

P-07-218

Oskarshamn site investigation

Boremap mapping of telescopic drilled borehole KLX21B

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November 2007

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Keywords: KLX21B, Geology, Drill core mapping, Boremap, Fractures, BIPS, Laxemar.

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

Data in SKB's database can be changed for different reasons. Minor changes in SKB's database will not necessarily result in a revised report. Data revisions may also be presented as supplements, available at www.skb.se.

A pdf version of this document can be downloaded from www.skb.se.

Abstract

This report presents the Boremap mapping of KLX21B, which is a c 859 m long telescopic drilled borehole. The borehole was drilled with the orientation 225/−71°. The mapping was conducted between 2007-01-31 and 2007-02-28.

The documentation of geological structures and lithologies intersecting borehole KLX21B was made using the drill core and BIPS-images. Geological structures are correctly oriented in space along the borehole with the Boremap system.

The lithology in KLX21B (Table 5-1) is dominated by Ävrö granite (501044). Subordinate rock types comprise quartz monzodiorite (501036), fine-grained dioritoid (501030), fine-grained granite (511058), diorite/gabbro (501030) and fine-grained diorite-gabbro (505102).

Six sections have been highlighted based on increased fracture frequencies, alterations and structural features. These sections cover the following intervals: 100–110 m, 131–135 m, 150–157 m, 210–215 m, 445–456 m and 590–707 m.

Sammanfattning

Denna rapport presenterar boremapkarteringen av KLX21B som är ett ca 859 meter långt teleskopborrat kärnborrhål. Borrhålet borrades med orienteringen 225/-71° och karterades mellan 2007-01-31 och 2007-02-28.

Dokumentationen av geologiska strukturer och litologi som genomskär borrhål KLX21B har utförts med borkärna och BIPS-bilder. Geologiska strukturer har orienterats i rummet längs med borrhålet med Boremap systemet.

KLX21B domineras av Ävrö granit (501044). Underordnade bergarter utgörs av kvartsmonzodiorit (501036), finkornig dioritoid (501030), finkornig granit (511058), diorit/gabbro (501030) och finkornig diorit-gabbro (505102).

Sex sektioner i KLX21B kan urskiljas baserat på förhöjd sprickfrekvens, bergets omvandlingar och geologiska strukturer. Dessa sektioner återfinns i följande intervall: 100–110 m, 131–135 m, 150–157 m, 210–215 m, 445–456 m och 590–707 m.

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1 Introduction

This report gives a brief presentation of the data gained from the mapping of KLX21B in the Laxemar area, which is one of the activities performed within the site investigation at Oskarshamn. The work was carried out in accordance with Activity Plan AP PS 400-07-015. In Table 1-1 controlling documents for performing this activity are listed. Both Activity Plan and Method Descriptions are SKB's internal controlling documents. Rock type nomenclature that has been used is shown in Table 1-2.

SKB investigates two potential sites for a deep repository for nuclear waste in the Swedish Precambrian basement at approximately 500 m depth. These places are Forsmark in northern Uppland and Oskarshamn in eastern Småland. In order to make a preliminary evaluation of the rock mass down to a depth of about 1,000 m at these sites, SKB has initiated a drilling program using core drilled boreholes. Every borehole usually starts with a percussion drilled part the first 100 m, where only drill cuttings are examined together with BIPS, followed by core drilling.

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

Activity Plan	Number	Version
Boremapkartering av KLX21B	AP PS 400-07-015	1.0
Method Descriptions	Number	Version
Nomenklatur vid Boremapkartering	SKB MD 143.008	1.0
Method Description for Boremap mapping	SKB MD 143.006	2.0
Mätsystembeskrivning för Boremap	SKB MD 146.005	1.0
Instruktion: Regler för bergarters benämningar vid platsundersökning i Oskarshamn	SKB MD 132.004	1.0
Instruktion för längdkalibrering vid undersökningar i kärnborrhål	SKB MD 620.010	2.0

Table 1-2. Rock type nomenclature for the site investigation at Oskarshamn.

Rock type	Rock code	Rock description
Dolerite	501027	Dolerite
Fine-grained Götemar granite	531058	Granite, fine-to medium-grained, ("Götemar granite")
Coarse-grained Götemar granite	521058	Granite, coarse-grained, ("Götemar granite")
Fine-grained granite	511058	Granite, fine-to medium-grained
Pegmatite	501061	Pegmatite
Granite	501058	Granite, medium- to coarse-grained
Ävrö granite	501044	Granite to quartz monzodiorite, generally porphyritic
Quartz monzodiorite	501036	Quartz monzonite to monzodiorite, equigranular to weakly porphyritic
Diorite/gabbro	501033	Diorite to gabbro
Fine-grained dioritoid	501030	Intermediate magmatic rock
Fine-grained diorite-gabbro	505102	Mafic rock, fine-grained
Sulphide mineralization	509010	Sulphide mineralization
Sandstone	506007	Sandstone

Borehole KLX21B is situated within the Laxemar area (Figure 1-1). KLX21B is a c 859 m long telescopic borehole with the orientation 225/-71°. Mapping of the borehole was performed between 2007-01-31 and 2007-02-28.

Detailed mapping of the drill cores is essential for a three dimensional modelling of the geology at depth. The mapping is based on the use of BIPS-image (Borehole Image Processing System) of the borehole wall and by the study of the drill core itself. The BIPS-image enables the study of orientations, since the Boremap software calculates strike and dip of planar features such as foliations, rock contacts and fractures.

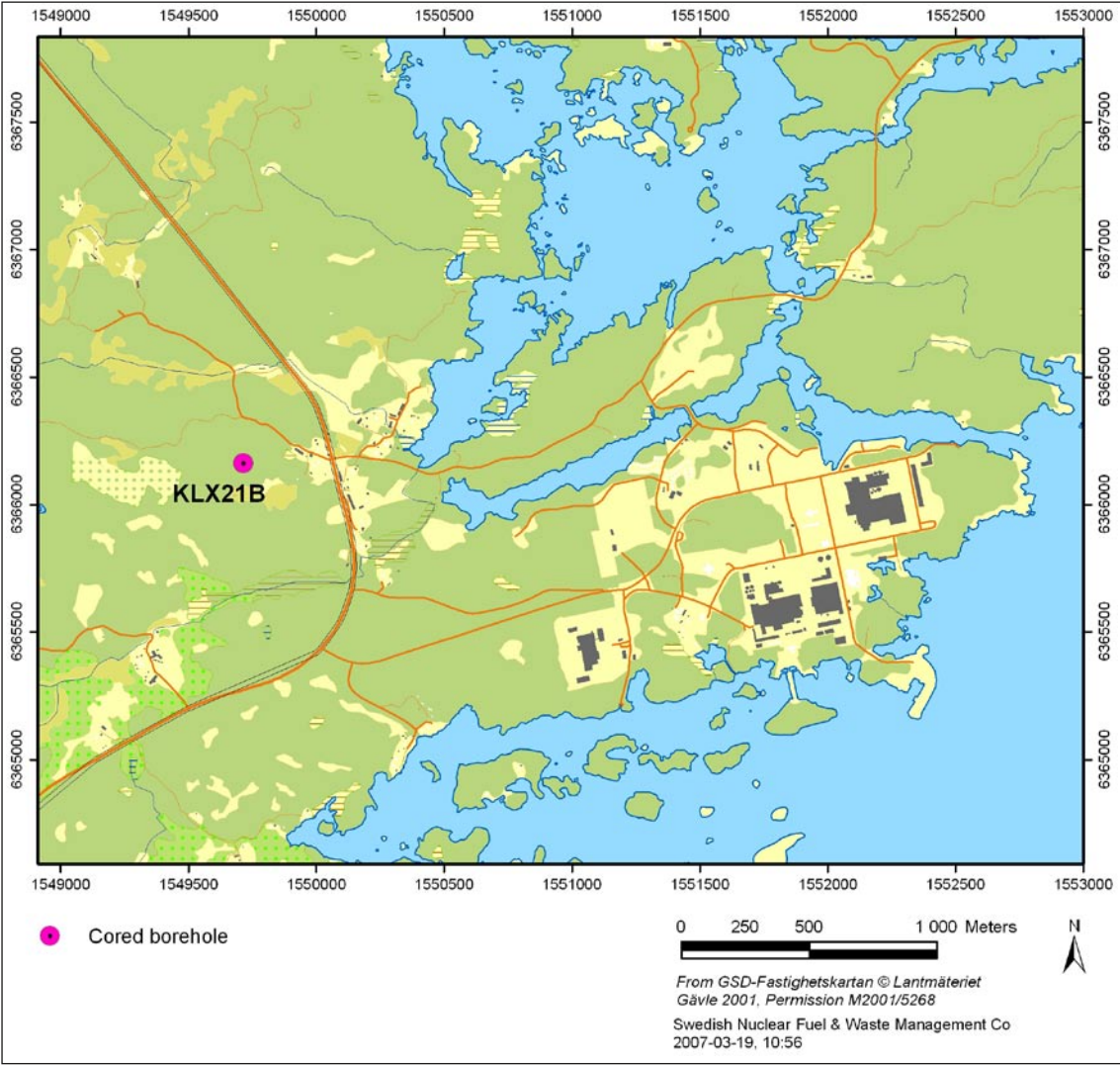


Figure 1-1. Location of the core drilled borehole KLX21B.

2 Objective and scope

The principal aim of the mapping activities presented in this report is to obtain a documentation of geological structures and lithologies intersecting borehole KLX21B. Geological structures will be correctly orientated in space along the borehole with the Boremap system. The result will serve as a platform for forthcoming investigations of the drill core, as well as various site descriptive modelling.

3 Equipment

3.1 Description of software

Software used for the mapping of KLX21B was Boremap v. 3.9 with bedrock and mineral standards of SKB. The data presentation was made using WellCad v. 4, Microsoft Access and Microsoft Excel. Boremap is the software that unites orthodox core mapping with modern video mapping, where Boremap shows the image from BIPS (Borehole Image Processing System) and extracts the geometrical parameters: length, width, strike and dip from the image.

3.2 Other equipment

The following equipment is used to facilitate the core mapping: folding rule, pen, diluted hydrochloric acid, knife, water-filled atomiser and hand lens.

3.3 BIPS-image video film sequences

The BIPS-image of KLX21B covers the interval 100.00 m–855.867 m.

3.4 BIPS-image video film quality

The visibility of thin fractures in BIPS depends on image resolution, image contrast and image quality.

3.4.1 BIPS-image resolution

Resolution of the BIPS-image is perhaps the principal reason why very thin fractures as well as very thin apertures are not visible in the BIPS-image and the resolution depends on the BIPS video camera pixel size and illumination angle.

3.4.2 BIPS-image contrast

Thick fractures are always visible in both drill core and the BIPS-image. However, the visibility of thin fractures depends strongly on the contrast between the fracture and the wall rock. A bright fracture in a dark rock is clearly visible in the BIPS-image. But a bright coloured fracture in a light coloured rock might, however, be clearly visible in the drill core but not visible in the BIPS-image, especially if the fracture and wall rock have the same colour. The opposite is true for dark fractures.

In very rare cases when the BIPS-image contrast between a very thin fracture and the wall rock is very strong the fracture might be visible in the BIPS-image even if it is not visible in the drill core.

3.4.3 BIPS-image quality

BIPS-image quality is sometimes limited due to:

- 1) blackish coatings probably related to the drilling equipment,
- 2) vertical bleached bands from the clayey mixture of drill cuttings and water,
- 3) light and dark bands at high angle to the drill hole related to the automatic aperture of the video camera,
- 4) vertical enlargements of pixels due to stick-slip movement of the camera probe.

Vertical bleached bands and blackish coatings are usually the main disturbances in the BIPS-image quality.

The image quality is classified into four levels; good, acceptable, bad and very bad. Good quality means a more or less clear image which is easy to interpret. If the quality is acceptable it means that the image is not good, but that the mapping can be performed without any problems. An image of bad quality is somewhat difficult to interpret while an image of very bad quality cannot be interpreted except from very obvious and outstanding features. When the BIPS-image quality is so bad that fractures and structures cannot be identified, they can still be oriented using the guide-line method (Section 4.3.3). The BIPS-image quality for KLX21B is presented in Table 3-1.

Table 3-1. BIPS-image quality in KLX21B.

From (m)	To (m)	Quality
100	856	Good

4 Execution

4.1 General

Mapping of the drill core of the telescopic drilled borehole was performed and documented according to Activity Plan AP PS 400-07-015 (SKB, internal document) referring to the Method Description for Boremap mapping (SKB MD 143.006, v.2.0), Nomenklatur vid Boremapkartering (SKB MD 143.008, v.1.0), Instruktion: Regler för bergarters benämningar vid platsundersökningen i Oskarshamn (SKB MD 132.004, v.1.0) and Instruktion för längdkalibrering vid undersökningar i kärnborrhål (SKB MD 620.010, v.2.0), all of them SKB internal documents.

The drill core was displayed on inclined roller tables and mapped in its entire length with the Boremap software. The core mapping was carried out without any detailed geological knowledge of the area but with access to geophysical logs from the borehole and rock samples.

The term oxidation has been used as an alteration type until the mapping of KLX05. However, research has shown that the red colour of the bedrock is actually not only a result of oxidation. Since April 2005 the term red staining is used instead of the term oxidation.

The mapping was performed by Karl-Johan Mattsson, Peter Dahlin and Emil Lundberg (Geosigma AB).

4.2 Preparations

Any depth registered in the BIPS-image deviates from the true depth in the borehole, a deviation which increases with depth, with approximately 0.4 m/100 m. This problem is eliminated by adjusting the depth of the BIPS-image to reference slots cut into the borehole walls every fiftieth meter (Appendix 7). The level for each slot is measured in the BIPS-images and then adjusted to the correct level using the correct depth value from the SICADA database.

Necessary in data for length adjustment and orientation in space are borehole diameter, reference marks, length and deviation; all collected from SICADA database (Appendices 6–8).

4.3 Execution of measurements

Concepts used during the core mapping, are defined in this chapter.

4.3.1 Fracture definitions

Definitions of different fracture types and aperture, crush zones and sealed fracture network are found in Nomenklatur vid Boremapkartering (SKB MD 143.008, v.1.0), SKB internal documents.

