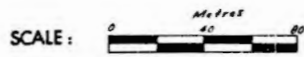




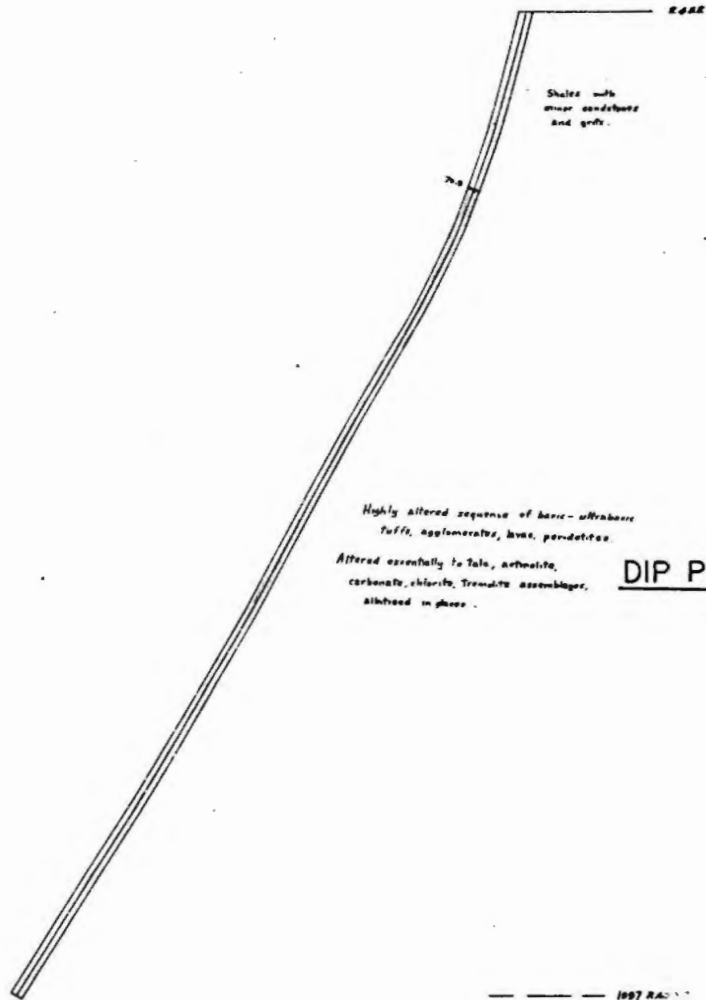
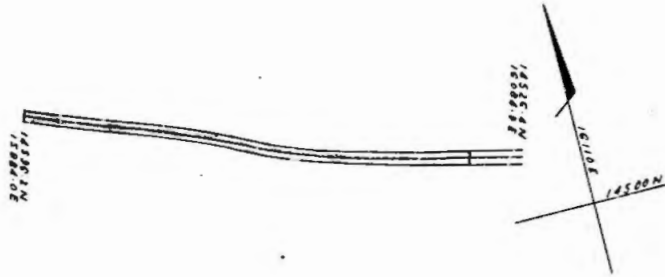
HOLE No. : S453



RENISON LIMITED  
DIAMOND DRILL HOLE PLOT

WPP 3441

PLAN



DIP PROFILE







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HOLE No. :

SCALE:

C.M.S. PETROLOGICAL REPORT 77/10/21

5453

38.0m This is a laminated intercalation of carbonaceous silty shale, argillaceous siltstone and fine sandy siltstone. The rock is layered on a millimetric scale, with locally weakly graded planar to weakly lenticular bedding. Clastic components comprise extensively degraded feldspar particles and rock fragments (shale ?volcanics) with slightly subordinate quartz and minor white mica flakes. The matrix is argillaceous material (?kaolin) pervasively stained with carbonaceous matter and poorly resolved against the similarly altered clastic particles.

Incipient recrystallisation reflects load or burial metamorphic conditions with a very weak slaty cleavage intersecting bedding at a low angle. There are no tangible metasomatic alteration effects. Fine grained pyrite is sparsely disseminated throughout, tends to be concentrated in the coarser bands and is partly framboidal.

59.0m This is a carbonaceous pyritic lithic sandstone in faulted Contact with a carbonaceous silty shale.

The sandstone is poorly sized in the fine to medium sand range and locally grades into a finer (silty fine) sandstone. Framework components, apart from rare clastic grains comprise almost entirely chert (pure, argillaceous and carbonaceous varieties) and subordinate kaolinitic, variably carbonaceous argillite clasts. There are thinly dispersed clasts of carbonaceous quartzose siltstone and a few clasts of microfelsitic ?militite.

