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Oskarshamn site investigation

Boremap mapping of core drilled boreholes KLX07A and KLX07B

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December 2005

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Keywords: KLX07A, KLX07B, Geology, Drill core mapping, Boremap, Fractures, BIPS, Simpevarp, Laxemar.

Abstract

Boreholes KLX07A and KLX07B are situated in Laxemar and were drilled within the site investigation program in the Oskarshamn area. The boreholes were drilled between 2005-01-05 and 2005-06-03. KLX07A covers the interval 100–845 m and KLX07B covers the interval 0–200 m.

Rock types, alterations, fractures and other structures are studied using drill core and BIPS-images and the information is documented in the software Boremap. All these data will be used in further interpretation and modelling of the area.

KLX07A are to 99% and KLX07B to 94% made up of Ävrö granite (501044). Thinner bands (3–10 m) of fine-grained diorite-gabbro (505102) occur at 130 m and 150 m borehole length in KLX07B and at 200 m borehole length in KLX07A.

The subdivision of KLX07A and KLX07B in sections is principally based on the occurrence of structures, sealed fracture network and broken fractures, since the monotonous lithology and the closely spaced alteration with varying intensity did not give useful information.

KLX07A was divided in six sections; section I (100–200 m), section II (200–315 m), section III (315–460 m), section IV (460–600 m), section V (600–720 m) and section VI (720–836 m). KLX07B was divided in four sections as follows; section I (10–60 m), section II (60–115 m), section III (115–155 m) and section IV (155–200 m). There is a general tendency of low brittle deformation in sections I, II and III in KLX07A compared with sections IV and V.

Open fractures in KLX07A shows the highest frequencies in sections V and VI. At 114.75 m borehole depth in KLX07A a gouge was mapped.

Sammanfattning

KLX07A och KLX07B är belägna i Laxemar och borrningen är ett steg i Platsundersökningen i Oskarshamnsområdet. Hålen borrades under perioden 2005-01-05 och 2005-06-03. KLX07A täcker intervallet 100–845 m och KLX07B täcker intervallet 0–200 m.

Bergarter, omvandlingar, sprickor och andra strukturer studerades i såväl borrkärna som BIPS-bild och dokumenterades i programmet Boremap. Dessa data kommer att användas som underlag vid tolkningar och modelleringar av området.

Ävrögranit (501044) är den dominerande bergarten och utgör 99 % av KLX07A och 94 % av KLX07B. Tunnare band (3–10 m) av finkornig diorit-gabbro (505102) uppträder på 200 m borrhålelängd och på 130 m och 150 m i KLX07B.

Uppdelningen av KLX07A och KLX07B i sektioner är i huvudsak baserad på förekomsten av strukturer, läkt nätverk och öppna sprickor, eftersom litologin är densamma och tätheten mellan omvandlingarna med varierande intensitet inte har kunnat användas till denna uppdelning.

KLX07A är uppdelad i sex sektioner: sektion I (100–200 m), sektion II (200–315 m), sektion III (315–460 m), sektion IV (460–600 m), sektion V (600–720 m) och sektion VI (720–836 m). KLX07B är uppdelad i fyra sektioner: sektion I (10–60 m), sektion II (60–115 m), sektion III (115–155 m) och sektion IV (155–200 m). Det finns en generell tendens till spröd deformation i sektion I–III i KLX07A vilket saknas i sektion IV–V.

Öppna sprickor i KLX07A har frekvensmaxima i sektion V–VI. På 114,75 m djup i KLX07A karterades en gouge.

Contents

1 Introduction

This document reports the data gained by Boremap mapping of the boreholes KLX07A and KLX07B 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 400-05-057. In Table 1-1 controlling documents for performing this activity are listed. Both activity plan and method descriptions are SKB's internal controlling documents.

SKB investigates two potential sites for a deep deposition of 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.

Boreholes KLX07A and KLX07B were drilled in 2005 and is situated within the Laxemar area (Figure 2-1). The two boreholes are telescopic and KLX07A covers the interval 100–845 m and KLX07B covers the interval 0–200 m.

Detailed mapping of the drill cores is essential for a three dimensional understanding of the geology at depth. The mapping is based on the use of borehole TV-images (BIPS) of the borehole wall and by the study of the drill core itself. The BIPS-images enable the study of orientations, since the Boremap software calculates strike and dip of planar structures such as foliations, rock contacts and fractures. Also the fracture apertures in the rock can be estimated.

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*.

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

Activity plan	**Number**	**Version**
Boremapkartering av KLX07A och KLX07B	AP PS 400-05-057	1.0
Method descriptions	**Number**	**Version**
Nomenklatur vid Boremapkartering	SKB MD 143.008	1.0
Method Description for Boremap mapping	SKB MD 143.006	1.0
Mätsystembeskrivning för Boremap	SKB MD 146.001	1.0

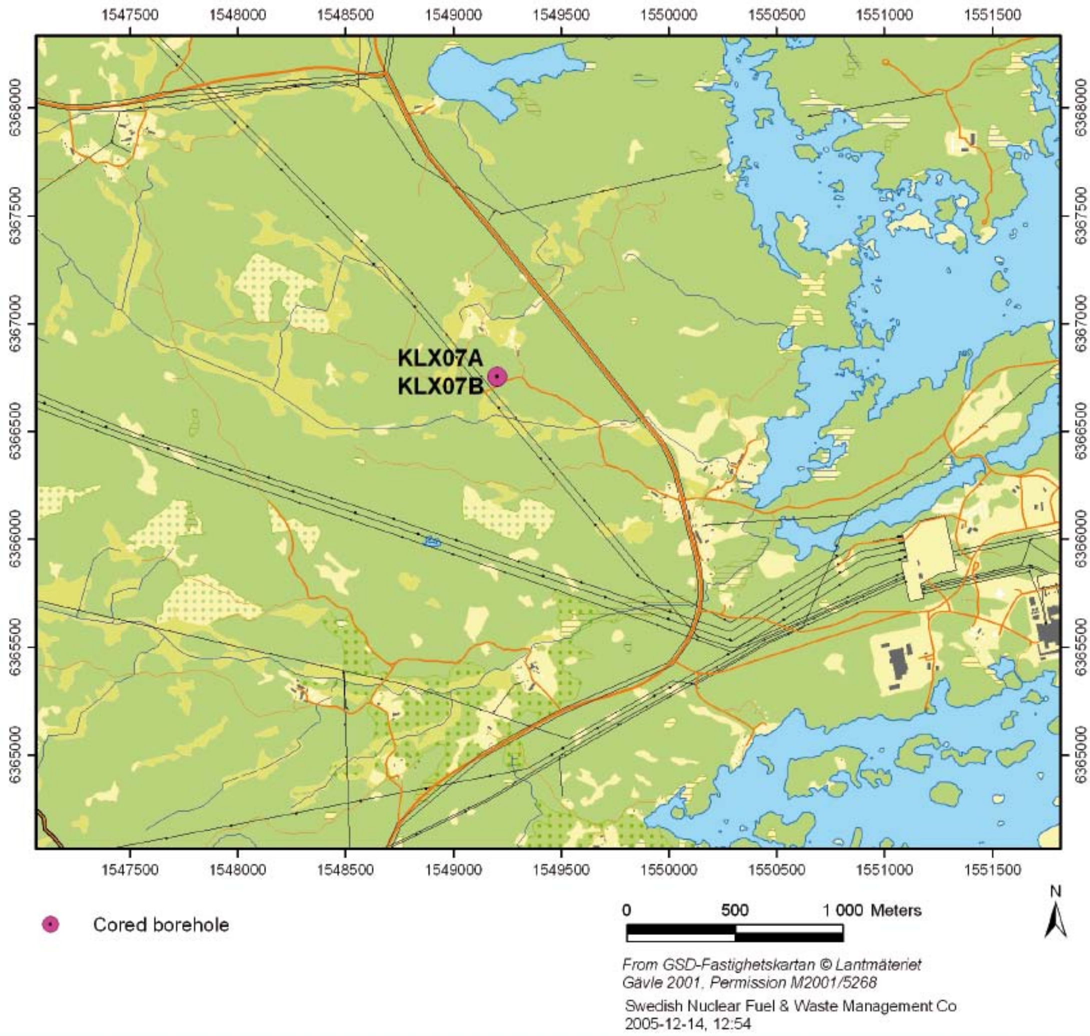


Figure 1-1. *Location of the core drilled boreholes KLX07A and KLX07B.*

2 Objective and scope

The principal aim of the mapping activities presented in this report is to obtain a detailed documentation of geological structures and lithologies intersecting the boreholes KLX07A and KLX07B. Geological structures will be correctly orientated in space along the borehole. The results 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

The mapping was performed with Boremap v. 3.6, with bedrock and mineral standards of SKB. The final data presentation was made using StereoNet, WellCad v. 4, and BIPS Image Print.

Boremap is the software that unite orthodox core mapping with modern video mapping. The software deals with the mapping data as well as the internal communication between programs. Boremap shows the video 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 and pen, hydrochloric acid, knife, water-filled atomizer and hand lens.

3.3 BIPS-image video film sequences

The BIPS video film of KLX07A covers the interval 100–836 m and of KLX07B the interval 0–200 m. No BIPS-images were available for the interval 0–9.64 m of KLX07B and the interval 836–845 m of KLX07A.

3.4 BIPS-image video film: resolution, contrast and quality

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

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

Thick fractures are always visible in both drill core and the BIPS-image. However, the visibility of thin fractures depends strongly on the colour contrast between the fracture and the wall rock.

A bright fracture in a dark rock is clearly visible in the BIPS-image. A bright coloured fracture in a bright 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 the rare case 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.

The BIPS-image quality is sometimes limited by disturbances such as:

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 right 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.

Problems related to the video camera aperture and the enlargement of pixels can be neglected. The main disturbances caused by the BIPS-image quality are the vertical bleached bands and the blackish coatings.

The image quality is classified into four classes; good, acceptable, bad and very bad. With good quality means a more or less clear image which is easy to interpret. Acceptable quality means that the image is not good, but that the mapping can be performed without 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. It should be remembered that even if only 10–20% of the image is visible, this is often enough for an acceptable interpretation. When the BIPS-image quality is so bad that fractures and structures can not be identified in the BIPS-image, they can still be oriented using the *guide-line method* (chapter 4.3.3). Better cleaning of the borehole could increase the mapping quality drastically.

The BIPS-image quality for KLX07A and KLX07B is presented in Table 3-1 and 3-2.

Table 3-1. BIPS-image quality in KLX07A.

SecUp (m)	SecLow (m)	Length (m)	Quality
100	272	172	Acc-bad
272	317	45	Acc-good
317	410	93	Acc
410	483	73	Acc-good
483	540	57	Good
540	562	22	Bad-acc-good
562	836	274	Good-Excellent

Table 3-2. BIPS-image quality in KLX07B.

SecUp (m)	SecLow (m)	Length (m)	Quality
10	12	2	Bad
12	14	2	Acc-good
14	197	183	Good
197	200	3	Acc-good

4 Execution

4.1 General

The Boremap-mapping of the telescopic drilled boreholes KLX07A and KLX07B were performed and documented according to activity plan AP PS 400-05-057 (SKB, internal document) referring to the *Method Description for Boremap mapping* (SKB MD 143.006, v. 1.0, SKB, internal controlling document) and *Nomenklatur vid Boremapkartering* (SKB MD 143.008, v. 1.0)

KLX07A covers the interval 100–845 m and KLX07B covers the interval 0–200 m.

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

The mapping was performed by Jan Ehrenborg (Mirab Mineral Resurser AB) and Peter Dahlin (Geosigma). The interval 153–200 m in KLX07B was mapped by Christin Döse and Eva Samuelsson, both from Geosigma.

4.2 Preparations

Any depth registered in the BIPS-image deviates from the true depth in the borehole, a deviation which increases with depth. This problem is eliminated by adjusting the depth of the BIPS-image to reference slots cut into the borehole walls every fiftieth meter (Appendix 14). 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.

The orientations of the different observations are adjusted to true space. Data necessary for this adjustment are borehole diameter, length and deviation; both collected from SICADA database (Appendices 12–13, 15–16).

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). Apertures for broken fractures have been mapped in accordance with the definitions in MD 143.008 v. 1.0.

In the mapping phase, fractures that split the core are mapped as BROKEN and fractures that have not parted the core are mapped as UNBROKEN. 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 hard 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 that possess apertures > 0 mm, are in the SICADA database interpreted as OPEN. Only a few BROKEN fractures are given the aperture = 0 mm. UNBROKEN fractures usually have apertures = 0 mm. If UNBROKEN fractures possess apertures > 0 mm, they are interpreted as partly open and included in the OPEN-category. OPEN and SEALED fractures are finally frequency calculated and shown in Appendices 1, 2, 8 and 9.

4.3.2 Fracture alteration and joint alteration number

The 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 a joint alteration numbers between 2 and 3. The majority of the broken fractures are very thin to extremely thin and seldom contain clay minerals and receive a 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.

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

Joint alteration number equal to 1.5: Minerals as epidote, prehnite, hematite, chlorite and/or clay minerals is regarded as fracture minerals most likely resulting from altered wall rock material. 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.

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. These fractures are orientated by using the *guide-line method*, based on the following data:

- Absolute depth.
- Amplitude (measured along the drill core). The amplitude 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.

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. Anyhow, the *guide-line method* is so far considered better than only marking fractures that are non-visible in the BIPS-images as planes perpendicular to the borehole. 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.

When using the *guide-line method* the difference between the 50 mm drill core diameter and the 76 mm borehole diameter must be considered. This difference result in displacements of the structures seen in the drill core compared with the structures seen in the BIPS-image which represents the borehole walls. This displacement is zero for structures that cut the drill core at right angle and successively becomes larger as the orientation of the structure approximates the direction of the drill core axis. This displacement always has to be corrected for, since displacements of up to a few cm are common even if they seldom reach 10 cm.

Orientation of fractures and other structures with the *guide-line method* is done in the following way: The first step in the guide-line method is to calculate the amplitude of the fracture trace in the BIPS-image (with 76 mm diameter) from the 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 fracture/structure 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 fracture/structure as the personnel delineating the fracture trace in the BIPS-image, especially in intervals rich in fractures.

4.3.4 Definition of veins and dikes

Chiefly two different rock occurrences are mapped: veins and dikes. These two are differentiated by their respectively length in the 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:

X5 whitish, bleached feldspar.

X6 the drill core is broken at a right angle and the broken surfaces have a polished appearance. This is believed to indicate that a sealed fracture broke up during drilling and that the two drill core parts have rotated against each other wearing away the mineral fill.

X7 fracture with no detectable mineral fill.

X8 fractures with epidotized walls.

4.4 Data handling

The mapping 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.

As a regular quality check every working day a summary report 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 from the mapping is stored in SKB's database SICADA under field note number: Simpevarp 842. Only these data are to be used for further interpretation and modelling.

4.5 Geological Summary table, general description

An overview of the geological parameters mapped with the Boremap system is collected in the Geological Summary table (Appendices 1 and 2). It also facilitates comparisons between Boremap information collected from different boreholes and is more objective than a pure descriptive borehole summary.

The Geological Summary table is the result of cooperation between Jan Ehrenborg from the mapping personnel at Simpevarp and Pär Kinnbom from PO (site investigation, Simpevarp). The aim was to make a standard form in handy A4-size, where all information is taken directly from the SICADA database using simple and well defined search paths for each geological parameter (Appendix 3).

The search paths are, however, yet not automatic and the geological information therefore has to be extracted from the Boremap database before it is reworked on separate Excel-files and finally presented in the Geological Summary table. At the moment it is only possible to extract the Rock Type and Alteration parameters directly from the Boremap database.

The main reason why the information in the SICADA database cannot be extracted automatically is the lack of formula for calculation of frequencies for different parameters.

The Geological Summary table is made up of 23 columns, each one representing a specific geological parameter. The geological parameters are presented as either intervals or frequencies. Intervals are calculated for parameters with a width ≥ 1 m and frequencies for parameters with a width < 1 m. Frequency information is treated as if it does not have any extension along the borehole axis. They are treated as point observations. It should be noted that parameters with a thickness of only 1 mm therefore has 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.*

- 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 (Appendices 1 and 2) 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 / Red staining*, interval column. No frequency column is presented for alteration/red staining. The alteration/red staining column is 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. Ductile sections in mm–cm scale are mapped as shear structures and in dm–m scale as sections with foliation in column 12.

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 / Foliation < 1 m wide* is a frequency column. Sections with foliation < 1 m wide are mapped as rock occurrence/structure in Boremap. Very thin sections with foliation are called ductile shear structures and presented in column 7.

Column 13: *Structure / Foliation ≥ 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 and this includes unbroken fractures where the drill core is not broken as well as unbroken 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 certain and > 0.5*, frequency column. This column includes fractures that with certainty 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.

5 Results

The results from the mapping of KLX07A and KLX07B are principally found in the appendices. The information in from Boremap database has been compressed to the size of an A4-sheet in the Geological Summary table, Appendices 1 and 2. The search paths for the Geological Summary table are presented in Appendix 3. Stereographic diagrams of the orientations of open fractures are presented in Appendices 4 and 5. The BIPS-images of KLX07A and KLX07B are shown in Appendices 6 and 7 and the corresponding WellCad diagrams in Appendices 8 and 10. In-data, as borehole length, diameter and deviation data are presented in Appendices 12–16.

5.1 Geological Summary table

All length information in the description below is taken from the Geological Summary table and may therefore have an error of 5–10 m.

Rock types mapped are shown in Table 5-1.

Table 5-1. Rock types in KLX07A.

%	Rock Type
99.6	Ävrö Granite (501044)
0.3	Mafic rock, fine-grained (505102)
0.1	Granite, fine-grained (511058)

Table 5-2. Rock types in KLX07B.

%	Rock Type
94.1	Ävrö Granite (501044)
5.9	Mafic rock, fine-grained (505102)

5.1.1 KLX07A

The Geological Summary table for KLX07A is presented in Appendix 1.

KLX07A is unevenly oxidized down to a depth of 760 m and shows strong variation in red staining intensity within short intervals.

Veins and dikes are common in KLX07A. A minor decrease in frequency maxima can be seen around 475–575 m.

Foliation zones < 1 m wide are common in KLX07A. Scattered foliation zones > 1 m wide occur throughout KLX07A and as longer intervals at 0–75 m, 580–650 m and 730–836 m in KLX07A.

Of the observed 10 thin mylonites 6 occur in the interval 150–200 m.

Sealed fractures are rather evenly distributed throughout KLX07A.

Sealed fracture network occur as 1–3 m long intervals scattered throughout KLX07A except for the interval 200–300 m. Longer sections (7–30 m) of sealed fracture network are found in the intervals 100–180 m and 600–835 m.

Thin breccias show a strong frequency maximum at 150 m.

Open fractures show low frequency maxima in the intervals 200–300 m and 450–600 m. A continuous series of relatively high frequency maxima are found in the interval 600–836 m.

High J_a-numbers are concentrated to the intervals 100–150 m, 475–485 m, 615–625 m, 690–700 m and 740–765 m.

Crush zones occur most frequent in the interval 635–835 m although they occur sparsely all through KLX07A. About 1 m long crush zones were mapped at 450 m and 675 m.

The subdivision of KLX07A in six sections is based on the occurrence of breccias, foliation zones > 1 m wide, sealed fracture network, open fractures and high joint alteration numbers.

Section I (100–200 m): Thin breccias show a frequency maximum in this section. Foliation is rare but sealed fracture network cover a large interval of this section. Open fractures as well as J_a-numbers show frequency maximum in the same interval as the sealed fracture network namely 100–135 m. The widest crush zone occurs in this section at 120 m.

Section II (200–315 m): The highest vein + dike frequencies occur in this section and frequencies of breccias and foliation zones are rather low which is normal for the boreholes. Open fractures show low frequencies and J_a-numbers as well as thin crush zones are very rare.

Section III (315–460 m): This section shows rather normal frequencies for different geological parameters.

Section IV (460–600 m): Vein + dike frequencies as well as frequencies of open fractures show the lowest frequency minima in KLX07A. High J_a-numbers and thin crush zones are almost absent.

Section V (600–720 m): Vein + dike frequencies rise to normal values for KLX07A, especially foliation zones > 1 m are frequent in the upper part of the section and sealed fracture networks are common and usually > 1 m wide. Open fractures show high frequencies in this interval, high J_a-numbers show 3 frequency maxima and thin crush zones are rather common.

Section VI (720–836 m): Red staining is lacking in the interval 760–836 m and the whole section is foliated. Sealed fracture network are common and often > 1 m wide, open fractures show high frequencies, high J_a-numbers show a frequency maximum at 620 m and thin crush zones are rather common.

5.1.2 KLX07B

The Geological Summary table for KLX07B is presented in Appendix 2.

Ävrö granite occurs all through KLX07B except for two 3 and 10 m long intervals of fine-grained diorite-gabbro (505102) in section III (see below).

KLX07B shows uneven red staining and strong variation in red staining intensity within short intervals and rather high shear structure frequency maxima occurs in the interval 150–200 m.

Thin breccias show a strong frequency maximum in the interval 150–200 m. A breccia > 1 m wide occurs in fine-grained diorite-gabbro at 150 m in KLX07B.

6 thin mylonites occur in the interval 150–200 m.

Foliation zones < 1 m wide are common throughout KLX07B. Foliation zones > 1 m wide occur in the upper part of KLX07B.

Sealed fracture network occur as 1–3 m long intervals scattered throughout KLX07B except for the interval 0–100 m where no such network is found. Longer sections (7–30 m) of sealed fracture network are found in the interval 100–180 m.

Sealed fractures are rather evenly distributed throughout KLX07B. Lower frequency maxima are found in the interval 0–150 m.

Open fractures show a high frequency maximum in the interval 130–150 m.

High J_a-numbers are concentrated around 130 m in KLX07B.

KLX07B was subdivided into four sections based on lithology, red staining, breccia zones, foliation, sealed fracture network, open fractures and high J_a-numbers.

Section I (10–60 m): This section show a rather homogeneous distribution of weakly to faintly red stained intervals as well as intervals with no red staining. Foliation is rather common with two longer continuous intervals at 9.64–20 m and 51.5–62 m. A frequency maximum of open fractures occur in the interval 9.64–26 m. Open fractures certain, high joint alteration number and crush is found at 30–34 m.

Section II (60–115 m): The whole section shows a faint to weak red staining, structures are almost lacking and open fractures have a frequency maximum at 86–94 m.