Two types of fractures are mapped in Boremap; broken and unbroken. Broken are fractures that split the core while unbroken fractures do not split the core. All fractures are described with their fracture minerals and other characteristics, e.g. width, aperture and roughness. Visible apertures are measured down to 1 mm in the BIPS-image. Smaller apertures, which are impossible to detect in the BIPS-image, are denoted a value of 0.5 mm. If the core pieces don't fit well, the aperture is considered "probable". If the core pieces do fit well, but the fracture surfaces are dull or altered, the aperture is considered "possible".

All fractures with apertures > 0 mm are treated as open in the SICADA database. Only few broken fractures are given the aperture = 0 mm. Unbroken fractures usually have apertures = 0 mm. Unbroken fractures that have apertures > 0 mm are interpreted as partly open and are included in the open-category. Open and sealed fractures are finally frequency calculated and shown in Appendix 1.

4.3.2 Fracture alteration and joint alteration number

Joint alteration number is principally related to the thickness of, and the clay content in a fracture. Thick fractures rich in clay minerals are given joint alteration numbers between 2 and 3. The majority of the broken fractures are very thin to extremely thin and seldom contain clay minerals. These fractures receive joint alteration numbers between 1 and 2.

A subdivision of fractures with joint alteration numbers between 1 and 2 was introduced to facilitate both the evaluation process for fracture alterations and the possibility to compare the alterations between different fractures in the boreholes. The subdivision is based on fracture mineralogy as follows:

- a) fracture wall alterations,
- b) fracture mineral fillings assumed to have been deposited from circulating water-rich solutions,
- c) fracture mineral fillings most likely resulting from altered wall rock material.

Joint alteration number equal to 1: Fractures with or without wall rock alteration, e.g. oxidation or epidotization, and without mineral fillings is considered as fresh. The joint alteration number is thus set to 1.

Minerals such as calcite, quartz, fluorite, zeolites, laumontite and sulphides are regarded as deposited by circulating water-rich solutions and not as true fracture alteration minerals. The joint alteration number is thus set to 1.

Joint alteration number equal to 1.5: Epidote, prehnite, hematite, chlorite and/or clay minerals are regarded as fracture minerals most likely resulting from altered wall rock. A weak alteration is thus assumed and the joint alteration number was set to 1.5. Extra considerations have been given to clay minerals since the occurrence of these minerals often resulted in a higher joint alteration number.

Joint alteration numbers higher than 1.5: When the mineral fillings is thick and contain a few mm of clay minerals, often together with epidote and chlorite, the joint alteration number is set to 2. In rare cases, when a fracture contains 5–10 mm thick clay, together with chlorite, the joint alteration number is set to 3 or higher.

When the alteration of a fracture is too thick (and/or intense) to give the fracture the joint alteration number 1.5 and too thin and/or weak to give it a 2, 1.7 and 1.8 is used.

4.3.3 Mapping of fractures not visible in the BIPS-image

Not all fractures are visible in the BIPS-images, and these fractures are orientated by using the guide-line method, based on the following data:

- Amplitude (measured along the drill core) which is the interval between fracture extremes along the drill core.
- The relation between the orientations of the fracture trace, measured on the drill core and a well defined structure visible in the BIPS-image.
- Absolute depth.

Orientation of fractures and other structures with the guide-line method is done in the following way: The first step is to calculate the amplitude of the fracture trace in the BIPS-image (with 76 mm diameter) from the measured fracture amplitude in the drill core (with 50 mm diameter). The second step is the correction of strike and dip. This is done by rotating the fracture trace in the BIPS-image relative to a feature with known orientation. The fracture trace is then put at the correct depth according to the depth measured on the drill core.

The guide-line method can be used to orientate any feature that is not visible in the BIPS-image. It is also a valuable tool to control that the personnel working with the drill core is observing the same feature as the personnel delineating the trace in the BIPS-image, especially in intervals rich in fractures.

The error of orientating fractures using the guide-line method is not known but experience and an estimation using stereographic plots indicated that the error is most likely insignificant. Accordingly, the guide-line method is so far considered better than mapping lots of non-oriented fractures. The fractures in question are mapped as “non-visible in BIPS” and can therefore be separated from fractures visible in BIPS which probably have a more accurate orientation.

4.3.4 Definition of veins and dikes

Rock occurrence is the way Boremap handles the occurrence of lithology up to 1 meter wide. Chiefly two different rock occurrences are mapped: veins and dikes. These two are separated by their respectively length in the drill core; veins are set to 0–20 cm and dikes are set to 20–100 cm. Rock occurrences that covers more than 100 cm of the drill core are mapped under the feature rock type.

4.3.5 Mineral codes

In the case where properties and/or minerals are not represented in the mineral list, following mineral codes have been used:

X1 Gypsum.

X5 Bleached fracture walls.

X7 Fractures with a fresh appearance and no detectable mineral.

X8 Fractures with epidotized/saussuritized walls.

4.4 Data handling

Mapping of the drill core is performed on-line on the SKB network, in order to obtain the best possible data security. Before every break (> 15 minutes) a back-up is saved on the local disk. Regular quality controls are performed. Every working day a Summary report (from Boremap) and a WellCad plot are printed in order to find possible misprints. The mapping is also quality checked by a routine in Boremap before it is exported to and archived in SICADA database. Personnel from SKB also perform spot test controls and regular quality revisions. All primary data is stored in SKB's database SICADA and only these data are later used for interpretation and modelling.

4.5 Geological summary table, general description

A Geological summary table (Appendix 1) is an overview of the features mapped with the Boremap software. It also facilitates comparisons between Boremap information collected from different boreholes and is more objective than a pure descriptive borehole summary. All

information is taken directly from the Boremap database using simple and well defined search paths for each geological parameter (Appendix 2).

The Geological summary table consists of 23 columns, each one representing a specific geological parameter, presented as either intervals or frequencies (see Section 4.5.1 for column description). Intervals are calculated for parameters with a width ≥ 1 m and frequencies for parameters with a width < 1 m. Frequency information is treated as treated as point observations. It should be noted that parameters with a thickness of only 1 mm get the same “value” as a similar parameter with a thickness of 999 mm since both are treated as point observations and used for frequency calculations.

Parameters are sometimes related in such a way that the mapping of one parameter cause a decrease in the frequency of another parameter. This type of intimate relationship between parameters has been noted for the following cases;

- There is a decrease in the frequency of unbroken fractures with oxidized walls and without mineral fillings in intervals mapped with Alteration – red staining.
- No unbroken fractures are mapped in intervals of sealed fracture network.
- No broken fractures are mapped in intervals with crush.
- Hybrid rock and composite dikes generally include a large amount of fine to medium grained granite veins. These veins are not mapped and the frequency presented for veins + dikes in column 6 (Appendix 1) are lower than the true frequency in composite dike intervals.

4.5.1 Columns in the Geological summary table

The Geological summary table includes the following 23 columns:

Column 1: *Rock Type/Lithology*, interval column. Only lithologies longer than 1 m are presented here. Shorter lithologies are presented in column 6. This column is identical with the ordinary WellCad presentation.

Column 2: *Rock Type/Grain size*, interval column. Interval limits follows column 1. This column is identical with the ordinary WellCad presentation.

Column 3: *Rock Type/Texture*, interval column. Interval limits follows column 1. This column is identical with the ordinary WellCad presentation.

Column 4: *Alteration/Type*, interval column. No frequency column is presented for alteration/type. The alteration/type column are identical with the ordinary WellCad presentation.

Column 5: *Alteration/intensity*, interval column. This column is identical with the ordinary WellCad presentation.

Column 6: *Rock Occurrence/Veins + Dikes < 1 m wide*, frequency column. This rock type column can be seen as the frequency complement to the rock type/lithology interval column. Only rock type sections that are thinner than 1 m can be described as rock occurrences in Boremap. Thicker rock type sections are mapped as rock type.

Column 7: *Structure/Shear Zone < 1 m wide*, frequency column. This column includes ductile shear structures as well as brittle-ductile shear structures and these are mapped as rock occurrences in Boremap.

Column 8: *Structure/Brecciated < 1 m wide*, frequency column. Breccias < 1 m wide are mapped as rock occurrence in Boremap. Very thin micro breccias along sealed/natural fracture planes are generally not considered.

Column 9: *Structure/Brecciated ≥ 1 m wide*, interval column. Breccias > 1 m wide are mapped as rock type/structure in Boremap.

Column 10: *Structure/Mylonite < 1 m wide*, frequency column. Mylonites <1 m wide are mapped as rock occurrence/structure in Boremap.

Column 11: *Structure/Mylonite ≥ 1 m wide* is an interval column. Mylonites > 1 m wide are mapped as rock type/structure in Boremap.

Column 12: *Structure/Foliated < 1 m wide* is a frequency column. Sections with foliation < 1 m wide are mapped as rock occurrence/structure in Boremap.

Column 13: *Structure/Foliated ≥ 1 m wide* is an interval column. Sections with foliation ≥ 1 m wide are mapped as rock type/structure in Boremap.

Column 14: *Sealed fractures/All*, frequency column. This column includes all fractures mapped as unbroken in the Boremap system as well as broken fractures interpreted to have broken up artificially during/after drilling.

Column 15: *Sealed fractures/Broken fractures with aperture = 0*, frequency column. This column includes unbroken fractures interpreted to have broken up artificially during/after drilling.

Column 16: *Sealed fractures/Sealed Fracture Network < 1 m wide*, frequency column. The sealed fracture network parameter is the only parameter that is generally evaluated directly from observations of the drill core. These types of sealed fractures can only in rare cases be observed in the BIPS-image.

Column 17: *Sealed fractures/Sealed Fracture Network ≥ 1 m wide*, interval column.

Column 18: *Open fractures/All Apertures > 0*, frequency column. This column includes all broken fractures, both fractures that with certainty were open before drilling and fractures that probably or possibly were open before drilling.

Column 19: *Open fractures/Uncertain, Aperture = 0.5 probable + 0.5 possible*, frequency column. This column includes fractures that probably or possibly open before drilling.

Column 20: *Open fractures/Certain Aperture = 0.5 and > 0.5*, frequency column. This column includes fractures that certainly were open before drilling.

Column 21: *Open fractures/Joint alteration > 1.5*, frequency column. This column show fractures with stronger joint alteration than normal. This parameter is generally correlated with the location of lithologies with a more weathered appearance.

Column 22: *Open fractures/Crush < 1 m wide*, frequency column. This column includes shorter sections with crush.

Column 23: *Open fractures/Crush ≥ 1 m wide*, interval column. This column includes longer sections with crush.

4.6 Nonconformities

The section at 855.867–858.780 m was mapped only with core.

Core loss occurs at 592.672–592.900 m.

5 Results

5.1 General

Borehole KLX21B is oriented 225/−71°. The drill core covers the interval 100.00–858.78 m and the BIPS-image covers the interval 100.00–855.867 m.

All results from the mapping are principally found in the appendices. Information from the SICADA database is shown in the Geological summary table in Appendix 1 and a search path to Geological summary table is presented in Appendix 2. The BIPS-image is presented in Appendix 3, the WellCad diagram in Appendix 4, legend to WellCad in Appendix 5 and In-data, such as borehole length, reference marks, deviation data and diameter are presented in Appendices 6–8.

Original data from the reported activity are stored in the primary database SICADA. Data are traceable in SICADA by the Activity Plan number (AP PS 400-07-015). Only data in databases are accepted for further interpretation and modelling. The data presented in this report are regarded as copies of the original data. Data in the databases may be revised, if needed. Such revisions will not necessarily result in a revision of the P-report, although the normal procedure is that major revisions entail a revision of the P-report. Minor revisions are normally presented as supplements, available at www.skb.se.

5.2 Lithology and structures

The lithology in KLX21B (Table 5-1) is dominated by Ävrö granite (501044). Subordinate rock types comprise quartz monzodiorite (501036), fine-grained dioritoid (501030), fine-grained granite (511058), diorite/gabbro (501030) and fine-grained diorite-gabbro (505102).

Seven sections in KLX21B are recognized by increased fracture frequencies, alterations and structural features;

Section interval characteristics

1. 100–110 m. Increased frequency of sealed fractures, slight increase of open fractures and open fractures with aperture > 0.5 mm, sealed fracture networks and one ductile shear zone. The section is partly red stained and silicificated.
2. 131–135 m. Increased frequency of sealed fractures and sealed networks, breccias and cataclasites. The section is weak to medium red stained.

Table 5-1. Lithology distribution in KLX21B.

Rock types	%
Ävrö granite (501044)	83.5
Quartz monzodiorite (501036)	9.8
Fine-grained dioritoid (501030)	5.2
Fine-grained granite (511058)	1.0
Diorite/Gabbro (501033)	0.4
Fine-grained diorite-gabbro (505102)	0.1

3. 150–157 m. Increased frequency of sealed fractures and sealed fracture networks. Slight increase of open fractures. Brittle-ductile shear zones, cataclasites and breccias. The section is weak to medium red stained and partly epidotized.
4. 210–215 m. Increased frequency of sealed fractures, sealed fracture networks, slight increase of opened fractures and eight cataclasites. The section is weak to medium red stained and partly epidotized.
5. 445–456 m. Increased frequency of opened and sealed fractures, sealed fracture networks, cataclasites and brittle-ductile shear zones. The section is partly red stained and epidotized.
6. 590–707 m. Increased frequency of open and sealed fractures, open fractures with aperture > 0.5 mm, sealed fracture networks, brittle-ductile shear zones, cataclasites, mylonites ductile shear zoned, breccias, three crush zones and one core loss. The section is weak to medium red stained and partly epidotized.

5.3 Fracture mineralogy

Tables 5-3 and 5-4 show the frequency of minerals and rock wall alteration in sealed fractures and open fractures respectively. Minerals less than 0.1 % are not accounted for. For X-mineral classification, see Section 4.3.5.

Calcite and chlorite are the most frequently occurring minerals in open fractures. Subordinate minerals are pyrite and epidote. In sealed fractures the dominating mineral and rock wall alteration is oxidized walls and calcite. Subordinate minerals are epidote and chlorite.

