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Äspö Hard Rock Laboratory

Prototype Repository

Hydrogeology–Injection test Campaign 2, flow measurement of DA3575G01, ground water salinity, ground water leakage into G-, I- and J-tunnels

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September 2001

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Abstract

This report includes details from four different sub-projects related to the Prototype Repository.

- The second injection test campaign of thirty-nine sections in thirteen bore holes
- The second detailed flow measurement of a deposition hole
- Estimation of groundwater salinity in the prototype repository area
- Summary of inflow rates into different tunnel parts

The injection test campaign showed that a few of the sections shows a transmissivity increase compared to the first campaign, which was done before the deposition holes were drilled. The major part of certain changes are observed in sections closest to the tunnel floor, 0.25 – 0.75 metres. The sections closest to a deposition hole indicate a larger variation of certain changes than sections more distant to a deposition hole. For most of the sections the values are below measurement limit (approximately $Q_p = 4 \cdot 10^{-4}$ L/min) in both test campaigns, which at least indicates that the changes are small.

The detailed flow measurement indicated an inleakage rate to DA3575G01 to be $3 \cdot 10^{-3}$ L/min for the whole deposition hole. A statistical analysis of the estimated hydraulic conductivity (K) produces a geometric mean of $3.3 \cdot 10^{-13}$ m/s with a standard deviation of 0.67 for $Log_{10}(K)$.

The salinity study produces a geometric mean of the salinity (S) of 6.8 g/l with a standard deviation of 0.69 for S.

The inflow rates to the tunnel system increases as expected due to the construction of new sub-tunnels. Three new tunnels of 74 meters length created an increase of approximately 6 - 10 L/min or 0.08 – 0.14 L/min and meter tunnel.

Sammanfattning

Denna rapport innehåller data och utvärderade resultat från fyra olika delprojekt i anknytning till prototypförvaret.

- Den andra injektionstestomgången med resultat från 39 sektioner i 13 borrhål
- Den andra detaljerade flödesmätningen i ett depositionshål
- Grundvattnets salthalt i området närmast prototypförvaret
- Sammanfattning av inflöden till olika deltunnlar

Resultaten från den andra injektionstestomgången visade att ett mindre antal av sektionerna visar en transmissivitetsökning i förhållande till den första omgången som genomfördes innan depositionshålen borrades. Det är i huvudsak de ytligast belägna sektionerna, 0.25 – 0.75 meter, som uppvisar en säker förändring. Sektionerna närmast ett depositionshål påvisar en större variation av säkra förändringar i jämförelse med undersökta borrhålssektioner längre från ett depositionshål. För de flesta av sektionerna har uppmätta värden varit under mätgränsen ($Q_p = 4 \cdot 10^{-4}$ L/min) i båda testkampanjerna vilket indikerar att förändringarna är små.

Den detaljerade flödesmätningen gav ett inläckage till DA3575G01 på $3 \cdot 10^{-3}$ L/min för hela depositionshålet. En statistisk analys av hydraulisk konduktivitet (K) i borrhålsväggen gav ett geometriskt medelvärde av $3.3 \cdot 10^{-13}$ m/s med en standard avvikelse på 0.67 för Log_{10} (K).

Salinitetsstudien gav ett geometriskt medelvärde på grundvattnets salinitet (S) på 6.8 g/l med en standardavvikelse av 0.69 för S.

Inflödesmängderna till tunnelsystemet ökade som en följd av utbyggnaden av nya deltunnlar. Tre nya deltunnlar med en sammanlagd längd av 74 meter gav en ökning av approximativt 6 – 10 L/min eller 0.08 – 0.14 L/min och meter tunnel.

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1 BACKGROUND

1.1 Äspö Hard Rock Laboratory

In order to prepare for the siting and licensing of a spent fuel repository SKB has constructed an underground research laboratory.

In the autumn of 1990, SKB began the construction of the Äspö Hard Rock Laboratory (Äspö HRL), see Figure 1-1, near Oskarshamn in the southeastern part of Sweden. A 3.6-km long tunnel was excavated in crystalline rock down to a depth of approximately 460 meters.

The laboratory was completed in 1995 and research concerning the disposal of nuclear waste in crystalline rock has since then been carried out.

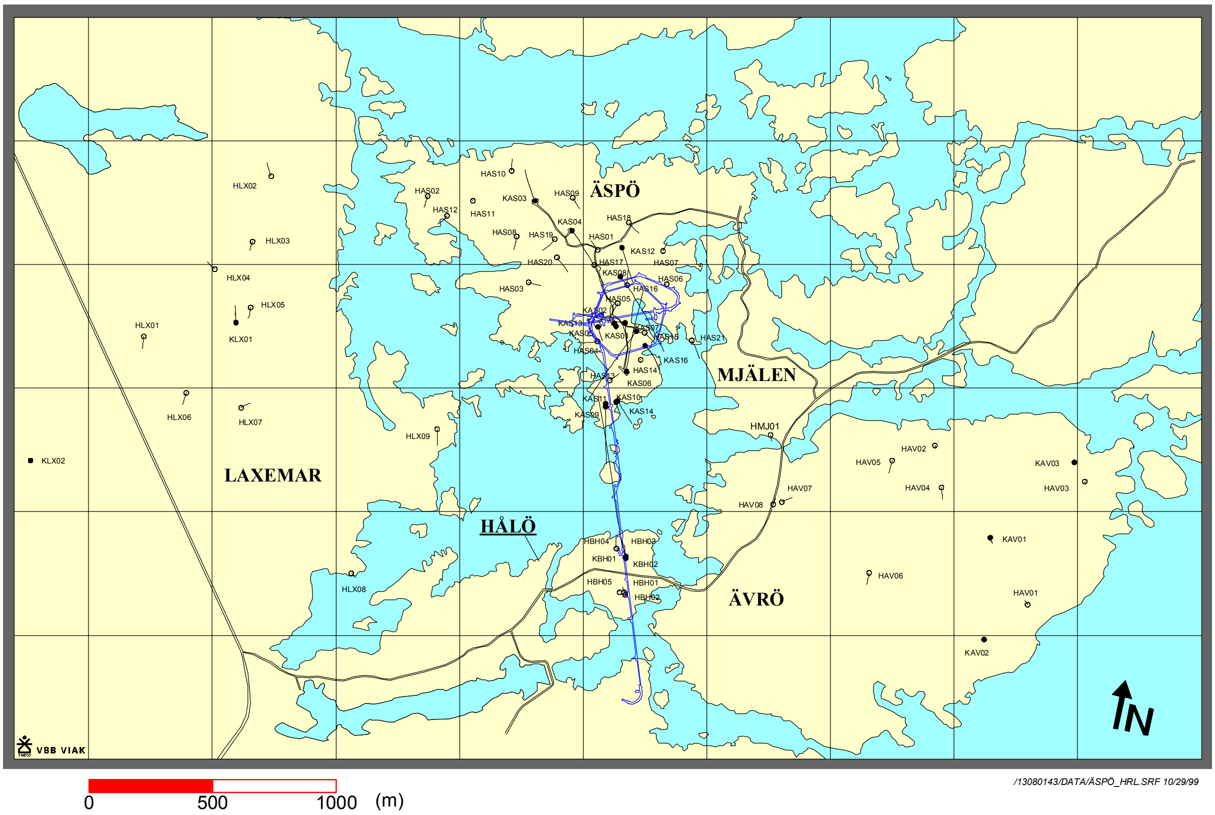

Figure 1-1 *Äspö Hard Rock Laboratory*

1.2 Prototype repository

The Äspö Hard Rock Laboratory is an essential part of the research, development, and demonstration work performed by SKB in preparation for construction and operation of the deep repository for spent fuel. Within the scope of the SKB program for RD&D 1995, SKB has decided to carry out a project with the designation "Prototype Repository Test". The aim of the project is to test important components in the SKB deep repository system in full scale and in a realistic environment.

The Prototype Repository Test is focused on testing and demonstrating the function of the SKB deep repository system. Activities aimed at contributing to development and testing of the practical, engineering measures required to rationally perform the steps of a deposition sequence are also included. However, efforts in this direction are limited, since these matters are addressed in the Demonstration of Repository Technology project and to some extent in the Backfill and Plug Test.

1.2.1 General objectives

The Prototype Repository should simulate as many aspects as possible a real repository, for example regarding geometry, materials, and rock environment. The Prototype Repository is a demonstration of the integrated function of the repository components. Results will be compared with models and assumptions to their validity.

The major objectives for the Prototype Repository are:

- To test and demonstrate the integrated function of the repository components under realistic conditions in full scale and to compare results with models and assumptions.

- To develop, test and demonstrate appropriate engineering standards and quality assurance methods.

- To simulate appropriate parts of the repository design and construction process.

The objectives for the characterisation program are:

- To provide a basis for determination of localisation of the deposition holes

- To provide data on boundary and rock conditions to enable interpretation of the experimental data

1.2.2 Characterisation stages

The characterisation will be made in three stages. Each stage is intended to contribute to more details useful for the determination of the localisation of the deposition holes and the boundary and rock conditions needed for the interpretation of the experimental data. The three stages are:

1. Mapping of the tunnel
2. Pilot and exploratory holes
3. Deposition holes

Stage 1 is completed and stage 2 has been divided into three drilling campaigns:

1. Drilling of pilot holes
2. Drilling of exploratory holes - short bore holes
3. Drilling of exploratory holes - long bore holes

2 OBJECTIVE

The objectives of the exploratory bore holes is to obtain data for prediction of the characteristics in the deposition holes, data for modelling and to quantify the criteria needed for validation of the suitability of the position for canister deposition. Acceptance of a canister position is based on scrutinization of characterisation data such as fracturing, permeability and stability of the bore hole wall.

The main objectives for the injection tests in the exploratory boreholes are:

- The hydraulic tests in the exploratory holes shall provide hydrogeological data useful for setting up a hydrogeological model, of the rock volume around the TBM tunnel.
- Data shall constitute together with the geological and other investigations a basis for interpretation of changes, of the rock characteristics, around the upper part of the rock volume due to drilling of the deposition holes.

The main objective for the inleakage measurement to a deposition hole is:

- To provide data for the estimation of the wetting process of the bentonite clay surrounding the canisters

The main objective for the measurements of the salinity of the groundwater is:

- To provide data for the groundwater flow modeling
- To provide data for the evaluation of the hydro geochemistry

This report describes

- Results of a second round of 39 injection tests in 13 of the exploratory boreholes.
- Result of a detailed inleakage measurement of deposition hole DA3575G01
- Estimation of groundwater salinity in Prototype Repository Area
- Water flow into the main tunnels near the Prototype Repository

3 INJECTION TEST CAMPAIGN 2

3.1 Scope

The injection tests were performed (Gentzschein, 2001) in 13 boreholes located in the TBM drilled part of the tunnel between section 3/542 meter and section 3/578 meter. Nine of the boreholes are vertical or subvertical; four have an inclination of 45 degrees. The nominal diameter is 76 mm. The borehole lengths and the dates of drilling are presented in Table 3-1.

Table 3-1 Drilling data and borehole data of the 13 boreholes.

Borehole	Drilling Completed (Date)	Borehole length (m)	Comment
KA3542G01	980623	30.04	inclination 45º
KA3542G02	980616	30.01	“
KA3544G01	980324	12.00	
KA3546G01	980323	12.00	
KA3548G01	980323	12.01	
KA3550G01	980322	12.03	
KA3552G01	980321	12.01	
KA3554G01	980623	30.01	inclination 45º
KA3554G02	980616	30.01	“
KA3572G01	980320	12.00	
KA3574G01	980425	12.00	
KA3576G01	980426	12.01	
KA3578G01	980319	12.58	

Three tests with section length 0.50 m were carried out in all boreholes in the interval 0.25 m - 1.75 m. Consequently 39 sections were tested, see Table 3-2. The test period started February 13 and ended February 23 2001. The demobilisation of the test equipment was carried out February 23.

A plan view of the test area is shown in Figure 3-1 and a length section is shown in Figure 3-2.

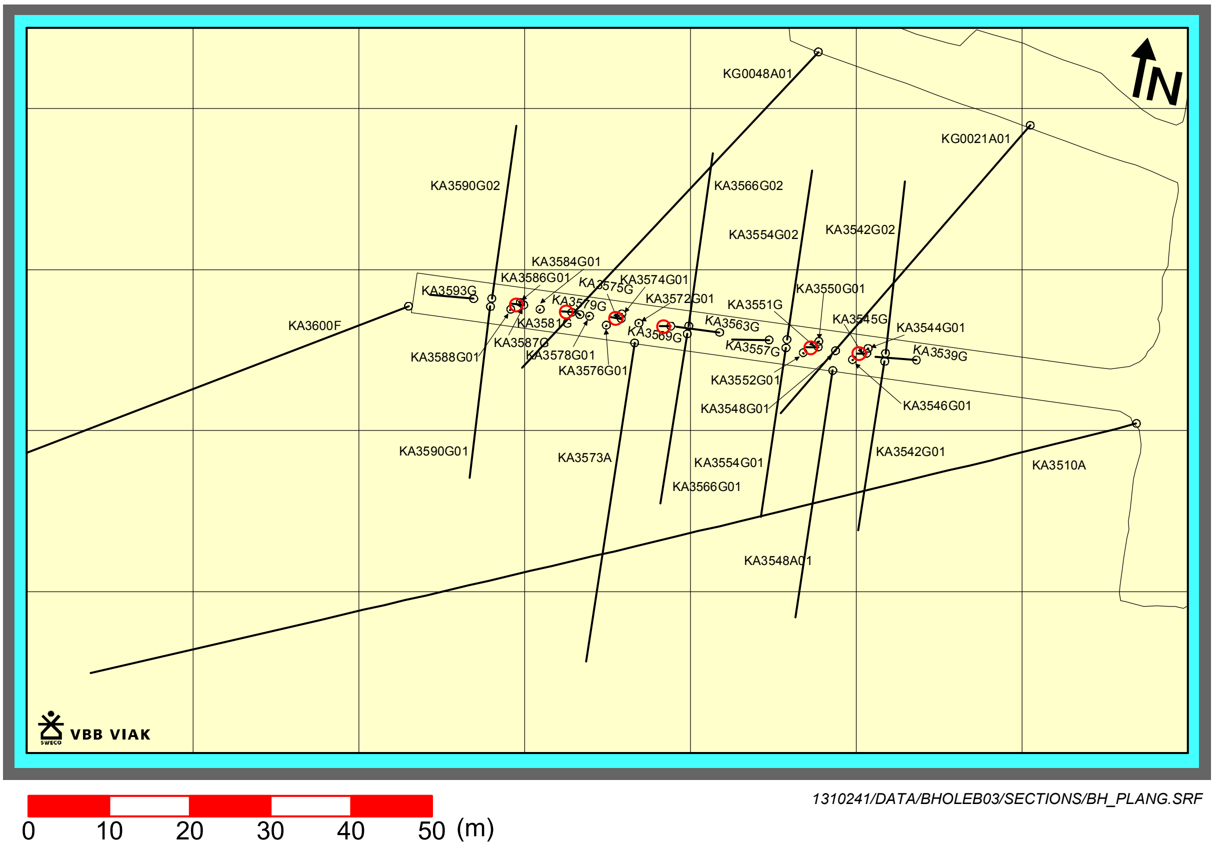

***Figure 3-1** Plan of the Prototype Repository Test Area*

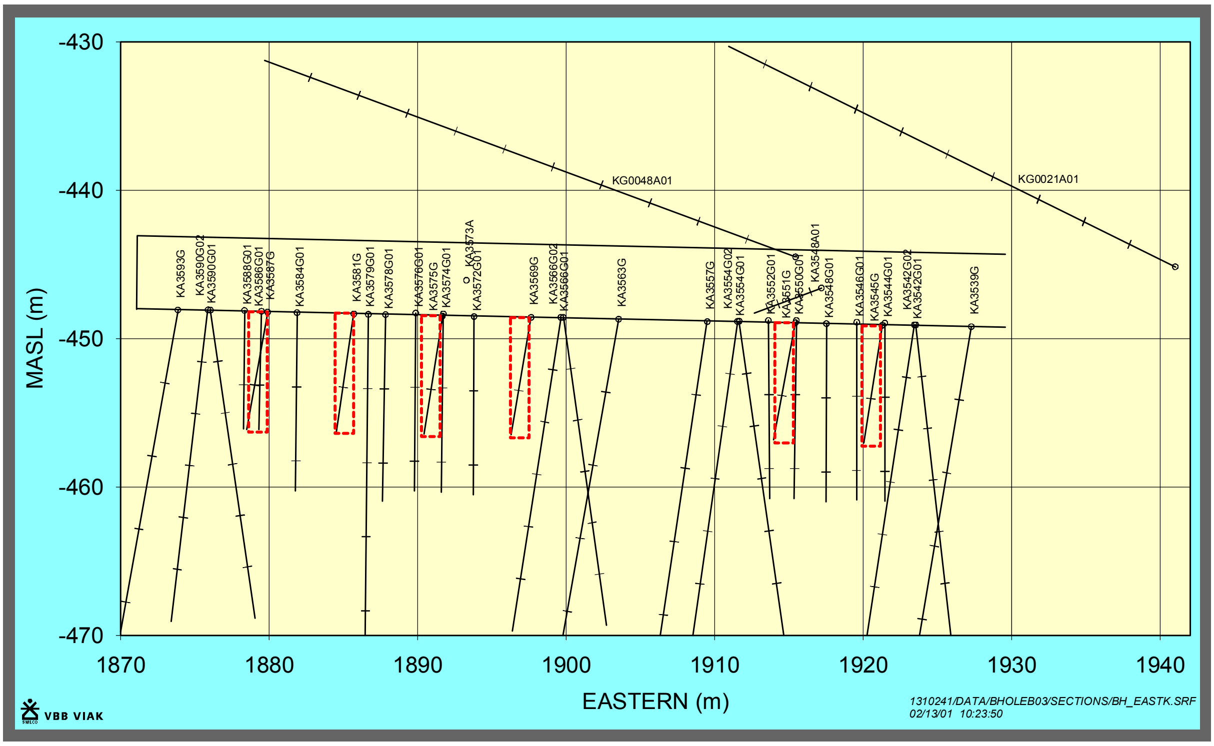

***Figure 3-2** Section of the Prototype Repository Test Area*

Table 3-2 A list of injection tests conducted in exploratory boreholes Prototype Repository February 2001

Borehole	Date of test	Test No	Section	Start Test	V. 0pen	V Close	End of Test
KA3542G02	010213	1a	0.25 - 0.75	15:05	17:16:00	17:36:00	17:46:00
KA3542G02	010213	1b	0.75 -.1.25	17:52	18:19:00	18:39:00	08:09:00 (14/2)
KA3542G02	010214	1c	1.25 - 1.75	08:24	09:56:00	10:16:01	10:37:00
KA3542G01	010214	1d	0.25 - 0.75	10:43	11:07:00	11:27:00	13:32:00
KA3542G01	010214	1e	0.75 -.1.25	13:27	13:58:00	14:18:00	14:28:17
KA3542G01	010214	1f	1.25 - 1.75	14:33	14:59:00	15:19:00	15:38
KA3548G01	010214	1g	0.25 - 0.75	15:55	16:45:00	17:05:00	17:15:55
KA3548G01	010214	1	0.75 -.1.25	17:30	17:53:00	18:13:00	08:14:11 (15/2)
KA3548G01	010215	2	1.25 - 1.75	08:24	08:46	09:06:00	09:16:00
KA3548G01	010215	3	0.25 - 0.75	09:25	09:52:01	10:12:01	10:23
KA3554G01	010215	4	0.25 - 0.75	10:45	14:09:0	14:29:01	14:39:20
KA3554G01	010215	6a	0.75 -.1.25	14:47	15:21:00	15:41:00	15:53:10
KA3554G01	010215	5	1.25 - 1.75	16:02	16:28:00	16:48:00	16:59
KA3554G01	010215	5	0.75 - 1.25	17:05	17:30:00	17:50:00	08:05 (16/5)
KA3554G02	010216	7	0.25 - 0.75	08:59	09:16:00	09:36:00	09:46:21
KA3554G02	010216	8	0.75 -.1.25	09:52	10:12:00	10:32:00	10:42
KA3554G02	010216	9	1.25 - 1.75	10:45	11:12:01	11:32:01	12:47
KA3546G01	010216	10a	0.25 - 0.75	13:10	13:44:01	14:04:01	14:16:01
KA3546G01	010219	10	0.25 - 0.75	13:10(16/2)	09:29:01	09:49:01	09:59:20
KA3546G01	010219	11	0.75 -.1.25	10:05	10:29:02	10:49:02	10:59
KA3546G01	010219	12	1.25 - 1.75	11:07	11:19:03	11:39:02	13:02
KA3544G01	010219	13	0.25 - 0.75	13:37	14:36:02	14:56:02	15:06
KA3544G01	010219	14	0.75 -.1.25	15:10	15:35:02	15:55:02	16:15
KA3544G01	010219	15	1.25 - 1.75	16:08	16:30:02	16:50:02	17:02
KA3550G01	010220	16	0.25 - 0.75	11:22	11:50:03	12:10:02	13:30
KA3550G01	010220	17	0.75 -.1.25	13:35	13:54:03	14:14:03	14:24:01
KA3550G01	010220	18	1.25 - 1.75	14:27	14:48:03	15:08:03	15:28
KA3552G01	010220	19	0.25 - 0.75	15:45	16:05:03	16:25:03	16:35
KA3552G01	010220	20	0.75 -.1.25	16:37	16:57:03	17:17:03	08:07 (21/2)
KA3552G01	010221	21	1.25 - 1.75	08:18	08:37:03	08:57:02	09:23:30
KA3578G01	010221	22	0.25 - 0.75	10:37	11:06:02	11:26:02	12:51
KA3578G01	010221	23	0.75 -.1.25	12:55	13:16:02	13:36:02	13:47:01
KA3578G01	010221	24	1.25 - 1.75	13:49	14:10:03	14:30:03	14:58
KA3572G01	010221	25	0.25 - 0.75	15:20	15:53:03	16:13:03	16:24
KA3572G01	010221	26	0.75 -.1.25	16:25	16:45:03	17:05:03	08:04:22 (22/2)
KA3572G01	010222	27	1.25 - 1.75	08:05	08:27:03	08:47:03	09:09
KA3542G01	010222	28	0.25 - 0.75	09:12	10:14:03	10:34:03	10:45
KA3542G01	010222	29	0.75 -.1.25	10:48	11:08:3	11:28:03	12:48
KA3542G01	010222	30	1.25 - 1.75	12:55	13:11:03	13:31:03	13:41
KA3542G02	010222	31	0.25 - 0.75	14:48	15:11:03	15:31:03	15:56:51
KA3542G02	010222	32	0.75 -.1.25	16:03	16:20:03	16:40:03	16:50
KA3542G02	010222	33	1.25 - 1.75	16:53	17:52:03	18:12:03	18:23:40
KA3576G01	010222	34	0.25 - 0.75	18:28	19:10:03	19:30:03	19:40:01
KA3576G01	010222	35	0.75 -.1.25	19:42	19:58:04	20:18:04	20:28
KA3576G01	010222	36	1.25 - 1.75	20:30	20:50:04	21:10:04	08:27:25(23/2)
KA3574G01	010223	37	0.25 - 0.75	08:28	09:43:04	10:03:04	10:13
KA3574G01	010223	38	0.75 -.1.25	10:16	10:33:03	10:53:03	11:03:01
KA3574G01	010223	39	1.25 - 1.75	11:05	11:25:04	11:45:04	13:30

3.2 Injection test equipment

A specially designed test system developed by GEOSIGMA AB was used for the tests.

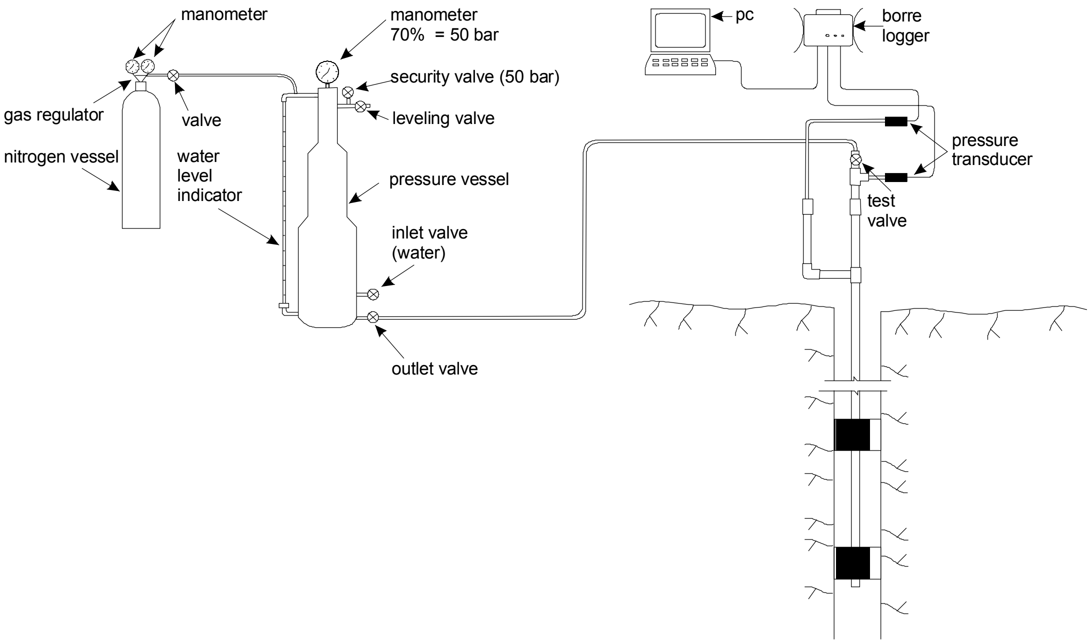

Figure 3-3 *Schematic figure of the test system for constant head tests with a mechanical packer in the borehole*

The test system used for constant-head injection tests is shown in Figure 3-3, with a mechanical packer in the borehole. In principle, the system consists of a pressure vessel (used to measure the injected water volume) with three different diameters to increase the measurement range. On the pressure vessel, a graduated standpipe, used to measure the decline of the water level during injection, is mounted. The pressure vessel is connected to a nitrogen gas vessel and a gas regulator.

Prior to the test, the boreholes must be de-aired. During the injection phase, water is injected into the borehole through a reinforced hydraulic hose (∅ 13.4/8-mm) from the pressure vessel by opening the test valve mounted on the packer pipe. The injection pressure is kept constant with the help of the gas regulator. The recovery phase starts by closing the test valve and the pressure recovery in the test section is measured.

The pressure in the test section and in the interval below the double packer will be monitored using the data logger BORRE MDL ver. 2.2, manufactured by IPA-konsult AB. The data logger has standard test sequences and standard measurement intervals, but the logger can easily be reprogrammed to perform individual test sequences.

The average flow rate (during injection) is calculated from the change of water level in the graduated standpipe on the pressure vessel during a period.

3.2.1 Test procedures and measurement limits

For injection tests, pressure is applied to the tested borehole section by opening the gas regulator and the test valve. The applied pressure should aim at exceeding the maximal borehole pressure about the same amount, as was the case in the previous tests in January 1999.

During the initial phase of injection, a rapid (apparent) decline in flow rate will result due to compression of the water/gas volume in the pressure bottle. These effects are similar to borehole storage effects (during the recovery phase) in low-conductive sections due to the compressibility of water and any deformation of equipment. Prior to testing, it is possible to determine the Well Bore Storage (WBS) coefficient of the test system.

After the initial phase, the flow rate is monitored by manual recording of the decline of the water level in the standpipe during the injection period. This period is stopped by closing the test valve. Then the pressure recovery in the tested section is monitored by the Borre data logger. The pressure eventually reaches the natural hydrostatic borehole pressure depending on the hydraulic conductivity of the borehole.

For tests, with the mechanical packers, the lower measurement limit of flow rate could be estimated to **Q_{min}= 0.4 mL/min ($6.7\cdot10^{-9}$ m^3/s)**. This is due considering the uncertainty of the flow rate measurement (reading) and elastic deformation of (mainly) the packer. During the injection phase variations of the pressure (not perfectly constant), also affect the lower measurement limit. The potential error associated with the above estimate of Q_{min} is estimated to c. ±50 %. Assuming an injection pressure of 50 m this corresponds to a lower measurement limit in terms of transmissivity of $T_{min}=1.5\cdot10^{-10}$ m^2/s . In a 0.5 m long section this corresponds to an average hydraulic conductivity $K_{min}=3\cdot10^{-10}$ m/s.

The upper measurement limit for the actual test system is rather subjective. The maximal flow rate, during injection, may correspond to the maximal change of water level in the standpipe (total range) of c. 1400 mm. This corresponds to a volume of c. 1370 ml, during a certain time, say 4 minutes. These values correspond to an average flow rate of c. $6\cdot10^{-6}$ m^3/s (0.36 L/min) during this time interval. Assuming an injection pressure of dp_s=50 m as above, the upper measurement limit in terms of (steady-state) transmissivity from the injection phase may then be estimated to $T_{max}= 1.5\cdot10^{-7}$ m^2/s . This value corresponds to $K_{max}= 3\cdot10^{-7}$ m/s for a 0.5 m section. However, the performance of the actual test system in this measurement range is uncertain.

3.2.2 Packers

A mechanical packer manufactured by LIVINSTONE AB will be used. The packer enables testing of 0.5 meter intervals. The whole length is 2.3 m and the length of the sealing rubber is 0.1 m, see Figure 3-4. The packer is the same packer that was used when testing the Prototype boreholes in January 1999.

3.2.3 Pressure transducers

The pressure transducers used were of type Druck PTX 1400. The pressure range was 60 bar. The level of each pressure transducer above the tunnel floor is listed in Table 3-3. The technical specifications of the pressure transducers are:

Supply voltage:	9 - 28 VDC
Output current:	4 - 20 mA
Linearity, hysteresis and Repeatability:	± 0.25 % of full scale (typically 0.15 % F.S)
Best straight line definition:	±0.2 % F.S. (typically ±0.1 % F.S)
Temperature error:	± 2 % F.S. over -20 °C to +80 °C (typically 1.5 % F.S)

Table 3-3 Level of pressure transducers above the tunnel floor. Prototype Repository. Injection tests_2, February 2001.

Borehole	Level of transducer above floor (m)
KA3542G01	0.40
KA3542G02	0.40
KA3544G01	0.35
KA3546G01	0.35
KA3548G01	0.49
KA3550G01	0.35
KA3552G01	0.35
KA3554G01	0.40
KA3554G02	0.40
KA3572G01	0.49
KA3574G02	0.35
KA3576G01	0.35
KA3578G01	0.49

Prior to the tests 9 of the 13 boreholes were shut in by means of short mechanichal packers, see Table 3-4.

Table 3-4 Date and time of packer release and packer expansion during Injection tests_2, Prototype Repository February 2001.

Borehole	Packer release (YYMMDD hh:mm)	Packer expansion (YYMMDD hh:mm)	Comment
KA3542G01	010213 15:30	010215 10:55	
KA3542G01	010222 09:30	010215 10:55	
KA3542G02	010215 14:30	-	No reinstallation due to malfunction of the packer
KA3544G01	010219 13:00	010220 09:55	
KA3546G01			No packer
KA3548G01			No packer
KA3550G01			No packer
KA3552G01	010220 14:30	010221 09:33	
KA3554G01			No packer
KA3554G02	010216 08:39	010216 13:40	
KA3572G01	010221 14:55	010222 10:00	
KA3574G02	010223 08:15	010223 13:45	
KA3576G01			No Packer
KA3578G01	010221 10:00	010221 15:30	

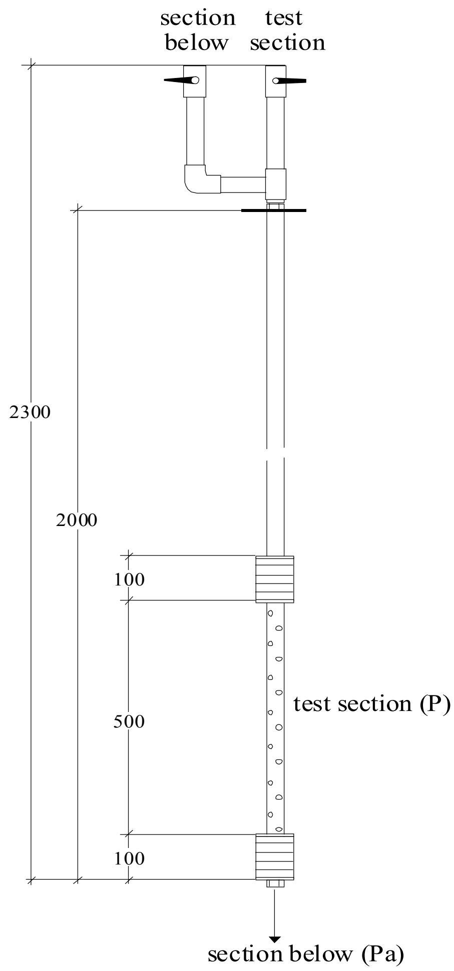

Figure 3-4 *Mechanical double packer used in the Injection tests of 13 exploratory boreholes of the Prototype Repository, February 2001*

The tests were performed as constant-pressure injection tests. At first the test packer, see Figure 3-4 was expanded. The test interval and the packer pipe were thereafter filled with water. The pressure stabilised for approximately 20 minutes. Water was injected to the test section using an excess pressure of approximately 2-3 bar over the initial undisturbed pressure. After 20 minutes, the injection flow was stopped and the pressure recovery was monitored during 10 minutes. Thereafter the packers were lowered 0.5 m for the next test.

The pressure was measured within the test section as well as in the borehole interval below the packers.

3.3 Results

In Table 3-5 a summary of the results from the injection-tests are presented. The parameters shown in the table are:

- Borehole — Borehole name
- Secup — Upper section limit in metres
- Seclow — Lower section limit in metres
- Inj. time — Injection time in minutes
- V_{tot} — Total injected volume of water in m^3 according to *Gentzschein (2001).*
- Q_p — Flowrate of the test section at the end of the injection period in L/min
- Q_{pc} — Adjusted flowrate, in regard to measurement limits, of the test section at the end of the injection period in L/min
- Rec. time — Pressure recovery period in minutes
- P_0 — Pressure head of the test section before start of injection in kPa
- P_p — Pressure head a moment before ending the injection period in kPa
- P_f — Pressure head at the end of the recovery in kPa
- Q_{pc}/dp — Steady state value of specific capacity, $Q_{pc}/(P_p-P_0)$, from injection period in $m^3/s \cdot m$

Table 3-5 Results of the injection tests. Bold values of Q_{pc}/dp indicate the specific capacity as a certain value of the section, while the values in Italics indicate the parameter is lower or equal to the value given in the table.

Injection tests - Prototype repository February 2001											
Borehole	Secup	Seclow	Inj. time	V_{tot}	Q_p	Q_{pc}	Rec time	P_0	P_p	P_f	Q_p/dp
	(m)	(m)	(min)	(m^3)	(l/min)	(l/min)	(min)	(kPa)	(kPa)	(kPa)	(m^3/s m)
KA3542G02	0.25	0.75	20	3.30E-05	1.80E-05	4.00E-04	15.8	112.2	354.9	355.8	*2.7E-10*
	0.75	1.25	20	8.20E-05	1.80E-05	4.00E-04	10	108.7	353	353.5	*2.7E-10*
	1.25	1.75	20	1.30E-04	6.80E-03	**6.80E-03**	21	2419.2	117.5	2325.5	**4.9E-10**
KA3542G01	0.25	0.75	20	1.90E-05	6.00E-04	**6.00E-04**	11	281.7	440.2	377.1	**6.3E-10**
	0.75	1.25	20	1.80E-05	1.80E-05	4.00E-04	10	116.3	349.8	347.7	*2.9E-10*
	1.25	1.75	20	1.70E-05	1.20E-05	4.00E-04	10	111.3	350	349.6	*2.8E-10*
KA3544G01	0.25	0.75	20	1.60E-05	5.40E-05	4.00E-04	10	109.6	336.6	322.1	*2.9E-10*
	0.75	1.25	20	1.30E-05	1.00E-06	4.00E-04	10	115.2	342.2	341.3	*2.9E-10*
	1.25	1.75	20	1.10E-05	1.00E-06	4.00E-04	10	135.7	339.4	342.2	*3.3E-10*
KA3546G01	0.25	0.75	20	3.50E-05	7.10E-04	**7.10E-04**	10.3	116.3	316.6	229.1	**5.9E-10**
	0.75	1.25	20	1.50E-05	5.40E-05	4.00E-04	10	117.5	337.8	336.6	*3.0E-10*
	1.25	1.75	20	1.50E-05	1.00E-06	4.00E-04	80	110.3	380.7	371.2	*2.5E-10*
KA3548G01	0.25	0.75	20	4.10E-06	1.00E-06	4.00E-04	11	114	320.3	315.7	*3.2E-10*
	0.75	1.25	20	6.00E-06	1.00E-05	4.00E-04	841	120.7	329.5	219	*3.2E-10*
	1.25	1.75	20	4.80E-06	1.00E-06	4.00E-04	10	109.4	318.2	315	*3.2E-10*
KA3550G01	0.25	0.75	20	9.50E-05	4.30E-03	**4.30E-03**	81	101.6	315.9	101.6	**3.3E-09**
	0.75	1.25	20	4.60E-06	9.00E-06	4.00E-04	10	109.2	349.1	346.8	*2.8E-10*
	1.25	1.75	20	3.60E-06	1.00E-06	4.00E-04	20	121.6	345	340.6	*3.0E-10*
KA3552G01	0.25	0.75	20	3.00E-05	2.70E-05	4.00E-04	10	114.5	347.7	344.5	*2.9E-10*
	0.75	1.25	20	2.70E-05	2.70E-05	4.00E-04	890	112.9	348.2	311.7	*2.8E-10*
	1.25	1.75	20	2.60E-05	1.20E-05	4.00E-04	26.5	107.3	341.7	340.8	*2.8E-10*
KA3554G02	0.25	0.75	20	8.30E-06	1.09E-04	4.00E-04	10.3	119.8	317	310.6	*3.4E-10*
	0.75	1.25	20	2.50E-05	1.00E-06	4.00E-04	10	122.1	325.8	325.8	*3.3E-10*
	1.25	1.75	20	2.10E-05	1.00E-06	4.00E-04	75	122.8	325.6	318.4	*3.3E-10*
KA3554G01	0.25	0.75	20	3.80E-04	1.90E-02	**1.90E-02**	10.3	134.3	310.8	123.5	**1.8E-08**
	0.75	1.25	20	3.30E-06	5.40E-05	4.00E-04	855	340.8	618.3	428.2	*2.4E-10*
	1.25	1.75	20	2.80E-06	1.00E-06	4.00E-04	11	125.1	416.5	407.5	*2.3E-10*
KA3572G01	0.25	0.75	20	3.10E-05	5.40E-05	4.00E-04	11	112.2	348.6	332	*2.8E-10*
	0.75	1.25	20	2.50E-05	5.40E-05	4.00E-04	899	111.5	348.6	229.1	*2.8E-10*
	1.25	1.75	20	2.40E-05	5.40E-05	4.00E-04	12	105	338.3	323	*2.9E-10*
KA3574G01	0.25	0.75	20	7.00E-04	1.00E-06	4.00E-04	9.9	119.8	331.1	328.8	*3.2E-10*
	0.75	1.25	20	2.30E-05	5.40E-05	4.00E-04	10	116.3	348.9	345.4	*2.9E-10*
	1.25	1.75	20	2.70E-05	1.00E-06	4.00E-04	105	121.2	360.4	361.6	*2.8E-10*
KA3576G01	0.25	0.75	20	2.40E-05	5.40E-05	4.00E-04	10	108.3	356.7	355.1	*2.7E-10*
	0.75	1.25	20	1.70E-05	1.20E-05	4.00E-04	9.9	120.5	347.7	350.3	*2.9E-10*
	1.25	1.75	20	1.80E-05	1.00E-06	4.00E-04	677.4	110.8	347.2	348.4	*2.8E-10*
KA3578G01	0.25	0.75	20	1.00E-05	2.20E-05	4.00E-04	86	111.7	348.6	304.1	*2.8E-10*
	0.75	1.25	20	8.00E-06	1.60E-05	4.00E-04	11	117	348.4	346.8	*2.9E-10*
	1.25	1.75	20	7.70E-06	1.80E-05	4.00E-04	28	120.2	363.4	357.2	*2.7E-10*

Radial flow did not occur during the recovery phase in any of the tests. Accordingly, no Jacob semi-logarithmic evaluation of the transmissivity of any of the tested sections was possible to do. One section (KA3554G01, 0.25-0.75 m) is more conductive than the rest of the sections, as during the first injection campaign in 1999. Its final injection flowrate, however, is lower now, 0.019 L/min compared to 0.054 L/min in 1999.

The specific capacity is calculated from the injection phase, Q_{pc}/dp.

Details of each test are found in Appendix 1. The Q_{pc} value in Table 3-*5* is the best estimate of the injection flow rate.

The transmissivity have been estimated from the specific capacity calculated from the injection phase. The following relationship have been used, (Rhén et al, 1997):

3 meter injection tests : $\mathrm{Log}_{10}\, T = 1.52 + 1.18 \cdot \mathrm{Log}_{10}\, (Q_{pc}/dp)$ (3-1)

In this series of injection tests the packer distance have been 0.5 m. Still it is believed that the relationship above will give a good estimation of the actual transmissivity of the tested sections. In Table 3-6 the estimated transmissivity of the sections are detailed.

Table 3-6 Estimated transmissivity and hydraulic conductivity according to eq. 3-1. Bold values of T and K indicate the parameter value as a certain value of the section, while the values in Italics indicate the parameter is lower or equal to the value given in the table.

Borehole	Secup	Seclow	Log_{10} T (m^2/s)	K_{inj} (m/s)
KA3542G02	0.25	0.75	*$1.7 \cdot 10^{-10}$*	*$3.5 \cdot 10^{-10}$*
	0.75	1.25	*$1.7 \cdot 10^{-10}$*	*$3.4 \cdot 10^{-10}$*
	1.25	1.75	**$3.4 \cdot 10^{-10}$**	**$6.9 \cdot 10^{-10}$**
KA3542G01	0.25	0.75	**$4.6 \cdot 10^{-10}$**	**$9.2 \cdot 10^{-10}$**
	0.75	1.25	*$1.8 \cdot 10^{-10}$*	*$3.6 \cdot 10^{-10}$*
	1.25	1.75	*$1.8 \cdot 10^{-10}$*	*$3.5 \cdot 10^{-10}$*
KA3544G01	0.25	0.75	*$1.9 \cdot 10^{-10}$*	*$3.7 \cdot 10^{-10}$*
	0.75	1.25	*$1.9 \cdot 10^{-10}$*	*$3.7 \cdot 10^{-10}$*
	1.25	1.75	*$2.1 \cdot 10^{-10}$*	*$4.3 \cdot 10^{-10}$*
KA3546G01	0.25	0.75	**$4.3 \cdot 10^{-10}$**	**$8.5 \cdot 10^{-10}$**
	0.75	1.25	*$1.9 \cdot 10^{-10}$*	*$3.9 \cdot 10^{-10}$*
	1.25	1.75	*$1.5 \cdot 10^{-10}$*	*$3.0 \cdot 10^{-10}$*
KA3548G01	0.25	0.75	*$2.1 \cdot 10^{-10}$*	*$4.2 \cdot 10^{-10}$*
	0.75	1.25	*$2.1 \cdot 10^{-10}$*	*$4.1 \cdot 10^{-10}$*
	1.25	1.75	*$2.1 \cdot 10^{-10}$*	*$4.1 \cdot 10^{-10}$*
KA3550G01	0.25	0.75	**$3.3 \cdot 10^{-9}$**	**$6.6 \cdot 10^{-9}$**
	0.75	1.25	*$1.8 \cdot 10^{-10}$*	*$3.5 \cdot 10^{-10}$*
	1.25	1.75	*$1.9 \cdot 10^{-10}$*	*$3.8 \cdot 10^{-10}$*
KA3552G01	0.25	0.75	*$1.8 \cdot 10^{-10}$*	*$3.6 \cdot 10^{-10}$*
	0.75	1.25	*$1.8 \cdot 10^{-10}$*	*$3.6 \cdot 10^{-10}$*
	1.25	1.75	*$1.8 \cdot 10^{-10}$*	*$3.6 \cdot 10^{-10}$*
KA3554G02	0.25	0.75	*$2.2 \cdot 10^{-10}$*	*$4.4 \cdot 10^{-10}$*
	0.75	1.25	*$2.1 \cdot 10^{-10}$*	*$4.3 \cdot 10^{-10}$*
	1.25	1.75	*$2.1 \cdot 10^{-10}$*	*$4.3 \cdot 10^{-10}$*
KA3554G01	0.25	0.75	**$2.4 \cdot 10^{-8}$**	**$4.8 \cdot 10^{-8}$**
	0.75	1.25	*$1.5 \cdot 10^{-10}$*	*$3.0 \cdot 10^{-10}$*
	1.25	1.75	*$1.4 \cdot 10^{-10}$*	*$2.8 \cdot 10^{-10}$*
KA3572G01	0.25	0.75	*$1.8 \cdot 10^{-10}$*	*$3.6 \cdot 10^{-10}$*
	0.75	1.25	*$1.8 \cdot 10^{-10}$*	*$3.6 \cdot 10^{-10}$*
	1.25	1.75	*$1.8 \cdot 10^{-10}$*	*$3.6 \cdot 10^{-10}$*
KA3574G01	0.25	0.75	*$2.0 \cdot 10^{-10}$*	*$4.1 \cdot 10^{-10}$*

Borehole	Secup	Seclow	Log_{10} T (m^2/s)	K $_{inj}$ (m/s)
	0.75	1.25	*1.8 · 10^{-10}*	*3.6 · 10^{-10}*
	1.25	1.75	*1.8 · 10^{-10}*	*3.5 · 10^{-10}*
KA3576G01	0.25	0.75	*1.9 · 10^{-10}*	*3.4 · 10^{-10}*
	0.75	1.25	*1.8 · 10^{-10}*	*3.7 · 10^{-10}*
	1.25	1.75	*1.8 · 10^{-10}*	*3.5 · 10^{-10}*
KA3578G01	0.25	0.75	*1.8 · 10^{-10}*	*3.6 · 10^{-10}*
	0.75	1.25	*1.8 · 10^{-10}*	*3.7 · 10^{-10}*
	1.25	1.75	*1.7 · 10^{-10}*	*3.4 · 10^{-10}*

As shown in the table above the range of the transmissivity is $1 \cdot 10^{-10} – 5 \cdot 10^{-10}$ m^2/s . The exceptions are KA3554G01, 0.25 – 0.75 m where the estimated transmissivity is $2.4 \cdot 10^{-8}$ m^2/s and KA3550G01, 0.25 – 0.75 m with a transmissivity of $3.3 \cdot 10^{-9}$ m^2/s.

In the 1999 injection test campaign (Forsmark and Rhén, 2000a) a different kind of measurement equipment was used and a lower measurement limit regarding the injection flow, $Q_p = 1 \cdot 10^{-4}$ L/min, prevailed. This in turn produced lower transmissivity values than was possible to evaluate in this second campaign.

In order to compare the results of the two test campaigns the 1999 test results have been re-calculated using the 2001 measurement limit of the injection flow. In Table 3-7, the results of the two campaigns are shown in the same table. The measurement limit of the calculations is in both cases $Q_p = 4 \cdot 10^{-4}$ L/min.

Table 3-7 Comparison of the two test campaigns. Sections with measurement limits in italics and sections with measured value in bold. Fracture location within brackets is located outside the test section but close by.

Borehole	Secup	Seclow	Log_{10} T (m^2/s) 1999	Log_{10} T (m^2/s) 2001	Mapped open fractures in section (m)	Comments on changes (S=small or below meas. limit; R=Reliable)
KA3542G02	0.25	0.75	*2.3 · 10^{-10}*	*1.7 · 10^{-10}*	0.31, 0.58	S
	0.75	1.25	*2.2 · 10^{-10}*	*1.7 · 10^{-10}*	-	S
	1.25	1.75	**3.0 · 10^{-10}**	**3.4 · 10^{-10}**	(1.85)	S
KA3542G01	0.25	0.75	*1.0 · 10^{-10}*	**4.6 · 10^{-10}**	0.51, 0.63, 0.73, 0.75	R
	0.75	1.25	*9.4 · 10^{-11}*	*1.8 · 10^{-10}*	0.75	S
	1.25	1.75	*9.0 · 10^{-11}*	*1.8 · 10^{-10}*	-	S
KA3544G01	0.25	0.75	*6.9 · 10^{-11}*	*1.9 · 10^{-10}*	-	S
	0.75	1.25	**1.7 · 10^{-10}**	*1.9 · 10^{-10}*	-	S
	1.25	1.75	*9.6 · 10^{-11}*	*2.1 · 10^{-10}*	-	S
KA3546G01	0.25	0.75	*6.3 · 10^{-11}*	**4.3 · 10^{-10}**	0.25, 0.28, 0.31	R
	0.75	1.25	**6.2 · 10^{-10}**	*1.9 · 10^{-10}*	0.96	R
	1.25	1.75	*8.4 · 10^{-11}*	*1.5 · 10^{-10}*	-	S
KA3548G01	0.25	0.75	*9.7 · 10^{-11}*	*2.1 · 10^{-10}*	-	S
	0.75	1.25	*5.0 · 10^{-11}*	*2.1 · 10^{-10}*	1.03	S
	1.25	1.75	*9.6 · 10^{-11}*	*2.1 · 10^{-10}*	-	S
KA3550G01	0.25	0.75	**1.8 · 10^{-10}**	**3.3 · 10^{-9}**	0.25	R
	0.75	1.25	*8.7 · 10^{-11}*	*1.8 · 10^{-10}*	-	S

Borehole	Secup	Seclow	Log $_{10}$ T (m^2/s) 1999	Log $_{10}$ T (m^2/s) 2001	Mapped open fractures in section (m)	Comments on changes (S=small or below meas. limit; R=Reliable)
	1.25	1.75	*$6.5 \cdot 10^{-11}$*	*$1.9 \cdot 10^{-10}$*	-	S
KA3552G01	0.25	0.75	*$8.7 \cdot 10^{-11}$*	*$1.8 \cdot 10^{-10}$*	-	S
	0.75	1.25	*$5.3 \cdot 10^{-11}$*	*$1.8 \cdot 10^{-10}$*	-	S
	1.25	1.75	*$9.6 \cdot 10^{-11}$*	*$1.8 \cdot 10^{-10}$*	-	S
KA3554G02	0.25	0.75	**$3.9 \cdot 10^{-10}$**	*$2.2 \cdot 10^{-10}$*	0.50	R
	0.75	1.25	*$9.6 \cdot 10^{-11}$*	*$2.1 \cdot 10^{-10}$*	-	S
	1.25	1.75	*$8.3 \cdot 10^{-11}$*	*$2.1 \cdot 10^{-10}$*	-	S
KA3554G01	0.25	0.75	**$3.2 \cdot 10^{-8}$**	**$2.4 \cdot 10^{-8}$**	0.40, 0.42	R
	0.75	1.25	*$7.5 \cdot 10^{-11}$*	*$1.5 \cdot 10^{-10}$*	0.93, 0.96	S
	1.25	1.75	*$9.5 \cdot 10^{-11}$*	*$1.4 \cdot 10^{-10}$*	1.42, 1.55	S
KA3572G01	0.25	0.75	*$9.9 \cdot 10^{-11}$*	*$1.8 \cdot 10^{-10}$*	-	S
	0.75	1.25	**$5.8 \cdot 10^{-11}$**	*$1.8 \cdot 10^{-10}$*	0.91, 0.99	S
	1.25	1.75	*$9.8 \cdot 10^{-11}$*	*$1.8 \cdot 10^{-10}$*	1.30	S
KA3574G01	0.25	0.75	*$9.2 \cdot 10^{-11}$*	*$2.0 \cdot 10^{-10}$*	-	S
	0.75	1.25	*$9.6 \cdot 10^{-11}$*	*$1.8 \cdot 10^{-10}$*	1.02, 1.06	S
	1.25	1.75	*$8.6 \cdot 10^{-11}$*	*$1.8 \cdot 10^{-10}$*	-	S
KA3576G01	0.25	0.75	*$9.7 \cdot 10^{-11}$*	*$1.9 \cdot 10^{-10}$*	0.62	S
	0.75	1.25	*$9.7 \cdot 10^{-11}$*	*$1.8 \cdot 10^{-10}$*	-	S
	1.25	1.75	*$9.7 \cdot 10^{-11}$*	*$1.8 \cdot 10^{-10}$*	-	S
KA3578G01	0.25	0.75	*$9.3 \cdot 10^{-11}$*	*$1.8 \cdot 10^{-10}$*	-	S
	0.75	1.25	**$1.4 \cdot 10^{-10}$**	*$1.8 \cdot 10^{-10}$*	-	S
	1.25	1.75	*$9.6 \cdot 10^{-11}$*	*$1.7 \cdot 10^{-10}$*	1.72	S

The values of KA3550G01, 0.25 – 0.75 m differ rather much. An increased transmissivity is evaluated in 2001, $3.3 \cdot 10^{-9}$ m^2/s versus $1.8 \cdot 10^{-10}$ m^2/s in 1999. An explanation to this may be a fracture located at 0.25 m in the borehole that may have been activated due to the drilling of the deposition holes and seen during the second test campaign. It is to be observed that the hole is located very close to the deposition hole DA3551G01. Another reason may be the conductive part of the fracture happens to have a good connection to the deposition hole. In such a case one may argue that due to the close distance to the boundary (deposition hole) the increase of the specific capacity may not be comparable to the value of 1999.

In order to check this out the following was done. An estimation of the possible influence radius of a test was done using the influence radius criteria for pseudo-stationary conditions

$$r_p =< [\ 0.01 \cdot 4 \cdot T \cdot t_p / S\ ]^{1/2}$$

The storativity, S, was estimated using a relation presented in Forsmark and Rhén (2000b) where

$$\text{Log}_{10}\, S = 0.640 \cdot \text{Log}_{10}\, T - 1.570$$

The resulting interval of r_p is shown in Table 3-8. As shown the estimated influence radius interval is 0.66 – 2.32 meter.

Table 3-8 Estimation of possible influence radius

T (m^2/s)	S (T) (-)	r_p=< (m)
$1 \cdot 10^{-10}$	$1.1 \cdot 10^{-8}$	0.66
$1 \cdot 10^{-7}$	$8.9 \cdot 10^{-7}$	2.32

In Figure 3-5 a system of a test well and a mirror well is shown.

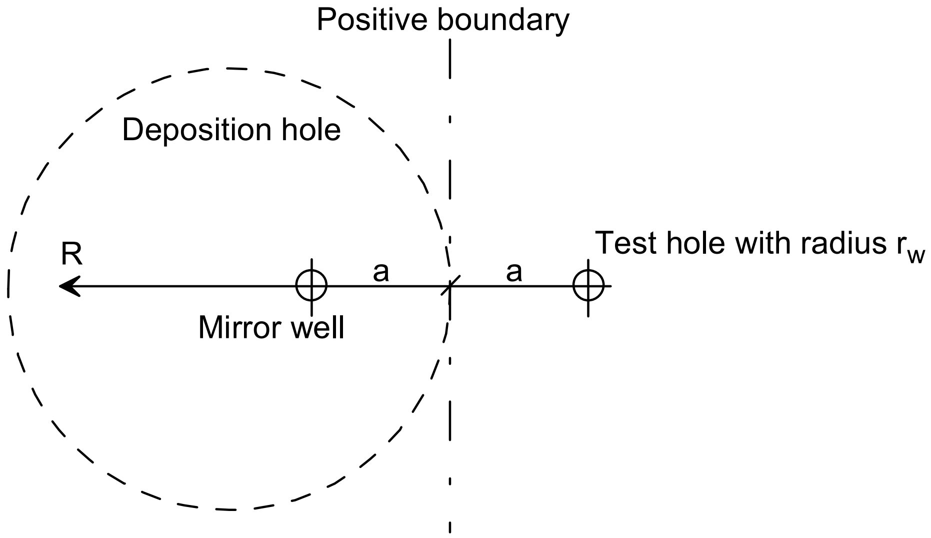

Figure 3-5 *System of test well and mirror well*

The specific capacity for the test well assuming a positive boundary is

$$[Q/s]_B = [2 \cdot \pi \cdot T / \ln(2 \cdot a / r_w)]$$

Thiem´s formula for stationary groundwater flow is (setting $h_2 - h_w = s$)

$$[Q/s]_{Rf} = [2 \cdot \pi \cdot T / \ln(r_2 / r_w)]$$

Combining these two relationships produce the following

$$[Q/s]_{Rf} / [Q/s]_B = [\ln(2 \cdot a / r_w)] / [\ln(r_2 / r_w)]$$

In Figure 3-6 this relationsship is plotted. In the figure it is clearly shown that the boundary has a large influence on the evaluated hydrological properties. It is however shown that the result will end up in the same order of magnitude differing approximately 0 to +30% for the specific capacity with parameters according to Table 3-8. However, the T values from 1999 for tests close to the depositionholes are in the range 10^{-10} m^2/s except for one section with $T = 6 \cdot 10^{-10}$ m^2/s. Most of the values measured 2001 are also in the range 10^{-10} m^2/s and $4 \cdot 10^{-10}$ m^2/s with two exceptions $T = 3.3 \cdot 10^{-9}$ m^2/s and $2.4 \cdot 10^{-8}$ m^2/s. This means that the possible error due to the depositionhole is less or much less than 30%. The increase of transmissivity, in KA3546G01 and KA3550G01 is judged to be real and not an artifact of the boundary conditions.

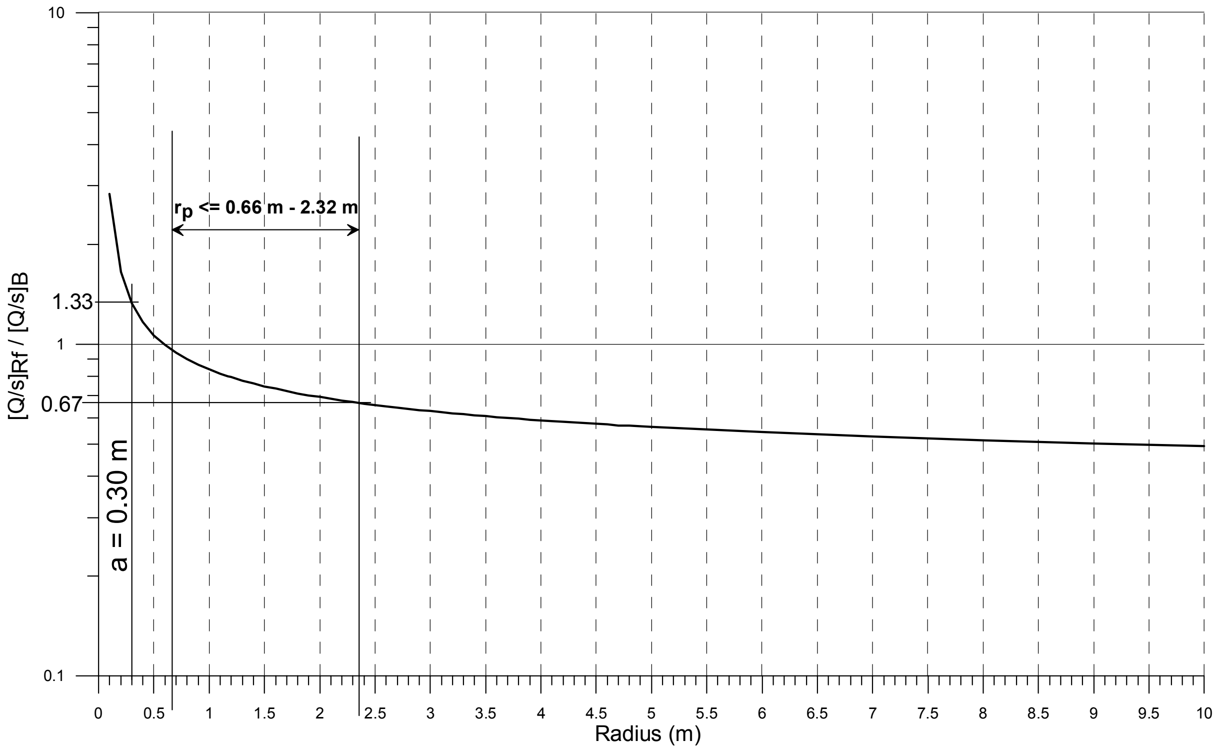

***Figure 3-6** Sensitivity plot of influence of hydraulic boundary*

When comparing the upper end transmissivities, of 2001, with the values of 1999 in KA3554G01, 0.25 – 0.75 m, the values are within the same order of magnitude, $2.4 \cdot 10^{-8}$ m^2/s (2001) vs $3.2 \cdot 10^{-8}$ m^2/s (1999). There are two fractures at 0.40 m and 0.42 m in this section of the borehole.

In order to study any link between the position of the holes in relation to the deposition holes the tested boreholes were divided into three categories:

Category 1 (holes close to a deposition hole):

KA3544G01, KA3546G01, KA3550G01, KA3552G01, KA3574G01 and KA3576G01.

Category 2 (holes more distant to a deposition hole):

KA3548G01, KA3572G01 and KA3578G01

Category 3 (inclined holes; most distant to deposition hole):

KA3542G01, KA3542G02, KA3554G01 and KA3554G02

In *Figure 3-7* the resulting transmissivities are plotted to show the relative overall change of the permeability of the rock before and after the deposition holes were drilled. There are only a few tests sections that indicate more reliable changes of the transmissivity due to drilling of the depositionholes. These are indicated in Table 3-7 and plotted in Figures 3-7 and 3-8. No category 2 holes shows reliable changes. All other sections indicate transmissivities below $2 \cdot 10^{-10}$ m^2/s (i.e. $K = 4 \cdot 10^{-10}$ m/s) which was the approximate measurement limit. If there are changes in these sections they are at least small.

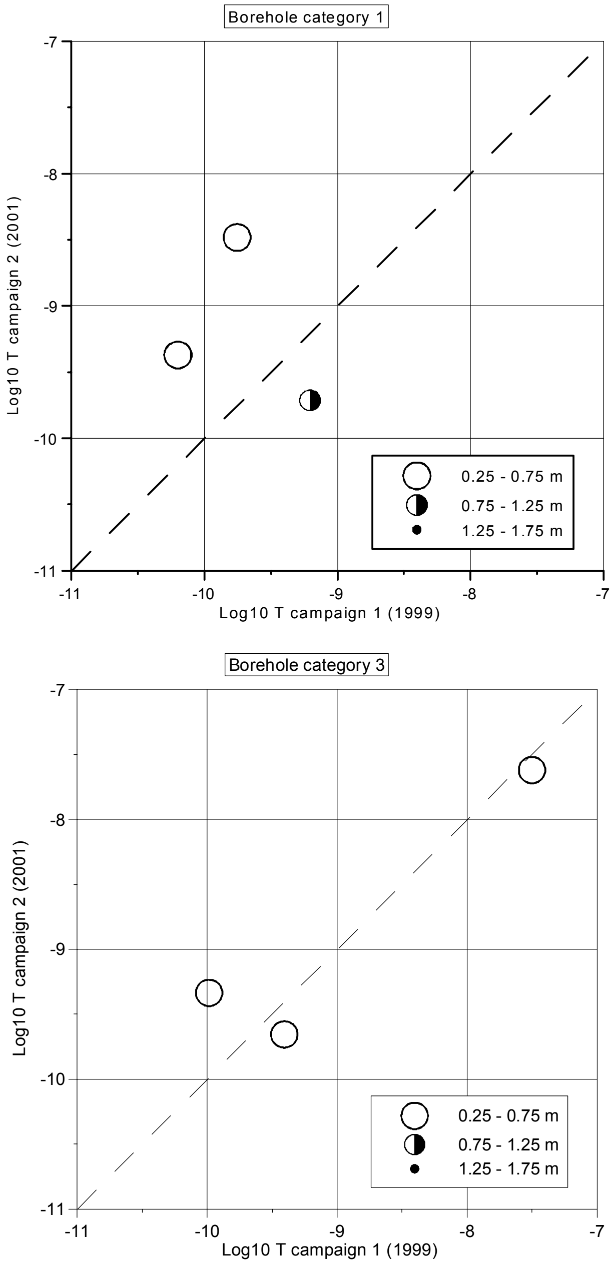

Figure 3-7 *Relative overall change of transmissivities*

As noticed above a few of the sections shows a significant transmissivity increase between the tests in 1999 and the tests in 2001.

In Figure 3-8, the transmissivity changes of the test section are plotted against the squared distance. The change is defined as the logarithmic value of the transmissivity of test campaign 2 minus logarithmic value of the transmissivity of test campaign 1.

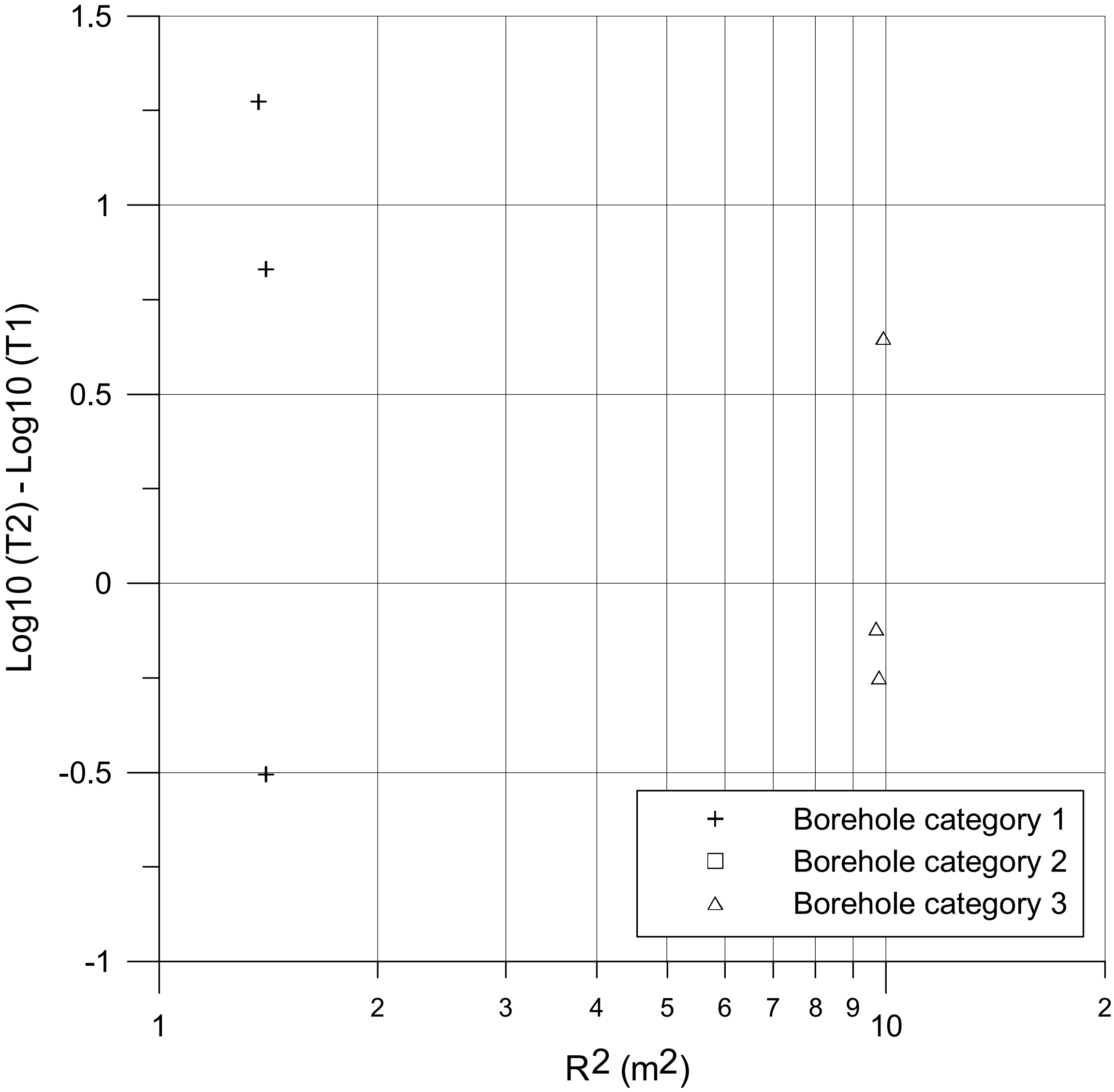

Figure 3-8 *The transmissivity changes of the test section plotted against the squared distance.*

The group of borehole section closest to a deposition hole indicates a larger variation of changes than the groups more distant to a deposition hole.

3.4 Wellbore storage

In an attempt to estimate the flowrate for those sections with rates below the measurement limit, see chapter 3.2, the wellbore storage has been used as follows.

The wellbore storage, C, for all test sections is assumed reasonably constant, as the geometry of the injection equipment is the same for each interval. From the logarithmic graph of the recovery of the injection test, a straight line with the slope 1:1 can be matched to the graph of a test. The equation of the well bore storage is

$$C = (Q_{pc} \cdot t_i) / p_i \qquad (3\text{-}1)$$

where t_i and p_i is the time and pressure at any point along the straight line. C can be calculated if the flowrate Q is known. Using p_i at a fixed time t_i for each test interval with an acceptable recovery makes it possible to estimate the injection capacity. This may be useful for the intervals with flowrates below the measurement limit.

Of the injection test campaign 2, two tests were selected as suitable to estimate the wellbore storage, namely KA3542G01 (0.25-0.75 m) and KA3546G01 (0.25–0.75 m). The result was

- KA3542G01 (0.25 - 0.75 m): $C = 4.3 \cdot 10^{-7}$ m^2
- KA3546G01 (0.25 - 0.75 m): $C = 4.7 \cdot 10^{-7}$ m^2

Considering these results an estimated wellbore storage of $C = 4.5 \cdot 10^{-7}$ m^2 was used in calculation to estimate the flowrate, Q_{pc}^{C}, for those sections with flowrates below the measurement limit. In Table 3-8, the result of this attempt is shown. For some sections it was not possible to get reliable estimates of p_i and t_i.

Table 3-9 Calculated flowrates using wellbore storage estimation $C = 4.5 \cdot 10^{-7}$ m^2 and equation 3-1. p_i and t_i from recovery curve.

Borehole	Secup (m)	Seclow (m)	p_i (m)	t_i (s)	Q_{pc} (L/min)	Q^{C}_{pc} (L/min)
KA3542G01	0.25	0.75	0.14	6	**$6.0 \cdot 10^{-4}$**	
	0.75	1.25	0.081	600	$4.0 \cdot 10^{-4}$	$3.7 \cdot 10^{-6}$
	1.25	1.75	0.0129	60	$4.0 \cdot 10^{-4}$	$5.8 \cdot 10^{-6}$
KA3542G02	0.25	0.75	-	-	$4.0 \cdot 10^{-4}$	-
	0.75	1.25	-	-	$4.0 \cdot 10^{-4}$	-
	1.25	1.75	0.16	5.3	**$6.8 \cdot 10^{-3}$**	
KA3544G01	0.25	0.75	0.16	60	$4.0 \cdot 10^{-4}$	$7.2 \cdot 10^{-5}$
	0.75	1.25	-	-	$4.0 \cdot 10^{-4}$	-
	1.25	1.75	-	-	$4.0 \cdot 10^{-4}$	-
KA3546G01	0.25	0.75	1.52	60	**$7.1 \cdot 10^{-4}$**	
	0.75	1.25	0.17	600	$4.0 \cdot 10^{-4}$	$7.7 \cdot 10^{-6}$
	1.25	1.75	0.2	600	$4.0 \cdot 10^{-4}$	$9.0 \cdot 10^{-6}$
KA3548G01	0.25	0.75	0.5	600	$4.0 \cdot 10^{-4}$	$2.3 \cdot 10^{-5}$
	0.75	1.25	0.69	60	$4.0 \cdot 10^{-4}$	$3.1 \cdot 10^{-4}$
	1.25	1.75	0.47	600	$4.0 \cdot 10^{-4}$	$2.1 \cdot 10^{-5}$

Borehole	Secup (m)	Seclow (m)	p_i (m)	t_i (s)	Q_{pc} (L/min)	Q^C_{pc} (L/min)
KA3550G01	0.25	0.75	0.35	60	**$4.3 \cdot 10^{-3}$**	
	0.75	1.25	0.031	60	$4.0 \cdot 10^{-4}$	$1.4 \cdot 10^{-5}$
	1.25	1.75	0.44	600	$4.0 \cdot 10^{-4}$	$2.0 \cdot 10^{-5}$
KA3552G01	0.25	0.75	0.51	600	$4.0 \cdot 10^{-4}$	$2.3 \cdot 10^{-5}$
	0.75	1.25	0.12	600	$4.0 \cdot 10^{-4}$	$5.4 \cdot 10^{-6}$
	1.25	1.75	0.067	600	$4.0 \cdot 10^{-4}$	$3.0 \cdot 10^{-6}$
KA3554G01	0.25	0.75	5.48	3	**$1.9 \cdot 10^{-2}$**	
	0.75	1.25	1.31	60	$4.0 \cdot 10^{-4}$	$5.9 \cdot 10^{-4}$
	1.25	1.75	1	600	$4.0 \cdot 10^{-4}$	$4.5 \cdot 10^{-5}$
KA3554G02	0.25	0.75	0.72	60	$4.0 \cdot 10^{-4}$	$3.2 \cdot 10^{-4}$
	0.75	1.25	-	-	$4.0 \cdot 10^{-4}$	-
	1.25	1.75	0.18	600	$4.0 \cdot 10^{-4}$	$8.1 \cdot 10^{-6}$
KA3572G01	0.25	0.75	0.11	60	$4.0 \cdot 10^{-4}$	$5.0 \cdot 10^{-5}$
	0.75	1.25	0.16	60	$4.0 \cdot 10^{-4}$	$7.2 \cdot 10^{-5}$
	1.25	1.75	0.95	600	$4.0 \cdot 10^{-4}$	$4.3 \cdot 10^{-5}$
KA3574G01	0.25	0.75	0.24	600	$4.0 \cdot 10^{-4}$	$1.1 \cdot 10^{-5}$
	0.75	1.25	0.52	600	$4.0 \cdot 10^{-4}$	$2.3 \cdot 10^{-5}$
	1.25	1.75	-	-	$4.0 \cdot 10^{-4}$	-
KA3576G01	0.25	0.75	0.195	600	$4.0 \cdot 10^{-4}$	$8.8 \cdot 10^{-6}$
	0.75	1.25	-	-	$4.0 \cdot 10^{-4}$	-
	1.25	1.75	0.028	60	$4.0 \cdot 10^{-4}$	$1.3 \cdot 10^{-5}$
KA3578G01	0.25	0.75	0.83	600	$4.0 \cdot 10^{-4}$	$3.7 \cdot 10^{-5}$
	0.75	1.25	0.018	60	$4.0 \cdot 10^{-4}$	$8.1 \cdot 10^{-6}$
	1.25	1.75	0.019	60	$4.0 \cdot 10^{-4}$	$8.6 \cdot 10^{-6}$

The estimated flowrates, Q_{pc}^{C}, are within a magnitude of two decades lower than the measurement limit, Q_{pc}. Comparing with values in Table 3-6 this indicates hydraulic conductivities around 10^{-11} to 10^{-12} m/s for the tighter rock. The uncertainty are, however, rather large and no further conclusions are made.

4 INFLOW RATE MEASUREMENT

4.1 Scope

Detailed inflow measurements have earlier been made in DA3581G01 (Forsmark et al, 2001). In order to complement that measurement a similar measurement was done in DA3575G01. The results of these measurements are detailed in this chapter.

4.2 Detailed flow measurement in DA3575G01

A detailed flow measurement was made in DA3575G01 2001-02-12 to 2001-02-21. Ordinary baby diapers were applied to a plank. Eight diapers were applied in a row to each of 76 planks. Each diaper was weighted before applying to the plank. All of the plank-diaper arrangements were then applied tight to the borehole wall. The first 38 were applied vertically at level 4.60 – 7.60 meters and the last 38 were applied vertically at level 1.30 – 4.30 meters. After the end of the period, each diaper was again weighted to be able to estimate the inflow to each diaper. The arrangement is shown in Figure 4-1. Measurement data is detailed in Appendix 2.

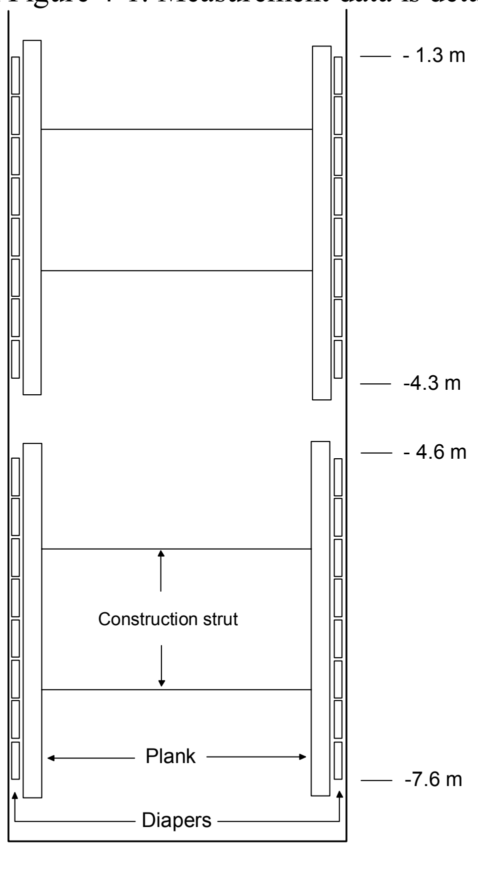

Figure 4-1 *Diaper measurement arrangement in DA3575G01*

To be able to estimate the effect of the background humidity on water content in the diaper some reference diapers were used at different levels in the borehole. Eight reference diapers were applied on the “outside” of a plank and covered with a Plexiglas at different levels in the hole. These diapers increased their weight with 5.8 grams to 6.8 grams. Five diapers were hanging freely in the hole with plexi-glass covers on both sides (increase with 4.7 to 6.8 g). Finally, three diapers were hanging totally in the free air (increase 9 to 12 g) at different levels in the hole. In the calculations to estimate the flow and hydraulic conductivity the measured weights were lessened by 6 grams, in order to estimate the net inflow rate from the rock.

A simple test was carried out to see how much water a diaper could absorb. With 200 gram water the diaper felt moist, and with 300 gram, it was possible to squeeze the water out of the diaper.

A weight increase of 0 – 1 grams is considered as uncertain, giving that an increase of 1 gram could represent a “zero” flow as well as flow causing an increase of 1 gram. A 1 gram increase during one week gives a flow of $1 \cdot 10^{-7}$ L/min. This flow is therefor set as the measurement limit of this methodology.

Each diaper covered an area of 0.04125 (0.11 x 0.375) m^2. The distance between the planks was approximately 0.05 meters.

The planks were mounted clock-wise along the circumference of the borehole. Plank 1 was situated perpendicular to the centreline of the tunnel and at the north side of the hole.

In Figures 4-2 to 4-5, the hole and the diaper measurement arrangement are shown.

Figure 4-2 *Upper part of hole before diapers were applied in DA3575G01.*

Figure 4-3 *The deposition hole with applied diapers in DA3575G01.*

Figure 4-4 *Upper part of hole with diapers applied in DA3575G01.*

Figure 4-5 *Reference diaper between plank and Plexiglas in DA3575G01.*

During the measurement campaign 5 sections (27 - 31) out of 38 (1 - 38) became waterlogged by leaking water through a fracture short-cutting the tunnel floor with the deposition hole. It was not possible to locate and stop the leak before the measurements commenced. Therefor these sections are marked as blank in the following Figures 4-6 and 4-8 to 4-10.

No mapped water bearing structure in this borehole is located in this hole.

In Figure 4-6, the result is shown graphically together with the geological mapping of structures and inleaking locations.

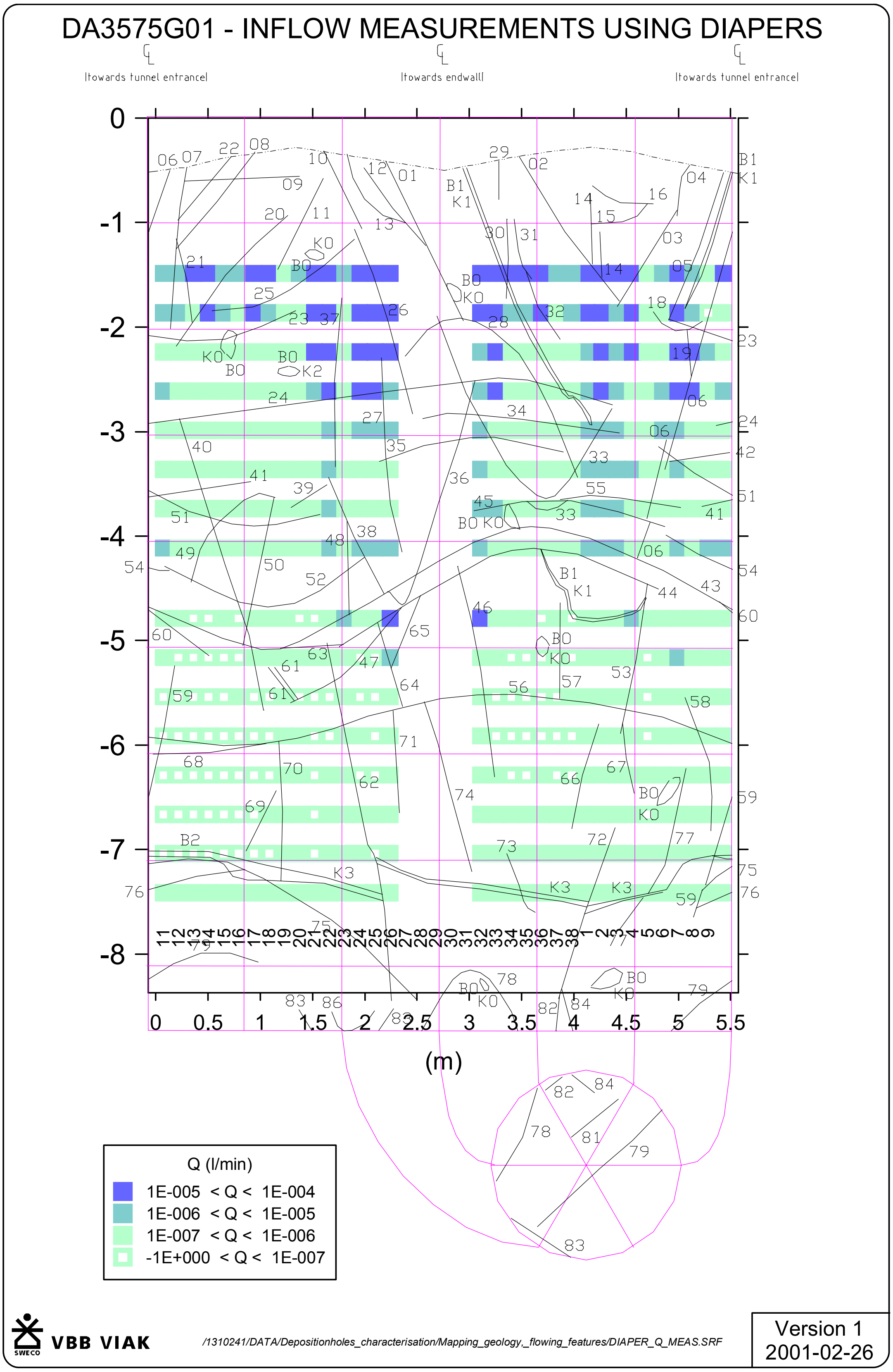

Figure 4-6 Inflow measurements using diapers in DA3575G01.

Earlier whole borehole measurements (Forsmark et al, 2001) gives an estimated borehole flow of $3 \cdot 10^{-3}$ L/min. In the calculation the total measured flow (water absorbed by diapers) is $1.6 \cdot 10^{-3}$ L/min. Taken into account, that parts of the borehole is not covered by diapers and the rows with diapers excluded due to leakage this flow was upscaled by a factor 2. The estimated flow is within the same order of magnitude as earlier whole borehole measurements.

If the pressure in the rock mass is known, the measured flow can be translated to a hydraulic conductivity. To be able to estimate a relevant pressure, measured pressures in existing boreholes close to the deposition holes were utilised to develop a relationship. The relationship is between the distance between the deposition borehole centre and the pressure at a location in the rockmass outside the borehole wall. In Table 4-1, the utilised pressures are presented together with the distance to the centre of the closest deposition borehole.

Table 4-1 Utilized pressures when developing a relationship between the horizontal distance between the deposition borehole centre and the pressure at a location in the rockmass outside the borehole wall. Pressures for the inner section are from July 1999 and for the outer section from January 2000.

Borehole	Secup (m)	Seclow (m)	R (m)	P (m)
KA3539G:1	19.30	30.01	6.82	262.0
KA3539G:2	9.80	18.30	6.82	262.0
KA3539G:3	1.30	8.80	6.82	205.0
KA3544G01:1	6.30	12.00	1.17	227.5
KA3544G01:2	1.30	5.30	1.17	101.0
KA3546G01:1	6.80	12.00	1.18	12.8
KA3546G01:2	1.30	5.80	1.18	6.5
KA3548G01:1	0.30	12.01	3.00	8.4
KA3550G01:1	6.30	12.03	1.18	5.2
KA3550G01:2	1.30	5.30	1.18	6.5
KA3552G01:1	8.80	12.01	1.18	48.0
KA3552G01:2	4.05	7.80	1.18	12.5
KA3552G01:3	1.30	3.05	1.18	23.4
KA3557G:1	0.30	30.04	5.13	17.9
KA3563G01:1	9.30	30.00	6.83	137.8
KA3563G01:2	3.80	8.30	6.83	137.8
KA3563G01:3	1.30	2.80	6.83	25.5
KA3572G01:1	6.30	12.00	2.97	98.0
KA3572G01:2	1.30	5.30	2.97	98.2
KA3574G01:1	8.80	12.00	1.18	37.4
KA3574G01:2	5.30	7.80	1.18	10.3
KA3574G01:3	1.30	4.30	1.18	10.1

Borehole	Secup (m)	Seclow (m)	R (m)	P (m)
KA3576G01:1	8.80	12.01	1.15	162.3
KA3576G01:2	3.80	7.80	1.15	7.3
KA3576G01:3	1.30	2.80	1.15	161.5
KA3578G01:1	6.80	12.58	2.99	142.9
KA3578G01:2	1.30	5.80	2.99	7.3
KA3579G01:1	9.30	22.65	1.83	155.3
KA3579G01:2	5.30	8.30	1.83	49.1
KA3579G01:3	1.30	4.30	1.83	42.6
KA3584G01:1	0.30	12.00	2.99	11.0
KA3593G01:1	8.30	30.02	5.14	199.1
KA3593G01:2	1.30	7.30	5.14	126.6

The pressures in the Table 4-1 above are pressures measured 14 – 20 months before the diaper measurements. This fact may cause that the pressures in some cases are overrated since the open deposition boreholes will reduce the pressure in the closest surrounding rockmass. This will, be the case in the borehole sections with the highest pressure. The declining pressure trend is, however, at most 2 – 3 metres per month in those sections in the outer section where pressure time series are available.

The pressure at the borehole wall with the radius 0.875 meters is set to 0. The simple regression analysis gives the following relationship with a correlation coefficient of 0.59, which indicates a relatively strong relationship between the variables. The relationship shown in Figure 4-3 is

$$P = 7.835 + 94.397 \cdot LOG\_R$$

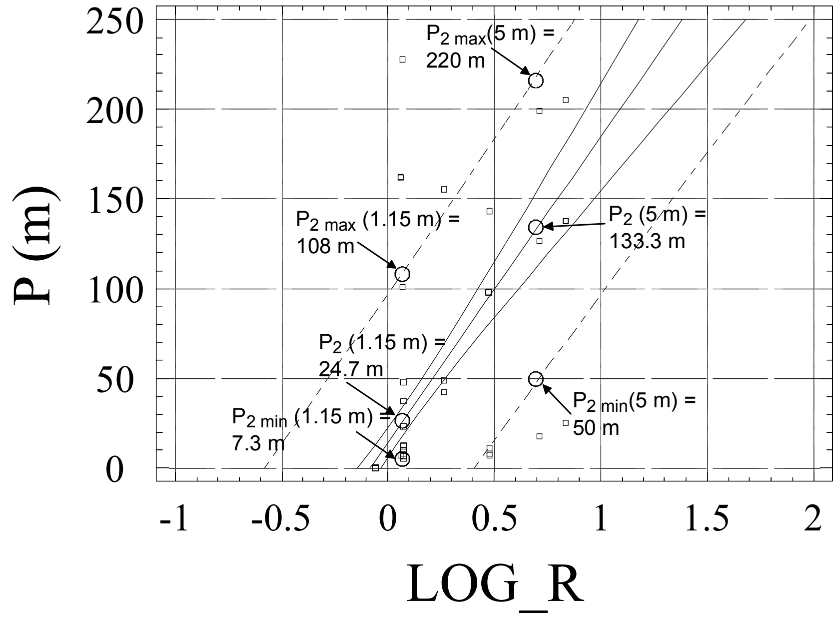

Figure 4-7 *Simple regression analysis with 95 % confidence limits (inner pair of dotted lines) for mean value and predicted value*

The hydraulic conductivity, K, was estimated using Thiem´s relationship in the form below:

$$K = q \cdot r_1 \cdot \ln (r_2 / r_1) / (P_2 - P_1) \text{ where}$$

q = measured inflow for each area covered with a diaper ($m^3/s \cdot m^2$)
r_1 = radius of deposition borehole (=0.875 m)
r_2 = distance to location outside borehole from borehole centre, where pressure is estimated from relationship above
P_1 = Pressure at borehole wall (=0 m of water)
P_2 = Pressure estimated from relationship above (meters of water)

Two cases have been calculated. The first is with r_2 = 1.15 m and the second with r_2 = 5 m. The pressure P_2 used for the different cases are shown in Figure 4-7. The resulting K_{min}, K_{mean} and K_{max} are presented in Figures 4-8 to 4-10 and in Appendix 2.

As earlier described the estimated measurement limit of a diaper is +/- 1 gram. Using the different extreme pressures, P_2, in Figure 4-7 above this indicate a hydraulic conductivity (m/s) interval for the 1.15 meter case of $5.6 \cdot 10^{-14}$ (P_{min}) – $3.8 \cdot 10^{-15}$ (P_{max}) and for the 5 meter case of $5.1 \cdot 10^{-14}$ (P_{min}) – $1.2 \cdot 10^{-14}$ (P_{max}). Considering this, the measurement limit for hydraulic conductivity is estimated to be $\underline{5 \cdot 10^{-14}}$ m/s.

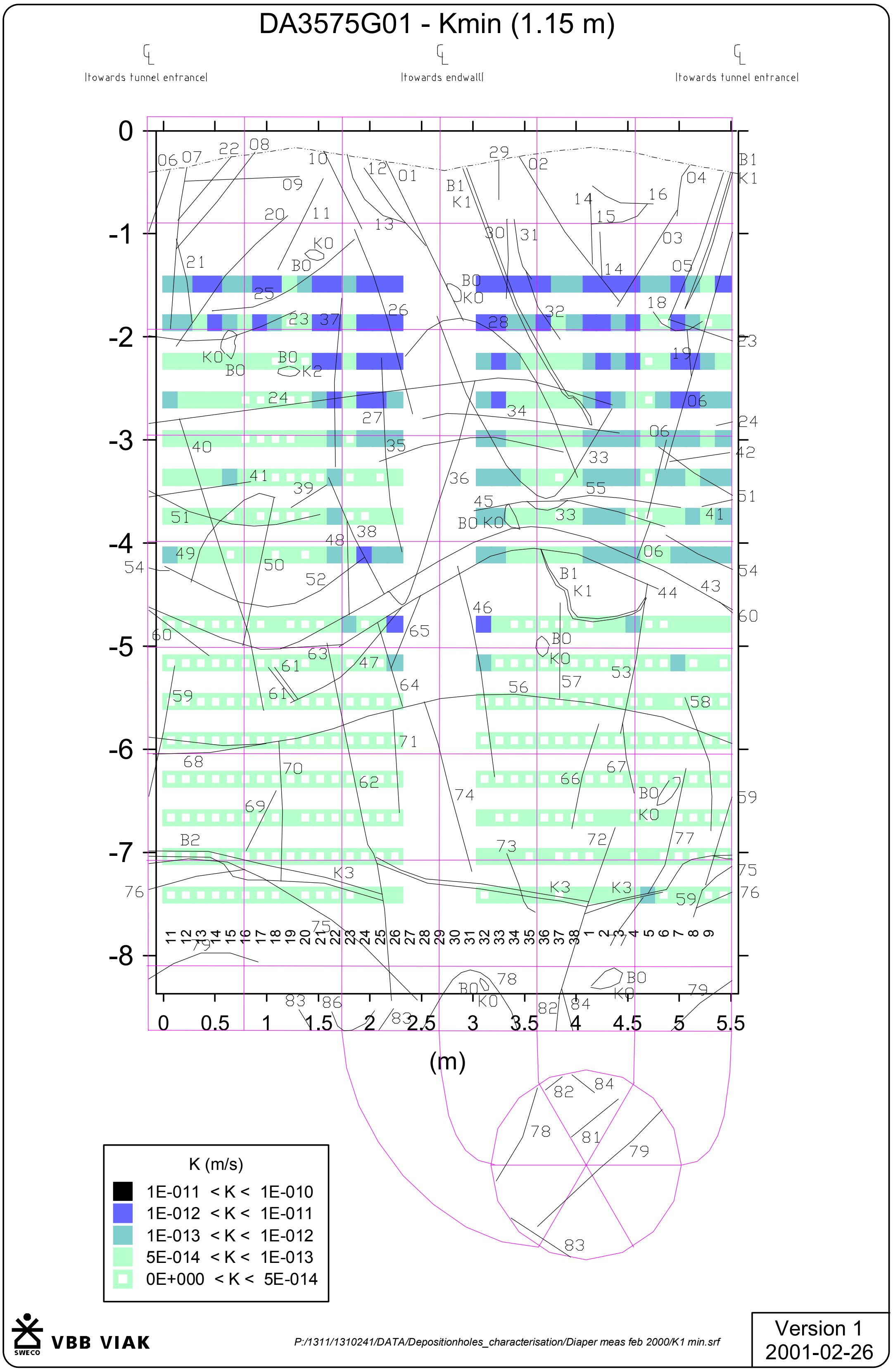

***Figure 4-8** Estimated K_{min} at distance 1.15 meters from borehole center*

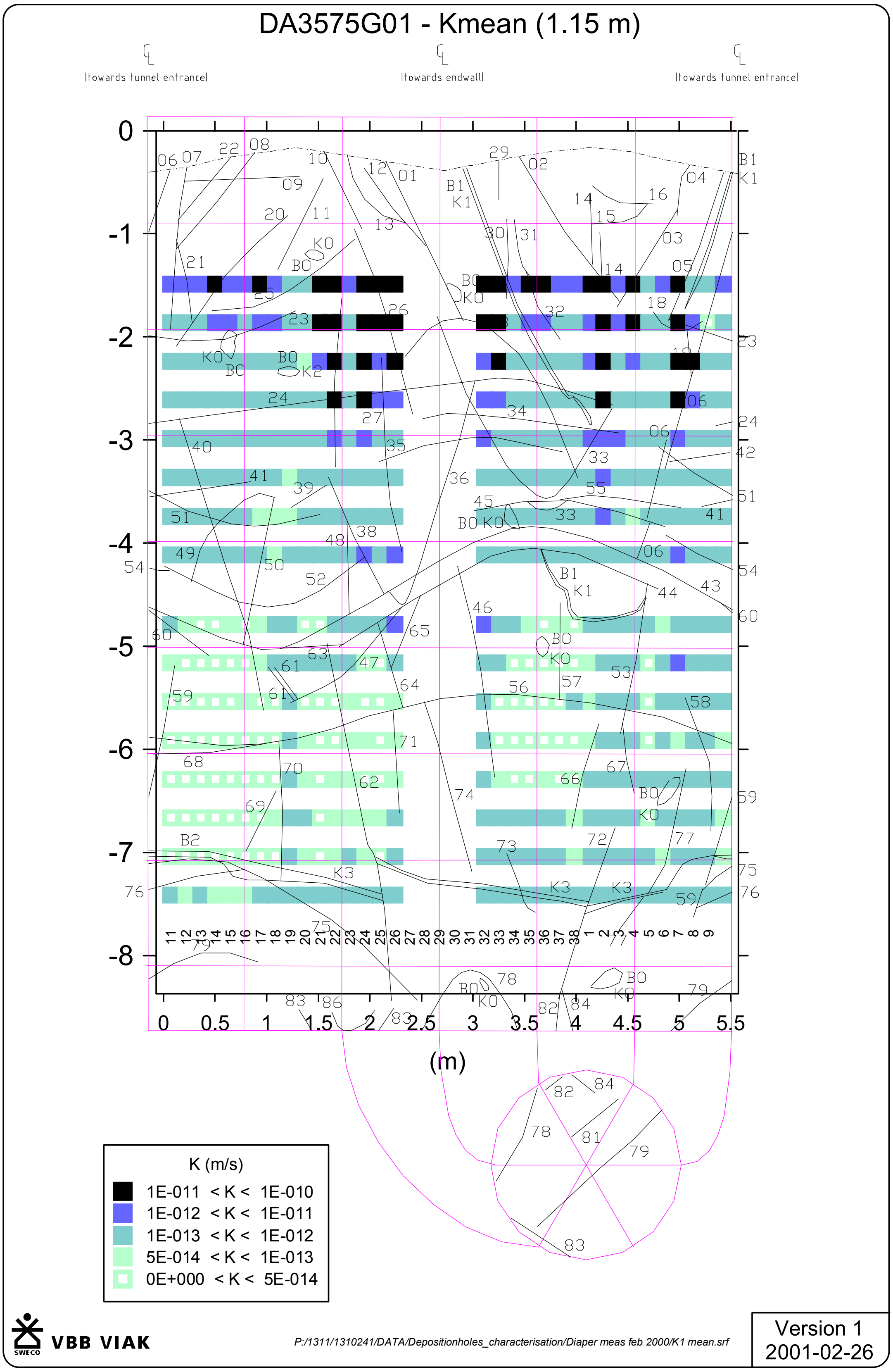

Figure 4-9 *Estimated K_{mean} at distance 1.15 meters from borehole center*

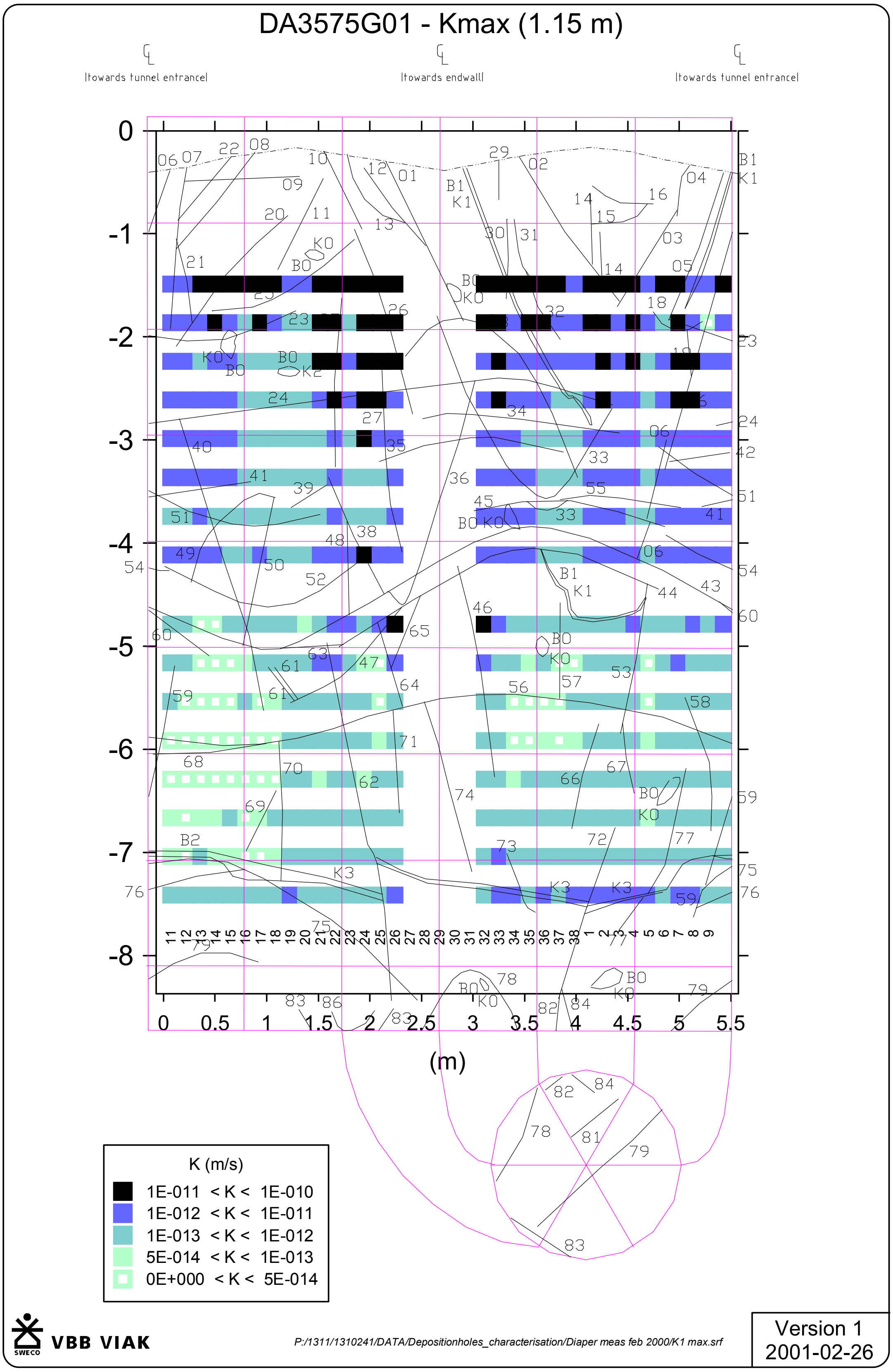

Figure 4-10 *Estimated K_{max} at distance 1.15 meters from borehole center*

The result of a statistical analysis of K_{min}, K_{mean} and K_{max} for the two distances 1.15 and 5 meters from deposition borehole centre is shown in Table 4-2. Detailed results are presented in Appendix 2.

Table 4-2 Result of statistical analysis of K_{min}, K_{mean} and K_{max} for the two distances 1.15 and 5 meters from deposition borehole centre

Data set	Geometric mean (m/s)	Standard deviation (Log10 K)
K_{min} (d = 1.15 m)	$1.1 \cdot 10^{-13}$	0.75 *
K_{mean} (d = 1.15 m)	$3.3 \cdot 10^{-13}$	0.67
K_{max} (d = 1.15 m)	$1.0 \cdot 10^{-12}$	0.72
K_{min} (d = 5 m)	$1.1 \cdot 10^{-13}$	0.75 *
K_{mean} (d = 5 m)	$1.6 \cdot 10^{-13}$	0.75 *
K_{max} (d = 5 m)	$3.6 \cdot 10^{-13}$	0.68

* estimated by fitting a line (dotted line i Appendix 2) in the probability diagrams in Appendix 2

K_{min} and K_{max} should be seen as the possible range for individual values. The distribution of K_{mean} should be the best estimate of the hydraulic conductivity. The K values should be considered uncertain as the actual pressure profile is not known.

5 GROUND WATER SALINITY

5.1 Scope

During 1998 and 1999 a number of water samples were collected from investigation boreholes located in the near vicinity of the prototype repository. In order to provide modelers of the repository with relevant chemistry data the salinity of the groundwater is highlighted in this chapter.

The TBM drilled tunnel where the prototype repository is to be situated was finalized in the early autumn 1994. The drilling of the deposition holes commenced 1999-06-19 (DA3587G01) and continued in stages until the finalisation of the last hole 1999-09-18 (DA3545G01). Most of the sampling results presented in chapter 5.3 are from the period before those holes were drilled.

5.2 Sampling procedure

During the drilling campaigns 1 – 3 which occurred in the period of 1997 - 1999 water sampling was made. During the flow logging of each hole, water sampling was carried out if the flow rate exceeded 50 mL/minute in the 1 m-sections or 200 mL/minute in the 3 m-sections.

Water samples have also been taken at some of the weirs in the tunnel system. Only pH, electrical conductivity and chloride content have been analysed.

5.3 Salinity estimations

The salinity has been estimated using two different algoritms. The first equation, Eq. 5-1, uses the electrical conductivity, C, of the sample:

$$\mathbf{S\ (mg/l) = C\ (mS/m) \cdot 4.670 / 0.0741} \qquad (5\text{-}1)$$

The second equation, Eq. 5-2, uses as many as ten constituents of the water:

$$\mathbf{S\ (mg/l) = [Na^+]+[Mg^+]+[Ca^{2+}]+[K^+]+[Sr^{2+}]+[Cl^-]+3\cdot[SO_4\_S]+[HCO^{3-}]+[Br^-]+[F^-]} \qquad (5\text{-}2)$$

All concentrations are given in mg/l in Eq. 5-2.

It can be noted that $\mathbf{[SO_4^{2-}]}$ can be used in Eq. 5-2 instead of $\mathbf{3\cdot[SO_4\_S]}$. $\mathbf{[SO_4\_S]}$ is the measured concentration of sulphur in the sulphate phase.

In Table 5-1 the resulting salinity of the two calculations is given.

Some of the samples were not analyzed regarding especially **[F^-]** and **[Sr^{2+}].** Those parameters are of minor importance to the salinity and can be disregarded in those cases where they are missing. If other parameters are missing as well the salinity value derived from the electrical conductivity measurements have been used, see Appendix 3. Some of the electrical conductivity values are considered uncertain as they seem to give too high values compared to the cloride content. This can be seen if the all samples for Cl and COND is plotted in a x-y diagram.

In some holes, several samples were collected. In order to avoid multiple values for the same section, short section samples have been preferred before whole-borehole samples in the statistical analysis.

Table 5-1 Resulting salinity values from Eq. 5-1 and 5-2. Bold figures are best estimates of that hole section. Where S (chem) is not given as a best estimate, not enough constituents were available and therefor S (cond) has been chosen. The last column includes data used in the statistical analysis in chapter 5.4.

Borehole	Secup	Seclow	Date (YYYY-MM-DD)	S (cond) (g/l)	S(chem) (g/l)	Salinity value for statistical analysis (g/l)
KA3510A	4.52	113	1999-01-15	**6.05**	3.92	6.05
	114	121	1999-01-15	**8.57**	5.89	8.57
KA3539G	0	30.01	1998-03-02	6.24	**6.73**	
	0	30.01	1998-07-03	6.49	**6.86**	
	15	18	1998-08-02	5.88	**6.70**	6.70
KA3542G01	0	30.04	1998-07-03	7.81	**7.80**	
	15	18	1998-07-31	5.97	**6.96**	6.96
	18	21	1998-07-31	6.19	**6.83**	6.83
	21	24	1998-07-31	6.24	**7.19**	7.19
KA3542G02	0	30	1998-07-03	6.04	**6.52**	
	3	4	1998-07-27	6.55	**6.88**	6.88
	5	6	1998-07-27	6.05	**6.51**	6.51
	11	12	1998-07-28	6.29	**6.74**	6.74
KA3545G	0	8.08	1998-03-02	7.31	**6.76**	6.76

Borehole	Secup	Seclow	Date (YYYY-MM-DD)	S (cond) (g/l)	S(chem) (g/l)	Salinity value for statistical analysis (g/l)
KA3548A01	0	30	1998-07-05	6.43	**6.88**	
	5	6	1998-08-05	5.60	**6.33**	6.33
	9	10	1998-08-06	5.77	**6.38**	6.38
KA3548A01	10	14	1999-01-13	**5.48**	3.59	5.48
	15	30	1999-01-13	**6.11**	4.26	6.11
	18	21	1998-08-07	5.58	**6.42**	6.42
KA3554G01	0	30.01	1998-07-02	6.81	**6.91**	
	21	24	1998-07-24	7.31	**7.79**	7.79
	24	27	1998-07-24	6.68	**7.44**	7.44
KA3554G02	0	30.01	1998-07-02	**6.68**	7.15	
	11	12	1998-07-21	6.37	**6.60**	6.60
	12	15	1998-07-21	6.30	**6.79**	6.79
KA3566G01	0	30.01	1998-07-02	5.92	**6.68**	
	12.3	19.8	1999-04-09	6.93	**7.27**	7.27
	20.8	30.01	1999-04-16	6.01	**7.26**	7.26
KA3566G02	0	30.01	1998-07-31	5.99	**6.65**	
	1.3	6.8	1999-05-17	6.74	**6.84**	6.84
	7.8	11.3	1999-05-03	7.12	**7.39**	7.39
	12.3	18.3	1999-04-08	6.05	**7.27**	7.27
	19.3	30.01	1999-04-15	6.74	**7.42**	7.42
KA3572G01	1.3	5.3	1999-05-17	7.75	**8.68**	8.68
KA3573A	4.5	17	1998-03-09	-	**6.75**	
	4.5	17	1998-09-28	6.43	**6.45**	
	4.5	17	1999-01-15	**5.80**	3.98	
	4.5	17	1999-04-07	5.92	**7.13**	6.53
	4.5	17	1999-09-29	7.00	**6.27**	

Borehole	Secup	Seclow	Date (YYYY-MM-DD)	S (cond) (g/l)	S(chem) (g/l)	Salinity value for statistical analysis (g/l)
	18	40.07	1998-03-09	5.56	**6.36**	
	18	40.07	1998-09-28	6.43	**6.42**	
	18	40.07	1999-01-15	**6.11**	4.23	
KA3573A	18	40.07	1999-04-07	6.68	**7.52**	6.60
	18	40.07	1999-09-29	6.62	**5.87**	
KA3590G01	0	30.06	1998-07-01	6.68	**7.04**	
	1	2	1998-07-07	7.04	**7.19**	7.19
	8	9	1998-07-08	6.37	**7.49**	7.49
KA3590G02	0	30.05	1998-07-01	6.74	**7.15**	
	8.3	16.3	1999-04-13	6.11	**7.56**	7.56
	17.3	22.3	1999-04-13	5.99	**7.47**	7.47
	24	27	1998-06-26	**6.55**	6.99	6.55
KA3593G	0	30.02	1998-07-01	7.18	**7.91**	
	0	30.02	1998-03-02	9.26	**8.46**	
	1.3	7.3	1999-04-15	6.87	**8.50**	8.50
KA3600F	4.5	21	1998-03-09	7.06	**6.76**	
	4.5	21	1998-09-28	6.49	**6.60**	
	4.5	21	1999-01-13	**7.63**	5.16	
	4.5	21	1999-04-09	6.93	**8.60**	7.40
	4.5	21	1999-09-29	7.44	**6.31**	
	22	50.01	1998-03-09	8.38	**7.51**	
	22	50.01	1998-09-28	6.93	**7.17**	
	22	50.01	1999-01-13	**8.57**	6.02	
	22	50.01	1999-04-09	7.94	**9.11**	8.09
	22	50.01	1999-09-29	10.08	**9.16**	
KG0021A01	0	48.82	1998-10-16	**5.94**	3.77	

Borehole	Secup	Seclow	Date (YYYY-MM-DD)	S (cond) (g/l)	S(chem) (g/l)	Salinity value for statistical analysis (g/l)
	10	13	1998-12-03	5.62	**6.39**	6.39
	25	26	1998-12-07	5.10	**6.21**	6.21
	27	28	1998-12-07	5.53	**6.37**	6.37
KG0021A01	28	29	1998-12-07	5.49	**6.35**	6.35
	29	30	1998-12-08	5.45	**6.45**	6.45
	30	31	1998-12-08	5.39	**6.32**	6.32
	32	33	1998-12-09	5.12	**6.08**	6.08
	35	36	1998-12-09	5.22	**6.08**	6.08
	40	41	1998-12-11	5.04	**6.10**	6.10
KG0048A01	0	54.69	1998-10-06	5.81	**6.52**	6.52
	5	8	1998-10-08	6.18	**6.73**	6.73
	23	24	1998-10-10	**6.43**	6.83	6.43
	24	25	1998-10-10	**6.26**	6.41	6.26
	33	34	1998-10-11	**5.59**	5.91	5.59
	38	39	1998-07-31	5.84	**6.54**	6.54
	45	46	1998-10-14	5.80	**6.33**	6.33
	46	47	1998-10-14	5.75	**6.24**	6.24
	53	54.69	1998-10-16	6.19	**6.91**	6.91

An overview of the spatial distribution is shown in Figures 5-1 and 5-2.

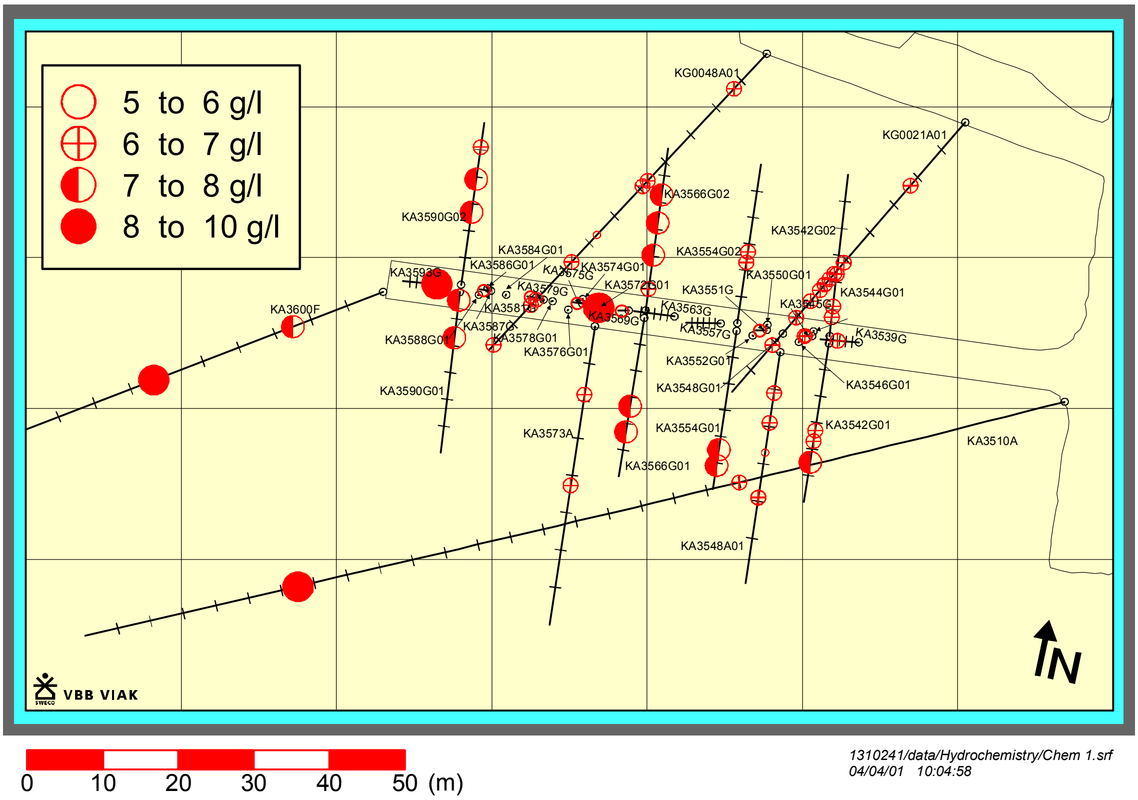

Figure 5-1 *Distribution of salinity (g/l) – horizontal view of prototype repository.*

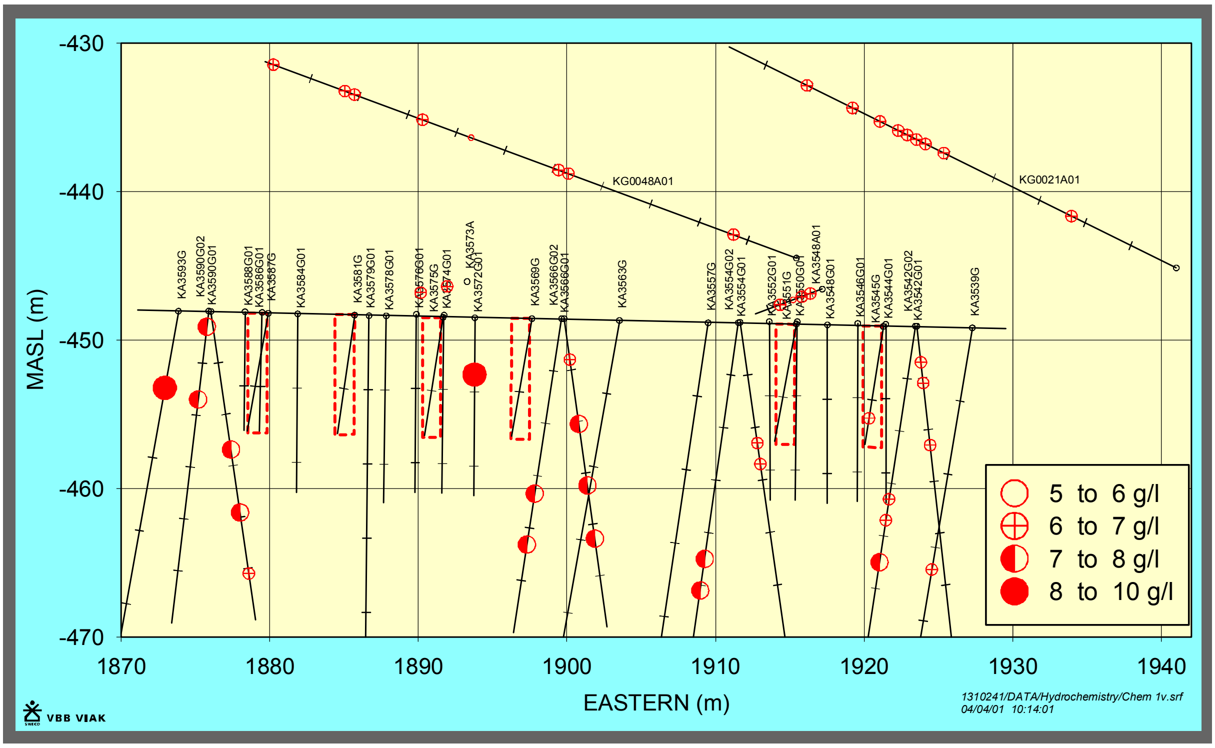

Figure 5-2 *Distribution of salinity (g/l) - vertical view of prototype repository.*

The salinity tends to be higher in the western part of the repository test area. Four sections indicate a salinity of the highest-ranking class in Figures 5-1 and 5-2 above. One of those values, in KA3572G01, is from a section with low hydraulic conductivity indicating water not transported from a large distance. The other three values, within the highest ranking class, are from sections with higher hydraulic conductivity, thus indicating possible water transport from larger depth where saline water are occurring.

When comparing boreholes drilled above the repository with those drilled downwards from the repository tunnel, there is an indication of higher values of salinity below than above the tunnel.

5.4 Statistical analysis

A statistical analysis was done regarding salinity and the separate chemical components in equation 5-2 using values in Table 5-1 and Appendix 3. The analysis produce a geometrical mean of the salinity of 6.8 g/l with a standard deviation of 0.69, see Appendix 3 for the detailed results. The summary statistics of salinity are shown below and a normal probability plot is shown in Figure 5-3.

```
Summary Statistics for S

Count = 53
Average = 6.81925
Median = 6.7
Mode =
Geometric mean = 6.7859
Variance = 0.482907
Standard deviation = 0.694915
Standard error = 0.0954539
Minimum = 5.48
Maximum = 8.68
Range = 3.2
Lower quartile = 6.35
Upper quartile = 7.27
Interquartile range = 0.92
Skewness = 0.825673
Stnd. skewness = 2.45398
Kurtosis = 0.701706
Stnd. kurtosis = 1.04277
Coeff. of variation = 10.1905%
Sum = 361.42
```

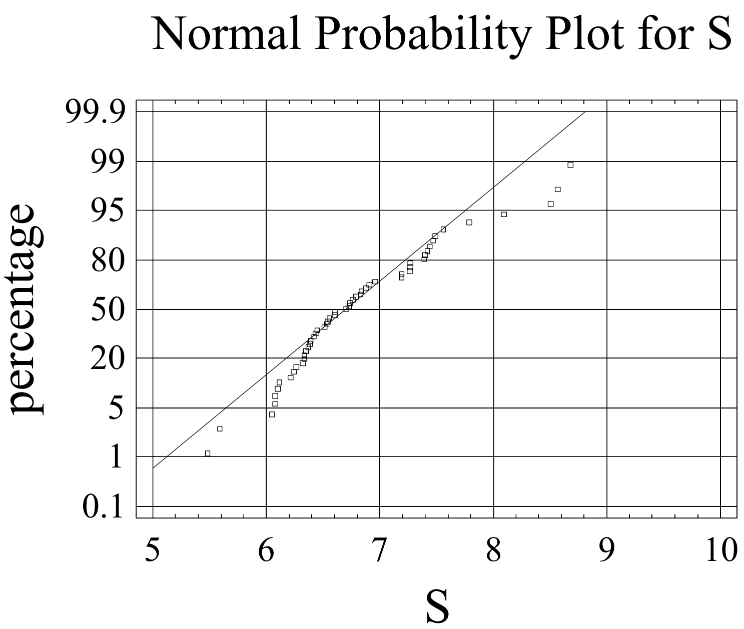

Figure 5-3 *Normal probability plot salinity analysis*

The analysis result of all the components are presented in Table 5-2 and detailed in Appendix 3. The samples from the same sections as in Table 5-1 were used.

Table 5-2 Results of statistical analysis of chemical components

Chemical Component	Sample size	Mean, mg/L	Median, mg/L	Standard deviation, mg/L	Max value mg/L	Min value mg/L
Na^+	49	1721	1680	150	2340	1540
Mg^+	49	84.8	87.2	11.6	98.0	24.8
Ca^{2+}	49	655.5	643.0	115.9	974.0	494.0
K^+	49	9.5	9.5	0.96	12.0	7.3
Sr^{2+}	49	9.7	9.6	2.3	15.7	6.0
Cl^-	53	3936	3880	459	5860	3340
SO_4^{2-}	47	315.8	302.0	52.3	617.0	277.0
SO_4_S	49	103.2	100.0	17.6	217.0	93.8
HCO^{3-}	48	181.8	190.0	37.2	219.0	26.0
Br^-	47	16.9	17.0	3.2	27.2	12.0

Chemical Component	Sample size	Mean, mg/L	Median, mg/L	Standard deviation, mg/L	Max value mg/L	Min value mg/L
F^-	30	1.54	1.28	0.89	3.90	0.11
Salinity (g/L)	53	6.82	6.70	0.69	8.68	5.48
Fe^{2+}	42	0.32	0.29	0.18	0.91	0.02
Mn^{2+}	42	0.56	0.57	0.04	0.66	0.47
Li^+	49	0.33	0.32	0.10	0.63	0.16
Si^{4+}	49	6.67	6.50	1.16	12.6	5.40
pH (-)	49	7.4	7.4	0.10	7.7	7.2
Cond (mS/m)	53	987	970	116	1360	800

Water samples have been taken at weirs MF0061G and MA3426G, see Chapter 6. Summary of results is given in Table 5-3. Electrical conductivity (COND) is considered less reliable than the chloride content in Table 5-3. Activities in the tunnels may have affected the results to some extent. Samples from 1998-09-29 for MF0061G and 1998-03-02, 1998-09-29, 1999-09-27 for MA3426G can possibly be less representative for the actual inflowing water to the tunnel considering inflow from open boreholes or drilling activities.

Table 5-3 Water samples taken in weirs MF0061G and MA3426G.

IDCODE	DATUM	CL (mg/l)	PH	COND (mS/m)
MF0061G	1998-03-02 09:00	5700.0	8.20	1750.0
MF0061G	1998-09-29 11:00	5830.0	7.20	1500.0
MF0061G	1999-04-06 10:00	5810.0	7.20	1250.0
MF0061G	1999-09-27 10:00	5990.0	7.10	1470.0
MF0061G	2000-09-18 10:00	6050.0	7.20	1790.0
MA3426G	1998-03-02 09:00	5920.0	7.60	1680.0
MA3426G	1998-09-29 11:00	5070.0	7.60	1340.0
MA3426G	1999-04-06 10:00	5190.0	7.60	1310.0
MA3426G	1999-09-27 10:00	5150.0	7.50	1220.0
MA3426G	2000-09-18 10:00	5090.0	7.20	1530.0

In two of the holes, four sections were sampled at five occasions thereby producing a possibility to find possible trends in those areas. In Figure 5-4, the values of those sections are plotted. Four of the samples were collected before the deposition holes were drilled in mid-1999, while the fifth value of all sections represent the salinity after the deposition holes were drilled.

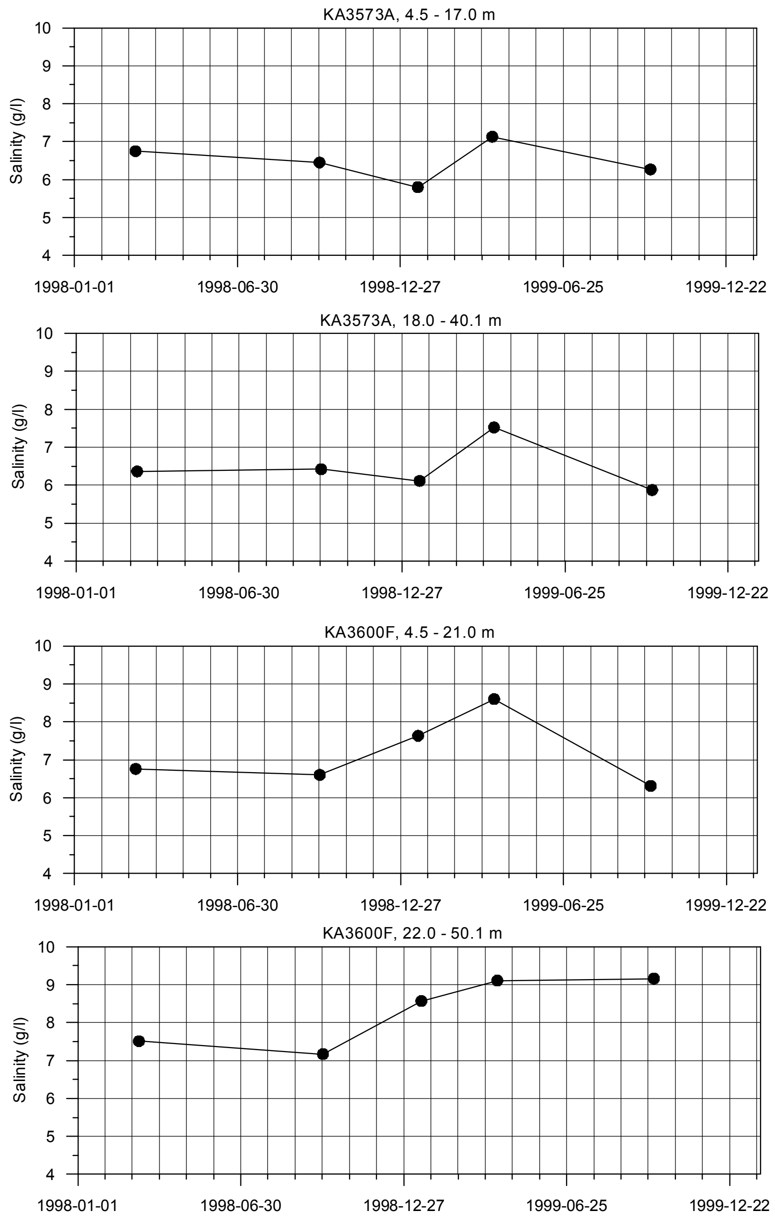

Figure 5-4 *Diagrams of salinity distribution over a 2-year period in four hole sections. The six deposition holes were all drilled within the period between the fourth and fifth value above. Deposition holes were drilled from mid-June 1999 to mid-september 1999.*

In the diagrams is shown a decrease in the three sections closest to the tunnel system after the deposition holes were drilled while the outermost section show a slight increase. No direct conclusion regarding the effect of drilling the deposition holes on the salinity values can be made.