Section III (115–155 m): The whole section shows rapid alternation between weak and strong red staining, especially in the interval 115–123 m where it coincides with a more or less continuous sealed fracture network in the interval 117–155 m. Foliation and veins are common in the fine-grained diorite-gabbro (505102). Frequency maxima for open fractures, high J_a-numbers and crush occur in the interval 130–140 m.

Section IV (155–200 m): This section show rapid alternation between weak and strong red staining similar to section III. Structures, for example, breccias and mylonites show a strong increase in section IV compared with section III. Sealed fractures are very common as in section III even though no sealed fracture networks were mapped. Open fracture frequencies show pronounced minima and no crush zones occurred. High J_a-numbers occur as a continuation of the maxima in section III but they are not very common.

5.2 Orientation of broken fractures

Broken fractures are presented in stereograms for each 100 m interval (Appendices 4 and 5). The stereographic information is from plane to pole plot data. Fracture orientation values are strike/dip values using the right hand rule.

At ground level the orientation for borehole KLX07A is 174/+60 and KLX07B has the orientation 170/+85.

Broken fractures not visible in the BIPS-image are oriented according to the *guide-line method* (see chapter 4.3.3), thus not drawn as lines at right angle to the drill core in BIPS.

There is a general strong overrepresentation of broken fractures cutting the borehole at high angles compared to fractures cutting the borehole at low angles. This results in artificially high anomaly values for fractures cutting the borehole at high angles and in semi circular distortion of anomaly shapes in the stereographic plots. These effects are stronger the longer the plotted depth interval. It is therefore not recommended to plot intervals longer than 100 m in the same stereogram.

Fracture orientations in KLX07A are limited to a few well defined directions.

The dominating fracture set in KLX07A has east-west orientation, 260–285°, and with 40–50° dip, and is oriented approximately perpendicular to the borehole.

Another fracture set in KLX07A has WNW-ESE orientation and dip steeply (85° dip). The rather elongate stereonet plot anomalies vary from W-E to WNW-ESE. This orientation can be seen all through KLX07A but strong anomalies occur only in the interval 200–600 m.

The third important fracture set in KLX07A has WSW-ENE orientations and steep dips (60–90° dip). This orientation is also found all through KLX07A but strong anomalies are found only in the intervals 200–300 m and 500–700 m. This fracture set generally has very steep dips (80–90° dip) except for the interval 700–833 m where the dip is 60–75°. This fracture set also show rather elongated anomalies especially for the broad stereonet anomaly in the 700–833 m interval. This anomaly is continuous from W-E to WSW-ENE to SW-NE to S30W-N30E.

Subhorizontal to low dip fractures occur occasionally in KLX07A, for example in the intervals 100–200 m (NNW-SSE with 20° dip) and 700–833 m (NE-SW with 5° dip).

Only one true maximum occur in the stereogram for broken fractures in KLX07B. This maximum is oriented at right angle to the drill core both in the interval 0–100 m and 100–200 m. The orientation is ENE with very low dip (5° dip).

5.3 Fracture mineralogy

Percentages of minerals in both open and sealed fractures for KLX07A and KLX07B are shown in the Tables 5-2 to 5-6. The total amount of open fractures in KLX07A is 2,410 (3.2 average per meter) and the total amount of sealed fracture is 4,138 (5.5 average per meter). The total amount of open fractures in KLX07B is 590 (3.1 average per meter) and the total amount of sealed fracture is 778 (4.1 average per meter).

Table 5-3. Percentages of fracture minerals in open fractures, KLX07A.

%	Mineral
74.8	Calcite
70.8	Chlorite
37.5	Clay Minerals
18.1	Pyrite
14.4	Hematite
9.3	Oxidized Walls
6.1	Epidote
3.8	Quartz
2.5	X7 (No detectable minerals)
1.9	Adularia
0.5	Laumontite
0.5	Unknown Mineral
0.4	Chalcopyrite
0.3	Flourite
0.1	Zeolite

Table 5-4. Percentages of fracture minerals in sealed fractures, KLX07A.

%	Mineral
49.0	Calcite
44.1	Oxidized Walls
42.9	Chlorite
25.8	Quartz
8.3	Hematite
6.1	Epidote
5.7	Adularia
3.7	Clay Minerals
3.3	Pyrite
1.5	X7 (No detectable minerals)
1.1	Prehnite
0.8	X5 (bleached fracture walls)
0.3	Laumontite
0.1	X8 (epidotized fracture walls)
0.1	Flourite
0.1	Unknown Mineral
0.1	Chalcopyrite

Table 5-5. Percentages of fracture minerals in open fractures, KLX07B.

%	Mineral
78.3	Calcite
63.4	Chlorite
28.8	Clay Minerals
15.4	Hematite
13.9	Pyrite
11.7	Oxidized Walls
8.0	Epidote
2.7	Quartz
1.9	Unknown Mineral
1.2	X7 (No detectable minerals)
0.8	Sericite
0.7	Laumontite
0.5	Prehnite
0.5	Chalcopyrite
0.3	Adularia
0.2	Muscovite
0.2	Iron Hydroxide
0.2	White Feldspar
0.2	Zeolite
0.2	Flourite
0.2	Sphalerite
0.2	X5 (bleached fracture walls)

Table 5-6. Percentages of fracture minerals in sealed fractures, KLX07B.

%	Mineral
53.0	Oxidized Walls
47.0	Calcite
35.3	Chlorite
24.8	Quartz
13.4	Epidote
4.9	Hematite
3.5	Adularia
1.8	Pyrite
0.8	Clay Minerals
0.8	Prehnite
0.8	X8 (saussuritization)
0.4	X5 (bleached fracture walls)
0.4	Flourite
0.3	Unknown Mineral
0.3	White Feldspar
0.3	Laumontite
0.1	X7 (No detectable minerals)
0.1	X4 (epidotized fracture walls)

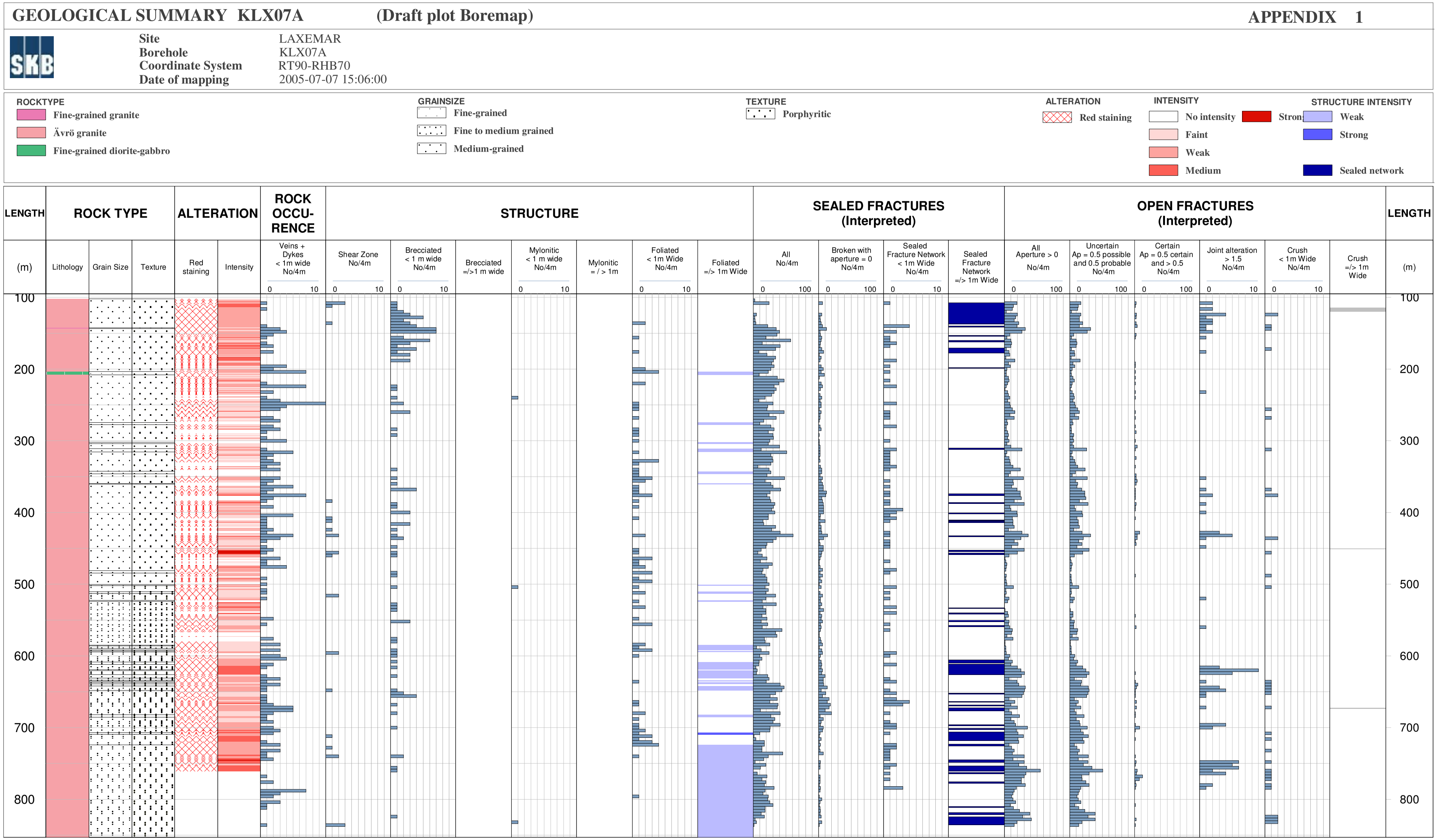
6 Discussion

High frequency maxima of shear structures in KLX07B occur at approximately the same depth as high frequency maxima of breccia structures in KLX07A. This might be true but it might also be a consequence of that the interval 153–200 m in KLX07A was mapped by other personnel than the same interval 153–200 m in KLX07B.

It is noticeable that the strongest broken fracture orientation anomaly in the interval 100–200 m in both KLX07A and KLX07B has the same orientation (i.e. around perpendicular to the borehole) especially since the borehole orientation of KLX07A and KLX07B are different in this interval. One possible interpretation is that the drilling process itself at this location had a strong influence on which fractures that opened up during the drilling.

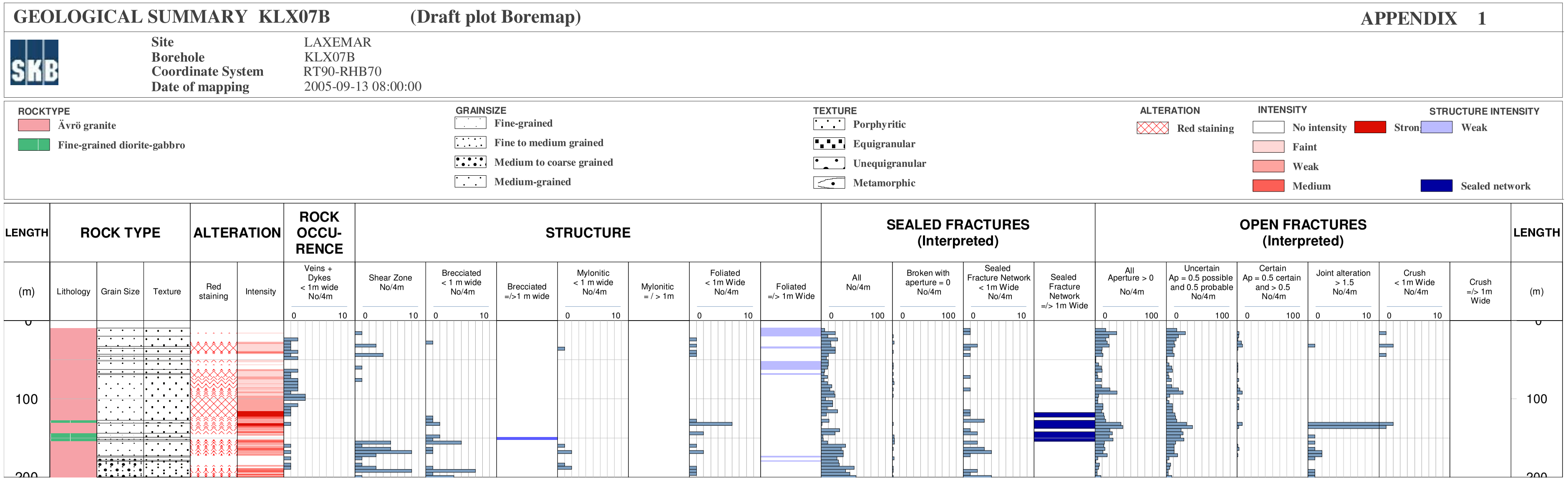
The drill core diameter is 31 mm from 447.57 m (adjusted length) to 552.50 m (borehole length are according to the drilling personnel). In this interval broken fractures that can not be seen in the BIPS-image were not oriented so only broken fractures visible in the BIPS-image were mapped in this interval. Unbroken fractures not visible in the BIPS-image were not mapped at all in this section.

Geological Summary table KLX07A



Appendix 2

Geological Summary table KLX07B



Appendix 3

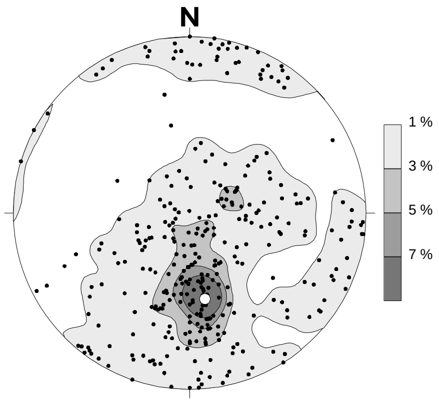
Search paths for the Geological Summary table

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

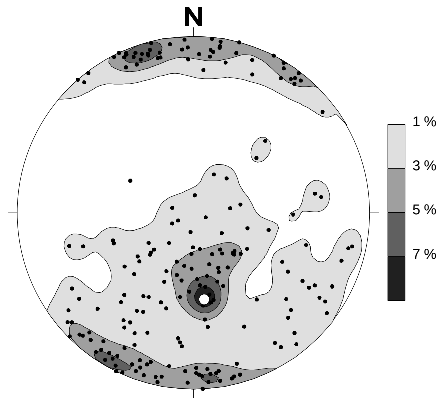
Appendix 4

Stereographic projections of broken fractures, KLX07A

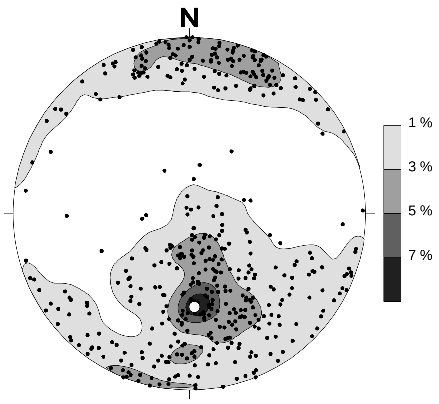
Stereonet plots that show the contoured pole to plane to broken fractures in borehole KLX07A, Schmidt's Net, lower hemisphere. The white circle marks the drill hole orientation.



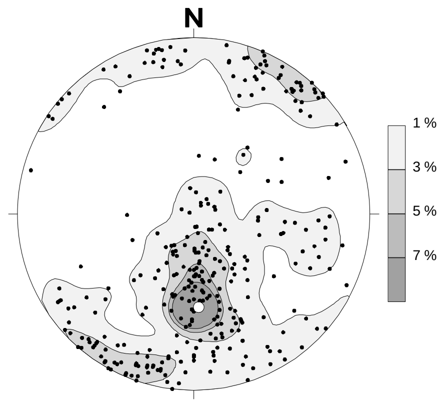
100-200 m (384 fractures)



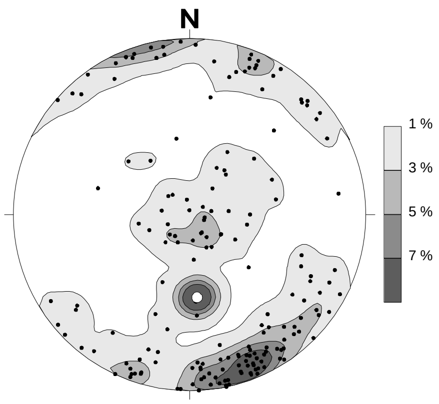
200-300 m (220 fractures)



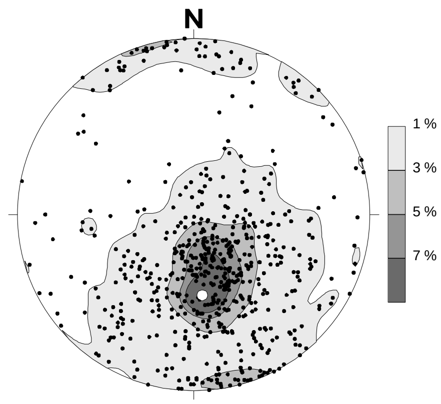
300-400 m (490 fractures)



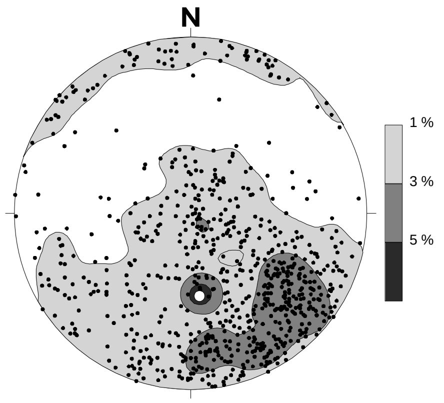
400-500 m (398 fractures)



500-600 m (213 fractures)



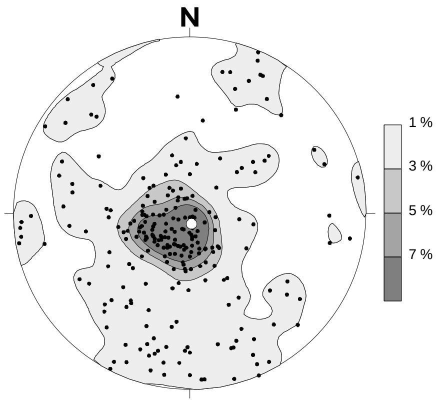
600-700 m (676 fractures)



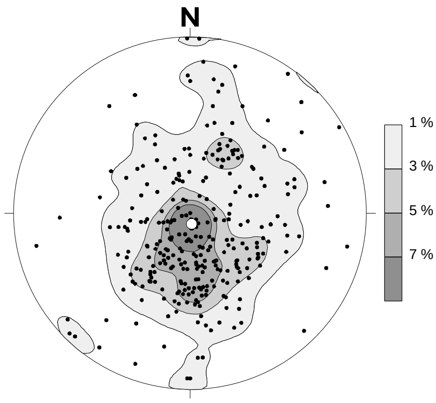
700-833 m (819 fractures)

Stereographic projections of broken fractures, KLX07B

Stereonet plots that show the contoured pole to plane to broken fractures in borehole KLX07B, Schmidt's Net, lower hemisphere. The white circle marks the drill hole orientation.



