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Forsmark site investigation

Boremap mapping of telescopic drilled borehole KFM08D

Eva Samuelsson, Gunnar Rauséus
Geosigma AB

December 2007

Svensk Kärnbränslehantering AB

Swedish Nuclear Fuel
and Waste Management Co
Box 250, SE-101 24 Stockholm
Tel +46 8 459 84 00



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Keywords: Geology, Fractures, BIPS, Boremap, Drill core, AP PF 400-06-116.

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

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

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

Abstract

This report presents the result from the Boremap mapping of core drilled borehole KFM08D at drill site 8 in the Forsmark candidate area. Drill site 8 (DS 8) is situated in the north-eastern part of the candidate area. The borehole was drilled with the bearing 100.0°, inclination -55.0° and a core was recovered from 60.80 to 941.76 m. The aims of the drilling were to receive geological data of the rock volume in the north-eastern part of the candidate area, and to verify the existence and obtain properties of north-northeast trending deformation zones.

The dominant rock type in KFM08D is a generally foliated metagranite-granodiorite (~ 78%) followed by fine- to medium-grained metagranitoid (~ 9%) and pegmatitic granite (~ 5%). Subordinate rock types comprise medium-grained metadiorite-gabbro (3%), amphibolite (~ 3%), fine- to medium-grained granite (~ 2%), felsic to intermediate metavolcanic rock (< 1%) and aplitic metagranite (< 1%). The section mapped without BIPS-image is not included.

The borehole shows fracture frequencies of 1.5 open and partly open fractures/m and 5.9 sealed fractures/m. The sections mapped without BIPS-image are not included.

Borehole sections with increased fracture frequencies with open fractures, sealed fractures and sealed fracture networks are concentrated to the intervals 184–210 m, 544–570 m, 582–609 m, 621–688 m, 737–570 m, 819–842 m and 900–941.76 m. The borehole intervals 184–210 m, 582–609 m and 621–688 m also includes fractures with apertures ranging up to 10 mm. The most frequent fracture minerals are chlorite, calcite, clay minerals and adularia.

Two intervals with generally medium to strong albitization occur at 395–580 m and 610–840 m borehole length. These intervals also include sections with faint to medium intensity of oxidation.

Sammanfattning

Denna rapport redovisar resultatet från Boremapkartering av kärnborrhålet KFM08D vid borrhålsplats 8 i Forsmark kandidat område. Borrhålsplats 8 är belägen i den nordligaste delen av en tektonisk lins, som har utvalts att vara kandidat område för deponering av kärnavfall. Borrhålet är borrarat med riktning 100°, lutning -55.0°. Borrhålskärna finns för sektionen mellan 60,80 och 941,76 m. Syftet med borrhålsborrningen var att erhålla geologiska data för bergvolymen i den nordöstra delen av kandidat området, och att belägga förekomst och egenskaper för nord-nordostliga deformationszoner i området.

Den dominerande bergarten i KFM08D är en generellt folierad metagranit-granodiorit (~ 78 %), följt av fin- till medelkornig granit (~ 9 %) och pegmatit till pegmatitisk granit (~ 5 %). Underordnade bergarter är medelkornig metadiorit-gabbro (~ 3 %), amfibolit (~ 3 %), fin- till medelkornig metagranitoid (~ 2 %), fin- till medelkornig granit (~ 1 %), felsisk till intermediär metavulkanit (< 1 %) och aplitisk metagranit (< 1 %). Sektionen karterad utan BIPS-bild är inte inkluderad.

Borrhålet uppvisar sprickfrekvenser på 1,5 öppna och delvis öppna sprickor/m och 5,9 läkta sprickor/m. Sektionen karterad utan BIPS-bild är inte inkluderad.

Sektioner med ökad sprickfrekvens av öppna sprickor, läkta sprickor och läkta spricknätverk är koncentrerade i intervallen: 184–210 m, 544–570 m, 582–609 m, 621–688 m, 737–570 m, 819– 842 m och 900–941,76 m. Inom borrhålsintervallen 184–210 m, 582–609 m och 621–688 m finns även sprickor med apertur upp till 10 mm. De vanligast förekommande sprickmineralen är klorit, kalcit, lermineral och adularia.

Två borrhålsintervall med generellt medium till stark albitisering förekommer mellan 395–580 m och 610–840 m. Dessa intervall inkluderar också sektioner med oxidation med svag till medelstark intensitet

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1 Introduction

This document reports the data gained by the Boremap mapping of the core drilled borehole KFM08D, which is one of the activities performed within the site investigation at Forsmark. The work was carried out in accordance with activity plan AP PF 400-06-116. In Table 1-1 controlling documents for performing this activity are listed. Both activity plan and method descriptions are SKB's internal controlling documents.

The borehole KFM08D was drilled from drill site 8 (DS 8) in the northernmost part of the tectonic lens which is of interest for future nuclear waste disposal (Figure 2-1) /1/. The borehole was drilled in easterly direction, in order to document rock type distribution and NNE-trending deformation zones. The drilling of KFM08D was finished on February 6th 2007 /4/. The Boremap mapping of the borehole started on January 18th and was finished on March 28th 2007.

The geological documentation of core drilled boreholes according to the Boremap method is based on the use of BIPS-images of the borehole wall and the simultaneous study of the drill core. Position, aperture and orientation data of features are based on the adjusted BIPS-image, while other data such as rock type, alteration, fracture mineralogy and surface are observed in the drill core. The Boremap mapping will be used for further 3D-modelling in the Forsmark area.

Original data from the reported activity are stored in the primary database Sicada, where they are traceable by the Activity Plan number (AP PF 400-06-116). Only data in SKB's databases are accepted for further interpretation and modelling. The data presented in this report are regarded as copies of the original data. Data in the databases may be revised, if needed. Such revisions will not necessarily result in a revision of the P-report, although the normal procedure is that major data revisions entail a revision of the P-report. Minor data revisions are normally presented as supplements, available at www.skb.se.

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

Activity Plan	Number	Version
Boremapkartering av kärnbråhåll KFM08D	AP PF 400-06-116	1.0
Method Descriptions	Number	Version
Metodbeskrivning för Boremapkartering	SKB MD 143.006	2.0
Mätssystembeskrivning för Boremap	SKB MD 146.001	1.0
Nomenklatur vid Boremapkartering	SKB MD 143.008	1.0
Instruktion: Regler för bergarters benämningar vid platsundersökningen i Forsmark	SKB MD 132.005	1.0

2 Objective and scope

The aim of this activity was to document lithologies, alterations, ductile structures and the occurrence and character of fractures in the bedrock penetrated by the core drilled borehole KFM08D. The detailed documentation will be used in 3D-modelling of the area.

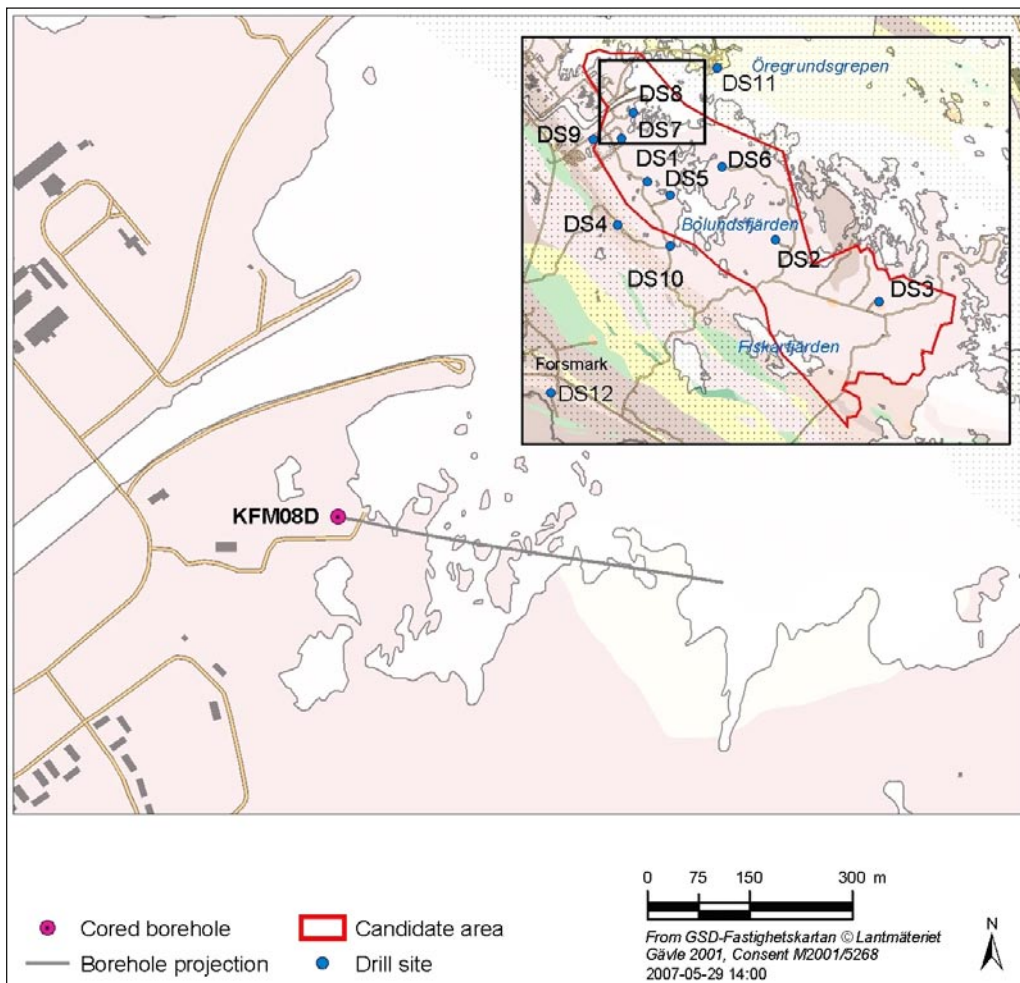


Figure 2-1. Location of borehole KFM08D.

3 Equipment

3.1 Description of equipment and interpretation tools

Mapping of BIPS-images and drill core was performed with the software Boremap v. 3.9.0.2 and v. 3.9.2.0. The Boremap software is loaded with the bedrock and mineral standard used for surface mapping at the Forsmark investigation site to enable correlation with the surface geology. The Boremap software calculates actual directions (strike and dip) of planar structures penetrated by the borehole (foliations, fractures, fracture zones, rock contacts etc). Data on inclination, bearing and diameter of the borehole are used as in-data for the calculations (Table 4-2, Appendix 2). The BIPS-image lengths were calibrated (Table 4-1).

Additional software used during mapping are BIPS Image Viewer and MicroSoft Access 2003. The schematic data presentation was made in WellCad v. 4.0.

The following equipment was used to facilitate the core documentation: folding rule, 10% hydrochloric acid, rock hardness tool, hand lens, paint brush and tap water.

3.1.1 BIPS-image quality

The following factors may disturb the mapping:

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

The BIPS-image of KFM08D suffers from blackish coatings from the drill rod and parts with diffuse image. The BIPS-image quality is listed in Table 3-1.

Table 3-1. BIPS Image Quality.

From	To	% visible	Comment
59.4	64	40–50	Bad. 50–60% of image non-visible.
64	66.6	60–80	Acceptable. Both sides of image slightly diffuse. Part of image dark to black.
66.6	69.2	100	Good. Both sides of image slightly diffuse.
69.2	71.5	80–100	Acceptable. Part of image dark to black.
71.5	75.2	70–100	Good. image slightly diffuse.
75.2	87.8	40–60	Bad. Image diffuse.
87.8	116	50	Acceptable. Mud on lower side of borehole.
116	165.4	30–40	Bad. Mud on lower side of borehole.
165.4	166.34	10–30	Bad. Mud. Less then 30% of image visible.
166.34	498.5	80–100	Acceptable. Part of image dark to black. Partly slightly diffuse image.
498.5	925	50–80	Acceptable. Part of image dark to black. partly diffuse image.
925	927.87	0–50	Bad. Muddy.

