671158

J.C. STEPHEN EXPLORATIONS LIMITED

QUEEN CHARLOTTE ISLANDS, BRITISH COLUMBIA

A PRELIMINARY EVALUATION

OF GOLD IN RESIDUAL SOILS

BY

S.A. AVERILL

OVERBURDEN DRILLING MANAGEMENT LIMITED

JUNE 10, 1980

Introduction

J.C. Stephen Explorations submitted to Overburden Drilling Management eight overburden samples from an area of the Queen Charlotte Islands known to be anomalous in gold. Overburden Drilling Management prepared heavy mineral (S.G. > 3.3) and mid-density (S.G. 2.8 - 3.3) concentrates from these samples to assist in isolating the contributing gold mineralization. Our concentrating procedures are summarized in Figure 1, and the weights of the various sample fractions are shown in Table 1. The approximate mineralogical compositions of the two types of concentrates are shown in Tables 2 and 3. A more detailed examination of the anomalous samples will be made on receipt of the analytical data.

Nature of the Overburden

The samples are of non-glacial residual soils and were collected near the soil/bedrock interface at sites where the soil depth ranged from 0.5 to 3 meters.

Samples 01 to 03 were collected from relatively thick soil sections in a topographically low area, and Samples 05 to 08 were obtained from thinner, sub-alpine soils on a high gabbro/diabase ridge. The soils are stony clays and sands. All of the clasts are leached, and in several samples the leaching is so severe that lithologies could not be determined (Table 4).

Mineralogy of the Concentrates

The heavy mineral suites of the residual soils are much simpler than those of glacial soils and appear to directly reflect the mineralogy of the underlying bedrock. Concentrates from the low-elevation soils consist primarily of olivine derived from an undetermined rock unit. Part of the olivine has been limonitized. Concentrates from the sub-alpine soils are enriched in a pale pink, grey or green, striated, crystal-forming mineral that has been tentatively identified as zoisite (epidote family). Minor minerals include ilmenite, which occurs as octahedral crystals, and pyrite which occurs as cubes that have been completely converted to secondary oxides.

The mid-density concentrates are mineralogically similar to the heavy mineral concentrates, consisting either of olivine (at low elevations) or of zoisite (at high elevations). Both of these minerals are of essentially the same specific gravity as the methylene iodide that was used to sink the heavy minerals and float the mid-density minerals. The mid-density concentrates contain the altered olivine and zoisite grains that have been partially converted to lighter clay minerals.

Common rock-forming mid-density minerals such as hornblende and carbonates are generally absent, reflecting their instability under the chemical weathering conditions that generated the residual soils. However, the altered zoisite does

react very slightly to dilute HCl, suggesting that the parent rock (assumed to be gabbro) has been carbonatized. Most of the samples contain low concentrations of blue-grey, blue-green, or blue-white amphibole, including some asbestiform tremolite.

Gold Content

Considerable free gold was noted on the shaking table while processing Sample 04, and one grain of gold was logged in the heavy mineral concentrate of Sample 08. On receipt of the analyses, other anomalous samples will be examined to determine whether free gold is present. It is expected that anomaly magnitude will be greatly influenced by concentrate size. For example, clayey samples such as 03 and 08 produced sensitive, undersized concentrates while the zoisite-rich concentrates from Samples 05 to 07 are oversized and are much less sensitive. For comparative purposes, therefore, the number of grains of gold per kilogram of sand/silt feed will be measured.

