International
Progress Report

IPR-02-57

Äspö Hard Rock Laboratory

Äspö Task Force for modelling of groundwater flow and transport of solutes Task 5

Data compilation: WP A3, WP A4

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March 1998

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Äspö Hard Rock Laboratory

Report no.
IPR-02-57
No.
F65K
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Keywords: Äspö HRL, Task 5, hydrogeological data, meteorological data, tunnel geometry

Abstract

The principle aim of the Äspö Task 5 modelling exercise has been to compare and ultimately integrate hydrogeochemistry and hydrogeology using the input data from the pre-investigation and construction phases. The main objectives were:

- to assess the consistency of groundwater-flow models and hydrogeochemical mixing-reaction models through integration and comparison of hydraulic and hydrogeochemical data obtained before and during tunnel construction, and

- to develop a procedure for integration of hydrological and hydrogeochemical information which could be used for disposal site assessments.

Equally important is that Task 5 has provided the opportunity to bring together two scientific disciplines which have traditionally tended to work in parallel rather in collaboration. This is an important first step. The process of understanding, interacting and integrating has now been started and, given more time and resources, the degree of scientific integration would have been greater. There is now a much stronger appreciation that the use of hydrogeochemistry can lead to an increased understanding of hydrogeology and vice-versa.

This report details the compilations made to meet the requirements of Modelling Task 5: Impact of the tunnel on the groundwater system at Äspö, hydrogeological-hydrochemical model assessment exercise. Two kinds of data are compiled:

- Meterological data, water chemical data measured at weirs in the tunnel, tunnelgeometry, tunnel face position as function of time and finally tunnel and fracture zone geometry

- Data regarding flow rate into the tunnel as function of time, piezometric levels (undisturbed conditions, drawdown by the Äspö HRL tunnel given as one of the Task 3 data set and also drawdown by the Äspö HRL tunnel given daily values), coordinates or the borehole sections and electrical conductivity of the water in the measurement sections.

Sammanfattning

Huvudsyftet med modelleringen i Äspö Task 5 har varit att jämföra och integrera hydrogeokemi och hydrogeologi genom att använda data från förundersöknings- och konstruktionsfaserna. Huvudsyftena var:

- att bedöma konsistensen mellan grundvattenflödesmodellerna och hydrogeokemiska blandningsmodeller genom integrering och jämförelse av hydrogeologiska och hydrogeokemiska data samlade före och under drivandet av laboratorietunneln och

- att utveckla en procedur för integrering av hydrogeologi och hydrogeokemisk information vilken skulle kunna nyttjas vid bedömning av en plats för ett djupförvar.

Lika betydelsefullt har varit att Task 5 gett möjligheten att sammanföra två vetenskapliga discipliner vilka traditionellt vanligen arbetat parallellt istället för tillsammans. Task 5 har varit ett första steg. Arbetet med förståelse, interagerande och integrerande har nu startats och, med mer tid och resurser, skulle den vetenskapliga integreringen ha blivit djupare. Resultatet har dock lett till att det i dag finns en mycket större förståelse för användndet av hydrogeokemi kan medföra en större förståelse av hydrogeologi och viceversa.

Denna rapport redogör för de datasammanställningar som gjorts för att mäta kraven som ställts upp i modelleringsuppdraget Task 5: Tunnelns påverkan på grundvattensystemet vid Äspö, en kombinerad hydrogeologisk-hydrokemisk modellstudie. Två grupper av data har sammanställts:

- Meterologiska data, vattenkemiska data uppmätta vid mätvallar i tunneln, tunnelgeometri, tunnelfrontsposition som funktion av tiden under drivnings-skedet samt slutligen tunnel och sprickzonsgeometri

- Inflöde till tunnel som funktion av tiden, grundvattentrycknivåer (ostörda förhållanden, avsänkningsdata orsakade av Äspö HRL tunneln framtagna som ett Task 3 datamaterial och även dagsavsänkningdata orsakade av tunneln), koordinater eller borrhålssektioner samt data för elektrisk konduktivitet i olika mätsektioner.

Contents

1 Introduction

The Äspö Hard Rock Laboratory (Äspö HRL) provides an important scientific and technical basis for the programme of siting, designing, constructing and operating a future deep geological repository in Sweden. The need for such an underground laboratory was identified at an early stage in the Swedish programme. The Äspö HRL was built to provide an opportunity for research, development and demonstration in a realistic and undisturbed rock environment down to the depth planned for a future deep repository for spent nuclear fuel.

Geological investigations in the region around Äspö were started in 1986. The *pre-investigation phase*, 1986-1990, involved siting the Äspö HRL and Äspö was selected as the site for the laboratory in 1988. The natural conditions in the bedrock were described and predictions made with respect to the hydrogeological and other conditions that would be observed during the construction phase. Planning for the construction and operating phases was also carried out.

Construction of the underground facility started in October 1990 with the laboratory being completed in the summer of 1995. During the *construction phase*, 1990-1995, extensive investigations, tests and experiments were carried out at the same time as the civil engineering activities. The focus of the experimental work was mainly to check the reliability of interpretations based on the pre-investigations and to broaden and detail the data base of the Äspö site. The first part of the tunnel was excavated using the drill-and-blast technique. The last 400 metres were excavated by a Tunnel Boring Machine (TBM) with a diameter of 5 metres. The total length of the tunnel is 3600 m. The underground excavations are connected to the Äspö Research Village, containing offices, stores, hoist and a ventilation building, by a hoist shaft and two ventilation shafts.

2 Hydrogeological data sets

2.1 Purpose

Compilation of the hydrogeological data sets has been carried out to meet the requirements of **Modelling Task 5: Impact of the tunnel on the groundwater system at Äspö, hydrogeological-hydrochemical model assessment exercise.** Two groups of data has been compiled:

- Appendix 1: Meteorological data, water chemical data measured at weirs in the tunnel, tunnel face position as function of time and finally tunnel and fracture zone geometry.
- Appendix 2: Flow rate into the tunnel as function of time, piezometric levels (Undisturbed conditions, drawdown by the Äspö HRL tunnel given as one of the Task 3 data set and also drawdown by the Äspö HRL tunnel given daily values), co-ordinates or the bore hole sections and electrical conductivity of the water in the measurement sections.

In *Sections 2.2* and *2.3* an overview is given to *Appendix 1* (Data delivery No 2 for Task No 5) and *Appendix 21* (Data delivery No 3 for Task No 5).

2.2 Data delivery No 2 for Task No 5

LIST OF DELIVERED FILES (Zipped in ASCII-format):

HYDROGEOLOGICAL DATA: METEROLO.zip

File name	Content
- READSM01.TXT	Explanations to the contents in the files in METEROLO.zip
- METEO-1.XLS	The annual mean temperature, precipitation and potential evapotranspiration
- METEO-1.TXT	The annual mean temperature, precipitation and potential evapotranspiration

HYDROGEOLOGICAL DATA: TUNNFPOS.zip

File name	Content
- READTF01.TXT	Explanations to the contents in the files in TUNNFPOS.zip
- TASA.XLS	The position in time for the tunnel face (main tunnel) along the tunnel line
- TASA.TXT	The position in time for the tunnel face (main tunnel) along the tunnel line
- SHAFTSWE.DOC	The position in time for the bottom of the shafts
- SHAFTSWE.TXT	The position in time for the bottom of the shafts

HYDROGEOLOGICAL DATA: TUNNGEOM.zip

File name	Content
- READTG01.TXT	Explanations to the contents in the files in TUNNGEOM.zip and some general comments about the tunnel and shaft geometries.
- TASahvw.XLS	Geometry of the main tunnel(A), elevator shaft(H), ventilation-in shaft(V) and ventilation-out shaft(W).
- TASa.TXT	Geometry of the main tunnel(A),
- TASh.TXT	Geometry of the elevator shaft(H)
- TASv.TXT	Geometry of the ventilation-in shaft(V)
- TASw.TXT	Geometry of the ventilation-out shaft(W).
- TUNNEL.DXF	The main tunnel, elevator shaft, ventilation-in shaft and ventilation out shaft and minor nisches defined as lines.
- TUN_21.DOC	The main tunnel, elevator shaft, ventilation-in shaft and ventilation-out shaft and minor nisches. The intended use is to provide an overview of the tunnel system.

HYDROGEOLOGICAL DATA: WEIRCH01.zip

File name	Content
- READWC01.TXT	Explanations to the contents in the files in WEIRCH01.zip
- WEIRCH01.XLS	Data of Cloride, pH and electrical conductivity measured at the weirs along the Äspo tunnel during the excavation of Äspo Hard Rock Laboratory for period: July 1993 - Aug 1993
- WEIRCH01.TXT	Data of Cloride, pH and electrical conductivity measured at the weirs along the Äspo tunnel during the excavation of Äspo Hard Rock Laboratory for period: July 1993 - Aug 1993

Data for the period after 1994 January 25, when the tunnel face was at tunnel section 2870m, will be part of data delivery for work packages A6 (Head and inflow data) according to the Task Plan and will be sent out later.

HYDROGEOLOGICAL DATA: ZONEGEOM.zip

File name	Content
- READZG01.TXT	Explanations to the contents in the files in ZONEGEOM.zip and reference to report describing the geometry.
- HCD-SR97.XLS	Hydraulic Conductor Domains used in a SKB project called SR97
- HCD-SR97.TXT	Hydraulic Conductor Domains used in a SKB project called SR97

COMMENTS TO DELIVERED FILES:

The hydrogeological data files sent out are a part of the sub-task 5A.

Description of hydrogeological and hydrological data data useful for the modelling are mainly found in:

- SKB Technical Report 97-06, Äspö HRL - Geoscientific evaluation 1997/5

The above report was sent out according to Data delivery No 1. Data useful for calibration (pumping tests and drawdown by the tunnel) has been sent as data sets for Task 1 and 3. The following reports describes these data sets:

- SKB Progress Report 25-90-17b, Information for numerical modeling 1990. Calibration cases.
- SKB Progress Report 25-92-14, Information for numerical modeling 1992.
- SKB Progress Report 25-94-16, Information for numerical modeling 1994.

Data describing (tabulated) monthly mean sea level (1991-July-01-1993-May-21) is found in:

- SKB Progress Report 25-94-16, Information for numerical modeling 1994.

Estmates of undisturbed piezometric levels are found in:

- SKB Technical Note 25-92-63G, Information for numerical modelling. Undisturbed piezometric levels and uncertainty of piezometric levels.

Data describing dilution tests is found in:

- SKB Progress Report 25-94-26, Groundwater flow measurements during tunnel construction phase.

The LPT2 test (Long term Pumping and Tracer test) is reported in:

- SKB TR 92-32, Äspö Hard Rock Laboratory: Evaluation of the combined long term pumping and tracer test (LPT2) in bore hole KAS06.
- SKB Technical Note 25-92-62G, Evaluation of the combined long term pumping and tracer test (LPT2) in bore hole KAS06. Notes concerning injection and sampling of tracers during LPT2.

Fracture data useful for setting up a DFN model and the LPT2 test (Long term Pumping and Tracer test) were provided as data sets for Task 1.

Other data in the above mentioned Progess Reports should not be used as new data are available as data set for Task 5. SKB Progress Report 25-94-26 was sent out together with the reports mentioned in the letter for Data delivery No1. The other reports mentioned above have been sent out for Task 1 and 3.

2.3 Data delivery No 3 for Task No 5

LIST OF DELIVERED FILES (Zipped in ASCII-format):

HYDROGEOLOGICAL DATA: WEIRFL01.zip

File name	Content
- READWF01.TXT	Explanations to the contents in the files in WEIRFL01.zip
- WEIRF-01.XLS - WEIRF-01.TXT	This file contains data of the monthly mean flow rates measured at the weirs along the Äspö tunnel during the excavation of Aspo Hard Rock Laboratory for period: May 1991 - January 1994.

HYDROGEOLOGICAL DATA: PIEZOL01.zip

File name	Content
- READSP01.TXT	Explanations to the contents in the files in PIEZOL01.zip
- XXXXX.WK1 XXXXX.TXT	Values of the piezometric levels for bore hole XXXXX for every 30th day from 1 of June 1991 to 21 of May 1993. These data were sent as a part of the Task 3 data set and were presented in SKB PR 25-94-16. The bore holes included are : KAS01 - KAS16, HAS01 - HAS21 and HAV08, HLX09, HMJ01.

HYDROGEOLOGICAL DATA: PIEZOL02.zip

File name	Content
- READSP02.TXT	Explanations to the contents in the files in PIEZOL02.zip
- SAL_PR01.XLS - SAL_PR01.TXT	Electrical conductivity and salinity of water in bore hole sections and pipes up to the position of the pressure transducer. Data shown are for core drilled holes. These data, up to September 1993, were sent as a part of the Task 3 data set and were presented in SKB PR 25-94-16.

- UNDISLEV.XLS
- UNDISLEV.TXT

Undisturbed pietzometric levels. The data are the same as the data presented in Technical Note 25-92-63G. The uncertainty of the pietzometric levels is also outlined in Technical Note 25-92-63G.

- BHCOORD1.XLS
- BHCOORD1.TXT

Co-ordinates for the bore hole sections with measured piezometric levels. The bore hole groups are:
-HAS and KAS: bore holes on Äspö
-HAV and KAV: bore holes on Ävrö
-HLX and KLX: bore holes on Laxemar
-HBH and KBH: bore holes on Hålö
-HMJ : bore holes on Mjälen

HYDROGEOLOGICAL DATA: XXXX01.zip contains data for Modelling Task 5 where XXXX stands for:

-HAS and KAS: bore holes on Äspö
-KAVHAV : bore holes on Ävrö and on Mjälen
-KLXHLX : bore holes on Laxemar
-KBHHBH : bore holes on Hålö

File name **Content**

- READSP03.TXT Explanations to the contents in the files in XXXX01.zip

- YYYYY.XLS Daily values of the piezometric levels for bore holeYYYYY. The draw-down data are for period 1 of July 1990 to 24 of January 1994. The bore hole groups are
  -HAS and KAS: bore holes on Äspö
  -HAV and KAV: boreholes on Ävrö
  -HLX and KLX: bore holes on Laxemar
  -HBH and KBH: bore holes on Hålö
  -HMJ : bore holes on Mjälen

COMMENTS TO DELIVERED FILES:

The hydrogeological data files sent out are a part of the sub-task 5A.

Description of hydrogeological and hydrological reports useful for the modelling were presented in the letter for the data delivery 2.

A few comments on data delivery 3 can be made:

- The earliest pietzometric levels are from July 1 1990. There are measurements before that date but these are to a large extent affected by the hydraulic tests and drillings performed, and are not considered useful for Task 5.
- The measurements was completed in a number of bore holes during 1995 and 1996 and therefor data are missing in some bore holes for part of theses two years. Sometimes the measurement with the data loggers failed. Longer periods with missing logger-data have been filled with data from the manual levellings.
- The data set in the zip files HAS, KAS, KAVHAV, KLXHLX and KBHHBH is very large. The data in PIETZOL01.zip, UNDISLEV.XLS and the calibration cases delivered to Task 1 and 3 are probable sufficient for the first part of Task 5. It should be observed that it is only the measured levels in the pipes from the bore hole sections that are provided in zip files HAS, KAS, KAVHAV, KLXHLX and KBHHBH. Freshwater head or the pressure in a bore hole section has to be calculated with help of SAL_PR01.XLS if there is saline water in the bore hole section.
- Levels in HMJ01 0-32 m is almost identical to section 33-46 m and is therefor not provided in the data set.
- There are a number of more rapid changes in the pietzometric levels which probably can be ignored if just the impact of the flow in to the Äspö HRL tunnel is considered.
    - During manual levellings minor packers in the pipes from the measurement sections are deflated and inflated. In some low conductive sections can this be seen, for example KAS07 291-410, 411-500 m.
    - During chemical sampling there are sometimes minor drawdowns.
    - Rainfall causes the level in the upper most section to rise rapidly in a few bore holes, example HAS13 0-50 m.
    - The pumping test LPT2 was started September 17 1990 and ended January 18 1991. This test caused large drawdowns.
    - The drilling of KLX02 was started October 6 1992 and ended November 1992 and hydraulic tests were performed from November 3 1992 to June 16 1993. Four hydraulic tests were also performed 1995 in KLX02. The start dates for the tests were: April 28 1995 (C2, section 505-803 m, duration of pumping 15 h) , June 28 1995 (C4, section1103.5-1401.5 m, duration of pumping 48 h), September 26 1995 (C6, section 207-505 m, duration of pumping 12 h), October 19 1995 (C3, section 805-1103 m, duration of pumping 864 h).
    - A large number of hydraulic tests were performed during the construction of the tunnel. Generally the test duration was short. September 19 1991 the core hole KBH02 was damaged by the blasting in the tunnel, which caused large drawdowns for a short period. The water flowing out from KBH02 was

mainly from fracture zone NE-1. Two tests in the fracture zone NE-1 caused a larger drawdown (Flowing bore hole KA1061A, start of test January 25 1992, duration of flow 40 h. Flowing bore hole KA1131B, start of test February 16 1992, duration of flow 44 h). Water was mainly coming from fracture zone NE-1 where the tunnel intersects NE-1. A number of hydraulic tests with short duration was made in fracture zone NE-1 during March 13-15 1992 and November 14-15 1992. Short percussion-drilled bore holes drilled from the tunnel were used as the flowing bore holes or KA1061A and KA1131B. Kas16 was drilled summer 1992 and hydraulic tests were performed in July to September 1992 in KAS16.

- On the southern Äspö a few of the measurements showing large drawdown are uncertain due to problems caused by the increasing drawdown starting late 1992. Manual levellings for control of the measurements sometime failed in sections with large drawdown. Data from some bore hole sections are also missing after 1993 or later because of the large drawdown.

Elucidation of data in TR 97-06.

Appendix 2, Table A2-5 and A2-6

"EW-1S,78°SE" in *Table A2-6* refers to the dip of EW-1S and not dips for NNW-1 and NNW-7. The second column in *Table A2-5* shows only the dip of the feature.

Appendix 2, Table A2-5, A2-6 and A2-8

The interpretation of NE-1, NE-3 and NE-4 is presented in *Tables A2-5* and *A2-6* as **two features** but it should be seen as the approximate boundaries for the fracture zone and the transmissivity in *Table A2-8* should be considered as the total transmissivity of the fracture zone. If then one of the fracture zones is modelled as two features the half of the transmissivity value should be assigned to each feature.

Figures 6-31 and 6-32

Figure 6-31 shows the deterministic hydraulic conductor domains interpreted to intersect the surface. In *Figure 6-32* NNW-5 and NNW-6 are missing but the purpose is to indicate the characteristics of the fracturing of the rock mass close to the tunnel and not to show all deterministic hydraulic conductor domains.

Overview of bore holes and deterministic hydraulic conductor domains.

In *Figures 2-1* to *2-3* an overview of the locations of the bore holes and the positions of the interpreted deterministic hydraulic conductor domains are shown.

