLOAT s Start time for evaluated parameter from start of flow period dte2 FLOAT s Start time for evaluated parameter from start of recovery p_horner FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT kPa p*:Horner extrapolated pressure, see table description transmissivity_t_nIr FLOAT m**2/s T_NLR Transmissivity based on None Linear Regression storativity_s_nIr FLOAT S_NLR=storativity based on None Linear Regression, see	
t2 FLOAT s Stop time for evaluated parameter from start of flow period dte1 FLOAT s Start time for evaluated parameter from start of recovery dte2 FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT kPa p*:Horner extrapolated pressure, see table description transmissivity_t_nlr FLOAT m**2/s T_NLR Transmissivity based on None Linear Regression storativity_s_nlr FLOAT S_NLR=storativity based on None Linear Regression, see	
dte1 FLOAT s Start time for evaluated parameter from start of recovery dte2 FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT kPa p*:Horner extrapolated pressure, see table description transmissivity_t_nlr FLOAT m**2/s T_NLR Transmissivity based on None Linear Regression storativity_s_nlr FLOAT S_NLR=storativity based on None Linear Regression, see	
dte2 FLOAT s Stop time for evaluated parameter from start of recovery p_horner FLOAT kPa p*:Horner extrapolated pressure, see table description transmissivity_t_nlr FLOAT m**2/s T_NLR Transmissivity based on None Linear Regression storativity_s_nlr FLOAT S_NLR=storativity based on None Linear Regression, see	
p_horner FLOAT kPa p*:Horner extrapolated pressure, see table description transmissivity_t_nlr FLOAT m**2/s T_NLR Transmissivity based on None Linear Regression storativity_s_nlr FLOAT S_NLR=storativity based on None Linear Regression,see	
transmissivity_t_nlr FLOAT m**2/s T_NLR Transmissivity based on None Linear Regression storativity_s_nlr FLOAT S_NLR=storativity based on None Linear Regression,see	
storativity_s_nlr FLOAT S_NLR=storativity based on None Linear Regression,see	
value_type_t_nlr CHAR 0:true value,-1:T_NLR <lower meas.limit,1:="">upper meas.limit</lower>	
bc_t_nlr CHAR Best choice code. 1 means T_NLR is best choice of T, else 0	
c_nlr FLOAT m**3/pa Wellbore storage coefficient, based on NLR, see descr.	
cd_nlr FLOAT Dimensionless wellbore storage constant, see table descrip.	
skin_nlr FLOAT Skin factor based on Non Linear Regression, see desc.	
transmissivity t_grf FLOAT m**2/s T_GRF:Transmissivity based on Genelized Radial Flow,see	
value_type_t_grf CHAR 0.true value,-1:T_GRF <lower meas.limit<="" td=""><td></td></lower>	
bc_t_grf CHAR Best choice code. 1 means T_GRF is best choice of T, else 0	
storativity_s_grf FLOAT S_GRF:Storativity based on Generalized Radial Flow, see des.	
flow_dim_grf FLOAT Inferred flow dimesion based on Generalized Rad. Flow model	
comment VARCHAR no_unit Short comment to the evaluated parameters	
error_flag CHAR If error_flag = "*" then an error occured and an error	
in_use CHAR If in_use = "*" then the activity has been selected as	
sign CHAR Signature for QA data accknowledge (QA - OK)	

							formation_	-			spec_ca	apacity_	value_type_	transmissivity_t	value_type_		transmissivity_
idcode	start_date	stop_date	secup	seclow	section_no	test_type	type	lp	seclen	_class	q_s		q_s	q	tq	bc_tq	moye
KLX 19A	061128 19:53	061205 15:52	764.00	769.00		1B	· ·	l 766.	50	5	ł	5.43E-07	0				5.43E-07
KLX 19A	061207 15:07	070109 12:28	495.00	515.00		1B	3	l 505.	00	20	2	2.70E-06	0				2.90E-06

idcode	secup	seclow	bc_tm			formation_ width b	width_of_channel_ b	tb	I measl tb	u measl tb	sb	leakage_factor_ If	transmissivity tt	value_type_tt	bc tt	I measi q s	u measl q s
KLX 19A	764.00		0	0	1.09E-07		-						2.90E-07		1	5.00E-08	3.00E-07
KLX 19A	495.00	515.00	0	0	1.45E-07								5.80E-06	0	1	1.00E-06	6.00E-06