4 Execution

4.1 General

Boremap mapping of the drill core KFM08D was performed and documented in accordance with the activity plan AP PF 400-06-116 (SKB, internal document) and the method description for Boremap mapping (SKB, MD 143.006, Version 2.0, Metodbeskrivning för Boremap-kartering, SKB, internal controlling document). The mapping was preceded by an overview documentation of the geology in the borehole by Kenneth Åkerström. All observations are made by ocular inspection, since no other data were available.

The mapping was performed in SKB's facilities in Forsmark between January 18th and March 28st in 2007 by Christin Döse, Gunnar Rauséus, Peter Dahlin, Emil Lundberg and Eva Samuelsson from Geosigma AB, Jan Ehrenborg, Mirab, Anders Wängnerud, Jesper Petersson and Ulf B Andersson from Vattenfall Power Consultant.

4.2 Preparations

The lengths registered during the BIPS-logging deviates from the true length, which usually increases with depth. Therefore length adjustments were made. The length of the BIPS-image was adjusted with reference to slots cut into the borehole wall approximately every 50th metre and with reference to the end of casing (see Table 4-1).

Geometrical data for the borehole is given in Table 4-2. Background data (Appendix 2) prior to the Boremap mapping included:

- Borehole diameter.
- Reference slots for length adjustments.
- Borehole deviation.

Table 4-1. Length adjustments.

Rec. length (m)	Adj. length (m)	Difference (m)
199.516	200	-0.484
249.327	250	-0.673
299.188	300	-0.812
349.073	350	-0.927
398.947	400	-1.053
448.758	450	-1.242
499.655	501	-1.345
548.581	550	-1.419
598.507	600	-1.493
648.429	650	-1.571
698.362	700	-1.638
748.393	750	-1.607
798.356	800	-1.644
848.465	850	-1.535
898.557	900	-1.443

Table 4-2. Borehole data for KFM08D.

Mapping Nr	Mapping interval	Bearing (degrees)	Inclination (degrees)	Diameter (mm)	Borehole length (m)	BIPS-image interval (m)	End of casing
1	59.00–941.76	100.0	–55.0	77	942.3	59.0–927.87	

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 apertures; crush zones and sealed fracture network are found in SKB MD 143.008 (Nomenklatur vid Boremapkartering, internal controlling document).

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

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

4.3.2 Fracture alteration and joint alteration number

Joint alteration number is principally related to the thickness of, and the clay content in a fracture /2/. Over 1 mm thick fractures rich in clay minerals are usually given joint alteration numbers between 2 and 4. The majority of the broken fractures are very thin to extremely thin and seldom contain clay minerals. These fractures receive joint alteration numbers between 1 and 2.

A subdivision of fractures with joint alteration numbers between 1 and 2 was introduced to facilitate both the evaluation process for fracture alterations and the possibility to compare the alterations between different fractures in the boreholes. The subdivision is in accordance with the subdivision introduced by Ehrenborg and Steiskal /3/.

4.3.3 Mapping of fractures not visible in the BIPS-image

Not all fractures are visible in the BIPS-image, and these fractures are oriented using the *guide-line method* /3/, with one modification. The orientation performed in this work is based on the following data:

- Amplitude (measured along the drill core) which is the interval between fracture extremes along the drill core.
- The relation between the rotation of the fracture trace and a well defined structure visible in both drill core and BIPS-image. This rotation is measured with measuring tape on the drill core.
- Absolute depth relative to a well defined structure visible in both drill core and BIPS-image.

The fractures mapped with *the guide-line method* are mapped as “non-visible in BIPS” and can therefore be separated from fractures visible in BIPS which probably have a more accurate orientation.

4.3.4 Definition of veins and dikes

A rock sequence that covers less than 1 m of the drill core is mapped as a “rock occurrence” in Boremap. Rock occurrences that cover more than 1 m of the drill core are mapped as a separate *rock type*.

Chiefly two different types of rock occurrences are mapped: veins and dikes. These two are separated by their respective length in the drill core; veins are set to 0–20 cm and dikes are set to 20–100 cm if evidence for intrusion is visible in the drill core. If the rock occurrence cannot be classified as a vein or a dyke, the occurrence type is mapped as “unspecified”. In Forsmark there are boudinated veins, xenoliths, blobs etc and the occurrence type is usually difficult to determine from the drill core.

4.3.5 Mineral codes

In cases where properties or minerals are not represented in the mineral list, the following mineral codes have been used in the mapping of KFM08D:

- X1 = Bleached fracture walls.
- X2 = Interpreted grouting, which is only observed in the borehole wall and hence in the BIPS-image (not used in this borehole).
- X3 = The drill core is broken at a right angle and the broken surfaces have a polished appearance. This is caused by rotation of two core pieces along an intermediate fracture wearing away possible mineral filling. It is impossible to say whether this fracture was open or sealed in situ.
- X4 = Dull fracture surface, no visible fracture mineral.
- X5 = Fresh fracture surface, no detectable fracture mineral.
- X6 = Striated surfaces, probably slickensided.
- X7 = Saussurite.

4.4 Data handling

In order to obtain the best possible data security, the mapping was performed on the SKB network, with regular back-ups on the local drive in accordance with the consultants’ quality plan. Each day, a summary report was printed in order to find possible misprints. If misprints were observed, they were corrected before the mapping proceeded. A WellCad-diagram was also plotted before the drill cores were changed on the roller table. When the mapping was completed, data was checked once more for possible misprints. Before exporting data to SICADA, borehole lengths, mapping lengths, deviation data and length adjustments were checked again, and then the mapping was checked by a routine in Boremap which detects logical defects.

4.5 Nonconformities

4.5.1 Core loss

Core loss occurs in two sections: 340.08–340.10 m and 924.341–924.68 m.

4.5.2 Overrepresented fracture mineral

The occurrence of calcite in fractures is overrepresented relative to other minerals, since it is detected by reaction with diluted hydrochloric acid even though it is macroscopically invisible.

4.5.3 Fracture roughness and surface

The estimation of roughness of fractures in this work diverges rather much from the mappings by Vattenfall Power Consultant. For example: Geosigma considers more than half of fractures as undulating, while the remaining fractures are considered stepped, planar and irregular. The proportion of planar, undulating, stepped and irregular fractures in the mappings of Vattenfall Power Consultant is different. This is because the personal interpretation of the definitions of fractures /5/, since the definitions are made for another scale, i.e. for tunnels and excavations, and not for boreholes. Work has been started to synchronize the mapping teams.

4.5.4 Mapping without BIPS-image

The borehole section between 927.87–942.230 m was mapped without BIPS-image. All observations are mapped without orientation and located using the recorded length. This section is not included in the calculation of fracture frequencies and rock type proportions made in this report.

5 Results

The Boremap mapping of KFM08D is stored in SICADA and it is only these data that shall be used for further interpretation and modelling. The interpreter should be aware of the assumptions mentioned in Chapter 4.

Results from the Boremap mapping are briefly described in this chapter and the graphical presentation of the data is given in Appendix 1 (WellCad-diagram).

5.1 Rock type

The dominant rock type in KFM08D is a generally foliated metagranite-granodiorite (rock code 101057) followed fine- to medium-grained metagranitoid (rock code 101051) and pegmatitic granite (rock code 101061). Subordinate rock types are medium-grained metadiorit-gabbro (rock code 101033), amphibolite (rock code 102017), fine- to medium-grained granite (rock code 111058), felsic to intermediate metavolcanic rock (rock code 103076) and aplitic metagranite (rock code 101058). Rock type distribution listen in Table 5-1.

In areas with medium to strong albitization the rock type is difficult to determine. The determination has been done mainly with respect to grain-size and mica content. Rock type with aphanitic to fine grain-size and none to low mica content was mapped as aplitic metagranite (rock code 101058). Rock type with medium grain-size and spotted with mica was mapped as medium-grained metagranitoid (rock code 101057), and a medium to coarse grain-size was mapped as pegmatitic granite (rock code 101061).

5.2 Fractures and crushed sections

A total of 4,930 unbroken and 1,505 broken fractures were documented in KFM08D (59.44–927.87 m). Of the unbroken fractures, 31 show an aperture, while 219 of the broken fractures are considered artificial and have an aperture = 0. This results in the following interpreted fracture frequencies: 5.9 sealed fractures/m (sealed network excluded), 1.5 open fractures/m (crushed sections excluded) and 0.36 partly open fractures/m.

The open fractures, sealed fractures and sealed fracture networks are concentrated to the borehole intervals 184–210 m, 544–570 m, 582–609 m, 621–688 m, 737–570, 819–842 m and 900–942.3 m. The three borehole intervals 184–210 m, 582–609 m and 621–688 m also include fractures with apertures ranging up to 10 mm. The most frequent fracture minerals are chlorite, calcite, clay minerals and adularia.

A crushed core section occurs at 925.940–926.113 m borehole length. The fracture surfaces are highly altered with clay minerals.

Table 5-1. Rock type distribution (%) in KFM08D.

Borehole	101057	101051	101061	101033	102017	111058	103076	101058
KFM08D	78	9	5	3	3	2	< 1	< 1

5.3 Sealed brittle to ductile deformation

The rock types in borehole KFM08D show commonly weak to moderate foliation and lineation. The foliation is undulating in the borehole, but mostly striking S-SE (see Appendix 1). The intensity of the foliation in the borehole varies from weak to medium. In the parts of the borehole, lineation is dominating over foliation and shows a W-SW trend.

Narrow shear bands occur throughout the borehole, ranging from ductile to brittle in character. Deformation bands occur in the borehole interval 112–114 m (brittle to ductile), 202–210 m (brittle to ductile), 430–431 m (ductile), 455–456 m (ductile), 597–599 m (brittle to ductile) and 926–927 m (brittle to ductile).

5.4 Alteration

Three borehole intervals with generally medium to strong albitization occur at 395–580 m, 610–840 m and 926–942 m (this borehole interval is partly mapped without BIPS-image) /6/. These intervals also include sections with faint to medium oxidation.

Other alteration types are sporadic and usually very sparse. These are epidotization and chloritization. Chloritization occurs in three minor borehole sections 904–906 m (weak-strong), 910–912 m (weak) and 924–928 m (strong).

One minor section with quartz dissolution occurs at 932.62–932.68 m borehole length.