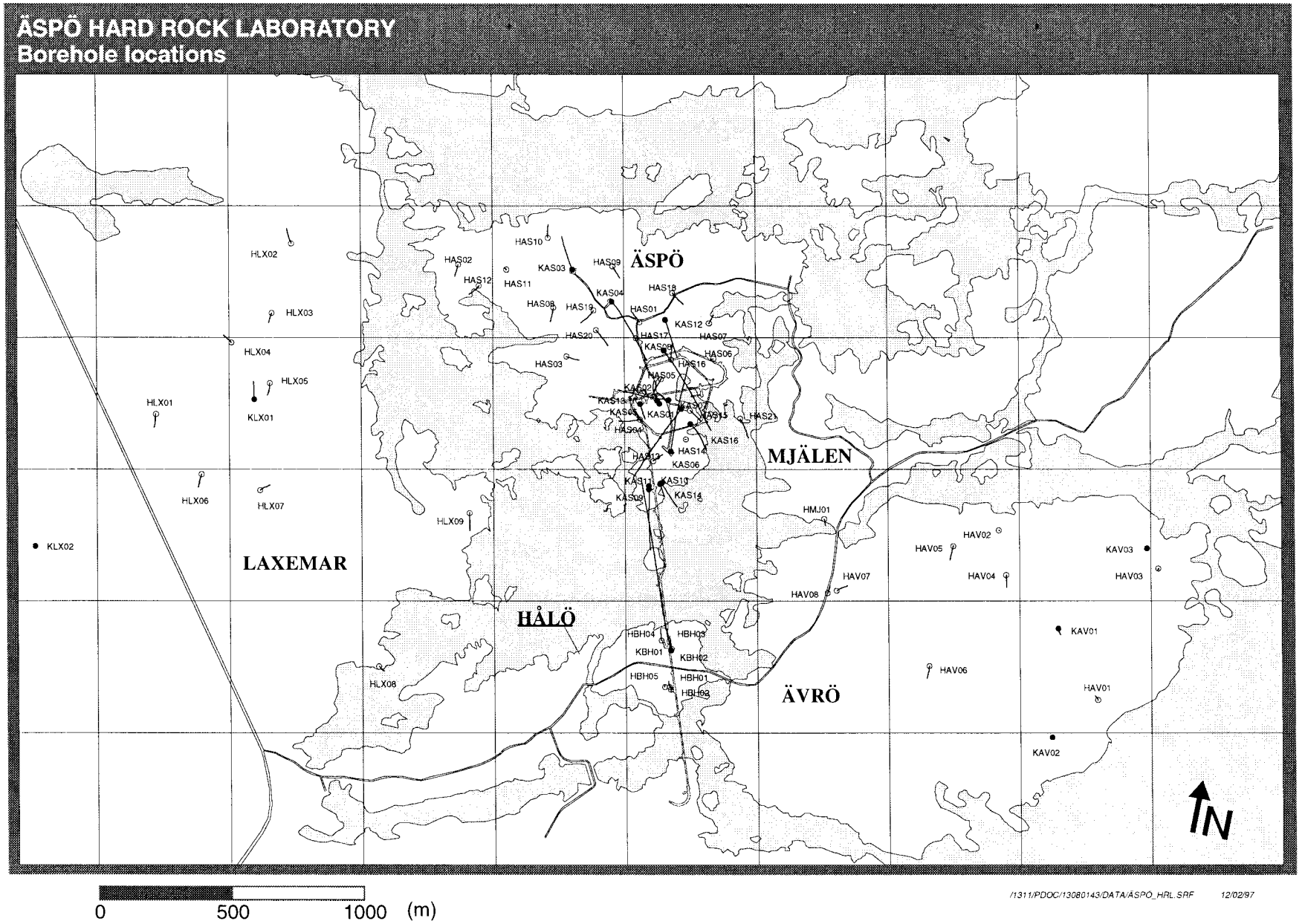

Figure 2-1. *Äspö Hard Rock Laboratory. Bore hole locations.*

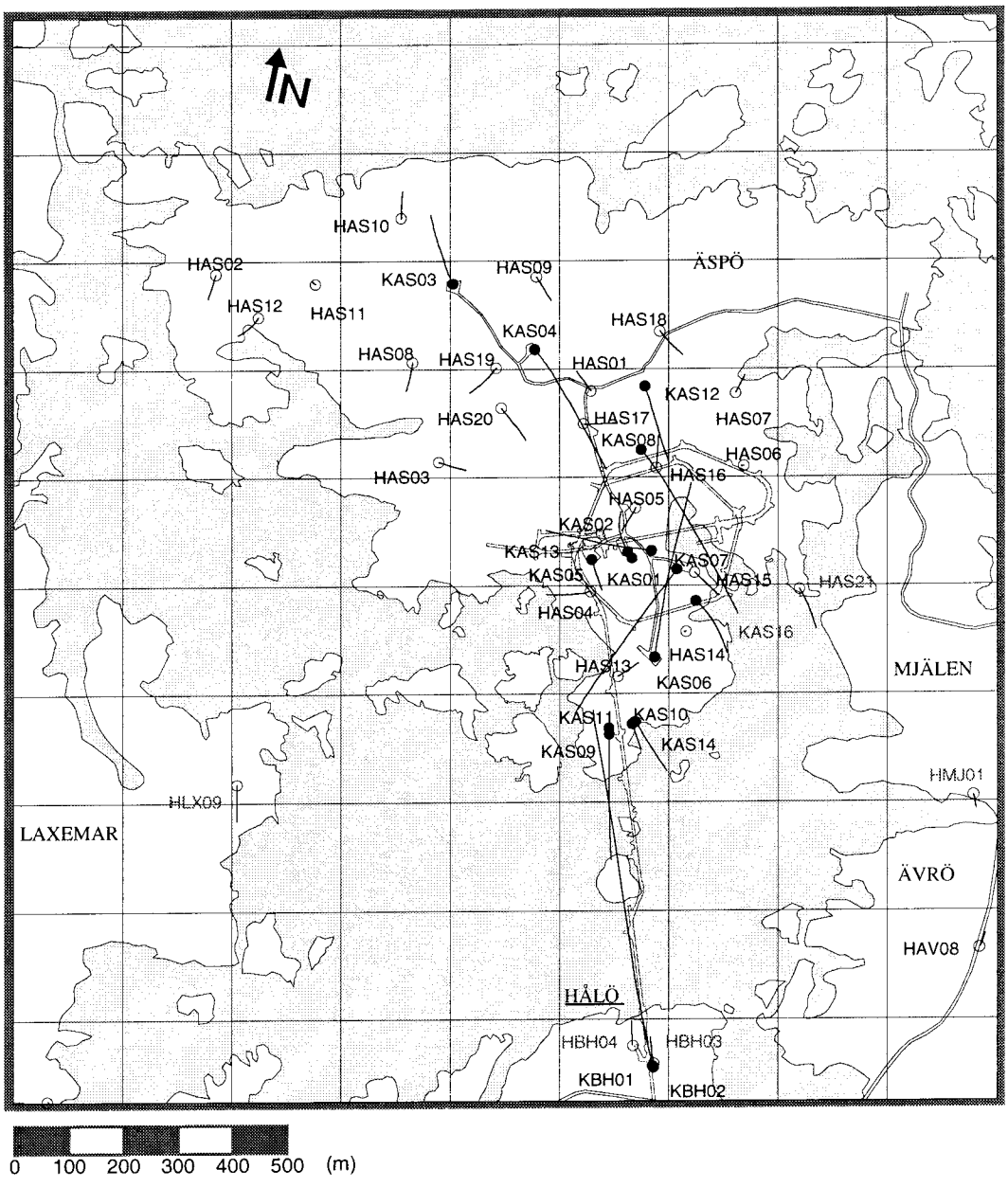

Figure 2-2. *Äspö Hard Rock Laboratory. Bore hole locations.*

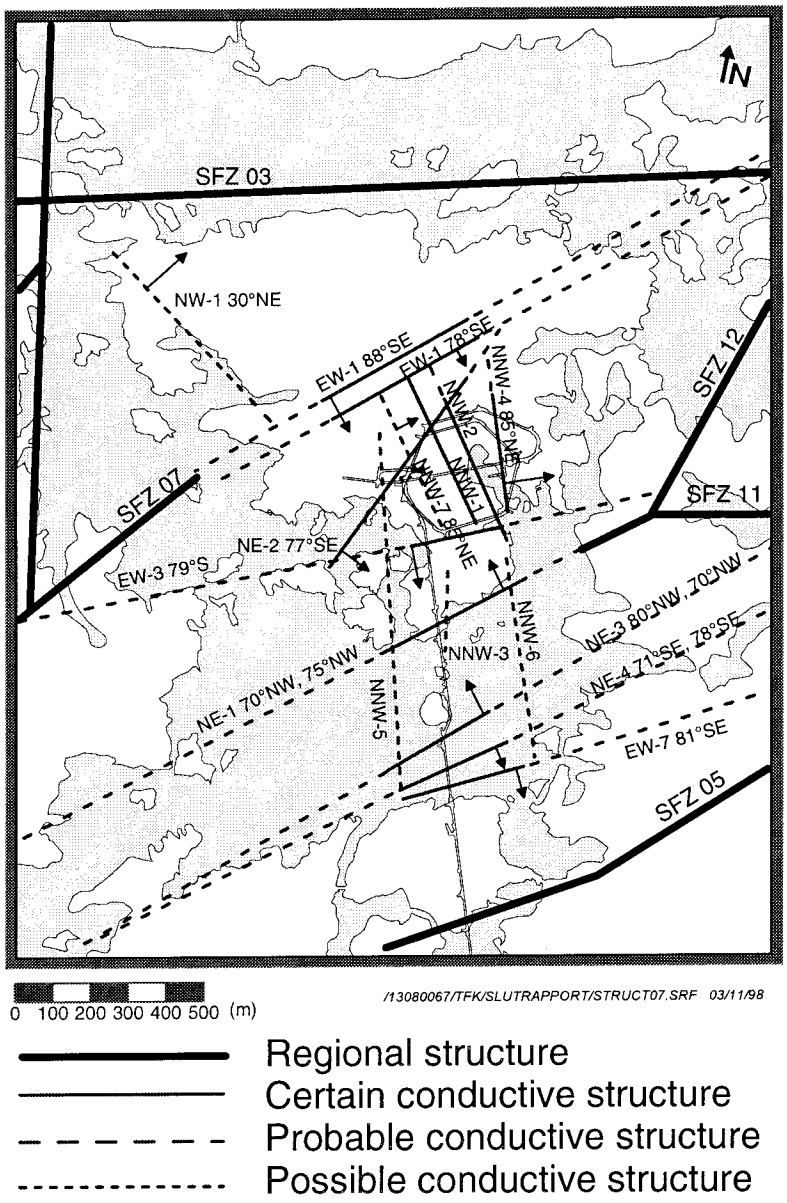

Figure 2-3. *Model of hydraulic conductor domains on the site scale, Rhén et al. /1997/.*

3 References

Rhén I, Gustafson G, Stanfors R, Wikberg P, 1997b. Äspö HRL - Geoscientific evaluation 1997/5. Models based on site characterization 1986-1995. SKB TR 97-06.

Appendix 1

This file: READSM01.TXT

This ZIP-file with the files below contains SKB data from the Aspo Hard Rock Laboratory. These data are SKB proprietary and shall only be used within specified tasks agreed upon between SKB and participating organizations.

METEOROLOGICAL DATA

METEOROLOGICAL DATA ZIP-file METEROLO.zip contains data of the annual mean temperature, precipitation and potential evapotranspiration for Modelling Task 5. In (1) Chapter 6 some details are presented.

The data is available in two different file formats
- Ascii files (*.TXT)
- Microsoft EXEL files, version 7.0 (*.XLS)

(1) Rhén I (ed), Gustafson G, Stanfors R, Wikberg P, 1997. Äspö HRL - Geoscientific evaluation 1997/5. Models based on site characterization 1986-1995. SKB TR 97-06.

Filename: METEO-1

Contents: Contains data of the annual mean temperature, precipitation and potential evapotranspiration.

Column:	Unit:	Description:
YEAR 1	YYYY	Year for annual mean of temperature and precipitation.
TEMP.	Degree C	Annual mean air temperature at Oskarshamn ((1) p 164-165).
PRECIP.	mm/year	Annual mean precipitation at Oskarshamn, corrected values ((1) p 164-165).
EVAPOTRAN.	mm/year	Annual mean air temperature as average of Västervik and Ölands Norra Udde ((1) p 164-165).
YEAR 2	YYYY	Year for annual mean of potential evapotranspiration.

YEAR 1	TEMPERATURE	PRECIPITATION x 1.18	EVAPOTRANSPIRATION	YEAR 2
1961-1990	6.5	652.5	608.0	1987-1996
1987	4.9	754.0	535.0	1987
1988	6.8	864.9	545.0	1988
1989	8.3	507.4	635.0	1989
1990	8.4	675.0	605.0	1990
1991	7.1	593.5	566.0	1991
1992	7.6	587.6	704.0	1992
1993	6.8	751.7	638.0	1993
1994	7.5	729.2	665.0	1994
1995	7.4	794.1	570.0	1995
1996	6.1	740.0	463.0	1996

This file: READTF01.TXT

This ZIP-file with the files below contains SKB data from the Aspo Hard Rock Laboratory. These data are SKB proprietary and shall only be used within specified tasks agreed upon between SKB and participating organizations.

TUNNEL FACE POSTION

TUNNEL FACE POSTION ZIP-file TUNNFPOS.zip contains data of the position in time for the tunnel face along the tunnel line for Modelling Task 5. The geometry of the tunnel line is given in TUNNGEOM.zip.

The data is available in three different file formats
- Ascii files (*.TXT)
- Microsoft EXEL files, version 7.0 (*.XLS) or
- Microsoft Word file, version 7.0 (*.DOC)

Filename:		Contents:
TASA		The main tunnel.
Column:	Unit:	Description:
START_DATE	YYYYMMDD	Date for tunnel face position at SECLOW.
TIME	hhmmss	Hours, minutes, seconds for tunnel face position at SECLOW.
IDCODE	-	Code for measurement point in SICADA.
SECLOW	m	Lower measurement section. Length of the tunnel line projection on a horizontal plane from tunnel entrance to the tunnel face.

Filename:		Contents:
SHAFTSWE		The shafts and a few comments to the construction of the tunnel system.

TABLE 1

Column:	Unit:	Description:
NAME	-	Name during construction of the shafts.
CODE	-	Code for measurement point in SICADA.
SECUP	m	Upper measurement section.
SECLOW	m	Lower measurement section.
FUNCTION	-	Present function at Aspo HRL.
PEN.PILOTHOLE	DDMMYYYY	Date for the penetration of the pilot hole at SECLOW.
RAISE DRILLING	DDMMYYYY	Time for the raise drilling between SECUP and SECLOW.

TABLE 2

Column:	Unit:	Description:
DAM/EVENT	-	Code for measurement point in SICADA.
TIME	YYMMDD	Date for the event.
COMMENT	-	Comments to the event.

START_DATE	TIME	IDCODE	SECLOW
1990-10-19	08:00:00	TASA	13.9
1990-10-22	18:00:00	TASA	16.9
1990-10-22	20:00:00	TASA	16.9
1990-10-23	12:30:00	TASA	19.7
1990-10-23	14:15:00	TASA	19.7
1990-10-23	22:30:00	TASA	23.1
1990-10-24	13:30:00	TASA	27.8
1990-10-24	22:15:00	TASA	31.8
1990-10-25	12:30:00	TASA	35.7
1990-10-26	09:15:00	TASA	40
1990-10-29	10:30:00	TASA	44.6
1990-10-29	21:00:00	TASA	53.1
1990-10-30	10:30:00	TASA	53.7
1990-10-30	21:15:00	TASA	53.7
1990-10-31	10:00:00	TASA	61.1
1990-10-31	18:30:00	TASA	65.2
1990-11-01	10:30:00	TASA	68.8
1990-11-01	18:45:00	TASA	77.4
1990-11-02	09:30:00	TASA	81.2
1990-11-05	12:30:00	TASA	85.5
1990-11-05	20:00:00	TASA	89.1
1990-11-06	09:15:00	TASA	93.1
1990-11-06	21:00:00	TASA	96.6
1990-11-07	10:15:00	TASA	100.7
1990-11-07	18:30:00	TASA	104.9
1990-11-08	07:30:00	TASA	109
1990-11-08	16:00:00	TASA	112
1990-11-08	22:30:00	TASA	116.7
1990-11-09	10:00:00	TASA	121.2
1990-11-12	11:00:00	TASA	125.5
1990-11-12	13:30:00	TASA	125.5
1990-11-12	21:30:00	TASA	129.6
1990-11-13	10:30:00	TASA	129.6
1990-11-13	19:30:00	TASA	133.8
1990-11-15	09:45:00	TASA	137.8
1990-11-15	19:30:00	TASA	141.6
1990-11-16	10:30:00	TASA	145.6
1990-11-19	15:30:00	TASA	149.9
1990-11-20	09:45:00	TASA	153.3
1990-11-20	21:00:00	TASA	157.8
1990-11-21	13:20:00	TASA	161.9
1990-11-22	10:45:00	TASA	166
1990-11-22	22:15:00	TASA	169.3
1990-11-23	10:45:00	TASA	174
1990-11-26	10:15:00	TASA	176.2
1990-11-27	07:45:00	TASA	180.5
1990-11-27	18:30:00	TASA	184.3
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1994-03-10	08:45:00	TASA	3115.7
1994-03-11	09:45:00	TASA	3119.1
1994-03-15	06:45:00	TASA	3119.1
1994-03-15	19:05:00	TASA	3122.7
1994-03-16	21:30:00	TASA	3127
1994-03-17	18:30:00	TASA	3131.3
1994-03-17	21:40:00	TASA	3131.3
1994-03-18	22:45:00	TASA	3135.6
1994-03-19	13:20:00	TASA	3140
1994-03-25	17:45:00	TASA	3140.6
1994-03-20	12:30:00	TASA	3144.3
1994-03-28	11:00:00	TASA	3144.5
1994-03-28	20:15:00	TASA	3148.5
1994-03-21	09:55:00	TASA	3148.6
1994-03-29	08:15:00	TASA	3152.5
1994-03-22	22:00:00	TASA	3152.9
1994-03-29	16:45:00	TASA	3156.5
1994-03-23	13:55:00	TASA	3157.2
1994-04-05	09:45:00	TASA	3160.4
1994-04-05	19:00:00	TASA	3164.4
1994-03-25	04:45:00	TASA	3165
1994-03-25	08:15:00	TASA	3165
1994-04-06	10:00:00	TASA	3168.4
1994-04-06	18:45:00	TASA	3172.3
1994-04-07	09:15:00	TASA	3176.3
1994-04-14	15:45:00	TASA	3177
1994-04-11	10:00:00	TASA	3180.3
1994-04-18	08:30:00	TASA	3181
1994-04-19	08:35:00	TASA	3181
1994-04-11	22:00:00	TASA	3184.2
1994-04-12	19:30:00	TASA	3187.6
1994-04-21	07:30:00	TASA	3187.6
1994-04-22	12:45:00	TASA	3191.3
1994-06-16	17:45:00	TASA	3192.3
1994-06-17	07:45:00	TASA	3194.8
1994-06-17	22:30:00	TASA	3200.3
1994-06-18	22:30:00	TASA	3206.3
1994-06-19	14:00:00	TASA	3209.8
1994-06-19	22:00:00	TASA	3213.1
1994-06-20	11:00:00	TASA	3214.6
1994-06-20	16:00:00	TASA	3215
1994-06-27	21:00:00	TASA	3216.2
1994-06-28	06:25:00	TASA	3217.5
1994-06-28	08:00:00	TASA	3219
1994-06-28	12:15:00	TASA	3220.5
1994-06-28	14:25:00	TASA	3222
1994-06-29	12:10:00	TASA	3224.7
1994-06-29	19:00:00	TASA	3225.7
1994-06-30	11:50:00	TASA	3230.2
1994-06-30	14:15:00	TASA	3231.4
1994-07-04	12:00:00	TASA	3234.4
1994-07-04	20:45:00	TASA	3239.8
1994-07-05	13:00:00	TASA	3245.6
1994-07-05	22:10:00	TASA	3250.1
1994-07-06	10:00:00	TASA	3250.3
1994-07-07	12:30:00	TASA	3255.9
1994-07-07	14:00:00	TASA	3257
1994-07-07	22:10:00	TASA	3265.3
1994-07-08	06:15:00	TASA	3267.3
1994-07-08	09:00:00	TASA	3268.5
1994-07-11	21:30:00	TASA	3272.1

1994-07-12	13:40:00	TASA	3281.5
1994-07-12	15:15:00	TASA	3282.6
1994-07-13	08:35:00	TASA	3284.6
1994-07-13	17:55:00	TASA	3285.2
1994-07-14	20:15:00	TASA	3288.5
1994-07-15	13:45:00	TASA	3292.8
1994-07-18	13:45:00	TASA	3298.4
1994-07-18	16:00:00	TASA	3299.8
1994-07-20	13:30:00	TASA	3303.4
1994-07-20	21:50:00	TASA	3306.3
1994-07-21	12:25:00	TASA	3313.8
1994-07-21	19:30:00	TASA	3319.2
1994-07-22	13:00:00	TASA	3321.4
1994-07-25	13:05:00	TASA	3325.7
1994-07-25	21:40:00	TASA	3331
1994-07-26	13:10:00	TASA	3337.1
1994-07-26	20:45:00	TASA	3339.6
1994-07-27	11:25:00	TASA	3344.1
1994-07-27	20:00:00	TASA	3351.5
1994-07-28	21:25:00	TASA	3355.4
1994-07-29	08:40:00	TASA	3359.9
1994-08-01	13:45:00	TASA	3367.6
1994-08-01	21:05:00	TASA	3373.7
1994-08-03	12:05:00	TASA	3379.7
1994-08-03	21:50:00	TASA	3384.9
1994-08-04	21:15:00	TASA	3391.7
1994-08-05	11:35:00	TASA	3400.3
1994-08-08	13:40:00	TASA	3407.3
1994-08-08	16:35:00	TASA	3409.7
1994-08-08	20:30:00	TASA	3415
1994-08-09	12:42:00	TASA	3422.3
1994-08-09	14:15:00	TASA	3422.3
1994-08-10	13:35:00	TASA	3425.3
1994-08-15	12:20:00	TASA	3430.7
1994-08-15	21:25:00	TASA	3437.9
1994-08-16	13:45:00	TASA	3443.4
1994-08-16	17:35:00	TASA	3448.4
1994-08-17	13:30:00	TASA	3452.9
1994-08-17	18:35:00	TASA	3457.4
1994-08-18	10:20:00	TASA	3460.8
1994-08-18	19:25:00	TASA	3462.1
1994-08-19	08:20:00	TASA	3464.6
1994-08-22	12:05:00	TASA	3469.1
1994-08-22	17:45:00	TASA	3473.9
1994-08-23	13:30:00	TASA	3479.2
1994-08-23	21:05:00	TASA	3482.4
1994-08-24	13:30:00	TASA	3483.5
1994-08-24	21:30:00	TASA	3487.2
1994-08-25	12:15:00	TASA	3488
1994-08-25	20:30:00	TASA	3494
1994-08-27	15:45:00	TASA	3497
1994-08-29	13:35:00	TASA	3498.6
1994-08-29	15:50:00	TASA	3499.8
1994-08-30	13:35:00	TASA	3505.5
1994-08-30	20:30:00	TASA	3508.5
1994-08-31	13:45:00	TASA	3512
1994-08-31	21:20:00	TASA	3518
1994-09-01	11:10:00	TASA	3521.7
1994-09-01	19:00:00	TASA	3525.6
1994-09-05	13:05:00	TASA	3534.3
1994-09-05	16:05:00	TASA	3537.1
1994-09-08	14:00:00	TASA	3544.6
1994-09-08	14:50:00	TASA	3546.1
1994-09-09	11:30:00	TASA	3551.3
1994-09-12	13:30:00	TASA	3556.5
1994-09-12	18:55:00	TASA	3561
1994-09-13	10:05:00	TASA	3565.5
1994-09-13	21:30:00	TASA	3572
1994-09-14	12:35:00	TASA	3577.8
1994-09-14	20:50:00	TASA	3583.6
1994-09-15	13:15:00	TASA	3590.1
1994-09-15	16:25:00	TASA	3593
1994-09-16	11:20:00	TASA	3600

Table 1. Construction of shafts / SKB PR 25-95-28/.

Name	Code	Level (z) secup (m)	Level (z) seclow (m)	Function	Penetration of pilot hole into tunnel	Raise drilling
RAS01	TASV213	0	-213	Ventilation-in	25 Oct. 1992	27 Oct. - 3 Nov. 1992
RAS02	TASW213	0	-213	Ventilation-out	1 Dec. 1992	2-9 Dec. 1992
RAS03	TASH213	0	-213	Elevator	5 Feb. 1993	11 Feb. - 9 Mar. 1993
RAS01	TASV333	-220	-333	Ventilation-in	5 Feb. 1994	6 Feb. - 11 Feb. 1994
RAS02	TASW333	-220	-333	Ventilation-out	19 Feb. 1994	19 Feb. - 23 Feb. 1994
RAS03	TASH333	-220	-333	Elevator	15 Dec. 1993	17 Dec. - 13 Jan. 1993/4
RAS01	TASV450	-340	-450	Ventilation-in	22 Nov. 1994	?-28 Nov. 1994
RAS02	TASW450	-340	-450	Ventilation-out	4 Dec- 1994	?-10 Dec. 1994
RAS03	TASH450	-340	-450	Elevator	14 Jan. 1995	?-24 Jan. 1995

Table 2. Time schedule for when the tunnel passed positions where the dams have been constructed or some important event in the tunnel. / SKB PR 25-95-28/

Dam/Event	Time	Comment
MA682G	910523	
MA1030G	911126	
MA1232G	920213	
MA1372G	920629	
MA1584G	920909	
MA1745G	921102	
MA1883G	921210	
MA2028G	930121	
MA2178G	930308	
MA2357G	930419	
MA2496G	930511	
	930615	Stop of excavation at chainage 2600 m.
	931101	Start of excavation at chainage 2600 m.
MA2694G	931202	
MA2840G	940119	
	940124	Passage of chainage 2870 m.
MA2994G	940215	
MA3179G	940421	
	940616	Start of drilling with TBM.
MA3411G	940808	
MA3426G	940815	
	940916	Stop of drilling with TBM.
Tunnel-F	941201	Start of excavation on tunnel F.
MF0061G	950123	
Tunnel-F	950201	Stop of excavation of tunnel F.
	950213	Tunnel construction completed.

This file: READTG01.TXT

This ZIP-file with the files below contains SKB data from the Aspo Hard Rock Laboratory. These data are SKB proprietary and shall only be used within specified tasks agreed upon between SKB and participating organizations.

TUNNEL GEOMETRY

TUNNEL GEOMETRY ZIP-file TUNNGEOM.zip contains data of the geometry of the tunnel line for Modelling Task 5.

