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ÉNERGIE ATOMIQUE
DU CANADA LIMITÉE
Société de Recherche

GEOLOGICAL DATA SUMMARY FOR A BOREHOLE

DRILLED BETWEEN 1991 SEPTEMBER 16 AND 1991 OCTOBER 1
FOR THE TRANSPORT PROPERTIES IN HIGHLY FRACTURED ROCK EXPERIMENT
AT THE UNDERGROUND RESEARCH LABORATORY

RÉSUMÉ DES RÉSULTATS GÉOLOGIQUES LORS DU FORAGE D'UN TROU ENTRE LE
16 SEPTEMBRE ET LE 1^{er} OCTOBRE 1991 POUR L'ÉTUDE DES PROPRIÉTÉS
DE MIGRATION LORS DE L'ESSAI SUR ROCHE FORTEMENT FRACTURÉE
AU LABORATOIRE DE RECHERCHES SOUTERRAIN

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Geotechnical Science
and Engineering Branch
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Pinawa, Manitoba ROE 1L0
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Sciences et études
géotechniques
Laboratoires de Whitehell

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ABSTRACT

Borehole 101-013-HG4 was drilled between 1991 September 16 and October 1 from the 130 Level station, as part of the Transport Properties in Highly Fractured Rock Experiment, to explore the geological, hydrogeological and geochemical conditions of the rock mass in an area northwest of the Underground Research Laboratory (URL) shaft. The borehole was drilled to provide information at an intersection with Fracture Zone 2.0, 100 m to the west of boreholes collared from Room 211 of the 240 Level for future solute transport experiments within Fracture Zone 2.0, and to further our understanding of the rock mass in the area. Fracture Zones 2.5, 2.0, 1.9 and a subvertical joint zone in the footwall were all intersected in the borehole. Preliminary results from detailed core logging show that the lithostructural domains intersected in the borehole correlate with those previously identified in the URL shaft, and in nearby exploration boreholes drilled from the 130 Level. The domains are shallow-dipping toward the southeast and are parallel to the three main fracture zones intersected in the borehole.

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RÉSUMÉ

On a foré le trou 101-013-HG4 entre le 16 septembre et le 1^{er} octobre 1991 à partir du poste du Niveau 130 dans le cadre de l'Essai sur roche fortement fracturée pour l'étude des propriétés de migration et des conditions géologiques, hydrogéologiques et géochimiques de la masse rocheuse dans une zone située au nord-ouest du puits du Laboratoire de recherches souterrain (LRS). On a foré le trou pour obtenir des renseignements à un point d'intersection avec la zone de fractures 2.0 à l'ouest des trous amorcés à partir de la Chambre 211 du Niveau 240 pour exécuter les essais futurs de migration de solutés dans la Zone de fractures 2.0 et pour mieux connaître la masse rocheuse de cette zone. Il y a eu intersection avec les zones de fractures 2.5, 2.0 et 1.9 et avec une zone de fractures (diaclases) presque verticales du compartiment inférieur lors du forage du trou. Les résultats préliminaires de la diagraphie du trou de forage montrent que les zones lithostructurales intersectées correspondent avec celles identifiées antérieurement dans le puits du LRS et dans les trous de recherche avoisinants forés à partir du Niveau 130. Les zones s'inclinent à faible profondeur vers le sud-est et sont parallèles aux trois zones de fractures principales intersectées.

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1. INTRODUCTION

An exploratory borehole (101-013-HG4) was drilled between 1991 September 16 and 1991 October 1 from the 130 Level station as part of the Transport Properties in Highly Fractured Rock (HFR) Experiment to investigate the geological, hydrogeological and geochemical conditions of the rock mass northwest of the Underground Research Laboratory (URL) shaft. The borehole was to intersect Fracture Zone 2.0 (FZ 2.0) at a point about 100 m west of the hydrogeology boreholes drilled from Room 211 at the 240 Level; to intersect the other main fracture zones; and to provide additional information to that previously collected during shaft excavation and the drilling of nearby boreholes.

This report presents the drill-core log data from borehole 101-013-HG4. Preliminary interpretations of the geological structures are based on data from the borehole, the URL shaft and other boreholes in the area. The nomenclature used in this report, and in the graphic core logs presented herein, follows standards in place at the URL (Brown and Everitt, in preparation; Read 1990). All structural orientations are recorded as strike(dip direction)/dip and will appear as, for example, 220°(130°)/28°.

This report contains

- 1) a descriptive summary of the core log data,
- 2) a plan showing the borehole location and a section showing the rock mass discontinuities intersected in the borehole,
- 3) summary scattergrams and lower hemisphere, equal-area stereonets of fractures and other structural features,
- 4) borehole survey information (Appendix A),
- 5) a graphic core log legend (Appendix B),
- 6) a graphic core log of 101-013-HG4 (Appendix C),
- 7) structure contours of the upper and lower surfaces of the main fracture zones and major lithostructural domains (Appendix D), and
- 8) core log data and calculated structure orientation data (Appendix E).

2. SUMMARY OF RESULTS

A graphic core log is a record of the natural features intersected during drilling, the instrumentation installed in the borehole following drilling, and the engineering index results for the core. The graphic core log for borehole 101-013-HG4 is found in Appendix C. In keeping with a generalized format of the graphic core log, the core logging results are summarized as to drilling information, lithology (rock substance), rock mass and discontinuities (fracture zones), and testing information.

2.1 DRILLING

Borehole 101-013-HG4 was drilled subhorizontally from the 130 Level toward the northwest using HQ-3 size core bits producing a 61.1-mm core. The borehole ended at a downhole distance of 190.420 m in competent grey granite (Domain 10). Figure 1 is a plan showing the location of the borehole. A vertical section in the plane of the borehole was produced prior to drilling to predict the fracture-zone intersection locations. Figure 2 is the vertical section following drilling, showing the actual fracture-zone intersection locations.

Recorded drilling parameters varied along the borehole, especially near the main fracture zones. Percent-water-return increased to a downhole distance near FZ 2.0, then remained constant for the rest of the borehole. The drill-water colour was pink during drilling. Core recovery was maintained at or near 100%, while the rock quality designation (RQD) varied from 23%, through the fracture zones, to 100% in the less fractured regions (Appendix C).

2.2 LITHOLOGY

The lithology, or rock substance, comprised fine to porphyritic pink granite. Compositional variations of xenoliths, early leucocratic segregations, granodiorite dykes, late pegmatite dykes, and fine-grained granitic dykes were also identified.

Nine lithostructural domains were recorded from the core. Table 1 summarizes the downhole distances in the core where the domains were intersected. The same lithostructural domains could be correlated from the borehole to the shaft by using the downhole distance intersection orientations observed in the core for each domain. These orientations are based on the local scale as seen in the core, and may vary on the larger scale. The boundaries are often undulating, diffuse, crosscut and possibly offset by other lithologic structures, such as granodiorite dykes.

Orientation measurements of the coarse gneissic layering and other foliations were recorded. Appendix E contains the detailed data results measured from the core. The results are widely scattered and therefore the prediction of the number of foliation sets is uncertain.

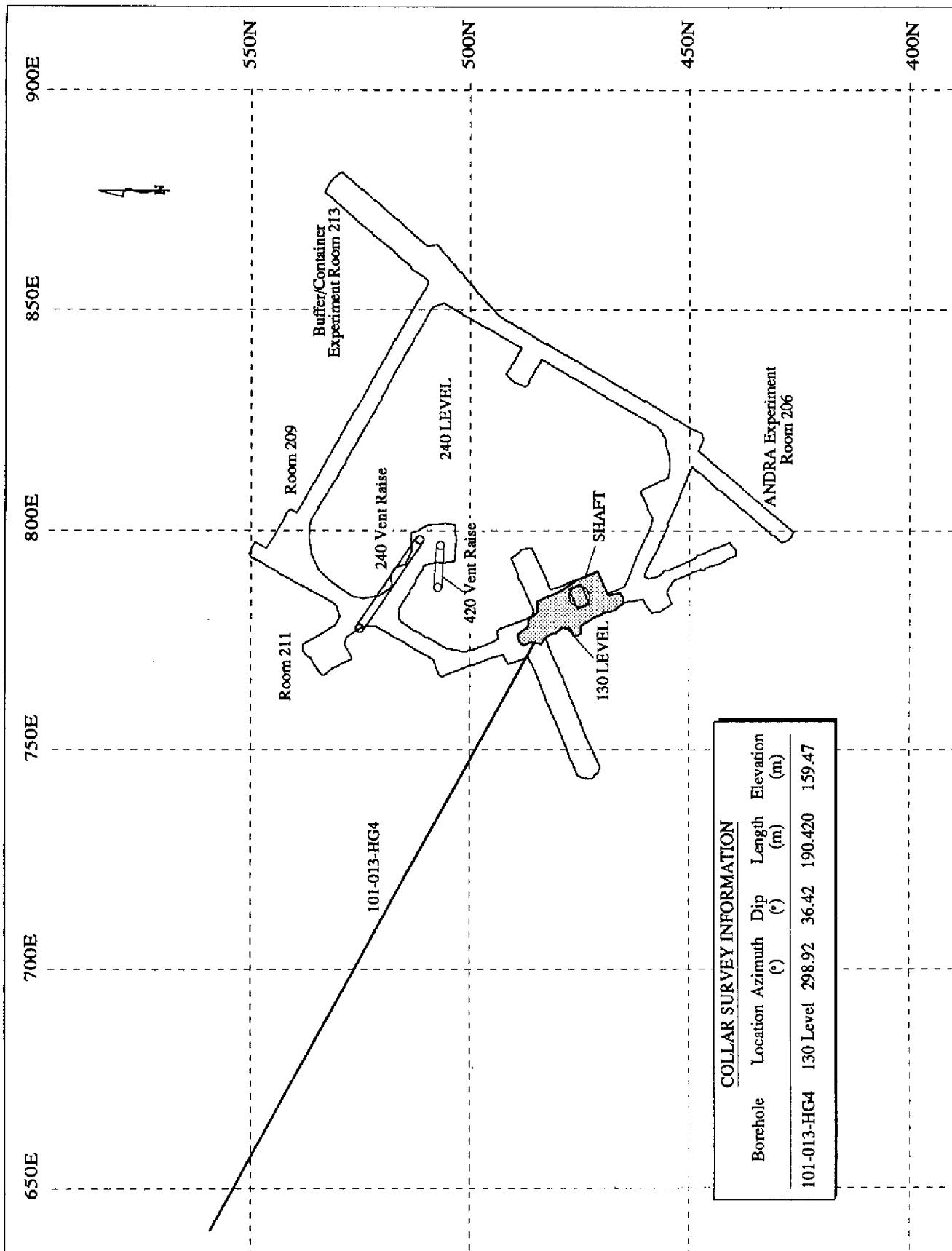


FIGURE 1: Plan Showing Borehole 101-013-HG4 Drilled From the 130 Level

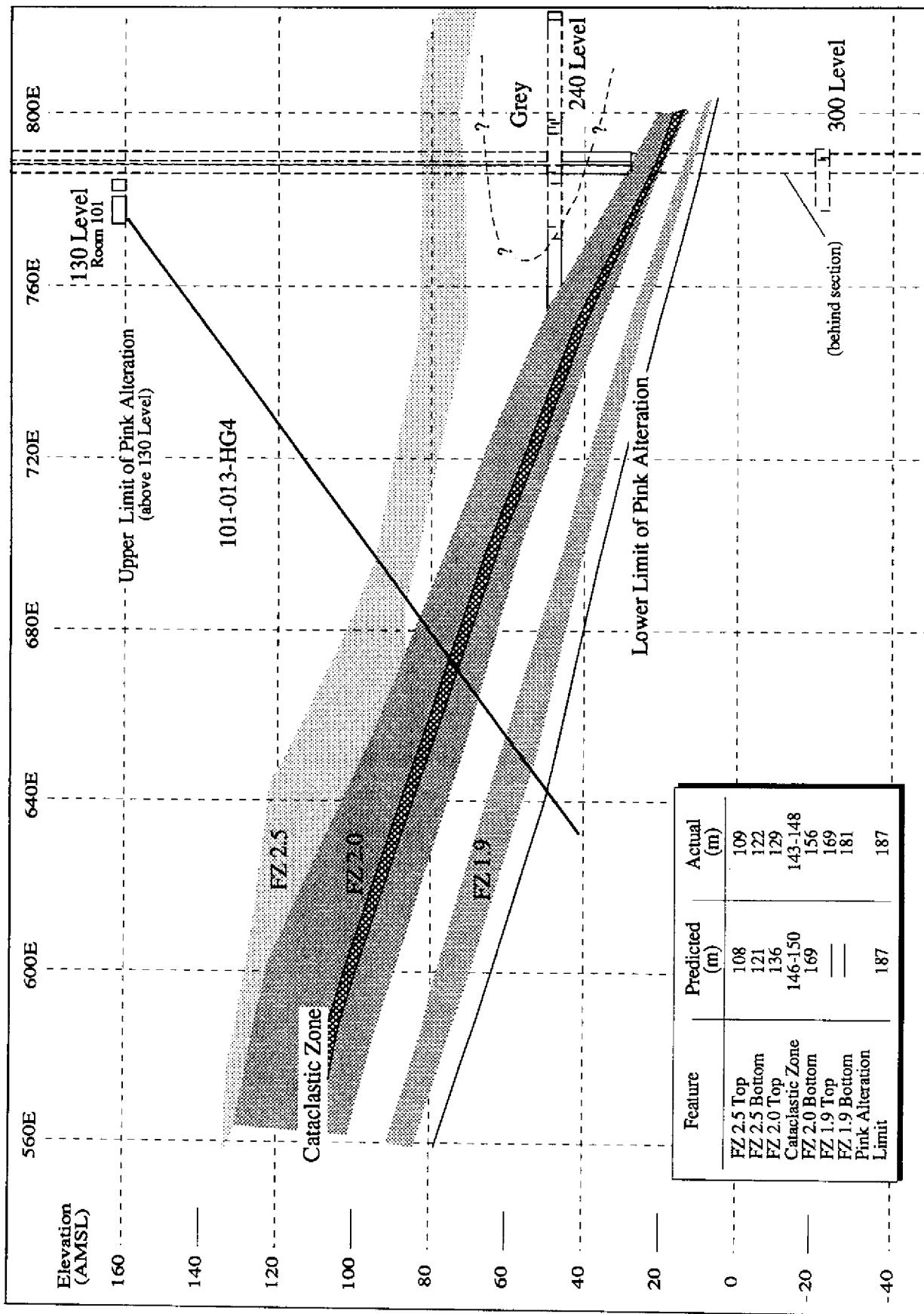


FIGURE 2: Vertical Section in the Plane of Borehole 101-013-HG4 Showing Actual Fracture Intersections

TABLE 1
LITHOSTRUCTURAL DOMAINS IN 101-013-HG4 CORE

Lithologic Domain (#)	Description	Downhole Distance (m)	Lower Contact Orientation	Depth Below Shaft Collar (m)
Upper Xenolithic Granite (2)	Medium to porphyritic leucocratic granite with xenoliths	0.000-4.839	221°(131°)/38°	115-145
Upper Gneissic Porphyritic Granite (3)	Medium to coarse-grained to weakly gneissic pink granite, leucocratic granite, and pegmatite dykes	4.839-37.705	229°(139°)/40°	145-162
Xenolithic Granite (4)	Medium to pegmatitic, porphyritic pink xenolithic granite	37.705-59.738	216°(126°)/31°	162-186
Lower Gneissic Granite (5)	Medium to porphyritic weakly gneissic pink granite with pegmatite dykes	59.738-118.295	239°(149°)/23°	186-218
Heterogeneous Granite (6)	Heterogeneous medium to coarse-grained granite, leucocratic granite	118.295-136.002	196°(106°)/34°	218-255
Lower Xenolithic Granite (7)	Xenolithic pink granite, biotite-rich granite	136.002-155.890	083°(353°)/13°	255-276
Homogeneous Granite (8)	Homogeneous, medium to coarse-grained pink granite	155.890-169.369	248°(158°)/34°	276-285
Xenolithic Granite (9)	Moderately gneissic, xenolithic, leucocratic pink granite	169.369-179.825	254°(164°)/50°	285-289
Gneissic Granite (10)	Heterogeneous weakly gneissic, medium to coarse-grained granite leucocratic granite	179.825-EOH	Not observed	289-313

(Figure 3). The dominant foliation set has an orientation of $075^\circ(165^\circ)/42^\circ$. Lineation orientation measurements were also recorded and may be found in Appendix E. The pole plot stereonet (Figure 4) suggests possibly two or three lineation sets.

Rock fabric varied from massive to xenolithic over the length of the borehole. Rock strength was estimated as weak (R1) within the fracture zones to very strong (R5) in intact core. The decomposition grade varied from I to II for intact rock and III to IV for fractured rock (Appendix C).

2.3 ROCK MASS AND DISCONTINUITIES

Fracture zones are identified by observing the first low-dipping fracture and the last low-dipping fracture in core (Everitt and Brown 1986). The borehole intersected three main fracture zones. The intersection intervals in downhole distance (m) are as follows: 108.189-122.297 (FZ 2.5), 129.805-155.895 (FZ 2.0), and 168.894-180.948 (FZ 1.9). The core also showed a distinct set of subvertical fractures, as well as regions of unfractured rock, along the length of the borehole. Appendix E contains the data of all oriented fractures and their infillings, with the most abundant infilling appearing first. The full names of the infillings listed appear in Appendix B, the graphic core log legend.

On the basis of the principal pole orientations interpreted from widely scattered data, FZ 2.5 exhibits possibly three fracture sets (Figure 5). The steeply dipping fracture set, oriented at $023^\circ(113^\circ)/75^\circ$, contains only hematite or hematite/quartz infilling. The low-dipping set, oriented at $062^\circ(152^\circ)/26^\circ$, contains primarily chlorite, carbonate and hematite infilling. The apertures of the fractures in the latter set are smaller than in the first set. There was no cataclasite horizon visible in the core between 108.189 and 122.297 m downhole distance. Water measurements taken at the borehole revealed a 35 L/min flow rate.

Figure 6, a pole plot stereonet of all oriented FZ 2.0 fractures, suggests two or more possible fracture set orientations. The possible orientations are $022^\circ(112^\circ)/18^\circ$, $035^\circ(125^\circ)/09^\circ$ and $038^\circ(128^\circ)/30^\circ$. The pole intersections for another set are widely distributed. The fractures oriented $035^\circ(125^\circ)/09^\circ$ are chloritic with 0.5- to 4.0-mm apertures. The other fracture sets have smaller apertures. The primary fracture infillings include hematite, chlorite, carbonate and traces of clay.

A significant characteristic of FZ 2.0 is the presence of two cataclastic zones. A 0.107-m-thick cataclasite horizon and an intact cataclastic zone 0.654 m thick were observed in the core from 143.002 to 143.107 m and 147.352 to 148.006 m, downhole distance, respectively. Some surfaces within the lower cataclastic zone showed high concentrations up to 0.015 m thick of chlorite and/or clay on their slickensided surfaces. Flow measurements taken at 139.400 m during drilling indicated an 81 L/min flow rate. Approximately 7 m below, at 146.400 m downhole distance, a flow of 120 L/min was recorded. The higher flow rate occurred only 0.700 m above one of three rubble zones identified in the core, and within 1 m of the main, intact cataclastic zone.

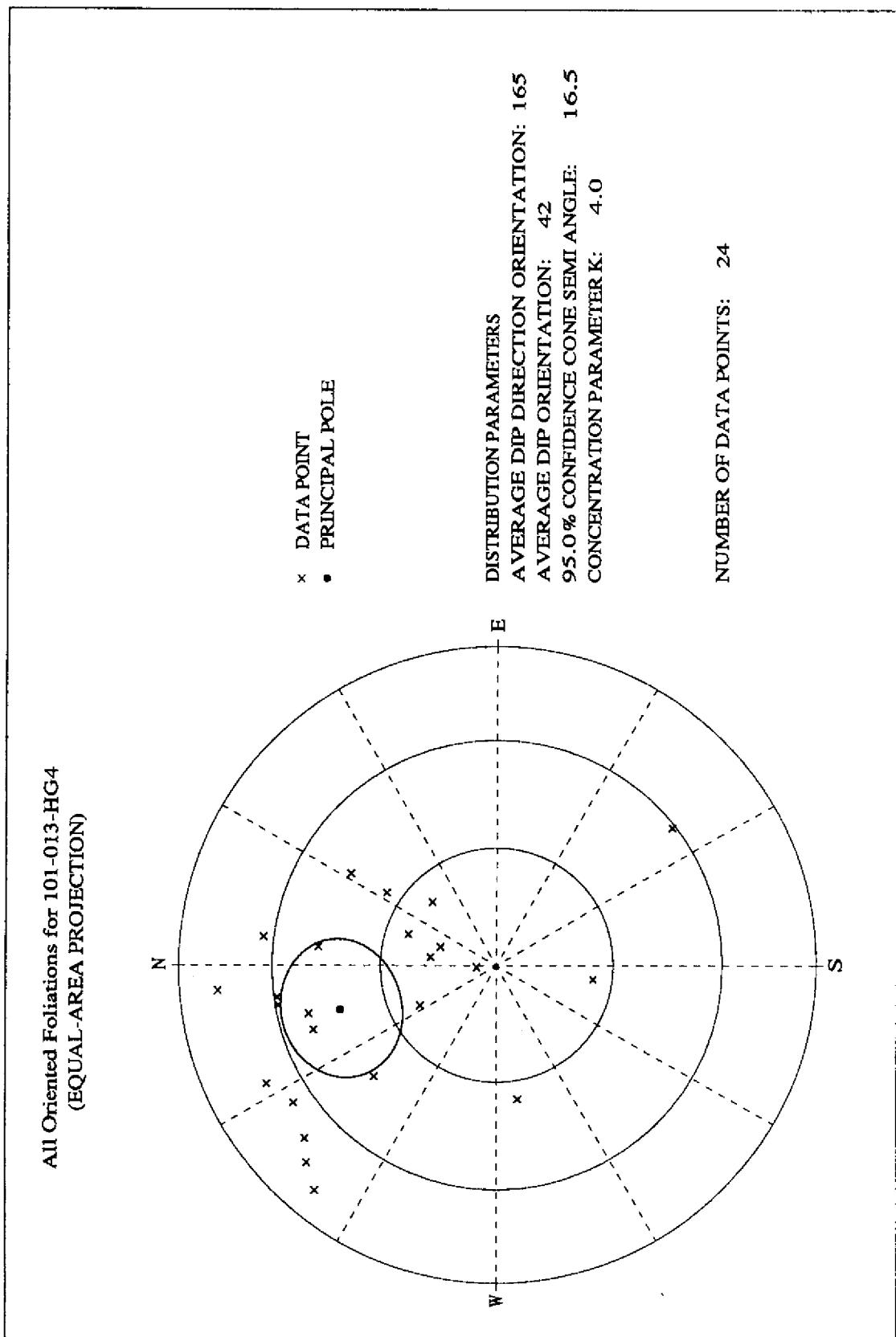


FIGURE 3: Watson Pole-to-Plane Stereonet for All Measured Oriented Foliations for 101-013-HG4

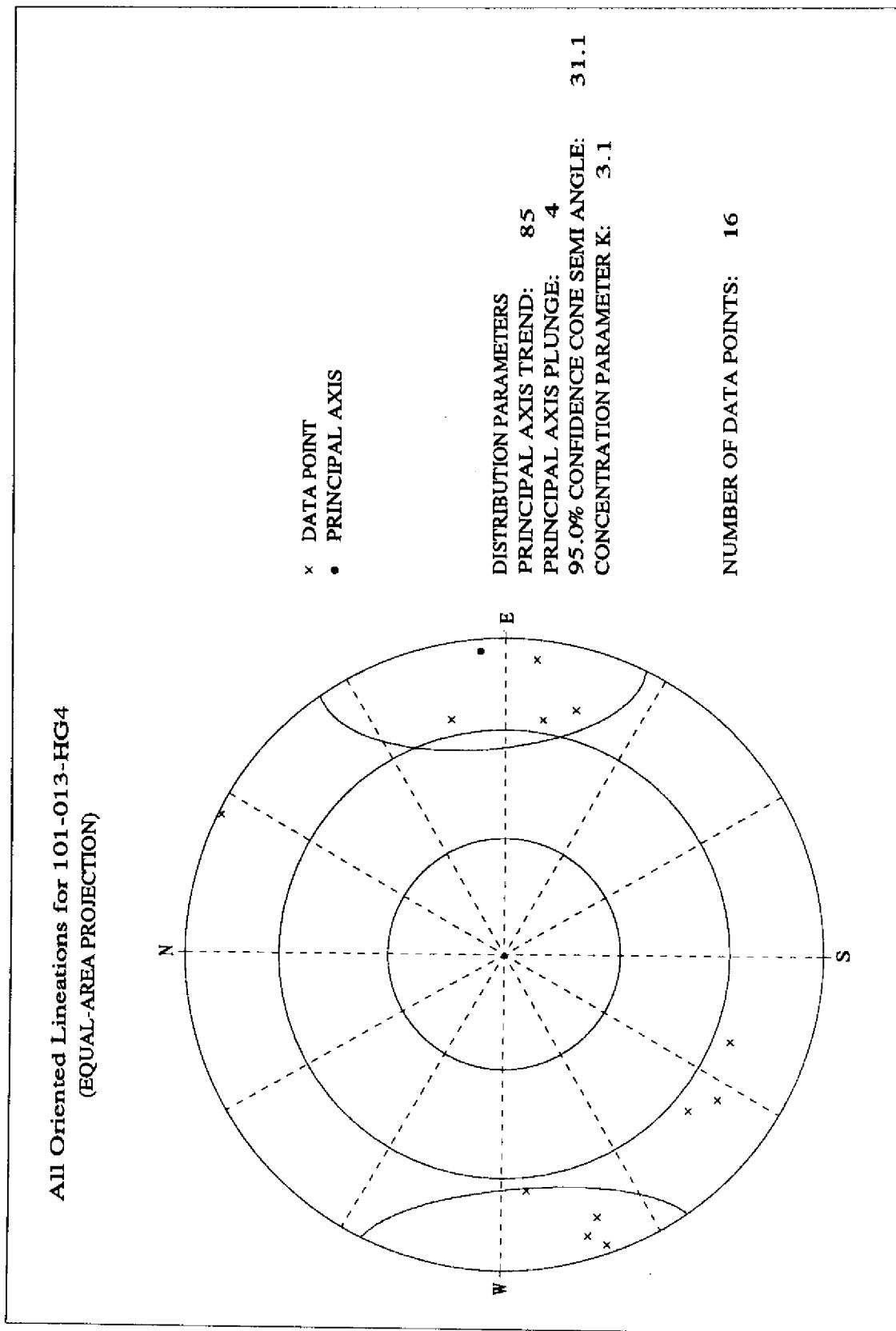


FIGURE 4: Watson Pole-to-Plane Stereonet for All Oriented Lineations in Fractures for 101-013-HG4