0-100 m (268 fractures)



100-200 m (349 fractures)

Appendix 6

BIPS-image of KLX07A

Borehole Image Report

Borehole Name:	KLX07A
Mapping Name:	KLX07A_JE_PD_4
Mapping Range:	101.000 - 832.776 m
Diameter:	76.0 mm
Printed Range:	101.000 - 832.776
Pages:	31

Image File Information:

File:	D:\BIPSbilder\KLX07A\KLX07A_101-832m.BIP
Date/Time:	2005-07-06 15:45:00
Start Depth:	101.000 m
End Depth:	832.776 m
Resolution:	1.00 mm/pixel (depth)
Orientation:	Gravmetric
Image height:	731776 pixels
Image width:	360 pixels
BIP Version:	BIP-III
Locality:	LAXEMAR
Borehole:	KLX07A
Scan Direction:	Down
Color adjust:	0 0 0 (RGB)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 101.000 - 126.000 m
Azimuth: 168.2
Inclination: -50.6

101.000
101.000
101.500
101.500
102.000
102.000
102.500
102.499
103.000
102.998
103.500
103.497
104.000
103.996
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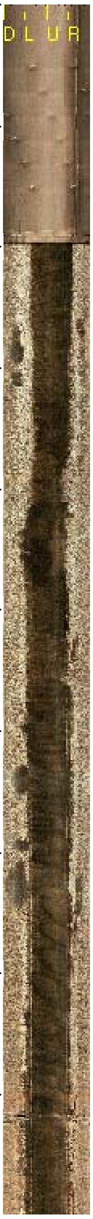
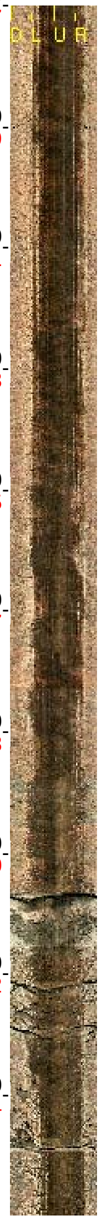
104.495
105.000
104.994
105.500
105.493



106.000
105.992
106.500
106.490
107.000
106.989
107.500
107.488
108.000
107.987
108.500
108.486
109.000
108.985
109.500
109.484
110.000
109.983
110.500
110.485

111.000
110.987
111.500
111.489
112.000
111.991
112.500
112.493
113.000
112.995
113.500
113.497
114.000
113.998
114.500
114.500
115.000
115.002
115.500
115.504



116.000
116.006
116.500
116.508
117.000
117.010
117.500
117.512
118.000
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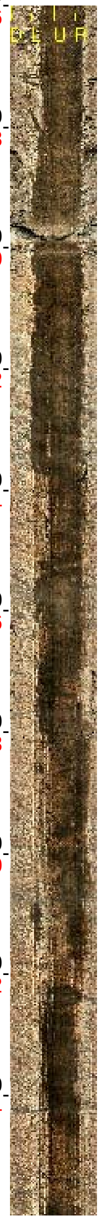
119.000
119.018
119.500
119.520
120.000
120.022
120.500
120.524



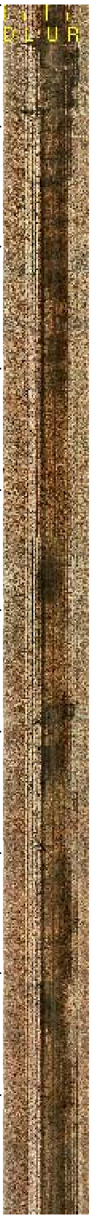
121.000
121.026
121.500
121.528
122.000
122.030
122.500
122.532
123.000
123.034
123.500
123.535
124.000
124.037
124.500
124.539
125.000
125.041
125.500
125.543

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 2 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 126.000 - 151.000 m
Azimuth: 169.0
Inclination: -49.9

126.000
126.045
126.500
126.547
127.000
127.049
127.500
127.551
128.000
128.053
128.500
128.555
129.000
129.057
129.500
129.559
130.000
130.061
130.500
130.563



131.000
131.065
131.500
131.567
132.000
132.069
132.500
132.570
133.000
133.072
133.500
133.574
134.000
134.076
134.500
134.578
135.000
135.080
135.500
135.582

136.000
136.084
136.500
136.586
137.000
137.088
137.500
137.590
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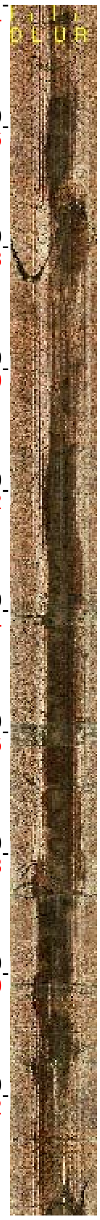
139.096
139.500
139.598
140.000
140.100
140.500
140.602



141.000
141.104
141.500
141.605
142.000
142.107
142.500
142.609
143.000
143.111
143.500
143.613
144.000
144.115
144.500
144.617
145.000
145.119
145.500
145.621

146.000
146.123
146.500
146.625
147.000
147.127
147.500
147.629
148.000
148.131
148.500
148.633
149.000
149.135
149.500
149.637
150.000
150.139
150.500
150.641

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 3 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 151.000 - 176.000 m
Azimuth: 170.6
Inclination: -49.1

151.000
151.144
151.500
151.646
152.000
152.149
152.500
152.651
153.000
153.154
153.500
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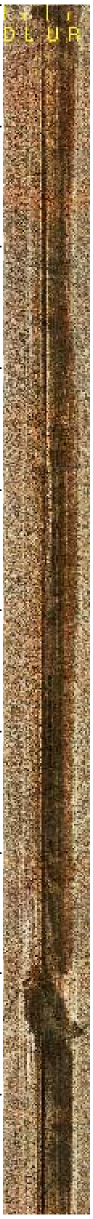
155.164
155.500
155.666



156.000
156.169
156.500
156.671
157.000
157.174
157.500
157.676
158.000
158.179
158.500
158.681
159.000
159.184
159.500
159.686
160.000
160.189
160.500
160.691

161.000
161.194
161.500
161.696
162.000
162.199
162.500
162.702
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165.214
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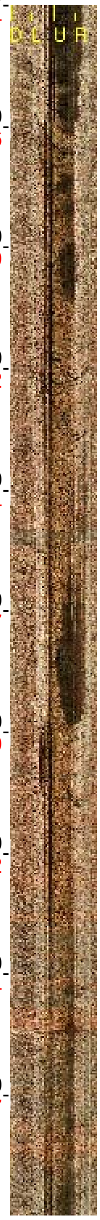
165.717



166.000
166.219
166.500
166.722
167.000
167.224
167.500
167.727
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168.229
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169.000
169.234
169.500
169.737
170.000
170.239
170.500
170.742

171.000
171.244
171.500
171.747
172.000
172.249
172.500
172.752
173.000
173.254
173.500
173.757
174.000
174.259
174.500
174.762
175.000
175.264
175.500
175.767

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 4 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

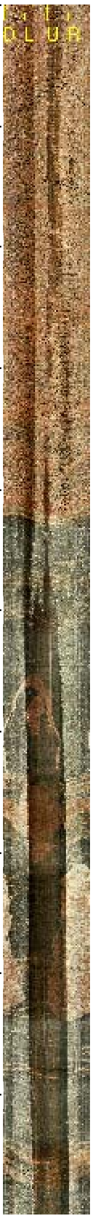
Depth range: 176.000 - 201.000 m
Azimuth: 171.6
Inclination: -48.5

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 5 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 201.000 - 226.000 m
Azimuth: 172.3
Inclination: -47.6

201.000 / 201.394
201.500 / 201.897
202.000 / 202.399
202.500 / 202.901
203.000 / 203.404
203.500 / 203.906
204.000 / 204.408
204.500 / 204.910
205.000 / 205.413
205.500 / 205.915



206.000 / 206.417
206.500 / 206.920
207.000 / 207.422
207.500 / 207.924
208.000 / 208.427
208.500 / 208.929
209.000 / 209.431
209.500 / 209.934
210.000 / 210.436
210.500 / 210.938

211.000 / 211.440
211.500 / 211.943
212.000 / 212.445
212.500 / 212.947
213.000 / 213.450
213.500 / 213.952
214.000 / 214.454
214.500 / 214.956
215.000 / 215.459
215.500 / 215.961

216.000 / 216.463
216.500 / 216.966
217.000 / 217.468
217.500 / 217.970
218.000 / 218.473
218.500 / 218.975
219.000 / 219.477
219.500 / 219.980
220.000 / 220.482
220.500 / 220.984

221.000 / 221.486
221.500 / 221.989
222.000 / 222.491
222.500 / 222.993
223.000 / 223.496
223.500 / 223.998
224.000 / 224.500
224.500 / 225.003
225.000 / 225.505
225.500 / 226.007

Printed: 2005-10-12 08:49:43   Scale: 1 : 25   Aspect: 150 %   6 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 226.000 - 251.000 m
Azimuth: 172.7
Inclination: -49.4

Printed: 2005-10-12 08:49:43   Scale: 1 : 25   Aspect: 150 %   7 (31)

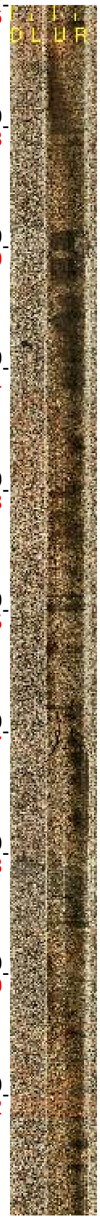
Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 251.000 - 276.000 m
Azimuth: 172.8
Inclination: -50.2

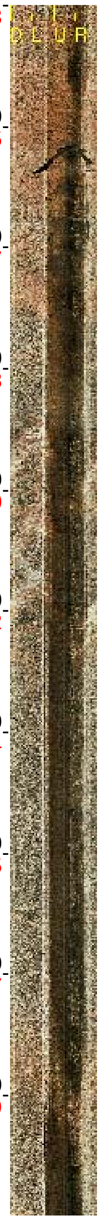
251.000 251.622
251.500 252.124
252.000 252.626
252.500 253.128
253.000 253.629
253.500 254.131
254.000 254.633
254.500 255.134
255.000 255.636
255.500 256.138

256.000 256.639
256.500 257.141
257.000 257.643
257.500 258.145
258.000 258.646
258.500 259.148
259.000 259.650
259.500 260.151
260.000 260.653
260.500 261.155

261.000 261.656
261.500 262.158
262.000 262.660
262.500 263.161
263.000 263.663
263.500 264.165
264.000 264.667
264.500 265.168
265.000 265.670
265.500 266.172



266.000 266.673
266.500 267.175
267.000 267.677
267.500 268.178
268.000 268.680
268.500 269.182
269.000 269.684
269.500 270.185
270.000 270.687
270.500 271.189



271.000 271.690
271.500 272.192
272.000 272.694
272.500 273.195
273.000 273.697
273.500 274.199
274.000 274.701
274.500 275.202
275.000 275.704
275.500 276.206

Printed: 2005-10-12 08:49:43   Scale: 1 : 25   Aspect: 150 %   8 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

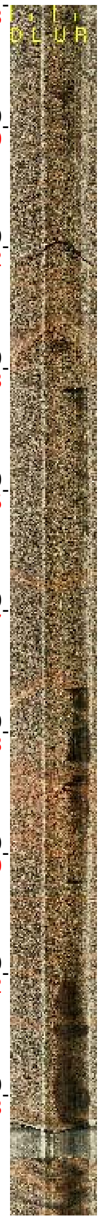
Depth range: 276.000 - 301.000 m
Azimuth: 173.6
Inclination: -49.2

276.000 276.707
276.500 277.209
277.000 277.711
277.500 278.212
278.000 278.714
278.500 279.216
279.000 279.717
279.500 280.219
280.000 280.721
280.500 281.223

281.000 281.724
281.500 282.226
282.000 282.728
282.500 283.229
283.000 283.731
283.500 284.233
284.000 284.734
284.500 285.236
285.000 285.738
285.500 286.240

286.000 286.741
286.500 287.243
287.000 287.745
287.500 288.246
288.000 288.748
288.500 289.250
289.000 289.751
289.500 290.253
290.000 290.755
290.500 291.256

291.000 291.758
291.500 292.260
292.000 292.762
292.500 293.263
293.000 293.765
293.500 294.267
294.000 294.768
294.500 295.270
295.000 295.772
295.500 296.273



296.000 296.775
296.500 297.277
297.000 297.779
297.500 298.280
298.000 298.782
298.500 299.284
299.000 299.785
299.500 300.287
300.000 300.789
300.500 301.291

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 9 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 301.000 - 326.000 m
Azimuth: 174.5
Inclination: -48.4

301.000 301.792
301.500 302.294
302.000 302.796
302.500 303.298
303.000 303.799
303.500 304.301
304.000 304.803
304.500 305.305
305.000 305.806
305.500 306.308

306.000 306.810
306.500 307.312
307.000 307.813
307.500 308.315
308.000 308.817
308.500 309.319
309.000 309.820
309.500 310.322
310.000 310.824
310.500 311.326

311.000 311.827
311.500 312.329
312.000 312.831
312.500 313.333
313.000 313.834
313.500 314.336
314.000 314.838
314.500 315.340
315.000 315.841
315.500 316.343

316.000 316.845
316.500 317.347
317.000 317.848
317.500 318.350
318.000 318.852
318.500 319.354
319.000 319.855
319.500 320.357
320.000 320.859
320.500 321.361

321.000 321.862
321.500 322.364
322.000 322.866
322.500 323.368
323.000 323.869
323.500 324.371
324.000 324.873
324.500 325.375
325.000 325.876
325.500 326.378

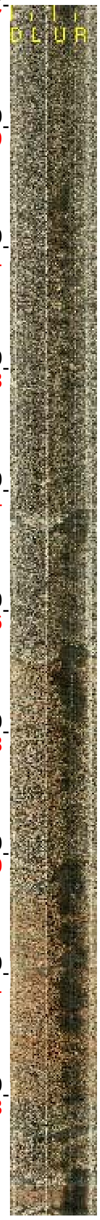
Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 10 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 326.000 - 351.000 m
Azimuth: 175.5
Inclination: -47.5

326.000
326.880
326.500
327.382
327.000
327.883
327.500
328.385
328.000
328.887
328.500
329.389
329.000
329.890
329.500
330.392
330.000
330.894
330.500
331.396

331.000
331.897
331.500
332.399
332.000
332.901
332.500
333.403
333.000
333.904
333.500
334.406
334.000
334.908
334.500
335.410
335.000
335.911
335.500
336.413



336.000
336.915
336.500
337.417
337.000
337.918
337.500
338.420
338.000
338.922
338.500
339.424
339.000
339.925
339.500
340.427
340.000
340.929
340.500
341.431

341.000
341.932
341.500
342.434
342.000
342.936
342.500
343.438
343.000
343.939
343.500
344.441
344.000
344.943
344.500
345.445
345.000
345.946
345.500
346.448

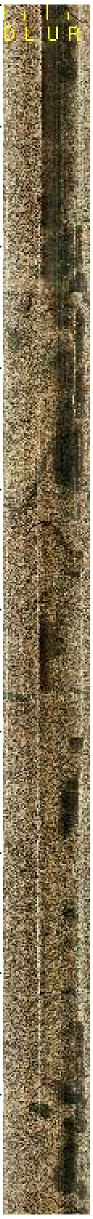
346.000
346.950
346.500
347.452
347.000
347.953
347.500
348.455
348.000
348.957
348.500
349.458
349.000
349.960
349.500
350.462
350.000
350.963
350.500
351.465

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 11 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 351.000 - 376.000 m
Azimuth: 177.2
Inclination: -46.6

351.000
351.966
351.500
352.468
352.000
352.970
352.500
353.471
353.000
353.973
353.500
354.474
354.000
354.976
354.500
355.478
355.000
355.979
355.500
356.481



356.000
356.982
356.500
357.484
357.000
357.986
357.500
358.487
358.000
358.989
358.500
359.490
359.000
359.992
359.500
360.493
360.000
360.995
360.500
361.497

361.000
361.998
361.500
362.500
362.000
363.001
362.500
363.503
363.000
364.005
363.500
364.506
364.000
365.008
364.500
365.509
365.000
366.011
365.500
366.513

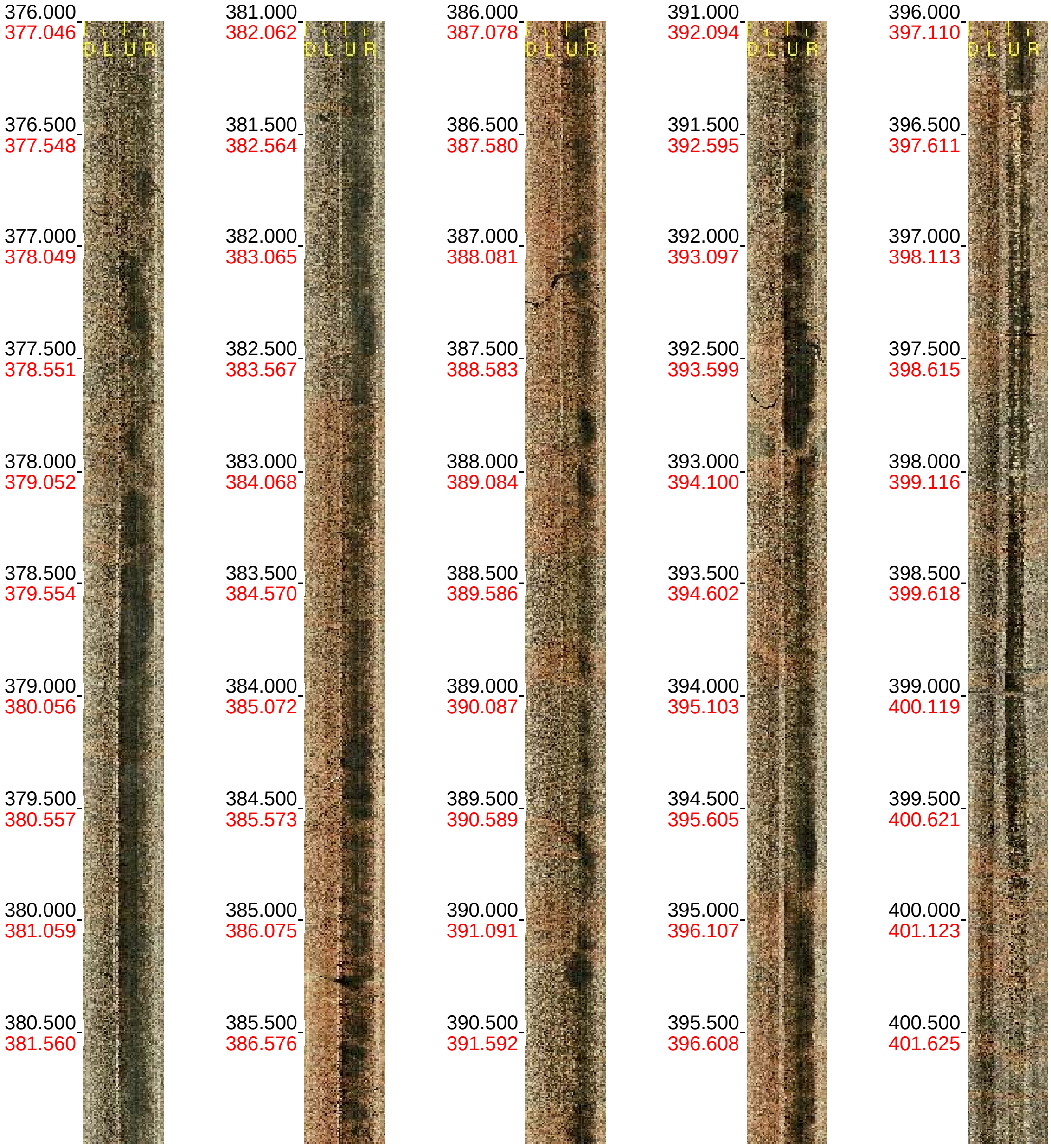
366.000
367.014
366.500
367.516
367.000
368.017
367.500
368.519
368.000
369.021
368.500
369.522
369.000
370.024
369.500
370.525
370.000
371.027
370.500
371.529

371.000
372.030
371.500
372.532
372.000
373.033
372.500
373.535
373.000
374.037
373.500
374.538
374.000
375.040
374.500
375.541
375.000
376.043
375.500
376.544

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 12 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 376.000 - 401.000 m
Azimuth: 178.4
Inclination: -45.3



Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 13 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 401.000 - 426.000 m
Azimuth: 180.0
Inclination: -43.9

401.000
402.126
401.500
402.628
402.000
403.130
402.500
403.631
403.000
404.133
403.500
404.635
404.000
405.137
404.500
405.638
405.000
406.140
405.500
406.642

406.000
407.143
406.500
407.645
407.000
408.147
407.500
408.649
408.000
409.150
408.500
409.652
409.000
410.154
409.500
410.655
410.000
411.157
410.500
411.659

411.000
412.161
411.500
412.662
412.000
413.164
412.500
413.666
413.000
414.167
413.500
414.669
414.000
415.171
414.500
415.673
415.000
416.174
415.500
416.676

416.000
417.178
416.500
417.679
417.000
418.181
417.500
418.683
418.000
419.185
418.500
419.686
419.000
420.188
419.500
420.690
420.000
421.191
420.500
421.693

421.000
422.195
421.500
422.697
422.000
423.198
422.500
423.700
423.000
424.202
423.500
424.703
424.000
425.205
424.500
425.707
425.000
426.209
425.500
426.710

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 14 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 426.000 - 451.000 m
Azimuth: 180.3
Inclination: -44.9

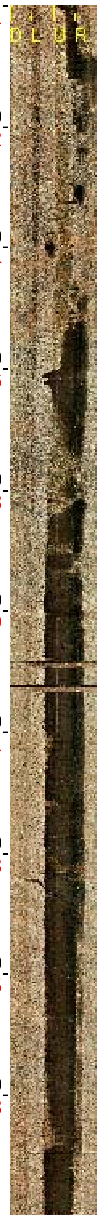
426.000
427.212
426.500
427.714
427.000
428.215
427.500
428.717
428.000
429.219
428.500
429.721
429.000
430.222
429.500
430.724
430.000
431.226
430.500
431.728

431.000
432.229
431.500
432.731
432.000
433.233
432.500
433.734
433.000
434.236
433.500
434.738
434.000
435.240
434.500
435.741
435.000
436.243
435.500
436.745

436.000
437.246
436.500
437.748
437.000
438.250
437.500
438.752
438.000
439.253
438.500
439.755
439.000
440.257
439.500
440.758
440.000
441.260
440.500
441.762

441.000
442.264
441.500
442.765
442.000
443.267
442.500
443.769
443.000
444.270
443.500
444.772
444.000
445.274
444.500
445.776
445.000
446.277
445.500
446.779

446.000
447.281
446.500
447.782
447.000
448.284
447.500
448.786
448.000
449.288
448.500
449.789
449.000
450.291
449.500
450.793
450.000
451.295
450.500
451.798

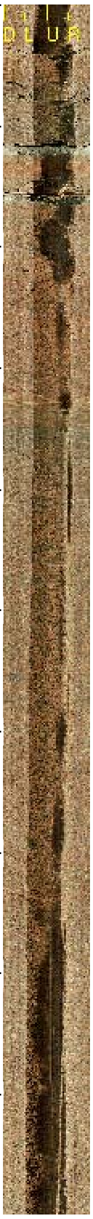


Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 15 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 451.000 - 476.000 m
Azimuth: 180.3
Inclination: -44.3

451.000 / 452.300
451.500 / 452.802
452.000 / 453.304
452.500 / 453.806
453.000 / 454.308
453.500 / 454.810
454.000 / 455.312
454.500 / 455.814
455.000 / 456.316
455.500 / 456.819



456.000 / 457.321
456.500 / 457.823
457.000 / 458.325
457.500 / 458.827
458.000 / 459.329
458.500 / 459.831
459.000 / 460.333
459.500 / 460.835
460.000 / 461.337
460.500 / 461.840

461.000 / 462.342
461.500 / 462.844
462.000 / 463.346
462.500 / 463.848
463.000 / 464.350
463.500 / 464.852
464.000 / 465.354
464.500 / 465.856
465.000 / 466.358
465.500 / 466.860

466.000 / 467.363
466.500 / 467.865
467.000 / 468.367
467.500 / 468.869
468.000 / 469.371
468.500 / 469.873
469.000 / 470.375
469.500 / 470.877
470.000 / 471.379
470.500 / 471.881

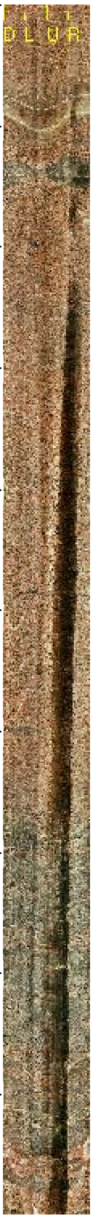
471.000 / 472.384
471.500 / 472.886
472.000 / 473.388
472.500 / 473.890
473.000 / 474.392
473.500 / 474.894
474.000 / 475.396
474.500 / 475.898
475.000 / 476.400
475.500 / 476.902

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 16 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

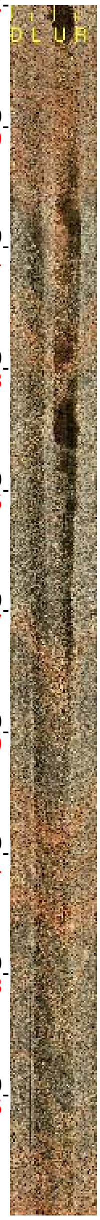
Depth range: 476.000 - 501.000 m
Azimuth: 176.1
Inclination: -46.6