The data is available in three different file formats
- Ascii files (*.TXT)
- Microsoft EXEL files, version 7.0 (*.XLS)
- Auto Cad file (*.DXF)

Overview is also presented as a
- Microsoft Word file, version 7.0 (*.DOC)

Filename:	Contents:
TASahvw.xls	The main tunnel(A), elevator shaft(H), ventilation-in shaft(V) and ventilation-out shaft(W).
TASa.txt	The main tunnel(A).
TASh.txt	Elevator shaft(H).
TASv.txt	Ventilation-in shaft(V),
TASw.txt	Ventilation-out shaft(W).

The coordinates for the tunnel line for tunnel A is .25 m above the tunnel floor in the drill and blasted tunnel (tunnel section 0-3191m) and 0.8 m above the tunnel floor in the TBM tunnel(tunnel section 3191-3600 m).
An observation or measurement in the tunnel is linked to a "Tunnel section". "Tunnel section" is defined as the length of the projection of the tunnel line on a horizontal plane, called LENGTH in the tables for tunnel A.
The cross-section area of the drill and blasted tunnel is about 25 m2 in the straight parts of the tunnel and about 43 m2 in the bends. In the TBM assembly hall the cross-section area is about 100 m2.
The diamtre of the drilled parts are:

TBM tunnel	5.0 m
Elevator shaft(H)	3.8 m
Ventilation-in shaft(V)	1.5 m
Ventilation-out shaft(W)	1.5 m

Column:	Unit:	Description:
LENGTH	m	Length of the tunnel line projection on a horizontal plane.
X	m	Easting coordinate in the Aspo HRL coordinate system.
Y	m	Northing coordinate in the Aspo HRL coordinate system.
Z	m	Vertical coordinate in the Aspo HRL coordinate system, postive upwards.

Filename:	Contents:
TUNNEL.dxf	The main tunnel, elevator shaft, ventilation-in shaft and ventilation-out shaft and minor nisches defined as lines.

Filename:	Contents:
TUN_21.doc	The main tunnel, elevator shaft, ventilation-in shaft and ventilation-out shaft and minor nisches. The intended use is to provide an overview of the tunnel system to better understand geometry of the main tunnel and the shafts.

TASA

Length (XY)	X (m)	Y (m)	Z (m)
0	2158.34	5740.71	-5.00
10	2166.92	5735.56	-6.00
20	2175.49	5730.41	-7.00
30	2184.61	5726.37	-7.98
40	2194.45	5724.73	-8.99
50	2204.39	5725.57	-10.01
60	2213.81	5728.86	-11.01
70	2222.12	5734.38	-11.97
80	2228.81	5741.77	-12.98
90	2233.45	5750.60	-14.00
100	2235.77	5760.31	-15.01
110	2235.60	5770.28	-15.99
120	2234.33	5780.20	-16.99
130	2233.06	5790.12	-17.99
140	2231.78	5800.04	-18.99
150	2230.51	5809.95	-20.18
160	2229.24	5819.87	-21.58
170	2227.97	5829.79	-22.98
180	2226.69	5839.71	-24.38
190	2225.42	5849.63	-25.78
200	2224.15	5859.55	-27.18
210	2222.87	5869.47	-28.58
220	2221.60	5879.39	-29.98
230	2220.33	5889.30	-31.38
240	2219.06	5899.22	-32.78
250	2217.78	5909.14	-34.18
260	2216.51	5919.06	-35.58
270	2215.24	5928.98	-36.98
280	2213.97	5938.90	-38.38
290	2212.69	5948.82	-39.78
300	2211.42	5958.73	-41.18
310	2210.15	5968.65	-42.58
320	2208.87	5978.57	-43.98
330	2207.60	5988.49	-45.38
340	2206.33	5998.41	-46.78
350	2205.05	6008.33	-48.18
360	2203.78	6018.25	-49.58
370	2202.51	6028.17	-50.98
380	2201.24	6038.08	-52.38
390	2199.96	6048.00	-53.78
400	2198.69	6057.92	-55.18
410	2197.42	6067.84	-56.58
420	2196.15	6077.76	-57.98
430	2194.87	6087.68	-59.38
440	2193.60	6097.60	-60.78
450	2192.33	6107.52	-62.18
460	2191.06	6117.43	-63.58
470	2189.78	6127.35	-64.98
480	2188.51	6137.27	-66.38
490	2187.24	6147.19	-67.78
500	2185.96	6157.11	-69.18
510	2184.69	6167.03	-70.58
520	2183.42	6176.95	-71.98
530	2182.15	6186.86	-73.38
540	2180.87	6196.78	-74.78
550	2179.60	6206.70	-76.18
560	2178.33	6216.62	-77.58
570	2177.06	6226.54	-78.98
580	2175.79	6236.46	-80.38
590	2174.51	6246.38	-81.78
600	2173.24	6256.29	-83.18
610	2171.97	6266.21	-84.58
620	2170.69	6276.13	-85.98
630	2169.42	6286.05	-87.38
640	2168.15	6295.97	-88.78
650	2166.87	6305.89	-90.18
660	2165.60	6315.81	-91.58
670	2164.33	6325.73	-92.98
680	2163.06	6335.64	-94.38
690	2161.79	6345.56	-95.78
700	2160.51	6355.48	-97.18
710	2159.24	6365.40	-98.58
720	2157.97	6375.32	-99.98
730	2156.69	6385.24	-101.38
740	2155.42	6395.16	-102.45
750	2154.15	6405.08	-103.45
760	2152.87	6414.99	-104.45
770	2151.61	6424.91	-105.46
780	2150.33	6434.83	-106.86
790	2149.06	6444.75	-108.26
800	2147.78	6454.67	-109.66
810	2146.51	6464.59	-111.06
820	2145.24	6474.51	-112.46
830	2143.97	6484.42	-113.86
840	2142.69	6494.34	-115.26
850	2141.42	6504.26	-116.66
860	2140.15	6514.18	-118.06

Length (XY)	X (m)	Y (m)	Z (m)
870	2138.88	6524.10	-119.46
880	2137.60	6534.02	-120.86
890	2136.33	6543.94	-122.26
900	2135.06	6553.85	-123.66
910	2133.79	6563.77	-125.06
920	2132.51	6573.69	-126.46
930	2132.08	6583.60	-127.86
940	2135.45	6593.02	-129.26
950	2138.85	6602.42	-130.66
960	2142.24	6611.83	-132.06
970	2145.63	6621.24	-133.46
980	2149.03	6630.64	-134.86
990	2150.12	6640.48	-136.26
1000	2148.79	6650.39	-137.66
1010	2147.46	6660.30	-139.06
1020	2146.12	6670.21	-140.46
1030	2144.79	6680.12	-141.86
1040	2143.45	6690.03	-143.26
1050	2142.12	6699.94	-144.66
1060	2140.79	6709.85	-146.06
1070	2139.45	6719.76	-147.46
1080	2138.11	6729.67	-148.86
1090	2136.78	6739.58	-150.26
1100	2135.45	6749.49	-151.66
1110	2134.11	6759.40	-153.06
1120	2132.78	6769.31	-154.46
1130	2131.44	6779.23	-155.86
1140	2130.11	6789.14	-157.26
1150	2128.77	6799.05	-158.66
1160	2127.44	6808.96	-160.06
1170	2126.10	6818.87	-161.46
1180	2124.77	6828.78	-162.86
1190	2123.44	6838.69	-164.26
1200	2122.10	6848.60	-165.66
1210	2120.77	6858.51	-167.06
1220	2119.43	6868.42	-168.46
1230	2118.10	6878.33	-169.86
1240	2116.77	6888.24	-171.26
1250	2115.43	6898.15	-172.66
1260	2114.10	6908.06	-174.06
1270	2112.76	6917.97	-175.46
1280	2111.43	6927.88	-176.86
1290	2110.09	6937.79	-178.26
1300	2108.76	6947.70	-179.66
1310	2107.42	6957.61	-181.06
1320	2106.09	6967.53	-182.46
1330	2104.75	6977.44	-183.86
1340	2103.42	6987.35	-185.26
1350	2102.08	6997.26	-186.66
1360	2100.75	7007.17	-188.06
1370	2099.42	7017.08	-189.46
1380	2098.08	7026.99	-190.86
1390	2096.75	7036.90	-192.26
1400	2095.41	7046.81	-193.66
1410	2094.08	7056.72	-195.06
1420	2092.74	7066.63	-196.46
1430	2091.41	7076.54	-197.86
1440	2090.08	7086.45	-199.26
1450	2088.74	7096.36	-200.66
1460	2087.40	7106.27	-202.06
1470	2086.07	7116.18	-203.46
1480	2084.74	7126.09	-204.86
1490	2083.40	7136.00	-206.26
1500	2082.01	7145.91	-207.66
1510	2078.94	7155.40	-209.06
1520	2074.10	7164.14	-210.46
1530	2069.15	7172.83	-211.86
1540	2064.19	7181.52	-213.26
1550	2059.24	7190.20	-214.66
1560	2054.29	7198.89	-216.06
1570	2049.34	7207.58	-217.46
1580	2044.38	7216.27	-218.86
1590	2039.43	7224.95	-220.26
1600	2034.47	7233.64	-221.63
1610	2030.83	7242.93	-222.62
1620	2029.60	7252.83	-223.64
1630	2030.85	7262.72	-224.64
1640	2034.27	7272.11	-225.63
1650	2037.99	7281.39	-226.63
1660	2041.71	7290.67	-227.16
1670	2045.44	7299.95	-227.56
1680	2049.16	7309.24	-228.75
1690	2052.89	7318.52	-230.15
1700	2056.61	7327.80	-231.55
1710	2060.33	7337.08	-232.95
1720	2064.06	7346.36	-234.35
1730	2067.78	7355.64	-235.75
1740	2071.50	7364.92	-237.15

Length (XY)	X (m)	Y (m)	Z (m)
1750	2075.23	7374.20	-238.21
1760	2079.86	7383.00	-239.21
1770	2087.92	7388.74	-240.22
1780	2097.51	7391.57	-241.21
1790	2107.12	7394.34	-242.46
1800	2116.73	7397.10	-243.86
1810	2126.35	7399.86	-245.26
1820	2135.95	7402.62	-246.66
1830	2145.56	7405.39	-248.06
1840	2155.17	7408.15	-249.46
1850	2164.78	7410.91	-250.86
1860	2174.40	7413.67	-252.26
1870	2184.01	7416.44	-253.66
1880	2193.61	7419.20	-255.06
1890	2203.23	7421.96	-256.40
1900	2212.84	7424.72	-257.40
1910	2222.73	7425.25	-258.40
1920	2231.65	7420.98	-259.41
1930	2238.88	7414.07	-260.40
1940	2246.08	7407.13	-261.66
1950	2253.28	7400.19	-263.06
1960	2260.48	7393.25	-264.46
1970	2267.68	7386.31	-265.86
1980	2274.87	7379.36	-267.26
1990	2282.07	7372.42	-268.66
2000	2289.27	7365.48	-270.06
2010	2296.47	7358.54	-271.46
2020	2303.66	7351.60	-272.86
2030	2310.86	7344.65	-274.26
2040	2318.06	7337.71	-275.52
2050	2325.21	7330.73	-276.51
2060	2329.70	7321.91	-277.52
2070	2329.43	7312.01	-278.52
2080	2327.02	7302.31	-279.52
2090	2324.61	7292.60	-280.86
2100	2322.19	7282.90	-282.26
2110	2319.78	7273.19	-283.66
2120	2317.37	7263.49	-285.06
2130	2314.96	7253.78	-286.47
2140	2312.54	7244.08	-287.87
2150	2310.13	7234.37	-289.27
2160	2307.72	7224.67	-290.67
2170	2305.30	7214.97	-292.07
2180	2302.89	7205.26	-293.47
2190	2300.48	7195.56	-294.63
2200	2297.72	7185.96	-295.63
2210	2291.49	7178.27	-296.64
2220	2282.38	7174.33	-297.63
2230	2272.77	7171.57	-298.67
2240	2263.16	7168.80	-300.07
2250	2253.55	7166.04	-301.47
2260	2243.94	7163.28	-302.87
2270	2234.33	7160.51	-304.27
2280	2224.71	7157.75	-305.67
2290	2215.11	7154.99	-307.07
2300	2205.50	7152.23	-308.47
2310	2195.88	7149.46	-309.87
2320	2186.27	7146.70	-311.27
2330	2176.66	7143.94	-312.67
2340	2167.05	7141.18	-314.07
2350	2157.44	7138.41	-315.47
2360	2147.83	7135.65	-316.87
2370	2138.22	7132.89	-317.92
2380	2128.41	7131.24	-318.91
2390	2118.98	7134.24	-319.93
2400	2111.50	7140.85	-321.12
2410	2104.31	7147.79	-322.48
2420	2097.11	7154.73	-323.84
2430	2089.91	7161.67	-325.19
2440	2082.72	7168.61	-326.55
2450	2075.52	7175.56	-327.90
2460	2068.32	7182.50	-329.26
2470	2061.12	7189.44	-330.62
2480	2053.92	7196.38	-331.97
2490	2046.73	7203.33	-333.33
2500	2039.53	7210.27	-334.68
2510	2032.75	7217.60	-335.77
2520	2027.89	7226.31	-336.78
2530	2025.35	7235.95	-337.81
2540	2025.25	7245.93	-338.83
2550	2027.64	7255.62	-339.80
2560	2031.36	7264.89	-340.80
2570	2035.08	7274.18	-341.80
2580	2038.81	7283.46	-342.79
2590	2042.53	7292.74	-343.19
2600	2046.26	7302.02	-343.60
2610	2049.99	7311.30	-345.00
2620	2053.71	7320.58	-346.40

Length (XY)	X (m)	Y (m)	Z (m)
2630	2057.43	7329.86	-347.80
2640	2061.16	7339.14	-349.20
2650	2064.88	7348.42	-350.59
2660	2068.61	7357.70	-351.99
2670	2072.33	7366.98	-353.39
2680	2076.05	7376.26	-354.79
2690	2079.78	7385.54	-356.19
2700	2083.51	7394.82	-357.58
2710	2087.23	7404.11	-358.98
2720	2092.01	7412.81	-360.38
2730	2100.22	7418.33	-361.79
2740	2109.82	7421.13	-363.18
2750	2119.44	7423.89	-364.58
2760	2129.05	7426.66	-365.98
2770	2138.66	7429.42	-367.38
2780	2148.27	7432.19	-368.78
2790	2157.87	7434.95	-370.18
2800	2167.48	7437.72	-371.58
2810	2177.10	7440.48	-372.98
2820	2186.71	7443.25	-374.38
2830	2196.31	7446.01	-375.78
2840	2205.92	7448.78	-377.18
2850	2215.54	7451.54	-378.58
2860	2225.15	7454.30	-379.98
2870	2235.04	7454.69	-381.38
2880	2244.32	7451.02	-382.78
2890	2253.45	7446.95	-384.18
2900	2262.59	7442.88	-385.58
2910	2271.72	7438.81	-386.98
2920	2280.85	7434.73	-388.38
2930	2289.98	7430.66	-389.78
2940	2299.12	7426.59	-391.18
2950	2308.25	7422.52	-392.58
2960	2317.39	7418.45	-393.98
2970	2326.52	7414.38	-395.38
2980	2335.66	7410.30	-396.78
2990	2344.79	7406.23	-398.18
3000	2353.92	7402.16	-399.58
3010	2363.01	7397.99	-400.96
3020	2371.13	7392.20	-402.33
3030	2377.57	7384.58	-403.77
3040	2381.92	7375.61	-405.22
3050	2383.91	7365.83	-406.63
3060	2383.43	7355.87	-407.96
3070	2380.49	7346.33	-409.33
3080	2375.28	7337.82	-410.76
3090	2368.14	7330.87	-412.21
3100	2359.49	7325.89	-413.63
3110	2349.89	7323.19	-414.98
3120	2340.04	7321.43	-416.37
3130	2330.19	7319.68	-417.16
3140	2320.36	7317.92	-417.82
3150	2310.51	7316.16	-418.02
3160	2300.67	7314.40	-418.22
3170	2290.82	7312.63	-418.46
3180	2280.98	7310.87	-418.85
3190	2271.13	7309.12	-419.39
3200	2261.29	7307.36	-420.84
3210	2251.45	7305.60	-422.29
3220	2241.60	7303.84	-423.74
3230	2231.76	7302.08	-425.19
3240	2221.92	7300.32	-426.64
3250	2212.07	7298.56	-428.09
3260	2202.23	7296.80	-429.54
3270	2192.38	7295.04	-430.99
3280	2182.54	7293.28	-432.44
3290	2172.70	7291.52	-433.89
3300	2162.85	7289.76	-435.34
3310	2153.01	7288.00	-436.79
3320	2143.16	7286.24	-438.24
3330	2133.32	7284.48	-439.69
3340	2123.47	7282.72	-441.14
3350	2113.63	7280.96	-442.59
3360	2103.79	7279.20	-444.04
3370	2093.94	7277.44	-445.49
3380	2084.10	7275.68	-446.94
3390	2074.26	7273.92	-447.92
3400	2064.41	7272.16	-448.64
3410	2054.57	7270.40	-449.36
3420	2044.72	7268.64	-450.04
3430	2034.87	7266.94	-449.84
3440	2024.98	7265.44	-449.59
3450	2015.07	7264.15	-449.35
3460	2005.12	7263.13	-449.27
3470	1995.14	7262.51	-449.27
3480	1985.14	7262.32	-449.28
3490	1975.15	7262.55	-449.26
3500	1965.17	7263.26	-449.16

Length (XY)	X (m)	Y (m)	Z (m)
3510	1955.24	7264.46	-449.06
3520	1945.34	7265.87	-448.86
3530	1935.45	7267.29	-448.66
3540	1925.54	7268.70	-448.46
3550	1915.65	7270.11	-448.26
3560	1905.75	7271.53	-448.06
3570	1895.85	7272.94	-447.86
3580	1885.95	7274.36	-447.66
3590	1876.05	7275.77	-447.46
3599.346	1866.685	7277.112	-447.271

TASH

Sec	X (m)	Y (m)	Z (m)
-3.846	2074.6678	7299.3035	-3.846
-219.146	2074.6678	7299.3035	-219.146
-226.97	2074.6678	7299.3035	-226.97
-334.97	2074.6678	7299.3035	-334.97
-342.67	2075.0078	7299.2185	-342.67
-441.7	2075.0078	7299.2185	-441.7

TASV

Sec	X (m)	Y (m)	Z (m)
-3.89	2072.73	7291.54	-3.89
-218.84	2072.73	7291.54	-218.84
-226.70	2073.04	7291.28	-226.70
-336.42	2073.04	7291.28	-336.42
-342.66	2073.19	7291.32	-342.66
-440.71	2073.19	7291.32	-440.71

TASW

Sec	X (m)	Y (m)	Z (m)
-3.93	2080.49	7289.60	-3.93
-219.13	2080.49	7289.60	-219.13
-226.70	2081.58	7288.63	-226.70
-336.36	2081.58	7288.63	-336.36
-342.65	2081.59	7288.63	-342.65
-439.58	2081.59	7288.63	-439.58

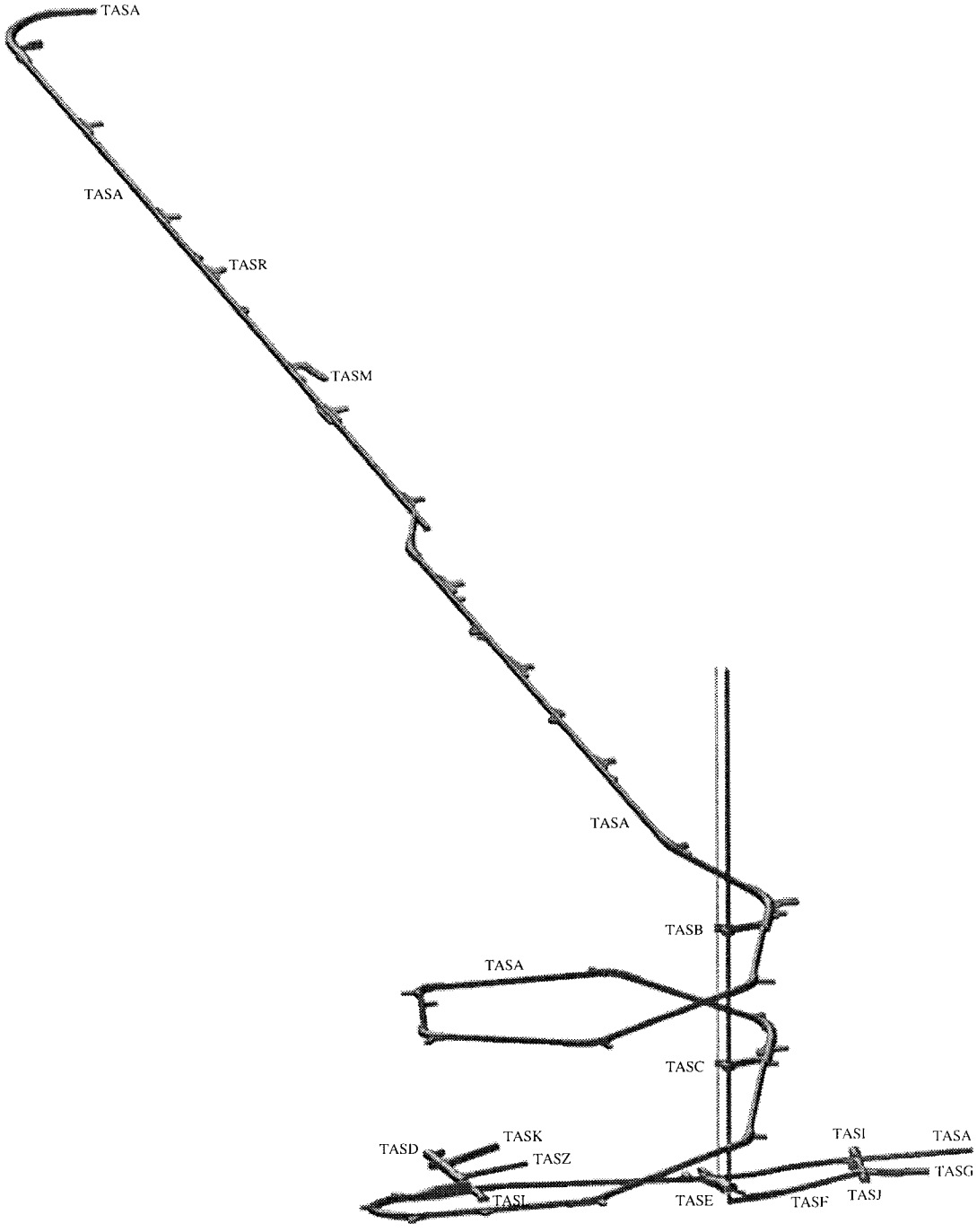

Figure 2-##. *Overview of the Äspö tunnel layout. The tunnel is viewed from a point located NNE of the Äspö Island.*

This file: READWC01.TXT

This ZIP-file with the files below contains SKB data from the Aspo Hard Rock Laboratory. These data are SKB proprietary and shall only be used within specified tasks agreed upon between SKB and participating organizations.