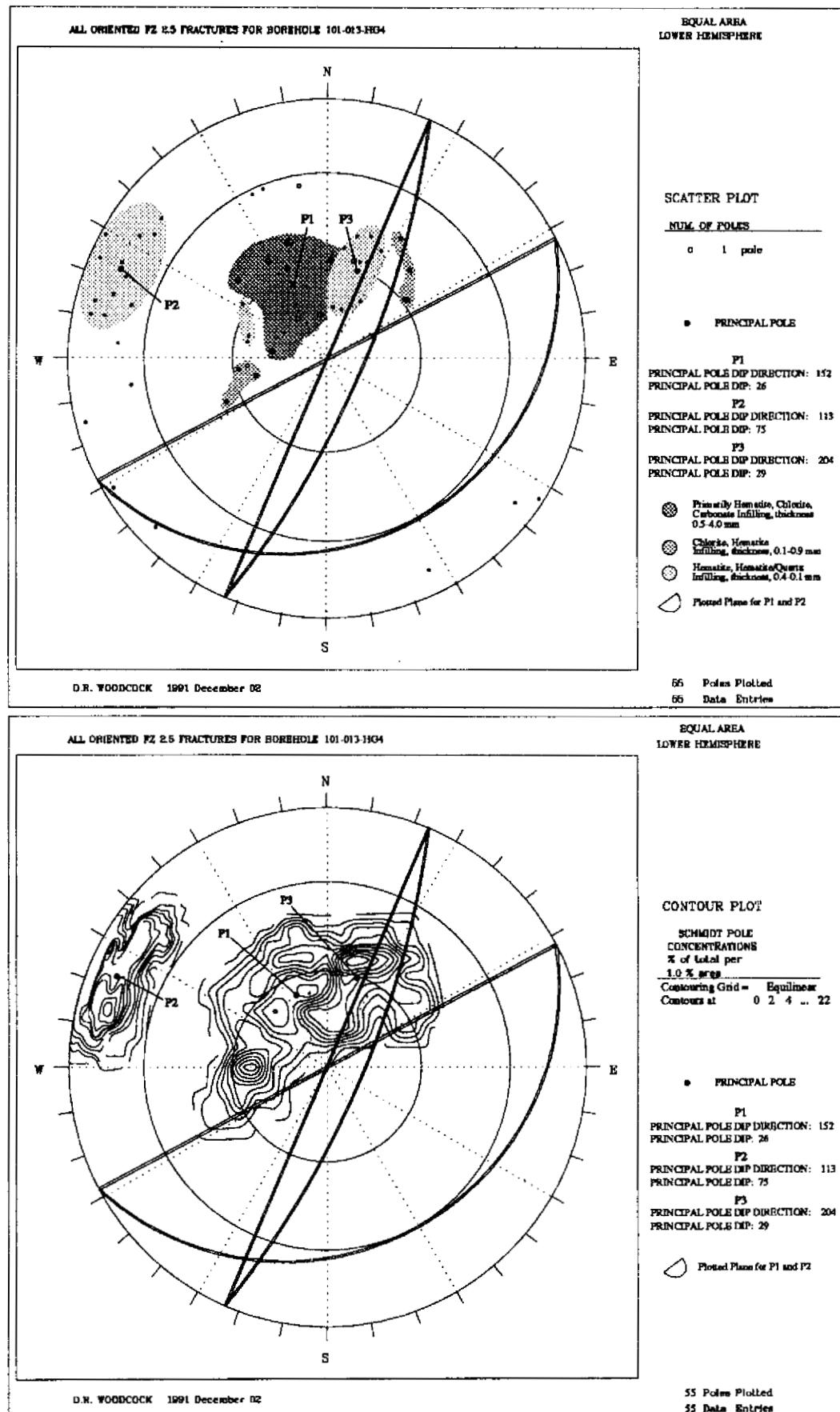


FIGURE 5: Lower Hemisphere Equal-Area Pole and Contour Plots
for All Oriented FZ 2.5 Fractures in 101-013-HG4

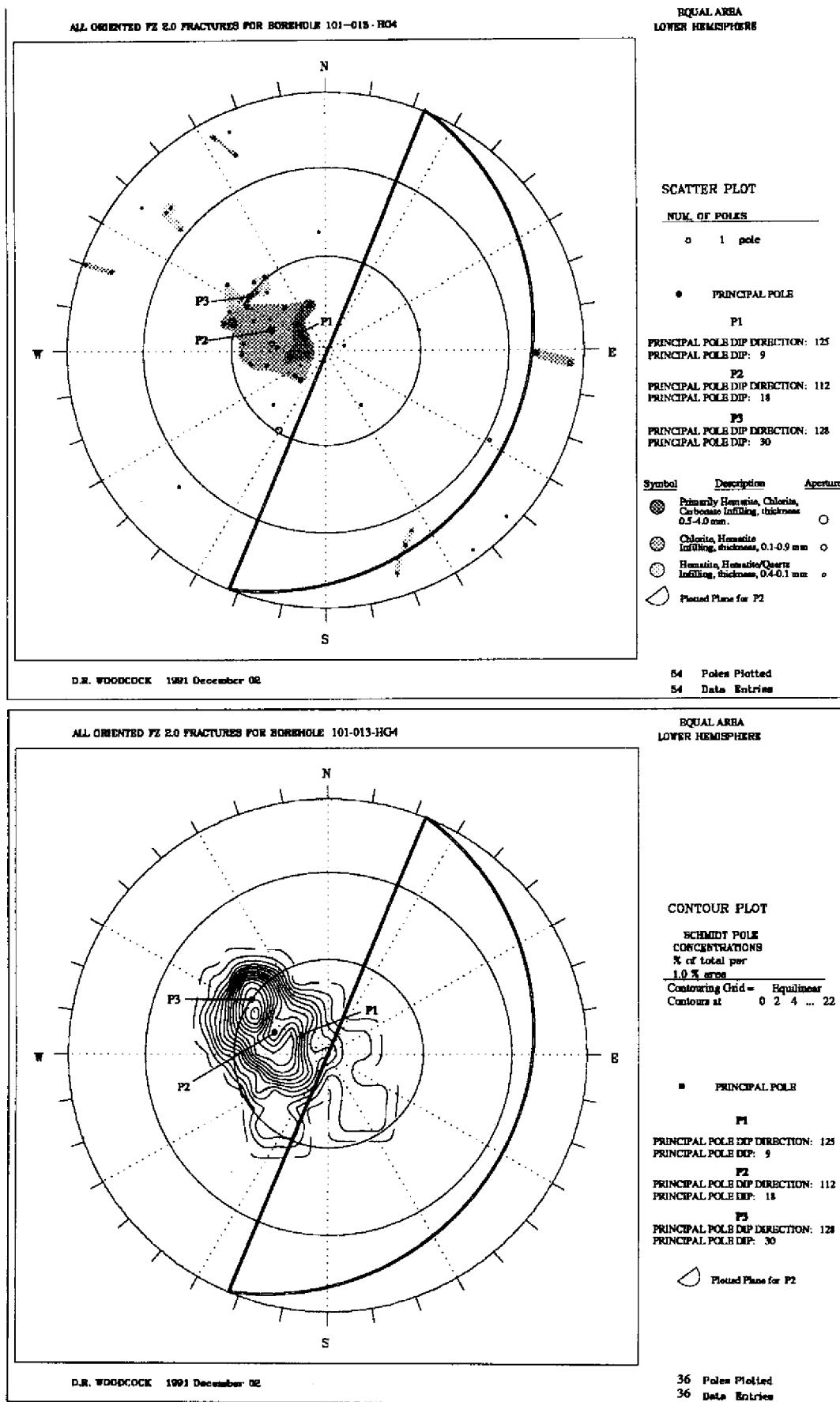


FIGURE 6: Lower Hemisphere Equal-Area Pole and Contour Plots
for All Oriented FZ 2.0 Fractures in 101-013-HG4

Fracture Zone 1.9 showed three distinct fracture sets (Figure 7). The steeply dipping set is oriented $205^{\circ}(115^{\circ})/88^{\circ}$, while the low-dipping set has an orientation of $107^{\circ}(197^{\circ})/18^{\circ}$. The orientation of another low-dipping set was not determined. The steeply dipping set is primarily quartz-healed fractures with some hematite infilling. The low-dipping fracture infillings are primarily hematite, chlorite and minor carbonate. The occurrence of quartz-healed fractures increased in comparison with the other fracture zones intersected by 101-013-HG4.

No cataclastic or rubble zones were observed in the core from FZ 1.9. Flow measurements taken following completion of the borehole indicated no change from the flow rate of 120 L/min recorded after the intersection of FZ 2.0.

A scattergram plotting the dip versus downhole distance for all oriented fractures in 101-013-HG4 (Figure 8) indicates the following:

- 1) occurrence of steeply dipping fractures in all fracture zones;
- 2) greater frequency of steeply dipping fractures from 5 to 25 m downhole distance; and
- 3) lack of vertical fractures from about 30 to 40 m and 57 to 70 m downhole distance, corresponding to the relatively unfractured gneissic granite (Domain 3) observed in the shaft.

Figure 9 plots the dip direction versus downhole distance for all oriented fractures in 101-013-HG4. From Figure 9, the average dip direction for the subvertical fractures above the fracture zones is consistent with that of the main fracture zone fractures. However, in the fracture zones, the dip direction of the subvertical fractures becomes more variable. The core log indicates the subvertical fractures have primarily hematite, quartz and carbonate infillings. All fractures observed in the core between the main fracture zones are hematite-filled.

Excavation damage refers to the various scales of fracturing induced in the rock as a result of excavation. Excavation damage may be assessed both by measuring the damage on the borehole wall using a probe, and from core observation. The core suggests an excavation damage zone and/or drill-induced break zone up to 2.859 m downhole distance. Confirmation of the excavation damage depth would require further examination at the borehole using a blunted probe with a spike perpendicular to its long axis. The probe would be used to scrape along the borehole wall. The nose would catch at locations in the borehole wall where cracks developed during excavation. This information could then be correlated to the core, and an excavation damage zone and drill-induced break zone could be more clearly defined. The probe could not be used in 101-014-HG4 because of the hydrogeological instrumentation installed in the borehole.

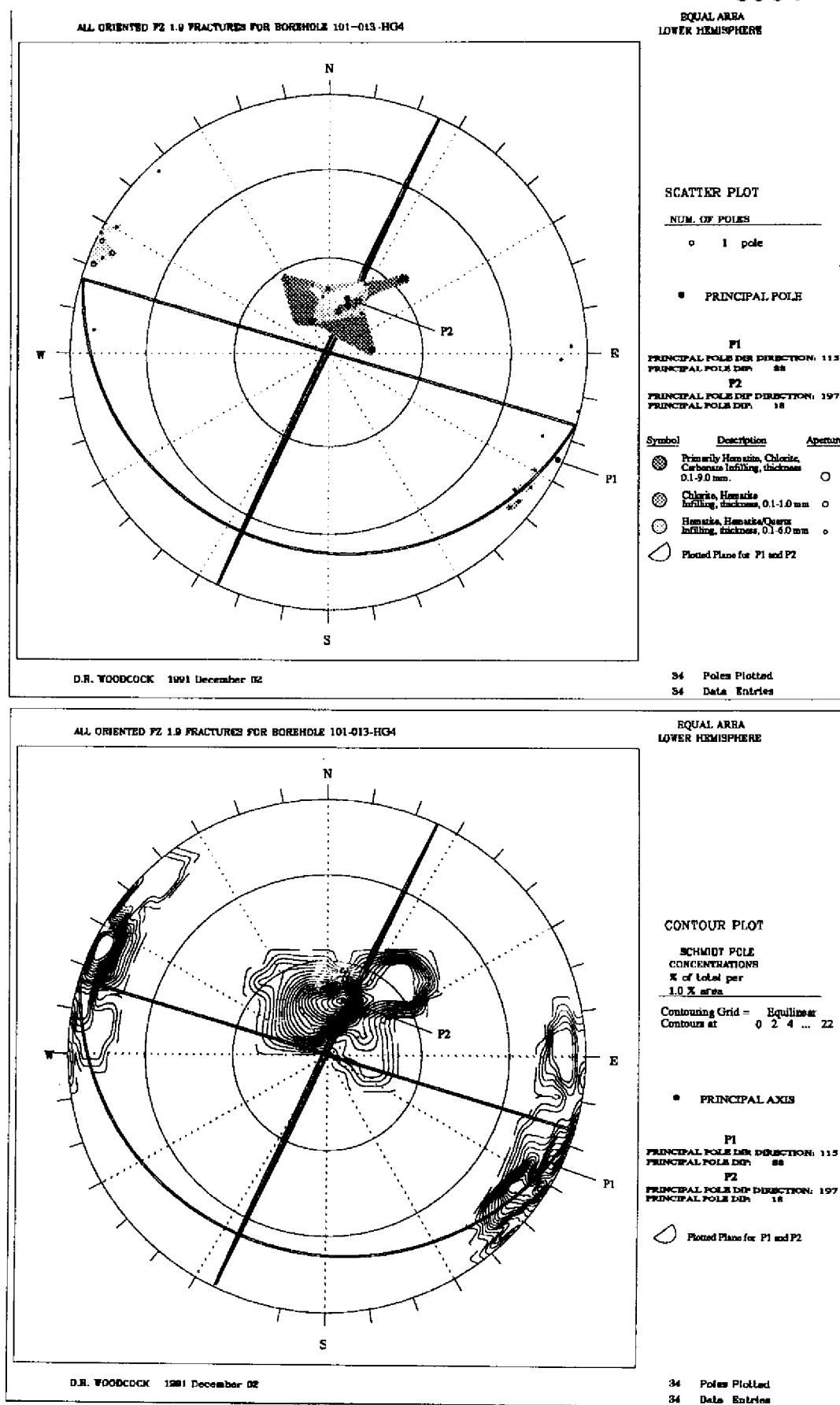


FIGURE 7: Lower Hemisphere Equal-Area Pole and Contour Plots for All Oriented FZ 1.9 Fractures in 101-013-HG4

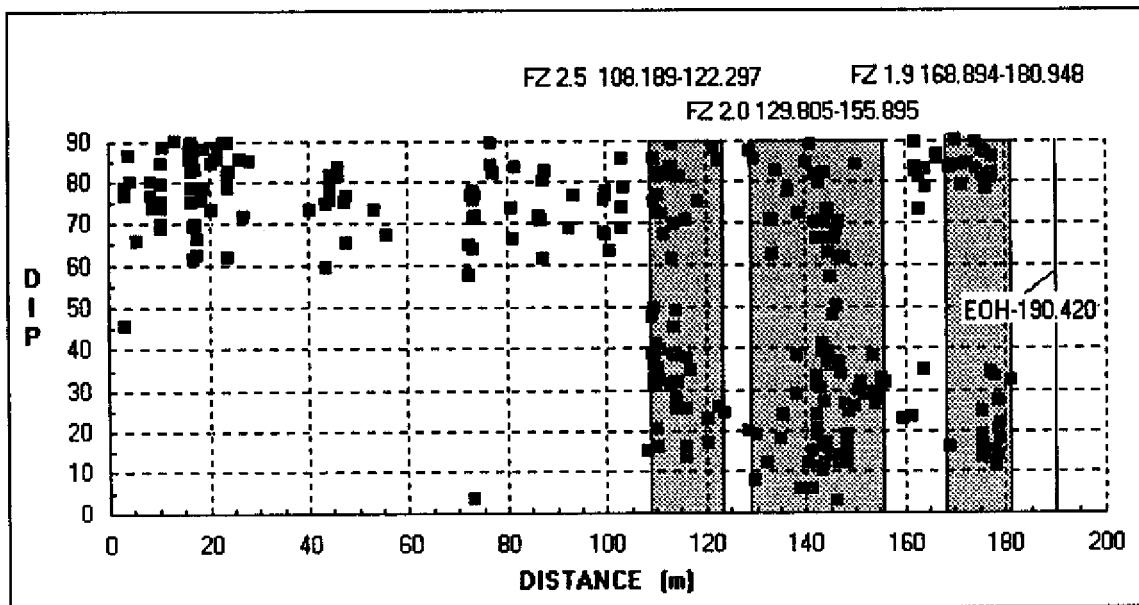


FIGURE 8: A Scattergram of Dip versus Downhole Distance for All Oriented Fractures in 101-013-HG4.

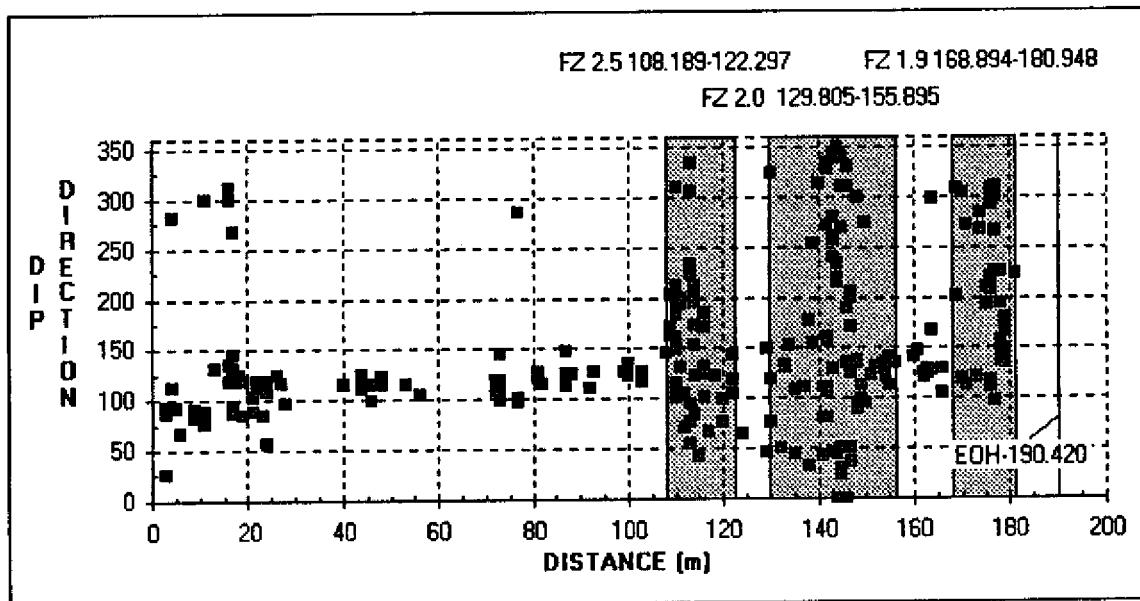


FIGURE 9: A Scattergram of Dip Direction versus Downhole Distance for All Oriented Fractures in 101-013-HG4.

2.4 TESTING AND INSTRUMENTATION

Five core samples of various lengths were recovered from FZ 2.0 between 142.800 and 145.425 m downhole distance. The rock type sampled is biotite-rich granite with 0.100 m being cataclasite. The samples were maintained in an in situ condition by using special sample collection tubes. The tubes are clear polycarbonate with a 0.076-m diameter and 0.005-m wall thickness. The tubes were purged with nitrogen and sterilized to remove bacteria from within the tube prior to collecting the samples (B. Payne pers. comm.). The tubes were then sealed using rubber stoppers at each end. The samples were required for a study of microorganisms thought to exist in FZ 2.0, a highly fractured and permeable environment.

A borehole multipacker system was installed in 101-013-HG4 to allow monitoring of the hydraulic conditions in the rock mass and for hydraulic testing.

3. DISCUSSION OF RESULTS

3.1 GENERAL

The lithostructural domains and fracture zones intersected in 101-013-HG4 correlate with the intersections observed in the nearby boreholes, ventilation raises, and the URL rectangular and circular shafts. Everitt et al. (1987) reported seven lithostructural domains from the surface to just below the 240 Level both in the shaft and the 240 Level ventilation raise, from geological mapping. These same seven domains are seen in 101-013-HG4 core. All three fracture zones observed in the core, along with a subvertical fracture set, are also intersected in the URL rectangular shaft.

Eight of nine lithostructural domains observed in the core are shallow-dipping toward the southeast. The other, Domain 3, a gneissic pink porphyritic granite, is shallow-dipping toward the southwest. Most domain contacts intersected are sharp, or have a minor recognizable transition zone; however, the contact between Domain 5 and Domain 6 is very gradual over several metres. Domain 5 is weakly gneissic granite, while Domain 6 is heterogeneous medium- to coarse-grained granite. Between Domain 9 and Domain 10 a leucocratic unit associated with the xenolithic horizon, Domain 9, was recognized in the core and correlated to the circular shaft. The leucocratic unit is also observed in some hydrogeology cores recovered from the HC-series boreholes drilled from Room 211 at the 240 Level.

Generally, the lithostructural domains narrow to the northwest; Domain 5, however, thickens. The gradational contact between Domain 5 and Domain 6 may explain this difference. The overall distribution of the lithostructural domains suggests four main xenolithic granite horizons separated by massive, heterogeneous and/or gneissic domains. Pervasive pink alteration is present along nearly the entire 101-013-HG4 core.

There are three fracture zones and a subvertical fracture set identified in the core from 101-013-HG4. All of these zones can be correlated to the shaft and nearby boreholes.

Fracture Zone 2.5 falls primarily within lithostructural Domain 5, while FZ 2.0 was observed in Domain 7. Fracture Zone 1.9 falls within lithostructural Domain 9. All of the domains are xenolithic granite.

3.2 STRUCTURE CONTOURS

Structure contours, presented in Appendix D, highlight the lithostructural and fracture domain surface orientations. Borehole 101-013-HG4, along with most of the intersection points from various excavations, nearby boreholes, ventilation raises (Everitt and Gann 1990) and shafts (Everitt and Hillary 1987), was used to construct the structure contours. Boreholes drilled on the lease area, the M-Series for example, were not plotted because of the long projected distances to the structures observed in 101-013-HG4.

Of the eight lower domain contacts plotted, only Domain 3 shows a southwest dip orientation (Figure D-1); the others are southeast. The surfaces of most lithostructural domains appear uniform. Domains 8 and 9, however, show a predominant undulation toward the southeast.

The fracture zones were also contoured (Hobbs and Everitt 1989). Both the upper and lower fracture surfaces show a southeast dip orientation. The fracture surfaces were contoured focusing on the area near 101-013-HG4 including all available fracture intersection data from nearby boreholes, ventilation raises, shafts and excavations. The intersection of the fracture zone correlates with the intersection of the lithostructural domain. For example, the structure contour for the intersection of the lower surface of FZ 2.0 is at 66.930 m elevation (Figure D-14). The lithostructural domain intersection is at 67.000 m elevation (Figure D-7). The two intersections are comparable. Again, for FZ 1.9 in 101-013-HG4, the intersection elevation is 52.212 m. The lithostructural Domain 9 contact is at 53.000 m.

Further investigation, analysis and modelling is required to more clearly understand the relationship between the lithostructural and fracture domains. This work is beyond the scope of this report.

ACKNOWLEDGEMENTS

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APPENDIX A

SURVEY INFORMATION

**AECL - URL DRILLING PROGRAMME
SURVEY INFORMATION**

PROJECT: 130 LEVEL

EXPERIMENT: Transport Properties in Highly Fractured Rock (HFR) Experiment

Borehole	Core Size	Length (m)	Dip	Azimuth	Northing	Easting	Elevation (m)	Start Drilling	Complete Drilling
101-013-HG4	61.2 mm	190.420	36.42	298.92	5570485.070	295774.713	159.547	1991.09.16	1991.10.01

Instrumentation: Hydrogeological packer systems
Microbiological samples taken

All co-ordinates to centre of borehole.
No Sperry-Sun Survey at time of reporting

APPENDIX B

GRAPHIC CORE LOG LEGEND

1. SAMPLE CORE LOG PAGE

2. CORE LOG LEGEND

DRILLING

Depth (Elev)

Downhole depth in metres from borehole collar. Where applicable elevation above mean sea level is given in parentheses.

Water

Colour and percentage drill water return (from drill records if available).

Recovery %

Ratio of length of core recovered per drill run to length drilled expressed as a percentage.

