

**GRID:** 22+700W

**HOLE:** NO 4

**COORDINATES:** 10+230N

**ANGLE:** -90°

**DEPTH:** 230 FEET

**FROM**

**TO**

**DESCRIPTIONS**

**0'**

**61'**

**OVBN**

Approximately 40'-61': Dark gray to black - very carbonaceous.

**61'**

**69'**

**FINE TO COARSE QUARTZ BRECCIA**

61'-62' : Clay altered fine sand matrix with darker sections. Disseminated pyrite to 1/2%.

62'-63 1/4' : Silicified sandy, gray-black breccia clast with pyrite flooding as 1 cm x 4cm. irregular edged replacements. Clasts are of sub-angular to rounded quartz and unidentified fine black-banded fragments. Also within this section is noted a 6 inch fragment of silicified black silty material with green chlorite fractures.

66' : A 10cm. section of medium to coarse grained quartz breccia, with 1/2cm. and less sub-angular fragments of white quartz, unidentified black clasts and approximately 40% by volume of light coloured tuffaceous volcanics. Minor quartz calcite veinlets plus fine pyrite replacement within selective clasts also within this section.

66'-69' : Carbonaceous, clay rich sandy material.

**69'**

**74'**

**TUFF?**

Very clay rich, only 3% recovery. Fine grained gray sandy matrix with thin approximately 2mm. acicular crystals throughout. The crystals have ragged looking ends. Are these crystal shards resulting from air fall?

**74'**

**76'**

**EQUIGRANULAR CLASTIC QUARTZ**

Clasts are generally 1-2mm. and well crystallized together, having the appearance of an igneous intrusive at first glance. Lath like black clasts have a preferred orientation in places.

**76'**

**81'**

**TUFF?**

Identified as 69'-74'.

Observations: a) Scattered 1mm. spherical amygdules.

b) Brittle core - breaks into small sections in removal from core tube.

c) Fine pyrite throughout.

d) Rare pyrite, biotite-chlorite masses.

81'                      83'                      EQUIGRANULAR CLASTIC QUARTZ

As 74'-76': Silicified.

83'                      90'                      TUFF?

As Above.

84': Scattered quartz-calcite veinlets and silicification.

85'-90': Occasional parallel lineaments varying from 1-10cm. of fine fragmented quartz.

90'                      108'                      COARSE TO FINE GRAINED QUARTZ BRECCIA

Sub-angular to rounded clast supported material varying from < 1cm.-6cm. Fragments consist of 50% white quartz, 40% dark, finely banded and 5% of a green hue. Generally, contacts between the coarse and more sandy breccia are abrupt, often separated by shearing.

100½': section of fine cubic pyrite.

108'                      112½'                      CARBONACEOUS (SILTSTONE)?

Perhaps a result of attrition due to shearing and focused fluid flow.

112½'                      129'                      COARSE QUARTZ BRECCIA (CLAST SUPPORTED)

60% sub angular to rounded white quartz.

10% rounded green-micaceous quartz.

30% siliceous, elongate, finely banded and carbonaceous.

122': A minor, fragmented discontinuous quartz veinlet.

129'                      131'                      TUFF?

As above.

129': Short section of massive fine pyrite. Uncommon core angle contact with preceding unit at 90°. Abundant fractures in section consist of a greasy white clay.

131': Contact at 131' is 90° to core angle, with quartz fragments incorporated from the underlying unit.

**131'                      149½'**                      COARSE TO FINE GRAINED QUARTZ BRECCIA

Similar to 90'-108': Silicified.

140': Carbonaceous shear zone @ 17° to core angle. Transition between the separate breccias is often gradational, but there are also abrupt changes.

**149½'                      152½'**                      CARBONACEOUS VOLCANICLASTIC

Carbonaceous fine grain clay matrix incorporating 1-3mm. quartz and tuffaceous appearing volcanics.

150': Shear @ 17° to c.a.

151': Shear @ 30° to c.a.

**152½'                      155½'**                      COARSE QUARTZ BRECCIA (CLAST SUPPORTED)

As 112½'-129'.

**155½'                      158½'**                      BANDED SEDIMENT?

Alternating ½-¼cm. bands of carbonaceous and fine brown sandy material, ending in a 16cm. segment of well indurated sand.

**158½'                      176'**                      CARBONACEOUS FAULT ZONE

158½': 40° shearing core angle.

158½'-165': Carbonaceous, highly crushed clay rich matrix incorporating clasts of a fine gray quartz. approximately 10% of these clasts are finely stockwork veined. Total pyrite at approximately ½% throughout section, occurring both as pyrite clasts or replacing the fine quartz clasts noted.

**176'                      192½'**                      *CARBONACEOUS CLAY RICH QUARTZ BRECCIA*

Gravel like white-gray to green quartz fragments comprise 90% of section. Clay accounts for 20%. Brecciated short vein section forms are often strung out in an irregular banded manner, at times bound by thin carbonaceous clay layers. Much of this section has been healed by subsequent quartz flooding.

179½': 80% to c.a. black clay seam bound by fine cubic pyrite.

190'-192½': Fault zone. Quartz fragment size decreases from 190'-192½', most likely due to greater attrition. Carbon presence also increases.

**192½'                      201'**                      *CARBONACEOUS MUDSTONE*

20° to c.a. fracture pattern.

5% of section features thin vein stockworks.

194': Chlorite bearing features over 10cm. - minor veinlets.

**201'                      208'**                      *COARSE SANDSTONE*

40° fracture planes. Abundant sericite throughout. Minor quartz-calcite stockwork.

204': 7cm. of intense brecciation hosting 3cm. quartz-calcite veined clasts. Minor silicification.

**208'                      211'**                      *CARBONACEOUS FINE MATRIX BRECCIA*

Fault: Large 6cm. angular to semi-rounded white quartz, clasts occur scattered within a fine, carbonaceous silica-clay matrix. Silicification is general. Shearing appears at approximately 40° to c.a.

**211'                      230'**                      *CARBONACEOUS QUARTZ BRECCIA*

Brecciated throughout in varying intensity, resulting in a fine to coarse grained quartz breccia, primarily composed of sub-rounded to angular gravelly quartz. Dispersed throughout are visibly crushed white quartz masses that have been strung out to some degree. Between 211'-214', one of these features continues for 10cm., associated with fine pyrite to 4%.

223'-224': Brecciated quartz veining with clay alteration enveloping the fragments.

225½'-229': To 4cm. quartz veined clasts in a gritty clay matrix.

229'-230': A rapid fining of quartz fragments within the clay matrix.

The nature of the core and associated alteration created unmanageable sanding problems. We do not have the ability to case to this depth, or reduce.