WEIRCHEM

WEIRCHEM ZIP-file WEIRCH01.zip contains hydochemistry data for Modelling Task 5. This ZIP-file has one file containing data of Cloride, pH and electrical conductivity measured at the weirs along the Aspo tunnel during the excavation of Aspo Hard Rock Laboratory for period:
July 1993 - Aug 1993

The data is available in two different file formats
- Ascii files (*.TXT)
- Microsoft EXEL files, version 7.0 (*.XLS)

Filename:
WEIRCH01

Column:	Unit:	Description:
START_DATE	YYYYMMDD	Date for sampling
TIME	hhmmss	Hours,minutes, seconds for sampling
IDCODE	-	Code for measurement point
SECUP	m	Upper measurement section in the tunnel
SECLOW	m	Lower measurement section in the tunnel
SAMPLE_NO	-	The No of the sample
CL	mg/l	Cloride
PH	-	Ph
COND	mS/m	Electrical conductivity

START_DATE	TIME	IDCODE	SECUP	SECLOW	SAMPLE_NO	CL	PH	COND
1993-07-22	12:10:00	MA0682G	0	682	-1	2850	8.0	780
1993-07-22	11:55:00	MA1232G	1033	1232	-1	3540	7.3	1040
1993-07-22	11:53:00	MA1372G	1232	1372	-1	4100	7.6	1160
1993-07-22	11:50:00	MA1584G	1372	1584	-1	3300	7.8	988
1993-07-22	11:42:00	MA1745G	1584	1745	-1	4640	7.7	1300
1993-07-22	11:40:00	MA1883G	1745	1883	-1	5470	7.6	1520
1993-07-22	11:46:00	MA2028G	1883	2028	-1	3470	7.9	1020
1993-07-23	11:58:00	MA1033G	682	1033	-1	3850	7.1	1080
1993-07-29	11:16:00	MA0682G	0	682	-1	2840	8.0	810
1993-07-29	11:08:00	MA1033G	682	1033	-1	3830	7.5	1100
1993-07-29	10:40:00	MA1232G	1033	1232	-1	3520	7.4	1040
1993-07-29	10:37:00	MA1372G	1232	1372	-1	4080	7.5	1160
1993-07-29	10:28:00	MA1584G	1372	1584	-1	3400	7.8	1000
1993-07-29	10:13:00	MA1745G	1584	1745	-1	5080	7.6	1420
1993-07-29	10:05:00	MA2028G	1883	2082	-1	3480	7.9	1020
1993-08-04	01:00:00	MA0682G	0	682	-1	2800	8.0	790
1993-08-04	15:46:00	MA1033G	682	1033	-1	3840	7.6	1100
1993-08-04	01:00:00	MA1232G	1033	1232	-1	3530	7.6	1020
1993-08-04	01:00:00	MA1372G	1232	1372	-1	4070	7.7	1160
1993-08-04	15:05:00	MA1584G	1372	1584	-1	3410	7.8	980
1993-08-04	01:00:00	MA1883G	1745	1883	-1	5120	7.6	1510
1993-08-04	01:00:00	MA2028G	1883	2028	-1	4540	7.7	1260

This file: READZG01.TXT

This ZIP-file with the files below contains SKB data from the Aspo Hard Rock Laboratory. These data are SKB proprietary and shall only be used within specified tasks agreed upon between SKB and participating organizations.

FRACTURE ZONE GEOMETRY

FRACTURE ZONE GEOMETRY ZIP-file ZONEGEOM.zip contains data of the geometry of the hydraulic conductor domains near Aspo HRL. A complete description of the hydraulic conductor domains is given in SKB Technical Report (1) for Modelling Task 5.

The data is available in two different file formats
- Ascii files (*.TXT)
- Microsoft EXEL files, version 7.0 (*.XLS)

(1) Rhén I (ed), Gustafson G, Stanfors R, Wikberg P, 1997. Äspö HRL - Geoscientific evaluation 1997/5. Models based on site characterization 1986-1995. SKB TR 97-06.

Filename:	Contents:
HCD-SR97	Hydraulic Donductor Domains used in a SKB project called SR97.

The model set up in the project SR97 covers a volume of 2000 x 2000 x 1000 m3 and includes therefore only a few of the regional hydraulic conductor domains. However,it is possibly easier to generate some of the hydraulic conductor domains with help of the data in the file HCD-SR97.

Column:	Unit:	Description:
DOMAIN	-	Name of hydraulic Conductor Domains (CD) and hydraulic Rock mass Domains(RD) in (1).
PLANE DEF. DOMAINS DOMAIN EQ. (A,B,C,D)	m	Planes limiting the extent of the DOMAIN. Equation for the DOMAIN: A*x + B*y + C*z + D=0.
HCD. COORD.	m	DOMAIN coordinates constrained by DOMAIN or SR97 model domain.

Report (1) is however the base for the geometrical description of the hydraulic conductor domains. In report (1) Chapter 6 gives an description of the hydraulic conditions, Appendix 2 gives detailed descriptions of hydraulic properties and geometry and finally in Chapter 8 the result of a calibration exercise is presented. Important sections in (1) are:

Reginal hydraulic Conductor Domains (RCD)	Fig 6-21 p 186, Table 6-3 p 187, Appendix 2 p 4-6.
Reginal hydraulic Rock mass Domains (RRD)	Fig 6-23 p 193, Table 6-13 p 221, Appendix 2 Table A2-3 p,
Site hydraulic Conductor Domains (SCD)	Fig 6-31 p 207, Appendix 2 p 11-15, Table 8-1 p 364.
Site hydraulic Rock mass Domains (SRD)	Fig 6-36 p 219, Table 6-21 p 246, Table 6-13 p 221, Appendix 2 p 18-45, Tables 8-2 and 8-3 p 365.

Domain	Planes defining the domain	Hyd. conductor domain plane on equation form				Hyd. cond. domain coordinates (constrained by domains or by model domain)													
		A	B	C	D	Northings	Eastings	Z	Northings	Eastings	Z	Northings	Eastings	Z	Northings	Eastings	Z	Northings	Eastings	Z
EW-1N	BW03,BW04	-0.49	0.87	-0.03	-5636.18	6989.111	1000.000	-1000	8000.000	2801.940	-1000	8000.000	2734.960	0	7026.687	1000.000	0			
EW-1S	BW01,BW03,BW04	-0.48	0.85	-0.20	-5472.54	8000.000	2848.895	0	8000.000	3000.000	-363.088	7851.384	3000.000	-1000	6730.017	1000.000	-1000	6963.355	1000.000	0
EW-3	NE-1,BW03	-0.20	0.96	-0.19	-6409.20	7256.333	2835.023	0	6875.651	1000.000	0	6677.116	1000.000	-1000	6686.910	1047.211	-1000			
EW-7	NE-4N,BW01	-0.26	0.95	-0.16	-5606.41	6377.686	1869.942	0	6680.589	3000.000	0	6516.847	3000.000	-1000						
NE-1	BW03,BW01	-0.44	0.85	0.30	-4905.35	7341.639	3000.000	0	6307.481	1000.000	0	6662.498	1000.000	-1000	7696.656	3000.000	-1000			
NE-2	EW-1S,NE-1,EW-3	-0.79	0.57	-0.22	-2588.86	8000.000	2528.528	0	7049.470	1837.871	0	6965.753	1922.690	-510.307	7359.991	2348.910	-1000	8000.000	2813.942	-1000
NE-3	BW01,BW02,BW03	-0.48	0.83	0.27	-4462.14	7084.391	3000.000	0	6000.000	1121.876	0	6000.000	1000.000	-216.759	6254.270	1000.000	-1000	7409.029	3000.000	-1000
NE-4N	BW01,BW03	-0.39	0.86	-0.32	-4794.61	6000.000	1021.866	0	6880.952	3000.000	0	6507.941	3000.000	-1000	6000.000	1859.444	-1000			
NE-4S	NE-4N,BW02	-0.47	0.86	-0.20	-4608.54	6000.000	1183.612	0	6000.000	1361.371	-405.341	6400.904	1922.076	0						
NW-1	EW-1N,BW04	0.37	0.34	0.87	-3132.45	7413.420	1689.243	0	8000.000	1148.901	0	8000.000	2781.390	-693.179						
NNW-1	EW-3, EW-1S	0.95	0.31	0.00	-4312.29	7129.929	2225.708	0	7570.647	2083.129	0	7373.136	2147.027	-1000	6943.880	2285.898	-1000			
NNW-2	NE-1, EW-1S	0.92	0.40	0.00	-4958.39	7576.749	2094.011	0	7003.116	2345.316	0	7292.565	2218.511	-1000	7389.424	2176.077	-1000			
NNW-3	F2,F3	1.00	-0.03	0.00	-1921.13	7025.400	2143.600	0	6812.900	2136.900	0	6812.900	2136.900	-1000	7025.400	2143.600	-1000			
NNW-4	NE-1, EW-1S	0.99	0.13	0.09	-3176.61	6993.104	2325.952	0	7659.337	2241.311	0	7487.704	2351.363	-1000	7369.054	2366.436	-1000			
NNW-5	NE-4N, F1	1.00	0.05	0.00	-2325.57	6440.049	2009.974	0	7394.100	1962.800	0	7394.100	1962.800	-1000	6075.075	2028.020	-1000			
NNW-6	EW-7, NE-4N, NE-1	0.99	0.14	0.00	-3266.71	6984.413	2309.147	0	6513.314	2375.938	0	6444.381	2385.711	-436.984	6246.843	2413.718	-1000	7315.182	2262.252	-1000
NNW-7	EW-3, EW-1S	0.90	0.42	0.09	-4915.15	7112.829	2143.281	0	7503.054	1962.574	0	7360.570	2124.614	-1000	6949.876	2314.800	-1000			
NNW-8	EW-1N,A1,A2,BW04	0.71	0.71	0.00	-6788.23	7584.902	2015.099	-300	8000.000	1600.000	-300	8000.000	1600.000	-700	7575.245	2024.755	-700			
SFZ11	NE-1, BW01	0.20	0.98	0.00	-7540.77	7158.734	2646.272	0	7087.343	3000.000	0	7087.343	3000.000	-1000	7258.402	2152.442	-1000			
SFZ14a	BW03, SFZ14b	-0.99	0.14	0.00	-23.42	7860.000	1095.000	0	7192.500	1000.000	0	7192.500	1000.000	-1000	7860.000	1095.000	-1000			
SFZ14b	SFZ14a, BW04	-0.98	0.21	0.00	-550.85	7860.000	1095.000	0	8000.000	1124.531	0	8000.000	1124.531	-1000	7860.000	1095.000	-1000			
SRD5	Q1, Q2, Q3, Q4, Q5, Q6																			
SRD1	EW-1N, SFZ14a, SFZ14b, BW03																			
SRD2	EW-1N, BW03, BW04, EW-1S																			
SRD3	EW-1S, NE-1, BW01, BW04, BW03, EW-3																			
SRD4	NE-4N, EW-7, BW01, NE-1, EW-3, BW03, BW02																			
Fictive boundary planes																				
A1	Defines NNW-8 to be below -300 m	0	0	1	300.00															
A2	Defines NNW-8 to be above -700 m	0	0	1	700.00															
F1	Defines NNW-5 to be south of 7394 m	0	-1	0	7394.10															
F2	Defines NNW-3 to be south of 7025 m	0	-1	0	7025.40															
F3	Defines NNW-3 to be north of 6813 m	0	-1	0	6812.90															
Q1	Defines SRD5	0	1	0	-7352.50															
Q2	Defines SRD5	-1	0	0	2265.00															
Q3	Defines SRD5	0	1	0	-7277.50															
Q4	Defines SRD5	-1	0	0	2115.00															
Q5	Defines SRD5	0	0	-1	-387.50															
Q6	Defines SRD5	0	0	-1	-312.50															
BW01	Defines Eastern model boundary	1	0	0	-3000.00	8000	3000	0	6000	3000	0	6000	3000	-1000	8000	3000	-1000			
BW02	Defines Southern model boundary	0	1	0	-6000.00	6000	1000	0	6000	3000	0	6000	3000	-1000	6000	1000	-1000			
BW03	Defines Western model boundary	1	0	0	-1000.00	8000	1000	0	6000	1000	0	6000	1000	-1000	8000	1000	-1000			
BW04	Defines Northern model boundary	0	1	0	-8000.00	8000	1000	0	8000	3000	0	8000	3000	-1000	8000	1000	-1000			

Appendix 2

This file: READWF01.TXT

This ZIP-file with the files below contains SKB data from the Aspo Hard Rock Laboratory. These data are SKB proprietary and shall only be used within specified tasks agreed upon between SKB and participating organizations.

WEIRFLOW

WEIRFLOW ZIP-file WEIRFL01.zip contains data for Modelling Task 5 describing the water flow into the Aspö HRL tunnel. This ZIP-file has one file containing data of the monthly mean flow rates measured at the weirs along the Aspo tunnel during the excavation of Aspo Hard Rock Laboratory for period:
May 1991 - January 1994.

The data is available in two different file formats
- Ascii files (*.TXT)
- Microsoft EXEL files, version 7.0 (*.XLS)

Filename:
WEIRF-01

Column:	Unit:	Description:
Month	MMYY	Period for the estimated montly mean flow rate.
MA682G etc	l/min	IDCODE for the weir. The figure (in this case 682) is the position in the tunnel A for the ditch (dam) that is collecting the water. Figures in the column shows the estimated or mean value of the measured flowrate.
Total inflow	l/min	Sum of all measurements of the flow into the tunnel.

In the lower part of the table shown in the file the measurement sections are defined.

ROW:	Unit:	Description:
SECUP	m	Upper mesurment section along the tunnel line or depth in the shafts, which were defined in TUNNGEOM.zip.
SECLOW	m	Lower mesurment section along the tunnel line or depth in the shafts, which were defined in TUNNGEOM.zip.
Tunnel part	-	IDCODE for tunnel or "shafts"

Details about the flow measurements are found in SKB PR 25-95-28, App. 2:4. The flow rates have also been presented in SKB TR 97-06, App. 2. However minor ajustments of the flowrates reported in SKB TR 97-06 and in SKB PR 25-95-28 have been made for some of the monthly mean flowrates after August 1995.
A few corrections of the measured flowrates have been made according to SKB PR 25-95-28:

-The pump pit PG2 is losing water by leacage, which January 1994 was estimated to 42 i/min. The monthly mean flow rate measured at MA1030G has been reduced with this amount when PG2 was in operation.

-The pump pit PG3 is probaly losing water by leacage, which has been esimated to 5 i/min. The monthly mean flow rate measured at MA1745G has been reduced with this amount when PG3 was in operation.

-The pump pit PG4 is possibly losing water by leacage when the water level is high in the pump pit. The leacage has been esimated to 10 i/min. The monthly mean flow rate measured at MA2699G has been reduced with this amount when PG4 was used for a drilling operation 22 November 1994 -24 January 1995. When the water level is low in the pump pit, during normal operation, the leacage is probably small and no corrections have been made for other periods.

-Water is flowing into the pump pit P5 which is not measured by MF0061G

(down-streem the ditch (dam), the deepest part of tunnel F). Autumn 1995 this flow rate was estimated to 6 i/min. 6 1/min has been added to the monthly mean flow rate measured at MF0061G.

The columns SHAFT220, SHAFT340, SHAFT450 represents the estimated flow rates for -z=0-220 m, 220-340 m and 340-450 m respectivly. In May 1995 the measurements with weirs started. Unfortunatly not all shafts were equiped with water collecting devices at levels -220 m, -340 m and -450 m. Therefore must the mesurements after May 1995 for the shafts be ajusted to depth levels. In SKB PR 25-95-28, App. 2:4 and in SKB TR 97-06, App. 2 a suggestion was made of how to make these adjustments. These calculations have been made in the file fo
r
columns SHAFT220, SHAFT3340, SHAFT 450 for data collected after July 1995. The actual measurements at MA1659G, MA2587G and MA3384G are just provided to show the measured value AND SHALL NOT BE USED IN THE MODELLING.

MA3411G collects water from tunnelsection 3179-3426m in tunnel A.

MA3426G collects water from tunnelsection 3426-3600 m in tunnel A.

Tunnel F is parallell and close to tunnel A, approximatly section 3400-3510 m. The flow rate shown in column MF0061G should be added to MA3411G (50%) and MA3426G (50%) if tunnel F is not modelled.

Month	MA682G (l/min)	MA1030G (l/min)	MA1232G (l/min)	MA1372G (l/min)	MA1584G (l/min)	Shaft220 (l/min)	MA1659G (l/min)	MA1745G (l/min)	MA1883G (l/min)	MA2028G (l/min)	MA2178G (l/min)	MA2357G (l/min)	MA2496G (l/min)	Shaft340 (l/min)	MA2587G (l/min)	MA2699G (l/min)	MA2840G (l/min)	MA2994G (l/min)	MA3179G (l/min)	Shaft450 (l/min)	MA3384G (l/min)	MA3411G (l/min)	MA3426G (l/min)	MF0061G (l/min)	Tot inflow (l/min)
MAY-91	70.0	0.0																							70.0
JUN-91	70.0	10.0																							80.0
JUL-91	70.0	60.0																							130.0
AUG-91	70.0	90.0																							160.0
SEP-91	70.0	100.0																							170.0
OCT-91	70.0	175.0																							245.0
NOV-91	70.0	325.0																							395.0
DEC-91	70.0	400.0	40.0																						510.0
JAN-92	70.0	400.0	120.0																						590.0
FEB-92	70.0	400.0	180.0	26.0																					676.0
MAR-92	70.0	400.0	185.0	181.0																					836.0
APR-92	70.0	400.0	185.0	270.0																					925.0
MAY-92	70.0	400.0	185.0	270.0																					925.0
JUN-92	70.0	437.0	185.0	360.0																					1052.0
JUL-92	70.0	473.0	185.0	450.0	2.0																				1180.0
AUG-92	70.0	473.0	185.0	450.0	35.0																				1213.0
SEP-92	70.0	473.0	185.0	450.0	65.0			4.0																	1247.0
OCT-92	70.0	473.0	185.0	450.0	65.0	10.0		21.0																	1274.0
NOV-92	70.0	473.0	185.0	450.0	65.0	130.0		30.0	11.0																1414.0
DEC-92	70.0	473.0	185.0	450.0	65.0	200.0		30.0	29.0	5.9															1507.9
JAN-93	70.0	473.0	185.0	450.0	65.0	205.0		30.0	30.0	29.0	1.8														1538.8
FEB-93	70.0	473.0	185.0	450.0	65.0	246.0		30.0	30.0	35.0	28.0														1612.0
MAR-93	70.0	473.0	185.0	450.0	65.0	261.5		30.0	30.0	35.0	48.0	12.0													1659.5
APR-93	70.0	473.0	185.0	450.0	65.0	255.0		30.0	30.0	35.0	50.0	52.0	0.6												1695.6
MAY-93	70.0	473.0	196.0	450.0	62.2	211.0		27.0	30.0	35.0	50.0	60.0	5.4			2.4									1672.0
JUN-93	70.0	473.0	267.0	462.0	64.7	196.0		19.0	38.0	38.0	50.0	60.0	6.0			11.6									1755.3
JUL-93	70.0	473.0	188.0	462.0	78.4	191.0		32.0	45.0	35.0	50.0	60.0	6.0			13.0									1703.4
AUG-93	70.0	473.0	184.0	462.0	73.7	191.0		32.0	40.0	37.0	50.0	60.0	6.0			13.0									1691.7
SEP-93	70.0	473.0	180.0	462.0	73.0	191.0		32.0	40.0	37.0	50.0	60.0	6.0			13.0									1687.0
OCT-93	70.0	473.0	179.0	462.0	72.8	191.0		33.4	37.2	39.0	52.0	60.3	7.8			13.0									1690.5
NOV-93	70.0	473.0	181.0	462.0	72.3	191.0		20.3	31.3	36.8	136.0	61.3	4.1			34.4									1773.5
DEC-93	70.0	473.0	193.0	462.0	72.5	191.0		20.3	31.1	36.0	66.9	69.5	3.6	0.0		55.8	9.0								1753.7
JAN-94	70.0	473.0	189.0	426.0	72.9	183.0		20.3	31.3	37.9	54.9	69.0	4.1	0.0		55.8	29.0	6.6							1722.7
SECUP	0.00	682	1030	1232	1372	0		1584	1745	1883	2028	2178	2357	220		2496	2699	2840	2994	340		3179	3426	0	
SECLOW	682.00	1030	1232	1372	1584	220		1745	1883	2028	2178	2357	2496	340		2699	2840	2994	3179	450		3426	3600	110	
Tunnel part	A	A	A	A	A	Shafts	Shafts	A	A	A	A	A	A	Shafts	Shafts	A	A	A	A	Shafts	Shafts	A	A	F	

This file: READSP01.TXT

This ZIP-file with the files below contains SKB data from the Aspo Hard Rock Laboratory. These data are SKB proprietary and shall only be used within specified tasks agreed upon between SKB and participating organizations.

PIETZOMETRIC LEVELS MEASURED IN SURFACE BORE HOLES

PIETZOMETRIC LEVEL ZIP-file PIEZOL01.zip contains data for Modelling Task 5.

The data is available in two different file formats
- Ascii files (*.DAT)
- Lotus 123 files, version 2 (*.WK1)

These data has previus been sent out as a part of Task 3 data set. This zip file contains the pressure response data during the excavation of the Aspo HRL as described in Forsmark T, Rhen I, 1994. SKB - ASPO HARD ROCK LABORATORY Information for numerical modelling 1994. General information and calibration cases for the excavation of the Aspo Hard Rock Laboratory, tunnelsection 700 - 2545 metres. SKB Progress Report 25-94-16. The draw-down data are for period 1 of June 1991 to 21 of May 1993.

Filename:	Contents:
XXXXX.wk1	Values of the piezometric levels for bore hole XXXXX for every 30th day from 1 of June 1991 to 21 of May 1993. These data were sent as as a part of the Task 3 data set and were presented in SKB PR 25-94-16.

Filename:	Corresponding part in the the above mentioned report:
KAS01 - KAS16 (*.DAT *.WK1)	PM 1, pages 1:6 - 1:20
HAS01 - HAS21(*.DAT *.WK1)	PM 1, pages 1:21 - 1:41
HAV08, HLX09, HMJ01 (*.DAT *.WK1)	PM 1, pages 1:42 - 1:44

Column:	Unit:	Description:
BOREHOLE	-	Bore hole name
SECTION	m	Upper and lower measurment section in the bore hole, measured along the bore hole.
HMSCODE	-	Code used in the HMS system for the measurement section.
CONDUCTOR	m	Section in the bore hole, measured along the bore hole. The point of each section where the centre of gravity of the flow or hydraulic conductivity have been estimated to be. (Same as " point of application" in file SAL_PR01)
DATE	YYMMDD	The time for the measurement.
MEASURED LEVELS	m	Water level in measurement pipe above Z=0, where Z is the vertical coordinate in the Aspo HRL coordinate system, postive upwards.
C	mS/m	Electrical conductivity of the water in the measurement section and the pipe up to the pressure transducer.
Freshwater head	m	Calculated fresh-water head based on C and Z-level for the CONDUCTOR, see SKB PR 25-94-16.