RQD %

Rock Quality Designation, ratio of length of intact core > 10 centimetres recovered per drill run to length of drilled run expressed as a percentage. Only open natural fractures are considered in determining lengths of intact core.

ROCK SUBSTANCE

Rock Type

Primary, secondary and tertiary lithologic units as per Table 1.

Alteration

Primary, secondary and tertiary rock alteration as per Table 2.

Foliation

Average foliation type and orientation (dip/dip direction) for lithologic unit as per Table 3.

Fabric

Mesoscopic fabric for main phase of the granite (from array results) as per Table 4.

Strength

Average rock strength for lithologic unit as per Table 5.

Decomposition Grade

Average decomposition grade for lithologic unit as per Table 6.

Rock Substance Description

General description of main lithologic features and domains.

ROCK MASS AND DISCONTINUITIES

Frequency

Histogram of number of natural fractures per metre.

Block Size

Histogram of size in centimetres of intact core lengths separated by open natural fractures.

Intersection Depth

Downhole depth in metres to point where fracture intersects the core reference line.

Fracture Type

Type of fracture as per Table 7.

Subclass

Fracture subclass as per Table 8.

Number of Fractures

Total number of fractures and splays logged at a point.

Continuity

Fracture plane continuity as per Table 9.

Planarity

Shape of fracture plane in profile as per Table 10.

Roughness

Small-scale surface irregularities as per Table 11.

Infillings

Fracture fillings from most to least dominant as per Table 12.

Thickness

Thickness of infilling material in millimetres.

Lineation

Surface lineation as per Table 13.

Orientation

Dip/dip direction of fracture in zone with black reference line, alpha/beta angles for unoriented core.

Rock Mass and Discontinuity Description M

General literal description of rock mass and discontinuities.

Fractures (Graphic)

Plan view of core with fractures projected to plane parallel to core axis. Reference line in middle of column represents orientation: black (solid) for oriented core, green (dashed) for orientation within +/- 20°, and yellow (dotted) for orientation not known.

Zones

Graphic representation of various types of zonal features.

General Notes:

- 1) In cases where columns are left blank, no data were recorded for the interval.
- 2) The number of decimal places for survey data is used to supply each feature with a unique identifier; it does not indicate level of measuring accuracy.
- 3) The terms drill hole, corehole and borehole have been used on site and are interchangeable. Adherence to the term borehole is preferred.
- 4) Interval depths are given with each comment to facilitate interpretation of zone boundaries. This is particularly important for small intervals that preclude plotting of lithology symbols.
- 5) The reference number on the title page is used to maintain the organization of the geology library. All logs are filed by Geomechanic reference numbers (Rock Mechanics) organized by experiment.

Tests and Samples

Graphic representation of instrument and sample locations.

Description/Results

Description of test or instrumentation or results of testing.

TABLE 1
ROCK COMPOSITION (after Everitt et al. 1990)

Xenoliths - metavolcanic and felsic to intermediate plutonic.		Middle Granitoid Segregations - well-defined but irregular anastomosing dykes. Crosscut previous units but are in turn crosscut by those that follow.	
4	Undifferentiated	7	Granodiorite dykes, variety undifferentiated.
4A	Tonalitic	7A	Fine- to medium-grained biotitic (10 - 30%) granodiorite, homogeneous to heterogeneous (because of inclusions from adjacent rock). Matrix may be very finely foliated.
4B	Amphibolitic	7B	Leucocratic veinlets associated with the dyke margins in small fractures within the granodiorite dykes.
4C	Biotitic Metapelitic		
4D	Biotitic Feldspathic		
4E	Quartzose Iron Formation		
4F	Quartzose Diopsidic		
4G	Calcareous Diopsidic		
4H	Aplitic		
Groundmass of Batholith - equigranular to porphyritic or porphyroblastic (especially in proximity to early granitoid segregations), massive to gneissic, granitic to quartz monzonitic.			
Grey Pink*		Late Granitoid Segregations - pegmatite or aplite dykes and veins distinguished from earlier segregations in core by sharpness of contacts, dyke-like form and internal fabric (euhedral feldspars, central quartz-rich zone, evidence of crystal growth away from walls). Euhedral magnetite and biotite are also more common in these units than in the earlier types.	
3A	1A Biotite < 10%	6	Undifferentiated.
3F	1B Biotite 10 - 20%	6A	Feldspathic veinlets and lenses.
3G	1C Biotite > 20% (not common at mesoscopic scale).	6C	Coarse to pegmatitic subconcordant lenses or shapeless masses.
Early Granitoid Segregations - late magmato-hydrothermal segregations and auto-metasomatic derivatives. Variable textures and modes of occurrence.		6D	Pegmatite dykes.
Grey Pink*		6E	Aplitic dykes.
3B	5C Homogeneous coarse leucocratic granite.	6F	Quartz veins with well-defined wall rock alteration.
3C	5C Homogeneous pegmatitic leucocratic granite	6G	Quartz veins with no wall rock alteration.
3B, 3C	5B Heterogeneous coarse to pegmatitic leucocratic granite.		
3D	3D Large porphyroblasts/phenocrysts comprising > 25% of volume in matrix of homogeneous granite.		
5A	5A Fine-grained granite occurring as dykes or as inclusions within pegmatitic dykes or sills.	*Note: As of 1988 July 1, rock types are no longer differentiated by pink/grey colour.	
5D	5D Coarse-grained granite inclusions within pegmatites or other granites.		

TABLE 2
ALTERATION (after Everitt et al. 1990)

Type of Alteration		Degree of Alteration	
N	No Alteration	0	Minor disseminations
P	Pink	1	25% of feldspars coloured
G	Green	2	< 50% of feldspars coloured
K	Illitization	3.	< 75% of feldspars coloured
B	Bleaching	4	> 75% of feldspars coloured

TABLE 3
FOLIATIONS (after Everitt et al. 1990)

G1	Coarse gneissic layering (> 10 cm)	P4	Schistose foliations defined by mafic minerals.
G2	Semi-gneissic foliation; lenses of quartz/alkali feldspar and quartz/plagioclase. Lense magnitudes of < 0.2 m x < 0.01 m (usually subvertical).	C1	Open cleavages.
G3	Thin white bands of corroded and bleached feldspars.	C2	Healed cleavages.
P1	Schistose foliations defined by feldspar phenocrysts.	N1	Lineations defined by feldspar phenocrysts.
P2	Schistose foliations defined by matrix feldspar crystals.	N2	Lineations defined by matrix feldspar crystals.
P3	Schistose foliations defined by quartz lenses.	N3	Lineations defined by quartz lenses.
		N4	Lineations defined by mafic minerals.

TABLE 4
FABRIC (after Everitt et al. 1990)

0	Massive	5	Schlieric
1	Lineated	6	Oriented xenolithic
2	Weakly gneissic	7	Unoriented xenolithic
3	Moderately gneissic	8	Agnaticitic
4	Strongly gneissic	9	Boudinaged/migmatitic

TABLE 5

ROCK STRENGTH (after Brown 1981)

0 R0 -	Extremely weak rock. Indented by thumbnail (0.25 - 1.0 MPa uniaxial compressive strength).	4 R4 -	Strong rock. Specimen requires more than one blow of geological hammer to fracture it (50 - 100 MPa uniaxial compressive strength).
1 R1 -	Weak rock. Crumbles under firm blows with point of geological hammer, can be peeled by pocket knife (1.0 - 5.0 MPa uniaxial compressive strength).	5 R5 -	Very strong rock. Specimen requires many blows of geological hammer to fracture it (100 - 250 MPa uniaxial compressive strength).
2 R2 -	Medium-weak rock. Can be peeled by a pocket knife with difficulty, shallow indentation made by firm blow with point of geological hammer (5.0 - 25 MPa uniaxial compressive strength).	6 R6 -	Extremely strong rock. Specimen can only be chipped with geological hammer (> 250 MPa uniaxial compressive strength).
3 R3 -	Medium-strong rock. Cannot be peeled with a pocket knife, specimen can be fractured with single firm blow of geological hammer (25 - 50 MPa uniaxial compressive strength).		

TABLE 6

DECOMPOSITION GRADE (after Brown 1981)

1	No visible sign of rock material weathering, perhaps slight discolouration on major discontinuity surfaces. (I)	4	More than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discoloured rock is present either as a discontinuous framework or corestones. (IV)
2	Discolouration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discoloured by weathering and may be somewhat weaker externally than in its fresh condition. (II)	5	All the rock material is decomposed and/or disintegrated to a soil. The original mass structure is still largely intact. (V)
3	Less than half of the rock material is decomposed and/or disintegrated to a soil. Fresh or discoloured rock is present either as a continuous framework or as corestones. (III)	6	All the rock material is converted to a soil. The mass structure and material fabric are destroyed. There is a large change in volume but the soil has not been significantly transported. (VI)

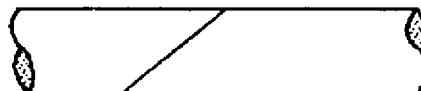
TABLE 7

FRACTURE TYPE (after Sikorsky and Eleckam in preparation)

AF	Open Fracture	HF	Fracture Opened by Hammer
BF	Possibly Open Fracture	OU	Open Break; Origin Uncertain
CF	Closed Fracture	CU	Closed Break; Origin Uncertain
DF	Fracture Opened by Drilling		

TABLE 8
FRACTURE SUBCLASS (after Sikorsky and Eleckam in preparation)

1 Simple Fracture



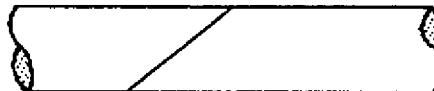
2 Simple Fracture with minor splays



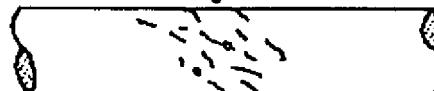
3 Simple Fracture with major splays



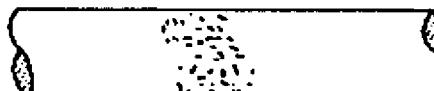
4 Hairline Fracture (< 0.1 mm wide, > 3 cm long and traceable in core)



5 Short Discontinuous Hairline Fractures < 3 cm long



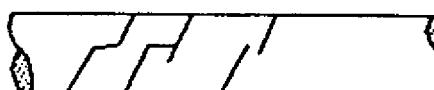
6 Microfractures (used only in logs completed in 1979 and 1980)



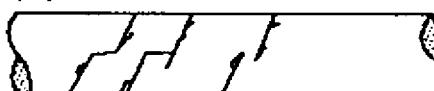
7 Braided Fracture



8 Stepped Fracture without splays



9 Stepped Fracture with minor splays



0 Stepped Fracture with major splays



TABLE 9
CONTINUITY (after Sikorsky and Elockam in preparation)

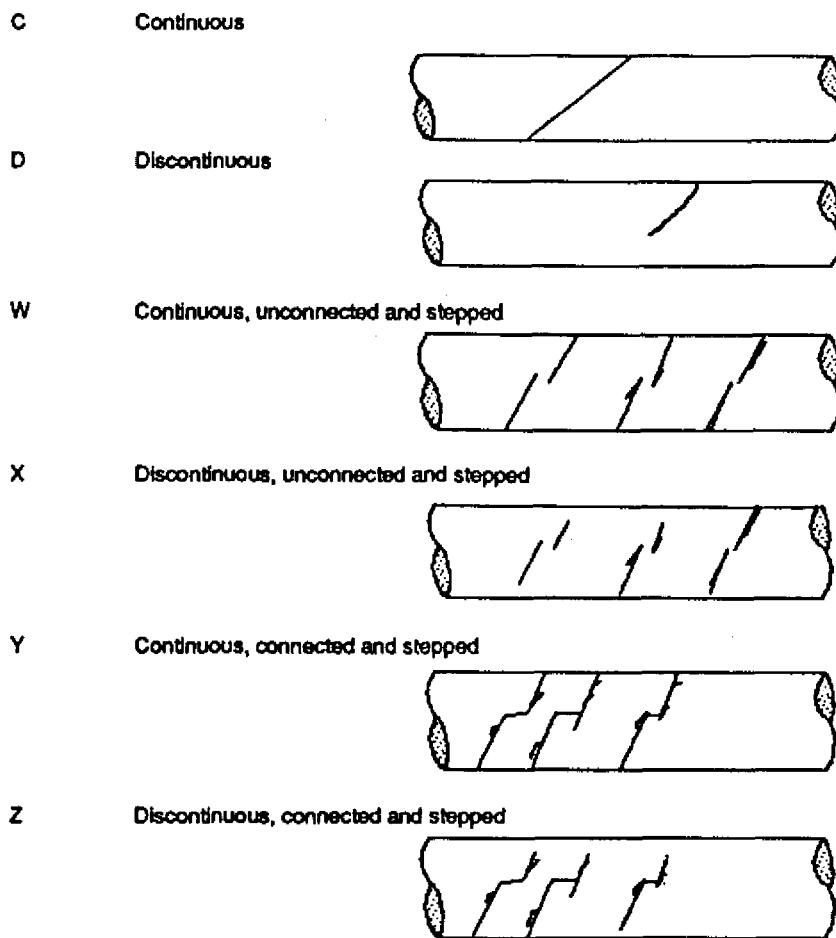


TABLE 10
PLANARITY (after Golder Associates)

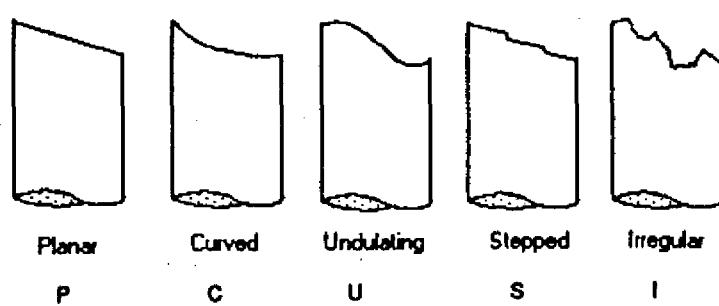


TABLE 11
ROUGHNESS (after Barton and Choubey 1977)

1	JRC 0-2	6	JRC 10-12
2	JRC 2-4	7	JRC 12-14
3	JRC 4-6	8	JRC 14-16
4	JRC 6-8	9	JRC 16-18
5	JRC 8-10	0	JRC 18-20

* Note: JRC Interval excludes lower bound.

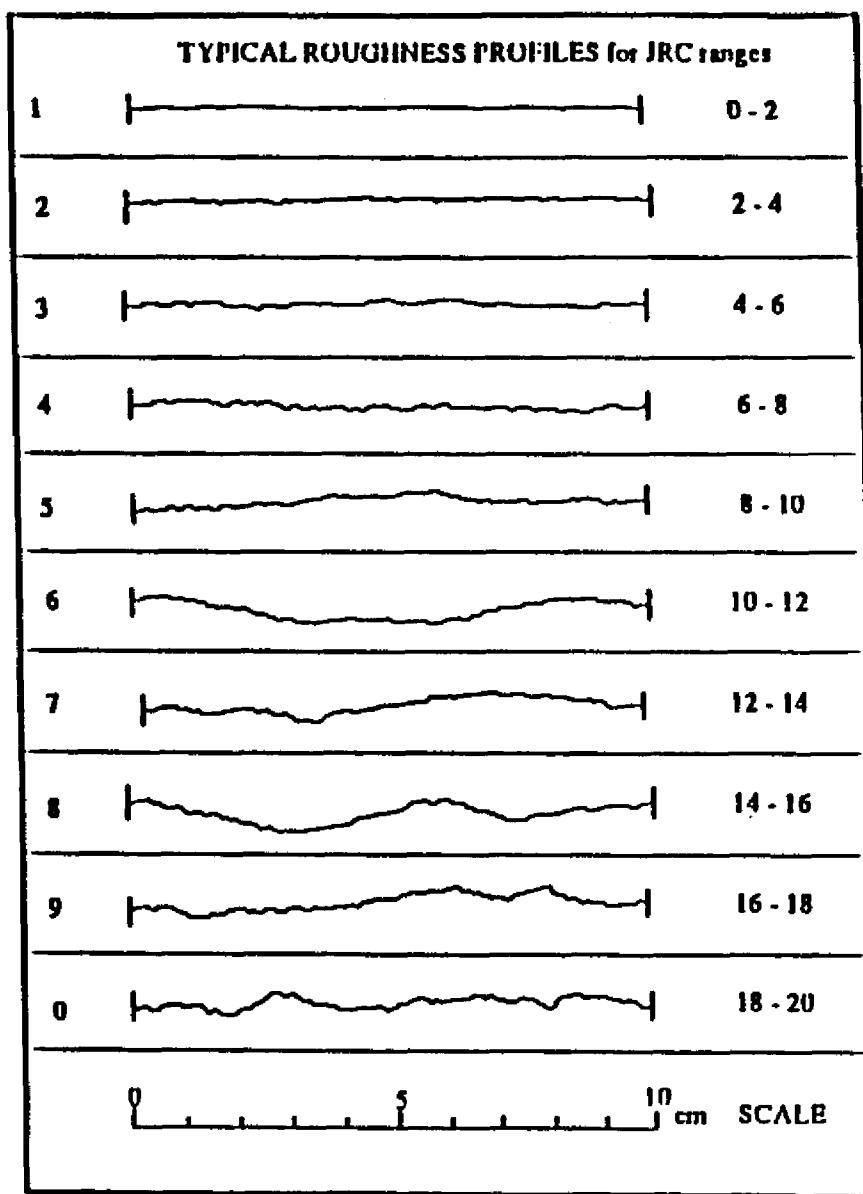


TABLE 12

INFILLINGS (after Everitt et al. 1990)

AL	Allanite	ML	Malachite
AM	Amphibole	MO	Molybdenite
AP	Apatite	MU	Muscovite
AT	Actinolite	NO	None
BA	Barite	OT	Other
BI	Biotite	PH	Purplish Hematite
CA	Calcite	PL	Plagioclase
CL	Chlorite	PR	Prehnite
CP	Chalcopyrite	PY	Pyrite
CR	Carbonate	PX	Pyroxene
CY	Clay	QZ	Quartz
DI	Diopside	RF	Rock Flour
EP	Epidote	RR	Rock Fragments
FD	Feldspar	SC	Scapolite
FU	Fluorite	SE	Serpentine
GA	Garnet	SH	Specular Hematite
GM	Micro Breccia	SL	Sulphide
GO	Goethite/Limonite	SP	Sphene
GR	Graphite	SR	Sericite
GY	Gypsum	TA	Talc
HB	Hornblende	TO	Tourmaline
HE	Red Hematite	TR	Tremolite
KS	Potash Feldspar	ZI	Zircon
MG	Magnetite	ZO	Zeolite
MI	Mica		

TABLE 13

FRACTURE SURFACE LINEATIONS (after Everitt et al. 1990)

- | | | | |
|---|--|---|--|
| 1 | L1 - slickenside striae; mechanically scratched grooves or scuffing. | 4 | L4 - aligned surface irregularities of unknown origin. |
| 2 | L2 - secondary fracture traces. | 5 | L5 - elongate pods of minerals. |
| 3 | L3 - aligned mineral crystallographic long axes. | 6 | L6 - foliation intersection trace. |

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APPENDIX C

GRAPHIC CORE LOG

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD.		BOREHOLE: 101-013-HG4			
DRILLING	ROCK SUBSTANCE	DRILL CORE LOG					
		PAGE 3 OF 43					
		ROCK MASS AND DISCONTINUITIES					
TESTING	DESCRIPTION/RESULTS						
TESTS AND SAMPLES	ROCK MASS AND DISCONTINUITY DESCRIPTION						
ZONES	FRACTURE ZONE CATASTROPHIC BUBBLE CORE LOSS DISCINO						
ZONES	FRACTURES (GRAPHIC)						
D.D.R. ORIENTATION DIP	LINEATION						
THICKNESS (mm)	INFILLINGS						
ROUGHNESS PLANARITY CONTINUITY	# OF FRACTURES						
SUBCLASS FRACTURE TYPE	INTERSECTION DEPTH						
BLOCK 1000 SIZE (cm) 100	FREQUENCY 10 (FRACTURES/m)						
DEPTH (m)	ROCK SUBSTANCE						
DEPTH (m)	ROCK SUBSTANCE DESCRIPTION						
12	10.945-12.235 12.235-12.260 12.260-12.290 12.290-12.320 12.320-12.350 12.350-12.380 12.380-12.410 12.410-12.440 12.440-12.470 12.470-12.500 12.500-12.530 12.530-12.560 12.560-12.590 12.590-12.620 12.620-12.650 12.650-12.680 12.680-12.710 12.710-12.740 12.740-12.770 12.770-12.800 12.800-12.830 12.830-12.860 12.860-12.890 12.890-12.920 12.920-12.950 12.950-12.980 12.980-13.010 13.010-13.040 13.040-13.070 13.070-13.100 13.100-13.130 13.130-13.160 13.160-13.190 13.190-13.220 13.220-13.250 13.250-13.280 13.280-13.310 13.310-13.340 13.340-13.370 13.370-13.400 13.400-13.430 13.430-13.460 13.460-13.490 13.490-13.520 13.520-13.550 13.550-13.580 13.580-13.610 13.610-13.640 13.640-13.670 13.670-13.700 13.700-13.730 13.730-13.760 13.760-13.790 13.790-13.820 13.820-13.850 13.850-13.880 13.880-13.910 13.910-13.940 13.940-13.970 13.970-14.000 14.000-14.030 14.030-14.060 14.060-14.090 14.090-14.120 14.120-14.150 14.150-14.180 14.180-14.210 14.210-14.240 14.240-14.270 14.270-14.300 14.300-14.330 14.330-14.360 14.360-14.390 14.390-14.420 14.420-14.450 14.450-14.480 14.480-14.510 14.510-14.540 14.540-14.570 14.570-14.600 14.600-14.630 14.630-14.660 14.660-14.690 14.690-14.720 14.720-14.750 14.750-14.780 14.780-14.810 14.810-14.840 14.840-14.870 14.870-14.900 14.900-14.930 14.930-14.960 14.960-14.990 14.990-15.020 15.020-15.050 15.050-15.080 15.080-15.110 15.110-15.140 15.140-15.170 15.170-15.200 15.200-15.230 15.230-15.260 15.260-15.290 15.290-15.320 15.320-15.350 15.350-15.380 15.380-15.410 15.410-15.440 15.440-15.470 15.470-15.500 15.500-15.530 15.530-15.560 15.560-15.590 15.590-15.620 15.620-15.650 15.650-15.680 15.680-15.710 15.710-15.740 15.740-15.770 15.770-15.800 15.800-15.830 15.830-15.860 15.860-15.890 15.890-15.920 15.920-15.950 15.950-15.980 15.980-16.010 16.010-16.040 16.040-16.070 16.070-16.100 16.100-16.130 16.130-16.160 16.160-16.190 16.190-16.220 16.220-16.250 16.250-16.280 16.280-16.310 16.310-16.340 16.340-16.370 16.370-16.400 16.400-16.430 16.430-16.460 16.460-16.490 16.490-16.520 16.520-16.550 16.550-16.580 16.580-16.610 16.610-16.640 16.640-16.670 16.670-16.700 16.700-16.730 16.730-16.760 16.760-16.790 16.790-16.820 16.820-16.850 16.850-16.880 16.880-16.910 16.910-16.940 16.940-16.970 16.970-17.000 17.000-17.030 17.030-17.060 17.060-17.090 17.090-17.120 17.120-17.150 17.150-17.180 17.180-17.210 17.210-17.240 17.240-17.270 17.270-17.300 17.300-17.330 17.330-17.360 17.360-17.390 17.390-17.420 17.420-17.450 17.450-17.480 17.480-17.510 17.510-17.540 17.540-17.570 17.570-17.600 17.600-17.630 17.630-17.660 17.660-17.690 17.690-17.720 17.720-17.750 17.750-17.780 17.780-17.810 17.810-17.840 17.840-17.870 17.870-17.900 17.900-17.930 17.930-17.960 17.960-17.990 17.990-18.020 18.020-18.050 18.050-18.080 18.080-18.110 18.110-18.140 18.140-18.170 18.170-18.200 18.200-18.230 18.230-18.260 18.260-18.290 18.290-18.320 18.320-18.350 18.350-18.380 18.380-18.410 18.410-18.440 18.440-18.470 18.470-18.500 18.500-18.530 18.530-18.560 18.560-18.590 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20.710-20.740 20.740-20.770 20.770-20.800 20.800-20.830 20.830-20.860 20.860-20.890 20.890-20.920 20.920-20.950 20.950-20.980 20.980-21.010 21.010-21.040 21.040-21.070 21.070-21.100 21.100-21.130 21.130-21.160 21.160-21.190 21.190-21.220 21.220-21.250 21.250-21.280 21.280-21.310 21.310-21.340 21.340-21.370 21.370-21.400 21.400-21.430 21.430-21.460 21.460-21.490 21.490-21.520 21.520-21.550 21.550-21.580 21.580-21.610 21.610-21.640 21.640-21.670 21.670-21.700 21.700-21.730 21.730-21.760 21.760-21.790 21.790-21.820 21.820-21.850 21.850-21.880 21.880-21.910 21.910-21.940 21.940-21.970 21.970-22.000 22.000-22.030 22.030-22.060 22.060-22.090 22.090-22.120 22.120-22.150 22.150-22.180 22.180-22.210 22.210-22.240 22.240-22.270 22.270-22.300 22.300-22.330 22.330-22.360 22.360-22.390 22.390-22.420 22.420-22.450 22.450-22.480 22.480-22.510 22.510-22.540 22.540-22.570 22.570-22.600 22.600-22.630 22.630-22.660 22.660-22.690 22.690-22.720 22.720-22.750 22.750-22.780 22.780-22.810 22.810-22.840 22.840-22.870 22.870-22.900 22.900-22.930 22.930-22.960 22.960-22.990 22.990-23.020 23.020-23.050 23.050-23.080 23.080-23.110 23.110-23.140 23.140-23.170 23.170-23.200 23.200-23.230 23.230-23.260 23.260-23.290 23.290-23.320 23.320-23.350 23.350-23.380 23.380-23.410 23.410-23.440 23.440-23.470 23.470-23.500 23.500-23.530 23.530-23.560 23.560-23.590 23.590-23.620 23.620-23.650 23.650-23.680 23.680-23.710 23.710-23.740 23.740-23.770 23.770-23.800 23.800-23.830 23.830-23.860 23.860-23.890 23.890-23.920 23.920-23.950 23.950-23.980 23.980-24.010 24.010-24.040 24.040-24.070 24.070-24.100 24.100-24.130 24.130-24.160 24.160-24.190 24.190-24.220 24.220-24.250 24.250-24.280 24.280-24.310 24.310-24.340 24.340-24.370 24.370-24.400 24.400-24.430 24.430-24.460 24.460-24.490 24.490-24.520 24.520-24.550 24.550-24.580 24.580-24.610 24.610-24.640 24.640-24.670 24.670-24.700 24.700-24.730 24.730-24.760 24.760-24.790 24.790-24.820 24.820-24.850 24.850-24.880 24.880-24.910 24.910-24.940 24.940-24.970 24.970-25.000 25.000-25.030 25.030-25.060 25.060-25.090 25.090-25.120 25.120-25.150 25.150-25.180 25.180-25.210 25.210-25.240 25.240-25.270 25.270-25.300 25.300-25.330 25.330-25.360 25.360-25.390 25.390-25.420 25.420-25.450 25.450-25.480 25.480-25.510 25.510-25.540 25.540-25.570 25.570-25.600 25.600-25.630 25.630-25.660 25.660-25.690 25.690-25.720 25.720-25.750 25.750-25.780 25.780-25.810 25.810-25.840 25.840-25.870 25.870-25.900 25.900-25.930 25.930-25.960 25.960-25.990 25.990-26.020 26.020-26.050 26.050-26.080 26.080-26.110 26.110-26.140 26.140-26.170 26.170-26.200 26.200-26.230 26.230-26.260 26.260-26.290 26.290-26.320 26.320-26.350 26.350-26.380 26.380-26.410 26.410-26.440 26.440-26.470 26.470-26.500 26.500-26.530 26.530-26.560 26.560-26.590 26.590-26.620 26.620-26.650 26.650-26.680 26.680-26.710 26.710-26.740 26.740-26.770 26.770-26.800 26.800-26.830 26.830-26.860 26.860-26.890 26.890-26.920 26.920-26.950 26.950-26.980 26.980-27.010 27.010-27.040 27.040-27.070 27.070-27.100 27.100-27.130 27.130-27.160 27.160-27.190 27.190-27.220 27.220-27.250 27.250-27.280 27.280-27.310 27.310-27.340 27.340-27.370 27.370-27.400 27.400-27.430 27.430-27.460 27.460-27.490 27.490-27.520 27.520-27.550 27.550-27.580 27.580-27.610 27.610-27.640 27.640-27.670 27.670-27.700 27.700-27.730 27.730-27.760 27.760-27.790 27.790-27.820 27.820-27.850 27.850-27.880 27.880-27.910 27.910-27.940 27.940-27.970 27.970-28.000 28.000-28.030 28.030-28.060 28.060-28.090 28.090-28.120 28.120-28.150 28.150-28.180 28.180-28.210 28.210-28.240 28.240-28.270 28.270-28.300 28.300-28.330 28.330-28.360 28.360-28.390 28.390-28.420 28.420-28.450 28.450-28.480 28.480-28.510 28.510-28.540 28.540-28.570 28.570-28.600 28.600-28.630 28.630-28.660 28.660-28.690 28.690-28.720 28.720-28.750 28.750-28.780 28.780-28.810 28.810-28.840 28.840-28.870 28.870-28.900 28.900-28.930 28.930-28.960 28.960-28.990 28.990-29.020 29.020-29.050 29.050-29.080 29.080-29.110 29.110-29.140 29.140-29.170 29.170-29.200 29.200-29.230 29.230-29.260 29.260-29.290 29.290-29.320 29.320-29.350 29.350-29.380 29.380-29.410 29.410-29.440 29.440-29.470 29.470-29.500 29.500-29.530 29.530-29.560 29.560-29.590 29.590-29.620 29.620-29.650 29.650-29.680 29.680-29.710 29.710-29.740 29.740-29.770 29.770-29.800 29.800-29.830 29.830-29.860 29.860-29.890 29.890-29.920 29.920-29.950 29.950-29.980 29.980-30.010 30.010-30.040 30.040-30.070 30.070-30.100 30.100-30.130 30.130-30.160 30.160-30.190 30.190-30.220 30.220-30.250 30.250-30.280 30.280-30.310 30.310-30.340 30.340-30.370 30.370-30.400 30.400-30.430 30.430-30.460 30.460-30.490 30.490-30.520 30.520-30.550 30.550-30.580 30.580-30.610 30.610-30.640 30.640-30.670 30.670-30.700 30.700-30.730 30.730-30.760 30.760-30.790 30.790-30.820 30.820-30.850 30.850-30.880 30.880-30.910 30.910-30.940 30.940-30.970 30.970-31.000	TESTING					
TESTING	DESCRIPTION/RESULTS						
TESTS AND SAMPLES	ROCK MASS AND DISCONTINUITIES						
ZONES	FRACTURE ZONE CATASTROPHIC BUBBLE CORE LOSS DISCINO						
ZONES	FRACTURES (GRAPHIC)						
D.D.R. ORIENTATION DIP	LINEATION						
THICKNESS (mm)	INFILLINGS						
DEPTH (m)	# OF FRACTURES						