5.5 Core discing and inferred drilling induced features

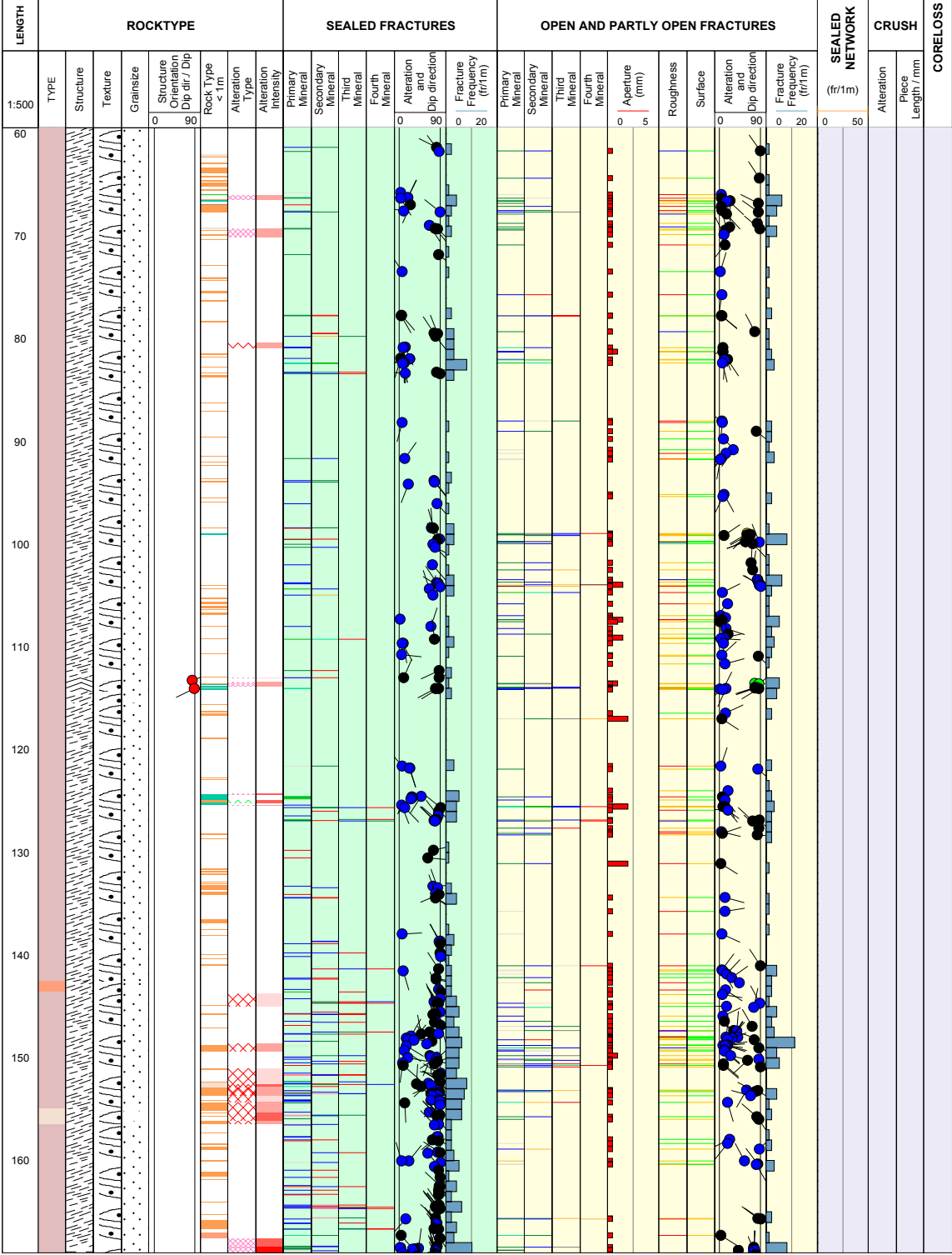
One minor section with core discing is observed at 328.27–328.59 m borehole length.

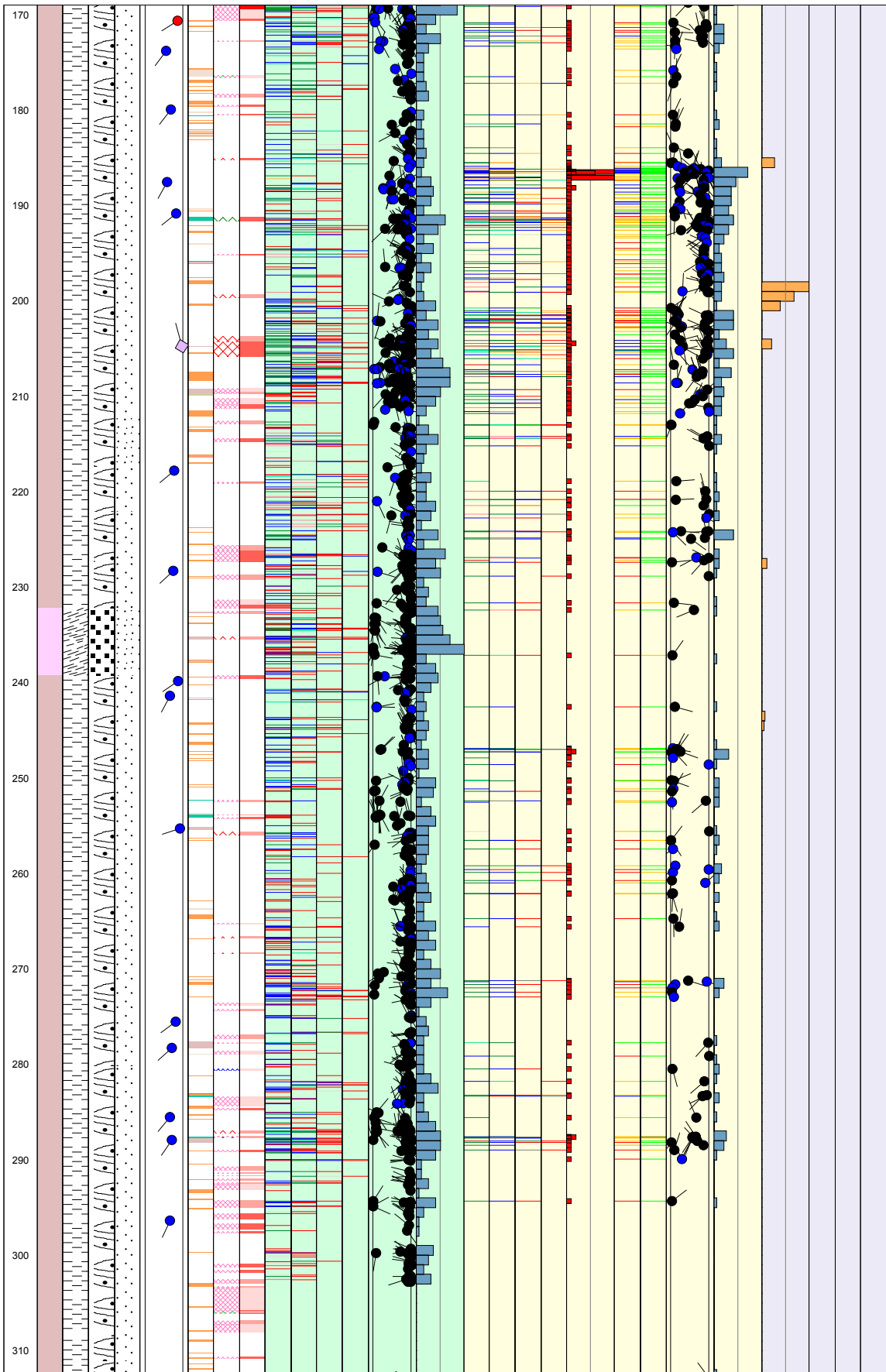
Drilling induced crush occurs at 417.13 m, 556.43 m, 556.47 m, 612.80 m, 905.45 m and 905.61 m borehole length.

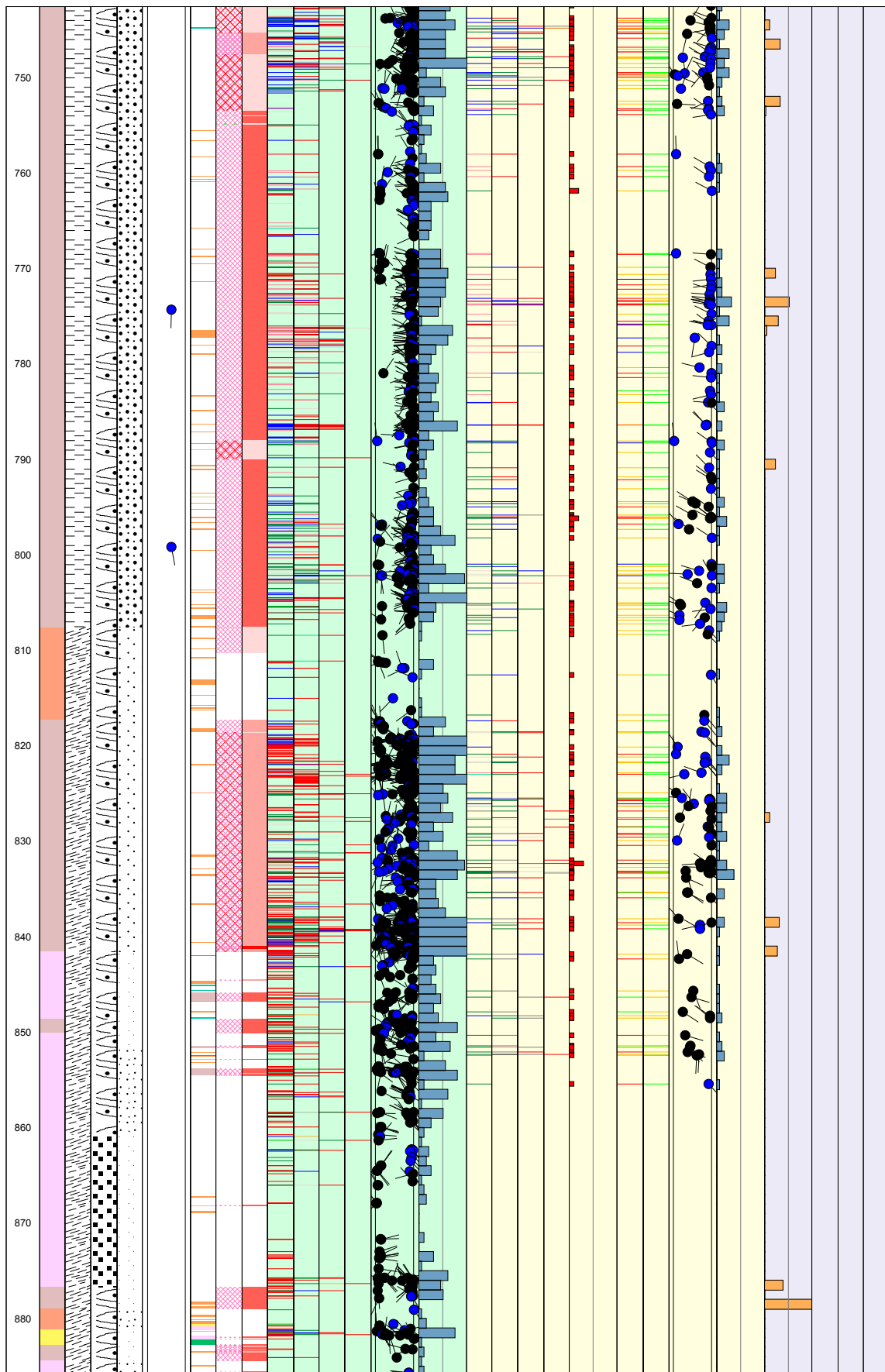
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Title GEOLOGY IN KFM08D		Appendix: 1		
	Site	FORSMARK	Coordinate System	RT90-RHB70
	Borehole	KFM08D	Northing [m]	6700491.68
	Diameter [mm]	77	Easting [m]	1631199.16
	Length [m]	942.300	Elevation [m.a.s.l.]	2.61
	Bearing [°]	99.98	Drilling Start Date	2006-12-13 10:00:00
	Inclination [°]	-55.18	Drilling Stop Date	2007-02-10 15:00:00
	Date of coremapping	2007-01-18 09:05:00	Plot Date	2007-06-03 23:15:13
	Rocktype data from	p_rock	Signed data	



