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RICHTER LITHO STUDY

During the course of mapping on the Richter property in 1989, a total of   samples were collected for whole rock analysis. These samples represent all observed lithologies and alteration types seen on the property. The samples were collected during regional mapping of the property, as well as during more detailed mapping programs on the Ridge and Testalinden grids, and in the Ridge Grid ????? trenches. Appendix 1 lists the results of all the litho samples collected. In this listing the samples have been classed into rock and alteration type (in numeric codes), the legend for which is found within the appendix.

Where possible the rock type is taken from field notes. In many cases, however, no identification was made in the field and the rock type has been determined by comparison with known rock chemistrys combined with descriptions contained in the field notes. Average rock compositions have been determined by plotting histograms for each element for all known unaltered samples of a particular rock type. Samples falling clearly outside the normal distribution for any element have been removed from this data set and reclassified as a different rock type. Some difficulty arises when the data set for a particular rock type is very small, or when there is a wide range in the chemistry of that rock type. ~~This was found to be the case with the Kobau Group phyllites.~~

Using the above procedure, the field classification has been modified, in one case adding a previously unrecognized rock type and in ~~one~~ another case removing a chemically indistinct ~~rock type~~ unit. These changes will be discussed in more detail later in the report. A similar process to that described above was used to assign alteration types to the litho samples.

As a result of the above study, eight different rock types have been recognized on the Richter property. The average composition for ~~the~~ each rock type ~~are~~ is shown in the following table. Individual rock types will be discussed in detail below.

KOBAU GROUP

QUARTZITE : The Kobau Group quartzite is typically a grey to green, fine to medium grained foliated rock. Chemically it is difficult to distinguish from the granodiorite of the Nelson Plutonic Suite. The distinction between unaltered varieties of these rocks should be relatively easy in the field. Subtle chemical variations include a slightly lower percent of Al_2O_3 and K_2O, and a slightly higher percent of SiO_2 in the quartzite.

PHYLLITE : The phyllite unit of the Kobau Group is commonly green in colour (varying shades), fine grained, strongly foliated, and chloritic. The composition of the phyllite varies considerably, as a result of changes in the original rock composition and because of the varying intensity of metamorphism. It may be difficult to identify these rocks based on chemisty alone, because of this and because of the similarity between these rocks and the gabbroic unit of the Nelson Plutonic Suite. Differences in the percent of Ba and S should allow this distinction. When either the gabbro or phyllite becomes altered significantly, it may be impossible to identify which represents the original host.

MARBLE : The Kobau Group marble is less widespread than either the quartzite or phyllite but where seen was white to pale grey in colour, fine grained, and crystalline. Chemically, these rocks are very distinctive, averaging about 20% in both CaO and SiO_2. There should be no difficulty identifying these rocks either in the field or by chemical analyses.

NELSON PLUTONIC SUITE

Three rock types, within the Nelson intrusives, are recognized on the property. Field mapping has suggested that these rock types belong to two separate intrusive events. During the first episode of intrusion, compositions ranged from dioritic to granodioritic. Field mapping identified a third, fine grained phase (classed as a monzonite), however this study has shown these rocks to be chemically indistinct from the granodiorite. It is believed that the "monzonite" is simply a finer grained version of the same intrusion. While the rocks belong to the same unit, it may be beneficial to identify the finer grained areas, since these may represent the borders of the intrusion. The second intrusive episode is characterized by more mafic intrusives of gabbroic composition.

GRANODIORITE : The granodiorite is typically fine to medium grained, with minor biotite and hornblende crystals visible. Commonly, the rocks are highly weathered. A finer grained, hornblende porphyritic version of the granodiorite is present. These rocks may represent border phases of the intrusion or may be related dykes. The average chemical composition of the granodiorite is given in the above table. As discussed above, the composition of the granodiorite and the Kobau Group quartzite is very similar. Distinctions are best made on the percentages of Al_2O_3, K_2O and SiO_2. When either of the two rocks becomes altered, identification of the original host by chemistry is not possible.

nearly identical have similar chemical comps to the coarse grained intrusives and are thought to.

DIORITE : The diorite has been interpreted from field mapping to be a phase of the above intrusion. Typically, these rocks are finer grained and fresher than the granodiorites, and may be hornblende porphyritic. They probably resulted from early fractionation from the same magma. Chemically they are distinct from the granodiorite and also from the later mafic intrusion. The attached histogram of CaO clearly shows the three rock types. On a plot of SiO_2, this distinction is not as clear, although the three intrusives have markedly different silica content. This could be partly due to the fact that there is a continual transition from granodiorite to diorite, but is probably largely due to the small data set and the biasing towards the granodiorite and gabbroic compositions due to a larger number of samples.

distinct populations; average silica content of the (see above table); reason this is poorly reflected in the histogram; fact that the; small; is; biased; of these rocks

The average percent of CaO compositions of each of the intrusions is shown on the histogram, and it can be seen that they correlate very well with the three populations of data.

GABBRO:

move after gabbro