6 Groundwater leakage into G-, I- and J-tunnel

6.1 Scope

When a tunnel system is expanded the inleakage of water usually increases. It is expected this is the case at Äspö HRL as well. In order to provide modellers with an estimation of the inleakage increase an attempt, using weir measurements is made in this chapter.

6.2 Construction work

The new tunnel system was constructed using the traditional Drill & Blast technique. In Table 6-1 the dates of the construction is detailed.

Table 6-1 Construction dates of tunnel segments

Tunnel (sections)	D & B start	D & B stop
G (2.5 m – 52.2 m)	1997-01-08 14:00	1997-02-05 15:30
I (15 m – 25 m)	1996-11-19 15:50	1996-12-02 10:15
J+ (10.6 m – 22.6 m) Extension	1996-11-21 10:20	1996-12-06 15:30

From tunnel A and some 5 meters beyond the intersection of tunnel G and F tunnel J was, at an earlier stage, excavated with an upward slope of the tunnel floor towards the north.

6.3 Flow measurements

6.3.1 Drainage water flow paths

The intention when constructing the tunnel system was to drain water from tunnel G and J+ to weir MF0061G, while water from tunnel A, I and J should be drained to weir MA3426G, see Figure 6-1. At this moment (2001-05-15) there are uncertainties of the flowrate and how much water from tunnel G flows to MF0061G and to MA3426G. This has to be clarified. In Figure 6-1, a flow path overview is presented.

As shown in Figure 6-1 an open drainage pipe is running on the south side of the G-tunnel to the start of the tunnel. There it connects to a closed pipe running to the north side of the tunnel, then crossing the opening of tunnel J+ and running down tunnel F towards MF0061G. Another open drainage pipe is running from the east side of tunnel J+ into tunnel F. Total length of tunnel J (J and J+) from tunnel A is 52 m.

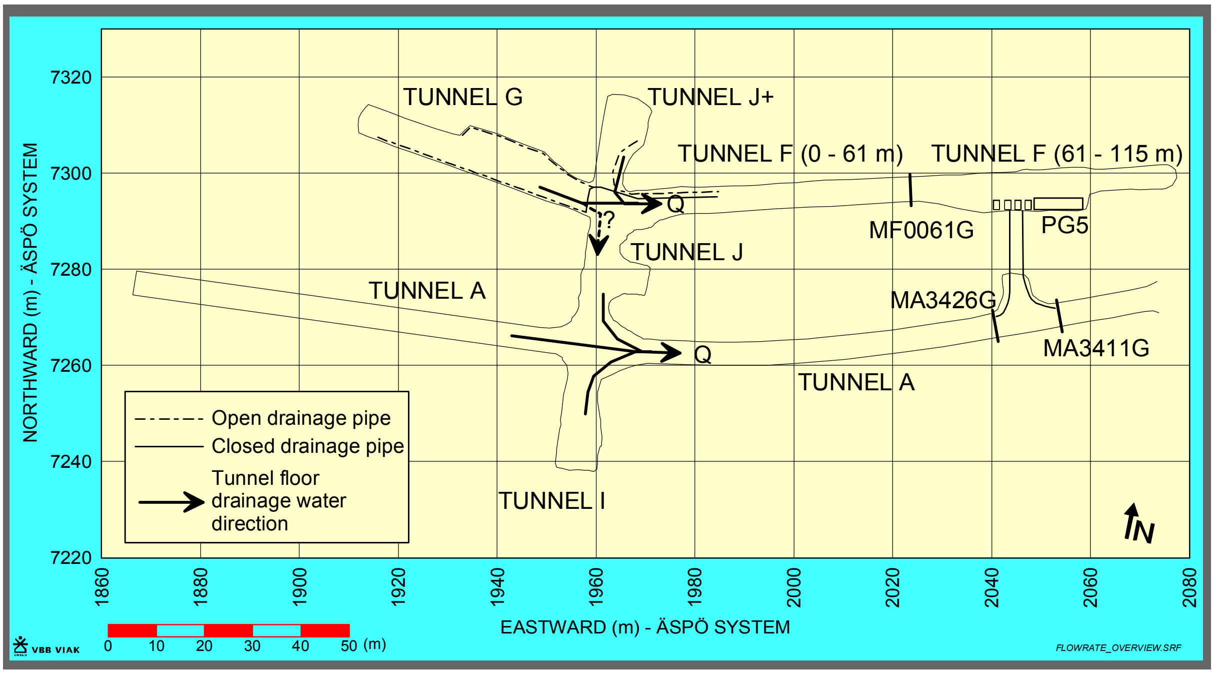

Figure 6-1 *Flow path overview*

In *Figure 6-1* is also shown the location of three weirs. MF0016G and MA3426G have been mentioned above while MA3411G measures the flow at section 3411 from the east along tunnel A. Included in its flow is also the water from the niche between MA3426G and MA3411G (Rhen, 1995). The water from the weir is lead via a measurement unit in tunnel F to PG5, see Figures 6-2 and 6-3.

__Figure 6-2__ Measurements units of weirs, including those of MA3411G and MA3426G, and beyond them the pump pit PG5.

Figure 6-3 *Measurement unit of MA3426G*

In the following chapters data from the weirs MF0061G and MA3426G mentioned above is analysed and discussed.

Most of the flow in tunnel G originates from the niche at the north side of the tunnel.

Most of the flow in tunnel I seems to come from the innermost section of the tunnel.

6.3.2 Weir MF0061G

This weir is located 61 meters into tunnel F, thereby initially collecting water from section 0 - 61 meter of this tunnel. The flow into the tunnel downstream MF0061G is drained directly to PG5 through two drainholes into PG5. In the autumn of 1995, the flow was estimated to be approximately 6 L/min. This flow has to be updated and added to the flow of the weir to get an estimation of the F-tunnel inleakage (0 – 115 m).

According to earlier investigations (Rhén et al, 1997) the flow of the weir at the end of 1995 was 2.5 L/min. In Figure 6-4, which shows the flow during the years 1996 – 1999, the flow is around 3 L/min at the beginning of 1996. During several periods drilling activities, hydraulic tests etc, has caused inflows to the tunnel system. A few periods have been judged to give representative flows for natural (undisturbed) conditions.

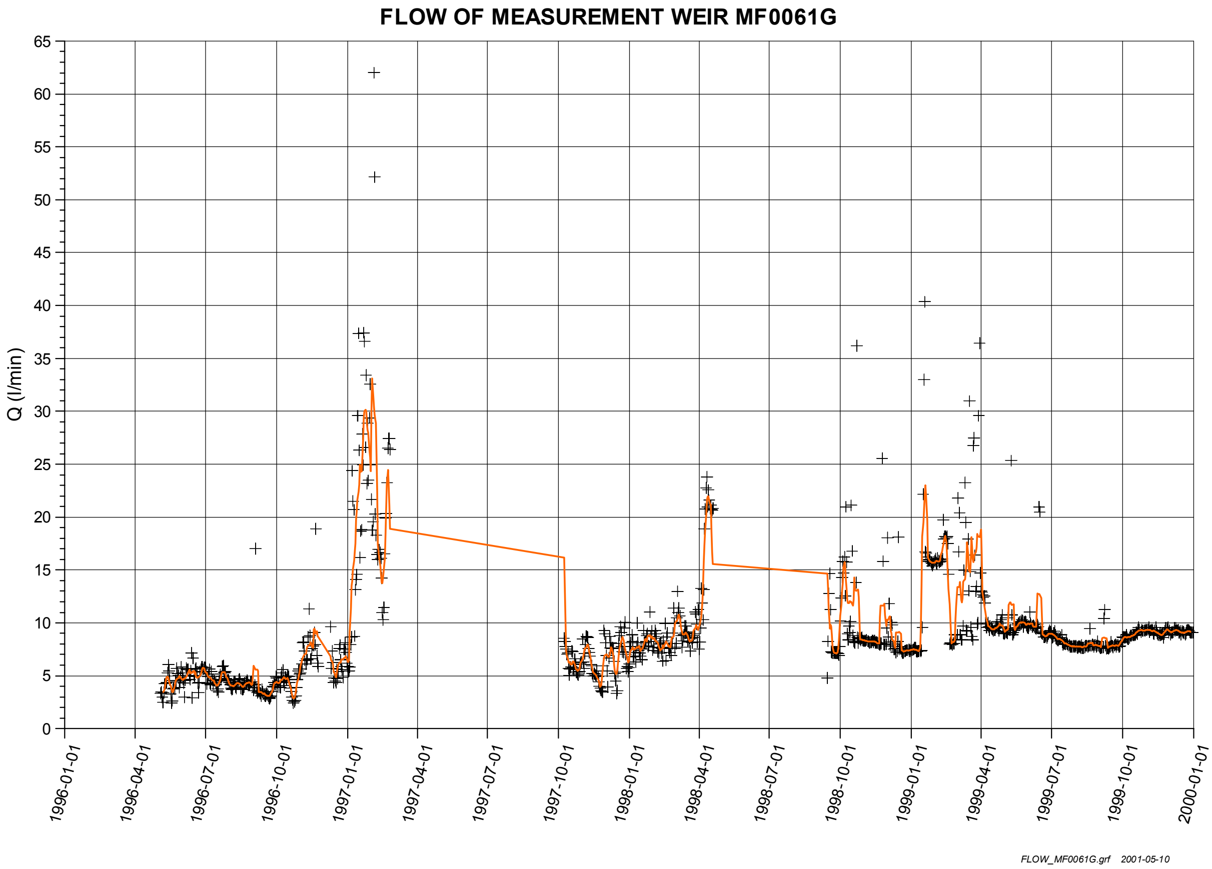

__Figure 6-4__ Flow measurement of weir MF0061G. The symbols represent daily values while the line represents a 7-days floating average.

During the period 1996-04-01 – 1996-10-01 the median value of the flowrates are 4.4 L/min. This period is judged to have no events that cause disturbances to the natural (undisturbed) flow. This flow originates from tunnel F (0 – 61 m) and probably to a minor extent from tunnel J+ (0 – 10.6 m). J+ was at this time used as a vehicle turning around niche. Excavation of the extension of tunnel J+ (10.6 – 22.6 m) started in November 1996 and was finished in December 1996. During the two weeks around New Year 1996/1997, no work was done in the tunnel and the weir flow stabilizes at a median of 6.2 L/min (1996-12-21 – 1997-01-05). The increase of the flow due to the excavation of J+ (10.6 – 22.6 m) is estimated to 1.8 L/min and judged to be within the interval 1 – 2 L/min. Construction work continued in January and February 1997 with the excavation of tunnel G.

The period 1999-07-01 – 1999-10-01 is considered a period with work in the tunnel not affecting the flow of MF0061G. The median value of the flowrate of this period is 7.9 L/min. The increase was only 1.7 L/min for the period before and after the G-tunnel was constructed and judged to be within the interval 1 – 2 L/min. This could be an indication that part of the drainage water from the G-tunnel flows not to MF0061G but somewhere else, i.e. to MA3526G.

6.3.3 Weir MA3426G

The weir is located at chainage 3426 in the main tunnel (Tunnel A). The water from the weir is lead to a measurement unit in tunnel F and then to PG5. The initial measurement section was between 3426 and 3600 in tunnel A and the first part of tunnel J (J and J+ (0 – 10.6 m) and first part at tunnel I (0-15 m)). Today the flow of the weir also consists of drainage water from the entire tunnel I.

The flowrate of the weir before the construction of tunnel G, I and J was according to Rhén et al (1997), 27.7 L/min at the end of 1995. The median value, *see* Figure 6-5, of the weir for the period 1996-04-01 to 1996-08-15 is 31.2 L/min.

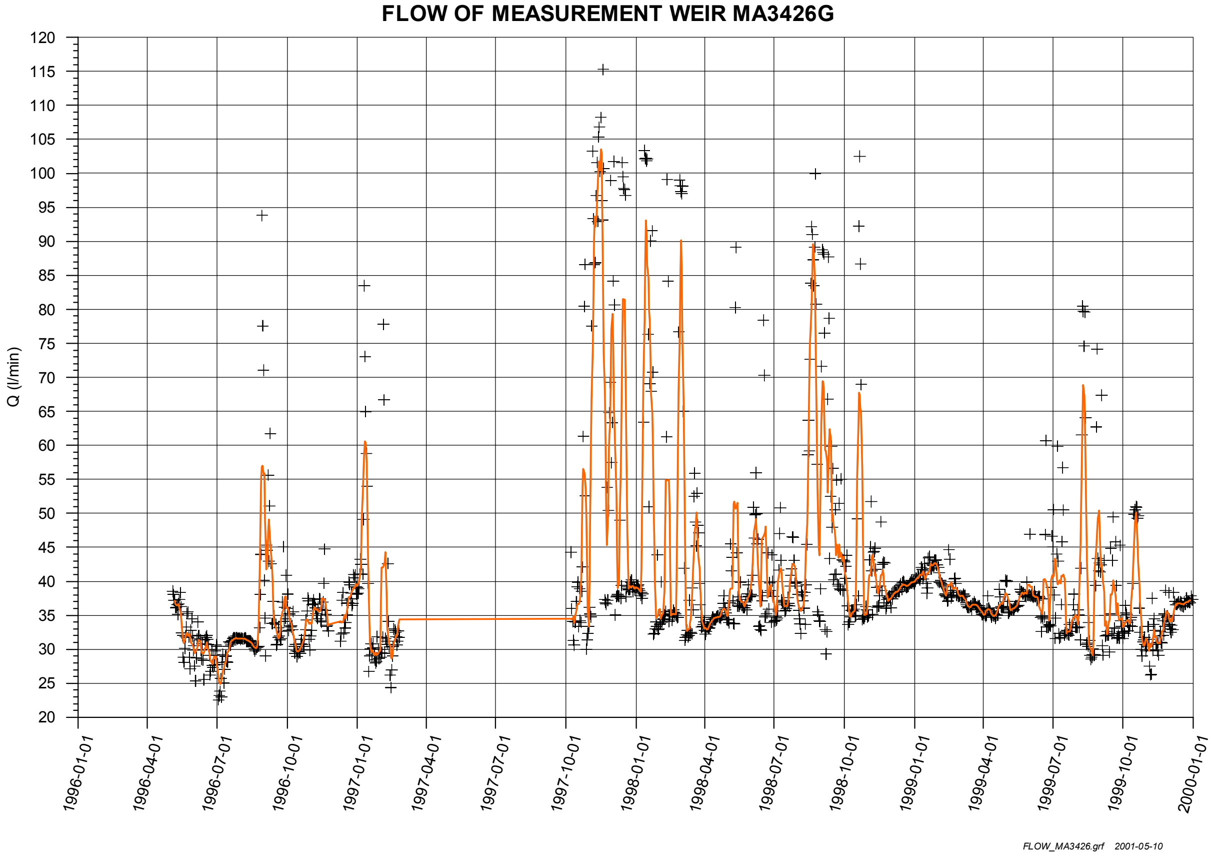

Figure 6-5 *Flow measurement of weir MA3426G. The symbols represent daily values while the line represents a 7-days floating average.*

During 1999-02-01 and 1999-04-06, no events occurred that should influence the natural (undisturbed) flowrate of MA3426G. During this period the median flowrate of the weir is 37.6 L/min.

The increase of the water flow between the period before and after the construction of the I-tunnel (and the G-tunnel) is 6.4 L/min. There is an uncertainty if this increase only includes water from the I-tunnel or if it also includes at least a part of the drainage water from the G-tunnel. It is difficult to judge how much of this increase that comes from tunnel I.

Assuming the contribution from the I-tunnel to be within the interval 0 – 1 L/min, the contribution from the G-tunnel would be 5 – 6 L/min. Adding to that figure the flowrate increase of 1 – 2 L/min from the MF0061G weir the increase of flowrate due to the excavation of the G-tunnel would be 5 – 7 L/min.

In Table 6-2, the flowrates from the discussion above are summarized. It is to be observed that the figures are approximate and should be regarded as uncertain.

Table 6-2 Summary of flows into different sub-tunnels.

Tunnel ID	Tunnel secup (m)	Tunnel seclow (m)	Meas. period	Weir	Flowrate L/min	Flowrate per m tunnel (l/(min·m)	Comments
A	3527	3600	1997	Temporary weirs	6.13	0.084	
A	3546	3600	1999-2000	Temporary weirs	4.50	0.083	
F J+	61 0	115 10.6	1995	-	6	0.11	
F J+	0 0	61 10.6	1996-07	MF0061G	4.40 (1)	0.061	Some flow from J+
F J+	0 0	61 22.6	1996-12	MF0061G	6.20 (2)	0.074	Flow from J+ prob. 1.8 L/min
J (J+)	40 (10.6)	52 (22.6)	1996-12	MF0061G	1-2 (3)	0.08 – 0.16	Estimated from mesurements (2) – (1)
F J+ G	0 0 0	61 22.6 52	1999	MF0061G	7.9 (4)	-	Probably only parts of the flow from tunnel G.
A I J	3426 0 0	3600 15 26	1996-08	MA3426G	31.2 (5)	0.14	
A I J G	3426 0 0 0	3600 25 26 52	1999	MA3426G	37.6 (6)	(0.13)	Flowrate per m tunnel, not entirely correct as some water from tunnel G probably goes to MF0061G.
I	15	25	1999	MA3426G	0-1 (7)	0 – 0.1	
G	0	52	1999	MF0016G MF3426G	5-7	0.10 – 0.13	Estimated from me-surements (6)-(5)–(7)+(4)-(2)-(3)

Three new tunnels of 74 meters length created an increase of approximately 6 - 10 L/min or 0.08 – 0.14 L/min and meter tunnel.

In Figure 6-6 the estimated inflow rates are visualized.

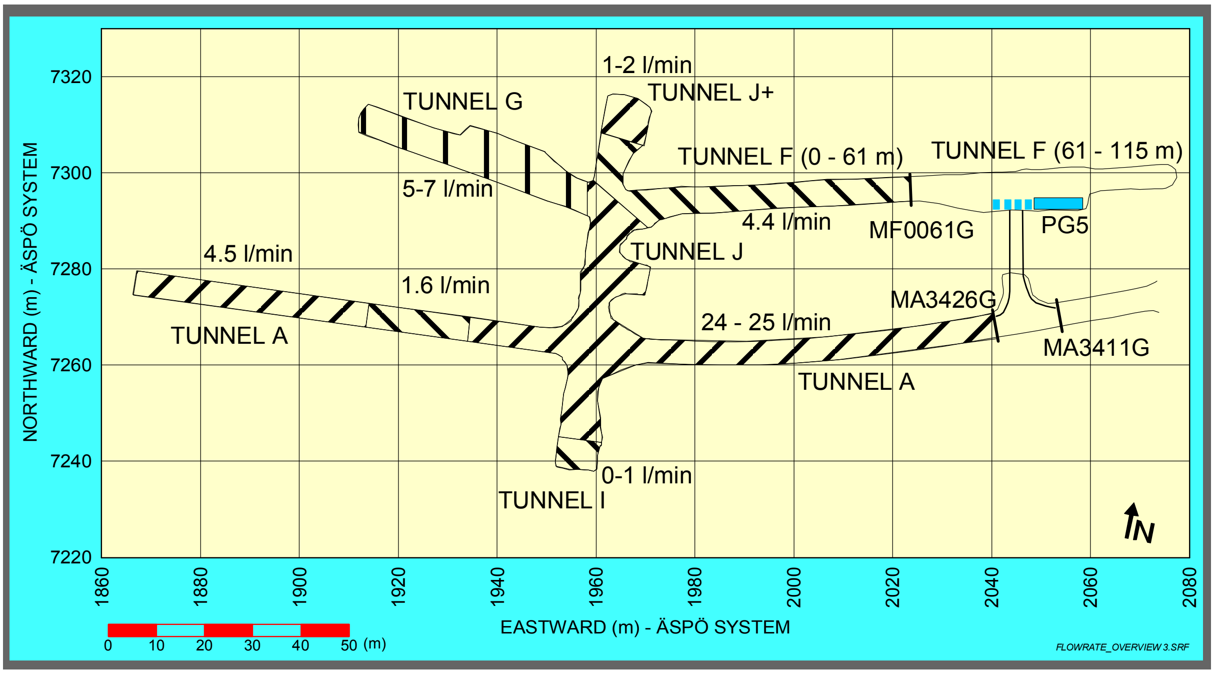

***Figure 6-6** Estimated flowrates of tunnel segments*

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APPENDIX 1

Details and diagrams from transient injection tests in 39 borehole sections

In the first diagram the following abbreviations are used:

P - **groundwater pressure of the test section (kPa)**

P_a - **groundwater pressure of the borehole interval below the test section (kPa)**

In the last two diagrams of each test section the fall-off in each section is plotted as recovery, sp, in kPa and Agarwal time, dte, in minutes which is

$$dte = (tp \cdot dt) / (tp + dt) \quad \text{where}$$

tp - **injection time**

dt - **recovery (fall-off time)**

Borehole KA3542G01, section 0.25 m - 0.75 m

Date: 01-02-22 Field Crew: B. Gentzschein, J.Källgården
Packer expansion: 010222 09:12
Valve opened: 010222 10:14.03 Valve closed: 010222 10:34.03
Total flowing time : 20.0 min. Tot. Pr. Build-up time 11 min.
Pressure data
Pressure before injection start (P0, KPa) : 281.7
Pressure just before closing the valve (Pp, KPa): 440.2
Pressure at the end of the recovery (Pf, KPa) : 377.1

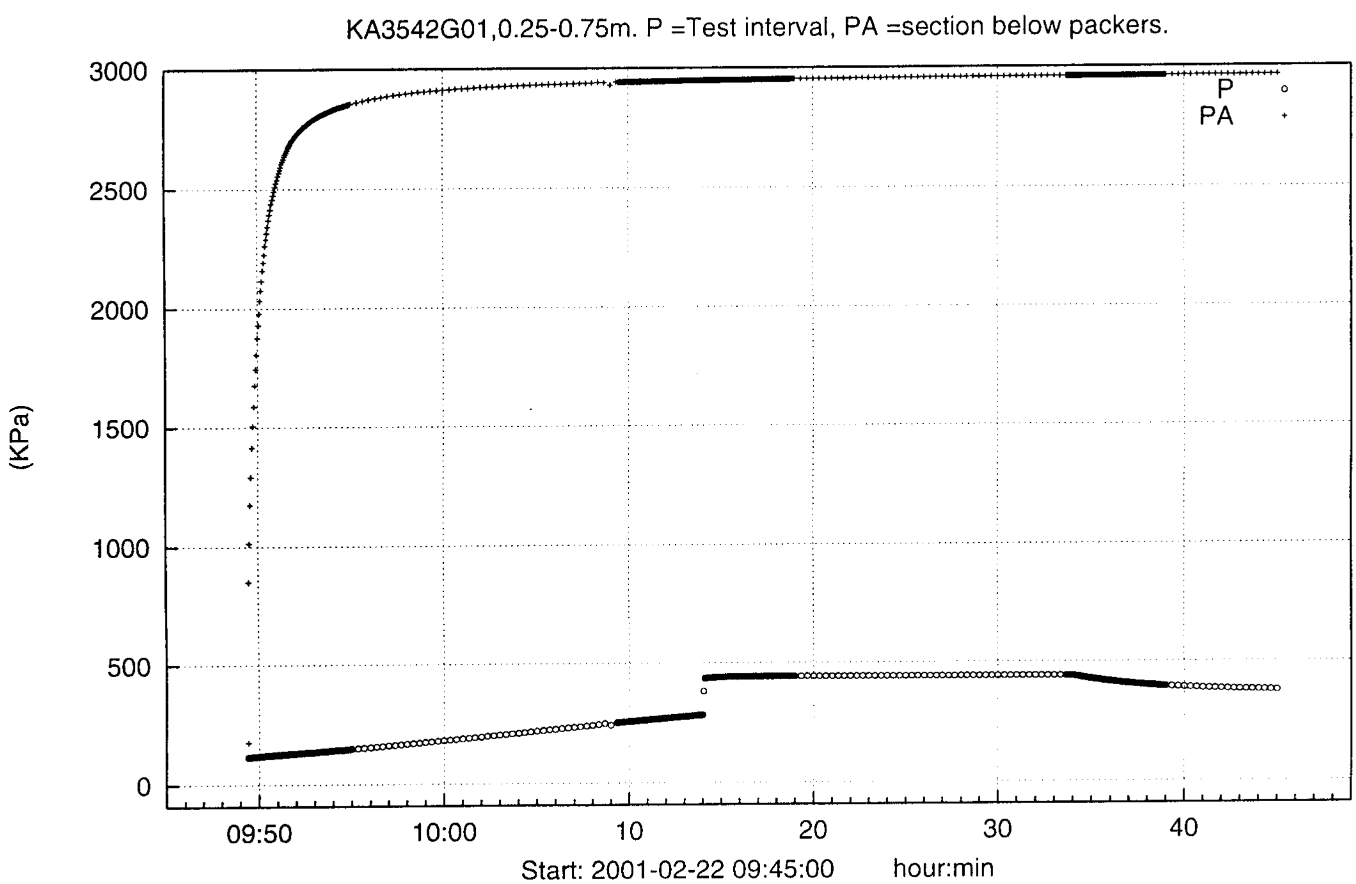
Flow data
Manually measured flow rates of KA3542G01, section 0.25 m –0.75 m, are presented in the table below.

Table Manually measured flow rates, Injection test in KA3542G01, section 0.25 m –0.75 m. Prototype Repository, February 2001

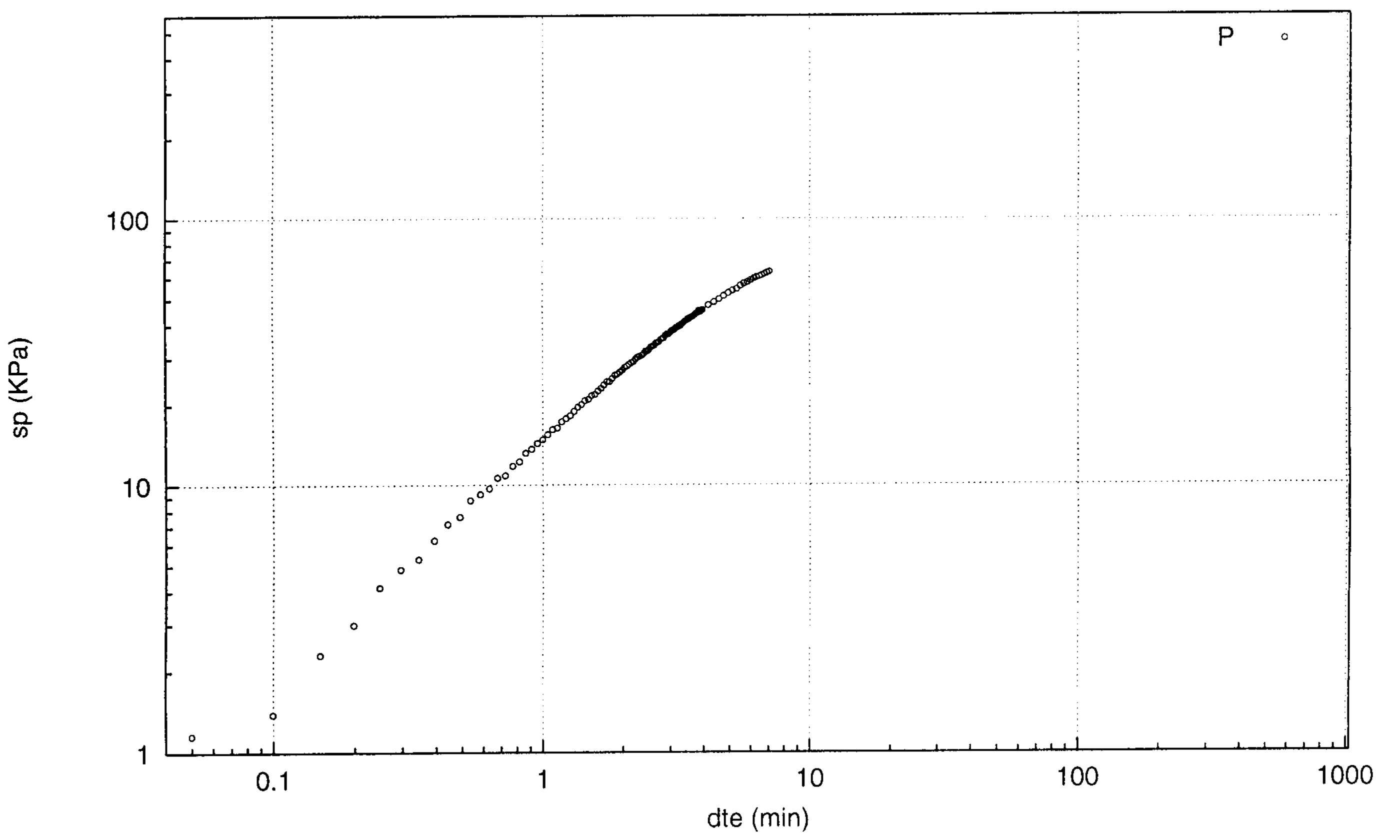
Time	Flow rate ($l/min * 10^{-3}$)
10:14:05	81,03
10:14:10	1,31
10:14:18	2,61
10:14:33	0,98
10:14:53	0,98
10:15:10	1,31
10:15:26	0,87
10:15:48	0,65
10:16:18	0,65
10:16:48	0,87
10:17:33	0,54
10:18:33	0,65
10:19:33	0,54
10:20:33	0,65
10:21:33	0,54
10:22:33	0,54
10:23:33	0,54
10:25:03	0,60
10:27:03	0,49
10:29:03	0,49
10:31:03	0,49
10:33:03	0,60

Calculated flow and volume data

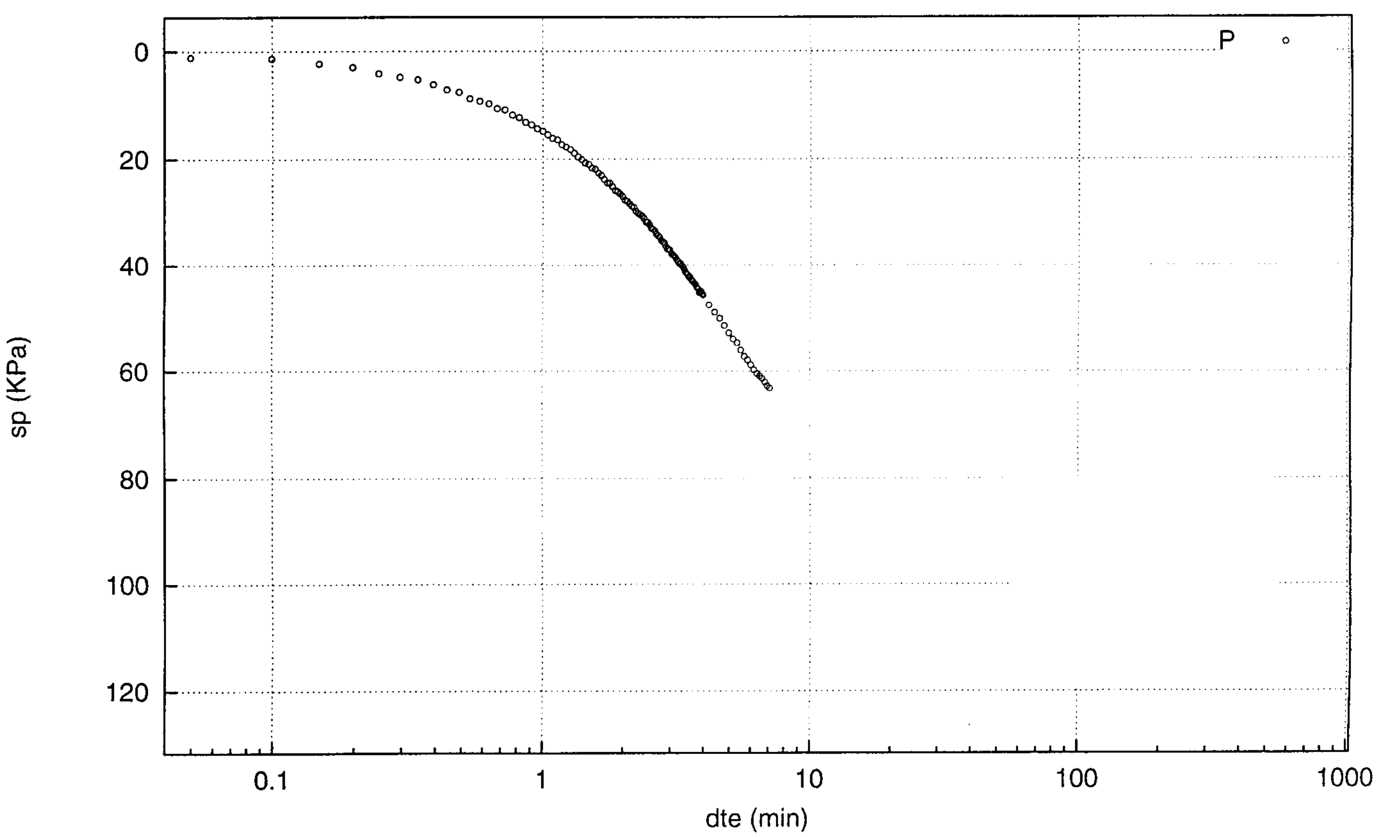
Total injected water volume (Vtot , m^3)	=	$1.9 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds(V,m^3)	=	$1,2 \cdot 10^{-5}$
Average flow rate based on Vtot (QTave, l/min)	=	$9.5 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min)	=	$6.1 \cdot 10^{-4}$
Flow rate at the end of the flow Phase (Qp, l/min)	=	$6.0 \cdot 10^{-4}$


KA3542G01,0.25-0.75m. P =Test interval, PA =section below packers.
P
PA
(KPa)
3000
2500
2000
1500
1000
500
0
09:50
10:00
10
20
30
40
Start: 2001-02-22 09:45:00
hour:min

PROTOTYPE,TR INJECTION TEST KA3542G01, 0.25-0.75 m. recovery 2001-02-22 10:34:03



PROTOTYPE,TR INJECTION TEST KA3542G01, 0.25-0.75 m. recovery 2001-02-22 10:34:03



Borehole KA3542G01, section 0.75 m – 1.25 m

Date: 01-02-22 Field Crew: B. Gentzschein, J.Källgården
Packer expansion: 010222 1048
Valve opened: 010222 110803 Valve closed: 010222 112803
Total flowing time : 20.0 min. Tot. Pr. Build-up time 10.0 mlin.

Pressure data
Pressure before injection start (P0, KPa) : 116.3
Pressure just before closing the valve (Pp, KPa): 349.8
Pressure at the end of the recovery (Pf, KPa) : 347.7

Flow data
Manually measured flow rates of KA3542G01, section 0.75 m –1.25 m, are presented in the table below.

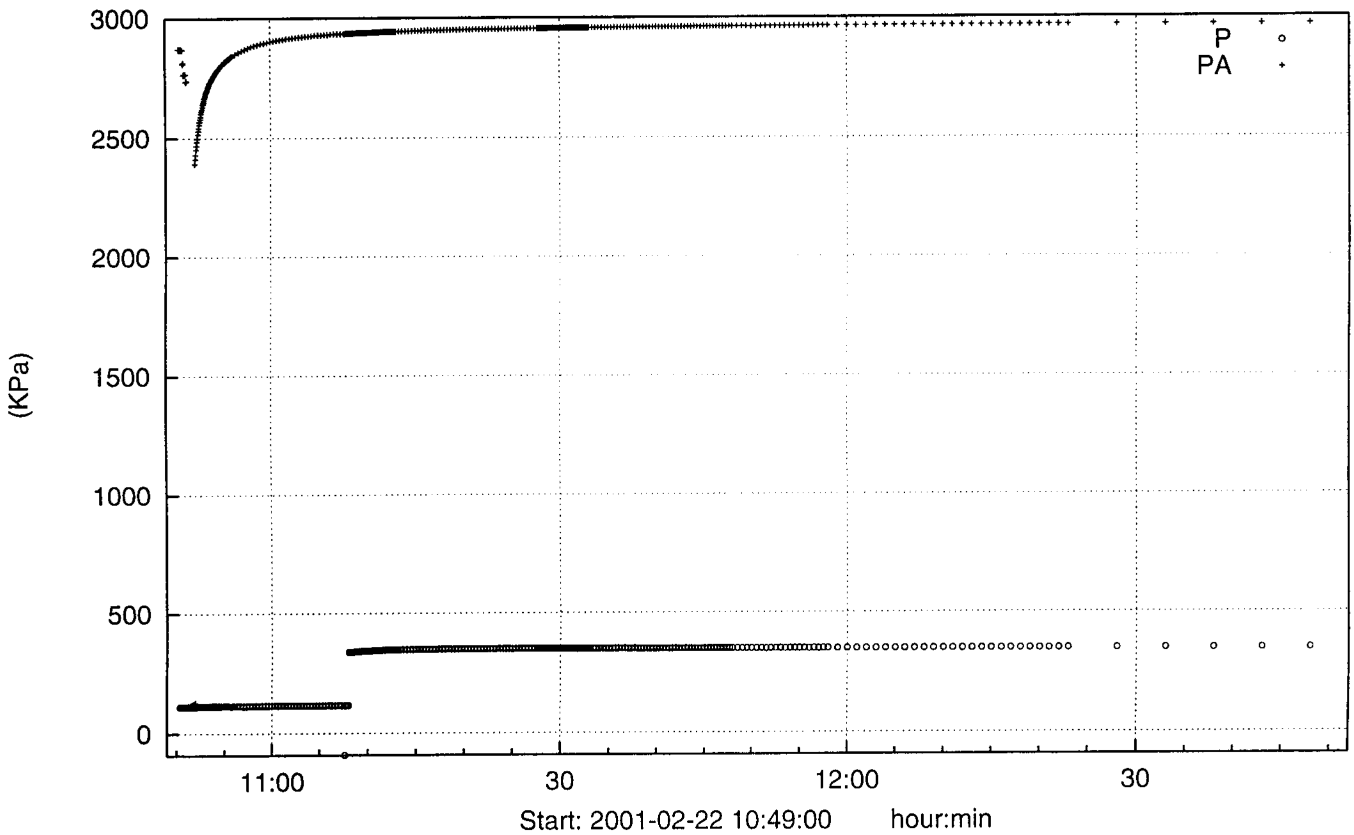
Table Manually measured flow rates, Injection test in KA3542G01, section 0.75 m –1.25 m. Prototype Repository, February 2001

Time	Flow rate (l/min * 10^{-3})
11:08:08	210,4
11:08:15	0,436
11:09:28	0,503
11:11:18	0,073
11:13:03	0,055
11:15:03	0,055
11:22:08	0,018

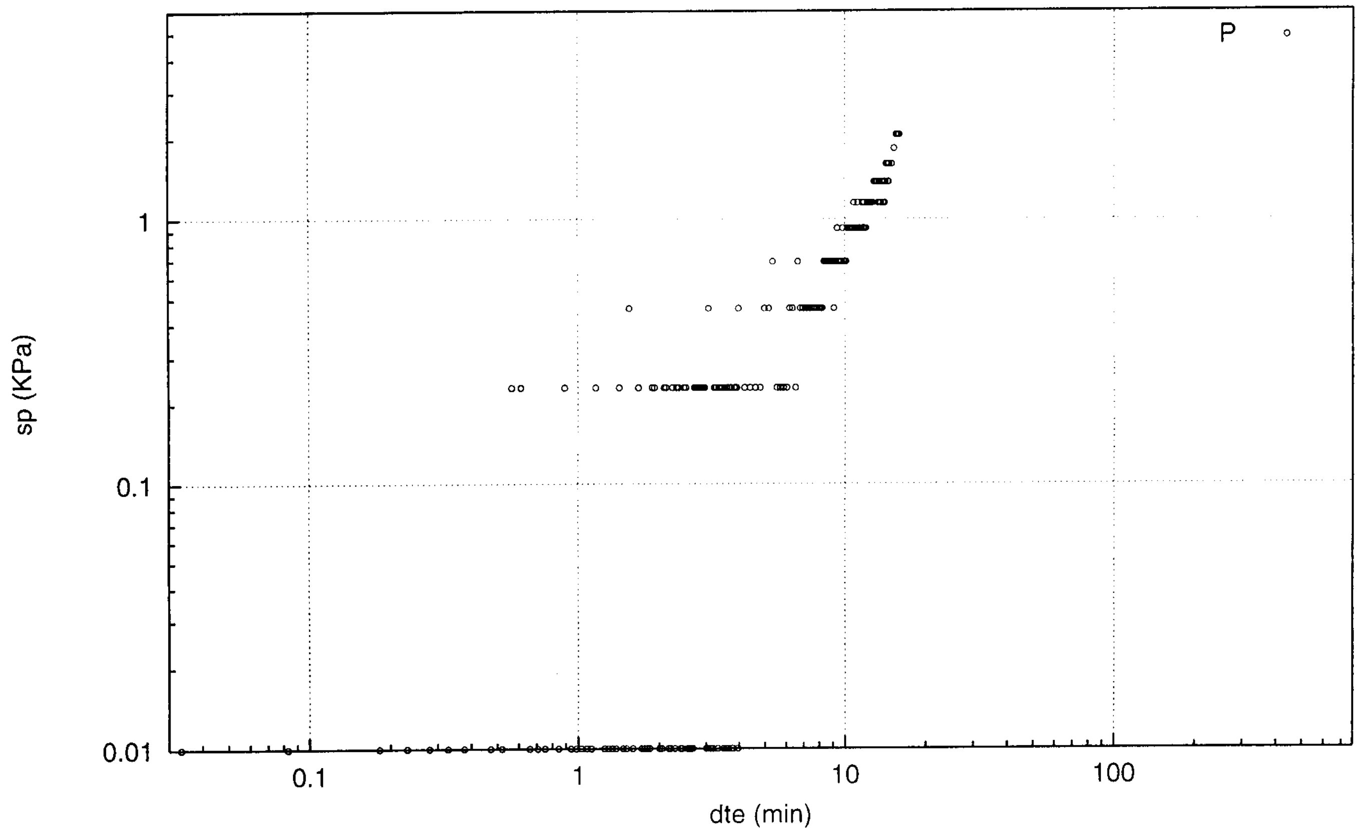
Calculated flow and volume data
Total injected water volume (Vtot, m^3) $= 1.8 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds(V,m^3) $= 4,4 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) $= 9.0 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) $= 2.2 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) $= 1.8 \cdot 10^{-5}$

Comment
Very small recovery

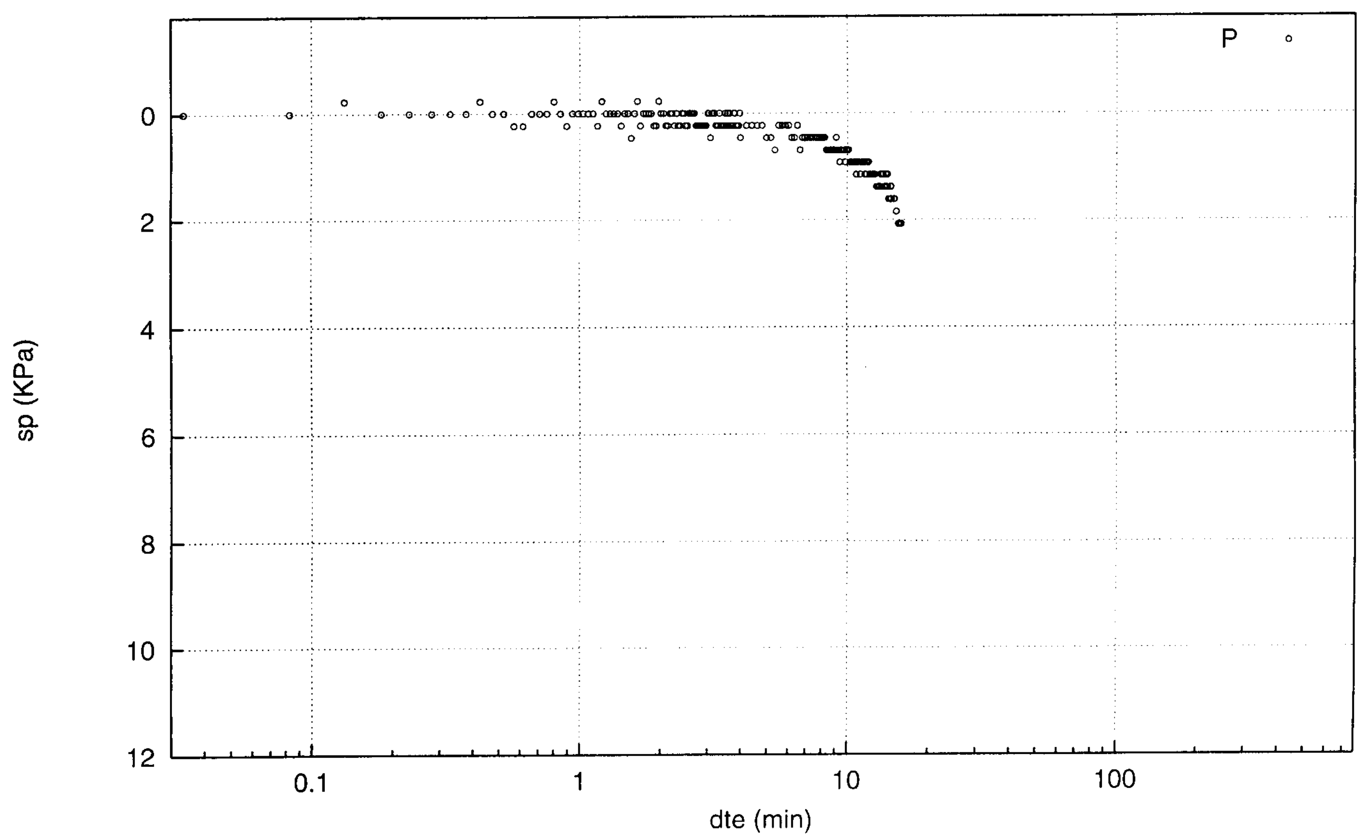
KA3542G01,0.75-1.25m. P =Test interval, PA =section below packers.



PROTOTYPE,TR INJECTION TEST KA3542G01, 0.75 - 1.25 m. recovery 2001-02-22 11:28:03



PROTOTYPE,TR INJECTION TEST KA3542G01, 0.75 - 1.25 m. recovery 2001-02-22 11:28:03



Borehole KA3542G01, section 1.25 m – 1.75 m

Date: 01-02-22 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010222 12:55
Valve opened: 010222 13:11.03 Valve closed: 010222 13:31.03
Total flowing time : 20.0 min. Tot. Pr. Build-up time 10.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 111.3
Pressure just before closing the valve (Pp, KPa): 350.0
Pressure at the end of the recovery (Pf, KPa) : 349.6

Flow data
Manually measured flow rates of KA3542G01, section 1.25 m –1.75 m, are presented in the table below.

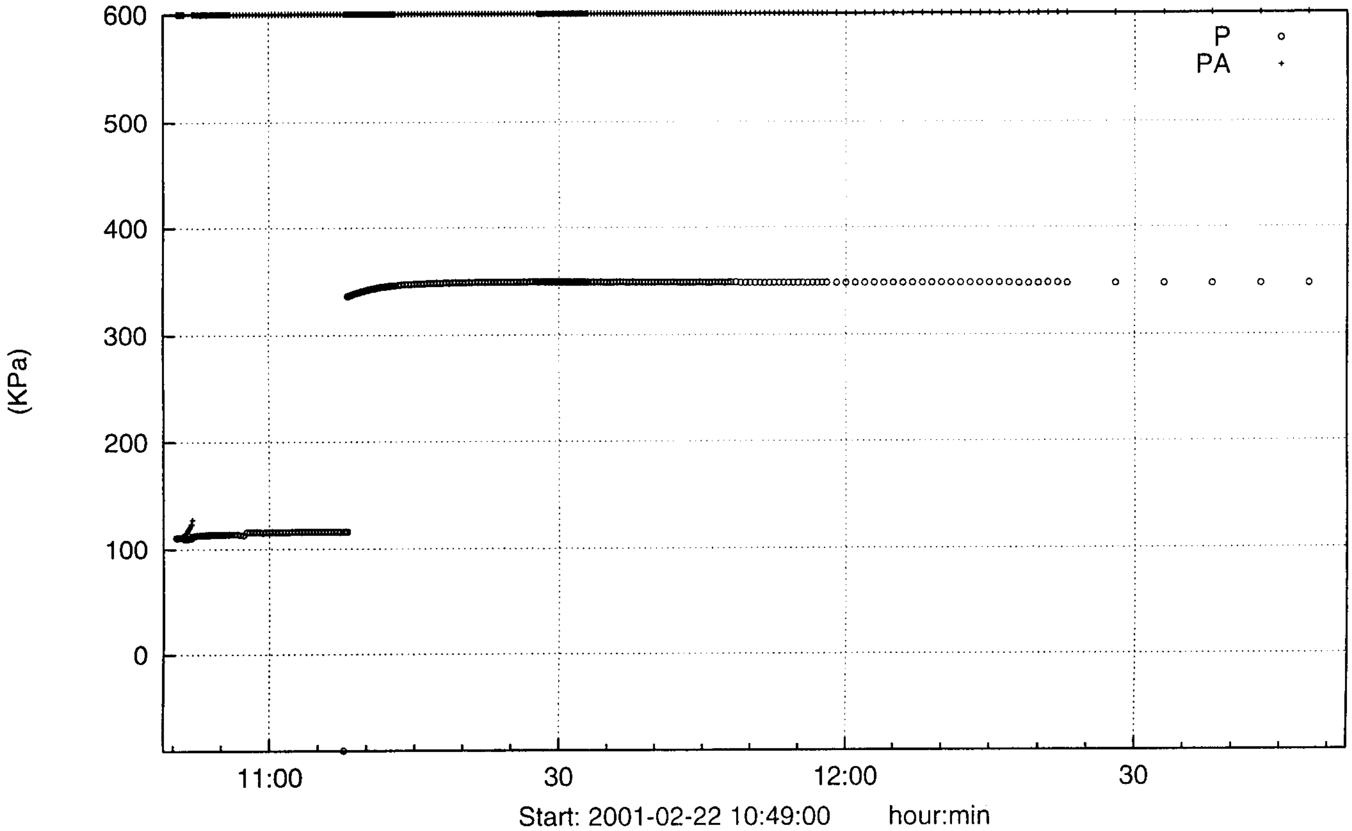
Table Manually measured flow rates, Injection Test in KA3542G01, section 1.25 m –1.75 m. Prototype Repository, February 2001

TimeFlow rate	(l/min * 10-3)
13:11:05	198.7
13:11:10	0,187
13:11:18	0,087
13:11:33	0,055
13:11:53	0,055
13:12:10	0,036
13:12:26	0,012

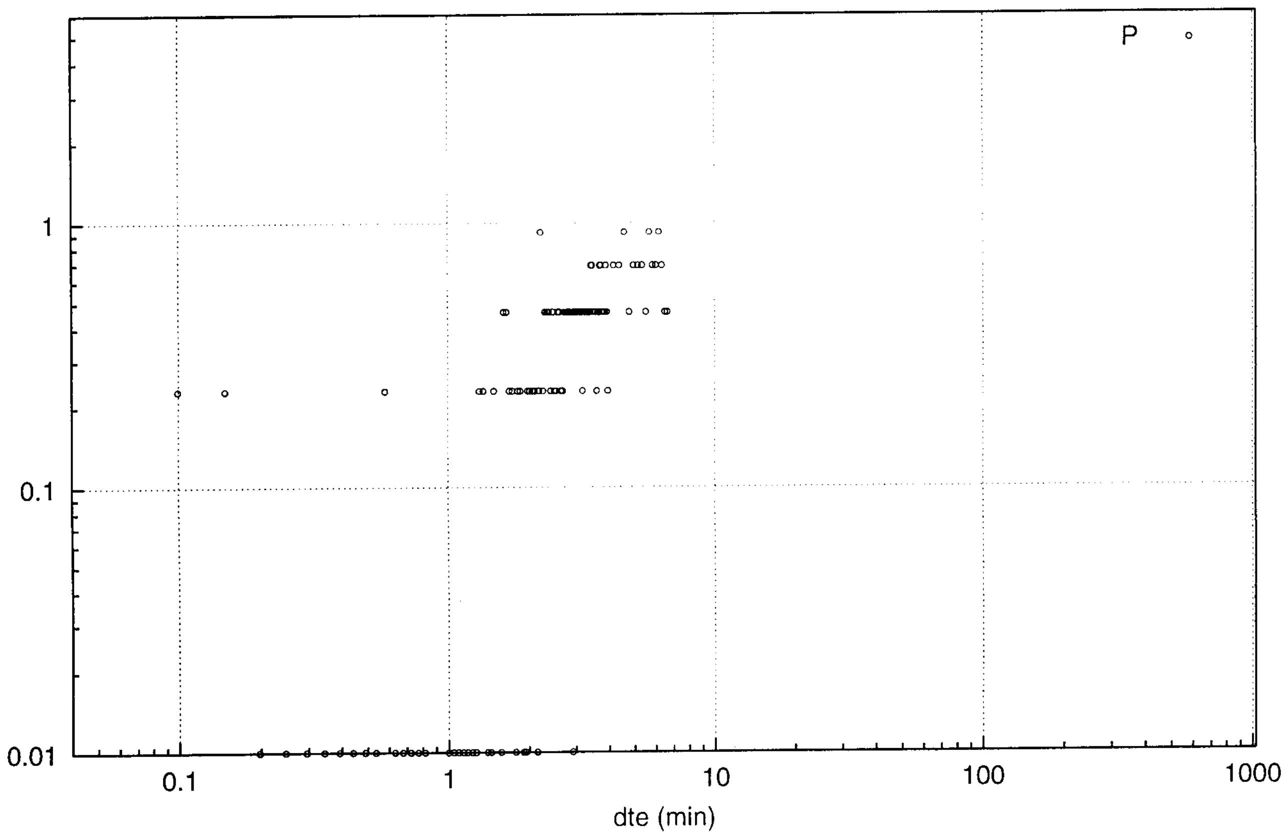
Calculated flow and volume data
Total injected water volume (Vtot, m^3) $= 1.7 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds(V,m^3) $= 6,5 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) $= 8.6 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) $= 3.3 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) $= 1.2 \cdot 10^{-5}$

Comment
Almost no recovery

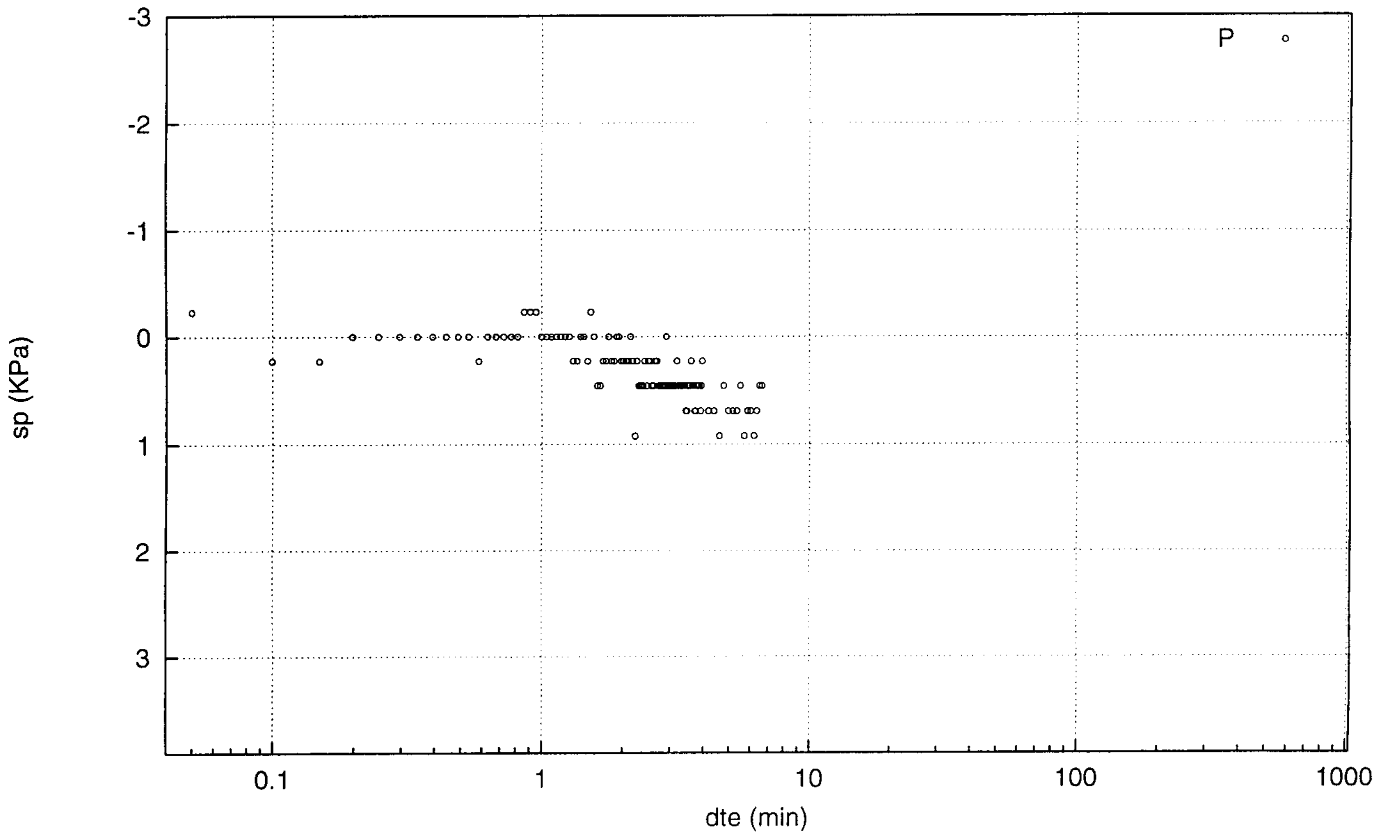
KA3542G01,1.25-1.75m. P =Test interval, PA =section below packers.



PROTOTYPE,TR INJECTION TEST KA3542G01, 1.25 - 1.75 m. recovery 2001-02-22 13:31:03



PROTOTYPE,TR INJECTION TEST KA3542G01, 1.25 - 1.75 m. recovery 2001-02-22 13:31:03



Borehole KA3542G02, section 0.25 m - 0.75 m

Borehole KA3542G02 section 0.25 - 0.75 m
Date: 01-02-22 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010222 14:48
Valve opened: 010222 15:11.03 Valve closed: 010222 15:31.03
Total flowing time : 20.0 min. Tot. Pr. Build-up time 15.8 min.

Pressure data
Pressure before injection start (P0, KPa) : 112.2
Pressure just before closing the valve (Pp, KPa): 354.9
Pressure at the end of the recovery (Pf, KPa) : 355.8

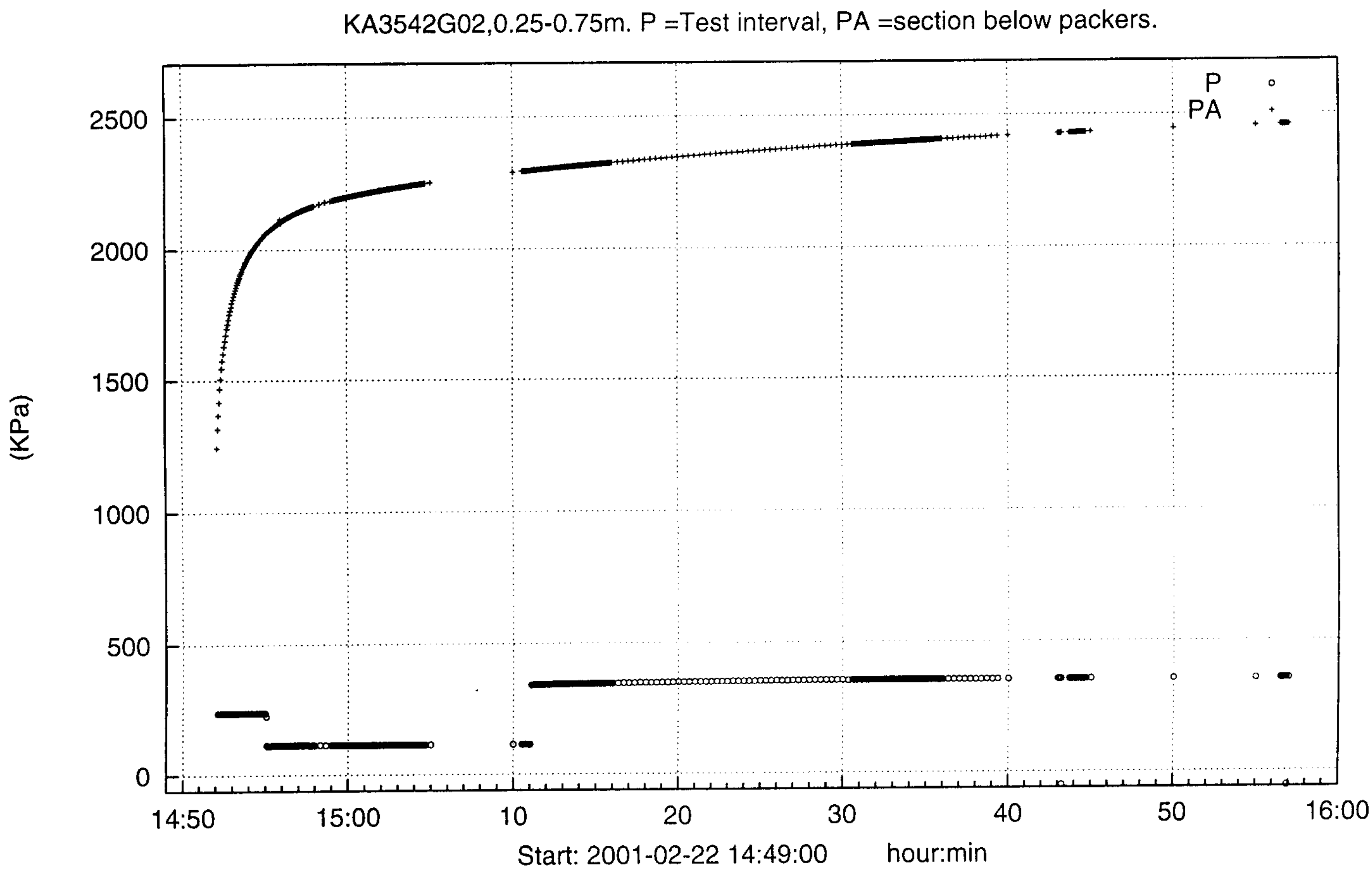
Flow data
Manually measured flow rates of KA3542G02, section 0.25 m –0.75 m, are presented in the table below.

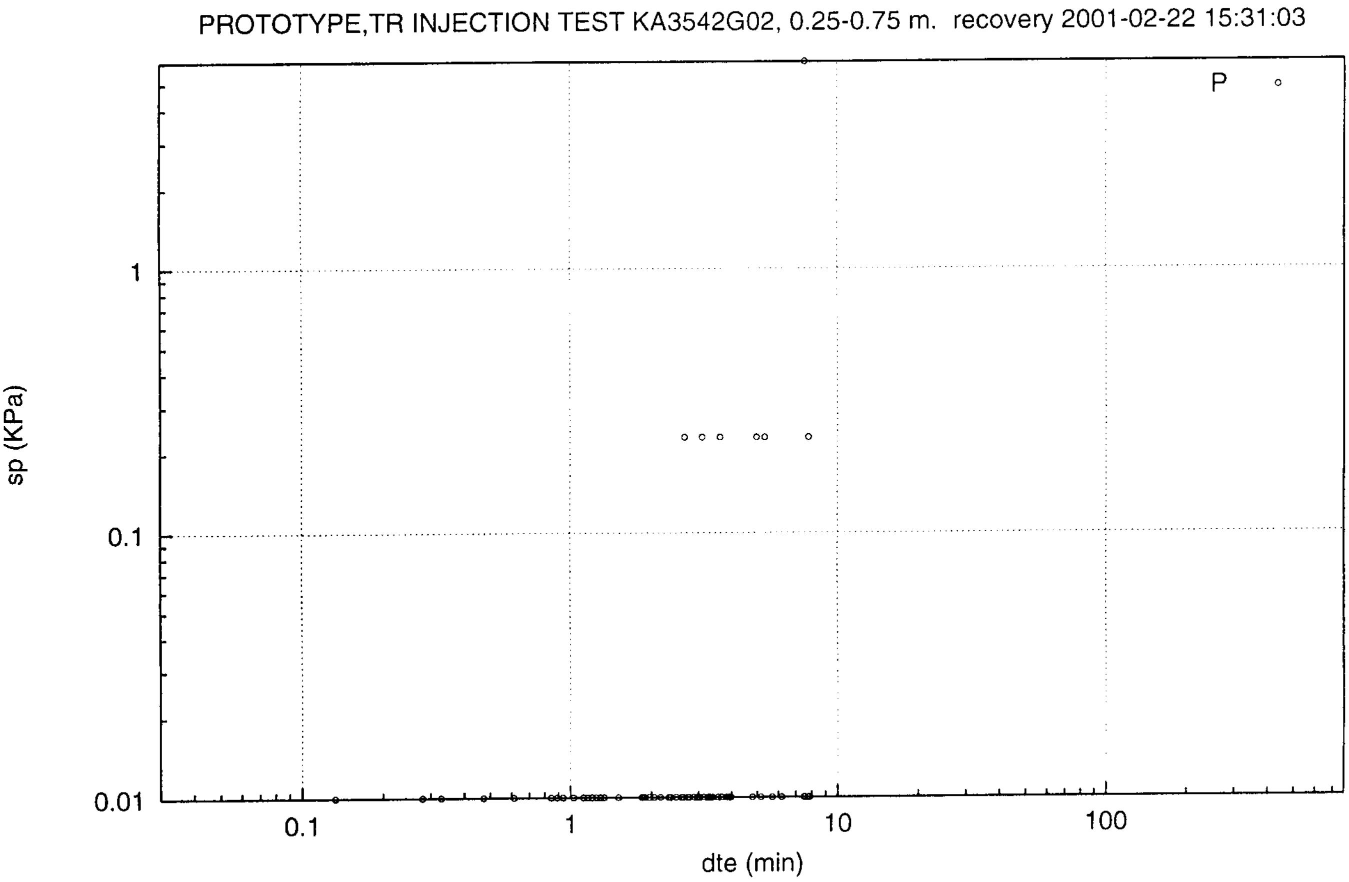
Table Manually measured flow rates, Injection Test in KA3542G02, section 0.25 m –0.75 m. Prototype Repository, February 2001

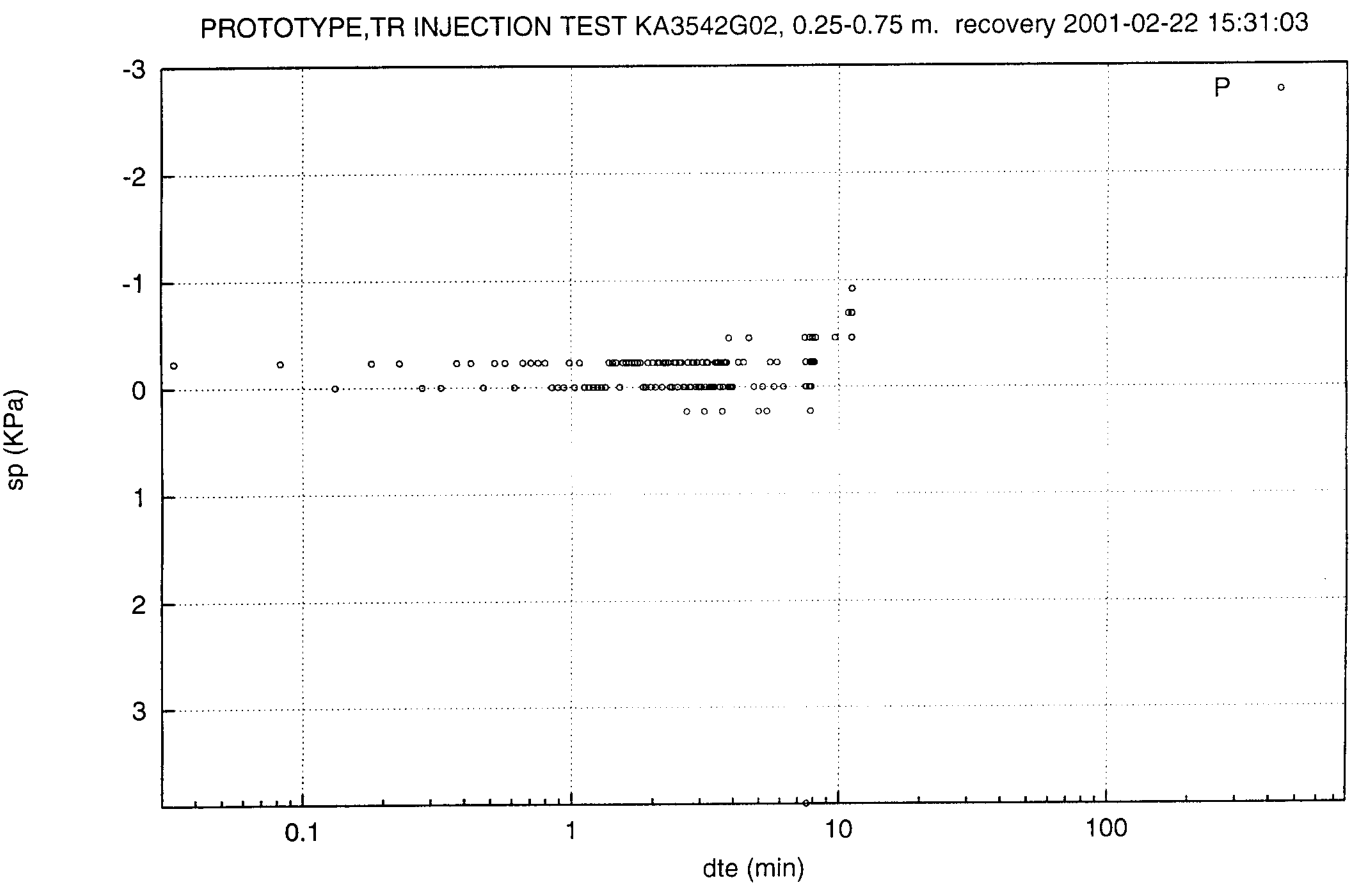
TimeFlow rate	(l/min * 10-3)
15:11:05	381,639
15:11:10	1,307
15:11:53	0,082
15:13:48	0,044
15:22:03	0,018
15:28:03	0,018

Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $3.3 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds(V,m^3) = $9,8 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min)= $1.6 \cdot 10^{-3}$
Average flow rate based on V (Qave ,l/min) = $4.9 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) = $1.8 \cdot 10^{-5}$

Comment
There were short breaks in the pressure monitoring.
The pressure increased during the recovery period..


KA3542G02,0.25-0.75m. P =Test interval, PA =section below packers.
P
PA
(KPa)
2500
2000
1500
1000
500
0
14:50
15:00
10
20
30
40
50
16:00
Start: 2001-02-22 14:49:00
hour:min


PROTOTYPE,TR INJECTION TEST KA3542G02, 0.25-0.75 m. recovery 2001-02-22 15:31:03
P
1
0.1
0.01
sp (KPa)
0.1
1
10
100
dte (min)


PROTOTYPE,TR INJECTION TEST KA3542G02, 0.25-0.75 m. recovery 2001-02-22 15:31:03
P
-3
-2
-1
0
1
2
3
sp (KPa)
0.1
1
10
100
dte (min)

Borehole KA3542G02, section 0.75 m – 1.25 m

Date: 01-02-22 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010222 16:03
Valve opened: 010222 16:20.03 Valve closed: 010222 16:40.03
Total flowing time : 20.0 min. Tot. Pr. Build-up time 10.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 108.7
Pressure just before closing the valve (Pp, KPa): 353.0
Pressure at the end of the recovery (Pf, KPa) : 353.5

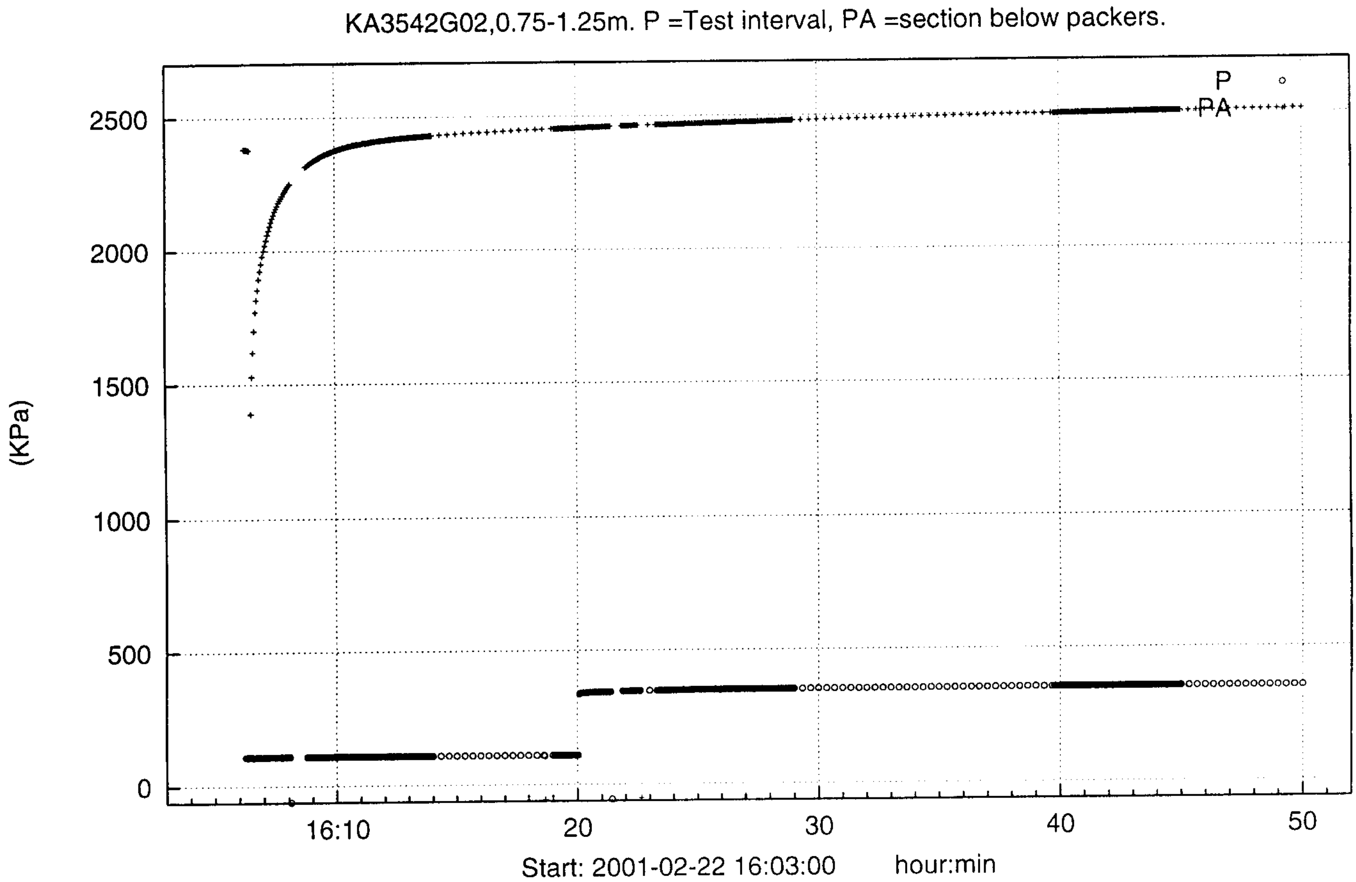
Flow data
Manually measured flow rates of KA3542G02, section 0.75 m –1.25 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3542G02, section 0.75 m –1.25 m. Prototype Repository, February 2001

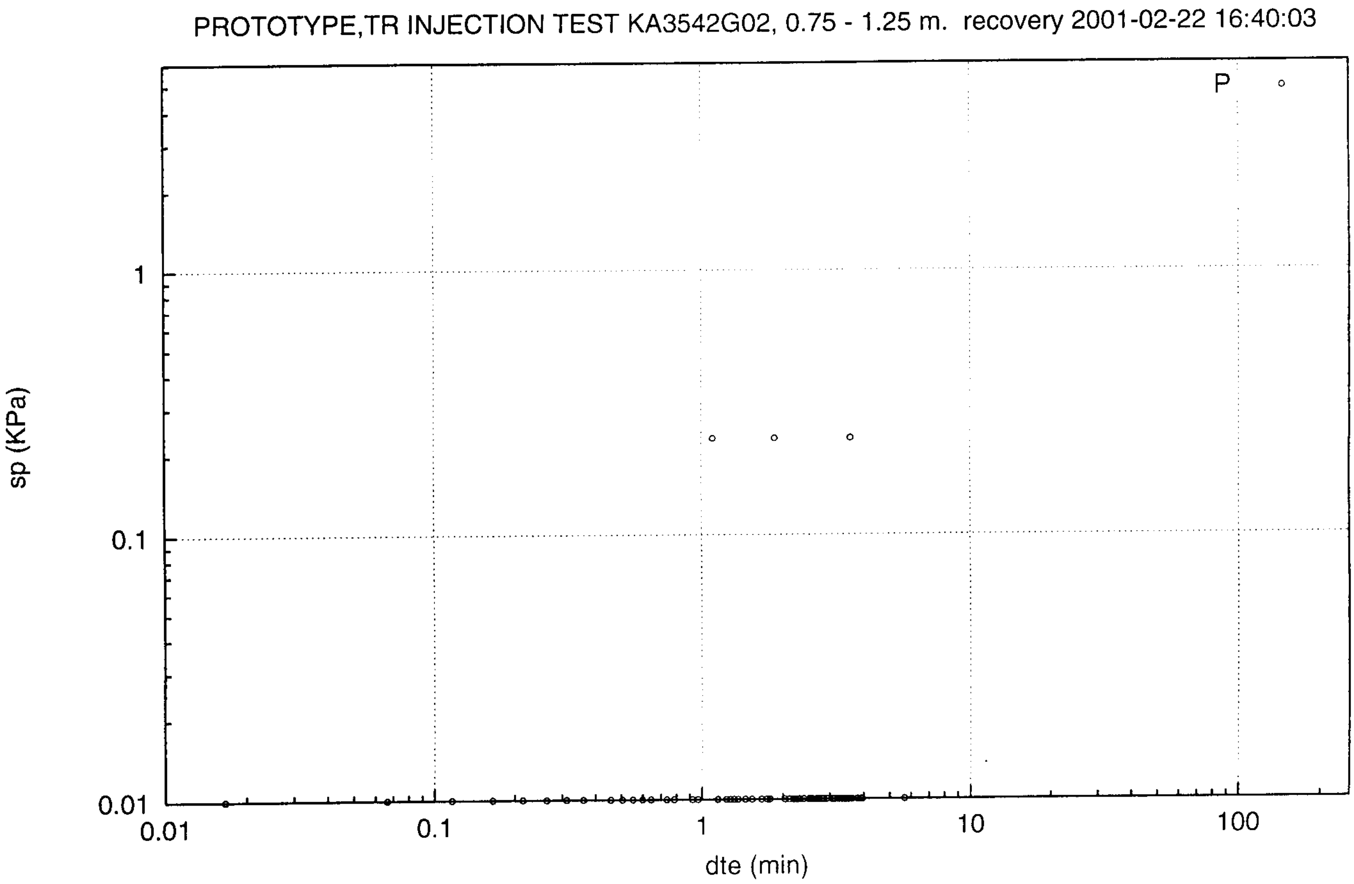
Time Flow rate	($l/min * 10^{-3}$)
16:20:13	243,1
16:21:13	0,131
16:22:33	0,218
16:26:03	0,055
16:28:33	0,036
16:35:03	0,182

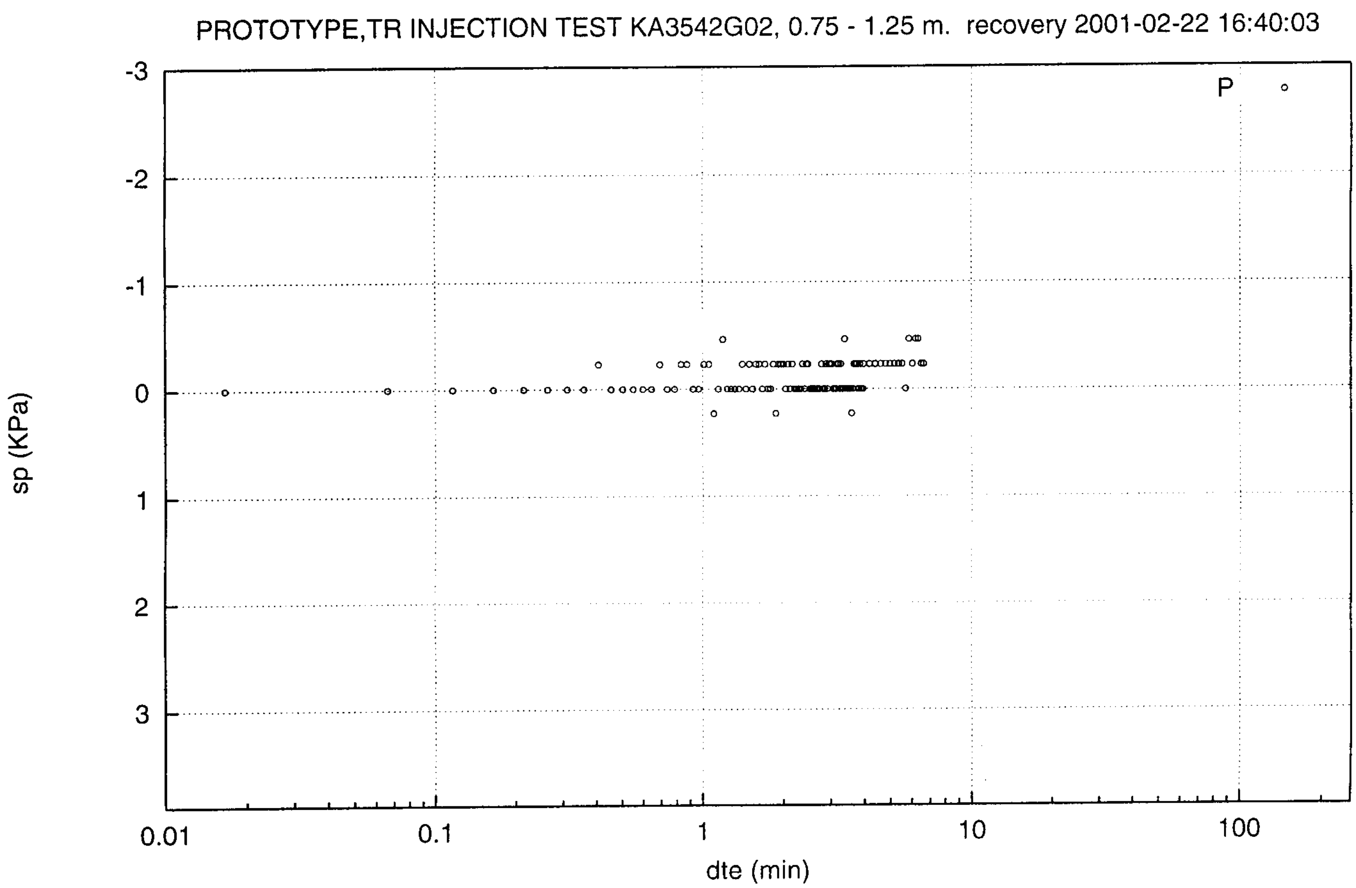
Calculated flow and volume data
Total injected water volume (V_{tot}, m^3) = $8.2 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds(V,m^3) = $1,1 \cdot 10^{-6}$
Average flow rate based on Vtot (QTave, l/min)= $4.1 \cdot 10^{-3}$
Average flow rate based on V (Qave ,l/min) = $5.5 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) = $1.8 \cdot 10^{-5}$

Comment
There were short breaks in the pressure monitoring.
The pressure increased during the recovery period..



KA3542G02,0.75-1.25m. P =Test interval, PA =section below packers.
P
PA
2500
2000
1500
1000
500
0
(KPa)
16:10
20
30
40
50
Start: 2001-02-22 16:03:00
hour:min


PROTOTYPE,TR INJECTION TEST KA3542G02, 0.75 - 1.25 m. recovery 2001-02-22 16:40:03
P
sp (KPa)
1
0.1
0.01
0.01
0.1
1
10
100
dte (min)


PROTOTYPE,TR INJECTION TEST KA3542G02, 0.75 - 1.25 m. recovery 2001-02-22 16:40:03
P
sp (KPa)
-3
-2
-1
0
1
2
3
0.01
0.1
1
10
100
dte (min)

Borehole KA3542G02, section 1.25 m – 1.75 m

Date: 01-02-14 Field Crew: B. Gentzschein, T. Sträng
Packer expansion: 010214 08:24
Valve opened: 010214 09:56.00 Valve closed: 010214 10:16.01
Total flowing time : 20.0 min. Tot. Pr. Build-up time 21.0 min.
The test was performed as an outflow Pressure Build-up Test

Pressure data

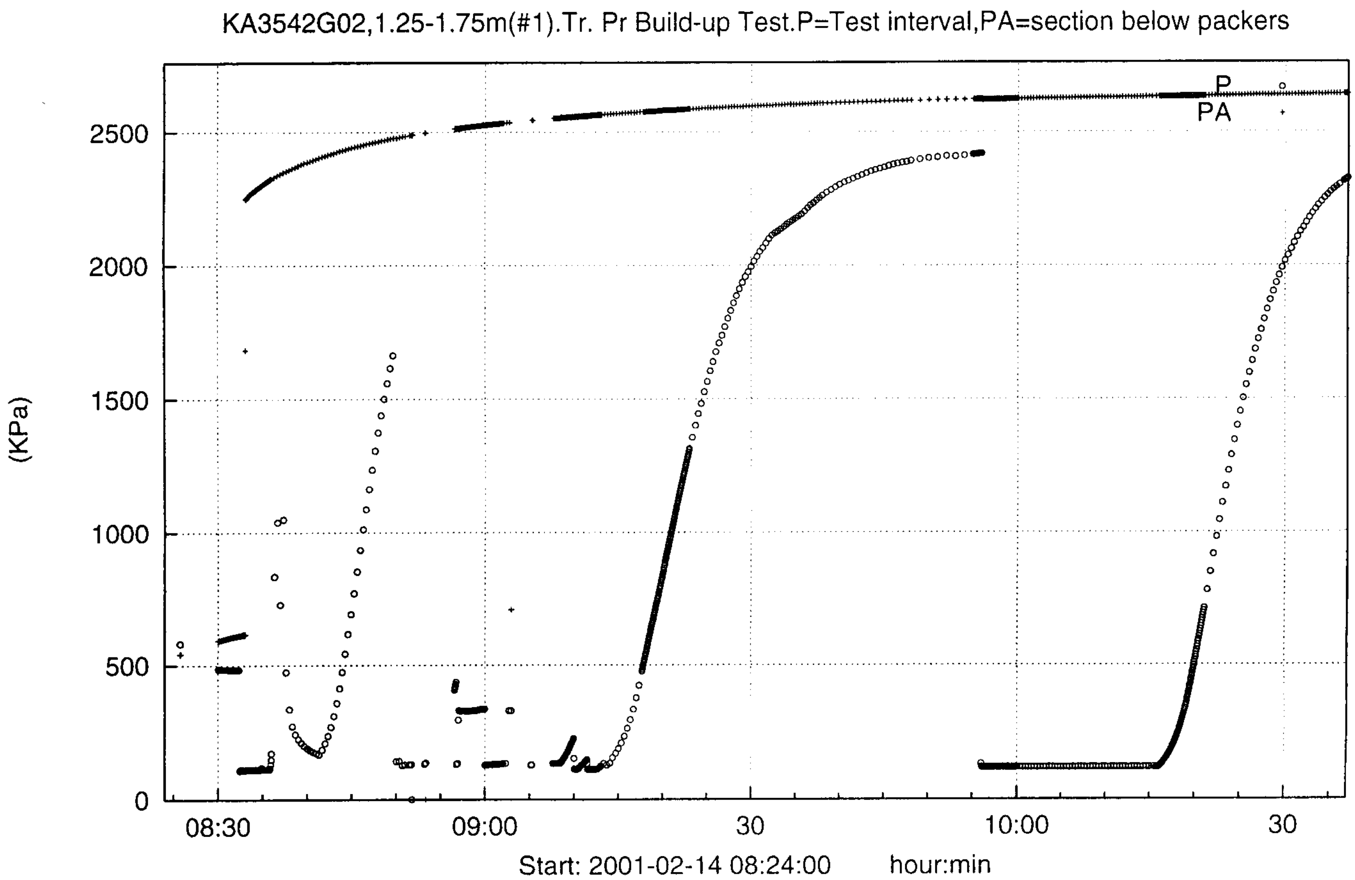
Pressure before injection start	(P0, KPa)	:	2419.2
Pressure just before closing the valve	(Pp, KPa)	:	117.5
Pressure at the end of the recovery	(Pf, KPa)	:	2325.5

Flow data
Manually measured flow rates of KA3542G02, section 1.25 m –1.75 m, are presented in the table below.

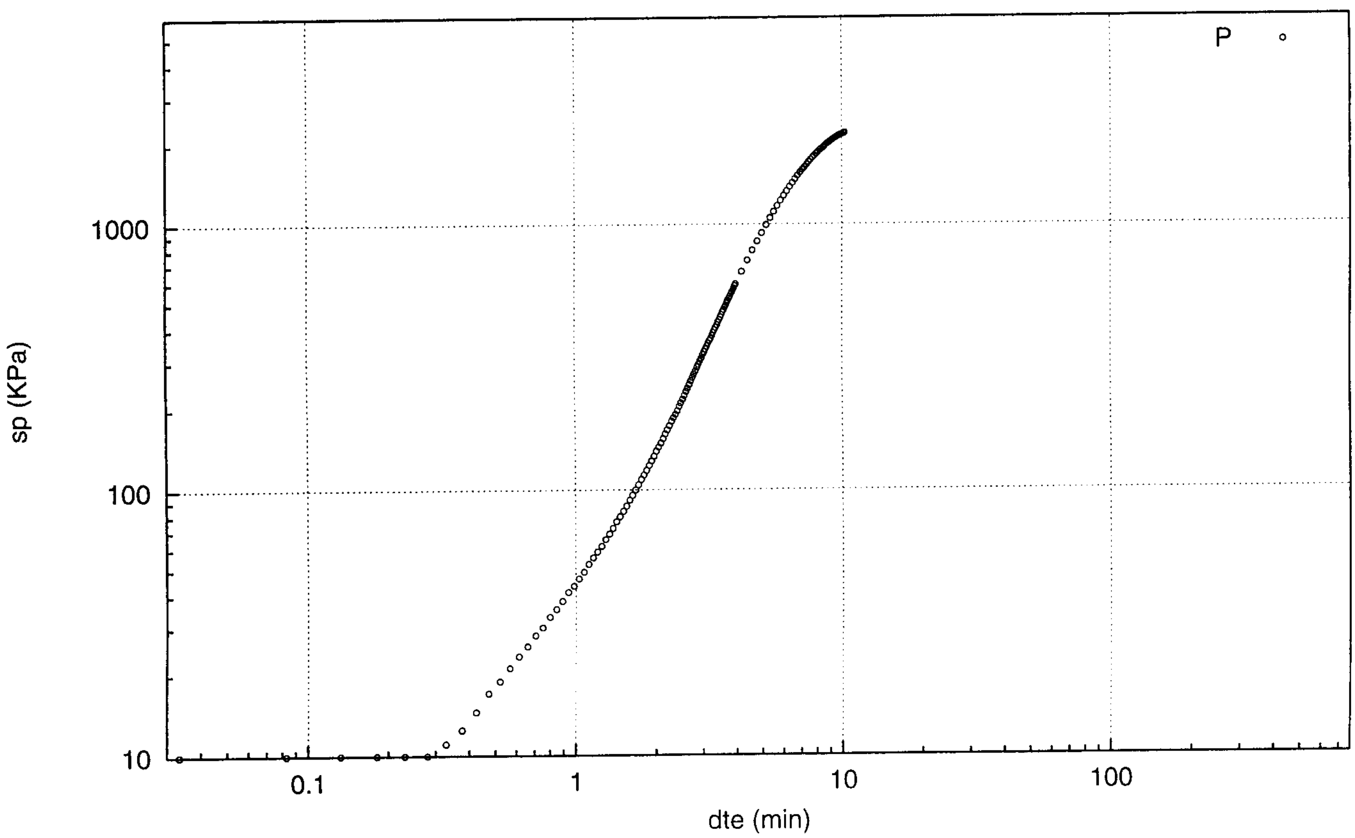
Table Manually measured flow rates, Pressure Buil-up Test in KA3542G02, section 1.25 m –1.75 m. Prototype Repository, February 2001

TimeFlow rate	(l/min * 10^{-3})
09:56:05	177,5
09:56:15	27,3
09:56:40	6,82
09:57:07	9,10
09:57:38	4,55
09:58:15	4,55
09:58:45	4,55
09:59:09	3,79
09:59:39	3,25
10:00:30	2,28
10:01:30	2,28
10:02:38	3,64
10:03:37	9,10
10:04:30	4,55
10:05:30	11,4
10:07:00	3,98
10:09:00	5,12
10:11:00	3,41
10:13:00	4,55
10:14:30	4,55
10:15:30	6,83

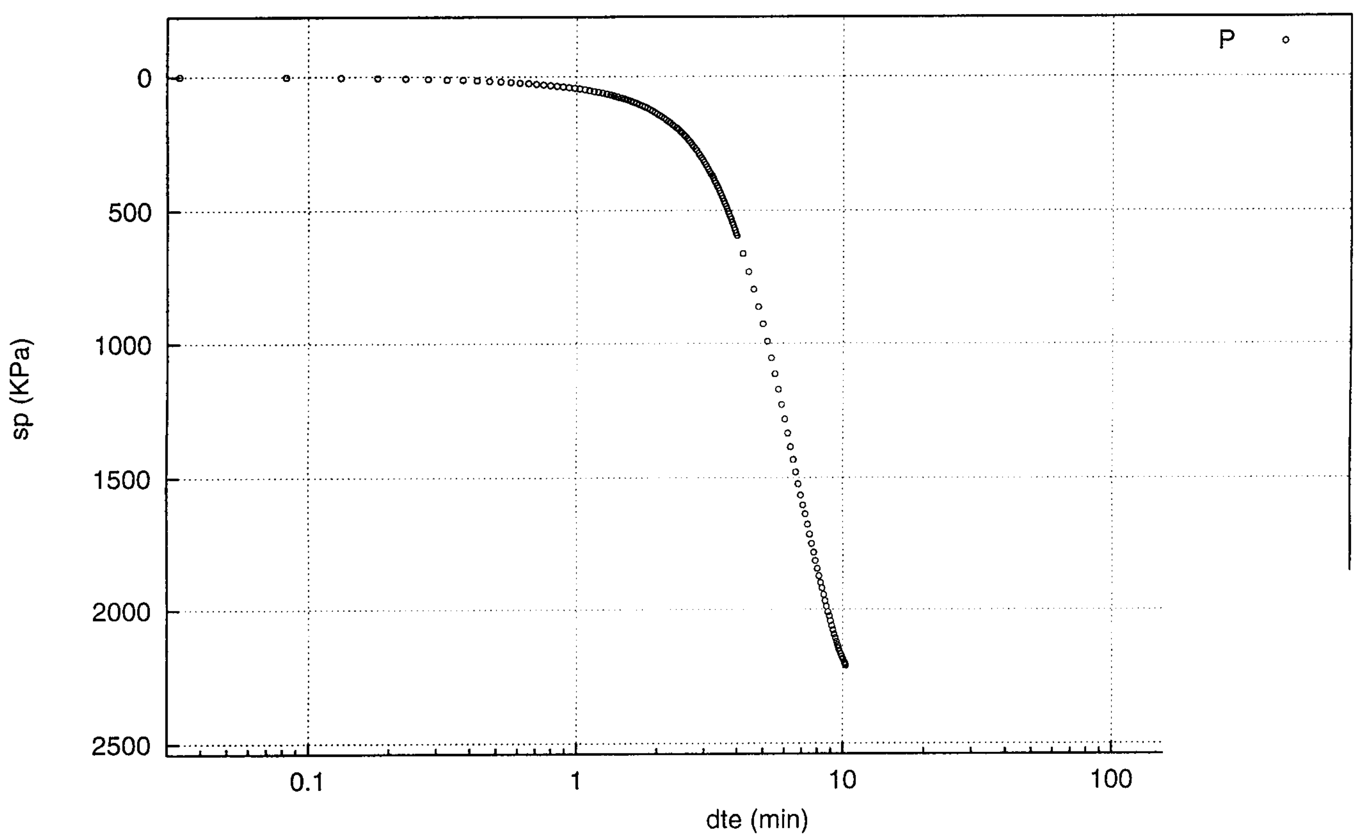
Calculated flow and volume data
Total Outflow water volume (Vtot, m^3) = $1.3 \cdot 10^{-4}$
Outflow volume excluding the first 10 seconds(V,m3) = $1{,}0 \cdot 10^{-4}$
Average flow rate based on Vtot (QTave, l/min) = $6.5 \cdot 10^{-3}$
Average flow rate based on V (Qave ,l/min) = $5.0 \cdot 10^{-3}$
Flow rate at the end of the Flow Phase (Qp, l/min) = $6.8 \cdot 10^{-3}$


KA3542G02,1.25-1.75m(#1).Tr. Pr Build-up Test.P=Test interval,PA=section below packers
P
PA
(KPa)
2500
2000
1500
1000
500
0
08:30
09:00
30
10:00
30
Start: 2001-02-14 08:24:00
hour:min

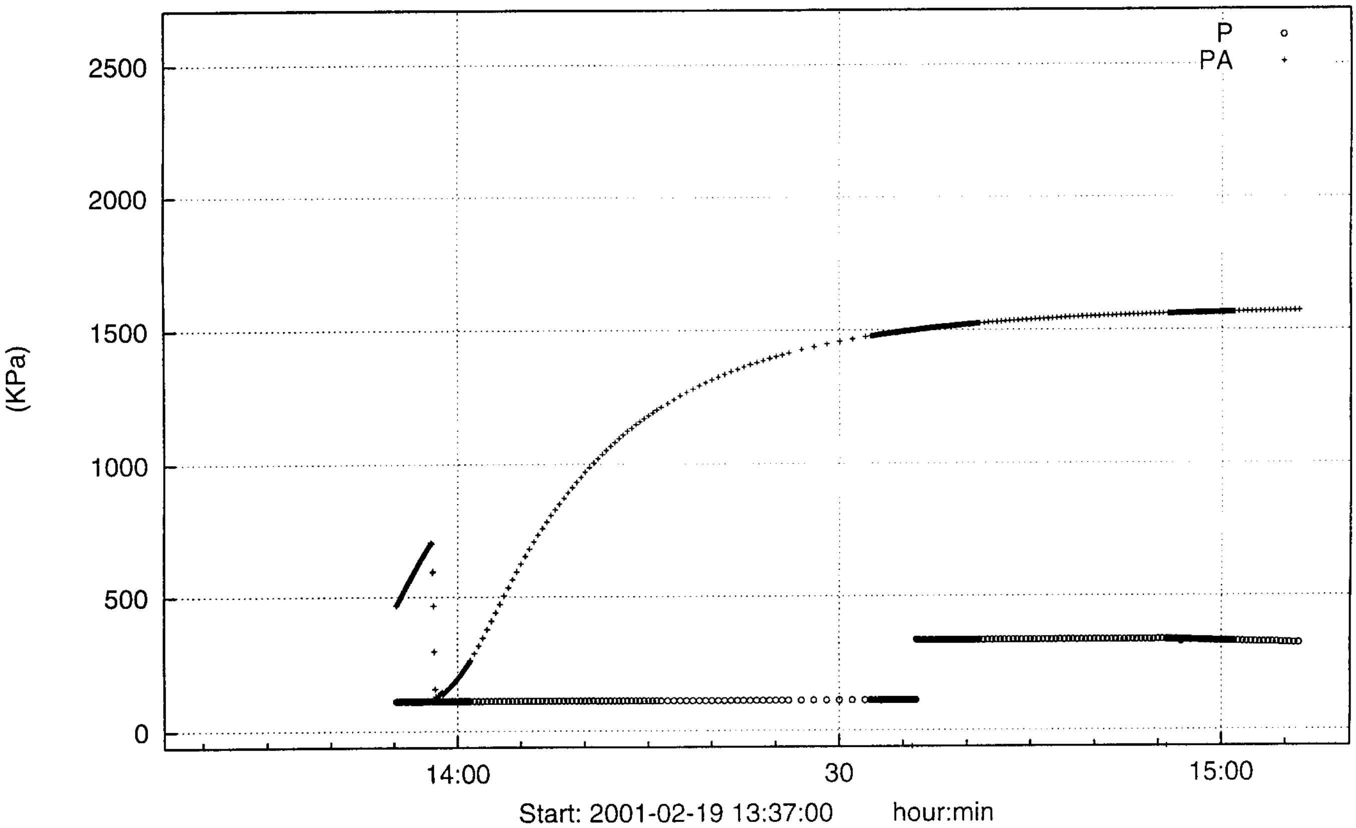
Prototype.Pr. Build-up Test. KA3542G02,1.25-1.75 m recovery 2001-02-14 10:16:01



Prototype.Pr. Build-up Test. KA3542G02,1.25-1.75 m recovery 2001-02-14 10:16:01



KA3544G01,0.25-0.75m. Tr.Injection test. P=Test interval,PA=section below packers



Borehole KA3544G01, section 0.25 m - 0.75 m

Date: 01-02-19 Field Crew: B. Gentzschein, J. Källgården

Packer expansion: 010219 13:37
Valve opened: 010219 14:36.02 Valve closed: 010219 14:56.02
Total flowing time : 20.0 min. Tot. Pr. Build-up time 10.0 min.

Pressure data
Pressure before injection start (P_0, KPa) : 109.6
Pressure just before closing the valve (P_p, KPa): 336.6
Pressure at the end of the recovery (P_f, KPa) : 322.1

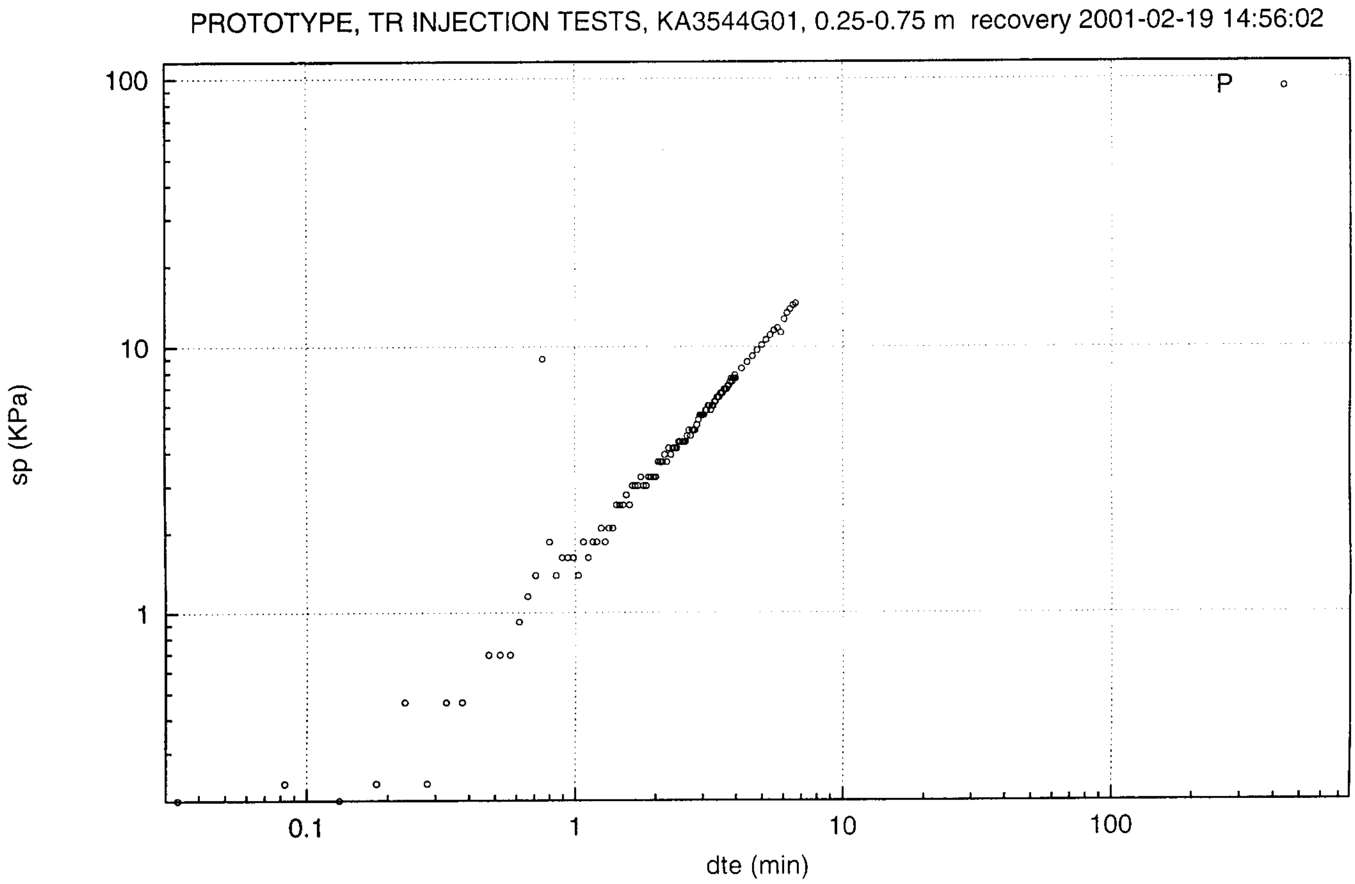
Flow data
Manually measured flow rates of KA3544G01, section 0.25 m –0.75 m, are presented in the table below.

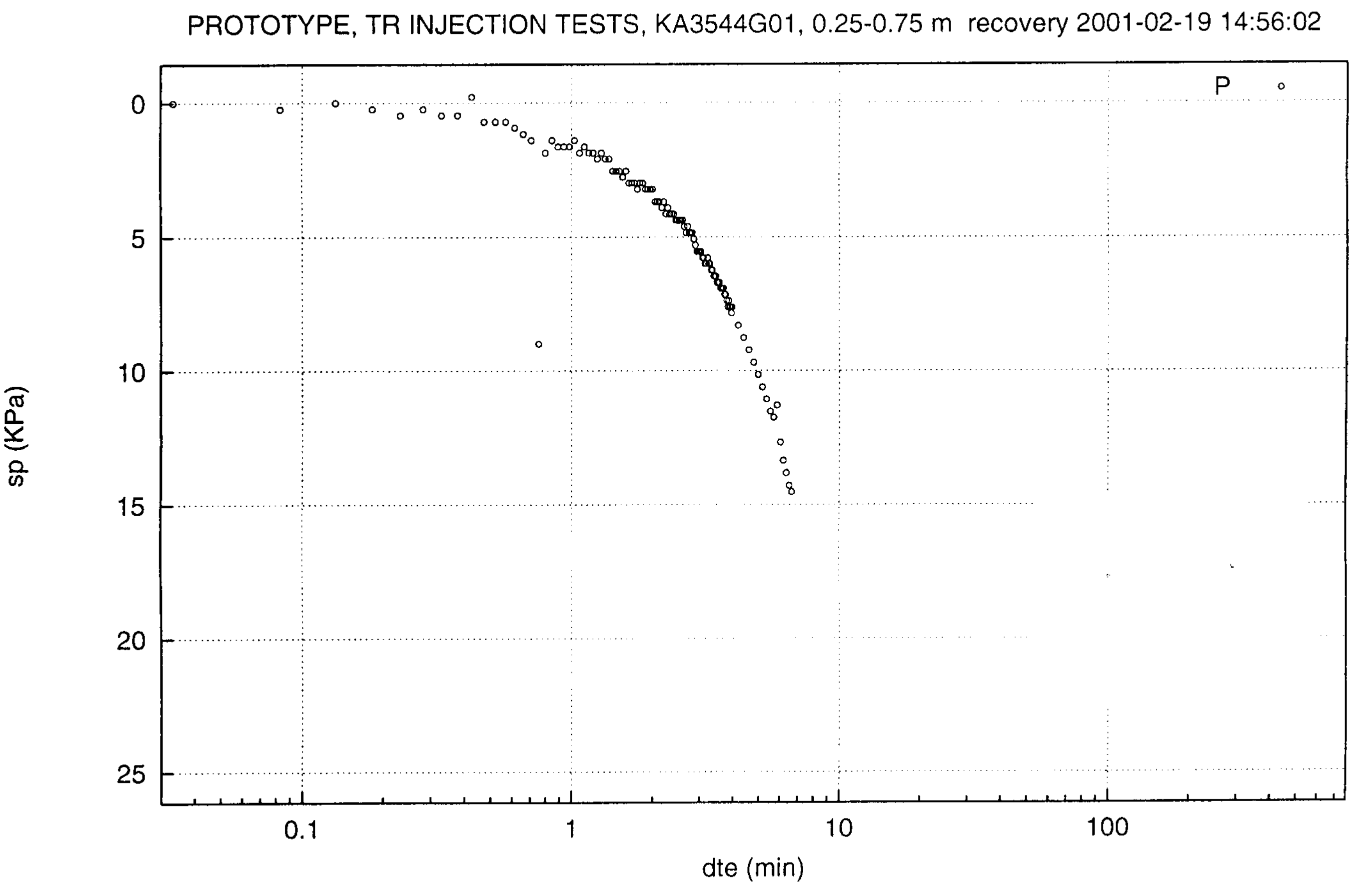
Table Manually measured flow rates, Injection Test in KA3544G01, section 0.25 m –0.75 m. Prototype Repository, February 2001

Time	Flow rate (l/min * 10^{-3})
14:36:04	177,7
14:37:19	0,045
14:39:02	0,073
14:42:02	0,054
14:43:32	0,109
14:46:00	0,054
14:49:02	0,054
14:51:02	0,054
14:53:02	0,054
14:55:02	0,054

Calculated flow and volume data

Total injected water volume (V_{tot}, m^3) $= 1.6 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds (V,m^3) $= 1,1 \cdot 10^{-6}$
Average flow rate based on V_{tot} (QT_{ave}, l/min) $= 7.9 \cdot 10^{-4}$
Average flow rate based on V (Q_{ave} ,l/min) $= 5.5 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) $= 5.4 \cdot 10^{-5}$


PROTOTYPE, TR INJECTION TESTS, KA3544G01, 0.25-0.75 m recovery 2001-02-19 14:56:02
P
100
10
1
sp (KPa)
0.1
1
10
100
dte (min)


PROTOTYPE, TR INJECTION TESTS, KA3544G01, 0.25-0.75 m recovery 2001-02-19 14:56:02
P
0
5
10
15
20
25
sp (KPa)
0.1
1
10
100
dte (min)

Borehole KA3544G01, section 0.75 m – 1.25 m

Date: 01-02-19 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010219 15:10
Valve opened: 010219 15:35.02 Valve closed: 010219 15:55.02
Total flowing time : 20.0 min. Tot. Pr. Build-up time 10.0 min.

Pressure data

Pressure before injection start	(P0, KPa) :	115.2
Pressure just before closing the valve	(Pp, KPa) :	342.2
Pressure at the end of the recovery	(Pf, KPa) :	341.3

Flow data
Manually measured flow rates of KA3544G01, section 0.75 m – 1.25 m, are presented in the table below.

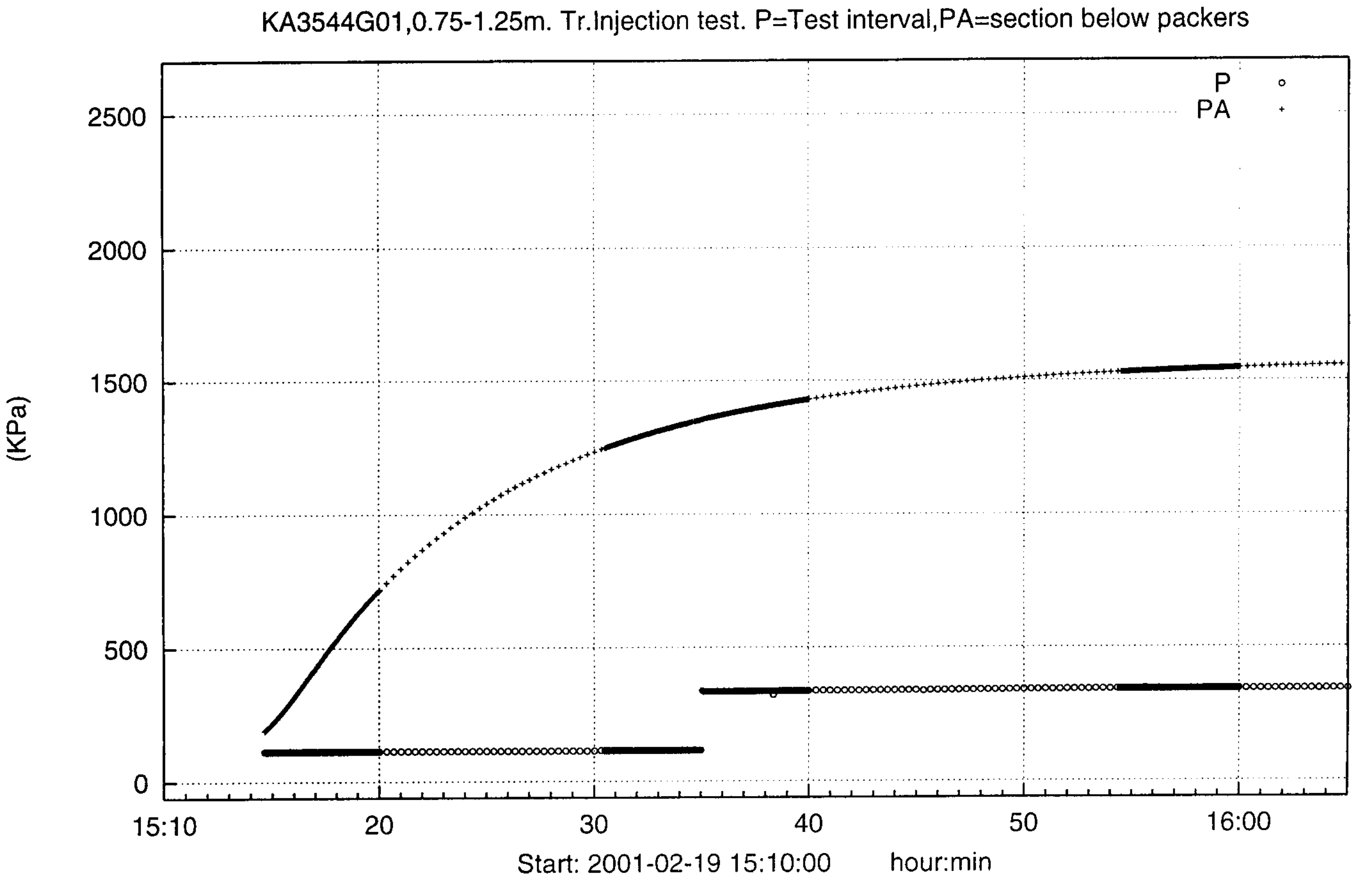
Table Manually measured flow rates, Injection Test in KA3544G01, section 0.75 m –1.25 m. Prototype Repository, February 2001

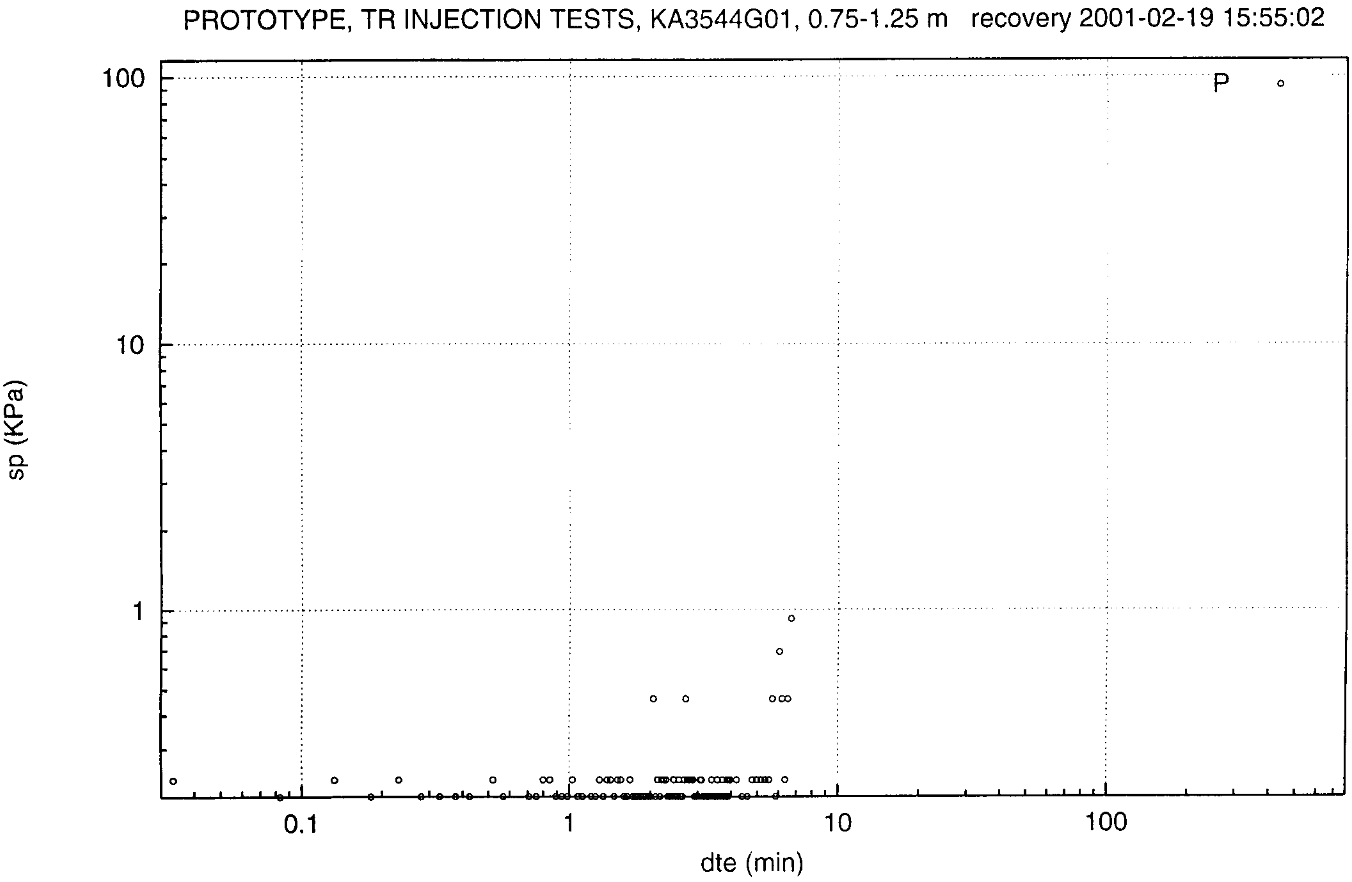
Time	Flow rate (l/min * 10^{-3})
13:35:04	147,7
13:35:24	0,187
13:37:20	0,033
13:41:30	0,022
13:46:30	0,022
13:49	0
13:54	0

Calculated flow and volume data

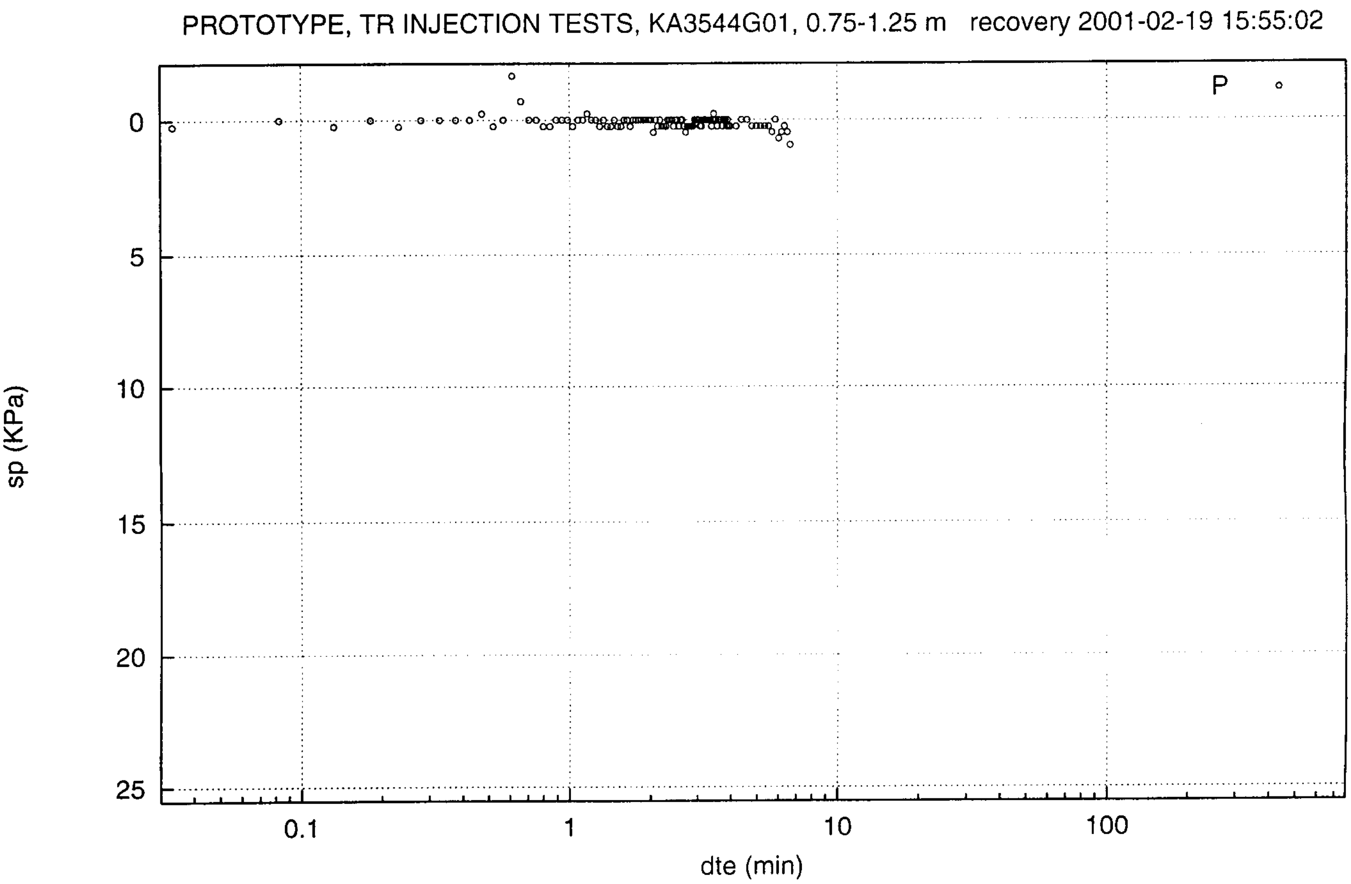
Total injected water volume	(Vtot, m^3)	= $1.3 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds	(V,m^3)	= $4,4 \cdot 10^{-7}$
Average flow rate based on Vtot	(QTave, l/min)	= $6.4 \cdot 10^{-4}$
Average flow rate based on V	(Qave ,l/min)	= $2.2 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase	(Qp, l/min)	= 0

Comment
Almost no recovery at all.


KA3544G01,0.75-1.25m. Tr.Injection test. P=Test interval,PA=section below packers
P
PA
2500
2000
1500
1000
500
0
(KPa)
15:10
20
30
40
50
16:00
Start: 2001-02-19 15:10:00
hour:min



PROTOTYPE, TR INJECTION TESTS, KA3544G01, 0.75-1.25 m recovery 2001-02-19 15:55:02
P
100
10
1
sp (KPa)
0.1
1
10
100
dte (min)



PROTOTYPE, TR INJECTION TESTS, KA3544G01, 0.75-1.25 m recovery 2001-02-19 15:55:02
P
0
5
10
15
20
25
sp (KPa)
0.1
1
10
100
dte (min)

Borehole KA3544G01, section 1.25 m – 1.75 m

Date: 01-02-19 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010219 16:08
Valve opened: 010219 16:30.02 Valve closed: 010219 16:50.02
Total flowing time : 20.0 min. Tot. Pr. Build-up time 10.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 135.7
Pressure just before closing the valve (Pp, KPa) : 339.4
Pressure at the end of the recovery (Pf, KPa) : 342.2

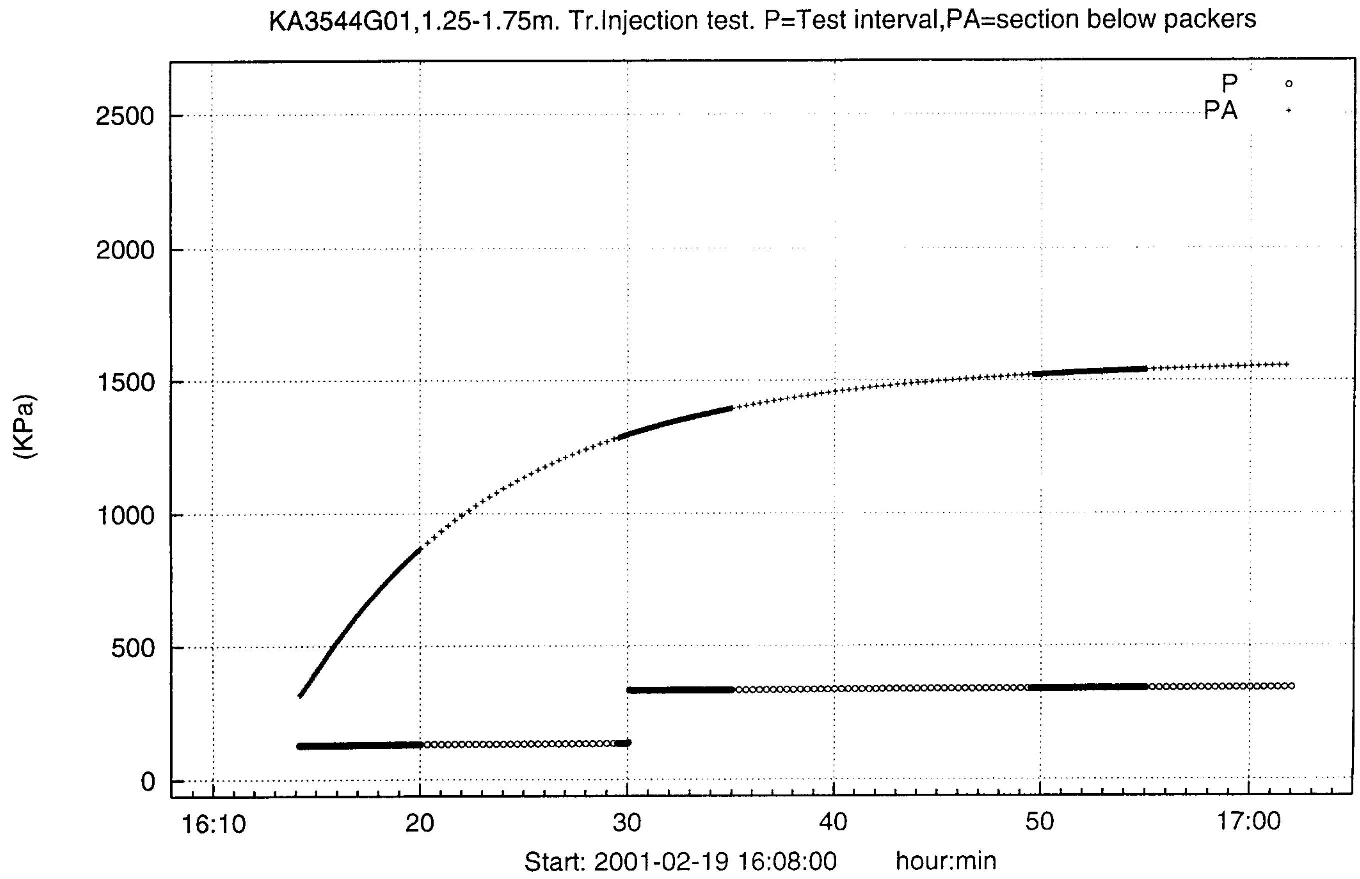
Flow data
Manually measured flow rates of KA3544G01, section 1.25 m –1.75 m, are presented in the table below.