idcode	secup	seclow	storativity_s	assumed_s	bc_s ri	i		leakage_ coeff	hydr_cond_k sf	value_type_k sf	u_measl_ ksf	spec_storage_ ssf	assumed_ ssf	c	cd s	skin	dt1	dt2
KLX 19A	764.00	769.00	1.00E-06	1.00E-06	8	61.82	-1							9.70E-10	1.1E-01	-4.60	0.6	23.3
KLX 19A	495.00	515.00	1.00E-06	1.00E-06	6	397.07	0							6.80E-09	7.5E-01	-2.20	11.4	95.5

							transmissivity_t_	storativity_s_	value_type_t_					transmissivity	value_type_t_		storativity_s_	flow_dim_g	
idcode	secup	seclow	t1 t2	dte1	dte2	p_horner	nir	nir	nir	bc_t_nlr	c_nlr	cd_nlr	skin_nlr	_t_grf	grf	bc_t_grf	grf	rf	comment
KLX 19A	764.00	769.00				6404.6													
KLX 19A	495.00	515.00				4331.2													

Borehole: KLX19A

APPENDIX 5-3

SICADA data tables (Pulse injection tests)

SKB		SI	[CAD	A/Dat	a Imp	ort Tem	plate			(Simplified version v1.8) SKB & Ergodata AB 2006		
File Identity Created By Created	1			File Time Zone		Quality	Compiled By Check For Delivery Delivery Approva	/				
Activity Type		HY665 PLU Pulse Test				Projec	t	PLU F	KLX 19A			
Activity Inform	ation					Additional Activity		l160	P20	P200	P220	R240
ldcode	Start Date	Stop Date	Secup (m)	Seclow (m)		Company evaluating data	Company performing field work	Instrument	Field crew manager	Field crew	Person evaluating data	Length calibration type
KLX 19A	2007-01-17 18:23	2007-01-31 09:01	171.00	776.00		Golder Associates	Golder Associates	PSS 2	Philipp Wolf	Philipp Wolf, Thomas Cronquist, Mesgena Gebrezghi, Danie Nordborg	Philipp Wolf, Stephan Rohs	

Page 5-3/2

Table		plu_slug	_test_ed
		Slug- & pulse test, calculat	ted and evaluated results
	-		
Column	Datatype	Unit	Column Description
site	CHAR		Investigation site name
dcode	CHAR		Object or borehole identification code
secup	FLOAT	m	
seclow	FLOAT	m	Lower section limit (m)
start_date	DATE		Date (yymmdd hh:mm:ss)
stop_date	DATE		Date (yymmdd hh:mm:ss)
activity_type	CHAR		Activity type code
sign	CHAR		Activity QA signature
error_flag	CHAR		*: Data for the activity is erroneous and should not be used
est_type	CHAR		Type of test, one of 7, see table description
ormation_type	CHAR		1: Rock, 2: Soil (superficial deposits)
start_flow_perio	DATE		Date and time of flow phase start (YYYYMMDD hhmmss)
dur_flow_phase	FLOAT	S	Time for the flowing phase of the test (tp)
dur_rec_phase	FLOAT	S	Time for the recovery phase of the test (tF)
nitial_head_h0	FLOAT	m	Initial formation hydraulic head, see table description
nitial_displace	r FLOAT	m	Initial displacement of hydraulic head, see table description
displacem_dh0	FLOAT	m	Initial displacement of slugtest, see table description
displacem_dh0		m	Initial displacement of bailtest, see table description
nead at flow of		m	Hydraulic head at end of flow phase, see table description
inal_head_hf		m	Hydraulic head at the end of the recovery, see table descr.
nitial_press_pi		kPa	Initial formation pressure
nitial_press_di		kPa	Initial pressure change from pi at time dt=0,pulse test
press_change_		kPa	Initial pressure change;pulse test-measured
press_at_flow_	-	kPa	Final pressure at the end of the flowing period
inal_press_pf	-	kPa	Final pressure at the end of the recovery period
formation_widtl		m	b:Interpreted formation thickness repr. for evaluated T,see
transmissivity_		m**2/s	Ts: Transmissivity based on slugtest, see table description
. –		111 2/3	0:true value,-1:Ts <lower meas.limit,1:ts="">upper meas.limit</lower>
value_type_ts			
oc_ts	CHAR	m**2/s	Best choice code.1 means Ts is best choice of transm.,else 0
ransmissivity_i		111 2/5	TP: Transmissivity based on pulse test, see table descript.
value_type_tp			0:true value,-1:Tp <lower meas.limit,1:tp="">upper meas.limit</lower>
oc_tp	CHAR		Best choice code.1 means Tp is best choice of transm.,else 0
_meas_limit_t		m**2	Estimated lower measurement limit for Ts orTp,see descript.
u_meas_limit_t		m**2	Estimated upper measurement limit for Ts & Tp, see descript.
storativity_s	FLOAT		S= Storativity, see table description
assumed_s	FLOAT		S*=assumed storativity, see table description
skin	FLOAT		Skin factor
assumed_skin			Asumed skin factor
2	FLOAT	m**3/pa	Well bore storage coefficient
luid_temp_tew		oC	Fluid temperature in the test section, see table description
luid_elcond_e	FLOAT	mS/m	Fluid electric conductivity in test section, see table descri
iuid_salinity_to	FLOAT	mg/l	Total salinity of the test section fluid (EC), see descr.
luid_salinity_to	FLOAT	mg/l	Total salinity of the test section fluid (samples), see descr
dt1	FLOAT	S	Estimated start time of evaluation, see table description
dt2	FLOAT	S	Estimated stop time of evaluation, see table description
reference	CHAR		SKB report No for reports describing data and evaluation
comments	CHAR		Short comment to evaluated parameters