Worth to notice is the occurrences of gypsum (X1) and fractures with thick sulphide mineralization. Also worth noticing is the occurrence of fracture wall alterations and rock wall alterations, silicification and/or sericitization, resembling the same type of alterations found in KLX06 and KLX09A.

Table 5-3. Frequency of minerals and rock wall alteration in open fractures.

Mineral	%
Adularia	3.1
Calcite	86.6
Chlorite	71.0
Clay Minerals	10.0
Epidote	29.5
Flourite	0.1
Hematite	9.8
Laumontite	0.2
Oxidized Walls	13.2
Prehnite	2.7
Pyrite	20.3
Quartz	1.1
Sulphides	0.4
Unknown Mineral	0.4
X1	0.1
X5	0.1
X7	1.6
X8	0.4

Table 5-4. Frequency of minerals and rock wall alteration in sealed fractures.

Mineral	%
Adularia	4.7
Calcite	48.0
Chlorite	25.6
Clay Minerals	0.2
Epidote	28.2
Fluorite	0.1
Hematite	0.8
Oxidized Walls	45.1
Prehnite	8.8
Pyrite	3.9
Quartz	8.5
Red Feldspar	0.4
Sericite	0.1
Sulphides	0.1
White Feldspar	2.7
X5	4.0
X7	0.3
X8	5.5

Search path for the Geological summary table

TABLE HEAD LINES		INFORMATION SOURCE			PRESENTATION
Head lines	Sub head lines	Varcode	First suborder	Second suborder	Interval / frequency
Rock type	Lithology	5	Sub 1		Interval
	Grain size	5	Sub 5		Interval
	Texture	5	Sub 6		Interval
Alteration	Type	7	Sub 1 = 700		Interval
	Intensity	7	Sub 1 = 700	Sub 2	Interval
Rock occurrence	Vein + dyke	31	Sub 1 = 2 and 18		Frequency
Structure	Shear zone, < 1m wide	31	Sub 4 = 41 and 42		Frequency
	Brecciated, < 1m wide	31	Sub 4 = 7		Frequency
	Brecciated, >= 1m wide	5	Sub 3 = 7	Sub 4; 101 and 102 = 102	Interval
		5	Sub 3 = 7	Sub 4; 103 and 104 = 104	
	Mylonite, < 1 m wide	31	Sub 4 = 34		Frequency
	Mylonite, >= 1 m wide	5	Sub 3 = 34	Sub 4; 101 and 102 = 102	Interval
		5	Sub 3 = 34	Sub 4; 103 and 104 = 104	
	Foliated, < 1 m wide	31	Sub 4 = 81		Frequency
Foliated, >= 1 m wide	5	Sub 3 = 81	Sub 4; 101 and 102 = 102	Interval	
	5	Sub 3 = 81	Sub 4; 103 and 104 = 104		
Sealed fracture	All unbroken fractures and broken fractures	3			Frequency
		2	SNUM 11= 0		
	Broken fractures, Aperture = 0	2	SNum 11 = 0		Frequency
	Sealed fracture network < 1 m wide	32			Frequency
Sealed fracture network >= 1 m wide	32			Interval	
Open fractures	All, Aperture > 0	2 and 3	SNum 11>0		Frequency
	Uncertain, Aperture = 0.5 possible and 0.5 probable	2 and 3	SNum 11>0	Sub 12 = 3	Frequency
		2 and 3	SNum 11>0	Sub 12 = 2	
	Certain, Aperture = 0.5 and >0.5	2 and 3	SNum 11>0	Sub 12 = 1	Frequency
	Joint alteration > 1.5	2	SNum16 > 1.5		Frequency
	Crush < 1 m wide	4			Frequency
	Crush >= 1 m wide	4			Interval

BIPS-image for KLX21B

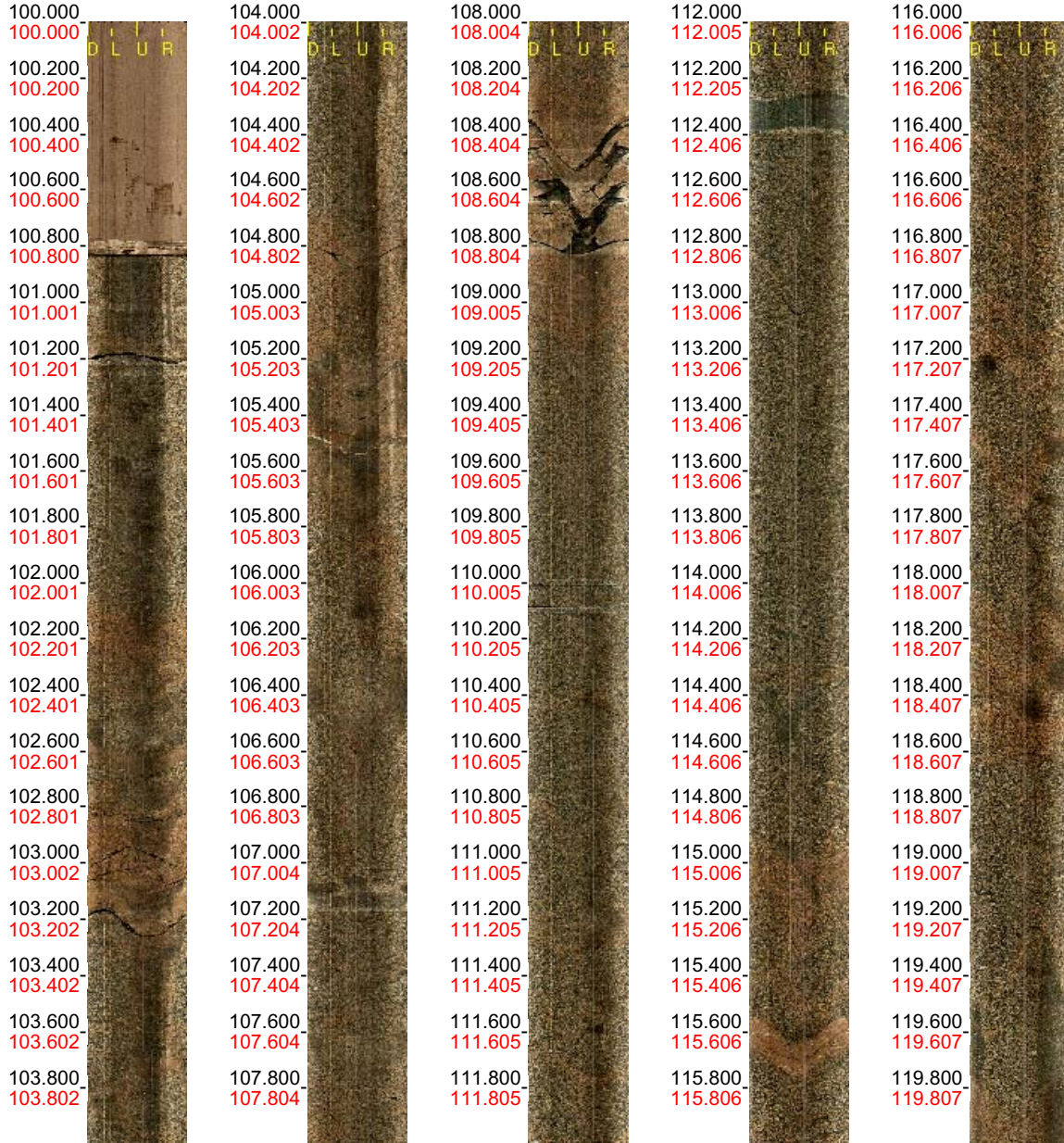
Borehole Name: KLX21B
Mapping Name: KLX21B_Geosigma_1
Mapping Range: 100.000 - 858.773 m
Diameter: 76.0 mm
Printed Range: 100.000 - 856.352
Pages: 39

Image File Information:

File: G:\skb\bips\oskarshamn\KLX21B\Used\KLX21B_100-856o227m.BIP
Date/Time: 2007-01-02 15:35:00
Start Depth: 100.000 m
End Depth: 856.352 m
Resolution: 1.00 mm/pixel (depth)
Orientation: Gravmetric
Image height: 756352 pixels
Image width: 360 pixels
BIP Version: BIP-III
Locality: LAXEMAR
Borehole: KLX21B
Scan Direction: Down
Color adjust: 0 0 0 (RGB)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 100.000 - 120.000 m
Azimuth: 226.8
Inclination: -69.3



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

2 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 120.000 - 140.000 m
Azimuth: 227.0
Inclination: -69.2



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

3 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 140.000 - 160.000 m
Azimuth: 227.2
Inclination: -69.2



Printed: 2007-03-01 08:31:58

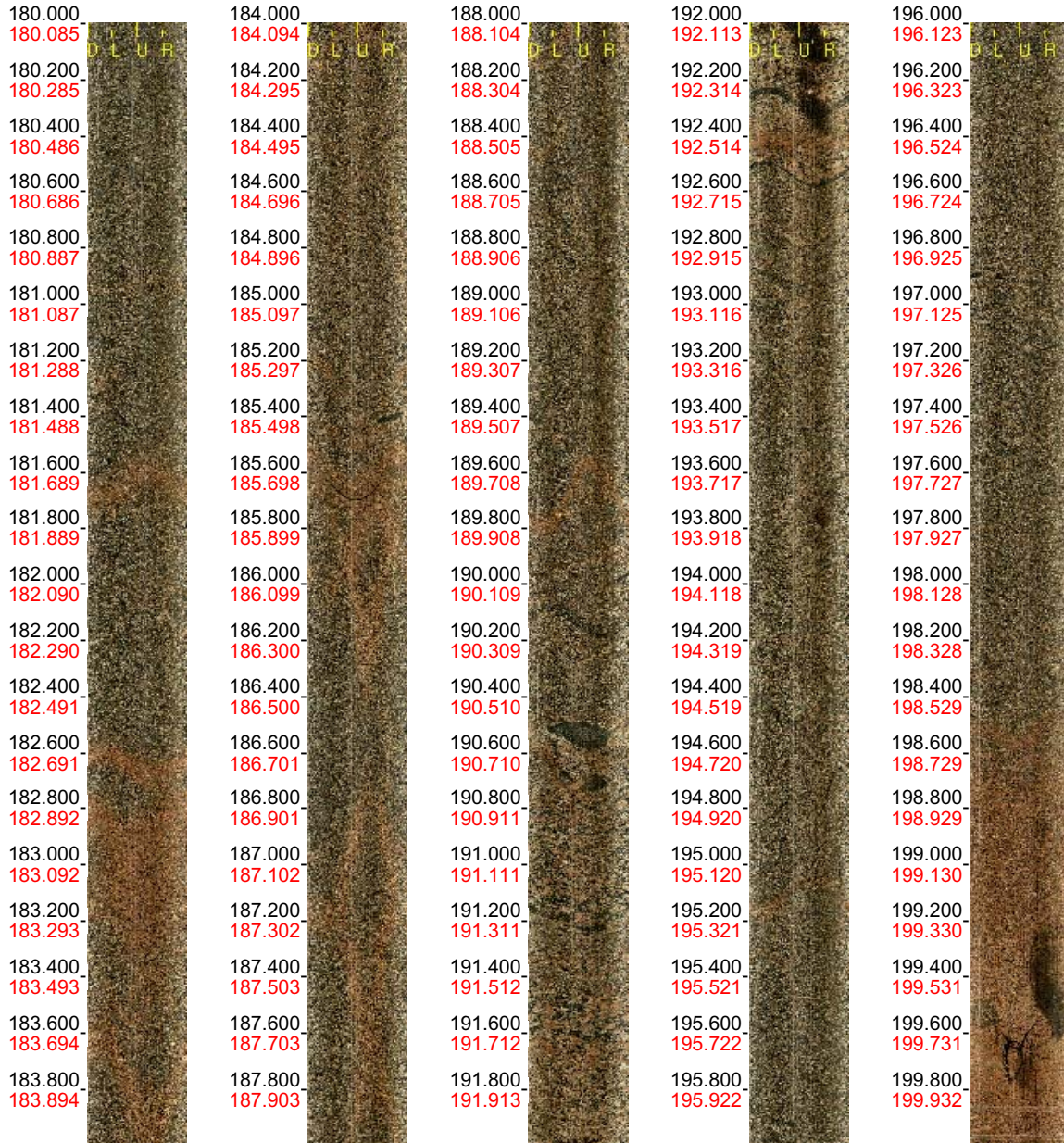
Scale: 1 : 20

Aspect: 150 %

4 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 180.000 - 200.000 m
Azimuth: 227.3
Inclination: -69.0



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

6 (39)

Borehole: KLX21B
 Mapping: KLX21B_Geosigma_1

Depth range: 200.000 - 220.000 m
 Azimuth: 226.9
 Inclination: -68.9



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

7 (39)

Borehole: KLX21B
 Mapping: KLX21B_Geosigma_1

Depth range: 220.000 - 240.000 m
 Azimuth: 227.6
 Inclination: -68.9



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

8 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 240.000 - 260.000 m
Azimuth: 227.0
Inclination: -68.8



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

9 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 260.000 - 280.000 m
Azimuth: 226.8
Inclination: -68.7



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

10 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 280.000 - 300.000 m
Azimuth: 226.2
Inclination: -68.7



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

11 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 300.000 - 320.000 m
Azimuth: 227.1
Inclination: -68.5



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

12 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 320.000 - 340.000 m
Azimuth: 226.0
Inclination: -68.5



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

13 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 340.000 - 360.000 m
Azimuth: 227.0
Inclination: -68.4