TUNNEL CONSTRUCTION 0/700 - 2/545 metres

Borehole :	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03
Section (m) :	627-1002	533-626	377-532	253-376	107-252	0-106	627-1002	533-626	377-532	253-376	107-252	627-1002	533-626	377-532	253-376	107-252	0-106
HMS code :	MA31	MA32	MA33	MA34	MA35	MA36	MA31	MA32	MA33	MA34	MA35	MA31	MA32	MA33	MA34	MA35	MA36
Conductor (m) :	691	618	527	357	220	60	691	618	527	357	220	691	618	527	357	220	60
	Measured levels						Electric conductivity					Freshwater head					
DATE (YY-MM-DD)	h (masl)	h (masl)	h (masl)	h (masl)	h (masl)	h (masl)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	h (masl)	h (masl)	h (masl)	h (masl)	h (masl)	h (masl)
01/06/91	-1.50	0.50	-0.20	0.60	1.40	3.60	1778	1102	1422	1360	497	4.11	3.61	3.21	2.80	1.89	3.60
01/07/91	-1.50	-0.20	-0.30	0.60	1.50	4.00	1778	1102	1422	1360	497	4.11	2.91	3.11	2.80	1.99	4.00
31/07/91	-2.00	0.00	-0.20	0.50	1.00	3.70	1778	1102	1422	1360	497	3.60	3.11	3.21	2.70	1.49	3.70
30/08/91	-2.20	-0.20	-0.20	0.40	1.00	4.50	1778	1102	1422	1360	497	3.40	2.91	3.21	2.60	1.49	4.50
29/09/91	-1.67	-0.12	-0.30	0.35	0.97	4.07	1778	1102	1422	1360	497	3.93	2.99	3.11	2.55	1.46	4.07
29/10/91	-1.88	-0.21	-0.51	0.13	1.03	4.17	1778	1102	1422	1360	497	3.73	2.90	2.90	2.33	1.52	4.17
28/11/91	-1.85	-0.13	-0.44	0.26	1.31	4.07	1778	1102	1422	1360	497	3.76	2.98	2.97	2.46	1.80	4.07
28/12/91	-1.71	-0.01	-0.28	0.42	1.49	4.03	1778	1102	1422	1360	497	3.89	3.10	3.14	2.61	1.98	4.03
27/01/92	-1.71	0.06	-0.28	0.39	1.07	5.21	1778	1102	1422	1360	497	3.89	3.17	3.13	2.59	1.56	5.21
26/02/92	-1.74	-0.07	-0.34	0.62	1.29	4.97	1778	1102	1422	1360	497	3.87	3.04	3.08	2.82	1.78	4.97
27/03/92	-1.72	0.11	-0.48	0.43	1.39	4.68	1778	1102	1422	1360	497	3.88	3.22	2.93	2.63	1.88	4.68
26/04/92	-1.93	-0.12	-0.54	0.33	1.20	4.41	1778	1102	1422	1360	497	3.67	2.99	2.88	2.52	1.68	4.41
26/05/92	-2.12	-0.28	-0.80	0.18	0.92	3.92	1778	1102	1422	1360	497	3.48	2.83	2.61	2.37	1.41	3.92
25/06/92	-2.27	-0.52	-1.00	0.06	0.68	3.52	1778	1102	1422	1360	497	3.33	2.58	2.41	2.25	1.16	3.52
25/07/92	-2.42	-0.70	-1.14	-0.30	0.50	5.59	1778	1102	1422	1360	497	3.18	2.41	2.27	1.90	0.99	5.59
24/08/92	-2.38	-0.26	-1.11	-0.39	0.66	4.27	1778	924	1422	1360	497	3.22	2.34	2.30	1.80	1.15	4.27
23/09/92	-2.53	-0.24	-1.25	-0.42	0.60	4.27	1778	924	1422	1360	497	3.07	2.37	2.16	1.77	1.09	4.27
23/10/92	-2.74	-0.71	-1.62	-0.85	0.56	3.71	1778	924	1422	1360	497	2.86	1.90	1.78	1.34	1.04	3.71
22/11/92	-4.18	-2.62	-3.29	-3.09	-0.11	5.94	1778	924	1422	1360	497	1.40	-0.03	0.10	-0.91	0.38	5.94
22/12/92	-5.27	-4.25	-4.58	-4.72	-0.67	4.34	1778	930	1422	1360	497	0.31	-1.64	-1.19	-2.55	-0.19	4.34
21/01/93	-5.45	-4.51	-4.56	-4.88	-0.47	6.15	1778	930	1422	1360	497	0.13	-1.90	-1.17	-2.72	0.01	6.15
20/02/93	-5.68	-4.79	-4.86	-5.11	-0.62	5.37	1778	1130	1422	1360	497	-0.11	-1.63	-1.48	-2.94	-0.13	5.37
22/03/93	-6.16	-5.29	-5.37	-5.75	-0.91	4.99	1778	1130	1422	1360	497	-0.59	-2.13	-2.00	-3.59	-0.43	4.99
21/04/93	-6.52	-5.56	-5.54	-6.08	-1.11	4.59	1778	1130	1422	1360	497	-0.96	-2.40	-2.17	-3.93	-0.62	4.59
21/05/93	-6.86	-6.21	-5.97	-6.13	-1.53	2.80	1778	1060	1422	1360	497	-1.30	-3.25	-2.60	-3.97	-1.04	2.80

This file: READSP02.TXT

This ZIP-file with the files below contains SKB data from the Aspo Hard Rock Laboratory. These data are SKB proprietary and shall only be used within specified tasks agreed upon between SKB and participating organizations.

PIETZOMETRIC LEVELS MEASURED IN SURFACE BORE HOLES

PIETZOMETRIC LEVEL ZIP-file PIEZOL02.zip contains data for Modelling Task 5.

The data is available in two different file formats
- Ascii files (*.TXT)
- Microsoft EXEL files, version 7.0 (*.XLS)

These data comprises the pietzometric levels measured in surface bore holes, undisturbed conditions, coordinates of the bore hole sections and salinity in bore hole sections.

Filename:	Contents:
SAL_PR01	Electrical conductivity and salinity of water in borehole sections and pipes up to the position of the pressure transducer. Data shown are for core drilled holes. These data, up to September 1993, were sent as as a part of the Task 3 data set and were presented in SKB PR 25-94-16.

When packers are installed in a bore hole the pipes from the test section are airlift pumped, and at least the volume of the pipe is pumped out. At the end of the pumping the electrical conductivity (C) of the water is measured. In some of the bore hole sections water samples for hydochemistry analysis have also been taken. These measurements give a possibility to estimate the density of the water in the measurement pipe and in the measured section. DATE is the time for packer istallation or time for collecting a water sample. The density of measured section is of course more uncertain than the density in the pipe because of the limited airlift pumping of some of the pipes. Electrical conductivity measurements made during the hydochemistry analysis of the water samples taken are concidered more reliable than the measurements made during the packer installation. The salinity (SAL) in the tables have been calulated according to equation 6-1 in SKB TR 97-06, and this equation can be used to calulate the density of the water. In Technical Note 25-92-63G the density of pure water as function of temperature and depth below ground surface at Aspo is shown.

The measurement method in KAV01 differs from all the others. In that bore hole there is pure water down to each measurment section, which is shown in the file. The pressures are measured with a tool 25 m below the water level in the upper most section. One can assume that it is the same salinity from the measured level down to the measurement section. The hydrochemical information shows that the salinity increases by depth.

Column:	Unit:	Description:
BOREHOLE	-	Bore hole name
SECTION	m	Upper and lower measurment section in the bore hole, measured along the bore hole.
HMSCODE	-	Code used in the HMS system for the measurement section.
POINT OF APPLICATION	m	Section in the bore hole, measured along the bore hole. The point of each section where the centre of gravity of the flow or hydraulic conductivity have been estimated to be.
DATE	YYYYMMDD	The time for packer istallation or time for collecting a water sample.
C	mS/m	Electrical conductivity of the water.

S	g/L	Salinity of the water.

Filename:	Contents:
UNDISLEV	Undisturbed pietzometric levels. The data are the same as the data presented in Technical Note 25-92-63G. The uncertainty of the pietzometric levels is also outlined in Technical Note 25-92-63G. The comments below is also from that report.

COMMENTS OF MEASUREMENTS OF THE PIETZOMETRIC LEVELS

KAS09-14	The pressure levels are from the period January - June 1991. After that period conditions are disturbed.
KAS16	This borehole was drilled during the summer of 1992 and no undisturbed conditions data are available.
HAS18-20	Probably undisturbed conditions. Data from January - August 1991.
HAS21	Data from December 1991. Disturbed conditions.
KBH01	Data are from a short pumping test, November 1989.
KBH02	Data are from December 1990-June 1991, and are probably for undisturbed conditions.
HBH01-02	Data are from March 1991.
HBH03-04	Data are from April - June 1991.
HBH05	No data is available.
KAV01	It is freshwater from the pressure transducer down to the upper packer of the section. The electric conductivity values are from chemical sampling in 1987. The values are approximate.
HMJ01	Data are from December 1991. Disturbed conditions.
KLX01	Data for 1989 are from the period June - August 1989.
HLX08	Data are from the period December 1991 - August 1992. Probably undisturbed conditions.
HLX09	Data are from the period December 1991 - August 1992. Probably undisturbed conditions. The minimum values may be influenced of the tunnel construction work.

UNDISTURBED PIEZOMETRIC LEVELS - Description of table columns

Borehole	Borehole name.
HMS code	The code name used for each of the measured section in the Hydro Monitoring System (HMS).
Section	The interval along the borehole between the upper and lower packer of a section.
Point of application	The point of each section where the centre of gravity of the flow or hydraulic conductivity have been estimated to be.

X	The west to east coordinate in the Äspö-system for the point of application.(The coordinates are approximate as some corrections has been made since Task 3. Coordinates in BHCOORD1.XLS should be used to calculate coordinates for point of application if point of application is used in the modelling.)
Y	The south to north coordinate in the Äspö-system for the point of application.(The coordinates are approximate as some corrections has been made since Task 3. Coordinates in BHCOORD1.XLS should be used to calculate coordinates for point of application if point of application is used in the modelling.)
MASL	The vertical coordinate measured from the sea level for the point of application. MASL = metres above sea level. (The coordinates are approximate as some corrections has been made since Task 3. Coordinates in BHCOORD1.XLS should be used to calculate coordinates for point of application if point of application is used in the modelling.)
d0	The fresh water density for the actual depth of the point of application. The density is a function of the temperature.
El. cond.90/91	Electric conductivity of water samples from the PEM-pipe.
Average Oct '89-Jan '90	An average pressue calculated for the period October 1989 - January 1990.
Min '90	The pressure values in this column is the minimum value measured during 1990.
Max '90	The pressure values in this column is the maximum value measure during 1990.
Average '90	The pressure values in this column is the measured average value during 1990.
dh '90	The pressure values in this column is the difference between Max '90 and Min '90.
Min '91	The pressure values in this column is the minimum value measured during 1991.
Max '91	The pressure values in this column is the maximum value measured during 1991.
Average '91	The pressure values in this column is the measured average value during 1991.
dh '91	The pressure values in this column are the difference between Max '91 and Min '91.
Undisturbed fresh water head	
Min	The pressure values in this column is the measured Min value recalculated to correspond the hydraulic head for a fresh water column.
Max	The pressure values in this column is the measured Max value recalculated to correspond the hydraulic head for a fresh water column.
Average	The pressure values in this column is the measured average

	value recalculated to correspond the hydraulic head for a fresh water column.
dh	The pressure values in this column is the difference between Max and Min.

Filename:	Contents:
BHCOORD1.xls	Coordinates for the bore hole sections with measured piezometric levels. The bore hole groups are: -HAS and KAS: boreholes on Aspo -HAV and KAV: boreholes on Avro -HLX and KLX: boreholes on Laxemar -HBH and KBH: boreholes on Halo -HMJ : boreholes on Mjalen

Column:	Unit:	Description:
IDCODE	-	Code for measured bore hole.
SECLOW	m	Lower measurement section in the bore hole.
SECUP	m	Upper measurement section in the bore hole.
START DATE	YYYYMMDD	First date for measurement connected to SECUP and SECLOW. In some cases there has been changes of the packer positions since first instrumentation of the bore hole.
X-SECLOW	m	Easting coordinate in the Aspo HRL coordinate system for SECLOW in the bore hole.
Y-SECLOW	m	Northing coordinate in the Aspo HRL coordinate system for SECLOW in the bore hole.
Z-SECLOW	m	Vertical coordinate in the Aspo HRL coordinate system, postive upwards for SECLOW in the bore hole.
X-SECUP	m	Easting coordinate in the Aspo HRL coordinate system for SECUP in the bore hole.
Y-SECUP	m	Northing coordinate in the Aspo HRL coordinate system for SECUP in the bore hole.
Z-SECUP	m	Vertical coordinate in the Aspo HRL coordinate system, postive upwards for SECUP in the bore hole.

Bore-hole	HMS code	Section	Point of appli-cation	X	Y	MASL	d0	El. cond. 90/91	Ave-rage Oct '89 - Jan '90	Min '90	Max '90	Ave-rage '90	dh '90	Min '91	Max '91	Ave-rage '91	dh '91	Undisturbed freshwater head Min	Max	Ave-rage	dh
		(m)	(m)	(m)	(m)	(m)	(kg/m3)	(mS/m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
ÄSPÖ																					
KAS01	MA11	0-101	60	2132.79	7250.11	-51.82	999.7		1.7	1.0	2.0	1.2	1.0					1.0	2.0	1.2	1.0
KAS02	MA26	0-113	60	2122.95	7266.47	-52.11	999.7	600	2.0	1.2	2.2	1.6	1.0					1.35	2.35	1.75	1.0
KAS02	MA25	114-308	197	2118.14	7276.85	-188.63	999.6	1150		0.0	1.5	0.8	1.5					1.01	2.52	1.82	1.5
KAS02	MA24	309-345	318	2114.63	7286.27	-309.21	999.6	1500		-0.3	1.2	0.0	1.5					1.86	3.38	2.17	1.5
KAS02	MA23	346-799	547	2109.82	7304.36	-537.44	999.3	1500		-0.5	0.2	-0.2	0.7					3.26	3.97	3.57	0.7
KAS02	MA22	800-854	835	2111.33	7327.92	-824.45	999.2	2250		-2.3	-1.9	-2.1	0.4					6.35	6.75	6.55	0.4
KAS02	MA21	855-924	884	2112.27	7332.13	-873.26	999	2500		-3.7	-3.0	-3.2	0.7					6.46	7.17	6.97	0.7
KAS03	MA36	0-106	60	1802.05	7764.45	-50.80	999.7	336	3.5	2.3	4.5	3.2	2.2					2.38	4.59	3.28	2.2
KAS03	MA35	107-252	220	1794.73	7781.91	-209.68	999.6	356		1.0	1.7	1.2	0.7					1.35	2.05	1.55	0.7
KAS03	MA34	253-376	357	1789.54	7798.15	-345.61	999.5	1360		-0.3	0.7	0.2	1.0					1.89	2.90	2.40	1.0
KAS03	MA33	377-532	527	1782.91	7818.39	-514.26	999.3	1422		-0.6	0.2	-0.3	0.8					2.81	3.62	3.12	0.8
KAS03	MA32	533-626	618	1778.84	7829.93	-604.44	999.3	1040		-0.2	2.6	0.5	2.8					2.74	5.55	3.44	2.8
KAS03	MA31	627-1002	691	1776.03	7839.54	-676.75	999.2	1778		-2.0	-1.4	-1.7	0.6					3.61	4.21	3.91	0.6
KAS04	MA46	0-185	176	2005.38	7561.18	-139.16	999.7	84	2.5	1.5	2.6	2.0	1.1					1.56	2.66	2.06	1.1
KAS04	MA45	186-214	188	2008.55	7555.68	-149.35	999.7	155		1.2	2.2	1.8	1.0					1.31	2.31	1.91	1.0
KAS04	MA44	215-287	231	2020.34	7535.97	-185.70	999.6	192		1.2	2.2	1.8	1.0					1.37	2.37	1.97	1.0
KAS04	MA43	288-331	290	2035.62	7507.96	-235.32	999.6	395		0.9	1.7	1.4	0.8					1.34	2.14	1.84	0.8
KAS04	MA42	332-392	339	2048.50	7484.09	-276.13	999.6	840		0.5	1.2	0.8	0.7					1.59	2.29	1.89	0.7
KAS04	MA41	393-481	416	2068.60	7446.36	-340.16	999.5	1470		-0.3	0.3	0.0	0.6					2.03	2.64	2.34	0.6
KAS05	MA55	0-171	90	2062.28	7239.75	-81.32	999.7	120	2.0	1.1	2.1	1.5	1.0					1.15	2.15	1.55	1.0
KAS05	MA54	172-319	283	2067.86	7220.74	-263.35	999.6	190		1.0	1.8	1.3	0.8					1.23	2.04	1.53	0.8
KAS05	MA53	320-380	322	2069.49	7216.68	-312.06	999.6	980		-0.3	0.3	0.0	0.6					1.13	1.73	1.43	0.6
KAS05	MA52	381-439	437	2073.53	7204.41	-426.33	999.5	1240		0.3	1.0	0.5	0.7					2.77	3.48	2.97	0.7
KAS05	MA51	440-549	467	2074.60	7201.05	-456.12	999.5	1420		-1.2	-0.5	-0.8	0.7					1.82	2.52	2.22	0.7
KAS06	MA66	0-190	100	2182.89	7118.58	-81.01	999.7	500	0.8	0.3	1.0	0.6	0.7					0.49	1.19	0.79	0.7
KAS06	MA65	191-249	216	2192.22	7178.91	-179.64	999.6	780		0.0	0.7	0.4	0.7					0.65	1.36	1.06	0.7
KAS06	MA64	250-330	312	2202.50	7229.10	-260.81	999.6	1640		-0.5	0.3	-0.1	0.8					1.49	2.30	1.90	0.8
KAS06	MA63	331-390	353	2207.79	7250.89	-295.13	999.6	1580		-0.5	0.3	-0.1	0.8					1.67	2.48	2.08	0.8
KAS06	MA62	391-430	399	2213.88	7275.74	-333.36	999.5	1600		-0.7	0.3	-0.1	1.0					1.79	2.79	2.39	1.0
KAS06	MA61	431-500	448	2220.74	7302.44	-373.87	999.5	1720		-1.0	0.0	-0.3	1.0					2.00	3.00	2.70	1.0
KAS06		501-602	558	2235.79	7363.55	-464.08															
KAS07	MA76	0-109	60	2197.31	7204.63	-47.30	999.7	630	1.2	0.2	1.3	1.0	1.1					0.34	1.44	1.14	1.1
KAS07	MA75	110-190	126	2176.55	7177.78	-103.91	999.7	600		0.4	1.7	1.1	1.3					0.69	2.00	1.39	1.3
KAS07	MA74	191-290	245	2139.86	7127.90	-205.51	999.6	1050		-0.2	0.5	0.2	0.7					0.81	1.51	1.21	0.7
KAS07	MA73	291-410	350	2107.80	7082.53	-294.60	999.6	800		0.4	1.2	0.8	0.8					1.50	2.31	1.90	0.8
KAS07	MA72	411-500	431	2082.78	7046.98	-362.94	999.5	1550		0.1	0.9	0.5	0.8					2.73	3.54	3.13	0.8
KAS07	MA71	501-604	552	2046.90	6992.62	-469.93	999.5	1500		-0.5	0.2	-0.2	0.7					2.79	3.49	3.09	0.7
KAS08	MA84	0-139	70	2171.74	7421.71	-52.22	999.7	1110	1.0	0.6	1.2	0.8	0.6					0.87	1.48	1.07	0.6
KAS08	MA83	140-200	184	2206.23	7369.01	-147.18	999.7	1040		0.0	1.0	0.5	1.0					0.72	1.72	1.22	1.0
KAS08	MA82	201-502	392	2268.04	7261.89	-314.38	999.6	1424		-0.3	0.5	0.1	0.8					1.79	2.59	2.19	0.8
KAS08	MA81	503-601	570	2317.92	7164.78	-454.95	999.5	1622		-0.9	0.0	-0.5	0.9					2.54	3.45	2.94	0.9

Bore-hole	HMS code	Section	Point of appli-cation	X	Y	MASL	d0	El. cond. 90/91	Ave-rage Oct '89 - Jan '90	Min '90	Max '90	Ave-rage '90	dh '90	Min '91	Max '91	Ave-rage '91	dh '91	Undisturbed freshwater head Min	Max	Ave-rage	dh
		(m)	(m)	(m)	(m)	(m)	(kg/m3)	(mS/m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
KAS09	MA95	0-115	105.86	2091.09	6871.77	-87.53	999.7	1600								-0.2				0.45	
KAS09	MA94	116-150	140.21	2090.72	6854.08	-116.97	999.7	1600								-0.4				0.47	
KAS09	MA93	151-240	180.61	2090.49	6833.09	-151.49	999.7	1600								-0.4				0.73	
KAS09	MA92	241-260	248.19	2090.71	6798.12	-209.32	999.6	1600								-0.4				1.16	
KAS09	MA91	261-450	412.72	2093.77	6713.08	-350.13	999.5	1600								-0.4				2.21	
KAS10	MA101	0-99	50	2133.00	6943.95	-50.00	999.7							-0.75	0.0	-0.5	0.8				
KAS11	MA116	0-46	44.39	2091.10	6937.58	-40.39	999.7	1555						-0.4	0.5	-0.2	0.9	-0.11	0.80	0.09	0.9
KAS11	MA115	47-64	53.63	2091.15	6937.64	-49.63	999.7	1545						-0.6	0.3	-0.3	0.9	-0.25	0.66	0.06	0.9
KAS11	MA114	65-115	91.86	2091.43	6937.98	-87.86	999.7	1555						-0.6	0.3	-0.3	0.9	0.03	0.94	0.34	0.9
KAS11	MA113	116-152	137.59	2091.95	6938.57	-133.59	999.7	1555						-0.6	0.3	-0.3	0.9	0.37	1.27	0.67	0.9
KAS11	MA112	153-183	165.99	2092.34	6938.99	-161.99	999.7	1571						-0.6	0.3	-0.3	0.9	0.58	1.49	0.89	0.9
KAS11	MA111	184-249	218	2092.98	6939.63	-213.97	999.6	1586						-0.6	0.3	-0.3	0.9	0.98	1.89	1.28	0.9
KAS12	MA125	0-102	100	2167.54	7534.30	-88.49	999.7	130						1.6	2.0	1.8	0.4	1.65	2.05	1.85	0.4
KAS12	MA124	103-234	129.50	2170.46	7523.62	-115.83	999.7	113						2.4	2.6	2.5	0.2	2.46	2.66	2.56	0.2
KAS12	MA123	235-278	251.72	2184.24	7477.84	-228.31	999.6	186						0.0	0.4	0.2	0.4	0.20	0.60	0.40	0.4
KAS12	MA122	279-330	307.60	2190.93	7456.38	-279.46	999.6	134						-0.2	0.0	-0.1	0.2	-0.03	0.17	0.07	0.2
KAS12	MA121	331-380	375	2200.00	7430.00	-345.00	999.5	1200						1.6	2.0	1.8	0.4	3.54	3.95	3.74	0.4
KAS13	MA135	0-150	100.68	2122.01	7270.23	-85.20	999.7	332						1.6	1.9	1.8	0.3	1.73	2.04	1.93	0.3
KAS13	MA134	151-190	166.21	2091.18	7275.62	-142.76	999.7	383						1.6	1.9	1.8	0.3	1.86	2.16	2.06	0.3
KAS13	MA133	191-220	210.84	2069.90	7279.79	-181.75	999.7	885						1.1	1.5	1.3	0.4	1.86	2.26	2.06	0.4
KAS13	MA132	221-330	280.59	2036.80	7288.20	-242.57	999.6	1230						0.4	0.6	0.5	0.2	1.80	2.00	1.90	0.2
KAS13	MA131	331-407	384	1986.00	7299.00	-332.00	999.5	1510						0.2	0.4	0.3	0.2	2.54	2.75	2.64	0.2
KAS14	MA145	0-130	91.63	2162.97	6908.83	-75.25	999.7	1550						0.1	0.8	0.4	0.7	0.65	1.30	0.95	0.7
KAS14	MA144	131-138	133.36	2174.61	6890.54	-110.91	999.7	1640						-0.1	0.5	0.1	0.6	0.75	1.35	0.95	0.6
KAS14	MA143	139-146	143.53	2177.46	6886.07	-119.58	999.7	1640						-0.1	0.5	0.1	0.6	0.82	1.42	1.02	0.6
KAS14	MA142	147-175	158.56	2181.73	6879.51	-132.42	999.7	1640						-0.1	0.5	0.1	0.6	0.91	1.52	1.12	0.6
KAS14	MA141	176-212	186.98	2190.06	6867.27	-156.67	999.7	1640						-0.1	0.5	0.1	0.6	1.10	1.70	1.30	0.6
KAS16	MA164	0-120	105.48	2259.11	7162.29	-101.01	999.7														
KAS16	MA163	121-389	229.74	2272.64	7146.18	-223.45	999.6														
KAS16	MA162	390-465	421.80	2294.55	7107.84	-410.31	999.5														
KAS16	MA161	466-543	498.05	2302.38	7088.34	-483.61	999.5														