476.000	477.405
476.500	477.907
477.000	478.409
477.500	478.911
478.000	479.413
478.500	479.915
479.000	480.417
479.500	480.919
480.000	481.421
480.500	481.923



481.000	482.426
481.500	482.928
482.000	483.430
482.500	483.932
483.000	484.434
483.500	484.936
484.000	485.438
484.500	485.940
485.000	486.442
485.500	486.944

486.000	487.447
486.500	487.949
487.000	488.451
487.500	488.953
488.000	489.455
488.500	489.957
489.000	490.459
489.500	490.961
490.000	491.463
490.500	491.965



491.000	492.467
491.500	492.970
492.000	493.472
492.500	493.974
493.000	494.476
493.500	494.978
494.000	495.480
494.500	495.982
495.000	496.484
495.500	496.986

496.000	497.488
496.500	497.991
497.000	498.493
497.500	498.995
498.000	499.497
498.500	499.999
499.000	500.501
499.500	501.004
500.000	501.506
500.500	502.008

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 17 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 501.000 - 526.000 m
Azimuth: 176.2
Inclination: -49.1

501.000 502.511
501.500 503.013
502.000 503.515
502.500 504.018
503.000 504.520
503.500 505.022
504.000 505.525
504.500 506.027
505.000 506.529
505.500 507.032

506.000 507.534
506.500 508.036
507.000 508.539
507.500 509.041
508.000 509.543
508.500 510.046
509.000 510.548
509.500 511.050
510.000 511.553
510.500 512.055

511.000 512.557
511.500 513.060
512.000 513.562
512.500 514.065
513.000 514.567
513.500 515.069
514.000 515.572
514.500 516.074
515.000 516.576
515.500 517.079

516.000 517.581
516.500 518.083
517.000 518.586
517.500 519.088
518.000 519.590
518.500 520.093
519.000 520.595
519.500 521.097
520.000 521.600
520.500 522.102

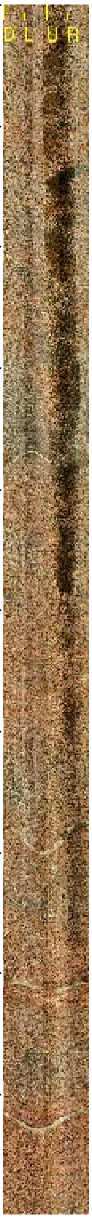
521.000 522.604
521.500 523.107
522.000 523.609
522.500 524.111
523.000 524.614
523.500 525.116
524.000 525.618
524.500 526.121
525.000 526.623
525.500 527.125

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 18 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 526.000 - 551.000 m
Azimuth: 174.8
Inclination: -51.4

526.000 527.628
526.500 528.130
527.000 528.632
527.500 529.135
528.000 529.637
528.500 530.139
529.000 530.642
529.500 531.144
530.000 531.646
530.500 532.149



531.000 532.651
531.500 533.154
532.000 533.656
532.500 534.158
533.000 534.661
533.500 535.163
534.000 535.665
534.500 536.168
535.000 536.670
535.500 537.172

536.000 537.675
536.500 538.177
537.000 538.679
537.500 539.182
538.000 539.684
538.500 540.186
539.000 540.689
539.500 541.191
540.000 541.693
540.500 542.196

541.000 542.698
541.500 543.200
542.000 543.703
542.500 544.205
543.000 544.707
543.500 545.210
544.000 545.712
544.500 546.214
545.000 546.717
545.500 547.219

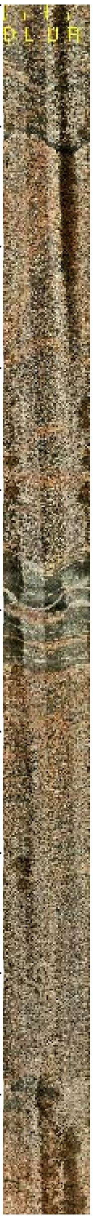
546.000 547.721
546.500 548.224
547.000 548.726
547.500 549.228
548.000 549.731
548.500 550.233
549.000 550.735
549.500 551.237
550.000 551.739
550.500 552.241

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 19 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

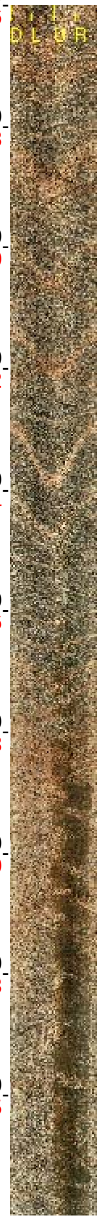
Depth range: 551.000 - 576.000 m
Azimuth: 174.7
Inclination: -51.9

551.000 / 552.744
551.500 / 553.246
552.000 / 553.748
552.500 / 554.250
553.000 / 554.752
553.500 / 555.254
554.000 / 555.756
554.500 / 556.258
555.000 / 556.760
555.500 / 557.263

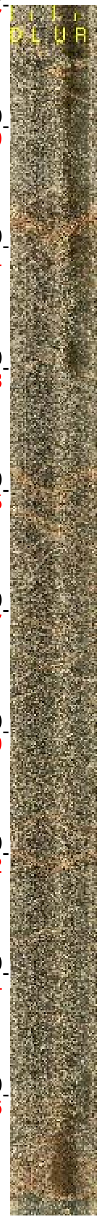


556.000 / 557.765
556.500 / 558.267
557.000 / 558.769
557.500 / 559.271
558.000 / 559.773
558.500 / 560.275
559.000 / 560.777
559.500 / 561.279
560.000 / 561.781
560.500 / 562.284

561.000 / 562.786
561.500 / 563.288
562.000 / 563.790
562.500 / 564.292
563.000 / 564.794
563.500 / 565.296
564.000 / 565.798
564.500 / 566.300
565.000 / 566.803
565.500 / 567.305



566.000 / 567.807
566.500 / 568.309
567.000 / 568.811
567.500 / 569.313
568.000 / 569.815
568.500 / 570.317
569.000 / 570.819
569.500 / 571.322
570.000 / 571.824
570.500 / 572.326



571.000 / 572.828
571.500 / 573.330
572.000 / 573.832
572.500 / 574.334
573.000 / 574.836
573.500 / 575.338
574.000 / 575.841
574.500 / 576.343
575.000 / 576.845
575.500 / 577.347

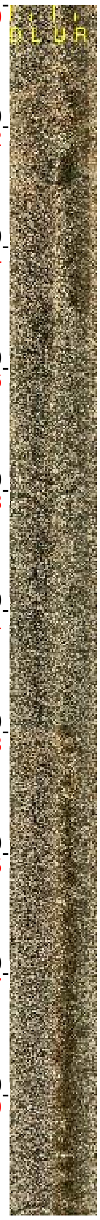
Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 20 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 576.000 - 601.000 m
Azimuth: 174.7
Inclination: -51.9

576.000 577.849
576.500 578.351
577.000 578.853
577.500 579.355
578.000 579.857
578.500 580.359
579.000 580.862
579.500 581.364
580.000 581.866
580.500 582.368

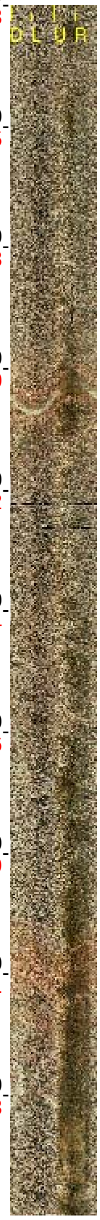
581.000 582.870
581.500 583.372
582.000 583.874
582.500 584.376
583.000 584.878
583.500 585.381
584.000 585.883
584.500 586.385
585.000 586.887
585.500 587.389



586.000 587.891
586.500 588.393
587.000 588.895
587.500 589.397
588.000 589.900
588.500 590.402
589.000 590.904
589.500 591.406
590.000 591.908
590.500 592.410

591.000 592.912
591.500 593.414
592.000 593.916
592.500 594.419
593.000 594.921
593.500 595.423
594.000 595.925
594.500 596.427
595.000 596.929
595.500 597.431

596.000 597.933
596.500 598.435
597.000 598.938
597.500 599.440
598.000 599.942
598.500 600.444
599.000 600.946
599.500 601.449
600.000 601.951
600.500 602.453



Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 21 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 601.000 - 626.000 m
Azimuth: 174.4
Inclination: -51.9

601.000 / 602.956
601.500 / 603.458
602.000 / 603.961
602.500 / 604.463
603.000 / 604.965
603.500 / 605.468
604.000 / 605.970
604.500 / 606.472
605.000 / 606.975
605.500 / 607.477

606.000 / 607.979
606.500 / 608.482
607.000 / 608.984
607.500 / 609.486
608.000 / 609.989
608.500 / 610.491
609.000 / 610.993
609.500 / 611.496
610.000 / 611.998
610.500 / 612.501

611.000 / 613.003
611.500 / 613.505
612.000 / 614.008
612.500 / 614.510
613.000 / 615.012
613.500 / 615.515
614.000 / 616.017
614.500 / 616.519
615.000 / 617.022
615.500 / 617.524

616.000 / 618.026
616.500 / 618.529
617.000 / 619.031
617.500 / 619.533
618.000 / 620.036
618.500 / 620.538
619.000 / 621.040
619.500 / 621.543
620.000 / 622.045
620.500 / 622.548

621.000 / 623.050
621.500 / 623.552
622.000 / 624.055
622.500 / 624.557
623.000 / 625.059
623.500 / 625.562
624.000 / 626.064
624.500 / 626.566
625.000 / 627.069
625.500 / 627.571

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 22 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 626.000 - 651.000 m
Azimuth: 174.4
Inclination: -51.8

626.000 628.073
626.500 628.576
627.000 629.078
627.500 629.580
628.000 630.083
628.500 630.585
629.000 631.088
629.500 631.590
630.000 632.092
630.500 632.595

631.000 633.097
631.500 633.599
632.000 634.102
632.500 634.604
633.000 635.106
633.500 635.609
634.000 636.111
634.500 636.613
635.000 637.116
635.500 637.618

636.000 638.120
636.500 638.623
637.000 639.125
637.500 639.628
638.000 640.130
638.500 640.632
639.000 641.135
639.500 641.637
640.000 642.139
640.500 642.642

641.000 643.144
641.500 643.646
642.000 644.149
642.500 644.651
643.000 645.153
643.500 645.656
644.000 646.158
644.500 646.660
645.000 647.163
645.500 647.665

646.000 648.167
646.500 648.670
647.000 649.172
647.500 649.674
648.000 650.177
648.500 650.679
649.000 651.181
649.500 651.683
650.000 652.185
650.500 652.687

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 23 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 651.000 - 676.000 m
Azimuth: 174.4
Inclination: -51.7

651.000
653.190
651.500
653.692
652.000
654.194
652.500
654.696
653.000
655.198
653.500
655.700
654.000
656.202
654.500
656.704
655.000
657.207
655.500
657.709

656.000
658.211
656.500
658.713
657.000
659.215
657.500
659.717
658.000
660.219
658.500
660.721
659.000
661.224
659.500
661.726
660.000
662.228
660.500
662.730

661.000
663.232
661.500
663.734
662.000
664.236
662.500
664.739
663.000
665.241
663.500
665.743
664.000
666.245
664.500
666.747
665.000
667.249
665.500
667.751

666.000
668.253
666.500
668.756
667.000
669.258
667.500
669.760
668.000
670.262
668.500
670.764
669.000
671.266
669.500
671.768
670.000
672.270
670.500
672.773

671.000
673.275
671.500
673.777
672.000
674.279
672.500
674.781
673.000
675.283
673.500
675.785
674.000
676.287
674.500
676.790
675.000
677.292
675.500
677.794

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 24 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 676.000 - 701.000 m
Azimuth: 174.5
Inclination: -51.4

676.000
678.296
676.500
678.798
677.000
679.300
677.500
679.802
678.000
680.305
678.500
680.807
679.000
681.309
679.500
681.811
680.000
682.313
680.500
682.815

681.000
683.317
681.500
683.819
682.000
684.322
682.500
684.824
683.000
685.326
683.500
685.828
684.000
686.330
684.500
686.832
685.000
687.334
685.500
687.836

686.000
688.339
686.500
688.841
687.000
689.343
687.500
689.845
688.000
690.347
688.500
690.849
689.000
691.351
689.500
691.853
690.000
692.356
690.500
692.858

691.000
693.360
691.500
693.862
692.000
694.364
692.500
694.866
693.000
695.368
693.500
695.870
694.000
696.373
694.500
696.875
695.000
697.377
695.500
697.879

696.000
698.381
696.500
698.883
697.000
699.385
697.500
699.888
698.000
700.390
698.500
700.893
699.000
701.396
699.500
701.898
700.000
702.401
700.500
702.904

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 25 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 701.000 - 726.000 m
Azimuth: 174.2
Inclination: -51.2

Printed: 2005-10-12 08:49:43   Scale: 1 : 25   Aspect: 150 %   26 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 726.000 - 751.000 m
Azimuth: 174.2
Inclination: -51.2

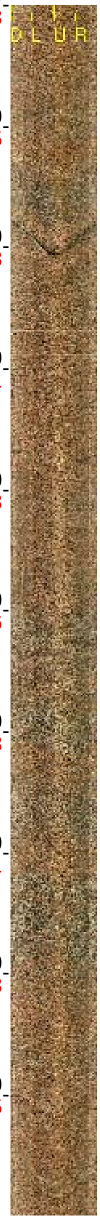
726.000	728.543
726.500	729.046
727.000	729.549
727.500	730.051
728.000	730.554
728.500	731.057
729.000	731.560
729.500	732.062
730.000	732.565
730.500	733.068

731.000	733.571
731.500	734.073
732.000	734.576
732.500	735.079
733.000	735.582
733.500	736.084
734.000	736.587
734.500	737.090
735.000	737.592
735.500	738.095

736.000	738.598
736.500	739.101
737.000	739.603
737.500	740.106
738.000	740.609
738.500	741.112
739.000	741.614
739.500	742.117
740.000	742.620
740.500	743.123

741.000	743.625
741.500	744.128
742.000	744.631
742.500	745.133
743.000	745.636
743.500	746.139
744.000	746.642
744.500	747.144
745.000	747.647
745.500	748.150

746.000	748.653
746.500	749.155
747.000	749.658
747.500	750.161
748.000	750.663
748.500	751.166
749.000	751.668
749.500	752.171
750.000	752.673
750.500	753.175



Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 27 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 751.000 - 776.000 m
Azimuth: 174.2
Inclination: -51.0

751.000 753.678
751.500 754.180
752.000 754.683
752.500 755.185
753.000 755.688
753.500 756.190
754.000 756.693
754.500 757.195
755.000 757.697
755.500 758.200

756.000 758.702
756.500 759.205
757.000 759.707
757.500 760.210
758.000 760.712
758.500 761.214
759.000 761.717
759.500 762.219
760.000 762.722
760.500 763.224

761.000 763.727
761.500 764.229
762.000 764.732
762.500 765.234
763.000 765.736
763.500 766.239
764.000 766.741
764.500 767.244
765.000 767.746
765.500 768.249

766.000 768.751
766.500 769.254
767.000 769.756
767.500 770.258
768.000 770.761
768.500 771.263
769.000 771.766
769.500 772.268
770.000 772.771
770.500 773.273

771.000 773.776
771.500 774.278
772.000 774.780
772.500 775.283
773.000 775.785
773.500 776.288
774.000 776.790
774.500 777.293
775.000 777.795
775.500 778.298

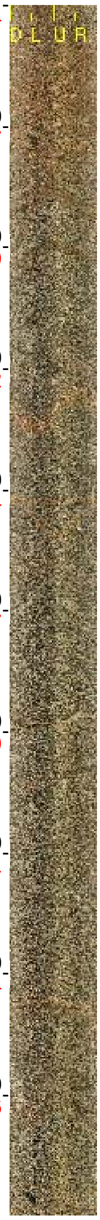
Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 28 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

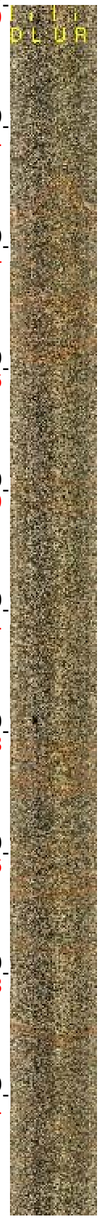
Depth range: 776.000 - 801.000 m
Azimuth: 174.0
Inclination: -50.8

776.000
778.800
776.500
779.302
777.000
779.805
777.500
780.307
778.000
780.810
778.500
781.312
779.000
781.815
779.500
782.317
780.000
782.820
780.500
783.322

781.000
783.824
781.500
784.327
782.000
784.829
782.500
785.332
783.000
785.834
783.500
786.337
784.000
786.839
784.500
787.341
785.000
787.844
785.500
788.346



786.000
788.849
786.500
789.351
787.000
789.854
787.500
790.356
788.000
790.859
788.500
791.361
789.000
791.863
789.500
792.366
790.000
792.868
790.500
793.371



791.000
793.873
791.500
794.376
792.000
794.878
792.500
795.381
793.000
795.883
793.500
796.385
794.000
796.888
794.500
797.390
795.000
797.893
795.500
798.395

796.000
798.898
796.500
799.400
797.000
799.903
797.500
800.405
798.000
800.907
798.500
801.410
799.000
801.912
799.500
802.415
800.000
802.917
800.500
803.420

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 29 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 801.000 - 826.000 m
Azimuth: 174.3
Inclination: -50.7

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 30 (31)

Borehole: KLX07A
Mapping: KLX07A_JE_PD_4

Depth range: 826.000 - 832.776 m
Azimuth: 174.3
Inclination: -50.5

826.000	829.044
826.500	829.547
827.000	830.049
827.500	830.552
828.000	831.054
828.500	831.556
829.000	832.059
829.500	832.561
830.000	833.064
830.500	833.566

831.000	834.069
831.500	834.571
832.000	835.073
832.500	835.576
833.000	
833.500	
834.000	
834.500	
835.000	
835.500	

Printed: 2005-10-12 08:49:43 Scale: 1 : 25 Aspect: 150 % 31 (31)

Appendix 7

BIPS-image of KLX07B

Borehole Image Report

Borehole Name:	KLX07B
Mapping Name:	KLX07B_CHES_2
Mapping Range:	9.000 - 199.700 m
Diameter:	76.0 mm
Printed Range:	9.000 - 199.464
Pages:	9

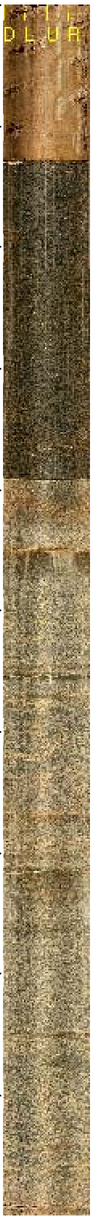
Image File Information:

File:	D:\BIPSbilder\KLX07B\KLX07B_9-199m.BIP
Date/Time:	2005-07-07 08:01:00
Start Depth:	9.000 m
End Depth:	199.464 m
Resolution:	1.00 mm/pixel (depth)
Orientation:	Gravmetric
Image height:	190464 pixels
Image width:	360 pixels
BIP Version:	BIP-III
Locality:	LAXEMAR
Borehole:	KLX07B
Scan Direction:	Down
Color adjust:	0 0 0 (RGB)

Borehole: KLX07B
Mapping: KLX07B_CHES_2

Depth range: 9.000 - 34.000 m
Azimuth: 171.1
Inclination: -85.2

9.000 / 9.000
9.500 / 9.500
10.000 / 10.001
10.500 / 10.502
11.000 / 11.003
11.500 / 11.504
12.000 / 12.005
12.500 / 12.506
13.000 / 13.008
13.500 / 13.509



14.000 / 14.010
14.500 / 14.511
15.000 / 15.012
15.500 / 15.513
16.000 / 16.014
16.500 / 16.516
17.000 / 17.017
17.500 / 17.518
18.000 / 18.019
18.500 / 18.520

19.000 / 19.021
19.500 / 19.522
20.000 / 20.023
20.500 / 20.525
21.000 / 21.026
21.500 / 21.527
22.000 / 22.028
22.500 / 22.529
23.000 / 23.030
23.500 / 23.531

24.000 / 24.032
24.500 / 24.534
25.000 / 25.035
25.500 / 25.536
26.000 / 26.037
26.500 / 26.538
27.000 / 27.039
27.500 / 27.540
28.000 / 28.042
28.500 / 28.543

29.000 / 29.044
29.500 / 29.545
30.000 / 30.046
30.500 / 30.547
31.000 / 31.048
31.500 / 31.549
32.000 / 32.051
32.500 / 32.552
33.000 / 33.053
33.500 / 33.554

Printed: 2005-10-12 08:43:09 Scale: 1 : 25 Aspect: 150 % 2 (9)

Borehole: KLX07B
Mapping: KLX07B_CHES_2

Depth range: 34.000 - 59.000 m
Azimuth: 171.1
Inclination: -85.2

Printed: 2005-10-12 08:43:09 Scale: 1 : 25 Aspect: 150 % 3 (9)

Borehole: KLX07B
Mapping: KLX07B_CHES_2

Depth range: 59.000 - 84.000 m
Azimuth: 171.1
Inclination: -85.2

59.000
59.112
59.500
59.613
60.000
60.114
60.500
60.615
61.000
61.116
61.500
61.617
62.000
62.118
62.500
62.620
63.000
63.121
63.500
63.622

64.000
64.123
64.500
64.624
65.000
65.125
65.500
65.626
66.000
66.128
66.500
66.629
67.000
67.130
67.500
67.631
68.000
68.132
68.500
68.633

69.000
69.134
69.500
69.635
70.000
70.137
70.500
70.638
71.000
71.139
71.500
71.640
72.000
72.141
72.500
72.642
73.000
73.143
73.500
73.644

74.000
74.146
74.500
74.647
75.000
75.148
75.500
75.649
76.000
76.150
76.500
76.651
77.000
77.152
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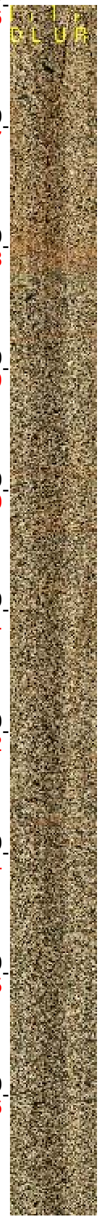
77.654
78.000
78.155
78.500
78.656