Printed: 2007-03-01 08:31:58

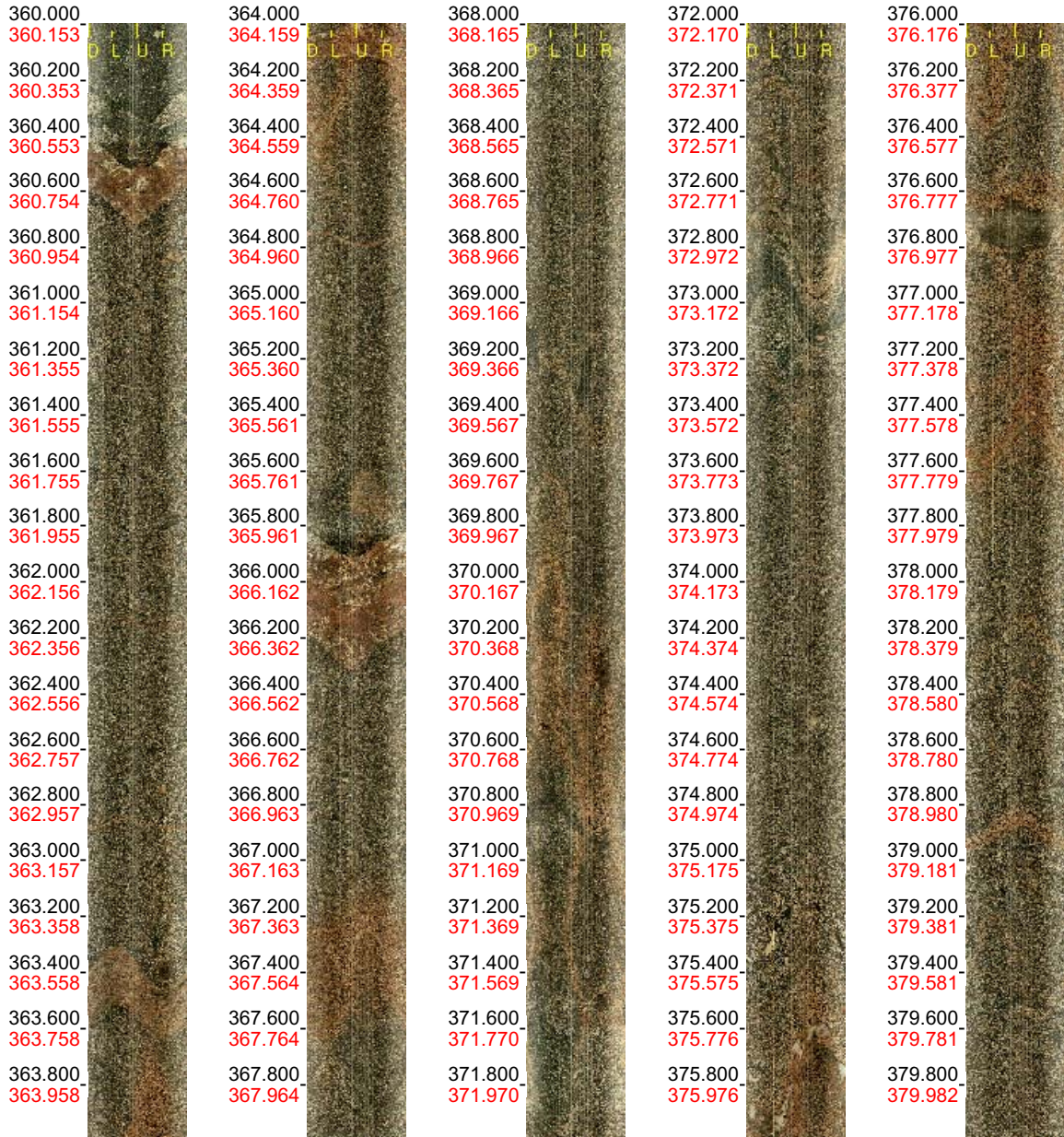
Scale: 1 : 20

Aspect: 150 %

14 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 360.000 - 380.000 m
Azimuth: 226.2
Inclination: -68.4



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

15 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 380.000 - 400.000 m
Azimuth: 225.7
Inclination: -68.5



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

16 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 400.000 - 420.000 m
Azimuth: 225.2
Inclination: -68.6



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

17 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 420.000 - 440.000 m
Azimuth: 225.5
Inclination: -68.6



Printed: 2007-03-01 08:31:58

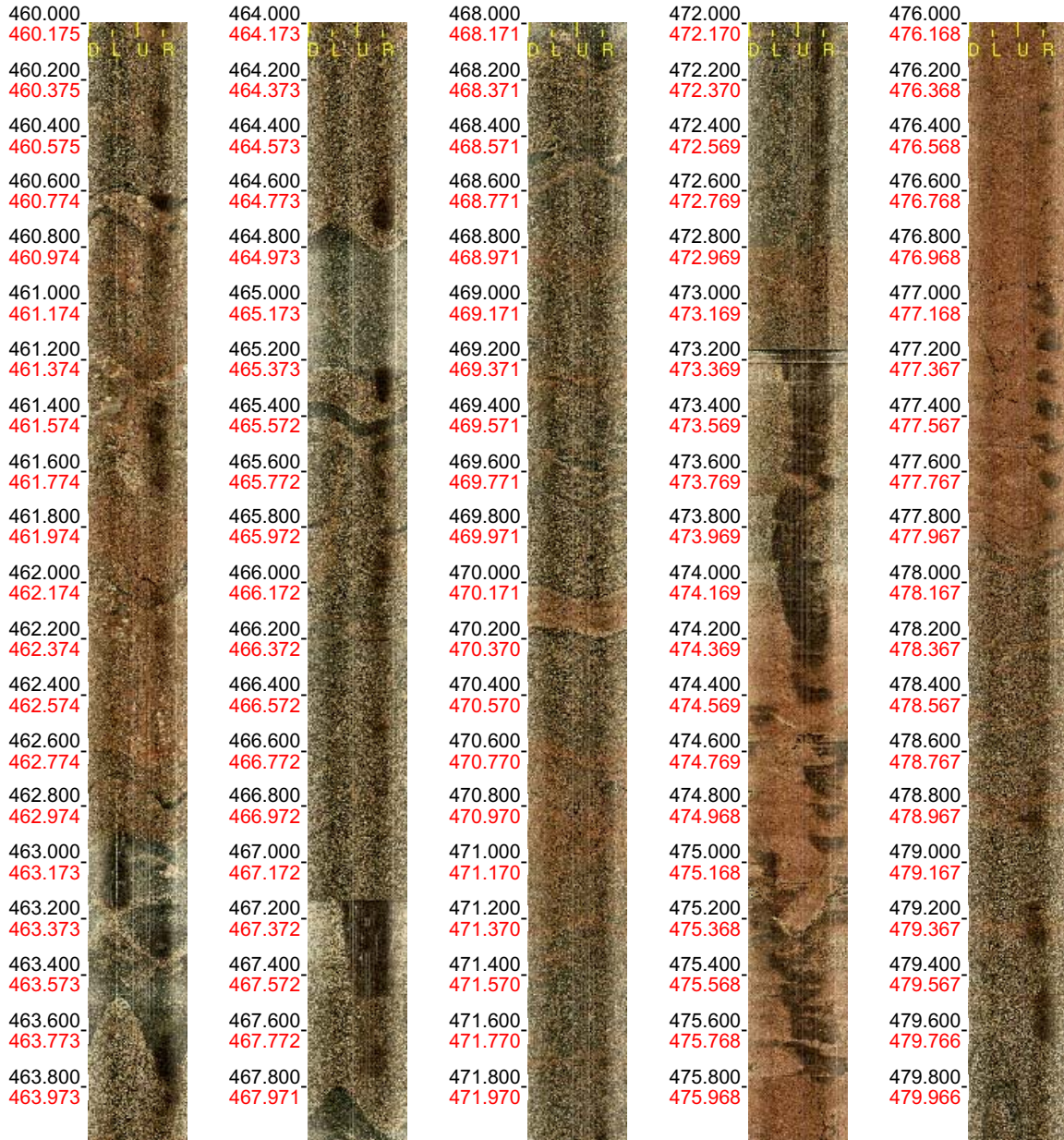
Scale: 1 : 20

Aspect: 150 %

18 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 460.000 - 480.000 m
Azimuth: 225.3
Inclination: -68.6



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

20 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 480.000 - 500.000 m
Azimuth: 224.8
Inclination: -68.5



Printed: 2007-03-01 08:31:58

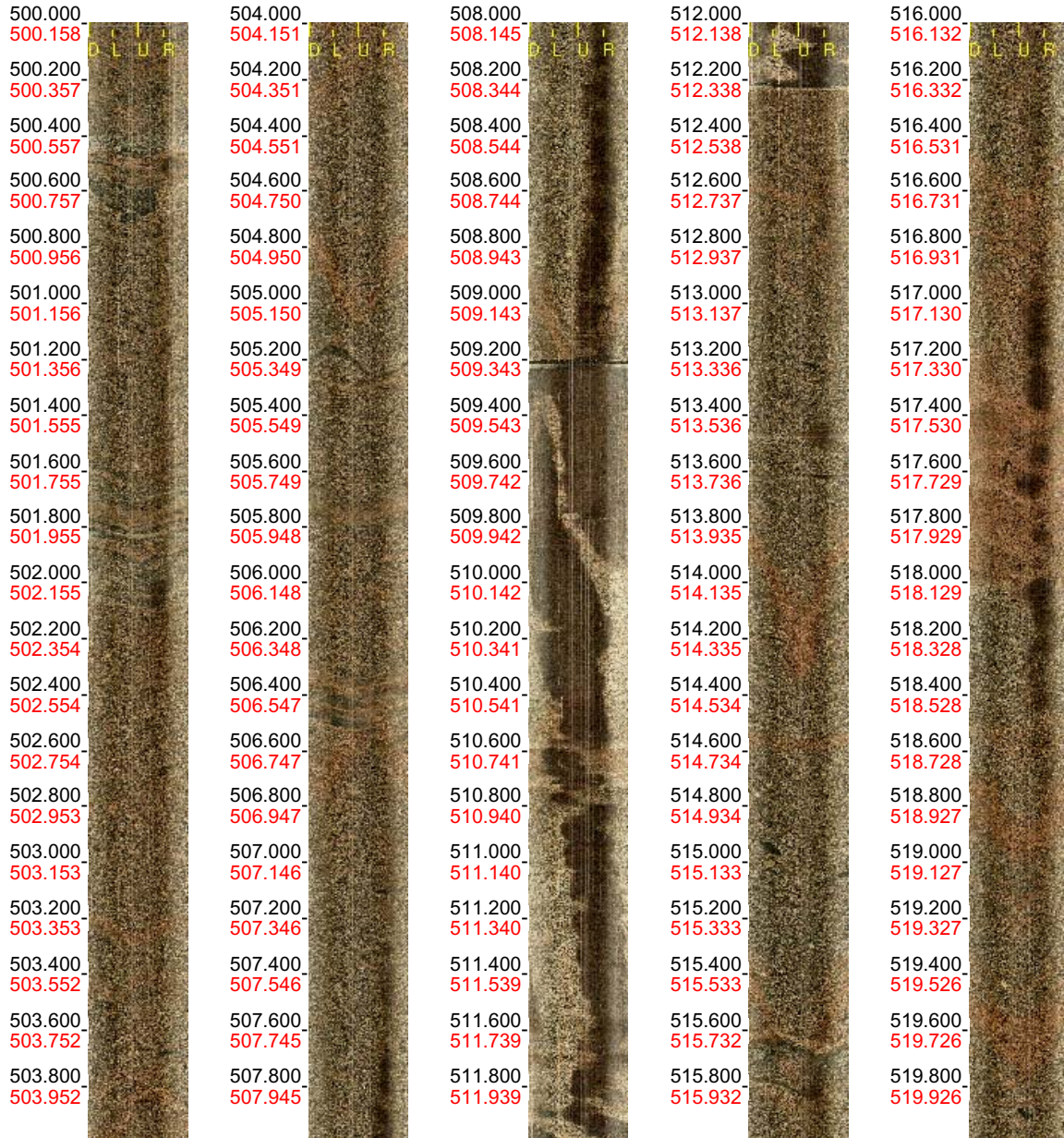
Scale: 1 : 20

Aspect: 150 %

21 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 500.000 - 520.000 m
Azimuth: 224.8
Inclination: -68.5



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

22 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 520.000 - 540.000 m
Azimuth: 224.9
Inclination: -68.5



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

23 (39)

Borehole: KLX21B
 Mapping: KLX21B_Geosigma_1

Depth range: 540.000 - 560.000 m
 Azimuth: 224.5
 Inclination: -68.5



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

24 (39)

Borehole: KLX21B
 Mapping: KLX21B_Geosigma_1

Depth range: 560.000 - 580.000 m
 Azimuth: 224.5
 Inclination: -68.4



Printed: 2007-03-01 08:31:58

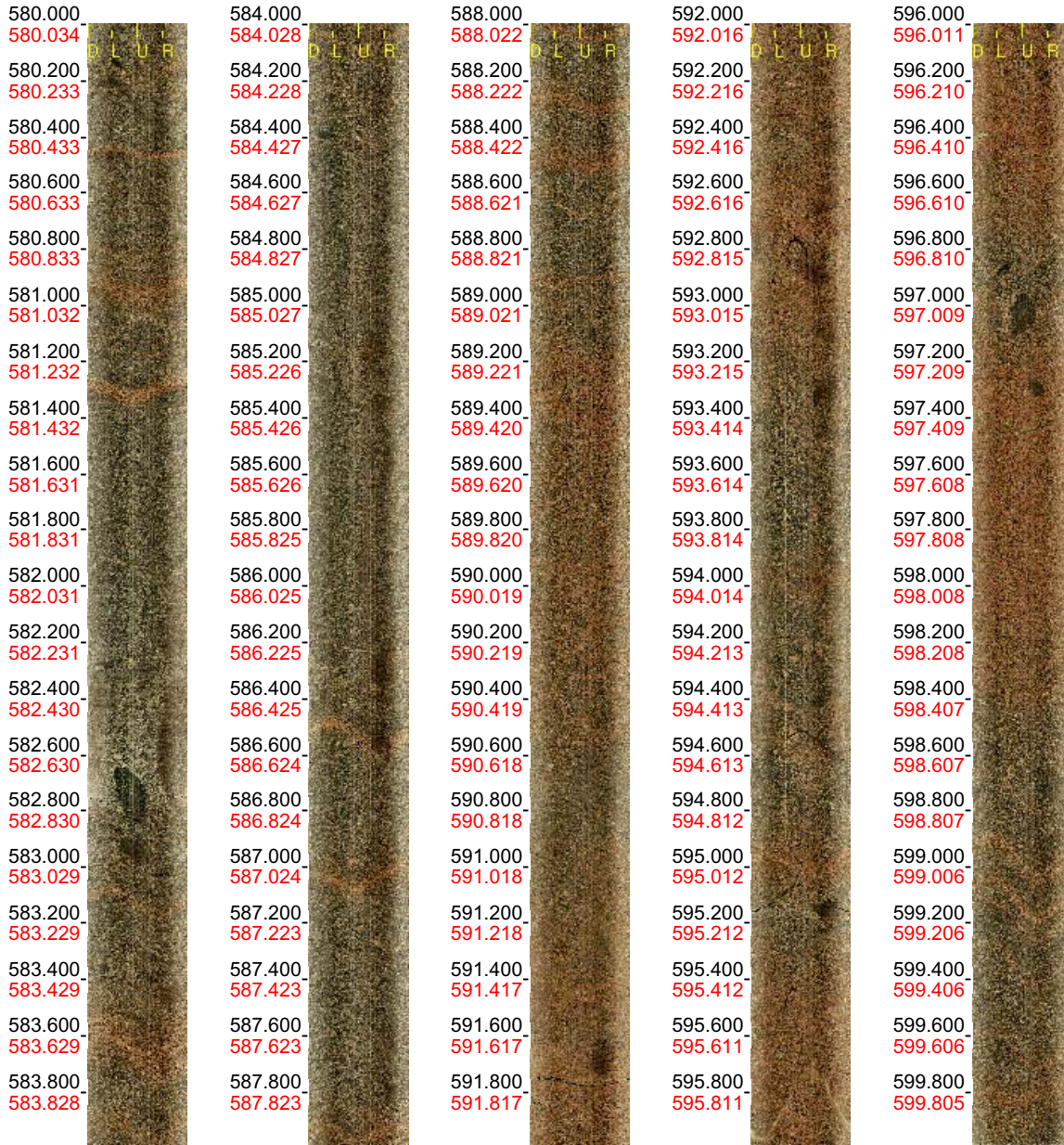
Scale: 1 : 20

Aspect: 150 %

25 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 580.000 - 600.000 m
Azimuth: 223.1
Inclination: -68.4