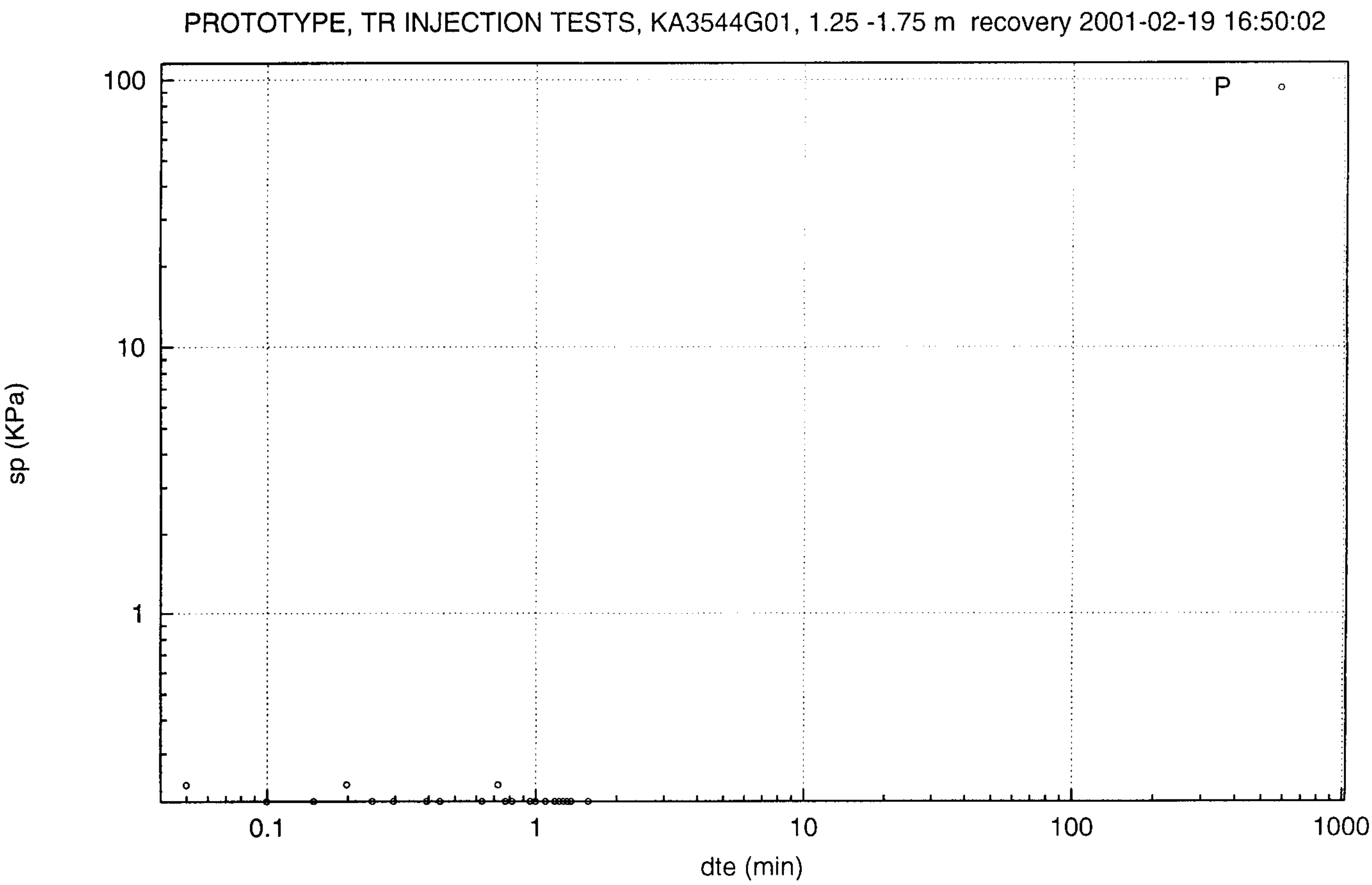
Table Manually measured flow rates, Injection Test in KA3544G01, section 1.25 m –1.75 m. Prototype Repository, February 2001

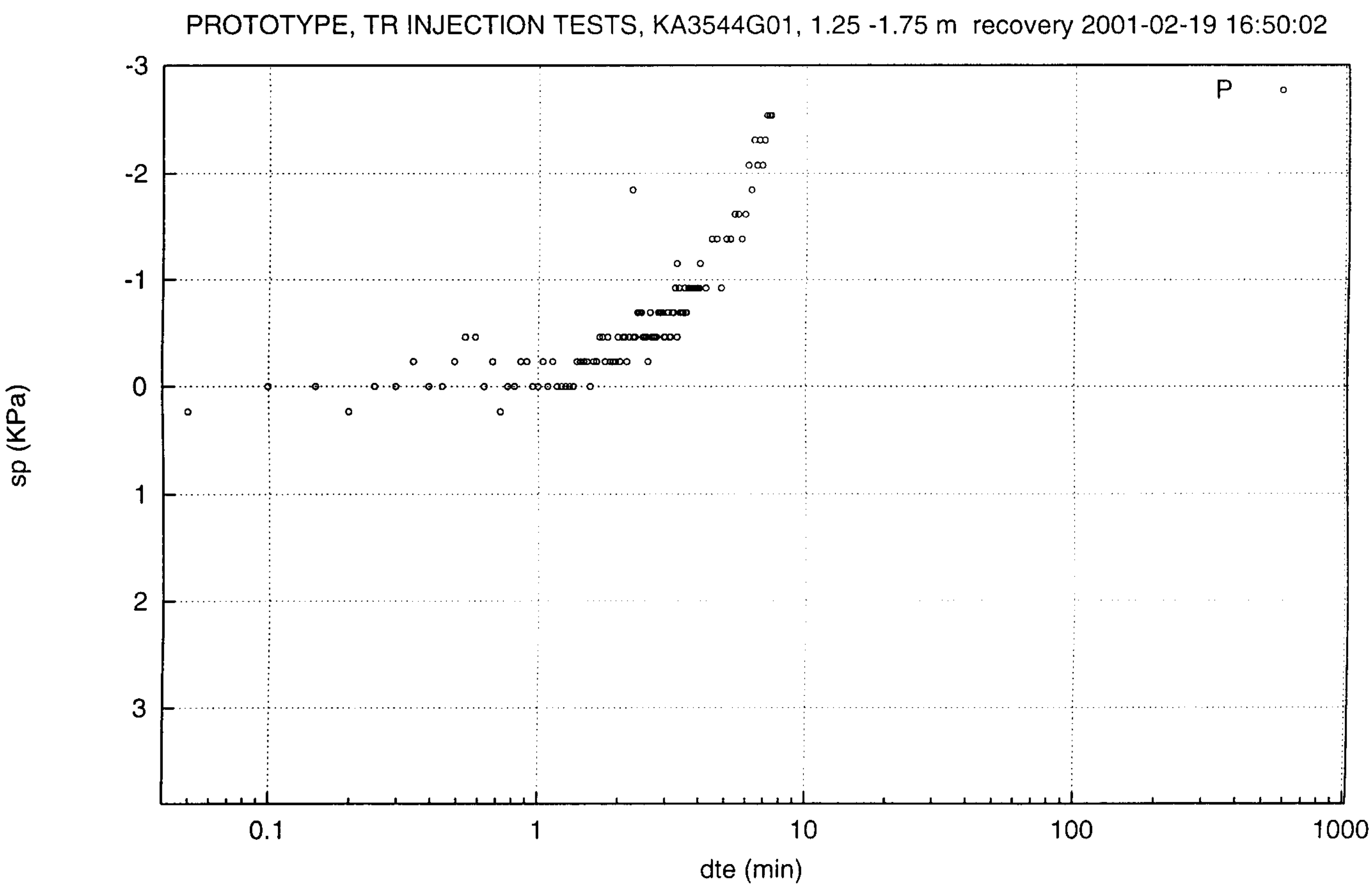
Time	Flow rate (l/min * 10^{-3})
16:30:04	125,5

Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $1.1 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds(V,m^3) = 0
Average flow rate based on Vtot (QTave, l/min) = $5.2 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) = 0
Flow rate at the end of the Flow Phase (Qp, l/min) = 0

Comment
The pressure increases during the recovery period.


KA3544G01,1.25-1.75m. Tr.Injection test. P=Test interval,PA=section below packers
P
PA
(KPa)
2500
2000
1500
1000
500
0
16:10
20
30
40
50
17:00
Start: 2001-02-19 16:08:00
hour:min


PROTOTYPE, TR INJECTION TESTS, KA3544G01, 1.25 -1.75 m recovery 2001-02-19 16:50:02
P
100
10
1
sp (KPa)
0.1
1
10
100
1000
dte (min)


PROTOTYPE, TR INJECTION TESTS, KA3544G01, 1.25 -1.75 m recovery 2001-02-19 16:50:02
P
-3
-2
-1
0
1
2
3
sp (KPa)
0.1
1
10
100
1000
dte (min)

Borehole KA3546G01, section 0.25 m - 0.75 m

Date: 01-02-19 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010216 13:10
Valve opened: 010219 09:29.01 Valve closed: 010219 09:49.01
Total flowing time : 20.0 min. Tot. Pr. Build-up time 10.3 min.

Pressure data
Pressure before injection start (P0, KPa) : 116.3
Pressure just before closing the valve (Pp, KPa) : 316.6
Pressure at the end of the recovery (Pf, KPa) : 229.1

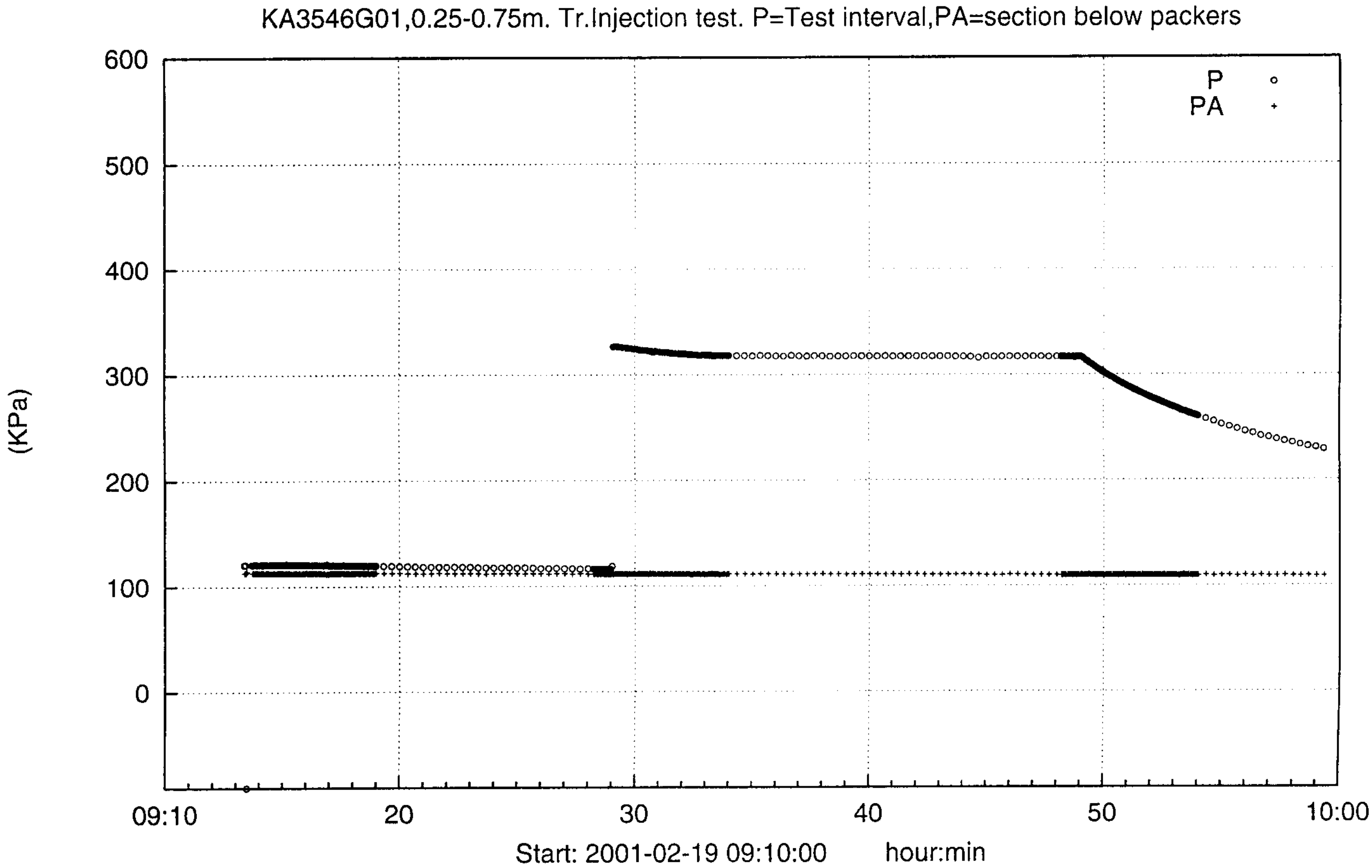
Flow data
Manually measured flow rates of KA3546G01, section 0.25 m –0.75 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3546G01, section 0.25 m –0.75 m. Prototype Repository, February 2001

TimeFlow rate	(l/min * 10^{-3})
09:29:03	231,3
09:29:08	2,61
09:29:16	0,653
09:29:31	1,634
09:29:51	0,980
09:30:46	1,089
09:34:31	0,762
09:35:31	0,871
09:36:31	0,653
09:37:31	0,871
09:38:31	0,762
09:40:01	0,599
09:42:01	0,653
09:44:01	0,817
09:46:01	0,545
09:48:01	0,708

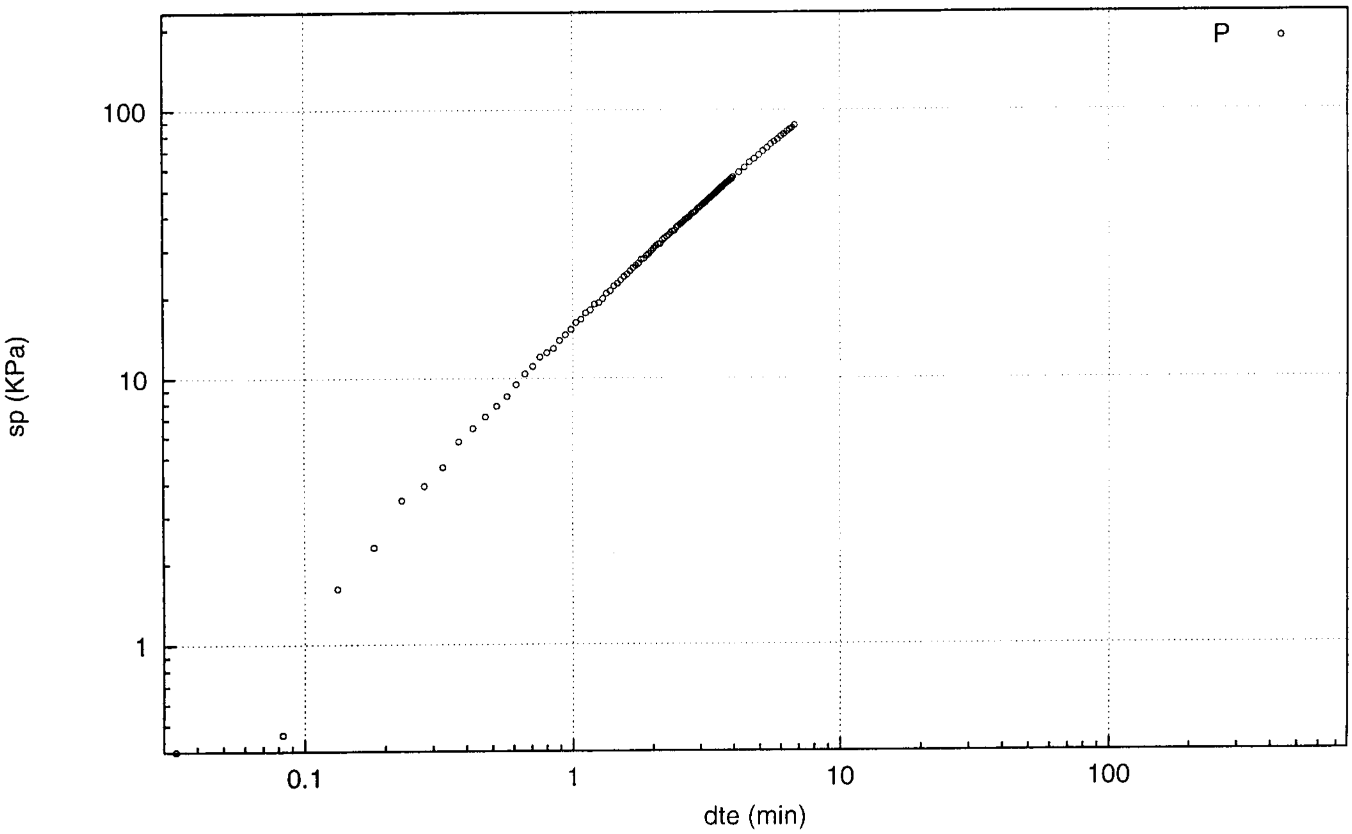
Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $3.5 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds(V,m^3) = $1,6 \cdot 10^{-5}$
Average flow rate based on Vtot (QTave, l/min) = $1.7 \cdot 10^{-3}$
Average flow rate based on V (Qave ,l/min) = $7.8 \cdot 10^{-4}$
Flow rate at the end of the Flow Phase (Qp, l/min) = $7.1 \cdot 10^{-4}$

Comment
The packer was expanded three days before the test.
The pressure decreases in the beginning of the flowing period.

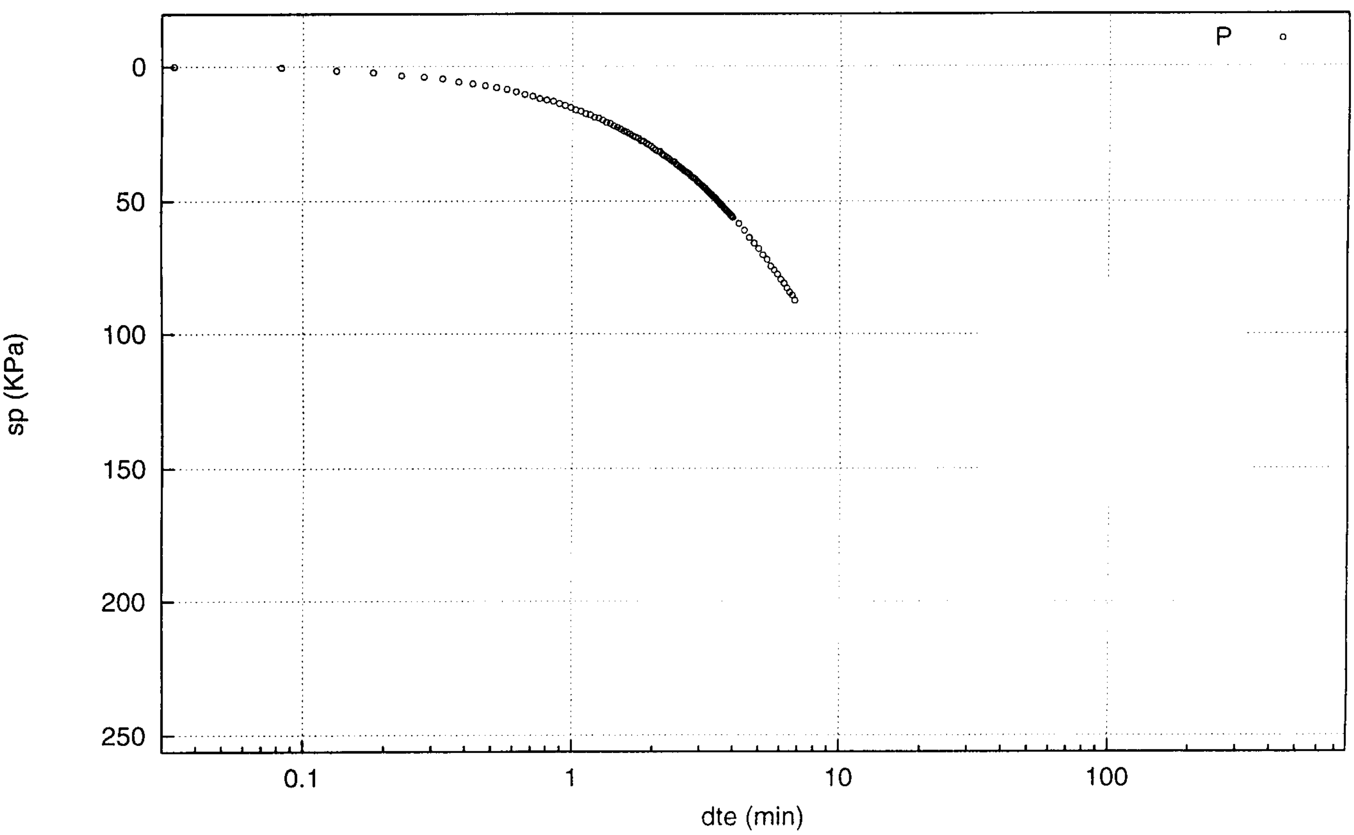


KA3546G01,0.25-0.75m. Tr.Injection test. P=Test interval,PA=section below packers
600
500
400
300
200
100
0
(KPa)
P
PA
09:10
20
30
40
50
10:00
Start: 2001-02-19 09:10:00
hour:min

PROTOTYPE, TR INJECTION TESTS, KA3546G01, 0.25-0.75 m recovery 2001-02-19 09:49:01



PROTOTYPE, TR INJECTION TESTS, KA3546G01, 0.25-0.75 m recovery 2001-02-19 09:49:01



Borehole KA3546G01, section 0.75 m – 1.25 m

Date: 01-02-19 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010219 10:05
Valve opened: 010219 10:29.02 Valve closed: 010219 10:49.02
Total flowing time : 20.0 min. Tot. Pr. Build-up time: 10.0 min.
Pressure data
Pressure before injection start (P0, KPa) : 117.5
Pressure just before closing the valve (Pp, KPa): 337.8
Pressure at the end of the recovery (Pf, KPa) : 336.6

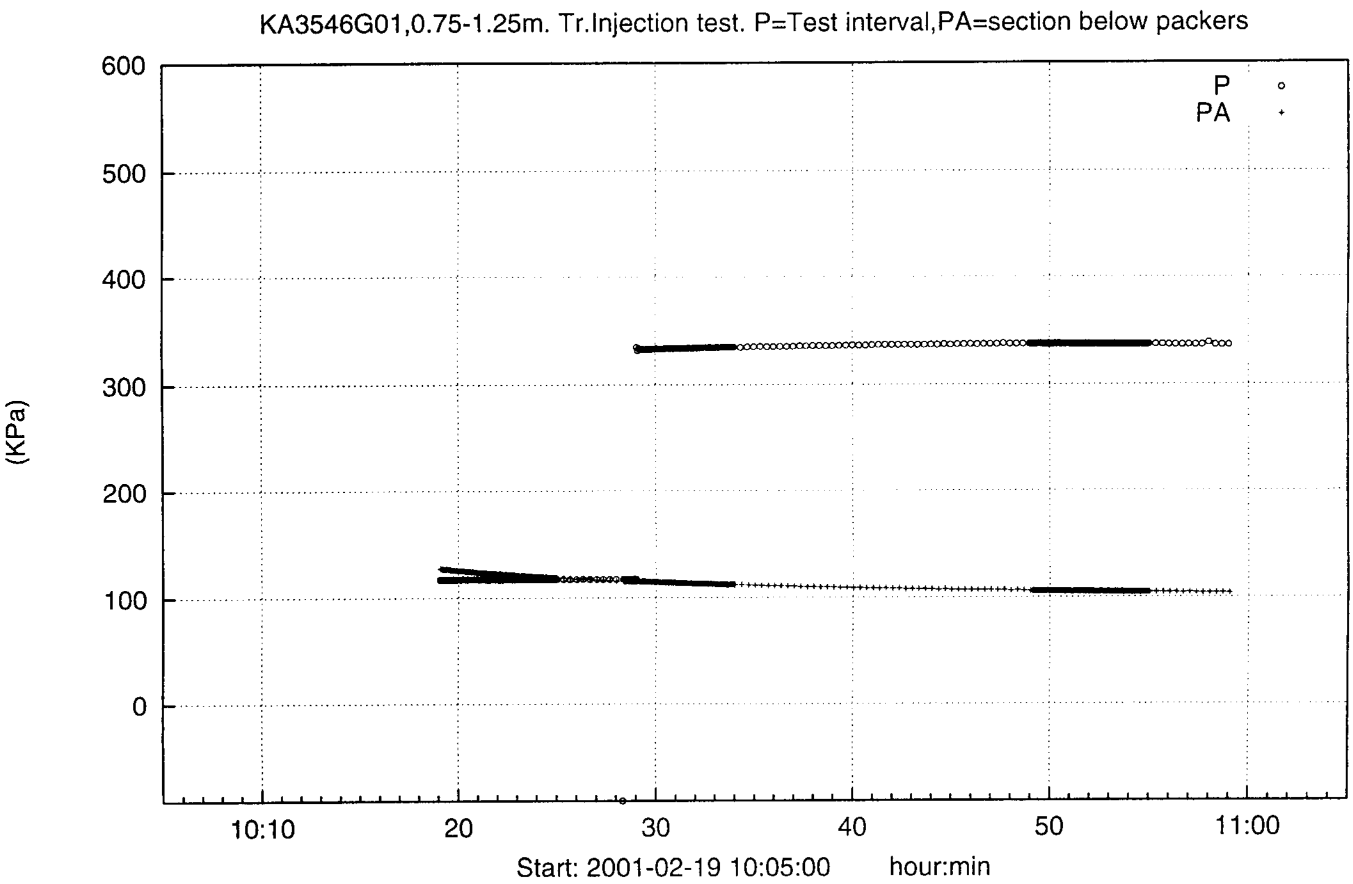
Flow data
Manually measured flow rates of KA3546G01, section 0.75 m –1.25 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3546G01, section 0.75 m –1.25 m. Prototype Repository, February 2001

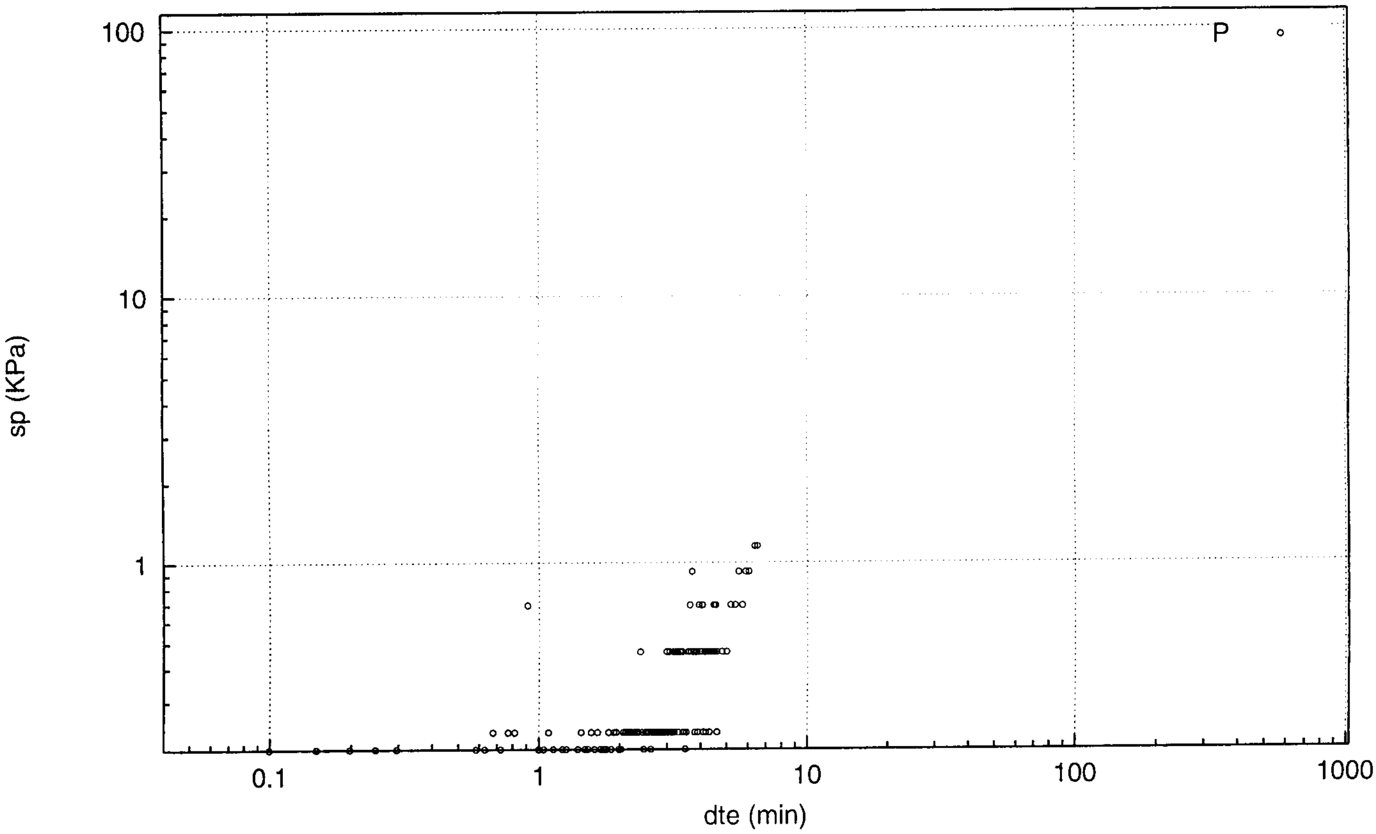
TimeFlow rate	(l/min * 10^{-3})
10:29:04	169,9
10:29:14	0,436
10:30:42	0,041
10:33:32	0,109
10:37:00	0,018
10:42:01	0,054

Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $1.5 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds (V,m^3) = $5,5 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) = $7.4 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) = $2.7 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) = $5.4 \cdot 10^{-5}$

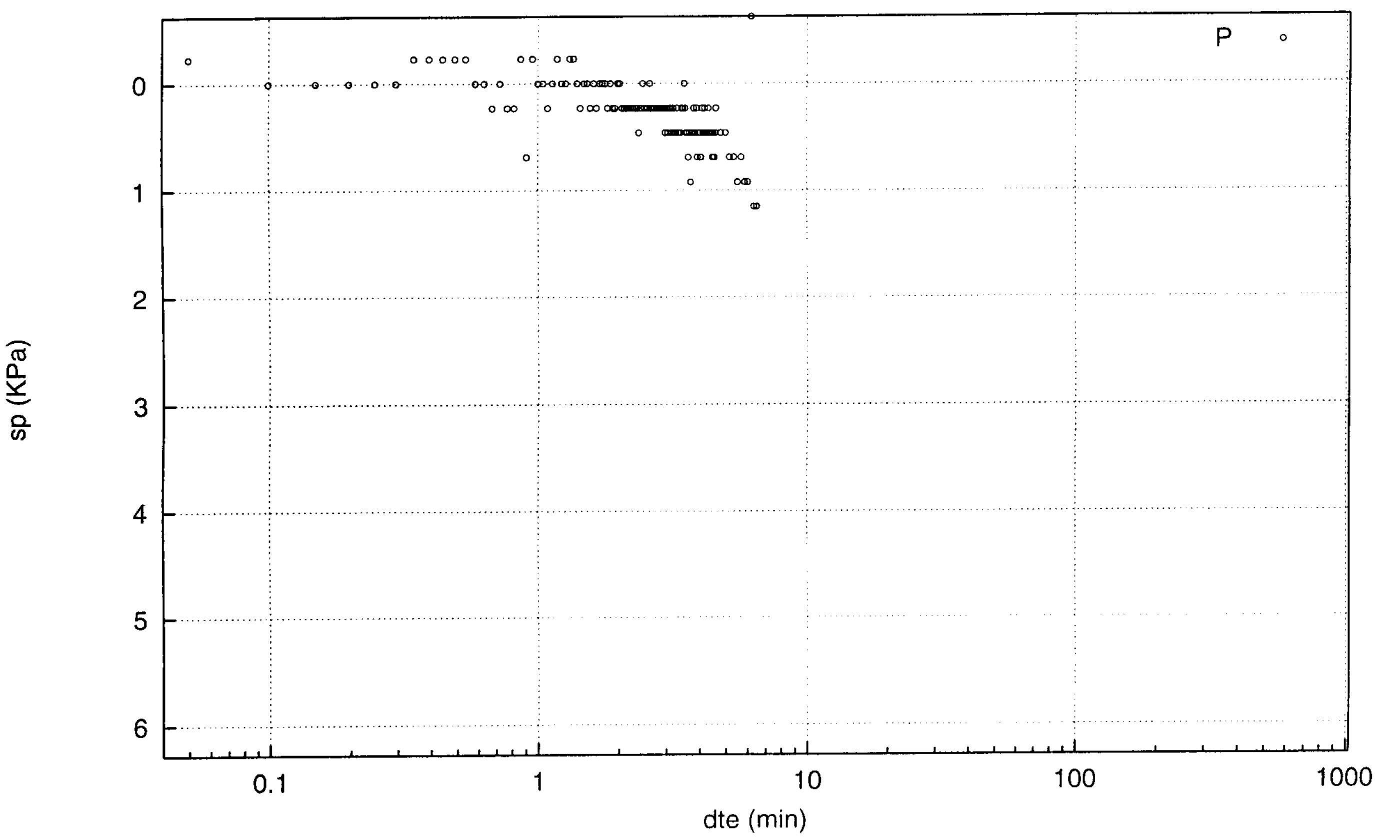
Comment
Very small recovery


KA3546G01,0.75-1.25m. Tr.Injection test. P=Test interval,PA=section below packers
P
PA
600
500
400
300
200
100
0
(KPa)
10:10
20
30
40
50
11:00
Start: 2001-02-19 10:05:00
hour:min

PROTOTYPE, TR INJECTION TESTS, KA3546G01, 0.75 - 1.25 m recovery 2001-02-19 10:49:02



PROTOTYPE, TR INJECTION TESTS, KA3546G01, 0.75 - 1.25 m recovery 2001-02-19 10:49:02



Borehole KA3546G01, section 1.25 m – 1.75 m

Date: 01-02-19 Field Crew: B. Gentzschein, J. Källgården

Packer expansion: 010219 11:07
Valve opened: 010219 11:19.03 Valve closed: 010219 11:39.02
Total flowing time : 20.0 min. Tot. Pr. Build-up time: 80.0 min.

Pressure data
Pressure before injection start (P_0, KPa) : 110.3
Pressure just before closing the valve (P_p, KPa) : 380.7
Pressure at the end of the recovery (P_f, KPa) : 371.2

Flow data
Manually measured flow rates of KA3546G01, section 1.25 m –1.75 m, are presented in the table below.

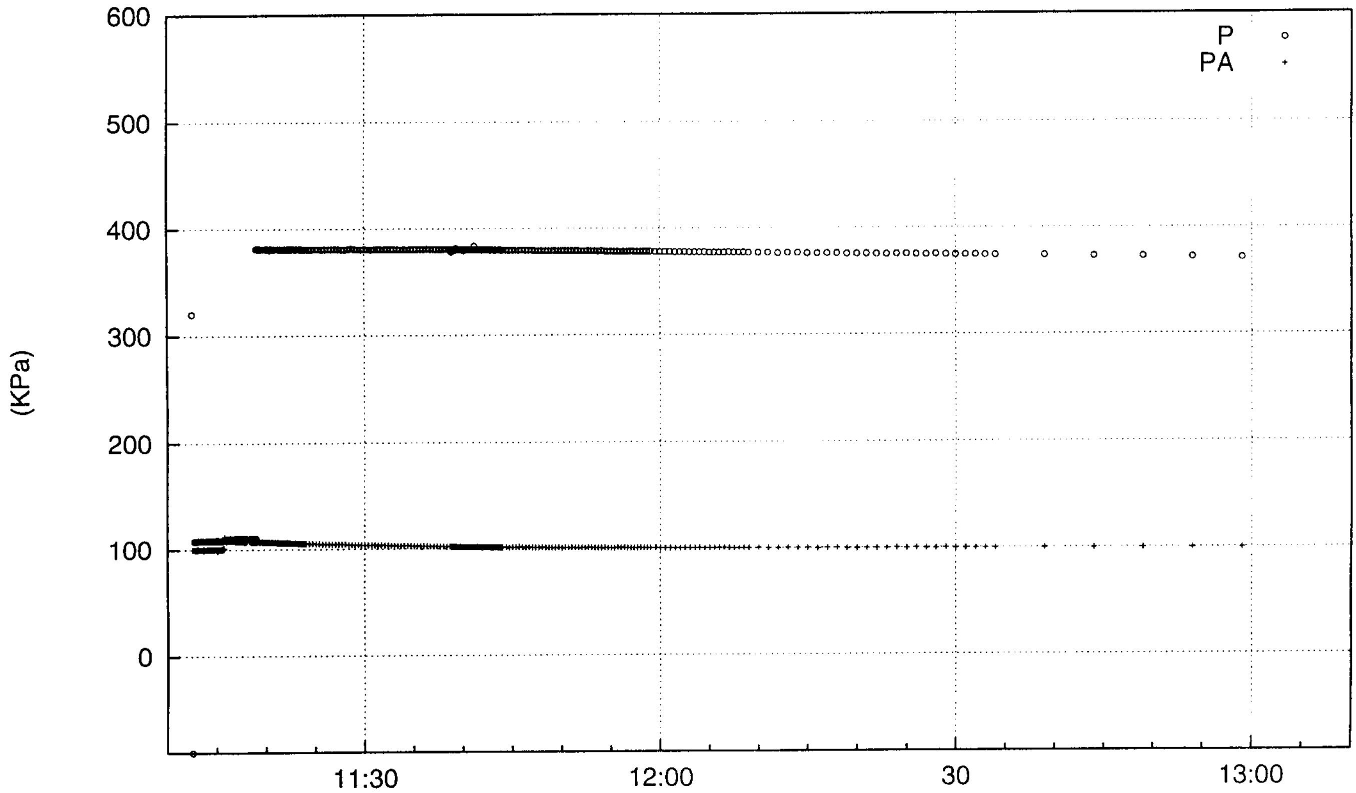
Table Manually measured flow rates, Injection Test in KA3546G01, section 1.25 m –1.75 m. Prototype Repository, February 2001

Time	Flow rate (l/min * 10^{-3})
11:19:05	181,7
11:19:53	0,327
11:21:03	0,055
11:24:03	0,027
11:28:30	0,022
11:32	0
11:39	0

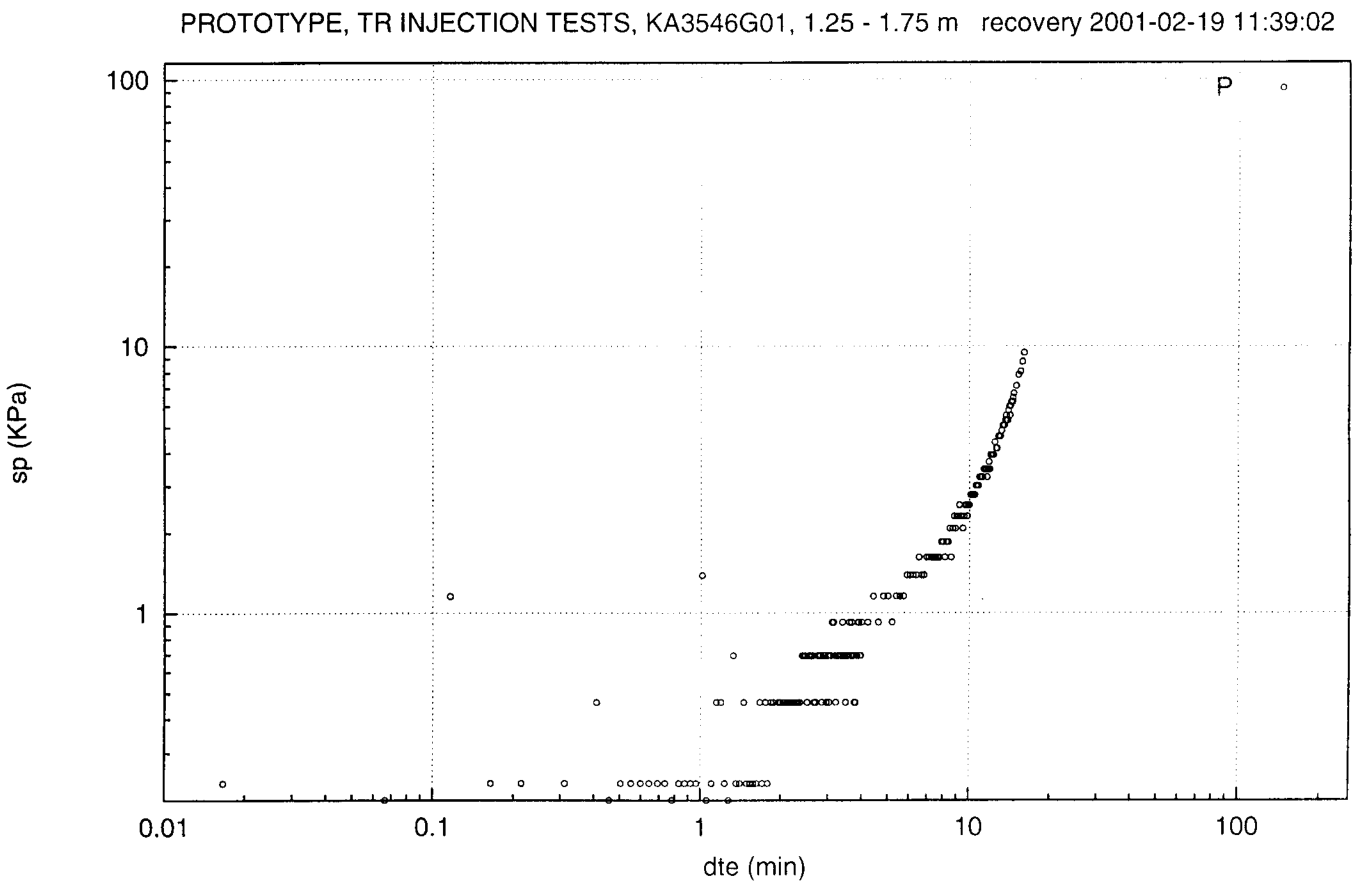
Calculated flow and volume data
Total injected water volume (V_{tot}, m^3) = $1.5 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds (V,m^3) = $4,4 \cdot 10^{-7}$
Average flow rate based on V_{tot} (QT_{ave}, l/min) = $7.5 \cdot 10^{-4}$
Average flow rate based on V (Q_{ave} ,l/min) = $2.2 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) = 0

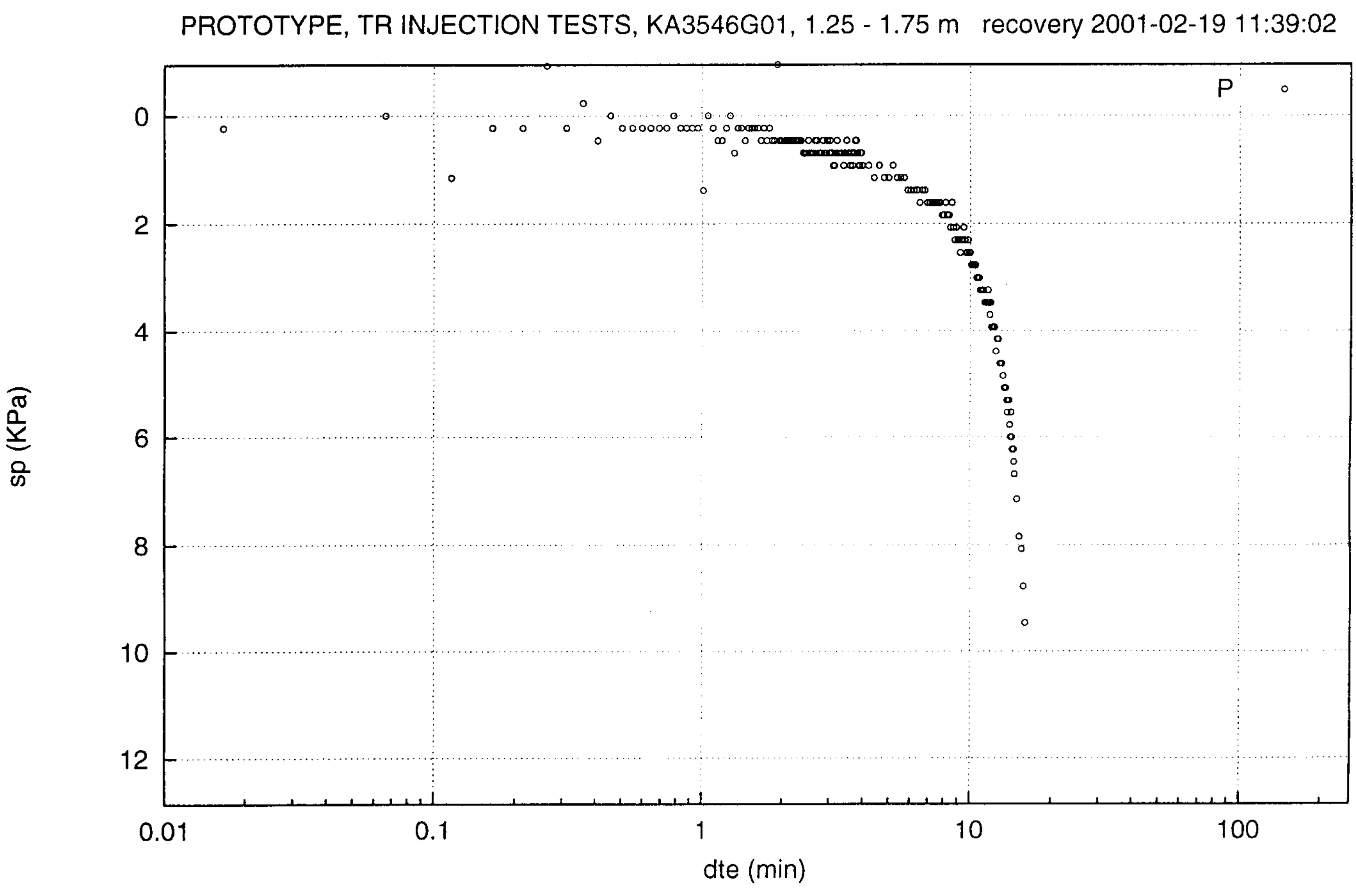
Comment
The recovery lasted over lunch.

KA3546G01,1.25-1.75m. Tr.Injection test. P=Test interval,PA=section below packers



Start: 2001-02-19 11:10:00 hour:min


PROTOTYPE, TR INJECTION TESTS, KA3546G01, 1.25 - 1.75 m recovery 2001-02-19 11:39:02
P
100
10
1
sp (KPa)
0.01
0.1
1
10
100
dte (min)


PROTOTYPE, TR INJECTION TESTS, KA3546G01, 1.25 - 1.75 m recovery 2001-02-19 11:39:02
P
0
2
4
6
8
10
12
sp (KPa)
0.01
0.1
1
10
100
dte (min)

Borehole KA3548G01, section 0.25 m - 0.75 m

Date: 01-02-15 Field Crew: B. Gentzschein, T. Sträng
Packer expansion: 010215 09:26
Valve opened: 010215 09:52.01 Valve closed: 010215 10:21.01
Total flowing time : 20.0 min. Tot. Pr. Build-up time 11.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 114.0
Pressure just before closing the valve (Pp, KPa): 320.3
Pressure at the end of the recovery (Pf, KPa) : 315.7

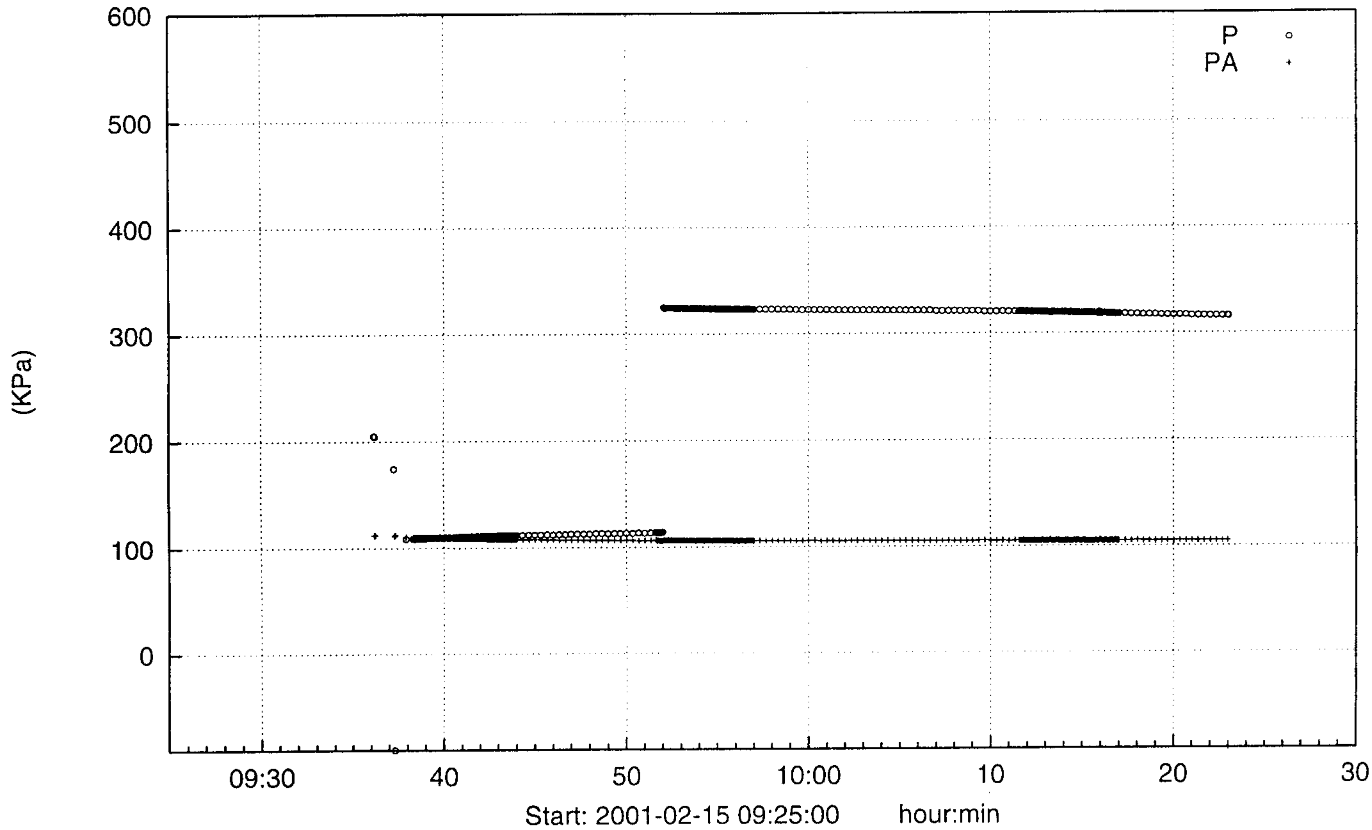
Flow data
Manually measured flow rates of KA3548G01, section 0.25 m –0.75 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3548G01, section 0.25 m –0.75 m. Prototype Repository, February 2001

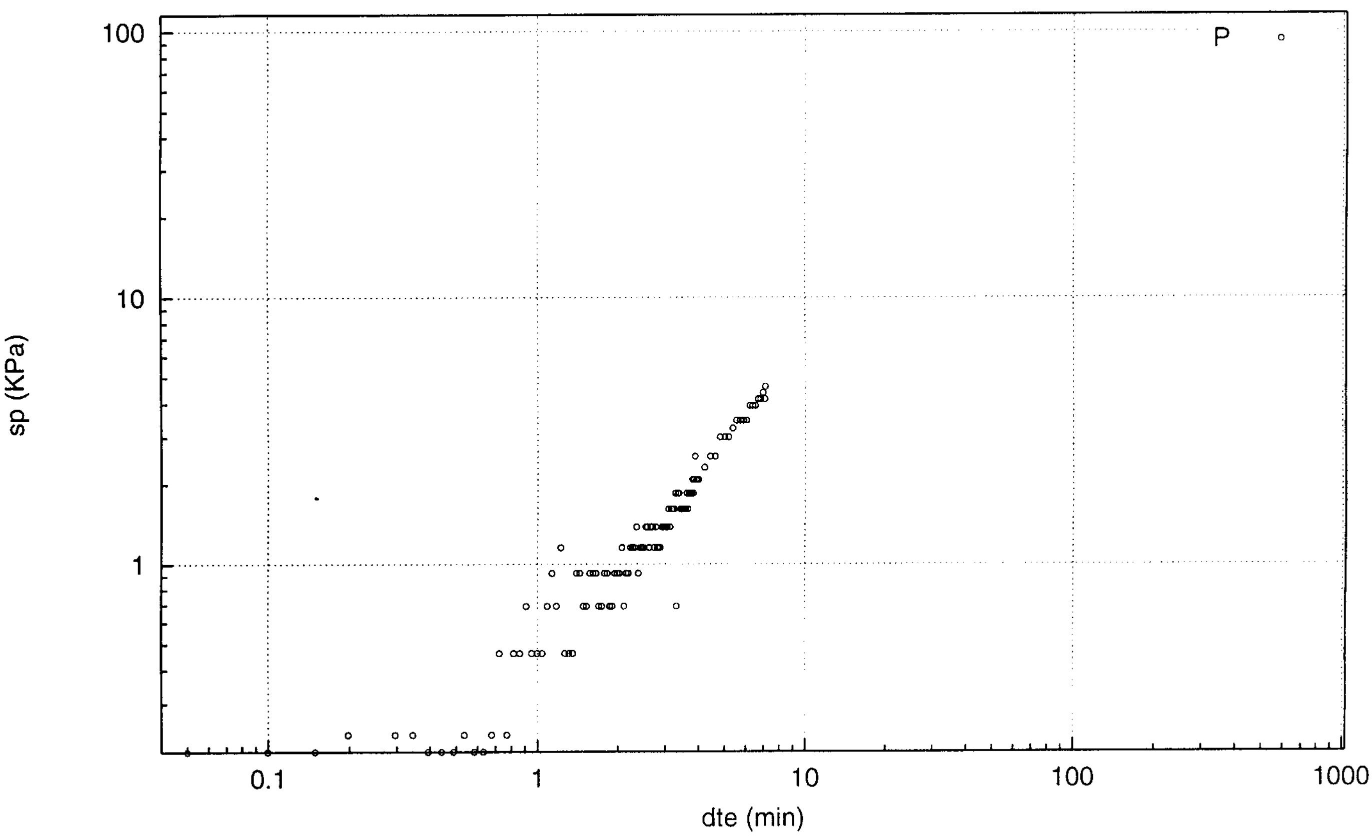
TimeFlow rate	(l/min * 10-3)
09:52:03	47,1
09:53:31	0,045
09:56:16	0,031
09:59:00	0
10:11	0

Calculated flow and volume data
Total injected water volume (Vtot, m^3) $= 4.1 \cdot 10^{-6}$
Injected volume excluding the first 10 seconds(V,m^3) $= 2,2 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) $= 2.1 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) $= 1.1 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) = 0

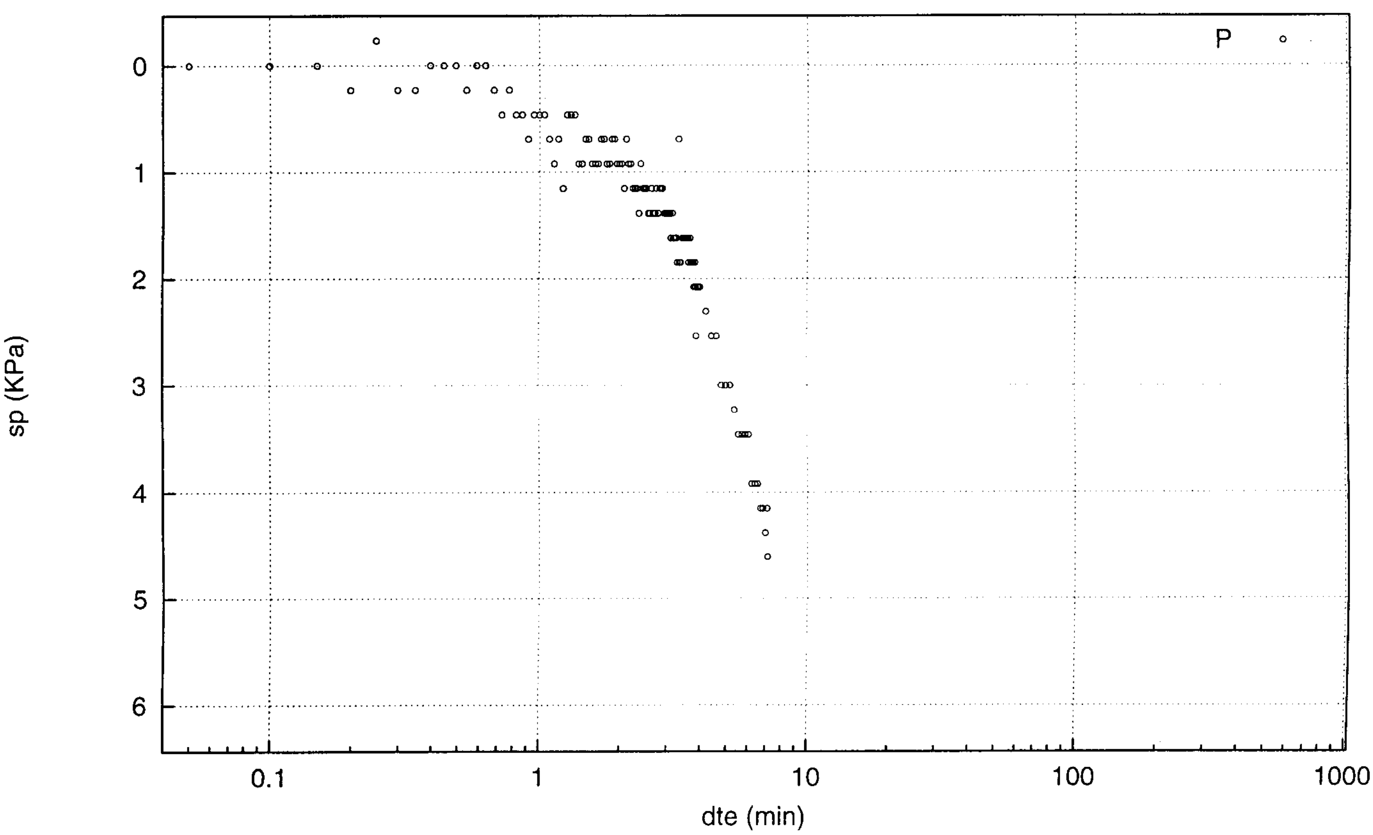
KA3548G01,0.25-0.75m. Tr.Injektion test.P=Test interval,PA=section below packers



PROTOTYPE, TR INJECTION TESTS, KA3548G01, 0.25-0.75 m recovery 2001-02-15 10:12:01



PROTOTYPE, TR INJECTION TESTS, KA3548G01, 0.25-0.75 m recovery 2001-02-15 10:12:01



Borehole KA3548G01, section 0.75 m – 1.25 m

Date: 01-02-14 Field Crew: B. Gentzschein, T. Sträng
Packer expansion: 010214 17:30
Valve opened: 010214 17:53.00 Valve closed: 010214 18:13.00
Total flowing time : 20.0 min. Tot. Pr. Build-up time: 841 min.

Pressure data
Pressure before injection start (P0, KPa) : 120.7
Pressure just before closing the valve (Pp, KPa): 329.5
Pressure at the end of the recovery (Pf, KPa) : 219.0

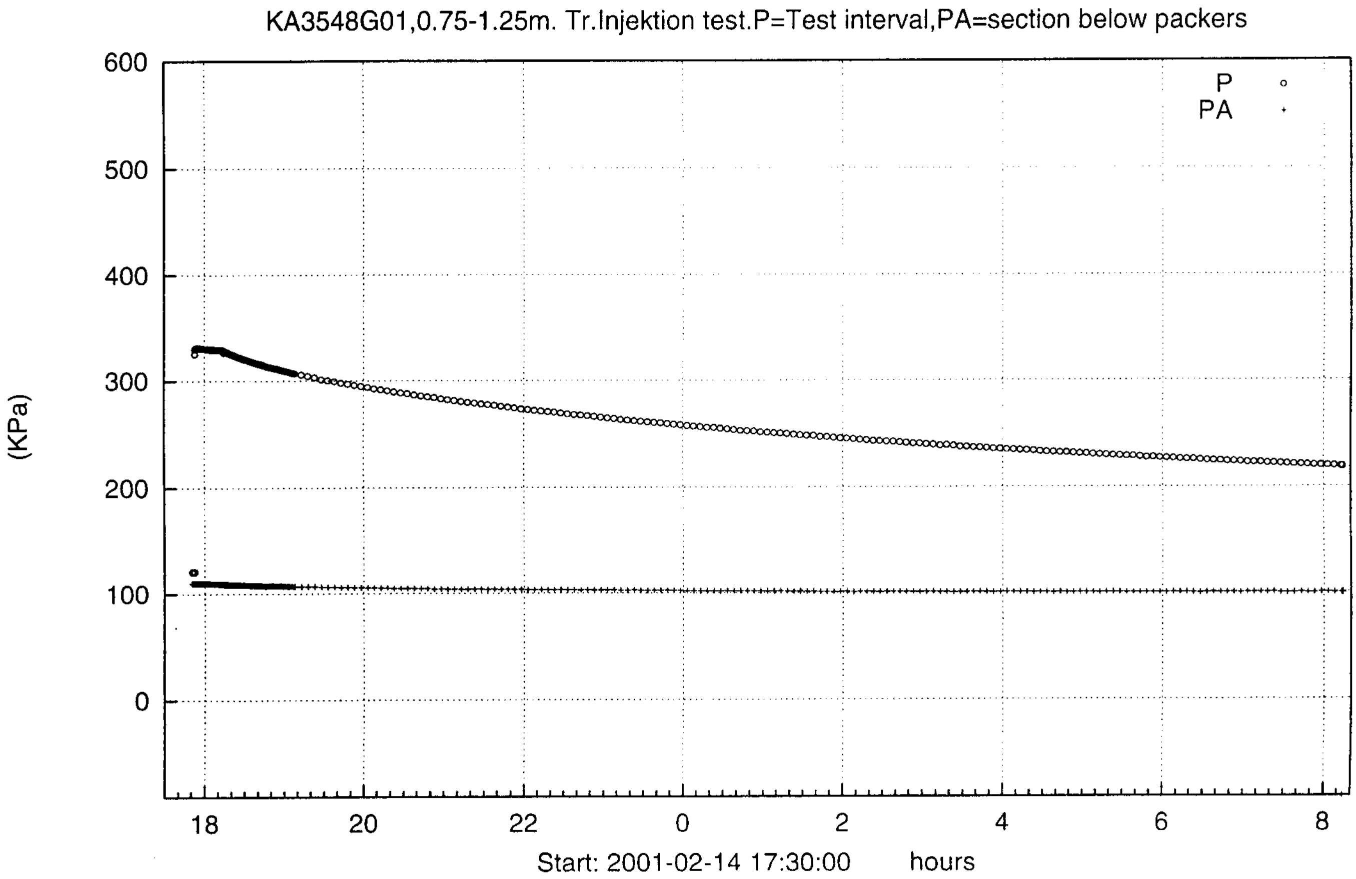
Flow data
Manually measured flow rates of KA3548G01, section 0.75 m –1.25 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3548G01, section 0.75 m –1.25 m. Prototype Repository, February 2001

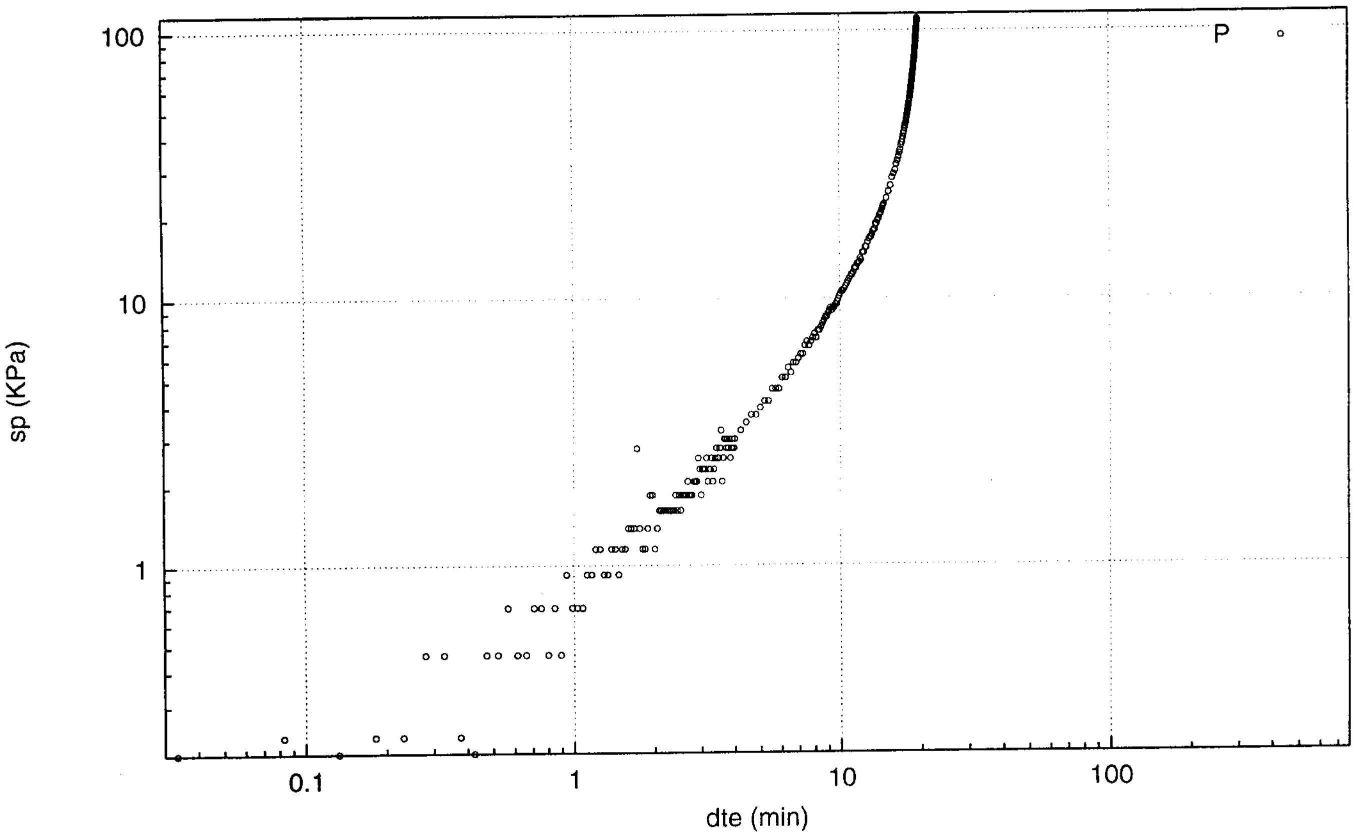
TimeFlow rate	(l/min * 10^{-3})
17:53:05	34,0
17:53:43	0,101
17:57:08	0,019
18:05:30	0,010

Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $6.0 \cdot 10^{-6}$
Injected volume excluding the first 10 seconds (V,m^3) = $3,3 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) = $3.0 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) = $1.6 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) = $1.0 \cdot 10^{-5}$

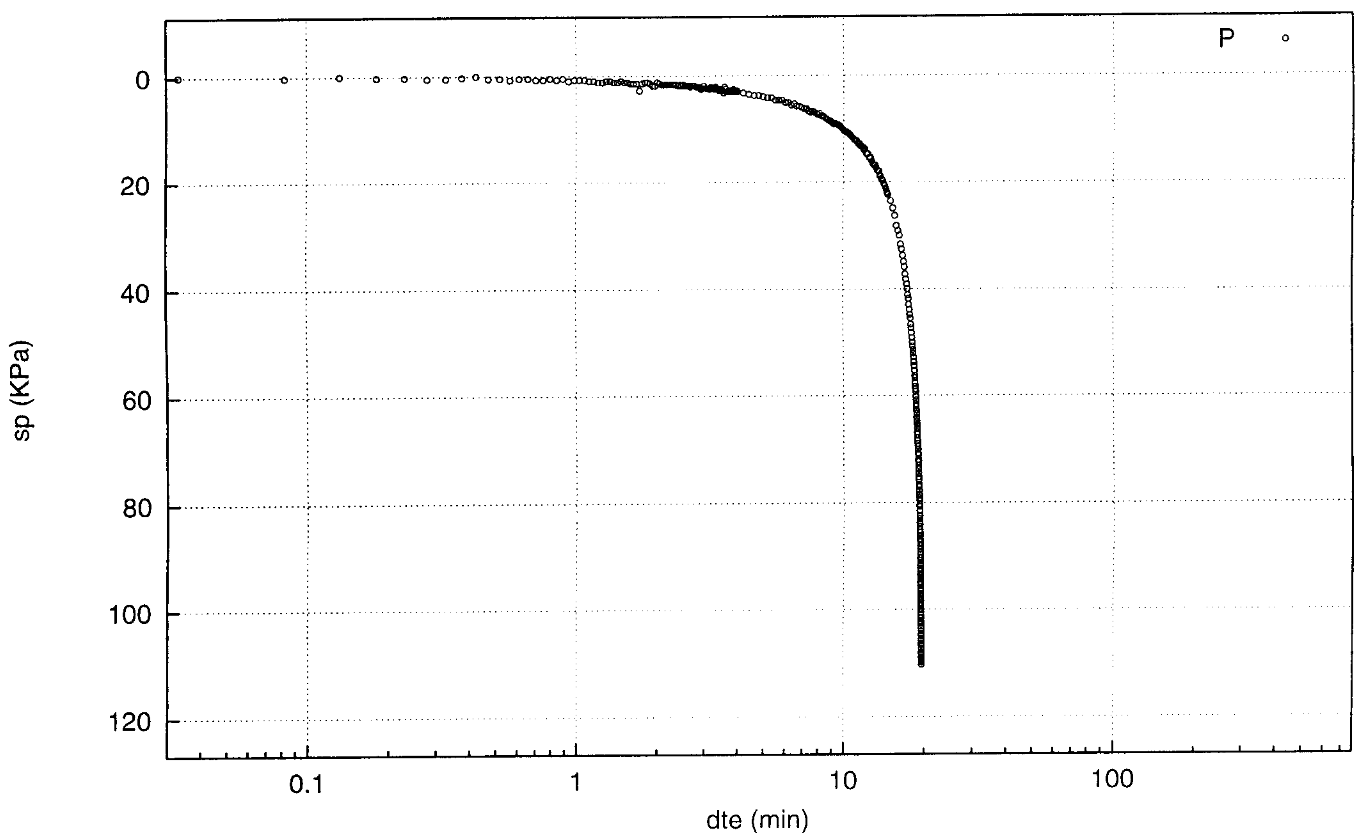
Comment
The recovery period lasted over the night.


KA3548G01,0.75-1.25m. Tr.Injektion test.P=Test interval,PA=section below packers
P
PA
(KPa)
600
500
400
300
200
100
0
18
20
22
0
2
4
6
8
Start: 2001-02-14 17:30:00
hours

PROTOTYPE, TR INJECTION TESTS, KA3548G01, 0.75-1.25 m recovery 2001-02-14 18:13:00



PROTOTYPE, TR INJECTION TESTS, KA3548G01, 0.75-1.25 m recovery 2001-02-14 18:13:00



Borehole KA3548G01, section 1.25 m – 1.75 m

Date:01-02-15 Field Crew: B. Gentzschein, T. Sträng

Packer expansion: 010215 08:24
Valve opened: 010215 08:46.00 Valve closed: 010214 09:06.00
Total flowing time : 20.0 min. Tot. Pr. Build-up time: 10.0 min.

Pressure data
Pressure before injection start (P_0, KPa) : 109.4
Pressure just before closing the valve (P_p, KPa): 318.2
Pressure at the end of the recovery (P_f, KPa) : 315.0

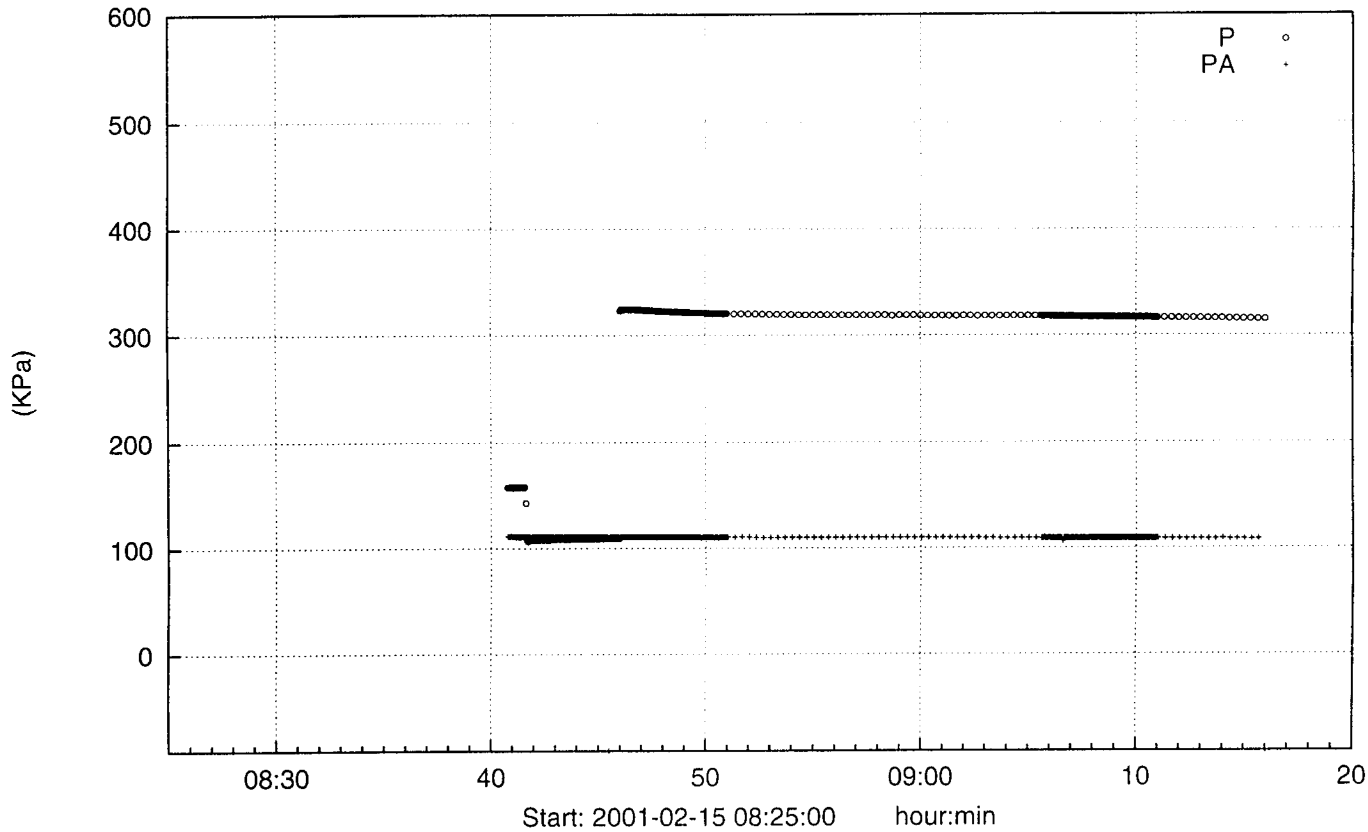
Flow data
Manually measured flow rates of KA3548G01, section 1.25 m –1.75 m, are presented in the table below.

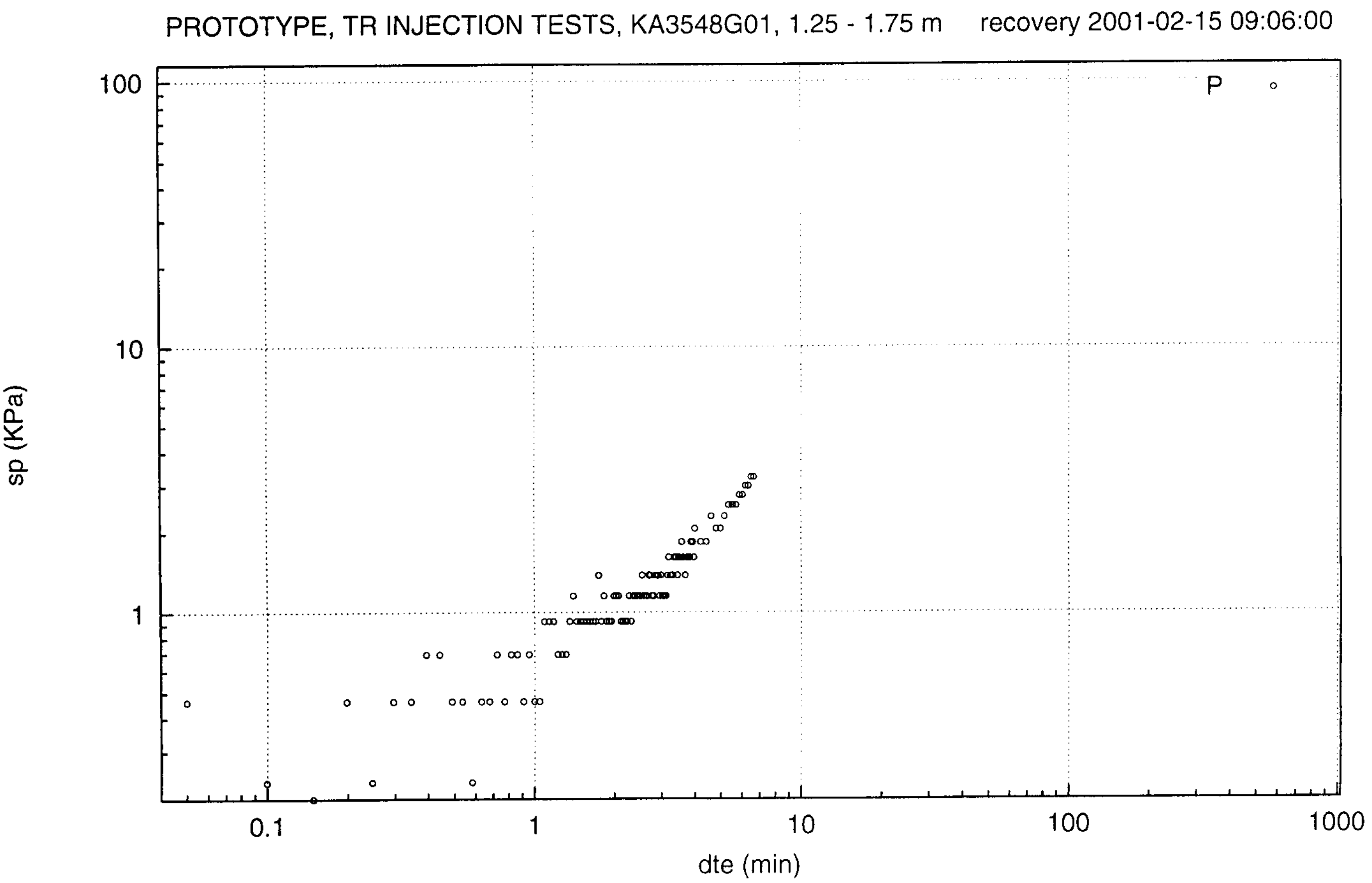
Table Manually measured flow rates, Injection Test in KA3548G01, section 1.25 m –1.75 m. Prototype Repository, February 2001

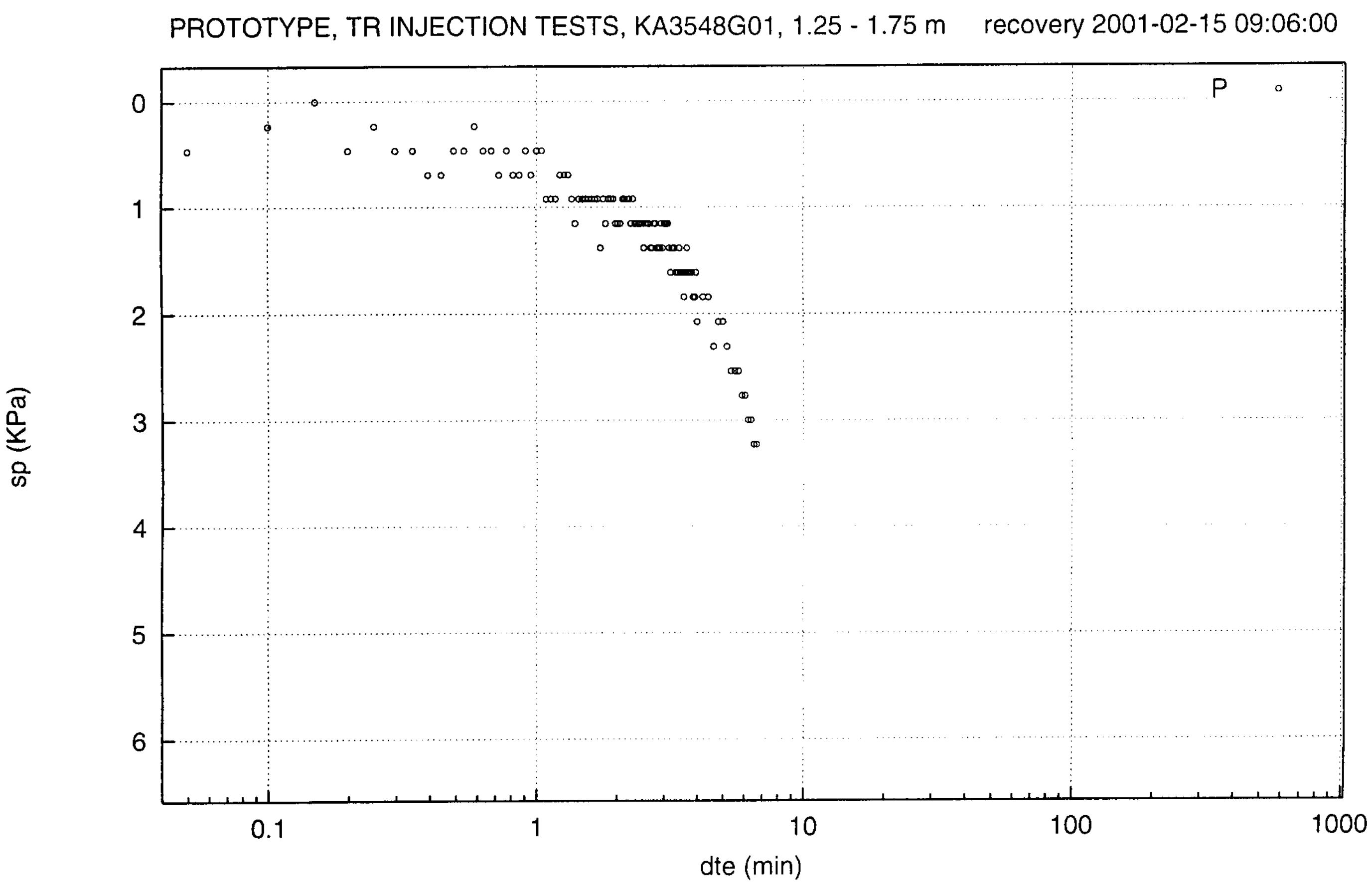
Time	Flow rate (l/min * 10^{-3})
08:46:05	27,4
08:46:15	0,653
08:47:10	0,065
08:49:00	0
09:05:00	0

Calculated flow and volume data
Total injected water volume (V_{tot}, m^3) = $4.8 \cdot 10^{-6}$
Injected volume excluding the first 10 seconds(V,m^3) = $2,2 \cdot 10^{-7}$
Average flow rate based on V_{tot} (QT_{ave}, l/min) = $2.4 \cdot 10^{-4}$
Average flow rate based on V (Q_{ave} ,l/min) = $1.1 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) = 0

KA3548G01,1.25-1.75m. Tr.Injektion test.P=Test interval,PA=section below packers




PROTOTYPE, TR INJECTION TESTS, KA3548G01, 1.25 - 1.75 m
recovery 2001-02-15 09:06:00
P
sp (KPa)
100
10
1
0.1
1
10
100
1000
dte (min)


PROTOTYPE, TR INJECTION TESTS, KA3548G01, 1.25 - 1.75 m
recovery 2001-02-15 09:06:00
P
sp (KPa)
0
1
2
3
4
5
6
0.1
1
10
100
1000
dte (min)

Borehole KA3550G01, section 0.25 m - 0.75 m

Date: 01-02-20 | Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010220 11:22
Valve opened :010220 11:50.03 | Valve closed: 010220 12:10.02
Total flowing time : 20.0 min. | Tot. Pr. Build-up time 81.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 101.6
Pressure just before closing the valve (Pp, KPa) : 315.9
Pressure at the end of the recovery (Pf, KPa) : 101.6

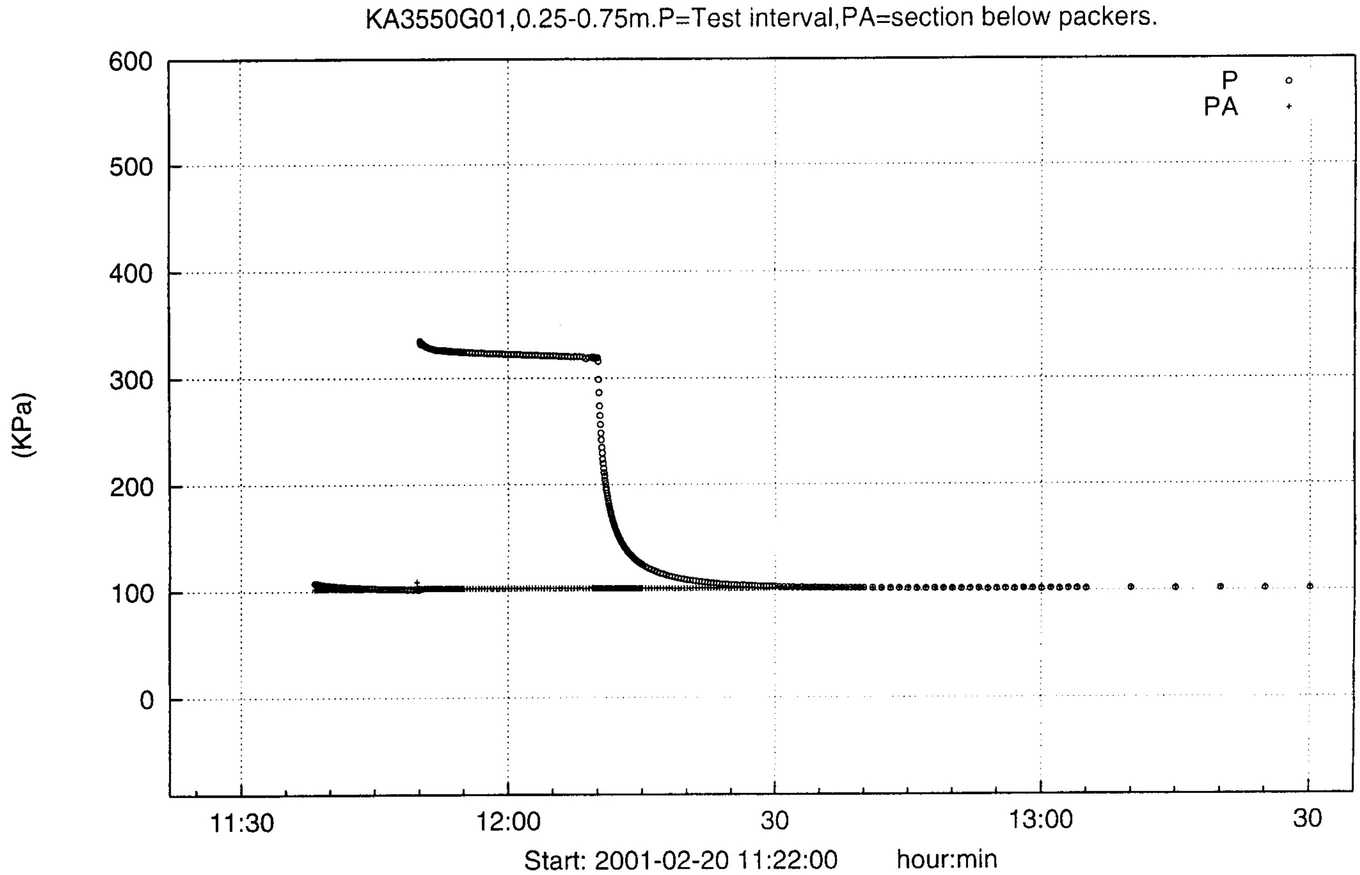
Flow data
Manually measured flow rates of KA3550G01, section 0.25 m –0.75 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3550G01, section 0.25 m –0.75 m. Prototype Repository, February 2001

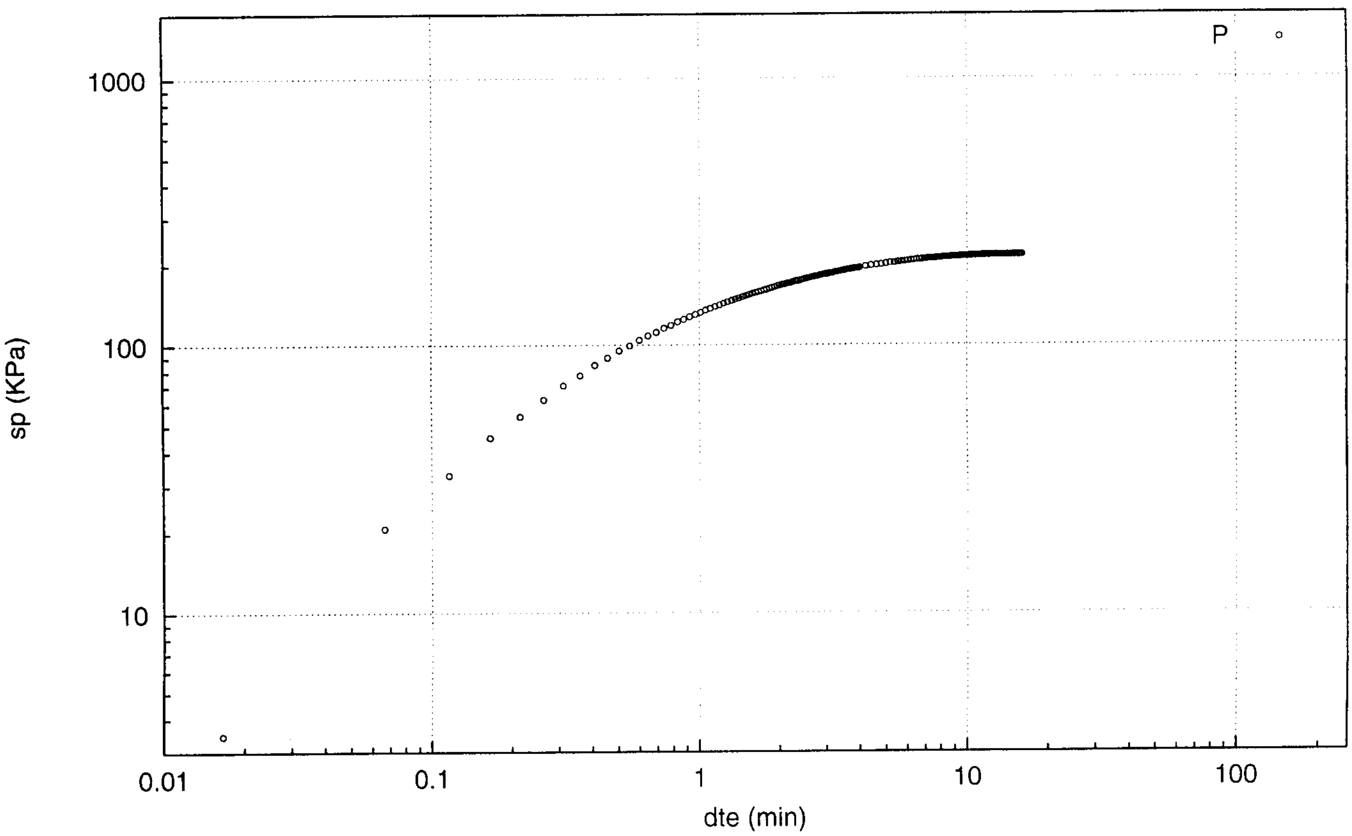
Time	Flow rate (l/min * 10-3)
11:50:05	78,4
11:50:10	5,228
11:50:18	7,842
11:50:33	5,881
11:50:53	5,554
11:51:25	7,406
11:51:48	4,356
11:52:18	4,792
11:52:48	5,010
11:54:33	4,683
11:56:33	4,465
11:58:33	4,356
12:01:03	4,302
12:03:03	4,193
12:05:03	3,921
12:07:03	0,926
12:09:03	7,134

Calculated flow and volume data
Total injected water volume (Vtot, m3) $= 9.5 \cdot 10^{-5}$
Injected volume excluding the first 10 seconds(V,m3) $= 8,8 \cdot 10^{-5}$
Average flow rate based on Vtot (QTave, l/min) $= 4.8 \cdot 10^{-3}$
Average flow rate based on V (Qave ,l/min) $= 4.4 \cdot 10^{-3}$
Flow rate at the end of the Flow Phase (Qp, l/min) $= 4.3 \cdot 10^{-3}$

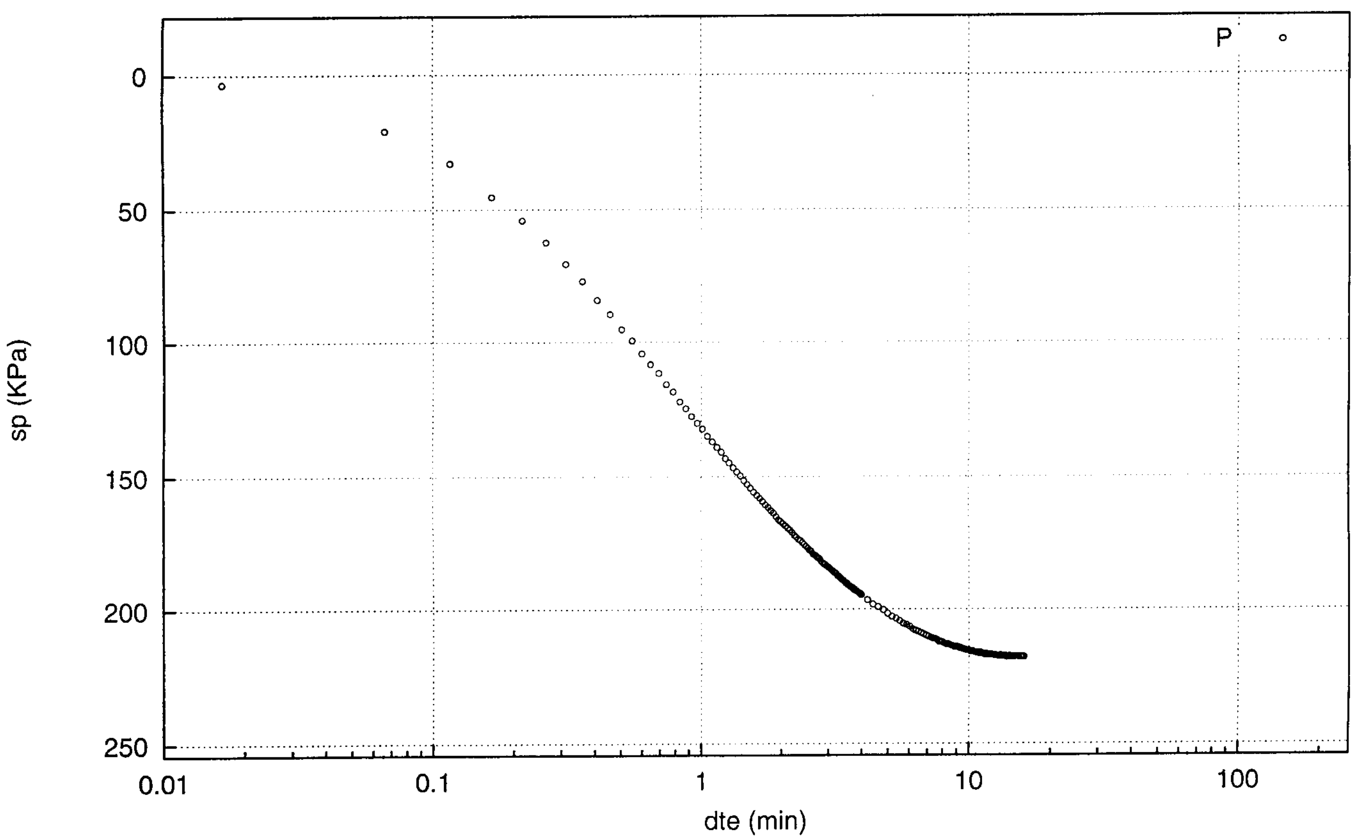
Comment
The two last flow rate values are too low and too high respectively compared with the preceding flow values, probably due to misreading of the water level. Therefore Qp has been set as the average of the two last flow rate values.


KA3550G01,0.25-0.75m.P=Test interval,PA=section below packers.
P
PA
600
500
400
300
200
100
0
(KPa)
11:30
12:00
30
13:00
30
Start: 2001-02-20 11:22:00
hour:min

PROTOTYPE,TR INJECTION TEST KA3550G01, 0.25-0.75 m recovery 2001-02-20 12:10:02



PROTOTYPE,TR INJECTION TEST KA3550G01, 0.25-0.75 m recovery 2001-02-20 12:10:02



Borehole KA3550G01, section 0.75 m – 1.25 m

Date: 01-02-20 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010220 13:35
Valve opened: 010220 13:54.03 Valve closed: 010220 14:14.03
Total flowing time : 20.0 min. Tot. Pr. Build-up time 10.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 109.2
Pressure just before closing the valve (Pp, KPa): 349.1
Pressure at the end of the recovery (Pf, KPa) : 346.8

Flow data
Manually measured flow rates of KA3550G01, section 0.75 m –1.25 m, are presented in the table below.

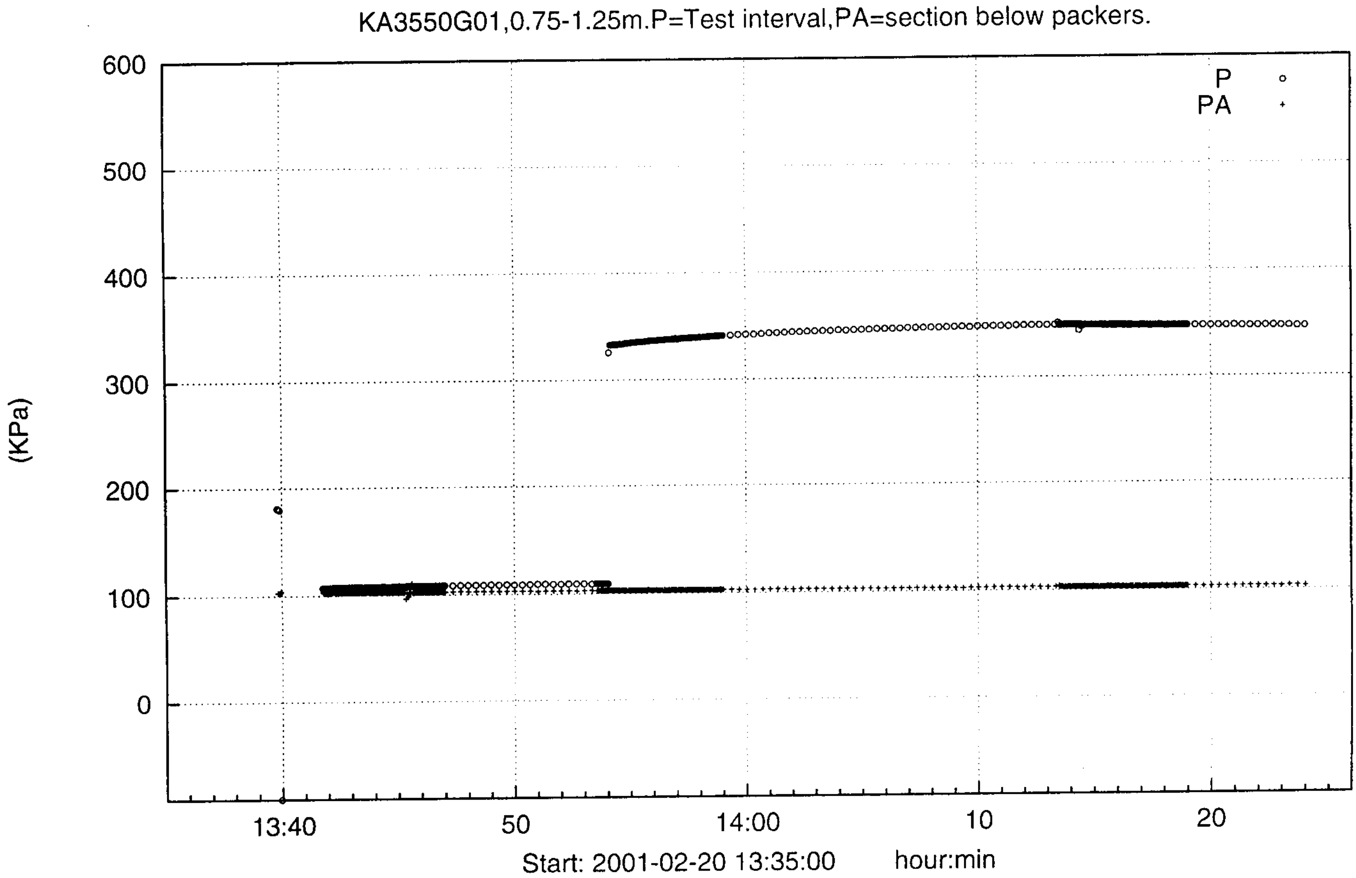
Table Manually measured flow rates, Injection Test in KA3550G01, section 0.75 m –1.25 m. Prototype Repository, February 2001

TimeFlow rate	(l/min * 10^{-3})
13:54:05	47,1
13:54:10	1,31
13:54:18	0,653
13:54:51	0,119
13:56:40	0,040
13:59:03	0,055
14:06:00	0,009

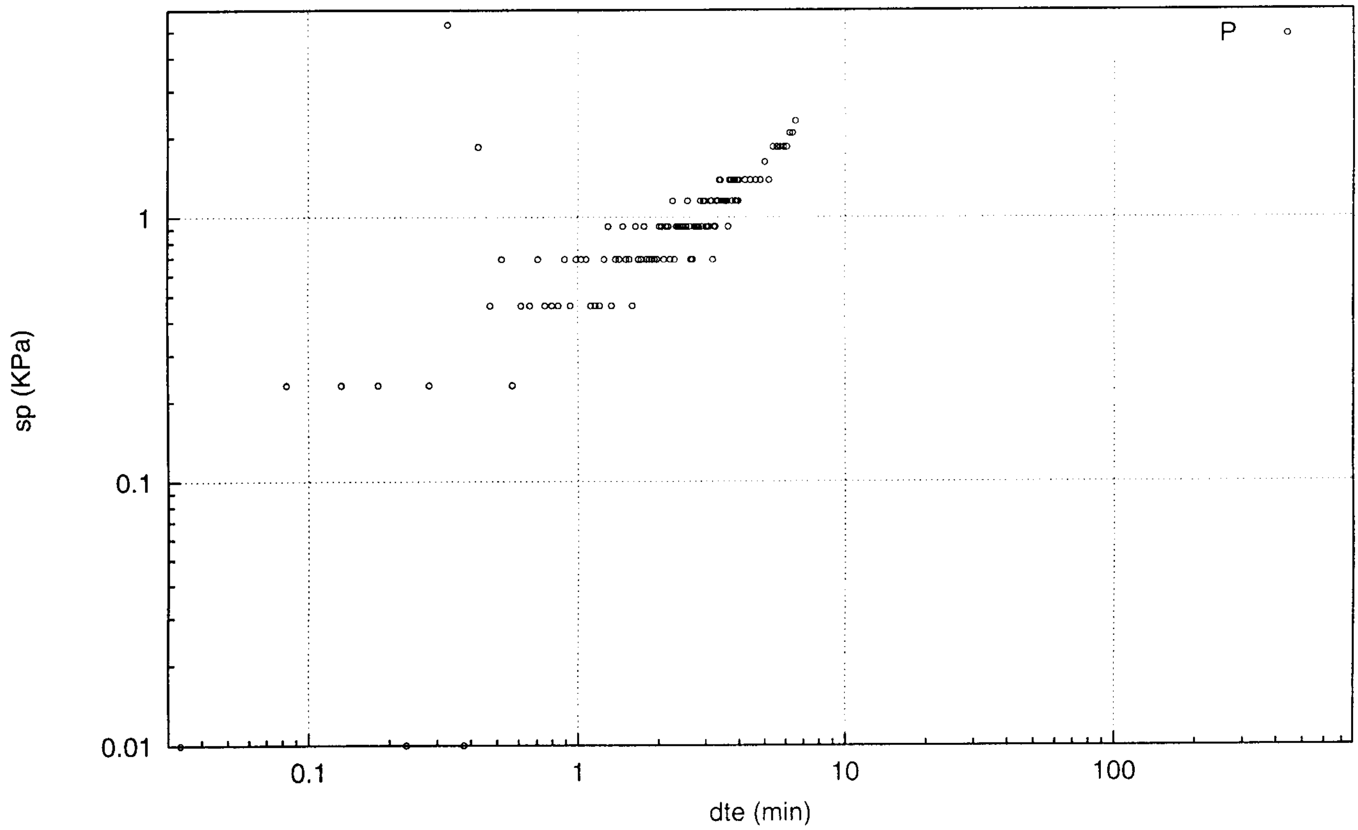
Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $4.6 \cdot 10^{-6}$
Injected volume excluding the first 10 seconds(V,m^3) = $6,5 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) = $2.3 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) = $3.3 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) = $9.0 \cdot 10^{-6}$

Comment

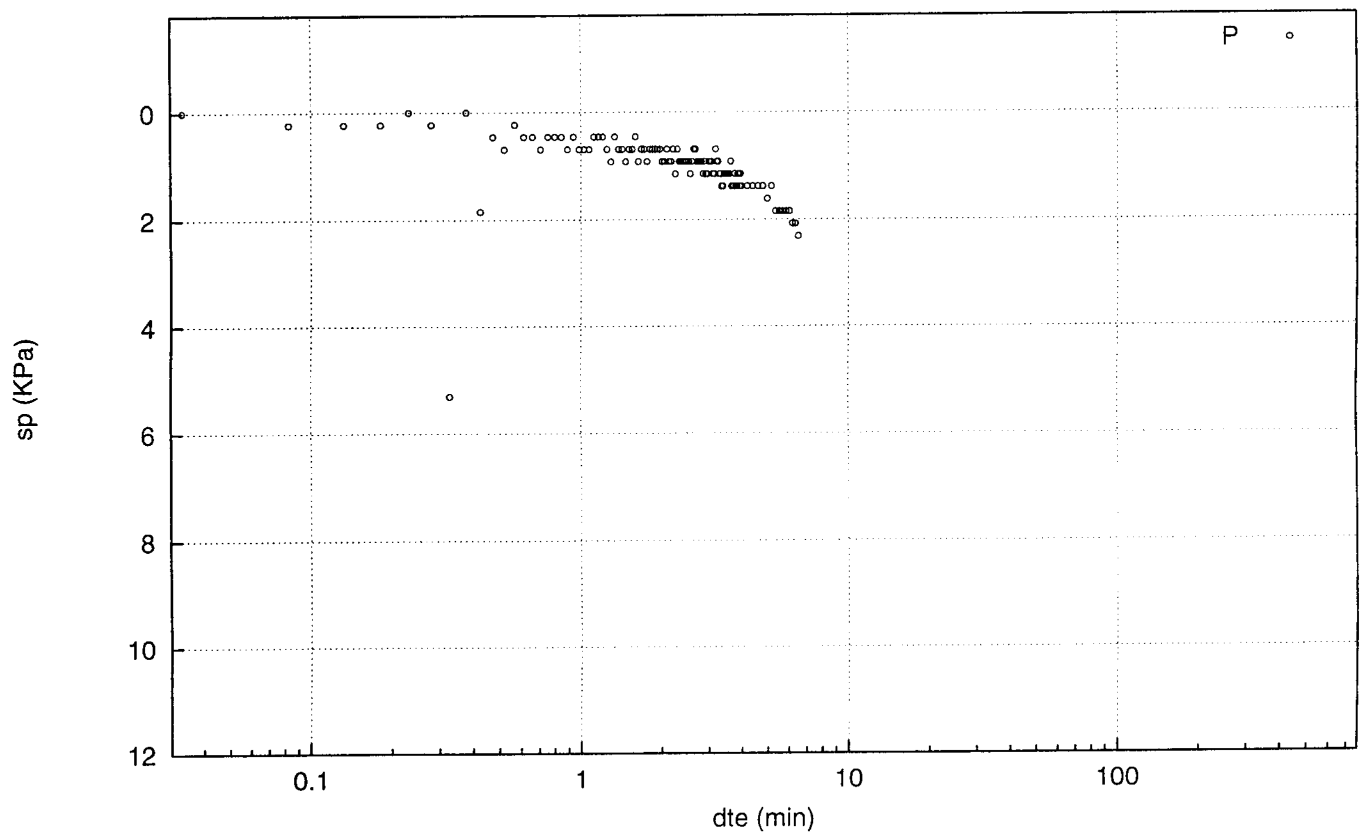
The pressure increases somewhat (c.14 KPa) during the flowing period.


KA3550G01,0.75-1.25m.P=Test interval,PA=section below packers.
P
PA
(KPa)
600
500
400
300
200
100
0
13:40
50
14:00
10
20
Start: 2001-02-20 13:35:00
hour:min

PROTOTYPE,TR INJECTION TEST KA3550G01, 0.75 - 1.25 m recovery 2001-02-20 14:14:03



PROTOTYPE,TR INJECTION TEST KA3550G01, 0.75 - 1.25 m recovery 2001-02-20 14:14:03



Borehole KA3550G01, section 1.25 m – 1.75 m

Date: 01-02-20 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010220 14:27
Valve opened: 010220 14:48.03 Valve closed: 010220 15:08.03
Total flowing time : 20.0 min. Tot. Pr. Build-up time 20.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 121.6
Pressure just before closing the valve (Pp, KPa): 345.0
Pressure at the end of the recovery (Pf, KPa) : 340.6

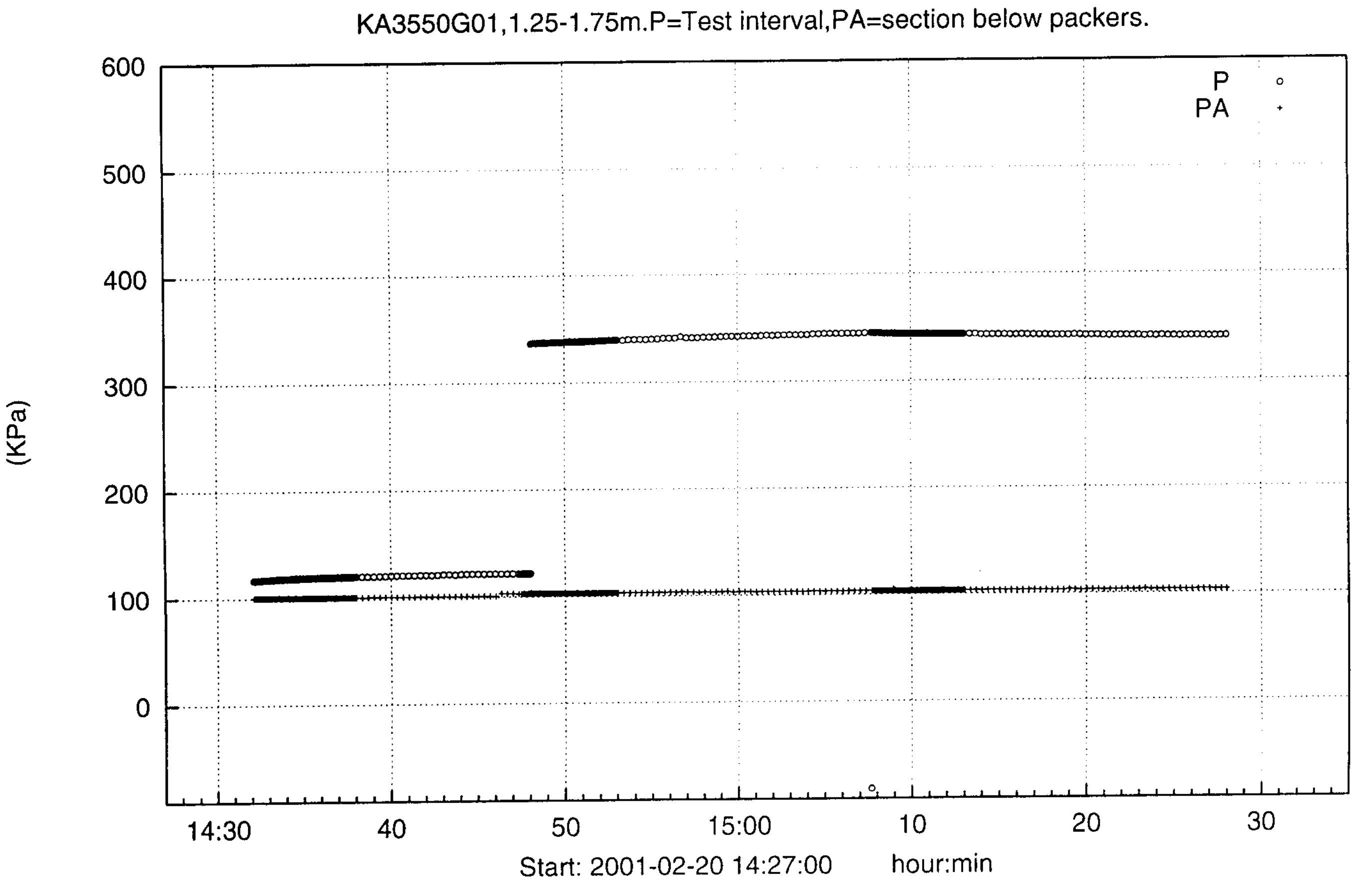
Flow data
Manually measured flow rates of KA3550G01, section 1.25 m –1.75 m, are presented in the table below.

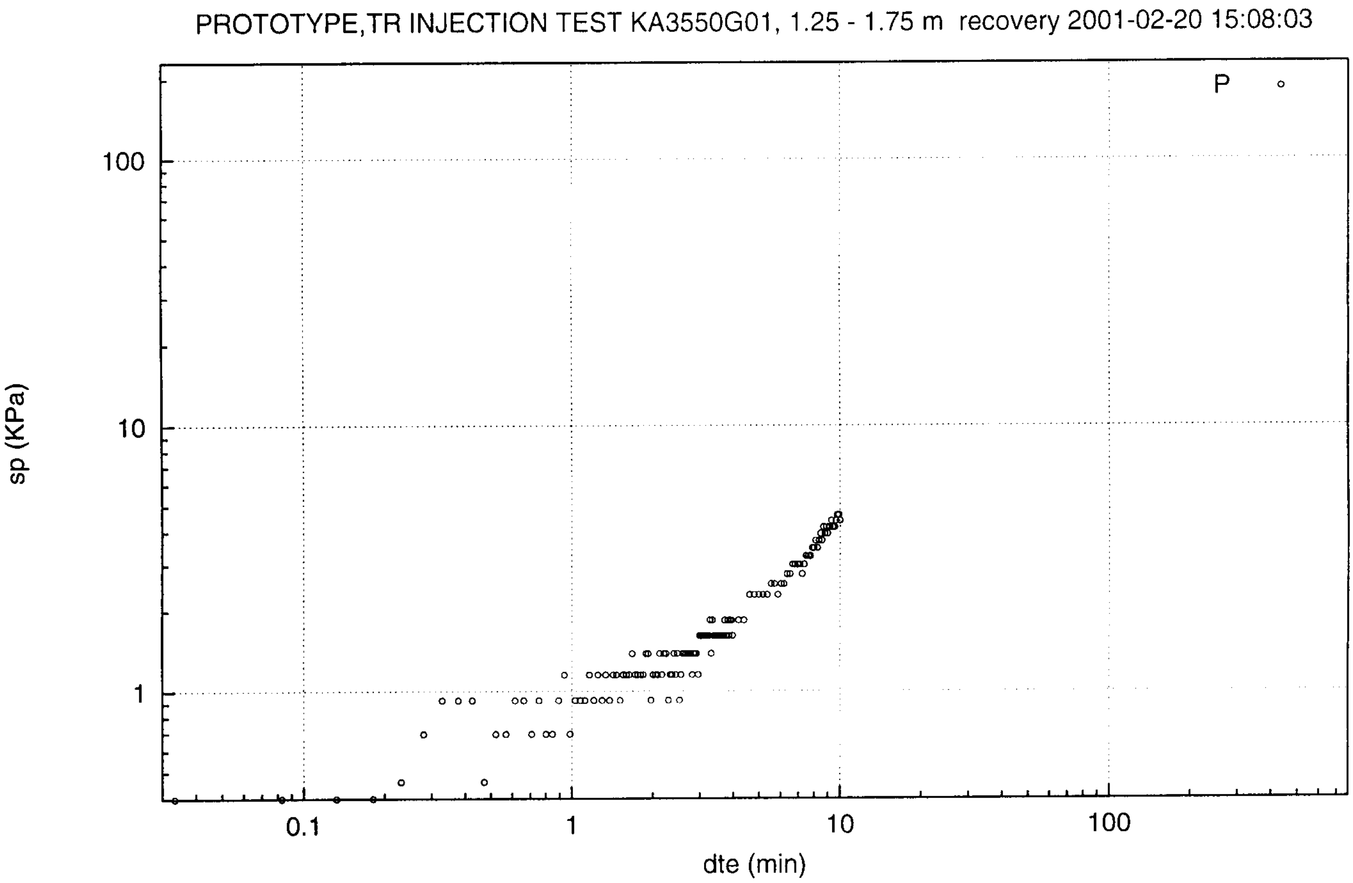
Table Manually measured flow rates, Injection Test in KA3550G01, section 1.25 m –1.75 m. Prototype Repository, February 2001

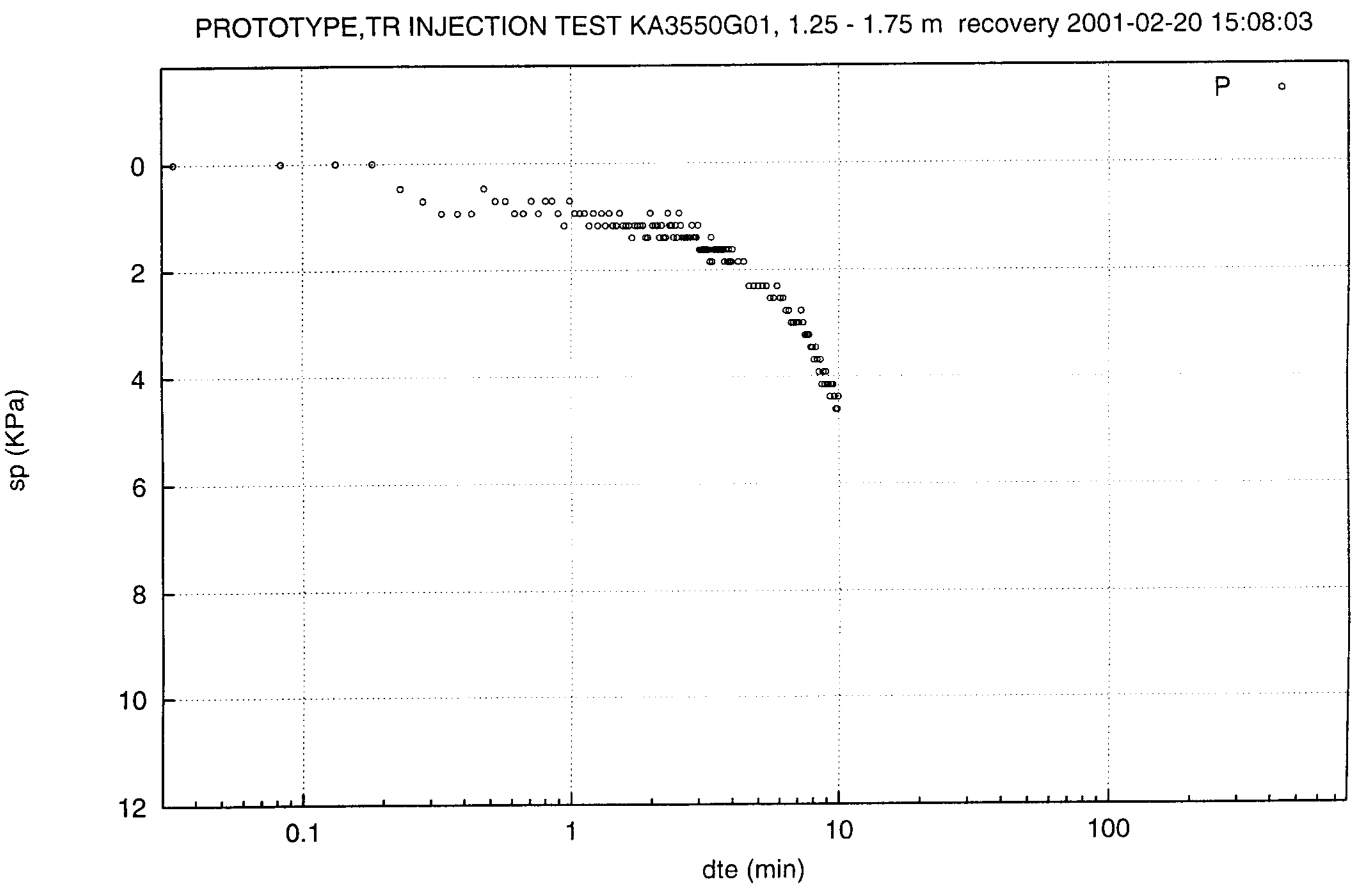
TimeFlow rate	(l/min * 10^{-3})
14:48:05	37,9
14:48:25	0,187
14:50:21	0,033
14:53:33	0,036
14:56:33	0,036
14:59	0
15:07	0

Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $3.6 \cdot 10^{-6}$
Injected volume excluding the first 10 seconds(V,m^3) = $4.4 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) = $1.8 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) = $2.2 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) = 0

Comment
The pressure increases somewhat (c.8 KPa) during the flowing period.


KA3550G01,1.25-1.75m.P=Test interval,PA=section below packers.
P
PA
600
500
400
300
200
100
0
(KPa)
14:30
40
50
15:00
10
20
30
Start: 2001-02-20 14:27:00
hour:min


PROTOTYPE,TR INJECTION TEST KA3550G01, 1.25 - 1.75 m recovery 2001-02-20 15:08:03
P
100
10
1
sp (KPa)
0.1
1
10
100
dte (min)


PROTOTYPE,TR INJECTION TEST KA3550G01, 1.25 - 1.75 m recovery 2001-02-20 15:08:03
P
0
2
4
6
8
10
12
sp (KPa)
0.1
1
10
100
dte (min)

Borehole KA3552G01, section 0.25 m - 0.75 m

Date: 01-02-20 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010220 15:45
Valve opened: 010220 16:05.03 Valve closed: 010220 16:25.03
Total flowing time : 20.0 min. Tot. Pr. Build-up time 10.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 114.5
Pressure just before closing the valve (Pp, KPa) : 347.7
Pressure at the end of the recovery (Pf, KPa) : 344.5

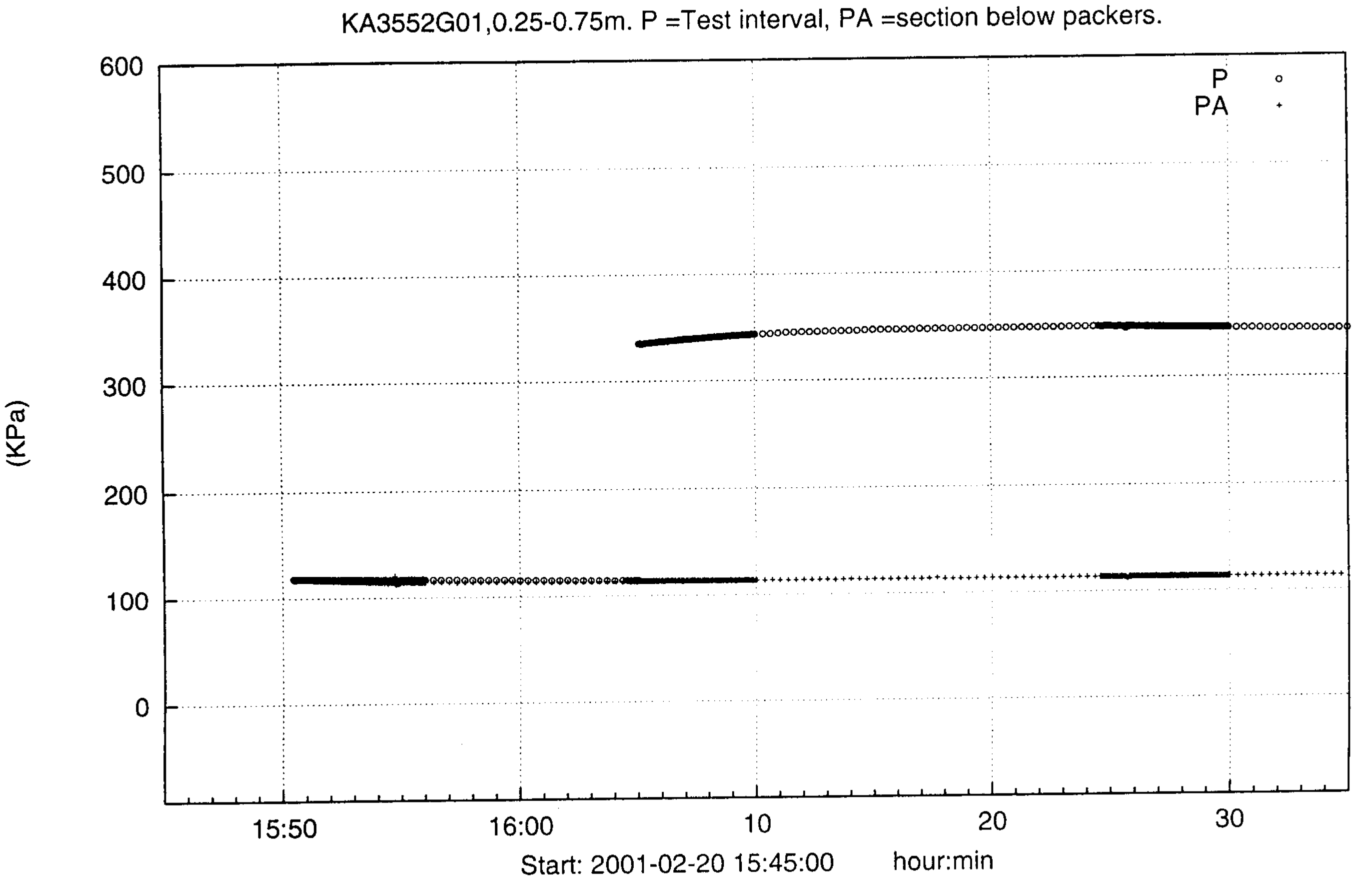
Flow data
Manually measured flow rates of KA3552G01, section 0.25 m –0.75 m, are presented in the table below.