Bore-hole	HMS code	Section	Point of appli-cation	X	Y	MASL	d0	El. cond. 90/91	Ave-rage Oct '89 - Jan '90	Min '90	Max '90	Ave-rage '90	dh '90	Min '91	Max '91	Ave-rage '91	dh '91	Undisturbed freshwater head Min	Max	Ave-rage	dh
		(m)	(m)	(m)	(m)	(m)	(kg/m3)	(mS/m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
HAS01	MA17	0-100	50	2044.40	7579.07	-37.98	999.7		3.0	2.0	3.3	2.5	1.3					2.0	3.3	2.5	1.3
HAS02	MA28	0-72	50	1362.13	7750.23	-39.62	999.7		0.5	-0.1	0.7	0.2	0.8					-0.1	0.7	0.2	0.8
HAS02	MA27	73-93	80	1357.68	7737.26	-66.29	999.7		0.2	-0.4	0.3	0.0	0.7					-0.4	0.3	0.0	0.7
HAS03	MA38	0-50	5	1781.71	7427.70	-2.41	999.7		0.2	-0.1	0.4	0.2	0.5					-0.1	0.4	0.2	0.5
HAS03	MA37	51-100	80	1820.58	7418.16	-65.75	999.7		0.1	-0.2	0.2	0.1	0.4					-0.2	0.2	0.1	0.4
HAS04	MA48	0-100	50	2033.60	7183.24	-37.74	999.7		1.0	0.5	1.3	0.9	0.8					0.5	1.3	0.9	0.8
HAS04	MA47	101-201	150	1993.57	7181.84	-129.27	999.7		1.0	0.4	1.1	0.8	0.7					0.4	1.1	0.8	0.7
HAS05	MA227	0-15	10	2139.73	7336.20	-2.15	999.7		1.8	1.5	3.0	2.2	1.5					1.5	3.0	2.2	1.5
HAS05	MA58	16-40	30	2137.31	7324.79	-18.72	999.7		1.5	1.0	1.8	1.2	0.8					1.0	1.8	1.2	0.8
HAS05	MA57	41-100	60	2129.57	7312.10	-44.78	999.7		1.5	1.0	1.8	1.2	0.8					1.0	1.8	1.2	0.8
HAS06	MA68	0-40	25	2336.66	7420.18	-20.24	999.7		0.8	0.5	1.1	0.7	0.6					0.5	1.1	0.7	0.6
HAS06	MA67	41-100	96	2332.42	7420.12	-91.07	999.7		0.8	0.4	0.8	0.6	0.4					0.4	0.8	0.6	0.4
HAS07	MA78	0-40	20	2329.42	7565.74	-12.43	999.7		0.6	0.2	0.9	0.5	0.7					0.2	0.9	0.5	0.7
HAS07	MA77	41-100	80	2338.78	7584.52	-68.58	999.7		0.5	0.2	0.7	0.4	0.5					0.2	0.7	0.4	0.5
HAS08	MA88	0-65	30	1728.74	7598.61	-19.59	999.7		0.9	0.2	1.3	0.6	1.1					0.2	1.3	0.6	1.1
HAS08	MA87	66-125	110	1720.99	7566.75	-92.49	999.7		1.2	0.5	1.3	0.7	0.8					0.5	1.3	0.7	0.8
HAS09	MA98	0-10	10	1960.78	7766.15	-1.59	999.7		4.0	4.0	4.5	4.2	0.5					4.0	4.5	4.2	0.5
HAS09	MA97	11-125	70	1974.34	7743.74	-55.52	999.7		2.5	2.1	2.6	2.4	0.5					2.1	2.6	2.4	0.5
HAS10	MA108	0-10	10	1710.99	7884.12	-2.77	999.7		3.8	2.8	3.8	3.3	1.0					2.8	3.8	3.3	1.0
HAS10	MA107	11-125	70	1711.60	7910.25	-56.72	999.7		2.8	2.8	2.9	2.8	0.1					2.8	2.9	2.8	0.1
HAS11	MA118	0-30	10	1553.95	7758.29	-4.90	999.7		3.7	3.2	3.9	3.5	0.7					3.2	3.9	3.5	0.7
HAS11	MA117	31-125	80	1550.61	7761.48	-74.72	999.7		2.0	1.2	1.8	1.4	0.6					1.2	1.8	1.4	0.6
HAS12	MA128	0-60	10	1446.42	7693.41	-6.17	999.7		0.4	0.0	0.7	0.4	0.7					0.0	0.7	0.4	0.7
HAS12	MA127	61-125	90	1422.14	7671.03	-78.84	999.7		0.8	0.3	1.0	0.6	0.7					0.3	1.0	0.6	0.7
HAS13	MA138	0-50	8	2110.69	7033.88	-2.72	999.7		0.5	-0.2	0.5	0.1	0.7					-0.2	0.5	0.1	0.7
HAS13	MA137	51-100	100	2143.71	7056.63	-88.06	999.7		0.5	-0.2	0.5	-0.1	0.7					-0.2	0.5	-0.1	0.7
HAS14	MA148	0-50	30	2231.63	7114.45	-28.82	999.7		0.5	-0.5	0.7	0.4	1.2					-0.5	0.7	0.4	1.2
HAS14	MA147	51-100	80	2229.88	7114.03	-78.79	999.7		0.6	0.0	0.8	0.3	0.8					0.0	0.8	0.3	0.8
HAS15	MA158	0-40	9	2251.62	7220.72	-3.60	999.7		0.3	-0.1	0.5	0.1	0.6					-0.1	0.5	0.1	0.6
HAS15	MA157	41-120	80	2276.43	7195.03	-65.09	999.7		0.5	0.3	0.7	0.5	0.4					0.3	0.7	0.5	0.4

Bore-hole	HMS code	Section	Point of appli-cation	X	Y	MASL	d0	El. cond. 90/91	Ave-rage Oct '89 - Jan '90	Min '90	Max '90	Ave-rage '90	dh '90	Min '91	Max '91	Ave-rage '91	dh '91	Undisturbed freshwater head Min	Max	Ave-rage	dh
		(m)	(m)	(m)	(m)	(m)	(kg/m3)	(mS/m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
HAS16	MA168	0-40	29	2178.85	7431.64	-20.75	999.7		1.7	1.0	1.9	1.2	0.9					1.0	1.9	1.2	0.9
HAS16	MA167	41-120	103	2181.46	7468.55	-84.84	999.7		2.0	1.2	2.2	1.4	1.0					1.2	2.2	1.4	1.0
HAS17	MA178	0-40	20	2054.47	7498.73	-9.43	999.7		2.8	2.0	3.0	2.3	1.0					2.0	3.0	2.3	1.0
HAS17	MA177	41-120	100	2094.46	7499.41	-78.71	999.7		2.2	1.5	2.6	1.8	1.1					1.5	2.6	1.8	1.1
HAS18	MA188	0-35	35	2194.01	7657.24	-23.67	999.7							1.2	2.2	1.8	1.0	1.2	2.2	1.8	1.0
HAS18	MA187	36-150	75	2205.80	7644.77	-59.80	999.7							0.5	1.3	1.0	0.8	0.5	1.3	1.0	0.8
HAS19	MA198	0-60	35	1873.11	7588.91	-20.94	999.7							6.7	9.0	7.5	2.3	6.7	9.0	7.5	2.3
HAS19	MA197	61-150	75	1859.46	7574.96	-64.62	999.7							0.7	1.5	1.2	0.8	0.7	1.5	1.2	0.8
HAS20	MA208	0-58	35	1904.44	7515.17	-23.99	999.7							-0.3	0.5	0.2	0.8	-0.3	0.5	0.2	0.8
HAS20	MA207	59-150	75	1918.06	7498.46	-57.68	999.7							-0.3	0.5	0.2	0.8	-0.3	0.5	0.2	0.8
HAS21	MA10	0-40	20	2444.31	7184.56	-15.09	999.7									-1.4				-1.4	
HAS21	MA9	41-148	100.45	2465.55	7150.39	-84.76	999.7									-1.6				-1.6	
HÅLÖ																					
KBH01		0-96	40	2165.81	6339.28	-22.77	999.7		-0.05											-0.05	
KBH02	MA6	0-105	70	2160.42	6365.66	-41.06	999.7	338						-0.4	0.4	-0.3	0.8	-0.34	0.47	-0.24	0.8
KBH02	MA5	106-150	130	2150.71	6416.67	-70.62	999.7	1530						-0.4	0.2	-0.5	0.6	0.10	0.71	0.00	0.6
KBH02	MA4	151-260	200	2139.94	6482.45	-91.99	999.7	1200						-0.4	0.1	-0.5	0.5	0.11	0.62	0.01	0.5
KBH02	MA3	261-410	330	2123.48	6607.52	-123.10	999.7	1370						-0.4	0.0	-0.5	0.4	0.39	0.79	0.28	0.4
KBH02	MA2	411-460	470	2099.50	6739.80	-158.40	999.7	1420						-0.4	-0.1	-0.5	0.3	0.65	0.95	0.55	0.3
KBH02	MA1	461-706	680	2066.70	6942.10	-204.20	999.6	1420						-0.4	-0.1	-0.5	0.3	0.95	1.25	0.85	0.3
KBH02 T	MB73	3-139	70	2117.65	6676.30	-141.34	999.7														
KBH02 T	MB72	140-239	190	2100.48	6792.04	-168.54	999.6														
KBH02 T	MB71	240-366	361	2077.15	6951.18	-202.52	999.6														
HBH01	MH103	0-30	15	2168.46	6171.47	-8.16	999.7									1.7				1.7	
HBH01	MH102	31-51	40	2166.15	6183.15	-30.14	999.7									-0.5				-0.5	
HBH02	MH105	0-20	10	2163.72	6180.30	-2.70	999.7									1.9				1.9	
HBH02	MH104	21-32	26	6160.82	6190.42	-14.75	999.7									1.7				1.7	
HBH03	MH19	0-54	27	2171.14	6332.27	-17.28	999.7									-0.3				-0.3	
HBH03	MA7	55-100	77	2168.16	6355.64	-61.38	999.7									-0.5				-0.5	
HBH04	MH210	0-30	15	2133.90	6358.71	-7.45	999.7									-0.3				-0.3	
HBH04	MA8	31-90	57	2131.97	6380.09	-43.53	999.7									-0.3				-0.3	
HBH05	MH206	0-10	5	2146.03	6177.47	-0.56	999.7														
HBH05	MH205	11-22	13	2144.66	6182.96	-6.22	999.7														

Bore-hole	HMS code	Section	Point of appli-cation	X	Y	MASL	d0	El. cond. 90/91	Ave-rage Oct '89 - Jan '90	Min '90	Max '90	Ave-rage '90	dh '90	Min '91	Max '91	Ave-rage '91	dh '91	Undisturbed freshwater head Min	Max	Ave-rage	dh
		(m)	(m)	(m)	(m)	(m)	(kg/m3)	(mS/m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
ÄVRÖ																					
KAV01	MH156	0-100	50	3645.44	6394.62	-36.19	999.7			7.5	9.5	8.8	2.0					7.5	9.5	8.8	2.0
KAV01	MH155	101-360	230	3644.33	6392.91	-216.17	999.6			6.4	7.6	7.1	1.2					6.4	7.6	7.1	1.2
KAV01	MH154	361-600	480	3647.15	6385.81	-466.03	999.5	1400		2.5	3.1	2.8	0.6					5.6	6.2	5.9	0.6
KAV01	MH153	601-744	662	3651.84	6376.88	-647.75	999.3	1400		3.8	4.5	4.2	0.7					8.1	8.8	8.5	0.7
KAV02	MH30	0-97	48	3621.00	5983.00	-40.46	999.7			2.5	3.4	3.0	0.9					2.5	3.4	3.0	0.9
HAV01	MH40	0-175	57	3795.29	6127.58	-47.57	999.7			1.5	2.1	1.8	0.6					1.5	2.1	1.8	0.6
HAV02	MH213	0-94	47	3422.56	6767.42	-40.91	999.7			1.0	1.7	1.5	0.7					1.0	1.7	1.5	0.7
HAV02	MH214	95-163	129	3424.03	6765.61	-122.87	999.7			1.5	2.8	2.2	1.3					1.5	2.8	2.2	1.3
HAV03	MH56	0-134	67	4028.55	6619.35	-58.29	999.7			0.2	1.1	0.7	0.9					0.2	1.1	0.7	0.9
HAV04	MH216	0-32	16	3449.24	6590.07	-6.36	999.7			4.3	4.8	4.6	0.5					4.3	4.8	4.6	0.5
HAV04	MH217	33-100	50	3450.46	6753.84	-36.21	999.7			4.2	5.0	4.6	0.8					4.2	5.0	4.6	0.8
HAV05	MH219	0-50	25	3245.86	6692.95	-13.60	999.7			3.1	4.2	3.8	1.1					3.1	4.2	3.8	1.1
HAV05	MH220	51-100	75	3239.37	6666.98	-55.82	999.7			3.0	4.0	3.6	1.0					3.0	4.0	3.6	1.0
HAV06	MH50	0-100	50	3151.54	6227.99	-31.13	999.7			4.8	5.8	5.3	1.0					4.8	5.8	5.3	1.0
HAV07	MH60	0-100	83	2838.54	6554.33	-69.54	999.7			0.5	1.2	0.8	0.7					0.5	1.2	0.8	0.7
HAV08	MH59	0-63	63	2778.90	6556.74	-48.98	999.7			0.4	1.3	1.0	0.9					0.4	1.3	1.0	0.9
MJÄLEN																					
HMJ01	MH100	0-33	16	2758.91	6802.46	-12.17	999.7														
HMJ01	MH98	34-46	35.98	2749.20	6793.18	-30.56	999.7									-2.7				-2.7	

Bore-hole	HMS code	Section	Point of appli-cation	X	Y	MASL	d0	El. cond. 90/91	Ave-rage Oct '89 - Jan '90	Min '90	Max '90	Ave-rage '90	dh '90	Min '91	Max '91	Ave-rage '91	dh '91	Undisturbed freshwater head Min	Max	Ave-rage	dh
		(m)	(m)	(m)	(m)	(m)	(kg/m3)	(mS/m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
LAXEMAR																					
KLX01		0-140	70	595.74	7270.80	-52.98	999.7	66				11.5				13.0				13.02	
KLX01		141-271	180	595.18	7278.30	-162.72	999.6	66				7.3				12.8				12.85	
KLX01		272-694	460	594.42	7295.38	-442.19	999.5	70				6.8				-					
KLX01		695-855	738	594.73	7310.79	-719.76	999.2	61								7.0				7.21	
KLX01		856-1078	933	593.91	7323.76	-914.33	999.0	1860								1.0				8.96	
HLX01	MH8	0-55	27	221.66	7195.86	-15.00	999.7							6.9	7.3	7.1	0.4	6.9	7.3	7.1	0.4
HLX01	MH7	56-100	78	219.10	7169.91	-59.98	999.7							6.9	7.3	7.1	0.4	6.9	7.3	7.1	0.4
HLX02	MH222	0-15	8	737.09	7860.91	1.78	999.7			4.5	5.2	4.9	0.7					4.5	5.2	4.9	0.7
HLX02	MH221	16-132	72	727.30	7890.03	-54.31	999.7			2.0	2.8	2.4	0.8					2.0	2.8	2.4	0.8
HLX03	MH225	0-10	5	662.11	7590.82	5.98	999.7			7.4	9.2	8.5	1.8					7.4	9.2	8.5	1.8
HLX03	MH224	11-100	55	656.56	7571.31	-39.70	999.7			6.7	7.8	7.2	1.1					6.7	7.8	7.2	1.1
HLX04	MH228	0-10	5	508.81	7482.86	5.87	999.7			8.0	8.2	8.1	0.2					8.0	8.2	8.1	0.2
HLX04	MH227	11-125	68	492.50	7497.48	-53.16	999.7			6.9	7.8	7.4	0.9					6.9	7.8	7.4	0.9
HLX05	MH231	0-10	5	654.96	7324.14	11.20	999.7			13.1	14.1	13.6	1.0					13.1	14.1	13.6	1.0
HLX05	MH230	11-100	55	652.37	7301.20	-33.11	999.7			12.6	13.4	12.9	0.8					12.6	13.4	12.9	0.8
HLX06	MH234	0-44	22	392.21	6969.83	-3.24	999.7			8.2	9.9	9.3	1.7					8.2	9.9	9.3	1.7
HLX06	MH233	45-100	70	385.02	6945.94	-44.24	999.7			7.4	8.8	8.2	1.4					7.4	8.8	8.2	1.4
HLX07	MH13	0-15	8	620.24	6922.61	1.66	999.7			5.8	6.8	6.3	1.0					5.8	6.8	6.3	1.0
HLX07	MH12	16-100	58	640.29	6933.10	-42.90	999.7			5.6	6.5	6.1	0.9					5.6	6.5	6.1	0.9
HLX08	MH161	0-10	5	1064.71	6248.55	-1.36	999.7							-0.4	0.6	0.0	1.0	-0.4	0.6	0.0	1.0
HLX08	MH159	11-40	22.08	1070.84	6237.74	-14.19	999.7							-0.5	0.5	0.0	1.0	-0.5	0.5	0.0	1.0
HLX09	MH164	0-50	25	1409.89	6822.50	-18.61	999.7							-0.5	1.2	0.2	1.7	-0.5	1.2	0.2	1.7
HLX09	MH162	51-151	124.09	1395.40	6773.87	-104.87	999.7							-1.0	0.5	-0.2	1.5	-1.0	0.5	-0.2	1.5

ELECTRICAL CONDUCTIVITY AND SALINITY

Borehole : KAS01
Section (m) : 0-101
HMS code : MA11
Conductor (m) : 60

No electrical conductivity measurements available

Borehole :	KAS02	KAS02	KAS02	KAS02	KAS02	KAS02	KAS02	KAS02	KAS02	KAS02	KAS02	KAS02
Section (m) :	855-924	800-854	346-799	309-345	114-308	0-113	855-924	800-854	346-799	309-345	114-308	0-113
HMS code :	MA21	MA22	MA23	MA24	MA25	MA26	MA21	MA22	MA23	MA24	MA25	MA26
Conductor (m) :	884	835	547	318	197	60	884	835	547	318	197	60
	Electric conductivity						Calculated salinity					
DATE (YY-MM-DD)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)
1989-09-21	2500	2250	1550	1500	1150	600	15.76	14.18	9.77	9.45	7.25	3.78
1989-11-12	2500	2250	1500	1500	1150	600	15.76	14.18	9.45	9.45	7.25	3.78
1990-06-13		2310		1490				14.56		9.39		
1990-09-13	2730	2100	1160	1100	907	660	17.21	13.23	7.31	6.93	5.72	4.16
1990-10-27		2030						12.79				
1990-11-10				1170						7.37		
1991-01-21				1180						7.44		
1991-01-22		2070						13.05				
1991-09-02	2650	2450	1405	1200	825	760	16.70	15.44	8.85	7.56	5.20	4.79
1992-02-08		3060		1490				19.29		9.39		
1992-08-19		2690		910				16.95		5.74		
1992-09-22		2650		960				16.70		6.05		
1993-03-21				2940						18.53		
1993-03-24				2860						18.02		
1993-09-07		2050						12.92				
1994-04-07				79						0.50		

Borehole :	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03	KAS03
Section (m) :	627-1002	533-626	377-532	253-376	107-252	0-106	627-1002	533-626	377-532	253-376	107-252	0-106
HMS code :	MA31	MA32	MA33	MA34	MA35	MA36	MA31	MA32	MA33	MA34	MA35	MA36
Conductor (m) :	691	618	527	357	220	60	691	618	527	357	220	60
	Electric conductivity						Calculated salinity					
DATE (YY-MM-DD)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)
1989-05-28	1778	1040	1422	1360	356	336	11.21	6.55	8.96	8.57	2.24	2.12
1990-07-26		1102						6.95				
1990-07-30					497						3.13	
1992-08-19		924						5.82				
1992-12-02		930						5.86				
1993-02-07		1130						7.12				
1993-05-15		1060						6.68				
1993-08-16		1300						8.19				
1993-09-07		1170						7.37				
1994-04-12		1320						8.32				
1994-04-24		820			670			5.17			4.22	