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

26 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 600.000 - 620.000 m
Azimuth: 223.0
Inclination: -68.3



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

27 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 620.000 - 640.000 m
Azimuth: 223.3
Inclination: -68.3



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

28 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 640.000 - 660.000 m
Azimuth: 223.8
Inclination: -68.3



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

29 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 660.000 - 680.000 m
Azimuth: 224.5
Inclination: -68.2



Printed: 2007-03-01 08:31:58

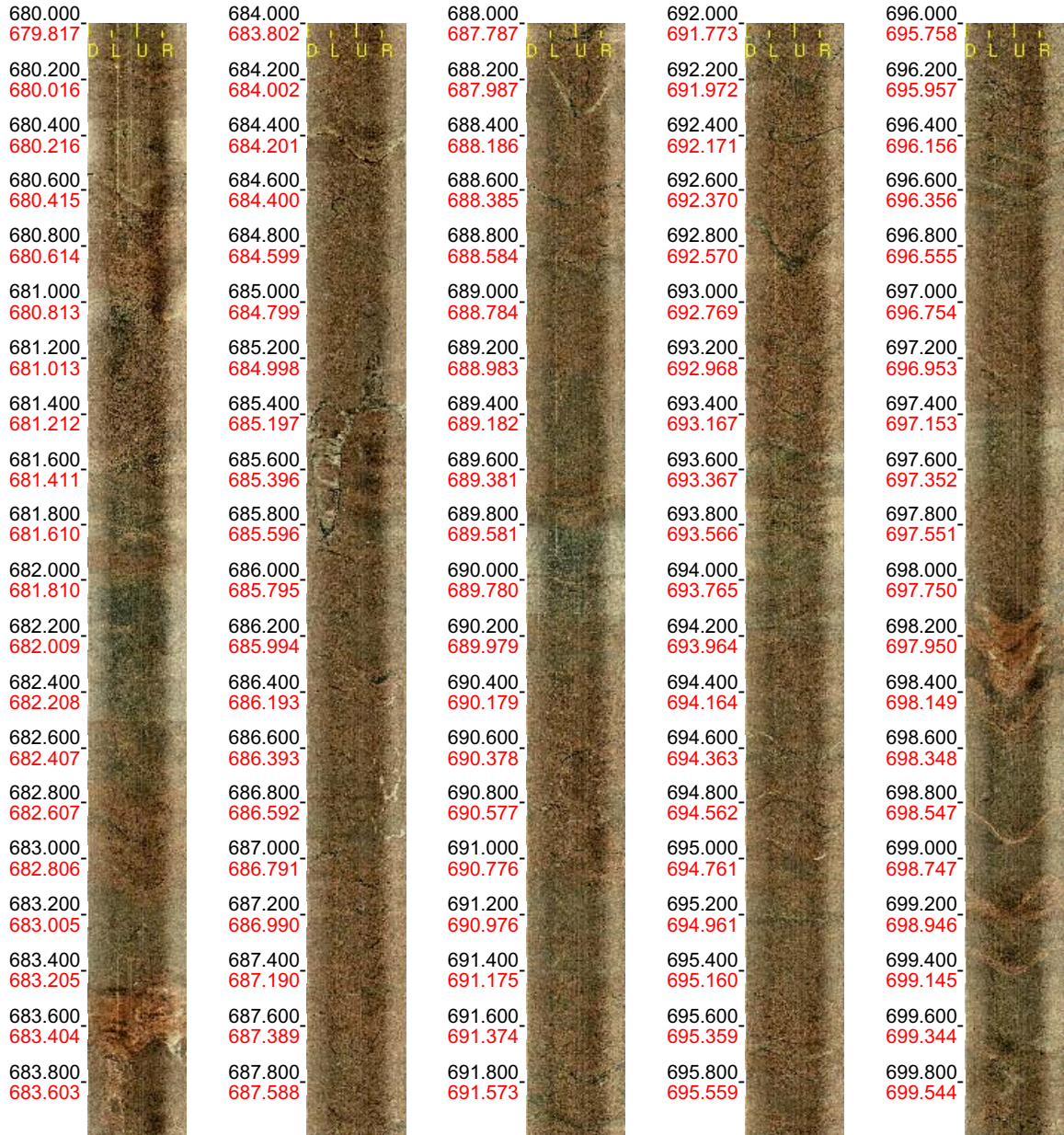
Scale: 1 : 20

Aspect: 150 %

30 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 680.000 - 700.000 m
Azimuth: 223.7
Inclination: -68.2



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

31 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 700.000 - 720.000 m
Azimuth: 223.9
Inclination: -68.2



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

32 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 720.000 - 740.000 m
Azimuth: 224.9
Inclination: -68.3



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

33 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 740.000 - 760.000 m
Azimuth: 224.4
Inclination: -68.2



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

34 (39)

Borehole: KLX21B
 Mapping: KLX21B_Geosigma_1

Depth range: 760.000 - 780.000 m
 Azimuth: 224.2
 Inclination: -68.1



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

35 (39)

Borehole: KLX21B
Mapping: KLX21B_Geosigma_1

Depth range: 780.000 - 800.000 m
Azimuth: 225.2
Inclination: -68.1



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

36 (39)

Borehole: KLX21B
 Mapping: KLX21B_Geosigma_1

Depth range: 800.000 - 820.000 m
 Azimuth: 223.0
 Inclination: -68.0



Printed: 2007-03-01 08:31:58

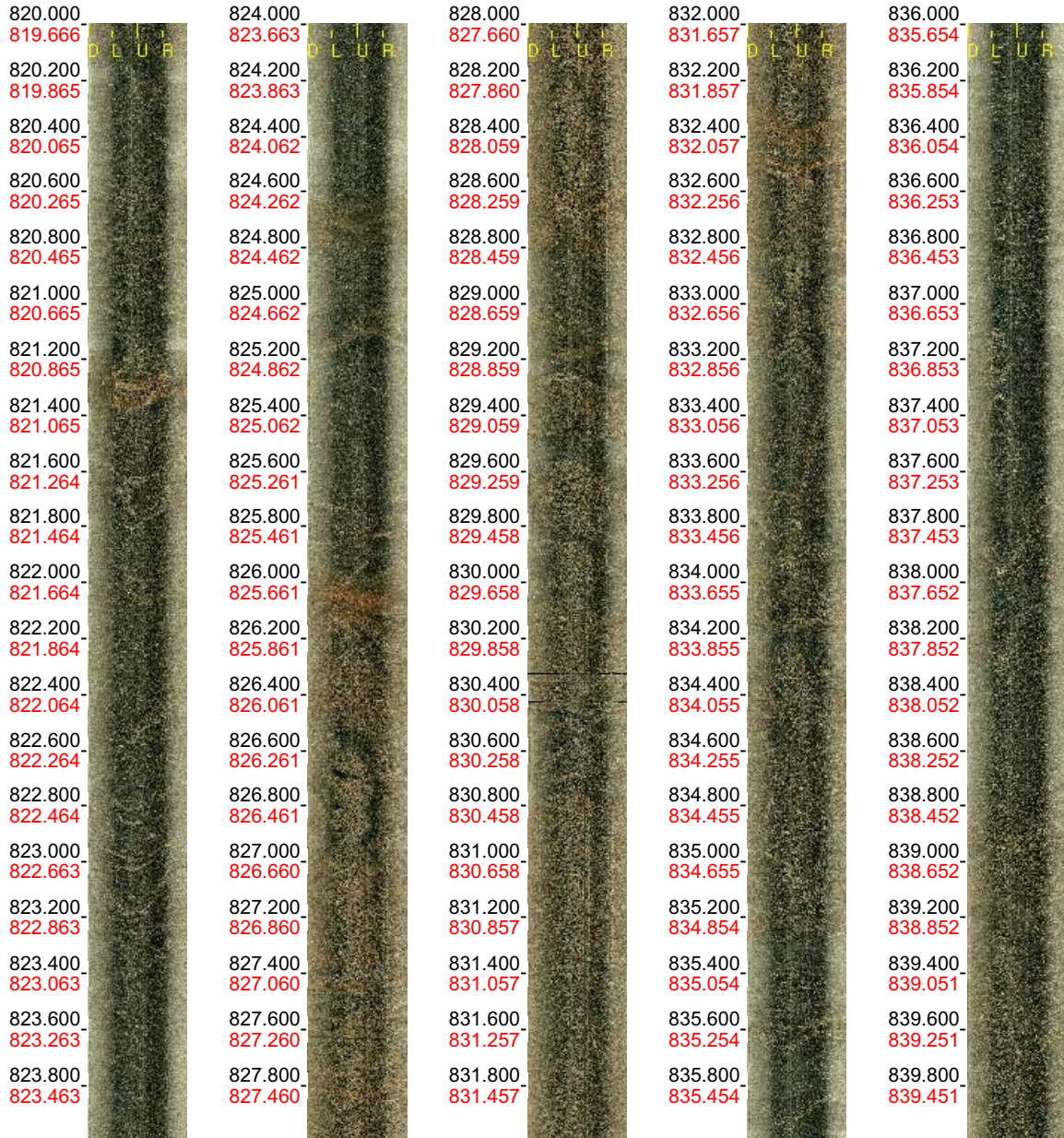
Scale: 1 : 20

Aspect: 150 %

37 (39)

Borehole: KLX21B
 Mapping: KLX21B_Geosigma_1

Depth range: 820.000 - 840.000 m
 Azimuth: 224.7
 Inclination: -68.0



Printed: 2007-03-01 08:31:58

Scale: 1 : 20

Aspect: 150 %

38 (39)