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 4 OF 43	
DRILLING	TESTING	DESCRIPTION/ RESULTS	TESTS AND SAMPLES	ROCK MASS AND DISCONTINUITIES	ROCK MASS AND DISCONTINUITIES
DEPTH (ELEV.)	DEPTH (ELEV.)	ROCK SUBSTANCE DESCRIPTION	ROCK SUBSTANCE DESCRIPTION	ROCK MASS AND DISCONTINUITIES	ROCK MASS AND DISCONTINUITIES
18	18	13.824-24.105 Homogeneous medium to coarse-grained pink sandstone (predominant). Inclusions of fine-grained litharenous sandstone (15%). Granular fabric is more prevalent at lower elevations (3A-3B).	14	18.459 NF 2 2 Y S 3 CR CL 18.477 AF 2 3 Y S 4 NE 18.918 CF 2 9 Y S 4 CR	0.1 76 119 0.3 79 119 0.0 88 85
19	19	20.377 NF 3 3 Y S 5 CR 20.738 AF 2 2 C P S CA	0 5 6 4 7	0.1 73 103 0.5 85 86	0.1 86 114 0.0 88 113
20	20	21.617 NF 1 1 C P S CA 21.662 NF 2 5 C P S CA	0 5 6 4 7	0.0 89 84	0.1 86 109 0.3 88 113 0.1 62 57
21	21	22.498 CF 2 4 C P S CA	0 5 6 4 7	0.0 89 84	0.1 86 109 0.3 88 113 0.1 62 57
22	22	23.723 NF 1 1 C P 4 NE CR CL 23.763 AF 1 1 C P 6 CL CR 24.892 CF 3 2 Z P 4 CA	0 5 6 4 7	0.0 89 84	0.1 86 109 0.3 88 113 0.1 62 57
23	23				
24	24				

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 8 OF 43	
DRILLING	TESTING	ROCK MASS AND DISCONTINUITIES			
		DESCRIPTION/RESULTS	TESTS AND SAMPLES	ROCK MASS AND DISCONTINUITY DESCRIPTION	
		ZONES			
		FRACTURE ZONE			
		CATACLASTIC			
		RUBBLE			
		CORE LOSS			
		DISCING			
		FRACTURES (GRAPHIC)			
		ORIENTATION D.DIR			
		DIP			
		LINEATION			
		THICKNESS (mm)			
		INFILLINGS			
		ROUGHNESS			
		PLANARITY			
		CONTINUITY			
		# OF FRACTURES			
		SUBCLASS			
		FRACTURE TYPE			
		INTERSECTION DEPTH			
		BLOCK SIZE (cm) 1000			
		100			
		10			
		1			
		FREQUENCY (FRACTURES/m) 10			
		5			
		0			
		(FRACTURES/m) 0			
		ROCK SUBSTANCE			
		ROCK SUBSTANCE DESCRIPTION			
		DECOMPOSITION GRADE			
		STRENGTH			
		FABRIC			
		FOLIATION D.DIR			
		DIP			
		TYPE			
		ALTERATION			
		ROCK TYPE			
		RQD (%) 100			
		50			
		100.0			
		99.7			
		RECOVERY (%) 100			
		50			
		100.0			
		100.0			
		WATER % RETURN			
		COLOUR			
		DEPTH (ELEV.) 42			
		43			
		44			
		45			
		46			
		47			
		48			
		PK 104			
		43			
		44			
		45			
		46			
		47			
		48			
		PK 104			
		43			
		44			
		45			
		46			
		47			
		48			
		PK 104			
		43			
		44			
		45			
		46			
		47			
		48			
		PK 104			
		43			
		44			
		45			
		46			
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		48			
		PK 104			
		43			
		44			
		45			
		46			
		47			
		48			
		PK 104			
		43			
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		47			
		48			
		PK 104			
		43			
		44			
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		46			
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		48			
		PK 104			
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		46			
		47			
		48			
		PK 104			
		43			
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		PK 104			
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		PK 104			
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		PK 104			
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		PK 104			
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		44			

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 13 OF 43		TESTING			
DRILLING	ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES							
	ROCK SUBSTANCE DESCRIPTION	ROCK MASS AND DISCONTINUITIES				TESTING			
	DECOMPOSITION GRADE	ROCK MASS AND DISCONTINUITIES				TESTING			
	STRENGTH FABRIC	ROCK MASS AND DISCONTINUITIES				TESTING			
	D.D.R. POLARITION DIP TYPE	ROCK MASS AND DISCONTINUITIES				TESTING			
	ALTERATION	ROCK MASS AND DISCONTINUITIES				TESTING			
72	ROCK TYPE	ROCK MASS AND DISCONTINUITIES				TESTING			
72	RQD (%)	ROCK MASS AND DISCONTINUITIES				TESTING			
72	RECOVERY (%)	ROCK MASS AND DISCONTINUITIES				TESTING			
72	WATER RETURN	ROCK MASS AND DISCONTINUITIES				TESTING			
73	DEPTH (ELEV.)	ROCK MASS AND DISCONTINUITIES				TESTING			
73	DEPTH (ELEV.)	ROCK MASS AND DISCONTINUITIES				TESTING			
74	DEPTH (ELEV.)	ROCK MASS AND DISCONTINUITIES				TESTING			
75	DEPTH (ELEV.)	ROCK MASS AND DISCONTINUITIES				TESTING			
76	DEPTH (ELEV.)	ROCK MASS AND DISCONTINUITIES				TESTING			
77	DEPTH (ELEV.)	ROCK MASS AND DISCONTINUITIES				TESTING			
78	DEPTH (ELEV.)	ROCK MASS AND DISCONTINUITIES				TESTING			

SCALE: 1:50

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 11 OF 43	
DRILLING	ROCK SUBSTANCE	TESTING	DESCRIPTION/ RESULTS		
	TESTS AND SAMPLES		ROCK MASS AND DISCONTINUITY DESCRIPTION		
	ZONES		FRACTURE ZONE CATACLASTIC RUBBLE CORE LOSS DISCING		
	FRACTURES (GRAPHIC)				
ORIENTATION	D.D.R. DIP				73.27
LINEATION	D.D.R.				68.27
THICKNESS (mm)				0.0	0.1
	INFILLINGS				0.1
	ROUGHNESS				
	PLANARITY				
	CONTINUITY				
	# OF FRACTURES				
	SUBCLASS				
	FRACTURE TYPE				
	INTERSECTION DEPTH				
BLOCK SIZE (cm) ¹⁰	1000 100 10			99.496 99.638 99.729 99.732 99.768	00 1 3 C P 3 H 00 1 1 C P 3 H 0 4 T S 3 H 0 1 C P 3 H 2 C P 3 L
FREQUENCY ¹⁰ (FRACTURES/m)	0			100.439	C P 2 0 C P 4 H
					0
	ROCK SUBSTANCE DESCRIPTION		94.420-100.567 Homogeneous medium to coarse-grained Plutic GRANITE (Qz)		
	DECOMPOSITION GRADE				
	STRENGTH				
	FABRIC				
FOLIATION	D.D.R. DIP				
	TYPE				
	ALTERATION				
	ROCK TYPE				
RQD (%) ¹⁰	100 50				
RECOVERY ¹⁰ (%)	100.0		95.7		96.8
WATER COLOR % RETURN	100.0		100.0		100.0
DEPTH (ELEV.)	96				
	97				
	98				
	99				
	100				
	101				
	102				

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD.		BOREHOLE: 101-013-HG4	
DRILLING		ROCK SUBSTANCE		PAGE 18 OF 43	
DESCRIPTION/RESULTS	TESTS AND SAMPLES	ROCK MASS AND DISCONTINUITIES		TESTING	
ROCK MASS AND DISCONTINUITIES	TESTS AND SAMPLES	ROCK MASS AND DISCONTINUITIES		TESTING	
ZONES	ROCK MASS AND DISCONTINUITY DESCRIPTION	ZONES	ROCK MASS AND DISCONTINUITY DESCRIPTION	ZONES	ROCK MASS AND DISCONTINUITY DESCRIPTION
FRACTURE ZONE					102.876-102.940 Rubber sleeve origin.
CATACLASTIC RUBBLE					
CORE LOSS DISCING					102.942 Possibly open fracture.
FRACTURES (GRAPHIC)					
ORIENTATION D.DIR					
LINERATION DIP					
THICKNESS (mm)					
INFILLINGS					
ROUGHNESS					
PLANARITY					
CONTINUITY					
# OF FRACTURES					
SUBCLASS					
FRACTURE TYPE					
INTERSECTION DEPTH					
BLOCK SIZE (cm)	1000	100	10	10	10
FREQUENCY (Fractures/m)	10	2	2	0	0
FRACURE(S) m	0	0	0	0	0
ROCK SUBSTANCE DESCRIPTION					
DECOMPOSITION GRADE					
STRENGTH FABRIC					
FOLIATION D.DIR DIP TYPE	D.DIR	DIP	TYPE		
ALTERATION					
ROCK TYPE					
RQD (%)	100	50	30	30	30
RECOVERY (%)	100	50	96.8	100.0	100.0
WATER % RETURN	100	50	100.0	100.0	100.0
DEPTH (ELEV.)	102	103	104	105	106
					107
					108
					SCALE: 1:50

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 19 OF 43			
DRILLING	ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES					
		DESCRIPTION/ RESULTS	TESTING				
TESTS AND SAMPLES		ROCK MASS AND DISCONTINUITY DESCRIPTION					
ZONES	FRACURE ZONE CATASTIC RUBBLE CORE LOSS DISCHG		108.160-122.297 FRACTURE ZONES 2.5 108.160-122.297 discontinuities	FZ 2.5			
FRACTURES (GRAPHIC)							
ORIENTATION D.D.R.	DIP		0.8 1 13 144				
LINEATION							
THICKNESS (mm)							
INFILLINGS							
ROUGHNESS							
PLANARITY							
CONTINUITY							
# OF FRACTURES							
SUBCLASS							
FRACTURE TYPE							
INTERSECTION DEPTH			108.160 AP 1 1 CP 6 CL HS CR				
BLOCK 100			108.160 AP 1 1 CP 6 CL HS CR				
SIZE (cm) 10			108.160 AP 1 1 CP 6 CL HS CR				
FREQUENCY 50 (FRACTURES/m)	1		108.160 AP 1 1 CP 6 CL HS CR				
19							
DECOMPOSITION GRADE							
STRENGTH							
FABRIC							
FOLIATION D.D.R.	DIP						
FOLIATION TYPE							
ALTERATION			N2 30 321.2 HS CL				
ROCK TYPE			P2				
RQD 100 (%) 50	99.2						
RECOVERY 100 (%) 50	100.0						
WATER % RETURN			PK				
DEPTH (ELEV.) 108	108.25		108.5				
			108.75				
			109				
			109.25				
			109.5				

SCALE: 1:12.5

DRILLING	ROCK SUBSTANCE	TESTING					
		DESCRIPTION/ RESULTS	TESTS AND SAMPLES				
ROCK MASS AND DISCONTINUITIES	DISCONTINUITY DESCRIPTION	ROCK MASS AND DISCONTINUITY DESCRIPTION					
		HGS-122 FRACTURE ZONES 2.3					
	FRACTURE ZONE						
	CATACLASTIC RUBBLE						
	CORE LOSS						
	DISCING						
	FRACTURES (GRAPHIC)	FZ 2.5					
ROCK MASS AND DISCONTINUITIES	ORIENTATION	D.D.R. DIP	35°	172			
	LINEATION	D.D.R. DIP	2.0	83			
	THICKNESS (mm)	0.3	0.2	25	84		
	INFILLINGS						
	ROUGHNESS	C P 5	Q				
	PLANARITY	C P 6	Q	18			
	CONTINUITY	C P 4	Q	18			
	# OF FRACTURES	7					
ROCK MASS AND DISCONTINUITIES	SUBCLASS						
	FRACTURE TYPE						
	INTERSECTION DEPTH	114.920	G				
	DEPTH	114.095	A P 1	1	C S	Q	12
	BLOCK SIZE (cm) 10 ³	114.120	C P 2	2	C	Q	12
	FREQUENCY 36 (FRACTURES/m)	114.497	B P 1	1	C	S	Q 2
ROCK SUBSTANCE	ROCK SUBSTANCE DESCRIPTION	114.612-115.842 Mafic to Coarse-Grained Gray GRANITE with minor Gneissic Structure (SA)					
	DECOMPOSITION GRADE						
	STRENGTH FABRIC						
	FOLIATION TYPE	D.D.R. DIP					
	ALTERATION						
	ROCK TYPE						
	RQD (%)	34	34	34	34	34	34
	RECOVERY (%)	98.3					
	WATER COLOR RETURN	100.0					
	DEPTH (ELEV.)	114.25					
		114.5					
		114.75					
		115					
		115.25					
		115.5					

SCALE: 1:12.5

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 24 OF 43	
DRILLING	ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES		TESTING	DESCRIPTION/RESULTS
		ZONES	ROCK MASS AND DISCONTINUITY DESCRIPTION	TESTS AND SAMPLES	
		FRACTURE ZONE	108-109-122-207 2.5	FRACURE ZONES	
	CATACLASTIC RUBBLE				
	CORE LOSS DISCING				
	FRACTURES (GRAPHIC)				
D.DIR	ORIENTATION DIP				
D.DIR	LINEATION DIP				
	THICKNESS (mm)				
INFILLINGS					
	ROUGHNESS				
	PLANARITY				
	CONTINUITY				
	# OF FRACTURES				
	SUBCLASS				
	FRACTURE TYPE				
	INTERSECTION DEPTH				
BLOCK 1000	SIZE (cm) 10	115.323 CP 2	4 CP 5 MS CL CT	0.6	14.171
100	10	115.329 AP 3	3 CP 5 CL CT	3.0	18.131
10	10	115.341 AP 3	5 CP 5 CT MS	2.0	16.186
1	1	115.361 AP 1	1 CP 5 CL CT BB	4.0	4.23.101
FREQUENCY 50	(FRACTURES/m)	116.214 MS 1	1 CP 5 CL CT	0.2	71.125
50	13	116.229 MS 1	1 CP 5 CL CT	0.5	33.66
ROCK SUBSTANCE DESCRIPTION					
	DECOMPOSITION GRADE				
	STRENGTH FABRIC				
D.DIR	FOLIATION DIP				
D.DIR	TYPE				
	ALTERATION	P3 B1			
	ROCK TYPE				
RQD 100 (%)	98.3				100.0
RECOVERY 100 (%)	100.0				100.0
WATER COLOR RETURN	PK	107			PK 108
DEPTH (ELEV.)	115.5				117
	115.75				
	116				
	116.25				
	116.5				
	116.75				

SCALE: 1:12.5

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 25 OF 43	
DRILLING	ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES		TESTING	
	ROCK SUBSTANCE DESCRIPTION				
	DECOMPOSITION GRADE				
	STRENGTH FABRIC				
	FOLIATION DIP TYPE				
	ALTERATION				
	ROCK TYPE				
	RQD (%)				
	RECOVERY (%)	100.0			
	WATER % RETURN	100.0			
117.7	117.25	P3	0 ms E	117.345-118.295 Medium to very coarse-grained limestone (A) (B)	
	117.5				
	117.75	108			
	118				
	118.25				
	118.5				
					118.295-118.000 DOMAIN Rock may be considered hard, but has some fragments of dolomite (C-A)
					118.326 ms 2 2 C P 4 HS
					0.1 73123
					SCALE: 1:12.5

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 26 OF 43		
DRILLING	ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES				TESTING
		ROCK MASS AND DISCONTINUITIES	TESTS AND SAMPLES	DESCRIPTION/RESULTS		
		ZONES	ROCK MASS AND DISCONTINUITIES DESCRIPTION			
		FRACTURE ZONE				
		CATACLASTIC RUBBLE				
		CORE LOSS				
		DISTING				
		FRACTURES (GRAPHIC)				
		ORIENTATION D.D.R.	DIP			
		LINERATION				
		THICKNESS (mm)				
		INFILLINGS				
		ROUGHNESS				
		PLANARITY				
		CONTINUITY				
		# OF FRACTURES				
		SUBCLASS				
		FRACTURE TYPE				
		INTERSECTION DEPTH				
		BLOCK 1000	100			
		SIZE (cm) 10	1			
		FREQUENCY 50	25	2		
		(FRACTURES/m)				
		ROCK SUBSTANCE DESCRIPTION				
		DECOMPOSITION GRADE				
		STRENGTH FABRIC				
		FOLIATION D.D.R.	DIP			
		TYPE				
		ALTERATION				
		ROCK TYPE				
		RQD 100 (%)	50	100.0		
		RECOVERY 100 (%)	50	100.0	100.0	
		WATER COLOR % RETURN				
		DEPTH (ELEV.)	118.5	118.75	PK 108	
				119		
				119.25		
				119.5		
				119.75		
				120		

SCALE: 1:12.5

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 27 OF 43
DRILLING	ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES		TESTING
	ROCK SUBSTANCE DESCRIPTION			DESCRIPTION/RESULTS
	DECOMPOSITION GRADE			TESTS AND SAMPLES
	STRENGTH FABRIC			
D.DIR	FOLIATION DIP TYPE			
	ALTERATION			
	ROCK TYPE			
RQD (%)	100 50	100.0	98.8	
RECOVERY (%)	100 50	100.0	100.0	100.0
WATER % RETURN			100	
DEPTH (ELEV.)	120	121	122	123
				124
				125
				126

SCALE: 1:50

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 28 OF 43			
DRILLING	ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES				TESTING	
		DESCRIPTION/RESULTS		TESTS AND SAMPLES			
		ZONES	ROCK MASS AND DISCONTINUITY DESCRIPTION				
		FRACTURE ZONE CATACLASTIC RUBBLE CORE LOSS DISCING					
		FRACTURES (GRAPHIC)					
		ORIENTATION D.DIR DIP					
		LINEATION					
		THICKNESS (mm)					
		INFILLINGS					
		ROUGHNESS					
		PLANARITY					
		CONTINUITY					
		# OF FRACTURES					
		SUBCLASS					
		FRACTURE TYPE					
		INTERSECTION DEPTH					
		BLOCK	1000				
		SIZE (cm)	100				
		FREQUENCY	10				
		(FRACTURES/m ³)	10				
126	Rock Substance	ROCK SUBSTANCE DESCRIPTION	124-445-135-450 Medium to coarse-grained, fractured, pink GRANITE with minor quartz and a 10-20% biotite-rich pink GRANITE (garnet). Discontinuous joints at lower margin (3-5 mm).				
		DECOMPOSITION GRADE	124-686 NF 2 2 CP 4 CL HE PY				
		STRENGTH FABRIC	124-738 CF 2 2 CS 3 HS				
		FOLIATION D.DIR DIP TYPE	0 ms 1				
		ALTERATION	125-805 NF 3 2 CP 4 CL HS				
		ROCK TYPE	125-826 NF 1 1 CP 3 CF HS				
		RQD (%)	130-097 NF 1 1 CP 4 HS QZ CL				
		RECOVERY (%)	100.0 99.3 100.0 100.0				
		WATER COLOUR @ RETURN	100.0 100.0 100.0 100.0				
		DEPTH (ELEV.)	127 128 129 130 131 132				