The matrix consists of cherty microcrystalline quartz weakly stained with kaolin, sericite and weakly but more or less pervasively with carbonaceous material. The adjacent silty shale is closely similar to that at 38m., with the faulted contact cutting bedding (in both rocks) almost at right angles and healed with films of carbonaceous matter.

Both rocks are variably pyritic. The sulphide is generally fine grained and is partly framboidal.

72.9m This is a weakly sheared chlorite-talc-carbonate rock clearly an altered ultramafic and reasonably interpreted on relict textural grounds as originally a lithic crystal tuff.

The rock has a distinct lithic-fragmental fabric enhanced by sporadic discrete bastite-like chlorite pseudomorphs of pyroxene crystals. Recognisable clasts are very poorly sized and generally show relict slaggy or spinifex-type microtextures. These and thinly disseminated particles of chromite (either discrete or included in the clasts) confirm the primary ultramafic nature of the rock.

Coarse subequant and ovoid grains of carbonate (?magnesite) are disseminated throughout the rock. These features are pre-tectonic and have the appearance of recrystallised nodules. This tends to be confirmed by thinly disseminated sheared carbonate veinlets.

75.6m This is an altered and weakly sheared, tuff similar and closely related to that at 72.9m. It consists mainly of altered (steatitised, sericitised, carbonated, locally silicified) rock fragments within a weakly schistose matrix of similar composition. Clasts are very poorly sorted and many are featureless in terms of primary rock type. However, others show relict slaggy, porphyritic and/or vesicular textures. Many include sub- to euhedral chromite grains, even the more siliceous types, and chromite also occurs as discrete particles.

This rock appears to have contained shards although these features are now altered virtually beyond recognition. Carbonate pseudomorphed indeterminate crystal fragments occur sporadically.

The rock is weakly impregnated with pyrite. Carbonate was introduced along irregular pre-tectonic veins.

83.1m This is a weakly schistose extremely fine grained talc rock with patchy weakly Fe-stained carbonate in disseminated aggregates and stressed semi-continuous veins and accessory to trace amounts of quartz and colorless Mg-chlorite.

The rock shows a vague but semi-pervasive relict fragmental fabric essentially similar to that at 72.9m. As previously the clasts are poorly sorted. Poorly preserved fabrics are mainly finely porphyritic and/or vesicular with subordinate granular types. There are occasional steatitised bastite-like pseudomorphs of coarse crystals/crystal fragments (evidently pyroxene originally) and locally poorly preserved shard-like features.

Chromite and chromiferous magnetite are sparsely disseminated throughout the rock and again, these features reinforce interpretation as an altered ultramafic tuff. Minor traces of pyrite are associated with the carbonate veins and aggregates.

98.2m This is a weakly schistose talc-carbonate rock. Talc is extremely fine grained, incipiently orientated and forms semi-massive aggregates enclosing frequent single grains and semi-lustre mottled aggregates of weakly Fe-stained carbonate. These features are weakly layered with respect to sizing and relative abundance and show irregular (but generally equant to subspherical shapes). These are accompanied in places by similarly shaped but relative fine aggregates and single grains of quartz or rarely albite.

This rock is devoid of tangible fragmental textures. The carbonate (and quartz, albite) grains and aggregates appear to represent amygdaloids. Traces of chromite are present. A faint fine scale banding is evident locally. Overall the rock is best interpreted as primarily a strongly vesicular aphyric (?glassy) ultramafic lava.

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Very fine particles of Fe-sulphide are thinly disseminated throughout. Ni-assays may be warranted.

131.8m This is an incipiently schistose talc-carbonate rock with frequent irregular to crudely vein-like fine grained aggregates of albite with subordinate to minor quartz. Talcose areas of the rock show a vague but nonetheless definite lithic fragmental fabric and tend to show irregular contacts the carbonate and albite aggregates. General features suggest the rock was initially a scoriaceous lithic tuff with carbonate and albite introduced largely as cavity fillings but to some extent in discontinuous veins prior to alteration (talc) and incipient regional metamorphism.

Carbonate is weakly Fe-stained (?Fe-magnesite) and locally porcellanous but generally microgranular. In places porcellanous carbonate shows vague colloform microstructures. The rock shows sparse disseminations of pyrrhotite in addition to more or less evenly disseminated fine grained chromiferous magnetite.

143.0m This is an incipiently sheared talc rock representing an altered coarsely spinifex-textured ultramafic.

Talc forms semi-massive aggregates showing frequent pseudomorphs (mean 50 $\mu$ ) of random to felted bladed crystals. These features outline a typical slaggy (or spinifex) fabric. Primary composition is obscure but there is some evidence that talc has replaced an amphibole (?tremolite-actinolite) in which case a clinopyroxene is the most likely primary phase.