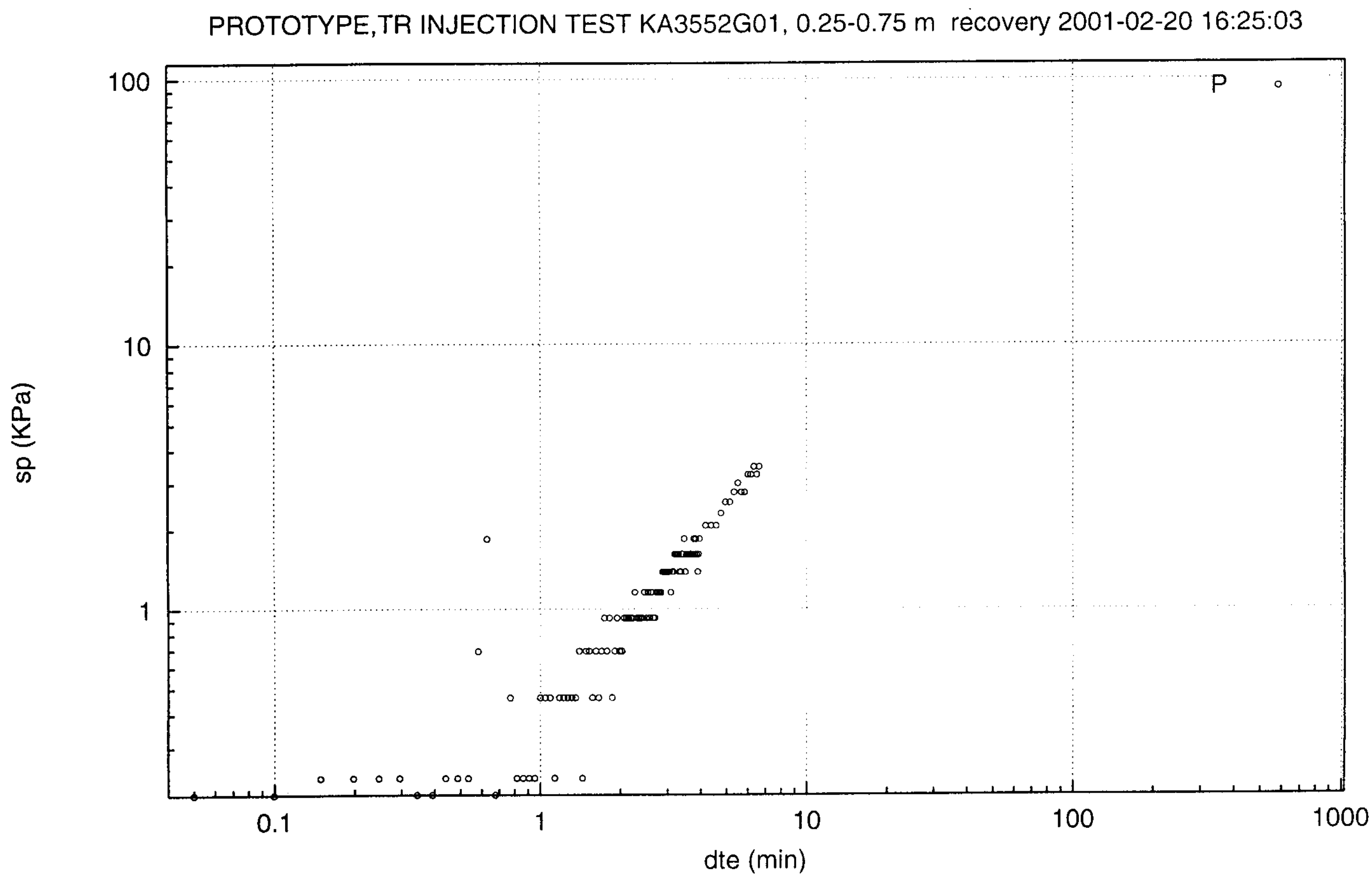
Table Manually measured flow rates, Injection Test in KA3552G01, section 0.25 m –0.75 m. Prototype Repository, February 2001

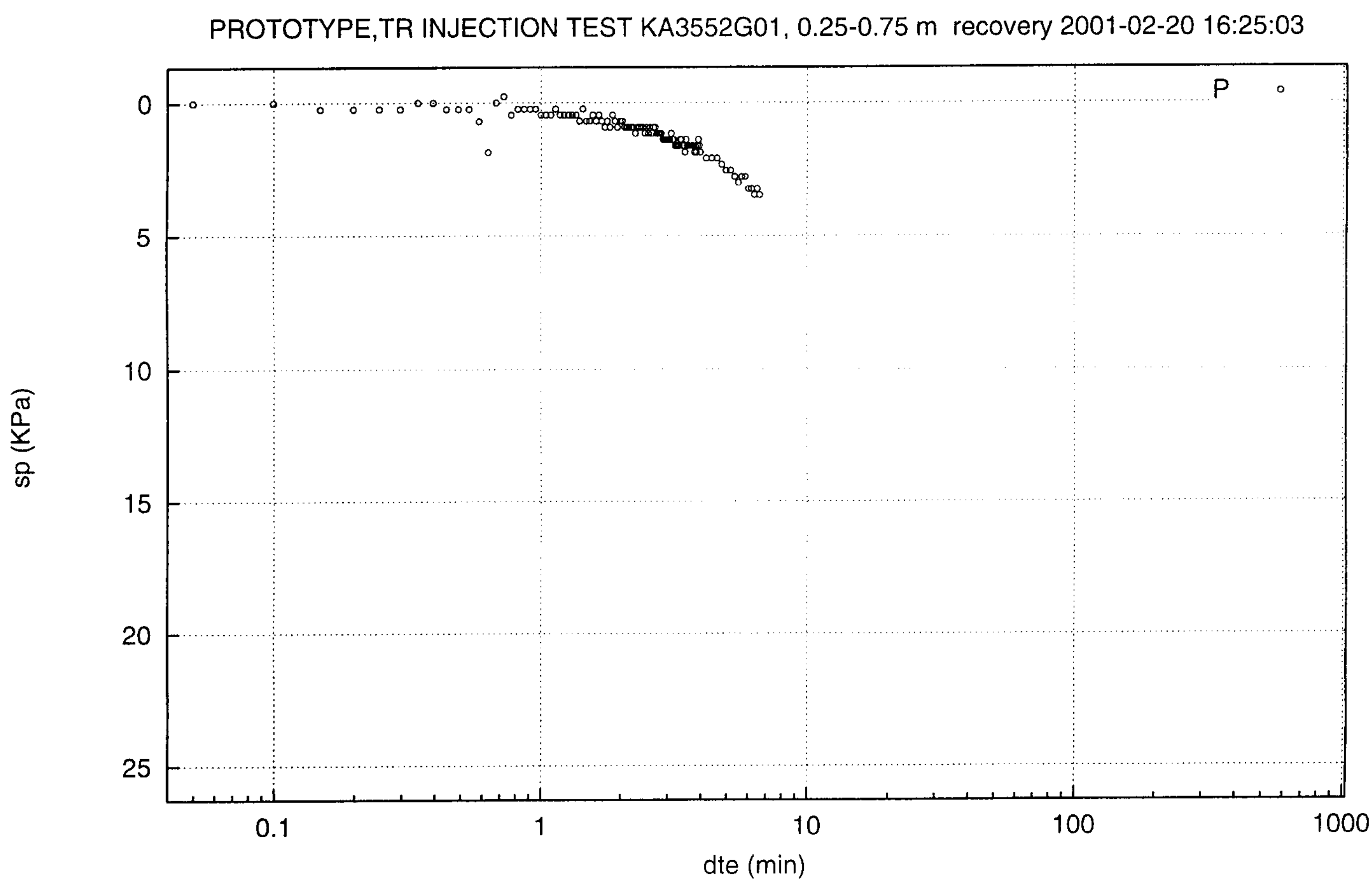
TimeFlow rate	(l/min * 10^{-3})
16:05:05	341,1
16:05:10	1,307
16:05:43	0,131
16:06:33	0,109
16:07:33	0,109
16:08:33	0,109
16:10:03	0,055
16:11:33	0,109
16:12:33	0,109
16:15:03	0,027
16:19:03	0,027

Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $3.0 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds (V,m^3) = $1,1 \cdot 10^{-6}$
Average flow rate based on Vtot (QTave, l/min) = $1.5 \cdot 10^{-3}$
Average flow rate based on V (Qave ,l/min) = $5.5 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min)

Comment
The pressure increases somewhat (c.13 KPa) during the flowing period.


KA3552G01,0.25-0.75m. P =Test interval, PA =section below packers.
P
PA
600
500
400
300
200
100
0
(KPa)
15:50
16:00
10
20
30
Start: 2001-02-20 15:45:00
hour:min


PROTOTYPE,TR INJECTION TEST KA3552G01, 0.25-0.75 m recovery 2001-02-20 16:25:03
P
100
10
1
sp (KPa)
0.1
1
10
100
1000
dte (min)


PROTOTYPE,TR INJECTION TEST KA3552G01, 0.25-0.75 m recovery 2001-02-20 16:25:03
P
0
5
10
15
20
25
sp (KPa)
0.1
1
10
100
1000
dte (min)

Borehole KA3552G01, section 0.75 m – 1.25 m

Date: 01-02-20 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010220 16:37
Valve opened: 010220 16:57.03 Valve closed: 010220 17:17.03
Total flowing time : 20.0 min. Tot. Pr. Build-up time 890.0 min.

Pressure data

Pressure before injection start	(P0, KPa) :	112.9
Pressure just before closing the valve	(Pp, KPa) :	348.2
Pressure at the end of the recovery	(Pf, KPa) :	311.7

Flow data
Manually measured flow rates of KA3552G01, section 0.75 m –1.25 m, are presented in the table below.

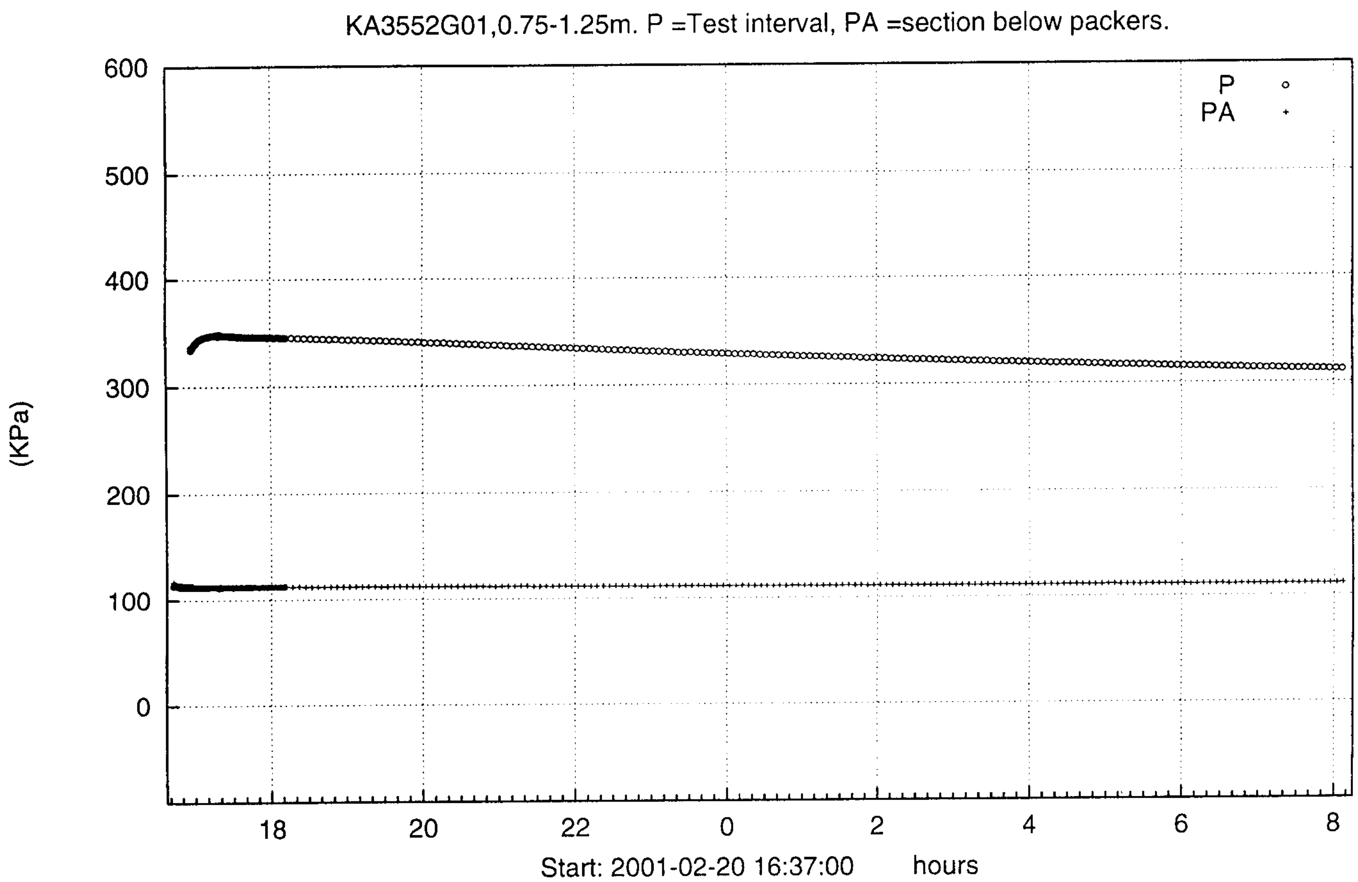
Table Manually measured flow rates, Injection Test in KA3552G01, section 0.75 m –1.25 m. Prototype Repository, February 2001

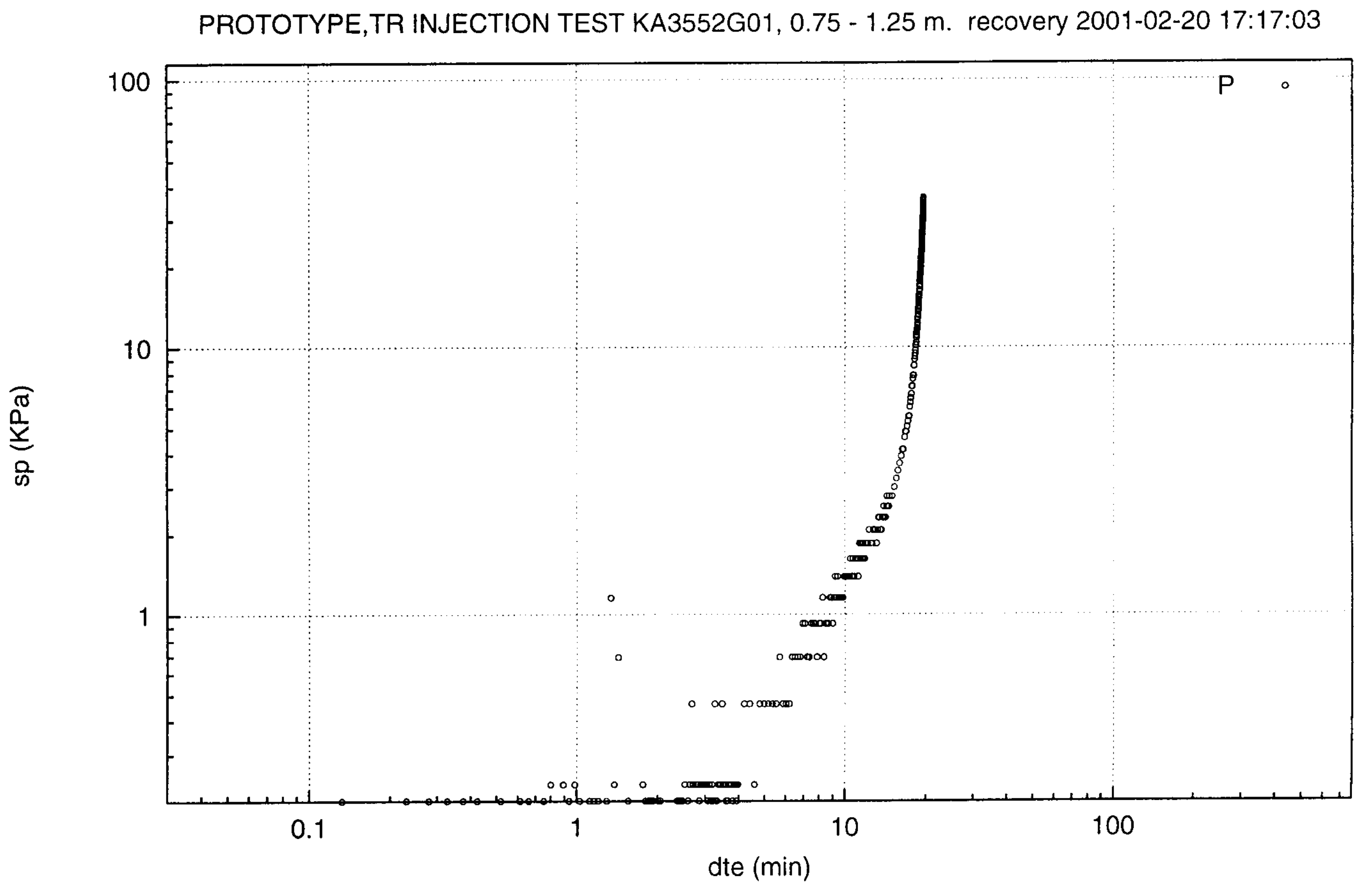
TimeFlow rate	(l/min * 10^{-3})
16:57:05	307,1
16:57:15	0,436
16:58:13	0,065
16:59:33	0,109
17:01:03	0,055
17:02:33	0,109
17:03:33	0,109
17:05:03	0,055
17:07:33	0,036
17:11:33	0,027

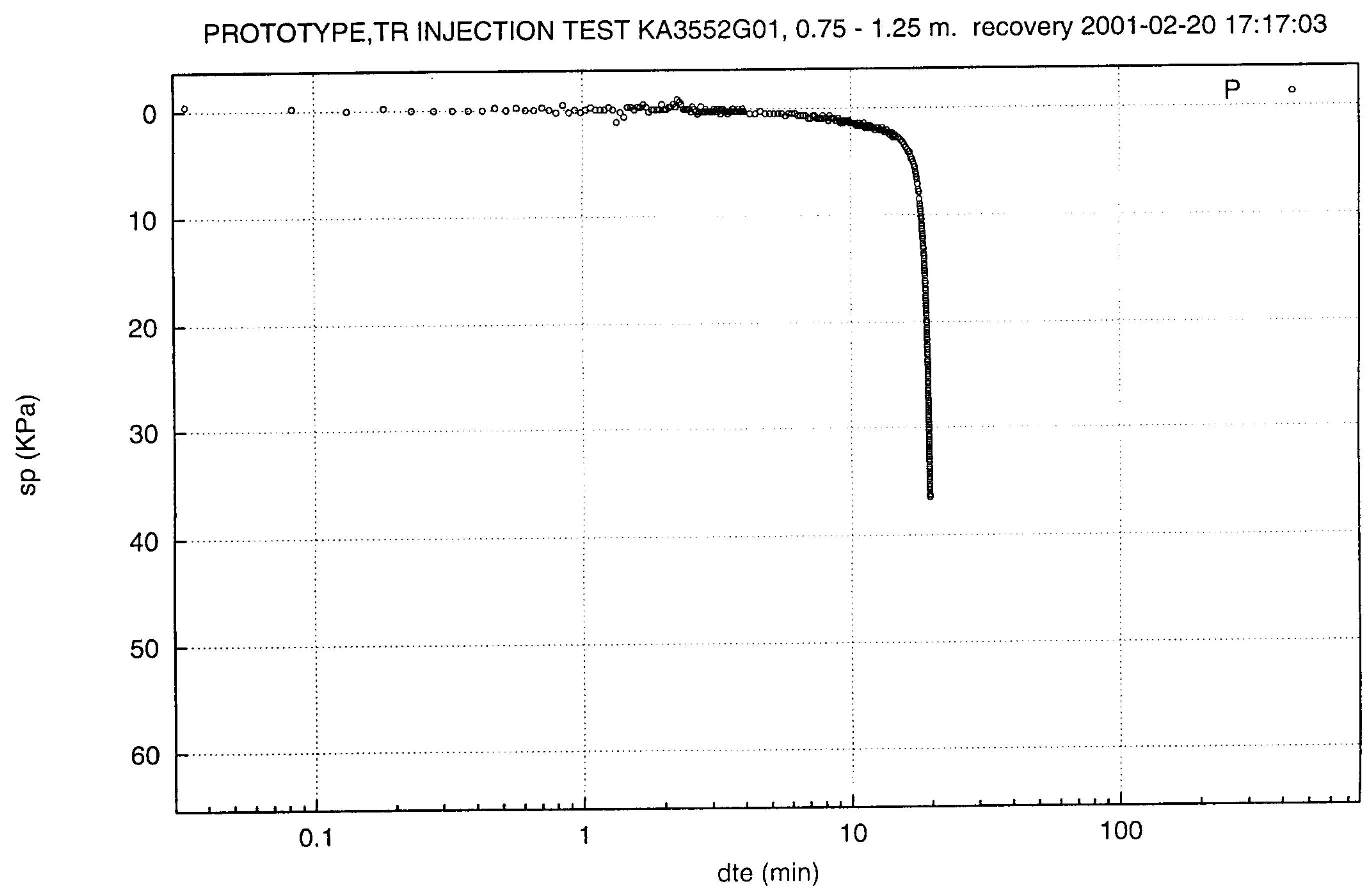
Calculated flow and volume data

Total injected water volume	(Vtot, m^3)	$= 2.7 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds	(V,m^3)	$= 9{,}8 \cdot 10^{-7}$
Average flow rate based on Vtot	(QTave, l/min)	$= 1.3 \cdot 10^{-3}$
Average flow rate based on V	(Qave ,l/min)	$= 4.9 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase	(Qp, l/min)	

Comment
The pressure increases somewhat (c.13 KPa) during the flowing period.
The recovery period lasted over the night.


KA3552G01,0.75-1.25m. P =Test interval, PA =section below packers.
P
PA
(KPa)
600
500
400
300
200
100
0
18
20
22
0
2
4
6
8
Start: 2001-02-20 16:37:00
hours


PROTOTYPE,TR INJECTION TEST KA3552G01, 0.75 - 1.25 m. recovery 2001-02-20 17:17:03
P
100
10
1
sp (KPa)
0.1
1
10
100
dte (min)


PROTOTYPE,TR INJECTION TEST KA3552G01, 0.75 - 1.25 m. recovery 2001-02-20 17:17:03
P
0
10
20
30
40
50
60
sp (KPa)
0.1
1
10
100
dte (min)

Borehole KA3552G01, section 1.25 m – 1.75 m

Date: 01-02-21 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010221 08:18
Valve opened: 010221 08:37.03 Valve closed: 010221 08:57.03
Total flowing time : 20.0 min. Tot. Pr. Build-up time 26.5 min.

Pressure data
Pressure before injection start (P0, KPa) : 107.3
Pressure just before closing the valve (Pp, KPa) : 341.7
Pressure at the end of the recovery (Pf, KPa) : 340.8

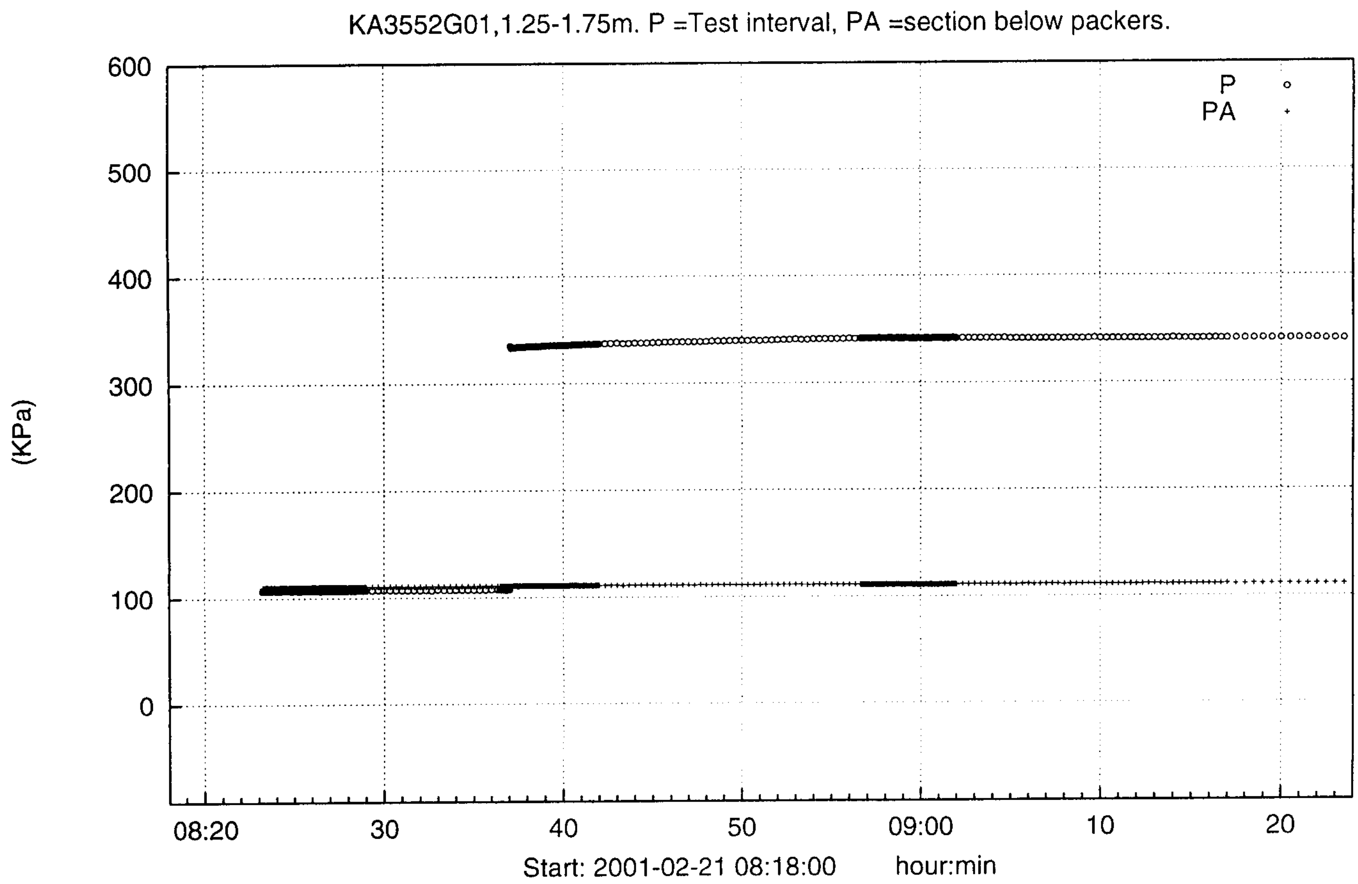
Flow data
Manually measured flow rates of KA3552G01, section 1.25 m –1.75 m, are presented in the table below.

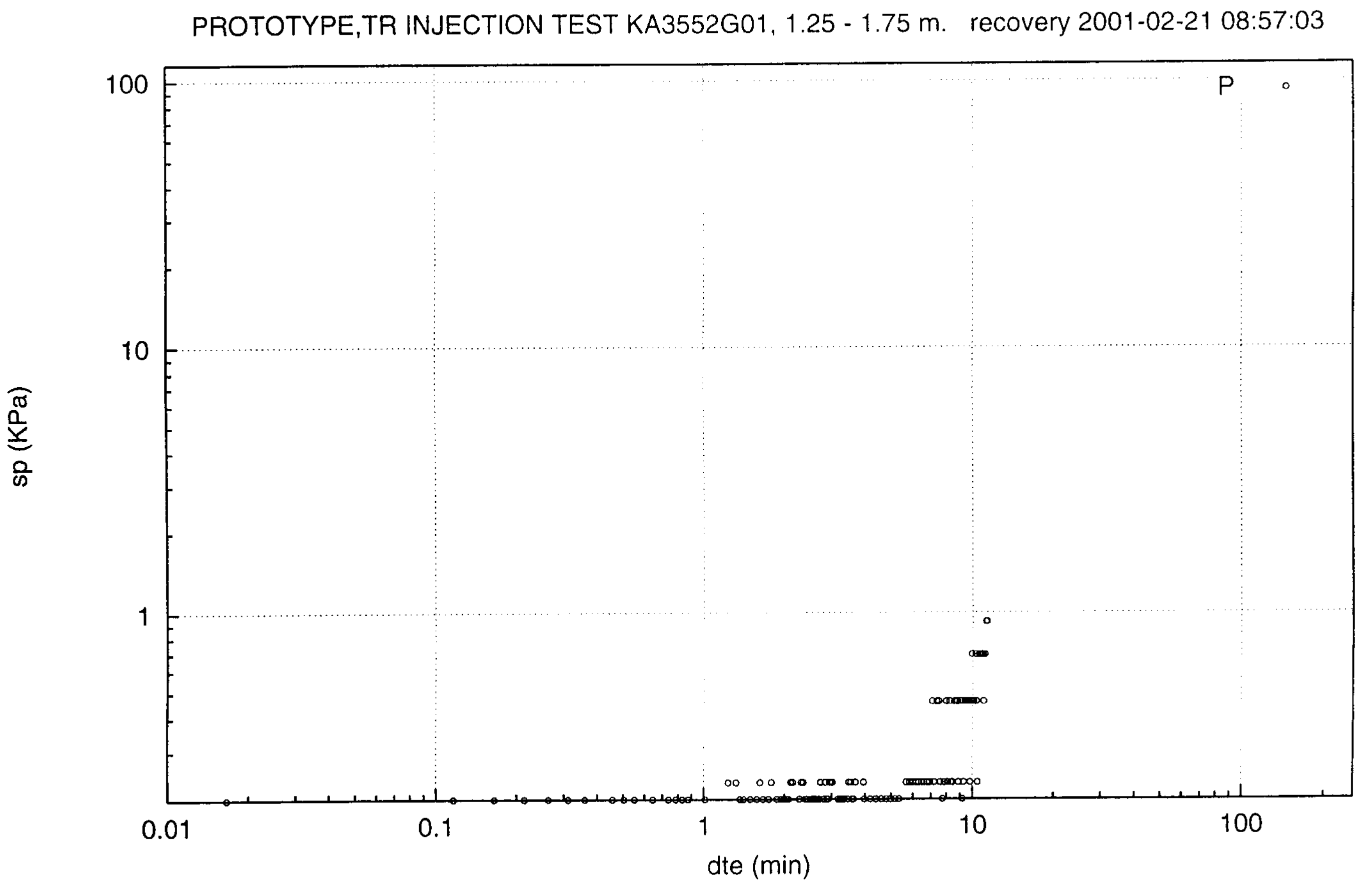
Table Manually measured flow rates, Injection Test in KA3552G01, section 1.25 m –1.75 m. Prototype Repository, February 2001

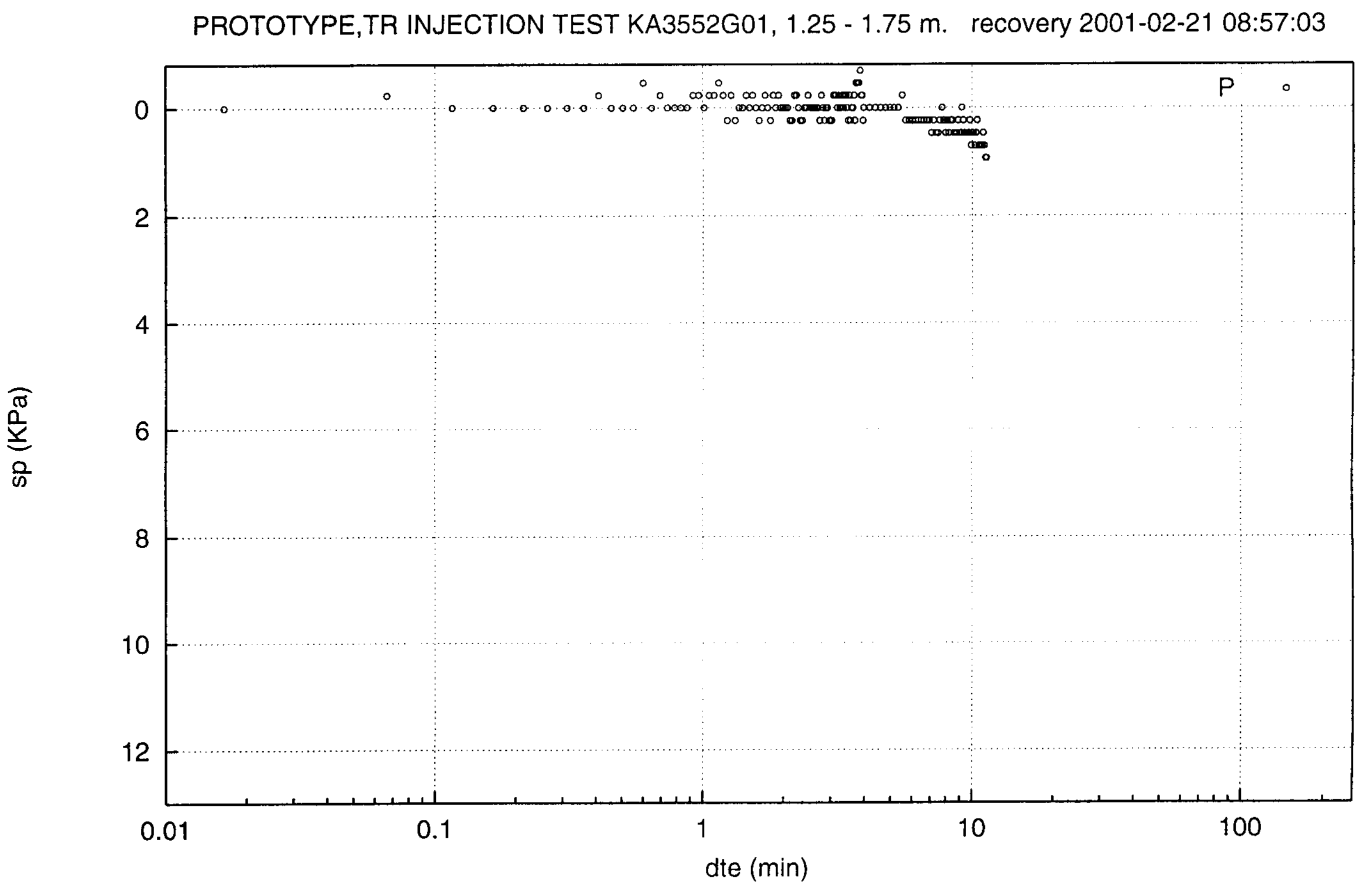
Time Flow rate	(l/min * 10^{-3})
08:37:05	307,141
08:37:10	1,30688
08:41:08	0,013
08:50:33	0,012

Calculated flow and volume data
Total injected water volume (Vtot, m^3) $= 2.6 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds(V,m^3) $= 3.3 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) $= 1.3 \cdot 10^{-3}$
Average flow rate based on V (Qave ,l/min) $= 1.6 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min)

Comment
The pressure increases somewhat (c.7 KPa) during the flowing period.
The recovery is very small


KA3552G01,1.25-1.75m. P =Test interval, PA =section below packers.
P
PA
600
500
400
300
200
100
0
(KPa)
08:20
30
40
50
09:00
10
20
Start: 2001-02-21 08:18:00
hour:min


PROTOTYPE,TR INJECTION TEST KA3552G01, 1.25 - 1.75 m. recovery 2001-02-21 08:57:03
sp (KPa)
100
10
1
P
0.01
0.1
1
10
100
dte (min)


PROTOTYPE,TR INJECTION TEST KA3552G01, 1.25 - 1.75 m. recovery 2001-02-21 08:57:03
sp (KPa)
0
2
4
6
8
10
12
P
0.01
0.1
1
10
100
dte (min)

Borehole KA3554G02, section 0.25 m - 0.75 m

Date: 01-02-16 Field Crew: B. Gentzschein, T. Sträng
Packer expansion: 010216 08:59
Valve opened: 010216 09:16.00 Valve closed: 010216 09:36.00
Total flowing time : 20.0 min. Tot. Pr. Build-up time:10.3 min.

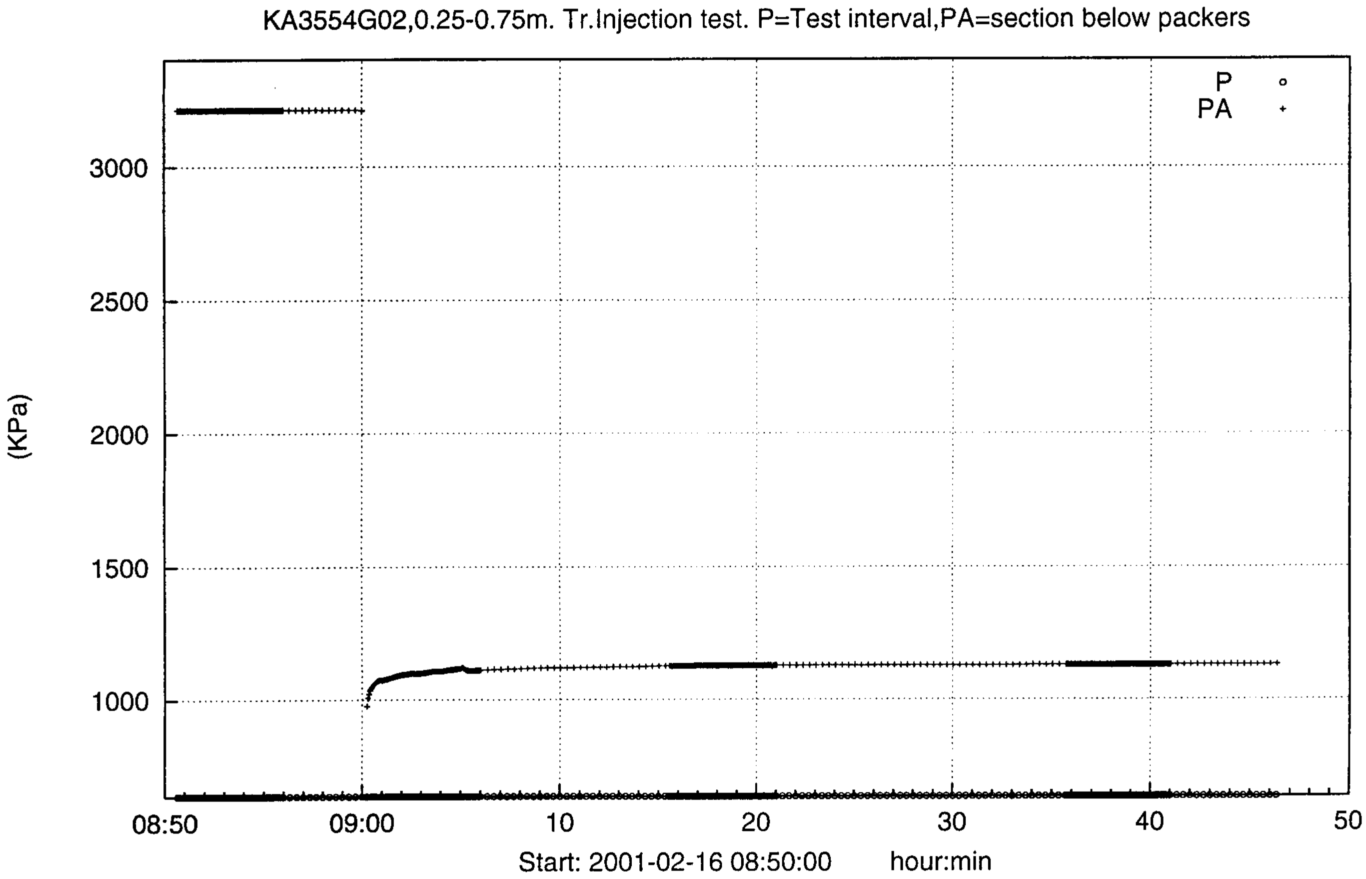
Pressure data
Pressure before injection start (P0, KPa) : 119.8
Pressure just before closing the valve (Pp, KPa) : 317.0
Pressure at the end of the recovery (Pf, KPa) : 310.6

Flow data
Manually measured flow rates of KA3554G02, section 0.25 m –0.75 m, are presented in the table below.

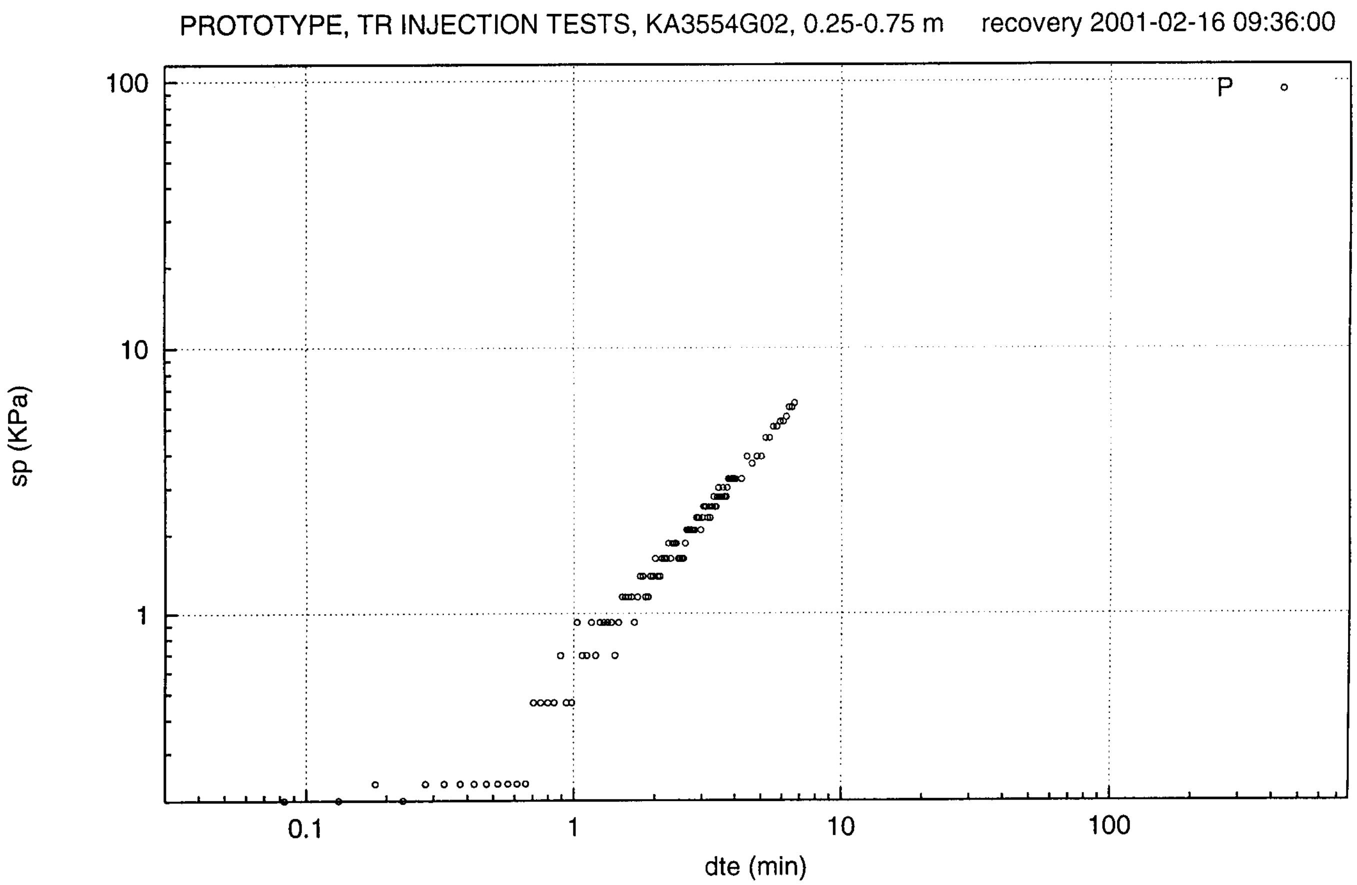
Table Manually measured flow rates, Injection Test in KA3554G02, section 0.25 m –0.75 m. Prototype Repository, February 2001

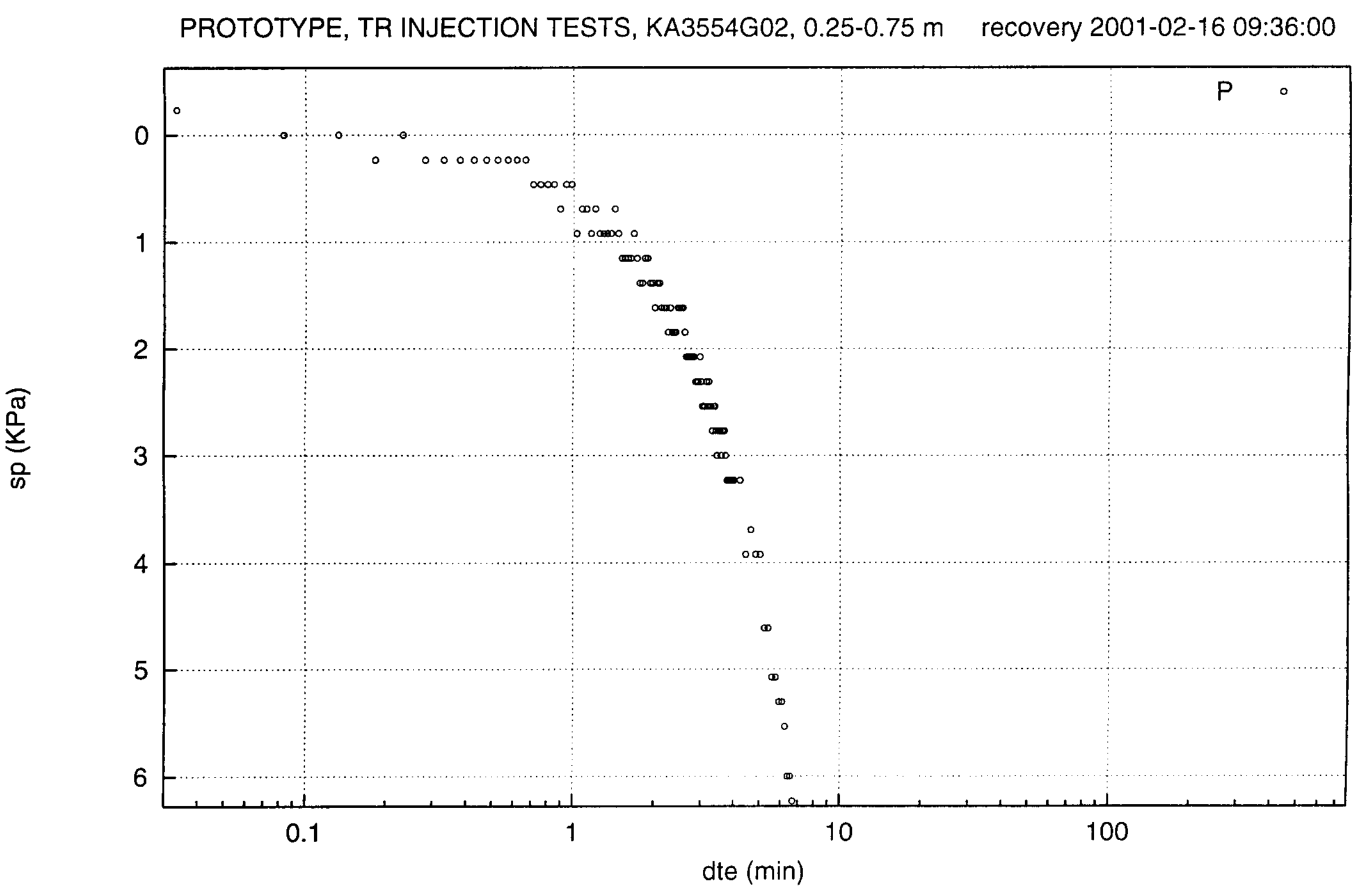
TimeFlow rate	(l/min * 10^{-3})
09:16:05	32,020
09:16:20	0,327
09:17:15	0,145
09:18:15	0,218
09:18:45	0,218
09:19:30	0,218
09:20:30	0,109
09:21:30	0,218
09:22:30	0,218
09:23:30	0,109
09:24:30	0,109
09:25:30	0,109
09:27:00	0,109
09:29:00	0,163
09:31:00	0,163
09:33:00	0,109
09:35:00	0,109

Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $8.3 \cdot 10^{-6}$
Injected volume excluding the first 10 seconds(V,m^3) = $2,9 \cdot 10^{-6}$
Average flow rate based on Vtot (QTave, l/min) = $4.1 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) = $1.5 \cdot 10^{-4}$
Flow rate at the end of the Flow Phase (Qp, l/min) = $1.1 \cdot 10^{-4}$



KA3554G02,0.25-0.75m. Tr.Injection test. P=Test interval,PA=section below packers
P
PA
(KPa)
3000
2500
2000
1500
1000
08:50
09:00
10
20
30
40
50
Start: 2001-02-16 08:50:00
hour:min


PROTOTYPE, TR INJECTION TESTS, KA3554G02, 0.25-0.75 m
recovery 2001-02-16 09:36:00
P
sp (KPa)
100
10
1
0.1
1
10
100
dte (min)


PROTOTYPE, TR INJECTION TESTS, KA3554G02, 0.25-0.75 m
recovery 2001-02-16 09:36:00
P
sp (KPa)
0
1
2
3
4
5
6
0.1
1
10
100
dte (min)

Borehole KA3554G02, section 0.75 m – 1.25 m

Date: 01-02-16 Field Crew: B. Gentzschein, T. Sträng
Packer expansion: 010216 09:52
Valve opened: 010216 10:12.00 Valve closed: 010216 10:32.00
Total flowing time : 20.0 min. Tot. Pr. Build-up time:10.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 122.1
Pressure just before closing the valve (Pp, KPa) : 325.8
Pressure at the end of the recovery (Pf, KPa) : 325.8

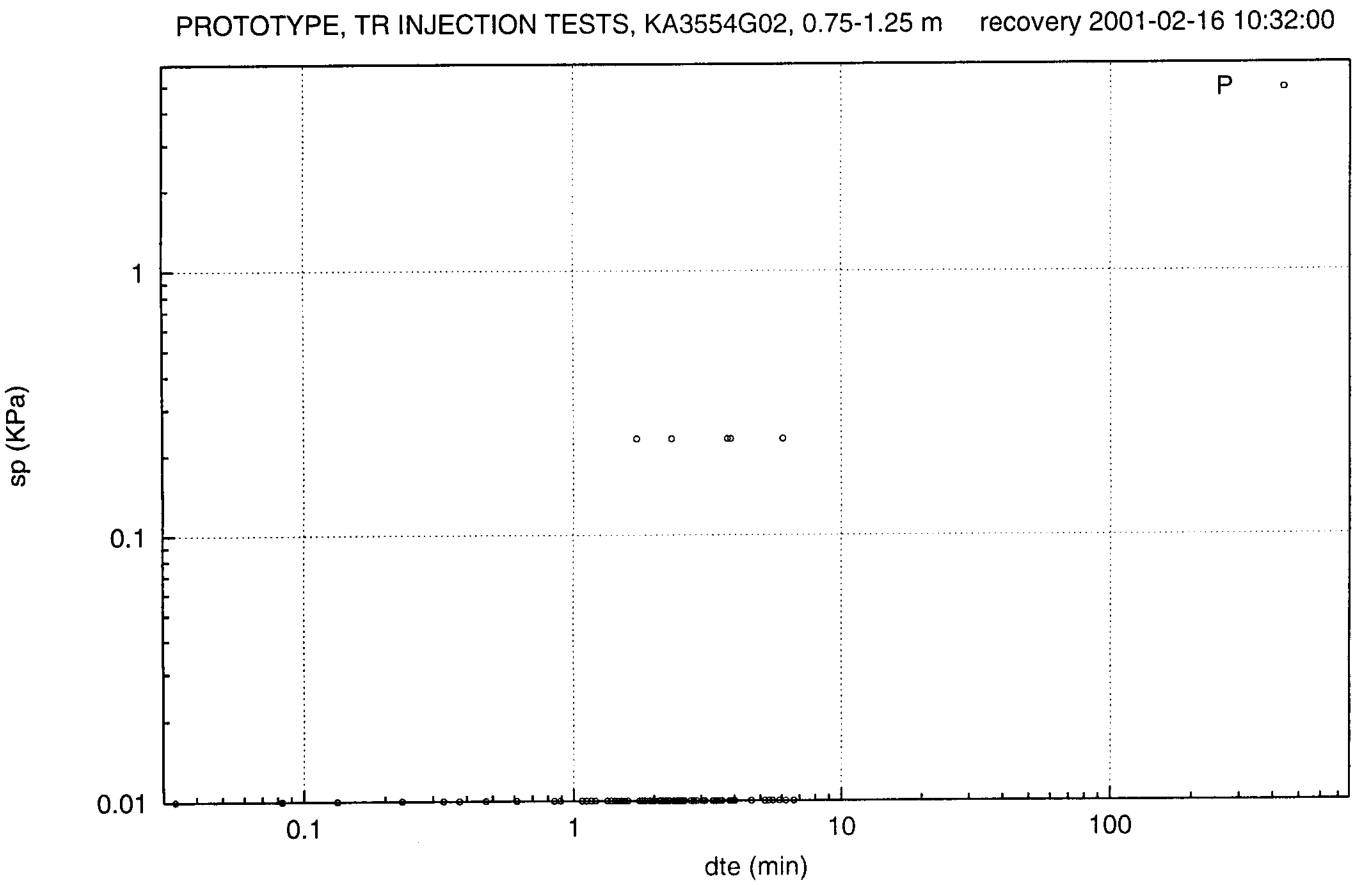
Flow data
Manually measured flow rates of KA3554G02, section 0.75 m –1.25 m, are presented in the table below.

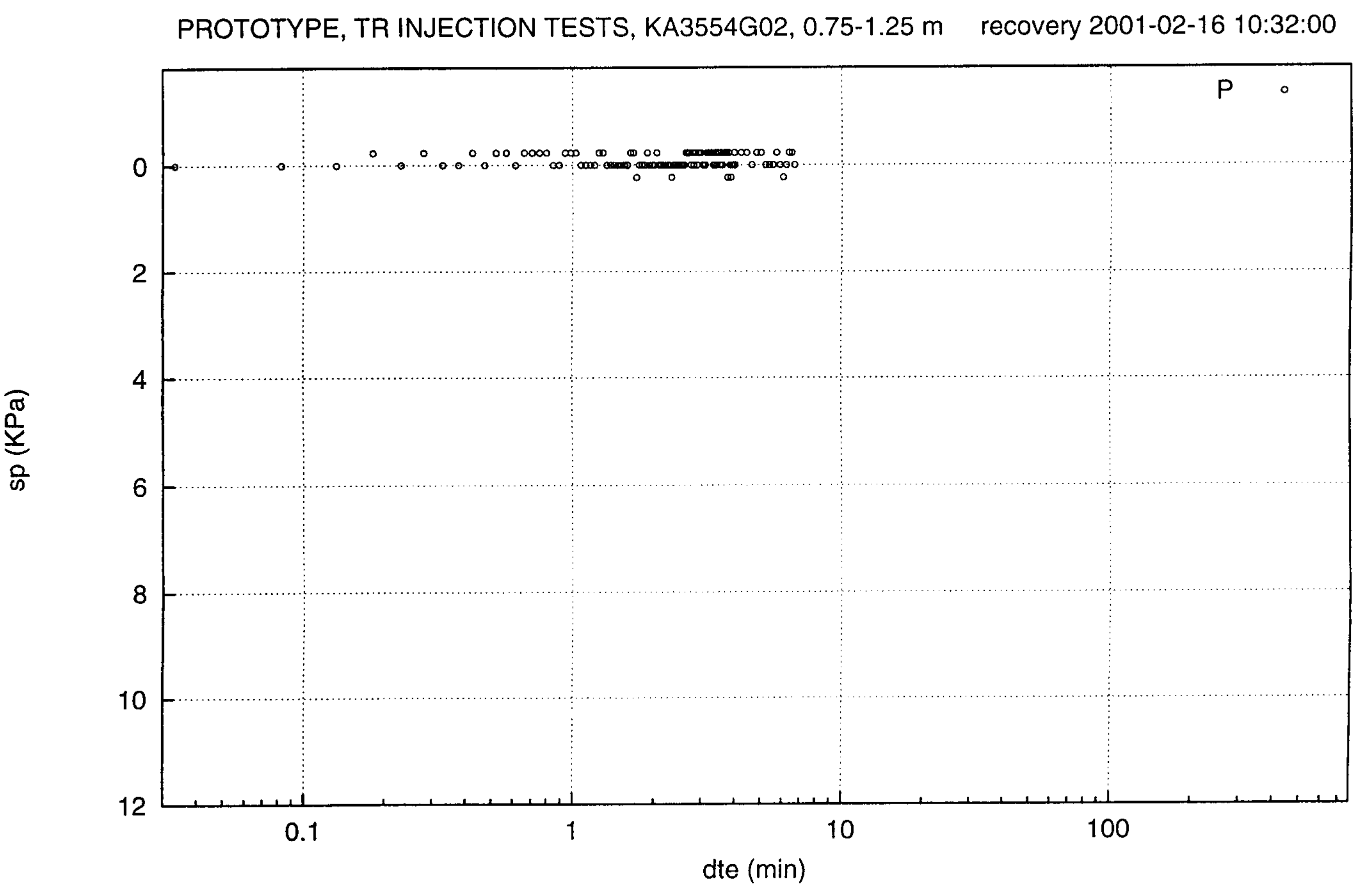
Table Manually measured flow rates, Injection Test in KA3554G02, section 0.75 m –1.25 m. Prototype Repository, February 2001

TimeFlow rate	($l/min * 10^{-3}$)
10:12:05	146,4
10:12:15	0,653
10:12:35	0,327
10:13	0
10:31	0

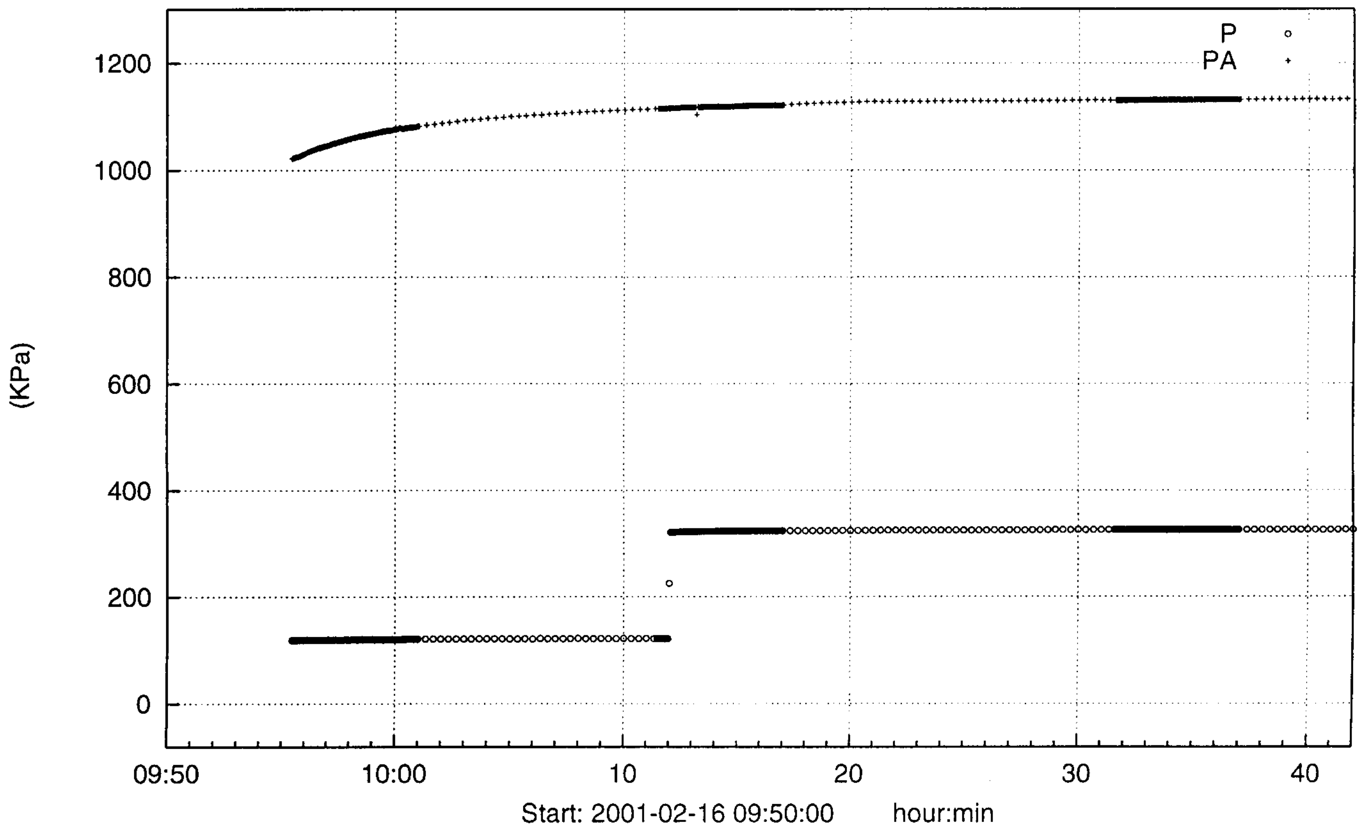
Calculated flow and volume data
Total injected water volume (V_{tot}, m^3) = $2.5 \cdot 10^{-5}$
Injected volume excluding the first 10 seconds (V,m^3) = $2,2 \cdot 10^{-7}$
Average flow rate based on Vtot ($QTave$, l/min) = $1.2 \cdot 10^{-3}$
Average flow rate based on V ($Qave$,l/min) = $1.1 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) = 0

Comment
No recovery was measured.


PROTOTYPE, TR INJECTION TESTS, KA3554G02, 0.75-1.25 m
recovery 2001-02-16 10:32:00
P
sp (KPa)
1
0.1
0.01
0.1
1
10
100
dte (min)


PROTOTYPE, TR INJECTION TESTS, KA3554G02, 0.75-1.25 m
recovery 2001-02-16 10:32:00
P
sp (KPa)
0
2
4
6
8
10
12
0.1
1
10
100
dte (min)

KA3554G02,0.75-1.25m. Tr.Injection test. P=Test interval,PA=section below packers



Borehole KA3554G02, section 1.25 m – 1.75 m

Date: 01-02-16 Field Crew: B. Gentzschein, T. Sträng
Packer expansion: 010216 10:45
Valve opened: 010216 11:12.01 Valve closed: 010216 11:32.01
Total flowing time : 20.0 min. Tot. Pr. Build-up time: 75.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 122.8
Pressure just before closing the valve (Pp, KPa): 325.6
Pressure at the end of the recovery (Pf, KPa) : 318.4

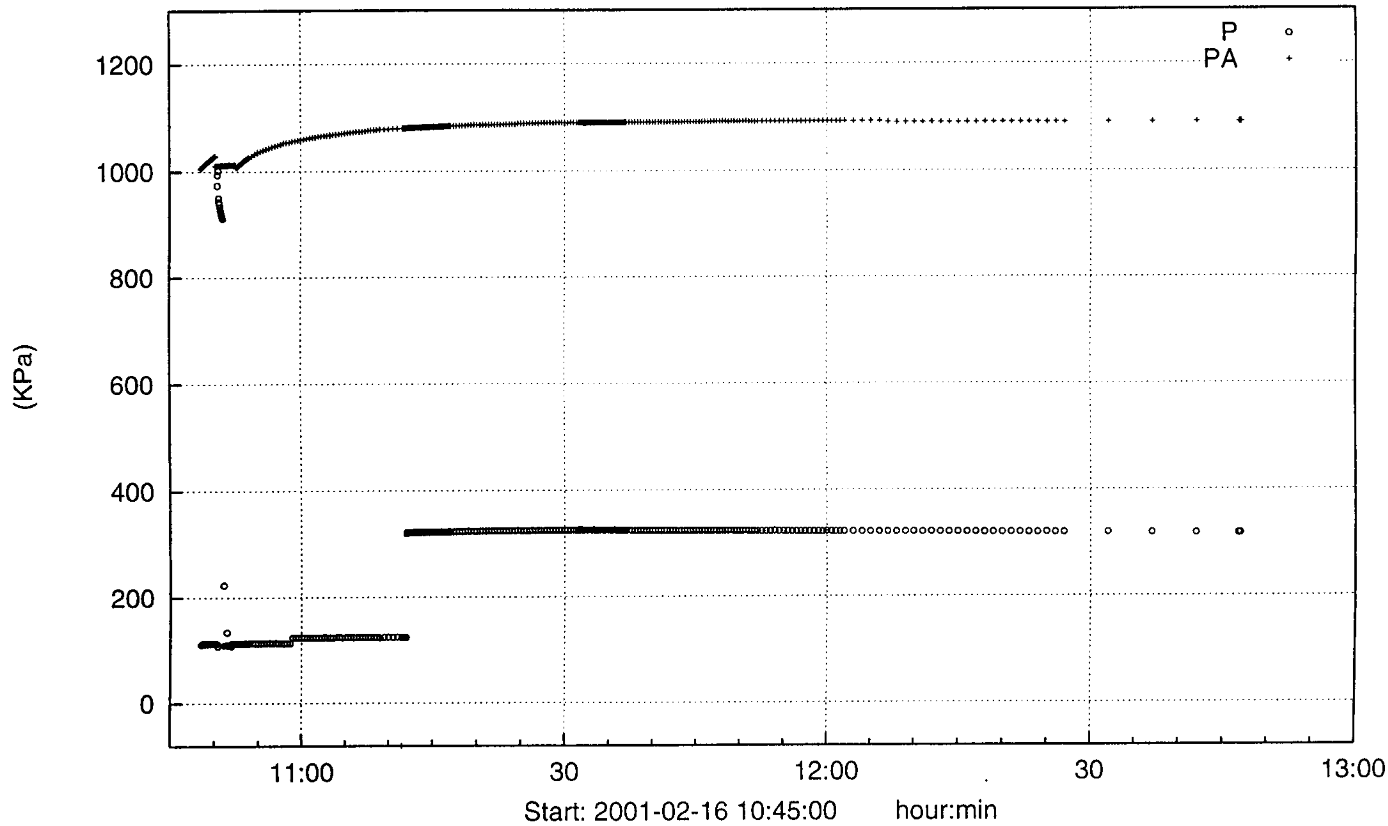
Flow data
Manually measured flow rates of KA3554G02, section 1.25 m –1.75 m, are presented in the table below.

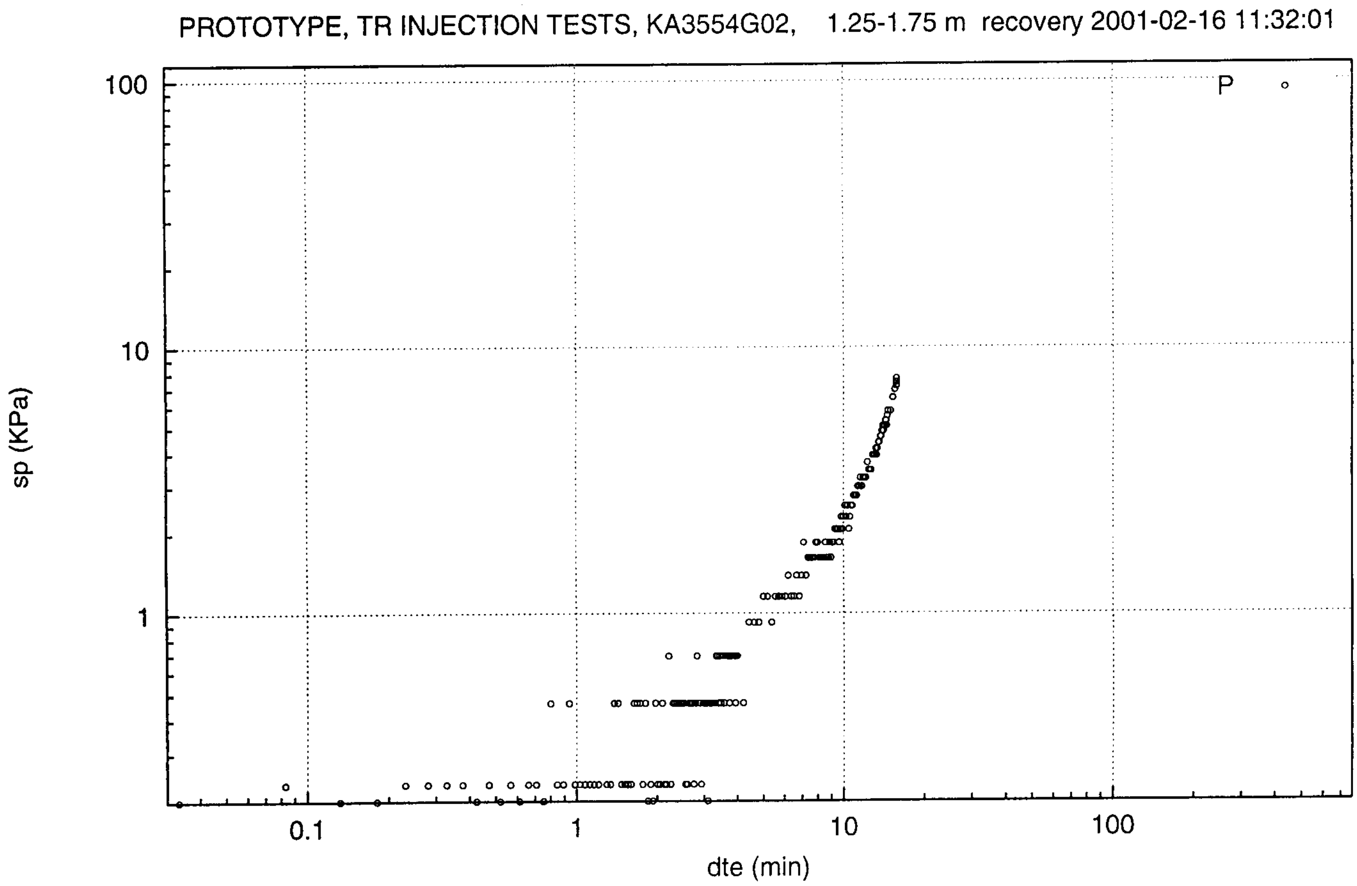
Table Manually measured flow rates, Injection Test in KA3554G02, section 1.25 m –1.75 m. Prototype Repository, February 2001

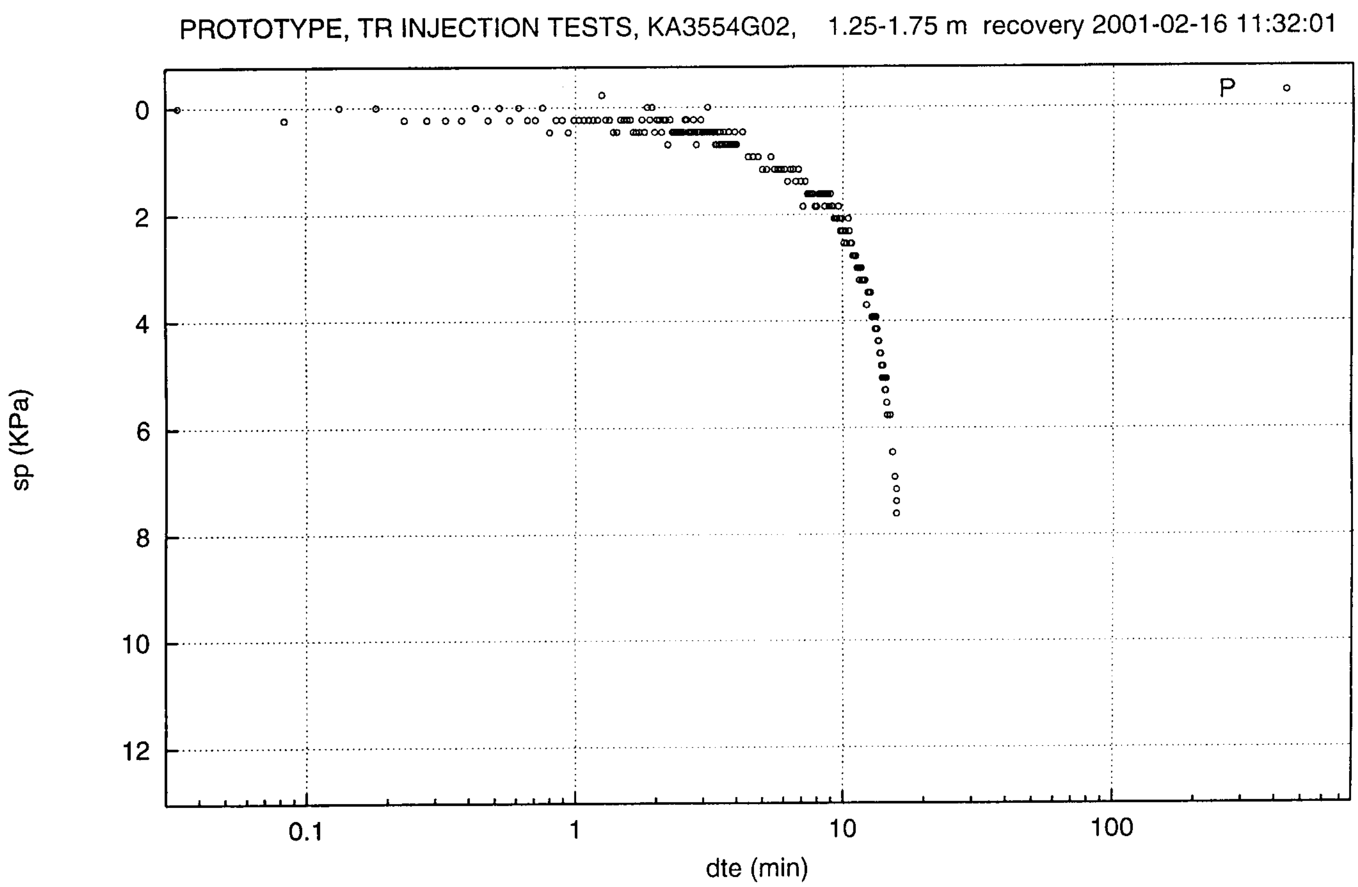
TimeFlow rate	(l/min * 10^{-3})
11:12:08	241,8
11:12:47	0,077
11:15:15	0,03
11:21:30	0,016
11:25	0
11:31	0

Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $2.1 \cdot 10^{-5}$
Injected volume excluding the first 15 seconds (V,m^3) = $3,3 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) = $1.0 \cdot 10^{-3}$
Average flow rate based on V (Qave ,l/min) = $1.6 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) = 0

KA3554G02,1.25-1.75m. Tr.Injection test. P=Test interval,PA=section below packers




PROTOTYPE, TR INJECTION TESTS, KA3554G02, 1.25-1.75 m recovery 2001-02-16 11:32:01
P
100
10
1
sp (KPa)
0.1
1
10
100
dte (min)


PROTOTYPE, TR INJECTION TESTS, KA3554G02, 1.25-1.75 m recovery 2001-02-16 11:32:01
P
0
2
4
6
8
10
12
sp (KPa)
0.1
1
10
100
dte (min)

Borehole KA3554G01, section 0.25 m - 0.75 m

Date: 01-02-15 Field Crew: B. Gentzschein, T. Sträng

Packer expansion: 010215 10:45
Valve opened: 010215 14:09.00 Valve closed: 010215 14:29.00
Total flowing time : 20.0 min. Tot. Pr. Build-up time 10.3 min.

Pressure data
Pressure before injection start (P_0, KPa) : 134.3
Pressure just before closing the valve (P_p, KPa): 310.8
Pressure at the end of the recovery (P_f, KPa) : 123.5

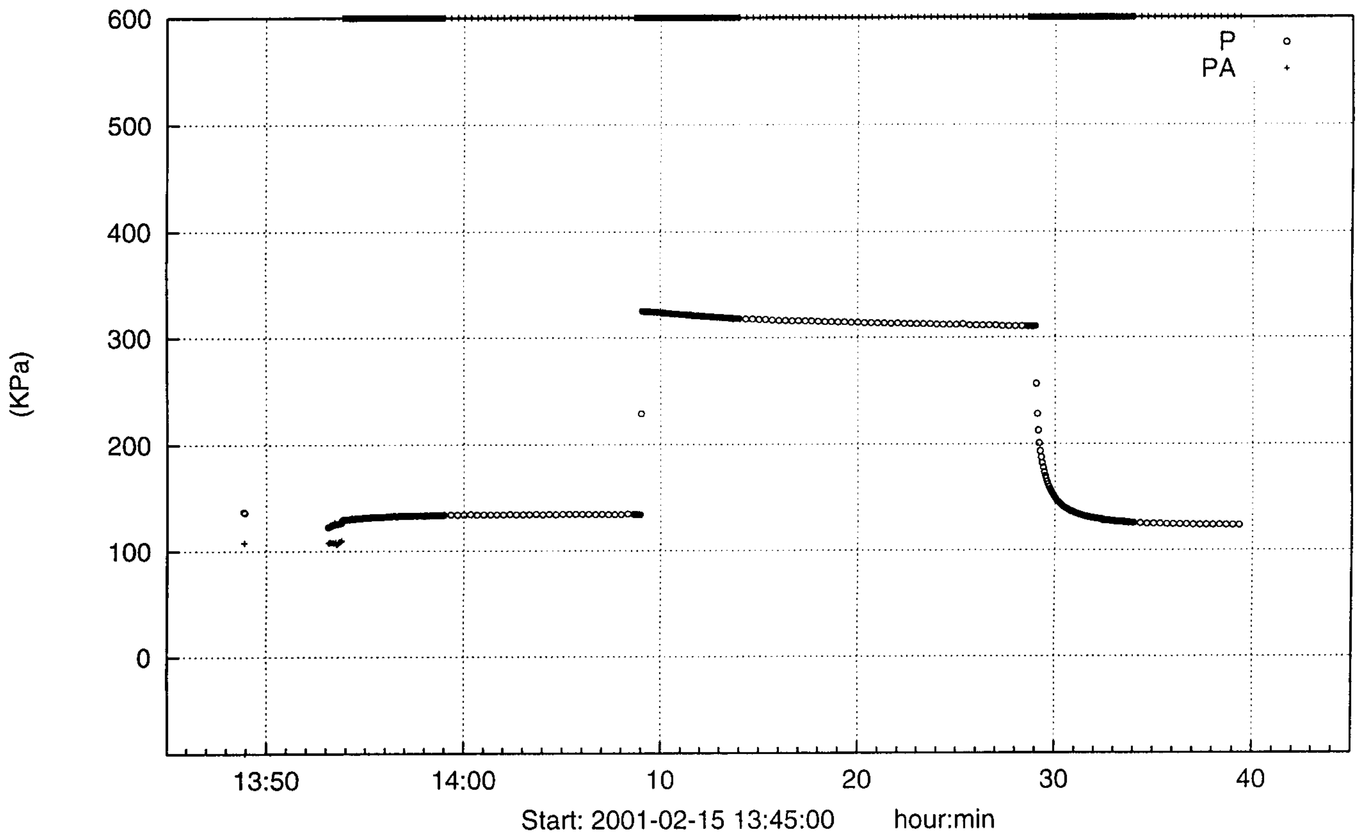
Flow data
Manually measured flow rates of KA3554G01, section 0.25 m –0.75 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3554G01, section 0.25 m –0.75 m. Prototype Repository, February 2001

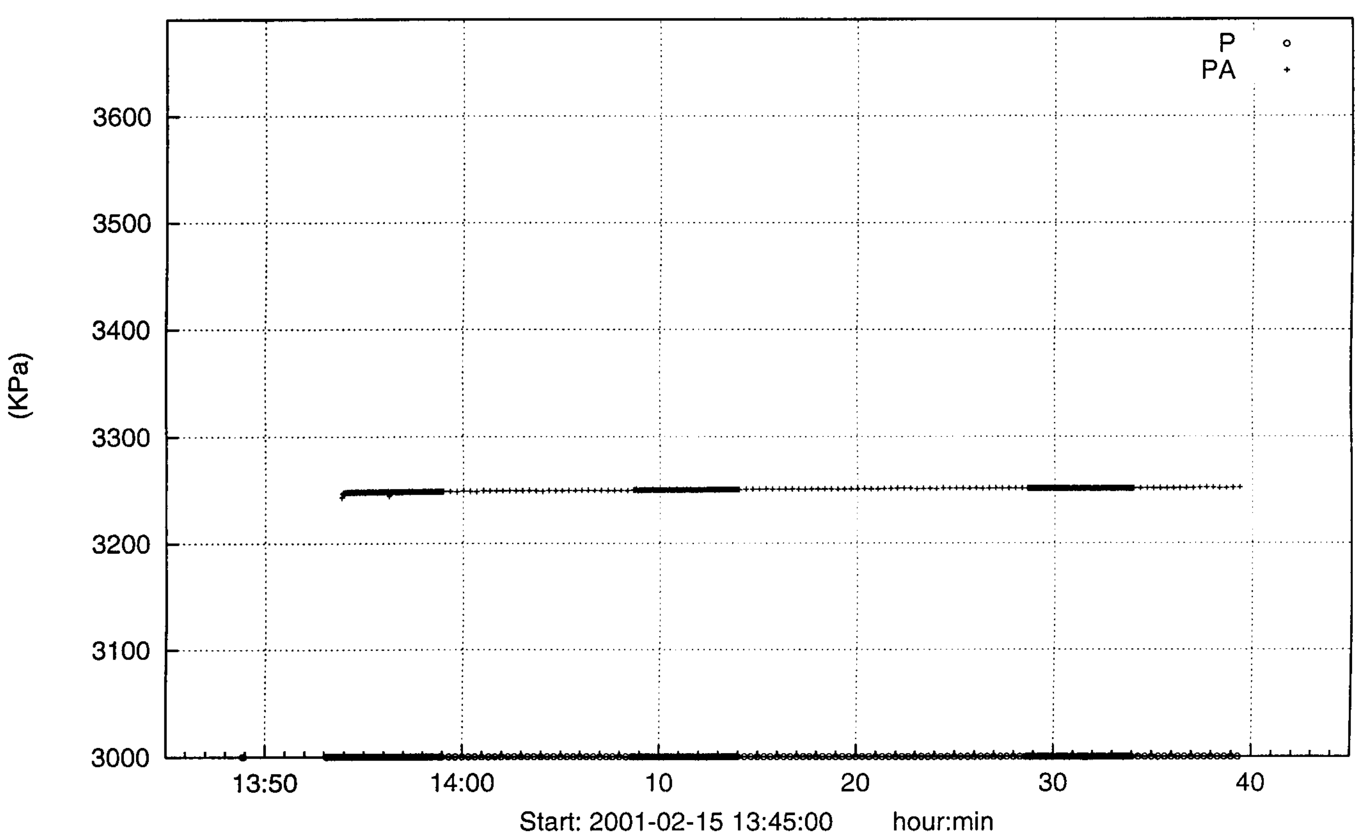
Time	Flow rate (l/min * 10^{-3})
14:09:05	49,0
14:09:15	26,1
14:09:25	22,9
14:09:35	21,6
14:09:50	0,98
14:10:15	33,3
14:10:45	20,0
14:11:15	19,6
14:11:45	19,2
14:12:30	20,0
14:13:30	18,2
14:14:30	18,1
14:15:32	18,1
14:16:32	15,6
14:17:30	21,0
14:18:30	18,7
14:24:00	17,8
14:26:02	18,4
14:28:02	19,2

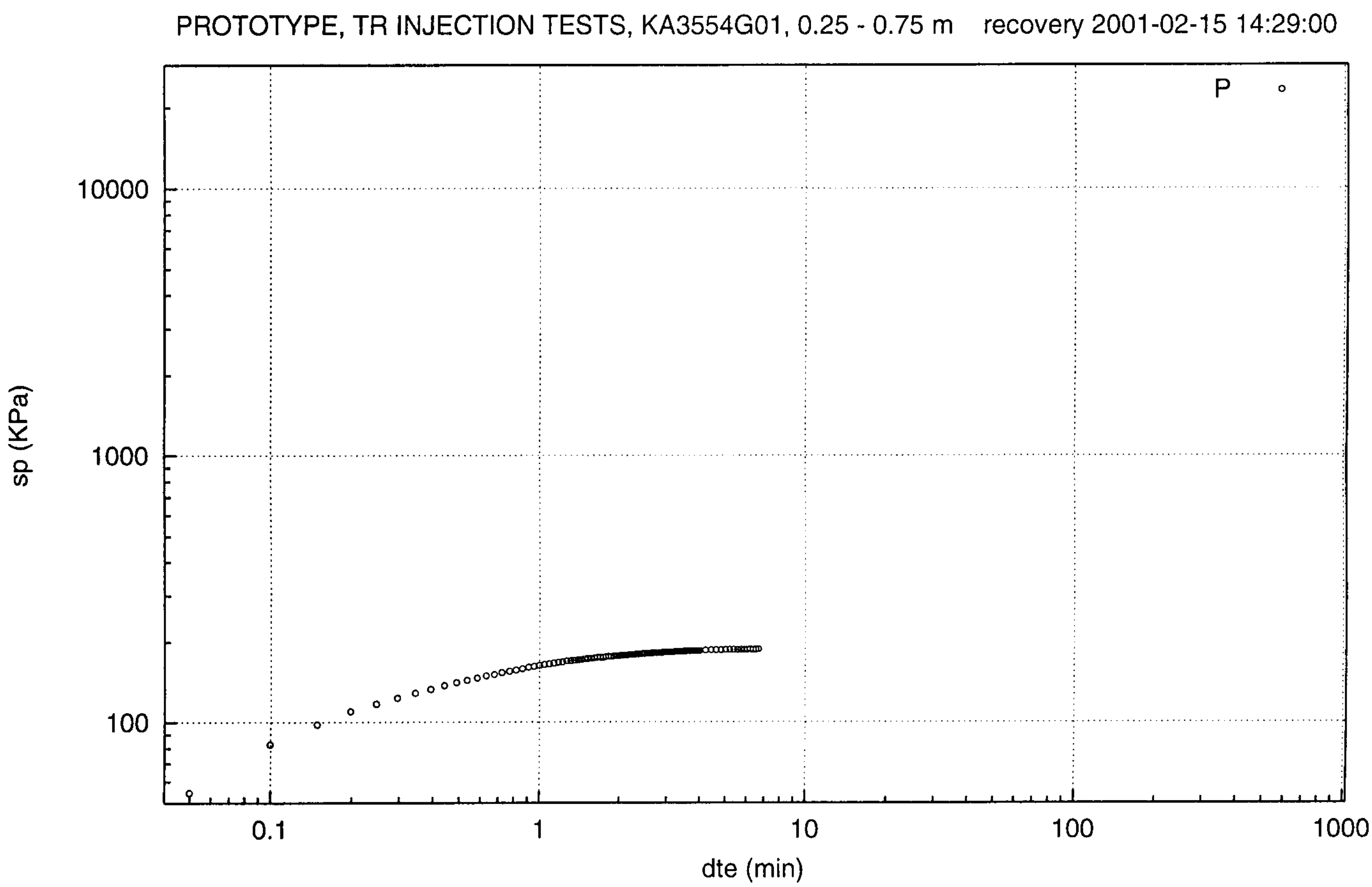
Calculated flow and volume data
Total injected water volume (V_{tot}, m^3) $= 3.8 \cdot 10^{-4}$
Injected volume excluding the first 10 seconds (V,m^3) $= 3,7 \cdot 10^{-4}$
Average flow rate based on V_{tot} (QT_{ave}, l/min) $= 1.91 \cdot 10^{-2}$
Average flow rate based on V (Q_{ave} ,l/min) $= 1.88 \cdot 10^{-2}$
Flow rate at the end of the Flow Phase (Qp, l/min) $= 1.9 \cdot 10^{-2}$

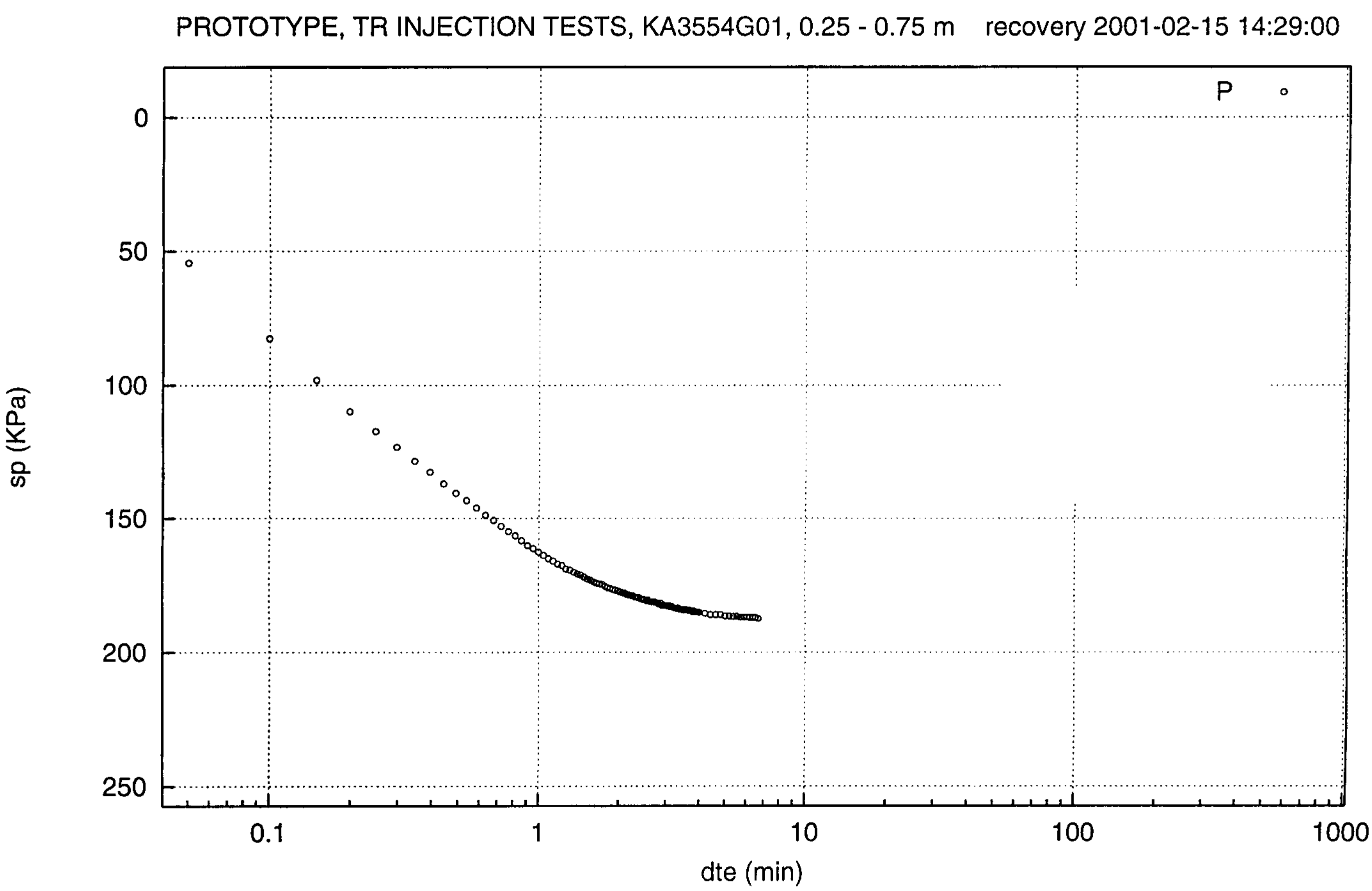
KA3554G01,0.25-0.75m. Tr.Injektion test. P=Test interval,PA=section below packers



KA3554G01,0.25-0.75m. Tr.Injektion test. P=Test interval,PA=section below packers




PROTOTYPE, TR INJECTION TESTS, KA3554G01, 0.25 - 0.75 m recovery 2001-02-15 14:29:00
P
10000
1000
100
sp (KPa)
0.1
1
10
100
1000
dte (min)


PROTOTYPE, TR INJECTION TESTS, KA3554G01, 0.25 - 0.75 m recovery 2001-02-15 14:29:00
P
0
50
100
150
200
250
sp (KPa)
0.1
1
10
100
1000
dte (min)

Borehole KA3554G01, section 0.75 m – 1.25 m

Date: 01-02-15 Field Crew: B. Gentzschein, T. Sträng
Packer expansion: 010215 17:05
Valve opened: 010215 17:30.00 Valve closed: 010215 17:50.00
Total flowing time : 20.0 min. Tot. Pr. Build-up time 855 min.

Pressure data
Pressure before injection start (P0, KPa) : 340.8
Pressure just before closing the valve (Pp, KPa): 618.3
Pressure at the end of the recovery (Pf, KPa) : 428.2

Flow data
Manually measured flow rates of KA3554G01, section 0.75 m –1.25 m, are presented in the table below.

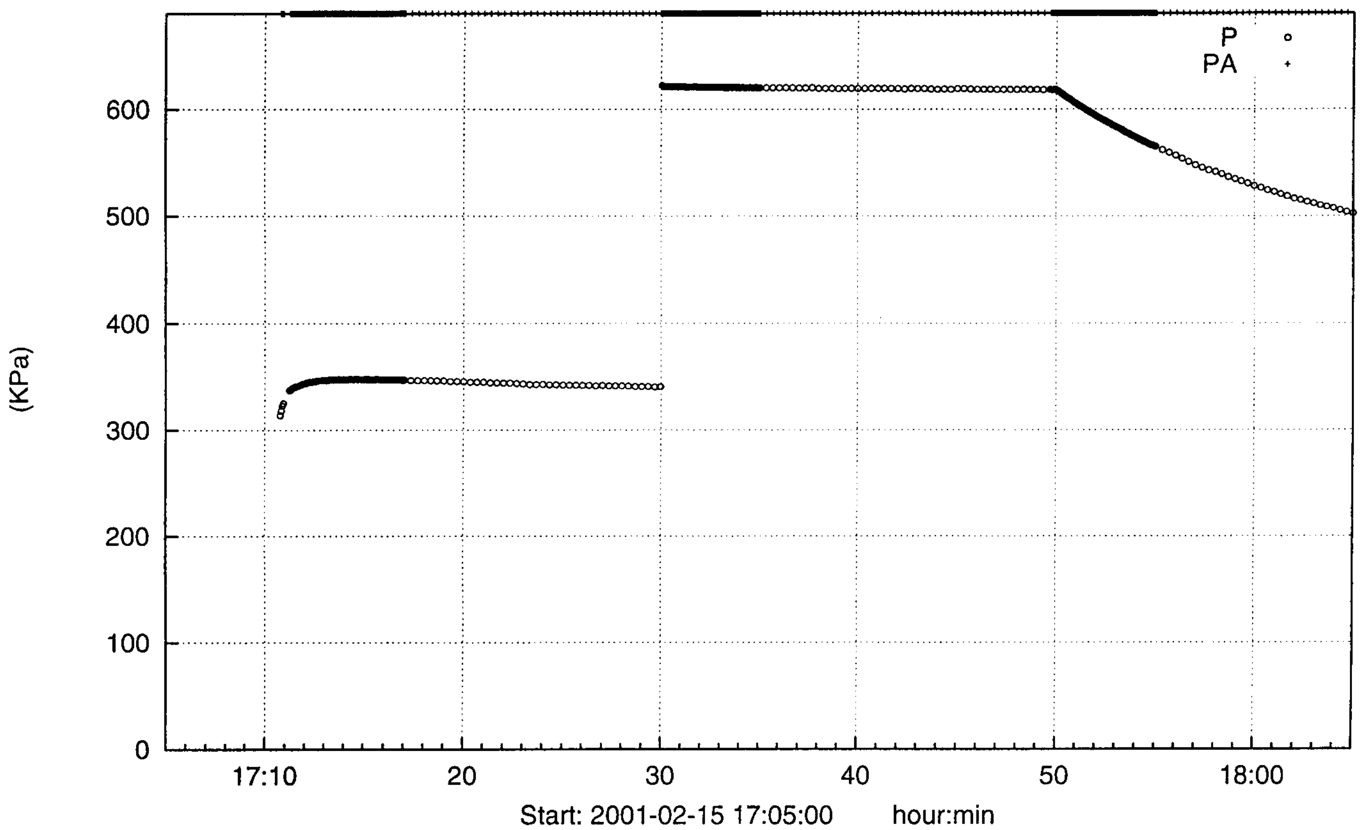
Table Manually measured flow rates, Injection Test in KA3554G01, section 0.75 m –1.25 m. Prototype Repository, February 2001

TimeFlow rate	(l/min * 10^{-3})
17:30:02	18,3
17:30:07	2,614
17:30:35	0,261
17:31:45	0,073
17:33:15	0,073
17:34:30	0,109
17:35:30	0,109
17:36:30	0,109
17:38:00	0,055
17:40:30	0,363
17:43:00	0,054
17:45:00	0,109
17:47:00	0,054
17:49:00	0,054

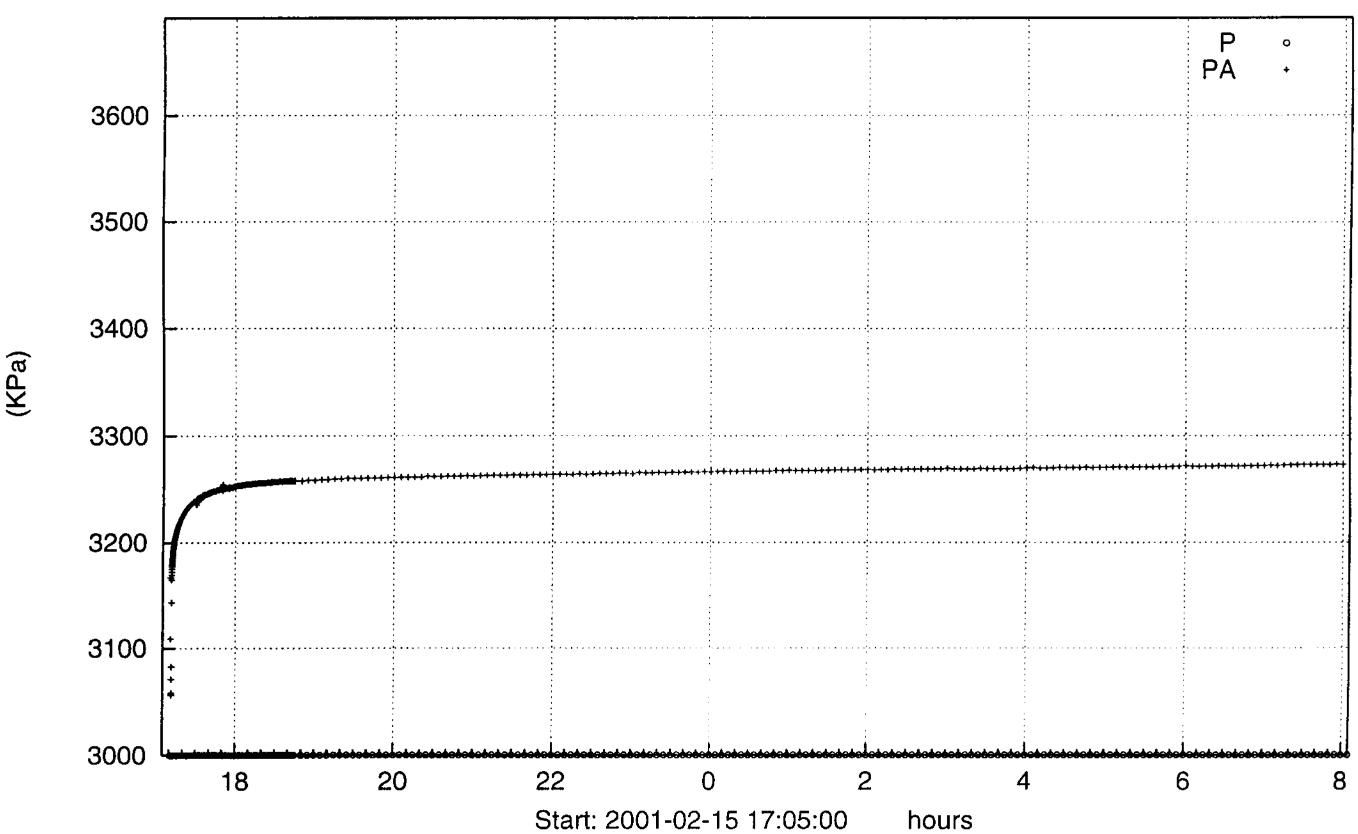
Calculated flow and volume data
Total injected water volume (Vtot, m^3) $= 3.3 \cdot 10^{-6}$
Injected volume excluding the first 5 seconds (V,m^3) $= 1,7 \cdot 10^{-6}$
Average flow rate based on Vtot (QTave, l/min) $= 1.6 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) $= 8.8 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) $= 5.4 \cdot 10^{-5}$

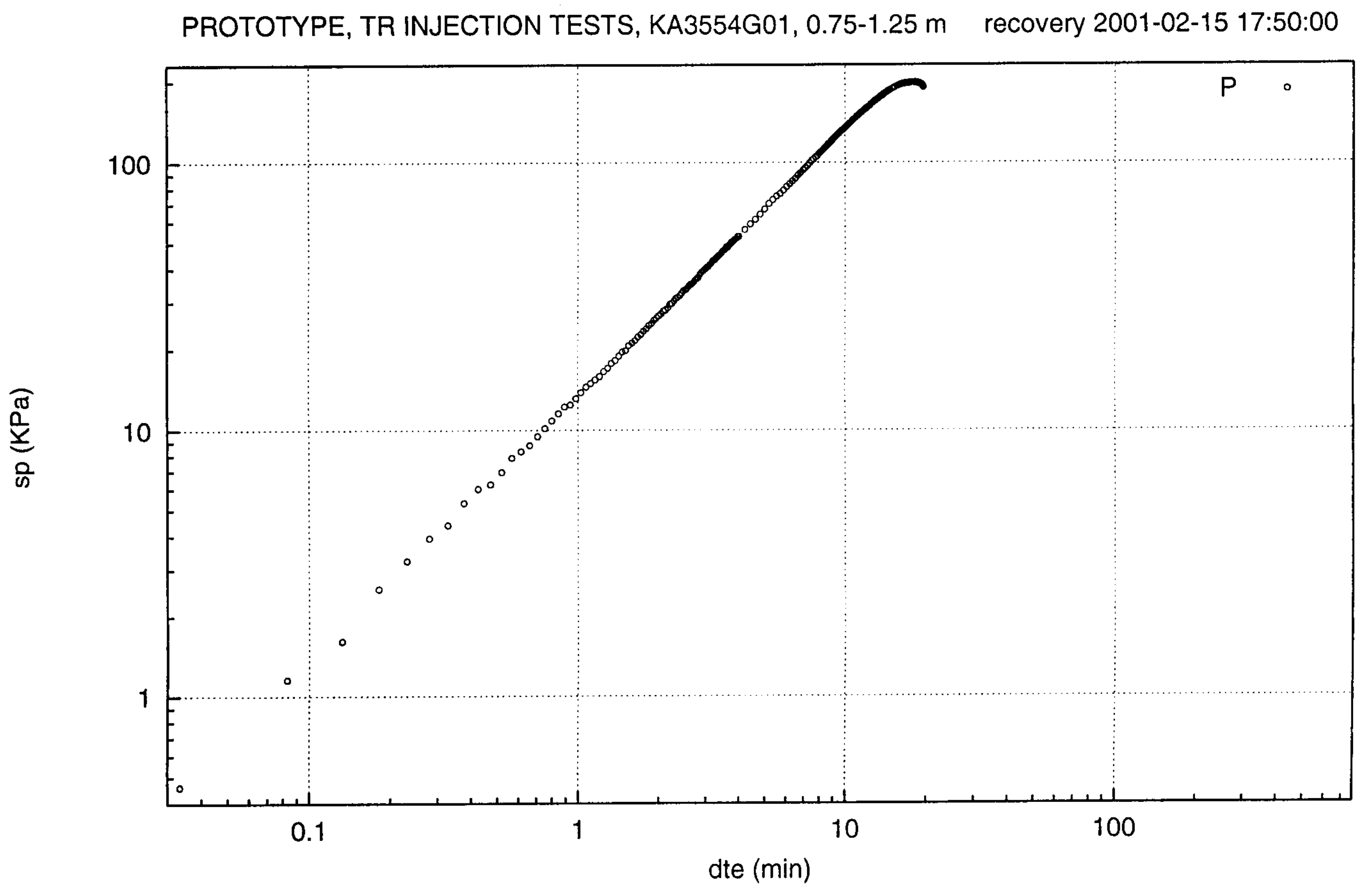
Comment
The recovery period lasted over the night.

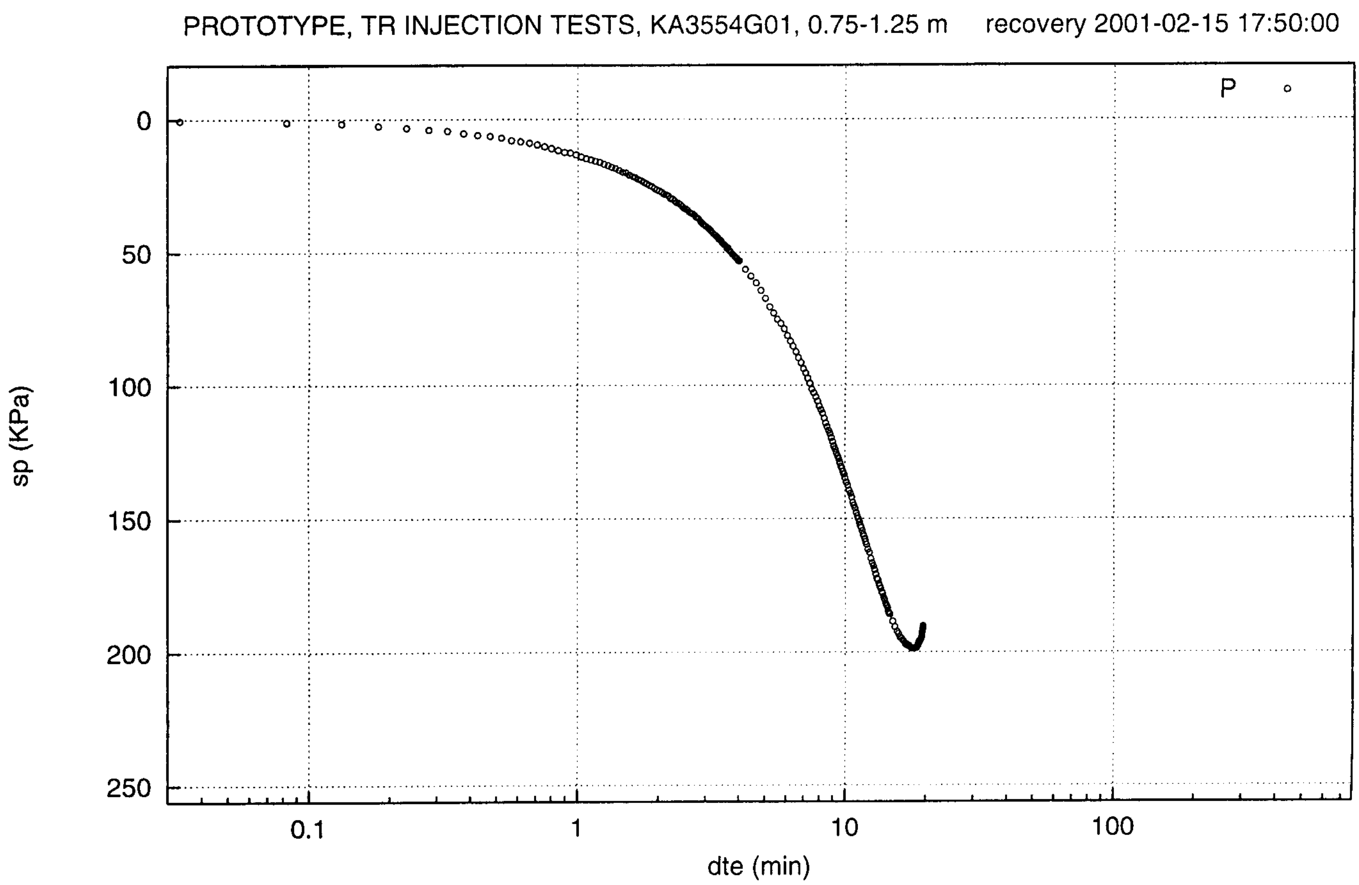
KA3554G01,0.75-1.25m. Tr.Injektion test. P=Test interval,PA=section below packers



KA3554G01,0.75-1.25m. Tr.Injektion test. P=Test interval,PA=section below packers




PROTOTYPE, TR INJECTION TESTS, KA3554G01, 0.75-1.25 m
recovery 2001-02-15 17:50:00
P
sp (KPa)
100
10
1
0.1
1
10
100
dte (min)


PROTOTYPE, TR INJECTION TESTS, KA3554G01, 0.75-1.25 m
recovery 2001-02-15 17:50:00
P
sp (KPa)
0
50
100
150
200
250
0.1
1
10
100
dte (min)

Borehole KA3554G01, section 1.25 m – 1.75 m

Date: 01-02-15 Field Crew: B. Gentzschein, T. Sträng
Packer expansion: 010215 16:02
Valve opened: 010215 16:28.00 Valve closed: 010215 16:48.00
Total flowing time : 20.0 min. Tot. Pr. Build-up time 11.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 125.1
Pressure just before closing the valve (Pp, KPa) : 416.5
Pressure at the end of the recovery (Pf, KPa) : 407.5

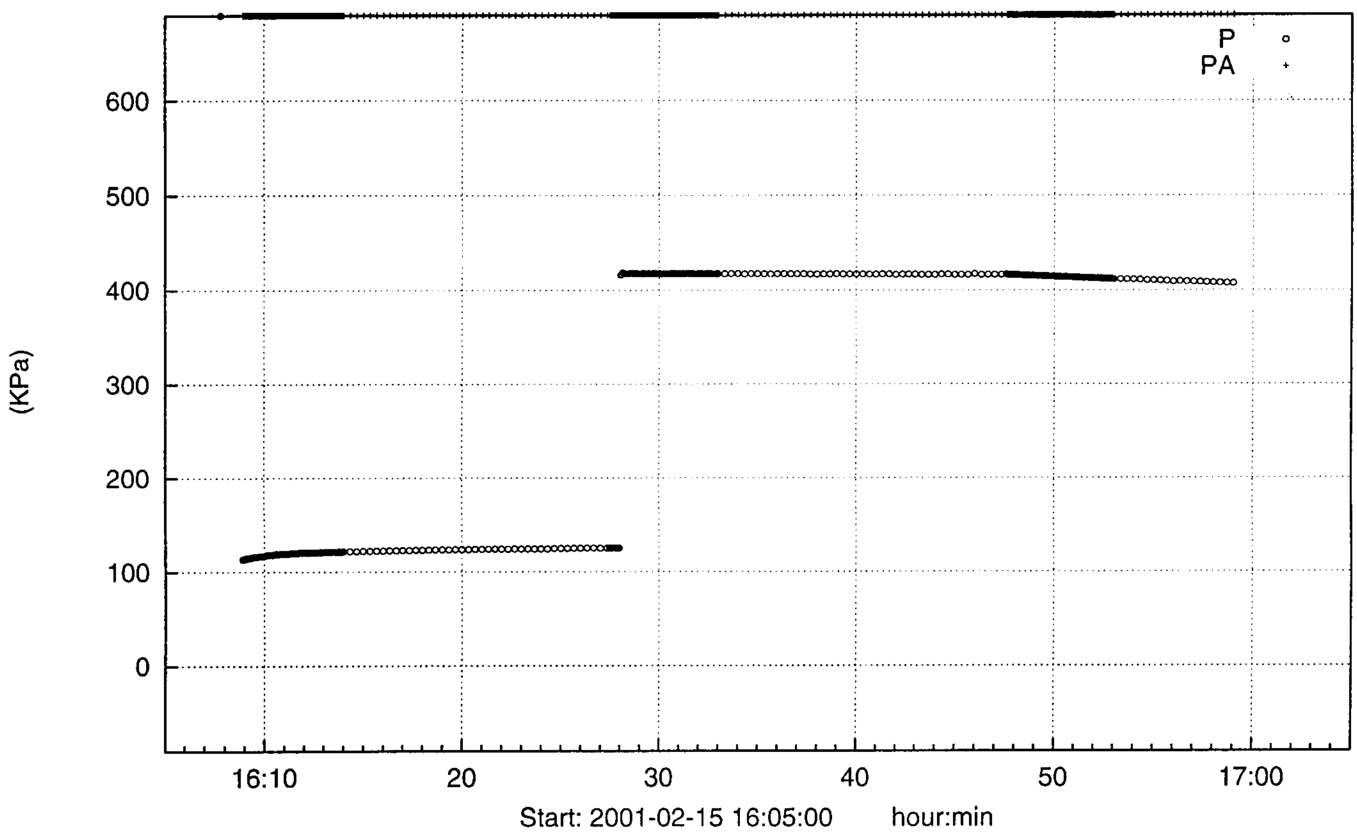
Flow data
Manually measured flow rates of KA3554G01, section 1.25 m –1.75 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3554G01, section 1.25 m –1.75 m. Prototype Repository, February 2001

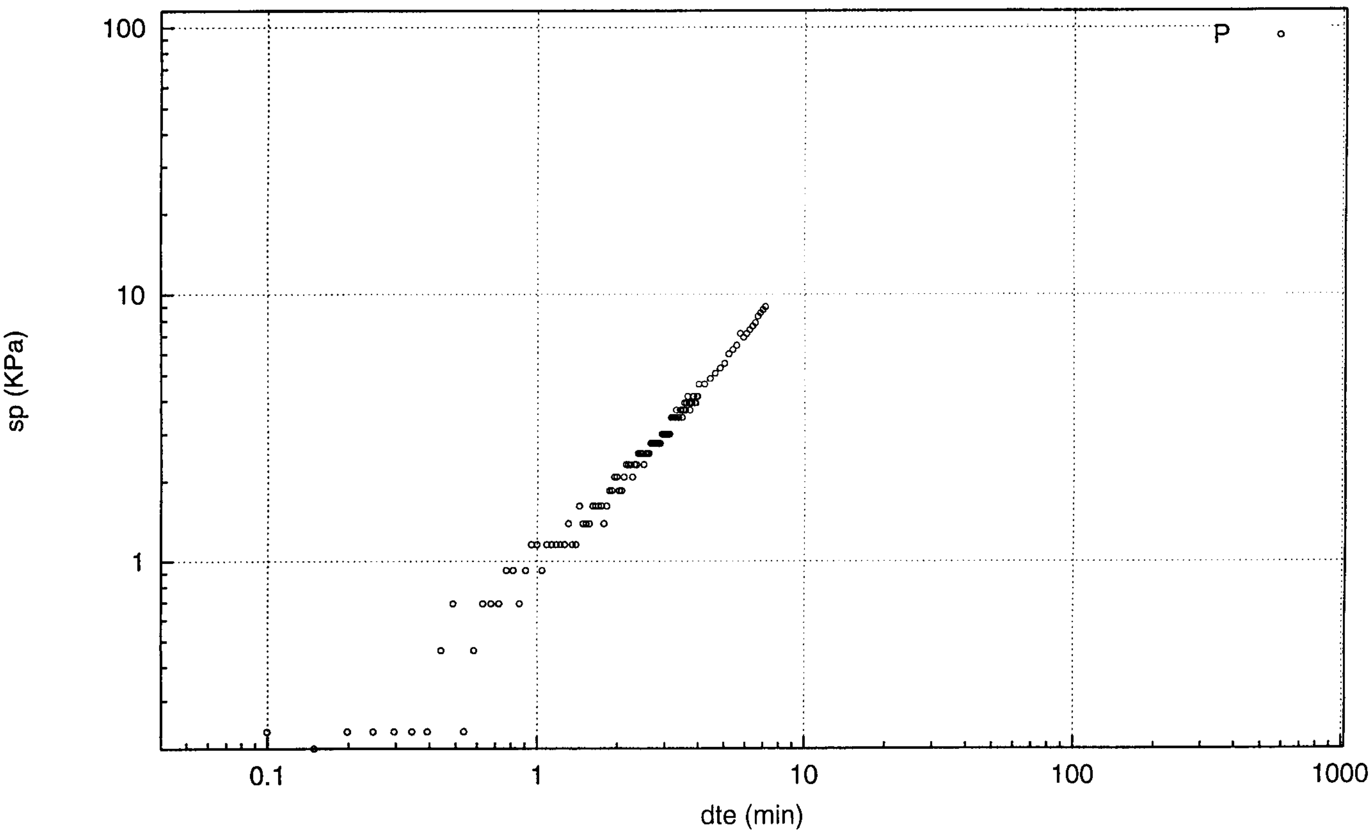
TimeFlow rate	(l/min * 10-3)
16:28:02	28,8
16:28:13	0,436
16:28:40	0,163
16:29:30	0,110
16:32:00	0,027
16:35:	0
16:47:	0

Calculated flow and volume data
Total injected water volume (Vtot, m^3) $= 2.8 \cdot 10^{-6}$
Injected volume excluding the first 5 seconds (V,m^3) $= 4{,}4 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) $= 1.4 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) $= 2.2 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) = 0

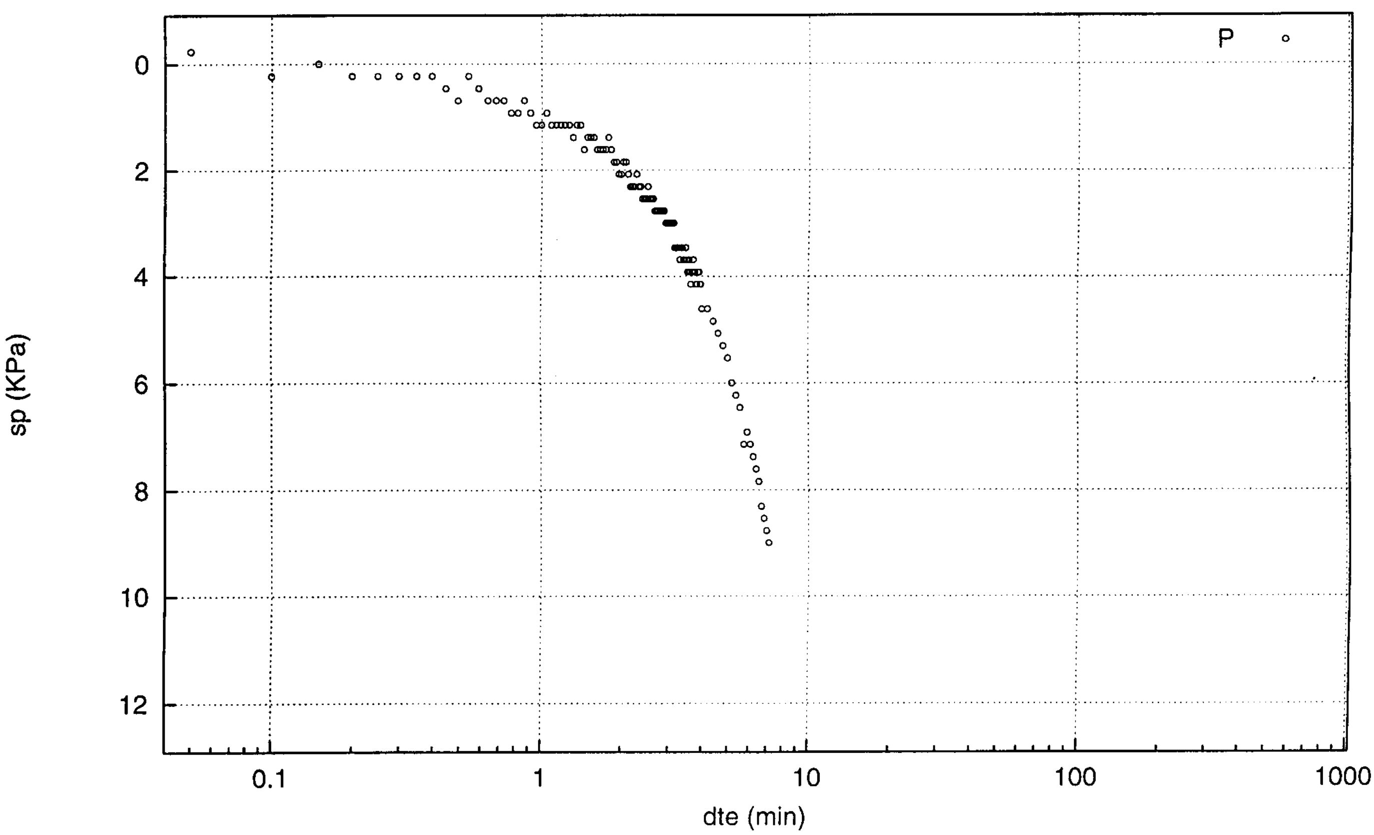
KA3554G01,1.25-1.75m. Tr.Injecktion test. P=Test interval,PA=section below packers



PROTOTYPE, TR INJECTION TESTS, KA3554G01, 1.25 - 1.75 m   recovery 2001-02-15 16:48:00



PROTOTYPE, TR INJECTION TESTS, KA3554G01, 1.25 - 1.75 m   recovery 2001-02-15 16:48:00



Borehole KA3572G01, section 0.25 m - 0.75 m

Date: 01-02-21 Field Crew: B. Gentzschein, J. Källgården

Packer expansion: 010221 15:30
Valve opened: 010221 15:53.03 Valve closed: 010221 16.13.03
Total flowing time : 20.0 min. Tot. Pr. Build-up time 11.0 min.

Pressure data
Pressure before injection start (P_0, KPa) : 112.2
Pressure just before closing the valve (P_p, KPa): 348.6
Pressure at the end of the recovery (P_f, KPa) : 332.0

Flow data
Manually measured flow rates of KA3572G01, section 0.25 m –0.75 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3572G01, section 0.25 m –0.75 m. Prototype Repository, February 2001

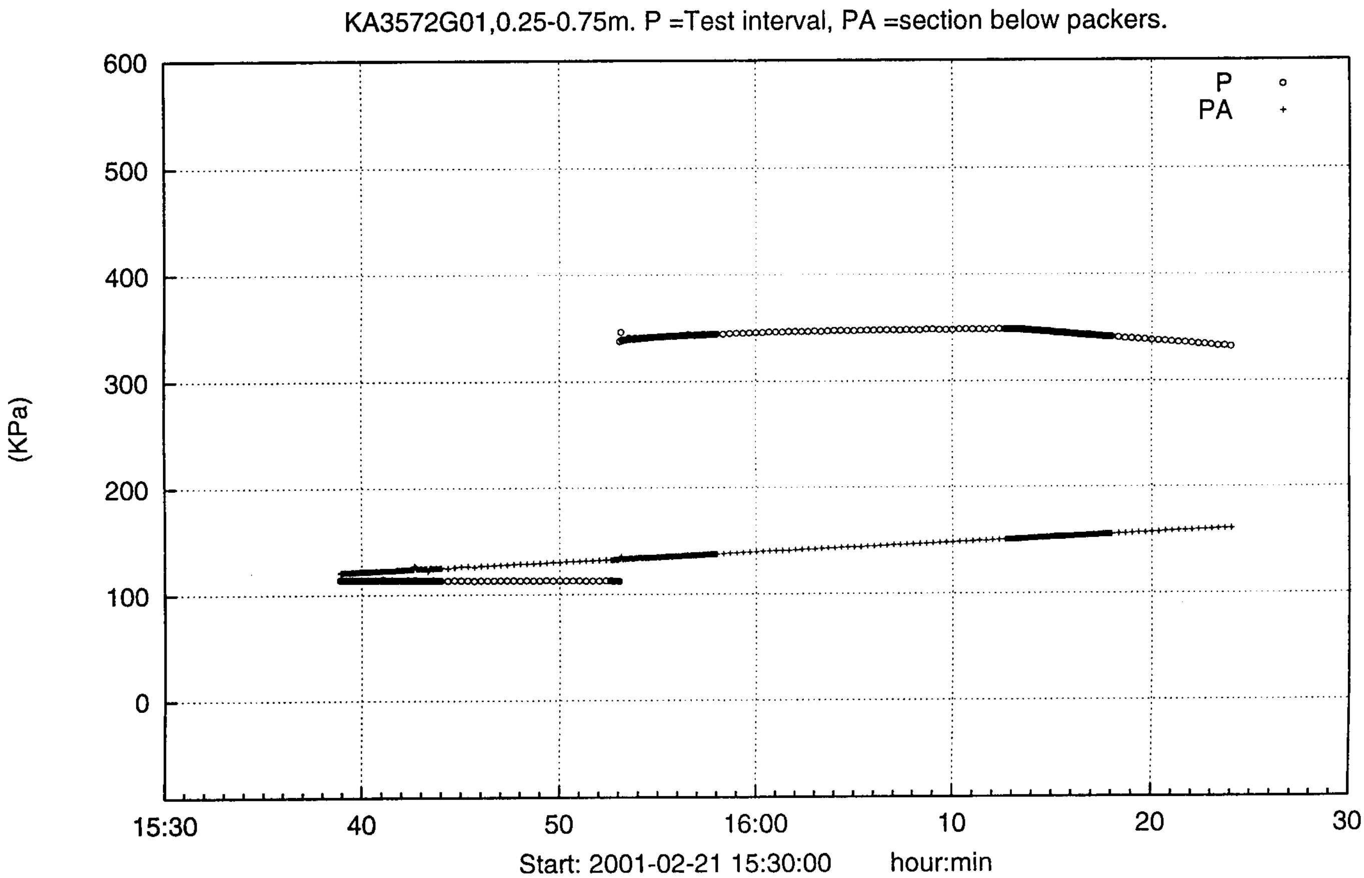
Time	Flow rate (l/min * 10^{-3})
15:53:05	343,7
15:53:15	0,871
15:53:33	0,327
15:54:00	0,187
15:54:25	0,436
15:54:48	0,436
15:55:33	0,109
15:56:33	0,109
15:57:33	0,327
15:58:33	0,109
16:02:33	0,109
16:04:03	0,109
16:06:03	0,109
16:08:03	0,054
16:10:03	0,109
16:12:03	0,054

Calculated flow and volume data

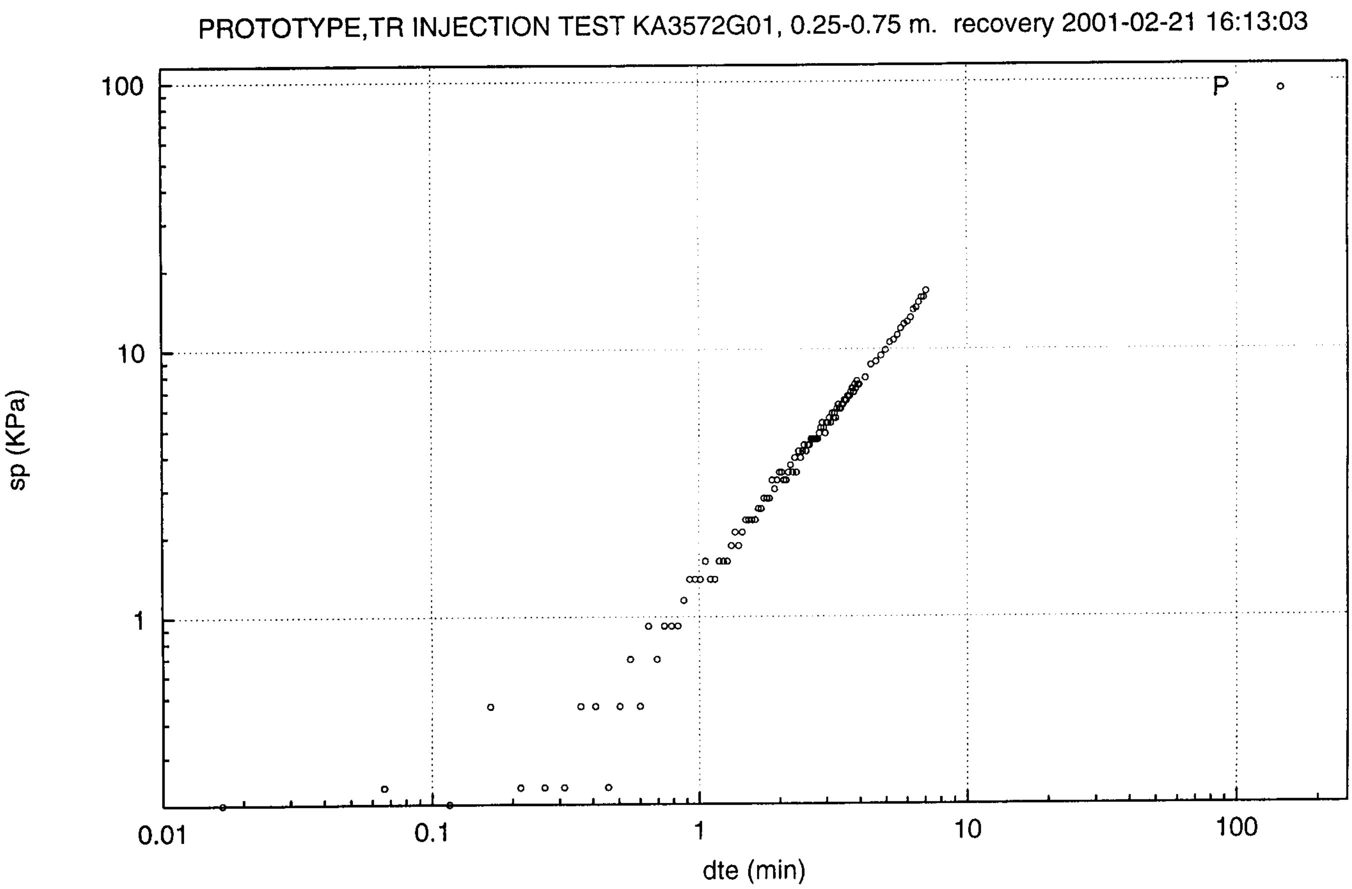
Total injected water volume (V_{tot}, m^3) = $3.1 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds (V,m^3) = $2,7 \cdot 10^{-6}$
Average flow rate based on V_{tot} (QT_{ave}, l/min) = $1.6 \cdot 10^{-3}$
Average flow rate based on V (Q_{ave} ,l/min) = $1.4 \cdot 10^{-4}$
Flow rate at the end of the Flow Phase (Qp, l/min) = $5.4 \cdot 10^{-5}$

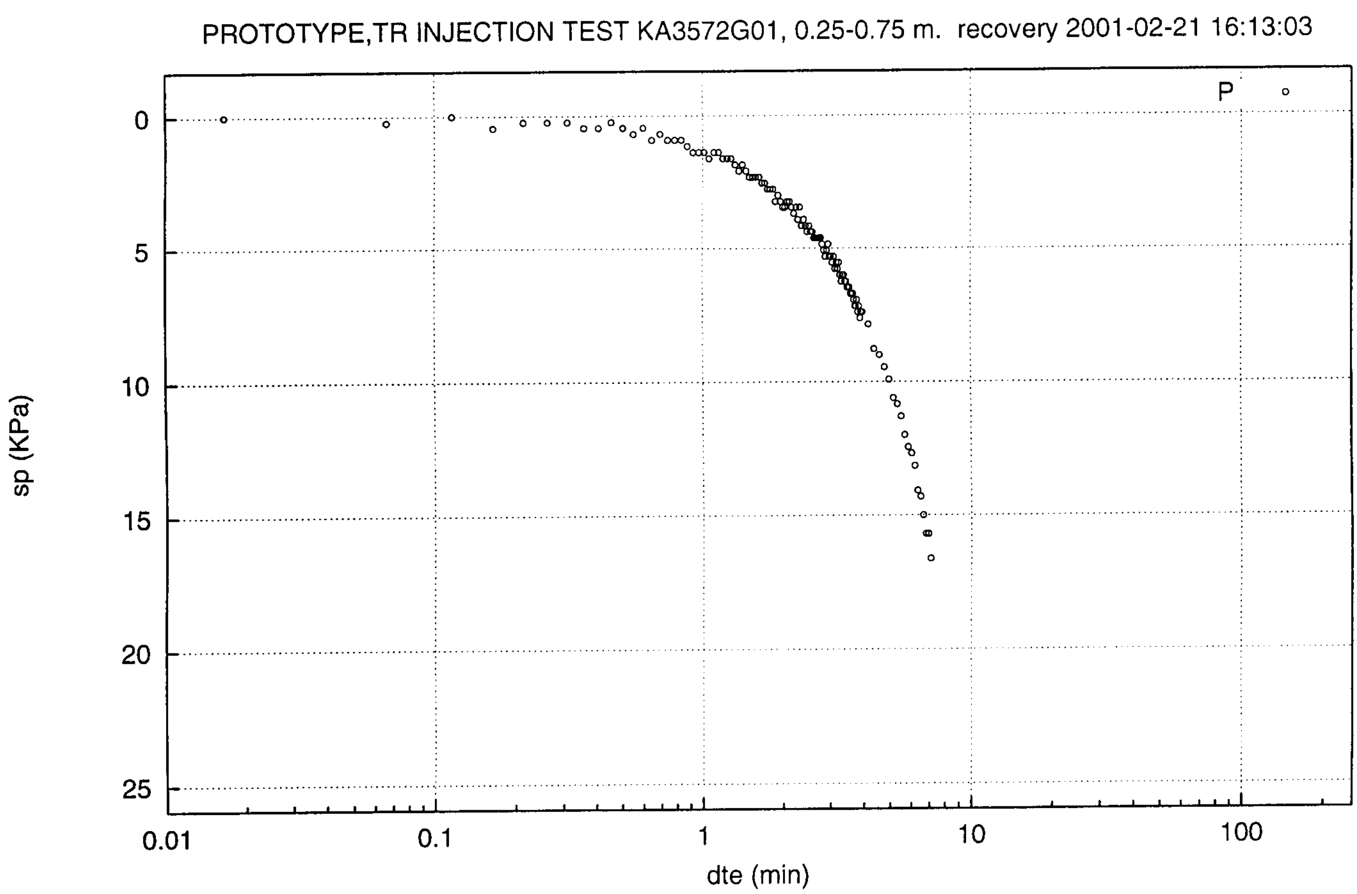
Comment

The pressure increases somewhat (c.7 KPa) during the flowing period.