SCALE: 1:50

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD.		BOREHOLE: 101-013-HG4	
DRILLING		ROCK SUBSTANCE		PAGE 29 OF 43	
TESTING		ROCK MASS AND DISCONTINUITIES		TESTING	
		DESCRIPTION/ RESULTS			
		TESTS AND SAMPLES			
		DISCONTINUITY DESCRIPTION			
		ROCK MASS AND FRACTURE ZONE DESCRIPTION			
		DISCONTINUITY DESCRIPTION	125.805-125.825 FRACTURE ZONE 2.0		
		FRACTURES (GRAPHIC)			
		ORIENTATION D.DIR DIP	0.5		
		LINEATION DIP			
		THICKNESS (mm)	0.5		
		INFILLINGS			
		ROUGHNESS			
		PLANARITY			
		CONTINUITY			
		# OF FRACTURES			
		SUBCLASS			
		FRACTURE TYPE			
		INTERSECTION DEPTH			
		BLOCK SIZE (cm)			
		FREQUENCY (FRACTURES/m)			
DRILLING	DEPTH (ELEV.)	ROCK SUBSTANCE			
		ROCK SUBSTANCE DESCRIPTION			
		DECOMPOSITION GRADE			
		STRENGTH FABRIC			
		D.DIR FOLIATION DIP TYPE			
		ALTERATION			
		ROCK TYPE			
		ROD (%)			
		RECOVERY (%)			
		WATER RETURN (%)			
	132				
	133				
	134				
	135				
	136				
	137				
	138				

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 32 OF 43	
DRILLING	ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES		TESTING	
	ROCK SUBSTANCE DESCRIPTION	TESTS AND SAMPLES		DESCRIPTION/RESULTS	
		TESTS AND SAMPLES		DESCRIPTION/RESULTS	
		ROCK MASS AND DISCONTINUITIES DESCRIPTION		DISCONTINUITY DESCRIPTION	
145.5	144.004-146.553 Homogeneous medium to coarse-grained blocky GRANITE (3F)	145.408 CP 1 1 D P 6 HS	145.425-145.551 Boulders in sandstone by fracturing.	145.408 Closed fractures, some weak zones by drilling.	
				129.805-131.895 FRACTURE ZONE 2.0	
145.75		145.930 CP 7 10 D 17 HS		146.142-146.306 Boulders zones.	FZ 2.0
		146.140 AP 1 1 C P 6 CT HS CL			
				146.308 AP 3 2 C 3 7 HS CL CT	146.308 Closed fractures containing open breaks with natural structure.
				146.353 AP 3 3 C 8 HS CT	
				146.450 AP 1 1 C 5 6 HS CT	
				146.535 AP 1 1 C P 6 CT CL HS	
				146.587 AP 1 1 C P 6 CT CL HS	
				146.698 AP 1 1 C P 7 CT CL HS	
				146.709 AP 3 2 C 1 8 CT HS	
				146.790 AP 1 1 C 1 9 CT HS	
				146.902 AP 1 1 C C 8 CT CL	
					146.962-148.327 Very weak weathered rock. (3A)
146.25	108				
146.5					
146.75					
147					

SCALE: 1:12.5

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG-4 PAGE 33 OF 43							
DRILLING	ROCK SUBSTANCE		ROCK MASS AND DISCONTINUITIES		TESTING						
	DESCRIPTION/RESULTS		TESTS AND SAMPLES								
	TESTS AND SAMPLES		TESTS AND SAMPLES								
	FRACTURE ZONE DISCONTINUITY DESCRIPTION		ROCK MASS AND DISCONTINUITY DESCRIPTION								
	CATASTIC RUBBLE CORE LOSS DISCING		FRACTURE ZONE DISCONTINUITY DESCRIPTION								
	FRACTURES (GRAPHIC)		FRACTURE ZONE DISCONTINUITY DESCRIPTION								
	ORIENTATION D.D.R. D.P.F.		FRACTURE ZONE DISCONTINUITY DESCRIPTION								
	LINEATION D.D.L. D.P.L.		FRACTURE ZONE DISCONTINUITY DESCRIPTION								
	THICKNESS (mm)		FRACTURE ZONE DISCONTINUITY DESCRIPTION								
	INFILLINGS		FRACTURE ZONE DISCONTINUITY DESCRIPTION								
147.00	ROUGHNESS PLANARITY CONTINUITY		FRACTURE ZONE DISCONTINUITY DESCRIPTION								
	# OF FRACTURES		FRACTURE ZONE DISCONTINUITY DESCRIPTION								
	SUBCLASS		FRACTURE TYPE								
	INTERSECTION DEPTH		FRACTURE TYPE								
	BLOCK 1000		INTERSECTION DEPTH								
	SIZE (cm) 100		INTERSECTION DEPTH								
	FREQUENCY 25		INTERSECTION DEPTH								
	(FRACTURES/m)		INTERSECTION DEPTH								
	147.00		INTERSECTION DEPTH								
	147.00		INTERSECTION DEPTH								
DECOMPOSITION GRADE											
STRENGTH FABRIC											
FOLIATION TYPE											
ALTERATION											
ROCK TYPE											
RQD (%) 35.7											
RECOVERY (%) 35.7											
WATER COLOR & RETURN 100.0											
DEPTH (ELEV.) 147											
147.00											
147.25											
147.5											
147.75											
148											
148.25											
148.5											

SCALE: 1:12.5

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 34 OF 43	
DRILLING	ROCK SUBSTANCE	TESTING	DESCRIPTION/RESULTS		
	ROCK SUBSTANCE DESCRIPTION		TESTS AND SAMPLES		
	DECOMPOSITION GRADE				
	STRENGTH FABRIC				
	FOLIATION D.DIR DIP TYPE				
	ALTERATION				
	ROCK TYPE				
	RQD (%)				
148.5	RECOVERY (%)	100.0			
	WATER COLOR RETURN	100.0			
148.75	DEPTH (ELEV.)	149			
149.25		149.5			
149.75					
150					

SCALE: 1:12.5

148.5337-131.1296
Horizontal laminated zones of
very coarse-grained pink
QUARTZ sandstone with
interbedded siltstone.
Foliation: SSW (348°)

FZ 2.0
129.305-135.895
Fracture Zones Z-0

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 350 OF 43		TESTING			
DRILLING	ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES				TESTS AND SAMPLES	DESCRIPTION/RESULTS		
		ZONES		ROCK MASS AND DISCONTINUITY DESCRIPTION					
		FRACTURE ZONE		PSA05-135.893 FRACTURE ZONE 2.0					
		CATASTIC	RUBBLE	150-150 Quartz filled fracture.					
		CORE LOSS	DISCING	FZ 2.0					
		FRACTURES (GRAPHIC)							
		D.DIR	DIF						
		LINEATION							
		THICKNESS (mm)							
		INFILLINGS							
INTERSECTION DEPTH	BLOCK SIZE (cm) 10 ³	ROUGHNESS	PLANARITY	0.5					
		CONTINUITY	# OF FRACTURES	26 95					
		SUBCLASS	FRACTURE TYPE	2.3 14 273					
		INTERSECTION DEPTH		0.2 30 123					
		BLOCK SIZE (cm) 10 ³		0.2 21 122					
		FREQUENCY (FRACTURES/m)		0.4 29 131					
		148.357-151.196 Very cataclasized-grained pink GRANITE (GRANITE metagneiss, (A-3B-7A))		0.2 29 126					
		150.354-150.368 1. C P S NS		0.4 29 131					
		150.754-150.754 1. C P S NS		0.2 29 126					
		151.053-151.053 1. C P S NS PY		0.1 38 123					
ALTERATION	ROCK TYPE	DECOMPOSITION GRADE							
		0		0.1					
		STRENGTH FABRIC		0					
		D.DIR	FOLIATION DIF TYPE	0					
		ALTERATION		0					
		RQD (%)		0					
		RECOVERY (%)		0					
		WATER RETURN		0					
		DEPTH (ELEV.)		0					
150	150	151.197-151.357 Homogeneous medium-grained pink GRANITE (GRANITE)				0			
151	151	151.357-151.422 Homogeneous medium-grained pink GRANITE (GRANITE)				0			
152	152	151.422-151.422 Medium-grained pink GRANITE (GRANITE) and 10-20% GRANITE (GRANITE, (A-3B-7A))				0			
153	153	151.422-151.422 Medium-grained pink GRANITE (GRANITE)				0			
154	154	151.422-151.422 Medium-grained pink GRANITE (GRANITE)				0			
155	155	151.422-151.422 Medium-grained pink GRANITE (GRANITE)				0			
156	156	151.422-151.422 Medium-grained pink GRANITE (GRANITE)				0			

SCALE: 1:50

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 36 OF 43		TESTING				
DRILLING	ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES				TESTING				
		FRACURE ZONE CATACLASTIC RUBBLE CORE LOSS DIRMING								
		FRACTURES (GRAPHIC)								
		ORIENTATION D.DIR DIP								
		LINEATION D.DIR								
		THICKNESS (mm)								
		INFILLINGS								
		ROUGHNESS PLANARITY CONTINUITY								
		# OF FRACTURES SUBCLASS FRACTURE TYPE								
		INTERSECTION DEPTH								
ROCK SUBSTANCE	ROCK SUBSTANCE	BLOCK SIZE (cm) 1000 100 10				159 693 NF1 1 C U G HS				
		FREQUENCY (FRACTURES/m) 10				161 478 NF1 1 C U G HS				
		ROCK SUBSTANCE DESCRIPTION				162 478 NF1 1 C U G HS				
		DECOMPOSITION GRADE				163 478 NF1 1 C U G HS				
		STRENGTH FABRIC				164 478 NF1 1 C U G HS				
		FOLIATION D.DIR DIP TYPE				165 478 NF1 1 C U G HS				
		ALTERATION				166 478 NF1 1 C U G HS				
		ROCK TYPE				167 478 NF1 1 C U G HS				
		RQD (%)				168 478 NF1 1 C U G HS				
		RECOVERY (%)				169 478 NF1 1 C U G HS				
WATER RETURN	DEPTH (ELEV.)	100.0				170 478 NF1 1 C U G HS				
		100.0				171 478 NF1 1 C U G HS				
156		157				172 478 NF1 1 C U G HS				
157		158				173 478 NF1 1 C U G HS				
158		159				174 478 NF1 1 C U G HS				
159		160				175 478 NF1 1 C U G HS				
160		161				176 478 NF1 1 C U G HS				
161		162				177 478 NF1 1 C U G HS				

SCALE: 1:50

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION DRILLING		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 37 OF 43		TESTING	
ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES		TESTS AND SAMPLES		DESCRIPTION/RESULTS		
	ZONES		ROCK MASS AND DISCONTINUITY DESCRIPTION		FRAC TURE ZONE		
	CATA CLASTIC		CATA CLASTIC		ZONE		
	RIVULET		RIVULET		ZONE		
	CORE LOSS		CORE LOSS		ZONE		
	DISCING		DISCING		ZONE		
	FRACTURES (GRAPHIC)		FRACTURES (GRAPHIC)		FRACTURE ZONE		
	ORIENTATION D.D.R.		D.D.R.		CATA CLASTIC		
	DIP		DIP		RIVULET		
	LINEATION		LINEATION		CORE LOSS		
	THICKNESS (mm)		THICKNESS (mm)		DISCING		
INFILLINGS	ROCK MASS AND DISCONTINUITIES		TESTS AND SAMPLES		DESCRIPTION/RESULTS		
	ROUGHNESS		ROUGHNESS		TESTS AND SAMPLES		
	PLANARITY		PLANARITY		TESTS AND SAMPLES		
	CONTINUITY		CONTINUITY		TESTS AND SAMPLES		
	# OF FRACTURES		# OF FRACTURES		TESTS AND SAMPLES		
	SUBCLASS		SUBCLASS		TESTS AND SAMPLES		
	FRACTURE TYPE		FRACTURE TYPE		TESTS AND SAMPLES		
	INTERSECTION DEPTH		INTERSECTION DEPTH		TESTS AND SAMPLES		
	BLOCK SIZE (cm) 1000		BLOCK SIZE (cm) 1000		TESTS AND SAMPLES		
	FREQUENCY (FRACTURES/m) 10		FREQUENCY (FRACTURES/m) 10		TESTS AND SAMPLES		
ROCK SUBSTANCE	ROCK SUBSTANCE		TESTS AND SAMPLES		DESCRIPTION/RESULTS		
	ROCK SUBSTANCE DESCRIPTION		TESTS AND SAMPLES		TESTS AND SAMPLES		
	DECOMPOSITION GRADE		TESTS AND SAMPLES		TESTS AND SAMPLES		
	STRENGTH FABRIC		TESTS AND SAMPLES		TESTS AND SAMPLES		
	D.D.R.		D.D.R.		TESTS AND SAMPLES		
	FOLIATION DIP		FOLIATION DIP		TESTS AND SAMPLES		
	TYPE		TYPE		TESTS AND SAMPLES		
	ALTERATION		ALTERATION		TESTS AND SAMPLES		
	ROCK TYPE		ROCK TYPE		TESTS AND SAMPLES		
	RQD (%)		RQD (%)		TESTS AND SAMPLES		
100		99.3		100.0		TESTS AND SAMPLES	
50		100.0		100.0		TESTS AND SAMPLES	
RECOVERY (%)		99.3		100.0		TESTS AND SAMPLES	
30		100.0		100.0		TESTS AND SAMPLES	
WATER % RETURN		100.0		100.0		TESTS AND SAMPLES	
DEPTH (ELEV.)		162		163		TESTS AND SAMPLES	
164		164		165		TESTS AND SAMPLES	
166		166		167		TESTS AND SAMPLES	
168		168		169		TESTS AND SAMPLES	

SCALE: 1:50

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 38 OF 43		TESTING	
DRILLING	ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES					
		TESTS AND SAMPLES		DESCRIPTION/RESULTS			
		ZONES		ROCK MASS AND DISCONTINUITY DESCRIPTION			
		FRACTURE ZONE CATASTIC SUBCUT CORING DISCING		164.894-165.946 19 FRACTURE ZONE			
		FRACTURES (GRAPHIC)		FZ 1.9			
		ORIENTATION D.D.R. DIP	LINEATION	O.4 0.2	16.201 43.308		
		THICKNESS (mm)		O.1	44.304		
		INFILLINGS					
		ROUGHNESS	PLANARITY	1 C P G	1 C P S		
		CONTINUITY		1 C	1 C		
		# OF FRACTURES		1 C	1 C		
		SUBCLASS		C	C		
		FRACTURE TYPE		G	G		
		INTERSECTION DEPTH		RP	RP		
		BLOCK SIZE (cm) 1000	100	100	100		
		SIZE (cm) 100	10	10	10		
		FREQUENCY (FRACTURES/m) 10	2	1	1		
		ROCK SUBSTANCE DESCRIPTION					
		DECOMPOSITION GRADE		169.369-170.625 DOMAIN: Biotite-rich (10-20%) rock. GRANITE (5%) with moderate to good intercalated gneissic foliation. Moderate to good intercalated gneissic metamorphism (CMB). (GP 3A)			
		STRENGTH FABRIC		169.369-170.625 DOMAIN: Biotite-rich (10-20%) rock. GRANITE (5%) with moderate to good intercalated gneissic foliation. Moderate to good intercalated gneissic metamorphism (CMB). (GP 3A)			
		D.D.R. FOLIATION DIP TYPE		169.369-170.625 DOMAIN: Biotite-rich (10-20%) rock. GRANITE (5%) with moderate to good intercalated gneissic foliation. Moderate to good intercalated gneissic metamorphism (CMB). (GP 3A)			
		ALTERATION		170.680-173.773 Homogeneous medium to coarse-grained pink GRANITE with some intercalated gneiss.			
		ROCK TYPE		171.311 NF 1 1 C C 7 NO 171.415 NF 1 1 C U 6 OG MS			
		RQD (%) 100	100.0	171.311 NF 1 1 C C 7 NO 171.415 NF 1 1 C U 6 OG MS			
		RECOVERY (%) 100	100.0	172.432 NF 1 1 C P 5 MS			
		WATER % RETURN	100	173.778-175.987 Biotite-rich (10-20%) rock. GRANITE (5%) with moderate to good intercalated gneissic foliation. Moderate to good intercalated gneissic metamorphism (CMB). (GP 3A)			
		DEPTH (ELEV.)	168	173.778-175.987 Biotite-rich (10-20%) rock. GRANITE (5%) with moderate to good intercalated gneissic foliation. Moderate to good intercalated gneissic metamorphism (CMB). (GP 3A)			
			169	173.778-175.987 Biotite-rich (10-20%) rock. GRANITE (5%) with moderate to good intercalated gneissic foliation. Moderate to good intercalated gneissic metamorphism (CMB). (GP 3A)			
			170	173.778-175.987 Biotite-rich (10-20%) rock. GRANITE (5%) with moderate to good intercalated gneissic foliation. Moderate to good intercalated gneissic metamorphism (CMB). (GP 3A)			
			171	173.778-175.987 Biotite-rich (10-20%) rock. GRANITE (5%) with moderate to good intercalated gneissic foliation. Moderate to good intercalated gneissic metamorphism (CMB). (GP 3A)			
			172	173.778-175.987 Biotite-rich (10-20%) rock. GRANITE (5%) with moderate to good intercalated gneissic foliation. Moderate to good intercalated gneissic metamorphism (CMB). (GP 3A)			
			173	173.778-175.987 Biotite-rich (10-20%) rock. GRANITE (5%) with moderate to good intercalated gneissic foliation. Moderate to good intercalated gneissic metamorphism (CMB). (GP 3A)			
			174	173.778-175.987 Biotite-rich (10-20%) rock. GRANITE (5%) with moderate to good intercalated gneissic foliation. Moderate to good intercalated gneissic metamorphism (CMB). (GP 3A)			

SCALE: 1:50

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 4 OF 43		TESTING	
DRILLING	ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES		DESCRIPTION/RESULTS			
		TESTS AND SAMPLES	DISCONTINUITY DESCRIPTION	ROCK MASS AND DISCONTINUITY DESCRIPTION	TESTS AND SAMPLES		
				169.394-180.948 FRACTURE ZONES 1.9			
		ZONES	FRACTURE ZONE	FZ 1.9			
		CATACLASTIC RUBBLE					
		CORE LOSS					
		DISCING					
		FRACTURES (GRAPHIC)					
		ORIENTATION D.D.R.	D.D.R.				
		DIP	DIP				
		LINEATION					
		THICKNESS (mm)					
		INFILLINGS					
		ROUGHNESS					
		PLANARITY					
		CONTINUITY					
		# OF FRACTURES					
		SUBCLASS					
		FRACTURE TYPE					
		INTERSECTION DEPTH					
		BLOCK SIZE (cm)	1000 100 10				
		FREQUENCY (Fractures/m)	50 25 0				
		ROCK SUBSTANCE DESCRIPTION	179.825-184.162 Metamorphic Stone and GRANITE with some Inclusions. (3A)				
		DECOMPOSITION GRADE					
		STRENGTH FABRIC					
		FOLIATION TYPE	D.D.R. DIP				
		ALTERATION					
		ROCK TYPE					
		RQD (%)	100 50	97.5			
		RECOVERY (%)	100 50	100.0			
		WATER % RETURN	COL. 10	102			
	DEPTH (ELEV.)						
		+80	180.25				
			180.5				
			180.75				
			181				
			181.25				
			+81.5				

SCALE: 1:12.5

EXPERIMENT: 30 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 41 OF 43		
DRILLING	ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES				TESTING
		DESCRIPTION/ RESULTS	TESTS AND SAMPLES	FRACURE ZONE ZONES	ROCK MASS AND DISCONTINUITY DESCRIPTION	
		CATACLASTIC RUBBLE CORE LOSS DISCING				
		FRACTURES (GRAPHIC)				
		ORIENTATION D DIR DIP				
		LINEATION				
		THICKNESS (mm)				
		INFILLINGS				
		ROUGHNESS				
		PLANARITY				
		CONTINUITY				
		# OF FRACTURES				
		SUBCLASS				
		FRACTURE TYPE				
		INTERSECTION DEPTH				
		BLOCK 1000				
		SIZE (cm) 100				
		10				
		1				
		FREQUENCY 50				
		25				
		0				
		0				
		0				
		DECOMPOSITION GRADE				
		STRENGTH FABRIC				
		D DIR FOLIATION DIP TYPE				
		ALTERATION				
		ROCK TYPE				
		ROD 100 (%)				
		50				
		0				
		RECOVERY 100 (%)				
		50				
		0				
		WATER COLOR % RETURN				
		181.5				
		181.75				
		182				
		182.25				
		182.5				
		182.75				
		183				

SCALE: 1:12.5

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 42 OF 43	
DRILLING	ROCK SUBSTANCE	TESTING	DESCRIPTION/ RESULTS		
	TESTS AND SAMPLES	ROCK MASS AND DISCONTINUITIES			
ZONES	ROCK MASS AND DISCONTINUITY DESCRIPTION				
FRACTURE ZONE					
CATACLASTIC					
RESONANCE					
CORE LOSS					
DISCING					
FRACTURES (GRAPHIC)					
ORIENTATION D.D.R.					
LINEATION D.P.					
THICKNESS (mm)					
INFILLINGS					
ROUGHNESS					
PLANARITY					
CONTINUITY					
# OF FRACTURES					
SUBCLASS					
FRACTURE TYPE					
INTERSECTION DEPTH					
BLOCK SIZE (cm)	1000	100	10		
FREQUENCY	100	10	1		
FRACTURES(m)	0	0	0		
ROCK SUBSTANCE DESCRIPTION	Moderately granular, fine-grained pinkish grey rock with intercalated GRANITE lenses. (3A)	179.3-25.184.162	184.1-62.187.394 Subangular to angular medium to coarse-grained pinkish grey rock with intercalated pinkish grey lenses. (3A)		
DECOMPOSITION GRADE					
STRENGTH FABRIC					
FOLIATION D.D.R.	NS 223.5 R5 I				
FOLIATION D.P.					
FOLIATION TYPE					
ALTERATION	P2				
ROCK TYPE					
RQD (%)	100	50	100		
RECOVERY (%)	100	50	100		
WATER RETURN	0	0	0		
DEPTH (ELEV.)	183	184	185	186	187
					188
					189
PICK					
108					
187.294-187.456 Foliated pinkish grey rock (3A) Orientation 202(112)80					
187.456-BOH (Weakly foliated pinkish grey GRANITE). Pinkish grey rock at 187.347 m. (3A)					

EXPERIMENT: 130 LEVEL GENERAL CHARACTERIZATION		ATOMIC ENERGY OF CANADA LTD. DRILL CORE LOG		BOREHOLE: 101-013-HG4 PAGE 43 OF 43	
DRILLING	ROCK SUBSTANCE	ROCK MASS AND DISCONTINUITIES			
	ROCK SUBSTANCE DESCRIPTION	TESTING			
		TESTS AND SAMPLES			
	ROCK MASS AND DISCONTINUITY DESCRIPTION				
	ZONES				
	FRACTURE ZONE CATASTIC CORE LOSS DISCING				
	FRACTURES (GRAPHIC)				
	ORIENTATION D.D.R. DIP				
	LINEATION D.R.				
	THICKNESS (mm)				
	INFILLINGS				
	ROUGHNESS PLANARITY CONTINUITY				
	# OF FRACTURES				
	SUBCLASS				
	FRACTURE TYPE				
	INTERSECTION DEPTH				
	BLOCK 1000 SIZE (cm) 10				
	FREQUENCY 10 (FRACTURES/m)	0	0		
	ROCK SUBSTANCE DESCRIPTION				
	DECOMPOSITION GRADE				
	STRENGTH				
	PABRIC				
	D.D.R. FOLIATION D.R.				
	TYPE				
	ALTERATION				
	ROCK TYPE				
	RQD 100 (%) 10				
	RECOVERY 100 (%) 10	100.0			
	WATER colour RETURN	100.0			
	DEPTH (ELEV.)	189	190	191	192
					193
					194
					195

SCALE: 1:50

APPENDIX D

STRUCTURE CONTOURS

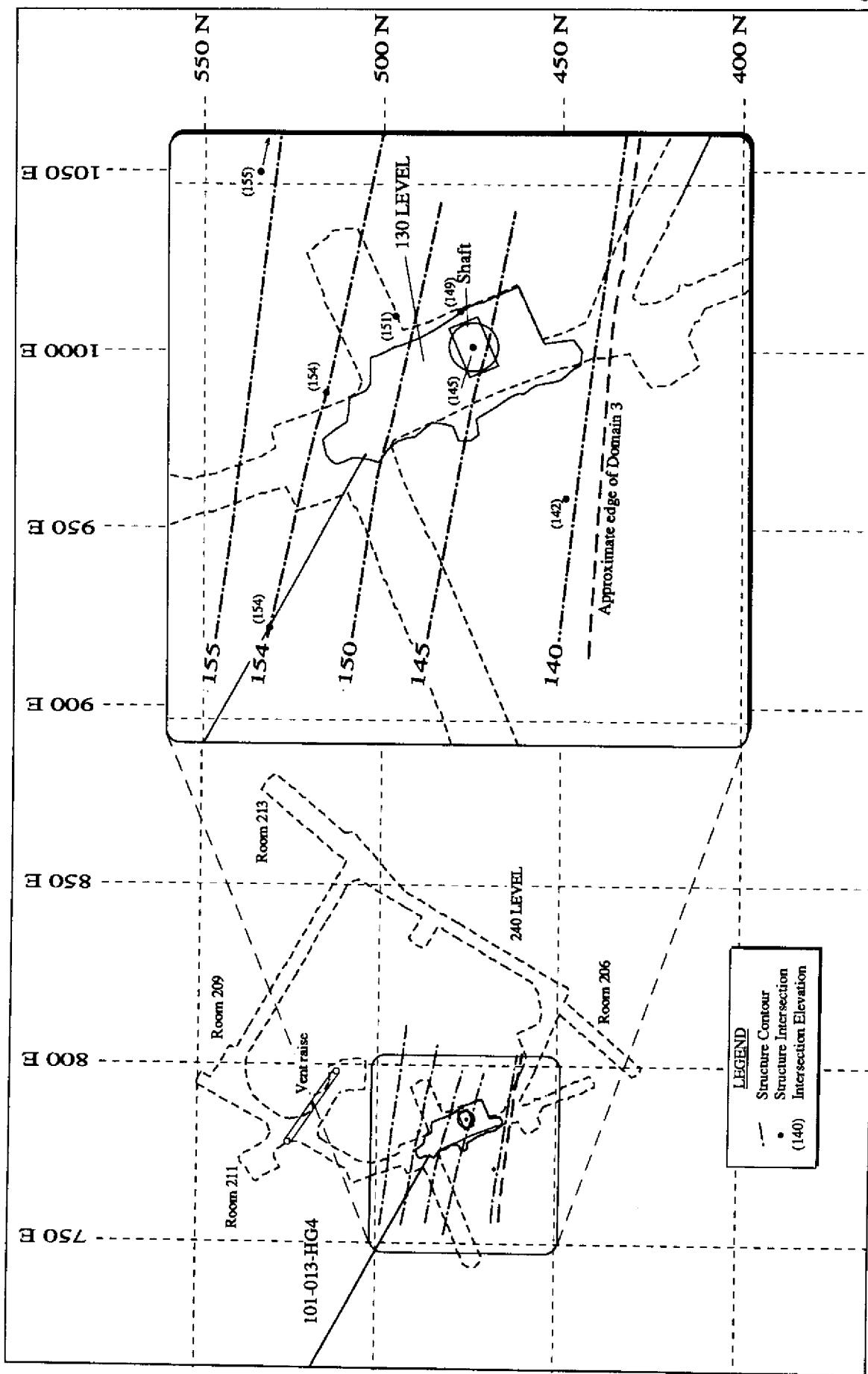


FIGURE D-1: Structure Contours for the Upper Contact of Domain 3 (gneissic granite). Borehole 101-013-HG4, the 130 and 240 Levels, ventilation raises and shaft are shown for reference.