Disseminated bastite-like aggregates (to 1mm) of Mg-chlorite, partly replaced by talc, represent pyroxene, phenocrysts. In addition there are fairly frequent subsequent aggregates of quartz and albite with the appearance of amygdalae (the grey-white spots, hand specimen).

The rock carries accessory fine grained chromiferous magnetite and minor ultrafine sulphide particles. Irregular chlorite veins occur sporadically and there is some evidence of brecciation locally.

294.4m This is partly steatitised serpentinite derived from a coarse grained poikilitic-textured peridotite.

Mineralogy comprises mainly random talc with slightly subordinate relict (i.e. unsteatitised) serpentine, and accessory amounts of tremolite primary chromiferous magnetite, finer secondary ("exsolved") magnetite and minor traces of phlogopite. Pseudomorphous structures are well developed and the rock clearly consisted of coarse poikilitic "phenocrysts" of pyroxene (olivine inclusions) disseminated throughout more even grained granular pyroxene and olivine intergrowths. General paucity of tremolite (and carbonate) suggest the pyroxene was an orthorhombic variety (harzburgite-peridotite).

There are no detectable sulphides.

349.5m This is an altered and incipiently sheared ultramafic lithic tuff essentially similar to the previous examples.

The rock consists largely of incipiently orientated talc with minor associated chlorite, minor traces of tremolite-actinolite and thinly disseminated grains of chromite and chromiferous magnetite. The relict fabric is relatively distinct and comprises fairly closely packed rock fragments poorly sorted and showing generally angular to subangular shapes. Sizing is typical of this suite of altered pyroclastics with individual particles ranging from approximately 500 $\mu$  to around 5 mm.

The clasts are recognisable as porphyritic and vesicular types with subordinate slaggy textured and probably some glassy varieties. Pheno-crystal shape is generally non-diagnostic but where recognisable, invariably pyroxene-types. This feature and the semi-ubiquitous chromiferous opaque confirm the ultramafic primary composition.

This rock contained thinly dispersed shards and crystal fragments. There are no detectable sulphides.

356.0m This is a talc-tremolite rock with accessory quartz and a little Ca-feldspar now extensively replaced by the pale green tremolite-actinolite. The rock is fairly fine grained with scaly talc developing largely by replacement of the amphibole.

The fabric indicates this rock was primarily a crystal tuff composed largely of moderately well sorted (mean 300 $\mu$ ) ferromagnesian crystal fragments (now tremolite-actinolite, presumed pyroxene initially) with a subordinate component of clastic feldspar. Thus inferred composition is picritic.

There are occasional indeterminate altered lithic clasts. Accessory fine grained chromiferous opaques are disseminated throughout and there are minor traces of ultrafine grained sulphide.

360.2m This is a talc-tremolite-quartz-albite rock clearly recognisable as originally a highly vesicular, weakly porphyritic slaggy textured lava.

Abundant subspherical amygdalae (to 3.5mm) appear as grey-white spots in hand specimen and consist mainly of granular to subradiating quartz with subordinate similarly textured albite and patchy talc (after ?carbonate in part). These features are more or less evenly disseminated throughout the rock which consists largely of semi-fibrous tremolite actinolite pseudomorphing a well developed rather fine scale slaggy fabric and in places phenocrystal grains of pyroxene. General features are thus rather similar to the coarser grained and less strongly amygdaloidal rock at 143.m.

Minor accessory traces of relict primary chromiferous spinel are present. Rare particles of fine grained secondary magnetite and ultrafine sulphide particles are associated with the amygdalae.

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379.0m This is a tremolite-chlorite-carbonate rock with accessory quartz thinly disseminated chromiferous opaques and traces of talc. Amphibole is a weakly green variety (tremolite-actinolite) partly replaced by carbonate (calcite-dolomite) or locally talc. In places quartz and tremolite form vague semi-pseudomorphs of feldspar and chlorite in part represents altered pyroxene.

Overall the fabric is relatively non-diagnostic. However, the rock appears to have been a weakly porphyritic medium-grained probably minor intrusive picritic type. Irregular vein-like masses of carbonate and relatively pale (tremolite) amphibole occur sporadically. Extremely rare very fine sulphide particles are present.

394.6m This is an altered vesicular lava of basic rather than ultramafic affinities.

The rock consists largely of random slightly feldted subacicular albitised feldspar laths (mean 15 $\mu$  diameter) with microgranular interstitial quartz-feldspathic material. More or less pervasively stained with chlorite. Sparsely disseminated patches of tremolite-actinolite (partly replaced by carbonate) appear to represent phenocrystal laths and subophitic patches of pyroxene. Small (typically 500 $\mu$ ) amygdaloids of quartz chlorite actinolite and carbonate are evenly disseminated throughout. The rock has a weakly slaggy fabric indicating fairly rapid cooling. It carries ultrafine accessory magnetite.