			(m)) (m)				(s)	(S)	(m) (i	m) (m) (m	i) (m	ı) (m) (kPa)	(kPa)
							formation_			dur_re	initial_h	ea initial_dis	ol displace	displace	ow_end_h	final_hea	initial_pr	initial_pres
idcode	start_date	stop_date	secup	seclow	section_no	test_type	уре –	start_flow_period	dur_flow_phase_tp	phase_	tf d_h0	acem_dh0	m_dh0_p	m_dh0_t	гр — —	d_hf	ess_pi	s_diff_dp0
KLX 19A	070117 18:23	070118 00:17	171.00	191.00)	4B	1	2007-01-17 18:59:55	1(180	00						1651	219
KLX 19A	070118 14:30	070118 15:53	251.00	271.00		4B	1	2007-01-18 15:06:04	1() 27	00						2306	220
KLX 19A	070120 13:39	070120 15:40	571.00	591.00		4B	1	2007-01-20 14:16:22	1() 45	60						4944	240
KLX 19A	070125 08:23	070125 09:40	416.00	421.00		4B	1	2007-01-25 09:03:39	1() 16	80						3553	
KLX 19A	070125 11:16	070125 12:55	426.00	431.00		4B	1	2007-01-25 11:53:15	1() 36	00						3636	231
KLX 19A	070125 15:07	070125 16:20	436.00	441.00		4B	1	2007-01-25 15:45:05	1() 16	20						3725	219
KLX 19A	070126 11:34	070126 13:12	556.00	561.00		4B	1	2007-01-26 12:08:44	#N/A	#N/A							#N/A	#N/A
KLX 19A	070126 14:59	070126 16:39	566.00	571.00		4B	1	2007-01-26 15:35:58	1() 36	00						4797	225
KLX 19A	070126 17:42	070126 19:21	631.00	636.00		4B	1	2007-01-26 18:19:08	#N/A	#N/A							#N/A	#N/A
KLX 19A	070127 08:26	070127 09:20	636.00	641.00		4B	1	2007-01-27 09:02:28	#N/A	#N/A							#N/A	#N/A
KLX 19A	070127 09:47	070127 10:37	641.00	646.00		4B	1	2007-01-27 10:24:00	#N/A	#N/A							#N/A	#N/A
KLX 19A	070127 17:13	070127 19:22	661.00	666.00		4B	1	2007-01-27 17:50:05	1() 54	00						5560	222
KLX 19A	070128 10:07	070128 11:55	671.00	676.00		4B	1	2007-01-28 10:52:05	1() 36	00						5642	229
KLX 19A	070128 16:10	070128 17:06	686.00	691.00		4B	1	2007-01-28 16:48:11	#N/A	#N/A							#N/A	#N/A
KLX 19A	070129 16:43	070129 18:22	736.00	741.00		4B	1	2007-01-29 17:20:21	1() 36	00						6183	213
KLX 19A	070130 14:54	070130 16:35	761.00	766.00		4B	1	2007-01-30 15:33:09	1() 36	00						6388	228
KLX 19A	070131 08:08	070131 09:01	771.00	776.00		4B	1	2007-01-31 08:44:40	#N/A	#N/A							#N/A	#N/A