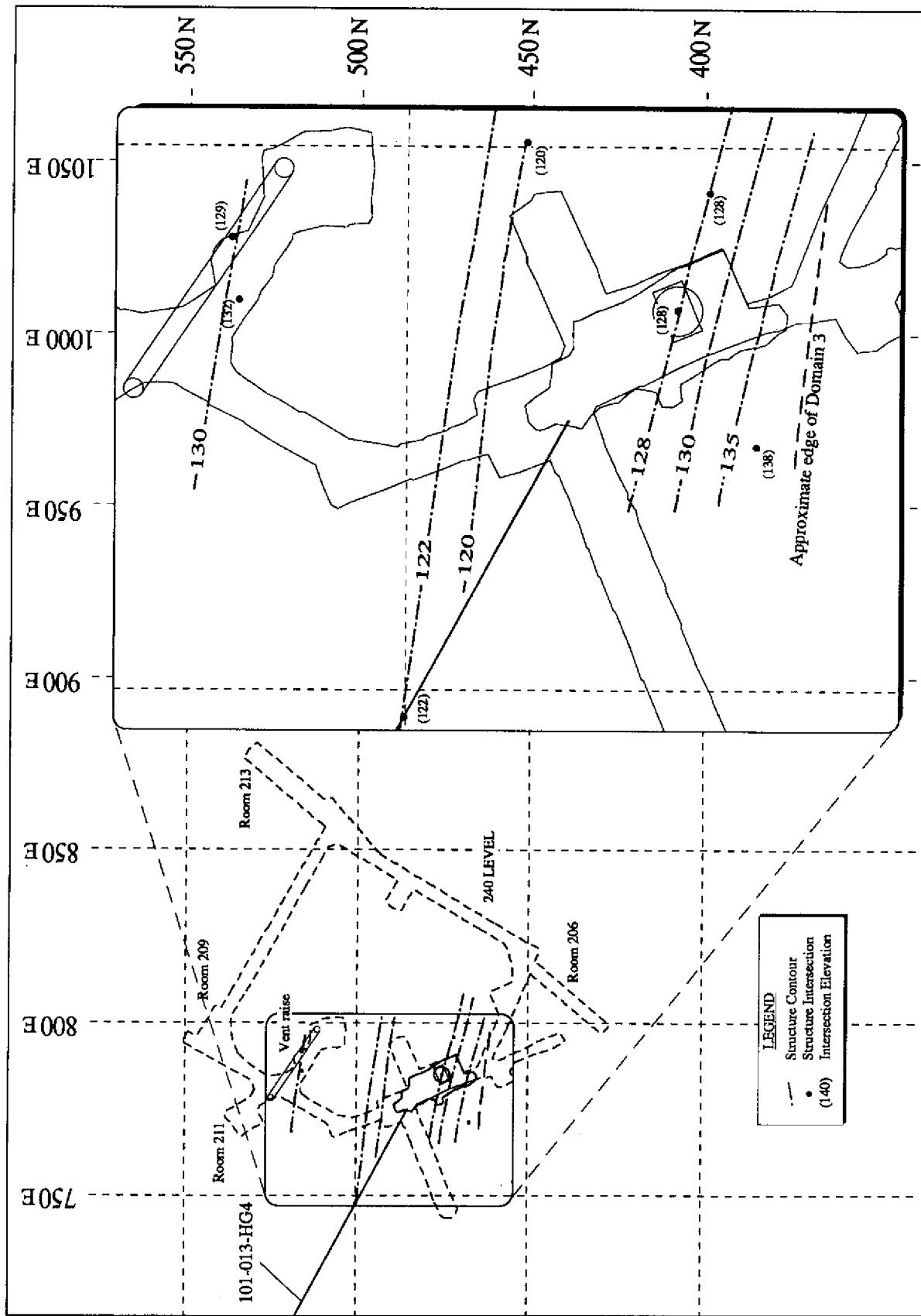


FIGURE D-2: Structure Contours for the Lower Contact of Domain 3 (gneissic granite). Borehole 101-013-HG4, the 130 and 240 Levels, ventilation raises and shaft are shown for reference.

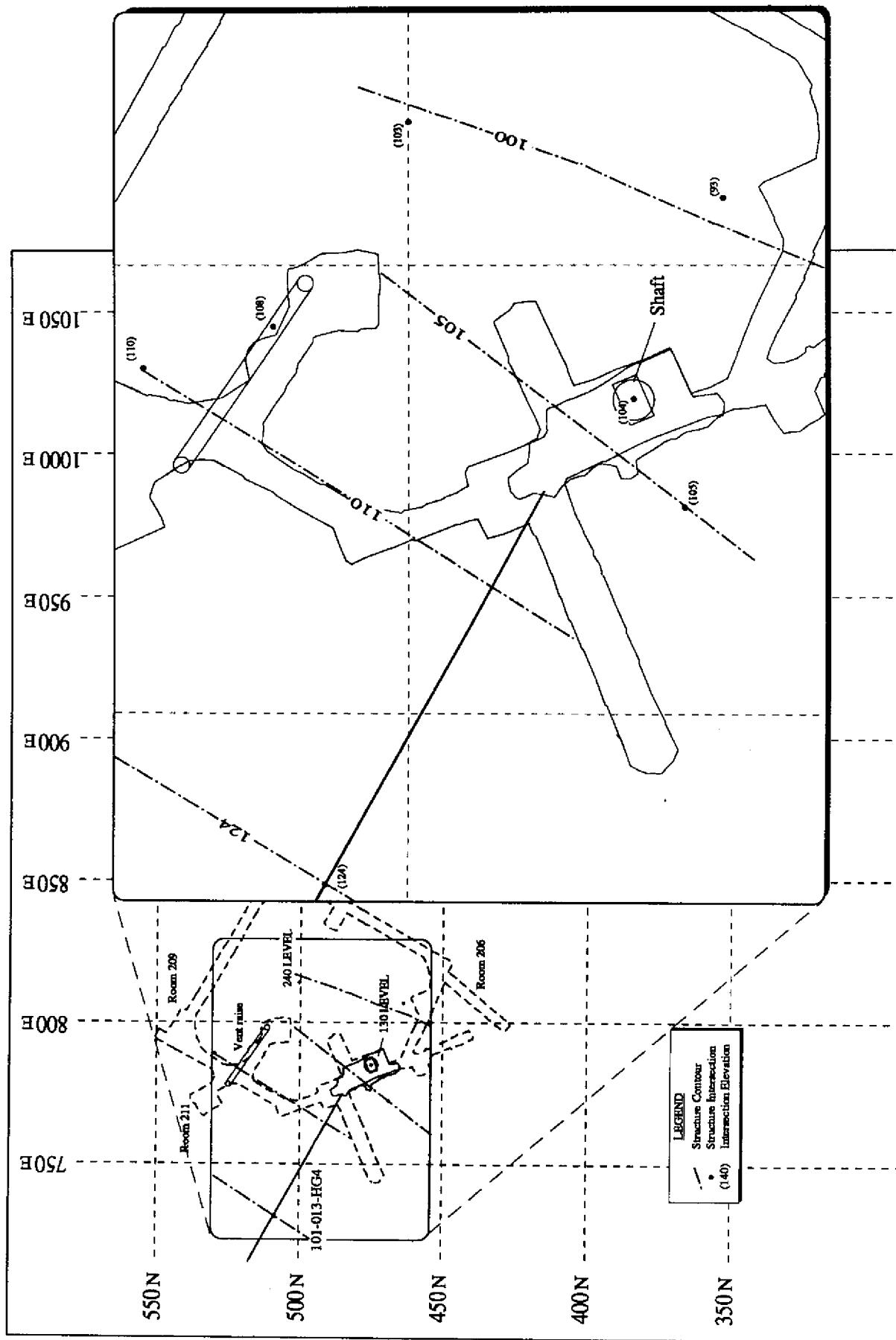


FIGURE D-3: Structure Contours for the Lower Contact of Domain 4 (xenolithic granite). Borehole 101-013-HG4, the 130 and 240 Levels, ventilation raises and shaft are shown for reference.

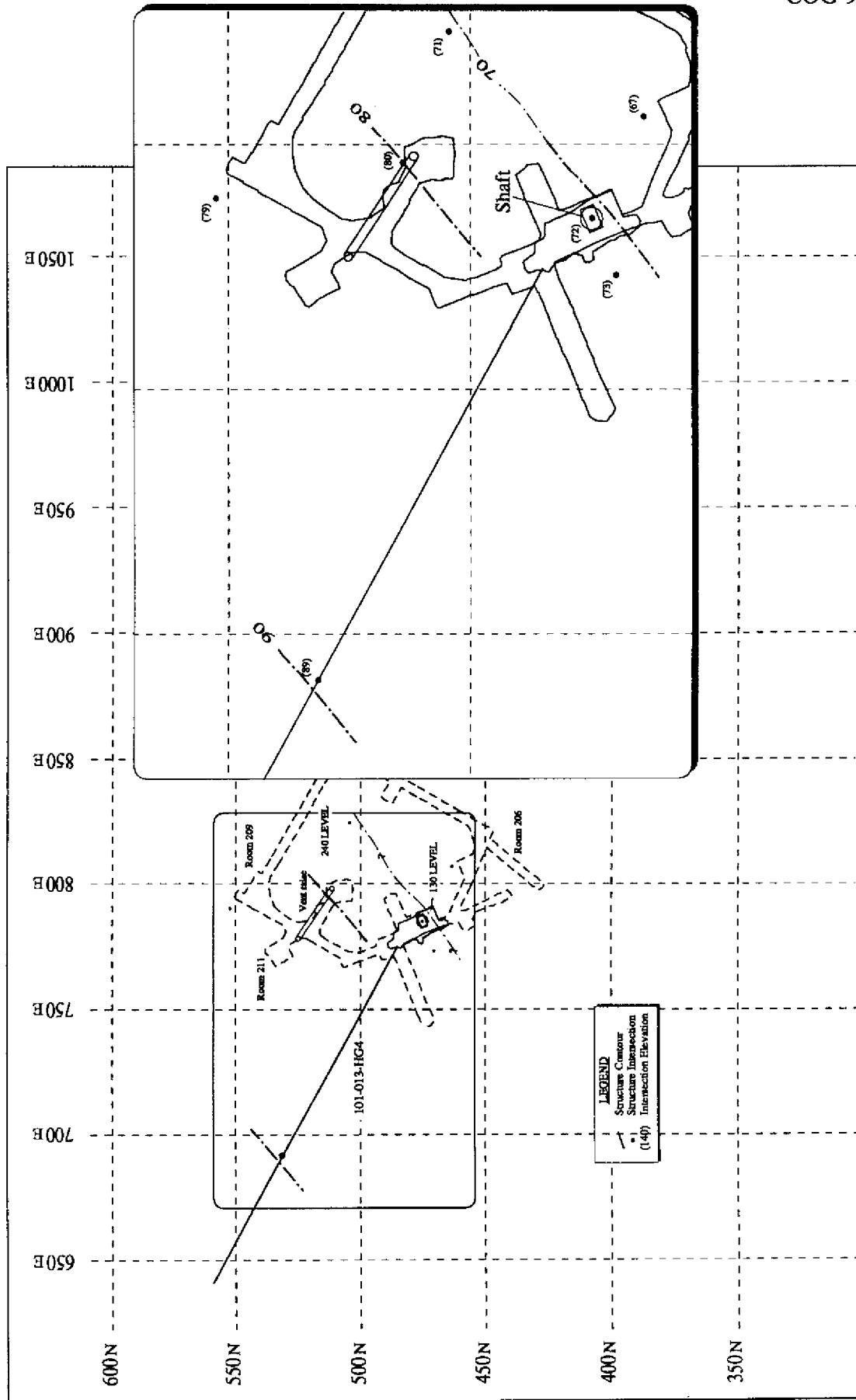


FIGURE D-4: Structure Contours for the Lower Contact of Domain 5 (gneissic granite). Borehole 101-013-HG4, the 130 and 240 Levels, ventilation raises and shaft are shown for reference.

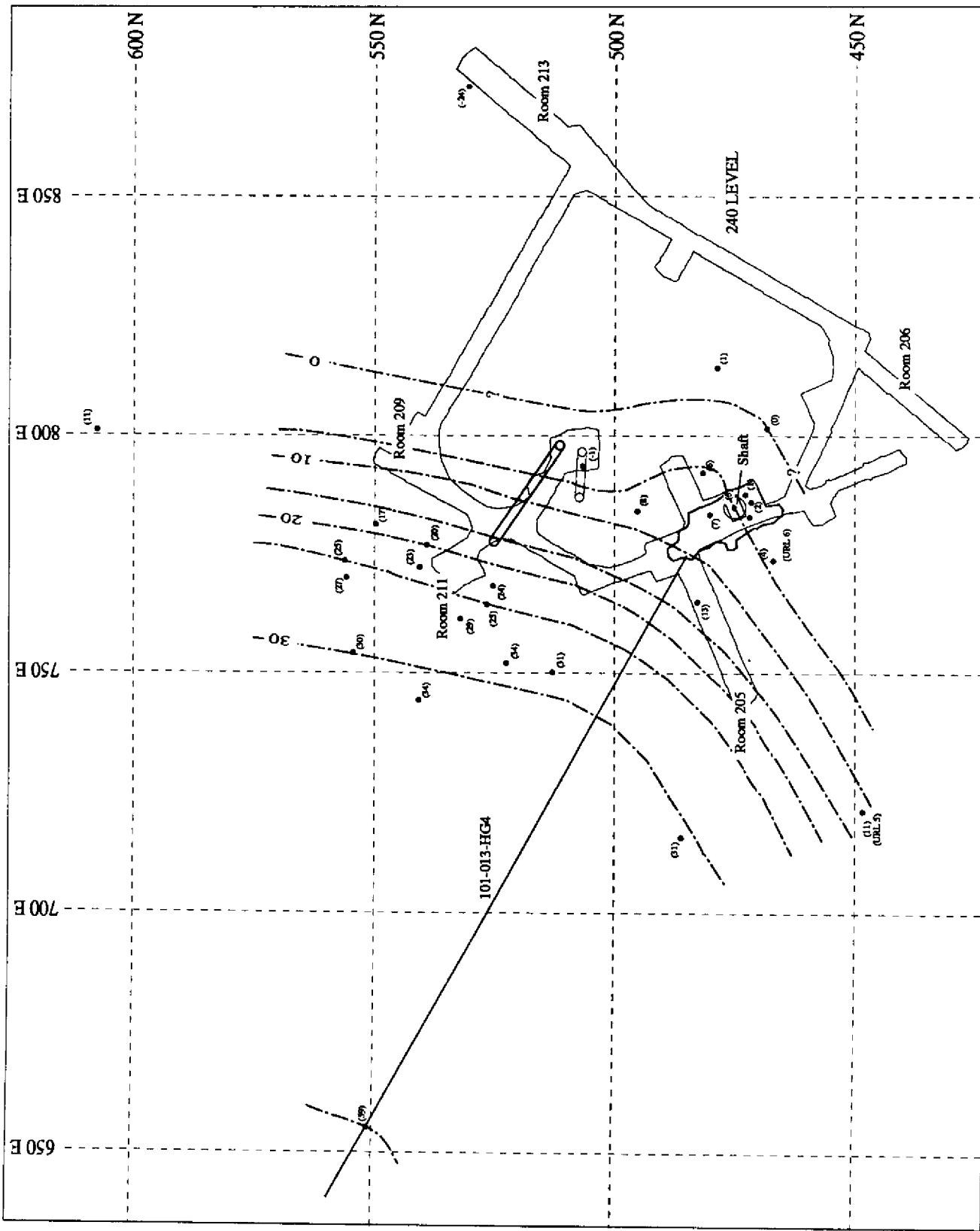


FIGURE D-7: Structure Contours for the Lower Contact of Domain 8 (homogeneous granite). Borehole 101-013-HG4, the 130 and 240 Levels, ventilation raises and shaft are shown for reference.

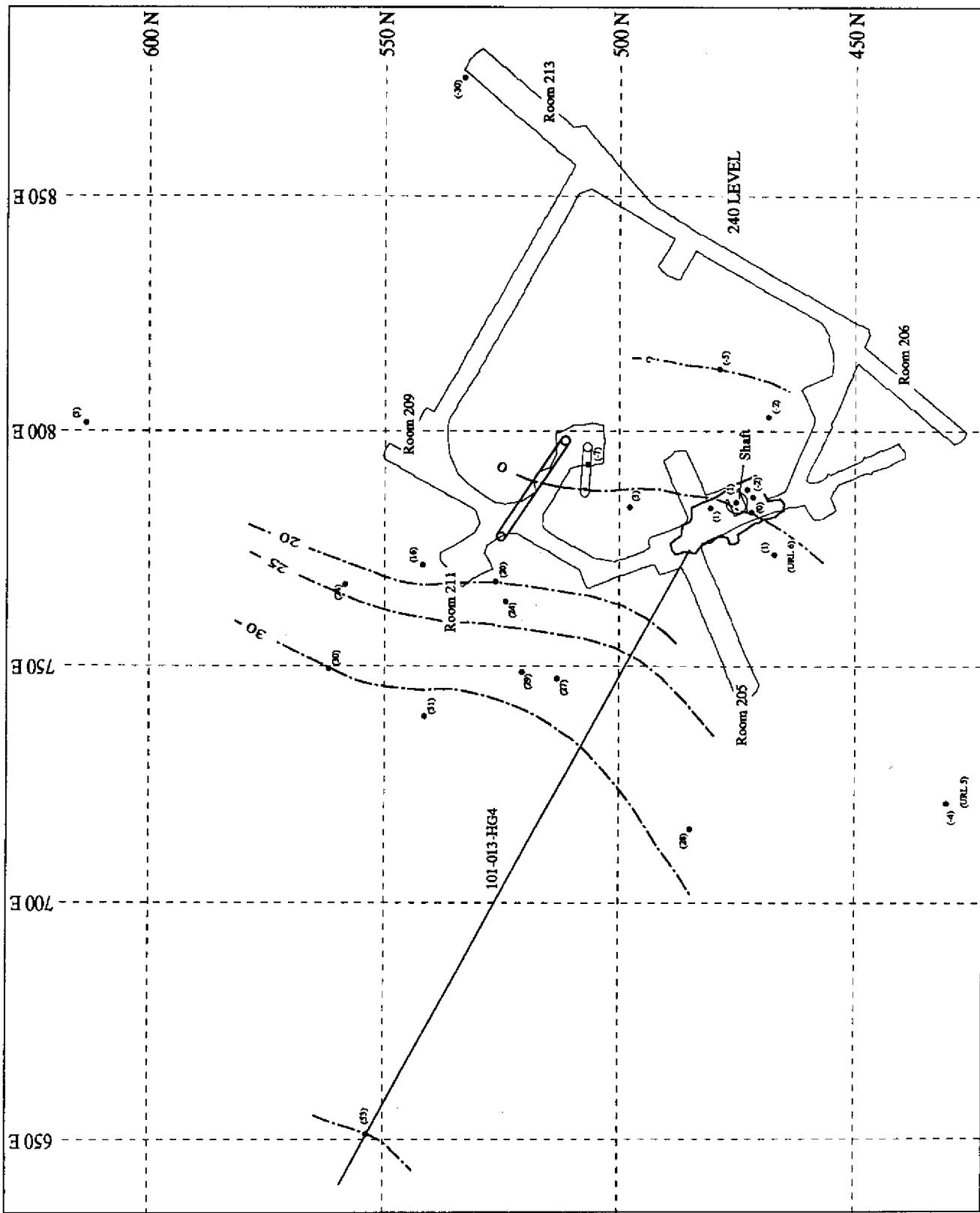


FIGURE D-8: Structure Contours for the Lower Contact for Domain 9 (xenolithic granite). Borehole 101-013-HG4, the 130 and 240 Levels, ventilation raises and shaft are shown for reference.