There are occasional quartz-chlorite veins. Spongy aggregates of pyrite (+ pyrrhotite, occasional blebs of chalcopyrite) are disseminated throughout these features and the amygdaloids. Virtually identical rocks have been seen from the Heazlewood Creek complex.

397.6m This is a generally fine grained chlorite-carbonate rock with accessory quartz, disseminated sulphides and traces of sphene. Chlorite largely represents altered tremolite which persists locally as relics. Relict textural features are vague but the rock appears to have been a fine grained somewhat slaggy textured basic to ultrabasic type partly by analogy with the associated specimens.

Crude veins of carbonate (calcite-dolomite) with accessory poikilitic quartz and patchy tremolite occur sporadically. These features include patches of pyrrhotite and chalcopyrite. In contrast the host rock is only incipiently mineralised.

435.0m This is a metasomatised coarse grained agglomerate or breccia (the distinction is tenuous due to small specimen size).

The sectioned area includes portion of four angular clasts cemented and partly replaced by fine grained random actinolite. One clast consists of heavily altered fine to medium grained incipiently porphyritic basic rock tentatively identified as a microgabro on the basis of the incipiently ophitic-like relict fabric. The coarsest fragment (approx. 3 cm diameter) is a quartz-actinolite rock representing a heavily metasomatised chert. The remaining two clasts are vaguely recognisable as heavily altered (silicified, actinolitised) fine to medium grained poorly sorted labile greywacke-like sediments.

Thus this rock cannot be closely correlated with the adjacent metabasites. Overall it appears to be a sedimentary breccia (agglomerate) but finer details have been obliterated by metasomatic effects.

Accessory traces of carbonate sphene magnetite and zircon are present. There are no detectable sulphides.

451m For want of better term this rock is best termed a metasomatised cherty spilite. It consists of irregular to ovoid clasts of chert and altered basic lava (texturally and compositionally similar to for example 394.6m) cemented by chert. Some of the variably altered lava clasts (to 1 cm +) show thin selvages suggestive of chilled margins and these features are corroded to varying degrees by the chert matrix. Overall the rock has the appearance of a pillow lava albeit on a rather fine scale.

The rock is variably altered to fine grained actinolite in irregular aggregates and veins. Secondary quartz and carbonate are common in places and there is patchy development of semi-vermiform aggregates of prehnite. Accessory traces of sphene are present and more heavily altered areas are variably impregnated with disseminations of pyrrhotite and chalcopyrite.

465.8m This is a complex rock but recognisable as a heavily altered "basalt".

Marginal portions of the area sectioned consists of random feldted subacicular albite microlaths with interstitial quartz-feldspathic material interspersed with fine grained rather patchy pale actinolite. These areas are similar to the basalts at 394.6m and 451m although in contrast are non-amygdaloidal.

Elsewhere the rock consists largely of coarse poikilitic anhedral quartz enclosing fine lath-like grains of albite and actinolite (texturally similar to the above) and studded throughout with coarse grained green brown weakly color-zoned tourmaline. The schorl is poikilitic with inclusions of actinolite and rarely albite. Texturally both quartz and tourmaline postdate the albite-actinolite alteration assemblage.

Minor accessory sphene and relict primary fine grained magnetite are present. There are no detectable sulphides.

467.0m This is an albite-actinolite rock representing an altered basalt with some similarities to those at 394.6m, 451m and 465.8m.

Generally the rock consists of random feldted to weakly (flow-) orientated albitised feldspar microlaths (mean 15-20 $\mu$ ) with interstitial fine grained actinolite and subordinate to minor quartz-feldspathic material. Elsewhere fine grained actinolite forms semi-massive aggregates enclosing corroded feldspar microlaths.

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Actinolite was introduced, partly at least, along irregular veins which carry sparse disseminations of pyrrhotite and chalcopyrite. Textural relationships suggest, that at least in this case, the actinolite postdates albitisation.

The rock is non-amygdaloidal. It carries minor accessory sphene and relict primary very fine grained magnetite.

476.2m This is an albitised and actinolitised basalt similar to the previous examples.

This rock was slightly coarser grained and has a more distinctly slaggy fabric. It was also incipiently porphyritic and weakly vesicular. Albitised feldspar microlaths have a mean diameter of about 20-25 $\mu$  and phenocrysts about 120 $\mu$ . Actinolite laths, disseminated throughout the rock, represent uranitized pyroxene laths. The thinly dispersed actinolite amygdales are sized to 3 mm and locally contain granular albite at the cores.

This rock contains sparse pyrite disseminations and traces of pyrrhotite partly associated with the amygdales and with sporadic actinolite veinlets. Ultrafine magnetite, characteristic of these altered basalts, is sparsely disseminated throughout.