	(m)	(m)	(kPa) (k	'a) (kPa	i) (m) (m**2	/s)	(m**	2/s)		(m**2)	(m**2)				(m**3/pa)	(oC)	(mS/m)) (mg	/l) (mg/l)	(S)	(s)	
			hange_d press_at	fl final_pre	formation transmis	si value_typ	transm	is value_ty		I_meas_limit	u_meas_lim	i storativit	assumed		assumed		fluid_te	ond_ec	inity_td	I nity_tds				
idcode	secup	seclow	p0_p ow_end_	p ss_pf	_width_b vity_ts	e_ts t	oc_ts sivity_	tp pe_tp	bc_tp	_t	t_t	y_s	_s	skin	_skin	c	mp_tew	w	sw	wm	dt1	dt2	reference	comments
KLX 19A	171.00	191.00	18	0 171	6		4.20E-	-12 -1	1 1	1.00E-12	8.00E-12	2 1.00E-06	1.00E-06	-1.1		3.15E-11	9.2				#N/A	#N/A		
KLX 19A	251.00	271.00	25	26 246	3		1.20E-	-11 -1	1 1	5.00E-12	5.00E-1	1.00E-06	1.00E-06	-0.3		5.40E-11	10.2				#N/A	#N/A		
KLX 19A	571.00	591.00	51	34 502	6		1.10E-	-10 -1	1 1	5.00E-11	5.00E-10	1.00E-06	1.00E-06	2.1		5.90E-11	14.3				#N/A	#N/A		
KLX 19A	416.00	421.00	37	74 355-	4		3.23E-	-10 -1	1 1	1.00E-10	6.00E-10	1.00E-06	1.00E-06	1.0		1.72E-11	12.1				0.22	20.84	1	
KLX 19A	426.00	431.00	38	371	2		2.30E-	-11 -1	1 1	9.00E-12	6.00E-11	1.00E-06	1.00E-06	1.1		1.40E-11	12.3				3.30	57.80)	
KLX 19A	436.00	441.00	39	4 372	2		1.82E-	-10 -1	1 1	8.00E-11	6.00E-10	1.00E-06	1.00E-06	1.3		1.08E-11	12.4				0.20	7.2	7	
KLX 19A	556.00	561.00	#N/A	#N/A			1.00E-	-11 -1	1 1	1.00E-11	1.00E-13	3 1.00E-06	1.00E-06	#N/A		#N/A	14.0				#N/A	#N/A		
KLX 19A	566.00	571.00	50	486	2		2.00E-	-10 -1	1 1	5.00E-11	5.00E-10	1.00E-06	1.00E-06	0.6		1.64E-11	14.1				0.29	14.10)	
KLX 19A	631.00	636.00	#N/A	#N/A			1.00E-	-11 -1	1 1	1.00E-11	1.00E-13	3 1.00E-06	1.00E-06	#N/A		#N/A	15.0				#N/A	#N/A		
KLX 19A	636.00	641.00	#N/A	#N/A			1.00E-	-11 -1	1 1	1.00E-11	1.00E-13	3 1.00E-06	1.00E-06	#N/A		#N/A	15.0				#N/A	#N/A		
KLX 19A	641.00	646.00	#N/A	#N/A			1.00E-	-11 -1	1 1	1.00E-11	1.00E-13	3 1.00E-06	1.00E-06	#N/A		#N/A	15.1				#N/A	#N/A		
KLX 19A	661.00	666.00	57	32 555	7		3.98E-	-10 -1	1 1	1.00E+10	8.00E-10	1.00E-06	1.00E-06	-3.1		1.43E-10	15.4				#N/A	#N/A		
KLX 19A	671.00	676.00	58	1 569	5		3.70E-	-11 -1	1 1	8.00E-12	5.00E-1	1.00E-06	1.00E-06	-0.9		1.83E-11	15.5				#N/A	#N/A		
KLX 19A	686.00	691.00	#N/A	#N/A			1.00E-	-11 -1	1 1	1.00E-11	1.00E-13	3 1.00E-06	1.00E-06	#N/A		#N/A	15.7				#N/A	#N/A		
KLX 19A	736.00	741.00	63	621	1		6.20E-	-11 -1	1 1	1.00E-11	7.00E-1	1.00E-06	1.00E-06	0.6		1.77E-11	16.3				1.33	37.7	7	
KLX 19A	761.00	766.00	66	6 646	3		2.52E-	-11 -1	1 1	8.00E-12	6.00E-11	1.00E-06	1.00E-06	0.4		2.06E-11	16.7				2.50	36.29	9	
KLX 19A	771.00	776.00	#N	'A #N//	A		1.00E-	-11 -1	1 1	1.00E-11	1.00E-13	1.00E-06	1.00E-06	#N/A		#N/A	16.8				#N/A	#N/A		