79.000
79.157
79.500
79.658
80.000
80.159
80.500
80.660
81.000
81.161
81.500
81.663
82.000
82.164
82.500
82.665
83.000
83.166
83.500
83.667

Printed: 2005-10-12 08:43:09 Scale: 1 : 25 Aspect: 150 % 4 (9)

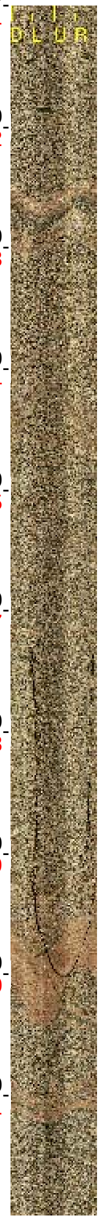
Borehole: KLX07B
Mapping: KLX07B_CHES_2

Depth range: 84.000 - 109.000 m
Azimuth: 171.1
Inclination: -85.2

84.000
84.168
84.500
84.669
85.000
85.171
85.500
85.672
86.000
86.173
86.500
86.674
87.000
87.175
87.500
87.676
88.000
88.177
88.500
88.678

89.000
89.180
89.500
89.681
90.000
90.182
90.500
90.683
91.000
91.184
91.500
91.685
92.000
92.186
92.500
92.687
93.000
93.189
93.500
93.690

94.000
94.191
94.500
94.692
95.000
95.193
95.500
95.694
96.000
96.195
96.500
96.697
97.000
97.198
97.500
97.699
98.000
98.200
98.500
98.701



99.000
99.202
99.500
99.703
100.000
100.204
100.500
100.706
101.000
101.207
101.500
101.708
102.000
102.209
102.500
102.710
103.000
103.211
103.500
103.712

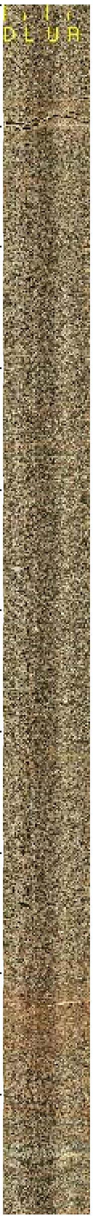
104.000
104.213
104.500
104.715
105.000
105.216
105.500
105.717
106.000
106.218
106.500
106.719
107.000
107.220
107.500
107.721
108.000
108.223
108.500
108.724

Printed: 2005-10-12 08:43:09 Scale: 1 : 25 Aspect: 150 % 5 (9)

Borehole: KLX07B
Mapping: KLX07B_CHES_2

Depth range: 109.000 - 134.000 m
Azimuth: 171.1
Inclination: -85.2

109.000
109.225
109.500
109.726
110.000
110.227
110.500
110.728
111.000
111.229
111.500
111.730
112.000
112.232
112.500
112.733
113.000
113.234
113.500
113.735



114.000
114.236
114.500
114.737
115.000
115.238
115.500
115.740
116.000
116.241
116.500
116.742
117.000
117.243
117.500
117.744
118.000
118.245
118.500
118.746

119.000
119.247
119.500
119.749
120.000
120.250
120.500
120.751
121.000
121.252
121.500
121.753
122.000
122.254
122.500
122.755
123.000
123.256
123.500
123.758

124.000
124.259
124.500
124.760
125.000
125.261
125.500
125.762
126.000
126.263
126.500
126.764
127.000
127.266
127.500
127.767
128.000
128.268
128.500
128.769

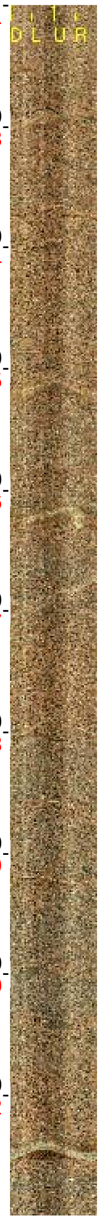
129.000
129.270
129.500
129.771
130.000
130.272
130.500
130.773
131.000
131.275
131.500
131.776
132.000
132.277
132.500
132.778
133.000
133.279
133.500
133.780

Printed: 2005-10-12 08:43:09 Scale: 1 : 25 Aspect: 150 % 6 (9)

Borehole: KLX07B
Mapping: KLX07B_CHES_2

Depth range: 134.000 - 159.000 m
Azimuth: 171.1
Inclination: -85.2

134.000
134.281
134.500
134.783
135.000
135.284
135.500
135.785
136.000
136.286
136.500
136.787
137.000
137.288
137.500
137.789
138.000
138.290
138.500
138.792



139.000
139.293
139.500
139.794
140.000
140.295
140.500
140.796
141.000
141.297
141.500
141.798
142.000
142.299
142.500
142.801
143.000
143.302
143.500
143.803

144.000
144.304
144.500
144.805
145.000
145.306
145.500
145.807
146.000
146.309
146.500
146.810
147.000
147.311
147.500
147.812
148.000
148.313
148.500
148.814

149.000
149.315
149.500
149.816
150.000
150.318
150.500
150.819
151.000
151.320
151.500
151.821
152.000
152.322
152.500
152.823
153.000
153.324
153.500
153.825

154.000
154.327
154.500
154.828
155.000
155.329
155.500
155.830
156.000
156.331
156.500
156.832
157.000
157.333
157.500
157.835
158.000
158.336
158.500
158.837

Printed: 2005-10-12 08:43:09   Scale: 1 : 25   Aspect: 150 %   7 (9)

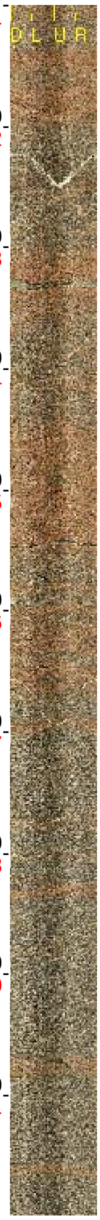
Borehole: KLX07B
Mapping: KLX07B_CHES_2

Depth range: 159.000 - 184.000 m
Azimuth: 171.1
Inclination: -85.2

159.000
159.338
159.500
159.839
160.000
160.340
160.500
160.841
161.000
161.342
161.500
161.844
162.000
162.345
162.500
162.846
163.000
163.347
163.500
163.848

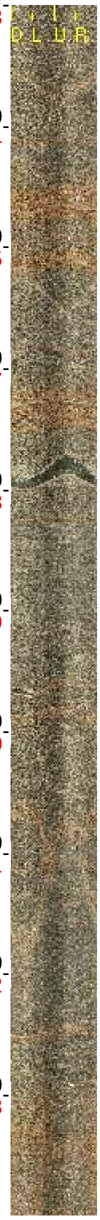
164.000
164.349
164.500
164.850
165.000
165.352
165.500
165.853
166.000
166.354
166.500
166.855
167.000
167.356
167.500
167.857
168.000
168.358
168.500
168.859

169.000
169.361
169.500
169.862
170.000
170.363
170.500
170.864
171.000
171.365
171.500
171.866
172.000
172.367
172.500
172.868
173.000
173.370
173.500
173.871



174.000
174.372
174.500
174.873
175.000
175.374
175.500
175.875
176.000
176.376
176.500
176.878
177.000
177.379
177.500
177.880
178.000
178.381
178.500
178.882

179.000
179.383
179.500
179.884
180.000
180.385
180.500
180.887
181.000
181.388
181.500
181.889
182.000
182.390
182.500
182.891
183.000
183.392
183.500
183.893



Printed: 2005-10-12 08:43:09 Scale: 1 : 25 Aspect: 150 % 8 (9)

Borehole: KLX07B
Mapping: KLX07B_CHES_2

Depth range: 184.000 - 199.464 m
Azimuth: 171.1
Inclination: -85.2

184.000
184.394
184.500
184.896
185.000
185.397
185.500
185.898
186.000
186.399
186.500
186.900
187.000
187.401
187.500
187.902
188.000
188.404
188.500
188.905

189.000
189.406
189.500
189.907
190.000
190.408
190.500
190.909
191.000
191.410
191.500
191.911
192.000
192.413
192.500
192.914
193.000
193.415
193.500
193.916

194.000
194.417
194.500
194.918
195.000
195.419
195.500
195.921
196.000
196.422
196.500
196.923
197.000
197.424
197.500
197.925
198.000
198.426
198.500
198.927

199.000
199.428
199.500
199.930
200.000
200.500
201.000
201.500
202.000
202.500
203.000
203.500

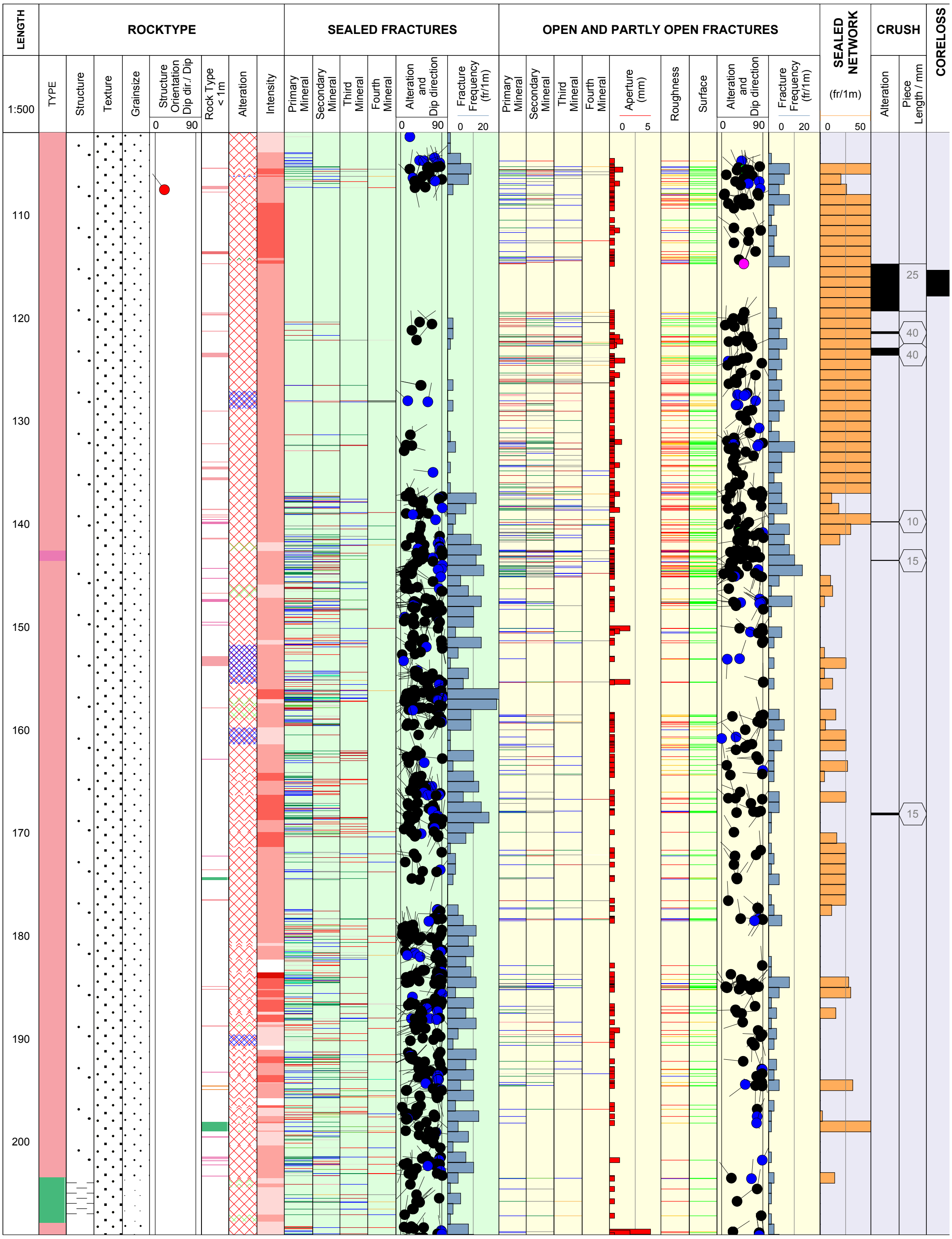
Printed: 2005-10-12 08:43:09 Scale: 1 : 25 Aspect: 150 % 9 (9)

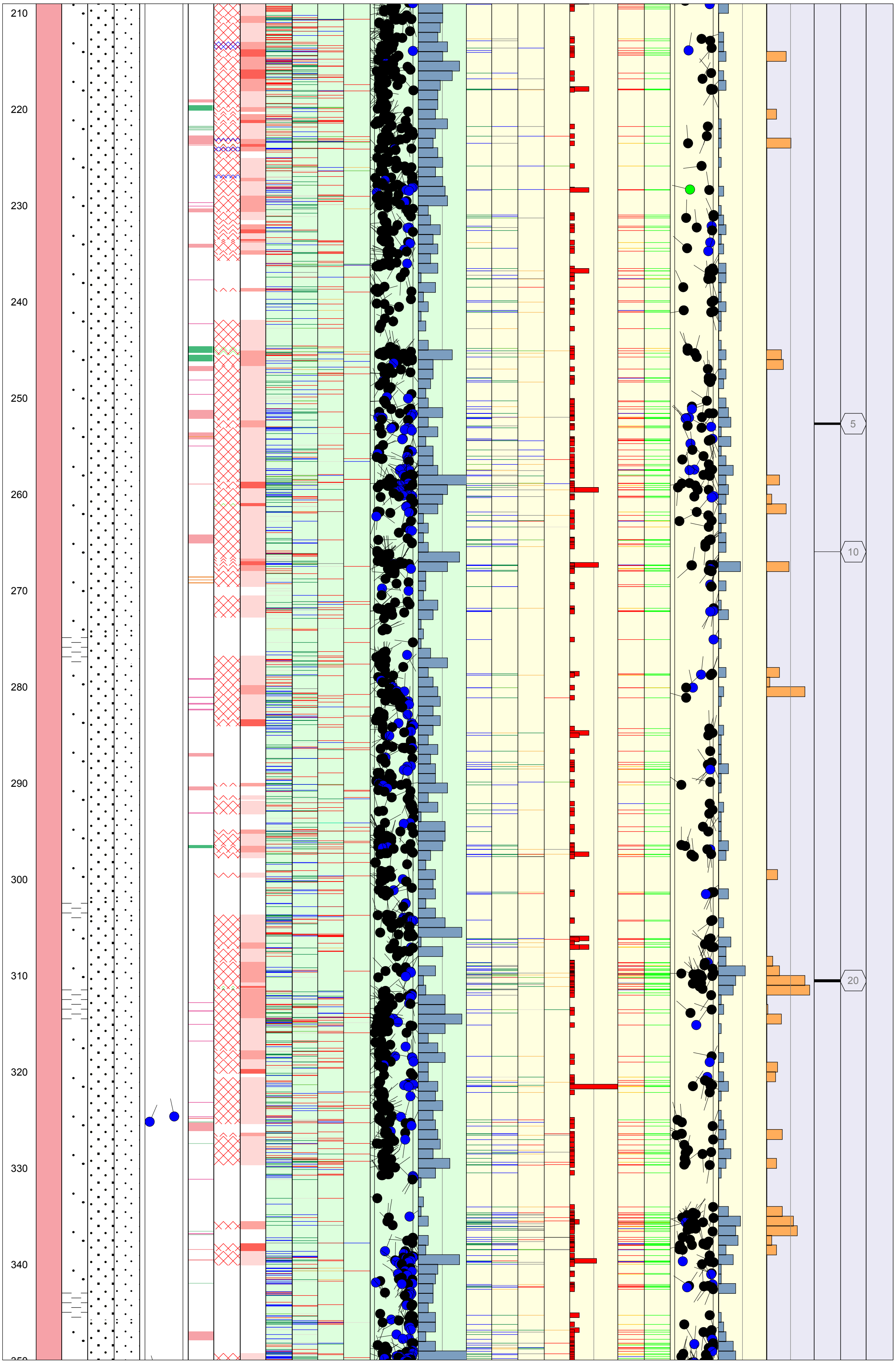
Appendix 8

WellCad diagram of KLX07A

Title GEOLOGY IN KLX07A **Appendix:**

Site	LAXEMAR	**Coordinate System**	RT90-RHB70
Borehole	KLX07A	**Northing [m]**	6366751.27
Diameter [mm]	76	**Easting [m]**	1549206.91
Length [m]	844.730	**Elevation [m.a.s.l.]**	18.40
Bearing [°]	174.18	**Drilling Start Date**	2004-11-23 07:00:00
Inclination [°]	-60.03	**Drilling Stop Date**	2004-12-07 09:00:00
Date of coremapping	2005-07-07 15:06:00	**Plot Date**	2006-04-10 21:15:08
Rocktype data from	p_rock	**Signed data**	