KA3572G01,0.25-0.75m. P =Test interval, PA =section below packers.
P
PA
(KPa)
600
500
400
300
200
100
0
15:30
40
50
16:00
10
20
30
Start: 2001-02-21 15:30:00
hour:min


PROTOTYPE,TR INJECTION TEST KA3572G01, 0.25-0.75 m. recovery 2001-02-21 16:13:03
P
sp (KPa)
100
10
1
0.01
0.1
1
10
100
dte (min)


PROTOTYPE,TR INJECTION TEST KA3572G01, 0.25-0.75 m. recovery 2001-02-21 16:13:03
P
sp (KPa)
0
5
10
15
20
25
0.01
0.1
1
10
100
dte (min)

Borehole KA3572G01, section 0.75 m – 1.25 m

Date: 01-02-21 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010221 16:25
Valve opened: 010221 16:45.03 Valve closed: 010221 17.05.03
Total flowing time : 20.0 min. Tot. Pr. Build-up time 899.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 111.5
Pressure just before closing the valve (Pp, KPa) : 348.6
Pressure at the end of the recovery (Pf, KPa) : 229.1

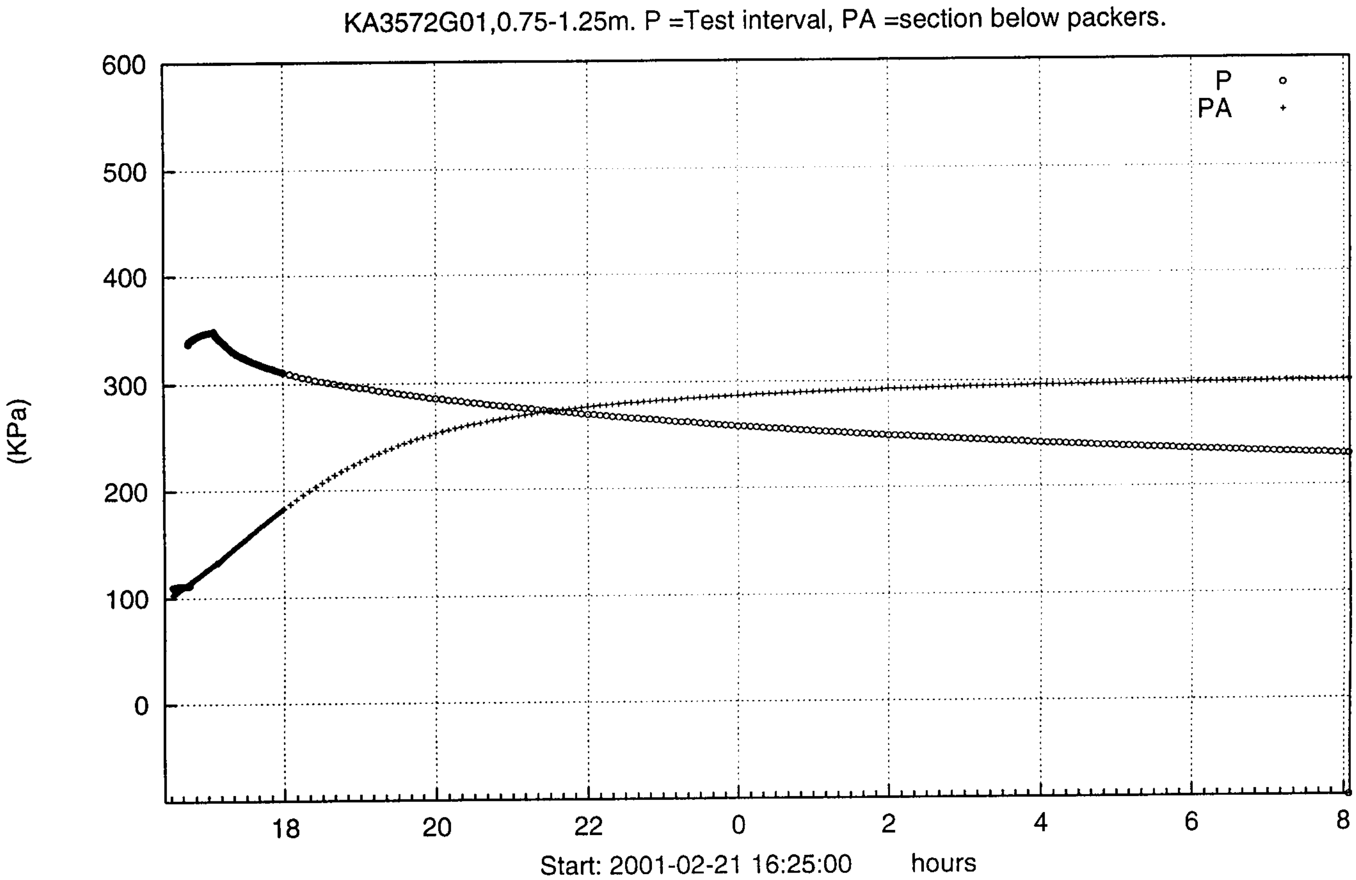
Flow data
Manually measured flow rates of KA3572G01, section 0.75 m –1.25 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3572G01, section 0.75 m –1.25 m. Prototype Repository, February 2001

TimeFlow rate	(l/min * 10^{-3})
16:45:05	271,8
16:45:10	1,31
16:45:28	0,218
16:45:53	0,327
16:46:10	0,436
16:46:40	0,109
16:47:18	0,218
16:47:48	0,218
16:48:33	0,109
16:49:33	0,218
16:50:33	0,109
16:51:33	0,218
16:52:33	0,109
16:53:33	0,109
16:54:33	0,109
16:56:03	0,109
16:58:03	0,054
17:00:03	0,054
17:02:03	0,054
17:04:03	0,054

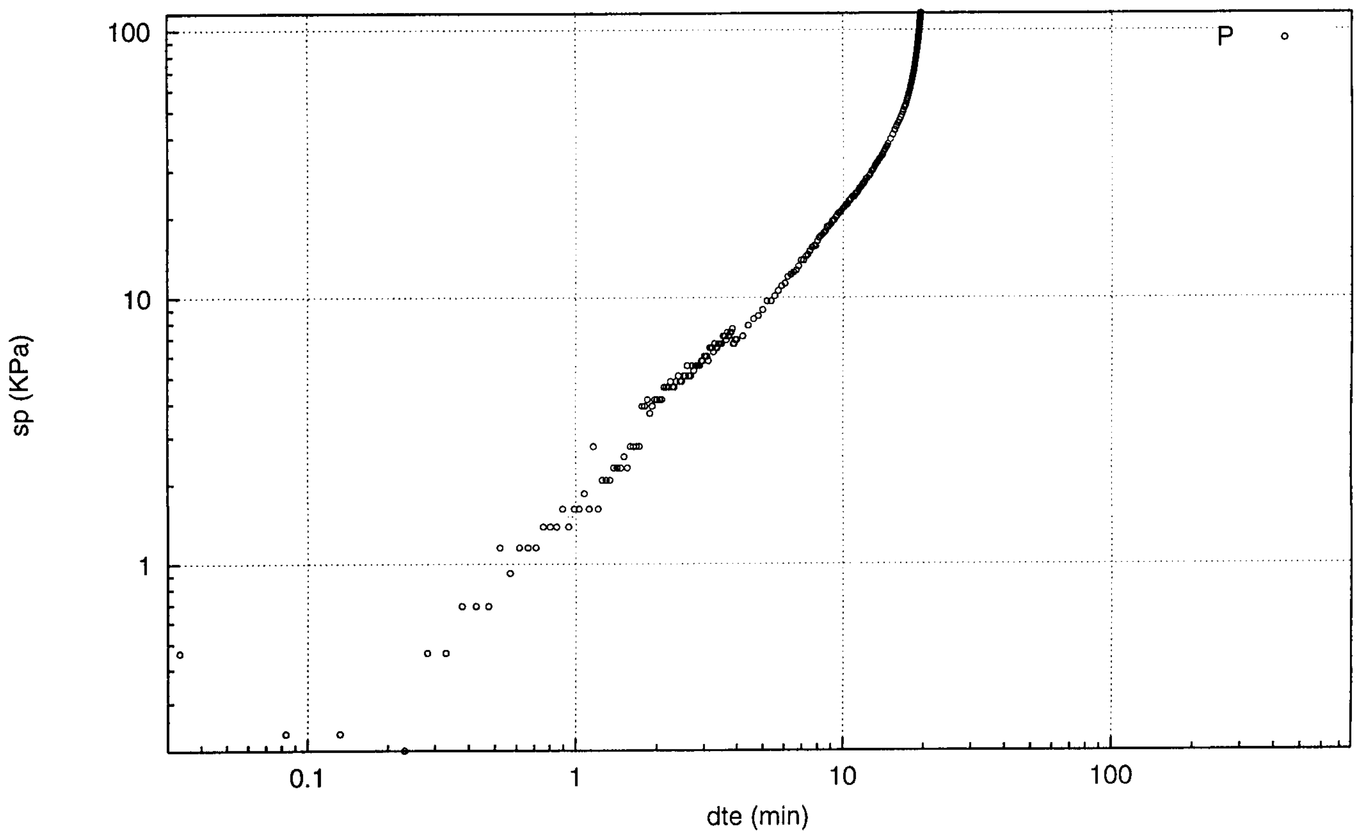
Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $2.5 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds (V,m^3) = $2,4 \cdot 10^{-6}$
Average flow rate based on Vtot (QTave, l/min) = $1.3 \cdot 10^{-3}$
Average flow rate based on V (Qave ,l/min) = $1.2 \cdot 10^{-4}$
Flow rate at the end of the Flow Phase (Qp, l/min) = $5.4 \cdot 10^{-5}$

Comment
The pressure increases somewhat (c.9 KPa) during the flowing period.

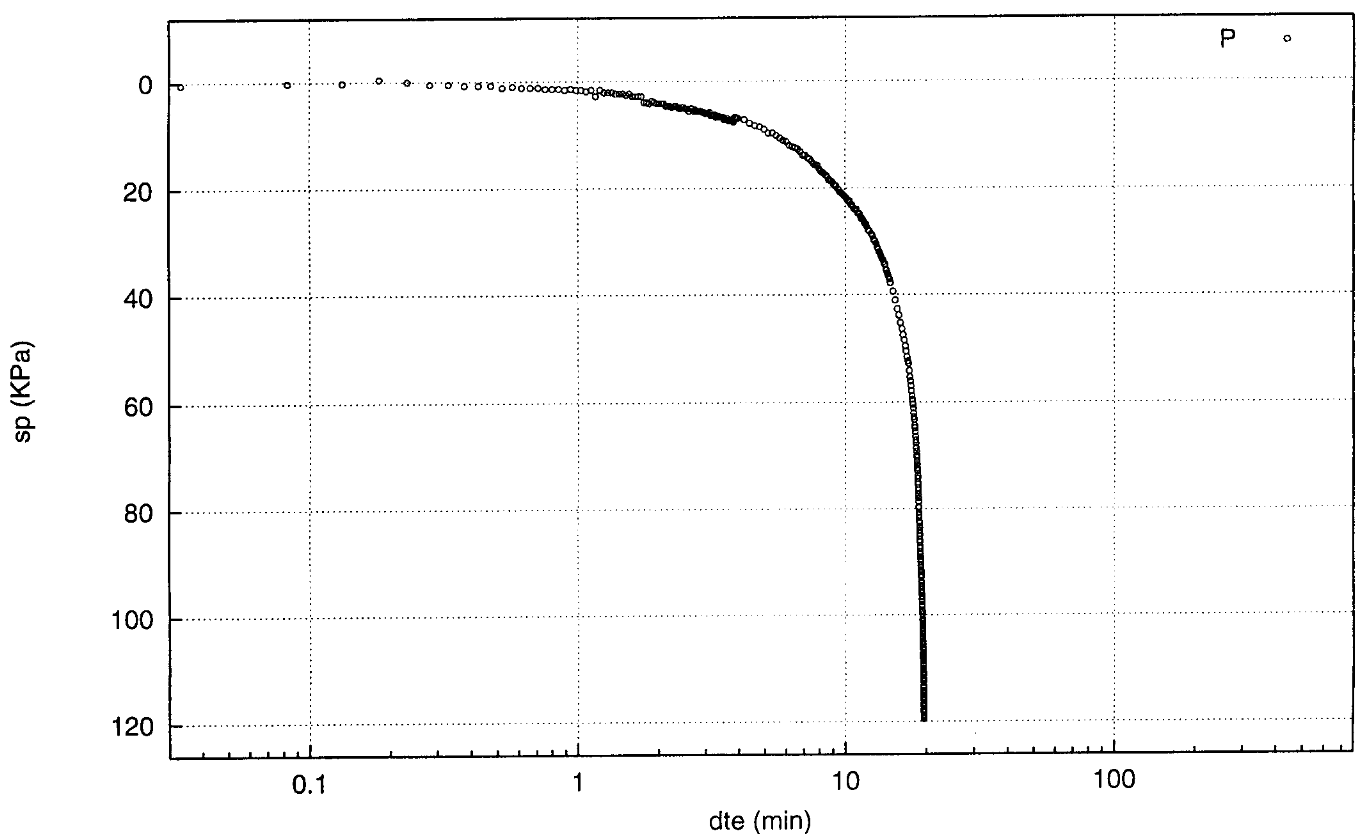


KA3572G01,0.75-1.25m. P =Test interval, PA =section below packers.
P
PA
600
500
400
300
200
100
0
(KPa)
18
20
22
0
2
4
6
8
Start: 2001-02-21 16:25:00
hours

PROTOTYPE,TR INJECTION TEST KA3572G01, 0.75 - 1.25 m. recovery 2001-02-21 17:05:03



PROTOTYPE,TR INJECTION TEST KA3572G01, 0.75 - 1.25 m. recovery 2001-02-21 17:05:03



Borehole KA3572G01, section 1.25 m – 1.75 m

Date: 01-02-22 Field Crew: B. Gentzschein, J. Källgården

Packer expansion: 010222 08:05
Valve opened: 010222 08:27.03 Valve closed: 010222 08:47.03
Total flowing time : 20.0 min. Tot. Pr. Build-up time 12.0 min.

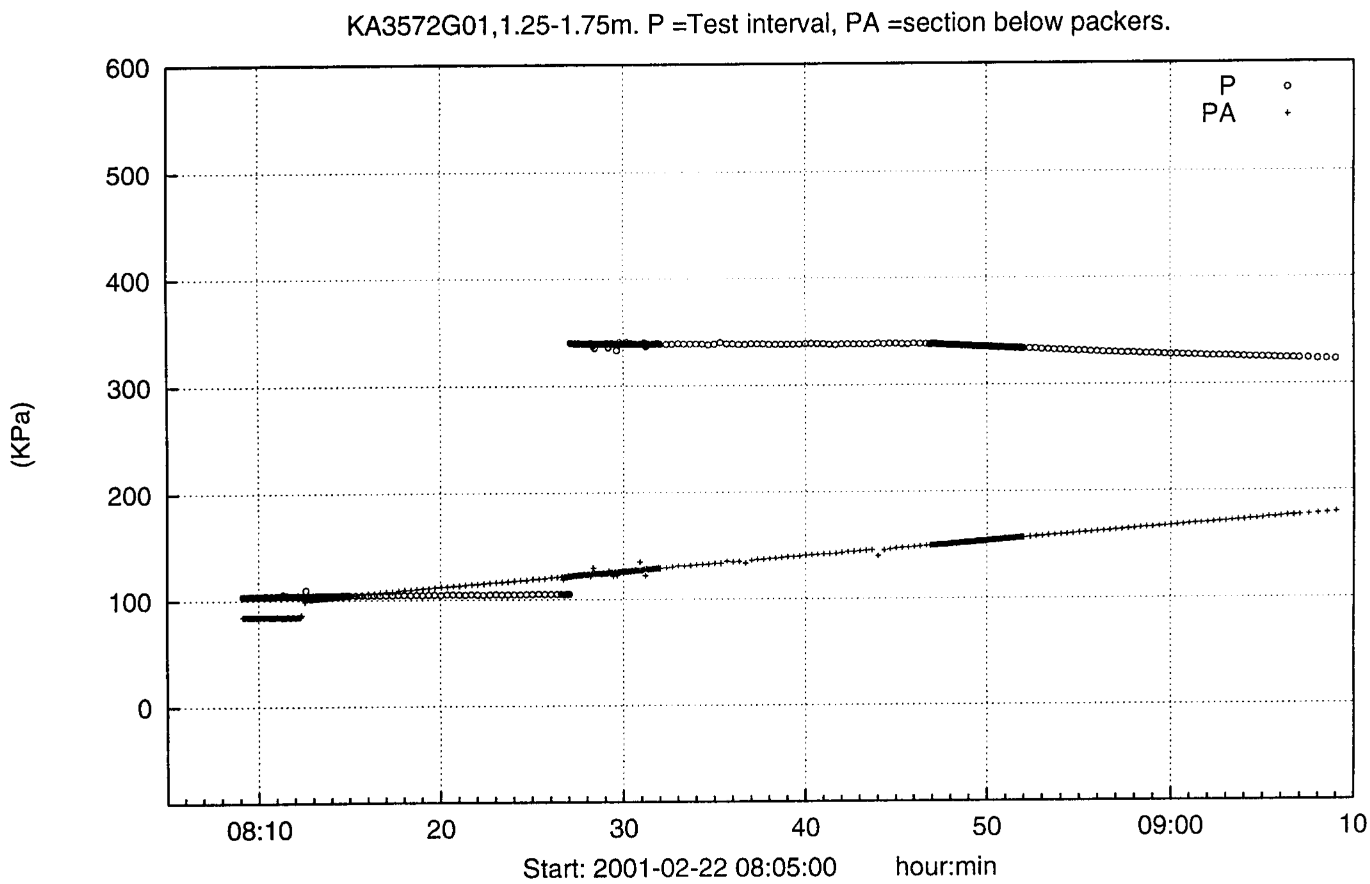
Pressure data
Pressure before injection start (P_0, KPa) : 105.0
Pressure just before closing the valve (P_p, KPa): 338.3
Pressure at the end of the recovery (P_f, KPa) : 323.0

Flow data
Manually measured flow rates of KA3572G01, section 1.25 m –1.75 m, are presented in the table below.

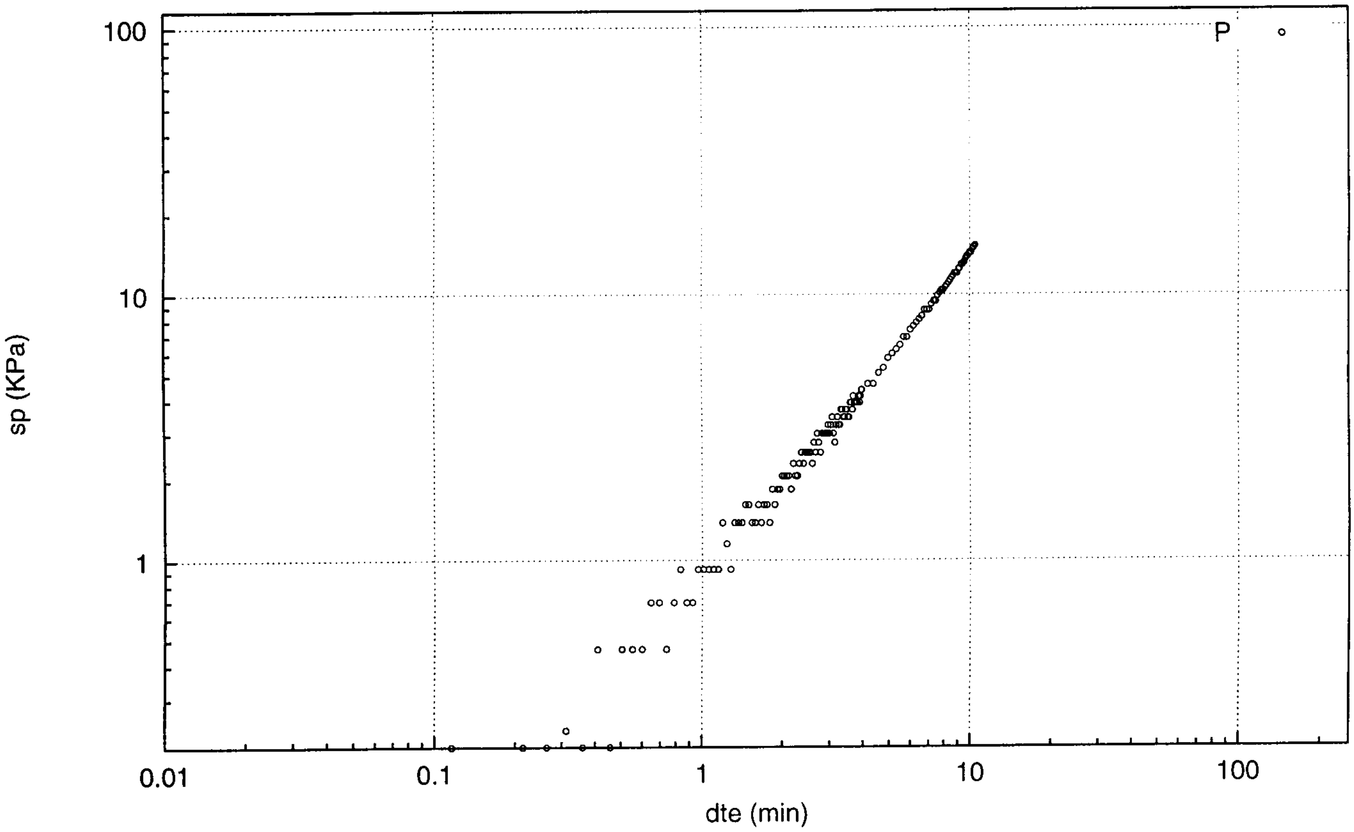
Table Manually measured flow rates, Injection Test in KA3572G01, section 1.25 m –1.75 m. Prototype Repository, February 2001

TimeFlow rate	(l/min * 10^{-3})
08:27:05	275,8
08:27:50	0,077
08:29:03	0,109
08:30:18	0,073
08:31:33	0,218
08:32:33	0,109
08:33:33	0,109
08:34:33	0,109
08:36:08	0,050
08:39:08	0,028
08:42:03	0,054
08:44:03	0,054

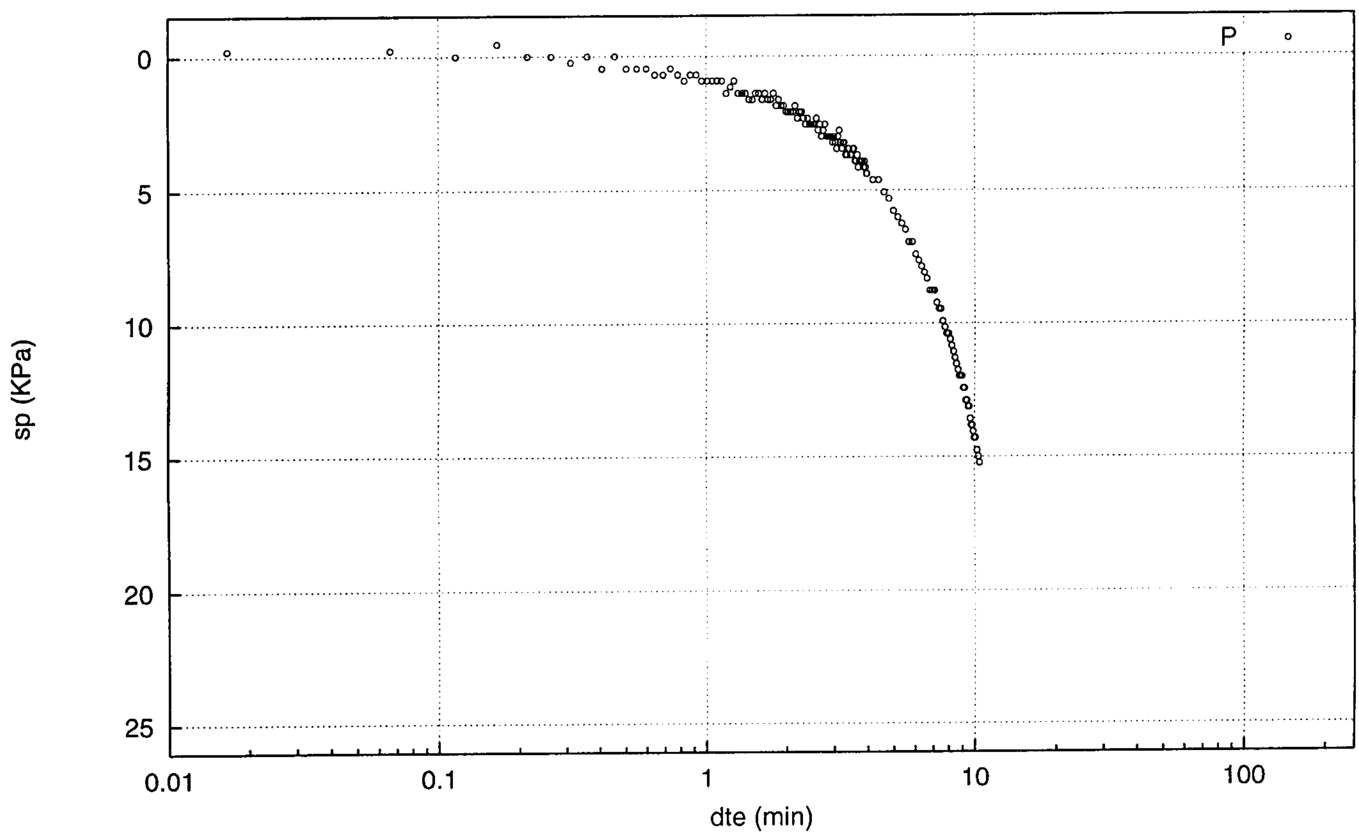
Calculated flow and volume data
Total injected water volume (V_{tot}, m^3) $= 2.4 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds (V,m^3) $= 1,3 \cdot 10^{-6}$
Average flow rate based on V_{tot} (QT_{ave}, l/min) $= 1.2 \cdot 10^{-3}$
Average flow rate based on V (Q_{ave} ,l/min) $= 6.6 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min)

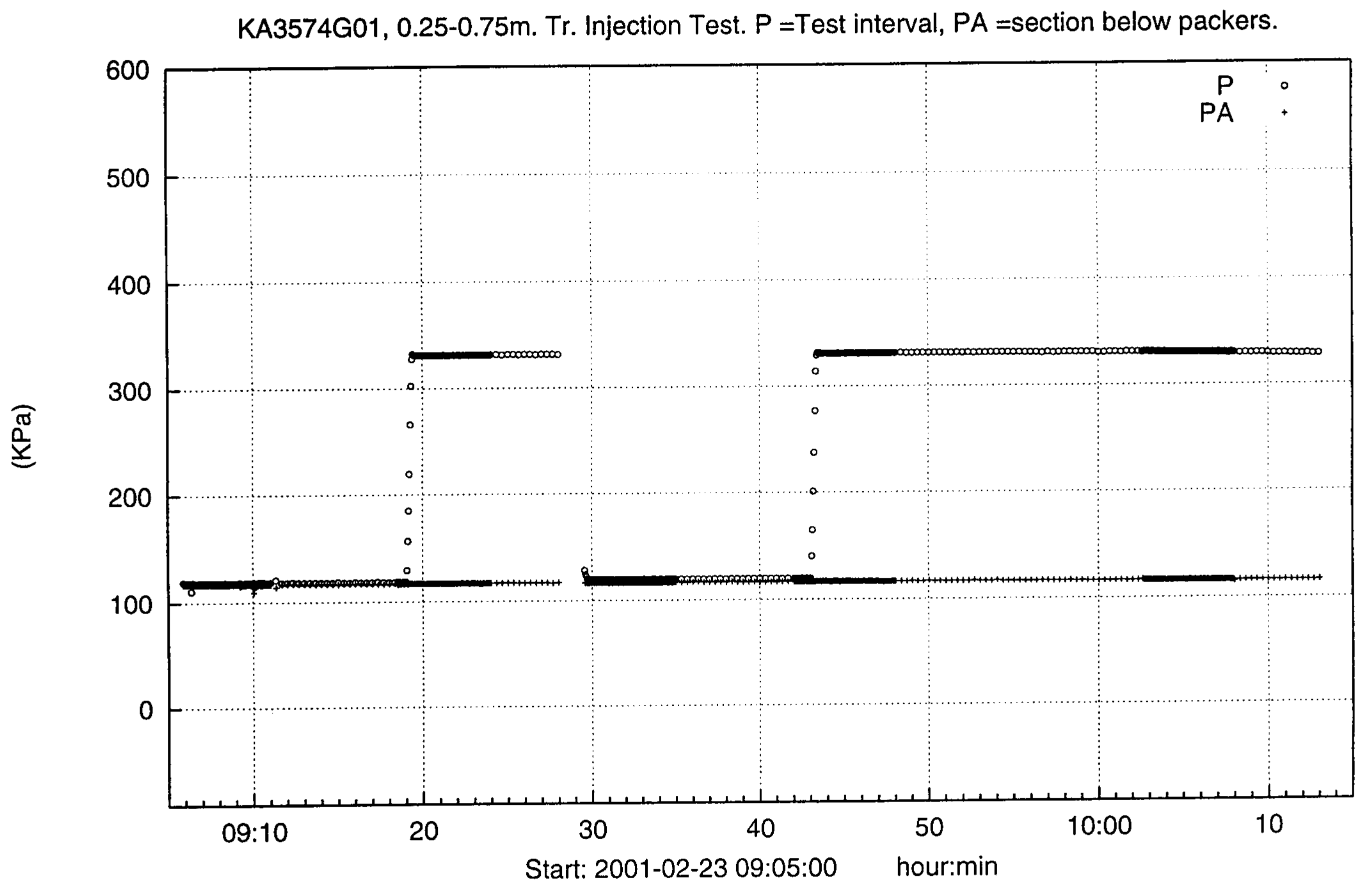

KA3572G01,1.25-1.75m. P =Test interval, PA =section below packers.
600
500
400
300
200
100
0
(KPa)
P
PA
08:10
20
30
40
50
09:00
10
Start: 2001-02-22 08:05:00
hour:min

PROTOTYPE,TR INJECTION TEST KA3572G01, 1.25 - 1.75 m. recovery 2001-02-22 08:47:03

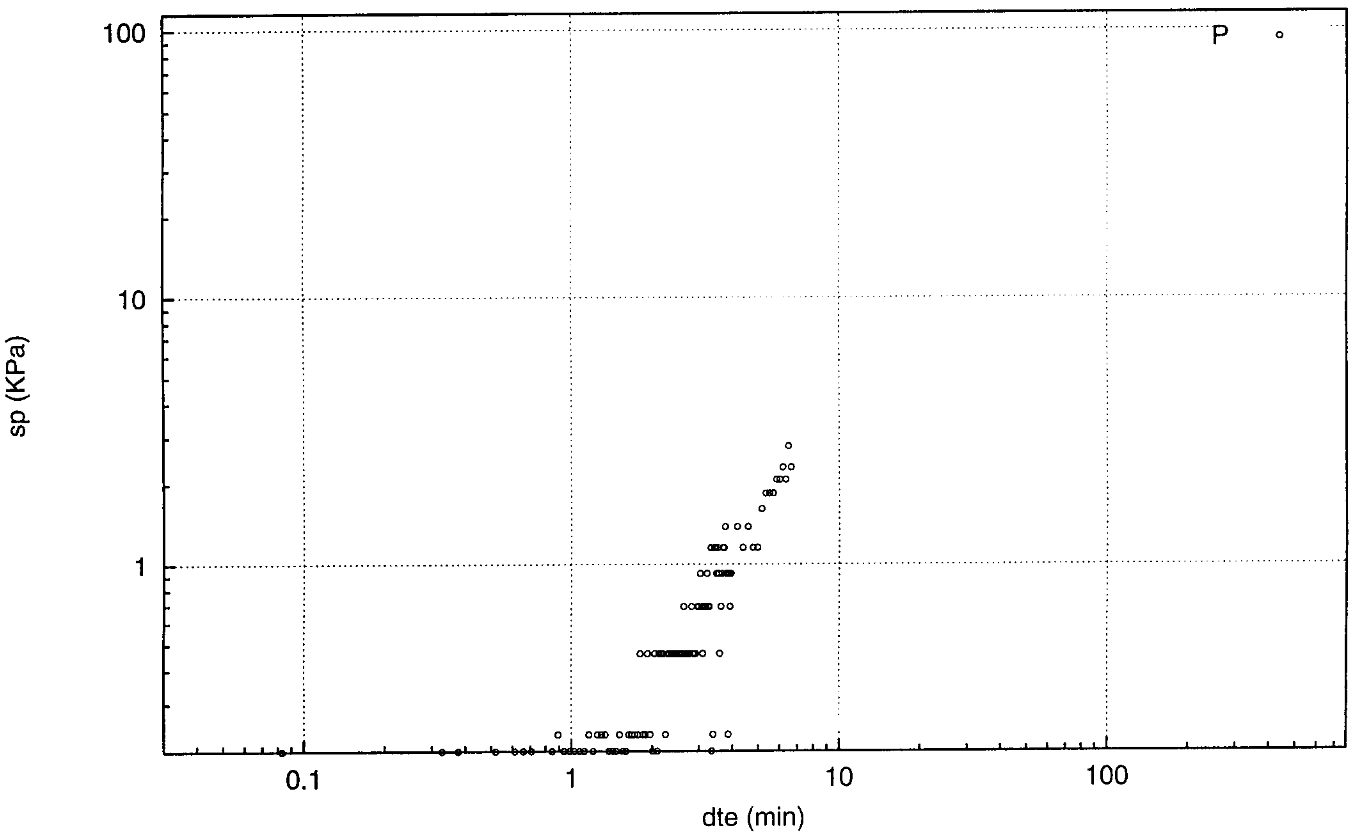


PROTOTYPE,TR INJECTION TEST KA3572G01, 1.25 - 1.75 m. recovery 2001-02-22 08:47:03

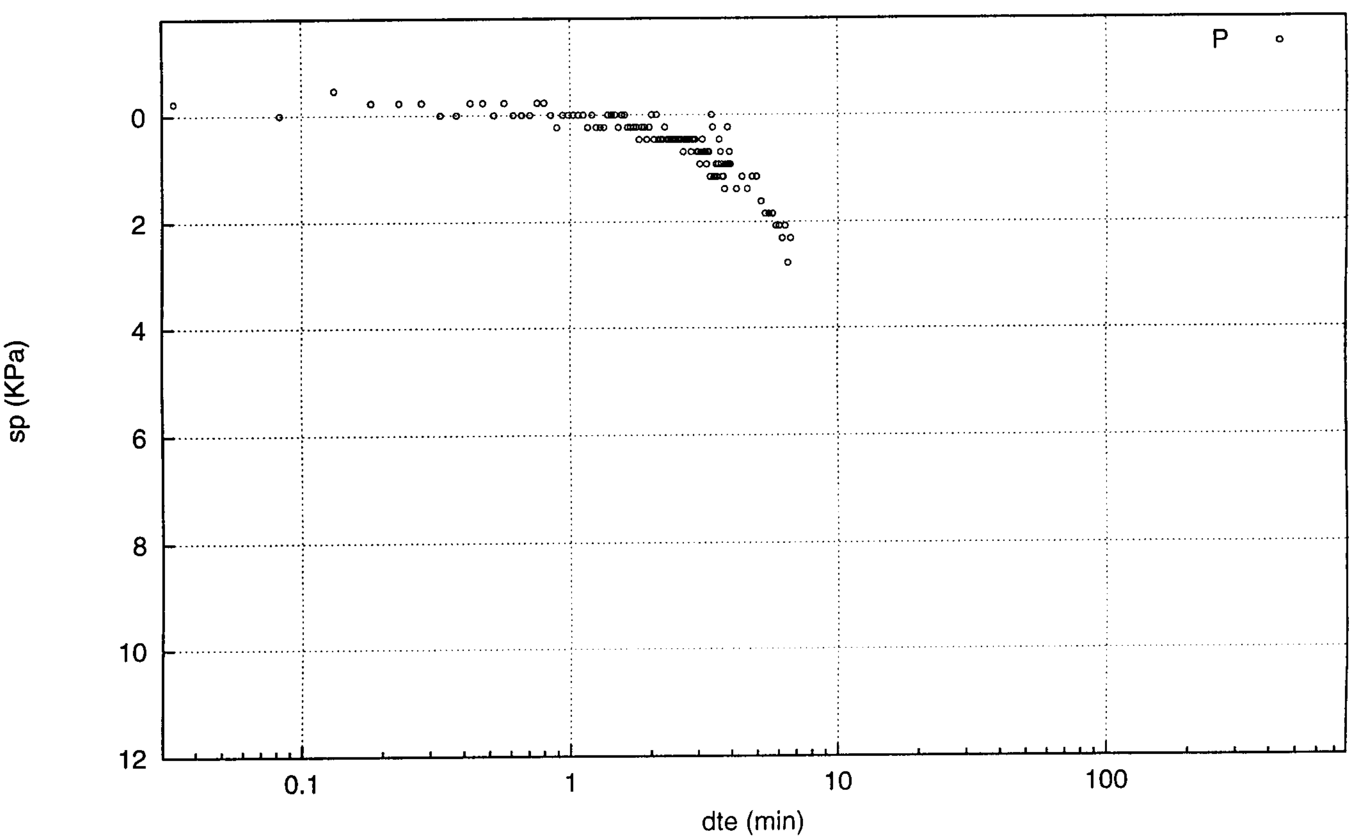



KA3574G01, 0.25-0.75m. Tr. Injection Test. P =Test interval, PA =section below packers.
P
PA
600
500
400
300
200
100
0
(KPa)
09:10
20
30
40
50
10:00
10
Start: 2001-02-23 09:05:00
hour:min

PROTOTYPE,TR INJECTION TEST KA3574G01, 0.25-0.75m recovery 2001-02-23 10:03:04



PROTOTYPE,TR INJECTION TEST KA3574G01, 0.25-0.75m recovery 2001-02-23 10:03:04



Borehole KA3574G01, section 0.25 m - 0.75 m

Date: 01-02-23 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010223 08:28
Valve opened: 010223 09:43.04 Valve closed: 010223 10:03.04
Total flowing time : 20.0 min. Tot. Pr.
Build-up time 9.9 min.

Pressure data
Pressure before injection start (P0, KPa) : 119.8
Pressure just before closing the valve (Pp, KPa): 331.1
Pressure at the end of the recovery (Pf, KPa) : 328.8

Flow data
Manually measured flow rates of KA3574G01, section 0.25 m –0.75 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3574G01, section 0.25 m –0.75 m. Prototype Repository, February 2001

Time	Flow rate ($l/min * 10^{-3}$)
09:43:09	2844,5
09:43:16	1857,2
09:43:21	597,5
09:43:29	66,9
09:43:39	54,6
09:44:49	2,28
09:45:49	9,104
09:46:34	2,27
09:49:39	2,66
09:50:34	1,14
09:53:34	0,380
09:56:04	0
10:02:04	0

Calculated flow and volume data
Total injected water volume (V_{tot}, m^3) $= 7.0 \cdot 10^{-4}$
Injected volume excluding the first 10 seconds (V,m^3) $= 2,3 \cdot 10^{-4}$
Average flow rate based on Vtot (QTave, l/min) $= 3.5 \cdot 10^{-2}$
Average flow rate based on V (Qave ,l/min) $= 1.2 \cdot 10^{-2}$
Flow rate at the end of the Flow Phase (Qp, l/min) = 0

Comment
It was difficult to evacuate the air from the test interval. A first test starting at 09:19 was interrupted after c. 9 minutes of injection. During the flowing period there were problems reading the water level, since “delayed drops” fell down in the stand pipe.

Borehole KA3574G01, section 0.75 m – 1.25 m

Date: 01-02-23 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010223 10:16
Valve opened: 010223 10:33.03 Valve closed: 010223 10:53.03
Total flowing time : 20.0 min. Tot. Pr. Build-up time 10.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 116.3
Pressure just before closing the valve (Pp, KPa): 348.9
Pressure at the end of the recovery (Pf, KPa) : 345.4

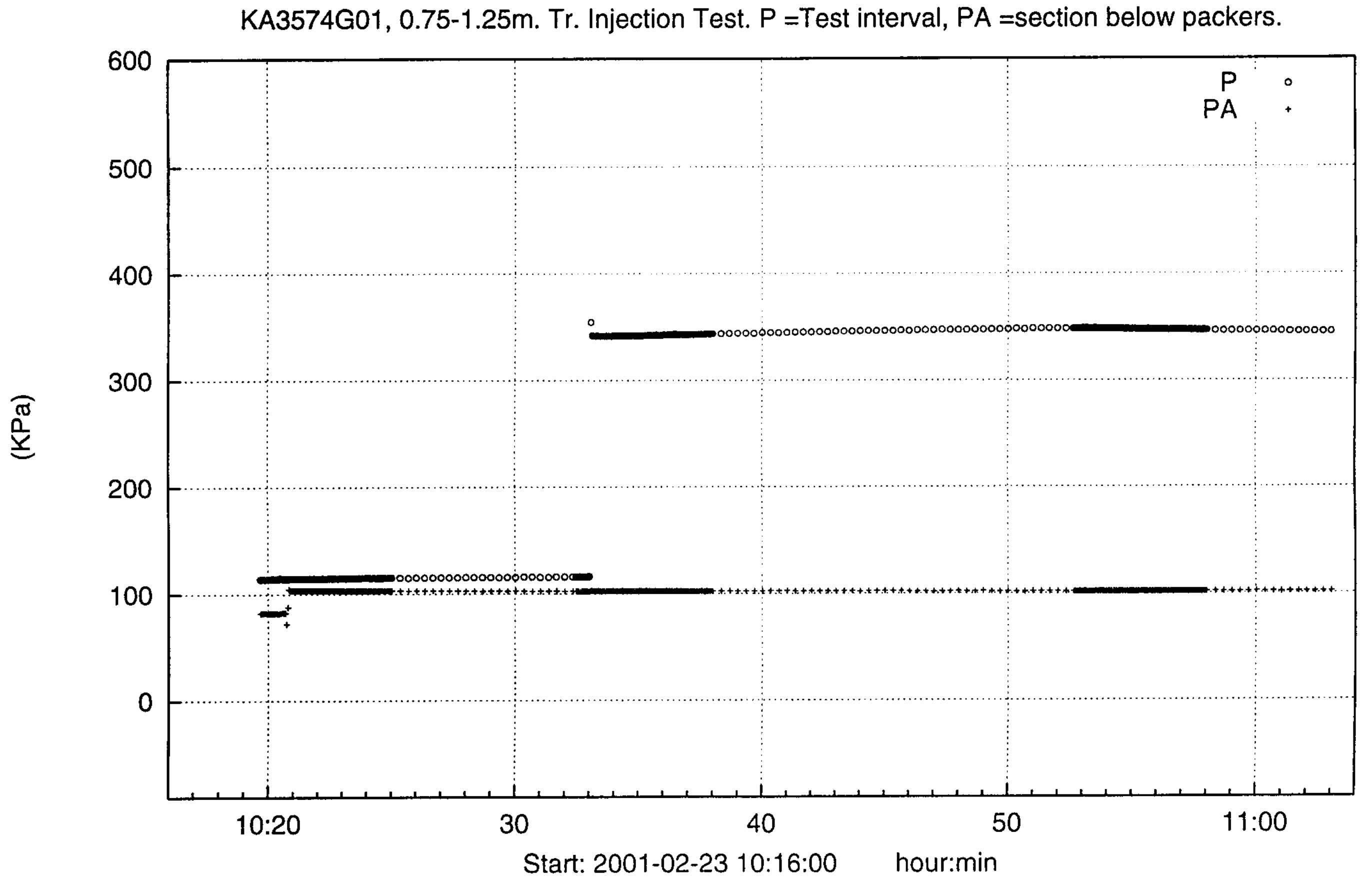
Flow data
Manually measured flow rates of KA3574G01, section 0.75 m –1.25 m, are presented in the table below.

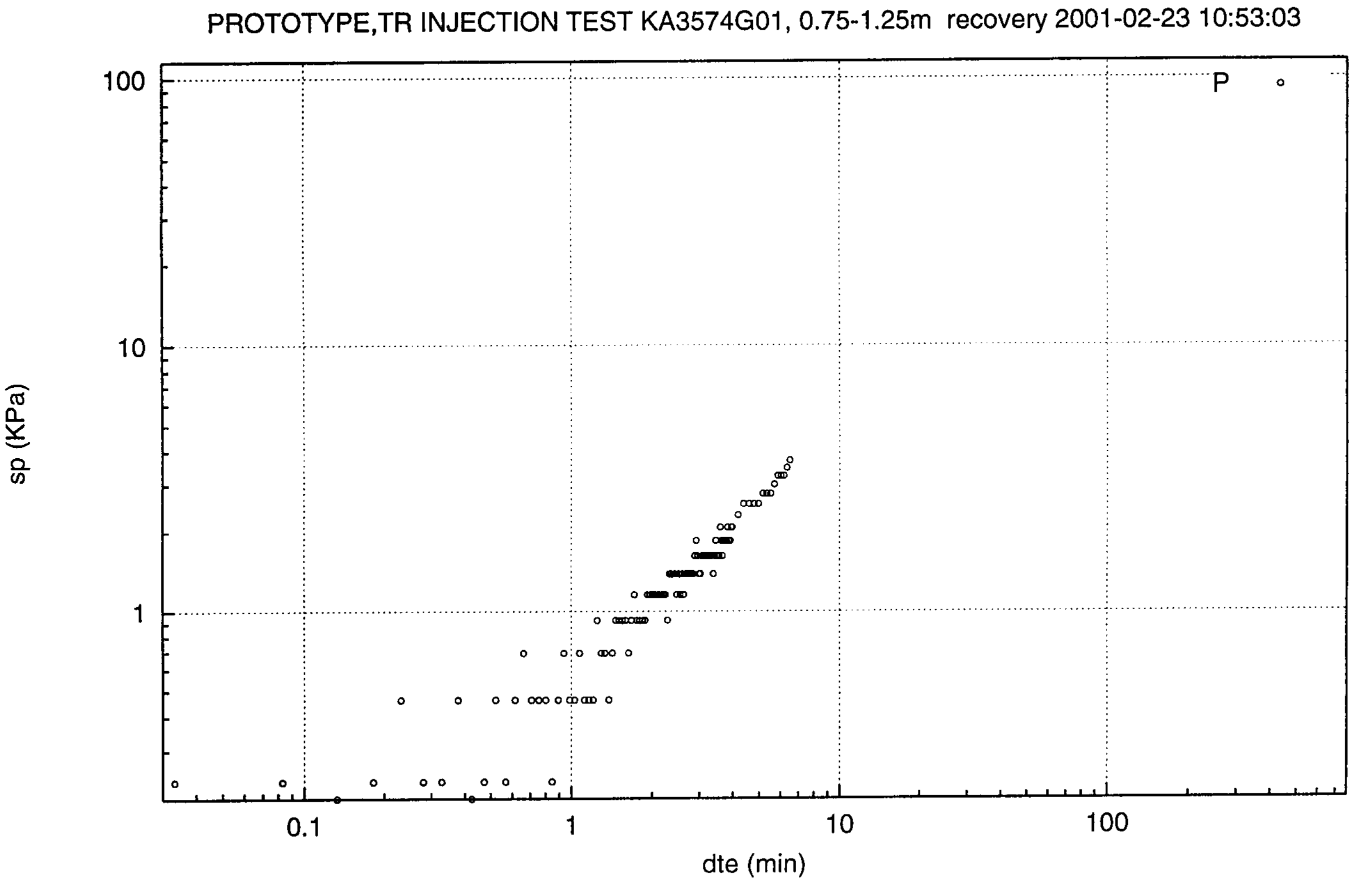
Table Manually measured flow rates, Injection Test in KA3574G01, section 0.75 m –1.25 m. Prototype Repository, February 2001

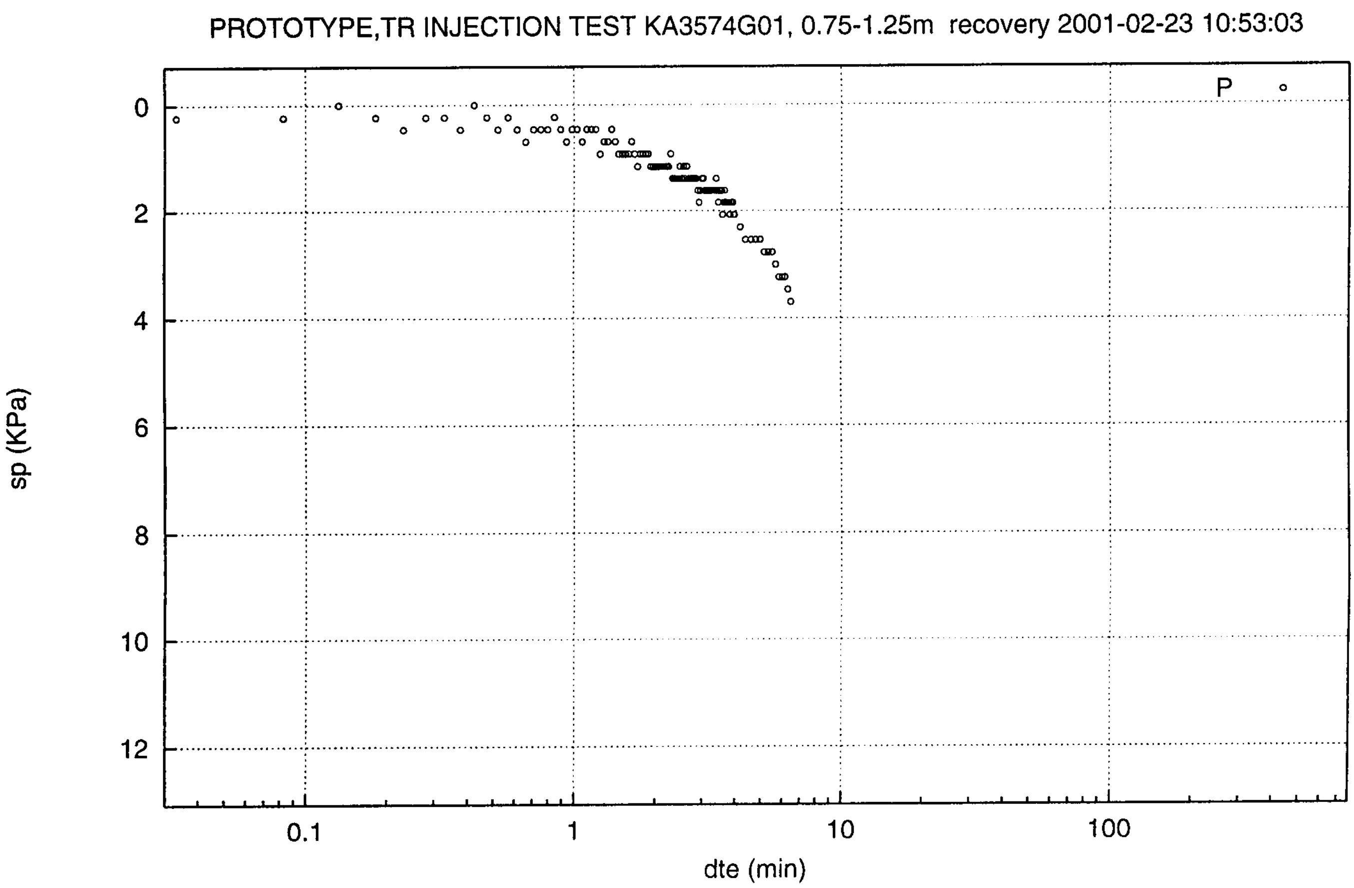
TimeFlow rate	(l/min * 10^{-3})
10:33:05	316,3
10:33:58	0,119
10:34:25	0,145
10:35:50	0,484
10:38:03	0,055
10:40:03	0,055
10:42:03	0,054
10:44:03	0,054
10:46:03	0,054
10:49:03	0,027
10:52:03	0,054

Calculated flow and volume data
Total injected water volume (Vtot, m^3) $= 2.3 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds (V,m^3) $= 1{,}1 \cdot 10^{-6}$
Average flow rate based on Vtot (QTave, l/min) $= 1.4 \cdot 10^{-3}$
Average flow rate based on V (Qave ,l/min) $= 5.5 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) $= 5.4 \cdot 10^{-5}$

Comment
The pressure increases somewhat (c.8 KPa) during the flowing period.


KA3574G01, 0.75-1.25m. Tr. Injection Test. P =Test interval, PA =section below packers.
(KPa)
600
500
400
300
200
100
0
P
PA
10:20
30
40
50
11:00
Start: 2001-02-23 10:16:00
hour:min


PROTOTYPE,TR INJECTION TEST KA3574G01, 0.75-1.25m recovery 2001-02-23 10:53:03
P
100
10
1
sp (KPa)
0.1
1
10
100
dte (min)


PROTOTYPE,TR INJECTION TEST KA3574G01, 0.75-1.25m recovery 2001-02-23 10:53:03
P
0
2
4
6
8
10
12
sp (KPa)
0.1
1
10
100
dte (min)

Borehole KA3574G01, section 1.25 m – 1.75 m

Date: 01-02-23 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010223 11:05
Valve opened: 010223 11:25.04 Valve closed: 010223 11:45.04
Total flowing time : 20.0 min. Tot. Pr.
Build-up time 105 min.

Pressure data
Pressure before injection start (P0, KPa) : 121.2
Pressure just before closing the valve (Pp, KPa): 360.4
Pressure at the end of the recovery (Pf, KPa) : 361.6

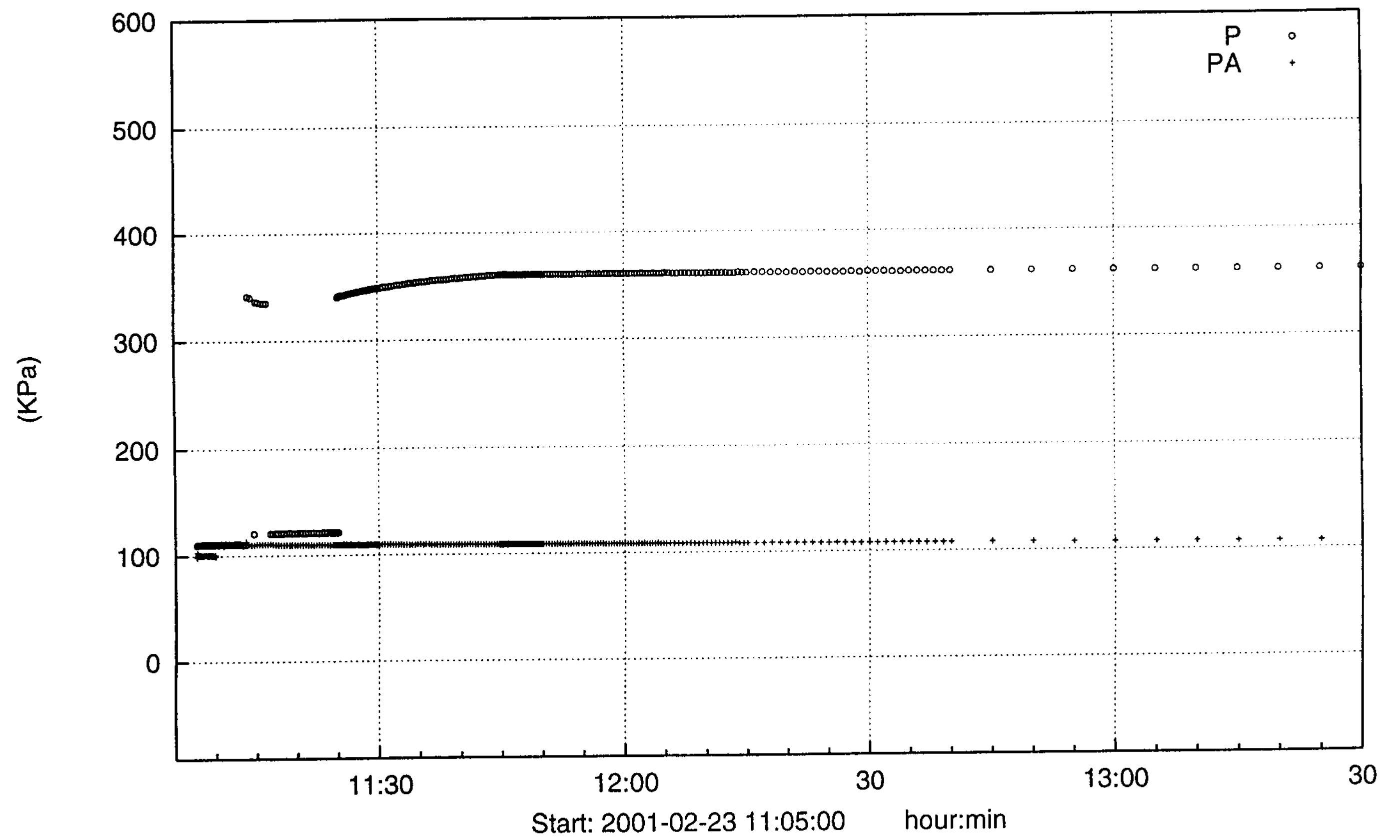
Flow data
Manually measured flow rates of KA3574G01, section 1.25 m –1.75 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3574G01, section 1.25 m –1.75 m. Prototype Repository, February 2001

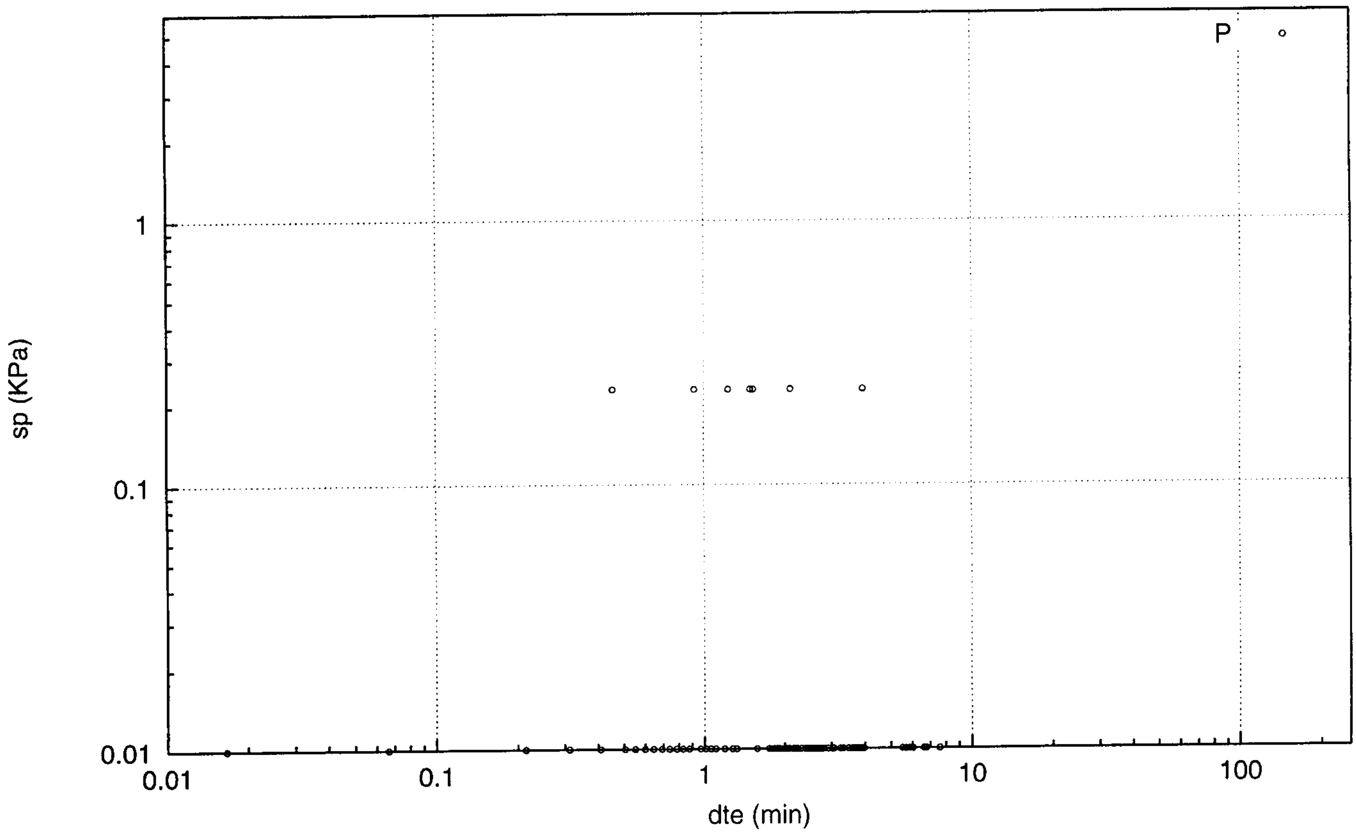
Time Flow rate	($l/min * 10^{-3}$)
11:25:06	269,2
11:25:11	1,307
11:25:19	0,653
11:26:29	0,050
11:28:19	0,073
11:30:04	0,055
11:32:04	0,055
11:34:04	0,055
11:37:04	0,027
11:40:04	0,054
11:42:04	0
11:44:04	0

Calculated flow and volume data
Total injected water volume (V_{tot}, m^3) $= 2.7 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds (V,m^3) $= 9,8 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) $= 1.2 \cdot 10^{-3}$
Average flow rate based on V (Qave ,l/min) $= 4.9 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) = 0
Comment
The pressure increases (c.18 KPa) during the flowing period. as well as the recovery period.

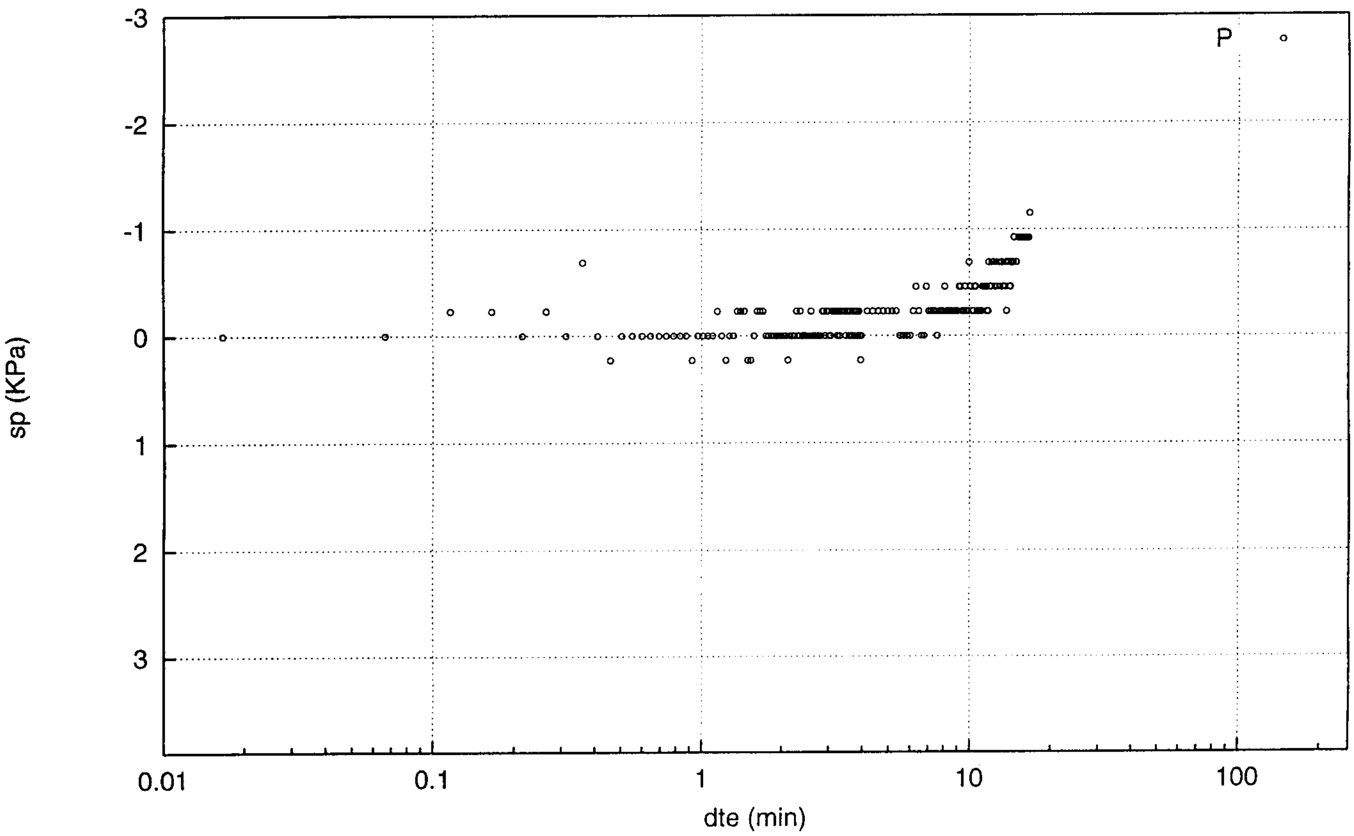
KA3574G01, 1.25-1.75m. Tr. Injection Test. P =Test interval, PA =section below packers.



PROTOTYPE,TR INJECTION TEST KA3574G01, 1.25 - 1.75 m. recovery 2001-02-23 11:45:04



PROTOTYPE,TR INJECTION TEST KA3574G01, 1.25 - 1.75 m. recovery 2001-02-23 11:45:04



Borehole KA3576G01, section 0.25 m - 0.75 m

Date: 01-02-22 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010222 18:28
Valve opened: 010222 19:10.03 Valve closed: 010222 19.30.03
Total flowing time : 20.0 min. Tot. Pr. Build-up time 10.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 108.3
Pressure just before closing the valve (Pp, KPa): 356.7
Pressure at the end of the recovery (Pf, KPa) : 355.1

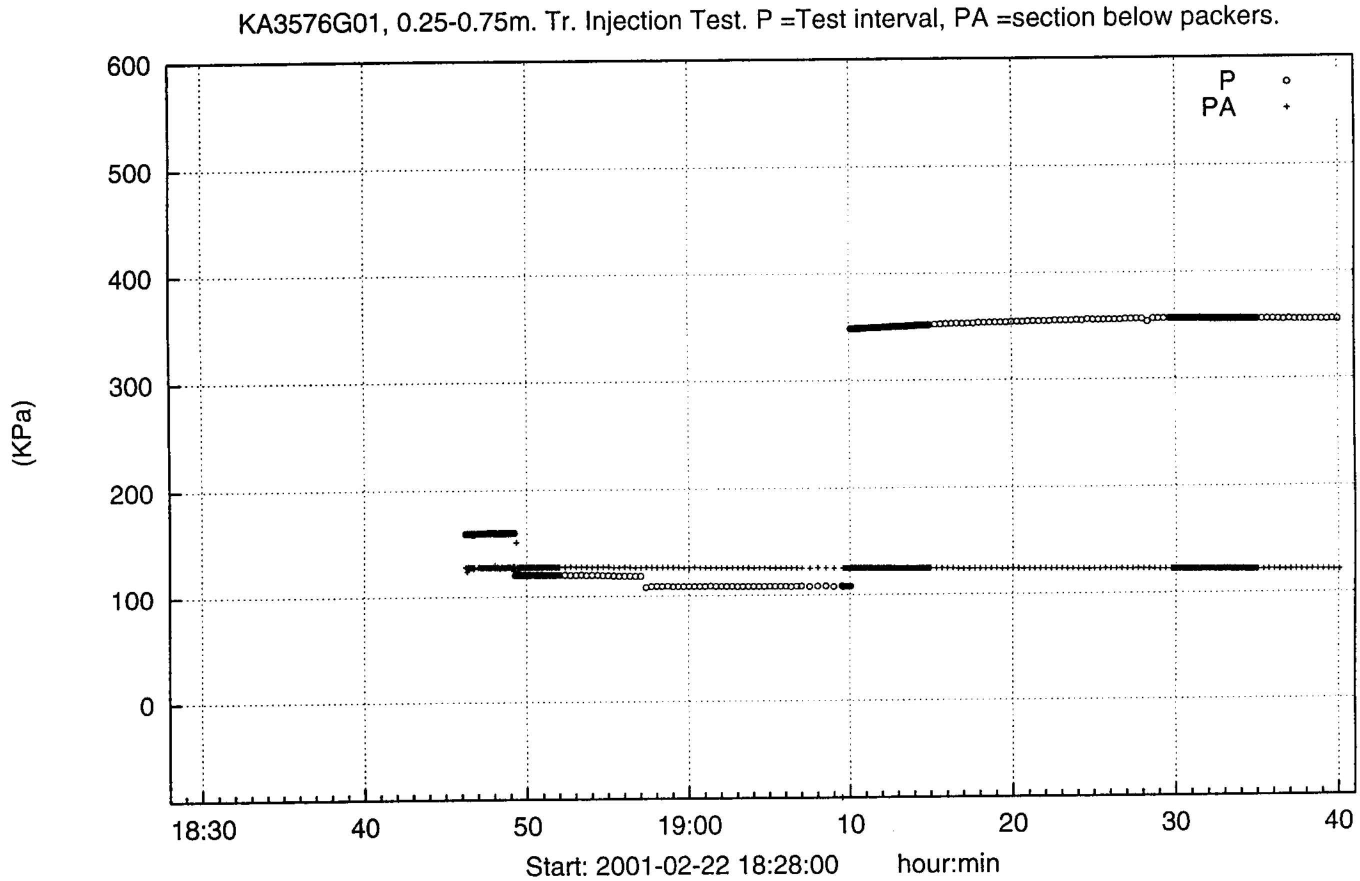
Flow data
Manually measured flow rates of KA3576G01, section 0.25 m –0.75 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3576G01, section 0.25 m –0.75 m. Prototype Repository, February 2001

TimeFlow rate	(l/min * 10^{-3})
19:10:05	271,8
19:10:15	0,436
19:10:50	0,119
19:12:40	0,040
19:15:03	0,055
19:16:33	0,109
19:18:03	0,055
19:21:33	0,218
19:25:03	0,054

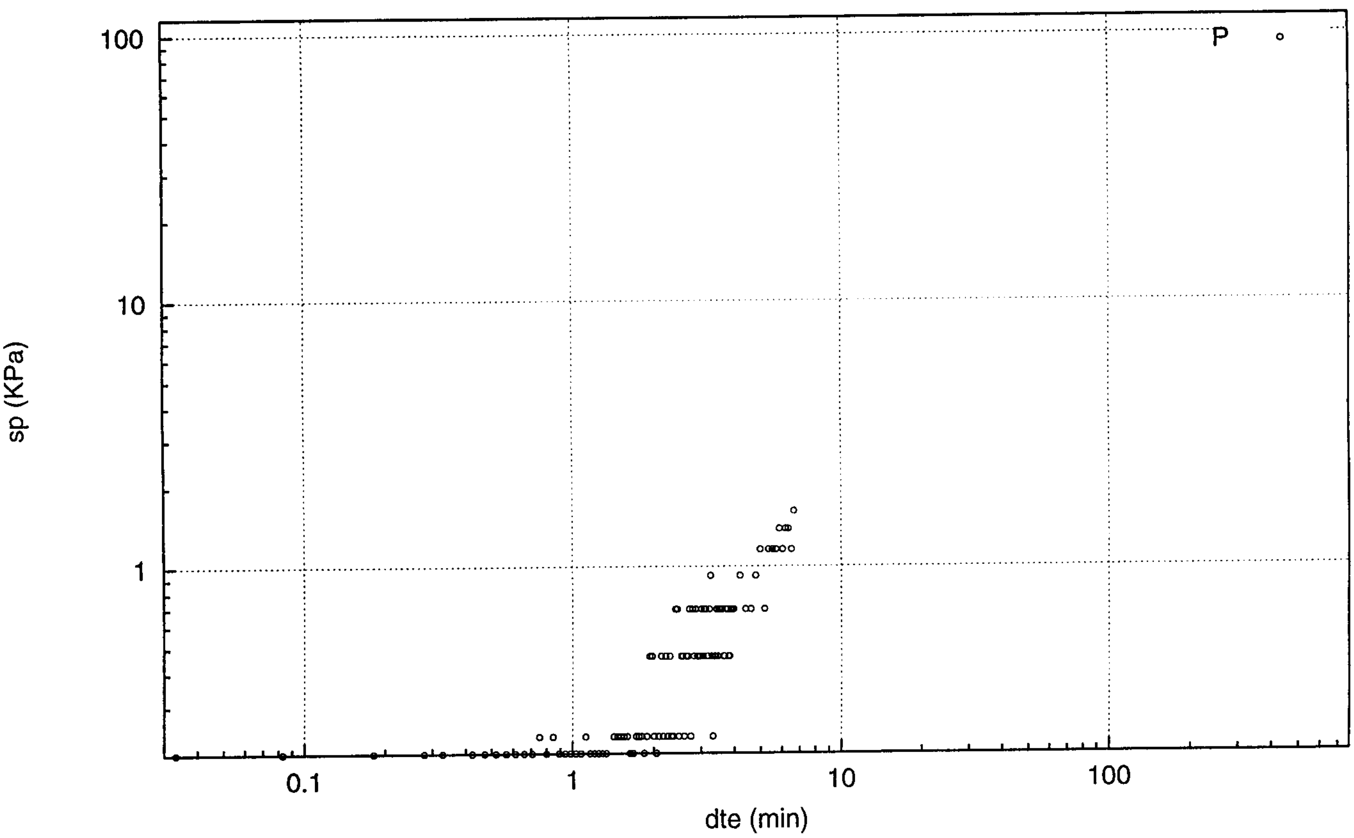
Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $2.4 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds (V,m^3) = $8,7 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) = $1.2 \cdot 10^{-3}$
Average flow rate based on V (Qave ,l/min) = $4.4 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min)

Comment
The pressure increases somewhat (c.8 KPa) during the flowing period.

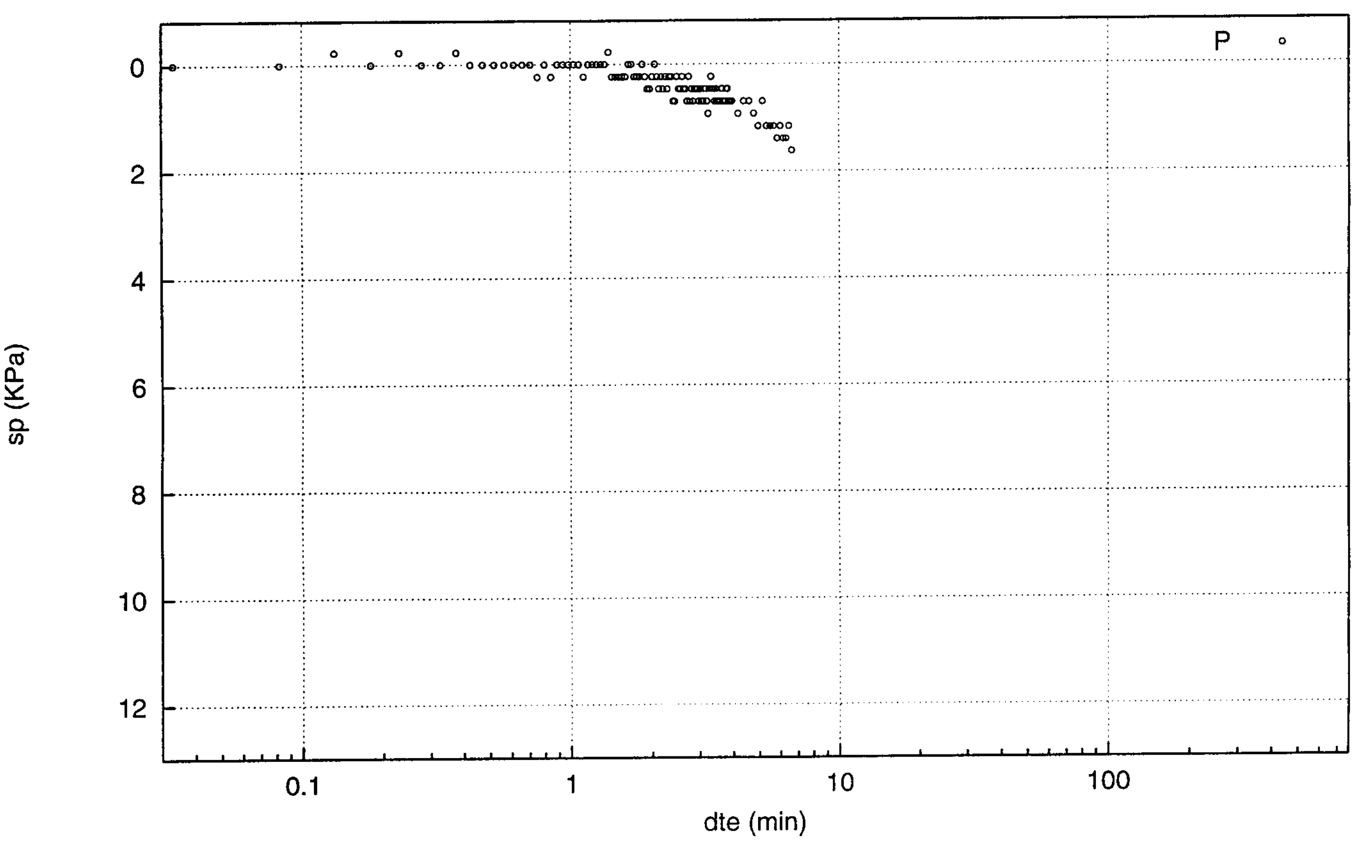


KA3576G01, 0.25-0.75m. Tr. Injection Test. P =Test interval, PA =section below packers.
600
500
400
300
200
100
0
(KPa)
P
PA
18:30
40
50
19:00
10
20
30
40
Start: 2001-02-22 18:28:00
hour:min

PROTOTYPE,TR INJECTION TEST KA3576G01, 0.25-0.75m recovery 2001-02-22 19:30:03



PROTOTYPE,TR INJECTION TEST KA3576G01, 0.25-0.75m recovery 2001-02-22 19:30:03



Borehole KA357601, section 0.75 m – 1.25 m

Date: 01-02-22 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010222 19:42
Valve opened: 010222 19:58.04 Valve closed: 010222 20.18.04
Total flowing time : 20.0 min. Tot. Pr. Build-up time 9.9 min.

Pressure data
Pressure before injection start (P0, KPa) : 120.5
Pressure just before closing the valve (Pp, KPa) : 347.7
Pressure at the end of the recovery (Pf, KPa) : 350.3

Flow data
Manually measured flow rates of KA3576G01, section 0.75 m –1.25 m, are presented in the table below.

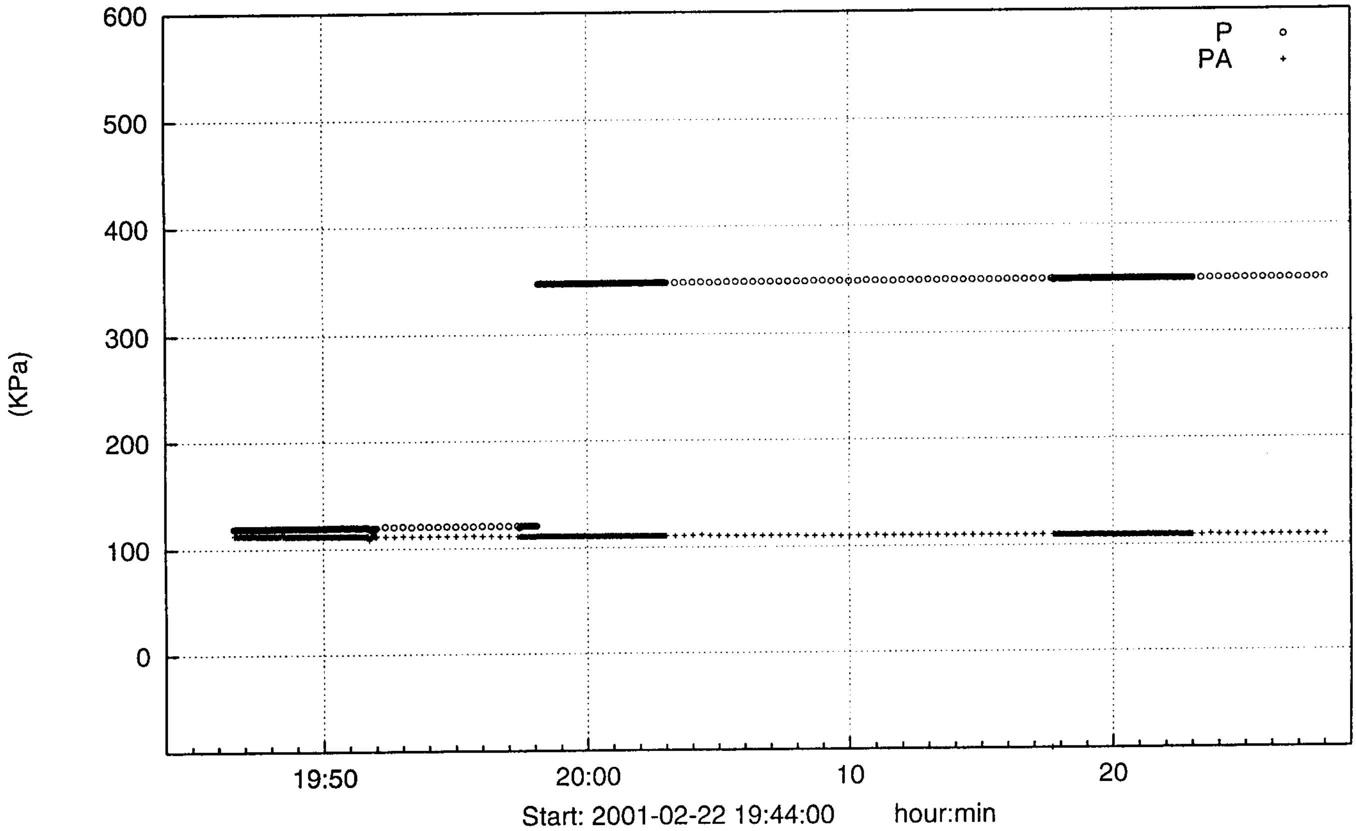
Table Manually measured flow rates, Injection Test in KA3576G01, section 0.75 m –1.25 m. Prototype Repository, February 2001

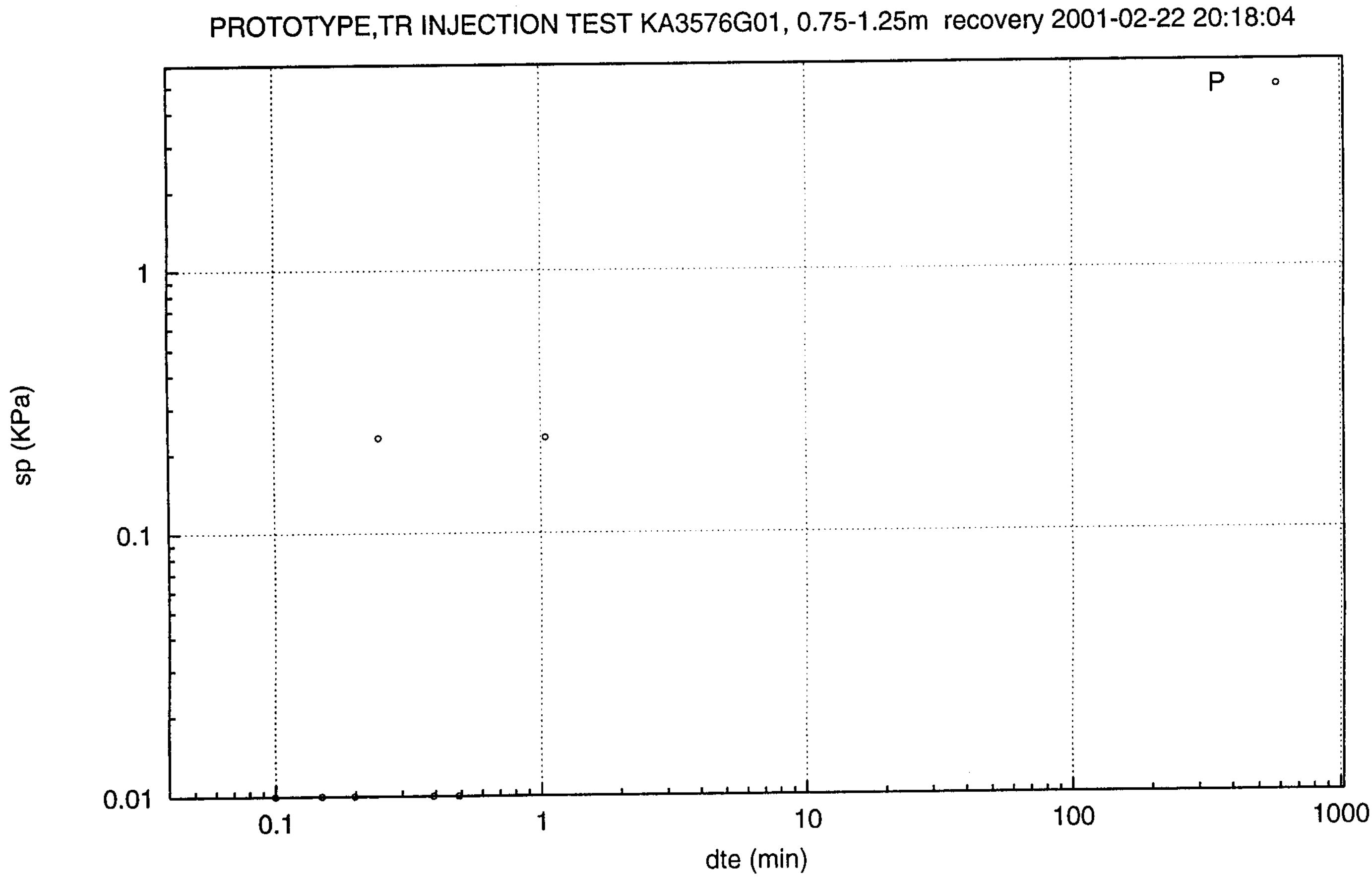
TimeFlow rate	(l/min * 10^{-3})
19:58:06	201,3
19:58:16	0,436
19:58:34	0,327
20:01:53	0,172
20:09:34	0,012

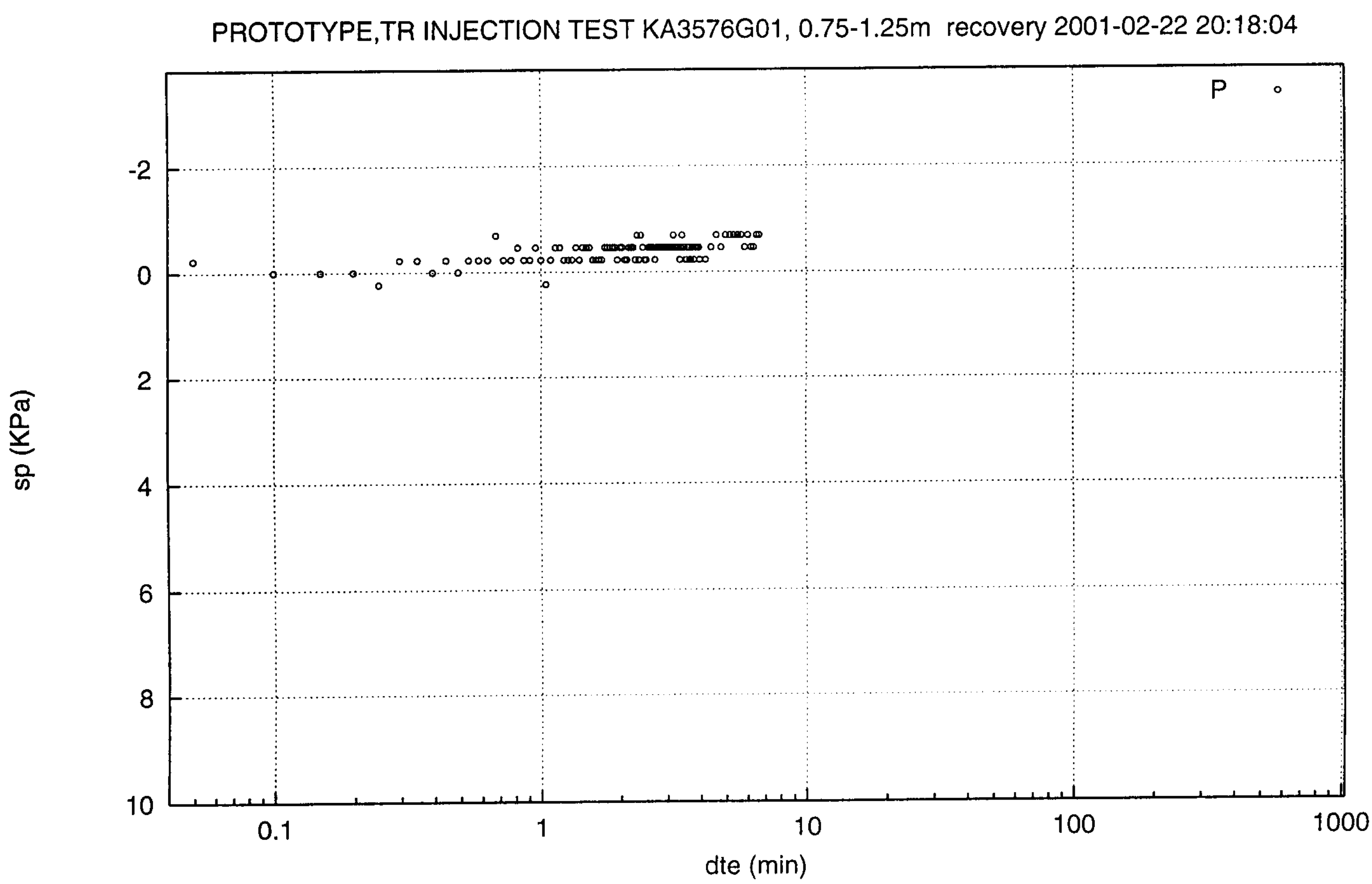
Calculated flow and volume data
Total injected water volume (Vtot, m^3) $= 1.7 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds (V,m^3) $= 4,4 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) $= 8.6 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) $= 2.2 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min)

Comment
The pressure increases during the recovery period.

KA3576G01, 0.75-1.25m. Tr. Injection Test. P =Test interval, PA =section below packers.




PROTOTYPE,TR INJECTION TEST KA3576G01, 0.75-1.25m recovery 2001-02-22 20:18:04
P
1
0.1
0.01
sp (KPa)
0.1
1
10
100
1000
dte (min)


PROTOTYPE,TR INJECTION TEST KA3576G01, 0.75-1.25m recovery 2001-02-22 20:18:04
P
-2
0
2
4
6
8
10
sp (KPa)
0.1
1
10
100
1000
dte (min)

Borehole KA357601, section 1.25 m – 1.75 m

Date: 01-02-22 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010222 20:30
Valve opened: 010222 20:50.04 Valve closed: 010222 21:10.04
Total flowing time : 20.0 min. Tot. Pr. Build-up time 677.4 min.

Pressure data
Pressure before injection start (P0, KPa) : 110.8
Pressure just before closing the valve (Pp, KPa) : 347.2
Pressure at the end of the recovery (Pf, KPa) : 348.4

Flow data
Manually measured flow rates of KA3576G01, section 1.25 m –1.75 m, are presented in the table below.

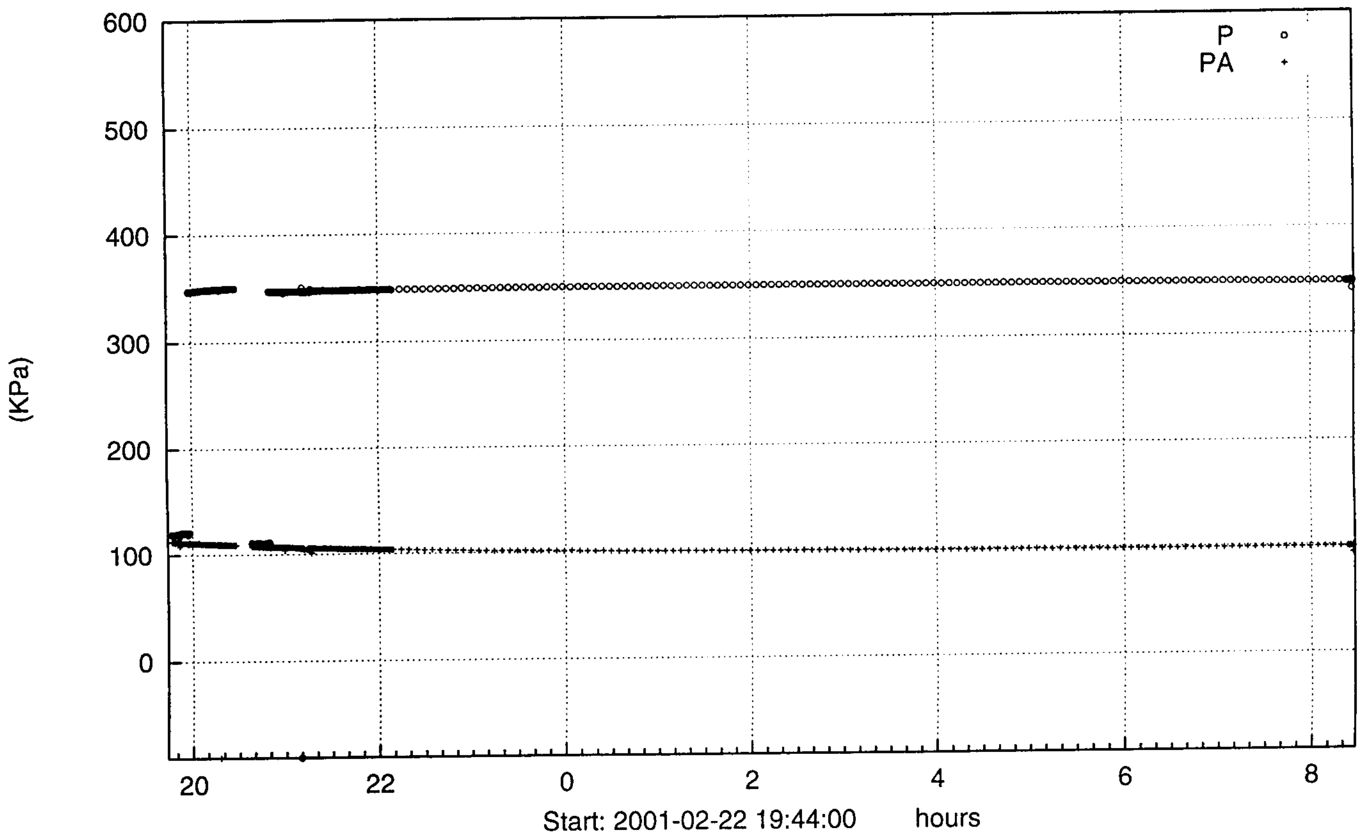
Table Manually measured flow rates, Injection Test in KA3576G01, section 1.25 m –1.75 m. Prototype Repository, February 2001

TimeFlow rate	(l/min * 10-3)
20:50:06	211,7
20:51:19	0,451
20:56:19	0,145
21:09:04	0

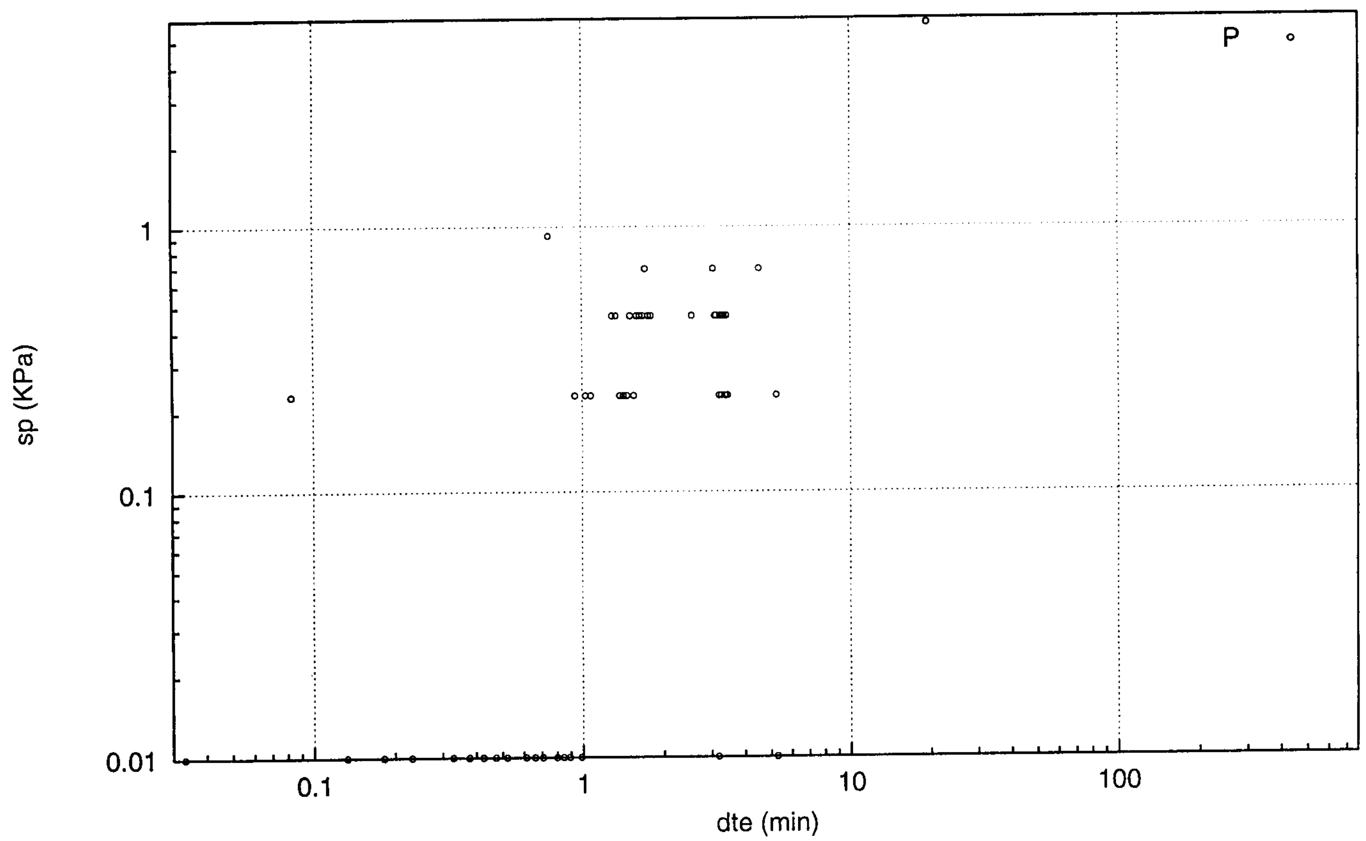
Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $1.8 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds (V,m^3) = $2,2 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) = $8.9 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) = $1.1 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min) = 0

Comment
The pressure increases during the recovery period.

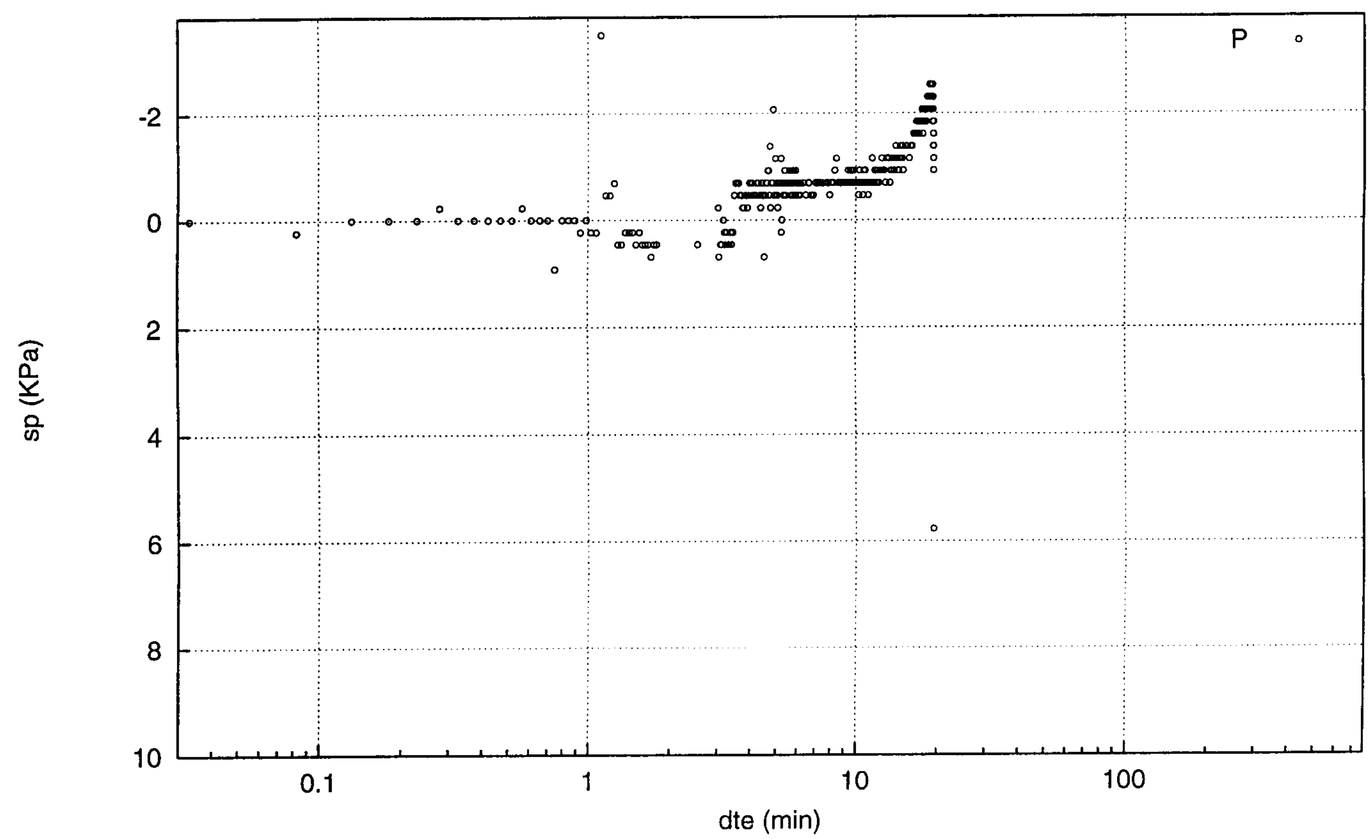
KA3576G01, 1.25-1.75m. Tr. Injection Test. P =Test interval, PA =section below packers.



PROTOTYPE,TR INJECTION TEST KA3576G01, 1.25-1.75m recovery 2001-02-22 21:10:04



PROTOTYPE,TR INJECTION TEST KA3576G01, 1.25-1.75m recovery 2001-02-22 21:10:04



Borehole KA3578G01, section 0.25 m - 0.75 m

Date: 01-02-21 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010221 10:37
Valve opened: 010221 11:06.02 Valve closed: 010221 11:26.02
Total flowing time : 20.0 min. Tot. Pr. Build-up time 86.0 min.

Pressure data

Pressure before injection start	(P0, KPa)	:	111.7
Pressure just before closing the valve	(Pp, KPa)	:	348.6
Pressure at the end of the recovery	(Pf, KPa)	:	304.1

Flow data
Manually measured flow rates of KA3578G01, section 0.25 m –0.75 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3578G01, section 0.25 m –0.75 m. Prototype Repository, February 2001

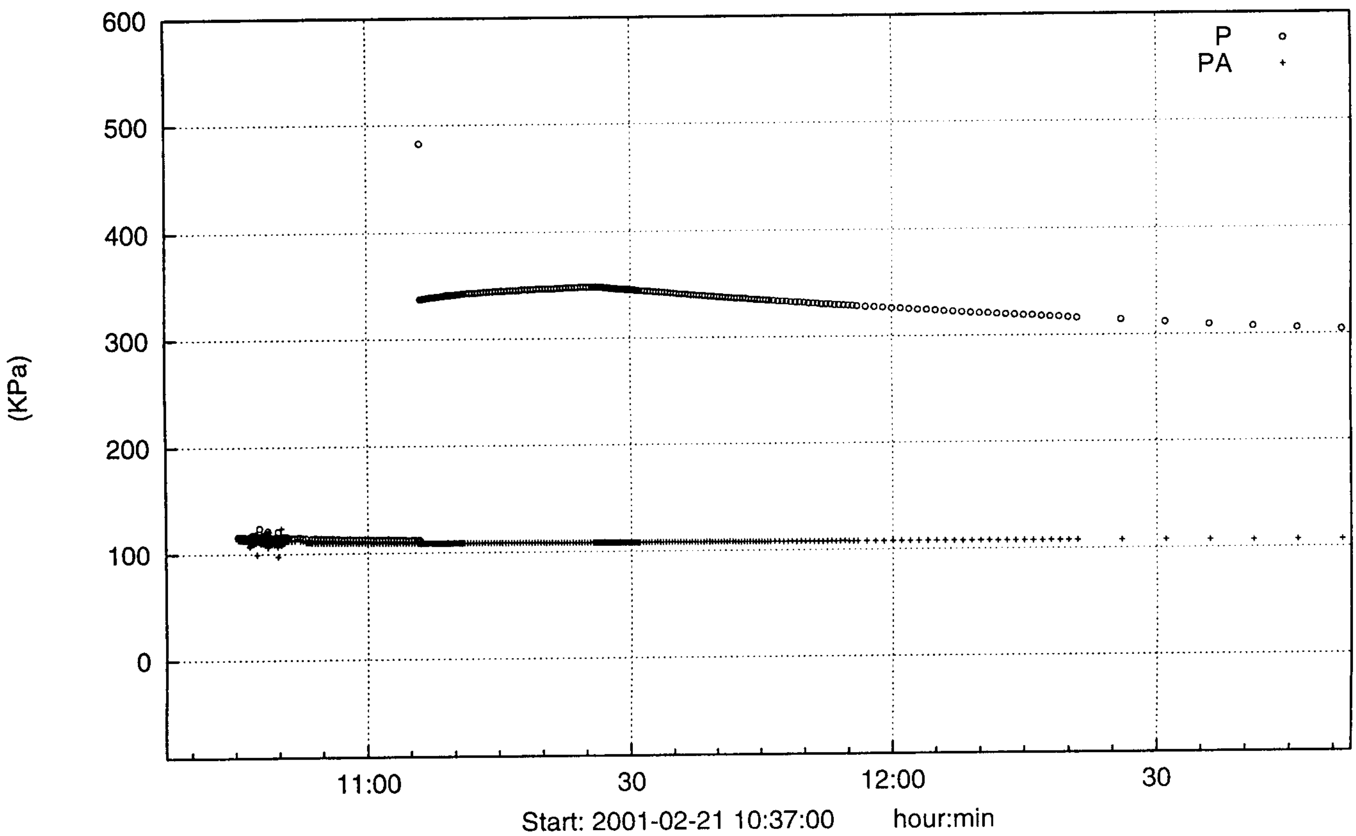
Time Flow rate	($l/min * 10^{-3}$)
11:06:04	109,8
11:06:09	1,31
11:06:37	0,131
11:07:17	0,218
11:07:47	0,109
11:09:32	0,055
11:11:32	0,055
11:13:32	0,036
11:16:32	0,036
11:20:02	0,272
11:24:02	0,022

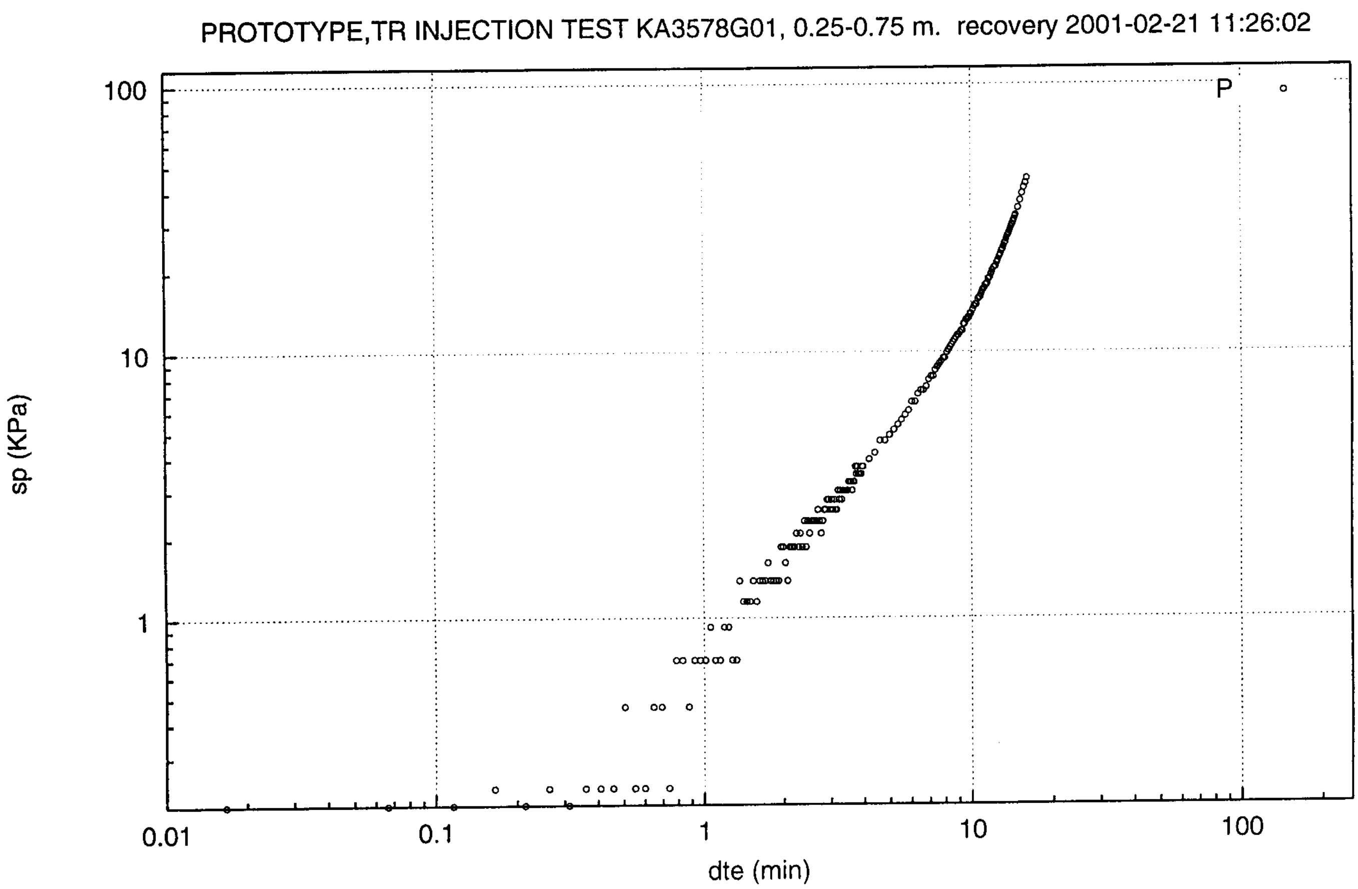
Calculated flow and volume data

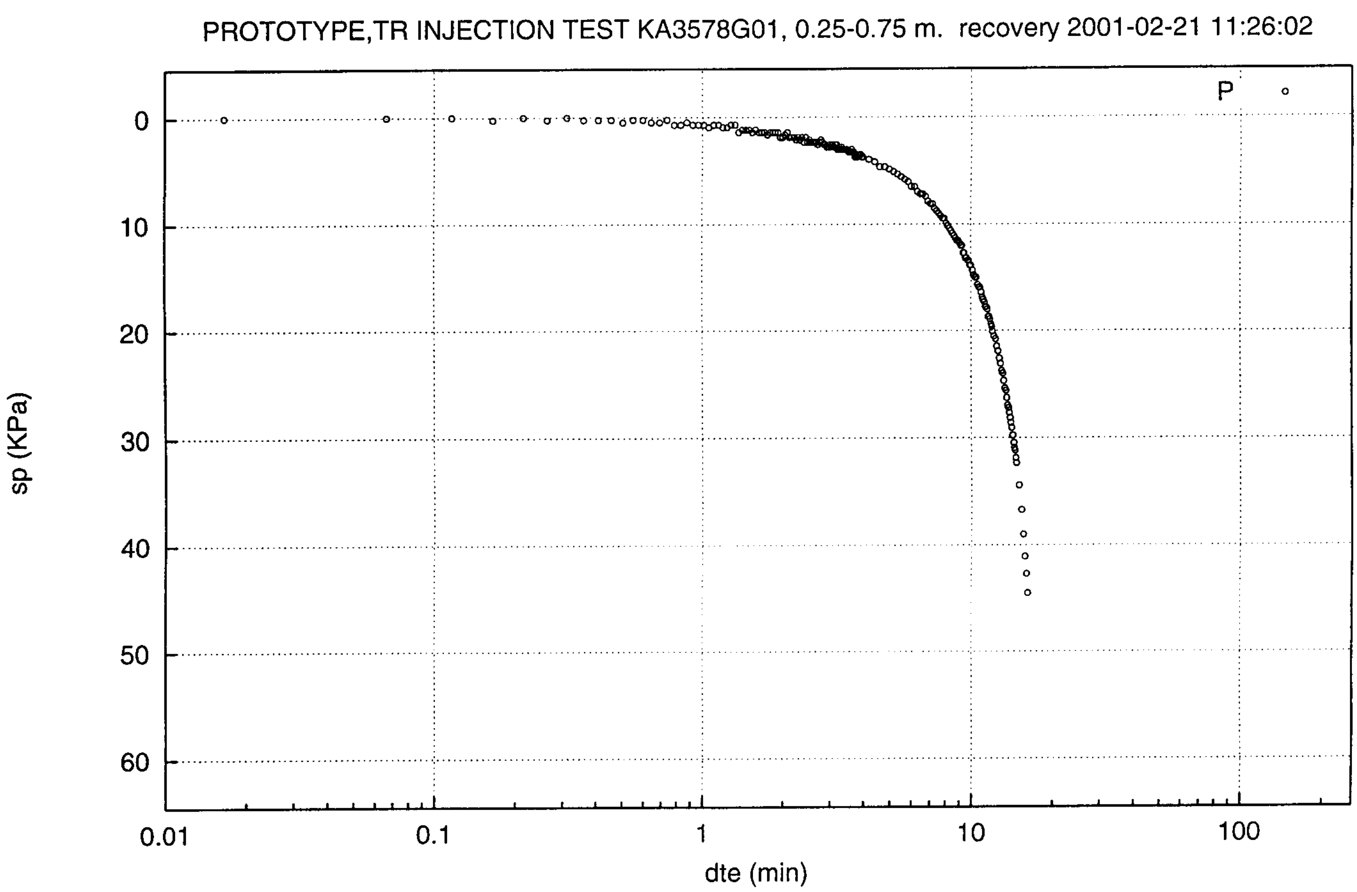
Total injected water volume	(V_{tot}, m^3)	$= 1.0 \cdot 10^{-5}$
Injected volume excluding the first 5 seconds	(V,m^3)	$= 1,1 \cdot 10^{-6}$
Average flow rate based on Vtot	(QTave, l/min)	$= 5.1 \cdot 10^{-4}$
Average flow rate based on V	(Qave ,l/min)	$= 5.4 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase	(Qp, l/min)	$= 2.2 \cdot 10^{-5}$

Comment
The pressure increases somewhat (c.10 KPa) during the flowing period.
The recovery lasted over the lunch.

KA3578G01,0.25-0.75m. P =Test interval, PA =section below packers.




PROTOTYPE,TR INJECTION TEST KA3578G01, 0.25-0.75 m. recovery 2001-02-21 11:26:02
P
100
10
1
sp (KPa)
0.01
0.1
1
10
100
dte (min)


PROTOTYPE,TR INJECTION TEST KA3578G01, 0.25-0.75 m. recovery 2001-02-21 11:26:02
P
0
10
20
30
40
50
60
sp (KPa)
0.01
0.1
1
10
100
dte (min)

Borehole KA357801, section 0.75 m – 1.25 m

Date: 01-02-21 Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010221 12:55
Valve opened: 010221 13:16.02 Valve closed: 010221 13:36.02
Total flowing time : 20.0 min. Tot. Pr. Build-up time 11.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 117.0
Pressure just before closing the valve (Pp, KPa) : 348.4
Pressure at the end of the recovery (Pf, KPa) : 346.8

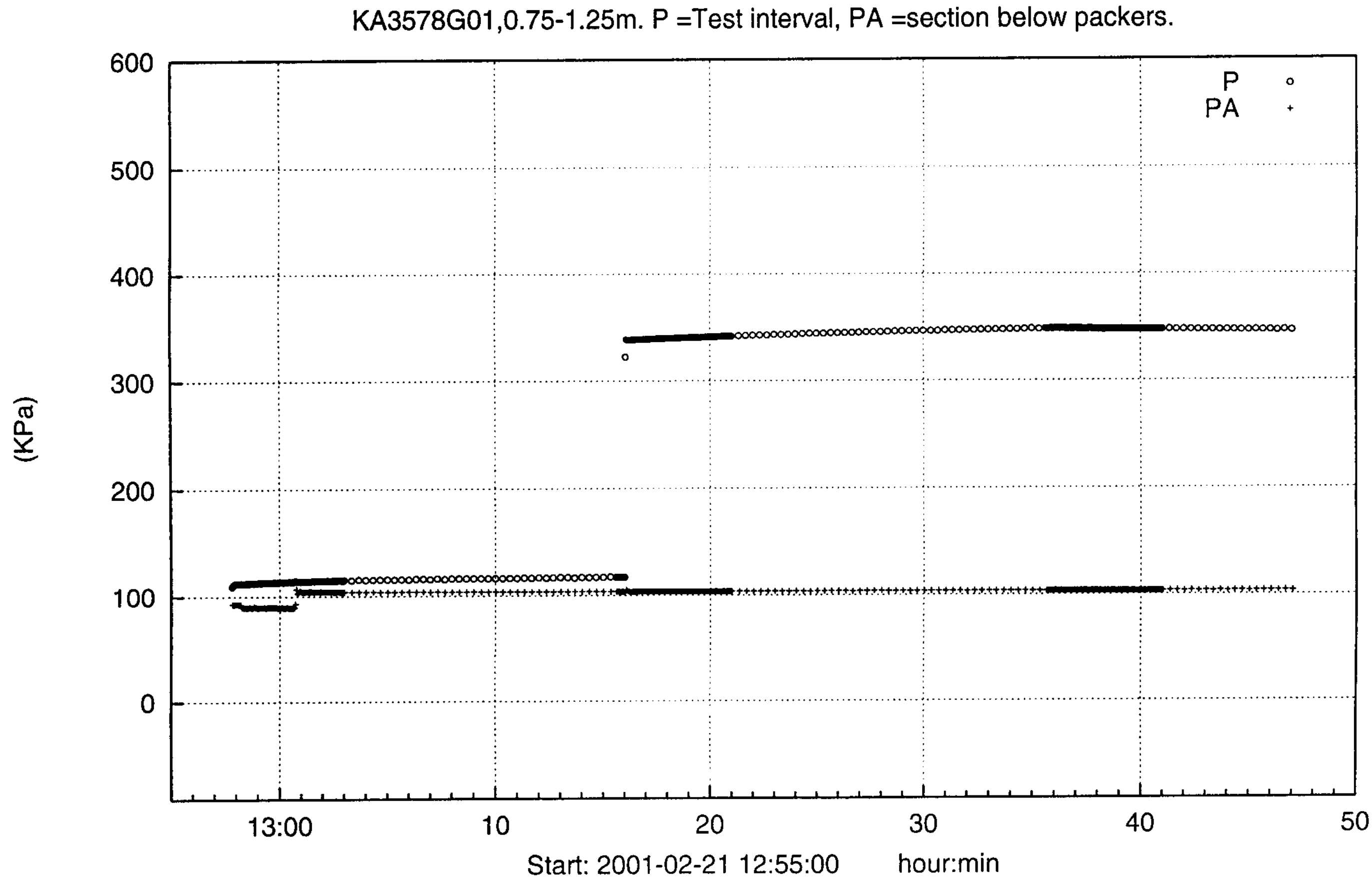
Flow data
Manually measured flow rates of KA3578G01, section 0.75 m –1.25 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3578G01, section 0.75 m –1.25 m. Prototype Repository, February 2001

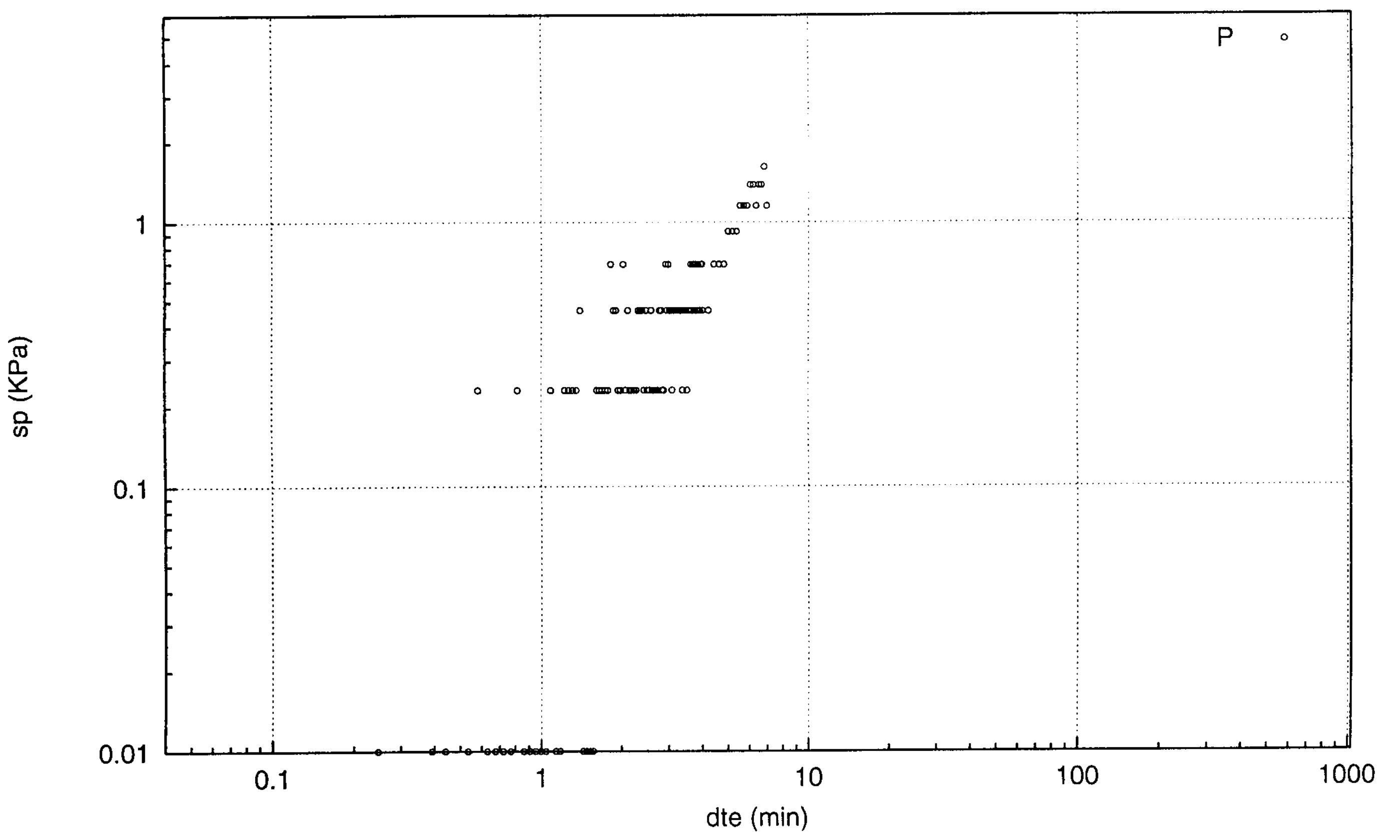
TimeFlow rate	(l/min * 10^{-3})
13:06:04	88,9
13:06:59	0,057
13:08:32	0,109
13:10:32	0,022
13:14:02	0,055
13:18:32	0,016

Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $8.0 \cdot 10^{-6}$
Injected volume excluding the first 5 seconds (V,m^3) = $5,5 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) = $4.0 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) = $2.7 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min)

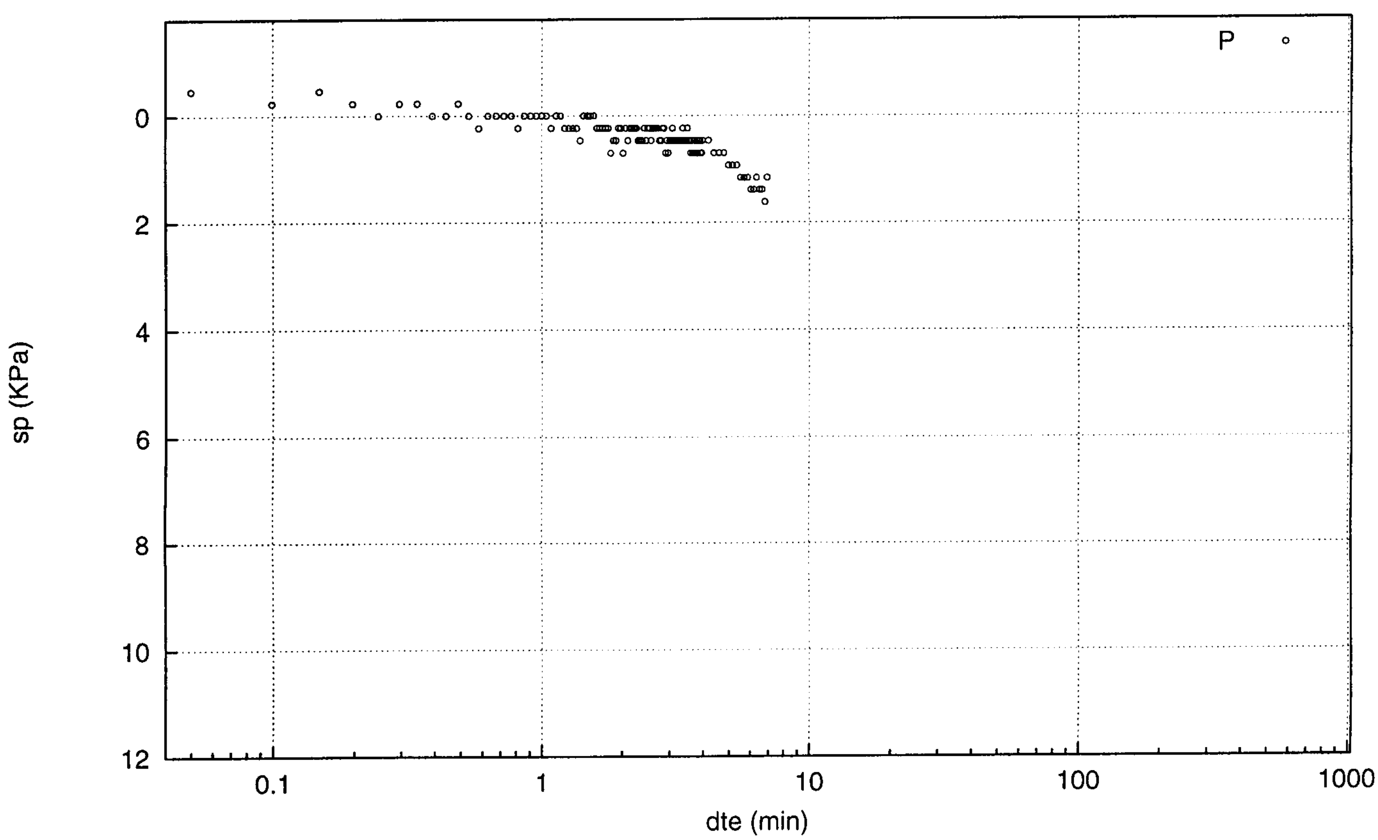
Comment
The pressure increases somewhat (c.10 KPa) during the flowing period.