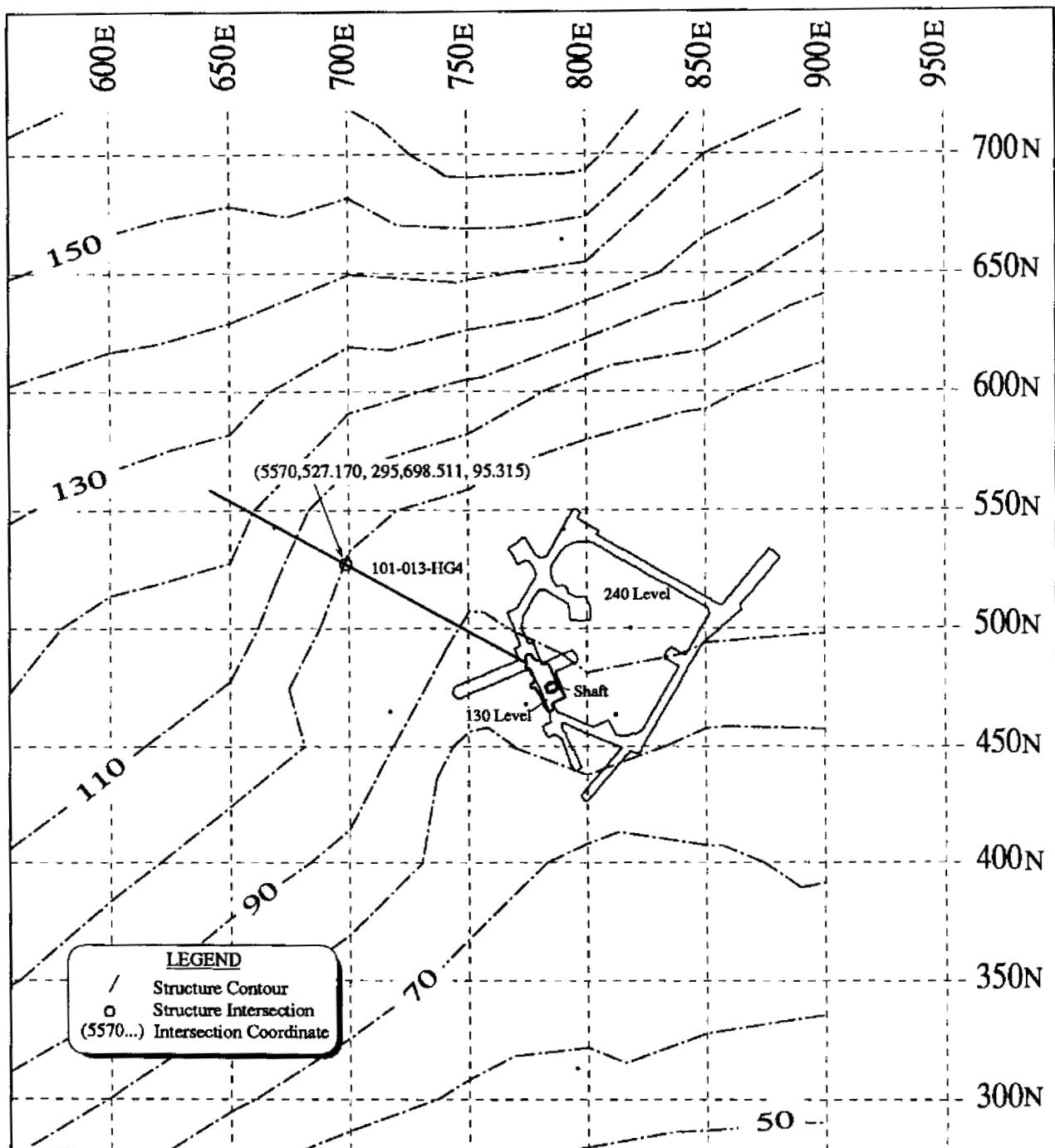


FIGURE D-9: Structure Contours for Upper Surface of Fracture Zone 2.5
Showing the Intersection at 101-013-HG4

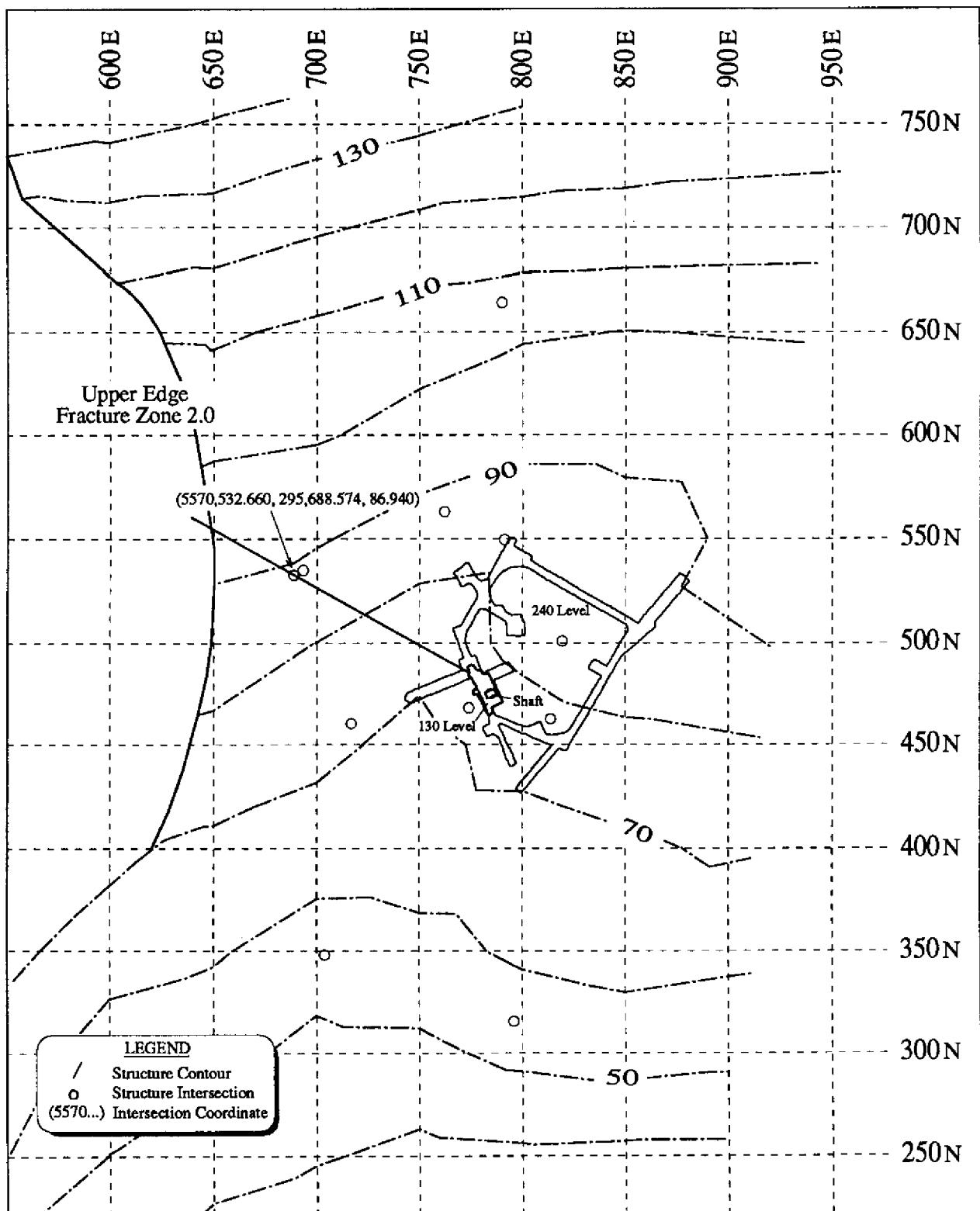


FIGURE D-10: Structure Contours for Lower Surface of Fracture Zone 2.5
Showing the Intersection at 101-013-HG4

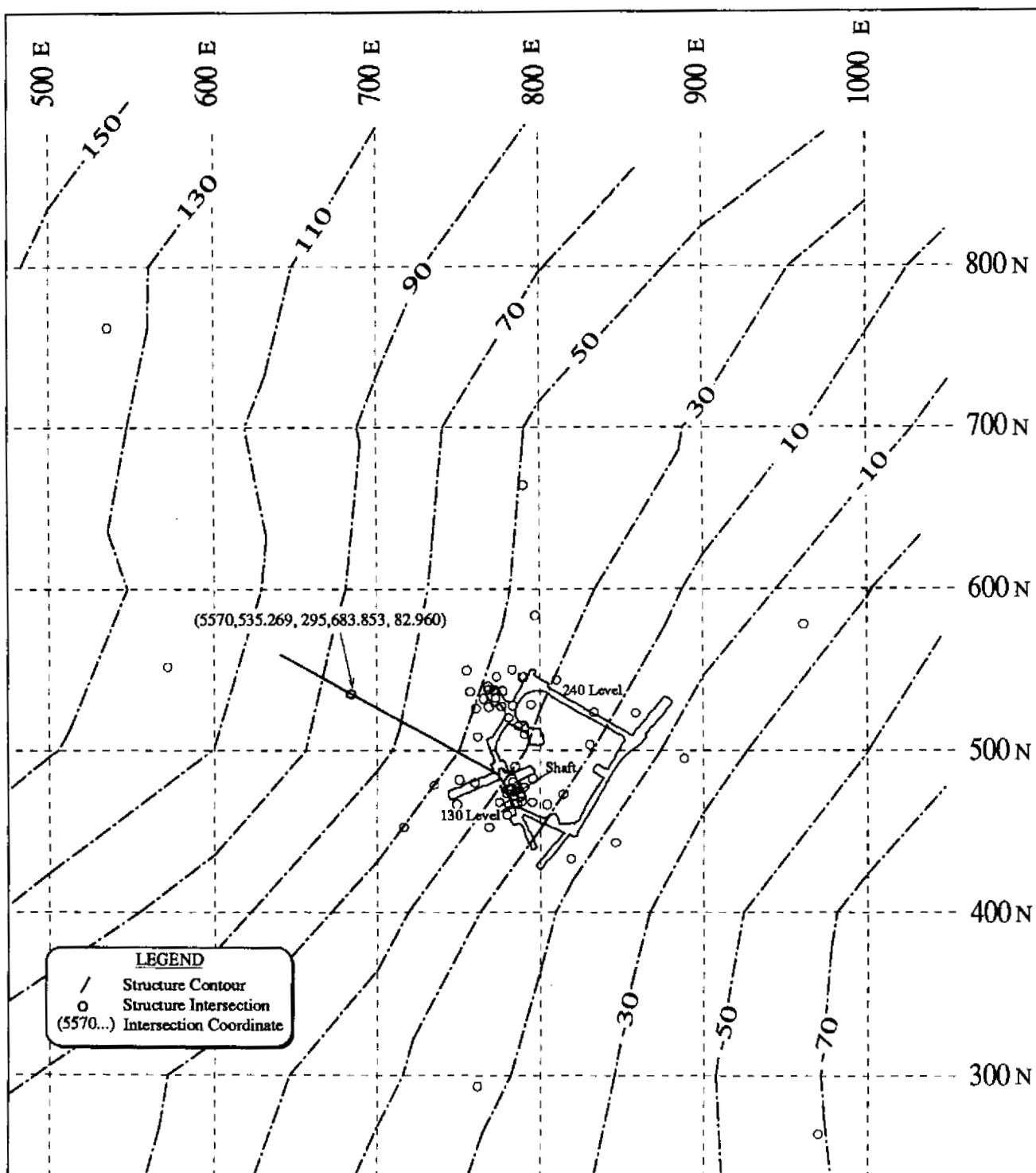


FIGURE D-11: Structure Contours for Upper Surface of Fracture Zone 2.0
Showing the Intersection at 101-013-HG4

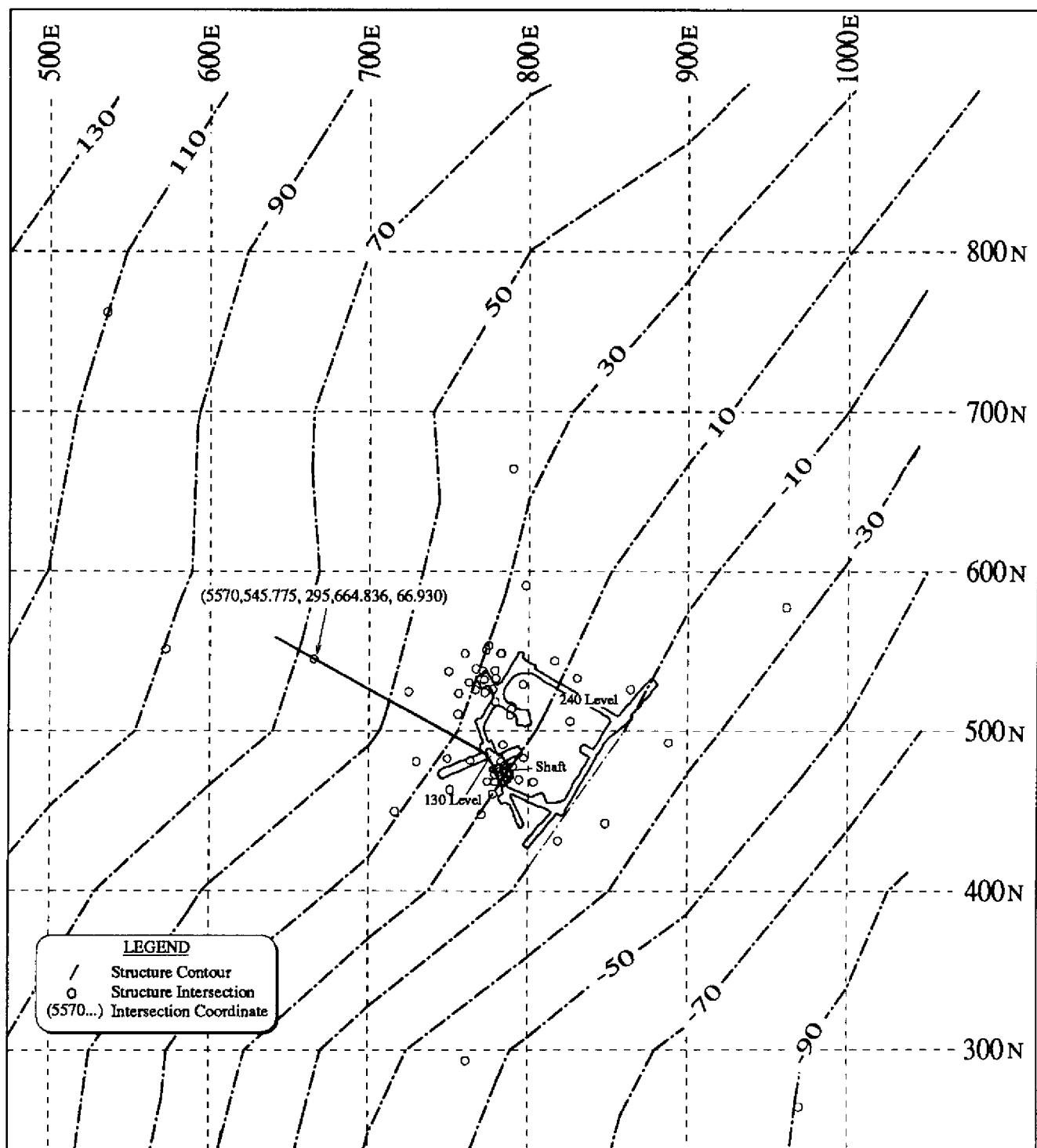


FIGURE D-12: Structure Contours for Lower Surface of Fracture Zone 2.0
Showing the Intersection at 101-013-HG4

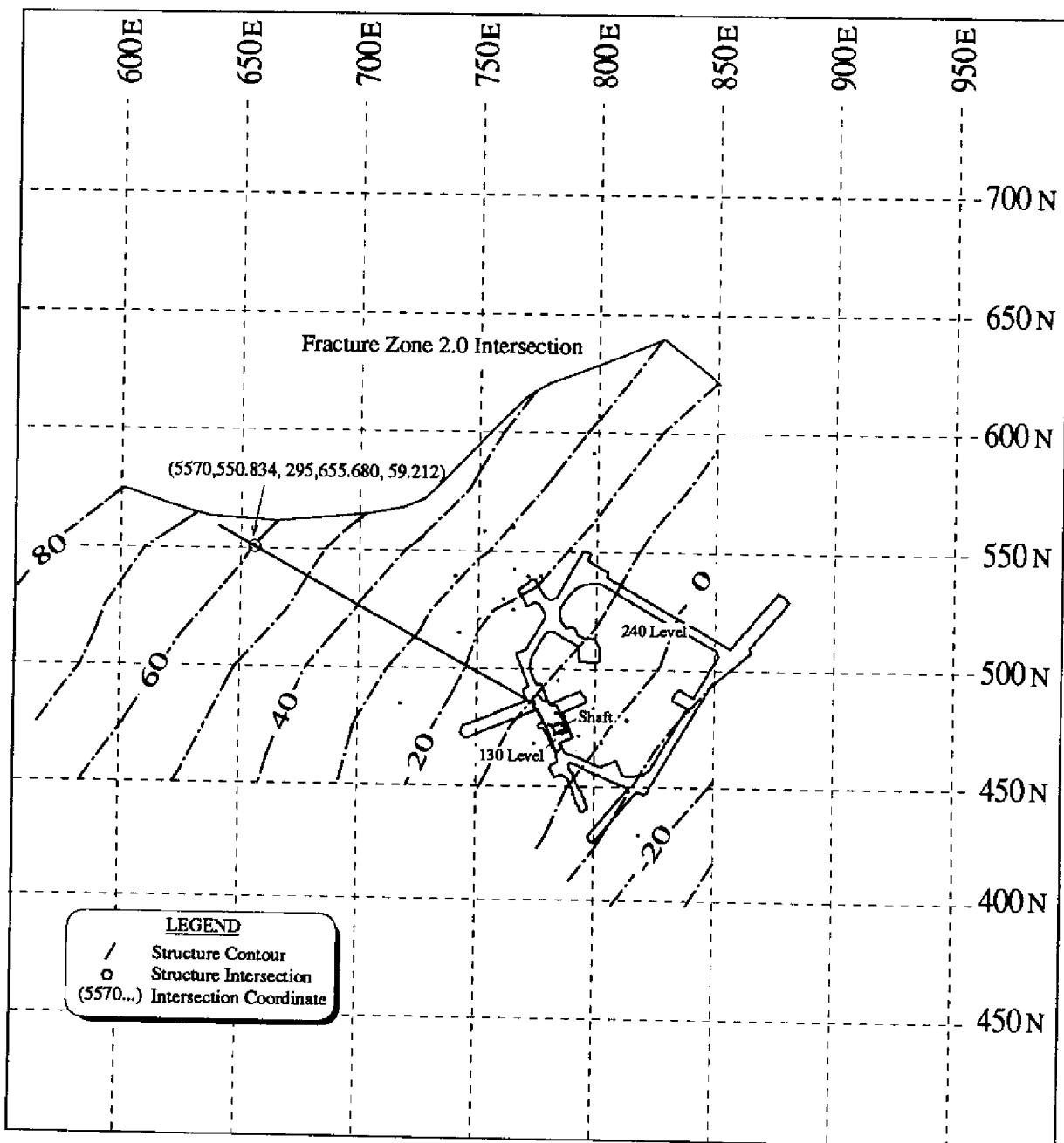


FIGURE D-13: Structure Contours for Upper Surface of Fracture Zone 1.9
Showing the Intersection at 101-013-HG4

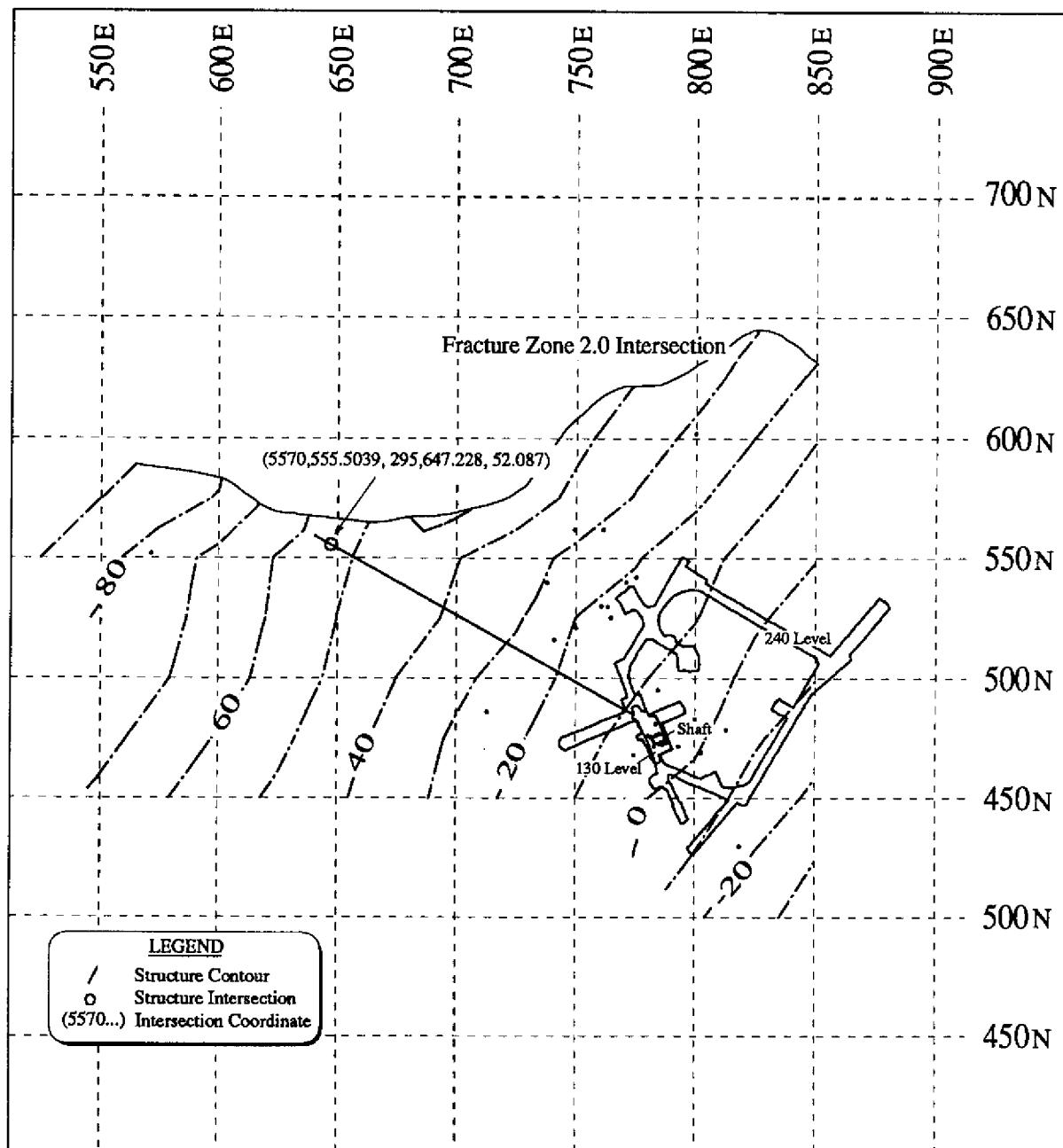


FIGURE D-14: Structure Contours for Lower Surface of Fracture Zone 1.9
Showing the Intersection at 101-013-HG4

APPENDIX E

DETAILED ORIENTATION DATA LISTING

FRACTURE ORIENTATION DATA
101-013-HG4

LOCATION	ALPHA	BETA	DIP DIRECTION	DIP	FILLINGS
2.973	46.00	115.00	79.03	79.00	CL HE CA
3.052	56.00	130.00	92.98	78.29	CL CA HE
3.076	22.00	50.00	24.70	45.41	CA
3.113	53.00	120.00	86.52	76.58	CY HE CA
3.162	53.00	120.00	86.52	76.58	CA
4.098	47.00	155.00	282.13	86.38	CA
4.187	57.00	170.00	113.48	86.20	CA
4.625	54.00	130.00	91.70	79.85	CA
5.814	44.00	90.00	66.77	65.64	CA
8.629	48.00	120.00	82.89	80.10	HE
8.657	53.00	120.00	86.52	76.58	HE
8.826	57.00	120.00	89.50	73.81	HE
10.511	48.00	130.00	87.93	84.54	HE
10.525	50.00	100.00	76.08	68.59	HE
10.553	53.00	105.00	80.58	69.59	HE CA
10.574	49.00	120.00	83.61	79.39	HE
10.602	54.00	115.00	85.21	73.71	HE
10.631	52.00	115.00	83.64	75.02	HE CA
10.948	52.00	180.00	298.92	88.42	HE CA
13.366	52.00	200.00	131.08	89.87	CA
16.044	58.00	180.00	118.92	85.58	CA HE
16.116	51.00	180.00	298.92	87.42	CR
16.389	58.00	210.00	134.43	82.29	NO
16.425	51.00	200.00	311.35	89.17	CR
16.500	66.00	210.00	131.07	74.99	CA
16.667	58.00	180.00	118.92	85.58	CR
16.724	64.00	200.00	127.73	78.34	CA
16.754	74.00	190.00	121.85	69.37	NO
16.808	42.00	135.00	267.21	88.53	CR
16.840	46.00	130.00	86.69	86.11	CR
16.902	48.00	220.00	144.41	88.35	CA
16.950	64.00	120.00	94.94	69.07	CR
16.995	58.00	180.00	118.92	85.58	HE CR PY
17.121	82.00	200.00	122.04	61.14	CR
17.248	60.00	195.00	126.42	82.79	NO
17.333	72.00	210.00	128.41	69.56	NO
17.755	80.00	210.00	124.54	62.38	CR
17.888	76.00	205.00	125.32	66.44	NO
18.659	68.00	180.00	118.92	75.58	CR CL
18.877	65.00	180.00	118.92	78.58	HE
18.918	44.00	130.00	85.45	87.69	CR
20.577	66.00	140.00	103.06	73.04	CR
20.738	48.00	130.00	87.93	84.54	CA
21.617	58.00	180.00	118.92	85.58	CA
21.662	55.00	170.00	113.20	88.18	CR
22.898	42.00	130.00	84.22	89.26	CR
23.723	61.00	160.00	109.26	81.22	HE CR CL
23.763	54.00	170.00	113.06	89.17	CL CR
23.892	38.00	80.00	57.01	61.60	CA
23.897	63.00	155.00	107.63	78.59	CR CL HE

LOCATION	ALPHA	BETA	DIP DIRECTION	DIP	FILLINGS
24.161	61.00	180.00	118.92	82.58	CR HE
26.250	58.00	190.00	124.22	85.21	HE
27.154	72.00	175.00	117.29	71.52	CR HE
28.297	52.00	140.00	95.51	84.93	QZ
40.386	70.00	165.00	113.61	73.02	HE CR
43.700	68.00	160.00	111.28	74.50	HE
43.744	84.00	180.00	118.92	59.58	HE
44.250	66.00	195.00	125.12	76.92	HE
44.276	62.00	170.00	114.19	81.25	CR
44.298	68.00	175.00	116.99	75.51	CL HE CA
44.337	67.00	170.00	114.92	76.30	CA HE CL
44.600	64.00	170.00	114.48	79.27	HE CR
45.920	60.00	170.00	113.90	83.23	CA CL HE
45.939	56.00	140.00	97.61	81.52	CA
47.379	68.00	170.00	115.06	75.31	CA CL HE
47.621	67.00	170.00	114.92	76.30	CR CL HE
47.830	78.00	195.00	122.32	65.22	HE CR CL
53.495	70.00	165.00	113.61	73.02	CR
55.705	72.00	135.00	105.20	67.12	CR
72.337	86.00	165.00	117.69	57.45	HE CA
72.354	76.00	140.00	109.02	64.73	CL HE CR
72.795	66.00	160.00	110.69	76.42	HE
73.053	40.00	0.00	118.92	3.58	QZ SL CR
73.107	57.00	230.00	144.22	77.51	CL HE CA
73.133	75.00	130.00	106.17	63.92	HE CA
73.203	67.00	135.00	101.94	71.08	HE CL CR
73.278	68.00	180.00	118.92	75.58	HE
73.360	65.00	130.00	98.94	71.37	CL CA HE
73.428	60.00	135.00	97.62	76.72	CL HE CR
76.944	53.00	140.00	96.03	84.08	HE
76.968	51.00	160.00	286.49	89.17	HE CA
77.014	57.00	145.00	100.53	82.01	NO
81.038	69.00	200.00	126.26	73.54	CR HE
81.086	77.00	190.00	121.36	66.41	HE CR
81.648	60.00	170.00	113.90	83.23	CA
86.531	72.00	175.00	117.29	71.52	CR HE
86.872	72.00	200.00	125.35	70.67	HE
87.352	54.00	230.00	146.14	79.85	HE PY
87.388	81.00	145.00	113.04	61.10	HE CA
87.563	61.00	190.00	123.79	82.24	CR HE
92.364	73.00	150.00	109.89	68.65	HE
93.262	66.00	200.00	127.15	76.42	HE
99.436	67.00	200.00	126.86	75.46	NO
99.638	74.00	210.00	127.48	67.75	NO
99.729	76.00	190.00	121.53	67.40	HE
99.752	66.00	200.00	127.15	76.42	HE
99.768	64.00	205.00	129.85	77.65	CA
100.439	73.00	240.00	135.39	63.25	HE
102.956	58.00	190.00	124.22	85.21	NO
102.962	69.00	200.00	126.26	73.54	UN
103.243	75.00	180.00	118.92	68.58	QZ HE
103.429	65.00	175.00	116.77	78.50	QZ HE
108.189	50.00	350.00	143.81	15.38	CL HE CR