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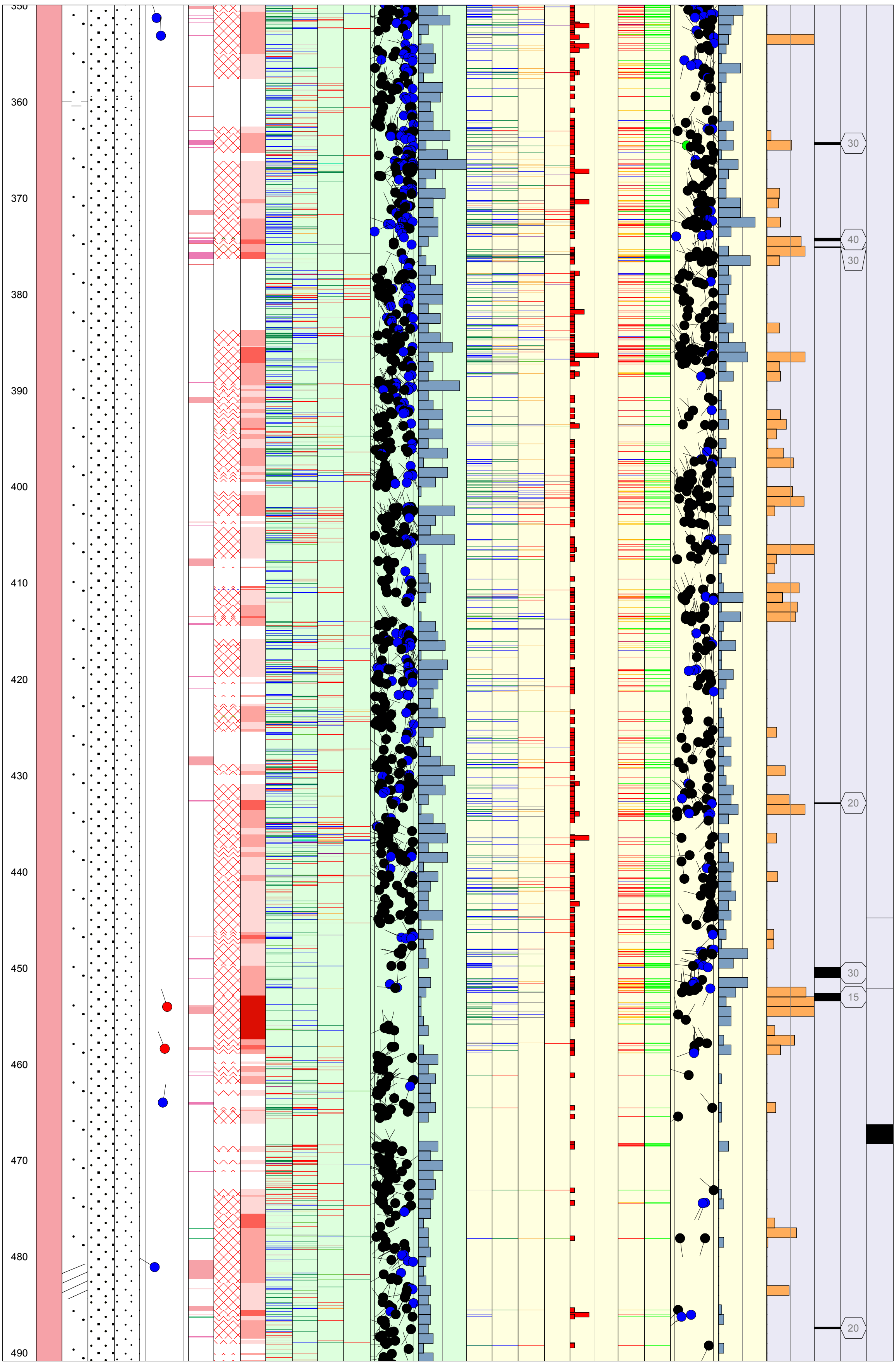
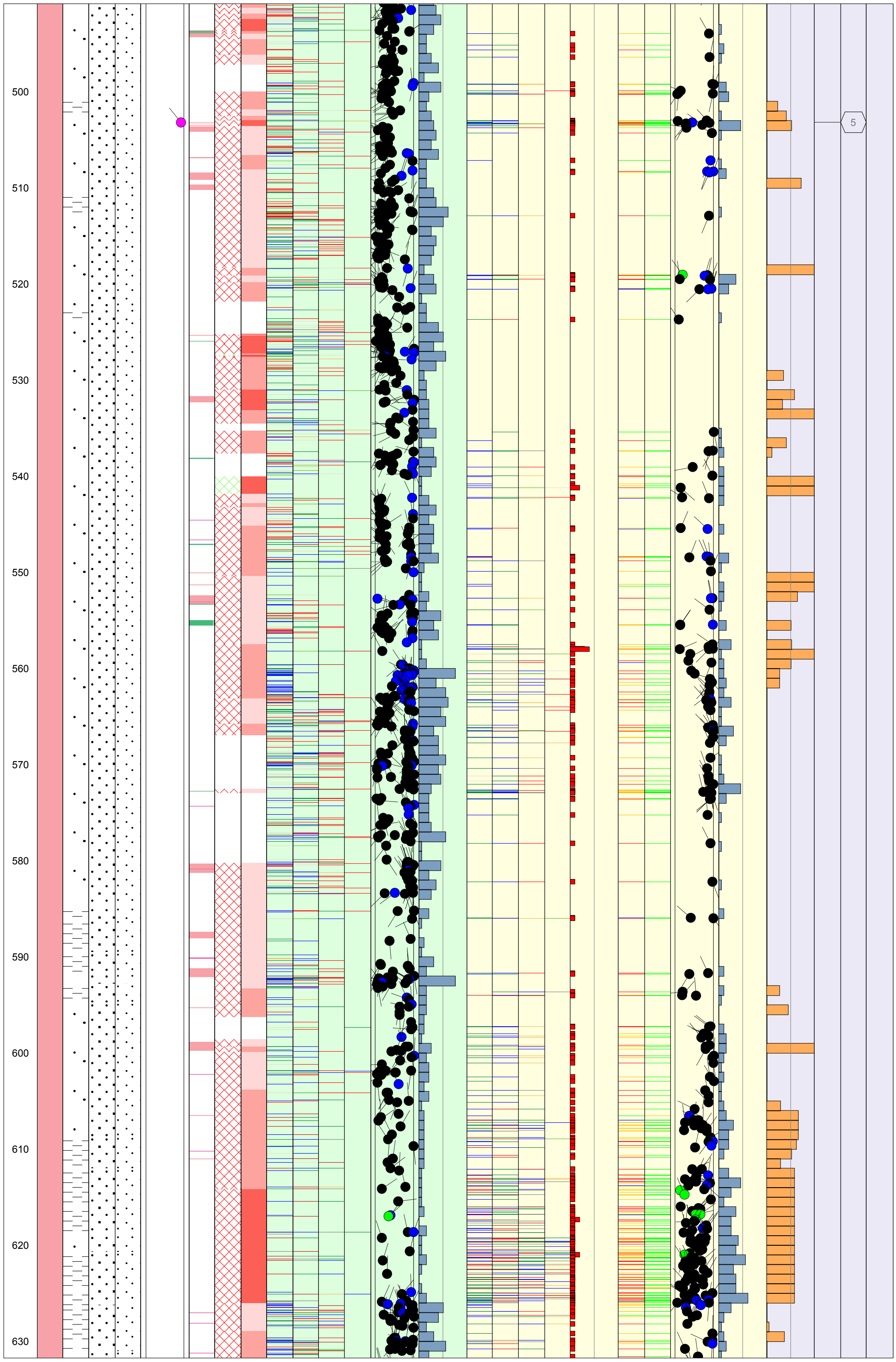
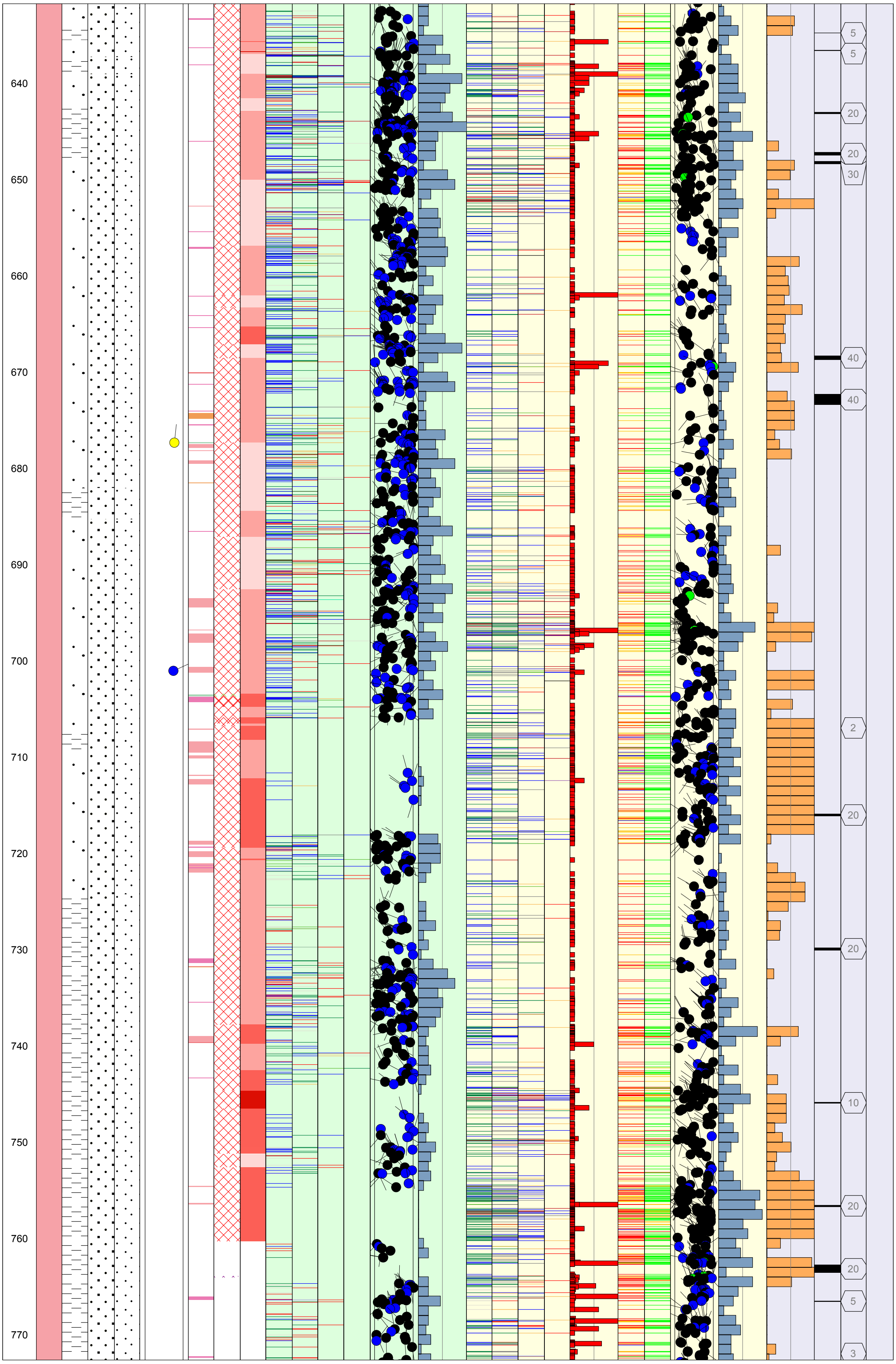
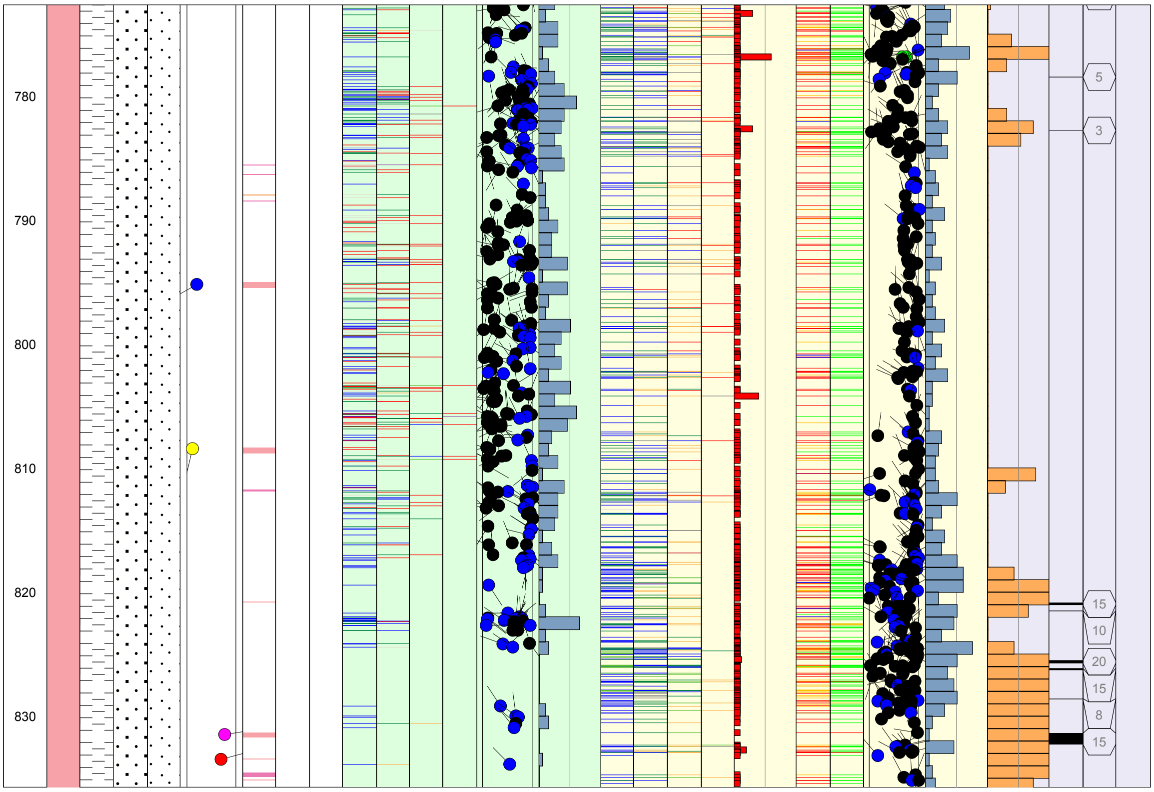
220
230
240
250
260
270
280
290
300
310
320
330
340
5
10
20


350
360
370
380
390
400
410
420
430
440
450
460
470
480
490
30
40
30
20
30
15
20


500
510
520
530
540
550
560
570
580
590
600
610
620
630
5


640
650
660
670
680
690
700
710
720
730
740
750
760
770
5
5
20
20
30
40
40
2
20
20
10
20
20
5
3


780
790
800
810
820
830
5
3
15
10
20
15
8
15

Appendix 9

Legend to WellCad Diagram KLX07A

Title LEGEND FOR SIMPEVARP KLX07A [Draft plot boremap]

Site LAXEMAR
Borehole KLX07A
Plot Date

ROCKTYPE
- Dolerite / Diabas
- 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

ROCK ALTERATION
- Oxidized
- Chloritisized
- Epidotisized
- Weathered
- Tectonized
- Sericitisized
- Quartz dissolution
- Silicification
- Argillization
- Albitization
- Carbonatization
- Saussuritization
- Steatitization
- Uralitization
- Laumontitization
- Fract zone alteration

MINERAL
- Epidote
- Flourite
- Hematite
- Calcite
- Chlorite
- Quartz
- Unknown
- Pyrite
- Clay Minerals
- Laumontite
- Zeolite
- Iron Hydroxide
- Oxidized Walls

STRUCTURE
- Cataclastic
- Schistose
- Gneissic
- Mylonitic
- Ductile Shear Zone
- Brittle-Ductile Zone
- Veined
- Banded
- Massive
- Foliated
- Brecciated
- Lineated

TEXTURE
- Hornfelsed
- Porphyritic
- Ophitic
- Equigranular
- Augen-Bearing
- Unequigranular
- Metamorphic

GRAINSIZE
- Aphanitic
- Fine-grained
- Fine to medium grained
- Medium to coarse grained
- Coarse-grained
- Medium-grained

STRUCTURE ORIENTATION
- Cataclastic
- Bedded
- Gneissic
- Schistose
- Brittle-Ductile Shear Zone
- Ductile Shear Zone
- Lineated
- Banded
- Veined
- Brecciated
- Foliated
- Mylonitic

ROCK ALTERATION INTENSITY
- No intensity
- Faint
- Weak
- Medium
- Strong

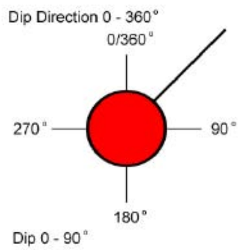
ROUGHNESS
- Planar
- Undulating
- Stepped
- Irregular

SURFACE
- Rough
- Smooth
- Slickensided

CRUSH ALTERATION
- Slightly Altered
- Moderately Altered
- Highly Altered
- Completley Altered
- Gouge
- Fresh

FRACTURE ALTERATION
- Fresh
- Gouge
- Completely Altered
- Highly Altered
- Moderately Altered
- Slightly Altered

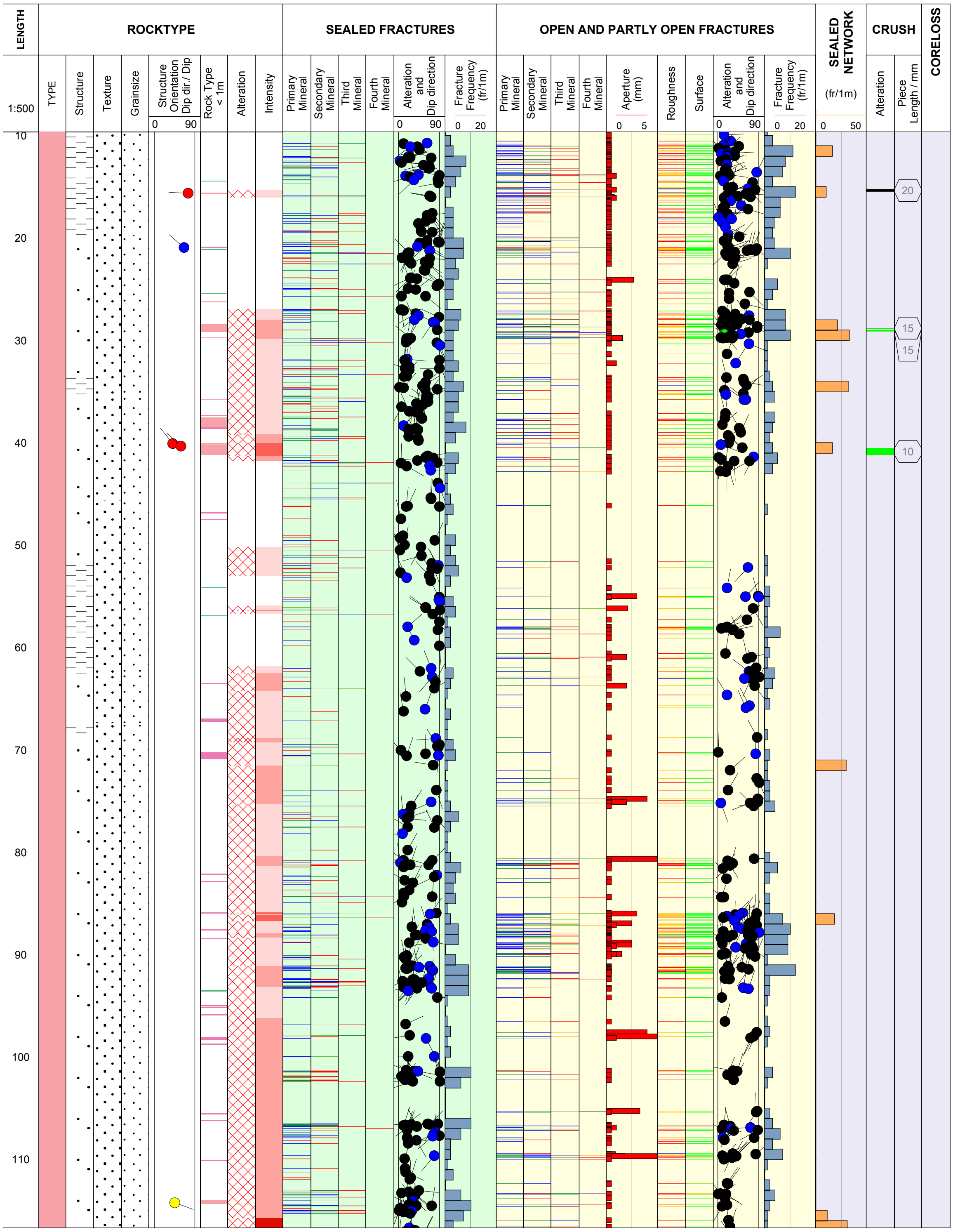
FRACTURE DIRECTION
STRUKTURE ORIENTATION

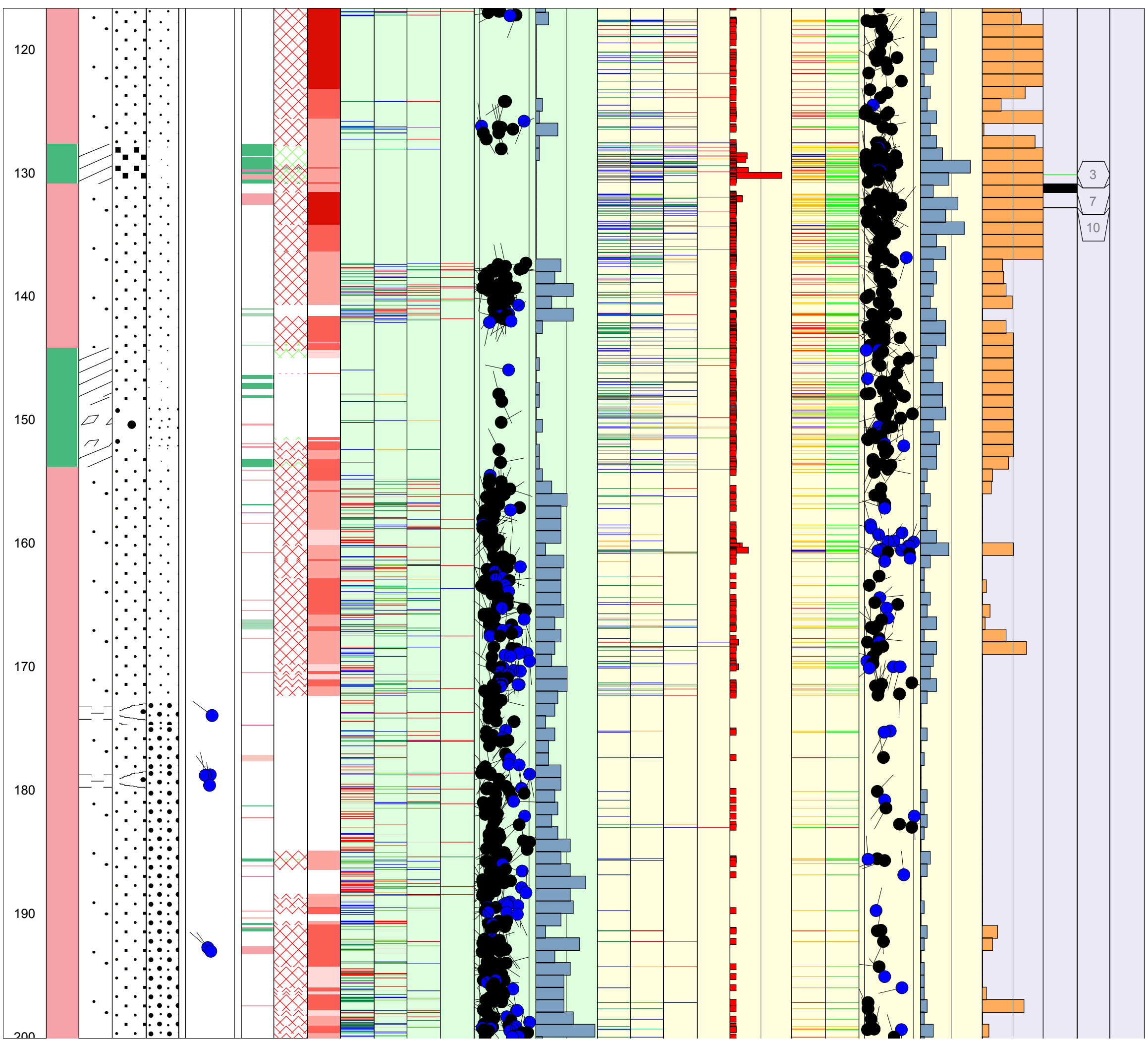


Appendix 10

WellCad diagram of KLX07B

Title	GEOLOGY IN KLX07B		Appendix:
Site	LAXEMAR	Coordinate System	RT90-RHB70
Borehole	KLX07B	Northing [m]	6366752.32
Diameter [mm]	76	Easting [m]	1549206.80
Length [m]	200.130	Elevation [m.a.s.l.]	18.31
Bearing [°]	174.33	Drilling Start Date	2005-05-23 18:00:00
Inclination [°]	-84.99	Drilling Stop Date	2005-06-03 08:00:00
Date of coremapping	2005-09-13 08:00:00	Plot Date	2006-04-10 21:15:08
Rocktype data from	p_rock	Signed data	




120
130
140
150
160
170
180
190
200
3
7
10

Legend to WellCad Diagram KLX07B

Title LEGEND FOR SIMPEVARP KLX07B [Draft plot boremap]

Site SIMPEVARP
Borehole KLX07B
Plot Date

ROCKTYPE
- Dolerite / Diabas
- 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

ROCK ALTERATION
- Oxidized
- Chloritisized
- Epidotisized
- Weathered
- Tectonized
- Sericitisized
- Quartz dissolution
- Silicification
- Argillization
- Albitization
- Carbonatization
- Saussuritization
- Steatitization
- Uralitization
- Laumontitization
- Fract zone alteration

MINERAL
- Epidote
- Hematite
- Calcite
- Chlorite
- Quartz
- Unknown
- Pyrite
- Clay Minerals
- Laumontite
- Prehnite
- Iron Hydroxide
- Oxidized Walls

STRUCTURE
- Cataclastic
- Schistose
- Gneissic
- Mylonitic
- Ductile Shear Zone
- Brittle-Ductile Zone
- Veined
- Banded
- Massive
- Foliated
- Brecciated
- Lineated

TEXTURE
- Hornfelsed
- Porphyritic
- Ophitic
- Equigranular
- Augen-Bearing
- Unequigranular
- Metamorphic

GRAINSIZE
- Aphanitic
- Fine-grained
- Fine to medium grained
- Medium to coarse grained
- Coarse-grained
- Medium-grained

STRUCTURE ORIENTATION
- Cataclastic
- Bedded
- Gneissic
- Schistose
- Brittle-Ductile Shear Zone
- Ductile Shear Zone
- Lineated
- Banded
- Veined
- Brecciated
- Foliated
- Mylonitic

ROCK ALTERATION INTENSITY
- No intensity
- Faint
- Weak
- Medium
- Strong

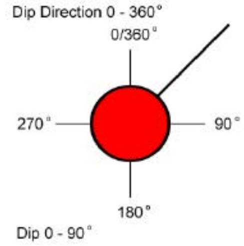
ROUGHNESS
- Planar
- Undulating
- Stepped
- Irregular

SURFACE
- Rough
- Smooth
- Slickensided

CRUSH ALTERATION
- Slightly Altered
- Moderately Altered
- Highly Altered
- Completley Altered
- Gouge
- Fresh

FRACTURE ALTERATION
- Fresh
- Gouge
- Completely Altered
- Highly Altered
- Moderately Altered
- Slightly Altered

FRACTURE DIRECTION
STRUKTURE ORIENTATION



Appendix 12

In-data: Borehole length and diameter for KLX07A

Hole Diam T - Drilling: Borehole diameter

KLX07A, 2005-01-06 14:00:00 - 2005-05-04 10:00:00 (100.460 - 844.730 m)

Sub Secup (m)	Sub Seclow (m)	Hole Diam (m)	Comment
100.460	101.980	0.086	T-86 (rymning 100.46-101.98)
101.980	844.730	0.076	Corac N/3

Printout from SICADA 2005-07-06 11:00:37.