Borehole :	KAS04	KAS04	KAS04	KAS04	KAS04	KAS04	KAS04	KAS04	KAS04	KAS04	KAS04	KAS04
Section (m) :	393-481	332-392	288-331	215-287	186-214	0-185	393-481	332-392	288-331	215-287	186-214	0-185
HMS code :	MA41	MA42	MA43	MA44	MA45	MA46	MA41	MA42	MA43	MA44	MA45	MA46
Conductor (m) :	416	339	290	231	188	176	416	339	290	231	188	176
	Electric conductivity						Calculated salinity					
DATE (YY-MM-DD)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)
1989-06-30	1470	840	395	192	155	84	9.26	5.29	2.49	1.21	0.98	0.53
1991-08-16	455	890	205	200	162	184	2.87	5.61	1.29	1.26	1.02	1.16
1992-02-08		1110						7.00				
1992-02-16	105	880	65	150	140	58	0.66	5.55	0.41	0.95	0.88	0.37
1992-08-31		780						4.92				
1992-09-22		950						5.99				
1993-03-18		920						5.80				
1993-05-18		865						5.45				

Borehole :	KAS05	KAS05	KAS05	KAS05	KAS05	KAS05	KAS05	KAS05	KAS05	KAS05
Section (m) :	440-549	381-439	320-380	172-319	0-171	440-549	381-439	320-380	172-319	0-171
HMS code :	MA51	MA52	MA53	MA54	MA55	MA51	MA52	MA53	MA54	MA55
Conductor (m) :	467	437	322	283	90	467	437	322	283	90
	Electric conductivity					Calculated salinity				
DATE (YY-MM-DD)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)
1989-05-28	1420	1240	980	190	120	8.95	7.81	6.18	1.20	0.76
1990-06-13	1930		1530			12.16		9.64		
1990-09-28	1530					9.64				
1991-12-04	1920	730	480	465	184	12.10	4.60	3.03	2.93	1.16
1992-09-01	1940		1230			12.23		7.75		
1994-04-05			450							
1994-04-12	2225					14.02				
1994-04-25	2150					13.55				
1994-05-02			1380					8.70		

Borehole :	KAS06	KAS06	KAS06	KAS06	KAS06	KAS06	KAS06	KAS06	KAS06	KAS06	KAS06	KAS06
Section (m) :	431-500	391-430	331-390	250-330	191-249	0-190	431-500	391-430	331-390	250-330	191-249	0-190
HMS code :	MA61	MA62	MA63	MA64	MA65	MA66	MA61	MA62	MA63	MA64	MA65	MA66
Conductor (m) :	448	399	353	312	216	100	448	399	353	312	216	100
	Electric conductivity						Calculated salinity					
DATE (YY-MM-DD)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)
1989-08-06	1720	1600	1580	1640	780	500	10.84	10.08	9.96	10.34	4.92	3.15
1990-06-13	1690				1430		10.65				9.01	
1991-08-05	1164	1205	1510	950	945	820	7.34	7.59	9.52	5.99	5.96	5.17
1992-02-08	1550				1100		9.77				6.93	
1992-08-19	1580				724		9.96				4.56	
1992-09-22	1630				830		10.27				5.23	
1993-03-24	1675						10.56					
1993-06-19		1530	500			510		9.64	3.15			3.21
1993-07-07				810						5.10		

Borehole :	KAS07	KAS07	KAS07	KAS07	KAS07	KAS07	KAS07	KAS07	KAS07	KAS07	KAS07	KAS07
Section (m) :	501-604	411-500	291-410	191-290	110-190	0-109	501-604	411-500	291-410	191-290	110-190	0-109
HMS code :	MA71	MA72	MA73	MA74	MA75	MA76	MA71	MA72	MA73	MA74	MA75	MA76
Conductor (m) :	552	431	350	245	126	60	552	431	350	245	126	60
	Electric conductivity						Calculated salinity					
DATE (YY-MM-DD)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)
1989-11-12	1340	1600	1040	1060	860	720	8.45	10.08	6.55	6.68	5.42	4.54
1990-01-16	1500	1550	800	1050	600	630	9.45	9.77	5.04	6.62	3.78	3.97
1990-06-13	1690			1460			10.65			9.20		
1990-11-21				1200						7.56		
1991-08-08	1530	1470	1170	475	240	196	9.64	9.26	7.37	2.99	1.51	1.24
1992-08-31	1600			696			10.08			4.39		
1993-09-06	1500			1020			9.45			6.43		
1994-04-06				1100						6.93		
1994-04-12	1690						10.65					
1994-04-27	1660						10.46					
1994-09-06	1540						9.71					

Borehole :	KAS08	KAS08	KAS08	KAS08	KAS08	KAS08	KAS08	KAS08
Section (m) :	503-601	201-502	140-200	0-139	503-601	201-502	140-200	0-139
HMS code :	MA81	MA82	MA83	MA84	MA81	MA82	MA83	MA84
Conductor (m) :	570	392	184	70	570	392	184	70
	Electric conductivity				Calculated salinity			
DATE (YY-MM-DD)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)
1989-05-28	1622	1424	1040	1110	10.22	8.97	6.55	7.00
1990-06-13	1770		1000		11.16		6.30	
1990-10-20			434				2.74	
1992-08-31	1650		300		10.40		1.89	
1993-03-22			1360				8.57	
1994-04-05			1140				7.18	
1994-04-06	1770				11.16			
1994-05-05	1760				11.09			

Borehole :	KAS09	KAS09	KAS09	KAS09	KAS09	KAS09	KAS09	KAS09	KAS09	KAS09
Section (m) :	261-450	241-260	151-240	116-150	0-115	261-450	241-260	151-240	116-150	0-115
HMS code :	MA91	MA92	MA93	MA94	MA95	MA91	MA92	MA93	MA94	MA95
Conductor (m) :	412.72	248.19	180.61	140.21	105.86	412.72	248.19	180.61	140.21	105.86
	Electric conductivity					Calculated salinity				
DATE (YY-MM-DD)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)
1990-04-07	1600	1600	1600	1600	1600	10.08	10.08	10.08	10.08	10.08
1990-06-13				1620					10.21	
1992-02-16				1400					8.82	
1992-09-01				1090					6.87	
1993-05-19				1070					6.74	
1993-09-06				980					6.18	
1994-04-06				970					6.11	
1994-09-06				890					5.61	
1995-10-12				865					5.45	

Borehole :	KAS10
Section (m) :	0-99
HMS code :	MA101
Conductor (m) :	50

No electrical conductivity measurements available

Borehole :	KAS11	KAS11	KAS11	KAS11	KAS11	KAS11	KAS11	KAS11	KAS11	KAS11	KAS11	KAS11
Section (m) :	184-249	153-183	116-152	65-115	47-64	0-46	184-249	153-183	116-152	65-115	47-64	0-46
HMS code :	MA111	MA112	MA113	MA114	MA115	MA116	MA111	MA112	MA113	MA114	MA115	MA116
Conductor (m) :	218	165.99	137.59	91.86	53.63	44.39	218	165.99	137.59	91.86	53.63	44.39
	Electric conductivity						Calculated salinity					
DATE (YY-MM-DD)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)
1990-05-17	1586	1571	1555	1555	1545	1555	10.00	9.90	9.80	9.80	9.74	9.80
1992-06-13		1000	1010	970	840	770		6.30	6.37	6.11	5.29	4.85

Borehole :	KAS12	KAS12	KAS12	KAS12	KAS12	KAS12	KAS12	KAS12	KAS12	KAS12
Section (m) :	331-380	279-330	235-278	103-234	0-102	331-380	279-330	235-278	103-234	0-102
HMS code :	MA121	MA122	MA123	MA124	MA125	MA121	MA122	MA123	MA124	MA125
Conductor (m) :	375	307.6	251.72	129.5	100	375	307.6	251.72	129.5	100
	Electric conductivity					Calculated salinity				
DATE (YY-MM-DD)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)
1990-06-13		1470					9.26			
1990-08-19	834	525	443	227	180	5.26	3.31	2.79	1.43	1.13
1990-08-28	629	1560	711	120	142	3.96	9.83	4.48	0.76	0.89
1990-09-28		1280					8.07			
1990-11-10		1300					8.19			
1991-08-17	1205	134	186	113	130	7.59	0.84	1.17	0.71	0.82
1992-09-01		1120					7.06			
1993-05-19			1180					7.44		
1993-09-07			1320					8.32		
1994-04-06			720					4.54		

Borehole :	KAS13	KAS13	KAS13	KAS13	KAS13	KAS13	KAS13	KAS13	KAS13	KAS13
Section (m) :	331-407	221-330	191-220	151-190	0-102	331-407	221-330	191-220	151-190	331-407
HMS code :	MA131	MA132	MA133	MA134	MA135	MA131	MA132	MA133	MA134	MA131
Conductor (m) :	384	280.59	210.84	166.21	100.68	384	280.59	210.84	166.21	384
	Electric conductivity					Calculated salinity				
DATE	C	C	C	C	C	SAL	SAL	SAL	SAL	SAL
(YY-MM-DD)	(mS/m)	(mS/m)	(mS/m)	(mS/m)	(mS/m)	(g/l)	(g/l)	(g/l)	(g/l)	(g/l)
1990-08-04	1390	940	547	454	338	8.76	5.92	3.45	2.86	2.13
1990-09-28			740					4.66		
1991-07-23	1510	1230	885	383	392	9.52	7.75	5.58	2.41	2.47
1992-09-01			610	220				3.84	1.39	

Borehole :	KAS14	KAS14	KAS14	KAS14	KAS14	KAS14	KAS14	KAS14	KAS14	KAS14
Section (m) :	176-212	147-175	139-146	131-138	0-130	176-212	147-175	139-146	131-138	0-130
HMS code :	MA141	MA142	MA143	MA144	MA145	MA141	MA142	MA143	MA144	MA145
Conductor (m) :	186.98	158.56	143.53	133.36	91.63	186.98	158.56	143.53	133.36	91.63
	Electric conductivity					Calculated salinity				
DATE	C	C	C	C	C	SAL	SAL	SAL	SAL	SAL
(YY-MM-DD)	(mS/m)	(mS/m)	(mS/m)	(mS/m)	(mS/m)	(g/l)	(g/l)	(g/l)	(g/l)	(g/l)
1990-06-15	1640	1640	1640	1640	1550	10.34	10.34	10.34	10.34	9.77
1990-10-23		1337					8.43			
1992-02-16		1520					9.58			
1994-04-07		1040		1060			6.55		6.68	
1994-05-05		1020		1020			6.43		6.43	

Borehole :	KAS16	KAS16	KAS16	KAS16	KAS16	KAS16	KAS16	KAS16
Section (m) :	466-543	390-465	121-389	0-120	466-543	390-465	121-389	0-120
HMS code :	MH181	MA162	MA163	MA164	MH181	MA162	MA163	MA164
Conductor (m) :	498.05	421.8	229.74	105.48	498.05	421.8	229.74	105.48
	Electric conductivity				Calculated salinity			
DATE (YY-MM-DD)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)
1992-10-20	1450	1350	800	750	9.14	8.51	5.04	4.73

Borehole :	KAV01	KAV01	KAV01	KAV01	KAV01	KAV01	KAV01	KAV01
Section (m) :	601-744	361-600	101-360	0-100	601-744	361-600	101-360	0-100
HMS code :	1	2	3	4	1	2	3	4
Conductor (m) :								
	Electric conductivity				Calculated salinity			
DATE (YY-MM-DD)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)
1994-06-23	32	32	32	32	0.20	0.20	0.20	0.20

Borehole :	KBH02	KBH02	KBH02	KBH02	KBH02	KBH02	KBH02	KBH02	KBH02	KBH02	KBH02	KBH02
Section (m) :	461-706	411-460	261-326(410)	151-260	106-150	0-105	461-706	411-460	261-326(410)	151-260	106-150	0-105
HMS code :	1	2	3	4	5	6	1	2	3	4	5	6
Conductor (m) :												
	Electric conductivity						Calculated salinity					
DATE (YY-MM-DD)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)
1990-10-14	1420	1420	1370	1200	1530	338	8.95	8.95	8.63	7.56	9.64	2.13
1992-05-14			970	1090	870	530			6.11	6.87	5.48	3.34

Borehole :	KLX01	KLX01	KLX01	KLX01	KLX01	KLX01	KLX01	KLX01	KLX01	KLX01
Section (m) :	856-1078	695-855	272-694	141-271	0-140	856-1078	695-855	272-694	141-271	0-140
HMS code :	1	2	3	4	5	1	2	3	4	5
Conductor (m) :										
	Electric conductivity					Calculated salinity				
DATE (YY-MM-DD)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	C (mS/m)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)	SAL (g/l)
1992-03-11	1860	61	70	66	66	11.72	0.38	0.44	0.42	0.42
1993-04-16	1838	349	60	91	50	11.58	2.20	0.38	0.57	0.32

IDCODE	SECLOW	SECUP	START DATE	X-SECLOW	Y-SECLOW	Z-SECLOW	X-SECUP	Y-SECUP	Z-SECUP
HAS01	100	0	1990-07-01	2.032E+03	7.597E+03	-8.238E+01	2.058E+03	7.560E+03	6.380E+00
HAS02	72	0	1990-07-01	1.359E+03	7.741E+03	-5.927E+01	1.371E+03	7.777E+03	2.110E+00
HAS02	93	73	1990-07-01	1.356E+03	7.733E+03	-7.815E+01	1.359E+03	7.741E+03	-6.016E+01
HAS03	50	0	1990-07-01	1.805E+03	7.420E+03	-3.942E+01	1.779E+03	7.428E+03	2.340E+00
HAS03	100	51	1990-07-01	1.828E+03	7.413E+03	-8.308E+01	1.806E+03	7.420E+03	-4.028E+01
HAS04	100	0	1990-07-01	2.012E+03	7.185E+03	-8.269E+01	2.057E+03	7.190E+03	6.260E+00
HAS04	201	101	1990-07-01	1.976E+03	7.186E+03	-1.771E+02	2.012E+03	7.185E+03	-8.361E+01
HAS05	15	0	1990-07-04	2.136E+03	7.336E+03	-6.441E+00	2.140E+03	7.343E+03	6.310E+00
HAS05	100	0	1993-04-02	2.113E+03	7.301E+03	-8.039E+01	2.140E+03	7.343E+03	6.310E+00
HAS05	40	16	1990-07-01	2.129E+03	7.326E+03	-2.801E+01	2.136E+03	7.336E+03	-7.293E+00
HAS05	100	41	1990-07-01	2.113E+03	7.301E+03	-8.039E+01	2.129E+03	7.325E+03	-2.888E+01
HAS06	40	0	1990-07-01	2.336E+03	7.420E+03	-3.522E+01	2.338E+03	7.421E+03	4.730E+00
HAS06	56	0	1996-01-17	2.335E+03	7.420E+03	-5.118E+01	2.338E+03	7.421E+03	4.730E+00
HAS06	100	41	1990-07-01	2.332E+03	7.420E+03	-9.508E+01	2.336E+03	7.420E+03	-3.622E+01
HAS06	100	57	1996-02-07	2.332E+03	7.420E+03	-9.508E+01	2.335E+03	7.420E+03	-5.218E+01
HAS07	40	0	1990-07-01	2.331E+03	7.570E+03	-3.218E+01	2.323E+03	7.555E+03	3.760E+00
HAS07	100	41	1990-07-08	2.340E+03	7.588E+03	-8.897E+01	2.331E+03	7.571E+03	-3.310E+01
HAS08	65	0	1990-07-01	1.725E+03	7.583E+03	-5.047E+01	1.731E+03	7.614E+03	6.620E+00
HAS08	125	66	1990-07-01	1.719E+03	7.561E+03	-1.059E+02	1.725E+03	7.583E+03	-5.138E+01
HAS09	10	0	1990-07-04	1.961E+03	7.766E+03	-7.800E-01	1.958E+03	7.770E+03	7.840E+00
HAS09	17	0	1993-10-30	1.963E+03	7.763E+03	-6.880E+00	1.958E+03	7.770E+03	7.840E+00
HAS09	125	11	1990-07-01	1.985E+03	7.726E+03	-1.057E+02	1.961E+03	7.766E+03	-1.647E+00
HAS09	125	18	1993-10-27	1.985E+03	7.726E+03	-1.057E+02	1.963E+03	7.763E+03	-7.753E+00
HAS10	30	0	1993-10-17	1.711E+03	7.894E+03	-1.995E+01	1.711E+03	7.879E+03	6.310E+00
HAS10	125	31	1993-10-14	1.714E+03	7.929E+03	-1.079E+02	1.711E+03	7.894E+03	-2.085E+01
HAS11	30	0	1990-07-01	1.554E+03	7.759E+03	-2.440E+01	1.554E+03	7.758E+03	5.590E+00
HAS11	125	31	1990-07-01	1.548E+03	7.765E+03	-1.190E+02	1.554E+03	7.759E+03	-2.539E+01
HAS12	60	0	1990-07-01	1.431E+03	7.678E+03	-5.047E+01	1.450E+03	7.697E+03	2.900E+00
HAS12	125	61	1990-07-01	1.411E+03	7.666E+03	-1.113E+02	1.430E+03	7.678E+03	-5.139E+01
HAS13	50	0	1990-07-01	2.127E+03	7.044E+03	-4.201E+01	2.107E+03	7.032E+03	2.050E+00
HAS13	100	51	1990-07-01	2.145E+03	7.056E+03	-8.738E+01	2.128E+03	7.045E+03	-4.291E+01
HAS14	50	0	1990-07-01	2.231E+03	7.114E+03	-4.830E+01	2.232E+03	7.115E+03	1.670E+00
HAS14	100	51	1990-07-01	2.229E+03	7.114E+03	-9.826E+01	2.231E+03	7.114E+03	-4.930E+01
HAS15	40	0	1990-07-04	2.262E+03	7.210E+03	-3.045E+01	2.248E+03	7.224E+03	4.190E+00
HAS15	120	41	1990-07-01	2.290E+03	7.181E+03	-9.973E+01	2.263E+03	7.209E+03	-3.132E+01
HAS16	40	0	1990-07-05	2.180E+03	7.437E+03	-3.028E+01	2.178E+03	7.417E+03	4.360E+00
HAS16	120	41	1990-07-01	2.183E+03	7.477E+03	-9.956E+01	2.180E+03	7.438E+03	-3.115E+01
HAS17	40	0	1990-07-04	2.064E+03	7.499E+03	-2.675E+01	2.044E+03	7.499E+03	7.890E+00
HAS17	80	0	1993-09-30	2.084E+03	7.498E+03	-6.139E+01	2.044E+03	7.499E+03	7.890E+00
HAS17	120	0	1995-01-25	2.104E+03	7.498E+03	-9.603E+01	2.044E+03	7.499E+03	7.890E+00
HAS17	87	0	1996-01-01	2.088E+03	7.498E+03	-6.745E+01	2.044E+03	7.499E+03	7.890E+00
HAS17	120	41	1990-07-01	2.104E+03	7.498E+03	-9.603E+01	2.065E+03	7.499E+03	-2.762E+01
HAS17	120	81	1993-10-01	2.104E+03	7.498E+03	-9.603E+01	2.085E+03	7.498E+03	-6.226E+01
HAS17	120	88	1996-01-01	2.104E+03	7.498E+03	-9.603E+01	2.088E+03	7.498E+03	-6.832E+01

IDCODE	SECLOW	SECUP	START DATE	X-SECLOW	Y-SECLOW	Z-SECLOW	X-SECUP	Y-SECUP	Z-SECUP
HAS18	35	0	1990-07-04	2.194E+03	7.657E+03	-2.367E+01	2.184E+03	7.670E+03	7.460E+00
HAS18	70	0	1993-09-30	2.204E+03	7.646E+03	-5.529E+01	2.184E+03	7.670E+03	7.460E+00
HAS18	150	36	1990-07-04	2.228E+03	7.623E+03	-1.281E+02	2.194E+03	7.657E+03	-2.457E+01
HAS18	150	71	1993-10-01	2.228E+03	7.623E+03	-1.281E+02	2.204E+03	7.646E+03	-5.619E+01
HAS19	60	0	1990-07-05	1.864E+03	7.580E+03	-4.242E+01	1.885E+03	7.603E+03	8.970E+00
HAS19	150	61	1990-07-01	1.831E+03	7.555E+03	-1.220E+02	1.864E+03	7.580E+03	-4.330E+01
HAS20	68	0	1990-12-14	1.915E+03	7.501E+03	-5.182E+01	1.894E+03	7.529E+03	6.240E+00
HAS20	150	69	1990-12-14	1.940E+03	7.464E+03	-1.206E+02	1.915E+03	7.501E+03	-5.266E+01
HAS21	40	0	1991-12-10	2.448E+03	7.176E+03	-3.187E+01	2.439E+03	7.193E+03	3.040E+00
HAS21	148	41	1991-12-11	2.468E+03	7.119E+03	-1.215E+02	2.448E+03	7.175E+03	-3.274E+01
HAV01	175	0	1990-07-01	3.786E+03	6.140E+03	-1.644E+02	3.797E+03	6.123E+03	9.270E+00
HAV02	94	0	1990-07-06	3.423E+03	6.766E+03	-8.790E+01	3.422E+03	6.767E+03	6.080E+00
HAV02	163	95	1990-09-05	3.425E+03	6.764E+03	-1.568E+02	3.423E+03	-8.890E+01	6.766E+03
HAV03	134	0	1990-07-06	4.027E+03	6.615E+03	-1.252E+02	4.028E+03	6.621E+03	8.650E+00
HAV04	32	0	1990-07-06	3.449E+03	6.581E+03	-2.036E+01	3.449E+03	6.597E+03	7.530E+00
HAV04	100	33	1990-07-01	3.451E+03	6.549E+03	-8.044E+01	3.449E+03	6.581E+03	-2.124E+01
HAV05	50	0	1990-07-06	3.242E+03	6.679E+03	-3.448E+01	3.249E+03	6.706E+03	6.830E+00
HAV05	100	51	1990-07-01	3.235E+03	6.654E+03	-7.751E+01	3.242E+03	6.678E+03	-3.533E+01
HAV06	100	0	1990-07-01	3.144E+03	6.205E+03	-7.536E+01	3.156E+03	6.252E+03	1.193E+01
HAV07	100	0	1990-07-06	2.844E+03	6.555E+03	-8.551E+01	2.803E+03	6.538E+03	3.680E+00
HAV08	63	0	1990-07-06	2.779E+03	6.556E+03	-4.898E+01	2.768E+03	6.529E+03	6.980E+00
HBH01	5	0	1991-03-01	2.169E+03	6.166E+03	4.242E-01	2.170E+03	6.164E+03	4.710E+00
HBH01	30	0	1991-11-20	2.167E+03	6.179E+03	-2.128E+01	2.170E+03	6.164E+03	4.710E+00
HBH01	50.6	6	1991-03-01	2.166E+03	6.188E+03	-3.971E+01	2.169E+03	6.167E+03	-4.330E-01
HBH01	51	31	1991-11-20	2.166E+03	6.188E+03	-3.971E+01	2.167E+03	6.179E+03	-2.216E+01
HBH02	5	0	1991-03-01	2.165E+03	6.177E+03	9.818E-01	2.166E+03	6.174E+03	4.680E+00
HBH02	20	0	1991-11-20	2.162E+03	6.187E+03	-1.018E+01	2.166E+03	6.174E+03	4.680E+00
HBH02	32.4	6	1991-03-01	2.160E+03	6.194E+03	-1.967E+01	2.165E+03	6.178E+03	2.422E-01
HBH02	32.4	21	1991-11-20	2.160E+03	6.194E+03	-1.967E+01	2.162E+03	6.187E+03	-1.095E+01
HBH03	56	0	1991-04-06	2.170E+03	6.346E+03	-4.277E+01	2.173E+03	6.319E+03	5.920E+00
HBH03	54	0	1991-12-12	2.170E+03	6.345E+03	-4.101E+01	2.173E+03	6.319E+03	5.920E+00
HBH03	100	55	1991-12-11	2.168E+03	6.366E+03	-8.196E+01	2.170E+03	6.346E+03	-4.189E+01
HBH03	100	57	1991-04-04	2.168E+03	6.366E+03	-8.196E+01	2.170E+03	6.347E+03	-4.366E+01
HBH04	30	0	1991-04-06	2.133E+03	6.366E+03	-2.041E+01	2.135E+03	6.351E+03	5.520E+00
HBH04	90.4	31	1991-04-08	2.132E+03	6.396E+03	-7.012E+01	2.133E+03	6.367E+03	-2.127E+01
HBH05	10	0	1992-07-11	2.145E+03	6.181E+03	-4.101E+00	2.147E+03	6.174E+03	2.970E+00
HBH05	22	11	1992-07-11	2.143E+03	6.189E+03	-1.259E+01	2.145E+03	6.182E+03	-4.808E+00
HLX01	55	0	1990-12-09	2.199E+02	7.182E+03	-3.940E+01	2.232E+02	7.209E+03	8.500E+00
HLX01	100	56	1991-08-06	2.164E+02	7.159E+03	-7.799E+01	2.198E+02	7.182E+03	-4.027E+01
HLX02	15	0	1990-07-06	7.359E+02	7.864E+03	-4.210E+00	7.387E+02	7.857E+03	8.610E+00
HLX02	132	16	1990-07-01	7.233E+02	7.913E+03	-1.095E+02	7.358E+02	7.865E+03	-5.077E+00
HLX03	10	0	1990-07-06	6.614E+02	7.589E+03	1.520E+00	6.627E+02	7.593E+03	1.043E+01
HLX03	100	11	1990-07-01	6.511E+02	7.557E+03	-8.195E+01	6.613E+02	7.588E+03	6.186E-01