KA3578G01,0.75-1.25m. P =Test interval, PA =section below packers.
P
PA
(KPa)
600
500
400
300
200
100
0
13:00
10
20
30
40
50
Start: 2001-02-21 12:55:00
hour:min

PROTOTYPE,TR INJECTION TEST KA3578G01, 0.75 - 1.25 m. recovery 2001-02-21 13:36:02



PROTOTYPE,TR INJECTION TEST KA3578G01, 0.75 - 1.25 m. recovery 2001-02-21 13:36:02



Borehole KA3578G01, section 1.25 m – 1.75 m

Date: 01-02-21
Field Crew: B. Gentzschein, J. Källgården
Packer expansion: 010221 13:49
Valve opened: 010221 14:10.03
Valve closed: 010221 14:30.03
Total flowing time : 20.0 min.
Tot. Pr. Build-up time 28.0 min.

Pressure data
Pressure before injection start (P0, KPa) : 120.2
Pressure just before closing the valve (Pp, KPa) : 363.4
Pressure at the end of the recovery (Pf, KPa) : 357.2

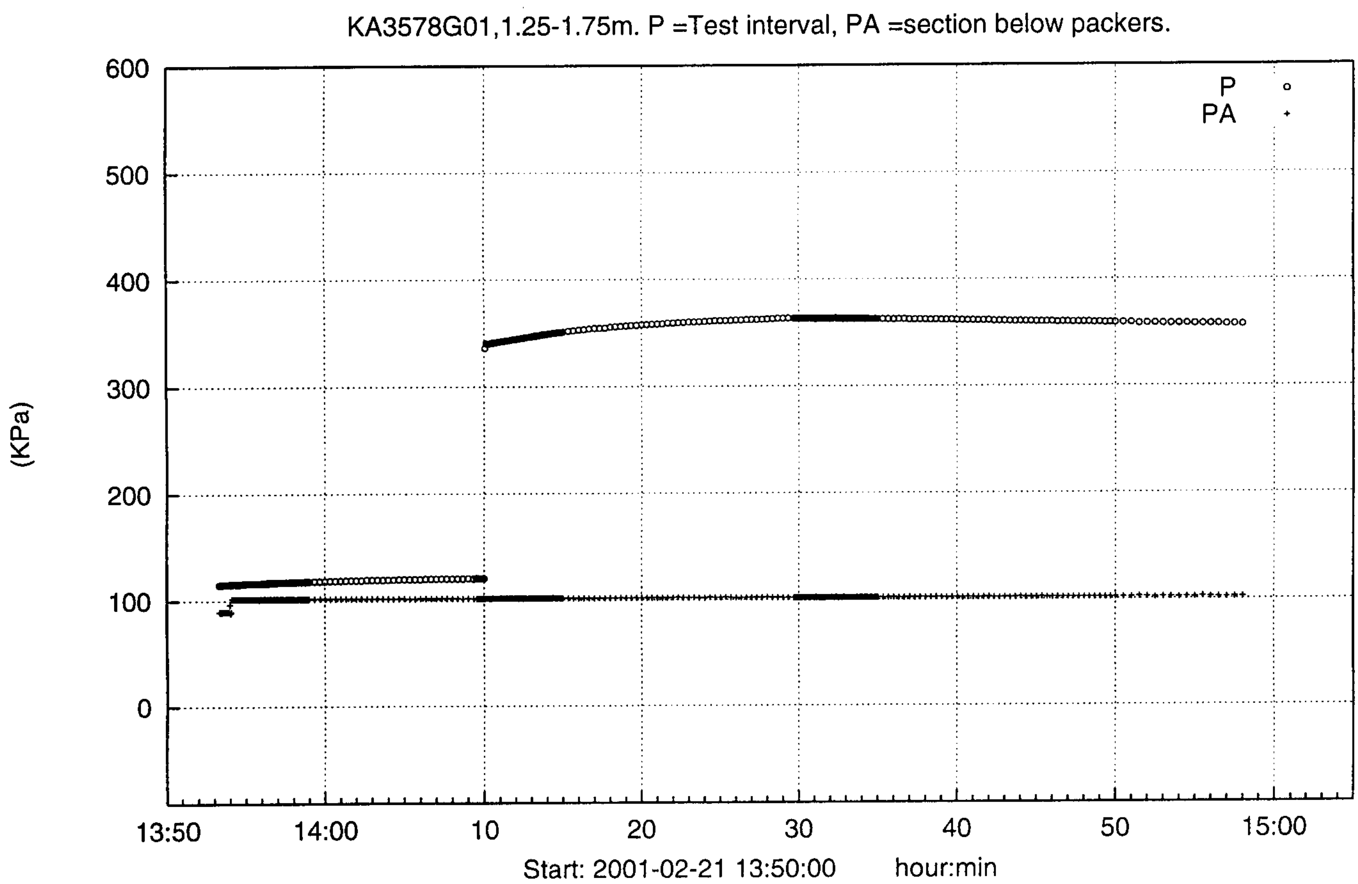
Flow data
Manually measured flow rates of KA3578G01, section 1.25 m –1.75 m, are presented in the table below.

Table Manually measured flow rates, Injection Test in KA3578G01, section 1.25 m –1.75 m. Prototype Repository, February 2001

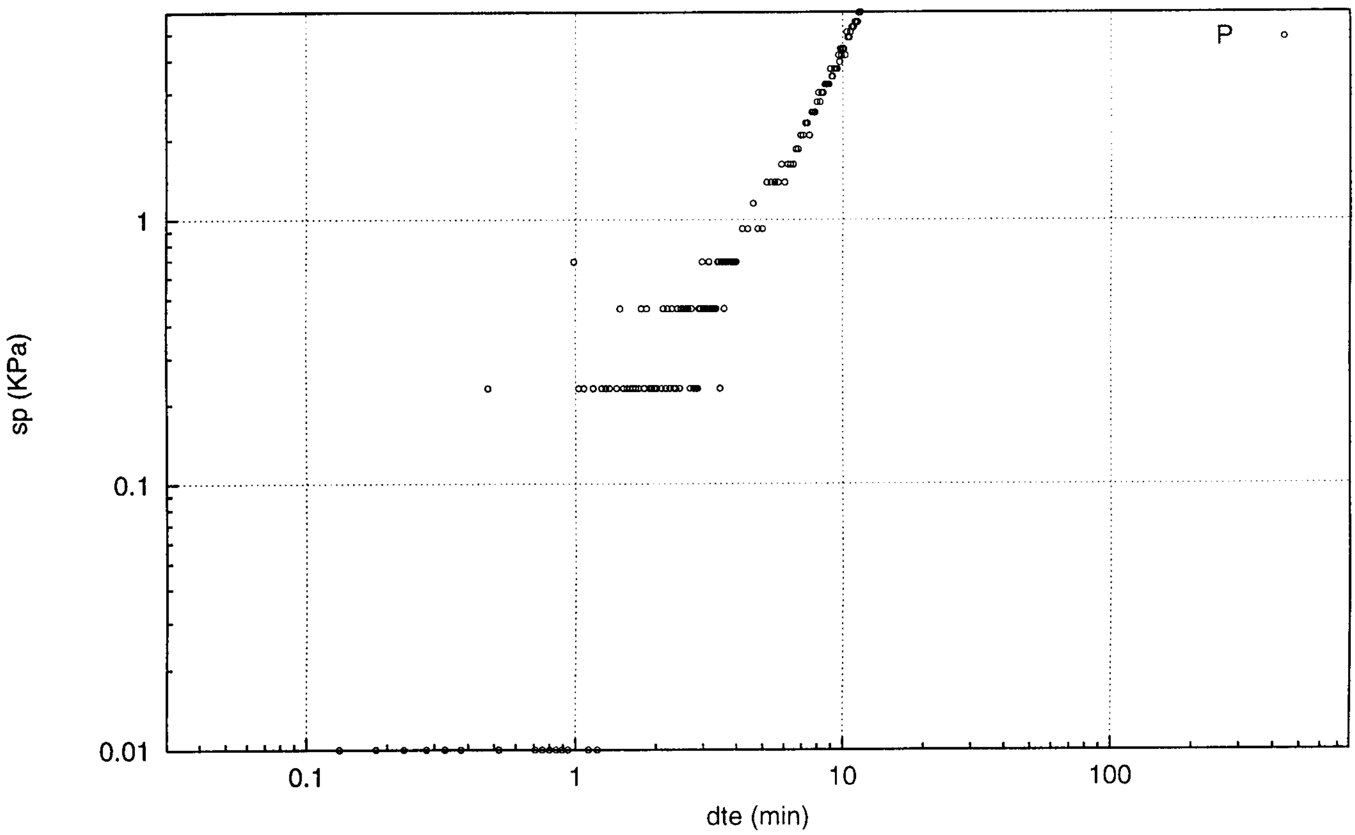
Time Flow rate	(l/min * 10^{-3})
14:10:05	82,3
14:10:43	0,187
14:11:40	0,145
14:13:03	0,055
14:15:03	0,055
14:17:03	0,055
14:20:03	0,027
14:25:02	0,018

Calculated flow and volume data
Total injected water volume (Vtot, m^3) = $7.7 \cdot 10^{-6}$
Injected volume excluding the first 5 seconds (V,m^3) = $8,7 \cdot 10^{-7}$
Average flow rate based on Vtot (QTave, l/min) = $3.9 \cdot 10^{-4}$
Average flow rate based on V (Qave ,l/min) = $4.4 \cdot 10^{-5}$
Flow rate at the end of the Flow Phase (Qp, l/min)

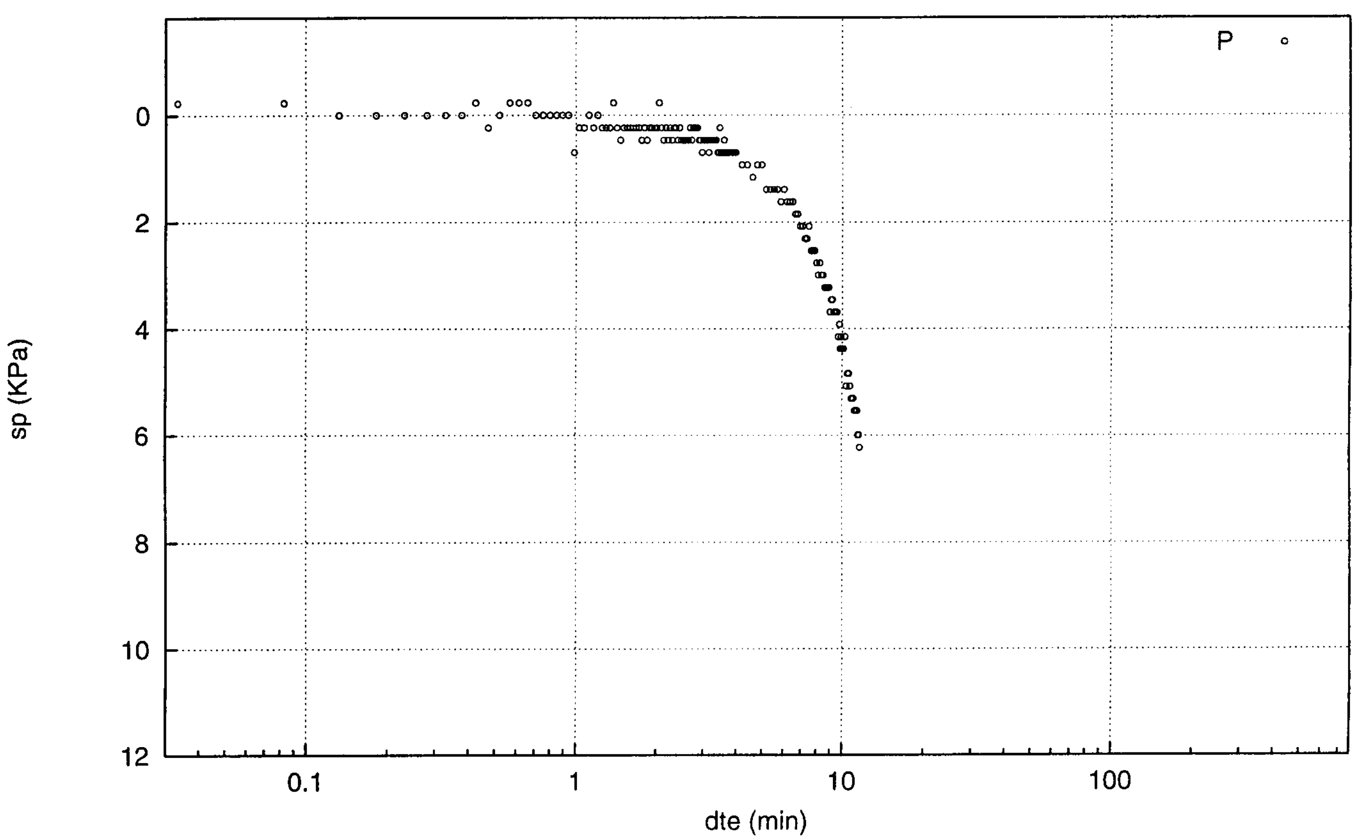
Comment
The pressure increases somewhat (c.20 KPa) during the flowing period.


KA3578G01,1.25-1.75m. P =Test interval, PA =section below packers.
P
PA
(KPa)
600
500
400
300
200
100
0
13:50
14:00
10
20
30
40
50
15:00
Start: 2001-02-21 13:50:00
hour:min

PROTOTYPE,TR INJECTION TEST KA3578G01, 1.25 - 1.75 m. recovery 2001-02-21 14:30:03



PROTOTYPE,TR INJECTION TEST KA3578G01, 1.25 - 1.75 m. recovery 2001-02-21 14:30:03



APPENDIX 2

Measurement of inflow rates to deposition hole DA3575G01 using diapers

This appendix includes the details of the diaper measurement of DA3575G01 as described in chapter 4 and consists of three parts:

1. Flow measurements using diapers

2. Hydraulic conductivity estimations

3. Statistics of hydraulic conductivity estimations

Part 1 Flow measurements using diapers

Plank The plank number

Diaper The diaper number applied downwards

O_length The "length" following the borehole circumference starting at centreline of the tunnel facing east and running clock-wise

Depth Centre of each diaper at borehole depth

Date_start Start of measurement

Weight_start Weight of diaper at the start of the measurement, grams

Date_end Stop of measurement

Weight_end Weight of diaper at the end of the measurement, grams

Weight_diff Difference in weight between start and stop time, grams

Q_corrected The calculated flowrate of each area covered by a diaper, m^3/s, after reducing the weight_diff with the reference value 6 grams.

Plank	Diaper	O_length (m)	Depth (m)	Date_start	Weight_start (g)	Date_end	Weight_end (g)	Weight_diff (g)	Q_corrected (m^3/s)	Q_corrected (l/min)
Upper 01	1	4.125	-1.4875	2001-02-12 14:05	43.87	2001-02-20 10:05	277.92	234.05	3.37E-10	2.02E-05
Upper 01	2	4.125	-1.8625	2001-02-12 14:05	40.94	2001-02-20 10:05	168.84	127.9	1.80E-10	1.08E-05
Upper 01	3	4.125	-2.2375	2001-02-12 14:05	40.47	2001-02-20 10:05	77.58	37.11	4.60E-11	2.76E-06
Upper 01	4	4.125	-2.6125	2001-02-12 14:05	42.25	2001-02-20 10:05	69.36	27.11	3.12E-11	1.87E-06
Upper 01	5	4.125	-2.9875	2001-02-12 14:05	40.51	2001-02-20 10:05	73.17	32.66	3.94E-11	2.36E-06
Upper 01	6	4.125	-3.3625	2001-02-12 14:05	42.92	2001-02-20 10:05	63.5	20.58	2.15E-11	1.29E-06
Upper 01	7	4.125	-3.7375	2001-02-12 14:05	43.01	2001-02-20 10:05	62.35	19.34	1.97E-11	1.18E-06
Upper 01	8	4.125	-4.1125	2001-02-12 14:05	38.54	2001-02-20 10:05	62.66	24.12	2.68E-11	1.61E-06
Upper 02	1	4.270	-1.4875	2001-02-12 14:10	41.94	2001-02-20 10:10	392.11	350.17	5.09E-10	3.05E-05
Upper 02	2	4.270	-1.8625	2001-02-12 14:10	41.64	2001-02-20 10:10	418.11	376.47	5.47E-10	3.28E-05
Upper 02	3	4.270	-2.2375	2001-02-12 14:10	44.44	2001-02-20 10:10	389.77	345.33	5.01E-10	3.01E-05
Upper 02	4	4.270	-2.6125	2001-02-12 14:10	42.47	2001-02-20 10:10	333.92	291.45	4.22E-10	2.53E-05
Upper 02	5	4.270	-2.9875	2001-02-12 14:10	42.11	2001-02-20 10:10	113.15	71.04	9.61E-11	5.77E-06
Upper 02	6	4.270	-3.3625	2001-02-12 14:10	42.11	2001-02-20 10:10	108.08	65.97	8.86E-11	5.32E-06
Upper 02	7	4.270	-3.7375	2001-02-12 14:10	42.39	2001-02-20 10:10	73.83	31.44	3.76E-11	2.26E-06
Upper 02	8	4.270	-4.1125	2001-02-12 14:10	40.15	2001-02-20 10:10	62.07	21.92	2.35E-11	1.41E-06
Upper 03	1	4.414	-1.4875	2001-02-12 14:20	44.51	2001-02-20 10:25	225.61	181.1	2.59E-10	1.55E-05
Upper 03	2	4.414	-1.8625	2001-02-12 14:20	43.24	2001-02-20 10:25	95.18	51.94	6.78E-11	4.07E-06
Upper 03	3	4.414	-2.2375	2001-02-12 14:20	50.5	2001-02-20 10:25	68.55	18.05	1.78E-11	1.07E-06
Upper 03	4	4.414	-2.6125	2001-02-12 14:20	40.13	2001-02-20 10:25	65.78	25.65	2.90E-11	1.74E-06
Upper 03	5	4.414	-2.9875	2001-02-12 14:20	43.93	2001-02-20 10:25	92.33	48.4	6.26E-11	3.76E-06
Upper 03	6	4.414	-3.3625	2001-02-12 14:20	42.16	2001-02-20 10:25	67.25	25.09	2.82E-11	1.69E-06
Upper 03	7	4.414	-3.7375	2001-02-12 14:20	41.29	2001-02-20 10:25	60.68	19.39	1.98E-11	1.19E-06
Upper 03	8	4.414	-4.1125	2001-02-12 14:20	39.37	2001-02-20 10:25	63.48	24.11	2.67E-11	1.60E-06
Upper 04	1	4.559	-1.4875	2001-02-12 14:25	43.66	2001-02-20 10:30	481.85	438.19	6.38E-10	3.83E-05
Upper 04	2	4.559	-1.8625	2001-02-12 14:25	43.7	2001-02-20 10:30	446.84	403.14	5.87E-10	3.52E-05
Upper 04	3	4.559	-2.2375	2001-02-12 14:25	46.73	2001-02-20 10:30	240.56	193.83	2.77E-10	1.66E-05
Upper 04	4	4.559	-2.6125	2001-02-12 14:25	43.16	2001-02-20 10:30	57.95	14.79	1.30E-11	7.79E-07
Upper 04	5	4.559	-2.9875	2001-02-12 14:25	40.5	2001-02-20 10:30	57.15	16.65	1.57E-11	9.44E-07
Upper 04	6	4.559	-3.3625	2001-02-12 14:25	42.39	2001-02-20 10:30	62.62	20.23	2.10E-11	1.26E-06
Upper 04	7	4.559	-3.7375	2001-02-12 14:25	51.32	2001-02-20 10:30	59.35	8.03	3.00E-12	1.80E-07
Upper 04	8	4.559	-4.1125	2001-02-12 14:25	44.7	2001-02-20 10:30	61.03	16.33	1.53E-11	9.15E-07
Upper 05	1	4.704	-1.4875	2001-02-12 14:30	41.10	2001-02-20 10:35	58.08	16.98	1.62E-11	9.73E-07
Upper 05	2	4.704	-1.8625	2001-02-12 14:30	42.43	2001-02-20 10:35	56.31	13.88	1.16E-11	6.98E-07
Upper 05	3	4.704	-2.2375	2001-02-12 14:30	43.81	2001-02-20 10:35	54.34	10.53	6.69E-12	4.01E-07
Upper 05	4	4.704	-2.6125	2001-02-12 14:30	41.97	2001-02-20 10:35	51.61	9.64	5.38E-12	3.23E-07
Upper 05	5	4.704	-2.9875	2001-02-12 14:30	44.67	2001-02-20 10:35	56.48	11.81	8.58E-12	5.15E-07
Upper 05	6	4.704	-3.3625	2001-02-12 14:30	40.96	2001-02-20 10:35	50.79	9.83	5.66E-12	3.39E-07
Upper 05	7	4.704	-3.7375	2001-02-12 14:30	40.47	2001-02-20 10:35	50.24	9.77	5.57E-12	3.34E-07
Upper 05	8	4.704	-4.1125	2001-02-12 14:30	44.09	2001-02-20 10:35	54.33	10.24	6.26E-12	3.76E-07
Upper 06	1	4.849	-1.4875	2001-02-13 11:15	41	2001-02-20 10:50	121.69	80.69	1.24E-10	7.43E-06
Upper 06	2	4.849	-1.8625	2001-02-13 11:15	40.91	2001-02-20 10:50	50.89	9.98	6.60E-12	3.96E-07
Upper 06	3	4.849	-2.2375	2001-02-13 11:15	42.87	2001-02-20 10:50	55.24	12.37	1.06E-11	6.34E-07
Upper 06	4	4.849	-2.6125	2001-02-13 11:15	43.53	2001-02-20 10:50	61.24	17.71	1.94E-11	1.16E-06
Upper 06	5	4.849	-2.9875	2001-02-13 11:15	43.21	2001-02-20 10:50	61.62	18.41	2.06E-11	1.23E-06
Upper 06	6	4.849	-3.3625	2001-02-13 11:15	42.97	2001-02-20 10:50	57.88	14.91	1.48E-11	8.86E-07
Upper 06	7	4.849	-3.7375	2001-02-13 11:15	39.41	2001-02-20 10:50	52.55	13.14	1.18E-11	7.10E-07
Upper 06	8	4.849	-4.1125	2001-02-13 11:15	40.06	2001-02-20 10:50	54.74	14.68	1.44E-11	8.63E-07
Upper 07	1	4.993	-1.4875	2001-02-13 11:20	40.97	2001-02-20 10:55	324.74	283.77	4.60E-10	2.76E-05
Upper 07	2	4.993	-1.8625	2001-02-13 11:20	42.37	2001-02-20 10:55	407.30	364.93	5.95E-10	3.57E-05
Upper 07	3	4.993	-2.2375	2001-02-13 11:20	42.36	2001-02-20 10:55	351.18	308.82	5.02E-10	3.01E-05
Upper 07	4	4.993	-2.6125	2001-02-13 11:20	43.57	2001-02-20 10:55	296.1	252.53	4.09E-10	2.45E-05
Upper 07	5	4.993	-2.9875	2001-02-13 11:20	41.54	2001-02-20 10:55	107.24	65.7	9.90E-11	5.94E-06
Upper 07	6	4.993	-3.3625	2001-02-13 11:20	43.05	2001-02-20 10:55	59.85	16.8	1.79E-11	1.07E-06
Upper 07	7	4.993	-3.7375	2001-02-13 11:20	40.52	2001-02-20 10:55	53.26	12.74	1.12E-11	6.70E-07
Upper 07	8	4.993	-4.1125	2001-02-13 11:20	41.98	2001-02-20 10:55	68.81	26.83	3.45E-11	2.07E-06
Upper 08	1	5.138	-1.4875	2001-02-13 11:25	39.8	2001-02-20 11:00	65.85	26.05	3.32E-11	1.99E-06
Upper 08	2	5.138	-1.8625	2001-02-13 11:25	42.03	2001-02-20 11:00	69.85	27.82	3.62E-11	2.17E-06
Upper 08	3	5.138	-2.2375	2001-02-13 11:25	38.74	2001-02-20 11:00	267.7	228.96	3.70E-10	2.22E-05
Upper 08	4	5.138	-2.6125	2001-02-13 11:25	39.38	2001-02-20 11:00	186.13	146.75	2.33E-10	1.40E-05
Upper 08	5	5.138	-2.9875	2001-02-13 11:25	41.43	2001-02-20 11:00	57.25	15.82	1.63E-11	9.77E-07
Upper 08	6	5.138	-3.3625	2001-02-13 11:25	39.73	2001-02-20 11:00	53.39	13.66	1.27E-11	7.62E-07
Upper 08	7	5.138	-3.7375	2001-02-13 11:25	41.26	2001-02-20 11:00	56.35	15.09	1.51E-11	9.04E-07
Upper 08	8	5.138	-4.1125	2001-02-13 11:25	41.22	2001-02-20 11:00	56.92	15.7	1.61E-11	9.65E-07
Upper 09	1	5.283	-1.4875	2001-02-13 11:30	38.86	2001-02-20 11:05	53.2	14.34	1.38E-11	8.29E-07
Upper 09	2	5.283	-1.8625	2001-02-13 11:30	40.30	2001-02-20 11:05	21.90	-18.4	-4.04E-11	-2.43E-06
Upper 09	3	5.283	-2.2375	2001-02-13 11:30	39.88	2001-02-20 11:05	58.65	18.77	2.12E-11	1.27E-06
Upper 09	4	5.283	-2.6125	2001-02-13 11:30	41.88	2001-02-20 11:05	57.48	15.6	1.59E-11	9.55E-07
Upper 09	5	5.283	-2.9875	2001-02-13 11:30	36.9	2001-02-20 11:05	51.77	14.87	1.47E-11	8.82E-07
Upper 09	6	5.283	-3.3625	2001-02-13 11:30	41.45	2001-02-20 11:05	56.76	15.31	1.54E-11	9.26E-07
Upper 09	7	5.283	-3.7375	2001-02-13 11:30	39.6	2001-02-20 11:05	53.12	13.52	1.25E-11	7.48E-07
Upper 09	8	5.283	-4.1125	2001-02-13 11:30	40.56	2001-02-20 11:05	59.8	19.24	2.19E-11	1.32E-06
Upper 10	1	5.428	-1.4875	2001-02-13 11:35	41.83	2001-02-20 11:15	157.12	115.29	1.81E-10	1.09E-05
Upper 10	2	5.428	-1.8625	2001-02-13 11:35	40.48	2001-02-20 11:15	53.8	13.32	1.21E-11	7.28E-07
Upper 10	3	5.428	-2.2375	2001-02-13 11:35	39.48	2001-02-20 11:15	52.30	12.82	1.13E-11	6.78E-07
Upper 10	4	5.428	-2.6125	2001-02-13 11:35	40.89	2001-02-20 11:15	58.34	17.45	1.90E-11	1.14E-06
Upper 10	5	5.428	-2.9875	2001-02-13 11:35	39.29	2001-02-20 11:15	55.11	15.82	1.63E-11	9.76E-07
Upper 10	6	5.428	-3.3625	2001-02-13 11:35	41.06	2001-02-20 11:15	56.43	15.37	1.55E-11	9.31E-07
Upper 10	7	5.428	-3.7375	2001-02-13 11:35	39.81	2001-02-20 11:15	55.01	15.2	1.52E-11	9.15E-07
Upper 10	8	5.428	-4.1125	2001-02-13 11:35	41.98	2001-02-20 11:15	62.6	20.62	2.42E-11	1.45E-06
Upper 11	1	0.072	-1.4875	2001-02-13 11:40	40.95	2001-02-20 11:25	95.58	54.63	8.05E-11	4.83E-06

Plank	Diaper	O_length (m)	Depth (m)	Date_start	Weight_start (g)	Date_end	Weight_end (g)	Weight_diff (g)	Q_corrected (m^3/s)	Q_corrected (l/min)
Upper 11	2	0.072	-1.8625	2001-02-13 11:40	43.56	2001-02-20 11:25	61.05	17.49	1.90E-11	1.14E-06
Upper 11	3	0.072	-2.2375	2001-02-13 11:40	40.28	2001-02-20 11:25	54.44	14.16	1.35E-11	8.11E-07
Upper 11	4	0.072	-2.6125	2001-02-13 11:40	40.69	2001-02-20 11:25	58.4	17.71	1.94E-11	1.16E-06
Upper 11	5	0.072	-2.9875	2001-02-13 11:40	39	2001-02-20 11:25	51.42	12.42	1.06E-11	6.38E-07
Upper 11	6	0.072	-3.3625	2001-02-13 11:40	40.04	2001-02-20 11:25	53.68	13.64	1.27E-11	7.59E-07
Upper 11	7	0.072	-3.7375	2001-02-13 11:40	39.7	2001-02-20 11:25	51.53	11.83	9.65E-12	5.79E-07
Upper 11	8	0.072	-4.1125	2001-02-13 11:40	38.97	2001-02-20 11:25	56.08	17.11	1.84E-11	1.10E-06
Upper 12	1	0.217	-1.4875	2001-02-13 11:45	37.03	2001-02-20 11:35	94.11	57.08	8.45E-11	5.07E-06
Upper 12	2	0.217	-1.8625	2001-02-13 11:45	38.62	2001-02-20 11:35	58.75	20.13	2.34E-11	1.40E-06
Upper 12	3	0.217	-2.2375	2001-02-13 11:45	43.92	2001-02-20 11:35	58.21	14.29	1.37E-11	8.23E-07
Upper 12	4	0.217	-2.6125	2001-02-13 11:45	42.29	2001-02-20 11:35	56.49	14.2	1.36E-11	8.14E-07
Upper 12	5	0.217	-2.9875	2001-02-13 11:45	41.91	2001-02-20 11:35	54.85	12.94	1.15E-11	6.89E-07
Upper 12	6	0.217	-3.3625	2001-02-13 11:45	41.36	2001-02-20 11:35	54.02	12.66	1.10E-11	6.61E-07
Upper 12	7	0.217	-3.7375	2001-02-13 11:45	41.74	2001-02-20 11:35	53.35	11.61	9.29E-12	5.57E-07
Upper 12	8	0.217	-4.1125	2001-02-13 11:45	42.65	2001-02-20 11:35	57.5	14.85	1.46E-11	8.79E-07
Upper 13	1	0.361	-1.4875	2001-02-13 11:50	39.97	2001-02-20 11:40	157.12	117.15	1.84E-10	1.10E-05
Upper 13	2	0.361	-1.8625	2001-02-13 11:50	39.08	2001-02-20 11:40	52.14	13.06	1.17E-11	7.01E-07
Upper 13	3	0.361	-2.2375	2001-02-13 11:50	38.52	2001-02-20 11:40	50.32	11.8	9.60E-12	5.76E-07
Upper 13	4	0.361	-2.6125	2001-02-13 11:50	42.15	2001-02-20 11:40	55.9	13.75	1.28E-11	7.70E-07
Upper 13	5	0.361	-2.9875	2001-02-13 11:50	39.99	2001-02-20 11:40	52.51	12.52	1.08E-11	6.47E-07
Upper 13	6	0.361	-3.3625	2001-02-13 11:50	38.99	2001-02-20 11:40	51.75	12.76	1.12E-11	6.71E-07
Upper 13	7	0.361	-3.7375	2001-02-13 11:50	41.48	2001-02-20 11:40	53.73	12.25	1.03E-11	6.21E-07
Upper 13	8	0.361	-4.1125	2001-02-13 11:50	39.51	2001-02-20 11:40	54.16	14.65	1.43E-11	8.59E-07
Upper 14	1	0.506	-1.4875	2001-02-13 11:55	38.99	2001-02-20 11:50	314.62	275.63	4.46E-10	2.68E-05
Upper 14	2	0.506	-1.8625	2001-02-13 11:55	41.61	2001-02-20 11:50	237.29	195.68	3.14E-10	1.88E-05
Upper 14	3	0.506	-2.2375	2001-02-13 11:55	40.25	2001-02-20 11:50	52.98	12.73	1.11E-11	6.68E-07
Upper 14	4	0.506	-2.6125	2001-02-13 11:55	41.35	2001-02-20 11:50	55.55	14.2	1.36E-11	8.14E-07
Upper 14	5	0.506	-2.9875	2001-02-13 11:55	40.4	2001-02-20 11:50	54.88	14.48	1.40E-11	8.42E-07
Upper 14	6	0.506	-3.3625	2001-02-13 11:55	39.76	2001-02-20 11:50	52.32	12.56	1.09E-11	6.51E-07
Upper 14	7	0.506	-3.7375	2001-02-13 11:55	39.31	2001-02-20 11:50	50.72	11.41	8.95E-12	5.37E-07
Upper 14	8	0.506	-4.1125	2001-02-13 11:55	38.32	2001-02-20 11:50	50.88	12.56	1.09E-11	6.51E-07
Upper 15	1	0.651	-1.4875	2001-02-13 12:00	41.09	2001-02-20 11:55	119.88	78.79	1.20E-10	7.22E-06
Upper 15	2	0.651	-1.8625	2001-02-13 12:00	43.11	2001-02-20 11:55	81.26	38.15	5.32E-11	3.19E-06
Upper 15	3	0.651	-2.2375	2001-02-13 12:00	40.85	2001-02-20 11:55	55.22	14.37	1.38E-11	8.31E-07
Upper 15	4	0.651	-2.6125	2001-02-13 12:00	41.62	2001-02-20 11:55	55.69	14.07	1.33E-11	8.01E-07
Upper 15	5	0.651	-2.9875	2001-02-13 12:00	40.83	2001-02-20 11:55	55.21	14.38	1.39E-11	8.32E-07
Upper 15	6	0.651	-3.3625	2001-02-13 12:00	43.43	2001-02-20 11:55	59.52	16.09	1.67E-11	1.00E-06
Upper 15	7	0.651	-3.7375	2001-02-13 12:00	40.93	2001-02-20 11:55	50.84	9.91	6.47E-12	3.88E-07
Upper 15	8	0.651	-4.1125	2001-02-13 12:00	40.73	2001-02-20 11:55	50.17	9.44	5.69E-12	3.41E-07
Upper 16	1	0.796	-1.4875	2001-02-13 14:25	42.25	2001-02-20 12:00	132.72	90.47	1.42E-10	8.50E-06
Upper 16	2	0.796	-1.8625	2001-02-13 14:25	38.44	2001-02-20 12:00	50.25	11.81	9.75E-12	5.85E-07
Upper 16	3	0.796	-2.2375	2001-02-13 14:25	42.69	2001-02-20 12:00	53.62	10.93	8.27E-12	4.96E-07
Upper 16	4	0.796	-2.6125	2001-02-13 14:25	41.83	2001-02-20 12:00	51.66	9.83	6.43E-12	3.86E-07
Upper 16	5	0.796	-2.9875	2001-02-13 14:25	43.66	2001-02-20 12:00	53.79	10.13	6.93E-12	4.16E-07
Upper 16	6	0.796	-3.3625	2001-02-13 14:25	47.9	2001-02-20 12:00	58.34	10.44	7.45E-12	4.47E-07
Upper 16	7	0.796	-3.7375	2001-02-13 14:25	43.65	2001-02-20 12:00	54.17	10.52	7.58E-12	4.55E-07
Upper 16	8	0.796	-4.1125	2001-02-13 14:25	44.32	2001-02-20 12:00	56.13	11.81	9.75E-12	5.85E-07
Upper 17	1	0.940	-1.4875	2001-02-13 14:30	40.64	2001-02-20 12:05	319.69	279.05	4.58E-10	2.75E-05
Upper 17	2	0.940	-1.8625	2001-02-13 14:30	42.02	2001-02-20 12:05	155.68	113.66	1.81E-10	1.08E-05
Upper 17	3	0.940	-2.2375	2001-02-13 14:30	40.8	2001-02-20 12:05	51.55	10.75	7.97E-12	4.78E-07
Upper 17	4	0.940	-2.6125	2001-02-13 14:30	42.99	2001-02-20 12:05	53.31	10.32	7.25E-12	4.35E-07
Upper 17	5	0.940	-2.9875	2001-02-13 14:30	41.67	2001-02-20 12:05	51.73	10.06	6.81E-12	4.09E-07
Upper 17	6	0.940	-3.3625	2001-02-13 14:30	40.55	2001-02-20 12:05	49.00	8.45	4.11E-12	2.47E-07
Upper 17	7	0.940	-3.7375	2001-02-13 14:30	43.47	2001-02-20 12:05	51.35	7.88	3.15E-12	1.89E-07
Upper 17	8	0.940	-4.1125	2001-02-13 14:30	43.64	2001-02-20 12:05	55.69	12.05	1.01E-11	6.09E-07
Upper 18	1	1.085	-1.4875	2001-02-13 14:35	42.8	2001-02-20 12:10	165.6	122.8	1.96E-10	1.18E-05
Upper 18	2	1.085	-1.8625	2001-02-13 14:35	42.17	2001-02-20 12:10	93.20	51.03	7.55E-11	4.53E-06
Upper 18	3	1.085	-2.2375	2001-02-13 14:35	39.21	2001-02-20 12:10	48.5	9.29	5.52E-12	3.31E-07
Upper 18	4	1.085	-2.6125	2001-02-13 14:35	41.82	2001-02-20 12:10	51.07	9.25	5.45E-12	3.27E-07
Upper 18	5	1.085	-2.9875	2001-02-13 14:35	41.11	2001-02-20 12:10	50.32	9.21	5.39E-12	3.23E-07
Upper 18	6	1.085	-3.3625	2001-02-13 14:35	41.13	2001-02-20 12:10	49.25	8.12	3.56E-12	2.13E-07
Upper 18	7	1.085	-3.7375	2001-02-13 14:35	42.53	2001-02-20 12:10	49.85	7.32	2.21E-12	1.33E-07
Upper 18	8	1.085	-4.1125	2001-02-13 14:35	43.74	2001-02-20 12:10	51.72	7.98	3.32E-12	1.99E-07
Upper 19	1	1.230	-1.4875	2001-02-13 14:40	42.58	2001-02-20 12:15	55.75	13.17	1.20E-11	7.22E-07
Upper 19	2	1.230	-1.8625	2001-02-13 14:40	40.3	2001-02-20 12:15	48.72	8.42	4.06E-12	2.44E-07
Upper 19	3	1.230	-2.2375	2001-02-13 14:40	43.55	2001-02-20 12:15	52.09	8.54	4.26E-12	2.56E-07
Upper 19	4	1.230	-2.6125	2001-02-13 14:40	43.38	2001-02-20 12:15	51.73	8.35	3.94E-12	2.37E-07
Upper 19	5	1.230	-2.9875	2001-02-13 14:40	41.97	2001-02-20 12:15	50.14	8.17	3.64E-12	2.18E-07
Upper 19	6	1.230	-3.3625	2001-02-13 14:40	42.85	2001-02-20 12:15	50.64	7.79	3.00E-12	1.80E-07
Upper 19	7	1.230	-3.7375	2001-02-13 14:40	41.85	2001-02-20 12:15	49.77	7.92	3.22E-12	1.93E-07
Upper 19	8	1.230	-4.1125	2001-02-13 14:40	43.63	2001-02-20 12:15	54.05	10.42	7.41E-12	4.45E-07
Upper 20	1	1.375	-1.4875	2001-02-13 14:45	43.88	2001-02-20 13:30	61.28	17.4	1.90E-11	1.14E-06
Upper 20	2	1.375	-1.8625	2001-02-13 14:45	43.32	2001-02-20 13:30	53.99	10.67	7.78E-12	4.67E-07
Upper 20	3	1.375	-2.2375	2001-02-13 14:45	42.73	2001-02-20 13:30	50.65	7.92	3.20E-12	1.92E-07
Upper 20	4	1.375	-2.6125	2001-02-13 14:45	41.45	2001-02-20 13:30	49.85	8.4	4.00E-12	2.40E-07
Upper 20	5	1.375	-2.9875	2001-02-13 14:45	53.60	2001-02-20 13:30	64.65	11.05	8.41E-12	5.05E-07
Upper 20	6	1.375	-3.3625	2001-02-13 14:45	44.07	2001-02-20 13:30	53.59	9.52	5.86E-12	3.52E-07
Upper 20	7	1.375	-3.7375	2001-02-13 14:45	45.67	2001-02-20 13:30	54.63	8.96	4.93E-12	2.96E-07
Upper 20	8	1.375	-4.1125	2001-02-13 14:45	41.00	2001-02-20 13:30	51.19	10.19	6.98E-12	4.19E-07
Upper 21	1	1.519	-1.4875	2001-02-13 14:50	43.97	2001-02-20 13:35	310.32	266.35	4.34E-10	2.60E-05
Upper 21	2	1.519	-1.8625	2001-02-13 14:50	43.46	2001-02-20 13:35	333.31	289.85	4.73E-10	2.84E-05

Plank	Diaper	O_length (m)	Depth (m)	Date_start	Weight_start (g)	Date_end	Weight_end (g)	Weight_diff (g)	Q_corrected (m^3/s)	Q_corrected (l/min)
Upper 21	3	1.519	-2.2375	2001-02-13 14:50	38.98	2001-02-20 13:35	188.27	149.29	2.39E-10	1.43E-05
Upper 21	4	1.519	-2.6125	2001-02-13 14:50	44.05	2001-02-20 13:35	60.3	16.25	1.71E-11	1.02E-06
Upper 21	5	1.519	-2.9875	2001-02-13 14:50	43.36	2001-02-20 13:35	53.85	10.49	7.48E-12	4.49E-07
Upper 21	6	1.519	-3.3625	2001-02-13 14:50	38.79	2001-02-20 13:35	48.63	9.84	6.40E-12	3.84E-07
Upper 21	7	1.519	-3.7375	2001-02-13 14:50	42.04	2001-02-20 13:35	52.6	10.56	7.60E-12	4.56E-07
Upper 21	8	1.519	-4.1125	2001-02-13 14:50	43.72	2001-02-20 13:35	57.12	13.4	1.23E-11	7.40E-07
Upper 22	1	1.664	-1.4875	2001-02-13 14:55	41.41	2001-02-20 13:40	289.39	247.98	4.03E-10	2.42E-05
Upper 22	2	1.664	-1.8625	2001-02-13 14:55	42.49	2001-02-20 13:40	356.00	313.51	5.12E-10	3.07E-05
Upper 22	3	1.664	-2.2375	2001-02-13 14:55	42.85	2001-02-20 13:40	375.1	332.25	5.43E-10	3.26E-05
Upper 22	4	1.664	-2.6125	2001-02-13 14:55	41.24	2001-02-20 13:40	251.45	210.21	3.40E-10	2.04E-05
Upper 22	5	1.664	-2.9875	2001-02-13 14:55	40.66	2001-02-20 13:40	83.17	42.51	6.08E-11	3.65E-06
Upper 22	6	1.664	-3.3625	2001-02-13 14:55	41.68	2001-02-20 13:40	59.05	17.37	1.89E-11	1.14E-06
Upper 22	7	1.664	-3.7375	2001-02-13 14:55	42.11	2001-02-20 13:40	58.49	16.38	1.73E-11	1.04E-06
Upper 22	8	1.664	-4.1125	2001-02-13 14:55	39.2	2001-02-20 13:40	56.89	17.69	1.95E-11	1.17E-06
Upper 23	1	1.809	-1.4875	2001-02-14 10:30	40.63	2001-02-20 13:45	112.79	72.16	1.25E-10	7.49E-06
Upper 23	2	1.809	-1.8625	2001-02-14 10:30	39.24	2001-02-20 13:45	50.4	11.16	9.73E-12	5.84E-07
Upper 23	3	1.809	-2.2375	2001-02-14 10:30	40.94	2001-02-20 13:45	52.74	11.8	1.09E-11	6.56E-07
Upper 23	4	1.809	-2.6125	2001-02-14 10:30	40.63	2001-02-20 13:45	53.1	12.47	1.22E-11	7.32E-07
Upper 23	5	1.809	-2.9875	2001-02-14 10:30	42.5	2001-02-20 13:45	51.41	8.91	5.49E-12	3.29E-07
Upper 23	6	1.809	-3.3625	2001-02-14 10:30	41.86	2001-02-20 13:45	49.8	7.94	3.66E-12	2.20E-07
Upper 23	7	1.809	-3.7375	2001-02-14 10:30	42.21	2001-02-20 13:45	51.09	8.88	5.43E-12	3.26E-07
Upper 23	8	1.809	-4.1125	2001-02-14 10:30	38.47	2001-02-20 13:45	52.2	13.73	1.46E-11	8.75E-07
Upper 24	1	1.954	-1.4875	2001-02-14 10:35	39.85	2001-02-20 14:25	244.65	204.8	3.74E-10	2.24E-05
Upper 24	2	1.954	-1.8625	2001-02-14 10:35	40.86	2001-02-20 14:25	271.84	230.98	4.23E-10	2.54E-05
Upper 24	3	1.954	-2.2375	2001-02-14 10:35	41.28	2001-02-20 14:25	311.46	270.18	4.96E-10	2.98E-05
Upper 24	4	1.954	-2.6125	2001-02-14 10:35	40.13	2001-02-20 14:25	268.88	228.75	4.19E-10	2.51E-05
Upper 24	5	1.954	-2.9875	2001-02-14 10:35	40.52	2001-02-20 14:25	109.92	69.4	1.19E-10	7.15E-06
Upper 24	6	1.954	-3.3625	2001-02-14 10:35	40.44	2001-02-20 14:25	50.7	10.26	8.00E-12	4.80E-07
Upper 24	7	1.954	-3.7375	2001-02-14 10:35	39.14	2001-02-20 14:25	47.9	8.76	5.19E-12	3.11E-07
Upper 24	8	1.954	-4.1125	2001-02-14 10:35	40.91	2001-02-20 14:25	134.83	93.92	1.65E-10	9.91E-06
Upper 25	1	2.098	-1.4875	2001-02-14 10:40	42.01	2001-02-20 14:30	228.75	186.74	3.40E-10	2.04E-05
Upper 25	2	2.098	-1.8625	2001-02-14 10:40	41	2001-02-20 14:30	265.8	224.8	4.11E-10	2.47E-05
Upper 25	3	2.098	-2.2375	2001-02-14 10:40	41.32	2001-02-20 14:30	137.19	95.87	1.69E-10	1.01E-05
Upper 25	4	2.098	-2.6125	2001-02-14 10:40	40.63	2001-02-20 14:30	164.84	124.21	2.22E-10	1.33E-05
Upper 25	5	2.098	-2.9875	2001-02-14 10:40	41.98	2001-02-20 14:30	61.98	20	2.63E-11	1.58E-06
Upper 25	6	2.098	-3.3625	2001-02-14 10:40	39.95	2001-02-20 14:30	49.27	9.32	6.24E-12	3.74E-07
Upper 25	7	2.098	-3.7375	2001-02-14 10:40	44.6	2001-02-20 14:30	55.54	10.94	9.28E-12	5.57E-07
Upper 25	8	2.098	-4.1125	2001-02-14 10:40	41.21	2001-02-20 14:30	62.95	21.74	2.96E-11	1.77E-06
Upper 26	1	2.243	-1.4875	2001-02-14 10:45	44.5	2001-02-20 14:33	281.39	236.89	4.34E-10	2.60E-05
Upper 26	2	2.243	-1.8625	2001-02-14 10:45	41.21	2001-02-20 14:33	360.74	319.53	5.89E-10	3.54E-05
Upper 26	3	2.243	-2.2375	2001-02-14 10:45	41.78	2001-02-20 14:33	289.81	248.03	4.55E-10	2.73E-05
Upper 26	4	2.243	-2.6125	2001-02-14 10:45	41.24	2001-02-20 14:33	85.32	44.08	7.16E-11	4.29E-06
Upper 26	5	2.243	-2.9875	2001-02-14 10:45	38.4	2001-02-20 14:33	54.03	15.63	1.81E-11	1.09E-06
Upper 26	6	2.243	-3.3625	2001-02-14 10:45	39	2001-02-20 14:33	52.28	13.28	1.37E-11	8.21E-07
Upper 26	7	2.243	-3.7375	2001-02-14 10:45	40.12	2001-02-20 14:33	53.62	13.5	1.41E-11	8.46E-07
Upper 26	8	2.243	-4.1125	2001-02-14 10:45	43.11	2001-02-20 14:33	69.6	26.49	3.85E-11	2.31E-06
Upper 27	1	2.388	-1.4875	2001-02-14 10:50	40.26	2001-02-20 14:40	223.73	183.47	3.33E-10	
Upper 27	2	2.388	-1.8625	2001-02-14 10:50	41	2001-02-20 14:40	358.57	317.57	5.85E-10	
Upper 27	3	2.388	-2.2375	2001-02-14 10:50	41.55	2001-02-20 14:40	406.31	364.76	6.74E-10	
Upper 27	4	2.388	-2.6125	2001-02-14 10:50	40.7	2001-02-20 14:40	303.69	262.99	4.83E-10	
Upper 27	5	2.388	-2.9875	2001-02-14 10:50	41.74	2001-02-20 14:40	275.16	233.42	4.27E-10	
Upper 27	6	2.388	-3.3625	2001-02-14 10:50	40.21	2001-02-20 14:40	261.06	220.85	4.04E-10	
Upper 27	7	2.388	-3.7375	2001-02-14 10:50	41.12	2001-02-20 14:40	248.88	207.76	3.79E-10	
Upper 27	8	2.388	-4.1125	2001-02-14 10:50	39.81	2001-02-20 14:40	276.96	237.15	4.34E-10	
Upper 28	1	2.533	-1.4875	2001-02-14 10:55	41.74	2001-02-20 14:50	412.76	371.02	6.85E-10	
Upper 28	2	2.533	-1.8625	2001-02-14 10:55	40.08	2001-02-20 14:50	425.17	385.09	7.12E-10	
Upper 28	3	2.533	-2.2375	2001-02-14 10:55	41.46	2001-02-20 14:50	421.8	380.34	7.03E-10	
Upper 28	4	2.533	-2.6125	2001-02-14 10:55	39.15	2001-02-20 14:50	423.15	384	7.10E-10	
Upper 28	5	2.533	-2.9875	2001-02-14 10:55	41.58	2001-02-20 14:50	377.3	335.72	6.19E-10	
Upper 28	6	2.533	-3.3625	2001-02-14 10:55	42.33	2001-02-20 14:50	404.74	362.41	6.69E-10	
Upper 28	7	2.533	-3.7375	2001-02-14 10:55	42.84	2001-02-20 14:50	463.54	420.7	7.79E-10	
Upper 28	8	2.533	-4.1125	2001-02-14 10:55	41.43	2001-02-20 14:50	186.74	145.31	2.62E-10	
Upper 29	1	2.677	-1.4875	2001-02-14 11:00	41.21	2001-02-20 14:51	184.78	143.57	2.58E-10	
Upper 29	2	2.677	-1.8625	2001-02-14 11:00	43.5	2001-02-20 14:51	191.67	148.17	2.67E-10	
Upper 29	3	2.677	-2.2375	2001-02-14 11:00	41.18	2001-02-20 14:51	173.06	131.88	2.37E-10	
Upper 29	4	2.677	-2.6125	2001-02-14 11:00	41.15	2001-02-20 14:51	182.18	141.03	2.54E-10	
Upper 29	5	2.677	-2.9875	2001-02-14 11:00	41.31	2001-02-20 14:51	202.55	161.24	2.92E-10	
Upper 29	6	2.677	-3.3625	2001-02-14 11:00	41.63	2001-02-20 14:51	315.29	273.66	5.03E-10	
Upper 29	7	2.677	-3.7375	2001-02-14 11:00	37.74	2001-02-20 14:51	340.15	302.41	5.57E-10	
Upper 29	8	2.677	-4.1125	2001-02-14 11:00	40.84	2001-02-20 14:51	406.55	365.71	6.76E-10	
Upper 30	1	2.822	-1.4875	2001-02-14 11:05	39.33	2001-02-20 14:52	172.59	133.26	2.39E-10	
Upper 30	2	2.822	-1.8625	2001-02-14 11:05	40.3	2001-02-20 14:52	196.69	156.39	2.83E-10	
Upper 30	3	2.822	-2.2375	2001-02-14 11:05	47.61	2001-02-20 14:52	211.61	164	2.97E-10	
Upper 30	4	2.822	-2.6125	2001-02-14 11:05	41.27	2001-02-20 14:52	182.96	141.69	2.55E-10	
Upper 30	5	2.822	-2.9875	2001-02-14 11:05	38.43	2001-02-20 14:52	161.13	122.7	2.19E-10	
Upper 30	6	2.822	-3.3625	2001-02-14 11:05	40.56	2001-02-20 14:52	278.93	238.37	4.37E-10	
Upper 30	7	2.822	-3.7375	2001-02-14 11:05	43.11	2001-02-20 14:52	412.44	369.33	6.83E-10	
Upper 30	8	2.822	-4.1125	2001-02-14 11:05	39.9	2001-02-20 14:52	366.5	326.6	6.03E-10	
Upper 31	1	2.967	-1.4875	2001-02-14 11:10	40.72	2001-02-20 14:55	272.23	231.51	4.24E-10	
Upper 31	2	2.967	-1.8625	2001-02-14 11:10	39.19	2001-02-20 14:55	375.43	336.24	6.21E-10	
Upper 31	3	2.967	-2.2375	2001-02-14 11:10	42.53	2001-02-20 14:55	403.71	361.18	6.68E-10	

Plank	Diaper	O_length (m)	Depth (m)	Date_start	Weight_start (g)	Date_end	Weight_end (g)	Weight_diff (g)	Q_corrected (m^3/s)	Q_corrected (l/min)
Upper 31	4	2.967	-2.6125	2001-02-14 11:10	39.73	2001-02-20 14:55	319.51	279.78	5.15E-10	
Upper 31	5	2.967	-2.9875	2001-02-14 11:10	40.16	2001-02-20 14:55	338.55	298.39	5.50E-10	
Upper 31	6	2.967	-3.3625	2001-02-14 11:10	42.92	2001-02-20 14:55	349.27	306.35	5.65E-10	
Upper 31	7	2.967	-3.7375	2001-02-14 11:10	42.62	2001-02-20 14:55	356.33	313.71	5.79E-10	
Upper 31	8	2.967	-4.1125	2001-02-14 11:10	40.13	2001-02-20 14:55	309.45	269.32	4.95E-10	
Upper 32	1	3.112	-1.4875	2001-02-14 01:15	39.43	2001-02-20 14:56	382.83	343.4	5.94E-10	3.57E-05
Upper 32	2	3.112	-1.8625	2001-02-14 01:15	41.52	2001-02-20 14:56	259.19	217.67	3.73E-10	2.24E-05
Upper 32	3	3.112	-2.2375	2001-02-14 01:15	39.26	2001-02-20 14:56	71.04	31.78	4.54E-11	2.72E-06
Upper 32	4	3.112	-2.6125	2001-02-14 01:15	39.55	2001-02-20 14:56	82.17	42.62	6.45E-11	3.87E-06
Upper 32	5	3.112	-2.9875	2001-02-14 01:15	39.92	2001-02-20 14:56	69.5	29.58	4.15E-11	2.49E-06
Upper 32	6	3.112	-3.3625	2001-02-14 01:15	40.02	2001-02-20 14:56	62.64	22.62	2.93E-11	1.76E-06
Upper 32	7	3.112	-3.7375	2001-02-14 01:15	39.16	2001-02-20 14:56	60.29	21.13	2.67E-11	1.60E-06
Upper 32	8	3.112	-4.1125	2001-02-14 01:15	39.67	2001-02-20 14:56	57.75	18.08	2.13E-11	1.28E-06
Upper 33	1	3.256	-1.4875	2001-02-14 11:30	39.4	2001-02-20 15:00	322.85	283.45	5.23E-10	3.14E-05
Upper 33	2	3.256	-1.8625	2001-02-14 11:30	41.04	2001-02-20 15:00	413.01	371.97	6.89E-10	4.14E-05
Upper 33	3	3.256	-2.2375	2001-02-14 11:30	39.41	2001-02-20 15:00	318.52	279.11	5.14E-10	3.09E-05
Upper 33	4	3.256	-2.6125	2001-02-14 11:30	39.23	2001-02-20 15:00	136.20	96.97	1.71E-10	1.03E-05
Upper 33	5	3.256	-2.9875	2001-02-14 11:30	39.3	2001-02-20 15:00	53.84	14.54	1.61E-11	9.65E-07
Upper 33	6	3.256	-3.3625	2001-02-14 11:30	40.17	2001-02-20 15:00	54.58	14.41	1.58E-11	9.50E-07
Upper 33	7	3.256	-3.7375	2001-02-14 11:30	40.07	2001-02-20 15:00	55.79	15.72	1.83E-11	1.10E-06
Upper 33	8	3.256	-4.1125	2001-02-14 11:30	40.14	2001-02-20 15:00	54.72	14.58	1.62E-11	9.69E-07
Upper 34	1	3.401	-1.4875	2001-02-14 11:25	41.74	2001-02-20 15:03	148.85	107.11	1.90E-10	1.14E-05
Upper 34	2	3.401	-1.8625	2001-02-14 11:25	38.94	2001-02-20 15:03	56.57	17.63	2.19E-11	1.31E-06
Upper 34	3	3.401	-2.2375	2001-02-14 11:25	39.66	2001-02-20 15:03	54.56	14.9	1.67E-11	1.00E-06
Upper 34	4	3.401	-2.6125	2001-02-14 11:25	39.26	2001-02-20 15:03	52.04	12.78	1.28E-11	7.65E-07
Upper 34	5	3.401	-2.9875	2001-02-14 11:25	39.6	2001-02-20 15:03	51.86	12.26	1.18E-11	7.07E-07
Upper 34	6	3.401	-3.3625	2001-02-14 11:25	41.16	2001-02-20 15:03	55.56	14.4	1.58E-11	9.48E-07
Upper 34	7	3.401	-3.7375	2001-02-14 11:25	39.08	2001-02-20 15:03	52.19	13.11	1.34E-11	8.03E-07
Upper 34	8	3.401	-4.1125	2001-02-14 11:25	41.48	2001-02-20 15:03	55.25	13.77	1.46E-11	8.77E-07
Upper 35	1	3.546	-1.4875	2001-02-14 11:30	40.99	2001-02-20 15:04	279.05	238.06	4.37E-10	2.62E-05
Upper 35	2	3.546	-1.8625	2001-02-14 11:30	38.99	2001-02-20 15:04	103.21	64.22	1.10E-10	6.58E-06
Upper 35	3	3.546	-2.2375	2001-02-14 11:30	39.74	2001-02-20 15:04	51.61	11.87	1.10E-11	6.63E-07
Upper 35	4	3.546	-2.6125	2001-02-14 11:30	40.46	2001-02-20 15:04	52.79	12.33	1.19E-11	7.15E-07
Upper 35	5	3.546	-2.9875	2001-02-14 11:30	39.68	2001-02-20 15:04	50.89	11.21	9.81E-12	5.88E-07
Upper 35	6	3.546	-3.3625	2001-02-14 11:30	40.35	2001-02-20 15:04	53.33	12.98	1.31E-11	7.88E-07
Upper 35	7	3.546	-3.7375	2001-02-14 11:30	40.82	2001-02-20 15:04	53.73	12.91	1.30E-11	7.80E-07
Upper 35	8	3.546	-4.1125	2001-02-14 11:30	38.27	2001-02-20 15:04	50.23	11.96	1.12E-11	6.73E-07
Upper 36	1	3.691	-1.4875	2001-02-14 11:35	40.71	2001-02-20 15:06	296.42	255.71	4.70E-10	2.82E-05
Upper 36	2	3.691	-1.8625	2001-02-14 11:35	39.31	2001-02-20 15:06	185.64	146.33	2.64E-10	1.59E-05
Upper 36	3	3.691	-2.2375	2001-02-14 11:35	38.93	2001-02-20 15:06	52.27	13.34	1.38E-11	8.29E-07
Upper 36	4	3.691	-2.6125	2001-02-14 11:35	39.05	2001-02-20 15:06	51.14	12.09	1.15E-11	6.88E-07
Upper 36	5	3.691	-2.9875	2001-02-14 11:35	41.19	2001-02-20 15:06	51.62	10.43	8.34E-12	5.01E-07
Upper 36	6	3.691	-3.3625	2001-02-14 11:35	38.17	2001-02-20 15:06	48.77	10.6	8.66E-12	5.20E-07
Upper 36	7	3.691	-3.7375	2001-02-14 11:35	42.4	2001-02-20 15:06	53.18	10.78	9.00E-12	5.40E-07
Upper 36	8	3.691	-4.1125	2001-02-14 11:35	38.47	2001-02-20 15:06	49.11	10.64	8.74E-12	5.24E-07
Upper 37	1	3.835	-1.4875	2001-02-14 11:40	40.9	2001-02-20 15:08	124.89	83.99	1.47E-10	8.81E-06
Upper 37	2	3.835	-1.8625	2001-02-14 11:40	40.82	2001-02-20 15:08	53.3	12.48	1.22E-11	7.32E-07
Upper 37	3	3.835	-2.2375	2001-02-14 11:40	41.65	2001-02-20 15:08	53.93	12.28	1.18E-11	7.10E-07
Upper 37	4	3.835	-2.6125	2001-02-14 11:40	40.58	2001-02-20 15:08	51.25	10.67	8.80E-12	5.28E-07
Upper 37	5	3.835	-2.9875	2001-02-14 11:40	40.01	2001-02-20 15:08	50.69	10.68	8.82E-12	5.29E-07
Upper 37	6	3.835	-3.3625	2001-02-14 11:40	40.66	2001-02-20 15:08	50.56	9.9	7.35E-12	4.41E-07
Upper 37	7	3.835	-3.7375	2001-02-14 11:40	41.94	2001-02-20 15:08	51.84	9.9	7.35E-12	4.41E-07
Upper 37	8	3.835	-4.1125	2001-02-14 11:40	45.32	2001-02-20 15:08	56.01	10.69	8.83E-12	5.30E-07
Upper 38	1	3.980	-1.4875	2001-02-14 11:45	42.01	2001-02-20 15:10	84.51	42.5	6.88E-11	4.13E-06
Upper 38	2	3.980	-1.8625	2001-02-14 11:45	40.34	2001-02-20 15:10	58.19	17.85	2.23E-11	1.34E-06
Upper 38	3	3.980	-2.2375	2001-02-14 11:45	39.73	2001-02-20 15:10	52.4	12.67	1.26E-11	7.54E-07
Upper 38	4	3.980	-2.6125	2001-02-14 11:45	39.65	2001-02-20 15:10	50.66	11.01	9.44E-12	5.66E-07
Upper 38	5	3.980	-2.9875	2001-02-14 11:45	41.58	2001-02-20 15:10	51.8	10.22	7.95E-12	4.77E-07
Upper 38	6	3.980	-3.3625	2001-02-14 11:45	43.53	2001-02-20 15:10	54.29	10.76	8.97E-12	5.38E-07
Upper 38	7	3.980	-3.7375	2001-02-14 11:45	41.95	2001-02-20 15:10	52.56	10.61	8.69E-12	5.21E-07
Upper 38	8	3.980	-4.1125	2001-02-14 11:45	47.21	2001-02-20 15:10	58.1	10.89	9.21E-12	5.53E-07
Lower 01	1	4.125	-4.7875	2001-02-14 14:15	40.58	2001-02-21 08:00	49	8.42	4.16E-12	2.49E-07
Lower 01	2	4.125	-5.1625	2001-02-14 14:15	42.01	2001-02-21 08:00	49.63	7.62	2.78E-12	1.67E-07
Lower 01	3	4.125	-5.5375	2001-02-14 14:15	38.66	2001-02-21 08:00	46.4	7.74	2.99E-12	1.79E-07
Lower 01	4	4.125	-5.9125	2001-02-14 14:15	43.35	2001-02-21 08:00	51.29	7.94	3.33E-12	2.00E-07
Lower 01	5	4.125	-6.2875	2001-02-14 14:15	43.07	2001-02-21 08:00	51.81	8.74	4.71E-12	2.82E-07
Lower 01	6	4.125	-6.6625	2001-02-14 14:15	41	2001-02-21 08:00	50.16	9.16	5.43E-12	3.26E-07
Lower 01	7	4.125	-7.0375	2001-02-14 14:15	39.12	2001-02-21 08:00	48.66	9.54	6.08E-12	3.65E-07
Lower 01	8	4.125	-7.4125	2001-02-14 14:15	40.83	2001-02-21 08:00	52.8	11.97	1.03E-11	6.15E-07
Lower 02	1	4.270	-4.7875	2001-02-14 14:20	41.43	2001-02-21 08:02	52.03	10.6	7.90E-12	4.74E-07
Lower 02	2	4.270	-5.1625	2001-02-14 14:20	39.97	2001-02-21 08:02	48.84	8.87	4.93E-12	2.96E-07
Lower 02	3	4.270	-5.5375	2001-02-14 14:20	38.98	2001-02-21 08:02	48.7	9.72	6.39E-12	3.83E-07
Lower 02	4	4.270	-5.9125	2001-02-14 14:20	44.33	2001-02-21 08:02	54.6	10.27	7.34E-12	4.40E-07
Lower 02	5	4.270	-6.2875	2001-02-14 14:20	40.53	2001-02-21 08:02	50.77	10.24	7.28E-12	4.37E-07
Lower 02	6	4.270	-6.6625	2001-02-14 14:20	42.51	2001-02-21 08:02	53.50	10.99	8.57E-12	5.14E-07
Lower 02	7	4.270	-7.0375	2001-02-14 14:20	40.66	2001-02-21 08:02	51.64	10.98	8.55E-12	5.13E-07
Lower 02	8	4.270	-7.4125	2001-02-14 14:20	42.8	2001-02-21 08:02	56.8	14	1.37E-11	8.25E-07
Lower 03	1	4.414	-4.7875	2001-02-14 14:25	42.48	2001-02-21 08:05	53.31	10.83	8.30E-12	4.98E-07
Lower 03	2	4.414	-5.1625	2001-02-14 14:25	41.58	2001-02-21 08:05	50.21	8.63	4.52E-12	2.71E-07
Lower 03	3	4.414	-5.5375	2001-02-14 14:25	43.95	2001-02-21 08:05	53.71	9.76	6.46E-12	3.88E-07
Lower 03	4	4.414	-5.9125	2001-02-14 14:25	39.25	2001-02-21 08:05	47.86	8.61	4.48E-12	2.69E-07

Plank	Diaper	O_length (m)	Depth (m)	Date_start	Weight_start (g)	Date_end	Weight_end (g)	Weight_diff (g)	Q_corrected (m^3/s)	Q_corrected (l/min)
Lower 03	5	4.414	-6.2875	2001-02-14 14:25	37.8	2001-02-21 08:05	47.19	9.39	5.82E-12	3.49E-07
Lower 03	6	4.414	-6.6625	2001-02-14 14:25	41.87	2001-02-21 08:05	53.15	11.28	9.07E-12	5.44E-07
Lower 03	7	4.414	-7.0375	2001-02-14 14:25	43.43	2001-02-21 08:05	55.12	11.69	9.78E-12	5.87E-07
Lower 03	8	4.414	-7.4125	2001-02-14 14:25	41.23	2001-02-21 08:05	54.19	12.96	1.20E-11	7.18E-07
Lower 04	1	4.559	-4.7875	2001-02-14 14:30	42.78	2001-02-21 08:07	66.63	23.85	3.07E-11	1.84E-06
Lower 04	2	4.559	-5.1625	2001-02-14 14:30	43.61	2001-02-21 08:07	53.02	9.41	5.86E-12	3.52E-07
Lower 04	3	4.559	-5.5375	2001-02-14 14:30	40.9	2001-02-21 08:07	49.9	9	5.16E-12	3.09E-07
Lower 04	4	4.559	-5.9125	2001-02-14 14:30	41.67	2001-02-21 08:07	50.36	8.69	4.62E-12	2.77E-07
Lower 04	5	4.559	-6.2875	2001-02-14 14:30	41.57	2001-02-21 08:07	49.93	8.36	4.06E-12	2.43E-07
Lower 04	6	4.559	-6.6625	2001-02-14 14:30	41.58	2001-02-21 08:07	50.11	8.53	4.35E-12	2.61E-07
Lower 04	7	4.559	-7.0375	2001-02-14 14:30	40.84	2001-02-21 08:07	49.85	9.01	5.17E-12	3.10E-07
Lower 04	8	4.559	-7.4125	2001-02-14 14:30	40.11	2001-02-21 08:07	52.27	12.16	1.06E-11	6.35E-07
Lower 05	1	4.704	-4.7875	2001-02-14 14:35	39.33	2001-02-21 08:10	49.1	9.77	6.48E-12	3.89E-07
Lower 05	2	4.704	-5.1625	2001-02-14 14:35	41.38	2001-02-21 08:10	47.65	6.27	4.64E-13	2.78E-08
Lower 05	3	4.704	-5.5375	2001-02-14 14:35	43.76	2001-02-21 08:10	49.03	5.27	-1.25E-12	-7.53E-08
Lower 05	4	4.704	-5.9125	2001-02-14 14:35	43.38	2001-02-21 08:10	49.84	6.46	7.91E-13	4.74E-08
Lower 05	5	4.704	-6.2875	2001-02-14 14:35	40.93	2001-02-21 08:10	48.95	8.02	3.47E-12	2.08E-07
Lower 05	6	4.704	-6.6625	2001-02-14 14:35	42.47	2001-02-21 08:10	48.93	6.46	7.91E-13	4.74E-08
Lower 05	7	4.704	-7.0375	2001-02-14 14:35	40.52	2001-02-21 08:10	51.14	10.62	7.94E-12	4.77E-07
Lower 05	8	4.704	-7.4125	2001-02-14 14:35	41.04	2001-02-21 08:10	56.48	15.44	1.62E-11	9.74E-07
Lower 06	1	4.849	-4.7875	2001-02-14 14:40	40.35	2001-02-21 08:13	47.78	7.43	2.46E-12	1.48E-07
Lower 06	2	4.849	-5.1625	2001-02-14 14:40	40.2	2001-02-21 08:13	49.35	9.15	5.42E-12	3.25E-07
Lower 06	3	4.849	-5.5375	2001-02-14 14:40	41.16	2001-02-21 08:13	52.4	11.24	9.01E-12	5.41E-07
Lower 06	4	4.849	-5.9125	2001-02-14 14:40	41.87	2001-02-21 08:13	51.47	9.6	6.19E-12	3.71E-07
Lower 06	5	4.849	-6.2875	2001-02-14 14:40	40.19	2001-02-21 08:13	49.63	9.44	5.91E-12	3.55E-07
Lower 06	6	4.849	-6.6625	2001-02-14 14:40	40.45	2001-02-21 08:13	51.06	10.61	7.93E-12	4.76E-07
Lower 06	7	4.849	-7.0375	2001-02-14 14:40	42.07	2001-02-21 08:13	49.66	7.59	2.73E-12	1.64E-07
Lower 06	8	4.849	-7.4125	2001-02-14 14:40	41.9	2001-02-21 08:13	52.11	10.21	7.24E-12	4.34E-07
Lower 07	1	4.993	-4.7875	2001-02-14 14:45	42.84	2001-02-21 08:22	53.29	10.45	7.65E-12	4.59E-07
Lower 07	2	4.993	-5.1625	2001-02-14 14:45	4.085	2001-02-21 08:22	48.6	44.515	6.62E-11	3.97E-06
Lower 07	3	4.993	-5.5375	2001-02-14 14:45	42.28	2001-02-21 08:22	51.38	9.1	5.33E-12	3.20E-07
Lower 07	4	4.993	-5.9125	2001-02-14 14:45	40.93	2001-02-21 08:22	48.62	7.69	2.90E-12	1.74E-07
Lower 07	5	4.993	-6.2875	2001-02-14 14:45	41.01	2001-02-21 08:22	49.71	8.7	4.64E-12	2.78E-07
Lower 07	6	4.993	-6.6625	2001-02-14 14:45	47.29	2001-02-21 08:22	57.51	10.22	7.25E-12	4.35E-07
Lower 07	7	4.993	-7.0375	2001-02-14 14:45	44.09	2001-02-21 08:22	53.54	9.45	5.93E-12	3.56E-07
Lower 07	8	4.993	-7.4125	2001-02-14 14:45	41.27	2001-02-21 08:22	53.08	11.81	9.99E-12	5.99E-07
Lower 08	1	5.138	-4.7875	2001-02-14 14:50	41.54	2001-02-21 08:25	54.41	12.87	1.18E-11	7.09E-07
Lower 08	2	5.138	-5.1625	2001-02-14 14:50	43.61	2001-02-21 08:25	51.96	8.35	4.04E-12	2.42E-07
Lower 08	3	5.138	-5.5375	2001-02-14 14:50	40.83	2001-02-21 08:25	49.33	8.5	4.30E-12	2.58E-07
Lower 08	4	5.138	-5.9125	2001-02-14 14:50	40.33	2001-02-21 08:25	48.86	8.53	4.35E-12	2.61E-07
Lower 08	5	5.138	-6.2875	2001-02-14 14:50	38.95	2001-02-21 08:25	47.93	8.98	5.12E-12	3.07E-07
Lower 08	6	5.138	-6.6625	2001-02-14 14:50	42.06	2001-02-21 08:25	51.74	9.68	6.33E-12	3.80E-07
Lower 08	7	5.138	-7.0375	2001-02-14 14:50	42.76	2001-02-21 08:25	52.49	9.73	6.41E-12	3.85E-07
Lower 08	8	5.138	-7.4125	2001-02-14 14:50	41.85	2001-02-21 08:25	53.83	11.98	1.03E-11	6.17E-07
Lower 09	1	5.283	-4.7875	2001-02-14 14:55	41.13	2001-02-21 08:26	51.68	10.55	7.83E-12	4.70E-07
Lower 09	2	5.283	-5.1625	2001-02-14 14:55	42.01	2001-02-21 08:26	53.09	11.08	8.74E-12	5.24E-07
Lower 09	3	5.283	-5.5375	2001-02-14 14:55	42.58	2001-02-21 08:26	51.79	9.21	5.52E-12	3.31E-07
Lower 09	4	5.283	-5.9125	2001-02-14 14:55	41.11	2001-02-21 08:26	49.14	8.03	3.49E-12	2.09E-07
Lower 09	5	5.283	-6.2875	2001-02-14 14:55	42.9	2001-02-21 08:26	51.44	8.54	4.37E-12	2.62E-07
Lower 09	6	5.283	-6.6625	2001-02-14 14:55	42.25	2001-02-21 08:26	51.2	8.95	5.07E-12	3.04E-07
Lower 09	7	5.283	-7.0375	2001-02-14 14:55	43.72	2001-02-21 08:26	51.8	8.08	3.58E-12	2.15E-07
Lower 09	8	5.283	-7.4125	2001-02-14 14:55	41.31	2001-02-21 08:26	51.22	9.91	6.72E-12	4.03E-07
Lower 10	1	5.428	-4.7875	2001-02-14 15:00	42.66	2001-02-21 08:29	54.89	12.23	1.07E-11	6.43E-07
Lower 10	2	5.428	-5.1625	2001-02-14 15:00	41.42	2001-02-21 08:29	51.03	9.61	6.21E-12	3.73E-07
Lower 10	3	5.428	-5.5375	2001-02-14 15:00	41.59	2001-02-21 08:29	50.64	9.05	5.25E-12	3.15E-07
Lower 10	4	5.428	-5.9125	2001-02-14 15:00	40.55	2001-02-21 08:29	47.73	7.18	2.03E-12	1.22E-07
Lower 10	5	5.428	-6.2875	2001-02-14 15:00	42.1	2001-02-21 08:29	50.22	8.12	3.65E-12	2.19E-07
Lower 10	6	5.428	-6.6625	2001-02-14 15:00	40.89	2001-02-21 08:29	48.09	7.2	2.06E-12	1.24E-07
Lower 10	7	5.428	-7.0375	2001-02-14 15:00	40.71	2001-02-21 08:29	48.58	7.87	3.22E-12	1.93E-07
Lower 10	8	5.428	-7.4125	2001-02-14 15:00	41.88	2001-02-21 08:29	50.18	8.3	3.96E-12	2.37E-07
Lower 11	1	0.072	-4.7875	2001-02-15 10:05	42.74	2001-02-21 08:31	50.55	7.81	3.53E-12	2.12E-07
Lower 11	2	0.072	-5.1625	2001-02-15 10:05	42.71	2001-02-21 08:31	49.95	7.24	2.42E-12	1.45E-07
Lower 11	3	0.072	-5.5375	2001-02-15 10:05	39.37	2001-02-21 08:31	46.11	6.74	1.44E-12	8.66E-08
Lower 11	4	0.072	-5.9125	2001-02-15 10:05	40.59	2001-02-21 08:31	46.36	5.77	-4.49E-13	-2.69E-08
Lower 11	5	0.072	-6.2875	2001-02-15 10:05	42.22	2001-02-21 08:31	48.19	5.97	-5.85E-14	-3.51E-09
Lower 11	6	0.072	-6.6625	2001-02-15 10:05	43.29	2001-02-21 08:31	49.72	6.43	8.39E-13	5.03E-08
Lower 11	7	0.072	-7.0375	2001-02-15 10:05	40.93	2001-02-21 08:31	47.21	6.28	5.46E-13	3.28E-08
Lower 11	8	0.072	-7.4125	2001-02-15 10:05	41.19	2001-02-21 08:31	48.94	7.75	3.41E-12	2.05E-07
Lower 12	1	0.217	-4.7875	2001-02-15 10:10	42.86	2001-02-21 08:35	49.78	6.92	1.79E-12	1.08E-07
Lower 12	2	0.217	-5.1625	2001-02-15 10:10	44.04	2001-02-21 08:35	50.75	6.71	1.38E-12	8.31E-08
Lower 12	3	0.217	-5.5375	2001-02-15 10:10	39.35	2001-02-21 08:35	45.31	5.96	-7.80E-14	-4.68E-09
Lower 12	4	0.217	-5.9125	2001-02-15 10:10	41.67	2001-02-21 08:35	46.86	5.19	-1.58E-12	-9.48E-08
Lower 12	5	0.217	-6.2875	2001-02-15 10:10	42.18	2001-02-21 08:35	47.62	5.44	-1.09E-12	-6.55E-08
Lower 12	6	0.217	-6.6625	2001-02-15 10:10	41.42	2001-02-21 08:35	47.54	6.12	2.34E-13	1.40E-08
Lower 12	7	0.217	-7.0375	2001-02-15 10:10	41.15	2001-02-21 08:35	47	5.85	-2.93E-13	-1.76E-08
Lower 12	8	0.217	-7.4125	2001-02-15 10:10	39.97	2001-02-21 08:35	47.1	7.13	2.20E-12	1.32E-07
Lower 13	1	0.361	-4.7875	2001-02-15 10:15	38.83	2001-02-21 10:17	44.77	5.94	-1.16E-13	-6.94E-09
Lower 13	2	0.361	-5.1625	2001-02-15 10:15	42.35	2001-02-21 10:17	48.13	5.78	-4.24E-13	-2.55E-08
Lower 13	3	0.361	-5.5375	2001-02-15 10:15	42.53	2001-02-21 10:17	48.56	6.03	5.79E-14	3.47E-09
Lower 13	4	0.361	-5.9125	2001-02-15 10:15	42.65	2001-02-21 10:17	48.01	5.36	-1.23E-12	-7.41E-08
Lower 13	5	0.361	-6.2875	2001-02-15 10:15	40.85	2001-02-21 10:17	46.63	5.78	-4.24E-13	-2.55E-08

Plank	Diaper	O_length (m)	Depth (m)	Date_start	Weight_start (g)	Date_end	Weight_end (g)	Weight_diff (g)	Q_corrected (m^3/s)	Q_corrected (l/min)
Lower 13	6	0.361	-6.6625	2001-02-15 10:15	42.12	2001-02-21 10:17	48.43	6.31	5.98E-13	3.59E-08
Lower 13	7	0.361	-7.0375	2001-02-15 10:15	41.15	2001-02-21 10:17	47.73	6.58	1.12E-12	6.71E-08
Lower 13	8	0.361	-7.4125	2001-02-15 10:15	40.88	2001-02-21 10:17	49.16	8.28	4.40E-12	2.64E-07
Lower 14	1	0.506	-4.7875	2001-02-15 10:20	40.44	2001-02-21 10:20	46.67	6.23	4.44E-13	2.66E-08
Lower 14	2	0.506	-5.1625	2001-02-15 10:20	38.91	2001-02-21 10:20	44.1	5.19	-1.56E-12	-9.37E-08
Lower 14	3	0.506	-5.5375	2001-02-15 10:20	39.40	2001-02-21 10:20	45.13	5.73	-5.21E-13	-3.12E-08
Lower 14	4	0.506	-5.9125	2001-02-15 10:20	40.52	2001-02-21 10:20	45.84	5.32	-1.31E-12	-7.87E-08
Lower 14	5	0.506	-6.2875	2001-02-15 10:20	40.72	2001-02-21 10:20	46.93	6.21	4.05E-13	2.43E-08
Lower 14	6	0.506	-6.6625	2001-02-15 10:20	39.95	2001-02-21 10:20	46.25	6.3	5.79E-13	3.47E-08
Lower 14	7	0.506	-7.0375	2001-02-15 10:20	41.16	2001-02-21 10:20	47.66	6.5	9.65E-13	5.79E-08
Lower 14	8	0.506	-7.4125	2001-02-15 10:20	40.24	2001-02-21 10:20	47.61	7.37	2.64E-12	1.59E-07
Lower 15	1	0.651	-4.7875	2001-02-15 10:25	40.66	2001-02-21 10:22	47.73	7.07	2.06E-12	1.24E-07
Lower 15	2	0.651	-5.1625	2001-02-15 10:25	41.10	2001-02-21 10:22	46.66	5.56	-8.49E-13	-5.09E-08
Lower 15	3	0.651	-5.5375	2001-02-15 10:25	41.10	2001-02-21 10:22	47.29	6.19	3.67E-13	2.20E-08
Lower 15	4	0.651	-5.9125	2001-02-15 10:25	40.30	2001-02-21 10:22	45.48	5.18	-1.58E-12	-9.49E-08
Lower 15	5	0.651	-6.2875	2001-02-15 10:25	38.81	2001-02-21 10:22	43.88	5.07	-1.79E-12	-1.08E-07
Lower 15	6	0.651	-6.6625	2001-02-15 10:25	41.00	2001-02-21 10:22	47.68	6.68	1.31E-12	7.87E-08
Lower 15	7	0.651	-7.0375	2001-02-15 10:25	39.55	2001-02-21 10:22	46.06	6.51	9.84E-13	5.90E-08
Lower 15	8	0.651	-7.4125	2001-02-15 10:25	38.09	2001-02-21 10:22	45.43	7.34	2.59E-12	1.55E-07
Lower 16	1	0.796	-4.7875	2001-02-15 10:30	39.18	2001-02-21 10:25	46.05	6.87	1.68E-12	1.01E-07
Lower 16	2	0.796	-5.1625	2001-02-15 10:30	40.39	2001-02-21 10:25	46.67	6.28	5.40E-13	3.24E-08
Lower 16	3	0.796	-5.5375	2001-02-15 10:30	44.60	2001-02-21 10:25	51.8	7.2	2.32E-12	1.39E-07
Lower 16	4	0.796	-5.9125	2001-02-15 10:30	44.06	2001-02-21 10:25	49.75	5.69	-5.98E-13	-3.59E-08
Lower 16	5	0.796	-6.2875	2001-02-15 10:30	40.87	2001-02-21 10:25	46.46	5.59	-7.91E-13	-4.75E-08
Lower 16	6	0.796	-6.6625	2001-02-15 10:30	41.50	2001-02-21 10:25	45.89	4.39	-3.11E-12	-1.86E-07
Lower 16	7	0.796	-7.0375	2001-02-15 10:30	41.11	2001-02-21 10:25	47.25	6.14	2.70E-13	1.62E-08
Lower 16	8	0.796	-7.4125	2001-02-15 10:30	41.34	2001-02-21 10:25	48.75	7.41	2.72E-12	1.63E-07
Lower 17	1	0.940	-4.7875	2001-02-15 10:35	39.04	2001-02-21 10:30	46.55	7.51	2.91E-12	1.75E-07
Lower 17	2	0.940	-5.1625	2001-02-15 10:35	40.57	2001-02-21 10:30	47.76	7.19	2.30E-12	1.38E-07
Lower 17	3	0.940	-5.5375	2001-02-15 10:35	41.71	2001-02-21 10:30	47.93	6.22	4.25E-13	2.55E-08
Lower 17	4	0.940	-5.9125	2001-02-15 10:35	40.22	2001-02-21 10:30	45.72	5.5	-9.65E-13	-5.79E-08
Lower 17	5	0.940	-6.2875	2001-02-15 10:35	40.72	2001-02-21 10:30	46.64	5.92	-1.54E-13	-9.26E-09
Lower 17	6	0.940	-6.6625	2001-02-15 10:35	40.36	2001-02-21 10:30	46.62	6.26	5.02E-13	3.01E-08
Lower 17	7	0.940	-7.0375	2001-02-15 10:35	40.21	2001-02-21 10:30	46.3	6.09	1.74E-13	1.04E-08
Lower 17	8	0.940	-7.4125	2001-02-15 10:35	41.21	2001-02-21 10:30	49.88	8.67	5.15E-12	3.09E-07
Lower 18	1	1.085	-4.7875	2001-02-15 10:40	41.17	2001-02-21 10:32	51	9.83	7.39E-12	4.44E-07
Lower 18	2	1.085	-5.1625	2001-02-15 10:40	39.62	2001-02-21 10:32	47.46	7.84	3.55E-12	2.13E-07
Lower 18	3	1.085	-5.5375	2001-02-15 10:40	40.95	2001-02-21 10:32	47.44	6.49	9.46E-13	5.68E-08
Lower 18	4	1.085	-5.9125	2001-02-15 10:40	38.70	2001-02-21 10:32	44.73	6.03	5.79E-14	3.48E-09
Lower 18	5	1.085	-6.2875	2001-02-15 10:40	40.87	2001-02-21 10:32	47.07	6.2	3.86E-13	2.32E-08
Lower 18	6	1.085	-6.6625	2001-02-15 10:40	40.62	2001-02-21 10:32	47.68	7.06	2.05E-12	1.23E-07
Lower 18	7	1.085	-7.0375	2001-02-15 10:40	38.88	2001-02-21 10:32	45.33	6.45	8.69E-13	5.21E-08
Lower 18	8	1.085	-7.4125	2001-02-15 10:40	41.21	2001-02-21 10:32	49.2	7.99	3.84E-12	2.31E-07
Lower 19	1	1.230	-4.7875	2001-02-15 10:45	42.60	2001-02-21 11:55	51.93	9.33	6.37E-12	3.82E-07
Lower 19	2	1.230	-5.1625	2001-02-15 10:45	41.73	2001-02-21 11:55	50.88	9.15	6.03E-12	3.62E-07
Lower 19	3	1.230	-5.5375	2001-02-15 10:45	38.74	2001-02-21 11:55	47.04	8.3	4.40E-12	2.64E-07
Lower 19	4	1.230	-5.9125	2001-02-15 10:45	41.60	2001-02-21 11:55	49.43	7.83	3.50E-12	2.10E-07
Lower 19	5	1.230	-6.2875	2001-02-15 10:45	38.83	2001-02-21 11:55	47.15	8.32	4.44E-12	2.66E-07
Lower 19	6	1.230	-6.6625	2001-02-15 10:45	41.10	2001-02-21 11:55	51.81	10.71	9.01E-12	5.41E-07
Lower 19	7	1.230	-7.0375	2001-02-15 10:45	40.14	2001-02-21 11:55	49.04	8.9	5.55E-12	3.33E-07
Lower 19	8	1.230	-7.4125	2001-02-15 10:45	41.04	2001-02-21 11:55	52.25	11.21	9.97E-12	5.98E-07
Lower 20	1	1.375	-4.7875	2001-02-15 10:50	41.07	2001-02-21 11:58	47.54	6.47	9.00E-13	5.40E-08
Lower 20	2	1.375	-5.1625	2001-02-15 10:50	42.00	2001-02-21 11:58	50.71	8.71	5.19E-12	3.11E-07
Lower 20	3	1.375	-5.5375	2001-02-15 10:50	38.29	2001-02-21 11:58	45.07	6.78	1.49E-12	8.96E-08
Lower 20	4	1.375	-5.9125	2001-02-15 10:50	41.05	2001-02-21 11:58	47.97	6.92	1.76E-12	1.06E-07
Lower 20	5	1.375	-6.2875	2001-02-15 10:50	42.01	2001-02-21 11:58	49.03	7.02	1.95E-12	1.17E-07
Lower 20	6	1.375	-6.6625	2001-02-15 10:50	42.26	2001-02-21 11:58	50.05	7.79	3.43E-12	2.06E-07
Lower 20	7	1.375	-7.0375	2001-02-15 10:50	40.35	2001-02-21 11:58	47.97	7.62	3.10E-12	1.86E-07
Lower 20	8	1.375	-7.4125	2001-02-15 10:50	42.95	2001-02-21 11:58	51.88	8.93	5.61E-12	3.36E-07
Lower 21	1	1.519	-4.7875	2001-02-15 10:55	39.31	2001-02-21 11:01	45.93	6.62	1.20E-12	7.17E-08
Lower 21	2	1.519	-5.1625	2001-02-15 10:55	42.22	2001-02-21 11:01	54	11.78	1.11E-11	6.69E-07
Lower 21	3	1.519	-5.5375	2001-02-15 10:55	40.77	2001-02-21 11:01	47.53	6.76	1.47E-12	8.79E-08
Lower 21	4	1.519	-5.9125	2001-02-15 10:55	40.10	2001-02-21 11:01	46.62	6.52	1.00E-12	6.01E-08
Lower 21	5	1.519	-6.2875	2001-02-15 10:55	40.00	2001-02-21 11:01	46.28	6.28	5.40E-13	3.24E-08
Lower 21	6	1.519	-6.6625	2001-02-15 10:55	41.10	2001-02-21 11:01	47.91	6.81	1.56E-12	9.37E-08
Lower 21	7	1.519	-7.0375	2001-02-15 10:55	41.94	2001-02-21 11:01	48.59	6.65	1.25E-12	7.52E-08
Lower 21	8	1.519	-7.4125	2001-02-15 10:55	42.60	2001-02-21 11:01	51.37	8.77	5.34E-12	3.20E-07
Lower 22	1	1.664	-4.7875	2001-02-15 11:00	39.86	2001-02-21 11:04	52.47	12.61	1.27E-11	7.65E-07
Lower 22	2	1.664	-5.1625	2001-02-15 11:00	42.05	2001-02-21 11:04	54.78	12.73	1.30E-11	7.79E-07
Lower 22	3	1.664	-5.5375	2001-02-15 11:00	42.05	2001-02-21 11:04	48.61	6.56	1.08E-12	6.48E-08
Lower 22	4	1.664	-5.9125	2001-02-15 11:00	40.62	2001-02-21 11:04	47.3	6.68	1.31E-12	7.87E-08
Lower 22	5	1.664	-6.2875	2001-02-15 11:00	41.85	2001-02-21 11:04	48.74	6.89	1.72E-12	1.03E-07
Lower 22	6	1.664	-6.6625	2001-02-15 11:00	40.25	2001-02-21 11:04	47.33	7.08	2.08E-12	1.25E-07
Lower 22	7	1.664	-7.0375	2001-02-15 11:00	42.40	2001-02-21 11:04	49.99	7.59	3.07E-12	1.84E-07
Lower 22	8	1.664	-7.4125	2001-02-15 11:00	40.68	2001-02-21 11:04	49.42	8.74	5.28E-12	3.17E-07
Lower 23	1	1.809	-4.7875	2001-02-15 11:05	39.04	2001-02-21 11:06	57.27	18.23	2.36E-11	1.42E-06
Lower 23	2	1.809	-5.1625	2001-02-15 11:05	43.24	2001-02-21 11:06	51.32	8.08	4.01E-12	2.41E-07
Lower 23	3	1.809	-5.5375	2001-02-15 11:05	41.22	2001-02-21 11:06	48.42	7.2	2.31E-12	1.39E-07
Lower 23	4	1.809	-5.9125	2001-02-15 11:05	40.97	2001-02-21 11:06	48.17	7.2	2.31E-12	1.39E-07
Lower 23	5	1.809	-6.2875	2001-02-15 11:05	40.95	2001-02-21 11:06	47.85	6.9	1.74E-12	1.04E-07
Lower 23	6	1.809	-6.6625	2001-02-15 11:05	40.77	2001-02-21 11:06	48.28	7.51	2.91E-12	1.75E-07

Plank	Diaper	O_length (m)	Depth (m)	Date_start	Weight_start (g)	Date_end	Weight_end (g)	Weight_diff (g)	Q_corrected (m^3/s)	Q_corrected (l/min)
Lower 23	7	1.809	-7.0375	2001-02-15 11:05	40.85	2001-02-21 11:06	48.76	7.91	3.68E-12	2.21E-07
Lower 23	8	1.809	-7.4125	2001-02-15 11:05	39.33	2001-02-21 11:06	48.46	9.13	6.04E-12	3.62E-07
Lower 24	1	1.954	-4.7875	2001-02-15 11:10	39.90	2001-02-21 11:09	48.37	8.47	4.77E-12	2.86E-07
Lower 24	2	1.954	-5.1625	2001-02-15 11:10	42.48	2001-02-21 11:09	48.82	6.34	6.56E-13	3.94E-08
Lower 24	3	1.954	-5.5375	2001-02-15 11:10	41.87	2001-02-21 11:09	48.61	6.74	1.43E-12	8.57E-08
Lower 24	4	1.954	-5.9125	2001-02-15 11:10	41.75	2001-02-21 11:09	48.84	7.09	2.10E-12	1.26E-07
Lower 24	5	1.954	-6.2875	2001-02-15 11:10	38.98	2001-02-21 11:09	45.41	6.43	8.30E-13	4.98E-08
Lower 24	6	1.954	-6.6625	2001-02-15 11:10	40.84	2001-02-21 11:09	48.03	7.19	2.30E-12	1.38E-07
Lower 24	7	1.954	-7.0375	2001-02-15 11:10	40.88	2001-02-21 11:09	47.91	7.03	1.99E-12	1.19E-07
Lower 24	8	1.954	-7.4125	2001-02-15 11:10	41.83	2001-02-21 11:09	52.21	10.38	8.45E-12	5.07E-07
Lower 25	1	2.098	-4.7875	2001-02-15 14:25	39.75	2001-02-21 11:25	51.55	11.8	1.14E-11	6.86E-07
Lower 25	2	2.098	-5.1625	2001-02-15 14:25	39.53	2001-02-21 11:25	45.14	5.61	-7.68E-13	-4.61E-08
Lower 25	3	2.098	-5.5375	2001-02-15 14:25	40.62	2001-02-21 11:25	46.45	5.83	-3.35E-13	-2.01E-08
Lower 25	4	2.098	-5.9125	2001-02-15 14:25	40.67	2001-02-21 11:25	47.07	6.4	7.88E-13	4.73E-08
Lower 25	5	2.098	-6.2875	2001-02-15 14:25	43.40	2001-02-21 11:25	50.24	6.84	1.65E-12	9.93E-08
Lower 25	6	2.098	-6.6625	2001-02-15 14:25	38.70	2001-02-21 11:25	45.71	7.01	1.99E-12	1.19E-07
Lower 25	7	2.098	-7.0375	2001-02-15 14:25	39.03	2001-02-21 11:25	45.87	6.84	1.65E-12	9.93E-08
Lower 25	8	2.098	-7.4125	2001-02-15 14:25	37.86	2001-02-21 11:25	47.66	9.8	7.49E-12	4.49E-07
Lower 26	1	2.243	-4.7875	2001-02-15 14:30	38.54	2001-02-21 11:27	130.68	92.14	1.70E-10	1.02E-05
Lower 26	2	2.243	-5.1625	2001-02-15 14:30	40.43	2001-02-21 11:27	59.29	18.86	2.53E-11	1.52E-06
Lower 26	3	2.243	-5.5375	2001-02-15 14:30	40.72	2001-02-21 11:27	47.77	7.05	2.07E-12	1.24E-07
Lower 26	4	2.243	-5.9125	2001-02-15 14:30	40.70	2001-02-21 11:27	47.59	6.89	1.75E-12	1.05E-07
Lower 26	5	2.243	-6.2875	2001-02-15 14:30	39.20	2001-02-21 11:27	46.9	7.7	3.35E-12	2.01E-07
Lower 26	6	2.243	-6.6625	2001-02-15 14:30	42.10	2001-02-21 11:27	50.36	8.26	4.45E-12	2.67E-07
Lower 26	7	2.243	-7.0375	2001-02-15 14:30	38.90	2001-02-21 11:27	47.75	8.85	5.62E-12	3.37E-07
Lower 26	8	2.243	-7.4125	2001-02-15 14:30	39.15	2001-02-21 11:27	52.22	13.07	1.39E-11	8.36E-07
Lower 27	1	2.388	-4.7875	2001-02-15 14:35	39.79	2001-02-21 11:30	360.07	320.28	6.20E-10	
Lower 27	2	2.388	-5.1625	2001-02-15 14:35	38.38	2001-02-21 11:30	409.65	371.27	7.20E-10	
Lower 27	3	2.388	-5.5375	2001-02-15 14:35	41.80	2001-02-21 11:30	355.4	313.6	6.06E-10	
Lower 27	4	2.388	-5.9125	2001-02-15 14:35	38.64	2001-02-21 11:30	76.53	37.89	6.29E-11	
Lower 27	5	2.388	-6.2875	2001-02-15 14:35	40.95	2001-02-21 11:30	81.8	40.85	6.87E-11	
Lower 27	6	2.388	-6.6625	2001-02-15 14:35	42.63	2001-02-21 11:30	56.09	13.46	1.47E-11	
Lower 27	7	2.388	-7.0375	2001-02-15 14:35	43.14	2001-02-21 11:30	62.42	19.28	2.62E-11	
Lower 27	8	2.388	-7.4125	2001-02-15 14:35	39.08	2001-02-21 11:30	143.49	104.41	1.94E-10	
Lower 28	1	2.533	-4.7875	2001-02-15 14:40	42.70	2001-02-21 11:33	324.14	281.44	5.43E-10	
Lower 28	2	2.533	-5.1625	2001-02-15 14:40	40.97	2001-02-21 11:33	406.31	365.34	7.09E-10	
Lower 28	3	2.533	-5.5375	2001-02-15 14:40	38.11	2001-02-21 11:33	405.23	367.12	7.12E-10	
Lower 28	4	2.533	-5.9125	2001-02-15 14:40	40.97	2001-02-21 11:33	479.78	438.81	8.53E-10	
Lower 28	5	2.533	-6.2875	2001-02-15 14:40	38.46	2001-02-21 11:33	391.97	353.51	6.85E-10	
Lower 28	6	2.533	-6.6625	2001-02-15 14:40	39.79	2001-02-21 11:33	380.91	341.12	6.61E-10	
Lower 28	7	2.533	-7.0375	2001-02-15 14:40	41.16	2001-02-21 11:33	224.96	183.8	3.51E-10	
Lower 28	8	2.533	-7.4125	2001-02-15 14:40	41.36	2001-02-21 11:33	266.39	225.03	4.32E-10	
Lower 29	1	2.677	-4.7875	2001-02-15 14:45	43.61	2001-02-21 11:35	206.63	163.02	3.10E-10	
Lower 29	2	2.677	-5.1625	2001-02-15 14:45	39.79	2001-02-21 11:35	213.29	173.5	3.30E-10	
Lower 29	3	2.677	-5.5375	2001-02-15 14:45	42.33	2001-02-21 11:35	322.65	280.32	5.41E-10	
Lower 29	4	2.677	-5.9125	2001-02-15 14:45	40.64	2001-02-21 11:35	417.02	376.38	7.31E-10	
Lower 29	5	2.677	-6.2875	2001-02-15 14:45	40.35	2001-02-21 11:35	391.73	351.38	6.81E-10	
Lower 29	6	2.677	-6.6625	2001-02-15 14:45	41.97	2001-02-21 11:35	446.34	404.37	7.86E-10	
Lower 29	7	2.677	-7.0375	2001-02-15 14:45	41.05	2001-02-21 11:35	443.83	402.78	7.83E-10	
Lower 29	8	2.677	-7.4125	2001-02-15 14:45	39.68	2001-02-21 11:35	443.74	404.06	7.85E-10	
Lower 30	1	2.822	-4.7875	2001-02-15 14:50	41.21	2001-02-21 11:38	374.12	332.91	6.45E-10	
Lower 30	2	2.822	-5.1625	2001-02-15 14:50	43.71	2001-02-21 11:38	476.5	432.79	8.42E-10	
Lower 30	3	2.822	-5.5375	2001-02-15 14:50	41.07	2001-02-21 11:38	407.87	366.8	7.12E-10	
Lower 30	4	2.822	-5.9125	2001-02-15 14:50	42.90	2001-02-21 11:38	356.08	313.18	6.06E-10	
Lower 30	5	2.822	-6.2875	2001-02-15 14:50	42.27	2001-02-21 11:38	297.86	255.59	4.92E-10	
Lower 30	6	2.822	-6.6625	2001-02-15 14:50	42.10	2001-02-21 11:38	400.22	358.12	6.95E-10	
Lower 30	7	2.822	-7.0375	2001-02-15 14:50	39.82	2001-02-21 11:38	308.75	268.93	5.19E-10	
Lower 30	8	2.822	-7.4125	2001-02-15 14:50	41.58	2001-02-21 11:38	296.95	255.37	4.92E-10	
Lower 31	1	2.967	-4.7875	2001-02-15 14:55	41.56	2001-02-21 11:42	299.01	257.45	4.96E-10	
Lower 31	2	2.967	-5.1625	2001-02-15 14:55	41.06	2001-02-21 11:42	171.63	130.57	2.46E-10	
Lower 31	3	2.967	-5.5375	2001-02-15 14:55	42.98	2001-02-21 11:42	67.07	24.09	3.57E-11	
Lower 31	4	2.967	-5.9125	2001-02-15 14:55	38.92	2001-02-21 11:42	65.01	26.09	3.96E-11	
Lower 31	5	2.967	-6.2875	2001-02-15 14:55	40.79	2001-02-21 11:42	72.86	32.07	5.14E-11	
Lower 31	6	2.967	-6.6625	2001-02-15 14:55	41.07	2001-02-21 11:42	62.23	21.16	2.99E-11	
Lower 31	7	2.967	-7.0375	2001-02-15 14:55	39.72	2001-02-21 11:42	53.03	13.31	1.44E-11	
Lower 31	8	2.967	-7.4125	2001-02-15 14:55	41.78	2001-02-21 11:42	156.67	114.89	2.15E-10	
Lower 32	1	3.112	-4.7875	2001-02-15 15:00	40.82	2001-02-21 13:41	138.31	97.49	1.78E-10	1.07E-05
Lower 32	2	3.112	-5.1625	2001-02-15 15:00	40.58	2001-02-21 13:41	54.69	14.11	1.58E-11	9.47E-07
Lower 32	3	3.112	-5.5375	2001-02-15 15:00	40.35	2001-02-21 13:41	48.76	8.41	4.69E-12	2.82E-07
Lower 32	4	3.112	-5.9125	2001-02-15 15:00	39.13	2001-02-21 13:41	46.92	7.79	3.48E-12	2.09E-07
Lower 32	5	3.112	-6.2875	2001-02-15 15:00	40.65	2001-02-21 13:41	50.24	9.59	6.99E-12	4.19E-07
Lower 32	6	3.112	-6.6625	2001-02-15 15:00	39.01	2001-02-21 13:41	49.59	10.58	8.92E-12	5.35E-07
Lower 32	7	3.112	-7.0375	2001-02-15 15:00	41.30	2001-02-21 13:41	52.15	10.85	9.44E-12	5.67E-07
Lower 32	8	3.112	-7.4125	2001-02-15 15:00	39.95	2001-02-21 13:41	49.72	9.77	7.34E-12	4.40E-07
Lower 33	1	3.256	-4.7875	2001-02-15 15:05	41.79	2001-02-21 13:44	55.07	13.28	1.42E-11	8.51E-07
Lower 33	2	3.256	-5.1625	2001-02-15 15:05	41.40	2001-02-21 13:44	49.73	8.33	4.54E-12	2.72E-07
Lower 33	3	3.256	-5.5375	2001-02-15 15:05	39.50	2001-02-21 13:44	46.26	6.76	1.48E-12	8.88E-08
Lower 33	4	3.256	-5.9125	2001-02-15 15:05	41.57	2001-02-21 13:44	48.24	6.67	1.30E-12	7.83E-08
Lower 33	5	3.256	-6.2875	2001-02-15 15:05	40.83	2001-02-21 13:44	48.4	7.57	3.06E-12	1.83E-07
Lower 33	6	3.256	-6.6625	2001-02-15 15:05	39.71	2001-02-21 13:44	48.91	9.2	6.23E-12	3.74E-07
Lower 33	7	3.256	-7.0375	2001-02-15 15:05	41.37	2001-02-21 13:44	53.92	12.55	1.28E-11	7.65E-07

Plank	Diaper	O_length (m)	Depth (m)	Date_start	Weight_start (g)	Date_end	Weight_end (g)	Weight_diff (g)	Q_corrected (m^3/s)	Q_corrected (l/min)
Lower 33	8	3.256	-7.4125	2001-02-15 15:05	41.13	2001-02-21 13:44	54.22	13.09	1.38E-11	8.28E-07
Lower 34	1	3.401	-4.7875	2001-02-15 15:10	41.79	2001-02-21 13:46	49.63	7.84	3.58E-12	2.15E-07
Lower 34	2	3.401	-5.1625	2001-02-15 15:10	40.95	2001-02-21 13:46	47.71	6.76	1.48E-12	8.88E-08
Lower 34	3	3.401	-5.5375	2001-02-15 15:10	38.32	2001-02-21 13:46	43.92	5.6	-7.79E-13	-4.68E-08
Lower 34	4	3.401	-5.9125	2001-02-15 15:10	42.02	2001-02-21 13:46	48.15	6.13	2.53E-13	1.52E-08
Lower 34	5	3.401	-6.2875	2001-02-15 15:10	43.11	2001-02-21 13:46	49.47	6.36	7.01E-13	4.21E-08
Lower 34	6	3.401	-6.6625	2001-02-15 15:10	41.64	2001-02-21 13:46	50.03	8.39	4.66E-12	2.79E-07
Lower 34	7	3.401	-7.0375	2001-02-15 15:10	41.75	2001-02-21 13:46	51.56	9.81	7.42E-12	4.45E-07
Lower 34	8	3.401	-7.4125	2001-02-15 15:10	42.63	2001-02-21 13:46	54.89	12.26	1.22E-11	7.32E-07
Lower 35	1	3.546	-4.7875	2001-02-15 15:15	40.07	2001-02-21 13:48	47.62	7.55	3.02E-12	1.81E-07
Lower 35	2	3.546	-5.1625	2001-02-15 15:15	39.72	2001-02-21 13:48	46.21	6.49	9.55E-13	5.73E-08
Lower 35	3	3.546	-5.5375	2001-02-15 15:15	42.63	2001-02-21 13:48	48.4	5.77	-4.48E-13	-2.69E-08
Lower 35	4	3.546	-5.9125	2001-02-15 15:15	40.98	2001-02-21 13:48	46.58	5.6	-7.79E-13	-4.68E-08
Lower 35	5	3.546	-6.2875	2001-02-15 15:15	44.75	2001-02-21 13:48	51.49	6.74	1.44E-12	8.65E-08
Lower 35	6	3.546	-6.6625	2001-02-15 15:15	52.10	2001-02-21 13:48	62.79	10.69	9.14E-12	5.48E-07
Lower 35	7	3.546	-7.0375	2001-02-15 15:15	40.42	2001-02-21 13:48	49.5	9.08	6.00E-12	3.60E-07
Lower 35	8	3.546	-7.4125	2001-02-15 15:15	44.48	2001-02-21 13:48	55.08	10.6	8.96E-12	5.38E-07
Lower 36	1	3.691	-4.7875	2001-02-15 15:20	41.95	2001-02-21 13:51	48.71	6.76	1.48E-12	8.89E-08
Lower 36	2	3.691	-5.1625	2001-02-15 15:20	43.57	2001-02-21 13:51	50.19	6.62	1.21E-12	7.25E-08
Lower 36	3	3.691	-5.5375	2001-02-15 15:20	41.60	2001-02-21 13:51	47.52	5.92	-1.56E-13	-9.36E-09
Lower 36	4	3.691	-5.9125	2001-02-15 15:20	41.60	2001-02-21 13:51	47.95	6.35	6.82E-13	4.09E-08
Lower 36	5	3.691	-6.2875	2001-02-15 15:20	42.06	2001-02-21 13:51	49.5	7.44	2.81E-12	1.68E-07
Lower 36	6	3.691	-6.6625	2001-02-15 15:20	42.66	2001-02-21 13:51	51.81	9.15	6.14E-12	3.68E-07
Lower 36	7	3.691	-7.0375	2001-02-15 15:20	43.79	2001-02-21 13:51	54.83	11.04	9.82E-12	5.89E-07
Lower 36	8	3.691	-7.4125	2001-02-15 15:20	41.98	2001-02-21 13:51	54.36	12.38	1.24E-11	7.46E-07
Lower 37	1	3.835	-4.7875	2001-02-15 15:25	40.21	2001-02-21 13:54	47.36	7.15	2.24E-12	1.35E-07
Lower 37	2	3.835	-5.1625	2001-02-15 15:25	43.47	2001-02-21 13:54	49.31	5.84	-3.12E-13	-1.87E-08
Lower 37	3	3.835	-5.5375	2001-02-15 15:25	46.31	2001-02-21 13:54	52.15	5.84	-3.12E-13	-1.87E-08
Lower 37	4	3.835	-5.9125	2001-02-15 15:25	43.34	2001-02-21 13:54	49.39	6.05	9.75E-14	5.85E-09
Lower 37	5	3.835	-6.2875	2001-02-15 15:25	40.89	2001-02-21 13:54	47.51	6.62	1.21E-12	7.25E-08
Lower 37	6	3.835	-6.6625	2001-02-15 15:25	43.11	2001-02-21 13:54	50.85	7.74	3.39E-12	2.04E-07
Lower 37	7	3.835	-7.0375	2001-02-15 15:25	44.44	2001-02-21 13:54	52.53	8.09	4.07E-12	2.44E-07
Lower 37	8	3.835	-7.4125	2001-02-15 15:25	41.57	2001-02-21 13:54	50.91	9.34	6.51E-12	3.91E-07
Lower 38	1	3.980	-4.7875	2001-02-15 15:30	41.63	2001-02-21 13:56	48.21	6.58	1.13E-12	6.79E-08
Lower 38	2	3.980	-5.1625	2001-02-15 15:30	42.67	2001-02-21 13:56	48.9	6.23	4.49E-13	2.69E-08
Lower 38	3	3.980	-5.5375	2001-02-15 15:30	38.88	2001-02-21 13:56	48.58	9.7	7.22E-12	4.33E-07
Lower 38	4	3.980	-5.9125	2001-02-15 15:30	44.07	2001-02-21 13:56	50.55	6.48	9.36E-13	5.62E-08
Lower 38	5	3.980	-6.2875	2001-02-15 15:30	43.53	2001-02-21 13:56	50.39	6.86	1.68E-12	1.01E-07
Lower 38	6	3.980	-6.6625	2001-02-15 15:30	42.99	2001-02-21 13:56	50.25	7.26	2.46E-12	1.47E-07
Lower 38	7	3.980	-7.0375	2001-02-15 15:30	41.77	2001-02-21 13:56	49.37	7.6	3.12E-12	1.87E-07
Lower 38	8	3.980	-7.4125	2001-02-15 15:30	46.08	2001-02-21 13:56	57.27	11.19	1.01E-11	6.07E-07

Part 2 Hydraulic conductivity estimations

Abbreviations in Table below

Plank	The plank number
Diaper	The diaper number applied downwards
O_length	The "length" following the borehole circumference starting at centreline of the tunnel facing east and running clock-wise
Depth	Centre of each diaper at borehole depth
Q_corrected	The calculated flowrate of each area covered by a diaper, l/min, after reducing the weight_diff with the reference value 6 grams.
K_{max} (d=1.15)	Maximum estimated hydraulic conductivity at a distance of 1.15 meters from deposition borehole centre.
K_{med} (d=1.15)	Mean estimated hydraulic conductivity at a distance of 1.15 meters from deposition borehole centre.
K_{min} (d=1.15)	Minimum estimated hydraulic conductivity at a distance of 1.15 meters from deposition borehole centre.
K_{max} (d=5)	Maximum estimated hydraulic conductivity at a distance of 5 meters from deposition borehole centre.
K_{med} (d=5)	Mean estimated hydraulic conductivity at a distance of 5 meters from deposition borehole centre.
K_{min} (d=5)	Minimum estimated hydraulic conductivity at a distance of 5 meters from deposition borehole centre.