Borehole: KLX21B
 Mapping: KLX21B_Geosigma_1

Depth range: 840.000 - 856.352 m
 Azimuth: 223.7
 Inclination: -68.0



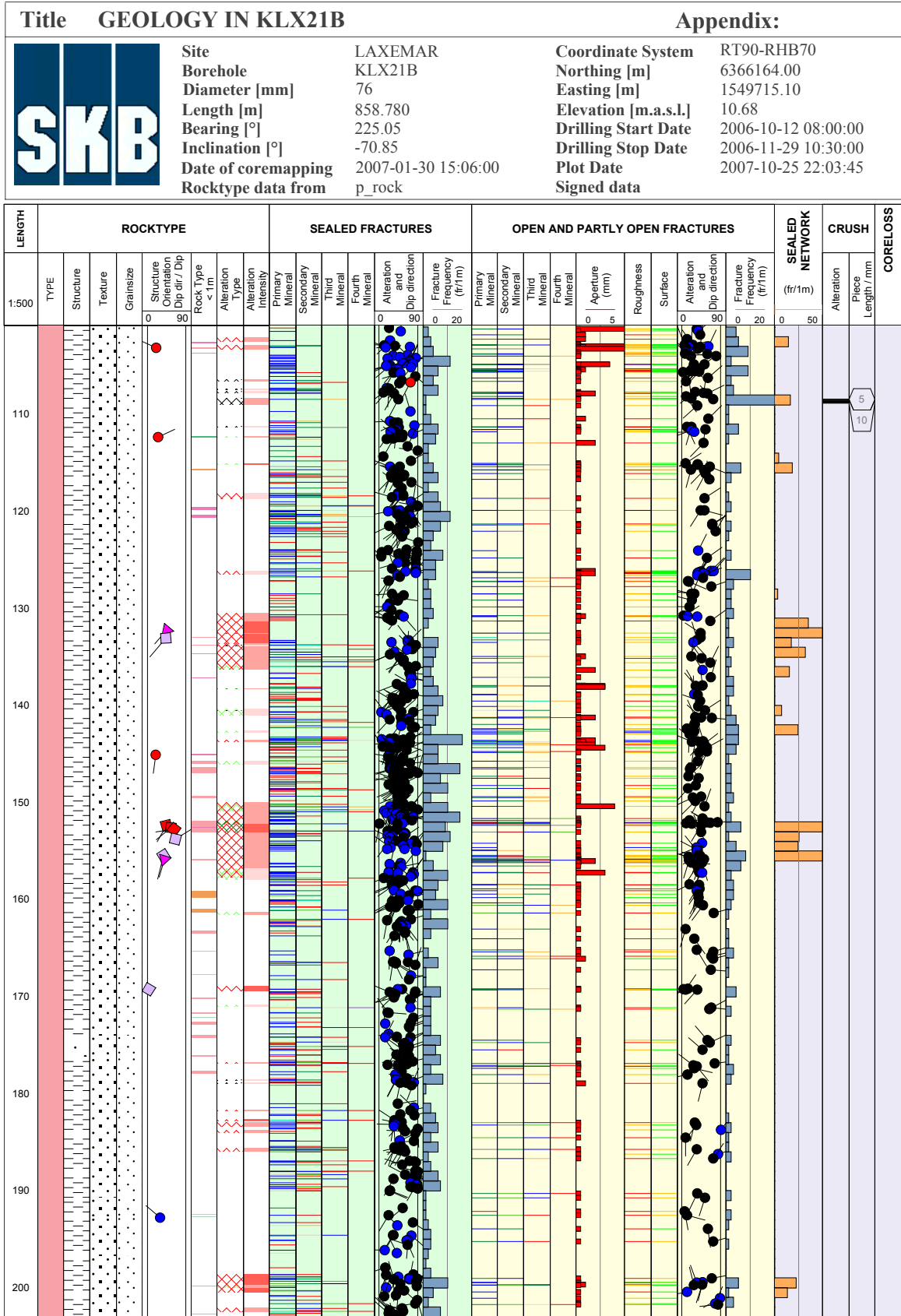
Printed: 2007-03-01 08:31:58

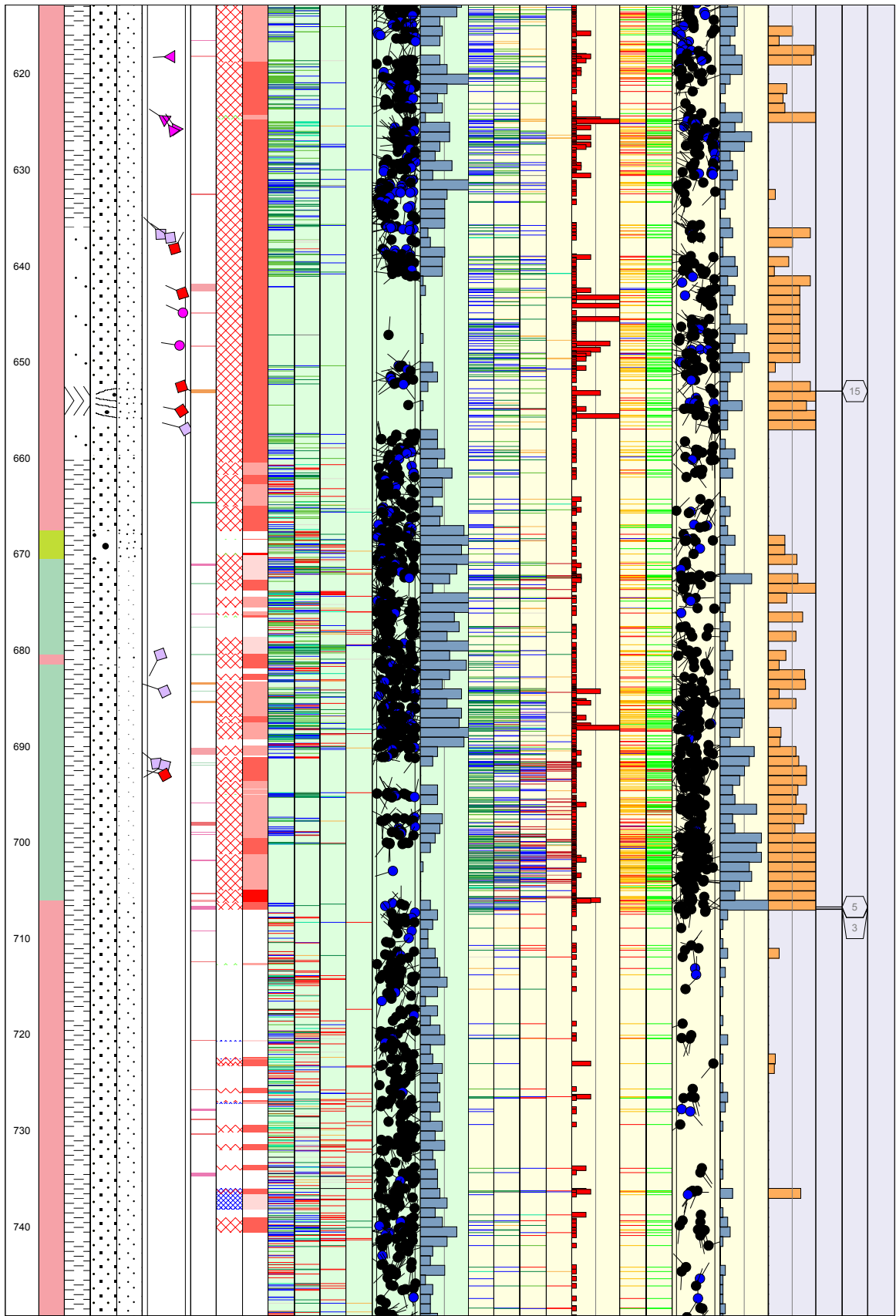
Scale: 1 : 20

Aspect: 150 %

39 (39)

WellCad diagram for KLX21B





Legend to WellCad diagram for KLX21B

Title		LEGEND FOR LAXEMAR	KLX21B
		Site	LAXEMAR
		Borehole	KLX21B
	Plot Date	2007-10-25 22:03:45	
	Signed data		
<p>ROCKTYPE LAXEMAR</p> <ul style="list-style-type: none"> Äspö Diorite Dolerite Fine-grained Götemargranite Coarse-grained Götemargranite Fine-grained granite Pegmatite Granite Ävrö granite Quartz monzodiorite Diorite / Gabbro Fine-grained dioritoid Fine-grained diorite-gabbro Sulphide mineralization Sandstone Soil Ävrö quartz monzodiorite Ävrö granodiorite 			
<p>ROCK ALTERATION TYPE</p> <ul style="list-style-type: none"> Oxidized Chloritized Epidotized Weathered Tectonized Sericitized Quartz dissolution Silicification Argillization Albitization Carbonatization Saussuritization Steatitization Uralitization Laumontitization Fract zone alteration 			
<p>MINERAL</p> <ul style="list-style-type: none"> Epidote Hematite Calcite Chlorite Quartz Unknown Pyrite Sulfides Clay Minerals Prehnite Oxidized Walls 			
<p>STRUCTURE</p> <ul style="list-style-type: none"> Cataclastic Schistose Gneissic Mylonitic Ductile Shear Zone Brittle-Ductile Zone Veined Banded Massive Foliated Brecciated Lineated 		<p>STRUCTURE ORIENTATION</p> <ul style="list-style-type: none"> Cataclastic Bedded Gneissic Schistose Brittle-Ductile Shear Zone Ductile Shear Zone Lineated Banded Veined Brecciated Foliated Mylonitic 	
<p>TEXTURE</p> <ul style="list-style-type: none"> Hornfelsed Porphyritic Ophitic Equigranular Augen-Bearing Unequigranular Metamorphic 		<p>ROCK ALTERATION INTENSITY</p> <ul style="list-style-type: none"> No intensity Faint Weak Medium Strong 	
<p>GRAINSIZE</p> <ul style="list-style-type: none"> Aphanitic Fine-grained Fine to medium grained Medium to coarse grained Coarse-grained Medium-grained 		<p>ROUGHNESS</p> <ul style="list-style-type: none"> Planar Undulating Stepped Irregular 	
		<p>SURFACE</p> <ul style="list-style-type: none"> Rough Smooth Slickensided 	
		<p>CRUSH ALTERATION</p> <ul style="list-style-type: none"> Slightly Altered Moderately Altered Highly Altered Completely Altered Gouge Fresh 	
		<p>FRACTURE ALTERATION</p> <ul style="list-style-type: none"> Slightly Altered Moderately Altered Highly Altered Completely Altered Gouge Fresh 	
		<p>FRACTURE DIRECTION STRUCTURE ORIENTATION</p> 	

In-data: Borehole length and diameter for KLX21B

KLX21B, 2006-10-12 08:00:00 - 2006-11-29 10:30:00 (99.410 - 858.780 m)

Sub Secup (m)	Sub Seclow (m)	Hole Diam (m)	Comment
99.410	100.000	0.0862	T-86
100.000	100.850	0.0862	T-86 (rymning)
100.850	858.780	0.0758	Corac N/3

Printout from SICADA 2007-03-01 08:50:19.

Appendix 7

In-data: Reference marks for length adjustments for KLX21B

KLX21B, 2006-12-06 11:30:00 - 2006-12-07 10:00:00 (110.000 - 830.000 m)

Bhlen (m)	Rotation Speed (rpm)	Start Flow (l/h)	Stop Flow (l/h)	Stop Pressure (bar)	Cutter Time (s)	Trace Detectable	Cutter Diameter (mm)	Comment
110.00	400.00			35.0	28	Yes		
150.00	400.00			34.0	42	Yes		Flödesmätaren på spårfräspumpen ur funktion fastnar på 400L/h
200.00	400.00			34.0	41	Yes		Glaset sprucket visar ej troligt värde
250.00	400.00			38.0	40	Yes		Kör på barmätaren får en tydlig
300.00	400.00			35.0	36	Yes		indikation när kutsarna är ute helt
350.00	400.00			36.0	38	Yes		med ett tryckfall på ca 3-5 bar
400.00	400.00			38.0	39	Yes		
450.00	400.00			34.0	35	Yes		
500.00	400.00			35.0	37	Yes		
550.00	400.00			35.0	38	Yes		
600.00	400.00			34.0	41	Yes		
650.00	400.00			40.0	43	Yes		
700.00	400.00			37.0	38	Yes		
750.00	400.00			39.0	40	Yes		
800.00	400.00			38.0	39	Yes		
830.00	400.00			39.0	38	Yes		Släppte kulan 9:18

Printout from SICADA 2007-02-12 14:56:22.

In-data: Borehole deviation data for KLX21B

SICADA - object_location

Idcode	Coord System	Northing (m)	Easting (m)	Elevation (m.a.s.l.)	Length (m)	Vertical Depth (m)	Inclination (degrees)	Bearing (degrees)	Inclination Uncert (degrees)	Bearing Uncert (degrees)	Radius Uncert (m)	Origin	Indat
KLX21B	RT90-RHB70	6366164.00	1549715.10	10.68	0.00	0.00	-70.86	225.05	0.135	3.350	0.00	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366163.30	1549714.41	7.84	3.00	2.83	-70.86	225.05	0.135	3.350	0.06	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366162.61	1549713.71	5.01	6.00	5.67	-70.68	225.16	0.135	3.350	0.12	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366161.91	1549713.00	2.18	9.00	8.50	-70.66	225.18	0.135	3.350	0.17	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366161.21	1549712.30	-0.65	12.00	11.33	-70.63	225.25	0.135	3.350	0.23	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366160.51	1549711.59	-3.48	15.00	14.16	-70.69	225.29	0.135	3.350	0.29	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366159.81	1549710.88	-6.31	18.00	16.99	-70.66	225.25	0.135	3.350	0.35	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366159.11	1549710.18	-9.14	21.00	19.82	-70.62	225.22	0.135	3.350	0.41	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366158.41	1549709.47	-11.97	24.00	22.65	-70.57	225.22	0.135	3.350	0.46	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366157.70	1549708.76	-14.80	27.00	25.48	-70.55	225.21	0.135	3.350	0.52	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366157.00	1549708.05	-17.63	30.00	28.31	-70.52	225.18	0.135	3.350	0.58	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366156.29	1549707.34	-20.46	33.00	31.13	-70.46	225.16	0.135	3.350	0.64	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366155.58	1549706.63	-23.28	36.00	33.96	-70.44	225.20	0.135	3.350	0.70	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366154.88	1549705.92	-26.11	39.00	36.79	-70.41	225.23	0.135	3.350	0.76	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366154.17	1549705.20	-28.94	42.00	39.61	-70.37	225.31	0.135	3.350	0.82	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366153.46	1549704.48	-31.76	45.00	42.44	-70.27	225.33	0.135	3.350	0.88	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366152.74	1549703.76	-34.58	48.00	45.26	-70.22	225.37	0.135	3.350	0.93	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366152.03	1549703.04	-37.41	51.00	48.09	-70.18	225.38	0.135	3.350	0.99	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366151.31	1549702.31	-40.23	54.00	50.91	-70.16	225.37	0.135	3.350	1.05	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366150.60	1549701.59	-43.05	57.00	53.73	-70.16	225.36	0.135	3.350	1.11	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366149.88	1549700.87	-45.87	60.00	56.55	-70.15	225.36	0.135	3.350	1.17	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366149.17	1549700.14	-48.69	63.00	59.37	-70.10	225.33	0.135	3.350	1.23	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366148.45	1549699.41	-51.51	66.00	62.19	-70.06	225.36	0.135	3.350	1.29	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366147.73	1549698.68	-54.33	69.00	65.01	-70.00	225.38	0.135	3.350	1.35	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366147.01	1549697.95	-57.15	72.00	67.83	-69.93	225.44	0.135	3.350	1.41	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366146.28	1549697.22	-59.97	75.00	70.65	-69.94	225.49	0.135	3.350	1.47	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366145.56	1549696.48	-62.79	78.00	73.47	-69.86	225.49	0.135	3.350	1.53	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366144.84	1549695.74	-65.60	81.00	76.28	-69.80	225.45	0.135	3.350	1.59	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366144.11	1549695.01	-68.42	84.00	79.10	-69.70	225.43	0.135	3.350	1.65	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366143.38	1549694.26	-71.23	87.00	81.91	-69.66	225.41	0.135	3.350	1.71	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366142.64	1549693.52	-74.04	90.00	84.72	-69.55	225.45	0.135	3.350	1.78	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366141.91	1549692.77	-76.85	93.00	87.53	-69.53	225.57	0.135	3.350	1.84	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366141.17	1549692.02	-79.66	96.00	90.34	-69.47	225.66	0.135	3.350	1.90	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366140.44	1549691.27	-82.47	99.00	93.15	-69.41	225.71	0.135	3.350	1.96	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366139.70	1549690.51	-85.28	102.00	95.96	-69.31	225.73	0.135	3.350	2.02	Measured	2007-08-21 09:04