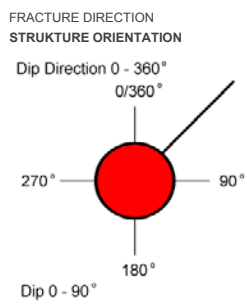






Site FORSMARK
 Borehole KFM08D
 Plot Date 2007-06-03 23:15:13
 Signed data

ROCKTYPE FORSMARK		ROCK ALTERATION		MINERAL	
	Granite, fine- to medium-grained		Oxidized		Epidote
	Pegmatite, pegmatitic granite		Chloritized		Hematite
	Granitoid, metamorphic		Epidotized		Calcite
	Granite, granodiorite and tonalite, metamorphic, fine- to medium-grained		Weathered		Chlorite
	Granite, metamorphic, aplitic		Tectonized		Quartz
	Granite to granodiorite, metamorphic, medium-grained		Sericitized		Unknown
	Granodiorite, metamorphic		Quartz dissolution		Pyrite
	Tonalite to granodiorite, metamorphic		Silicification		Clay Minerals
	Diorite, quartz diorite and gabbro, metamorphic		Argillization		Laumontite
	Ultramafic rock, metamorphic		Albitization		Prehnite
	Amphibolite		Carbonatization		Asphalt
	Calc-silicate rock (skarn)		Saussuritization		Oxidized Walls
	Magnetite mineralization associated with calc-silicate rock (skarn)		Steatitization		
	Sulphide mineralization		Uralitization		
	Felsic to intermediate volcanic rock, metamorphic		Laumontitization		
	Mafic volcanic rock, metamorphic		Fract zone alteration		
	Sedimentary rock, metamorphic				
STRUCTURE		ROCK ALTERATION INTENSITY		FRACTURE ALTERATION	
	Cataclastic		No intensity		Fresh
	Schistose		Faint		Gouge
	Gneissic		Weak		Completely Altered
	Mylonitic		Medium		Highly Altered
	Ductile Shear Zone		Strong		Moderately Altered
	Brittle-Ductile Zone				Slightly Altered
	Veined	ROUGHNESS			
	Banded		Planar		
	Massive		Undulating		
	Foliated		Stepped		
	Brecciated		Irregular		
	Lineated	SURFACE			
			Rough		
			Smooth		
			Slickensided		
TEXTURE		CRUSH ALTERATION			
	Hornfelsed		Slightly Altered		
	Porphyritic		Moderately Altered		
	Ophitic		Highly Altered		
	Equigranular		Completely Altered		
	Augen-Bearing		Gouge		
	Unequigranular		Fresh		
	Metamorphic				
GRAINSIZE		FRACTURE DIRECTION			
	Aphanitic	STRUCTURE ORIENTATION			
	Fine-grained	Dip Direction 0 - 360°			
	Fine to medium grained	Dip 0 - 90°			
	Medium to coarse grained				
	Coarse-grained				
	Medium-grained				



Indata: Length reference marks, borehole diameter, borehole length and borehole deviation

Reference Mark T – Reference mark in drillhole

KFM08D, 2007-02-07 09:30:00–2007-02-07 21:00:00 (100.000–900.000 m)

Bhlen (m)	Rotation speed (rpm)	Start flow (l/h)	Stop flow (l/h)	Stop pressure (bar)	Cutter time (s)	Trace detectable	Cutter diameter (mm)	Comment	QC
100.00	400.00	400	250	34.0	42	Ja	82.0	100.40/100.50	*
150.00	400.00	400	250	34.0	55	Ja	82.0	150.58/150.68	*
200.00	400.00	400	250	35.0	52	Ja	82.0	200.83/200.93	*
250.00	400.00	400	250	35.0	56	Ja	82.0	251.06/251.16	*
300.00	400.00	400	250	35.0	60	Ja	82.0	301.34/301.44	*
350.00	400.00	400	250	35.0	73	Ja	82.0	351.56/351.66	*
400.00	400.00	400	250	36.0	76	Ja	82.0	401.77/401.87	*
450.00	400.00	400	250	38.0	87	Ja	82.0	452.02/452.12	*
501.00	400.00	400	250	38.0	78	Ja	82.0	503.29/503.39	*
550.00	400.00	400	250	38.0	88	Ja	82.0	552.52/552.62	*
600.00	400.00	400	250	38.0	55	Ja	82.0	602.72/602.82	*
650.00	400.00	400	250	39.0	81	Ja	82.0	653.97/654.07	*
700.00	400.00	400	250	40.0	107	Ja	82.0	703.19/703.29	*
750.00	400.00	400	250	40.0	97	Ja	82.0	753.44/753.54	*
800.00	400.00	400	250	41.0	102	Ja	82.0	803.67/803.77	*
850.00	400.00	400	250	42.0	96	Ja	82.0	853.88/853.98	*
900.00	400.00	400	250	43.0	87	Ja	82.0	904.11/904.21	*

Printout from SICADA 2007-05-30 10:31:24.

Hole Diam T – Drilling: Borehole diameter

KFM08D, 2006-12-13 10:00:00–2007-02-10 15:00:00 (0.000–942.300 m)

Sub secup (m)	Sub seclo (m)	Hole diam (m)	Comment
59.040	60.800	0.0860	Borrad 59.04–59.48 och upprymnd ner itill 60.80
60.800	942.300	0.0773	

Printout from SICADA 2007-03-29 17:15:58.

Magnetic Acc Dev T–Magnetic accelerometer deviation measurement

KFM08D, 2007-02-14 17:19:00–2007-02-14 20:25:00 (3.000–936.000 m)

Bhlen (m)	Dip (°)	Magnetic Bearing (°)	Magfield (nT)	Magdip (°)	Gravfield	Toolroll (°)	Magtoolface (°)	Dis (°/m)	Status	Magh (nT)	Magv (nT)	Updown (m)	Leftright (m)	Shortfall (m)	QC
3.00	-55.19	97.63	20965	55.61	0.9998	203.70	302.68	0.000	3	11842.0	17300.0	0.00	0.00	0.00	*
6.00	-55.31	97.69	57962	74.75	1.0004	357.48	150.38	11.434	3	15250.0	55920.0	-0.39	0.78	-0.18	*
9.00	-55.25	97.75	51924	77.77	0.9991	56.47	217.72	5.250	2	11001.0	50745.0	-1.48	2.40	-0.91	*
12.00	-55.29	97.81	51190	73.28	0.9997	51.88	204.90	2.034	0	14725.0	49027.0	-2.76	4.10	-1.80	*
15.00	-55.34	97.87	51081	73.28	0.9995	56.10	209.09	0.021	0	14694.0	48922.0	-3.91	5.77	-2.59	*
18.00	-55.43	97.93	50769	73.57	0.9995	52.55	206.12	0.222	0	14362.0	48695.0	-5.08	7.45	-3.40	*
21.00	-55.51	97.99	51011	73.28	0.9992	56.93	210.20	0.129	0	14678.0	48854.0	-6.27	9.13	-4.21	*
24.00	-55.40	98.05	50849	73.22	0.9993	58.53	211.63	0.133	0	14683.0	48683.0	-7.46	10.81	-5.03	*
27.00	-55.31	98.11	50839	72.90	0.9992	58.53	211.31	0.077	0	14953.0	48591.0	-8.64	12.49	-5.85	*
30.00	-55.48	98.17	52206	75.71	0.9993	44.89	204.39	2.703	3	12883.0	50591.0	-10.01	14.19	-6.78	*
33.00	-55.44	98.23	50880	75.23	0.9995	58.86	217.51	0.227	2	12972.0	49199.0	-11.53	15.88	-7.83	*
36.00	-55.34	98.29	50958	73.22	0.9994	63.04	216.79	2.007	0	14709.0	48788.0	-12.91	17.58	-8.78	*
39.00	-55.35	98.35	51106	73.61	0.9992	61.67	216.35	0.360	0	14421.0	49029.0	-14.18	19.28	-9.66	*
42.00	-55.29	98.41	50672	72.98	0.9990	69.04	221.95	0.829	0	14834.0	48452.0	-15.42	20.97	-10.52	*
45.00	-55.13	98.46	50619	73.31	0.9993	70.48	224.64	0.634	0	14537.0	48486.0	-16.65	22.67	-11.37	*
48.00	-55.17	98.52	51552	74.49	0.9991	62.21	218.15	0.204	0	13789.0	49674.0	-17.92	24.38	-12.26	*
51.00	-55.14	98.58	51605	74.07	0.9993	69.26	225.51	0.745	0	14165.0	49623.0	-19.26	26.09	-13.19	*
54.00	-55.07	98.64	51599	73.87	0.9989	68.04	225.79	1.354	0	14338.0	49567.0	-20.74	27.80	-14.22	*
57.00	-55.07	98.70	50375	73.43	1.0003	259.07	53.30	2.409	0	14367.0	48283.0	-22.14	29.51	-15.19	*
60.00	-54.85	98.76	50231	73.55	0.9998	197.14	351.83	0.185	0	14225.0	48175.0	-23.40	31.22	-16.08	*
63.00	-54.76	98.82	50834	73.20	1.0005	219.70	14.07	0.092	0	14695.0	48664.0	-24.67	32.94	-16.98	*
66.00	-54.70	98.82	50806	73.20	1.0002	262.35	56.48	0.228	0	14688.0	48636.0	-25.93	34.67	-17.87	*
69.00	-54.70	99.14	50669	73.22	1.0005	266.59	60.83	0.062	0	14632.0	48510.0	-27.18	36.39	-18.76	*
72.00	-54.64	99.61	50739	73.35	0.9994	64.67	219.21	0.093	0	14540.0	48611.0	-28.44	38.12	-19.65	*
75.00	-54.56	99.45	50655	73.41	0.9994	65.53	220.16	0.041	0	14462.0	48546.0	-29.70	39.85	-20.55	*
78.00	-54.46	99.68	50728	73.22	1.0001	202.77	357.25	0.056	0	14644.0	48569.0	-30.96	41.58	-21.45	*
81.00	-54.37	99.99	50697	73.19	1.0002	206.69	1.24	0.067	0	14663.0	48530.0	-32.22	43.32	-22.36	*
84.00	-54.33	100.27	50792	73.19	1.0008	221.28	15.91	0.056	0	14688.0	48622.0	-33.50	45.06	-23.27	*
87.00	-54.32	99.92	50767	73.34	0.9997	44.61	199.37	0.068	0	14552.0	48636.0	-34.76	46.81	-24.18	*
90.00	-54.24	100.38	50804	73.26	1.0006	260.18	54.97	0.094	0	14634.0	48650.0	-36.03	48.55	-25.10	*