Plank	Diaper	O_length	Depth	Q_corrected (l/min)	K_{max} (d=1.15) (m/s)	K_{med} (d=1.15) (m/s)	K_{min} (d=1.15) (m/s)	K_{max} (d=5) (m/s)	K_{med} (d=5) (m/s)	K_{min} (d=5) (m/s)
	Distance from borehole centre:			d=	1.15	1.15	1.15	5	5	5
	Measurement limit K = 5E-14 m/s			Diaper area=	0.04125	0.04125	0.04125	0.04125	0.04125	0.04125
				P (m) in rock=	7.3	24.7	108	50	133.3	220
				Median K=	8.6E-13	2.6E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Upper 01	1	4.125	-1.4875	2.02E-05	3.4E-11	1.0E-11	2.3E-12	1.1E-11	4.2E-12	2.6E-12
Upper 01	2	4.125	-1.8625	1.08E-05	1.8E-11	5.4E-12	1.2E-12	6.0E-12	2.3E-12	1.4E-12
Upper 01	3	4.125	-2.2375	2.76E-06	4.6E-12	1.4E-12	3.1E-13	1.5E-12	5.7E-13	3.5E-13
Upper 01	4	4.125	-2.6125	1.87E-06	3.1E-12	9.3E-13	2.1E-13	1.0E-12	3.9E-13	2.4E-13
Upper 01	5	4.125	-2.9875	2.36E-06	4.0E-12	1.2E-12	2.7E-13	1.3E-12	4.9E-13	3.0E-13
Upper 01	6	4.125	-3.3625	1.29E-06	2.2E-12	6.4E-13	1.5E-13	7.2E-13	2.7E-13	1.6E-13
Upper 01	7	4.125	-3.7375	1.18E-06	2.0E-12	5.9E-13	1.3E-13	6.6E-13	2.5E-13	1.5E-13
Upper 01	8	4.125	-4.1125	1.61E-06	2.7E-12	8.0E-13	1.8E-13	8.9E-13	3.3E-13	2.0E-13
Upper 02	1	4.26974	-1.4875	3.05E-05	5.1E-11	1.5E-11	3.5E-12	1.7E-11	6.4E-12	3.9E-12
Upper 02	2	4.26974	-1.8625	3.28E-05	5.5E-11	1.6E-11	3.7E-12	1.8E-11	6.8E-12	4.1E-12
Upper 02	3	4.26974	-2.2375	3.01E-05	5.0E-11	1.5E-11	3.4E-12	1.7E-11	6.3E-12	3.8E-12
Upper 02	4	4.26974	-2.6125	2.53E-05	4.2E-11	1.3E-11	2.9E-12	1.4E-11	5.3E-12	3.2E-12
Upper 02	5	4.26974	-2.9875	5.77E-06	9.7E-12	2.9E-12	6.5E-13	3.2E-12	1.2E-12	7.3E-13
Upper 02	6	4.26974	-3.3625	5.32E-06	8.9E-12	2.6E-12	6.0E-13	3.0E-12	1.1E-12	6.7E-13
Upper 02	7	4.26974	-3.7375	2.26E-06	3.8E-12	1.1E-12	2.6E-13	1.3E-12	4.7E-13	2.8E-13
Upper 02	8	4.26974	-4.1125	1.41E-06	2.4E-12	7.0E-13	1.6E-13	7.8E-13	2.9E-13	1.8E-13
Upper 03	1	4.41448	-1.4875	1.55E-05	2.6E-11	7.7E-12	1.8E-12	8.6E-12	3.2E-12	2.0E-12
Upper 03	2	4.41448	-1.8625	4.07E-06	6.8E-12	2.0E-12	4.6E-13	2.3E-12	8.5E-13	5.1E-13
Upper 03	3	4.41448	-2.2375	1.07E-06	1.8E-12	5.3E-13	1.2E-13	5.9E-13	2.2E-13	1.3E-13
Upper 03	4	4.41448	-2.6125	1.74E-06	2.9E-12	8.6E-13	2.0E-13	9.7E-13	3.6E-13	2.2E-13
Upper 03	5	4.41448	-2.9875	3.76E-06	6.3E-12	1.9E-12	4.3E-13	2.1E-12	7.8E-13	4.7E-13
Upper 03	6	4.41448	-3.3625	1.69E-06	2.8E-12	8.4E-13	1.9E-13	9.4E-13	3.5E-13	2.1E-13
Upper 03	7	4.41448	-3.7375	1.19E-06	2.0E-12	5.9E-13	1.3E-13	6.6E-13	2.5E-13	1.5E-13
Upper 03	8	4.41448	-4.1125	1.60E-06	2.7E-12	8.0E-13	1.8E-13	8.9E-13	3.3E-13	2.0E-13
Upper 04	1	4.55922	-1.4875	3.83E-05	6.4E-11	1.9E-11	4.3E-12	2.1E-11	8.0E-12	4.8E-12
Upper 04	2	4.55922	-1.8625	3.52E-05	5.9E-11	1.7E-11	4.0E-12	2.0E-11	7.3E-12	4.4E-12
Upper 04	3	4.55922	-2.2375	1.66E-05	2.8E-11	8.3E-12	1.9E-12	9.2E-12	3.5E-12	2.1E-12
Upper 04	4	4.55922	-2.6125	7.79E-07	1.3E-12	3.9E-13	8.8E-14	4.3E-13	1.6E-13	9.8E-14
Upper 04	5	4.55922	-2.9875	9.44E-07	1.6E-12	4.7E-13	1.1E-13	5.2E-13	2.0E-13	1.2E-13
Upper 04	6	4.55922	-3.3625	1.26E-06	2.1E-12	6.3E-13	1.4E-13	7.0E-13	2.6E-13	1.6E-13
Upper 04	7	4.55922	-3.7375	1.80E-07	3.0E-13	8.9E-14	5.0E-14	1.0E-13	5.0E-14	5.0E-14
Upper 04	8	4.55922	-4.1125	9.15E-07	1.5E-12	4.5E-13	1.0E-13	5.1E-13	1.9E-13	1.2E-13
Upper 05	1	4.70396	-1.4875	9.73E-07	1.6E-12	4.8E-13	1.1E-13	5.4E-13	2.0E-13	1.2E-13
Upper 05	2	4.70396	-1.8625	6.98E-07	1.2E-12	3.5E-13	7.9E-14	3.9E-13	1.5E-13	8.8E-14
Upper 05	3	4.70396	-2.2375	4.01E-07	6.7E-13	2.0E-13	5.0E-14	2.2E-13	8.4E-14	5.1E-14
Upper 05	4	4.70396	-2.6125	3.23E-07	5.4E-13	1.6E-13	5.0E-14	1.8E-13	6.7E-14	5.0E-14
Upper 05	5	4.70396	-2.9875	5.15E-07	8.6E-13	2.6E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Upper 05	6	4.70396	-3.3625	3.39E-07	5.7E-13	1.7E-13	5.0E-14	1.9E-13	7.1E-14	5.0E-14
Upper 05	7	4.70396	-3.7375	3.34E-07	5.6E-13	1.7E-13	5.0E-14	1.9E-13	7.0E-14	5.0E-14
Upper 05	8	4.70396	-4.1125	3.76E-07	6.3E-13	1.9E-13	5.0E-14	2.1E-13	7.8E-14	5.0E-14
Upper 06	1	4.8487	-1.4875	7.43E-06	1.2E-11	3.7E-12	8.4E-13	4.1E-12	1.5E-12	9.4E-13
Upper 06	2	4.8487	-1.8625	3.96E-07	6.6E-13	2.0E-13	5.0E-14	2.2E-13	8.2E-14	5.0E-14
Upper 06	3	4.8487	-2.2375	6.34E-07	1.1E-12	3.1E-13	7.2E-14	3.5E-13	1.3E-13	8.0E-14
Upper 06	4	4.8487	-2.6125	1.16E-06	2.0E-12	5.8E-13	1.3E-13	6.5E-13	2.4E-13	1.5E-13
Upper 06	5	4.8487	-2.9875	1.23E-06	2.1E-12	6.1E-13	1.4E-13	6.9E-13	2.6E-13	1.6E-13
Upper 06	6	4.8487	-3.3625	8.86E-07	1.5E-12	4.4E-13	1.0E-13	4.9E-13	1.8E-13	1.1E-13
Upper 06	7	4.8487	-3.7375	7.10E-07	1.2E-12	3.5E-13	8.0E-14	3.9E-13	1.5E-13	9.0E-14
Upper 06	8	4.8487	-4.1125	8.63E-07	1.4E-12	4.3E-13	9.8E-14	4.8E-13	1.8E-13	1.1E-13
Upper 07	1	4.99344	-1.4875	2.76E-05	4.6E-11	1.4E-11	3.1E-12	1.5E-11	5.8E-12	3.5E-12
Upper 07	2	4.99344	-1.8625	3.57E-05	6.0E-11	1.8E-11	4.0E-12	2.0E-11	7.4E-12	4.5E-12
Upper 07	3	4.99344	-2.2375	3.01E-05	5.0E-11	1.5E-11	3.4E-12	1.7E-11	6.3E-12	3.8E-12
Upper 07	4	4.99344	-2.6125	2.45E-05	4.1E-11	1.2E-11	2.8E-12	1.4E-11	5.1E-12	3.1E-12
Upper 07	5	4.99344	-2.9875	5.94E-06	1.0E-11	2.9E-12	6.7E-13	3.3E-12	1.2E-12	7.5E-13

Plank	Diaper	O_length	Depth	Q_corrected (l/min)	K_{max} (d=1.15) (m/s)	K_{med} (d=1.15) (m/s)	K_{min} (d=1.15) (m/s)	K_{max} (d=5) (m/s)	K_{med} (d=5) (m/s)	K_{min} (d=5) (m/s)
	Distance from borehole centre:			d=	1.15	1.15	1.15	5	5	5
	Measurement limit K = 5E-14 m/s			Diaper area=	0.04125	0.04125	0.04125	0.04125	0.04125	0.04125
				P (m) in rock=	7.3	24.7	108	50	133.3	220
				Median K=	8.6E-13	2.6E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Upper 07	6	4.99344	-3.3625	1.07E-06	1.8E-12	5.3E-13	1.2E-13	6.0E-13	2.2E-13	1.4E-13
Upper 07	7	4.99344	-3.7375	6.70E-07	1.1E-12	3.3E-13	7.6E-14	3.7E-13	1.4E-13	8.5E-14
Upper 07	8	4.99344	-4.1125	2.07E-06	3.5E-12	1.0E-12	2.3E-13	1.2E-12	4.3E-13	2.6E-13
Upper 08	1	5.13818	-1.4875	1.99E-06	3.3E-12	9.9E-13	2.3E-13	1.1E-12	4.2E-13	2.5E-13
Upper 08	2	5.13818	-1.8625	2.17E-06	3.6E-12	1.1E-12	2.5E-13	1.2E-12	4.5E-13	2.7E-13
Upper 08	3	5.13818	-2.2375	2.22E-05	3.7E-11	1.1E-11	2.5E-12	1.2E-11	4.6E-12	2.8E-12
Upper 08	4	5.13818	-2.6125	1.40E-05	2.3E-11	6.9E-12	1.6E-12	7.8E-12	2.9E-12	1.8E-12
Upper 08	5	5.13818	-2.9875	9.77E-07	1.6E-12	4.8E-13	1.1E-13	5.4E-13	2.0E-13	1.2E-13
Upper 08	6	5.13818	-3.3625	7.62E-07	1.3E-12	3.8E-13	8.6E-14	4.2E-13	1.6E-13	9.6E-14
Upper 08	7	5.13818	-3.7375	9.04E-07	1.5E-12	4.5E-13	1.0E-13	5.0E-13	1.9E-13	1.1E-13
Upper 08	8	5.13818	-4.1125	9.65E-07	1.6E-12	4.8E-13	1.1E-13	5.4E-13	2.0E-13	1.2E-13
Upper 09	1	5.28292	-1.4875	8.29E-07	1.4E-12	4.1E-13	9.4E-14	4.6E-13	1.7E-13	1.0E-13
Upper 09	2	5.28292	-1.8625	-2.43E-06						
Upper 09	3	5.28292	-2.2375	1.27E-06	2.1E-12	6.3E-13	1.4E-13	7.1E-13	2.6E-13	1.6E-13
Upper 09	4	5.28292	-2.6125	9.55E-07	1.6E-12	4.7E-13	1.1E-13	5.3E-13	2.0E-13	1.2E-13
Upper 09	5	5.28292	-2.9875	8.82E-07	1.5E-12	4.4E-13	1.0E-13	4.9E-13	1.8E-13	1.1E-13
Upper 09	6	5.28292	-3.3625	9.26E-07	1.6E-12	4.6E-13	1.0E-13	5.1E-13	1.9E-13	1.2E-13
Upper 09	7	5.28292	-3.7375	7.48E-07	1.3E-12	3.7E-13	8.5E-14	4.2E-13	1.6E-13	9.4E-14
Upper 09	8	5.28292	-4.1125	1.32E-06	2.2E-12	6.5E-13	1.5E-13	7.3E-13	2.7E-13	1.7E-13
Upper 10	1	5.42766	-1.4875	1.09E-05	1.8E-11	5.4E-12	1.2E-12	6.0E-12	2.3E-12	1.4E-12
Upper 10	2	5.42766	-1.8625	7.28E-07	1.2E-12	3.6E-13	8.2E-14	4.0E-13	1.5E-13	9.2E-14
Upper 10	3	5.42766	-2.2375	6.78E-07	1.1E-12	3.4E-13	7.7E-14	3.8E-13	1.4E-13	8.6E-14
Upper 10	4	5.42766	-2.6125	1.14E-06	1.9E-12	5.6E-13	1.3E-13	6.3E-13	2.4E-13	1.4E-13
Upper 10	5	5.42766	-2.9875	9.76E-07	1.6E-12	4.8E-13	1.1E-13	5.4E-13	2.0E-13	1.2E-13
Upper 10	6	5.42766	-3.3625	9.31E-07	1.6E-12	4.6E-13	1.1E-13	5.2E-13	1.9E-13	1.2E-13
Upper 10	7	5.42766	-3.7375	9.15E-07	1.5E-12	4.5E-13	1.0E-13	5.1E-13	1.9E-13	1.2E-13
Upper 10	8	5.42766	-4.1125	1.45E-06	2.4E-12	7.2E-13	1.6E-13	8.1E-13	3.0E-13	1.8E-13
Upper 11	1	0.072	-1.4875	4.83E-06	8.1E-12	2.4E-12	5.5E-13	2.7E-12	1.0E-12	6.1E-13
Upper 11	2	0.072	-1.8625	1.14E-06	1.9E-12	5.7E-13	1.3E-13	6.3E-13	2.4E-13	1.4E-13
Upper 11	3	0.072	-2.2375	8.11E-07	1.4E-12	4.0E-13	9.2E-14	4.5E-13	1.7E-13	1.0E-13
Upper 11	4	0.072	-2.6125	1.16E-06	2.0E-12	5.8E-13	1.3E-13	6.5E-13	2.4E-13	1.5E-13
Upper 11	5	0.072	-2.9875	6.38E-07	1.1E-12	3.2E-13	7.2E-14	3.5E-13	1.3E-13	8.1E-14
Upper 11	6	0.072	-3.3625	7.59E-07	1.3E-12	3.8E-13	8.6E-14	4.2E-13	1.6E-13	9.6E-14
Upper 11	7	0.072	-3.7375	5.79E-07	9.7E-13	2.9E-13	6.6E-14	3.2E-13	1.2E-13	7.3E-14
Upper 11	8	0.072	-4.1125	1.10E-06	1.9E-12	5.5E-13	1.3E-13	6.1E-13	2.3E-13	1.4E-13
Upper 12	1	0.21674	-1.4875	5.07E-06	8.5E-12	2.5E-12	5.7E-13	2.8E-12	1.1E-12	6.4E-13
Upper 12	2	0.21674	-1.8625	1.40E-06	2.4E-12	7.0E-13	1.6E-13	7.8E-13	2.9E-13	1.8E-13
Upper 12	3	0.21674	-2.2375	8.23E-07	1.4E-12	4.1E-13	9.3E-14	4.6E-13	1.7E-13	1.0E-13
Upper 12	4	0.21674	-2.6125	8.14E-07	1.4E-12	4.0E-13	9.2E-14	4.5E-13	1.7E-13	1.0E-13
Upper 12	5	0.21674	-2.9875	6.89E-07	1.2E-12	3.4E-13	7.8E-14	3.8E-13	1.4E-13	8.7E-14
Upper 12	6	0.21674	-3.3625	6.61E-07	1.1E-12	3.3E-13	7.5E-14	3.7E-13	1.4E-13	8.3E-14
Upper 12	7	0.21674	-3.7375	5.57E-07	9.3E-13	2.8E-13	6.3E-14	3.1E-13	1.2E-13	7.0E-14
Upper 12	8	0.21674	-4.1125	8.79E-07	1.5E-12	4.4E-13	1.0E-13	4.9E-13	1.8E-13	1.1E-13
Upper 13	1	0.36148	-1.4875	1.10E-05	1.9E-11	5.5E-12	1.3E-12	6.1E-12	2.3E-12	1.4E-12
Upper 13	2	0.36148	-1.8625	7.01E-07	1.2E-12	3.5E-13	7.9E-14	3.9E-13	1.5E-13	8.8E-14
Upper 13	3	0.36148	-2.2375	5.76E-07	9.7E-13	2.9E-13	6.5E-14	3.2E-13	1.2E-13	7.3E-14
Upper 13	4	0.36148	-2.6125	7.70E-07	1.3E-12	3.8E-13	8.7E-14	4.3E-13	1.6E-13	9.7E-14
Upper 13	5	0.36148	-2.9875	6.47E-07	1.1E-12	3.2E-13	7.3E-14	3.6E-13	1.3E-13	8.2E-14
Upper 13	6	0.36148	-3.3625	6.71E-07	1.1E-12	3.3E-13	7.6E-14	3.7E-13	1.4E-13	8.5E-14
Upper 13	7	0.36148	-3.7375	6.21E-07	1.0E-12	3.1E-13	7.0E-14	3.4E-13	1.3E-13	7.8E-14
Upper 13	8	0.36148	-4.1125	8.59E-07	1.4E-12	4.3E-13	9.7E-14	4.8E-13	1.8E-13	1.1E-13
Upper 14	1	0.50622	-1.4875	2.68E-05	4.5E-11	1.3E-11	3.0E-12	1.5E-11	5.6E-12	3.4E-12

Plank	Diaper	O_length	Depth	Q_corrected (l/min)	K_{max} (d=1.15) (m/s)	K_{med} (d=1.15) (m/s)	K_{min} (d=1.15) (m/s)	K_{max} (d=5) (m/s)	K_{med} (d=5) (m/s)	K_{min} (d=5) (m/s)
	Distance from borehole centre:			d=	1.15	1.15	1.15	5	5	5
	Measurement limit K = 5E-14 m/s			Diaper area=	0.04125	0.04125	0.04125	0.04125	0.04125	0.04125
				P (m) in rock=	7.3	24.7	108	50	133.3	220
				Median K=	8.6E-13	2.6E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Upper 14	2	0.50622	-1.8625	1.88E-05	3.2E-11	9.3E-12	2.1E-12	1.0E-11	3.9E-12	2.4E-12
Upper 14	3	0.50622	-2.2375	6.68E-07	1.1E-12	3.3E-13	7.6E-14	3.7E-13	1.4E-13	8.4E-14
Upper 14	4	0.50622	-2.6125	8.14E-07	1.4E-12	4.0E-13	9.2E-14	4.5E-13	1.7E-13	1.0E-13
Upper 14	5	0.50622	-2.9875	8.42E-07	1.4E-12	4.2E-13	9.5E-14	4.7E-13	1.8E-13	1.1E-13
Upper 14	6	0.50622	-3.3625	6.51E-07	1.1E-12	3.2E-13	7.4E-14	3.6E-13	1.4E-13	8.2E-14
Upper 14	7	0.50622	-3.7375	5.37E-07	9.0E-13	2.7E-13	6.1E-14	3.0E-13	1.1E-13	6.8E-14
Upper 14	8	0.50622	-4.1125	6.51E-07	1.1E-12	3.2E-13	7.4E-14	3.6E-13	1.4E-13	8.2E-14
Upper 15	1	0.65096	-1.4875	7.22E-06	1.2E-11	3.6E-12	8.2E-13	4.0E-12	1.5E-12	9.1E-13
Upper 15	2	0.65096	-1.8625	3.19E-06	5.3E-12	1.6E-12	3.6E-13	1.8E-12	6.6E-13	4.0E-13
Upper 15	3	0.65096	-2.2375	8.31E-07	1.4E-12	4.1E-13	9.4E-14	4.6E-13	1.7E-13	1.0E-13
Upper 15	4	0.65096	-2.6125	8.01E-07	1.3E-12	4.0E-13	9.1E-14	4.4E-13	1.7E-13	1.0E-13
Upper 15	5	0.65096	-2.9875	8.32E-07	1.4E-12	4.1E-13	9.4E-14	4.6E-13	1.7E-13	1.0E-13
Upper 15	6	0.65096	-3.3625	1.00E-06	1.7E-12	5.0E-13	1.1E-13	5.6E-13	2.1E-13	1.3E-13
Upper 15	7	0.65096	-3.7375	3.88E-07	6.5E-13	1.9E-13	5.0E-14	2.2E-13	8.1E-14	5.0E-14
Upper 15	8	0.65096	-4.1125	3.41E-07	5.7E-13	1.7E-13	5.0E-14	1.9E-13	7.1E-14	5.0E-14
Upper 16	1	0.7957	-1.4875	8.50E-06	1.4E-11	4.2E-12	9.6E-13	4.7E-12	1.8E-12	1.1E-12
Upper 16	2	0.7957	-1.8625	5.85E-07	9.8E-13	2.9E-13	6.6E-14	3.2E-13	1.2E-13	7.4E-14
Upper 16	3	0.7957	-2.2375	4.96E-07	8.3E-13	2.5E-13	5.6E-14	2.8E-13	1.0E-13	6.3E-14
Upper 16	4	0.7957	-2.6125	3.86E-07	6.5E-13	1.9E-13	5.0E-14	2.1E-13	8.0E-14	5.0E-14
Upper 16	5	0.7957	-2.9875	4.16E-07	7.0E-13	2.1E-13	5.0E-14	2.3E-13	8.7E-14	5.2E-14
Upper 16	6	0.7957	-3.3625	4.47E-07	7.5E-13	2.2E-13	5.1E-14	2.5E-13	9.3E-14	5.6E-14
Upper 16	7	0.7957	-3.7375	4.55E-07	7.6E-13	2.3E-13	5.2E-14	2.5E-13	9.5E-14	5.7E-14
Upper 16	8	0.7957	-4.1125	5.85E-07	9.8E-13	2.9E-13	6.6E-14	3.2E-13	1.2E-13	7.4E-14
Upper 17	1	0.94044	-1.4875	2.75E-05	4.6E-11	1.4E-11	3.1E-12	1.5E-11	5.7E-12	3.5E-12
Upper 17	2	0.94044	-1.8625	1.08E-05	1.8E-11	5.4E-12	1.2E-12	6.0E-12	2.3E-12	1.4E-12
Upper 17	3	0.94044	-2.2375	4.78E-07	8.0E-13	2.4E-13	5.4E-14	2.7E-13	1.0E-13	6.0E-14
Upper 17	4	0.94044	-2.6125	4.35E-07	7.3E-13	2.2E-13	5.0E-14	2.4E-13	9.1E-14	5.5E-14
Upper 17	5	0.94044	-2.9875	4.09E-07	6.9E-13	2.0E-13	5.0E-14	2.3E-13	8.5E-14	5.2E-14
Upper 17	6	0.94044	-3.3625	2.47E-07	4.1E-13	1.2E-13	5.0E-14	1.4E-13	5.1E-14	5.0E-14
Upper 17	7	0.94044	-3.7375	1.89E-07	3.2E-13	9.4E-14	5.0E-14	1.1E-13	5.0E-14	5.0E-14
Upper 17	8	0.94044	-4.1125	6.09E-07	1.0E-12	3.0E-13	6.9E-14	3.4E-13	1.3E-13	7.7E-14
Upper 18	1	1.08518	-1.4875	1.18E-05	2.0E-11	5.8E-12	1.3E-12	6.5E-12	2.4E-12	1.5E-12
Upper 18	2	1.08518	-1.8625	4.53E-06	7.6E-12	2.2E-12	5.1E-13	2.5E-12	9.4E-13	5.7E-13
Upper 18	3	1.08518	-2.2375	3.31E-07	5.6E-13	1.6E-13	5.0E-14	1.8E-13	6.9E-14	5.0E-14
Upper 18	4	1.08518	-2.6125	3.27E-07	5.5E-13	1.6E-13	5.0E-14	1.8E-13	6.8E-14	5.0E-14
Upper 18	5	1.08518	-2.9875	3.23E-07	5.4E-13	1.6E-13	5.0E-14	1.8E-13	6.7E-14	5.0E-14
Upper 18	6	1.08518	-3.3625	2.13E-07	3.6E-13	1.1E-13	5.0E-14	1.2E-13	5.0E-14	5.0E-14
Upper 18	7	1.08518	-3.7375	1.33E-07	2.2E-13	6.6E-14	5.0E-14	7.4E-14	5.0E-14	5.0E-14
Upper 18	8	1.08518	-4.1125	1.99E-07	3.3E-13	9.9E-14	5.0E-14	1.1E-13	5.0E-14	5.0E-14
Upper 19	1	1.22992	-1.4875	7.22E-07	1.2E-12	3.6E-13	8.2E-14	4.0E-13	1.5E-13	9.1E-14
Upper 19	2	1.22992	-1.8625	2.44E-07	4.1E-13	1.2E-13	5.0E-14	1.4E-13	5.1E-14	5.0E-14
Upper 19	3	1.22992	-2.2375	2.56E-07	4.3E-13	1.3E-13	5.0E-14	1.4E-13	5.3E-14	5.0E-14
Upper 19	4	1.22992	-2.6125	2.37E-07	4.0E-13	1.2E-13	5.0E-14	1.3E-13	5.0E-14	5.0E-14
Upper 19	5	1.22992	-2.9875	2.18E-07	3.7E-13	1.1E-13	5.0E-14	1.2E-13	5.0E-14	5.0E-14
Upper 19	6	1.22992	-3.3625	1.80E-07	3.0E-13	8.9E-14	5.0E-14	1.0E-13	5.0E-14	5.0E-14
Upper 19	7	1.22992	-3.7375	1.93E-07	3.2E-13	9.6E-14	5.0E-14	1.1E-13	5.0E-14	5.0E-14
Upper 19	8	1.22992	-4.1125	4.45E-07	7.5E-13	2.2E-13	5.0E-14	2.5E-13	9.3E-14	5.6E-14
Upper 20	1	1.37466	-1.4875	1.14E-06	1.9E-12	5.7E-13	1.3E-13	6.3E-13	2.4E-13	1.4E-13
Upper 20	2	1.37466	-1.8625	4.67E-07	7.8E-13	2.3E-13	5.3E-14	2.6E-13	9.7E-14	5.9E-14
Upper 20	3	1.37466	-2.2375	1.92E-07	3.2E-13	9.5E-14	5.0E-14	1.1E-13	5.0E-14	5.0E-14
Upper 20	4	1.37466	-2.6125	2.40E-07	4.0E-13	1.2E-13	5.0E-14	1.3E-13	5.0E-14	5.0E-14
Upper 20	5	1.37466	-2.9875	5.05E-07	8.5E-13	2.5E-13	5.7E-14	2.8E-13	1.1E-13	6.4E-14
Upper 20	6	1.37466	-3.3625	3.52E-07	5.9E-13	1.7E-13	5.0E-14	2.0E-13	7.3E-14	5.0E-14

Plank	Diaper	O_length	Depth	Q_corrected (l/min)	K_{max} (d=1.15) (m/s)	K_{med} (d=1.15) (m/s)	K_{min} (d=1.15) (m/s)	K_{max} (d=5) (m/s)	K_{med} (d=5) (m/s)	K_{min} (d=5) (m/s)
	Distance from borehole centre:			d=	1.15	1.15	1.15	5	5	5
	Measurement limit K = 5E-14 m/s			Diaper area=	0.04125	0.04125	0.04125	0.04125	0.04125	0.04125
				P (m) in rock=	7.3	24.7	108	50	133.3	220
				Median K=	8.6E-13	2.6E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Upper 20	7	1.37466	-3.7375	2.96E-07	5.0E-13	1.5E-13	5.0E-14	1.6E-13	6.2E-14	5.0E-14
Upper 20	8	1.37466	-4.1125	4.19E-07	7.0E-13	2.1E-13	5.0E-14	2.3E-13	8.7E-14	5.3E-14
Upper 21	1	1.5194	-1.4875	2.60E-05	4.4E-11	1.3E-11	2.9E-12	1.4E-11	5.4E-12	3.3E-12
Upper 21	2	1.5194	-1.8625	2.84E-05	4.8E-11	1.4E-11	3.2E-12	1.6E-11	5.9E-12	3.6E-12
Upper 21	3	1.5194	-2.2375	1.43E-05	2.4E-11	7.1E-12	1.6E-12	8.0E-12	3.0E-12	1.8E-12
Upper 21	4	1.5194	-2.6125	1.02E-06	1.7E-12	5.1E-13	1.2E-13	5.7E-13	2.1E-13	1.3E-13
Upper 21	5	1.5194	-2.9875	4.49E-07	7.5E-13	2.2E-13	5.1E-14	2.5E-13	9.3E-14	5.7E-14
Upper 21	6	1.5194	-3.3625	3.84E-07	6.4E-13	1.9E-13	5.0E-14	2.1E-13	8.0E-14	5.0E-14
Upper 21	7	1.5194	-3.7375	4.56E-07	7.6E-13	2.3E-13	5.2E-14	2.5E-13	9.5E-14	5.8E-14
Upper 21	8	1.5194	-4.1125	7.40E-07	1.2E-12	3.7E-13	8.4E-14	4.1E-13	1.5E-13	9.3E-14
Upper 22	1	1.66414	-1.4875	2.42E-05	4.1E-11	1.2E-11	2.7E-12	1.3E-11	5.0E-12	3.1E-12
Upper 22	2	1.66414	-1.8625	3.07E-05	5.2E-11	1.5E-11	3.5E-12	1.7E-11	6.4E-12	3.9E-12
Upper 22	3	1.66414	-2.2375	3.26E-05	5.5E-11	1.6E-11	3.7E-12	1.8E-11	6.8E-12	4.1E-12
Upper 22	4	1.66414	-2.6125	2.04E-05	3.4E-11	1.0E-11	2.3E-12	1.1E-11	4.3E-12	2.6E-12
Upper 22	5	1.66414	-2.9875	3.65E-06	6.1E-12	1.8E-12	4.1E-13	2.0E-12	7.6E-13	4.6E-13
Upper 22	6	1.66414	-3.3625	1.14E-06	1.9E-12	5.6E-13	1.3E-13	6.3E-13	2.4E-13	1.4E-13
Upper 22	7	1.66414	-3.7375	1.04E-06	1.7E-12	5.1E-13	1.2E-13	5.8E-13	2.2E-13	1.3E-13
Upper 22	8	1.66414	-4.1125	1.17E-06	2.0E-12	5.8E-13	1.3E-13	6.5E-13	2.4E-13	1.5E-13
Upper 23	1	1.80888	-1.4875	7.49E-06	1.3E-11	3.7E-12	8.5E-13	4.2E-12	1.6E-12	9.5E-13
Upper 23	2	1.80888	-1.8625	5.84E-07	9.8E-13	2.9E-13	6.6E-14	3.2E-13	1.2E-13	7.4E-14
Upper 23	3	1.80888	-2.2375	6.56E-07	1.1E-12	3.3E-13	7.4E-14	3.6E-13	1.4E-13	8.3E-14
Upper 23	4	1.80888	-2.6125	7.32E-07	1.2E-12	3.6E-13	8.3E-14	4.1E-13	1.5E-13	9.2E-14
Upper 23	5	1.80888	-2.9875	3.29E-07	5.5E-13	1.6E-13	5.0E-14	1.8E-13	6.9E-14	5.0E-14
Upper 23	6	1.80888	-3.3625	2.20E-07	3.7E-13	1.1E-13	5.0E-14	1.2E-13	5.0E-14	5.0E-14
Upper 23	7	1.80888	-3.7375	3.26E-07	5.5E-13	1.6E-13	5.0E-14	1.8E-13	6.8E-14	5.0E-14
Upper 23	8	1.80888	-4.1125	8.75E-07	1.5E-12	4.3E-13	9.9E-14	4.9E-13	1.8E-13	1.1E-13
Upper 24	1	1.95362	-1.4875	2.24E-05	3.8E-11	1.1E-11	2.5E-12	1.2E-11	4.7E-12	2.8E-12
Upper 24	2	1.95362	-1.8625	2.54E-05	4.3E-11	1.3E-11	2.9E-12	1.4E-11	5.3E-12	3.2E-12
Upper 24	3	1.95362	-2.2375	2.98E-05	5.0E-11	1.5E-11	3.4E-12	1.7E-11	6.2E-12	3.8E-12
Upper 24	4	1.95362	-2.6125	2.51E-05	4.2E-11	1.2E-11	2.8E-12	1.4E-11	5.2E-12	3.2E-12
Upper 24	5	1.95362	-2.9875	7.15E-06	1.2E-11	3.5E-12	8.1E-13	4.0E-12	1.5E-12	9.0E-13
Upper 24	6	1.95362	-3.3625	4.80E-07	8.1E-13	2.4E-13	5.4E-14	2.7E-13	1.0E-13	6.1E-14
Upper 24	7	1.95362	-3.7375	3.11E-07	5.2E-13	1.5E-13	5.0E-14	1.7E-13	6.5E-14	5.0E-14
Upper 24	8	1.95362	-4.1125	9.91E-06	1.7E-11	4.9E-12	1.1E-12	5.5E-12	2.1E-12	1.3E-12
Upper 25	1	2.09836	-1.4875	2.04E-05	3.4E-11	1.0E-11	2.3E-12	1.1E-11	4.2E-12	2.6E-12
Upper 25	2	2.09836	-1.8625	2.47E-05	4.1E-11	1.2E-11	2.8E-12	1.4E-11	5.1E-12	3.1E-12
Upper 25	3	2.09836	-2.2375	1.01E-05	1.7E-11	5.0E-12	1.1E-12	5.6E-12	2.1E-12	1.3E-12
Upper 25	4	2.09836	-2.6125	1.33E-05	2.2E-11	6.6E-12	1.5E-12	7.4E-12	2.8E-12	1.7E-12
Upper 25	5	2.09836	-2.9875	1.58E-06	2.6E-12	7.8E-13	1.8E-13	8.8E-13	3.3E-13	2.0E-13
Upper 25	6	2.09836	-3.3625	3.74E-07	6.3E-13	1.9E-13	5.0E-14	2.1E-13	7.8E-14	5.0E-14
Upper 25	7	2.09836	-3.7375	5.57E-07	9.3E-13	2.8E-13	6.3E-14	3.1E-13	1.2E-13	7.0E-14
Upper 25	8	2.09836	-4.1125	1.77E-06	3.0E-12	8.8E-13	2.0E-13	9.9E-13	3.7E-13	2.2E-13
Upper 26	1	2.2431	-1.4875	2.60E-05	4.4E-11	1.3E-11	3.0E-12	1.4E-11	5.4E-12	3.3E-12
Upper 26	2	2.2431	-1.8625	3.54E-05	5.9E-11	1.8E-11	4.0E-12	2.0E-11	7.4E-12	4.5E-12
Upper 26	3	2.2431	-2.2375	2.73E-05	4.6E-11	1.4E-11	3.1E-12	1.5E-11	5.7E-12	3.4E-12
Upper 26	4	2.2431	-2.6125	4.29E-06	7.2E-12	2.1E-12	4.9E-13	2.4E-12	8.9E-13	5.4E-13
Upper 26	5	2.2431	-2.9875	1.09E-06	1.8E-12	5.4E-13	1.2E-13	6.0E-13	2.3E-13	1.4E-13
Upper 26	6	2.2431	-3.3625	8.21E-07	1.4E-12	4.1E-13	9.3E-14	4.6E-13	1.7E-13	1.0E-13
Upper 26	7	2.2431	-3.7375	8.46E-07	1.4E-12	4.2E-13	9.6E-14	4.7E-13	1.8E-13	1.1E-13
Upper 26	8	2.2431	-4.1125	2.31E-06	3.9E-12	1.1E-12	2.6E-13	1.3E-12	4.8E-13	2.9E-13
Upper 27	1	2.38784	-1.4875							
Upper 27	2	2.38784	-1.8625							

Plank	Diaper	O_length	Depth	Q_corrected (l/min)	K_{max} (d=1.15) (m/s)	K_{med} (d=1.15) (m/s)	K_{min} (d=1.15) (m/s)	K_{max} (d=5) (m/s)	K_{med} (d=5) (m/s)	K_{min} (d=5) (m/s)
	Distance from borehole centre:			d=	1.15	1.15	1.15	5	5	5
	Measurement limit K = 5E-14 m/s			Diaper area=	0.04125	0.04125	0.04125	0.04125	0.04125	0.04125
				P (m) in rock=	7.3	24.7	108	50	133.3	220
				Median K=	8.6E-13	2.6E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Upper 27	3	2.38784	-2.2375							
Upper 27	4	2.38784	-2.6125							
Upper 27	5	2.38784	-2.9875							
Upper 27	6	2.38784	-3.3625							
Upper 27	7	2.38784	-3.7375							
Upper 27	8	2.38784	-4.1125							
Upper 28	1	2.53258	-1.4875							
Upper 28	2	2.53258	-1.8625							
Upper 28	3	2.53258	-2.2375							
Upper 28	4	2.53258	-2.6125							
Upper 28	5	2.53258	-2.9875							
Upper 28	6	2.53258	-3.3625							
Upper 28	7	2.53258	-3.7375							
Upper 28	8	2.53258	-4.1125							
Upper 29	1	2.67732	-1.4875							
Upper 29	2	2.67732	-1.8625							
Upper 29	3	2.67732	-2.2375							
Upper 29	4	2.67732	-2.6125							
Upper 29	5	2.67732	-2.9875							
Upper 29	6	2.67732	-3.3625							
Upper 29	7	2.67732	-3.7375							
Upper 29	8	2.67732	-4.1125							
Upper 30	1	2.82206	-1.4875							
Upper 30	2	2.82206	-1.8625							
Upper 30	3	2.82206	-2.2375							
Upper 30	4	2.82206	-2.6125							
Upper 30	5	2.82206	-2.9875							
Upper 30	6	2.82206	-3.3625							
Upper 30	7	2.82206	-3.7375							
Upper 30	8	2.82206	-4.1125							
Upper 31	1	2.9668	-1.4875							
Upper 31	2	2.9668	-1.8625							
Upper 31	3	2.9668	-2.2375							
Upper 31	4	2.9668	-2.6125							
Upper 31	5	2.9668	-2.9875							
Upper 31	6	2.9668	-3.3625							
Upper 31	7	2.9668	-3.7375							
Upper 31	8	2.9668	-4.1125							
Upper 32	1	3.11154	-1.4875	3.57E-05	6.0E-11	1.8E-11	4.0E-12	2.0E-11	7.4E-12	4.5E-12
Upper 32	2	3.11154	-1.8625	2.24E-05	3.8E-11	1.1E-11	2.5E-12	1.2E-11	4.7E-12	2.8E-12
Upper 32	3	3.11154	-2.2375	2.72E-06	4.6E-12	1.4E-12	3.1E-13	1.5E-12	5.7E-13	3.4E-13
Upper 32	4	3.11154	-2.6125	3.87E-06	6.5E-12	1.9E-12	4.4E-13	2.1E-12	8.1E-13	4.9E-13
Upper 32	5	3.11154	-2.9875	2.49E-06	4.2E-12	1.2E-12	2.8E-13	1.4E-12	5.2E-13	3.1E-13
Upper 32	6	3.11154	-3.3625	1.76E-06	2.9E-12	8.7E-13	2.0E-13	9.8E-13	3.7E-13	2.2E-13
Upper 32	7	3.11154	-3.7375	1.60E-06	2.7E-12	7.9E-13	1.8E-13	8.9E-13	3.3E-13	2.0E-13
Upper 32	8	3.11154	-4.1125	1.28E-06	2.1E-12	6.3E-13	1.4E-13	7.1E-13	2.7E-13	1.6E-13
Upper 33	1	3.25628	-1.4875	3.14E-05	5.3E-11	1.6E-11	3.6E-12	1.7E-11	6.5E-12	4.0E-12
Upper 33	2	3.25628	-1.8625	4.14E-05	6.9E-11	2.1E-11	4.7E-12	2.3E-11	8.6E-12	5.2E-12
Upper 33	3	3.25628	-2.2375	3.09E-05	5.2E-11	1.5E-11	3.5E-12	1.7E-11	6.4E-12	3.9E-12
Upper 33	4	3.25628	-2.6125	1.03E-05	1.7E-11	5.1E-12	1.2E-12	5.7E-12	2.1E-12	1.3E-12
Upper 33	5	3.25628	-2.9875	9.65E-07	1.6E-12	4.8E-13	1.1E-13	5.4E-13	2.0E-13	1.2E-13
Upper 33	6	3.25628	-3.3625	9.50E-07	1.6E-12	4.7E-13	1.1E-13	5.3E-13	2.0E-13	1.2E-13
Upper 33	7	3.25628	-3.7375	1.10E-06	1.8E-12	5.4E-13	1.2E-13	6.1E-13	2.3E-13	1.4E-13

Plank	Diaper	O_length	Depth	Q_corrected (l/min)	K_{max} (d=1.15) (m/s)	K_{med} (d=1.15) (m/s)	K_{min} (d=1.15) (m/s)	K_{max} (d=5) (m/s)	K_{med} (d=5) (m/s)	K_{min} (d=5) (m/s)
	Distance from borehole centre:			d=	1.15	1.15	1.15	5	5	5
	Measurement limit K = 5E-14 m/s			Diaper area=	0.04125	0.04125	0.04125	0.04125	0.04125	0.04125
				P (m) in rock=	7.3	24.7	108	50	133.3	220
				Median K=	8.6E-13	2.6E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Upper 33	8	3.25628	-4.1125	9.69E-07	1.6E-12	4.8E-13	1.1E-13	5.4E-13	2.0E-13	1.2E-13
Upper 34	1	3.40102	-1.4875	1.14E-05	1.9E-11	5.7E-12	1.3E-12	6.3E-12	2.4E-12	1.4E-12
Upper 34	2	3.40102	-1.8625	1.31E-06	2.2E-12	6.5E-13	1.5E-13	7.3E-13	2.7E-13	1.7E-13
Upper 34	3	3.40102	-2.2375	1.00E-06	1.7E-12	5.0E-13	1.1E-13	5.6E-13	2.1E-13	1.3E-13
Upper 34	4	3.40102	-2.6125	7.65E-07	1.3E-12	3.8E-13	8.7E-14	4.3E-13	1.6E-13	9.7E-14
Upper 34	5	3.40102	-2.9875	7.07E-07	1.2E-12	3.5E-13	8.0E-14	3.9E-13	1.5E-13	8.9E-14
Upper 34	6	3.40102	-3.3625	9.48E-07	1.6E-12	4.7E-13	1.1E-13	5.3E-13	2.0E-13	1.2E-13
Upper 34	7	3.40102	-3.7375	8.03E-07	1.3E-12	4.0E-13	9.1E-14	4.5E-13	1.7E-13	1.0E-13
Upper 34	8	3.40102	-4.1125	8.77E-07	1.5E-12	4.4E-13	9.9E-14	4.9E-13	1.8E-13	1.1E-13
Upper 35	1	3.54576	-1.4875	2.62E-05	4.4E-11	1.3E-11	3.0E-12	1.5E-11	5.5E-12	3.3E-12
Upper 35	2	3.54576	-1.8625	6.58E-06	1.1E-11	3.3E-12	7.5E-13	3.7E-12	1.4E-12	8.3E-13
Upper 35	3	3.54576	-2.2375	6.63E-07	1.1E-12	3.3E-13	7.5E-14	3.7E-13	1.4E-13	8.4E-14
Upper 35	4	3.54576	-2.6125	7.15E-07	1.2E-12	3.5E-13	8.1E-14	4.0E-13	1.5E-13	9.0E-14
Upper 35	5	3.54576	-2.9875	5.88E-07	9.9E-13	2.9E-13	6.7E-14	3.3E-13	1.2E-13	7.4E-14
Upper 35	6	3.54576	-3.3625	7.88E-07	1.3E-12	3.9E-13	8.9E-14	4.4E-13	1.6E-13	1.0E-13
Upper 35	7	3.54576	-3.7375	7.80E-07	1.3E-12	3.9E-13	8.8E-14	4.3E-13	1.6E-13	9.9E-14
Upper 35	8	3.54576	-4.1125	6.73E-07	1.1E-12	3.3E-13	7.6E-14	3.7E-13	1.4E-13	8.5E-14
Upper 36	1	3.6905	-1.4875	2.82E-05	4.7E-11	1.4E-11	3.2E-12	1.6E-11	5.9E-12	3.6E-12
Upper 36	2	3.6905	-1.8625	1.59E-05	2.7E-11	7.9E-12	1.8E-12	8.8E-12	3.3E-12	2.0E-12
Upper 36	3	3.6905	-2.2375	8.29E-07	1.4E-12	4.1E-13	9.4E-14	4.6E-13	1.7E-13	1.0E-13
Upper 36	4	3.6905	-2.6125	6.88E-07	1.2E-12	3.4E-13	7.8E-14	3.8E-13	1.4E-13	8.7E-14
Upper 36	5	3.6905	-2.9875	5.01E-07	8.4E-13	2.5E-13	5.7E-14	2.8E-13	1.0E-13	6.3E-14
Upper 36	6	3.6905	-3.3625	5.20E-07	8.7E-13	2.6E-13	5.9E-14	2.9E-13	1.1E-13	6.6E-14
Upper 36	7	3.6905	-3.7375	5.40E-07	9.1E-13	2.7E-13	6.1E-14	3.0E-13	1.1E-13	6.8E-14
Upper 36	8	3.6905	-4.1125	5.24E-07	8.8E-13	2.6E-13	5.9E-14	2.9E-13	1.1E-13	6.6E-14
Upper 37	1	3.83524	-1.4875	8.81E-06	1.5E-11	4.4E-12	1.0E-12	4.9E-12	1.8E-12	1.1E-12
Upper 37	2	3.83524	-1.8625	7.32E-07	1.2E-12	3.6E-13	8.3E-14	4.1E-13	1.5E-13	9.2E-14
Upper 37	3	3.83524	-2.2375	7.10E-07	1.2E-12	3.5E-13	8.0E-14	3.9E-13	1.5E-13	9.0E-14
Upper 37	4	3.83524	-2.6125	5.28E-07	8.8E-13	2.6E-13	6.0E-14	2.9E-13	1.1E-13	6.7E-14
Upper 37	5	3.83524	-2.9875	5.29E-07	8.9E-13	2.6E-13	6.0E-14	2.9E-13	1.1E-13	6.7E-14
Upper 37	6	3.83524	-3.3625	4.41E-07	7.4E-13	2.2E-13	5.0E-14	2.4E-13	9.2E-14	5.6E-14
Upper 37	7	3.83524	-3.7375	4.41E-07	7.4E-13	2.2E-13	5.0E-14	2.4E-13	9.2E-14	5.6E-14
Upper 37	8	3.83524	-4.1125	5.30E-07	8.9E-13	2.6E-13	6.0E-14	2.9E-13	1.1E-13	6.7E-14
Upper 38	1	3.97998	-1.4875	4.13E-06	6.9E-12	2.0E-12	4.7E-13	2.3E-12	8.6E-13	5.2E-13
Upper 38	2	3.97998	-1.8625	1.34E-06	2.2E-12	6.6E-13	1.5E-13	7.4E-13	2.8E-13	1.7E-13
Upper 38	3	3.97998	-2.2375	7.54E-07	1.3E-12	3.7E-13	8.5E-14	4.2E-13	1.6E-13	9.5E-14
Upper 38	4	3.97998	-2.6125	5.66E-07	9.5E-13	2.8E-13	6.4E-14	3.1E-13	1.2E-13	7.1E-14
Upper 38	5	3.97998	-2.9875	4.77E-07	8.0E-13	2.4E-13	5.4E-14	2.6E-13	9.9E-14	6.0E-14
Upper 38	6	3.97998	-3.3625	5.38E-07	9.0E-13	2.7E-13	6.1E-14	3.0E-13	1.1E-13	6.8E-14
Upper 38	7	3.97998	-3.7375	5.21E-07	8.7E-13	2.6E-13	5.9E-14	2.9E-13	1.1E-13	6.6E-14
Upper 38	8	3.97998	-4.1125	5.53E-07	9.3E-13	2.7E-13	6.3E-14	3.1E-13	1.2E-13	7.0E-14
Lower 01	1	4.125	-4.7875	2.49E-07	4.2E-13	1.2E-13	5.0E-14	1.4E-13	5.2E-14	5.0E-14
Lower 01	2	4.125	-5.1625	1.67E-07	2.8E-13	8.3E-14	5.0E-14	9.3E-14	5.0E-14	5.0E-14
Lower 01	3	4.125	-5.5375	1.79E-07	3.0E-13	8.9E-14	5.0E-14	1.0E-13	5.0E-14	5.0E-14
Lower 01	4	4.125	-5.9125	2.00E-07	3.4E-13	9.9E-14	5.0E-14	1.1E-13	5.0E-14	5.0E-14
Lower 01	5	4.125	-6.2875	2.82E-07	4.7E-13	1.4E-13	5.0E-14	1.6E-13	5.9E-14	5.0E-14
Lower 01	6	4.125	-6.6625	3.26E-07	5.5E-13	1.6E-13	5.0E-14	1.8E-13	6.8E-14	5.0E-14
Lower 01	7	4.125	-7.0375	3.65E-07	6.1E-13	1.8E-13	5.0E-14	2.0E-13	7.6E-14	5.0E-14
Lower 01	8	4.125	-7.4125	6.15E-07	1.0E-12	3.1E-13	7.0E-14	3.4E-13	1.3E-13	7.8E-14
Lower 02	1	4.26974	-4.7875	4.74E-07	7.9E-13	2.4E-13	5.4E-14	2.6E-13	9.9E-14	6.0E-14
Lower 02	2	4.26974	-5.1625	2.96E-07	5.0E-13	1.5E-13	5.0E-14	1.6E-13	6.2E-14	5.0E-14
Lower 02	3	4.26974	-5.5375	3.83E-07	6.4E-13	1.9E-13	5.0E-14	2.1E-13	8.0E-14	5.0E-14

Plank	Diaper	O_length	Depth	Q_corrected (l/min)	K_{max} (d=1.15) (m/s)	K_{med} (d=1.15) (m/s)	K_{min} (d=1.15) (m/s)	K_{max} (d=5) (m/s)	K_{med} (d=5) (m/s)	K_{min} (d=5) (m/s)
	Distance from borehole centre:			d=	1.15	1.15	1.15	5	5	5
	Measurement limit K = 5E-14 m/s			Diaper area=	0.04125	0.04125	0.04125	0.04125	0.04125	0.04125
				P (m) in rock=	7.3	24.7	108	50	133.3	220
				Median K=	8.6E-13	2.6E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Lower 02	4	4.26974	-5.9125	4.40E-07	7.4E-13	2.2E-13	5.0E-14	2.4E-13	9.2E-14	5.6E-14
Lower 02	5	4.26974	-6.2875	4.37E-07	7.3E-13	2.2E-13	5.0E-14	2.4E-13	9.1E-14	5.5E-14
Lower 02	6	4.26974	-6.6625	5.14E-07	8.6E-13	2.6E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Lower 02	7	4.26974	-7.0375	5.13E-07	8.6E-13	2.5E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Lower 02	8	4.26974	-7.4125	8.25E-07	1.4E-12	4.1E-13	9.3E-14	4.6E-13	1.7E-13	1.0E-13
Lower 03	1	4.41448	-4.7875	4.98E-07	8.3E-13	2.5E-13	5.6E-14	2.8E-13	1.0E-13	6.3E-14
Lower 03	2	4.41448	-5.1625	2.71E-07	4.5E-13	1.3E-13	5.0E-14	1.5E-13	5.6E-14	5.0E-14
Lower 03	3	4.41448	-5.5375	3.88E-07	6.5E-13	1.9E-13	5.0E-14	2.2E-13	8.1E-14	5.0E-14
Lower 03	4	4.41448	-5.9125	2.69E-07	4.5E-13	1.3E-13	5.0E-14	1.5E-13	5.6E-14	5.0E-14
Lower 03	5	4.41448	-6.2875	3.49E-07	5.9E-13	1.7E-13	5.0E-14	1.9E-13	7.3E-14	5.0E-14
Lower 03	6	4.41448	-6.6625	5.44E-07	9.1E-13	2.7E-13	6.2E-14	3.0E-13	1.1E-13	6.9E-14
Lower 03	7	4.41448	-7.0375	5.87E-07	9.8E-13	2.9E-13	6.6E-14	3.3E-13	1.2E-13	7.4E-14
Lower 03	8	4.41448	-7.4125	7.18E-07	1.2E-12	3.6E-13	8.1E-14	4.0E-13	1.5E-13	9.1E-14
Lower 04	1	4.55922	-4.7875	1.84E-06	3.1E-12	9.1E-13	2.1E-13	1.0E-12	3.8E-13	2.3E-13
Lower 04	2	4.55922	-5.1625	3.52E-07	5.9E-13	1.7E-13	5.0E-14	2.0E-13	7.3E-14	5.0E-14
Lower 04	3	4.55922	-5.5375	3.09E-07	5.2E-13	1.5E-13	5.0E-14	1.7E-13	6.4E-14	5.0E-14
Lower 04	4	4.55922	-5.9125	2.77E-07	4.7E-13	1.4E-13	5.0E-14	1.5E-13	5.8E-14	5.0E-14
Lower 04	5	4.55922	-6.2875	2.43E-07	4.1E-13	1.2E-13	5.0E-14	1.4E-13	5.1E-14	5.0E-14
Lower 04	6	4.55922	-6.6625	2.61E-07	4.4E-13	1.3E-13	5.0E-14	1.4E-13	5.4E-14	5.0E-14
Lower 04	7	4.55922	-7.0375	3.10E-07	5.2E-13	1.5E-13	5.0E-14	1.7E-13	6.5E-14	5.0E-14
Lower 04	8	4.55922	-7.4125	6.35E-07	1.1E-12	3.2E-13	7.2E-14	3.5E-13	1.3E-13	8.0E-14
Lower 05	1	4.70396	-4.7875	3.89E-07	6.5E-13	1.9E-13	5.0E-14	2.2E-13	8.1E-14	5.0E-14
Lower 05	2	4.70396	-5.1625	2.78E-08	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 05	3	4.70396	-5.5375	-7.53E-08						
Lower 05	4	4.70396	-5.9125	4.74E-08	8.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 05	5	4.70396	-6.2875	2.08E-07	3.5E-13	1.0E-13	5.0E-14	1.2E-13	5.0E-14	5.0E-14
Lower 05	6	4.70396	-6.6625	4.74E-08	8.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 05	7	4.70396	-7.0375	4.77E-07	8.0E-13	2.4E-13	5.4E-14	2.6E-13	9.9E-14	6.0E-14
Lower 05	8	4.70396	-7.4125	9.74E-07	1.6E-12	4.8E-13	1.1E-13	5.4E-13	2.0E-13	1.2E-13
Lower 06	1	4.8487	-4.7875	1.48E-07	2.5E-13	7.3E-14	5.0E-14	8.2E-14	5.0E-14	5.0E-14
Lower 06	2	4.8487	-5.1625	3.25E-07	5.4E-13	1.6E-13	5.0E-14	1.8E-13	6.8E-14	5.0E-14
Lower 06	3	4.8487	-5.5375	5.41E-07	9.1E-13	2.7E-13	6.1E-14	3.0E-13	1.1E-13	6.8E-14
Lower 06	4	4.8487	-5.9125	3.71E-07	6.2E-13	1.8E-13	5.0E-14	2.1E-13	7.7E-14	5.0E-14
Lower 06	5	4.8487	-6.2875	3.55E-07	5.9E-13	1.8E-13	5.0E-14	2.0E-13	7.4E-14	5.0E-14
Lower 06	6	4.8487	-6.6625	4.76E-07	8.0E-13	2.4E-13	5.4E-14	2.6E-13	9.9E-14	6.0E-14
Lower 06	7	4.8487	-7.0375	1.64E-07	2.7E-13	8.1E-14	5.0E-14	9.1E-14	5.0E-14	5.0E-14
Lower 06	8	4.8487	-7.4125	4.34E-07	7.3E-13	2.2E-13	5.0E-14	2.4E-13	9.0E-14	5.5E-14
Lower 07	1	4.99344	-4.7875	4.59E-07	7.7E-13	2.3E-13	5.2E-14	2.5E-13	9.6E-14	5.8E-14
Lower 07	2	4.99344	-5.1625	3.97E-06	6.7E-12	2.0E-12	4.5E-13	2.2E-12	8.3E-13	5.0E-13
Lower 07	3	4.99344	-5.5375	3.20E-07	5.4E-13	1.6E-13	5.0E-14	1.8E-13	6.7E-14	5.0E-14
Lower 07	4	4.99344	-5.9125	1.74E-07	2.9E-13	8.6E-14	5.0E-14	9.7E-14	5.0E-14	5.0E-14
Lower 07	5	4.99344	-6.2875	2.78E-07	4.7E-13	1.4E-13	5.0E-14	1.5E-13	5.8E-14	5.0E-14
Lower 07	6	4.99344	-6.6625	4.35E-07	7.3E-13	2.2E-13	5.0E-14	2.4E-13	9.1E-14	5.5E-14
Lower 07	7	4.99344	-7.0375	3.56E-07	6.0E-13	1.8E-13	5.0E-14	2.0E-13	7.4E-14	5.0E-14
Lower 07	8	4.99344	-7.4125	5.99E-07	1.0E-12	3.0E-13	6.8E-14	3.3E-13	1.2E-13	7.6E-14
Lower 08	1	5.13818	-4.7875	7.09E-07	1.2E-12	3.5E-13	8.0E-14	3.9E-13	1.5E-13	8.9E-14
Lower 08	2	5.13818	-5.1625	2.42E-07	4.1E-13	1.2E-13	5.0E-14	1.3E-13	5.0E-14	5.0E-14
Lower 08	3	5.13818	-5.5375	2.58E-07	4.3E-13	1.3E-13	5.0E-14	1.4E-13	5.4E-14	5.0E-14
Lower 08	4	5.13818	-5.9125	2.61E-07	4.4E-13	1.3E-13	5.0E-14	1.4E-13	5.4E-14	5.0E-14
Lower 08	5	5.13818	-6.2875	3.07E-07	5.2E-13	1.5E-13	5.0E-14	1.7E-13	6.4E-14	5.0E-14
Lower 08	6	5.13818	-6.6625	3.80E-07	6.4E-13	1.9E-13	5.0E-14	2.1E-13	7.9E-14	5.0E-14
Lower 08	7	5.13818	-7.0375	3.85E-07	6.4E-13	1.9E-13	5.0E-14	2.1E-13	8.0E-14	5.0E-14
Lower 08	8	5.13818	-7.4125	6.17E-07	1.0E-12	3.1E-13	7.0E-14	3.4E-13	1.3E-13	7.8E-14

Plank	Diaper	O_length	Depth	Q_corrected (l/min)	K_{max} (d=1.15) (m/s)	K_{med} (d=1.15) (m/s)	K_{min} (d=1.15) (m/s)	K_{max} (d=5) (m/s)	K_{med} (d=5) (m/s)	K_{min} (d=5) (m/s)
	Distance from borehole centre:			d=	1.15	1.15	1.15	5	5	5
	Measurement limit K = 5E-14 m/s			Diaper area=	0.04125	0.04125	0.04125	0.04125	0.04125	0.04125
				P (m) in rock=	7.3	24.7	108	50	133.3	220
				Median K=	8.6E-13	2.6E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Lower 09	1	5.28292	-4.7875	4.70E-07	7.9E-13	2.3E-13	5.3E-14	2.6E-13	9.8E-14	5.9E-14
Lower 09	2	5.28292	-5.1625	5.24E-07	8.8E-13	2.6E-13	5.9E-14	2.9E-13	1.1E-13	6.6E-14
Lower 09	3	5.28292	-5.5375	3.31E-07	5.6E-13	1.6E-13	5.0E-14	1.8E-13	6.9E-14	5.0E-14
Lower 09	4	5.28292	-5.9125	2.09E-07	3.5E-13	1.0E-13	5.0E-14	1.2E-13	5.0E-14	5.0E-14
Lower 09	5	5.28292	-6.2875	2.62E-07	4.4E-13	1.3E-13	5.0E-14	1.5E-13	5.5E-14	5.0E-14
Lower 09	6	5.28292	-6.6625	3.04E-07	5.1E-13	1.5E-13	5.0E-14	1.7E-13	6.3E-14	5.0E-14
Lower 09	7	5.28292	-7.0375	2.15E-07	3.6E-13	1.1E-13	5.0E-14	1.2E-13	5.0E-14	5.0E-14
Lower 09	8	5.28292	-7.4125	4.03E-07	6.8E-13	2.0E-13	5.0E-14	2.2E-13	8.4E-14	5.1E-14
Lower 10	1	5.42766	-4.7875	6.43E-07	1.1E-12	3.2E-13	7.3E-14	3.6E-13	1.3E-13	8.1E-14
Lower 10	2	5.42766	-5.1625	3.73E-07	6.2E-13	1.8E-13	5.0E-14	2.1E-13	7.8E-14	5.0E-14
Lower 10	3	5.42766	-5.5375	3.15E-07	5.3E-13	1.6E-13	5.0E-14	1.7E-13	6.6E-14	5.0E-14
Lower 10	4	5.42766	-5.9125	1.22E-07	2.0E-13	6.0E-14	5.0E-14	6.8E-14	5.0E-14	5.0E-14
Lower 10	5	5.42766	-6.2875	2.19E-07	3.7E-13	1.1E-13	5.0E-14	1.2E-13	5.0E-14	5.0E-14
Lower 10	6	5.42766	-6.6625	1.24E-07	2.1E-13	6.1E-14	5.0E-14	6.9E-14	5.0E-14	5.0E-14
Lower 10	7	5.42766	-7.0375	1.93E-07	3.2E-13	9.6E-14	5.0E-14	1.1E-13	5.0E-14	5.0E-14
Lower 10	8	5.42766	-7.4125	2.37E-07	4.0E-13	1.2E-13	5.0E-14	1.3E-13	5.0E-14	5.0E-14
Lower 11	1	0.072	-4.7875	2.12E-07	3.6E-13	1.1E-13	5.0E-14	1.2E-13	5.0E-14	5.0E-14
Lower 11	2	0.072	-5.1625	1.45E-07	2.4E-13	7.2E-14	5.0E-14	8.1E-14	5.0E-14	5.0E-14
Lower 11	3	0.072	-5.5375	8.66E-08	1.5E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 11	4	0.072	-5.9125	-2.69E-08						
Lower 11	5	0.072	-6.2875	-3.51E-09						
Lower 11	6	0.072	-6.6625	5.03E-08	8.4E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 11	7	0.072	-7.0375	3.28E-08	5.5E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 11	8	0.072	-7.4125	2.05E-07	3.4E-13	1.0E-13	5.0E-14	1.1E-13	5.0E-14	5.0E-14
Lower 12	1	0.21674	-4.7875	1.08E-07	1.8E-13	5.3E-14	5.0E-14	6.0E-14	5.0E-14	5.0E-14
Lower 12	2	0.21674	-5.1625	8.31E-08	1.4E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 12	3	0.21674	-5.5375	-4.68E-09						
Lower 12	4	0.21674	-5.9125	-9.48E-08						
Lower 12	5	0.21674	-6.2875	-6.55E-08						
Lower 12	6	0.21674	-6.6625	1.40E-08	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 12	7	0.21674	-7.0375	-1.76E-08						
Lower 12	8	0.21674	-7.4125	1.32E-07	2.2E-13	6.6E-14	5.0E-14	7.3E-14	5.0E-14	5.0E-14
Lower 13	1	0.36148	-4.7875	-6.94E-09						
Lower 13	2	0.36148	-5.1625	-2.55E-08						
Lower 13	3	0.36148	-5.5375	3.47E-09	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 13	4	0.36148	-5.9125	-7.41E-08						
Lower 13	5	0.36148	-6.2875	-2.55E-08						
Lower 13	6	0.36148	-6.6625	3.59E-08	6.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 13	7	0.36148	-7.0375	6.71E-08	1.1E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 13	8	0.36148	-7.4125	2.64E-07	4.4E-13	1.3E-13	5.0E-14	1.5E-13	5.5E-14	5.0E-14
Lower 14	1	0.50622	-4.7875	2.66E-08	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 14	2	0.50622	-5.1625	-9.37E-08						
Lower 14	3	0.50622	-5.5375	-3.12E-08						
Lower 14	4	0.50622	-5.9125	-7.87E-08						
Lower 14	5	0.50622	-6.2875	2.43E-08	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 14	6	0.50622	-6.6625	3.47E-08	5.8E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 14	7	0.50622	-7.0375	5.79E-08	9.7E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 14	8	0.50622	-7.4125	1.59E-07	2.7E-13	7.9E-14	5.0E-14	8.8E-14	5.0E-14	5.0E-14
Lower 15	1	0.65096	-4.7875	1.24E-07	2.1E-13	6.1E-14	5.0E-14	6.9E-14	5.0E-14	5.0E-14
Lower 15	2	0.65096	-5.1625	-5.09E-08						
Lower 15	3	0.65096	-5.5375	2.20E-08	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 15	4	0.65096	-5.9125	-9.49E-08						

Plank	Diaper	O_length	Depth	Q_corrected (l/min)	K_{max} (d=1.15) (m/s)	K_{med} (d=1.15) (m/s)	K_{min} (d=1.15) (m/s)	K_{max} (d=5) (m/s)	K_{med} (d=5) (m/s)	K_{min} (d=5) (m/s)
	Distance from borehole centre:			d=	1.15	1.15	1.15	5	5	5
	Measurement limit K = 5E-14 m/s			Diaper area=	0.04125	0.04125	0.04125	0.04125	0.04125	0.04125
				P (m) in rock=	7.3	24.7	108	50	133.3	220
				Median K=	8.6E-13	2.6E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Lower 15	5	0.65096	-6.2875	-1.08E-07						
Lower 15	6	0.65096	-6.6625	7.87E-08	1.3E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 15	7	0.65096	-7.0375	5.90E-08	9.9E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 15	8	0.65096	-7.4125	1.55E-07	2.6E-13	7.7E-14	5.0E-14	8.6E-14	5.0E-14	5.0E-14
Lower 16	1	0.7957	-4.7875	1.01E-07	1.7E-13	5.0E-14	5.0E-14	5.6E-14	5.0E-14	5.0E-14
Lower 16	2	0.7957	-5.1625	3.24E-08	5.4E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 16	3	0.7957	-5.5375	1.39E-07	2.3E-13	6.9E-14	5.0E-14	7.7E-14	5.0E-14	5.0E-14
Lower 16	4	0.7957	-5.9125	-3.59E-08						
Lower 16	5	0.7957	-6.2875	-4.75E-08						
Lower 16	6	0.7957	-6.6625	-1.86E-07						
Lower 16	7	0.7957	-7.0375	1.62E-08	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 16	8	0.7957	-7.4125	1.63E-07	2.7E-13	8.1E-14	5.0E-14	9.1E-14	5.0E-14	5.0E-14
Lower 17	1	0.94044	-4.7875	1.75E-07	2.9E-13	8.7E-14	5.0E-14	9.7E-14	5.0E-14	5.0E-14
Lower 17	2	0.94044	-5.1625	1.38E-07	2.3E-13	6.8E-14	5.0E-14	7.7E-14	5.0E-14	5.0E-14
Lower 17	3	0.94044	-5.5375	2.55E-08	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 17	4	0.94044	-5.9125	-5.79E-08						
Lower 17	5	0.94044	-6.2875	-9.26E-09						
Lower 17	6	0.94044	-6.6625	3.01E-08	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 17	7	0.94044	-7.0375	1.04E-08	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 17	8	0.94044	-7.4125	3.09E-07	5.2E-13	1.5E-13	5.0E-14	1.7E-13	6.4E-14	5.0E-14
Lower 18	1	1.08518	-4.7875	4.44E-07	7.4E-13	2.2E-13	5.0E-14	2.5E-13	9.2E-14	5.6E-14
Lower 18	2	1.08518	-5.1625	2.13E-07	3.6E-13	1.1E-13	5.0E-14	1.2E-13	5.0E-14	5.0E-14
Lower 18	3	1.08518	-5.5375	5.68E-08	9.5E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 18	4	1.08518	-5.9125	3.48E-09	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 18	5	1.08518	-6.2875	2.32E-08	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 18	6	1.08518	-6.6625	1.23E-07	2.1E-13	6.1E-14	5.0E-14	6.8E-14	5.0E-14	5.0E-14
Lower 18	7	1.08518	-7.0375	5.21E-08	8.7E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 18	8	1.08518	-7.4125	2.31E-07	3.9E-13	1.1E-13	5.0E-14	1.3E-13	5.0E-14	5.0E-14
Lower 19	1	1.22992	-4.7875	3.82E-07	6.4E-13	1.9E-13	5.0E-14	2.1E-13	8.0E-14	5.0E-14
Lower 19	2	1.22992	-5.1625	3.62E-07	6.1E-13	1.8E-13	5.0E-14	2.0E-13	7.5E-14	5.0E-14
Lower 19	3	1.22992	-5.5375	2.64E-07	4.4E-13	1.3E-13	5.0E-14	1.5E-13	5.5E-14	5.0E-14
Lower 19	4	1.22992	-5.9125	2.10E-07	3.5E-13	1.0E-13	5.0E-14	1.2E-13	5.0E-14	5.0E-14
Lower 19	5	1.22992	-6.2875	2.66E-07	4.5E-13	1.3E-13	5.0E-14	1.5E-13	5.5E-14	5.0E-14
Lower 19	6	1.22992	-6.6625	5.41E-07	9.1E-13	2.7E-13	6.1E-14	3.0E-13	1.1E-13	6.8E-14
Lower 19	7	1.22992	-7.0375	3.33E-07	5.6E-13	1.7E-13	5.0E-14	1.8E-13	6.9E-14	5.0E-14
Lower 19	8	1.22992	-7.4125	5.98E-07	1.0E-12	3.0E-13	6.8E-14	3.3E-13	1.2E-13	7.6E-14
Lower 20	1	1.37466	-4.7875	5.40E-08	9.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 20	2	1.37466	-5.1625	3.11E-07	5.2E-13	1.5E-13	5.0E-14	1.7E-13	6.5E-14	5.0E-14
Lower 20	3	1.37466	-5.5375	8.96E-08	1.5E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 20	4	1.37466	-5.9125	1.06E-07	1.8E-13	5.2E-14	5.0E-14	5.9E-14	5.0E-14	5.0E-14
Lower 20	5	1.37466	-6.2875	1.17E-07	2.0E-13	5.8E-14	5.0E-14	6.5E-14	5.0E-14	5.0E-14
Lower 20	6	1.37466	-6.6625	2.06E-07	3.4E-13	1.0E-13	5.0E-14	1.1E-13	5.0E-14	5.0E-14
Lower 20	7	1.37466	-7.0375	1.86E-07	3.1E-13	9.2E-14	5.0E-14	1.0E-13	5.0E-14	5.0E-14
Lower 20	8	1.37466	-7.4125	3.36E-07	5.6E-13	1.7E-13	5.0E-14	1.9E-13	7.0E-14	5.0E-14
Lower 21	1	1.5194	-4.7875	7.17E-08	1.2E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 21	2	1.5194	-5.1625	6.69E-07	1.1E-12	3.3E-13	7.6E-14	3.7E-13	1.4E-13	8.4E-14
Lower 21	3	1.5194	-5.5375	8.79E-08	1.5E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 21	4	1.5194	-5.9125	6.01E-08	1.0E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 21	5	1.5194	-6.2875	3.24E-08	5.4E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 21	6	1.5194	-6.6625	9.37E-08	1.6E-13	5.0E-14	5.0E-14	5.2E-14	5.0E-14	5.0E-14
Lower 21	7	1.5194	-7.0375	7.52E-08	1.3E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 21	8	1.5194	-7.4125	3.20E-07	5.4E-13	1.6E-13	5.0E-14	1.8E-13	6.7E-14	5.0E-14

Plank	Diaper	O_length	Depth	Q_corrected (l/min)	K_{max} (d=1.15) (m/s)	K_{med} (d=1.15) (m/s)	K_{min} (d=1.15) (m/s)	K_{max} (d=5) (m/s)	K_{med} (d=5) (m/s)	K_{min} (d=5) (m/s)
	Distance from borehole centre:			d=	1.15	1.15	1.15	5	5	5
	Measurement limit K = 5E-14 m/s			Diaper area=	0.04125	0.04125	0.04125	0.04125	0.04125	0.04125
				P (m) in rock=	7.3	24.7	108	50	133.3	220
				Median K=	8.6E-13	2.6E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Lower 22	1	1.66414	-4.7875	7.65E-07	1.3E-12	3.8E-13	8.7E-14	4.2E-13	1.6E-13	9.7E-14
Lower 22	2	1.66414	-5.1625	7.79E-07	1.3E-12	3.9E-13	8.8E-14	4.3E-13	1.6E-13	9.8E-14
Lower 22	3	1.66414	-5.5375	6.48E-08	1.1E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 22	4	1.66414	-5.9125	7.87E-08	1.3E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 22	5	1.66414	-6.2875	1.03E-07	1.7E-13	5.1E-14	5.0E-14	5.7E-14	5.0E-14	5.0E-14
Lower 22	6	1.66414	-6.6625	1.25E-07	2.1E-13	6.2E-14	5.0E-14	6.9E-14	5.0E-14	5.0E-14
Lower 22	7	1.66414	-7.0375	1.84E-07	3.1E-13	9.1E-14	5.0E-14	1.0E-13	5.0E-14	5.0E-14
Lower 22	8	1.66414	-7.4125	3.17E-07	5.3E-13	1.6E-13	5.0E-14	1.8E-13	6.6E-14	5.0E-14
Lower 23	1	1.80888	-4.7875	1.42E-06	2.4E-12	7.0E-13	1.6E-13	7.9E-13	2.9E-13	1.8E-13
Lower 23	2	1.80888	-5.1625	2.41E-07	4.0E-13	1.2E-13	5.0E-14	1.3E-13	5.0E-14	5.0E-14
Lower 23	3	1.80888	-5.5375	1.39E-07	2.3E-13	6.9E-14	5.0E-14	7.7E-14	5.0E-14	5.0E-14
Lower 23	4	1.80888	-5.9125	1.39E-07	2.3E-13	6.9E-14	5.0E-14	7.7E-14	5.0E-14	5.0E-14
Lower 23	5	1.80888	-6.2875	1.04E-07	1.7E-13	5.2E-14	5.0E-14	5.8E-14	5.0E-14	5.0E-14
Lower 23	6	1.80888	-6.6625	1.75E-07	2.9E-13	8.7E-14	5.0E-14	9.7E-14	5.0E-14	5.0E-14
Lower 23	7	1.80888	-7.0375	2.21E-07	3.7E-13	1.1E-13	5.0E-14	1.2E-13	5.0E-14	5.0E-14
Lower 23	8	1.80888	-7.4125	3.62E-07	6.1E-13	1.8E-13	5.0E-14	2.0E-13	7.5E-14	5.0E-14
Lower 24	1	1.95362	-4.7875	2.86E-07	4.8E-13	1.4E-13	5.0E-14	1.6E-13	6.0E-14	5.0E-14
Lower 24	2	1.95362	-5.1625	3.94E-08	6.6E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 24	3	1.95362	-5.5375	8.57E-08	1.4E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 24	4	1.95362	-5.9125	1.26E-07	2.1E-13	6.3E-14	5.0E-14	7.0E-14	5.0E-14	5.0E-14
Lower 24	5	1.95362	-6.2875	4.98E-08	8.3E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 24	6	1.95362	-6.6625	1.38E-07	2.3E-13	6.8E-14	5.0E-14	7.7E-14	5.0E-14	5.0E-14
Lower 24	7	1.95362	-7.0375	1.19E-07	2.0E-13	5.9E-14	5.0E-14	6.6E-14	5.0E-14	5.0E-14
Lower 24	8	1.95362	-7.4125	5.07E-07	8.5E-13	2.5E-13	5.7E-14	2.8E-13	1.1E-13	6.4E-14
Lower 25	1	2.09836	-4.7875	6.86E-07	1.1E-12	3.4E-13	7.8E-14	3.8E-13	1.4E-13	8.7E-14
Lower 25	2	2.09836	-5.1625	-4.61E-08						
Lower 25	3	2.09836	-5.5375	-2.01E-08						
Lower 25	4	2.09836	-5.9125	4.73E-08	7.9E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 25	5	2.09836	-6.2875	9.93E-08	1.7E-13	5.0E-14	5.0E-14	5.5E-14	5.0E-14	5.0E-14
Lower 25	6	2.09836	-6.6625	1.19E-07	2.0E-13	5.9E-14	5.0E-14	6.6E-14	5.0E-14	5.0E-14
Lower 25	7	2.09836	-7.0375	9.93E-08	1.7E-13	5.0E-14	5.0E-14	5.5E-14	5.0E-14	5.0E-14
Lower 25	8	2.09836	-7.4125	4.49E-07	7.5E-13	2.2E-13	5.1E-14	2.5E-13	9.4E-14	5.7E-14
Lower 26	1	2.2431	-4.7875	1.02E-05	1.7E-11	5.1E-12	1.2E-12	5.7E-12	2.1E-12	1.3E-12
Lower 26	2	2.2431	-5.1625	1.52E-06	2.5E-12	7.5E-13	1.7E-13	8.4E-13	3.2E-13	1.9E-13
Lower 26	3	2.2431	-5.5375	1.24E-07	2.1E-13	6.2E-14	5.0E-14	6.9E-14	5.0E-14	5.0E-14
Lower 26	4	2.2431	-5.9125	1.05E-07	1.8E-13	5.2E-14	5.0E-14	5.8E-14	5.0E-14	5.0E-14
Lower 26	5	2.2431	-6.2875	2.01E-07	3.4E-13	1.0E-13	5.0E-14	1.1E-13	5.0E-14	5.0E-14
Lower 26	6	2.2431	-6.6625	2.67E-07	4.5E-13	1.3E-13	5.0E-14	1.5E-13	5.6E-14	5.0E-14
Lower 26	7	2.2431	-7.0375	3.37E-07	5.6E-13	1.7E-13	5.0E-14	1.9E-13	7.0E-14	5.0E-14
Lower 26	8	2.2431	-7.4125	8.36E-07	1.4E-12	4.1E-13	9.5E-14	4.6E-13	1.7E-13	1.1E-13
Lower 27	1	2.38784	-4.7875							
Lower 27	2	2.38784	-5.1625							
Lower 27	3	2.38784	-5.5375							
Lower 27	4	2.38784	-5.9125							
Lower 27	5	2.38784	-6.2875							
Lower 27	6	2.38784	-6.6625							
Lower 27	7	2.38784	-7.0375							
Lower 27	8	2.38784	-7.4125							
Lower 28	1	2.53258	-4.7875							
Lower 28	2	2.53258	-5.1625							
Lower 28	3	2.53258	-5.5375							
Lower 28	4	2.53258	-5.9125							
Lower 28	5	2.53258	-6.2875							

Plank	Diaper	O_length	Depth	Q_corrected	K_{max} (d=1.15)	K_{med} (d=1.15)	K_{min} (d=1.15)	K_{max} (d=5)	K_{med} (d=5)	K_{min} (d=5)
				(l/min)	(m/s)	(m/s)	(m/s)	(m/s)	(m/s)	(m/s)
	Distance from borehole centre:			d=	1.15	1.15	1.15	5	5	5
	Measurement limit K = 5E-14 m/s			Diaper area=	0.04125	0.04125	0.04125	0.04125	0.04125	0.04125
				P (m) in rock=	7.3	24.7	108	50	133.3	220
				Median K=	8.6E-13	2.6E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Lower 28	6	2.53258	-6.6625							
Lower 28	7	2.53258	-7.0375							
Lower 28	8	2.53258	-7.4125							
Lower 29	1	2.67732	-4.7875							
Lower 29	2	2.67732	-5.1625							
Lower 29	3	2.67732	-5.5375							
Lower 29	4	2.67732	-5.9125							
Lower 29	5	2.67732	-6.2875							
Lower 29	6	2.67732	-6.6625							
Lower 29	7	2.67732	-7.0375							
Lower 29	8	2.67732	-7.4125							
Lower 30	1	2.82206	-4.7875							
Lower 30	2	2.82206	-5.1625							
Lower 30	3	2.82206	-5.5375							
Lower 30	4	2.82206	-5.9125							
Lower 30	5	2.82206	-6.2875							
Lower 30	6	2.82206	-6.6625							
Lower 30	7	2.82206	-7.0375							
Lower 30	8	2.82206	-7.4125							
Lower 31	1	2.9668	-4.7875							
Lower 31	2	2.9668	-5.1625							
Lower 31	3	2.9668	-5.5375							
Lower 31	4	2.9668	-5.9125							
Lower 31	5	2.9668	-6.2875							
Lower 31	6	2.9668	-6.6625							
Lower 31	7	2.9668	-7.0375							
Lower 31	8	2.9668	-7.4125							
Lower 32	1	3.11154	-4.7875	1.07E-05	1.8E-11	5.3E-12	1.2E-12	5.9E-12	2.2E-12	1.3E-12
Lower 32	2	3.11154	-5.1625	9.47E-07	1.6E-12	4.7E-13	1.1E-13	5.3E-13	2.0E-13	1.2E-13
Lower 32	3	3.11154	-5.5375	2.82E-07	4.7E-13	1.4E-13	5.0E-14	1.6E-13	5.9E-14	5.0E-14
Lower 32	4	3.11154	-5.9125	2.09E-07	3.5E-13	1.0E-13	5.0E-14	1.2E-13	5.0E-14	5.0E-14
Lower 32	5	3.11154	-6.2875	4.19E-07	7.0E-13	2.1E-13	5.0E-14	2.3E-13	8.7E-14	5.3E-14
Lower 32	6	3.11154	-6.6625	5.35E-07	9.0E-13	2.7E-13	6.1E-14	3.0E-13	1.1E-13	6.8E-14
Lower 32	7	3.11154	-7.0375	5.67E-07	9.5E-13	2.8E-13	6.4E-14	3.1E-13	1.2E-13	7.2E-14
Lower 32	8	3.11154	-7.4125	4.40E-07	7.4E-13	2.2E-13	5.0E-14	2.4E-13	9.2E-14	5.6E-14
Lower 33	1	3.25628	-4.7875	8.51E-07	1.4E-12	4.2E-13	9.6E-14	4.7E-13	1.8E-13	1.1E-13
Lower 33	2	3.25628	-5.1625	2.72E-07	4.6E-13	1.4E-13	5.0E-14	1.5E-13	5.7E-14	5.0E-14
Lower 33	3	3.25628	-5.5375	8.88E-08	1.5E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 33	4	3.25628	-5.9125	7.83E-08	1.3E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 33	5	3.25628	-6.2875	1.83E-07	3.1E-13	9.1E-14	5.0E-14	1.0E-13	5.0E-14	5.0E-14
Lower 33	6	3.25628	-6.6625	3.74E-07	6.3E-13	1.9E-13	5.0E-14	2.1E-13	7.8E-14	5.0E-14
Lower 33	7	3.25628	-7.0375	7.65E-07	1.3E-12	3.8E-13	8.7E-14	4.3E-13	1.6E-13	9.7E-14
Lower 33	8	3.25628	-7.4125	8.28E-07	1.4E-12	4.1E-13	9.4E-14	4.6E-13	1.7E-13	1.0E-13
Lower 34	1	3.40102	-4.7875	2.15E-07	3.6E-13	1.1E-13	5.0E-14	1.2E-13	5.0E-14	5.0E-14
Lower 34	2	3.40102	-5.1625	8.88E-08	1.5E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 34	3	3.40102	-5.5375	-4.68E-08						
Lower 34	4	3.40102	-5.9125	1.52E-08	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 34	5	3.40102	-6.2875	4.21E-08	7.1E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 34	6	3.40102	-6.6625	2.79E-07	4.7E-13	1.4E-13	5.0E-14	1.6E-13	5.8E-14	5.0E-14
Lower 34	7	3.40102	-7.0375	4.45E-07	7.5E-13	2.2E-13	5.0E-14	2.5E-13	9.3E-14	5.6E-14
Lower 34	8	3.40102	-7.4125	7.32E-07	1.2E-12	3.6E-13	8.3E-14	4.1E-13	1.5E-13	9.2E-14
Lower 35	1	3.54576	-4.7875	1.81E-07	3.0E-13	9.0E-14	5.0E-14	1.0E-13	5.0E-14	5.0E-14

Plank	Diaper	O_length	Depth	Q_corrected (l/min)	K_{max} (d=1.15) (m/s)	K_{med} (d=1.15) (m/s)	K_{min} (d=1.15) (m/s)	K_{max} (d=5) (m/s)	K_{med} (d=5) (m/s)	K_{min} (d=5) (m/s)
	Distance from borehole centre:			d=	1.15	1.15	1.15	5	5	5
	Measurement limit K = 5E-14 m/s			Diaper area=	0.04125	0.04125	0.04125	0.04125	0.04125	0.04125
				P (m) in rock=	7.3	24.7	108	50	133.3	220
				Median K=	8.6E-13	2.6E-13	5.8E-14	2.9E-13	1.1E-13	6.5E-14
Lower 35	2	3.54576	-5.1625	5.73E-08	9.6E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 35	3	3.54576	-5.5375	-2.69E-08						
Lower 35	4	3.54576	-5.9125	-4.68E-08						
Lower 35	5	3.54576	-6.2875	8.65E-08	1.5E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 35	6	3.54576	-6.6625	5.48E-07	9.2E-13	2.7E-13	6.2E-14	3.0E-13	1.1E-13	6.9E-14
Lower 35	7	3.54576	-7.0375	3.60E-07	6.0E-13	1.8E-13	5.0E-14	2.0E-13	7.5E-14	5.0E-14
Lower 35	8	3.54576	-7.4125	5.38E-07	9.0E-13	2.7E-13	6.1E-14	3.0E-13	1.1E-13	6.8E-14
Lower 36	1	3.6905	-4.7875	8.89E-08	1.5E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 36	2	3.6905	-5.1625	7.25E-08	1.2E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 36	3	3.6905	-5.5375	-9.36E-09						
Lower 36	4	3.6905	-5.9125	4.09E-08	6.9E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 36	5	3.6905	-6.2875	1.68E-07	2.8E-13	8.4E-14	5.0E-14	9.4E-14	5.0E-14	5.0E-14
Lower 36	6	3.6905	-6.6625	3.68E-07	6.2E-13	1.8E-13	5.0E-14	2.0E-13	7.7E-14	5.0E-14
Lower 36	7	3.6905	-7.0375	5.89E-07	9.9E-13	2.9E-13	6.7E-14	3.3E-13	1.2E-13	7.4E-14
Lower 36	8	3.6905	-7.4125	7.46E-07	1.3E-12	3.7E-13	8.5E-14	4.1E-13	1.6E-13	9.4E-14
Lower 37	1	3.83524	-4.7875	1.35E-07	2.3E-13	6.7E-14	5.0E-14	7.5E-14	5.0E-14	5.0E-14
Lower 37	2	3.83524	-5.1625	-1.87E-08						
Lower 37	3	3.83524	-5.5375	-1.87E-08						
Lower 37	4	3.83524	-5.9125	5.85E-09	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 37	5	3.83524	-6.2875	7.25E-08	1.2E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 37	6	3.83524	-6.6625	2.04E-07	3.4E-13	1.0E-13	5.0E-14	1.1E-13	5.0E-14	5.0E-14
Lower 37	7	3.83524	-7.0375	2.44E-07	4.1E-13	1.2E-13	5.0E-14	1.4E-13	5.1E-14	5.0E-14
Lower 37	8	3.83524	-7.4125	3.91E-07	6.5E-13	1.9E-13	5.0E-14	2.2E-13	8.1E-14	5.0E-14
Lower 38	1	3.97998	-4.7875	6.79E-08	1.1E-13	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 38	2	3.97998	-5.1625	2.69E-08	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 38	3	3.97998	-5.5375	4.33E-07	7.3E-13	2.1E-13	5.0E-14	2.4E-13	9.0E-14	5.5E-14
Lower 38	4	3.97998	-5.9125	5.62E-08	9.4E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14	5.0E-14
Lower 38	5	3.97998	-6.2875	1.01E-07	1.7E-13	5.0E-14	5.0E-14	5.6E-14	5.0E-14	5.0E-14
Lower 38	6	3.97998	-6.6625	1.47E-07	2.5E-13	7.3E-14	5.0E-14	8.2E-14	5.0E-14	5.0E-14
Lower 38	7	3.97998	-7.0375	1.87E-07	3.1E-13	9.3E-14	5.0E-14	1.0E-13	5.0E-14	5.0E-14
Lower 38	8	3.97998	-7.4125	6.07E-07	1.0E-12	3.0E-13	6.9E-14	3.4E-13	1.3E-13	7.7E-14

Part 3 Statistics of hydraulic conductivity estimations

This part presents the detatiled result of a one-variable analysis of the hydraulic conductivity presented in Part 2 in this appendix. The software used is Statgraphics version 4.0.

Distribution characteristics presented in Chapter 4 is estimated from the dashed line, if it is drawn in the figures below, and from the calculated characteristics otherwise.

Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37

Analysis Summary

Data variable: Log_Kmin_1.15_m

497 values ranging from -13.6042 to -11.3279

The StatAdvisor

This procedure is designed to summarize a single sample of data. It will calculate various statistics and graphs. Also included in the procedure are confidence intervals and hypothesis tests. Use the Tabular Options and Graphical Options buttons on the analysis toolbar to access these different procedures.

Summary Statistics for Log_Kmin_1.15_m

Count = 497
Average = -12.9691
Median = -13.2366
Mode = -13.301
Geometric mean =
Variance = 0.292174
Standard deviation = 0.540532
Standard error = 0.0242462
Minimum = -13.6042
Maximum = -11.3279
Range = 2.27626
Lower quartile = -13.301
Upper quartile = -12.9586
Interquartile range = 0.342423
Skewness = 1.80472
Stnd. skewness = 16.4253
Kurtosis = 2.00778
Stnd. kurtosis = 9.13667
Coeff. of variation = -4.16783%
Sum = -6445.66

The StatAdvisor

This table shows summary statistics for Log_Kmin_1.15_m. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37

Percentiles for Log_Kmin_1.15_m

1.0% = -13.301
5.0% = -13.301
10.0% = -13.301
25.0% = -13.301
50.0% = -13.2366
75.0% = -12.9586
90.0% = -11.9208
95.0% = -11.5376
99.0% = -11.3979

The StatAdvisor

This pane shows sample percentiles for Log_Kmin_1.15_m. The percentiles are values below which specific percentages of the data are found. You can see the percentiles graphically by selecting Quantile Plot from the list of Graphical Options.

Frequency Tabulation for Log_Kmin_1.15_m

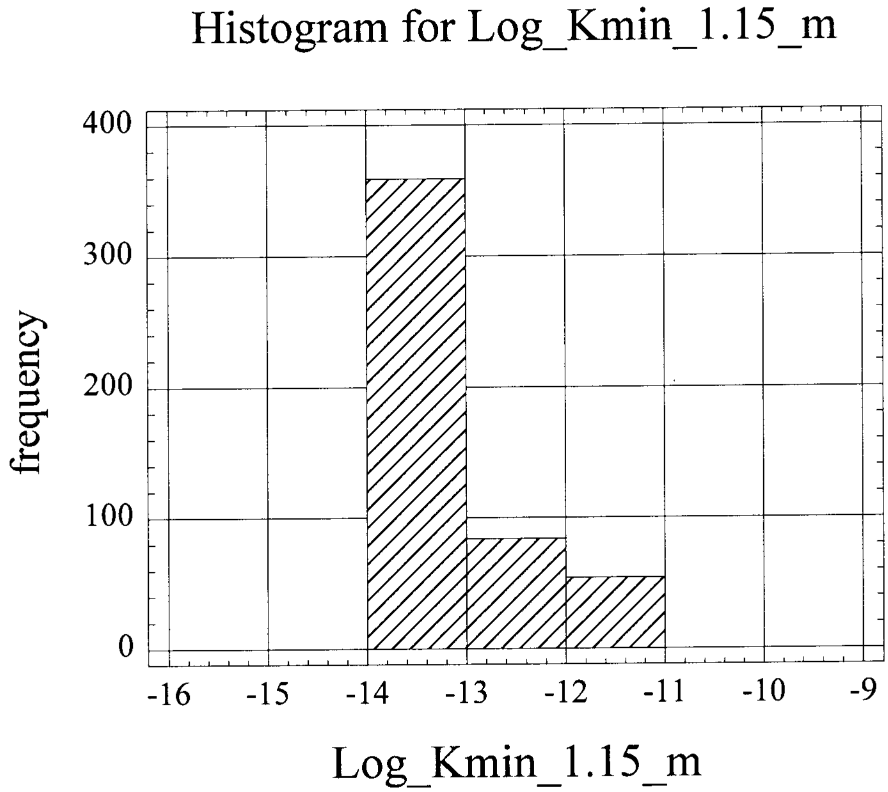
Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		-16.0		0	0.0000	0	0.0000
1	-16.0	-15.0	-15.5	0	0.0000	0	0.0000
2	-15.0	-14.0	-14.5	0	0.0000	0	0.0000
3	-14.0	-13.0	-13.5	359	0.7223	359	0.7223
4	-13.0	-12.0	-12.5	84	0.1690	443	0.8913
5	-12.0	-11.0	-11.5	54	0.1087	497	1.0000
6	-11.0	-10.0	-10.5	0	0.0000	497	1.0000
7	-10.0	-9.0	-9.5	0	0.0000	497	1.0000
above	-9.0			0	0.0000	497	1.0000

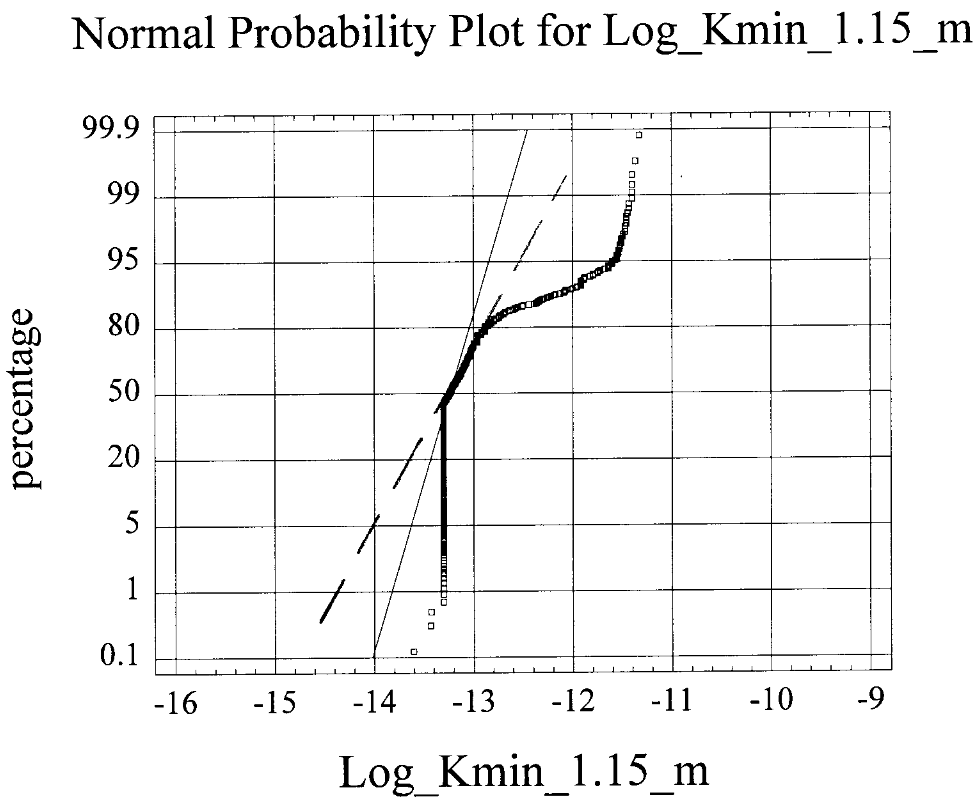
Mean = -12.9691 Standard deviation = 0.540532

The StatAdvisor

This option performs a frequency tabulation by dividing the range of Log_Kmin_1.15_m into equal width intervals and counting the number of data values in each interval. The frequencies show the number of data values in each interval, while the relative frequencies show the proportions in each interval. You can change the definition of the intervals by pressing the alternate mouse button and selecting Pane Options. You can see the results of the tabulation graphically by selecting Frequency Histogram from the list of Graphical Options.

Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37





Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37

Analysis Summary

Data variable: Log_Kmean_1.15_m

497 values ranging from -13.301 to -10.6778

The StatAdvisor

This procedure is designed to summarize a single sample of data. It will calculate various statistics and graphs. Also included in the procedure are confidence intervals and hypothesis tests. Use the Tabular Options and Graphical Options buttons on the analysis toolbar to access these different procedures.

Summary Statistics for Log_Kmean_1.15_m

Count = 497
Average = -12.4869
Median = -12.585
Mode = -13.301
Geometric mean =
Variance = 0.453808
Standard deviation = 0.673652
Standard error = 0.0302174
Minimum = -13.301
Maximum = -10.6778
Range = 2.62325
Lower quartile = -12.9586
Upper quartile = -12.301
Interquartile range = 0.657577
Skewness = 1.07323
Stnd. skewness = 9.76779
Kurtosis = 0.560002
Stnd. kurtosis = 2.54837
Coeff. of variation = -5.39487%
Sum = -6206.0

The StatAdvisor

This table shows summary statistics for Log_Kmean_1.15_m. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37

Percentiles for Log_Kmean_1.15_m

1.0% = -13.301
5.0% = -13.301
10.0% = -13.301
25.0% = -12.9586
50.0% = -12.585
75.0% = -12.301
90.0% = -11.2757
95.0% = -10.8861
99.0% = -10.7447

The StatAdvisor

This pane shows sample percentiles for Log_Kmean_1.15_m. The percentiles are values below which specific percentages of the data are found. You can see the percentiles graphically by selecting Quantile Plot from the list of Graphical Options.

Frequency Tabulation for Log_Kmean_1.15_m

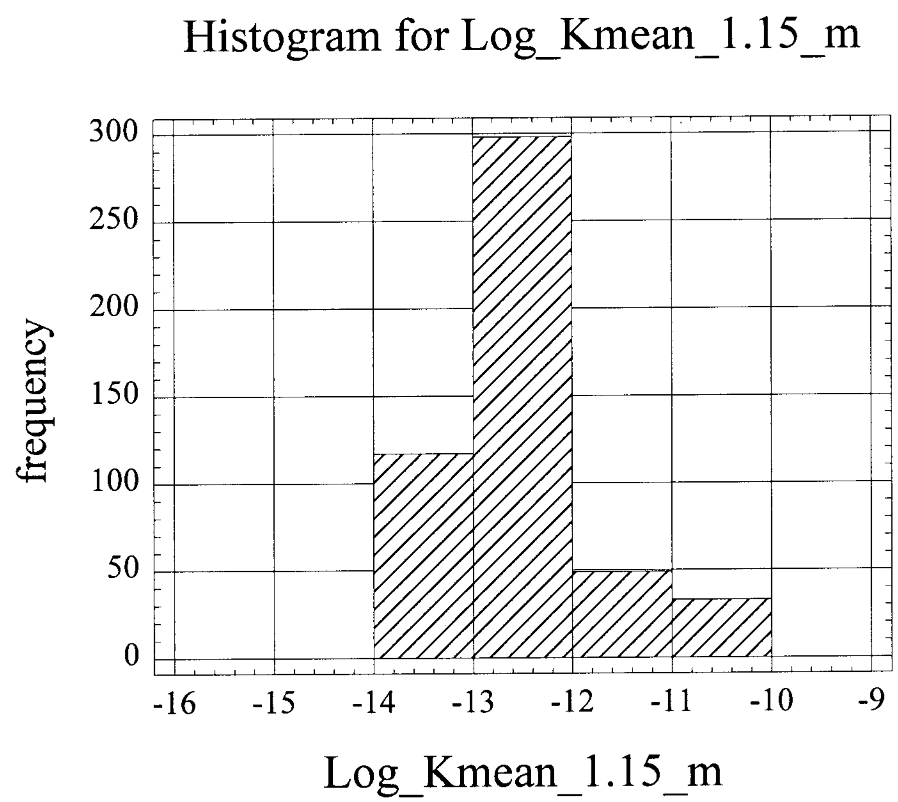
Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		-16.0		0	0.0000	0	0.0000
1	-16.0	-15.0	-15.5	0	0.0000	0	0.0000
2	-15.0	-14.0	-14.5	0	0.0000	0	0.0000
3	-14.0	-13.0	-13.5	117	0.2354	117	0.2354
4	-13.0	-12.0	-12.5	298	0.5996	415	0.8350
5	-12.0	-11.0	-11.5	49	0.0986	464	0.9336
6	-11.0	-10.0	-10.5	33	0.0664	497	1.0000
7	-10.0	-9.0	-9.5	0	0.0000	497	1.0000
above	-9.0			0	0.0000	497	1.0000

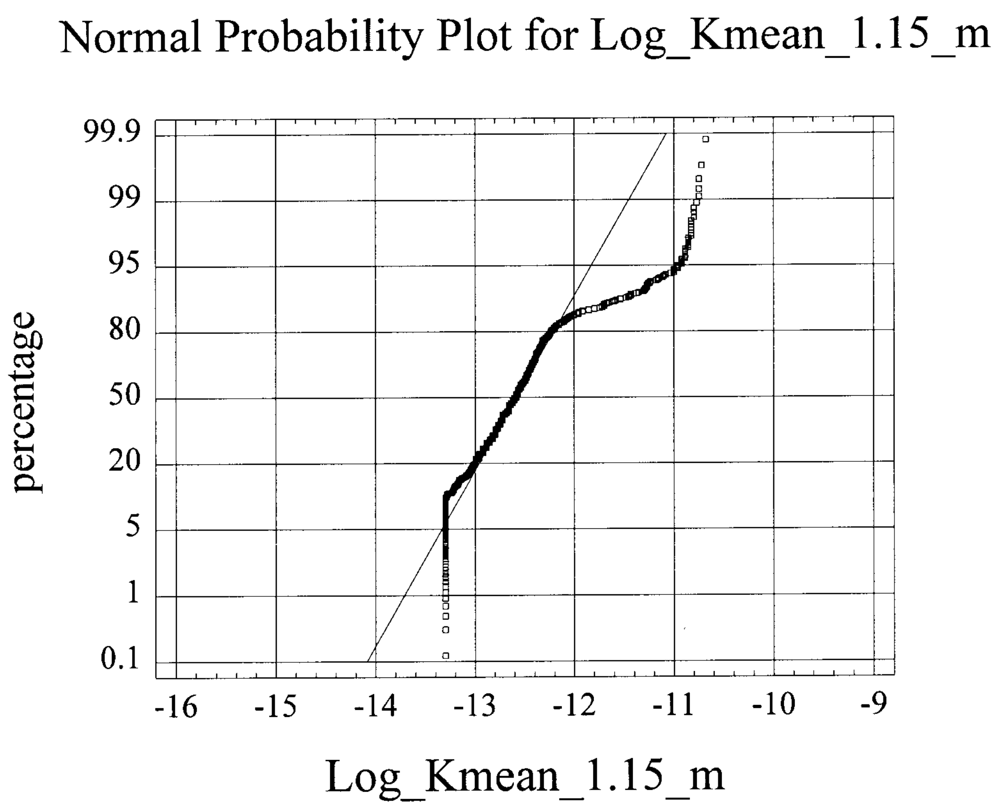
Mean = -12.4869 Standard deviation = 0.673652

The StatAdvisor

This option performs a frequency tabulation by dividing the range of Log_Kmean_1.15_m into equal width intervals and counting the number of data values in each interval. The frequencies show the number of data values in each interval, while the relative frequencies show the proportions in each interval. You can change the definition of the intervals by pressing the alternate mouse button and selecting Pane Options. You can see the results of the tabulation graphically by selecting Frequency Histogram from the list of Graphical Options.

Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37





Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37

Analysis Summary

Data variable: Log_Kmax_1.15_m

497 values ranging from -13.301 to -10.1612

The StatAdvisor

This procedure is designed to summarize a single sample of data. It will calculate various statistics and graphs. Also included in the procedure are confidence intervals and hypothesis tests. Use the Tabular Options and Graphical Options buttons on the analysis toolbar to access these different procedures.

Summary Statistics for Log_Kmax_1.15_m

Count = 497
Average = -11.9926
Median = -12.0655
Mode = -11.8539
Geometric mean =
Variance = 0.52293
Standard deviation = 0.723139
Standard error = 0.0324372
Minimum = -13.301
Maximum = -10.1612
Range = 3.13988
Lower quartile = -12.4318
Upper quartile = -11.7696
Interquartile range = 0.662247
Skewness = 0.718837
Stnd. skewness = 6.54234
Kurtosis = 0.375087
Stnd. kurtosis = 1.70689
Coeff. of variation = -6.02986%
Sum = -5960.33

The StatAdvisor

This table shows summary statistics for Log_Kmax_1.15_m. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is within the range expected for data from a normal distribution.

Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37

Percentiles for Log_Kmax_1.15_m

1.0% = -13.301
5.0% = -13.0969
10.0% = -12.8239
25.0% = -12.4318
50.0% = -12.0655
75.0% = -11.7696
90.0% = -10.7447
95.0% = -10.3665
99.0% = -10.2291

The StatAdvisor

This pane shows sample percentiles for Log_Kmax_1.15_m. The percentiles are values below which specific percentages of the data are found. You can see the percentiles graphically by selecting Quantile Plot from the list of Graphical Options.

Frequency Tabulation for Log_Kmax_1.15_m

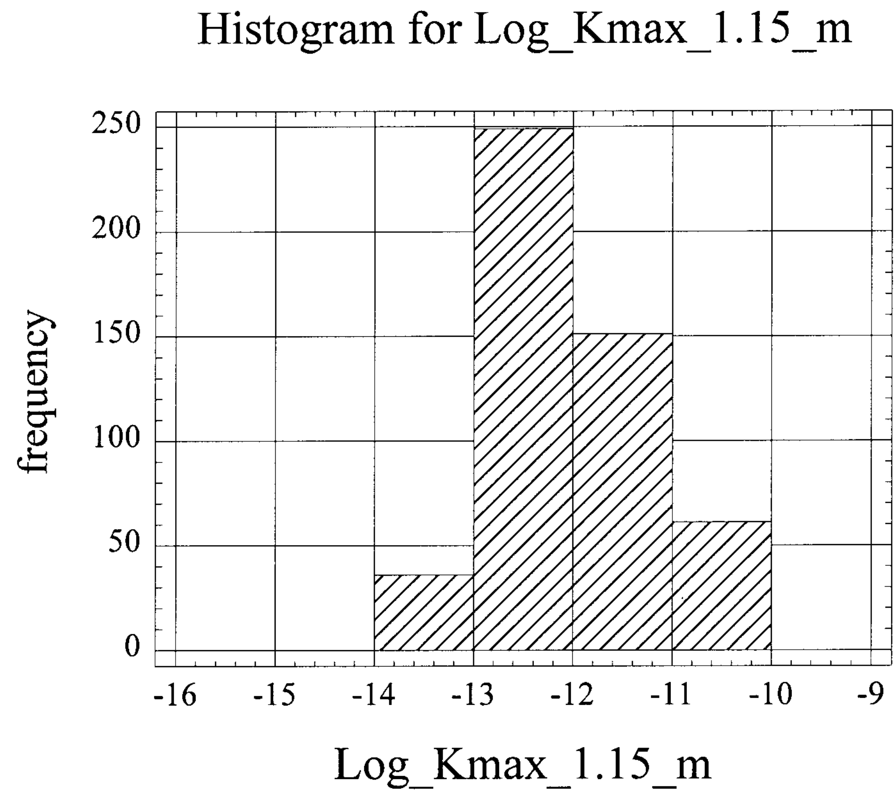
Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		-16.0		0	0.0000	0	0.0000
1	-16.0	-15.0	-15.5	0	0.0000	0	0.0000
2	-15.0	-14.0	-14.5	0	0.0000	0	0.0000
3	-14.0	-13.0	-13.5	36	0.0724	36	0.0724
4	-13.0	-12.0	-12.5	249	0.5010	285	0.5734
5	-12.0	-11.0	-11.5	151	0.3038	436	0.8773
6	-11.0	-10.0	-10.5	61	0.1227	497	1.0000
7	-10.0	-9.0	-9.5	0	0.0000	497	1.0000
above	-9.0			0	0.0000	497	1.0000

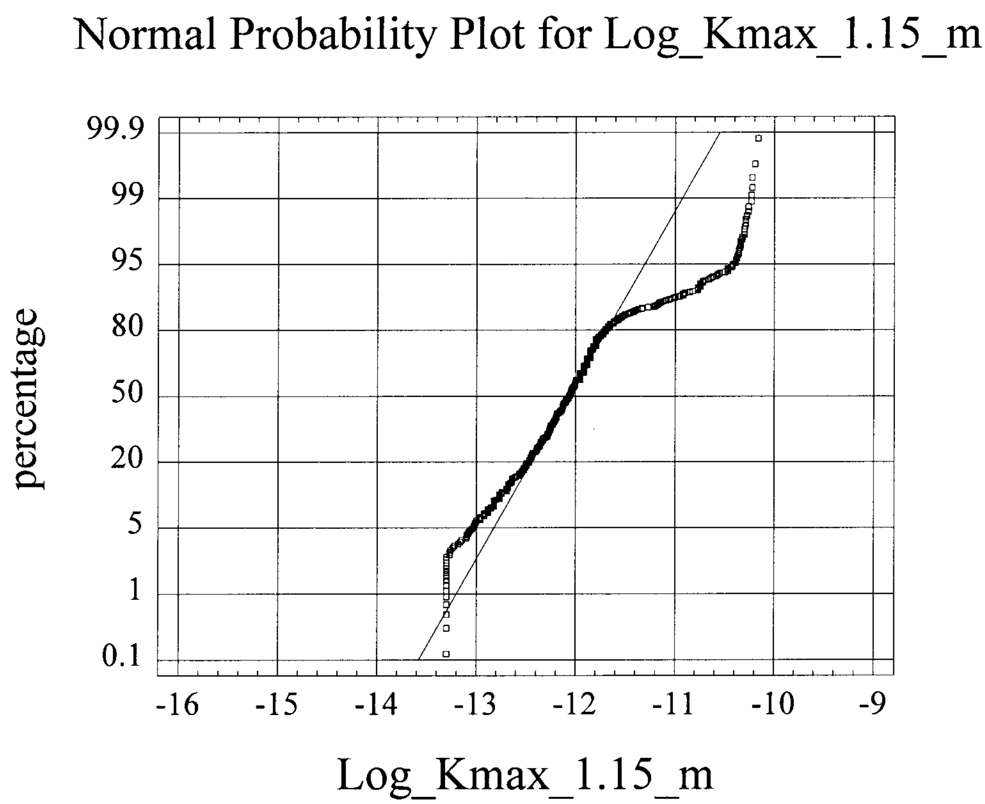
Mean = -11.9926 Standard deviation = 0.723139

The StatAdvisor

This option performs a frequency tabulation by dividing the range of Log_Kmax_1.15_m into equal width intervals and counting the number of data values in each interval. The frequencies show the number of data values in each interval, while the relative frequencies show the proportions in each interval. You can change the definition of the intervals by pressing the alternate mouse button and selecting Pane Options. You can see the results of the tabulation graphically by selecting Frequency Histogram from the list of Graphical Options.

Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37





Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37

Analysis Summary

Data variable: Log_Kmin_5_m

497 values ranging from -13.5572 to -11.284

The StatAdvisor

This procedure is designed to summarize a single sample of data. It will calculate various statistics and graphs. Also included in the procedure are confidence intervals and hypothesis tests. Use the Tabular Options and Graphical Options buttons on the analysis toolbar to access these different procedures.

Summary Statistics for Log_Kmin_5_m

Count = 497
Average = -12.9419
Median = -13.1871
Mode = -13.301
Geometric mean =
Variance = 0.306581
Standard deviation = 0.553697
Standard error = 0.0248367
Minimum = -13.5572
Maximum = -11.284
Range = 2.27325
Lower quartile = -13.301
Upper quartile = -12.8861
Interquartile range = 0.414973
Skewness = 1.74896
Stnd. skewness = 15.9178
Kurtosis = 1.85121
Stnd. kurtosis = 8.4242
Coeff. of variation = -4.27834%
Sum = -6432.11

The StatAdvisor

This table shows summary statistics for Log_Kmin_5_m. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37

Percentiles for Log_Kmin_5_m

1.0% = -13.301
5.0% = -13.301
10.0% = -13.301
25.0% = -13.301
50.0% = -13.1871
75.0% = -12.8861
90.0% = -11.8861
95.0% = -11.4949
99.0% = -11.3468

The StatAdvisor

This pane shows sample percentiles for Log_Kmin_5_m. The percentiles are values below which specific percentages of the data are found. You can see the percentiles graphically by selecting Quantile Plot from the list of Graphical Options.

Frequency Tabulation for Log_Kmin_5_m

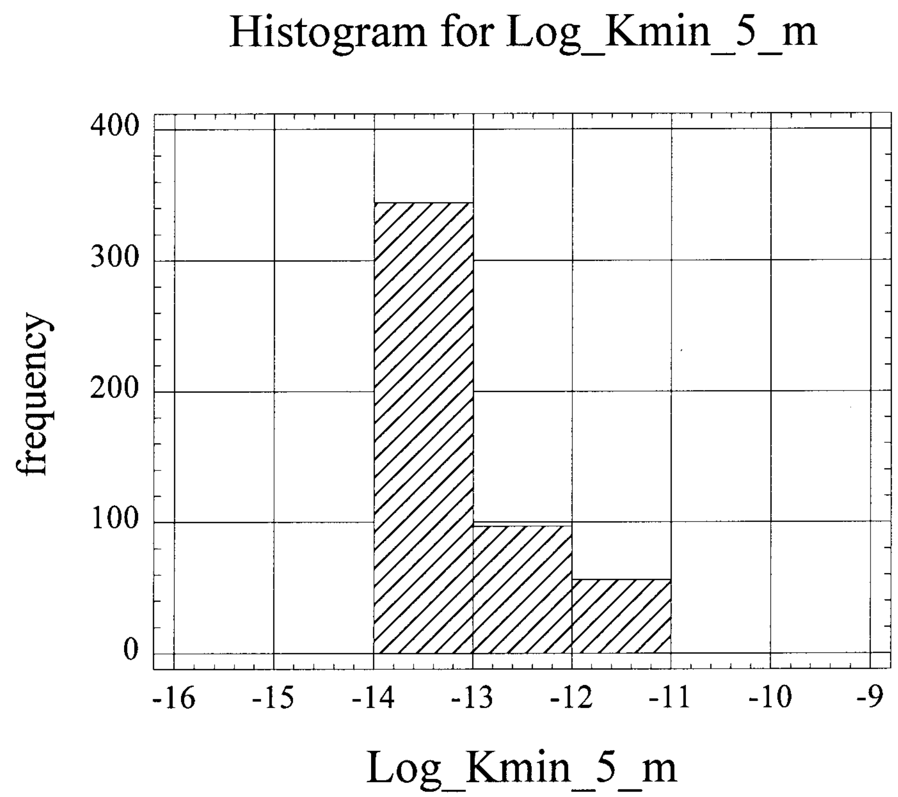
Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		-16.0		0	0.0000	0	0.0000
1	-16.0	-15.0	-15.5	0	0.0000	0	0.0000
2	-15.0	-14.0	-14.5	0	0.0000	0	0.0000
3	-14.0	-13.0	-13.5	344	0.6922	344	0.6922
4	-13.0	-12.0	-12.5	97	0.1952	441	0.8873
5	-12.0	-11.0	-11.5	56	0.1127	497	1.0000
6	-11.0	-10.0	-10.5	0	0.0000	497	1.0000
7	-10.0	-9.0	-9.5	0	0.0000	497	1.0000
above	-9.0			0	0.0000	497	1.0000

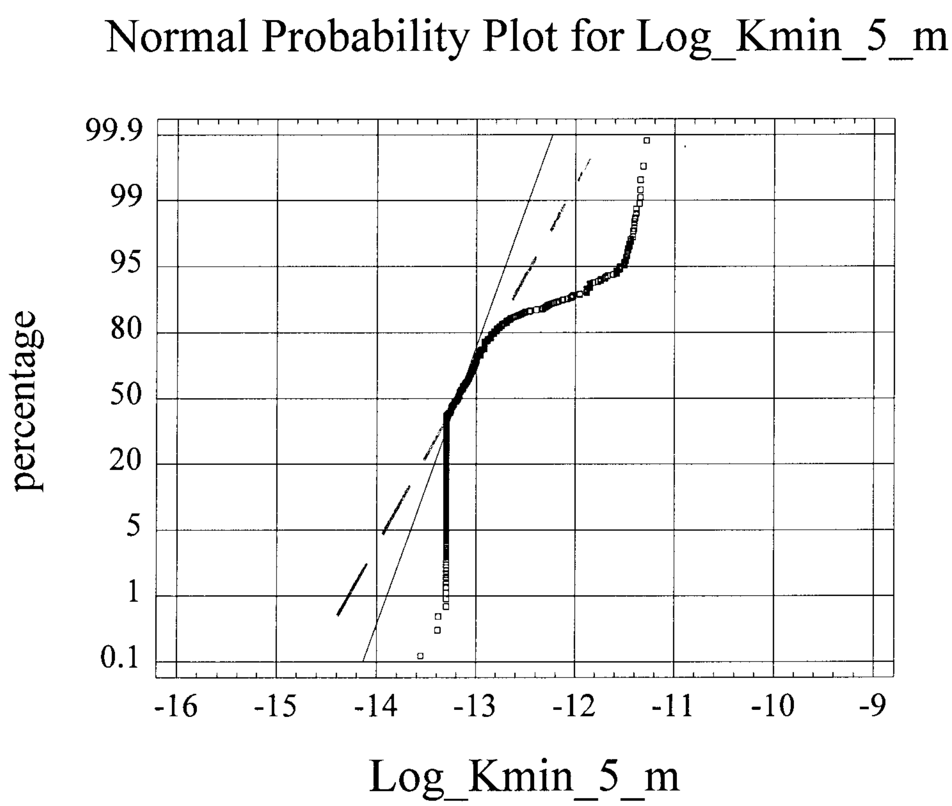
Mean = -12.9419 Standard deviation = 0.553697

The StatAdvisor

This option performs a frequency tabulation by dividing the range of Log_Kmin_5_m into equal width intervals and counting the number of data values in each interval. The frequencies show the number of data values in each interval, while the relative frequencies show the proportions in each interval. You can change the definition of the intervals by pressing the alternate mouse button and selecting Pane Options. You can see the results of the tabulation graphically by selecting Frequency Histogram from the list of Graphical Options.

Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37





Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37

Analysis Summary

Data variable: Log_Kmean_5_m

497 values ranging from -13.3398 to -11.0655

The StatAdvisor

This procedure is designed to summarize a single sample of data. It will calculate various statistics and graphs. Also included in the procedure are confidence intervals and hypothesis tests. Use the Tabular Options and Graphical Options buttons on the analysis toolbar to access these different procedures.

Summary Statistics for Log_Kmean_5_m

Count = 497
Average = -12.7961
Median = -12.9586
Mode = -13.301
Geometric mean =
Variance = 0.367064
Standard deviation = 0.605858
Standard error = 0.0271764
Minimum = -13.3398
Maximum = -11.0655
Range = 2.2743
Lower quartile = -13.301
Upper quartile = -12.6778
Interquartile range = 0.623249
Skewness = 1.47998
Stnd. skewness = 13.4697
Kurtosis = 1.21055
Stnd. kurtosis = 5.50878
Coeff. of variation = -4.7347%
Sum = -6359.66

The StatAdvisor

This table shows summary statistics for Log_Kmean_5_m. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37

Percentiles for Log_Kmean_5_m

1.0% = -13.301
5.0% = -13.301
10.0% = -13.301
25.0% = -13.301
50.0% = -12.9586
75.0% = -12.6778
90.0% = -11.6576
95.0% = -11.2757
99.0% = -11.1308

The StatAdvisor

This pane shows sample percentiles for Log_Kmean_5_m. The percentiles are values below which specific percentages of the data are found. You can see the percentiles graphically by selecting Quantile Plot from the list of Graphical Options.

Frequency Tabulation for Log_Kmean_5_m

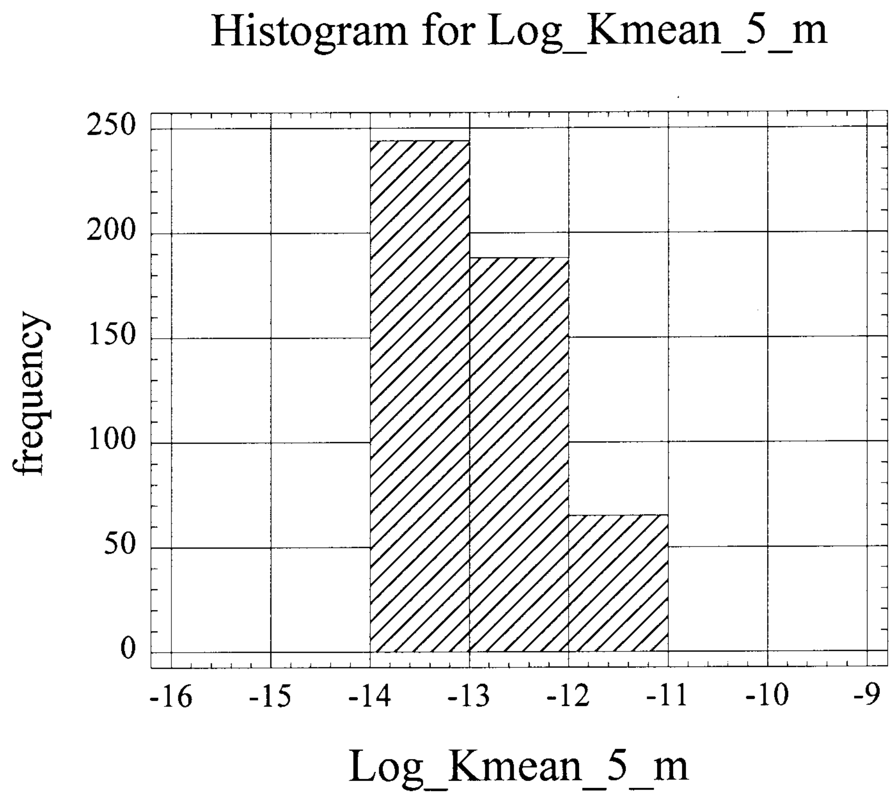
Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		-16.0		0	0.0000	0	0.0000
1	-16.0	-15.0	-15.5	0	0.0000	0	0.0000
2	-15.0	-14.0	-14.5	0	0.0000	0	0.0000
3	-14.0	-13.0	-13.5	244	0.4909	244	0.4909
4	-13.0	-12.0	-12.5	188	0.3783	432	0.8692
5	-12.0	-11.0	-11.5	65	0.1308	497	1.0000
6	-11.0	-10.0	-10.5	0	0.0000	497	1.0000
7	-10.0	-9.0	-9.5	0	0.0000	497	1.0000
above	-9.0			0	0.0000	497	1.0000

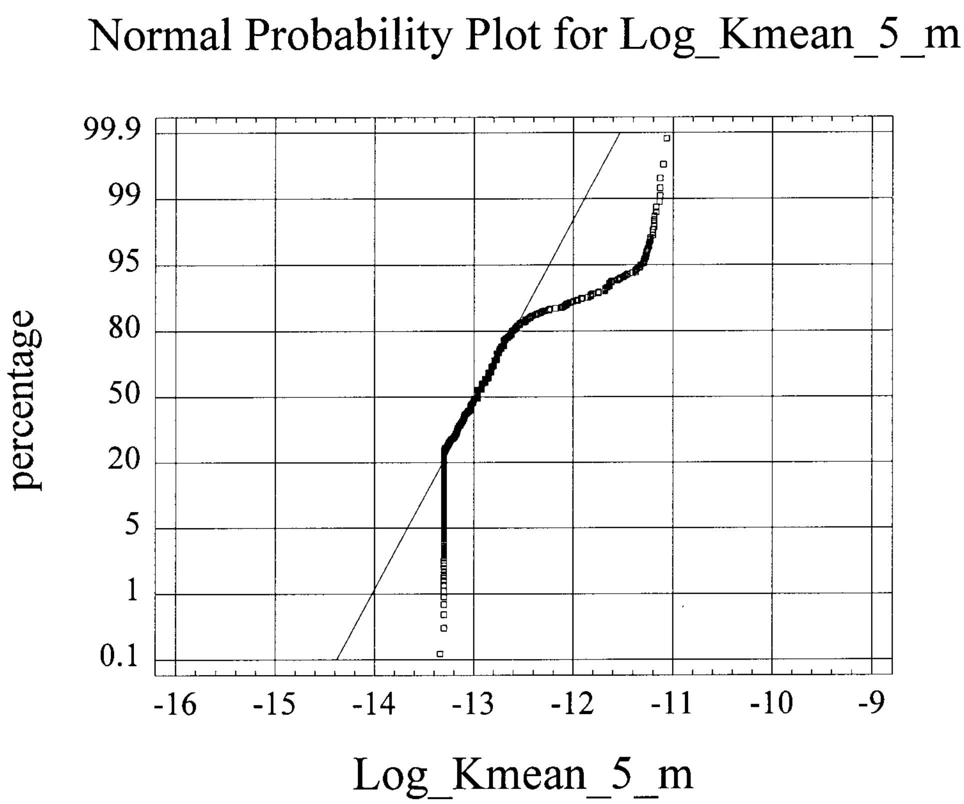
Mean = -12.7961 Standard deviation = 0.605858

The StatAdvisor

This option performs a frequency tabulation by dividing the range of Log_Kmean_5_m into equal width intervals and counting the number of data values in each interval. The frequencies show the number of data values in each interval, while the relative frequencies show the proportions in each interval. You can change the definition of the intervals by pressing the alternate mouse button and selecting Pane Options. You can see the results of the tabulation graphically by selecting Frequency Histogram from the list of Graphical Options.

Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37





Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37

Analysis Summary

Data variable: Log_Kmax_5_m

497 values ranging from -13.301 to -10.6383

The StatAdvisor

This procedure is designed to summarize a single sample of data. It will calculate various statistics and graphs. Also included in the procedure are confidence intervals and hypothesis tests. Use the Tabular Options and Graphical Options buttons on the analysis toolbar to access these different procedures.

Summary Statistics for Log_Kmax_5_m

Count = 497
Average = -12.4438
Median = -12.5376
Mode = -13.301
Geometric mean =
Variance = 0.462438
Standard deviation = 0.680028
Standard error = 0.0305034
Minimum = -13.301
Maximum = -10.6383
Range = 2.66276
Lower quartile = -12.9208
Upper quartile = -12.2518
Interquartile range = 0.669007
Skewness = 1.02763
Stnd. skewness = 9.35276
Kurtosis = 0.50927
Stnd. kurtosis = 2.3175
Coeff. of variation = -5.46479%
Sum = -6184.58

The StatAdvisor

This table shows summary statistics for Log_Kmax_5_m. It includes measures of central tendency, measures of variability, and measures of shape. Of particular interest here are the standardized skewness and standardized kurtosis, which can be used to determine whether the sample comes from a normal distribution. Values of these statistics outside the range of -2 to +2 indicate significant departures from normality, which would tend to invalidate any statistical test regarding the standard deviation. In this case, the standardized skewness value is not within the range expected for data from a normal distribution. The standardized kurtosis value is not within the range expected for data from a normal distribution.

Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37

Percentiles for Log_Kmax_5_m

1.0% = -13.301
5.0% = -13.301
10.0% = -13.301
25.0% = -12.9208
50.0% = -12.5376
75.0% = -12.2518
90.0% = -11.2291
95.0% = -10.8539
99.0% = -10.699

The StatAdvisor

This pane shows sample percentiles for Log_Kmax_5_m. The percentiles are values below which specific percentages of the data are found. You can see the percentiles graphically by selecting Quantile Plot from the list of Graphical Options.

Frequency Tabulation for Log_Kmax_5_m

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		-16.0		0	0.0000	0	0.0000
1	-16.0	-15.0	-15.5	0	0.0000	0	0.0000
2	-15.0	-14.0	-14.5	0	0.0000	0	0.0000
3	-14.0	-13.0	-13.5	103	0.2072	103	0.2072
4	-13.0	-12.0	-12.5	310	0.6237	413	0.8310
5	-12.0	-11.0	-11.5	48	0.0966	461	0.9276
6	-11.0	-10.0	-10.5	36	0.0724	497	1.0000
7	-10.0	-9.0	-9.5	0	0.0000	497	1.0000
above	-9.0			0	0.0000	497	1.0000

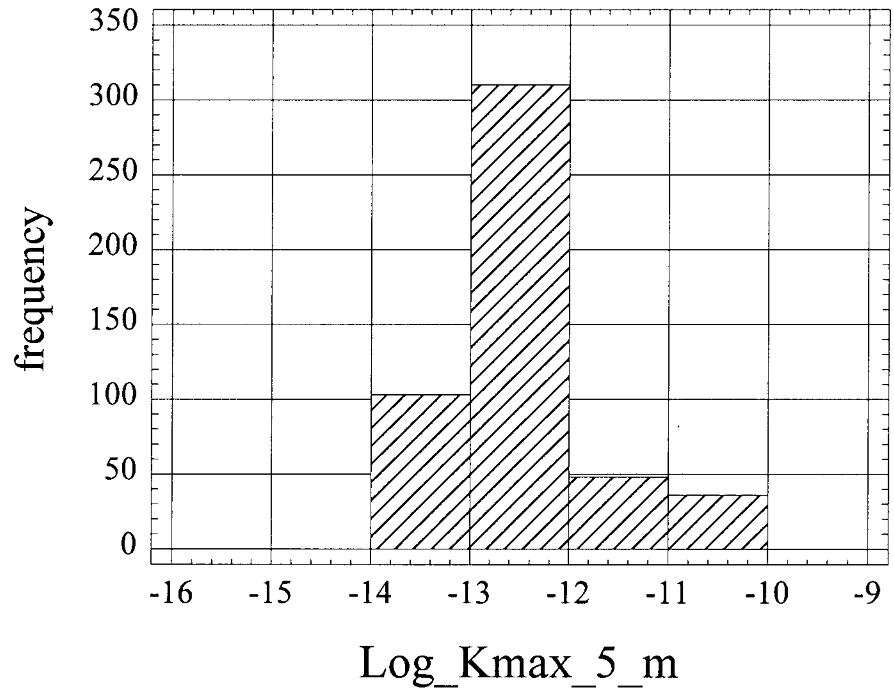
Mean = -12.4438 Standard deviation = 0.680028

The StatAdvisor

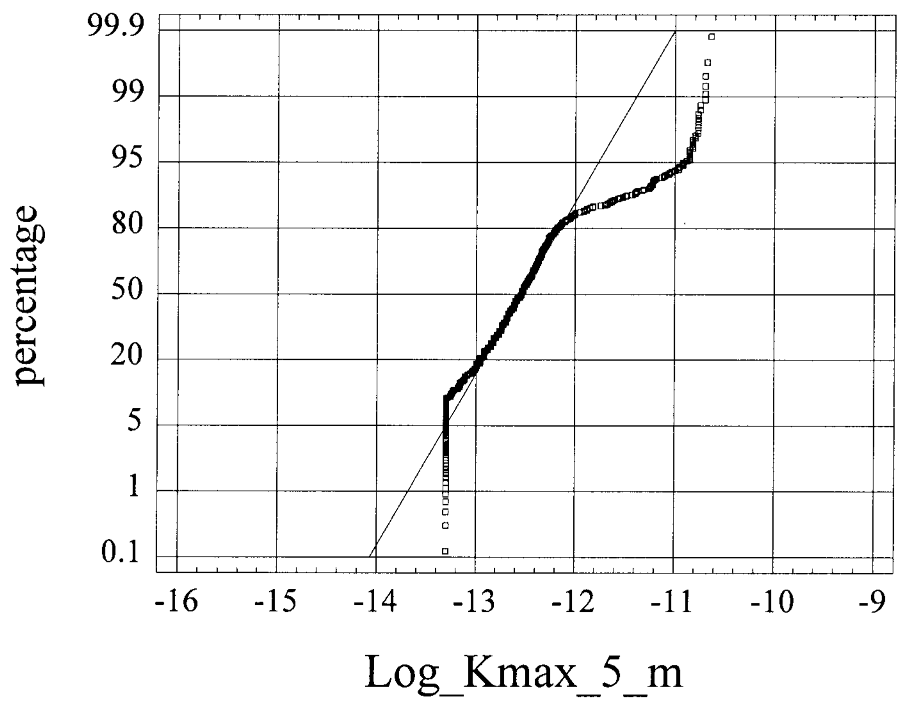
This option performs a frequency tabulation by dividing the range of Log_Kmax_5_m into equal width intervals and counting the number of data values in each interval. The frequencies show the number of data values in each interval, while the relative frequencies show the proportions in each interval. You can change the definition of the intervals by pressing the alternate mouse button and selecting Pane Options. You can see the results of the tabulation graphically by selecting Frequency Histogram from the list of Graphical Options.

Diaper_conductivity 2.sgp (Diaper_conductivity 2.sf3)
2001-04-04 1:37

Histogram for Log_Kmax_5_m



Normal Probability Plot for Log_Kmax_5_m



APPENDIX 3

Statistical analysis of salinity and chemical components

This appendix includes the result of the analysis of water samples collected in or near the prototype repository area in 1998 – 1999.

In the table the following is shown

IDCODE	Borehole name
SECUP	Upper section limit
SECLOW	Lower section limit
Hydraulic conductor	Position of an estimated hydraulic point of balance
East	Eastern coordinate in Äspö system of hydraulic conductor
North	Northern coordinate in Äspö system of hydraulic conductor
Masl	Vertical coordinate in Äspö system of hydraulic conductor
START_DATE	Sampling date of water sample
START_TIME	Sampling time of water sample
S (Cond) (g/L)	Salinity as derived from electrical conductivity C (eq 5-1)
S (g/L)	Salinity as derived water sample constituents (eq 5-2)
S (estim 1)	Best estimate of salinity of each sampled section, see chap. 5
S (estim 2)	As S (estim 1), but with whole borehole sections excluded
SAMPLE_NO	Sample number sequence
NA	[Na^{+}] concentration in sample (mg/L)
K	[K^{+}] concentration in sample (mg/L)
CA	[Ca^{2+}] concentration in sample (mg/L)
MG	[Mg^{+}] concentration in sample (mg/L)
HCO3	[HCO^{3-}] concentration in sample (mg/L)
CL	[Cl^{-}] concentration in sample (mg/L)

SO4	[SO_4^{2-}] concentration of sulphate in sample (mg/L)
SO4_S	[SO_4-S] concentration of sulphur in sample (mg/L)
BR	[Br^-] concentration in sample (mg/L)
F	[F^+] concentration in sample (mg/L)
SI	[Si^{4+}] concentration in sample (mg/L)
FE	[Fe^{2+}] concentration in sample (mg/L)
MN	[Mn^{2+}] concentration in sample (mg/L)
LI	[Li^+] concentration in sample (mg/L)
SR	[Sr^{2+}] concentration in sample (mg/L)
PH	pH value of sample
COND	Electrical conductivity (mS/m)

The statistical analysis regarding the chemical components is done utilizing the water samples from the hole sections used to estimate **S (estim 2)**.