KLX21B	RT90-RHB70	6366138.96	1549689.75-88.09	105.00	98.77	-69.30	225.76	0.135	3.350	2.08	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366138.22	1549688.99-90.89	108.00	101.57	-69.28	225.76	0.135	3.350	2.15	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366137.48	1549688.23-93.70	111.00	104.38	-69.27	225.77	0.135	3.350	2.21	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366136.74	1549687.47-96.51	114.00	107.18	-69.27	225.83	0.135	3.350	2.27	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366136.00	1549686.71-99.31	117.00	109.99	-69.23	225.85	0.135	3.350	2.33	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366135.26	1549685.93-102.12	120.00	112.79	-69.22	226.95	0.135	3.350	2.39	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366134.54	1549685.16-104.92	123.00	115.60	-69.22	226.95	0.135	3.350	2.46	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366133.81	1549684.38-107.73	126.00	118.40	-69.22	226.45	0.135	3.350	2.52	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366133.07	1549683.61-110.53	129.00	121.21	-69.22	226.45	0.135	3.350	2.58	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366132.34	1549682.84-113.34	132.00	124.01	-69.22	226.45	0.135	3.350	2.64	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366131.61	1549682.06-116.14	135.00	126.82	-69.19	227.20	0.135	3.350	2.71	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366130.89	1549681.28-118.94	138.00	129.62	-69.18	227.21	0.135	3.350	2.77	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366130.17	1549680.50-121.75	141.00	132.43	-69.18	227.43	0.135	3.350	2.83	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366129.45	1549679.71-124.55	144.00	135.23	-69.19	228.01	0.135	3.350	2.89	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366128.72	1549678.93-127.36	147.00	138.03	-69.19	226.17	0.135	3.350	2.96	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366127.99	1549678.16-130.16	150.00	140.84	-69.23	226.24	0.135	3.350	3.02	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366127.25	1549677.39-132.97	153.00	143.64	-69.24	226.28	0.135	3.350	3.08	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366126.52	1549676.62-135.77	156.00	146.45	-69.24	226.45	0.135	3.350	3.14	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366125.79	1549675.84-138.58	159.00	149.25	-69.21	228.12	0.135	3.350	3.20	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366125.08	1549675.04-141.38	162.00	152.06	-69.13	228.14	0.135	3.350	3.27	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366124.37	1549674.25-144.18	165.00	154.86	-69.09	228.12	0.135	3.350	3.33	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366123.65	1549673.45-146.99	168.00	157.66	-69.09	228.05	0.135	3.350	3.39	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366122.94	1549672.65-149.79	171.00	160.47	-69.07	228.52	0.135	3.350	3.45	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366122.23	1549671.85-152.59	174.00	163.27	-69.06	227.76	0.135	3.350	3.52	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366121.50	1549671.06-155.39	177.00	166.07	-69.05	227.54	0.135	3.350	3.58	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366120.78	1549670.27-158.19	180.00	168.87	-69.04	227.34	0.135	3.350	3.64	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366120.05	1549669.48-160.99	183.00	171.67	-69.03	227.23	0.135	3.350	3.70	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366119.32	1549668.69-163.80	186.00	174.47	-69.02	227.24	0.135	3.350	3.77	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366118.59	1549667.90-166.60	189.00	177.27	-69.01	227.22	0.135	3.350	3.83	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366117.86	1549667.12-169.40	192.00	180.08	-68.98	227.22	0.135	3.350	3.89	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366117.13	1549666.33-172.20	195.00	182.88	-68.95	226.94	0.135	3.350	3.96	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366116.39	1549665.54-175.00	198.00	185.68	-68.94	226.92	0.135	3.350	4.02	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366115.65	1549664.75-177.80	201.00	188.47	-68.89	226.89	0.135	3.350	4.08	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366114.91	1549663.96-180.59	204.00	191.27	-68.87	226.87	0.135	3.350	4.15	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366114.17	1549663.18-183.39	207.00	194.07	-68.87	226.25	0.135	3.350	4.21	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366113.42	1549662.40-186.19	210.00	196.87	-68.85	226.20	0.135	3.350	4.27	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366112.67	1549661.61-188.99	213.00	199.67	-68.86	226.18	0.135	3.350	4.34	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366111.92	1549660.83-191.79	216.00	202.47	-68.85	226.16	0.135	3.350	4.40	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366111.18	1549660.04-194.59	219.00	205.26	-68.85	227.60	0.135	3.350	4.46	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366110.45	1549659.25-197.38	222.00	208.06	-68.82	226.66	0.135	3.350	4.53	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366109.70	1549658.46-200.18	225.00	210.86	-68.81	226.64	0.135	3.350	4.59	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366108.96	1549657.67-202.98	228.00	213.66	-68.81	226.64	0.135	3.350	4.65	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366108.22	1549656.88-205.77	231.00	216.45	-68.80	227.02	0.135	3.350	4.72	Measured	2007-08-21	09:04

KLX21B	RT90-RHB70	6366107.48	1549656.09-208.57	234.00	219.25	-68.77	227.01	0.135	3.350	4.78	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366106.74	1549655.29-211.37	237.00	222.05	-68.76	227.40	0.135	3.350	4.84	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366106.00	1549654.49-214.16	240.00	224.84	-68.76	227.00	0.135	3.350	4.91	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366105.26	1549653.70-216.96	243.00	227.64	-68.75	226.99	0.135	3.350	4.97	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366104.52	1549652.90-219.76	246.00	230.43	-68.75	226.97	0.135	3.350	5.03	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366103.77	1549652.12-222.55	249.00	233.23	-68.72	225.83	0.135	3.350	5.10	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366103.01	1549651.33-225.35	252.00	236.02	-68.70	225.82	0.135	3.350	5.16	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366102.25	1549650.55-228.14	255.00	238.82	-68.69	225.82	0.135	3.350	5.22	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366101.49	1549649.76-230.94	258.00	241.61	-68.70	226.82	0.135	3.350	5.29	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366100.75	1549648.97-233.73	261.00	244.41	-68.70	226.80	0.135	3.350	5.35	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366099.99	1549648.18-236.53	264.00	247.20	-68.69	225.58	0.135	3.350	5.41	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366099.23	1549647.40-239.32	267.00	250.00	-68.68	225.56	0.135	3.350	5.48	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366098.47	1549646.63-242.12	270.00	252.79	-68.68	225.55	0.135	3.350	5.54	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366097.71	1549645.84-244.91	273.00	255.59	-68.68	226.29	0.135	3.350	5.61	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366096.95	1549645.05-247.71	276.00	258.38	-68.68	226.28	0.135	3.350	5.67	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366096.20	1549644.27-250.50	279.00	261.18	-68.66	226.18	0.135	3.350	5.73	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366095.44	1549643.48-253.29	282.00	263.97	-68.63	226.01	0.135	3.350	5.80	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366094.68	1549642.69-256.09	285.00	266.77	-68.61	225.97	0.135	3.350	5.86	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366093.92	1549641.91-258.88	288.00	269.56	-68.60	225.93	0.135	3.350	5.93	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366093.16	1549641.12-261.67	291.00	272.35	-68.59	226.06	0.135	3.350	5.99	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366092.40	1549640.33-264.47	294.00	275.14	-68.59	226.49	0.135	3.350	6.05	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366091.65	1549639.53-267.26	297.00	277.94	-68.56	226.48	0.135	3.350	6.12	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366090.90	1549638.73-270.05	300.00	280.73	-68.50	227.07	0.135	3.350	6.18	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366090.15	1549637.93-272.84	303.00	283.52	-68.48	227.07	0.135	3.350	6.25	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366089.39	1549637.13-275.63	306.00	286.31	-68.47	226.03	0.135	3.350	6.31	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366088.63	1549636.34-278.42	309.00	289.10	-68.47	226.06	0.135	3.350	6.37	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366087.86	1549635.54-281.21	312.00	291.89	-68.48	226.08	0.135	3.350	6.44	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366087.10	1549634.75-284.01	315.00	294.68	-68.47	226.02	0.135	3.350	6.50	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366086.33	1549633.96-286.80	318.00	297.47	-68.47	226.02	0.135	3.350	6.57	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366085.57	1549633.17-289.59	321.00	300.27	-68.46	226.01	0.135	3.350	6.63	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366084.80	1549632.37-292.38	324.00	303.06	-68.45	226.01	0.135	3.350	6.70	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366084.04	1549631.58-295.17	327.00	305.85	-68.45	226.00	0.135	3.350	6.76	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366083.27	1549630.79-297.96	330.00	308.64	-68.45	226.05	0.135	3.350	6.83	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366082.51	1549629.99-300.75	333.00	311.43	-68.44	226.16	0.135	3.350	6.89	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366081.75	1549629.19-303.54	336.00	314.22	-68.44	227.26	0.135	3.350	6.95	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366081.00	1549628.38-306.33	339.00	317.01	-68.41	227.04	0.135	3.350	7.02	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366080.24	1549627.58-309.12	342.00	319.80	-68.41	225.53	0.135	3.350	7.08	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366079.47	1549626.80-311.91	345.00	322.59	-68.40	225.53	0.135	3.350	7.15	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366078.69	1549626.01-314.70	348.00	325.37	-68.41	225.57	0.135	3.350	7.21	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366077.93	1549625.22-317.49	351.00	328.16	-68.42	226.14	0.135	3.350	7.28	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366077.16	1549624.42-320.28	354.00	330.95	-68.44	226.14	0.135	3.350	7.34	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366076.40	1549623.63-323.07	357.00	333.74	-68.45	226.14	0.135	3.350	7.41	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366075.63	1549622.83-325.86	360.00	336.53	-68.44	226.17	0.135	3.350	7.47	Measured	2007-08-21	09:04

KLX21B	RT90-RHB70	6366074.87	1549622.04-328.65	363.00	339.32	-68.44	226.16	0.135	3.350	7.53	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366074.10	1549621.24-331.44	366.00	342.11	-68.44	225.76	0.135	3.350	7.60	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366073.34	1549620.45-334.23	369.00	344.91	-68.45	225.74	0.135	3.350	7.66	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366072.57	1549619.67-337.02	372.00	347.70	-68.47	225.72	0.135	3.350	7.73	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366071.80	1549618.88-339.81	375.00	350.49	-68.48	225.75	0.135	3.350	7.79	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366071.03	1549618.09-342.60	378.00	353.28	-68.49	225.73	0.135	3.350	7.86	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366070.26	1549617.30-345.39	381.00	356.07	-68.50	225.70	0.135	3.350	7.92	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366069.50	1549616.51-348.18	384.00	358.86	-68.52	226.13	0.135	3.350	7.98	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366068.74	1549615.72-350.97	387.00	361.65	-68.55	226.04	0.135	3.350	8.05	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366067.97	1549614.93-353.77	390.00	364.44	-68.55	225.88	0.135	3.350	8.11	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366067.21	1549614.15-356.56	393.00	367.24	-68.55	225.21	0.135	3.350	8.18	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366066.43	1549613.37-359.35	396.00	370.03	-68.55	225.19	0.135	3.350	8.24	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366065.66	1549612.59-362.14	399.00	372.82	-68.55	225.16	0.135	3.350	8.30	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366064.89	1549611.81-364.93	402.00	375.61	-68.55	225.29	0.135	3.350	8.37	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366064.12	1549611.03-367.73	405.00	378.41	-68.56	225.62	0.135	3.350	8.43	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366063.35	1549610.25-370.52	408.00	381.20	-68.56	225.62	0.135	3.350	8.50	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366062.58	1549609.47-373.31	411.00	383.99	-68.59	225.67	0.135	3.350	8.56	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366061.82	1549608.68-376.11	414.00	386.78	-68.59	225.67	0.135	3.350	8.63	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366061.05	1549607.90-378.90	417.00	389.58	-68.59	225.56	0.135	3.350	8.69	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366060.29	1549607.12-381.69	420.00	392.37	-68.59	225.55	0.135	3.350	8.75	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366059.52	1549606.34-384.48	423.00	395.16	-68.60	225.54	0.135	3.350	8.82	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366058.75	1549605.56-387.28	426.00	397.96	-68.61	224.93	0.135	3.350	8.88	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366057.97	1549604.79-390.07	429.00	400.75	-68.61	224.93	0.135	3.350	8.94	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366057.20	1549604.01-392.86	432.00	403.54	-68.61	224.91	0.135	3.350	9.01	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366056.43	1549603.24-395.66	435.00	406.34	-68.62	225.50	0.135	3.350	9.07	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366055.66	1549602.46-398.45	438.00	409.13	-68.62	225.62	0.135	3.350	9.14	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366054.90	1549601.68-401.24	441.00	411.92	-68.63	225.63	0.135	3.350	9.20	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366054.13	1549600.89-404.04	444.00	414.72	-68.63	225.72	0.135	3.350	9.26	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366053.37	1549600.11-406.83	447.00	417.51	-68.65	225.53	0.135	3.350	9.33	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366052.60	1549599.33-409.63	450.00	420.30	-68.68	225.52	0.135	3.350	9.39	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366051.84	1549598.55-412.42	453.00	423.10	-68.68	225.51	0.135	3.350	9.46	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366051.08	1549597.78-415.22	456.00	425.89	-68.67	225.49	0.135	3.350	9.52	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366050.31	1549597.00-418.01	459.00	428.69	-68.62	225.29	0.135	3.350	9.58	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366049.54	1549596.22-420.80	462.00	431.48	-68.60	225.15	0.135	3.350	9.65	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366048.76	1549595.45-423.60	465.00	434.27	-68.60	225.02	0.135	3.350	9.71	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366047.98	1549594.68-426.39	468.00	437.07	-68.58	224.16	0.135	3.350	9.78	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366047.20	1549593.91-429.18	471.00	439.86	-68.56	224.14	0.135	3.350	9.84	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366046.41	1549593.15-431.97	474.00	442.65	-68.55	224.13	0.135	3.350	9.90	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366045.62	1549592.39-434.77	477.00	445.44	-68.54	224.26	0.135	3.350	9.97	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366044.84	1549591.62-437.56	480.00	448.24	-68.53	224.81	0.135	3.350	10.03	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366044.06	1549590.84-440.35	483.00	451.03	-68.54	224.76	0.135	3.350	10.10	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366043.28	1549590.07-443.14	486.00	453.82	-68.54	224.75	0.135	3.350	10.16	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366042.51	1549589.30-445.93	489.00	456.61	-68.54	225.06	0.135	3.350	10.22	Measured	2007-08-21 09:04