Bhlen (m)	Dip (°)	Magnetic Bearing (°)	Magfield (nT)	Magdip (°)	Gravfield	Toolroll (°)	Magtoolface (°)	Dls (°/m)	Status	Magh (nT)	Magv (nT)	Updown (m)	Leftright (m)	Shortfall (m)	QC
93.00	-54.19	100.17	50785	73.18	1.0010	260.87	55.53	0.044	0	14698.0	48612.0	-37.31	50.30	-26.02	*
96.00	-54.15	99.52	50653	73.27	1.0006	261.56	56.21	0.128	0	14584.0	48508.0	-38.57	52.05	-26.93	*
99.00	-54.10	98.90	50771	73.18	1.0004	261.81	56.24	0.122	0	14690.0	48599.0	-39.81	53.80	-27.84	*
102.00	-54.06	100.49	50675	73.19	1.0005	275.92	70.72	0.311	0	14657.0	48510.0	-41.06	55.55	-28.75	*
105.00	-54.01	100.09	50737	73.18	0.9992	139.33	294.05	0.080	0	14684.0	48565.0	-42.33	57.31	-29.68	*
108.00	-53.92	100.32	50853	73.38	0.9993	139.57	294.65	0.055	0	14549.0	48727.0	-43.60	59.07	-30.60	*
111.00	-53.88	101.00	50800	73.31	0.9994	139.82	294.98	0.134	0	14589.0	48660.0	-44.87	60.83	-31.53	*
114.00	-53.78	98.89	50679	73.26	0.9991	139.57	294.25	0.416	0	14600.0	48530.0	-46.13	62.59	-32.46	*
117.00	-53.80	100.00	50795	73.25	0.9991	140.26	295.17	0.219	0	14637.0	48640.0	-47.37	64.36	-33.37	*
120.00	-53.76	99.21	50755	73.26	0.9991	142.03	296.80	0.156	0	14616.0	48605.0	-48.61	66.12	-34.29	*
123.00	-53.68	99.86	50824	73.28	0.9993	142.60	297.56	0.131	0	14624.0	48675.0	-49.86	67.89	-35.21	*
126.00	-53.58	99.72	50763	73.29	0.9991	141.65	296.65	0.043	0	14597.0	48619.0	-51.10	69.66	-36.13	*
129.00	-53.43	99.84	50874	73.14	0.9992	141.29	296.19	0.055	0	14756.0	48687.0	-52.35	71.44	-37.06	*
132.00	-53.35	99.88	50817	73.26	0.9988	141.38	296.47	0.027	0	14639.0	48663.0	-53.59	73.22	-37.99	*
135.00	-53.29	99.25	50704	73.27	0.9991	141.62	296.62	0.127	0	14598.0	48557.0	-54.83	75.00	-38.92	*
138.00	-53.23	99.17	50689	73.30	0.9991	141.79	296.85	0.027	0	14567.0	48551.0	-56.05	76.79	-39.85	*
141.00	-53.15	100.38	50908	73.26	0.9990	141.50	296.80	0.243	0	14661.0	48752.0	-57.29	78.58	-40.78	*
144.00	-53.05	100.26	50758	73.21	0.9993	141.11	296.36	0.043	0	14662.0	48594.0	-58.54	80.37	-41.73	*
147.00	-53.03	99.28	50697	73.32	0.9996	140.78	295.98	0.197	0	14554.0	48563.0	-59.77	82.17	-42.67	*
150.00	-52.97	100.04	50726	73.16	0.9993	140.46	295.64	0.154	0	14693.0	48552.0	-61.00	83.97	-43.60	*
153.00	-52.94	100.09	50632	73.27	1.0007	260.25	55.59	0.014	0	14578.0	48488.0	-62.24	85.77	-44.55	*
156.00	-52.94	99.45	50766	73.18	1.0006	260.39	55.49	0.129	0	14686.0	48595.0	-63.48	87.57	-45.49	*
159.00	-52.92	100.01	50945	73.06	1.0006	260.46	55.53	0.113	0	14841.0	48735.0	-64.71	89.37	-46.43	*
162.00	-52.94	99.63	50790	73.29	1.0003	260.01	55.29	0.077	0	14601.0	48646.0	-65.94	91.17	-47.37	*
165.00	-52.98	100.41	50760	73.37	1.0007	260.48	56.00	0.157	0	14529.0	48636.0	-67.18	92.97	-48.32	*
168.00	-53.04	99.54	50743	72.98	1.0005	261.08	55.89	0.176	0	14852.0	48521.0	-68.42	94.77	-49.26	*
171.00	-53.10	98.64	50886	73.16	1.0007	259.91	54.74	0.182	0	14744.0	48703.0	-69.64	96.56	-50.19	*
174.00	-53.16	99.32	50880	73.28	1.0007	261.00	56.11	0.137	0	14636.0	48729.0	-70.85	98.35	-51.11	*
177.00	-53.27	99.22	50769	73.07	1.0007	261.69	56.79	0.318	0	14787.0	48568.0	-72.10	100.14	-52.05	*
180.00	-53.36	99.12	50876	73.03	1.0007	260.92	55.56	0.356	0	14853.0	48660.0	-73.35	101.93	-52.99	*
183.00	-53.45	100.08	50867	73.45	1.0006	261.27	56.61	0.193	0	14490.0	48760.0	-74.58	103.71	-53.91	*
186.00	-53.52	99.20	50731	73.28	1.0009	261.32	56.23	0.176	0	14593.0	48587.0	-75.82	105.49	-54.84	*

Bhlen (m)	Dip (°)	Magnetic Bearing (°)	Magfield (nT)	Magdip (°)	Gravfield	Toolroll (°)	Magtoolface (°)	Dis (°/m)	Status	Magh (nT)	Magv (nT)	Updown (m)	Leftright (m)	Shortfall (m)	QC
189.00	-53.54	99.06	50694	73.24	1.0007	260.64	55.45	0.029	0	14620.0	48540.0	-77.05	107.26	-55.75	*
192.00	-53.55	98.55	50713	73.25	1.0006	265.25	59.98	0.101	0	14611.0	48562.0	-78.27	109.03	-56.66	*
195.00	-53.59	98.56	50704	73.25	1.0009	265.81	60.51	0.013	0	14613.0	48553.0	-79.49	110.80	-57.57	*
198.00	-53.64	98.56	50858	73.31	1.0006	269.30	64.05	0.018	0	14609.0	48715.0	-80.70	112.57	-58.47	*
201.00	-53.70	98.61	50690	73.27	1.0008	272.77	67.46	0.023	0	14589.0	48545.0	-81.92	114.34	-59.38	*
204.00	-53.76	98.83	50747	73.34	1.0009	351.51	146.30	0.047	0	14545.0	48618.0	-83.14	116.10	-60.28	*
207.00	-53.81	98.80	50726	73.39	1.0006	352.63	147.46	0.018	0	14498.0	48610.0	-84.37	117.86	-61.18	*
210.00	-53.91	99.07	50774	73.34	1.0005	351.74	146.51	0.062	0	14560.0	48642.0	-85.60	119.62	-62.09	*
213.00	-54.02	97.77	50661	73.29	1.0005	352.49	146.87	0.258	0	14567.0	48522.0	-86.82	121.38	-62.98	*
216.00	-54.10	99.09	50918	73.25	1.0006	354.32	148.89	0.260	0	14674.0	48758.0	-88.04	123.13	-63.87	*
219.00	-54.20	98.18	50690	73.35	1.0005	355.63	150.09	0.181	0	14526.0	48564.0	-89.27	124.87	-64.77	*
222.00	-54.32	98.60	50747	73.24	1.0008	357.78	152.12	0.090	0	14633.0	48591.0	-90.49	126.61	-65.65	*
225.00	-54.40	98.01	50662	73.24	1.0006	0.31	154.48	0.118	0	14614.0	48509.0	-91.72	128.35	-66.53	*
228.00	-54.47	98.58	50694	73.36	0.9994	161.68	316.09	0.113	0	14518.0	48570.0	-92.95	130.08	-67.42	*
231.00	-54.58	97.75	50740	73.30	1.0009	258.81	52.92	0.165	0	14579.0	48600.0	-94.17	131.81	-68.29	*
234.00	-54.65	97.44	50753	73.23	1.0008	259.11	53.02	0.063	0	14647.0	48594.0	-95.39	133.53	-69.16	*
237.00	-54.74	97.43	50819	73.29	1.0006	258.80	52.75	0.031	0	14614.0	48672.0	-96.60	135.25	-70.02	*
240.00	-54.81	97.43	50787	73.35	1.0006	258.50	52.92	0.391	0	14556.0	48656.0	-97.83	136.97	-70.89	*
243.00	-54.93	97.43	50723	73.30	1.0005	258.24	52.55	0.040	0	14576.0	48584.0	-99.10	138.69	-71.78	*
246.00	-55.04	97.43	50767	73.50	1.0006	259.52	53.94	0.089	0	14420.0	48676.0	-100.36	140.40	-72.67	*
249.00	-55.13	97.43	50911	73.20	1.0008	268.66	62.63	0.034	0	14712.0	48739.0	-101.62	142.11	-73.55	*
252.00	-55.21	97.43	50724	73.27	1.0008	255.23	48.91	0.296	0	14598.0	48578.0	-102.86	143.81	-74.41	*
255.00	-55.30	97.30	50852	73.25	1.0003	349.13	142.70	0.040	0	14656.0	48694.0	-104.08	145.51	-75.26	*
258.00	-55.33	98.07	50927	73.39	1.0007	349.05	142.96	0.146	0	14559.0	48801.0	-105.31	147.20	-76.11	*
261.00	-55.29	97.91	50741	73.34	1.0003	349.30	143.14	0.033	0	14546.0	48612.0	-106.55	148.89	-76.97	*
264.00	-55.26	97.91	50762	73.34	1.0003	349.72	143.57	0.010	0	14553.0	48631.0	-107.79	150.59	-77.82	*
267.00	-55.18	97.72	50779	73.32	1.0003	350.22	144.05	0.045	0	14574.0	48642.0	-109.02	152.29	-78.68	*
270.00	-55.11	96.89	50792	73.28	1.0008	350.41	144.04	0.160	0	14609.0	48646.0	-110.24	153.99	-79.52	*
273.00	-55.06	98.01	50787	73.45	1.0009	350.51	144.63	0.214	0	14467.0	48683.0	-111.46	155.69	-80.38	*
276.00	-55.01	97.85	50837	73.34	1.0004	350.53	144.49	0.035	0	14576.0	48703.0	-112.69	157.40	-81.24	*
279.00	-55.01	96.88	50790	73.16	1.0005	350.49	144.01	0.185	0	14714.0	48612.0	-113.90	159.10	-82.09	*
282.00	-55.02	97.54	50726	73.31	1.0004	350.79	144.64	0.126	0	14568.0	48589.0	-115.12	160.81	-82.94	*