Tat	ble		le_test_obs ections of single hole test
Column	Datatype	Unit	Column Description
site	CHAR		Investigation site name
activity_type	CHAR		Activity type code
idcode	CHAR		Object or borehole identification code
start_date	DATE		Date (yymmdd hh:mm:ss)
secup	FLOAT	m	Upper section limit (m)
seclow	FLOAT	m	Lower section limit (m)
sign	CHAR		Activity QA signature
error_flag	CHAR		*: Data for the activity is erroneous and should not be used
obs_secup	FLOAT	m	Upper limit of observation section
obs_seclow	FLOAT	m	Lower limit of observation section
pi_above	FLOAT	kPa	Groundwater pressure above test section, start of flow period
pp_above	FLOAT	kPa	Groundwater pressure above test section, at stop flow period
pf_above	FLOAT	kPa	Groundwater pressure above test section at stop recovery per
pi_below	FLOAT	kPa	Groundwater pressure below test section at start flow period
pp_below	FLOAT	kPa	Groundwater pressure below test section at stop flow period
pf_below	FLOAT	kPa	Groundwater pressure below test section at stop recovery per
comments	VARCHAR		Comment text row (unformatted text)

KLX19A

			(m)	(m)		(m)	(m)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	
idcode	start_date	stop_date	secup	seclow	section_no	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KLX 19A	070117 18:23	070118 00:17	171.00	191.00		192.00	800.07	1493	1493	1493	1665	1665	1664	
KLX 19A	070118 14:30	070118 15:53	251.00	271.00		272.00	800.07	2150	2150	2150	2323	2323	2323	
KLX 19A	070120 13:39	070120 15:40	571.00	591.00		592.00	800.07	4781	4782	4782	4943	4936	4936	
KLX 19A	070125 08:23	070125 09:40	416.00	421.00		422.00	800.07	3515	3515	3515	3564	3564	3564	
KLX 19A	070125 11:16	070125 12:55	426.00	431.00		432.00	800.07	3596	3598	3597	3646	3646	3646	
KLX 19A	070125 15:07	070125 16:20	436.00	441.00		442.00	800.07	3679	3679	3679	3728	3728	3727	
KLX 19A	070126 11:34	070126 13:12	556.00	561.00		562.00	800.07	4660	4661	4661	4700	4695	4695	
KLX 19A	070126 14:59	070126 16:39	566.00	571.00		572.00	800.07	4744	4743	4743	4783	4777	4777	
KLX 19A	070126 17:42	070126 19:21	631.00	636.00		637.00	800.07	5274	5274	5275	5317	5310	5310	
KLX 19A	070127 08:26	070127 09:20	636.00	641.00		642.00	800.07	5317	5317	5316	5359	5356	5356	
KLX 19A	070127 09:47	070127 10:37	641.00	646.00		647.00	800.07	5356	5356	5356	5398	5396	5395	
KLX 19A	070127 17:13	070127 19:22	661.00	666.00		667.00	800.07	5520	5520	5520	5561	5553	5553	
KLX 19A	070128 10:07	070128 11:55	671.00	676.00		677.00	800.07	5601	5601	5601	5641	5636	5636	
KLX 19A	070128 16:10	070128 17:06	686.00	691.00		692.00	800.07	5725	5724	5724	5768	5767	5767	
KLX 19A	070129 16:43	070129 18:22	736.00	741.00		742.00	800.07	6134	6134	6134	6179	6177	6177	
KLX 19A	070130 14:54	070130 16:35	761.00	766.00		767.00	800.07	6341	6341	6341	6382	6380	6379	
KLX 19A	070131 08:08	070131 09:01	771.00	776.00		777.00	800.07	6422	6422	6422	6469	6469	6468	