KLX21B	RT90-RHB70	6366041.73	1549588.52-448.73	492.00	459.40	-68.54	225.04	0.135	3.350	10.29	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366040.95	1549587.74-451.52	495.00	462.20	-68.54	224.84	0.135	3.350	10.35	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366040.18	1549586.97-454.31	498.00	464.99	-68.54	224.83	0.135	3.350	10.42	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366039.39	1549586.20-457.10	501.00	467.78	-68.53	224.32	0.135	3.350	10.48	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366038.61	1549585.43-459.89	504.00	470.57	-68.53	224.29	0.135	3.350	10.55	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366037.82	1549584.66-462.69	507.00	473.36	-68.53	224.29	0.135	3.350	10.61	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366037.04	1549583.89-465.48	510.00	476.16	-68.53	224.93	0.135	3.350	10.67	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366036.26	1549583.12-468.27	513.00	478.95	-68.54	224.93	0.135	3.350	10.74	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366035.49	1549582.34-471.06	516.00	481.74	-68.53	224.97	0.135	3.350	10.80	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366034.71	1549581.57-473.85	519.00	484.53	-68.51	224.94	0.135	3.350	10.87	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366033.93	1549580.80-476.64	522.00	487.32	-68.50	224.29	0.135	3.350	10.93	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366033.14	1549580.03-479.44	525.00	490.11	-68.48	224.25	0.135	3.350	10.99	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366032.35	1549579.26-482.23	528.00	492.90	-68.50	224.20	0.135	3.350	11.06	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366031.56	1549578.49-485.02	531.00	495.70	-68.48	224.59	0.135	3.350	11.12	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366030.78	1549577.72-487.81	534.00	498.49	-68.48	224.58	0.135	3.350	11.19	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366030.00	1549576.95-490.60	537.00	501.28	-68.47	224.48	0.135	3.350	11.25	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366029.21	1549576.18-493.39	540.00	504.07	-68.46	224.45	0.135	3.350	11.32	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366028.42	1549575.40-496.18	543.00	506.86	-68.45	224.42	0.135	3.350	11.38	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366027.64	1549574.63-498.97	546.00	509.65	-68.43	224.63	0.135	3.350	11.44	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366026.85	1549573.85-501.76	549.00	512.44	-68.41	224.87	0.135	3.350	11.51	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366026.07	1549573.08-504.55	552.00	515.23	-68.41	224.89	0.135	3.350	11.57	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366025.29	1549572.30-507.34	555.00	518.02	-68.41	224.89	0.135	3.350	11.64	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366024.50	1549571.52-510.13	558.00	520.81	-68.41	224.46	0.135	3.350	11.70	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366023.71	1549570.75-512.92	561.00	523.60	-68.41	224.07	0.135	3.350	11.77	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366022.92	1549569.98-515.71	564.00	526.39	-68.41	224.07	0.135	3.350	11.83	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366022.13	1549569.22-518.50	567.00	529.18	-68.41	223.88	0.135	3.350	11.90	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366021.33	1549568.45-521.29	570.00	531.97	-68.39	223.85	0.135	3.350	11.96	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366020.53	1549567.69-524.08	573.00	534.75	-68.39	223.07	0.135	3.350	12.03	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366019.72	1549566.94-526.87	576.00	537.54	-68.38	223.11	0.135	3.350	12.09	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366018.91	1549566.18-529.65	579.00	540.33	-68.36	223.11	0.135	3.350	12.15	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366018.12	1549565.41-532.44	582.00	543.12	-68.34	224.58	0.135	3.350	12.22	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366017.32	1549564.64-535.23	585.00	545.91	-68.32	223.69	0.135	3.350	12.28	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366016.52	1549563.88-538.02	588.00	548.70	-68.32	223.40	0.135	3.350	12.35	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366015.71	1549563.12-540.81	591.00	551.48	-68.32	223.05	0.135	3.350	12.41	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366014.90	1549562.36-543.59	594.00	554.27	-68.33	223.05	0.135	3.350	12.48	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366014.09	1549561.61-546.38	597.00	557.06	-68.32	223.05	0.135	3.350	12.54	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366013.28	1549560.85-549.17	600.00	559.85	-68.31	222.98	0.135	3.350	12.61	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366012.47	1549560.09-551.96	603.00	562.64	-68.31	222.97	0.135	3.350	12.67	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366011.66	1549559.34-554.74	606.00	565.42	-68.30	222.95	0.135	3.350	12.74	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366010.85	1549558.58-557.53	609.00	568.21	-68.31	223.13	0.135	3.350	12.80	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366010.04	1549557.82-560.32	612.00	571.00	-68.31	223.14	0.135	3.350	12.87	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366009.23	1549557.06-563.11	615.00	573.79	-68.33	223.35	0.135	3.350	12.93	Measured	2007-08-21 09:04
KLX21B	RT90-RHB70	6366008.43	1549556.30-565.90	618.00	576.57	-68.31	223.33	0.135	3.350	13.00	Measured	2007-08-21 09:04

KLX21B	RT90-RHB70	6366007.62	1549555.54-568.68	621.00	579.36	-68.29	223.34	0.135	3.350	13.06	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366006.81	1549554.78-571.47	624.00	582.15	-68.28	223.57	0.135	3.350	13.13	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366006.01	1549554.01-574.26	627.00	584.94	-68.29	223.58	0.135	3.350	13.19	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366005.21	1549553.25-577.04	630.00	587.72	-68.29	223.59	0.135	3.350	13.26	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366004.40	1549552.48-579.83	633.00	590.51	-68.30	223.61	0.135	3.350	13.32	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366003.60	1549551.72-582.62	636.00	593.30	-68.30	223.69	0.135	3.350	13.39	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366002.80	1549550.95-585.41	639.00	596.08	-68.28	223.77	0.135	3.350	13.45	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366002.00	1549550.18-588.19	642.00	598.87	-68.25	223.95	0.135	3.350	13.52	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366001.20	1549549.41-590.98	645.00	601.66	-68.20	224.05	0.135	3.350	13.58	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6366000.40	1549548.63-593.76	648.00	604.44	-68.18	224.54	0.135	3.350	13.65	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365999.60	1549547.85-596.55	651.00	607.23	-68.17	224.73	0.135	3.350	13.71	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365998.81	1549547.06-599.33	654.00	610.01	-68.17	224.83	0.135	3.350	13.78	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365998.02	1549546.27-602.12	657.00	612.80	-68.17	224.73	0.135	3.350	13.84	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365997.23	1549545.49-604.90	660.00	615.58	-68.16	224.45	0.135	3.350	13.91	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365996.43	1549544.71-607.69	663.00	618.37	-68.16	224.44	0.135	3.350	13.97	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365995.63	1549543.93-610.47	666.00	621.15	-68.16	224.41	0.135	3.350	14.04	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365994.83	1549543.15-613.26	669.00	623.94	-68.17	224.38	0.135	3.350	14.10	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365994.03	1549542.37-616.04	672.00	626.72	-68.17	223.78	0.135	3.350	14.17	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365993.23	1549541.60-618.83	675.00	629.51	-68.17	223.76	0.135	3.350	14.23	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365992.42	1549540.83-621.61	678.00	632.29	-68.17	223.66	0.135	3.350	14.30	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365991.61	1549540.06-624.40	681.00	635.08	-68.16	223.70	0.135	3.350	14.36	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365990.81	1549539.29-627.18	684.00	637.86	-68.16	223.74	0.135	3.350	14.43	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365990.00	1549538.51-629.97	687.00	640.64	-68.15	223.88	0.135	3.350	14.49	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365989.20	1549537.74-632.75	690.00	643.43	-68.16	223.88	0.135	3.350	14.56	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365988.39	1549536.97-635.54	693.00	646.21	-68.18	223.87	0.135	3.350	14.62	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365987.59	1549536.19-638.32	696.00	649.00	-68.19	223.88	0.135	3.350	14.69	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365986.79	1549535.42-641.11	699.00	651.78	-68.20	223.88	0.135	3.350	14.75	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365985.99	1549534.65-643.89	702.00	654.57	-68.22	224.24	0.135	3.350	14.82	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365985.19	1549533.87-646.68	705.00	657.36	-68.22	223.84	0.135	3.350	14.88	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365984.38	1549533.10-649.46	708.00	660.14	-68.24	223.84	0.135	3.350	14.95	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365983.58	1549532.33-652.25	711.00	662.93	-68.27	223.84	0.135	3.350	15.01	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365982.79	1549531.56-655.04	714.00	665.71	-68.27	224.96	0.135	3.350	15.08	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365982.00	1549530.77-657.82	717.00	668.50	-68.28	224.94	0.135	3.350	15.14	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365981.22	1549529.99-660.61	720.00	671.29	-68.29	224.92	0.135	3.350	15.21	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365980.43	1549529.21-663.40	723.00	674.08	-68.28	224.69	0.135	3.350	15.27	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365979.64	1549528.42-666.19	726.00	676.86	-68.28	224.66	0.135	3.350	15.34	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365978.85	1549527.64-668.97	729.00	679.65	-68.25	224.65	0.135	3.350	15.40	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365978.06	1549526.86-671.76	732.00	682.44	-68.22	224.41	0.135	3.350	15.47	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365977.26	1549526.08-674.54	735.00	685.22	-68.20	224.38	0.135	3.350	15.53	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365976.46	1549525.31-677.33	738.00	688.01	-68.19	224.37	0.135	3.350	15.60	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365975.67	1549524.52-680.11	741.00	690.79	-68.18	224.89	0.135	3.350	15.66	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365974.88	1549523.74-682.90	744.00	693.58	-68.18	224.87	0.135	3.350	15.73	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365974.09	1549522.95-685.68	747.00	696.36	-68.17	224.94	0.135	3.350	15.79	Measured	2007-08-21	09:04

KLX21B	RT90-RHB70	6365973.30	1549522.16-688.47	750.00	699.15	-68.16	225.01	0.135	3.350	15.86	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365972.51	1549521.38-691.25	753.00	701.93	-68.16	224.16	0.135	3.350	15.92	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365971.70	1549520.60-694.04	756.00	704.72	-68.15	224.16	0.135	3.350	15.99	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365970.90	1549519.82-696.82	759.00	707.50	-68.12	224.16	0.135	3.350	16.06	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365970.10	1549519.04-699.61	762.00	710.28	-68.10	224.51	0.135	3.350	16.12	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365969.31	1549518.25-702.39	765.00	713.07	-68.09	224.53	0.135	3.350	16.19	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365968.51	1549517.47-705.17	768.00	715.85	-68.07	224.67	0.135	3.350	16.25	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365967.71	1549516.68-707.96	771.00	718.63	-68.07	224.92	0.135	3.350	16.32	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365966.92	1549515.88-710.74	774.00	721.42	-68.06	225.15	0.135	3.350	16.38	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365966.14	1549515.08-713.52	777.00	724.20	-68.06	226.07	0.135	3.350	16.45	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365965.35	1549514.28-716.30	780.00	726.98	-68.05	225.19	0.135	3.350	16.51	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365964.56	1549513.49-719.09	783.00	729.76	-68.06	225.18	0.135	3.350	16.58	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365963.77	1549512.70-721.87	786.00	732.55	-68.06	224.41	0.135	3.350	16.64	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365962.97	1549511.91-724.65	789.00	735.33	-68.04	224.41	0.135	3.350	16.71	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365962.16	1549511.13-727.43	792.00	738.11	-68.03	224.41	0.135	3.350	16.78	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365961.35	1549510.35-730.22	795.00	740.89	-68.03	222.99	0.135	3.350	16.84	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365960.53	1549509.59-733.00	798.00	743.68	-68.03	223.04	0.135	3.350	16.91	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365959.71	1549508.82-735.78	801.00	746.46	-68.03	223.07	0.135	3.350	16.97	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365958.89	1549508.05-738.56	804.00	749.24	-68.01	223.66	0.135	3.350	17.04	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365958.08	1549507.27-741.34	807.00	752.02	-68.01	223.66	0.135	3.350	17.10	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365957.27	1549506.50-744.12	810.00	754.80	-68.00	223.65	0.135	3.350	17.17	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365956.46	1549505.72-746.91	813.00	757.58	-68.00	224.22	0.135	3.350	17.24	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365955.66	1549504.93-749.69	816.00	760.37	-68.00	224.66	0.135	3.350	17.30	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365954.86	1549504.14-752.47	819.00	763.15	-68.00	224.66	0.135	3.350	17.37	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365954.06	1549503.35-755.25	822.00	765.93	-68.02	224.57	0.135	3.350	17.43	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365953.26	1549502.56-758.03	825.00	768.71	-68.01	224.57	0.135	3.350	17.50	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365952.46	1549501.78-760.81	828.00	771.49	-68.01	224.58	0.135	3.350	17.56	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365951.67	1549500.98-763.60	831.00	774.27	-68.01	225.82	0.135	3.350	17.63	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365950.87	1549500.19-766.38	834.00	777.06	-68.01	223.69	0.135	3.350	17.69	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365950.06	1549499.41-769.16	837.00	779.84	-68.01	223.70	0.135	3.350	17.76	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365949.25	1549498.64-771.94	840.00	782.62	-68.02	223.72	0.135	3.350	17.83	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365948.44	1549497.85-774.72	843.00	785.40	-68.03	224.64	0.135	3.350	17.89	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365947.64	1549497.07-777.51	846.00	788.18	-68.05	224.39	0.135	3.350	17.96	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365946.85	1549496.27-780.29	849.00	790.97	-68.09	225.94	0.135	3.350	18.02	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365946.06	1549495.48-783.07	852.00	793.75	-68.06	224.40	0.135	3.350	18.09	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365945.26	1549494.69-785.86	855.00	796.53	-68.07	224.72	0.135	3.350	18.15	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365944.45	1549493.91-788.64	858.00	799.32	-67.94	222.97	0.135	3.350	18.22	Measured	2007-08-21	09:04
KLX21B	RT90-RHB70	6365944.24	1549493.71-789.36	858.78	800.04	-67.94	222.97	0.135	3.350	18.24	Measured	2007-08-21	09:04

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