IDCODE	SECLOW	SECUP	START DATE	X-SECLOW	Y-SECLOW	Z-SECLOW	X-SECUP	Y-SECUP	Z-SECUP
HLX04	10	0	1990-07-06	5.074E+02	7.484E+03	1.290E+00	5.104E+02	7.481E+03	1.040E+01
HLX04	125	11	1990-07-01	4.815E+02	7.510E+03	-1.076E+02	5.071E+02	7.485E+03	3.668E-01
HLX05	10	0	1990-07-06	6.547E+02	7.322E+03	6.850E+00	6.552E+02	7.327E+03	1.550E+01
HLX05	100	11	1990-07-01	6.447E+02	7.281E+03	-7.264E+01	6.547E+02	7.321E+03	5.984E+00
HLX06	44	0	1990-07-06	3.884E+02	6.959E+03	-2.195E+01	3.950E+02	6.981E+03	1.548E+01
HLX06	100	45	1990-07-01	3.803E+02	6.933E+03	-7.069E+01	3.883E+02	6.958E+03	-2.280E+01
HLX07	15	0	1990-09-16	6.232E+02	6.924E+03	-4.468E+00	6.169E+02	6.921E+03	8.610E+00
HLX07	100	16	1990-07-01	6.552E+02	6.938E+03	-8.181E+01	6.236E+02	6.924E+03	-5.348E+00
HLX08	10	0	1992-01-10	1.067E+03	6.246E+03	-4.850E+00	1.063E+03	6.251E+03	2.270E+00
HLX08	40	11	1991-12-09	1.082E+03	6.231E+03	-2.614E+01	1.068E+03	6.245E+03	-5.560E+00
HLX09	50	0	1992-01-30	1.410E+03	6.811E+03	-4.076E+01	1.410E+03	6.834E+03	3.430E+00
HLX09	151	51	1991-12-09	1.410E+03	6.767E+03	-1.318E+02	1.410E+03	6.810E+03	-4.165E+01
HMJ01	46	33	1991-12-13	2.757E+03	6.785E+03	-3.697E+01	2.757E+03	6.793E+03	-2.621E+01
KAS01	101	0	1990-08-22	2.128E+03	7.258E+03	-9.244E+01	2.133E+03	7.250E+03	8.180E+00
KAS02	113	0	1990-07-01	2.121E+03	7.271E+03	-1.049E+02	2.125E+03	7.262E+03	7.680E+00
KAS02	308	114	1990-07-01	2.115E+03	7.286E+03	-2.992E+02	2.121E+03	7.271E+03	-1.059E+02
KAS02	345	309	1990-07-01	2.114E+03	7.289E+03	-3.361E+02	2.115E+03	7.286E+03	-3.002E+02
KAS02	799	346	1990-07-01	2.112E+03	7.325E+03	-7.886E+02	2.114E+03	7.289E+03	-3.371E+02
KAS02	854	800	1990-07-01	2.113E+03	7.330E+03	-8.434E+02	2.112E+03	7.325E+03	-7.896E+02
KAS02	924	855	1990-07-01	2.114E+03	7.336E+03	-9.131E+02	2.113E+03	7.330E+03	-8.444E+02
KAS03	106	0	1990-07-01	1.800E+03	7.770E+03	-9.648E+01	1.805E+03	7.758E+03	8.790E+00
KAS03	252	107	1990-07-01	1.794E+03	7.786E+03	-2.414E+02	1.800E+03	7.770E+03	-9.747E+01
KAS03	376	253	1990-07-01	1.790E+03	7.801E+03	-3.645E+02	1.794E+03	7.786E+03	-2.424E+02
KAS03	532	377	1990-07-01	1.784E+03	7.819E+03	-5.192E+02	1.790E+03	7.801E+03	-3.655E+02
KAS03	626	533	1990-07-01	1.780E+03	7.831E+03	-6.124E+02	1.784E+03	7.819E+03	-5.202E+02
KAS03	1002	627	1990-07-01	1.767E+03	7.886E+03	-9.842E+02	1.780E+03	7.831E+03	-6.134E+02
KAS04	185	0	1990-07-01	2.006E+03	7.556E+03	-1.467E+02	1.955E+03	7.637E+03	1.166E+01
KAS04	214	186	1990-07-01	2.014E+03	7.543E+03	-1.712E+02	2.007E+03	7.556E+03	-1.475E+02
KAS04	287	215	1990-07-01	2.033E+03	7.508E+03	-2.327E+02	2.014E+03	7.542E+03	-1.721E+02
KAS04	331	288	1990-07-01	2.044E+03	7.487E+03	-2.694E+02	2.033E+03	7.508E+03	-2.335E+02
KAS04	392	332	1990-07-01	2.059E+03	7.456E+03	-3.201E+02	2.044E+03	7.486E+03	-2.702E+02
KAS04	481	393	1990-07-01	2.082E+03	7.412E+03	-3.936E+02	2.059E+03	7.456E+03	-3.210E+02
KAS05	171	0	1990-07-01	2.064E+03	7.232E+03	-1.615E+02	2.060E+03	7.248E+03	8.680E+00
KAS05	180	0	1991-12-17	2.064E+03	7.231E+03	-1.705E+02	2.060E+03	7.248E+03	8.680E+00
KAS05	319	172	1990-07-05	2.069E+03	7.217E+03	-3.087E+02	2.064E+03	7.232E+03	-1.625E+02
KAS05	306	181	1991-12-17	2.068E+03	7.218E+03	-2.957E+02	2.064E+03	7.231E+03	-1.715E+02
KAS05	353	307	1991-12-17	2.070E+03	7.213E+03	-3.425E+02	2.068E+03	7.218E+03	-2.967E+02
KAS05	380	320	1990-07-01	2.071E+03	7.210E+03	-3.693E+02	2.069E+03	7.217E+03	-3.097E+02
KAS05	420	354	1991-12-17	2.072E+03	7.206E+03	-4.090E+02	2.070E+03	7.213E+03	-3.434E+02
KAS05	439	381	1990-07-01	2.073E+03	7.204E+03	-4.279E+02	2.071E+03	7.210E+03	-3.703E+02
KAS05	550	421	1991-12-17	2.077E+03	7.192E+03	-5.377E+02	2.072E+03	7.206E+03	-4.100E+02
KAS05	550	440	1990-07-01	-2.037E+01	2.077E+03	7.192E+03	2.073E+03	7.204E+03	-4.289E+02

IDCODE	SECLOW	SECUP	START DATE	X-SECLOW	Y-SECLOW	Z-SECLOW	X-SECUP	Y-SECUP	Z-SECUP
KAS06	190	0	1990-07-01	2.192E+03	7.165E+03	-1.572E+02	2.175E+03	7.068E+03	5.160E+00
KAS06	249	191	1990-07-01	2.197E+03	7.196E+03	-2.073E+02	2.192E+03	7.165E+03	-1.581E+02
KAS06	330	250	1990-07-01	2.208E+03	7.238E+03	-2.756E+02	2.198E+03	7.196E+03	-2.081E+02
KAS06	390	331	1990-07-01	2.216E+03	7.270E+03	-3.257E+02	2.208E+03	7.238E+03	-2.764E+02
KAS06	430	391	1990-07-01	2.222E+03	7.292E+03	-3.588E+02	2.216E+03	7.270E+03	-3.265E+02
KAS06	500	431	1990-07-01	2.233E+03	7.330E+03	-4.164E+02	2.222E+03	7.292E+03	-3.596E+02
KAS07	109	0	1990-07-01	2.181E+03	7.185E+03	-8.886E+01	2.215E+03	7.230E+03	4.580E+00
KAS07	190	110	1990-07-01	2.155E+03	7.153E+03	-1.582E+02	2.181E+03	7.185E+03	-8.972E+01
KAS07	290	191	1990-07-01	2.124E+03	7.110E+03	-2.433E+02	2.155E+03	7.152E+03	-1.591E+02
KAS07	410	291	1990-09-11	2.086E+03	7.059E+03	-3.449E+02	2.123E+03	7.110E+03	-2.442E+02
KAS07	500	411	1990-07-01	2.058E+03	7.019E+03	-4.208E+02	2.086E+03	7.058E+03	-3.457E+02
KAS07	604	501	1990-07-01	2.026E+03	6.972E+03	-5.076E+02	2.058E+03	7.019E+03	-4.216E+02
KAS08	139	0	1990-07-01	2.192E+03	7.390E+03	-1.103E+02	2.150E+03	7.451E+03	7.660E+00
KAS08	200	140	1990-07-01	2.209E+03	7.360E+03	-1.604E+02	2.192E+03	7.390E+03	-1.111E+02
KAS08	502	201	1990-07-01	2.294E+03	7.200E+03	-4.020E+02	2.210E+03	7.360E+03	-1.613E+02
KAS08	601	503	1990-07-01	2.321E+03	7.145E+03	-4.795E+02	2.295E+03	7.200E+03	-4.028E+02
KAS09	115	0	1990-08-03	2.090E+03	6.867E+03	-9.516E+01	2.091E+03	6.925E+03	4.080E+00
KAS09	150	116	1990-08-03	2.089E+03	6.849E+03	-1.251E+02	2.090E+03	6.867E+03	-9.601E+01
KAS09	240	151	1990-08-03	2.088E+03	6.802E+03	-2.021E+02	2.089E+03	6.848E+03	-1.260E+02
KAS09	260	241	1990-08-03	2.088E+03	6.792E+03	-2.192E+02	2.088E+03	6.802E+03	-2.029E+02
KAS09	450	261	1990-08-03	2.090E+03	6.694E+03	-3.817E+02	2.088E+03	6.792E+03	-2.201E+02
KAS10	100	0	1991-09-09	2.148E+03	6.897E+03	-8.282E+01	2.133E+03	6.944E+03	3.720E+00
KAS11	46	0	1990-07-01	2.091E+03	6.938E+03	-4.173E+01	2.091E+03	6.937E+03	4.260E+00
KAS11	64	47	1990-07-01	2.091E+03	6.938E+03	-5.973E+01	2.091E+03	6.938E+03	-4.273E+01
KAS11	115	65	1990-07-01	2.092E+03	6.938E+03	-1.107E+02	2.091E+03	6.938E+03	-6.073E+01
KAS11	152	116	1990-07-01	2.092E+03	6.939E+03	-1.477E+02	2.092E+03	6.938E+03	-1.117E+02
KAS11	183	153	1990-07-01	2.093E+03	6.939E+03	-1.787E+02	2.092E+03	6.939E+03	-1.487E+02
KAS11	249	184	1990-07-01	2.094E+03	6.940E+03	-2.446E+02	2.093E+03	6.939E+03	-1.797E+02
KAS12	101	0	1990-07-01	2.167E+03	7.534E+03	-8.930E+01	2.157E+03	7.569E+03	4.830E+00
KAS12	233	102	1990-07-01	2.181E+03	7.485E+03	-2.110E+02	2.167E+03	7.533E+03	-9.023E+01
KAS12	277	234	1990-07-01	2.185E+03	7.468E+03	-2.513E+02	2.181E+03	7.484E+03	-2.119E+02
KAS12	329	278	1990-07-01	2.191E+03	7.447E+03	-2.989E+02	2.185E+03	7.467E+03	-2.523E+02
KAS12	380	330	1990-07-01	2.198E+03	7.428E+03	-3.455E+02	2.192E+03	7.447E+03	-2.998E+02
KAS13	150	0	1990-08-03	2.099E+03	7.276E+03	-1.283E+02	2.169E+03	7.264E+03	3.890E+00
KAS13	190	151	1990-08-03	2.080E+03	7.279E+03	-1.633E+02	2.099E+03	7.276E+03	-1.292E+02
KAS13	220	191	1990-08-03	2.066E+03	7.283E+03	-1.895E+02	2.080E+03	7.279E+03	-1.642E+02
KAS13	330	221	1990-08-03	2.013E+03	7.296E+03	-2.853E+02	2.065E+03	7.283E+03	-1.904E+02
KAS13	407	331	1990-08-03	1.976E+03	7.306E+03	-3.519E+02	2.013E+03	7.296E+03	-2.861E+02
KAS14	130	0	1990-07-01	2.161E+03	6.882E+03	-1.084E+02	2.127E+03	6.939E+03	3.350E+00
KAS14	138	131	1990-07-01	2.163E+03	6.879E+03	-1.152E+02	2.161E+03	6.882E+03	-1.092E+02
KAS14	146	139	1990-07-01	2.165E+03	6.875E+03	-1.220E+02	2.164E+03	6.878E+03	-1.161E+02
KAS14	175	147	1990-07-01	2.174E+03	6.862E+03	-1.468E+02	2.166E+03	6.875E+03	-1.229E+02
KAS14	212	176	1990-07-01	2.184E+03	6.846E+03	-1.783E+02	2.174E+03	6.862E+03	-1.477E+02

IDCODE	SECLOW	SECUP	START DATE	X-SECLOW	Y-SECLOW	Z-SECLOW	X-SECUP	Y-SECUP	Z-SECUP
KAS16	120	0	1992-11-20	2.260E+03	7.161E+03	-1.154E+02	2.250E+03	7.172E+03	3.660E+00
KAS16	389	121	1992-11-20	2.291E+03	7.115E+03	-3.785E+02	2.260E+03	7.160E+03	-1.164E+02
KAS16	465	390	1992-11-18	2.301E+03	7.097E+03	-4.516E+02	2.292E+03	7.115E+03	-3.795E+02
KAS16	543	466	1992-10-31	2.311E+03	7.075E+03	-5.259E+02	2.301E+03	7.096E+03	-4.526E+02
KAV01	100	0	1990-07-01	3.645E+03	6.393E+03	-8.618E+01	3.646E+03	6.394E+03	1.381E+01
KAV01	360	101	1990-07-01	3.644E+03	6.389E+03	-3.461E+02	3.645E+03	6.393E+03	-8.718E+01
KAV01	600	361	1990-07-01	3.650E+03	6.379E+03	-5.859E+02	3.644E+03	6.389E+03	-3.471E+02
KAV01	744	601	1990-07-01	3.654E+03	6.372E+03	-7.291E+02	3.650E+03	6.379E+03	-5.869E+02
KAV02	97	0	1990-07-01	3.620E+03	5.982E+03	-8.946E+01	3.620E+03	5.982E+03	7.540E+00
KBH02	105	0	1991-01-01	2.155E+03	6.394E+03	-6.076E+01	2.171E+03	6.314E+03	5.500E+00
KBH02	150	106	1991-01-01	2.149E+03	6.434E+03	-7.927E+01	2.155E+03	6.394E+03	-6.129E+01
KBH02	260	151	1991-01-01	2.134E+03	6.539E+03	-1.092E+02	2.149E+03	6.435E+03	-7.960E+01
KBH02	410	261	1991-01-01	2.115E+03	6.683E+03	-1.449E+02	2.134E+03	6.540E+03	-1.094E+02
KBH02	326	261	1991-10-22	2.126E+03	6.602E+03	-1.252E+02	2.134E+03	6.540E+03	-1.094E+02
KBH02	460	411	1991-01-01	2.109E+03	6.731E+03	-1.562E+02	2.115E+03	6.684E+03	-1.451E+02
KBH02	706	461	1991-01-01	2.075E+03	6.969E+03	-2.096E+02	2.109E+03	6.732E+03	-1.564E+02
KLX01	140	0	1992-03-18	5.956E+02	7.276E+03	-1.228E+02	5.960E+02	7.265E+03	1.681E+01
KLX01	271	141	1992-05-14	5.950E+02	7.284E+03	-2.535E+02	5.956E+02	7.276E+03	-1.238E+02
KLX01	694	272	1992-09-22	5.957E+02	7.308E+03	-6.758E+02	5.950E+02	7.284E+03	-2.545E+02
KLX01	855	695	1992-03-19	5.959E+02	7.316E+03	-8.366E+02	5.957E+02	7.308E+03	-6.768E+02
KLX01	1077.99	856	1992-03-18	5.961E+02	7.328E+03	-1.059E+03	5.959E+02	7.316E+03	-8.376E+02

This file: READSP03.TXT

This ZIP-file with the files below contains SKB data from the Aspo Hard Rock Laboratory. These data are SKB proprietary and shall only be used within specified tasks agreed upon between SKB and participating organizations.

PIETZOMETRIC LEVELS MEASURED IN SURFACE BORE HOLES

PIETZOMETRIC LEVEL ZIP-file XXXX01.zip contains data
for Modelling Task 5 where XXXX stands for:

- -HAS and KAS : boreholes on Aspo
- -KAVHAV : boreholes on Avro and on Mjalen
- -KLXHLX : boreholes on Laxemar
- -KBHHBH : boreholes on Halo

The data is available in two different file formats

- Ascii files (*.TXT)
- Microsoft EXEL files, version 7.0 (*.XLS)

These data comprises the pietzometric levels, daily values of the draw-down, measured in surface bore holes during the construction of the Aspo HRL. The draw-down data are for period 1 of July 1990 to 24 of January 1994.

Filename:		Contents:
YYYYY.xls		Daily values of the piezometric levels for bore hole YYYYY. The bore hole groups are -HAS and KAS: boreholes on Aspo -HAV and KAV: boreholes on Avro -HLX and KLX: boreholes on Laxemar -HBH and KBH: boreholes on Halo -HMJ : boreholes on Mjalen
Column:	**Unit:**	**Description:**
IDCODE	-	Code for measured bore hole.
SECLOW	m	Lower measurement section in the bore hole.
SECUP	m	Upper measurement section in the bore hole.
DATEx	YYYYMMDD	Date for measurement. "x" indicates that there are several measurement sections and in some cases that there has been changes of the packer positions since first instrumentation of the bore hole.
GRWHEADx	m	Water level in measurement pipe above Z=0, where Z is the vertical coordinate in the Aspo HRL coordinate system, postive upwards. "x" indicates that there are several measurement sections and in some cases that there has been changes of the packer positions since first instrumentation of the bore hole.
X-SECLOW	m	Easting coordinate in the Aspo HRL coordinate system for SECLOW in the bore hole.
Y-SECLOW	m	Northing coordinate in the Aspo HRL coordinate system for SECLOW in the bore hole.
Z-SECLOW	m	Vertical coordinate in the Aspo HRL coordinate system, postive upwards for SECLOW in the bore hole.
X-SECUP	m	Easting coordinate in the Aspo HRL coordinate system for SECUP in the bore hole.
Y-SECUP	m	Northing coordinate in the Aspo HRL coordinate system for SECUP in the bore hole.
Z-SECUP	m	Vertical coordinate in the Aspo HRL coordinate system, postive upwards for SECUP in the bore hole.

IDCODE	SECLOW	SECUP	DATE1	GRWHEAD1	X-SECLOW	Y-SECLOW	Z-SECLOW	X-SECUP	Y-SECUP	Z-SECUP
HAS02	72	0	1991-06-01	9.00E-02	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-02	1.20E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-03	1.40E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-04	2.20E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-05	1.70E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-06	1.90E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-07	1.90E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-08	2.30E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-09	1.80E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-10	1.90E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-11	1.50E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-12	1.10E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-13	1.30E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-14	1.10E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-15	1.20E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-06-17	-2.47E+00	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-07-03	1.70E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-07-04	1.80E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-07-05	1.70E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-07-06	1.60E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-07-07	1.30E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-07-08	1.20E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-07-09	4.00E-02	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-08-16	-2.80E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-08-17	-3.00E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-08-18	-2.20E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-08-19	-1.80E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-08-20	-1.80E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-08-21	-1.70E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-08-22	-1.90E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-08-23	-2.40E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00
HAS02	72	0	1991-08-24	-2.70E-01	1.36E+03	7.74E+03	-5.93E+01	1.37E+03	7.78E+03	2.11E+00

IDCODE	SECLOW	SECUP	DATE3	GRWHEAD3	X-SECLOW	Y-SECLOW	Z-SECLOW	X-SECUP	Y-SECUP	Z-SECUP
HAS02	93	73	1991-06-01	-1.70E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-02	-1.40E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-03	-1.20E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-04	-3.00E-02	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-05	-9.00E-02	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-06	-7.00E-02	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-07	-7.00E-02	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-08	-4.00E-02	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-09	-9.00E-02	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-10	-8.00E-02	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-11	-1.20E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-12	-1.70E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-13	-1.30E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-14	-1.60E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-15	-1.50E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-06-17	-3.70E+00	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-07-03	-5.00E-02	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-07-04	-7.00E-02	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-07-05	-8.00E-02	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-07-06	-9.00E-02	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-07-07	-1.20E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-07-08	-1.30E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-07-09	-2.10E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-08-16	-4.50E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-08-17	-4.70E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-08-18	-3.90E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-08-19	-3.50E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-08-20	-3.50E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-08-21	-3.50E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-08-22	-3.70E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-08-23	-4.20E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01
HAS02	93	73	1991-08-24	-4.40E-01	1.36E+03	7.73E+03	-7.82E+01	1.36E+03	7.74E+03	-6.02E+01