Bhlen (m)	Dip (°)	Magnetic Bearing (°)	Magfield (nT)	Magdip (°)	Gravfield	Toolroll (°)	Magtoolface (°)	Dls (°/m)	Status	Magh (nT)	Magv (nT)	Updown (m)	Leftright (m)	Shortfall (m)	QC
285.00	-55.01	96.82	50817	73.36	1.0005	350.76	144.53	0.138	0	14555.0	48688.0	-116.33	162.51	-83.79	*
288.00	-55.02	97.93	50801	73.43	1.0005	349.67	143.77	0.212	0	14488.0	48691.0	-117.54	164.21	-84.64	*
291.00	-55.02	97.93	50672	73.56	1.0006	349.67	143.95	0.000	0	14339.0	48600.0	-118.77	165.92	-85.50	*
294.00	-55.00	97.13	50993	73.13	1.0007	349.52	143.05	0.153	0	14800.0	48798.0	-119.99	167.63	-86.36	*
297.00	-55.01	96.96	50920	73.38	1.0005	348.56	142.39	0.033	0	14568.0	48792.0	-121.20	169.33	-87.20	*
300.00	-55.03	97.91	50808	73.46	1.0003	350.25	144.38	0.182	0	14466.0	48705.0	-122.42	171.04	-88.06	*
303.00	-55.06	97.65	50687	73.52	1.0003	349.09	143.24	0.050	0	14378.0	48605.0	-123.65	172.74	-88.92	*
306.00	-55.08	96.71	50835	73.21	1.0002	205.02	358.52	0.180	0	14686.0	48667.0	-124.86	174.44	-89.76	*
309.00	-55.11	97.44	50857	73.22	1.0001	211.82	5.49	0.139	0	14683.0	48691.0	-126.07	176.14	-90.61	*
312.00	-55.14	97.29	51062	73.13	1.0002	212.07	5.56	0.031	0	14820.0	48864.0	-127.29	177.84	-91.46	*
315.00	-55.15	96.78	50820	73.26	1.0002	212.48	6.41	0.232	0	14637.0	48667.0	-128.52	179.55	-92.32	*
318.00	-55.13	96.26	50822	73.15	1.0004	213.10	6.41	0.429	0	14728.0	48642.0	-129.74	181.25	-93.17	*
321.00	-55.14	97.78	50715	73.23	1.0001	212.51	6.25	0.290	0	14634.0	48558.0	-130.95	182.94	-94.01	*
324.00	-55.14	96.70	50816	73.35	1.0006	212.73	6.40	0.206	0	14562.0	48685.0	-132.17	184.64	-94.86	*
327.00	-55.10	97.11	50834	73.57	1.0002	213.11	7.62	0.460	0	14376.0	48759.0	-133.40	186.34	-95.72	*
330.00	-55.08	97.53	50886	73.28	1.0003	213.42	7.21	0.301	0	14639.0	48735.0	-134.64	188.05	-96.58	*
333.00	-54.97	97.32	50857	73.20	1.0003	214.24	7.93	0.056	0	14698.0	48687.0	-135.86	189.76	-97.44	*
336.00	-54.89	97.31	50873	73.27	1.0002	214.04	7.85	0.024	0	14646.0	48719.0	-137.07	191.46	-98.29	*
339.00	-54.78	96.65	50806	73.34	1.0004	214.41	8.24	0.132	0	14570.0	48672.0	-138.28	193.17	-99.14	*
342.00	-54.68	96.98	50683	73.34	1.0003	214.97	8.92	0.072	0	14534.0	48554.0	-139.47	194.89	-99.99	*
345.00	-54.58	97.42	50900	73.28	1.0002	216.00	10.01	0.090	0	14642.0	48749.0	-140.68	196.61	-100.84	*
348.00	-54.54	97.31	50916	73.26	0.9998	214.15	8.14	0.026	0	14663.0	48759.0	-141.88	198.33	-101.71	*
351.00	-54.51	97.47	50905	73.31	1.0000	213.82	7.93	0.032	0	14617.0	48762.0	-143.09	200.06	-102.57	*
354.00	-54.44	96.33	50875	73.24	1.0000	205.79	359.60	0.222	0	14675.0	48713.0	-144.28	201.79	-103.43	*
357.00	-54.37	96.54	50814	73.19	1.0001	205.83	359.65	0.046	0	14692.0	48644.0	-145.46	203.51	-104.27	*
360.00	-54.37	97.12	50896	73.34	1.0001	205.90	0.04	0.113	0	14590.0	48759.0	-146.65	205.24	-105.13	*
363.00	-54.35	96.88	50860	73.35	1.0002	206.16	0.29	0.047	0	14569.0	48729.0	-147.85	206.97	-105.99	*
366.00	-54.35	97.12	50892	73.39	1.0002	205.99	0.22	0.047	0	14544.0	48769.0	-149.04	208.71	-106.85	*
369.00	-54.32	98.11	50961	73.20	1.0004	206.60	0.78	0.193	0	14729.0	48787.0	-150.25	210.44	-107.72	*
372.00	-54.31	97.33	50863	73.16	1.0002	206.69	0.66	0.152	0	14734.0	48682.0	-151.46	212.18	-108.60	*
375.00	-54.29	96.93	50883	73.29	1.0002	206.98	1.05	0.078	0	14632.0	48734.0	-152.65	213.91	-109.46	*
378.00	-54.25	97.26	50902	73.28	0.9999	206.99	1.13	0.065	0	14646.0	48750.0	-153.84	215.65	-110.32	*

Bhlen (m)	Dip (°)	Magnetic Bearing (°)	Magfield (nT)	Magdip (°)	Gravfield	Toolroll (°)	Magtoolface (°)	Dls (°/m)	Status	Magh (nT)	Magv (nT)	Updown (m)	Leftright (m)	Shortfall (m)	QC
381.00	-54.22	97.29	50858	73.32	1.0005	206.97	1.20	0.013	0	14595.0	48719.0	-155.04	217.38	-111.19	*
384.00	-54.15	96.99	50819	73.28	1.0003	207.16	1.30	0.063	0	14625.0	48670.0	-156.23	219.12	-112.06	*
387.00	-54.09	96.67	50836	73.40	1.0003	207.33	1.60	0.066	0	14526.0	48717.0	-157.42	220.86	-112.92	*
390.00	-54.04	95.77	50867	73.18	1.0004	207.63	1.45	0.177	0	14717.0	48692.0	-158.58	222.60	-113.77	*
393.00	-54.01	97.32	50878	73.52	1.0003	207.12	1.72	0.304	0	14438.0	48787.0	-159.76	224.35	-114.63	*
396.00	-54.00	95.99	50875	73.26	1.0003	207.30	1.30	0.261	0	14653.0	48719.0	-160.93	226.09	-115.49	*
399.00	-54.02	96.24	50837	73.23	1.0001	207.44	1.43	0.050	0	14666.0	48676.0	-162.10	227.83	-116.34	*
402.00	-54.02	95.94	50771	73.30	1.0004	207.34	1.37	0.059	0	14586.0	48630.0	-163.26	229.57	-117.20	*
405.00	-53.98	96.49	50648	73.39	1.0002	206.19	0.48	0.108	0	14475.0	48535.0	-164.42	231.32	-118.05	*
408.00	-53.95	96.70	50755	73.28	0.9999	206.12	0.32	0.043	0	14600.0	48610.0	-165.60	233.06	-118.91	*
411.00	-53.97	97.51	50878	73.19	1.0002	206.66	0.89	0.159	0	14711.0	48705.0	-166.79	234.81	-119.78	*
414.00	-53.95	96.62	50785	73.40	1.0002	207.14	1.48	0.175	0	14505.0	48669.0	-167.97	236.56	-120.65	*
417.00	-53.94	97.60	50709	73.17	1.0004	207.79	2.02	0.192	0	14683.0	48536.0	-169.16	238.31	-121.52	*
420.00	-53.93	96.41	50913	73.39	1.0001	208.39	2.68	0.234	0	14554.0	48789.0	-170.34	240.06	-122.39	*
423.00	-53.90	96.90	50631	73.12	0.9998	208.76	2.80	0.097	0	14699.0	48450.0	-171.52	241.81	-123.26	*
426.00	-53.90	97.52	50822	73.05	1.0002	209.12	3.19	0.122	0	14816.0	48615.0	-172.70	243.56	-124.13	*
429.00	-53.87	97.17	50746	73.18	1.0005	209.96	4.14	0.070	0	14689.0	48574.0	-173.89	245.31	-125.01	*
432.00	-53.80	96.49	50784	73.34	1.0003	210.52	4.83	0.135	0	14557.0	48653.0	-175.07	247.06	-125.87	*
435.00	-53.76	96.23	50782	73.23	1.0003	211.72	5.84	0.053	0	14654.0	48622.0	-176.23	248.82	-126.74	*
438.00	-53.71	96.13	50911	73.12	1.0001	211.84	5.81	0.027	0	14785.0	48717.0	-177.39	250.57	-127.60	*
441.00	-53.64	95.99	50911	73.18	1.0005	213.36	7.43	0.037	0	14730.0	48733.0	-178.55	252.33	-128.45	*
444.00	-53.58	96.32	50717	73.35	1.0007	254.80	49.19	0.068	0	14532.0	48590.0	-179.70	254.08	-129.32	*
447.00	-53.55	96.70	50873	73.48	1.0009	256.13	50.79	0.076	0	14464.0	48774.0	-180.86	255.85	-130.18	*
450.00	-53.54	97.55	51019	73.20	1.0008	258.76	53.22	0.168	0	14742.0	48843.0	-182.04	257.61	-131.06	*
453.00	-53.52	96.38	50641	73.44	1.0007	339.88	134.43	0.232	0	14436.0	48539.0	-183.22	259.38	-131.94	*
456.00	-53.48	96.51	50817	73.42	1.0001	10.99	165.56	0.029	0	14504.0	48704.0	-184.38	261.14	-132.81	*
459.00	-53.48	97.24	50662	73.60	1.0004	10.34	165.29	0.145	0	14308.0	48599.0	-185.55	262.91	-133.69	*
462.00	-53.46	96.71	50816	73.39	1.0006	10.50	165.09	0.105	0	14523.0	48697.0	-186.72	264.68	-134.57	*
465.00	-53.39	96.44	50813	73.45	1.0001	10.77	165.41	0.058	0	14473.0	48708.0	-187.88	266.45	-135.44	*
468.00	-53.35	96.27	50778	73.33	0.9996	10.52	164.98	0.036	0	14570.0	48643.0	-189.03	268.22	-136.31	*
471.00	-53.30	95.97	50784	73.39	1.0003	11.74	166.26	0.062	0	14514.0	48666.0	-190.18	269.99	-137.18	*
474.00	-53.29	96.58	50878	73.43	1.0004	12.56	167.25	0.122	0	14509.0	48766.0	-191.33	271.76	-138.05	*

Bhlen (m)	Dip (°)	Magnetic Bearing (°)	Magfield (nT)	Magdip (°)	Gravfield	Toolroll (°)	Magtoolface (°)	Dls (°/m)	Status	Magh (nT)	Magv (nT)	Updown (m)	Leftright (m)	Shortfall (m)	QC
477.00	-53.25	96.29	50750	73.31	1.0000	13.01	167.50	0.059	0	14578.0	48611.0	-192.49	273.53	-138.92	*
480.00	-53.23	96.69	50700	73.29	1.0003	13.05	167.61	0.080	0	14576.0	48559.0	-193.64	275.31	-139.80	*
483.00	-53.21	96.67	50774	73.29	1.0007	12.90	167.47	0.007	0	14595.0	48631.0	-194.80	277.09	-140.68	*
486.00	-53.19	97.00	50796	73.32	1.0001	12.46	167.14	0.066	0	14578.0	48659.0	-195.96	278.87	-141.56	*
489.00	-53.19	96.55	50812	73.42	1.0010	12.88	167.60	0.090	0	14501.0	48699.0	-197.12	280.65	-142.44	*
492.00	-53.16	96.64	50824	73.28	1.0005	12.82	167.37	0.020	0	14626.0	48674.0	-198.28	282.42	-143.32	*
495.00	-53.16	96.39	50786	73.34	1.0001	13.04	167.64	0.050	0	14558.0	48655.0	-199.43	284.20	-144.20	*
498.00	-53.13	95.99	50805	73.25	1.0008	11.97	166.39	0.081	0	14638.0	48651.0	-200.58	285.98	-145.07	*
501.00	-53.08	96.07	50783	73.33	1.0003	14.62	169.17	0.023	0	14571.0	48647.0	-201.72	287.76	-145.94	*
504.00	-53.06	96.07	50792	73.34	0.9992	45.97	200.55	0.007	0	14565.0	48659.0	-202.86	289.54	-146.81	*
507.00	-53.04	95.89	50768	73.37	0.9996	49.98	204.59	0.037	0	14527.0	48645.0	-204.00	291.32	-147.68	*
510.00	-53.00	96.64	50840	73.35	0.9995	50.15	204.87	0.151	0	14572.0	48707.0	-205.14	293.11	-148.56	*
513.00	-52.99	95.90	50838	73.30	0.9997	50.13	204.66	0.149	0	14613.0	48693.0	-206.28	294.89	-149.44	*
516.00	-52.96	95.79	50791	73.29	0.9997	50.42	204.94	0.024	0	14601.0	48647.0	-207.41	296.68	-150.31	*
519.00	-52.96	96.12	50830	73.34	0.9996	51.01	205.66	0.066	0	14570.0	48697.0	-208.55	298.46	-151.18	*
522.00	-52.96	96.21	50761	73.35	0.9994	51.86	206.52	0.018	0	14548.0	48632.0	-209.69	300.25	-152.06	*
525.00	-52.92	95.93	50755	73.23	0.9995	54.14	208.62	0.058	0	14641.0	48597.0	-210.83	302.03	-152.93	*
528.00	-52.89	96.01	50779	73.32	0.9995	57.84	212.47	0.019	0	14574.0	48642.0	-211.96	303.82	-153.80	*
531.00	-52.88	96.26	50720	73.32	0.9994	58.48	213.16	0.050	0	14561.0	48585.0	-213.10	305.61	-154.68	*
534.00	-52.87	96.22	50783	73.42	0.9996	59.28	214.09	0.009	0	14494.0	48671.0	-214.24	307.40	-155.56	*
537.00	-52.87	96.48	50677	73.22	0.9996	59.76	214.35	0.052	0	14634.0	48518.0	-215.38	309.19	-156.44	*
540.00	-52.83	96.18	50772	73.42	0.9996	59.61	214.42	0.062	0	14492.0	48660.0	-216.52	310.98	-157.32	*
543.00	-52.79	95.94	50805	73.35	0.9992	61.94	216.64	0.050	0	14556.0	48675.0	-217.66	312.77	-158.20	*
546.00	-52.79	96.23	50803	73.38	0.9997	62.58	217.38	0.058	0	14534.0	48680.0	-218.79	314.56	-159.08	*
549.00	-52.74	96.01	50715	73.38	0.9993	65.54	220.32	0.047	0	14502.0	48597.0	-219.92	316.36	-159.96	*
552.00	-52.70	95.62	50759	73.37	0.9990	67.81	222.52	0.080	0	14531.0	48635.0	-221.05	318.15	-160.83	*
555.00	-52.68	95.76	50830	73.32	0.9995	69.93	224.62	0.029	0	14590.0	48691.0	-222.17	319.95	-161.71	*
558.00	-52.69	96.43	50785	72.81	0.9994	70.63	224.76	0.135	0	15006.0	48517.0	-223.30	321.74	-162.59	*
561.00	-52.64	95.93	50858	73.30	0.9995	69.93	224.63	0.103	0	14617.0	48713.0	-224.44	323.54	-163.47	*
564.00	-52.64	96.03	50800	73.32	0.9997	69.98	224.73	0.020	0	14582.0	48662.0	-225.56	325.34	-164.35	*
567.00	-52.65	96.10	50848	73.41	0.9995	70.80	225.68	0.015	0	14519.0	48731.0	-226.69	327.14	-165.23	*
570.00	-52.62	96.28	50800	73.35	0.9994	71.52	226.37	0.037	0	14554.0	48670.0	-227.83	328.94	-166.12	*