LOCATION	ALPHA	BETA	DIP DIRECTION	DIP	FILLINGS
109.232	56.00	310.00	162.27	38.61	CL QZ HE
109.263	50.00	295.00	170.92	47.67	CL HE QZ
109.370	33.00	320.00	202.90	32.82	HE
109.572	66.00	150.00	106.77	74.99	HE
109.584	58.00	170.00	113.62	85.21	HE
109.607	57.00	325.00	156.23	31.03	CL HE CY
109.638	63.00	320.00	148.67	36.02	CL HE QZ
109.656	57.00	310.00	160.70	38.77	HE
109.709	60.00	290.00	157.20	49.32	HE
109.747	44.00	320.00	182.29	31.15	HE
109.829	33.00	335.00	211.02	20.77	HE PY
109.875	32.00	310.00	199.93	41.13	HE
109.902	67.00	170.00	114.92	76.30	QZ HE
109.920	70.00	160.00	111.88	72.59	NO
110.188	44.00	195.00	309.77	81.56	HE QZ
110.371	62.00	140.00	100.83	76.42	QZ HE
110.380	38.00	340.00	197.23	15.98	HE
110.385	57.00	145.00	100.53	82.01	HE QZ
110.399	41.00	340.00	186.43	16.22	HE
110.460	40.00	315.00	189.06	35.16	HE
110.570	36.00	310.00	194.08	39.88	CL HE
110.620	35.00	320.00	199.33	32.28	HE
111.333	69.00	210.00	129.76	72.27	HE
111.453	72.00	135.00	105.20	67.12	QZ HE
111.750	38.00	110.00	70.43	81.45	NO
112.373	59.00	150.00	103.82	81.37	HE
112.865	35.00	225.00	334.64	82.79	HE
112.905	20.00	330.00	232.79	30.92	HE CA
112.970	19.00	330.00	234.29	31.55	HE
113.025	52.00	190.00	305.06	88.85	HE CL
113.095	54.00	90.00	76.84	61.29	CL HE QZ
113.159	20.00	320.00	223.06	38.53	CL HE QZ
113.237	24.00	100.00	54.02	83.46	HE
113.415	63.00	120.00	94.14	69.74	CL
113.505	23.00	310.00	211.91	44.92	HE CL
113.587	29.00	315.00	206.80	38.23	HE
113.690	37.00	320.00	195.65	31.83	HE CL QZ
113.864	63.00	290.00	153.25	49.16	CL HE
113.928	50.00	310.00	171.91	38.07	HE CL
114.095	56.00	30.00	82.55	28.13	CL HE
114.120	55.00	25.00	84.26	25.23	HE
114.497	68.00	355.00	122.48	31.71	HE QZ
114.701	15.00	90.00	41.09	81.16	NO
115.923	44.00	345.00	170.73	13.70	HE CL CY
115.939	72.00	335.00	131.22	37.81	CL CY
115.941	41.00	340.00	186.43	16.22	CY HE
115.981	60.00	15.00	101.41	25.47	CL CY HE
116.214	72.00	200.00	125.35	70.67	QZ
116.729	50.00	45.00	66.25	34.86	HE
118.326	68.00	190.00	122.78	75.31	HE
120.257	52.00	10.00	97.62	17.11	HE
120.320	51.00	25.00	76.07	23.02	HE
121.675	56.00	180.00	118.92	87.58	HE

LOCATION	ALPHA	BETA	DIP DIRECTION	DIP	FILLINGS
122.297	61.00	12.00	105.49	25.73	HE
122.336	52.00	220.00	142.33	84.93	HE
123.885	47.00	30.00	63.82	24.57	HE CY
128.686	40.00	25.00	46.90	19.90	CL HE PY
128.758	47.00	225.00	147.79	87.35	HE
129.805	44.00	0.00	118.92	7.58	CL HE
129.826	43.00	215.00	323.80	85.57	QZ HE
130.097	49.00	20.00	76.00	19.24	HE QZ CL
132.086	40.00	15.00	50.38	12.30	CL HE
133.195	70.00	215.00	130.93	70.58	HE QZ
133.209	69.00	220.00	133.06	70.53	HE QZ
133.315	77.00	230.00	130.12	62.48	HE QZ PY
134.024	48.00	235.00	152.49	82.39	HE QZ
134.962	54.00	5.00	109.33	17.92	HE CL QZ
135.338	39.00	30.00	44.29	23.77	QZ HE
136.693	65.00	160.00	110.40	77.38	HE
136.756	65.00	160.00	110.40	77.38	HE PY
138.146	47.00	310.00	176.78	38.10	HE
138.265	32.00	35.00	30.57	29.12	CL HE
138.773	53.00	250.00	155.40	72.03	HE
139.217	32.00	355.00	254.40	6.05	HE QZ
140.313	46.00	200.00	312.73	84.36	QZ HE
140.694	38.00	15.00	40.96	12.04	CL
141.009	54.00	165.00	110.17	88.66	HE QZ
141.488	41.00	5.00	80.03	6.01	CL CY
141.548	47.00	345.00	160.72	15.36	CL CY HE
141.960	46.00	240.00	156.38	81.51	NO
141.994	28.00	150.00	270.96	70.33	CY CL
142.200	55.00	5.00	110.04	18.89	HE
142.202	21.00	215.00	334.72	66.26	HE
142.241	45.00	10.00	80.64	11.43	CY CL HE
142.248	66.00	15.00	107.07	30.85	CY CL HE
142.305	68.00	20.00	105.50	33.52	HE
142.426	53.00	25.00	80.34	24.07	HE PY EP
142.482	18.00	10.00	327.17	20.42	HE
142.636	28.00	230.00	342.34	79.75	HE CY QZ
142.698	28.00	80.00	47.17	66.29	HE CY
142.800	63.00	200.00	128.01	79.30	NO
143.111	23.00	220.00	337.83	70.40	HE CL CA
143.208	12.00	340.00	257.44	30.34	HE CA
143.404	39.00	280.00	280.00	39.00	HE
143.474	41.00	240.00	240.00	41.00	HE
143.490	40.00	260.00	260.00	40.00	CY HE
143.502	10.00	234.00	234.00	10.00	HE
143.636	16.00	220.00	220.00	16.00	HE CY
143.762	17.00	45.00	45.00	17.00	CY HE CL
143.786	27.00	215.00	215.00	27.00	CY HE
143.800	70.00	0.00	0.00	70.00	HE
143.905	12.00	0.00	0.00	12.00	HE CA
144.000	82.00	350.00	350.00	82.00	CA
144.242	17.00	340.00	340.00	17.00	HE
144.303	72.00	351.00	351.00	72.00	HE
144.503	37.00	30.00	30.00	37.00	HE CL

LOCATION	ALPHA	BETA	DIP	DIRECTION	DIP	FILLINGS		
144.504	73.00	0.00	0.00		73.00	HE	CL	CA
144.581	39.00	0.00	0.00		39.00	HE	CA	CL
144.715	73.00	0.00	0.00		73.00	HE	CL	CA
144.852	63.00	25.00	25.00		63.00	HE	CL	CA
144.963	57.00	310.00	310.00		57.00	HE	CA	CL
145.110	66.00	340.00	340.00		66.00	CA	HE	
145.112	14.00	0.00	0.00		14.00	CA	HE	
145.193	36.00	23.00	23.00		36.00	HE	CL	CA
145.315	57.00	270.00	270.00		57.00	HE	CL	
145.352	48.00	50.00	50.00		48.00	HE	CL	CA
145.608	14.00	190.00	190.00		14.00	HE		
145.990	66.00	310.00	310.00		66.00	HE		
146.140	14.00	330.00	330.00		14.00	CY	HE	CL
146.308	3.00	0.00	0.00		3.00	HE	CL	CY
146.450	68.00	135.00	135.00		68.00	HE	CY	
146.535	50.00	170.00	170.00		50.00	CY	CL	HE
146.587	62.00	200.00	200.00		62.00	CY	CL	HE
146.698	37.00	50.00	50.00		37.00	CY	CL	HE
146.709	70.00	200.00	200.00		70.00	CY	HE	
146.790	12.00	124.00	124.00		12.00	CY	HE	
146.962	34.00	205.00	205.00		34.00	CY	CL	
147.181	13.00	35.00	35.00		13.00	CY	CL	
148.017	57.00	25.00	87.84		26.48	PH		
148.018	25.00	180.00	298.92		61.42	HE		
148.273	54.00	350.00	137.29		18.90	HE	CL	
148.321	50.00	10.00	94.03		15.38	HE	CL	
148.478	48.00	355.00	135.01		12.15	HE	CL	CY
148.525	52.00	10.00	97.62		17.11	HE		
148.781	61.00	5.00	113.13		24.78	HE	CY	
150.095	59.00	20.00	95.28		26.06	HE		
150.388	41.00	145.00	273.11		83.80	QZ		
150.754	66.00	355.00	123.02		29.72	HE		
151.055	68.00	355.00	122.48		31.71	HE	PY	
151.828	64.00	347.00	130.78		28.68	HE		
152.609	65.00	350.00	127.57		29.19	HE		
153.682	74.00	347.00	124.69		38.11	HE		
154.020	61.00	345.00	135.34		26.35	HE		
154.230	65.00	359.00	119.80		28.59	CL	HE	
155.278	63.00	335.00	141.01		30.67	HE		
155.422	69.00	10.00	112.37		33.04	HE		
155.895	66.00	340.00	134.23		31.80	HE		
159.693	57.00	345.00	140.17		22.89	HE		
161.478	56.00	341.00	146.19		23.41	HE		
162.071	54.00	190.00	124.78		89.17	HE		
162.215	60.00	185.00	121.43		83.49	HE		
162.277	61.00	185.00	121.36		82.49	HE		
162.865	62.00	190.00	123.65		81.25	HE		
162.897	69.00	205.00	128.03		72.97	HE		
163.847	53.00	316.00	166.23		34.66	HE		
164.037	42.00	178.00	297.40		78.44	HE		
164.195	60.00	195.00	126.42		82.79	HE		
166.376	56.00	155.00	105.20		85.16	HE		
166.491	56.00	197.00	128.35		86.45	HE		

LOCATION	ALPHA	BETA	DIP DIRECTION	DIP	FILLINGS
168.894	37.00	340.00	200.85	16.01	CL HE
168.986	46.00	193.00	307.97	83.25	CY HE
169.674	47.00	187.00	303.72	83.66	HE CL
170.097	54.00	178.00	117.74	89.56	RF
171.311	36.00	146.00	271.48	79.00	NO
171.415	59.00	168.00	112.74	84.06	QZ HE
172.532	59.00	183.00	120.47	84.55	HE
174.123	50.00	155.00	283.16	89.20	HE
174.432	38.00	140.00	268.24	83.09	NO
175.287	39.00	343.00	192.91	13.67	CL CY HE
175.453	34.00	337.00	209.47	18.90	CL CY HE
175.518	33.00	330.00	207.96	24.80	HE
175.553	32.00	341.00	219.11	16.29	HE
175.602	62.00	171.00	114.66	81.31	QZ
175.644	56.00	175.00	116.12	87.48	QZ HE CY
176.215	41.00	170.00	291.22	77.96	HE
176.265	42.00	190.00	306.48	78.95	QZ HE
176.391	56.00	165.00	110.58	86.70	QZ
176.577	56.00	136.00	95.71	80.30	QZ HE
176.965	25.00	352.00	265.72	13.32	CL CY HE
176.981	45.00	181.00	299.64	81.43	HE
177.025	21.00	325.00	226.11	34.09	HE
177.408	44.00	196.00	310.48	81.72	HE
177.585	54.00	211.00	136.59	85.71	HE
177.685	39.00	341.00	193.42	15.22	CL CY HE
177.791	22.00	325.00	224.62	33.53	CY CL HE
178.098	46.00	351.00	151.28	11.71	CY HE CL
178.473	45.00	350.00	157.20	11.43	HE
178.692	58.00	334.00	149.09	27.53	HE SL
178.763	50.00	354.00	134.75	14.25	HE CL CY
178.820	44.00	335.00	179.43	20.44	CY CL HE
178.895	49.00	335.00	166.39	22.10	HE
178.926	45.00	339.00	173.97	18.01	HE
180.948	23.00	326.00	224.00	32.21	CL CY HE

UPPER CONTACT ORIENTATION DATA
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LOCATION	ALPHA	BETA	DIP DIRECTION	DIP	TYPE
1.591	38.00	100.00	100.00	38.00	SP
1.743	46.00	70.00	70.00	46.00	SP
3.417	68.00	210.00	130.20	73.18	SP
4.276	74.00	225.00	131.28	65.55	SP
4.839	64.00	225.00	137.78	73.49	SP
9.175	72.00	335.00	131.22	37.81	DP
10.499	50.00	120.00	84.33	78.69	SP
10.948	50.00	170.00	292.50	86.87	SP
12.235	40.00	165.00	287.21	77.65	SP
12.290	38.00	160.00	282.84	76.68	SP
13.726	49.00	170.00	292.36	85.88	SP
13.824	43.00	180.00	298.92	79.42	SP
24.105	55.00	10.00	101.82	19.80	DP
25.015	54.00	242.00	151.41	75.03	DI
25.312	75.00	346.00	124.61	39.14	DP
26.265	55.00	175.00	116.05	88.48	DP
37.705	70.00	320.00	139.02	39.76	DI
44.984	58.00	48.00	79.07	37.93	DP
47.748	80.00	152.00	113.65	62.53	SI
48.307	85.00	145.00	115.53	57.72	SI
48.427	74.00	125.00	104.33	63.67	SI
48.726	42.00	41.00	51.77	31.94	SU
51.258	78.00	15.00	114.31	42.07	SI
51.534	76.00	240.00	132.73	61.40	SI
51.913	39.00	130.00	262.37	88.38	SP
51.950	36.00	160.00	282.25	74.77	SP
52.102	50.00	245.00	155.76	76.34	SP
52.390	47.00	295.00	174.89	48.23	SP
53.271	50.00	80.00	69.91	57.00	SI
53.696	41.00	200.00	314.14	79.56	SC
53.868	46.00	175.00	295.42	82.54	SU
57.228	69.00	355.00	122.23	32.70	SP
59.738	67.00	350.00	126.46	31.11	DP
67.795	62.00	75.00	83.53	51.54	SI
70.651	86.00	0.00	118.92	49.58	DI
73.226	45.00	200.00	313.01	83.40	SP
73.323	48.00	200.00	312.18	86.29	SC
73.527	55.00	220.00	140.76	82.37	SC
76.708	56.00	250.00	152.86	70.23	SC
83.821	61.00	30.00	90.00	31.01	SC
89.227	64.00	0.00	118.92	27.58	DP
94.420	55.00	340.00	148.97	23.07	SP
100.667	45.00	190.00	190.00	45.00	SP
100.684	43.00	188.00	188.00	43.00	SP
104.897	46.00	358.00	127.20	9.70	DP
105.145	45.00	20.00	64.73	17.35	SP
105.396	38.00	123.00	77.54	88.84	OI
105.412	41.00	141.00	270.00	85.27	SC
107.669	56.00	105.00	83.27	67.93	SP
107.700	44.00	88.00	66.04	64.37	SU

LOCATION	ALPHA	BETA	DIP DIRECTION	DIP	TYPE
108.035	31.00	356.00	270.00	6.36	SP
112.506	4.00	103.00	219.94	82.00	SI
113.612	47.00	96.00	71.85	67.86	SI
115.851	48.00	10.00	90.00	13.72	SP
117.585	69.00	252.00	141.56	62.28	DU
118.295	41.00	30.00	49.26	23.73	SP
123.376	73.00	115.00	101.47	62.07	SI
123.488	58.00	57.00	77.91	42.63	DP
124.338	51.00	83.00	71.79	58.46	SI
124.445	54.00	6.00	107.49	18.07	SC
135.490	65.00	26.00	98.73	32.46	SI
135.621	76.00	200.00	124.08	66.85	SI
136.002	68.00	20.00	105.50	33.52	SP
136.365	58.00	210.00	134.43	82.29	SP
137.255	52.00	260.00	159.92	67.55	SI
143.941	42.00	20.00	20.00	42.00	SP
144.004	43.00	20.00	20.00	43.00	SP
146.555	50.00	180.00	180.00	50.00	SP
146.962	58.00	220.00	220.00	58.00	SP
148.357	46.00	65.00	61.64	48.45	SU
151.196	52.00	95.00	76.28	64.87	SC
154.242	69.00	18.00	107.51	34.05	SU
155.890	28.00	12.00	352.59	13.17	SP
169.369	57.00	320.00	158.26	33.52	DP
170.680	45.00	25.00	61.17	20.69	SP
173.778	40.00	0.00	118.92	3.58	SC
176.987	35.00	355.00	226.73	4.30	SP
177.186	16.00	312.00	221.55	47.06	SI
179.825	55.00	290.00	163.72	49.90	SP
184.162	48.00	300.00	174.35	44.73	SP
187.394	52.00	160.00	106.76	89.87	SP
187.456	63.00	165.00	112.06	79.86	SP

LOWER CONTACT ORIENTATION DATA
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LOCATION	ALPHA	BETA	DIP DIRECTION	DIP	TYPE
0.000	38.00	100.00	100.00	38.00	SP
1.591	46.00	70.00	70.00	46.00	SP
1.743	68.00	210.00	210.00	68.00	SP
3.417	74.00	225.00	131.28	65.55	SP
4.276	64.00	225.00	137.78	73.49	SP
4.839	72.00	335.00	131.22	37.81	DP
9.175	50.00	120.00	84.33	78.69	SP
10.499	50.00	170.00	292.50	86.87	SP
10.948	40.00	165.00	287.21	77.65	SP
12.235	38.00	160.00	282.84	76.68	SP
12.290	49.00	170.00	292.36	85.88	SP
13.726	43.00	180.00	298.92	79.42	SP
13.824	55.00	10.00	101.82	19.80	DP
24.105	54.00	242.00	151.41	75.03	DI
25.015	75.00	346.00	124.61	39.14	DP
25.312	55.00	175.00	116.05	88.48	DP
26.265	70.00	320.00	139.02	39.76	DI
37.705	58.00	48.00	79.07	37.93	DP
44.984	80.00	152.00	113.65	62.53	SI
47.748	85.00	145.00	115.53	57.72	SI
48.307	74.00	125.00	104.33	63.67	SI
48.427	42.00	41.00	51.77	31.94	SU
48.726	78.00	15.00	114.31	42.07	SI
51.258	76.00	240.00	132.73	61.40	SI
51.534	39.00	130.00	262.37	88.38	SP
51.913	36.00	160.00	282.25	74.77	SP
51.950	50.00	245.00	155.76	76.34	SP
52.102	47.00	295.00	174.89	48.23	SP
52.390	50.00	80.00	69.91	57.00	SI
53.271	41.00	200.00	314.14	79.56	SC
53.696	46.00	175.00	295.42	82.54	SU
53.868	69.00	355.00	122.23	32.70	SP
57.228	67.00	350.00	126.46	31.11	DP
59.738	62.00	75.00	83.53	51.54	DP
65.277	62.00	75.00	83.53	51.54	SI
67.795	86.00	0.00	118.92	49.58	DI
70.651	43.00	200.00	313.57	81.48	SP
73.226	48.00	200.00	312.18	86.29	SC
73.323	55.00	220.00	140.76	82.37	SC
73.527	56.00	250.00	152.86	70.23	SC
76.708	61.00	30.00	90.00	31.01	SC
83.821	64.00	0.00	118.92	27.58	DP
89.227	55.00	340.00	148.97	23.07	SP
94.420	45.00	190.00	306.04	81.92	SP
100.667	43.00	188.00	188.00	43.00	SP
100.684	46.00	358.00	358.00	46.00	DP
104.897	45.00	20.00	64.73	17.35	SP
105.145	38.00	123.00	77.54	88.84	OI
105.396	41.00	141.00	270.00	85.27	SC
105.412	56.00	105.00	83.27	67.93	SP

LOCATION	ALPHA	BETA	DIP	DIRECTION	DIP	TYPE
107.669	44.00	88.00	66.04		64.37	SU
107.700	31.00	356.00	270.00		6.36	SP
108.035	4.00	103.00	219.94		82.00	SI
112.506	47.00	96.00	71.85		67.86	SI
113.612	48.00	10.00	90.00		13.72	SP
115.851	69.00	252.00	141.56		62.28	DU
117.585	41.00	30.00	49.26		23.73	SP
118.295	73.00	115.00	101.47		62.07	SI
123.376	58.00	57.00	77.91		42.63	DP
123.488	51.00	83.00	71.79		58.46	SI
124.338	54.00	6.00	107.49		18.07	SC
124.445	65.00	26.00	98.73		32.46	SI
135.490	76.00	200.00	124.08		66.85	SI
135.621	68.00	20.00	105.50		33.52	SP
136.002	58.00	210.00	134.43		82.29	SP
136.365	52.00	260.00	159.92		67.55	SI
137.255	42.00	20.00	54.90		16.42	SP
143.941	43.00	20.00	20.00		43.00	SP
144.004	50.00	180.00	180.00		50.00	SP
146.555	58.00	220.00	220.00		58.00	SP
146.962	46.00	65.00	65.00		46.00	SU
148.357	52.00	95.00	76.28		64.87	SC
151.196	69.00	18.00	107.51		34.05	SU
154.242	28.00	12.00	352.59		13.17	SP
155.890	57.00	320.00	158.26		33.52	DP
169.369	45.00	25.00	61.17		20.69	SP
170.680	40.00	0.00	118.92		3.58	SC
173.778	35.00	355.00	226.73		4.30	SP
176.987	16.00	312.00	221.55		47.06	SI
177.186	55.00	290.00	163.72		49.90	SP
179.825	48.00	300.00	174.35		44.73	SP
184.162	52.00	160.00	106.76		89.87	SP
187.394	63.00	165.00	112.06		79.86	SP

FOLIATION ORIENTATION DATA
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LOCATION	ALPHA	BETA	DIP DIRECTION	DIP	TYPE
0.000	54.00	45.00	45.00	54.00	N2
1.743	59.00	170.00	170.00	59.00	N2
3.417	64.00	250.00	145.81	65.61	G2
4.839	72.00	315.00	137.89	42.23	N4
9.175	67.00	230.00	137.51	69.85	N4
10.948	63.00	200.00	128.01	79.30	G2
12.290	57.00	250.00	152.01	69.63	N4
24.105	23.00	310.00	211.91	44.92	G3
26.265	37.00	330.00	198.47	23.96	G2
37.705	53.00	340.00	152.77	21.69	G2
44.984	58.00	42.00	80.60	34.88	N4
57.228	54.00	290.00	165.01	50.05	N4
59.738	28.00	335.00	223.54	22.68	G1
65.277	39.00	355.00	174.29	4.72	G2
67.795	38.00	342.00	197.21	14.40	G2
73.527	49.00	250.00	158.70	74.48	N4
76.708	56.00	0.00	118.92	19.58	N4
89.227	47.00	280.00	171.27	58.03	N4
94.420	41.00	340.00	186.43	16.22	G2
100.684	51.00	161.00	161.00	51.00	G2
108.035	19.00	200.00	321.19	58.56	N2
118.295	25.00	25.00	7.85	24.23	N2
136.002	65.00	215.00	133.46	74.96	N4
170.680	35.00	260.00	174.83	76.93	N4
173.778	40.00	300.00	185.32	46.38	N4
179.825	28.00	322.00	212.64	33.01	N4
187.456	33.00	282.00	186.72	62.38	G2

LINEATION ORIENTATION DATA
101-013-HG4

LOCATION	ALPHA	BETA	GAMMA	TREND	PLUNGE	TYPE
44.298	68.00	175.00	70.00	200.16	24.72	4
44.337	67.00	170.00	98.00	25.01	0.40	4
108.189	50.00	350.00	10.00	118.92	14.01	1
109.232	56.00	310.00	165.00	249.46	2.24	1
109.263	50.00	295.00	170.00	249.20	12.57	1
109.607	57.00	325.00	20.00	105.25	20.75	1
109.638	63.00	320.00	20.00	98.99	25.19	1
113.864	63.00	290.00	145.00	219.60	24.89	1
115.939	72.00	335.00	165.00	76.66	24.23	1
115.981	60.00	15.00	170.00	123.67	23.79	4
141.488	41.00	5.00	165.00	112.22	5.10	1
141.548	47.00	345.00	163.00	95.46	6.56	1
142.248	66.00	15.00	175.00	129.37	28.93	1
164.195	60.00	195.00	62.00	213.88	19.27	4
175.287	39.00	343.00	130.00	252.33	7.06	3
180.948	23.00	326.00	133.00	263.44	25.95	1