Appendix 13

In-data: Borehole length and diameter for KLX07B

Hole Diam T - Drilling: Borehole diameter

KLX07B, 2005-05-23 15:00:00 - 2005-06-03 08:00:00 (0.000 - 200.130 m)

Sub Secup (m)	Sub Seclow (m)	Hole Diam (m)	Comment
0.000	9.640	0.096	HQ (rymning)
9.640	200.130	0.076	Corac N/3

Printout from SICADA 2005-07-06 11:02:00.

In-data: Reference marks for depth adjustments for KLX07A

Reference Mark T - Reference mark in drillhole

KLX07A, 2005-05-17 06:00:00 - 2005-05-17 16:00:00 (0.000 - 800.000 m)

Bhlen (m)	Rotation Speed (rpm)	Start Flow (l/min)	Stop Flow (l/min)	Stop Pressure (bar)	Cutter Time (s)	Trace Detectable	Cutter Diameter (mm)	Comment
110.00	400.00	100	1000	38.0	90	Yes		
150.00	400.00	100	1000	40.0	72	Yes		
200.00	400.00	120	1000	42.0	72	Yes		
250.00	400.00	110	1000	41.0	66	Yes		
300.00	400.00	110	1000	42.0	67	Yes		
349.00	400.00	110	1000	40.0	62	Yes		
400.00	400.00	130	1000	10.0	64	Yes		
450.00	400.00	140	1000	40.0	56	Yes		
500.00	400.00	220	1000	41.0	61	Yes		
550.00	400.00	120	1000	40.0	58	Yes		
600.00	400.00	140	1000	42.0	68	Yes		
650.00	400.00	180	1000	41.0	66	Yes		
700.00	400.00	160	1000	43.0	71	Yes		
750.00	400.00	180	1000	43.0	64	Yes		
800.00	400.00	200	1000	44.0	70	Yes		Släppte kulan kl 15:29

Printout from SICADA 2005-07-06 11:17:21.

In-data: Deviation data for KLX07A

Maxibor T - Borehole deviation: Maxibor

KLX07A, 2005-05-20 00:00:00 (3.000 - 837.000 m)

Length (m)	Northing (m)	Easting (m)	Elevation (m)	Coord System	Inclination (degrees)	Bearing (degrees)	Local A (m)	Local B (m)	Local C (m)	Extrapol Flag
3.00	6366750.60	1549207.01	-15.87	RT90-RHB70	-60.04	174.18	0.0000	0.0000	0.0000	
6.00	6366749.11	1549207.16	-13.27	RT90-RHB70	-59.86	174.49	1.5000	0.0000	0.0000	
9.00	6366747.61	1549207.31	-10.68	RT90-RHB70	-59.71	174.60	3.0000	0.0100	0.0100	
12.00	6366746.10	1549207.45	-8.09	RT90-RHB70	-59.52	174.36	4.5200	0.0200	0.0300	
15.00	6366744.59	1549207.60	-5.50	RT90-RHB70	-59.18	174.16	6.0400	0.0200	0.0500	
18.00	6366743.06	1549207.75	-2.92	RT90-RHB70	-58.80	173.99	7.5800	0.0200	0.1000	
21.00	6366741.51	1549207.92	-0.36	RT90-RHB70	-58.40	173.90	9.1300	0.0200	0.1600	
24.00	6366739.95	1549208.08	2.20	RT90-RHB70	-58.13	173.77	10.7000	0.0100	0.2500	
27.00	6366738.38	1549208.26	4.74	RT90-RHB70	-57.89	173.52	12.2900	0.0000	0.3500	
30.00	6366736.79	1549208.44	7.29	RT90-RHB70	-57.73	173.23	13.8800	-0.0200	0.4600	
33.00	6366735.20	1549208.63	9.82	RT90-RHB70	-57.62	172.82	15.4800	-0.0500	0.5800	
36.00	6366733.61	1549208.83	12.36	RT90-RHB70	-57.48	172.44	17.0900	-0.0800	0.7100	
39.00	6366732.01	1549209.04	14.89	RT90-RHB70	-57.25	172.15	18.7000	-0.1300	0.8400	
42.00	6366730.40	1549209.26	17.41	RT90-RHB70	-56.92	171.92	20.3200	-0.1900	0.9900	
45.00	6366728.78	1549209.49	19.92	RT90-RHB70	-56.51	171.76	21.9600	-0.2500	1.1500	
48.00	6366727.14	1549209.73	22.42	RT90-RHB70	-56.12	171.49	23.6100	-0.3200	1.3300	
51.00	6366725.49	1549209.97	24.91	RT90-RHB70	-55.71	171.26	25.2800	-0.4000	1.5400	
54.00	6366723.82	1549210.23	27.39	RT90-RHB70	-55.37	171.06	26.9700	-0.4900	1.7600	
57.00	6366722.13	1549210.50	29.86	RT90-RHB70	-55.00	170.93	28.6700	-0.5800	2.0000	
60.00	6366720.43	1549210.77	32.32	RT90-RHB70	-54.70	170.83	30.3900	-0.6800	2.2600	
63.00	6366718.72	1549211.04	34.77	RT90-RHB70	-54.31	170.66	32.1200	-0.7800	2.5400	
66.00	6366717.00	1549211.33	37.20	RT90-RHB70	-53.93	170.41	33.8700	-0.8900	2.8400	
69.00	6366715.25	1549211.62	39.63	RT90-RHB70	-53.56	170.18	35.6300	-1.0000	3.1500	
72.00	6366713.50	1549211.93	42.04	RT90-RHB70	-53.22	170.04	37.4100	-1.1300	3.4900	
75.00	6366711.73	1549212.24	44.45	RT90-RHB70	-53.00	169.98	39.2000	-1.2600	3.8400	
78.00	6366709.95	1549212.55	46.84	RT90-RHB70	-52.76	169.95	41.0000	-1.3900	4.2000	
81.00	6366708.16	1549212.87	49.23	RT90-RHB70	-52.44	169.71	42.8100	-1.5200	4.5800	
84.00	6366706.36	1549213.19	51.61	RT90-RHB70	-52.12	169.50	44.6300	-1.6700	4.9700	
87.00	6366704.55	1549213.53	53.98	RT90-RHB70	-52.00	169.25	46.4700	-1.8200	5.3800	
90.00	6366702.74	1549213.87	56.34	RT90-RHB70	-51.89	169.10	48.3100	-1.9800	5.7900	
93.00	6366700.92	1549214.22	58.70	RT90-RHB70	-51.64	168.88	50.1500	-2.1400	6.2100	
96.00	6366699.09	1549214.58	61.05	RT90-RHB70	-51.20	168.64	52.0100	-2.3100	6.6400	
99.00	6366697.25	1549214.95	63.39	RT90-RHB70	-50.82	168.44	53.8800	-2.4900	7.1000	
102.00	6366695.39	1549215.33	65.72	RT90-RHB70	-50.59	168.27	55.7700	-2.6800	7.5700	
105.00	6366693.53	1549215.72	68.03	RT90-RHB70	-50.47	168.29	57.6600	-2.8800	8.0500	
108.00	6366691.66	1549216.11	70.35	RT90-RHB70	-50.38	168.44	59.5600	-3.0700	8.5400	

111.00	6366689.79	1549216.49	72.66	RT90-RHB70	-50.29	168.58	61.4600	-3.2700	9.0400
114.00	6366687.91	1549216.87	74.97	RT90-RHB70	-50.24	168.69	63.3700	-3.4500	9.5400
117.00	6366686.02	1549217.25	77.27	RT90-RHB70	-50.16	168.80	65.2800	-3.6400	10.0400
120.00	6366684.14	1549217.62	79.58	RT90-RHB70	-50.07	168.86	67.1900	-3.8200	10.5500
123.00	6366682.25	1549217.99	81.88	RT90-RHB70	-49.97	168.97	69.1100	-3.9900	11.0600
126.00	6366680.36	1549218.36	84.17	RT90-RHB70	-49.93	169.15	71.0300	-4.1700	11.5800
129.00	6366678.46	1549218.73	86.47	RT90-RHB70	-49.87	169.35	72.9600	-4.3400	12.1000
132.00	6366676.56	1549219.08	88.76	RT90-RHB70	-49.77	169.58	74.8800	-4.5000	12.6200
135.00	6366674.65	1549219.43	91.05	RT90-RHB70	-49.70	169.79	76.8100	-4.6600	13.1500
138.00	6366672.74	1549219.78	93.34	RT90-RHB70	-49.59	170.02	78.7500	-4.8100	13.6900
141.00	6366670.83	1549220.11	95.63	RT90-RHB70	-49.45	170.21	80.6900	-4.9500	14.2300
144.00	6366668.91	1549220.45	97.91	RT90-RHB70	-49.31	170.40	82.6300	-5.0800	14.7700
147.00	6366666.98	1549220.77	100.18	RT90-RHB70	-49.22	170.53	84.5900	-5.2100	15.3300
150.00	6366665.05	1549221.09	102.45	RT90-RHB70	-49.15	170.66	86.5400	-5.3400	15.8900
153.00	6366663.11	1549221.41	104.72	RT90-RHB70	-49.06	170.79	88.5000	-5.4600	16.4500
156.00	6366661.17	1549221.73	106.99	RT90-RHB70	-48.99	170.93	90.4600	-5.5700	17.0200
159.00	6366659.23	1549222.04	109.25	RT90-RHB70	-48.91	171.07	92.4300	-5.6800	17.5900
162.00	6366657.28	1549222.34	111.51	RT90-RHB70	-48.85	171.14	94.4000	-5.7900	18.1700
165.00	6366655.33	1549222.65	113.77	RT90-RHB70	-48.77	171.19	96.3700	-5.9000	18.7500
168.00	6366653.37	1549222.95	116.03	RT90-RHB70	-48.71	171.25	98.3400	-6.0000	19.3300
171.00	6366651.42	1549223.25	118.28	RT90-RHB70	-48.64	171.36	100.3200	-6.1000	19.9200
174.00	6366649.46	1549223.55	120.53	RT90-RHB70	-48.54	171.46	102.3000	-6.2000	20.5100
177.00	6366647.49	1549223.84	122.78	RT90-RHB70	-48.45	171.45	104.2800	-6.2900	21.1100
180.00	6366645.52	1549224.14	125.03	RT90-RHB70	-48.33	171.44	106.2700	-6.3900	21.7100
183.00	6366643.55	1549224.44	127.27	RT90-RHB70	-48.24	171.46	108.2600	-6.4800	22.3100
186.00	6366641.58	1549224.73	129.51	RT90-RHB70	-48.19	171.50	110.2600	-6.5800	22.9300
189.00	6366639.60	1549225.03	131.74	RT90-RHB70	-48.11	171.58	112.2600	-6.6700	23.5400
192.00	6366637.62	1549225.32	133.98	RT90-RHB70	-48.02	171.70	114.2600	-6.7600	24.1600
195.00	6366635.63	1549225.61	136.21	RT90-RHB70	-47.92	171.88	116.2600	-6.8500	24.7800
198.00	6366633.64	1549225.90	138.43	RT90-RHB70	-47.80	172.03	118.2700	-6.9300	25.4100
201.00	6366631.65	1549226.18	140.65	RT90-RHB70	-47.66	172.21	120.2900	-7.0000	26.0400
204.00	6366629.64	1549226.45	142.87	RT90-RHB70	-47.64	172.38	122.3000	-7.0700	26.6900
207.00	6366627.64	1549226.72	145.09	RT90-RHB70	-47.89	172.65	124.3200	-7.1400	27.3300
210.00	6366625.64	1549226.98	147.31	RT90-RHB70	-48.36	172.77	126.3400	-7.1900	27.9600
213.00	6366623.67	1549227.23	149.56	RT90-RHB70	-48.71	172.76	128.3300	-7.2400	28.5700
216.00	6366621.70	1549227.48	151.81	RT90-RHB70	-49.11	172.62	130.3100	-7.2900	29.1600
219.00	6366619.76	1549227.73	154.08	RT90-RHB70	-49.38	172.49	132.2700	-7.3400	29.7200
222.00	6366617.82	1549227.98	156.36	RT90-RHB70	-49.36	172.48	134.2200	-7.4000	30.2800
225.00	6366615.88	1549228.24	158.63	RT90-RHB70	-49.29	172.51	136.1800	-7.4600	30.8300
228.00	6366613.94	1549228.49	160.91	RT90-RHB70	-49.41	172.56	138.1300	-7.5200	31.3900
231.00	6366612.01	1549228.75	163.18	RT90-RHB70	-49.76	172.53	140.0800	-7.5700	31.9500
234.00	6366610.09	1549229.00	165.47	RT90-RHB70	-49.97	172.57	142.0200	-7.6300	32.4800
237.00	6366608.17	1549229.25	167.77	RT90-RHB70	-49.99	172.59	143.9500	-7.6800	33.0000

240.00	6366606.26	1549229.50	170.07	RT90-RHB70	-50.10	172.62	145.8800	-7.7300	33.5300
243.00	6366604.35	1549229.74	172.37	RT90-RHB70	-50.24	172.65	147.8000	-7.7900	34.0400
246.00	6366602.45	1549229.99	174.68	RT90-RHB70	-50.21	172.61	149.7200	-7.8400	34.5500
249.00	6366600.54	1549230.24	176.98	RT90-RHB70	-50.11	172.67	151.6400	-7.8900	35.0700
252.00	6366598.64	1549230.48	179.28	RT90-RHB70	-50.01	172.75	153.5600	-7.9400	35.5800
255.00	6366596.72	1549230.72	181.58	RT90-RHB70	-49.88	172.84	155.4900	-7.9900	36.1000
258.00	6366594.80	1549230.97	183.88	RT90-RHB70	-49.78	172.92	157.4200	-8.0300	36.6300
261.00	6366592.88	1549231.20	186.17	RT90-RHB70	-49.68	172.97	159.3600	-8.0800	37.1700
264.00	6366590.96	1549231.44	188.45	RT90-RHB70	-49.58	173.06	161.3000	-8.1200	37.7100
267.00	6366589.02	1549231.68	190.74	RT90-RHB70	-49.49	173.12	163.2400	-8.1600	38.2500
270.00	6366587.09	1549231.91	193.02	RT90-RHB70	-49.40	173.22	165.1900	-8.1900	38.8000
273.00	6366585.15	1549232.14	195.30	RT90-RHB70	-49.31	173.35	167.1400	-8.2200	39.3500
276.00	6366583.21	1549232.37	197.57	RT90-RHB70	-49.20	173.41	169.1000	-8.2500	39.9100
279.00	6366581.26	1549232.59	199.84	RT90-RHB70	-49.13	173.48	171.0600	-8.2800	40.4800
282.00	6366579.31	1549232.82	202.11	RT90-RHB70	-49.08	173.62	173.0200	-8.3000	41.0400
285.00	6366577.36	1549233.03	204.38	RT90-RHB70	-49.01	173.80	174.9900	-8.3200	41.6100
288.00	6366575.40	1549233.25	206.64	RT90-RHB70	-48.92	173.99	176.9600	-8.3400	42.1900
291.00	6366573.44	1549233.45	208.90	RT90-RHB70	-48.82	174.16	178.9300	-8.3400	42.7700
294.00	6366571.48	1549233.65	211.16	RT90-RHB70	-48.71	174.33	180.9000	-8.3400	43.3500
297.00	6366569.51	1549233.85	213.42	RT90-RHB70	-48.59	174.40	182.8800	-8.3400	43.9400
300.00	6366567.53	1549234.04	215.67	RT90-RHB70	-48.46	174.49	184.8700	-8.3300	44.5400
303.00	6366565.55	1549234.23	217.91	RT90-RHB70	-48.34	174.57	186.8600	-8.3200	45.1400
306.00	6366563.57	1549234.42	220.15	RT90-RHB70	-48.23	174.64	188.8500	-8.3100	45.7500
309.00	6366561.58	1549234.61	222.39	RT90-RHB70	-48.14	174.71	190.8500	-8.2900	46.3600
312.00	6366559.58	1549234.79	224.62	RT90-RHB70	-48.08	174.78	192.8500	-8.2700	46.9800
315.00	6366557.59	1549234.98	226.86	RT90-RHB70	-48.02	174.89	194.8500	-8.2500	47.6000
318.00	6366555.59	1549235.15	229.09	RT90-RHB70	-47.91	175.01	196.8600	-8.2200	48.2300
321.00	6366553.58	1549235.33	231.31	RT90-RHB70	-47.81	175.20	198.8700	-8.2000	48.8600
324.00	6366551.58	1549235.50	233.54	RT90-RHB70	-47.70	175.37	200.8900	-8.1600	49.4900
327.00	6366549.56	1549235.66	235.75	RT90-RHB70	-47.57	175.56	202.9000	-8.1200	50.1300
330.00	6366547.55	1549235.82	237.97	RT90-RHB70	-47.46	175.75	204.9300	-8.0700	50.7800
333.00	6366545.52	1549235.97	240.18	RT90-RHB70	-47.34	175.92	206.9600	-8.0100	51.4300
336.00	6366543.50	1549236.11	242.39	RT90-RHB70	-47.19	176.10	208.9900	-7.9500	52.0900
339.00	6366541.46	1549236.25	244.59	RT90-RHB70	-47.06	176.24	211.0300	-7.8800	52.7600
342.00	6366539.42	1549236.39	246.78	RT90-RHB70	-46.93	176.42	213.0700	-7.8100	53.4300
345.00	6366537.38	1549236.51	248.97	RT90-RHB70	-46.81	176.62	215.1100	-7.7300	54.1100
348.00	6366535.33	1549236.63	251.16	RT90-RHB70	-46.67	176.83	217.1700	-7.6400	54.7900
351.00	6366533.27	1549236.75	253.34	RT90-RHB70	-46.52	177.05	219.2200	-7.5500	55.4800
354.00	6366531.21	1549236.85	255.52	RT90-RHB70	-46.38	177.25	221.2800	-7.4400	56.1800
357.00	6366529.14	1549236.95	257.69	RT90-RHB70	-46.24	177.43	223.3500	-7.3300	56.8900
360.00	6366527.07	1549237.05	259.86	RT90-RHB70	-46.10	177.56	225.4200	-7.2200	57.6000
363.00	6366524.99	1549237.14	262.02	RT90-RHB70	-45.96	177.68	227.5000	-7.0900	58.3200
366.00	6366522.91	1549237.22	264.18	RT90-RHB70	-45.84	177.82	229.5800	-6.9700	59.0500

369.00	6366520.82	1549237.30	266.33	RT90-RHB70	-45.71	177.95	231.6700	-6.8300	59.7800
372.00	6366518.73	1549237.37	268.48	RT90-RHB70	-45.54	178.14	233.7600	-6.6900	60.5200
375.00	6366516.63	1549237.44	270.62	RT90-RHB70	-45.36	178.31	235.8500	-6.5500	61.2700
378.00	6366514.52	1549237.50	272.75	RT90-RHB70	-45.18	178.51	237.9600	-6.4000	62.0200
381.00	6366512.41	1549237.56	274.88	RT90-RHB70	-44.99	178.68	240.0600	-6.2400	62.7900
384.00	6366510.28	1549237.61	277.00	RT90-RHB70	-44.82	178.87	242.1800	-6.0700	63.5600
387.00	6366508.16	1549237.65	279.12	RT90-RHB70	-44.66	179.06	244.3000	-5.9000	64.3400
390.00	6366506.02	1549237.69	281.22	RT90-RHB70	-44.50	179.24	246.4300	-5.7200	65.1300
393.00	6366503.88	1549237.71	283.33	RT90-RHB70	-44.34	179.44	248.5600	-5.5300	65.9300
396.00	6366501.74	1549237.73	285.42	RT90-RHB70	-44.19	179.64	250.6900	-5.3300	66.7300
399.00	6366499.59	1549237.75	287.52	RT90-RHB70	-44.03	179.84	252.8400	-5.1300	67.5400
402.00	6366497.43	1549237.75	289.60	RT90-RHB70	-43.87	180.03	254.9800	-4.9100	68.3600
405.00	6366495.27	1549237.75	291.68	RT90-RHB70	-43.73	180.22	257.1300	-4.6900	69.1900
408.00	6366493.10	1549237.74	293.75	RT90-RHB70	-43.80	180.36	259.2900	-4.4700	70.0200
411.00	6366490.93	1549237.73	295.83	RT90-RHB70	-44.14	180.42	261.4400	-4.2300	70.8500
414.00	6366488.78	1549237.72	297.92	RT90-RHB70	-44.45	180.43	263.5800	-4.0000	71.6600
417.00	6366486.64	1549237.70	300.02	RT90-RHB70	-44.53	180.41	265.7100	-3.7600	72.4500
420.00	6366484.50	1549237.68	302.12	RT90-RHB70	-44.52	180.43	267.8400	-3.5300	73.2400
423.00	6366482.36	1549237.67	304.23	RT90-RHB70	-44.61	180.41	269.9600	-3.3000	74.0300
426.00	6366480.23	1549237.65	306.33	RT90-RHB70	-44.85	180.35	272.0900	-3.0700	74.8200
429.00	6366478.10	1549237.64	308.45	RT90-RHB70	-44.99	180.33	274.2000	-2.8400	75.6000
432.00	6366475.98	1549237.63	310.57	RT90-RHB70	-44.99	180.25	276.3100	-2.6100	76.3700
435.00	6366473.86	1549237.62	312.69	RT90-RHB70	-44.95	180.20	278.4200	-2.3900	77.1300
438.00	6366471.73	1549237.61	314.81	RT90-RHB70	-44.85	180.20	280.5300	-2.1700	77.9000
441.00	6366469.61	1549237.60	316.93	RT90-RHB70	-44.75	180.30	282.6500	-1.9400	78.6800
444.00	6366467.48	1549237.59	319.04	RT90-RHB70	-44.66	180.39	284.7700	-1.7200	79.4600
447.00	6366465.34	1549237.58	321.15	RT90-RHB70	-44.57	180.44	286.8900	-1.4800	80.2500
450.00	6366463.21	1549237.56	323.25	RT90-RHB70	-44.46	180.42	289.0100	-1.2500	81.0400
453.00	6366461.06	1549237.55	325.35	RT90-RHB70	-44.42	180.28	291.1400	-1.0200	81.8300
456.00	6366458.92	1549237.54	327.45	RT90-RHB70	-44.45	180.10	293.2700	-0.7900	82.6300
459.00	6366456.78	1549237.53	329.56	RT90-RHB70	-44.58	179.83	295.4000	-0.5700	83.4200
462.00	6366454.64	1549237.54	331.66	RT90-RHB70	-44.95	179.23	297.5300	-0.3600	84.2100
465.00	6366452.52	1549237.57	333.78	RT90-RHB70	-45.41	178.29	299.6400	-0.1700	84.9900
468.00	6366450.42	1549237.63	335.92	RT90-RHB70	-45.74	177.18	301.7400	-0.0200	85.7400
471.00	6366448.32	1549237.73	338.07	RT90-RHB70	-46.08	176.38	303.8300	0.0900	86.4800
474.00	6366446.25	1549237.86	340.23	RT90-RHB70	-46.67	176.16	305.9100	0.1700	87.2000
477.00	6366444.19	1549238.00	342.41	RT90-RHB70	-47.23	176.28	307.9700	0.2400	87.8900
480.00	6366442.16	1549238.13	344.61	RT90-RHB70	-47.63	176.25	310.0100	0.3100	88.5600
483.00	6366440.14	1549238.27	346.83	RT90-RHB70	-48.06	176.21	312.0300	0.3900	89.2000
486.00	6366438.14	1549238.40	349.06	RT90-RHB70	-48.39	176.27	314.0300	0.4600	89.8200
489.00	6366436.15	1549238.53	351.30	RT90-RHB70	-48.57	176.27	316.0200	0.5300	90.4300
492.00	6366434.17	1549238.66	353.55	RT90-RHB70	-48.74	176.28	318.0000	0.6000	91.0200
495.00	6366432.20	1549238.79	355.81	RT90-RHB70	-48.92	176.28	319.9800	0.6800	91.6100