Bhlen (m)	Dip (°)	Magnetic Bearing (°)	Magfield (nT)	Magdip (°)	Gravfield	Toolroll (°)	Magtoolface (°)	Dls (°/m)	Status	Magh (nT)	Magv (nT)	Updown (m)	Leftright (m)	Shortfall (m)	QC
573.00	-52.59	96.03	50783	73.34	0.9994	72.25	227.05	0.052	0	14560.0	48651.0	-228.96	330.74	-167.00	*
576.00	-52.55	96.05	50819	73.34	0.9992	72.68	227.50	0.015	0	14572.0	48685.0	-230.09	332.54	-167.88	*
579.00	-52.53	96.01	50819	73.32	0.9994	72.30	227.10	0.011	0	14591.0	48679.0	-231.21	334.34	-168.77	*
582.00	-52.53	96.08	50798	73.30	0.9994	74.35	229.14	0.014	0	14595.0	48656.0	-232.34	336.14	-169.65	*
585.00	-52.52	95.71	50623	73.41	0.9990	75.25	230.12	0.075	0	14456.0	48515.0	-233.46	337.95	-170.53	*
588.00	-52.49	96.03	50766	73.39	0.9993	76.80	231.72	0.066	0	14511.0	48648.0	-234.58	339.75	-171.41	*
591.00	-52.48	95.90	50721	73.35	0.9994	77.50	232.34	0.027	0	14533.0	48595.0	-235.71	341.55	-172.29	*
594.00	-52.46	95.81	50689	73.33	0.9995	76.76	231.57	0.019	0	14539.0	48559.0	-236.83	343.36	-173.18	*
597.00	-52.46	95.95	50657	73.35	0.9994	76.97	231.84	0.028	0	14511.0	48534.0	-237.95	345.16	-174.06	*
600.00	-52.43	95.95	50637	73.47	0.9992	77.20	232.24	0.012	0	14411.0	48543.0	-239.07	346.97	-174.94	*
603.00	-52.41	95.71	50666	73.37	0.9993	77.40	232.27	0.049	0	14498.0	48547.0	-240.19	348.78	-175.82	*
606.00	-52.40	95.76	50786	73.54	0.9994	77.59	232.70	0.011	0	14394.0	48704.0	-241.31	350.58	-176.70	*
609.00	-52.36	95.39	50726	73.41	0.9994	77.75	232.64	0.076	0	14485.0	48614.0	-242.42	352.39	-177.58	*
612.00	-52.33	95.89	50936	73.32	0.9991	77.84	232.71	0.103	0	14617.0	48794.0	-243.53	354.20	-178.46	*
615.00	-52.32	95.73	50879	73.32	0.9992	77.80	232.64	0.033	0	14608.0	48736.0	-244.65	356.01	-179.35	*
618.00	-52.31	95.76	50827	73.38	0.9994	77.96	232.91	0.007	0	14535.0	48705.0	-245.76	357.82	-180.23	*
621.00	-52.28	95.62	50712	73.33	0.9991	78.51	233.37	0.030	0	14547.0	48581.0	-246.87	359.63	-181.11	*
624.00	-52.24	96.96	50447	73.55	0.9992	78.11	233.52	0.274	0	14289.0	48381.0	-248.00	361.44	-182.01	*
627.00	-52.20	95.74	50762	73.43	0.9994	78.17	233.22	0.250	0	14480.0	48653.0	-249.13	363.26	-182.90	*
630.00	-52.18	95.84	50771	73.31	0.9993	78.23	233.15	0.022	0	14579.0	48633.0	-250.24	365.08	-183.79	*
633.00	-52.18	96.03	50859	73.15	0.9992	77.96	232.70	0.039	0	14743.0	48675.0	-251.35	366.89	-184.68	*
636.00	-52.17	96.65	51097	73.06	0.9994	78.45	233.19	0.127	0	14892.0	48879.0	-252.48	368.71	-185.58	*
639.00	-52.12	95.95	50929	73.22	0.9994	78.97	233.81	0.144	0	14707.0	48759.0	-253.61	370.53	-186.47	*
642.00	-52.09	95.79	50705	72.81	0.9994	78.72	233.01	0.035	0	14983.0	48441.0	-254.72	372.35	-187.36	*
645.00	-52.05	95.40	51201	73.50	0.9994	77.49	232.65	0.081	0	14538.0	49094.0	-255.82	374.17	-188.25	*
648.00	-52.00	95.97	50692	73.50	0.9993	78.45	233.74	0.118	0	14393.0	48605.0	-256.93	375.99	-189.14	*
651.00	-51.96	96.17	50788	73.43	0.9993	78.85	234.09	0.043	0	14484.0	48678.0	-258.04	377.82	-190.03	*
654.00	-51.92	95.70	50835	73.45	0.9993	78.52	233.72	0.097	0	14478.0	48730.0	-259.15	379.64	-190.93	*
657.00	-51.93	96.84	50382	73.32	0.9995	78.30	233.52	0.234	0	14465.0	48261.0	-260.27	381.47	-191.83	*
660.00	-51.90	95.99	50763	73.29	0.9994	78.32	233.37	0.175	0	14595.0	48619.0	-261.39	383.30	-192.73	*
663.00	-51.89	95.25	50686	73.55	0.9992	77.95	233.22	0.152	0	14356.0	48611.0	-262.49	385.13	-193.62	*
666.00	-51.86	96.24	50834	73.35	0.9995	78.50	233.69	0.204	0	14569.0	48702.0	-263.60	386.96	-194.52	*

Bhlen (m)	Dip (°)	Magnetic Bearing (°)	Magfield (nT)	Magdip (°)	Gravfield	Toolroll (°)	Magtoolface (°)	Dis (°/m)	Status	Magh (nT)	Magv (nT)	Updown (m)	Leftright (m)	Shortfall (m)	QC
669.00	-51.83	96.24	50833	73.35	0.9993	78.31	233.51	0.010	0	14569.0	48701.0	-264.71	388.79	-195.42	*
672.00	-51.80	96.20	50834	73.34	0.9994	78.72	233.92	0.011	0	14572.0	48701.0	-265.83	390.62	-196.32	*
675.00	-51.76	96.30	50850	73.35	0.9996	79.24	234.48	0.025	0	14574.0	48717.0	-266.94	392.46	-197.23	*
678.00	-51.73	96.21	50819	73.32	0.9994	79.19	234.40	0.022	0	14584.0	48681.0	-268.06	394.29	-198.13	*
681.00	-51.69	96.25	50838	73.32	0.9995	80.14	235.37	0.015	0	14589.0	48699.0	-269.17	396.13	-199.04	*
684.00	-51.68	96.24	50843	73.32	0.9992	79.01	234.25	0.004	0	14592.0	48705.0	-270.28	397.97	-199.94	*
687.00	-51.69	96.32	50854	73.35	0.9994	79.30	234.59	0.017	0	14571.0	48722.0	-271.39	399.81	-200.85	*
690.00	-51.63	96.62	50866	73.48	0.9994	78.66	234.20	0.065	0	14464.0	48766.0	-272.51	401.65	-201.76	*
693.00	-51.57	96.61	50940	73.20	0.9995	78.95	234.14	0.019	0	14725.0	48765.0	-273.63	403.49	-202.68	*
696.00	-51.53	96.29	50858	73.34	0.9996	79.09	234.41	0.068	0	14584.0	48722.0	-274.75	405.34	-203.59	*
699.00	-51.49	96.35	50755	73.33	0.9992	78.69	234.04	0.018	0	14561.0	48622.0	-275.86	407.18	-204.50	*
702.00	-51.42	96.48	51022	73.22	0.9991	78.63	233.89	0.036	0	14734.0	48848.0	-276.97	409.03	-205.42	*
705.00	-51.46	96.39	50829	73.29	0.9993	78.81	234.13	0.023	0	14616.0	48682.0	-278.08	410.88	-206.33	*
708.00	-51.47	96.39	50872	73.31	0.9996	78.12	233.47	0.003	0	14608.0	48729.0	-279.19	412.73	-207.25	*
711.00	-51.42	96.34	50783	73.32	0.9994	78.52	233.89	0.019	0	14573.0	48647.0	-280.30	414.58	-208.16	*
714.00	-51.41	96.34	50796	73.37	0.9993	77.71	233.14	0.005	0	14541.0	48670.0	-281.41	416.43	-209.08	*
717.00	-51.38	96.53	50833	73.28	0.9995	78.76	234.13	0.040	0	14622.0	48684.0	-282.52	418.28	-209.99	*
720.00	-51.37	96.53	50833	73.36	0.9999	79.06	234.53	0.005	0	14557.0	48704.0	-283.63	420.13	-210.91	*
723.00	-51.34	96.58	50820	73.31	0.9996	78.69	234.12	0.015	0	14598.0	48678.0	-284.74	421.99	-211.83	*
726.00	-51.32	96.71	50867	73.37	0.9994	79.04	234.58	0.028	0	14561.0	48739.0	-285.86	423.84	-212.75	*
729.00	-51.30	96.39	50742	73.40	0.9993	78.62	234.16	0.067	0	14494.0	48628.0	-286.97	425.70	-213.67	*
732.00	-51.26	96.41	50839	73.41	0.9996	79.12	234.70	0.013	0	14512.0	48723.0	-288.08	427.55	-214.59	*
735.00	-51.27	96.73	50838	73.35	0.9996	79.98	235.53	0.067	0	14566.0	48707.0	-289.19	429.41	-215.51	*
738.00	-51.24	96.42	50819	73.42	0.9994	80.47	236.06	0.066	0	14500.0	48707.0	-290.30	431.27	-216.44	*
741.00	-51.22	96.61	50804	73.41	0.9995	80.69	236.31	0.040	0	14502.0	48690.0	-291.41	433.12	-217.36	*
744.00	-51.23	96.58	50862	73.41	0.9995	81.22	236.83	0.007	0	14525.0	48744.0	-292.52	434.98	-218.28	*
747.00	-51.21	96.59	50826	73.41	0.9994	82.04	237.66	0.007	0	14511.0	48710.0	-293.63	436.84	-219.21	*
750.00	-51.17	96.69	50825	73.44	0.9991	83.37	239.07	0.024	0	14486.0	48717.0	-294.74	438.70	-220.13	*
753.00	-51.15	96.73	50844	73.42	0.9997	84.35	240.04	0.010	0	14506.0	48731.0	-295.85	440.56	-221.06	*
756.00	-51.12	96.71	50837	73.40	0.9997	90.15	245.81	0.010	0	14527.0	48717.0	-296.96	442.43	-221.99	*
759.00	-51.08	96.61	50820	73.39	0.9992	86.90	242.55	0.026	0	14529.0	48699.0	-298.07	444.29	-222.91	*