IDCODE	SECUP	SECLOW	Hydraulic conductor	East	North	Masl	START_DATE	START_TIME	S (Cond) (g/l)	S (g/l)	S (estim 1)	S (estim 2)	SAMPLE_NO	NA	K	CA
KA3510A	4.52	113	50	1911.888	7250.178	-473.773	1999-01-15	11:30:00	6.05	3.92	6.05	6.05	2829			
KA3510A	114	121	117.5	1855.058	7236.351	-507.469	1999-01-15	08:45:00	8.57	5.89	8.57	8.57	2825			
KA3539G	0	30.01	16.11	1924.604	7268.967	-465.078	1998-03-02	08:00:00	6.24	6.73	6.73		2477	1720	8.9	632
KA3539G	0	30.01	16.11	1924.604	7268.967	-465.078	1998-07-03	15:15:00	6.49	6.86	6.86		2573	1690	9.82	638
KA3539G	15	18	16.5	1924.54	7268.972	-465.462	1998-08-02	16:00:00	5.88	6.70	6.70	6.70	2594	1610	9.2	643
KA3542G01	0	30.04	21.05	1921.180	7253.882	-463.946	1998-07-03	13:05:00	7.81	7.80	7.80		2572	1770	9.3	885
KA3542G01	15	18	16.5	1921.668	7257.065	-460.731	1998-07-31	09:07:00	5.97	6.96	6.96	6.96	2588	1640	9.7	695
KA3542G01	18	21	19.5	1921.453	7255.666	-462.144	1998-07-31	10:45:00	6.19	6.83	6.83	6.83	2590	1610	9.2	678
KA3542G01	21	24	22.5	1921.025	7252.868	-464.97	1998-07-31	10:00:00	6.24	7.19	7.19	7.19	2592	1680	9.7	755
KA3542G02	0	30	6.28	1924.030	7274.078	-453.449	1998-07-03	09:55:00	6.04	6.52	6.52		2564	1650	10	557
KA3542G02	3	4	3.5	1923.813	7272.097	-451.51	1998-07-27	12:05:00	6.55	6.88	6.88	6.88	2585	1620	9.2	697
KA3542G02	5	6	5.5	1923.969	7273.522	-452.905	1998-07-27	16:20:00	6.05	6.51	6.51	6.51	2586	1590	8.9	573
KA3542G02	11	12	11.5	1924.437	7277.798	-457.088	1998-07-28	15:22:00	6.29	6.74	6.74	6.74	2587	1620	9.5	624
KA3545G	0	8.08	6.25	1920.324	7269.599	-455.279	1998-03-02	08:00:00	7.31	6.76	6.76	6.76	2478	1730	8.2	639
KA3548A01	0	30	15.95	1914.857	7251.715	-447.442	1998-07-05	10:00:00	6.43	6.88	6.88		2574	1630	11.6	631
KA3548A01	5	6	5.5	1916.375	7262.039	-446.874	1998-08-05	09:53:00	5.60	6.33	6.33	6.33	2595	1540	8.7	555
KA3548A01	9	10	9.5	1915.794	7258.087	-447.092	1998-08-06	08:48:00	5.77	6.38	6.38	6.38	2596	1560	8.7	586
KA3548A01	10	14	13.49	1915.214	7254.145	-447.308	1999-01-13	10:15:00	5.48	3.59	5.48	5.48	2809			
KA3548A01	15	30	19.56	1914.332	7248.148	-447.638	1999-01-13	10:07:00	6.11	4.26	6.11	6.11	2808			
KA3548A01	18	21	19.5	1914.341	7248.208	-447.635	1998-08-07	12:30:00	5.58	6.42	6.42	6.42	2597	1580	8.8	561
KA3554G01	0	30.01	24.83	1909.032	7252.909	-466.402	1998-07-02	14:03:00	6.81	6.91	6.91		2565	1650	10.2	649
KA3554G01	21	24	22.5	1909.266	7254.539	-464.753	1998-07-24	09:40:00	7.31	7.79	7.79	7.79	2583	1750	9.7	898
KA3554G01	24	27	25.5	1908.964	7252.44	-466.876	1998-07-24	08:58:00	6.68	7.44	7.44	7.44	2584	1870	11.9	753
KA3554G02	0	30.01	13.69	1913.030	7280.889	-458.498	1998-07-02	17:18:00	6.68	7.15	6.68		2571	1730	10	690
KA3554G02	11	12	11.5	1912.81	7279.356	-456.95	1998-07-21	10:00:00	6.37	6.60	6.60	6.60	2579	1630	9.9	553
KA3554G02	12	15	13.5	1913.011	7280.756	-458.364	1998-07-21	13:10:00	6.30	6.79	6.79	6.79	2580	1640	9.5	643
KA3566G01	0	30.01	17.15	1897.764	7259.894	-460.763	1998-07-02	10:28:00	5.92	6.68	6.68		2566	1600	11.9	581
KA3566G01	12.3	19.8	16.71	1897.827	7260.300	-460.354	1999-04-09	10:00:00	6.93	7.27	7.27	7.27	2886	1850	9.3	783
KA3566G01	20.8	30.01	21.57	1897.301	7256.896	-463.782	1999-04-16	08:00:00	6.01	7.26	7.26	7.26	2910	1810	8.8	783
KA3566G02	0	30.01	17.29	1901.481	7285.363	-460.536	1998-07-01	18:35:00	5.99	6.65	6.65		2567	1660	10	594
KA3566G02	1.3	6.8	3.99	1900.192	7275.851	-451.329	1999-05-17	13:10:00	6.74	6.84	6.84	6.84	2921	1790	9.7	682
KA3566G02	7.8	11.3	10.25	1900.799	7280.328	-455.663	1999-05-03	08:00:00	7.12	7.39	7.39	7.39	2914	1860	7.3	775
KA3566G02	12.3	18.3	16.23	1901.378	7284.605	-459.802	1999-04-08	16:00:00	6.05	7.27	7.27	7.27	2880	1840	9.9	693
KA3566G02	19.3	30.01	21.41	1901.880	7288.310	-463.388	1999-04-15	08:00:00	6.74	7.42	7.42	7.42	2907	1880	8.1	754
KA3572G01	1.3	5.3	3.82	1893.782	7273.338	-452.332	1999-05-17	13:10:00	7.75	8.68	8.68	8.68	2928	2340	10.3	800
KA3573A	4.5	17	9.16	1891.939	7261.841	-446.391	1998-03-09	10:03:00		6.75	6.75		2512	1730	9.7	603
KA3573A	4.5	17	9.16	1891.939	7261.841	-446.391	1998-09-28	16:30:00	6.43	6.45	6.45		2617	1610	10	542
KA3573A	4.5	17	9.16	1891.939	7261.841	-446.391	1999-01-15	09:34:00	5.80	3.98	5.80		2827			
KA3573A	4.5	17	9.16	1891.939	7261.841	-446.391	1999-04-07	15:00:00	5.92	7.13	7.13	6.53	2872	1720	9.7	742
KA3573A	4.5	17	9.16	1891.939	7261.841	-446.391	1999-09-29	09:15:00	7.00	6.27	6.27		2979	1660	9.9	530
KA3573A	18	40.07	21.34	1890.154	7249.801	-446.822	1998-03-09	10:03:00	5.56	6.36	6.36		2511	1650	9.9	539
KA3573A	18	40.07	21.34	1890.154	7249.801	-446.822	1998-09-28	16:00:00	6.43	6.42	6.42		2619	1610	9.7	541
KA3573A	18	40.07	21.34	1890.154	7249.801	-446.822	1999-01-15	09:44:00	6.11	4.23	6.11		2826			
KA3573A	18	40.07	21.34	1890.154	7249.801	-446.822	1999-04-07	09:10:00	6.68	7.52	7.52	6.60	2864	1770	9.1	872
KA3573A	18	40.07	21.34	1890.154	7249.801	-446.822	1999-09-29	10:00:00	6.62	5.87	5.87		2980	1530	10.1	475
KA3590G01	0	30.06	4.33	1875.530	7272.336	-451.092	1998-07-01	13:42:00	6.68	7.04	7.04		2568	1640	10.3	665
KA3590G01	1	2	1.5	1875.764	7274.345	-449.112	1998-07-07	08:30:00	7.04	7.19	7.19	7.19	2575	1660	10.3	723
KA3590G01	8	9	8.5	1875.184	7269.377	-454.009	1998-07-08	08:40:00	6.37	7.49	7.49	7.49	2578	1820	11.2	803
KA3590G02	0	30.05	26.73	1878.715	7295.512	-466.589	1998-07-01	10:30:00	6.74	7.15	7.15		2569	1790	14.1	612
KA3590G02	8.3	16.3	13.44	1877.391	7286.015	-457.386	1999-04-13	08:00:00	6.11	7.56	7.56	7.56	2889	1940	8.8	767
KA3590G02	17.3	22.3	19.56	1878	7290.389	-461.624	1999-04-13	08:00:00	5.99	7.47	7.47	7.47	2892	1910	11.1	715
KA3590G02	24	27	25.5	1878.592	7294.633	-465.737	1998-06-26	10:00:00	6.55	6.99	6.55	6.55	2563	1780	11.46	655
KA3593G	0	30.02	6.45	1872.728	7276.478	-454.422	1998-07-01	16:04:00	7.18	7.91	7.91		2570	1860	11.3	812
KA3593G	0	30.02	6.45	1872.728	7276.478	-454.422	1998-03-02	08:00:00	9.26	8.46	8.46		2479	2020	8.5	950
KA3593G	1.3	7.3	5.24	1872.940	7276.458	-453.231	1999-04-15	08:00:00	6.87	8.50	8.50	8.50	2908	2100	8.9	974
KA3600F	4.5	21	12.51	1854.390	7270.842	-445.964	1998-03-09	10:05:00	7.06	6.76	6.76		2514	1750	9.4	656
KA3600F	4.5	21	12.51	1854.390	7270.842	-445.964	1998-09-28	17:00:00	6.49	6.60	6.60		2618	1580	9	590
KA3600F	4.5	21	12.51	1854.390	7270.842	-445.964	1999-01-13	09:48:00	7.63	5.16	7.63		2810			
KA3600F	4.5	21	12.51	1854.390	7270.842	-445.964	1999-04-09	09:00:00	6.93	8.60	8.60	7.40	2885	1990	7.7	1157
KA3600F	4.5	21	12.51	1854.390	7270.842	-445.964	1999-09-29	08:30:00	7.44	6.31	6.31		2976	1680	10.2	548
KA3600F	22	50.1	31.78	1836.479	7263.756	-446.530	1998-03-09	10:05:00	8.38	7.51	7.51		2513	1880	13.5	714
KA3600F	22	50.1	31.78	1836.479	7263.756	-446.530	1998-09-28	18:30:00	6.93	7.17	7.17		2622	1750	12.1	632
KA3600F	22	50.1	31.78	1836.479	7263.756	-446.530	1999-01-13	11:35:00	8.57	6.02	8.57		2813			
KA3600F	22	50.1	31.78	1836.479	7263.756	-446.530	1999-04-09	09:00:00	7.94	9.11	9.11	8.09	2887	2090	9.5	1243
KA3600F	22	50.1	31.78	1836.479	7263.756	-446.530	1999-09-29	08:30:00	10.08	9.16	9.16		2975	1980	8	1225
KG0021A01	0	48.82	27.41	1924.177	7277.939	-436.836	1998-10-16	21:16:00	5.94	3.77	5.94		2673			
KG0021A01	10	13	11.5	1933.941	7289.531	-441.667	1998-12-03	09:25:00	5.62	6.39	6.39	6.39	2678	1610	9.1	537
KG0021A01	25	26	25.5	1925.349	7279.328	-437.416	1998-12-07	09:01:00	5.10	6.21	6.21	6.21	2679	1600	8	516
KG0021A01	27	28	27.5	1924.121	7277.871	-436.808	1998-12-07	12:57:00	5.53	6.37	6.37	6.37	2680	1610	9.6	530
KG0021A01	28	29	28.5	1923.508	7277.142	-436.505	1998-12-07	16:30:00	5.49	6.35	6.35	6.35	2681	1640	9.3	520
KG0021A01	29	30	29.5	1922.894	7276.413	-436.201	1998-12-08	08:45:00	5.45	6.45	6.45	6.45	2682	1690	9.7	549
KG0021A01	30	31	30.5	1922.28	7275.684	-435.897	1998-12-08	12:43:00	5.39	6.32	6.32	6.32	2683	1660	9	541
KG0021A01	32	33	32.5	1921.053	7274.227	-435.29	1998-12-09	08:45:00	5.12	6.08	6.08	6.08	2684	1580	8.7	504
KG0021A01	35	36	35.5	1919.211	7272.041	-434.379	1998-12-09	15:00:00	5.22	6.08	6.08	6.08	2685	1560	8.2	494
KG0021A01	40	41	40.5	1916.143	7268.397	-432.86	1998-12-11	08:46:00	5.04	6.10	6.10	6.10	2686	1640	7.9	501
KG0048A01	0	54.69	48.25	1883.906	7272.434	-432.815	1998-10-06	19:20:00	5.81	6.52	6.52		2665	1660	10.4	621
KG0048A01	5	8	6.5	1911.206	7302.365	-442.909	1998-10-08	16:55:00	6.18	6.73	6.73	6.73	2666	1720	9.9	617
KG0048A01	23	24	23.5	1900.09	7290.178	-438.799	1998-10-10	08:31:00	6.43	6.83	6.43	6.43	2668	1760	10	681
KG0048A01	24	25	24.5	1899.436	7289.461	-438.557	1998-10-10	10:10:00	6.26	6.41	6.26	6.26	2669	1700	10.3	589
KG0048A01	33	34	33.5	1893.551	7283.009	-436.381	1998-10-11	15:34:00	5.59	5.91	5.59	5.59	2667	1620	9.4	507
KG0048A01	38	39	38.5	1890.281	7279.424	-435.173	1998-07-31	14:30:00	5.84	6.54	6.54	6.54	2593	1720	11	587
KG0048A01	45	46	45.5	1885.704	7274.406	-433.48	1998-10-14	10:00:00	5.80	6.33	6.33	6.33	2670	1630	9.6	536
KG0048A01	46	47	46.5	1885.05	7273.689	-433.239	1998-10-14	12:54:00	5.75	6.24	6.24	6.24	2671	1600	9.6	521
KG0048A01	53	54.69	53.85	1880.244	7268.42	-431.462	1998-10-16	08:40:00	6.19	6.91	6.91	6.91	2672	1730	9.8	687

IDCODE	SECUP	SECLOW	MG	HCO3	CL	SO4	SO4_S	BR	F	SI	FE	MN	LI	SR	PH	COND
KA3510A	4.52	113		190	3730										7.4	960
KA3510A	114	121		26	5860										7.6	1360
KA3539G	0	30.01	90.5	202	3750	308	99.4	15.5		6.9	0.304	0.57	0.312	10.2	7.44	990
KA3539G	0	30.01	71.8	175	3970	330	90.8	18		6.8			0.373	10.8	7.3	1030
KA3539G	15	18	77.7	180	3840	322	103	17.7		7.1	0.266	0.58	0.383	10.8	7.3	933
KA3542G01	0	30.04	68.5	127	4550	364	116	25.2		6.4			0.625	15.3	7.4	1240
KA3542G01	15	18	76.1	172	4020	358	107	19.5		6.5	0.247	0.57	0.443	11.6	7.4	947
KA3542G01	18	21	73.8	170	3940	355	106	14.9		6.6	0.245	0.57	0.437	11.4	7.5	982
KA3542G01	21	24	75.9	156	4150	361	109	20.4		6.7	0.28	0.57	0.507	12.7	7.4	990
KA3542G02	0	30	75.9	198	3750	310	86.1	15.5		6.8			0.298	9.31	7.3	958
KA3542G02	3	4	72.8	156	3980	354	105	18		6.8	0.285	0.58	0.459	11.8	7.4	1040
KA3542G02	5	6	83.3	200	3730	325	99.7	16.8		6.9	0.35	0.6	0.321	9.23	7.4	960
KA3542G02	11	12	79.4	188	3890	328	98.9	17		7.8	0.226	0.62	0.376	10.9	7.4	998
KA3545G	0	8.08	87.2	192	3790	297	97.6	13.8		7.8	0.13	0.53	0.306	10	7.5	1160
KA3548A01	0	30	80.2	183	4010	333	106	9.9		6.3			0.372	10.3	6.5	1020
KA3548A01	5	6	81.8	190	3630	296	102	12	1.96	6.8	0.292	0.58	0.295	9.04	7.4	888
KA3548A01	9	10	79.6	190	3620	299	104	12	1.85	6.6	0.285	0.57	0.327	9.58	7.4	915
KA3548A01	10	14		211	3380										7.4	870
KA3548A01	15	30		166	4090										7.4	970
KA3548A01	18	21	84	204	3650	306	101	15	1.98	6.5	0.342	0.58	0.312	8.91	7.5	886
KA3554G01	0	30.01	72.5	175	4030	356	97.5	18		6.1			0.427	10.8	7.2	1080
KA3554G01	21	24	67.1	130	4580		113			6.7	0.252	0.53	0.626	15.3	7.4	1160
KA3554G01	24	27	89	170	4200	346	105	19		7.1	0.349	0.6	0.415	12.4	7.4	1060
KA3554G02	0	30.01	81.6	158	4140		104	18.5		8.2			0.449	12.2	7.2	1060
KA3554G02	11	12	89.1	213	3790	299	96.4	15.7		7.1	0.373	0.66	0.289	9.1	7.3	1010
KA3554G02	12	15	74.8	178	3910	326	101	17.9		8	0.162	0.58	0.393	10.7	7.3	999
KA3566G01	0	30.01	71.6	187	3940	328	87.8	16.4		6			0.374	10.2	7.4	940
KA3566G01	12.3	19.8	85.3	165	4020	317	109	18.7	1.38	6.1	0.308	0.56	0.45	10.4	7.3	1100
KA3566G01	20.8	30.01	83	164	4070	321	104	18.5	0.98	6	0.425	0.55	0.348	10.2	7.2	953
KA3566G02	0	30.01	83.8	197	3780	315	101	15		7.1			0.322	9.86	7.28	951
KA3566G02	1.3	6.8	81.5		3940	280	102	17.6	1.1	8.3			0.39	11.7		1070
KA3566G02	7.8	11.3	74	101	4240	303	99	19.7	1.47	12.6			0.384	11.15	7.7	1130
KA3566G02	12.3	18.3	98	192	4110	277	98	18.5	1.29	7.3	0.225	0.63	0.307	9.4	7.2	960
KA3566G02	19.3	30.01	89	165	4210	298	94	20.4	1.27	8.4	0.801	0.65	0.324	10	7.3	1070
KA3572G01	1.3	5.3	24.8		4810	617	217	27.2	1.2	5.4			0.435	15.7	7.4	1230
KA3573A	4.5	17	91.7	213	3780	295	97.6	17.1		6.2	0.312	0.54	0.279	9.23	7.4	
KA3573A	4.5	17	88.2	215	3670	289	96	14.6		6.5	0.37	0.6	0.268	8.19	7.4	1020
KA3573A	4.5	17		193	3790										7.3	920
KA3573A	4.5	17	81	171	4060	311	105	19.6	1.04	6	0.335	0.57	0.37	10.5	7.4	940
KA3573A	4.5	17	89.4	215	3450	278	97	12.7	1.11	6.6	0.322	0.59	0.236	7.4	7.4	1110
KA3573A	18	40.07	91.7	209	3530	311	101	16.1		6.2	0.347	0.53	0.246	8.34	7.35	882
KA3573A	18	40.07	89.5	214	3640	302	98.3	14.5		6.2	0.656	0.57	0.256	7.8	7.4	1020
KA3573A	18	40.07		166	4060										7.4	970
KA3573A	18	40.07	73.2	136	4290	339	113	21.5	1.14	5.6	0.319	0.48	0.48	11.2	7.5	1060
KA3573A	18	40.07	90.9	231	3230	276	96	11.7	1.11	6.5	0.365	0.6	0.191	6.4	7.4	1050
KA3590G01	0	30.06	70	182	4180	337	88.5	18		6.2			0.394	11.2	7.3	1060
KA3590G01	1	2	74.7	167	4200	349	107	18.4		6.5	0.31	0.57	0.48	12.17	7.28	1116.3
KA3590G01	8	9	91.5	184	4250	304	100	17.1		6.7	0.378	0.65	0.445	11.6	7.3	1010
KA3590G02	0	30.05	102	231	4090	304	94.5	18.1		7.1			0.359	10.4	7.3	1070
KA3590G02	8.3	16.3	94.5	151	4270	294	100	20.5	1.19	7.2	0.269	0.56	0.34	9.3	7.2	970
KA3590G02	17.3	22.3	95.8	198	4220	279	97	18.8	1.19	7.9	0.248	0.63	0.304	11.8	7.2	950
KA3590G02	24	27	96.2	210	3940		97.4			7.1	0.351	0.66	0.349	9.94	7.3	1040
KA3593G	0	30.02	70	123	4670	373	108	24.2		7.7			0.541	14.2	7.3	1140
KA3593G	0	30.02	75.9	105	4900	366	121	23		8.4	0.147	0.52	0.538	14.8	7.3	1470
KA3593G	1.3	7.3	76.7	105	4810	406	127	26.3	1.52	7.5	0.165	0.55	0.45	13.1	7.2	1090
KA3600F	4.5	21	91.3	194	3730	298	102	18		5.9	0.289	0.51	0.304	9.31	7.31	1120
KA3600F	4.5	21	77.8	195	3830	298	98	15.1		6.5	0.305	0.54	0.322	9.1	7.5	1030
KA3600F	4.5	21		78	5080										7.4	1210
KA3600F	4.5	21	66.4	99	4870	346	124	24.5	1.4	5.1	0.265	0.39	0.63	14.7	7.3	1100
KA3600F	4.5	21	80	204	3480	284	95	13.4	1.01	6.4	0.281	0.52	0.283	8	7.5	1180
KA3600F	22	50.1	105	225	4260	277	94.5	21.4		6.7	0.373	0.67	0.381	11.4	7.21	1330
KA3600F	22	50.1	97.1	220	4150	291	93.8	18.6		6.6	0.355	0.64	0.319	9.26	7.3	1100
KA3600F	22	50.1		34	5990										7.6	1360
KA3600F	22	50.1	70	100	5180	365	124	27.1	1.09	5.9	0.197	0.45	0.64	14.5	7.3	1260
KA3600F	22	50.1	47.2	58	5420	391	124	27.9	1.16	6.5	0.174	0.46	0.76	20.5	7.6	1600
KG0021A01	0	48.82		215	3540	290		16.6							7.4	942
KG0021A01	10	13	86.4	213	3630	286	94.6	16.3	0.95	6.2	0.204	0.52	0.224	7.57	7.4	891
KG0021A01	25	26	90	214	3470	285	97.4	15.2	0.11	5.8	0.154	0.47	0.181	6.7	7.4	810
KG0021A01	27	28	91.7	217	3610	286	93.9	14.2	0.12	6.6	0.768	0.53	0.192	7.31	7.3	878
KG0021A01	28	29	92.3	219	3560	287	95.4	14.3	1.15	5.5	0.347	0.49	0.183	6.5	7.4	871
KG0021A01	29	30	94.8	217	3570	285	98.28	13.98	1.3	6	0.61	0.58	0.235	7.3	7.4	864
KG0021A01	30	31	93.3	217	3480	292	97.7	14.5	1.2	5.8	0.91	0.55	0.214	6.61	7.4	855
KG0021A01	32	33	87.4	213	3380	294	95.4	14.3	1.15	5.8	0.219	0.52	0.198	6.68	7.5	813
KG0021A01	35	36	83.9	208	3420	295	95.5	13.9	1.8	5.4	0.032	0.49	0.175	6.32	7.5	829
KG0021A01	40	41	90.1	208	3340	308	97.7	14	1.3	5.6	0.25	0.5	0.156	6	7.4	800
KG0048A01	0	54.69	90.7	212	3620	291	96.5	12.6		6.3			0.273	8.3	7.6	922
KG0048A01	5	8	92.4	210	3760	300	96.4	15.1	3.5	6	0.022	0.55	0.279	8.33	7.4	980
KG0048A01	23	24	91.8		3970	277	97.7	17.2		6.2			0.315	9.12		1020
KG0048A01	24	25	94		3710	284	94.5	16.1		5.9			0.247	7.57		994
KG0048A01	33	34	93.8		3370	288	96	14.4		5.9			0.195	6.54		887
KG0048A01	38	39	91.6	215	3590	320	100	14		6.9			0.281	9.72	7.5	926
KG0048A01	45	46	96.1	219	3530	302	93.8	14.1	3.2	5.7	0.41	0.56	0.216	6.87	7.4	921
KG0048A01	46	47	94.5	218	3490	285	94.7	12.2	3.5	5.6	0.381	0.56	0.214	6.48	7.4	913
KG0048A01	53	54.69	86.7	189	3880	312	100	14.4	3.9	5.7	0.343	0.51	0.309	8.61	7.4	982

Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:05

Analysis Summary

Data variable: Na

49 values ranging from 1540.0 to 2340.0

Summary Statistics for Na

Count = 49
Average = 1721.71
Median = 1680.0
Mode =
Geometric mean = 1715.84
Variance = 22520.3
Standard deviation = 150.067
Standard error = 21.4382
Minimum = 1540.0
Maximum = 2340.0
Range = 800.0
Lower quartile = 1620.0
Upper quartile = 1790.0
Interquartile range = 170.0
Skewness = 1.86838
Stnd. skewness = 5.33934
Kurtosis = 5.12464
Stnd. kurtosis = 7.32243
Coeff. of variation = 8.71617%
Sum = 84364.0

Frequency Tabulation for Na

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		1500.0		0	0.0000	0	0.0000
1	1500.0	1600.0	1550.0	8	0.1633	8	0.1633
2	1600.0	1700.0	1650.0	20	0.4082	28	0.5714
3	1700.0	1800.0	1750.0	9	0.1837	37	0.7551
4	1800.0	1900.0	1850.0	7	0.1429	44	0.8980
5	1900.0	2000.0	1950.0	3	0.0612	47	0.9592
6	2000.0	2100.0	2050.0	1	0.0204	48	0.9796
7	2100.0	2200.0	2150.0	0	0.0000	48	0.9796
8	2200.0	2300.0	2250.0	0	0.0000	48	0.9796
9	2300.0	2400.0	2350.0	1	0.0204	49	1.0000
10	2400.0	2500.0	2450.0	0	0.0000	49	1.0000
above	2500.0			0	0.0000	49	1.0000

Mean = 1721.71   Standard deviation = 150.067

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Chemical properties 1.sgp (Chem components.sf3)
2001-08-22  4:05
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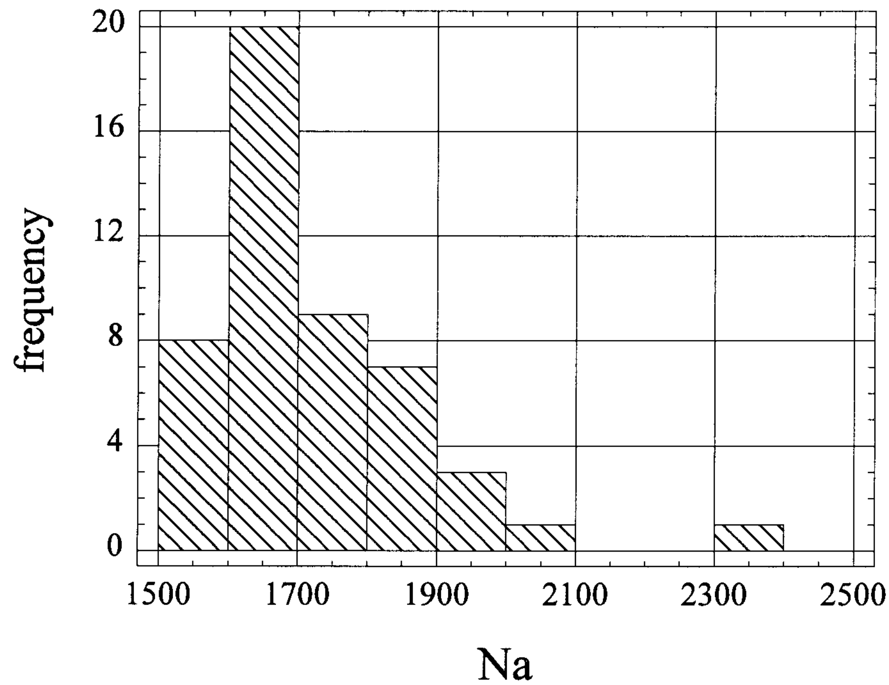
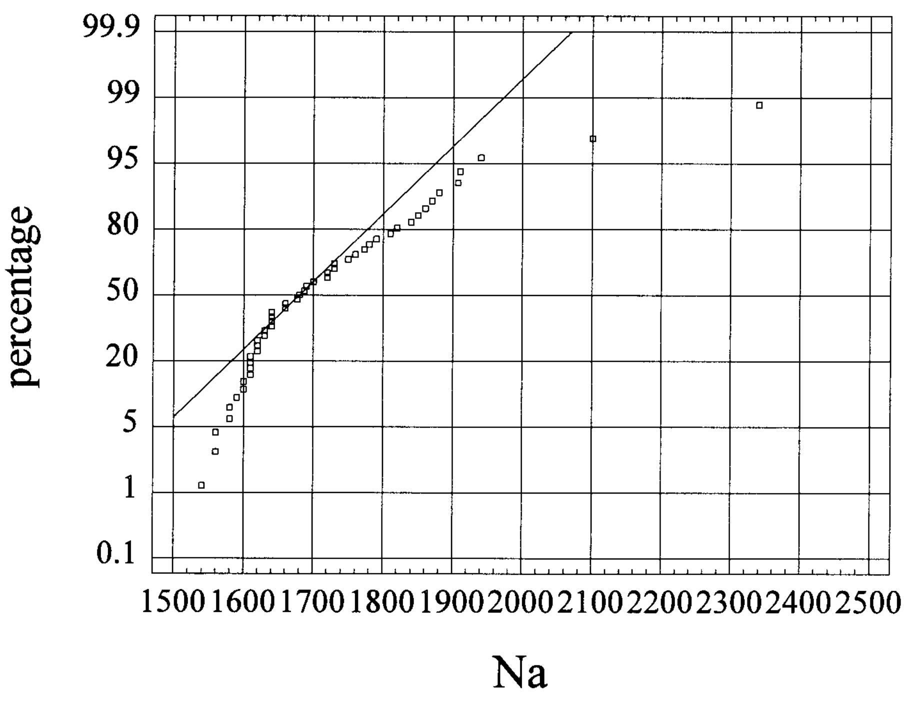
Histogram for Na



Normal Probability Plot for Na



Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:06

Analysis Summary

Data variable: Mg

49 values ranging from 24.8 to 98.0

Summary Statistics for Mg

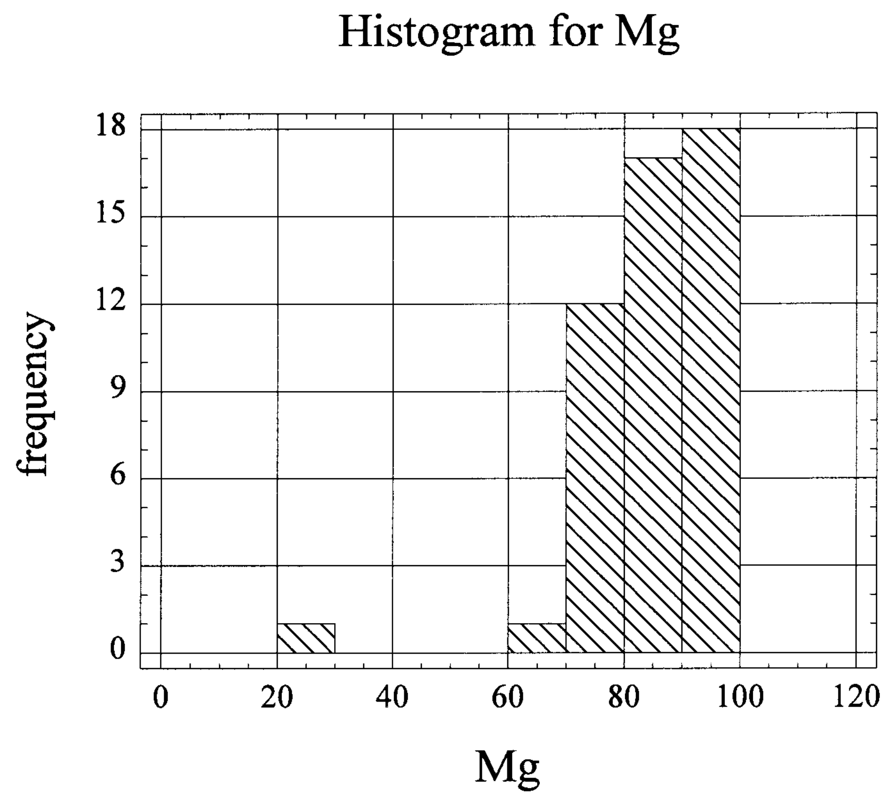
Count = 49
Average = 84.7551
Median = 87.2
Mode =
Geometric mean = 83.5155
Variance = 134.458
Standard deviation = 11.5956
Standard error = 1.65651
Minimum = 24.8
Maximum = 98.0
Range = 73.2
Lower quartile = 79.4
Upper quartile = 92.0
Interquartile range = 12.6
Skewness = -2.9947
Stnd. skewness = -8.55806
Kurtosis = 14.1133
Stnd. kurtosis = 20.166
Coeff. of variation = 13.6813%
Sum = 4153.0

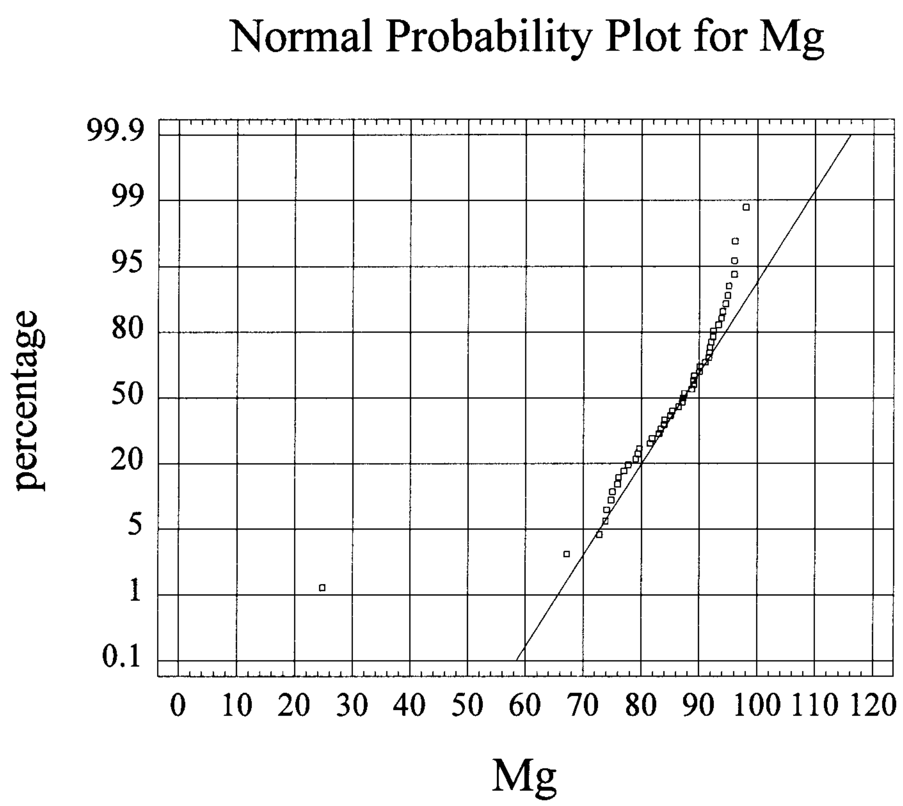
Frequency Tabulation for Mg

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		0.0		0	0.0000	0	0.0000
1	0.0	10.0	5.0	0	0.0000	0	0.0000
2	10.0	20.0	15.0	0	0.0000	0	0.0000
3	20.0	30.0	25.0	1	0.0204	1	0.0204
4	30.0	40.0	35.0	0	0.0000	1	0.0204
5	40.0	50.0	45.0	0	0.0000	1	0.0204
6	50.0	60.0	55.0	0	0.0000	1	0.0204
7	60.0	70.0	65.0	1	0.0204	2	0.0408
8	70.0	80.0	75.0	12	0.2449	14	0.2857
9	80.0	90.0	85.0	17	0.3469	31	0.6327
10	90.0	100.0	95.0	18	0.3673	49	1.0000
11	100.0	110.0	105.0	0	0.0000	49	1.0000
12	110.0	120.0	115.0	0	0.0000	49	1.0000
above	120.0			0	0.0000	49	1.0000

Mean = 84.7551   Standard deviation = 11.5956

Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:06





Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:08

Analysis Summary

Data variable: Ca

49 values ranging from 494.0 to 974.0

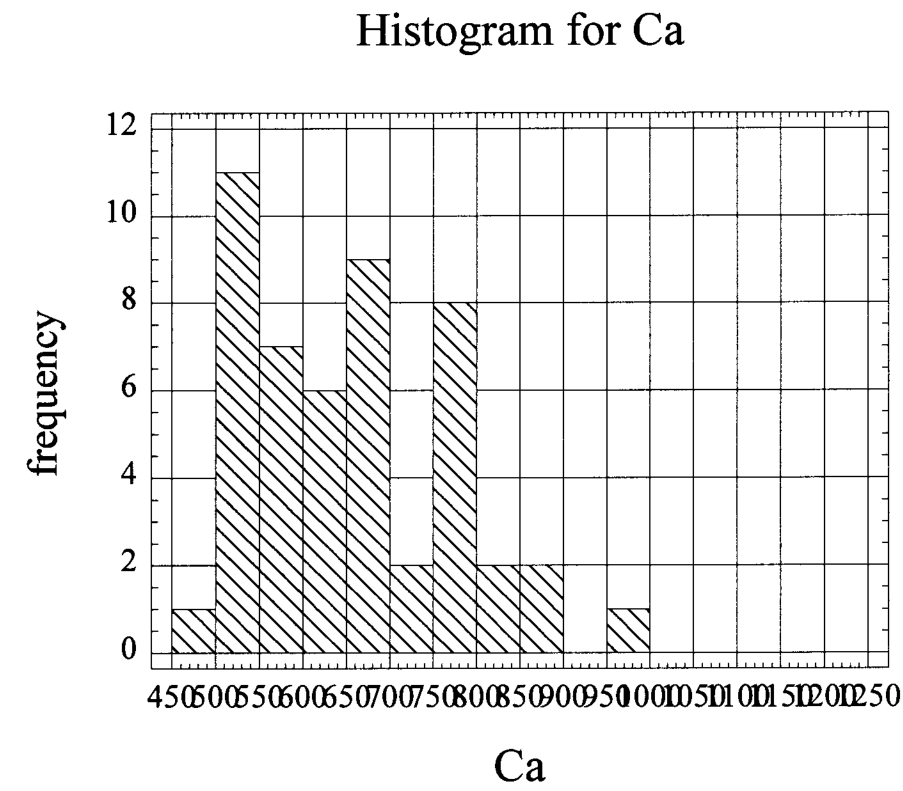
Summary Statistics for Ca

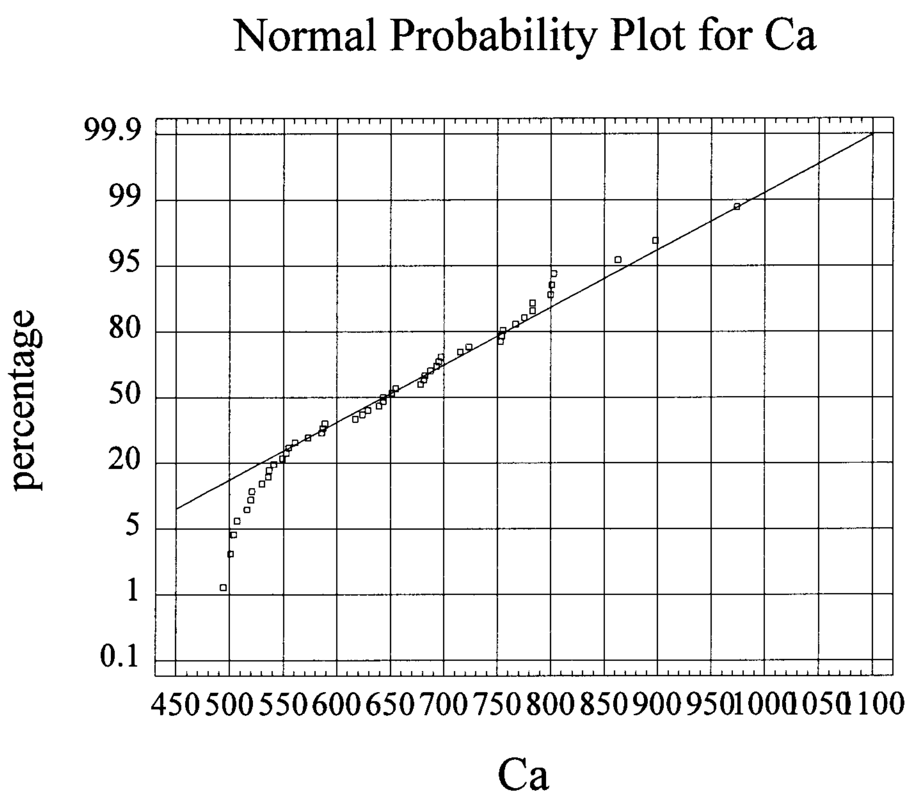
Count = 49
Average = 655.531
Median = 643.0
Mode =
Geometric mean = 645.862
Variance = 13428.0
Standard deviation = 115.879
Standard error = 16.5542
Minimum = 494.0
Maximum = 974.0
Range = 480.0
Lower quartile = 553.0
Upper quartile = 753.0
Interquartile range = 200.0
Skewness = 0.568541
Stnd. skewness = 1.62474
Kurtosis = -0.20779
Stnd. kurtosis = -0.296904
Coeff. of variation = 17.6772%
Sum = 32121.0

Frequency Tabulation for Ca

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		450.0		0	0.0000	0	0.0000
1	450.0	500.0	475.0	1	0.0204	1	0.0204
2	500.0	550.0	525.0	11	0.2245	12	0.2449
3	550.0	600.0	575.0	7	0.1429	19	0.3878
4	600.0	650.0	625.0	6	0.1224	25	0.5102
5	650.0	700.0	675.0	9	0.1837	34	0.6939
6	700.0	750.0	725.0	2	0.0408	36	0.7347
7	750.0	800.0	775.0	8	0.1633	44	0.8980
8	800.0	850.0	825.0	2	0.0408	46	0.9388
9	850.0	900.0	875.0	2	0.0408	48	0.9796
10	900.0	950.0	925.0	0	0.0000	48	0.9796
11	950.0	1000.0	975.0	1	0.0204	49	1.0000
12	1000.0	1050.0	1025.0	0	0.0000	49	1.0000
13	1050.0	1100.0	1075.0	0	0.0000	49	1.0000
above	1100.0			0	0.0000	49	1.0000

Mean = 655.531 Standard deviation = 115.879


Histogram for Ca
frequency
12
10
8
6
4
2
0
Ca


Normal Probability Plot for Ca
percentage
99.9
99
95
80
50
20
5
1
0.1
450 500 550 600 650 700 750 800 850 900 950 1000 1050 1100
Ca

Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:10

Analysis Summary

Data variable: K

49 values ranging from 7.3 to 12.0

Summary Statistics for K

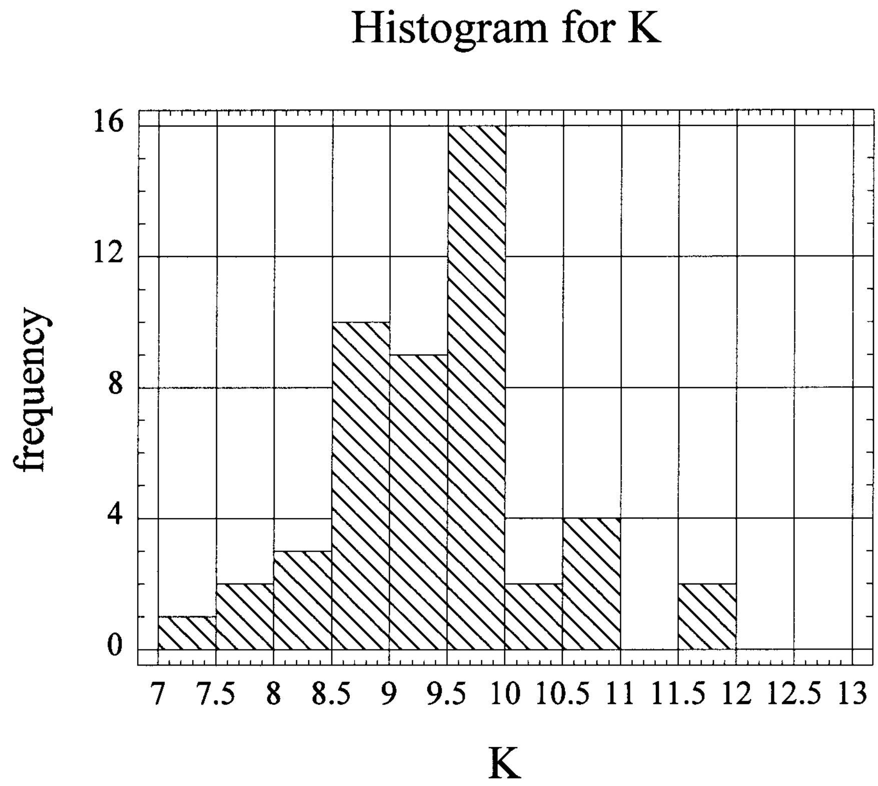
Count = 49
Average = 9.49592
Median = 9.5
Mode = 9.7
Geometric mean = 9.44938
Variance = 0.913733
Standard deviation = 0.955894
Standard error = 0.136556
Minimum = 7.3
Maximum = 12.0
Range = 4.7
Lower quartile = 9.0
Upper quartile = 9.9
Interquartile range = 0.9
Skewness = 0.420631
Stnd. skewness = 1.20205
Kurtosis = 0.780422
Stnd. kurtosis = 1.11512
Coeff. of variation = 10.0664%
Sum = 465.3

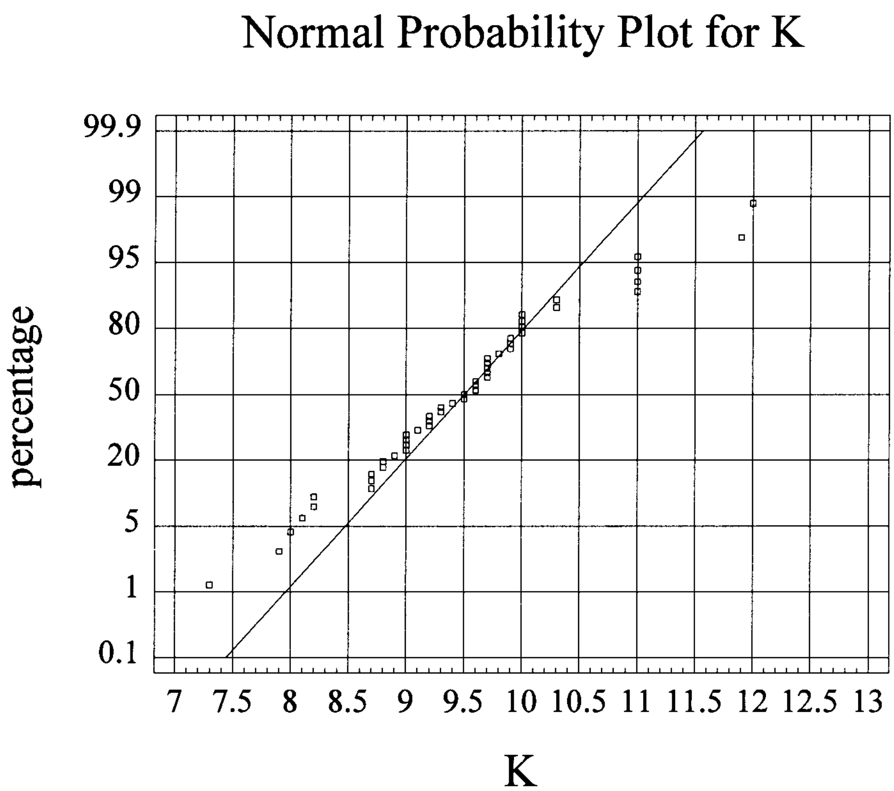
Frequency Tabulation for K

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		7.0		0	0.0000	0	0.0000
1	7.0	7.5	7.25	1	0.0204	1	0.0204
2	7.5	8.0	7.75	2	0.0408	3	0.0612
3	8.0	8.5	8.25	3	0.0612	6	0.1224
4	8.5	9.0	8.75	10	0.2041	16	0.3265
5	9.0	9.5	9.25	9	0.1837	25	0.5102
6	9.5	10.0	9.75	16	0.3265	41	0.8367
7	10.0	10.5	10.25	2	0.0408	43	0.8776
8	10.5	11.0	10.75	4	0.0816	47	0.9592
9	11.0	11.5	11.25	0	0.0000	47	0.9592
10	11.5	12.0	11.75	2	0.0408	49	1.0000
11	12.0	12.5	12.25	0	0.0000	49	1.0000
12	12.5	13.0	12.75	0	0.0000	49	1.0000
above	13.0			0	0.0000	49	1.0000

Mean = 9.49592   Standard deviation = 0.955894

Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:10





Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:12

Analysis Summary

Data variable: Sr

49 values ranging from 6.0 to 15.7

Summary Statistics for Sr

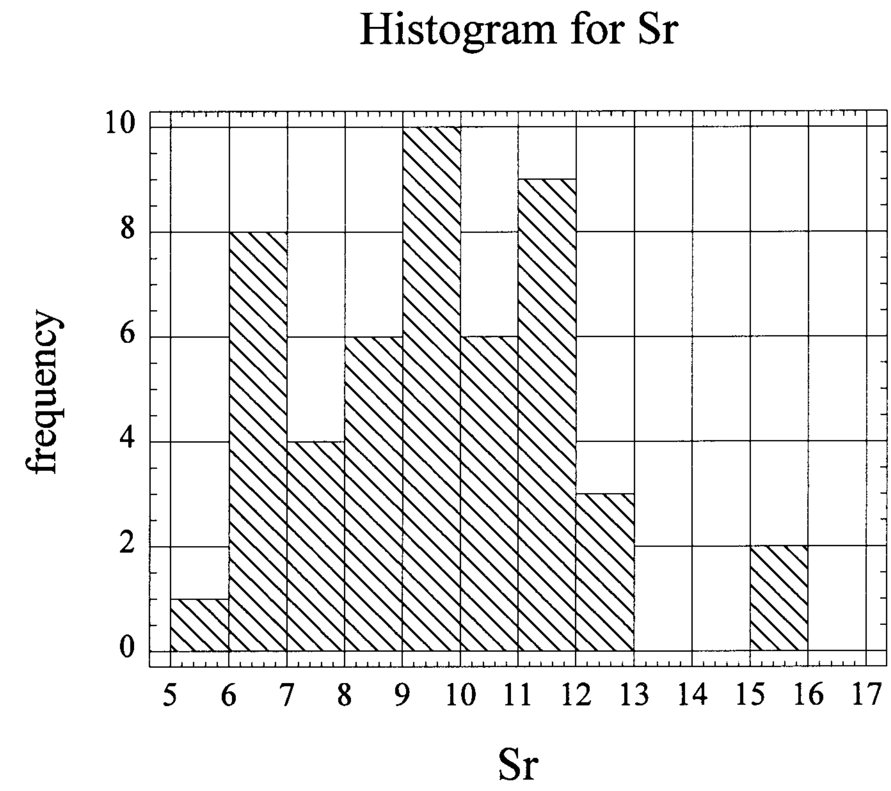
Count = 49
Average = 9.69878
Median = 9.58
Mode = 12.0
Geometric mean = 9.42848
Variance = 5.36689
Standard deviation = 2.31666
Standard error = 0.330951
Minimum = 6.0
Maximum = 15.7
Range = 9.7
Lower quartile = 7.57
Upper quartile = 11.4
Interquartile range = 3.83
Skewness = 0.377379
Stnd. skewness = 1.07845
Kurtosis = -0.101133
Stnd. kurtosis = -0.144506
Coeff. of variation = 23.8861%
Sum = 475.24

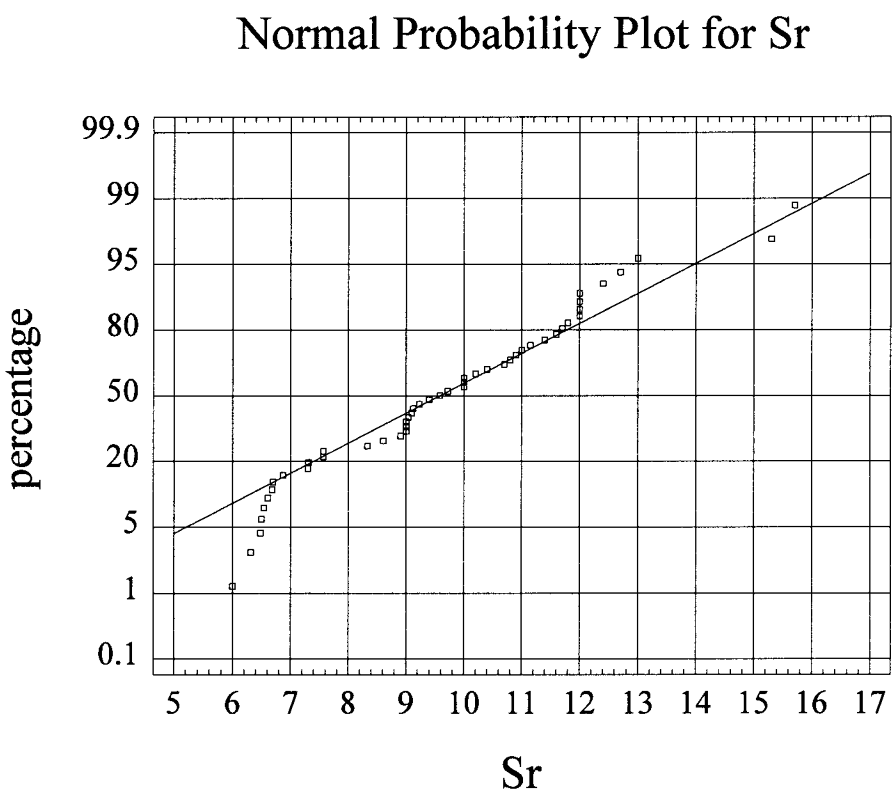
Frequency Tabulation for Sr

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		5.0		0	0.0000	0	0.0000
1	5.0	6.0	5.5	1	0.0204	1	0.0204
2	6.0	7.0	6.5	8	0.1633	9	0.1837
3	7.0	8.0	7.5	4	0.0816	13	0.2653
4	8.0	9.0	8.5	6	0.1224	19	0.3878
5	9.0	10.0	9.5	10	0.2041	29	0.5918
6	10.0	11.0	10.5	6	0.1224	35	0.7143
7	11.0	12.0	11.5	9	0.1837	44	0.8980
8	12.0	13.0	12.5	3	0.0612	47	0.9592
9	13.0	14.0	13.5	0	0.0000	47	0.9592
10	14.0	15.0	14.5	0	0.0000	47	0.9592
11	15.0	16.0	15.5	2	0.0408	49	1.0000
12	16.0	17.0	16.5	0	0.0000	49	1.0000
above	17.0			0	0.0000	49	1.0000

Mean = 9.69878 Standard deviation = 2.31666

Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:12





Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:28

Analysis Summary

Data variable: Cl

53 values ranging from 3340.0 to 5860.0

Summary Statistics for Cl

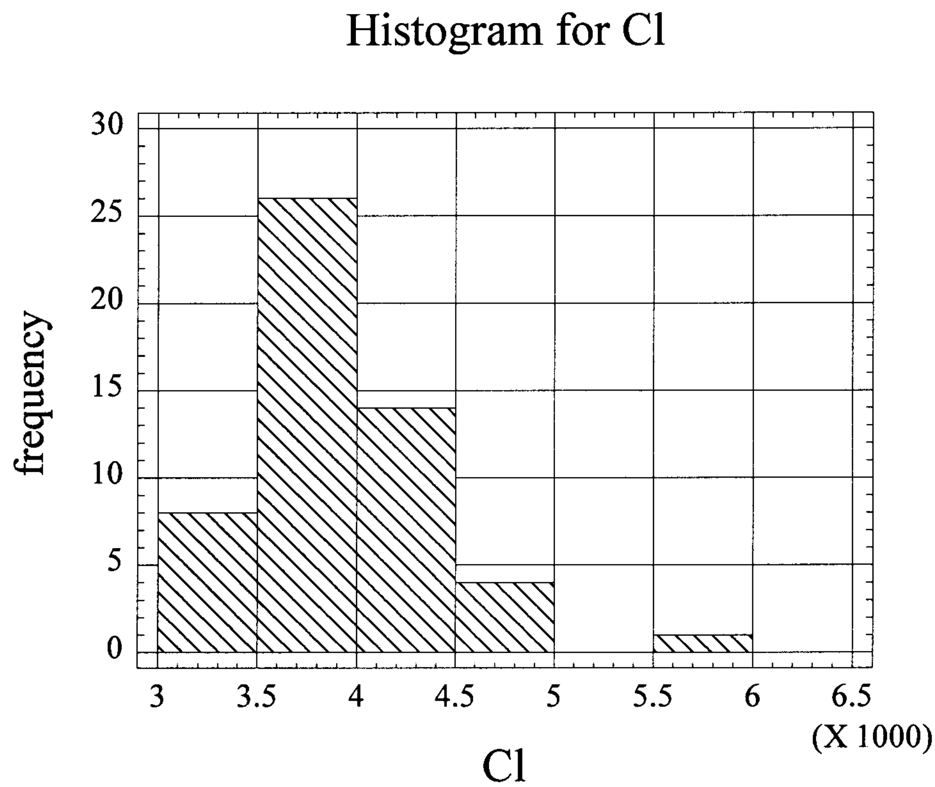
Count = 53
Average = 3936.0
Median = 3880.0
Mode = 3940.0
Geometric mean = 3912.23
Variance = 210603.0
Standard deviation = 458.915
Standard error = 63.0368
Minimum = 3340.0
Maximum = 5860.0
Range = 2520.0
Lower quartile = 3620.0
Upper quartile = 4150.0
Interquartile range = 530.0
Skewness = 1.72291
Stnd. skewness = 5.12066
Kurtosis = 4.96342
Stnd. kurtosis = 7.37587
Coeff. of variation = 11.6594%
Sum = 208608.0

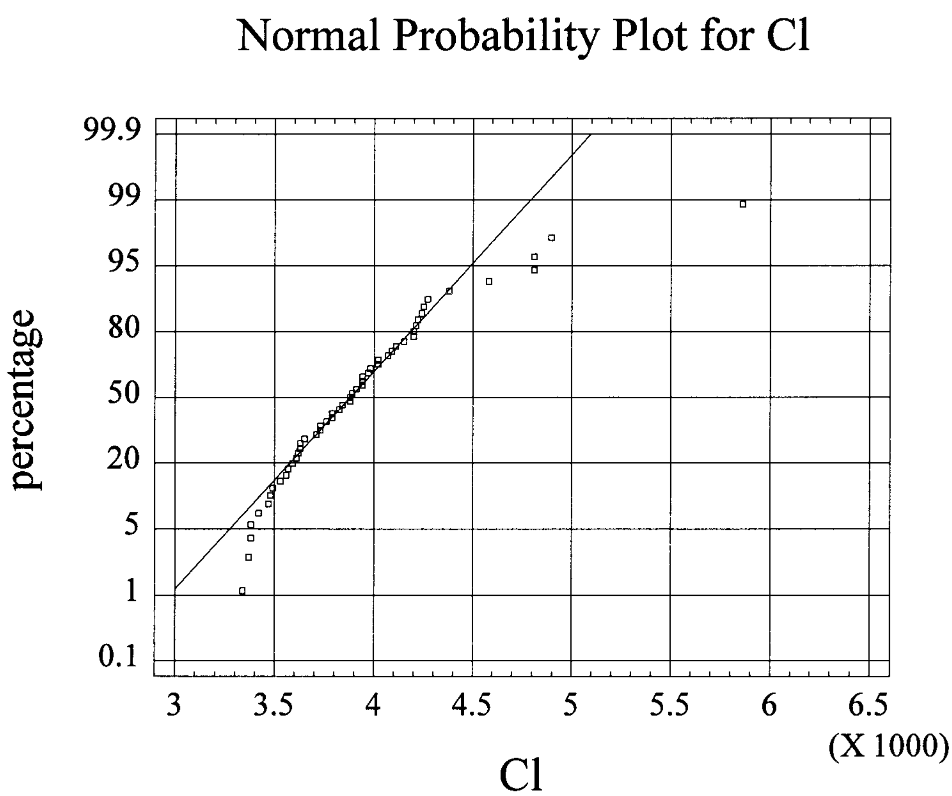
Frequency Tabulation for Cl

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		3000.0		0	0.0000	0	0.0000
1	3000.0	3500.0	3250.0	8	0.1509	8	0.1509
2	3500.0	4000.0	3750.0	26	0.4906	34	0.6415
3	4000.0	4500.0	4250.0	14	0.2642	48	0.9057
4	4500.0	5000.0	4750.0	4	0.0755	52	0.9811
5	5000.0	5500.0	5250.0	0	0.0000	52	0.9811
6	5500.0	6000.0	5750.0	1	0.0189	53	1.0000
7	6000.0	6500.0	6250.0	0	0.0000	53	1.0000
above	6500.0			0	0.0000	53	1.0000

Mean = 3936.0 Standard deviation = 458.915

Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:28





Chemical properties 1.sgp (Chem components.sf3)
2001-08-24 1:11

Analysis Summary

Data variable: SO4

47 values ranging from 277.0 to 617.0

Summary Statistics for SO4

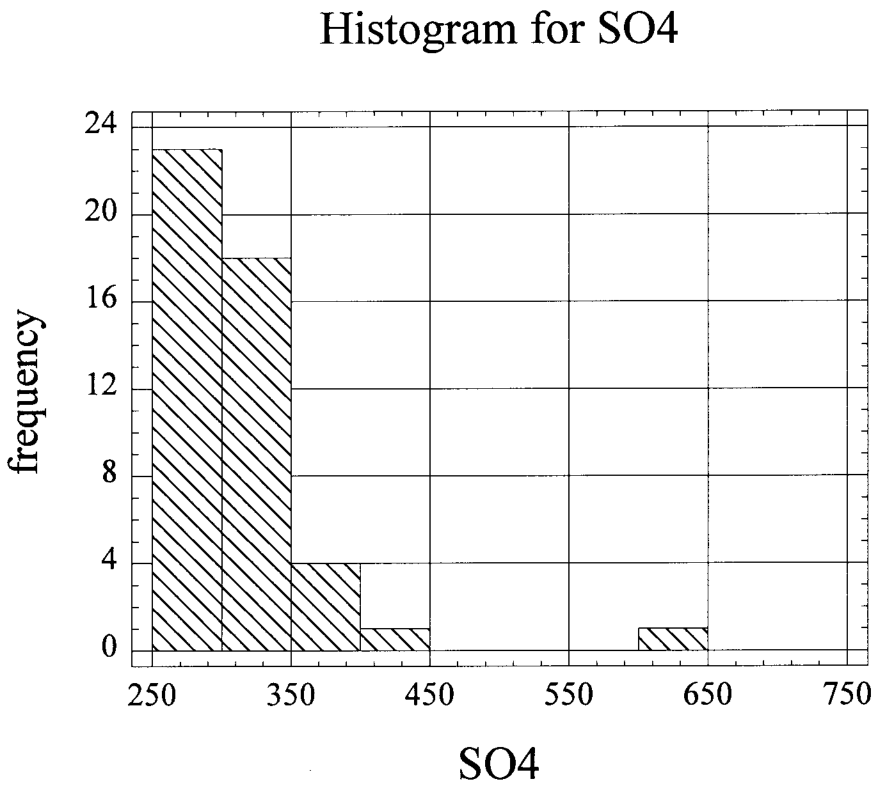
Count = 47
Average = 315.809
Median = 302.0
Mode = 285.0
Geometric mean = 312.758
Variance = 2735.46
Standard deviation = 52.3016
Standard error = 7.62898
Minimum = 277.0
Maximum = 617.0
Range = 340.0
Lower quartile = 288.0
Upper quartile = 322.0
Interquartile range = 34.0
Skewness = 4.42567
Stnd. skewness = 12.3866
Kurtosis = 24.3544
Stnd. kurtosis = 34.0816
Coeff. of variation = 16.5612%
Sum = 14843.0

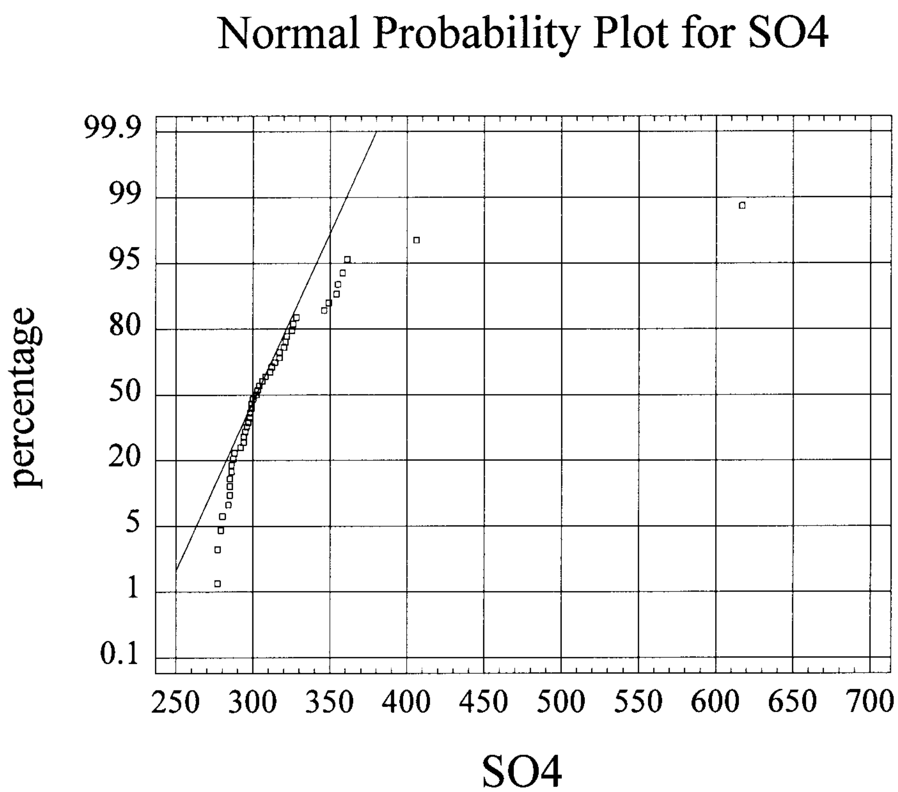
Frequency Tabulation for SO4

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		250.0		0	0.0000	0	0.0000
1	250.0	300.0	275.0	23	0.4894	23	0.4894
2	300.0	350.0	325.0	18	0.3830	41	0.8723
3	350.0	400.0	375.0	4	0.0851	45	0.9574
4	400.0	450.0	425.0	1	0.0213	46	0.9787
5	450.0	500.0	475.0	0	0.0000	46	0.9787
6	500.0	550.0	525.0	0	0.0000	46	0.9787
7	550.0	600.0	575.0	0	0.0000	46	0.9787
8	600.0	650.0	625.0	1	0.0213	47	1.0000
9	650.0	700.0	675.0	0	0.0000	47	1.0000
above	700.0			0	0.0000	47	1.0000

Mean = 315.809 Standard deviation = 52.3016

Chemical properties 1.sgp (Chem components.sf3)
2001-08-24 1:11





Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:30

Analysis Summary

Data variable: SO4_S

49 values ranging from 93.8 to 217.0

Summary Statistics for SO4_S

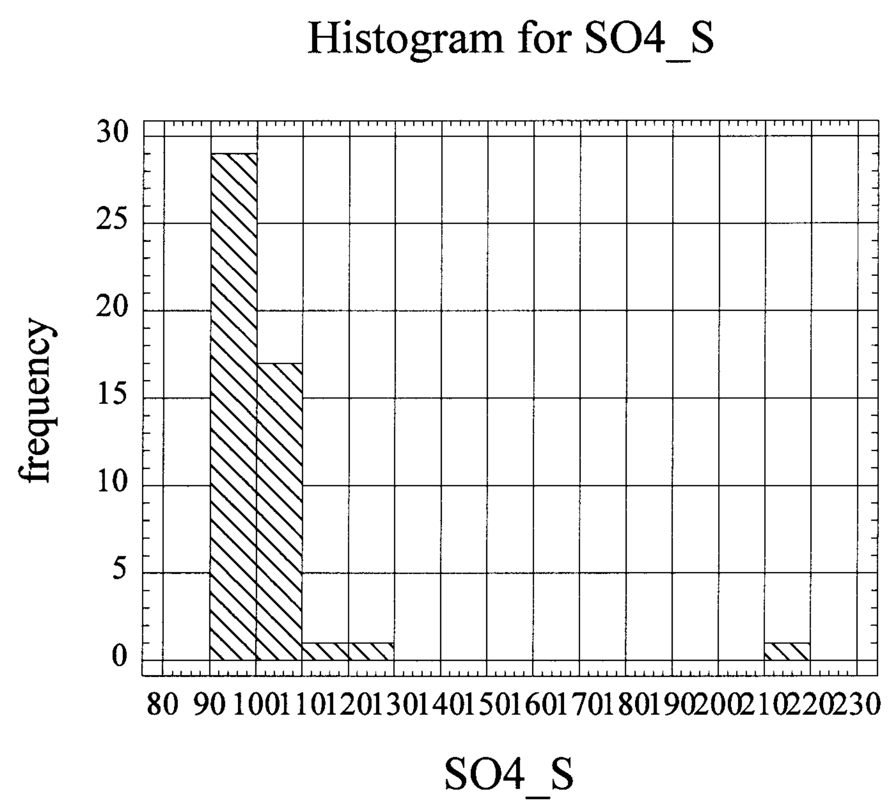
Count = 49
Average = 103.155
Median = 100.0
Mode = 100.0
Geometric mean = 102.207
Variance = 311.492
Standard deviation = 17.6491
Standard error = 2.52131
Minimum = 93.8
Maximum = 217.0
Range = 123.2
Lower quartile = 97.0
Upper quartile = 104.0
Interquartile range = 7.0
Skewness = 5.85565
Stnd. skewness = 16.7339
Kurtosis = 37.7736
Stnd. kurtosis = 53.9735
Coeff. of variation = 17.1094%
Sum = 5054.58

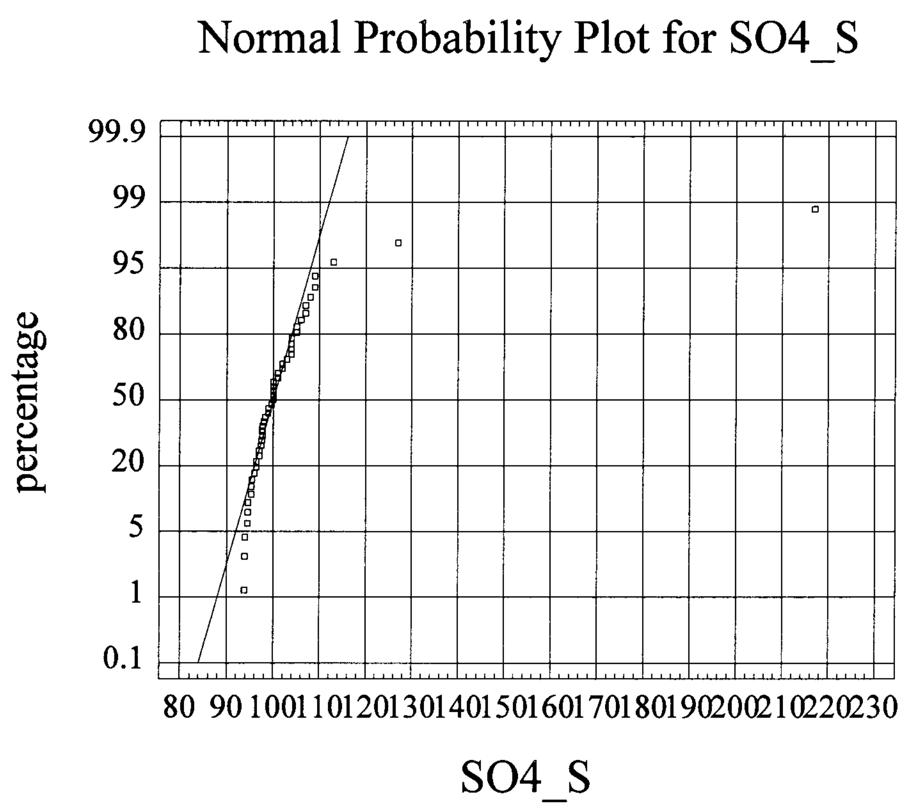
Frequency Tabulation for SO4_S

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		80.0		0	0.0000	0	0.0000
1	80.0	90.0	85.0	0	0.0000	0	0.0000
2	90.0	100.0	95.0	29	0.5918	29	0.5918
3	100.0	110.0	105.0	17	0.3469	46	0.9388
4	110.0	120.0	115.0	1	0.0204	47	0.9592
5	120.0	130.0	125.0	1	0.0204	48	0.9796
6	130.0	140.0	135.0	0	0.0000	48	0.9796
7	140.0	150.0	145.0	0	0.0000	48	0.9796
8	150.0	160.0	155.0	0	0.0000	48	0.9796
9	160.0	170.0	165.0	0	0.0000	48	0.9796
10	170.0	180.0	175.0	0	0.0000	48	0.9796
11	180.0	190.0	185.0	0	0.0000	48	0.9796
12	190.0	200.0	195.0	0	0.0000	48	0.9796
13	200.0	210.0	205.0	0	0.0000	48	0.9796
14	210.0	220.0	215.0	1	0.0204	49	1.0000
15	220.0	230.0	225.0	0	0.0000	49	1.0000
above	230.0			0	0.0000	49	1.0000

Mean = 103.155 Standard deviation = 17.6491

Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:30





Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:36

Analysis Summary

Data variable: HCO3

48 values ranging from 26.0 to 219.0

Summary Statistics for HCO3

Count = 48
Average = 181.813
Median = 190.0
Mode =
Geometric mean = 175.2
Variance = 1380.2
Standard deviation = 37.151
Standard error = 5.36229
Minimum = 26.0
Maximum = 219.0
Range = 193.0
Lower quartile = 165.5
Upper quartile = 210.5
Interquartile range = 45.0
Skewness = -1.96094
Stnd. skewness = -5.54637
Kurtosis = 5.67374
Stnd. kurtosis = 8.02389
Coeff. of variation = 20.4337%
Sum = 8727.0

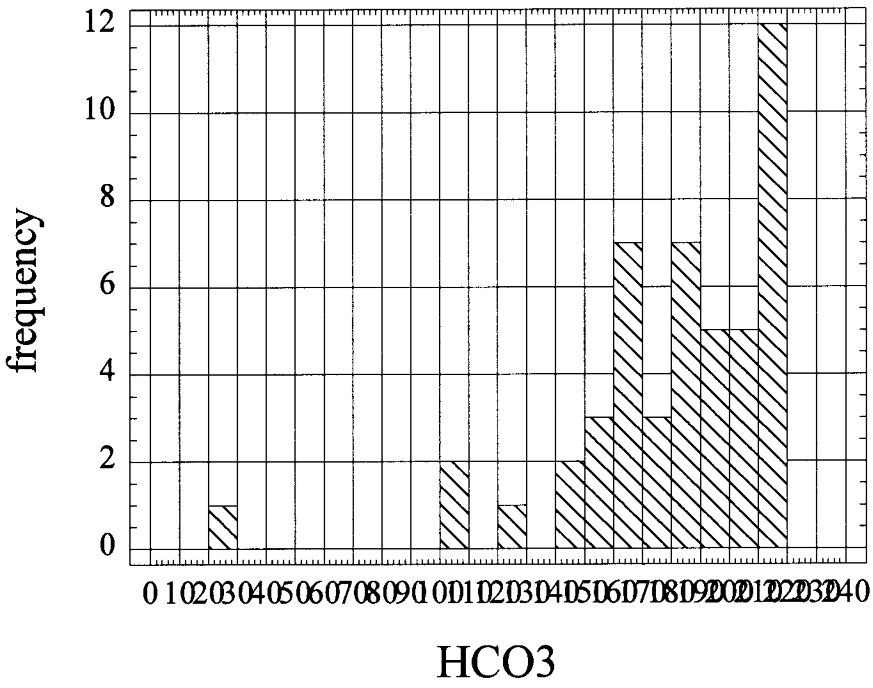
Frequency Tabulation for HCO3

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		0.0		0	0.0000	0	0.0000
1	0.0	10.0	5.0	0	0.0000	0	0.0000
2	10.0	20.0	15.0	0	0.0000	0	0.0000
3	20.0	30.0	25.0	1	0.0208	1	0.0208
4	30.0	40.0	35.0	0	0.0000	1	0.0208
5	40.0	50.0	45.0	0	0.0000	1	0.0208
6	50.0	60.0	55.0	0	0.0000	1	0.0208
7	60.0	70.0	65.0	0	0.0000	1	0.0208
8	70.0	80.0	75.0	0	0.0000	1	0.0208
9	80.0	90.0	85.0	0	0.0000	1	0.0208
10	90.0	100.0	95.0	0	0.0000	1	0.0208
11	100.0	110.0	105.0	2	0.0417	3	0.0625
12	110.0	120.0	115.0	0	0.0000	3	0.0625
13	120.0	130.0	125.0	1	0.0208	4	0.0833
14	130.0	140.0	135.0	0	0.0000	4	0.0833
15	140.0	150.0	145.0	2	0.0417	6	0.1250
16	150.0	160.0	155.0	3	0.0625	9	0.1875
17	160.0	170.0	165.0	7	0.1458	16	0.3333
18	170.0	180.0	175.0	3	0.0625	19	0.3958
19	180.0	190.0	185.0	7	0.1458	26	0.5417
20	190.0	200.0	195.0	5	0.1042	31	0.6458
21	200.0	210.0	205.0	5	0.1042	36	0.7500
22	210.0	220.0	215.0	12	0.2500	48	1.0000
23	220.0	230.0	225.0	0	0.0000	48	1.0000
24	230.0	240.0	235.0	0	0.0000	48	1.0000
above	240.0			0	0.0000	48	1.0000

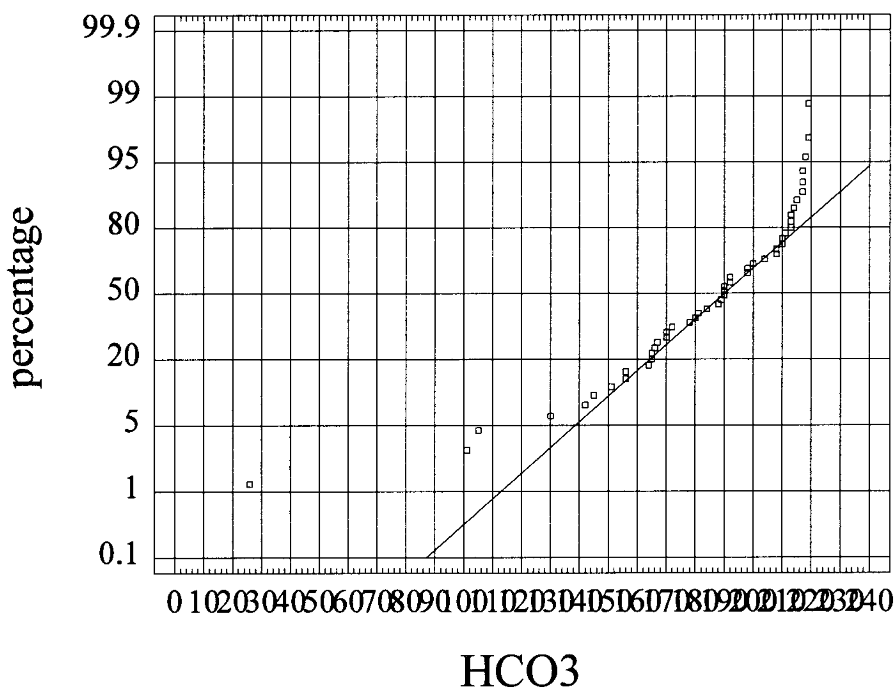
Mean = 181.813 Standard deviation = 37.151

Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:36

Histogram for HCO3



Normal Probability Plot for HCO3



Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:37

Analysis Summary

Data variable: Br

47 values ranging from 12.0 to 27.2

Summary Statistics for Br

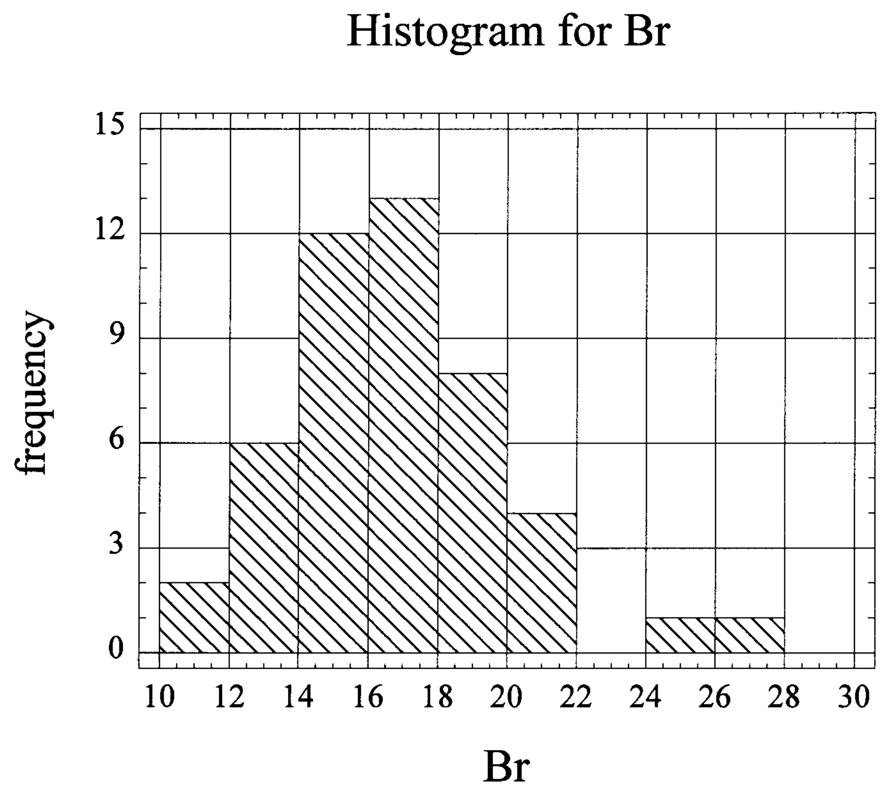
Count = 47
Average = 16.9038
Median = 17.0
Mode = 17.0
Geometric mean = 16.6289
Variance = 10.3099
Standard deviation = 3.2109
Standard error = 0.468359
Minimum = 12.0
Maximum = 27.2
Range = 15.2
Lower quartile = 14.3
Upper quartile = 18.7
Interquartile range = 4.4
Skewness = 1.09366
Stnd. skewness = 3.06094
Kurtosis = 1.90592
Stnd. kurtosis = 2.66715
Coeff. of variation = 18.9951%
Sum = 794.48

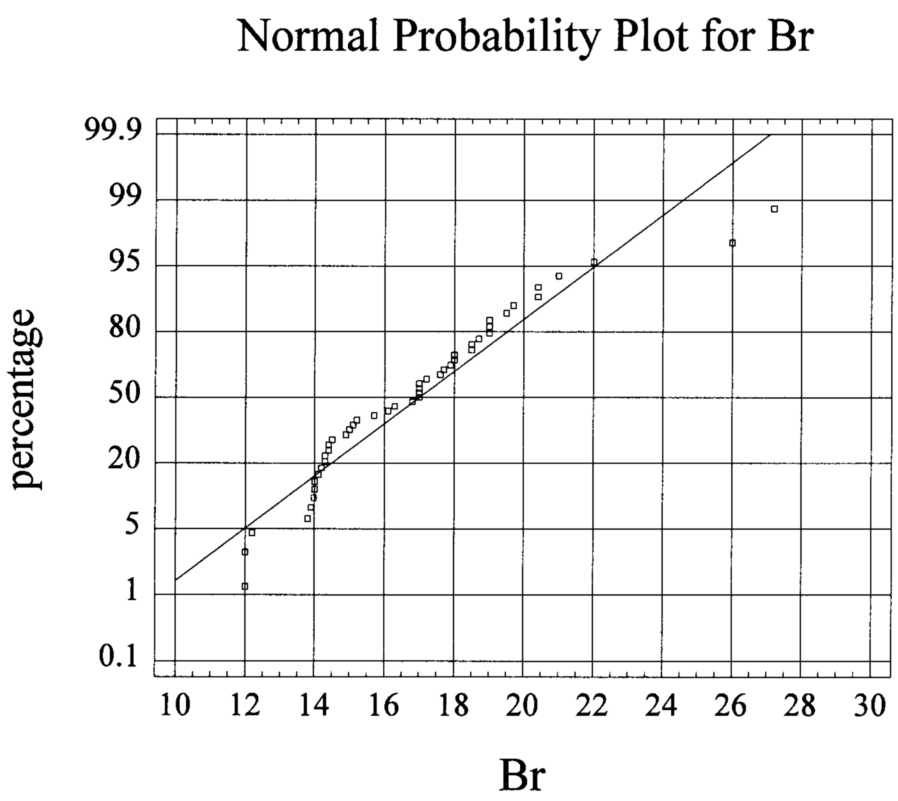
Frequency Tabulation for Br

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		10.0		0	0.0000	0	0.0000
1	10.0	12.0	11.0	2	0.0426	2	0.0426
2	12.0	14.0	13.0	6	0.1277	8	0.1702
3	14.0	16.0	15.0	12	0.2553	20	0.4255
4	16.0	18.0	17.0	13	0.2766	33	0.7021
5	18.0	20.0	19.0	8	0.1702	41	0.8723
6	20.0	22.0	21.0	4	0.0851	45	0.9574
7	22.0	24.0	23.0	0	0.0000	45	0.9574
8	24.0	26.0	25.0	1	0.0213	46	0.9787
9	26.0	28.0	27.0	1	0.0213	47	1.0000
10	28.0	30.0	29.0	0	0.0000	47	1.0000
above	30.0			0	0.0000	47	1.0000

Mean = 16.9038   Standard deviation = 3.2109

Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:37





Chemical properties 1.sgp (Chem components.sf3)
2001-08-24 1:39

Analysis Summary

Data variable: F

30 values ranging from 0.11 to 3.9

Summary Statistics for F

Count = 30
Average = 1.541
Median = 1.28
Mode =
Geometric mean = 1.26341
Variance = 0.798368
Standard deviation = 0.893514
Standard error = 0.163133
Minimum = 0.11
Maximum = 3.9
Range = 3.79
Lower quartile = 1.14
Upper quartile = 1.8
Interquartile range = 0.66
Skewness = 1.34803
Stnd. skewness = 3.01428
Kurtosis = 1.77792
Stnd. kurtosis = 1.98777
Coeff. of variation = 57.9828%
Sum = 46.23

Frequency Tabulation for F

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		0.0		0	0.0000	0	0.0000
1	0.0	0.5	0.25	2	0.0667	2	0.0667
2	0.5	1.0	0.75	2	0.0667	4	0.1333
3	1.0	1.5	1.25	17	0.5667	21	0.7000
4	1.5	2.0	1.75	5	0.1667	26	0.8667
5	2.0	2.5	2.25	0	0.0000	26	0.8667
6	2.5	3.0	2.75	0	0.0000	26	0.8667
7	3.0	3.5	3.25	3	0.1000	29	0.9667
8	3.5	4.0	3.75	1	0.0333	30	1.0000
9	4.0	4.5	4.25	0	0.0000	30	1.0000
10	4.5	5.0	4.75	0	0.0000	30	1.0000
above	5.0			0	0.0000	30	1.0000

Mean = 1.541 Standard deviation = 0.893514

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Chemical properties 1.sgp (Chem components.sf3)
2001-08-24  1:39
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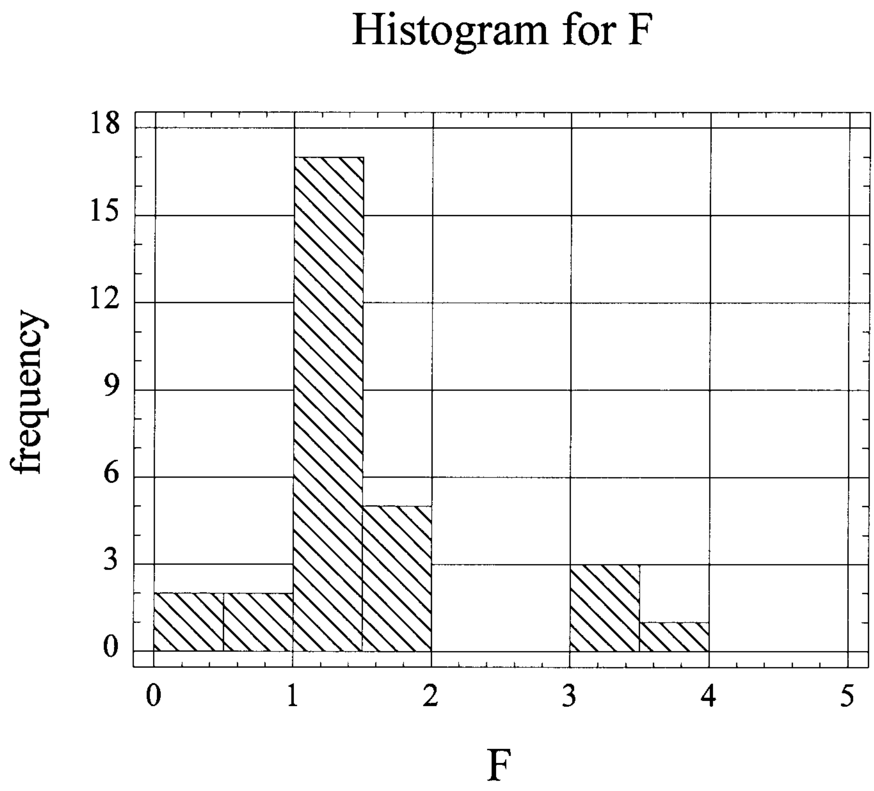
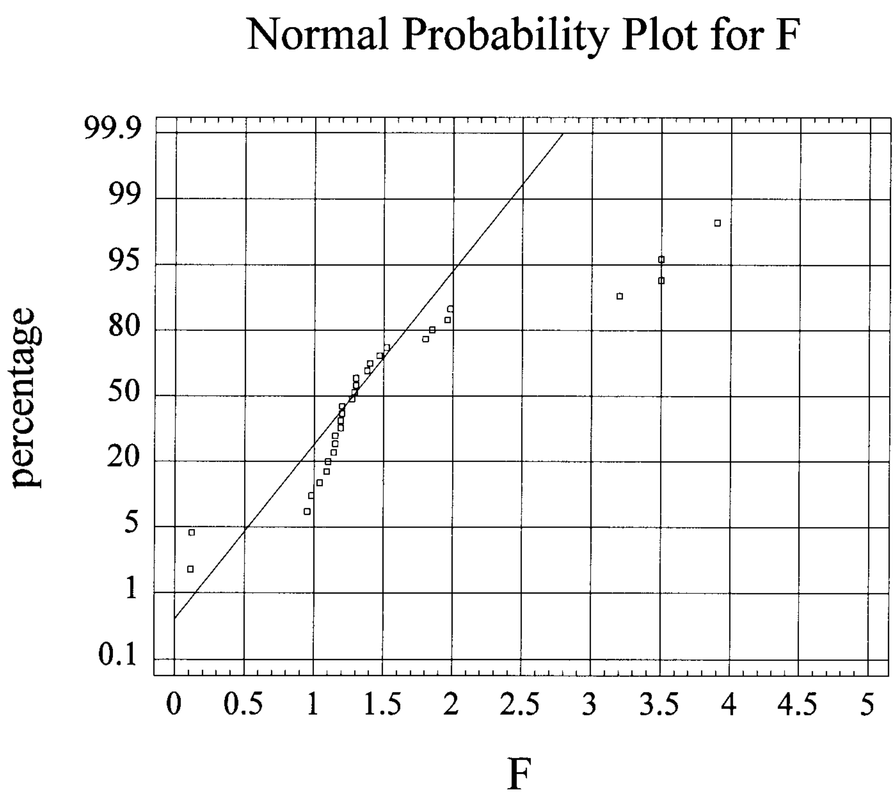




Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:01

Analysis Summary

Data variable: S

53 values ranging from 5.48 to 8.68

Summary Statistics for S

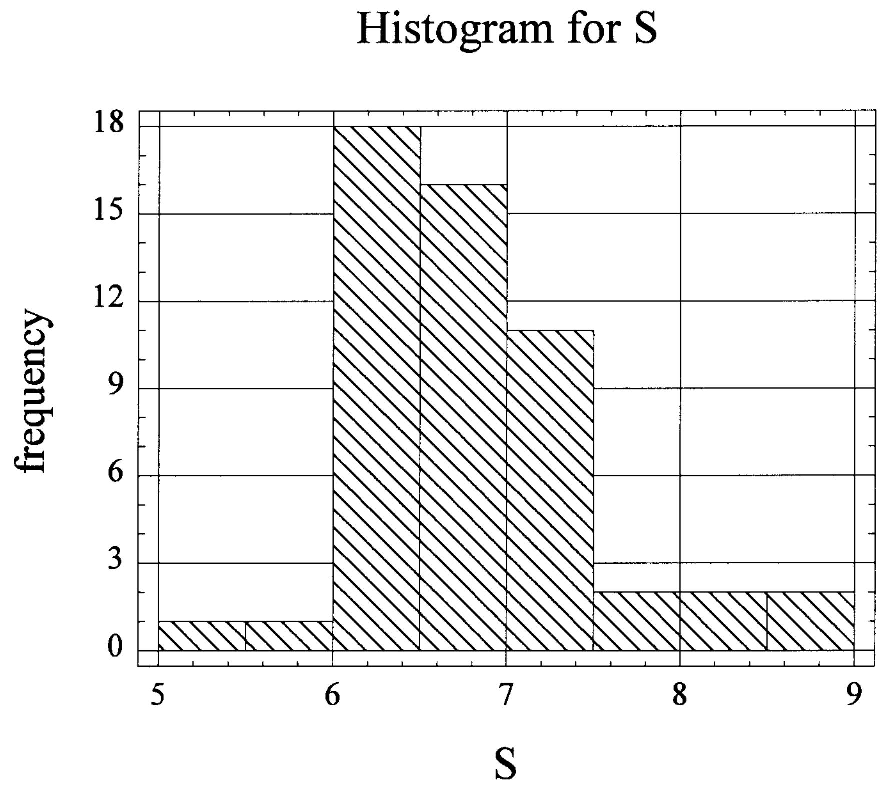
Count = 53
Average = 6.81925
Median = 6.7
Mode =
Geometric mean = 6.7859
Variance = 0.482907
Standard deviation = 0.694915
Standard error = 0.0954539
Minimum = 5.48
Maximum = 8.68
Range = 3.2
Lower quartile = 6.35
Upper quartile = 7.27
Interquartile range = 0.92
Skewness = 0.825673
Stnd. skewness = 2.45398
Kurtosis = 0.701706
Stnd. kurtosis = 1.04277
Coeff. of variation = 10.1905%
Sum = 361.42

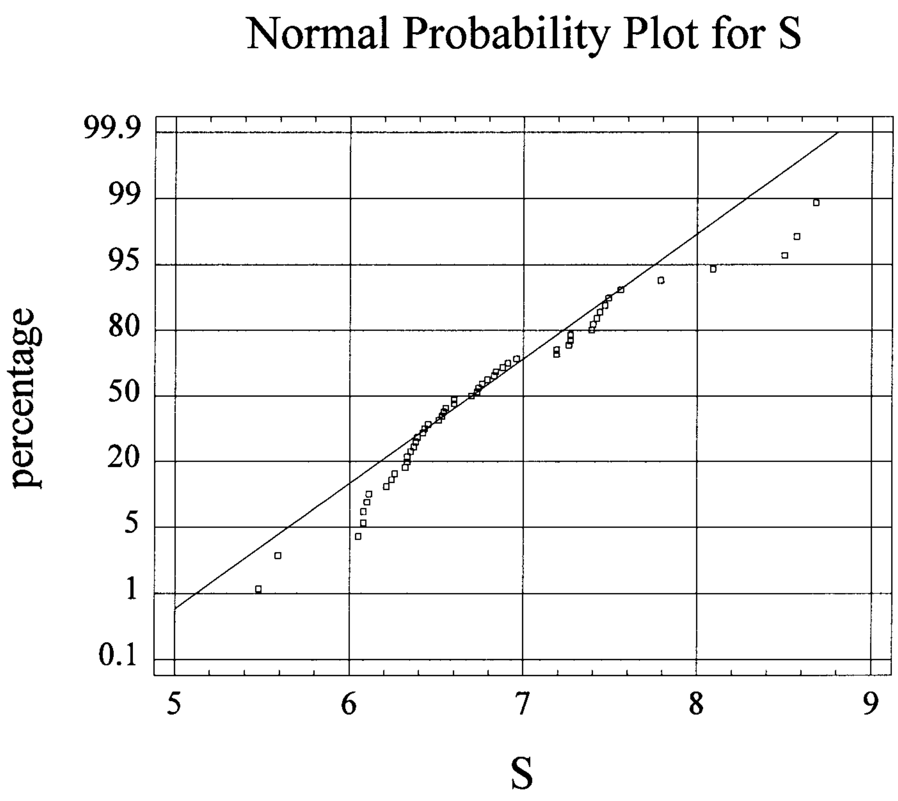
Frequency Tabulation for S

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		5.0		0	0.0000	0	0.0000
1	5.0	5.5	5.25	1	0.0189	1	0.0189
2	5.5	6.0	5.75	1	0.0189	2	0.0377
3	6.0	6.5	6.25	18	0.3396	20	0.3774
4	6.5	7.0	6.75	16	0.3019	36	0.6792
5	7.0	7.5	7.25	11	0.2075	47	0.8868
6	7.5	8.0	7.75	2	0.0377	49	0.9245
7	8.0	8.5	8.25	2	0.0377	51	0.9623
8	8.5	9.0	8.75	2	0.0377	53	1.0000
above	9.0			0	0.0000	53	1.0000

Mean = 6.81925 Standard deviation = 0.694915

Chemical properties 1.sgp (Chem components.sf3)
2001-08-22 4:01





Chemical properties 1.sgp (Chem components.sf3)
2001-08-24 1:40

Analysis Summary

Data variable: Fe

42 values ranging from 0.022 to 0.91

Summary Statistics for Fe

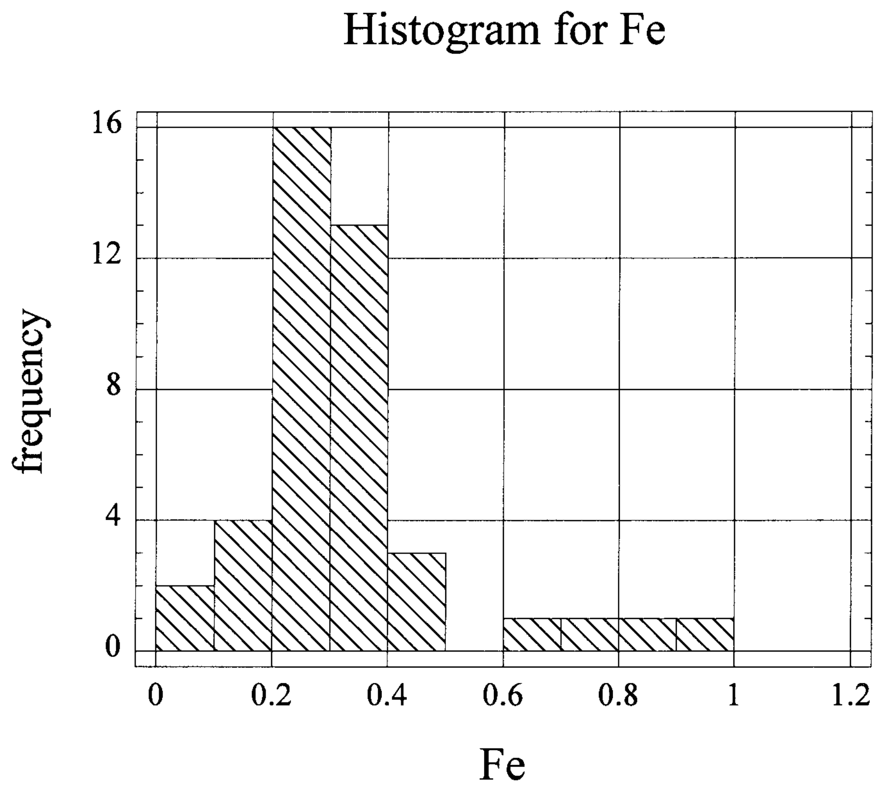
Count = 42
Average = 0.323532
Median = 0.289167
Mode = 0.285
Geometric mean = 0.274692
Variance = 0.0311113
Standard deviation = 0.176384
Standard error = 0.0272166
Minimum = 0.022
Maximum = 0.91
Range = 0.888
Lower quartile = 0.245
Upper quartile = 0.351
Interquartile range = 0.106
Skewness = 1.61343
Stnd. skewness = 4.26874
Kurtosis = 3.65613
Stnd. kurtosis = 4.83661
Coeff. of variation = 54.5183%
Sum = 13.5883

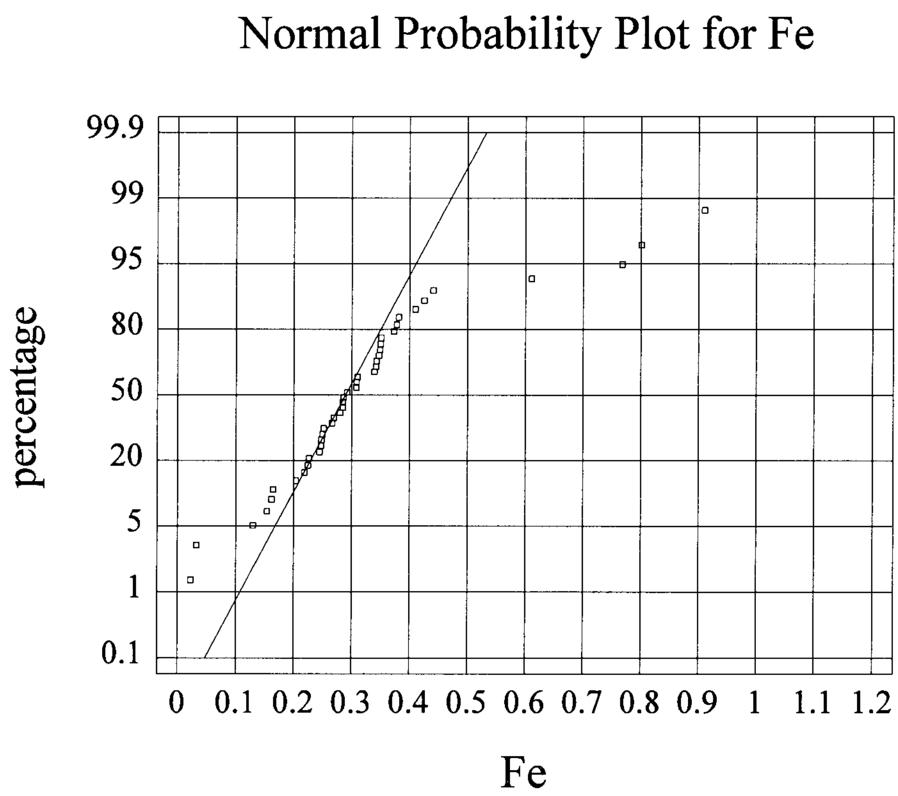
Frequency Tabulation for Fe

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		0.0		0	0.0000	0	0.0000
1	0.0	0.1	0.05	2	0.0476	2	0.0476
2	0.1	0.2	0.15	4	0.0952	6	0.1429
3	0.2	0.3	0.25	16	0.3810	22	0.5238
4	0.3	0.4	0.35	13	0.3095	35	0.8333
5	0.4	0.5	0.45	3	0.0714	38	0.9048
6	0.5	0.6	0.55	0	0.0000	38	0.9048
7	0.6	0.7	0.65	1	0.0238	39	0.9286
8	0.7	0.8	0.75	1	0.0238	40	0.9524
9	0.8	0.9	0.85	1	0.0238	41	0.9762
10	0.9	1.0	0.95	1	0.0238	42	1.0000
11	1.0	1.1	1.05	0	0.0000	42	1.0000
12	1.1	1.2	1.15	0	0.0000	42	1.0000
above	1.2			0	0.0000	42	1.0000

Mean = 0.323532 Standard deviation = 0.176384

Chemical properties 1.sgp (Chem components.sf3)
2001-08-24 1:40





Chemical properties 1.sgp (Chem components.sf3)
2001-08-24 1:40

Analysis Summary

Data variable: Mn

42 values ranging from 0.47 to 0.66

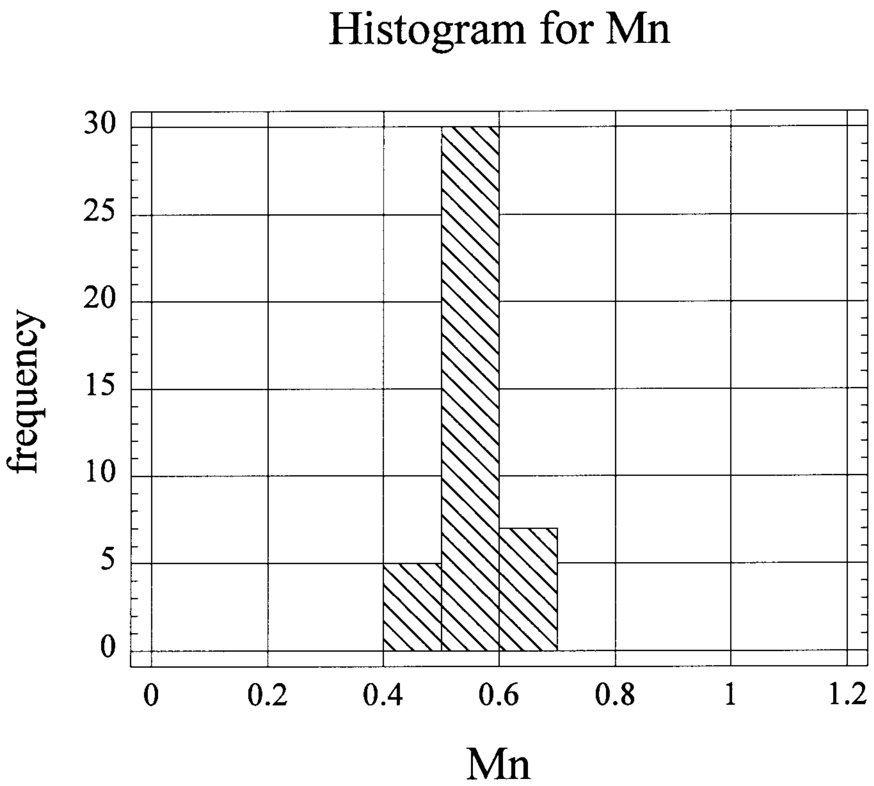
Summary Statistics for Mn

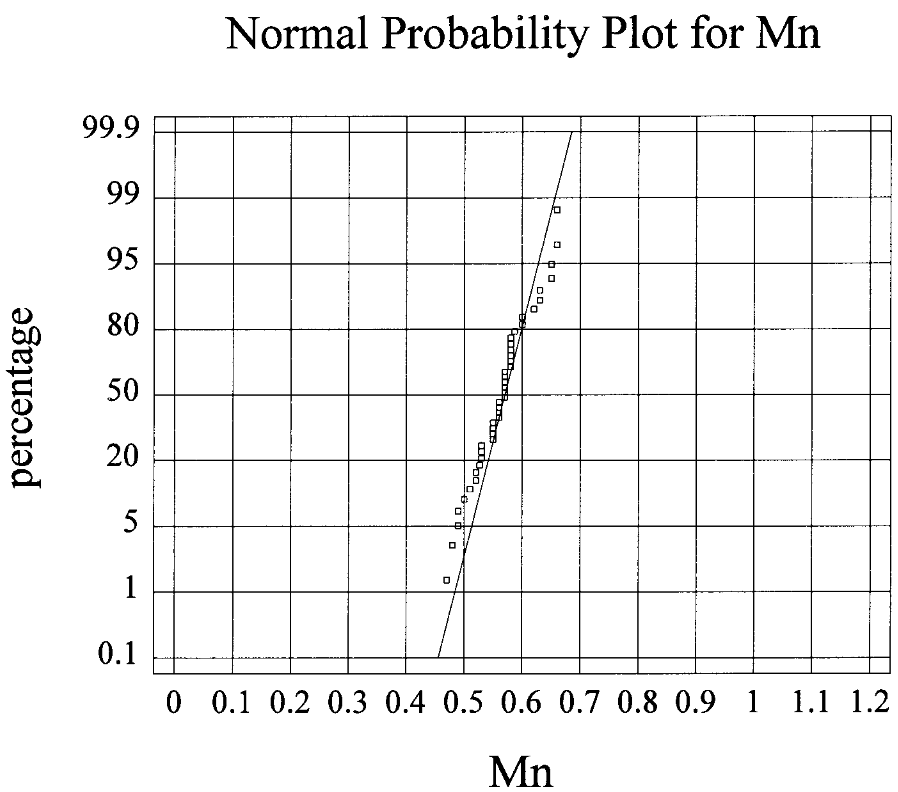
Count = 42
Average = 0.564841
Median = 0.57
Mode =
Geometric mean = 0.562876
Variance = 0.00227653
Standard deviation = 0.047713
Standard error = 0.00736228
Minimum = 0.47
Maximum = 0.66
Range = 0.19
Lower quartile = 0.53
Upper quartile = 0.58
Interquartile range = 0.05
Skewness = 0.160925
Stnd. skewness = 0.425766
Kurtosis = -0.208316
Stnd. kurtosis = -0.275576
Coeff. of variation = 8.44716%
Sum = 23.7233

Frequency Tabulation for Mn

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		0.0		0	0.0000	0	0.0000
1	0.0	0.1	0.05	0	0.0000	0	0.0000
2	0.1	0.2	0.15	0	0.0000	0	0.0000
3	0.2	0.3	0.25	0	0.0000	0	0.0000
4	0.3	0.4	0.35	0	0.0000	0	0.0000
5	0.4	0.5	0.45	5	0.1190	5	0.1190
6	0.5	0.6	0.55	30	0.7143	35	0.8333
7	0.6	0.7	0.65	7	0.1667	42	1.0000
8	0.7	0.8	0.75	0	0.0000	42	1.0000
9	0.8	0.9	0.85	0	0.0000	42	1.0000
10	0.9	1.0	0.95	0	0.0000	42	1.0000
11	1.0	1.1	1.05	0	0.0000	42	1.0000
12	1.1	1.2	1.15	0	0.0000	42	1.0000
above	1.2			0	0.0000	42	1.0000

Mean = 0.564841 Standard deviation = 0.047713


Histogram for Mn
frequency
30
25
20
15
10
5
0
0
0.2
0.4
0.6
0.8
1
1.2
Mn


Normal Probability Plot for Mn
percentage
99.9
99
95
80
50
20
5
1
0.1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
1.1
1.2
Mn

Chemical properties 1.sgp (Chem components.sf3)
2001-08-24 1:40

Analysis Summary

Data variable: Li

49 values ranging from 0.156 to 0.626

Summary Statistics for Li

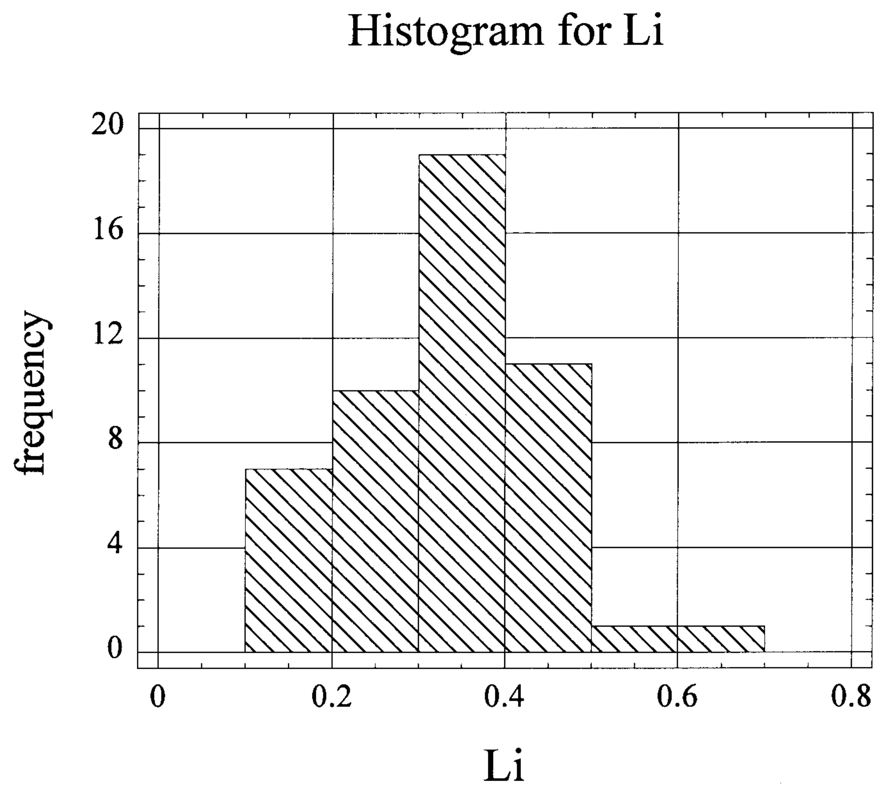
Count = 49
Average = 0.330762
Median = 0.321
Mode =
Geometric mean = 0.314588
Variance = 0.0106559
Standard deviation = 0.103228
Standard error = 0.0147468
Minimum = 0.156
Maximum = 0.626
Range = 0.47
Lower quartile = 0.247
Upper quartile = 0.415
Interquartile range = 0.168
Skewness = 0.353235
Stnd. skewness = 1.00945
Kurtosis = -0.0790916
Stnd. kurtosis = -0.113012
Coeff. of variation = 31.209%
Sum = 16.2073

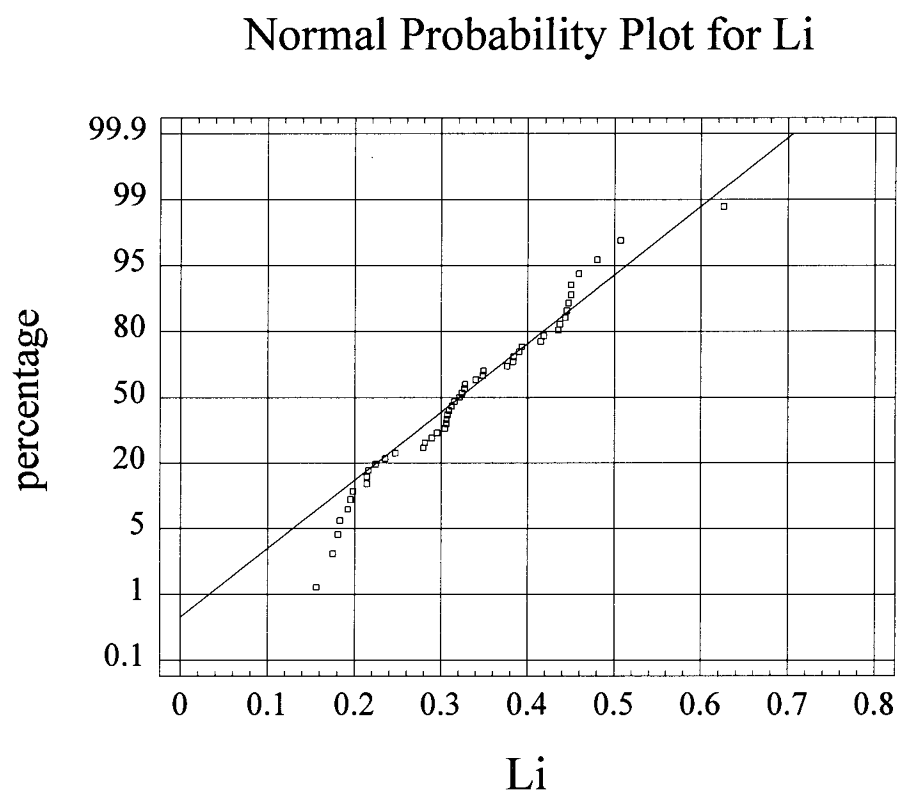
Frequency Tabulation for Li

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		0.0		0	0.0000	0	0.0000
1	0.0	0.1	0.05	0	0.0000	0	0.0000
2	0.1	0.2	0.15	7	0.1429	7	0.1429
3	0.2	0.3	0.25	10	0.2041	17	0.3469
4	0.3	0.4	0.35	19	0.3878	36	0.7347
5	0.4	0.5	0.45	11	0.2245	47	0.9592
6	0.5	0.6	0.55	1	0.0204	48	0.9796
7	0.6	0.7	0.65	1	0.0204	49	1.0000
8	0.7	0.8	0.75	0	0.0000	49	1.0000
above	0.8			0	0.0000	49	1.0000

Mean = 0.330762   Standard deviation = 0.103228

Chemical properties 1.sgp (Chem components.sf3)
2001-08-24 1:40





Chemical properties 1.sgp (Chem components.sf3)
2001-08-24 1:40

Analysis Summary

Data variable: Si

49 values ranging from 5.4 to 12.6

Summary Statistics for Si

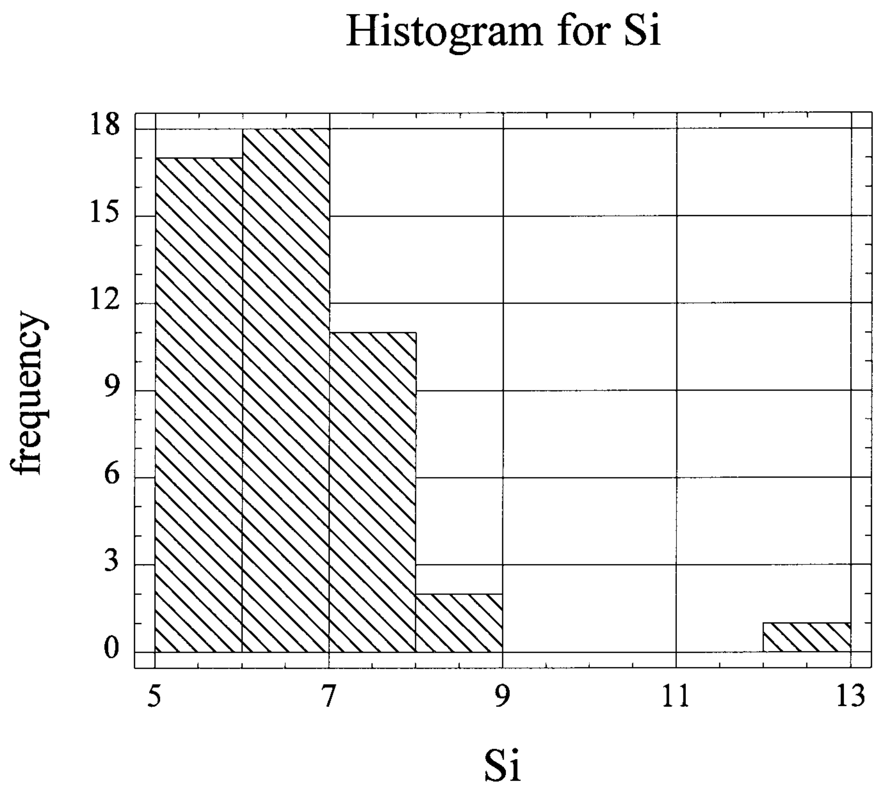
Count = 49
Average = 6.67483
Median = 6.5
Mode =
Geometric mean = 6.5953
Variance = 1.34891
Standard deviation = 1.16143
Standard error = 0.165918
Minimum = 5.4
Maximum = 12.6
Range = 7.2
Lower quartile = 5.9
Upper quartile = 7.1
Interquartile range = 1.2
Skewness = 2.91627
Stnd. skewness = 8.33394
Kurtosis = 13.3261
Stnd. kurtosis = 19.0413
Coeff. of variation = 17.4001%
Sum = 327.067

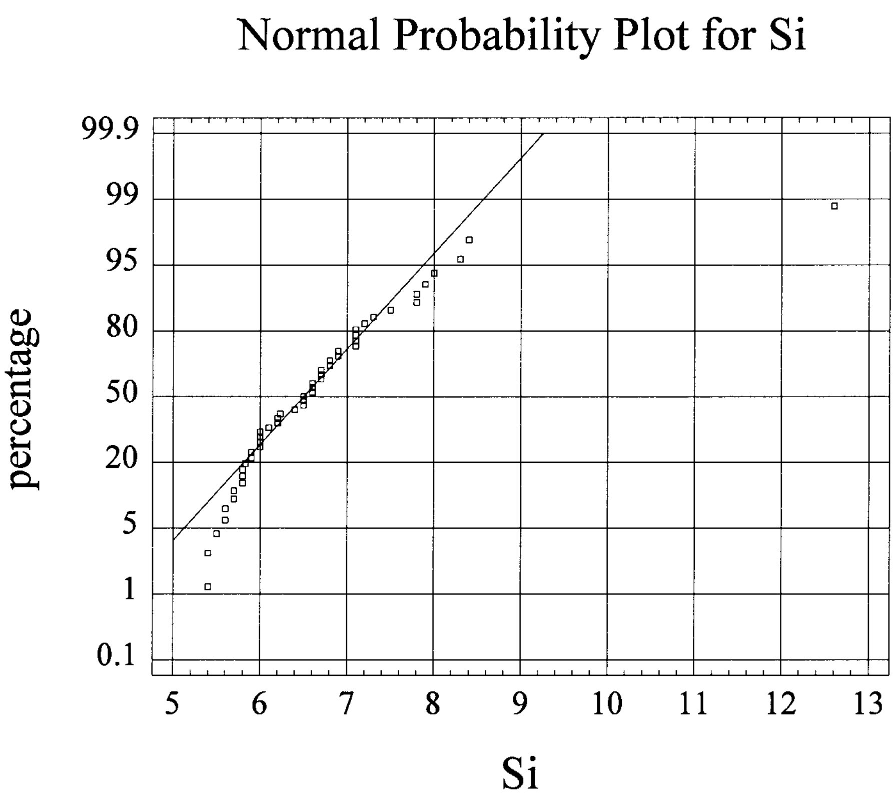
Frequency Tabulation for Si

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		5.0		0	0.0000	0	0.0000
1	5.0	6.0	5.5	17	0.3469	17	0.3469
2	6.0	7.0	6.5	18	0.3673	35	0.7143
3	7.0	8.0	7.5	11	0.2245	46	0.9388
4	8.0	9.0	8.5	2	0.0408	48	0.9796
5	9.0	10.0	9.5	0	0.0000	48	0.9796
6	10.0	11.0	10.5	0	0.0000	48	0.9796
7	11.0	12.0	11.5	0	0.0000	48	0.9796
8	12.0	13.0	12.5	1	0.0204	49	1.0000
above	13.0			0	0.0000	49	1.0000

Mean = 6.67483   Standard deviation = 1.16143

Chemical properties 1.sgp (Chem components.sf3)
2001-08-24 1:40





Chemical properties 1.sgp (Chem components.sf3)
2001-08-24 1:40

Analysis Summary

Data variable: pH

49 values ranging from 7.2 to 7.7

Summary Statistics for pH

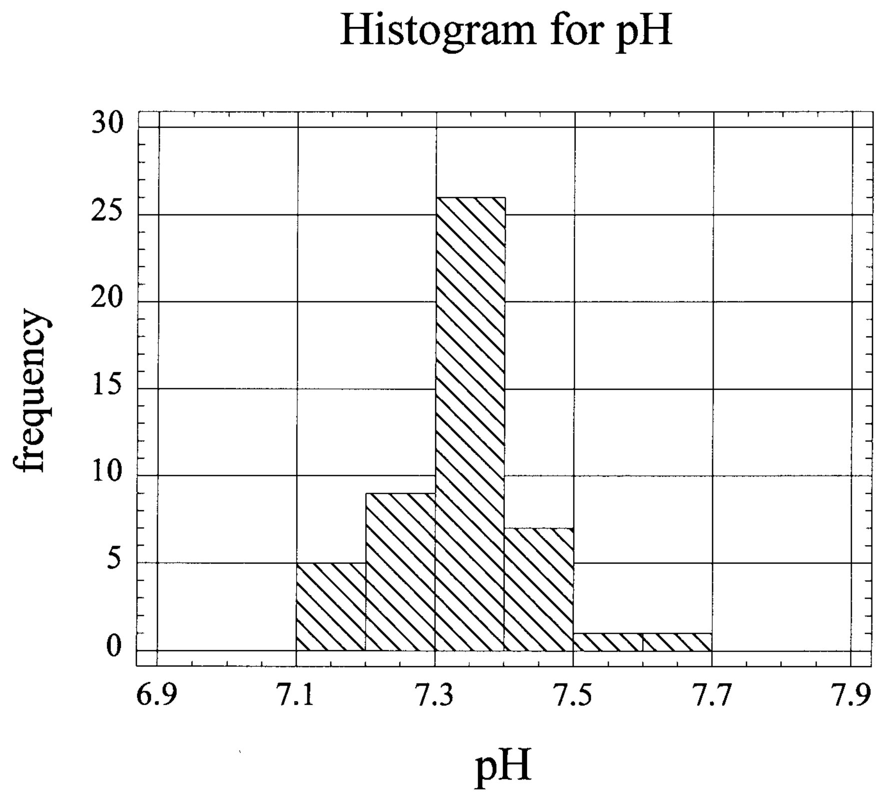
Count = 49
Average = 7.38158
Median = 7.4
Mode = 7.4
Geometric mean = 7.38093
Variance = 0.00981919
Standard deviation = 0.0990918
Standard error = 0.014156
Minimum = 7.2
Maximum = 7.7
Range = 0.5
Lower quartile = 7.3
Upper quartile = 7.4
Interquartile range = 0.1
Skewness = 0.390395
Stnd. skewness = 1.11565
Kurtosis = 1.61118
Stnd. kurtosis = 2.30216
Coeff. of variation = 1.34242%
Sum = 361.697

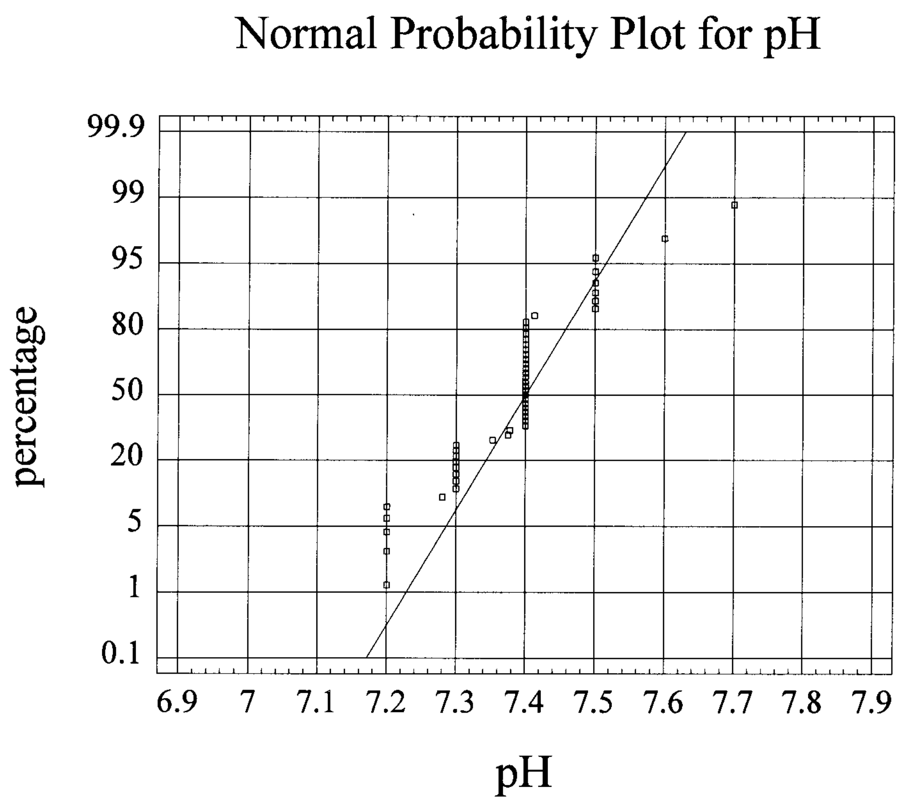
Frequency Tabulation for pH

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		6.9		0	0.0000	0	0.0000
1	6.9	7.0	6.95	0	0.0000	0	0.0000
2	7.0	7.1	7.05	0	0.0000	0	0.0000
3	7.1	7.2	7.15	5	0.1020	5	0.1020
4	7.2	7.3	7.25	9	0.1837	14	0.2857
5	7.3	7.4	7.35	26	0.5306	40	0.8163
6	7.4	7.5	7.45	7	0.1429	47	0.9592
7	7.5	7.6	7.55	1	0.0204	48	0.9796
8	7.6	7.7	7.65	1	0.0204	49	1.0000
9	7.7	7.8	7.75	0	0.0000	49	1.0000
10	7.8	7.9	7.85	0	0.0000	49	1.0000
above	7.9			0	0.0000	49	1.0000

Mean = 7.38158   Standard deviation = 0.0990918

Chemical properties 1.sgp (Chem components.sf3)
2001-08-24 1:40





Chemical properties 1.sgp (Chem components.sf3)
2001-08-24 1:39

Analysis Summary

Data variable: Cond

53 values ranging from 800.0 to 1360.0

Summary Statistics for Cond

Count = 53
Average = 987.396
Median = 970.0
Mode = 960.0
Geometric mean = 981.045
Variance = 13461.0
Standard deviation = 116.022
Standard error = 15.9368
Minimum = 800.0
Maximum = 1360.0
Range = 560.0
Lower quartile = 913.0
Upper quartile = 1040.0
Interquartile range = 127.0
Skewness = 0.932797
Stnd. skewness = 2.77236
Kurtosis = 1.22366
Stnd. kurtosis = 1.81841
Coeff. of variation = 11.7503%
Sum = 52332.0

Frequency Tabulation for Cond

Class	Lower Limit	Upper Limit	Midpoint	Frequency	Relative Frequency	Cumulative Frequency	Cum. Rel. Frequency
at or below		700.0		0	0.0000	0	0.0000
1	700.0	800.0	750.0	1	0.0189	1	0.0189
2	800.0	900.0	850.0	12	0.2264	13	0.2453
3	900.0	1000.0	950.0	22	0.4151	35	0.6604
4	1000.0	1100.0	1050.0	10	0.1887	45	0.8491
5	1100.0	1200.0	1150.0	5	0.0943	50	0.9434
6	1200.0	1300.0	1250.0	2	0.0377	52	0.9811
7	1300.0	1400.0	1350.0	1	0.0189	53	1.0000
8	1400.0	1500.0	1450.0	0	0.0000	53	1.0000
9	1500.0	1600.0	1550.0	0	0.0000	53	1.0000
above	1600.0			0	0.0000	53	1.0000

Mean = 987.396 Standard deviation = 116.022

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Chemical properties 1.sgp (Chem components.sf3)
2001-08-24  1:39
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