498.00	6366430.23	1549238.91	358.07	RT90-RHB70	-49.05	176.29	321.9500	0.7500	92.1900
501.00	6366428.27	1549239.04	360.33	RT90-RHB70	-49.17	176.29	323.9200	0.8200	92.7600
504.00	6366426.31	1549239.17	362.60	RT90-RHB70	-49.26	176.24	325.8800	0.8900	93.3200
507.00	6366424.36	1549239.30	364.88	RT90-RHB70	-49.36	176.15	327.8300	0.9600	93.8800
510.00	6366422.41	1549239.43	367.15	RT90-RHB70	-49.64	175.91	329.7900	1.0300	94.4400
513.00	6366420.47	1549239.57	369.44	RT90-RHB70	-50.08	175.50	331.7300	1.0900	94.9800
516.00	6366418.55	1549239.72	371.74	RT90-RHB70	-50.50	175.09	333.6500	1.1300	95.5000
519.00	6366416.65	1549239.88	374.06	RT90-RHB70	-50.87	174.93	335.5600	1.1600	95.9900
522.00	6366414.77	1549240.05	376.38	RT90-RHB70	-51.15	174.87	337.4500	1.1900	96.4700
525.00	6366412.89	1549240.22	378.72	RT90-RHB70	-51.34	174.77	339.3300	1.2100	96.9400
528.00	6366411.03	1549240.39	381.06	RT90-RHB70	-51.48	174.73	341.2100	1.2300	97.3900
531.00	6366409.17	1549240.56	383.41	RT90-RHB70	-51.56	174.63	343.0800	1.2500	97.8400
534.00	6366407.31	1549240.73	385.76	RT90-RHB70	-51.59	174.49	344.9400	1.2600	98.2800
537.00	6366405.45	1549240.91	388.11	RT90-RHB70	-51.68	174.39	346.8100	1.2700	98.7200
540.00	6366403.60	1549241.09	390.46	RT90-RHB70	-51.72	174.32	348.6700	1.2800	99.1500
543.00	6366401.75	1549241.28	392.82	RT90-RHB70	-51.72	174.41	350.5200	1.2800	99.5900
546.00	6366399.90	1549241.46	395.17	RT90-RHB70	-51.74	174.55	352.3800	1.2900	100.0200
549.00	6366398.05	1549241.64	397.53	RT90-RHB70	-51.81	174.66	354.2400	1.3000	100.4600
552.00	6366396.21	1549241.81	399.89	RT90-RHB70	-51.93	174.70	356.1000	1.3200	100.8800
555.00	6366394.36	1549241.98	402.25	RT90-RHB70	-52.09	174.75	357.9400	1.3300	101.3100
558.00	6366392.53	1549242.15	404.61	RT90-RHB70	-52.13	174.76	359.7900	1.3500	101.7200
561.00	6366390.70	1549242.32	406.98	RT90-RHB70	-52.12	174.72	361.6300	1.3700	102.1400
564.00	6366388.86	1549242.49	409.35	RT90-RHB70	-52.10	174.70	363.4700	1.3900	102.5500
567.00	6366387.03	1549242.66	411.72	RT90-RHB70	-52.09	174.64	365.3100	1.4100	102.9600
570.00	6366385.19	1549242.83	414.09	RT90-RHB70	-52.07	174.60	367.1600	1.4200	103.3800
573.00	6366383.36	1549243.00	416.45	RT90-RHB70	-52.05	174.57	369.0000	1.4300	103.7900
576.00	6366381.52	1549243.18	418.82	RT90-RHB70	-52.02	174.56	370.8500	1.4500	104.2100
579.00	6366379.68	1549243.35	421.18	RT90-RHB70	-52.00	174.55	372.6900	1.4600	104.6300
582.00	6366377.84	1549243.53	423.55	RT90-RHB70	-51.99	174.51	374.5400	1.4700	105.0500
585.00	6366376.00	1549243.70	425.91	RT90-RHB70	-51.97	174.48	376.3900	1.4800	105.4700
588.00	6366374.16	1549243.88	428.27	RT90-RHB70	-51.94	174.48	378.2300	1.4900	105.8900
591.00	6366372.32	1549244.06	430.63	RT90-RHB70	-51.92	174.48	380.0800	1.5000	106.3100
594.00	6366370.48	1549244.24	433.00	RT90-RHB70	-51.89	174.47	381.9300	1.5100	106.7400
597.00	6366368.64	1549244.41	435.36	RT90-RHB70	-51.87	174.45	383.7900	1.5200	107.1600
600.00	6366366.79	1549244.59	437.72	RT90-RHB70	-51.84	174.46	385.6400	1.5300	107.5900
603.00	6366364.95	1549244.77	440.08	RT90-RHB70	-51.82	174.47	387.4900	1.5400	108.0200
606.00	6366363.10	1549244.95	442.43	RT90-RHB70	-51.81	174.44	389.3500	1.5500	108.4500
609.00	6366361.26	1549245.13	444.79	RT90-RHB70	-51.79	174.42	391.2000	1.5600	108.8700
612.00	6366359.41	1549245.31	447.15	RT90-RHB70	-51.77	174.38	393.0600	1.5600	109.3100
615.00	6366357.56	1549245.49	449.51	RT90-RHB70	-51.75	174.38	394.9100	1.5700	109.7400
618.00	6366355.71	1549245.68	451.86	RT90-RHB70	-51.76	174.40	396.7700	1.5800	110.1700
621.00	6366353.87	1549245.86	454.22	RT90-RHB70	-51.75	174.40	398.6300	1.5800	110.6000
624.00	6366352.02	1549246.04	456.57	RT90-RHB70	-51.74	174.40	400.4800	1.5900	111.0300

627.00	6366350.17	1549246.22	458.93	RT90-RHB70	-51.73	174.37	402.3400	1.6000	111.4700
630.00	6366348.32	1549246.40	461.28	RT90-RHB70	-51.71	174.36	404.2000	1.6000	111.9000
633.00	6366346.47	1549246.58	463.64	RT90-RHB70	-51.68	174.36	406.0600	1.6100	112.3300
636.00	6366344.62	1549246.77	465.99	RT90-RHB70	-51.62	174.41	407.9200	1.6200	112.7700
639.00	6366342.77	1549246.95	468.34	RT90-RHB70	-51.60	174.44	409.7800	1.6200	113.2100
642.00	6366340.91	1549247.13	470.70	RT90-RHB70	-51.58	174.42	411.6500	1.6300	113.6500
645.00	6366339.06	1549247.31	473.05	RT90-RHB70	-51.57	174.39	413.5100	1.6400	114.0900
648.00	6366337.20	1549247.49	475.40	RT90-RHB70	-51.56	174.36	415.3700	1.6500	114.5300
651.00	6366335.34	1549247.68	477.75	RT90-RHB70	-51.55	174.37	417.2400	1.6500	114.9800
654.00	6366333.49	1549247.86	480.10	RT90-RHB70	-51.56	174.38	419.1000	1.6600	115.4200
657.00	6366331.63	1549248.04	482.45	RT90-RHB70	-51.55	174.38	420.9700	1.6700	115.8600
660.00	6366329.78	1549248.22	484.80	RT90-RHB70	-51.53	174.39	422.8300	1.6700	116.3000
663.00	6366327.92	1549248.41	487.14	RT90-RHB70	-51.52	174.38	424.7000	1.6800	116.7500
666.00	6366326.06	1549248.59	489.49	RT90-RHB70	-51.51	174.37	426.5700	1.6900	117.1900
669.00	6366324.20	1549248.77	491.84	RT90-RHB70	-51.50	174.35	428.4300	1.6900	117.6400
672.00	6366322.34	1549248.96	494.19	RT90-RHB70	-51.48	174.38	430.3000	1.7000	118.0800
675.00	6366320.48	1549249.14	496.54	RT90-RHB70	-51.45	174.42	432.1700	1.7000	118.5300
678.00	6366318.62	1549249.32	498.88	RT90-RHB70	-51.43	174.41	434.0400	1.7100	118.9800
681.00	6366316.76	1549249.50	501.23	RT90-RHB70	-51.39	174.41	435.9100	1.7200	119.4300
684.00	6366314.90	1549249.68	503.57	RT90-RHB70	-51.37	174.39	437.7800	1.7300	119.8800
687.00	6366313.04	1549249.87	505.92	RT90-RHB70	-51.35	174.38	439.6600	1.7300	120.3300
690.00	6366311.17	1549250.05	508.26	RT90-RHB70	-51.33	174.38	441.5300	1.7400	120.7800
693.00	6366309.30	1549250.24	510.60	RT90-RHB70	-51.30	174.35	443.4000	1.7500	121.2400
696.00	6366307.44	1549250.42	512.94	RT90-RHB70	-51.28	174.34	445.2800	1.7500	121.6900
699.00	6366305.57	1549250.60	515.28	RT90-RHB70	-51.26	174.33	447.1600	1.7600	122.1500
702.00	6366303.70	1549250.79	517.62	RT90-RHB70	-51.23	174.34	449.0300	1.7600	122.6100
705.00	6366301.83	1549250.98	519.96	RT90-RHB70	-51.19	174.34	450.9100	1.7700	123.0700
708.00	6366299.96	1549251.16	522.30	RT90-RHB70	-51.15	174.34	452.7900	1.7700	123.5300
711.00	6366298.09	1549251.35	524.64	RT90-RHB70	-51.14	174.34	454.6700	1.7800	123.9900
714.00	6366296.22	1549251.53	526.97	RT90-RHB70	-51.13	174.31	456.5600	1.7800	124.4600
717.00	6366294.34	1549251.72	529.31	RT90-RHB70	-51.12	174.29	458.4400	1.7900	124.9200
720.00	6366292.47	1549251.91	531.64	RT90-RHB70	-51.12	174.28	460.3200	1.7900	125.3900
723.00	6366290.60	1549252.09	533.98	RT90-RHB70	-51.12	174.28	462.2000	1.7900	125.8500
726.00	6366288.72	1549252.28	536.31	RT90-RHB70	-51.10	174.28	464.0900	1.8000	126.3200
729.00	6366286.85	1549252.47	538.65	RT90-RHB70	-51.09	174.26	465.9700	1.8000	126.7800
732.00	6366284.97	1549252.66	540.98	RT90-RHB70	-51.07	174.26	467.8600	1.8000	127.2500
735.00	6366283.10	1549252.85	543.32	RT90-RHB70	-51.06	174.25	469.7400	1.8100	127.7200
738.00	6366281.22	1549253.04	545.65	RT90-RHB70	-51.03	174.25	471.6300	1.8100	128.1800
741.00	6366279.34	1549253.22	547.98	RT90-RHB70	-51.02	174.26	473.5100	1.8100	128.6500
744.00	6366277.47	1549253.41	550.31	RT90-RHB70	-51.01	174.25	475.4000	1.8100	129.1300
747.00	6366275.59	1549253.60	552.65	RT90-RHB70	-50.98	174.27	477.2900	1.8200	129.6000
750.00	6366273.71	1549253.79	554.98	RT90-RHB70	-50.96	174.28	479.1800	1.8200	130.0700
753.00	6366271.83	1549253.98	557.31	RT90-RHB70	-50.95	174.27	481.0700	1.8200	130.5400

756.00	6366269.95	1549254.17	559.64	RT90-RHB70	-50.95	174.26	482.9600	1.8200	131.0200
759.00	6366268.07	1549254.36	561.97	RT90-RHB70	-50.94	174.21	484.8500	1.8300	131.4900
762.00	6366266.19	1549254.55	564.30	RT90-RHB70	-50.93	174.19	486.7400	1.8300	131.9600
765.00	6366264.31	1549254.74	566.62	RT90-RHB70	-50.92	174.18	488.6300	1.8300	132.4400
768.00	6366262.42	1549254.93	568.95	RT90-RHB70	-50.90	174.17	490.5200	1.8300	132.9200
771.00	6366260.54	1549255.12	571.28	RT90-RHB70	-50.87	174.20	492.4100	1.8300	133.3900
774.00	6366258.66	1549255.31	573.61	RT90-RHB70	-50.85	174.20	494.3000	1.8300	133.8700
777.00	6366256.77	1549255.51	575.94	RT90-RHB70	-50.84	174.22	496.2000	1.8300	134.3500
780.00	6366254.89	1549255.70	578.26	RT90-RHB70	-50.83	174.21	498.0900	1.8300	134.8300
783.00	6366253.00	1549255.89	580.59	RT90-RHB70	-50.81	174.23	499.9900	1.8300	135.3100
786.00	6366251.12	1549256.08	582.91	RT90-RHB70	-50.80	174.21	501.8800	1.8300	135.7900
789.00	6366249.23	1549256.27	585.24	RT90-RHB70	-50.80	174.19	503.7800	1.8400	136.2700
792.00	6366247.34	1549256.46	587.56	RT90-RHB70	-50.78	174.19	505.6800	1.8400	136.7500
795.00	6366245.46	1549256.65	589.89	RT90-RHB70	-50.75	174.20	507.5700	1.8400	137.2400
798.00	6366243.57	1549256.85	592.21	RT90-RHB70	-50.73	174.21	509.4700	1.8400	137.7200
801.00	6366241.68	1549257.04	594.53	RT90-RHB70	-50.71	174.21	511.3700	1.8400	138.2100
804.00	6366239.79	1549257.23	596.85	RT90-RHB70	-50.69	174.21	513.2700	1.8400	138.6900
807.00	6366237.90	1549257.42	599.18	RT90-RHB70	-50.67	174.20	515.1700	1.8400	139.1800
810.00	6366236.01	1549257.61	601.50	RT90-RHB70	-50.65	174.20	517.0700	1.8400	139.6700
813.00	6366234.11	1549257.80	603.82	RT90-RHB70	-50.63	174.21	518.9700	1.8400	140.1600
816.00	6366232.22	1549258.00	606.13	RT90-RHB70	-50.61	174.22	520.8800	1.8400	140.6500
819.00	6366230.33	1549258.19	608.45	RT90-RHB70	-50.59	174.25	522.7800	1.8400	141.1400
822.00	6366228.43	1549258.38	610.77	RT90-RHB70	-50.59	174.28	524.6900	1.8500	141.6300
825.00	6366226.54	1549258.57	613.09	RT90-RHB70	-50.57	174.30	526.5900	1.8500	142.1200
828.00	6366224.64	1549258.76	615.41	RT90-RHB70	-50.57	174.31	528.5000	1.8500	142.6200
831.00	6366222.75	1549258.95	617.72	RT90-RHB70	-50.54	174.32	530.4000	1.8600	143.1100
837.00	6366218.95	1549259.32	622.35	RT90-RHB70	-50.47	174.39	534.2200	1.8700	144.1100

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Appendix 16

In-data: Deviation data for KLX07B

Magnetic Acc Dev T - Magnetic accelerometer deviation measurement

KLX07B, 2005-07-09 12:30:00 - 2005-07-09 14:00:00 (0.000 - 198.000 m)

Bhlen (m)	Magnetic Bearing (degrees)	Dip (degrees)	Northing (m)	Easting (m)	Elevation (m)	Locala (m)	Localb (m)	Localc (m)
0.00	170.4	-85.2	6366753.140	1549206.760	18.380			
3.00	170.5	-85.2	6366752.890	1549206.800	15.390			
6.00	169.3	-85.1	6366752.640	1549206.840	12.400			
9.00	171.1	-85.2	6366752.390	1549206.890	9.410			
12.00	170.8	-85.2	6366752.140	1549206.930	6.420			
15.00	169.8	-85.2	6366751.890	1549206.970	3.430			
18.00	170.3	-85.2	6366751.640	1549207.010	0.440			
21.00	170.4	-85.2	6366751.390	1549207.060	-2.550			
24.00	169.8	-85.2	6366751.150	1549207.100	-5.530			
27.00	170.1	-85.2	6366750.900	1549207.140	-8.520			
30.00	170.1	-85.2	6366750.650	1549207.190	-11.510			
33.00	170.5	-85.1	6366750.400	1549207.230	-14.500			
36.00	169.1	-85.1	6366750.140	1549207.280	-17.490			
39.00	169.8	-85.0	6366749.890	1549207.320	-20.480			
42.00	169.7	-85.0	6366749.630	1549207.370	-23.470			
45.00	170.6	-85.0	6366749.370	1549207.410	-26.460			
48.00	170.2	-85.0	6366749.110	1549207.460	-29.450			
51.00	172.0	-84.9	6366748.850	1549207.500	-32.430			
54.00	170.7	-85.0	6366748.590	1549207.540	-35.420			
57.00	170.3	-84.9	6366748.330	1549207.580	-38.410			
60.00	171.6	-84.9	6366748.070	1549207.620	-41.400			
63.00	171.7	-85.1	6366747.810	1549207.660	-44.390			
66.00	170.4	-84.9	6366747.550	1549207.700	-47.380			
69.00	171.0	-84.9	6366747.290	1549207.750	-50.360			
72.00	172.3	-85.0	6366747.020	1549207.780	-53.350			
75.00	171.0	-85.0	6366746.770	1549207.820	-56.340			
78.00	172.4	-84.9	6366746.510	1549207.860	-59.330			
81.00	174.7	-85.0	6366746.240	1549207.890	-62.320			
84.00	171.4	-85.0	6366745.980	1549207.920	-65.310			
87.00	171.9	-85.1	6366745.720	1549207.960	-68.300			
90.00	172.4	-85.0	6366745.470	1549208.000	-71.280			
93.00	171.1	-85.1	6366745.210	1549208.030	-74.270			
96.00	171.5	-85.0	6366744.960	1549208.070	-77.260			
99.00	171.4	-85.0	6366744.700	1549208.110	-80.250			
102.00	171.4	-85.0	6366744.440	1549208.150	-83.240			
105.00	171.6	-85.0	6366744.180	1549208.190	-86.230			

108.00	171.4	-85.0	6366743.920	1549208.230	-89.220
111.00	172.1	-85.2	6366743.670	1549208.260	-92.200
114.00	173.2	-85.1	6366743.410	1549208.300	-95.190
117.00	171.2	-85.2	6366743.160	1549208.330	-98.180
120.00	170.9	-85.1	6366742.910	1549208.370	-101.170
123.00	170.9	-85.0	6366742.660	1549208.410	-104.160
126.00	171.3	-85.0	6366742.400	1549208.450	-107.150
129.00	171.5	-85.2	6366742.150	1549208.490	-110.140
132.00	171.7	-85.0	6366741.890	1549208.530	-113.130
135.00	172.0	-85.0	6366741.630	1549208.560	-116.120
138.00	172.6	-85.0	6366741.370	1549208.600	-119.110
141.00	172.7	-85.0	6366741.110	1549208.630	-122.090
144.00	174.2	-85.0	6366740.850	1549208.660	-125.080
147.00	173.6	-85.0	6366740.590	1549208.690	-128.070
150.00	173.2	-85.0	6366740.330	1549208.720	-131.060
153.00	172.9	-84.9	6366740.070	1549208.750	-134.050
156.00	171.2	-84.9	6366739.810	1549208.790	-137.040
159.00	171.1	-84.9	6366739.540	1549208.830	-140.020
162.00	171.0	-84.8	6366739.280	1549208.870	-143.010
165.00	171.1	-84.8	6366739.010	1549208.910	-146.000
168.00	172.0	-84.8	6366738.740	1549208.950	-148.990
171.00	172.6	-84.8	6366738.470	1549208.990	-151.970
174.00	172.8	-84.8	6366738.200	1549209.030	-154.960
177.00	172.0	-84.8	6366737.930	1549209.060	-157.950
180.00	173.4	-84.8	6366737.660	1549209.100	-160.940
183.00	175.0	-84.8	6366737.380	1549209.120	-163.920
186.00	175.7	-84.9	6366737.120	1549209.150	-166.910
189.00	173.6	-84.8	6366736.850	1549209.170	-169.900
192.00	172.4	-84.8	6366736.580	1549209.200	-172.890
195.00	175.7	-84.8	6366736.310	1549209.230	-175.880
198.00	173.5	-84.8	6366736.040	1549209.260	-178.860

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