Bhlen (m)	Dip (°)	Magnetic Bearing (°)	Magfield (nT)	Magdip (°)	Gravfield	Toolroll (°)	Magtoolface (°)	Dls (°/m)	Status	Magh (nT)	Magv (nT)	Updown (m)	Leftright (m)	Shortfall (m)	QC
762.00	-51.05	96.54	50845	73.35	0.9994	87.44	243.05	0.017	0	14565.0	48714.0	-299.18	446.16	-223.84	*
765.00	-51.07	96.75	50845	73.40	0.9994	87.91	243.61	0.044	0	14529.0	48725.0	-300.28	448.02	-224.77	*
768.00	-51.02	96.68	50859	73.37	0.9994	87.60	243.27	0.022	0	14553.0	48732.0	-301.39	449.89	-225.70	*
771.00	-51.00	96.60	50833	73.32	0.9996	88.03	243.63	0.018	0	14588.0	48695.0	-302.50	451.76	-226.63	*
774.00	-50.97	96.73	50828	73.35	0.9996	88.02	243.69	0.029	0	14567.0	48696.0	-303.61	453.62	-227.56	*
777.00	-50.95	96.96	50835	73.38	0.9995	87.46	243.21	0.049	0	14544.0	48710.0	-304.72	455.50	-228.49	*
780.00	-50.90	96.98	50850	73.44	0.9996	88.42	244.28	0.016	0	14496.0	48740.0	-305.83	457.37	-229.43	*
783.00	-50.85	97.52	50989	73.40	0.9995	88.62	244.55	0.115	0	14568.0	48864.0	-306.95	459.24	-230.38	*
786.00	-50.82	97.06	50858	73.39	0.9994	88.59	244.45	0.098	0	14535.0	48736.0	-308.07	461.12	-231.32	*
789.00	-50.78	97.00	50907	73.36	0.9996	88.80	244.62	0.017	0	14574.0	48776.0	-309.18	463.00	-232.26	*
792.00	-50.73	96.86	50922	73.32	0.9995	87.71	243.46	0.033	0	14617.0	48779.0	-310.29	464.88	-233.20	*
795.00	-50.69	96.95	50931	73.34	0.9996	89.03	244.85	0.023	0	14599.0	48794.0	-311.40	466.76	-234.15	*
798.00	-50.66	96.96	50863	73.30	0.9995	89.20	244.97	0.010	0	14620.0	48717.0	-312.51	468.64	-235.09	*
801.00	-50.60	96.91	50907	73.37	0.9994	89.48	245.36	0.023	0	14570.0	48778.0	-313.61	470.53	-236.03	*
804.00	-50.55	96.86	50940	73.40	0.9994	89.32	245.26	0.022	0	14555.0	48817.0	-314.72	472.41	-236.98	*
807.00	-50.49	97.09	50878	73.45	0.9997	89.58	245.65	0.052	0	14491.0	48771.0	-315.82	474.30	-237.93	*
810.00	-50.44	96.71	50865	73.39	0.9997	89.91	245.86	0.082	0	14541.0	48742.0	-316.92	476.19	-238.87	*
813.00	-50.38	96.46	50768	73.58	0.9997	89.52	245.69	0.056	0	14352.0	48697.0	-318.01	478.08	-239.82	*
816.00	-50.33	96.69	50734	73.53	0.9995	90.07	246.23	0.052	0	14388.0	48651.0	-319.10	479.98	-240.76	*
819.00	-50.28	96.67	50803	73.50	0.9996	89.85	246.01	0.018	0	14425.0	48712.0	-320.19	481.87	-241.71	*
822.00	-50.25	96.76	50932	73.35	0.9997	90.26	246.24	0.022	0	14597.0	48796.0	-321.28	483.77	-242.66	*
825.00	-50.21	96.74	50944	73.34	0.9996	89.11	245.10	0.014	0	14603.0	48807.0	-322.37	485.67	-243.61	*
828.00	-50.24	96.58	50954	73.38	0.9998	88.34	244.33	0.036	0	14577.0	48824.0	-323.46	487.57	-244.55	*
831.00	-50.23	96.86	50933	73.28	1.0004	355.60	151.51	0.060	0	14654.0	48779.0	-324.55	489.47	-245.50	*
834.00	-50.18	96.89	50948	73.22	1.0006	359.26	155.13	0.018	0	14707.0	48779.0	-325.65	491.37	-246.46	*
837.00	-50.17	96.91	50972	73.20	1.0007	359.94	155.79	0.006	0	14732.0	48796.0	-326.74	493.27	-247.41	*
840.00	-50.11	96.64	50954	73.21	1.0005	359.00	154.84	0.061	0	14720.0	48781.0	-327.83	495.18	-248.36	*
843.00	-50.13	96.82	50999	73.22	1.0009	359.20	155.08	0.039	0	14722.0	48828.0	-328.92	497.08	-249.32	*
846.00	-50.07	96.94	51116	73.23	1.0008	358.32	154.25	0.033	0	14750.0	48941.0	-330.01	498.98	-250.27	*
849.00	-50.05	97.38	51067	73.24	1.0006	358.02	154.05	0.094	0	14725.0	48898.0	-331.11	500.89	-251.23	*
852.00	-49.98	96.52	50845	73.27	1.0010	358.35	154.30	0.186	0	14637.0	48693.0	-332.20	502.80	-252.19	*

Bhlen (m)	Dip (°)	Magnetic Bearing (°)	Magfield (nT)	Magdip (°)	Gravfield	Toolroll (°)	Magtooface (°)	Dls (°/m)	Status	Magh (nT)	Magv (nT)	Updown (m)	Leftright (m)	Shortfall (m)	QC
855.00	-49.99	96.35	50860	73.29	1.0011	359.59	155.54	0.037	0	14620.0	48713.0	-333.28	504.71	-253.14	*
858.00	-50.00	97.61	51053	73.29	1.0008	282.88	79.04	0.270	0	14678.0	48897.0	-334.37	506.62	-254.10	*
861.00	-49.98	96.45	50703	73.27	1.0008	282.62	78.55	0.249	0	14599.0	48555.0	-335.46	508.53	-255.07	*
864.00	-49.95	96.45	50742	73.31	1.0009	282.95	78.95	0.009	0	14576.0	48604.0	-336.54	510.44	-256.02	*
867.00	-49.94	96.52	50662	73.38	1.0012	283.28	79.38	0.015	0	14491.0	48546.0	-337.62	512.35	-256.97	*
870.00	-49.91	96.74	50844	73.27	1.0010	282.96	78.98	0.048	0	14633.0	48693.0	-338.70	514.26	-257.92	*
873.00	-49.88	96.57	50655	73.32	1.0011	282.77	78.84	0.038	0	14536.0	48525.0	-339.78	516.17	-258.88	*
876.00	-49.84	96.68	50855	73.30	1.0011	283.04	79.12	0.028	0	14613.0	48710.0	-340.86	518.08	-259.84	*
879.00	-49.80	95.86	50670	73.45	1.0006	282.93	79.08	0.177	0	14430.0	48571.0	-341.92	520.00	-260.79	*
882.00	-49.78	97.00	51061	73.15	1.0009	282.89	78.85	0.245	0	14798.0	48870.0	-343.00	521.91	-261.74	*
885.00	-49.75	96.88	51011	73.10	1.0010	283.25	79.13	0.028	0	14833.0	48807.0	-344.08	523.83	-262.71	*
888.00	-49.73	96.54	50915	73.17	1.0010	283.21	79.13	0.074	0	14743.0	48733.0	-345.16	525.75	-263.67	*
891.00	-49.74	96.99	51187	73.25	1.0008	283.37	79.48	0.097	0	14749.0	49016.0	-346.24	527.67	-264.63	*
894.00	-49.71	96.96	50969	73.32	1.0009	283.22	79.43	0.011	0	14627.0	48825.0	-347.32	529.59	-265.60	*
897.00	-49.69	96.82	51127	73.17	1.0008	282.92	78.91	0.031	0	14805.0	48936.0	-348.41	531.51	-266.57	*
900.00	-49.72	97.27	50991	73.41	1.0007	283.66	80.03	0.098	0	14556.0	48869.0	-349.49	533.43	-267.53	*
903.00	-49.69	96.79	50998	73.32	1.0009	283.06	79.24	0.104	0	14638.0	48852.0	-350.58	535.35	-268.50	*
906.00	-49.64	96.46	50968	73.30	0.9997	149.21	305.33	0.074	0	14648.0	48818.0	-351.65	537.27	-269.46	*
909.00	-49.69	96.51	50909	73.33	1.0001	23.83	179.98	0.020	0	14601.0	48770.0	-352.72	539.20	-270.42	*
912.00	-49.68	96.48	50938	73.32	1.0004	22.41	178.55	0.007	0	14618.0	48796.0	-353.80	541.12	-271.38	*
915.00	-49.60	96.55	50939	73.35	1.0002	23.35	179.57	0.030	0	14593.0	48804.0	-354.87	543.04	-272.34	*
918.00	-49.56	96.60	50939	73.36	1.0007	23.38	179.62	0.017	0	14591.0	48805.0	-355.94	544.96	-273.30	*
921.00	-49.53	96.54	50926	73.38	1.0003	24.12	180.40	0.017	0	14569.0	48797.0	-357.01	546.89	-274.27	*
924.00	-49.47	96.44	50914	73.35	1.0005	21.10	177.35	0.029	0	14587.0	48780.0	-358.07	548.81	-275.23	*
927.00	-49.44	96.47	50910	73.45	1.0001	24.25	180.64	0.012	0	14501.0	48801.0	-359.14	550.74	-276.19	*
930.00	-49.41	96.45	50904	73.43	1.0002	28.98	185.36	0.011	0	14518.0	48789.0	-360.20	552.67	-277.16	*
933.00	-49.35	96.34	50871	73.31	1.0009	344.67	140.89	0.032	0	14613.0	48727.0	-361.26	554.60	-278.12	*
936.00	-49.27	96.49	50895	73.26	0.9995	55.17	211.39	0.040	0	14662.0	48737.0	-362.32	556.54	-279.09	*