S. Averill

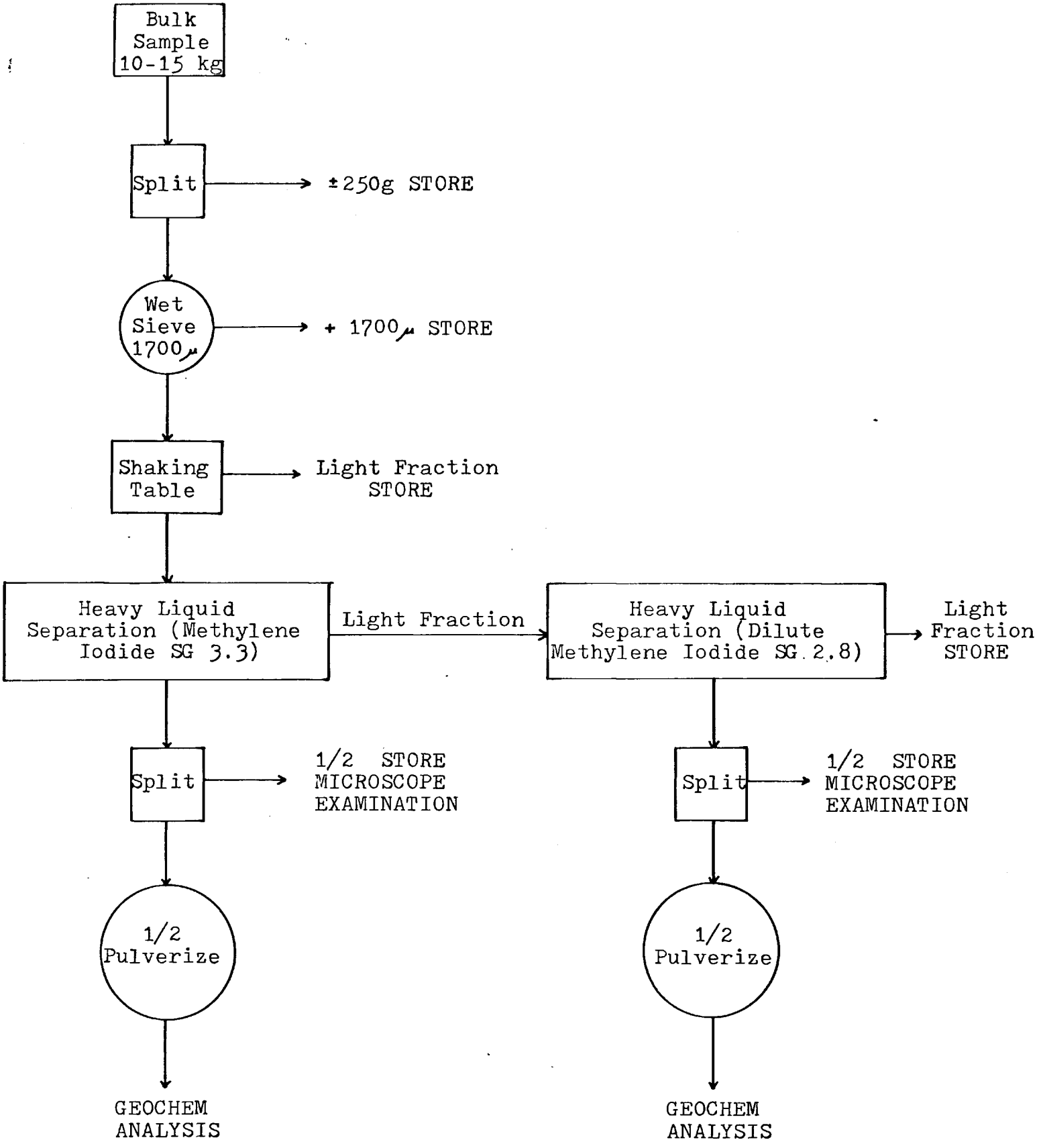

Fig. 1 - Sample processing flow sheet.

Sample No.	Weight (kg.) Whole Sample	Weight (kg.) +10 Mesh	Weight (g.) Table Conc.	Weight (g.) H.M. Conc.	Weight (g.) M.D. Conc.	Remarks
01	16.0	10.0	72.5	9.8	8.1	
02	15.4	9.0	70.25	9.3	7.5	
03	13.4	6.0	63.74	1.4	2.3	
04	13.0	5.9	156.4	13.3	7.2	5+ grains V.G.
05	9.9	3.4	126.8	47.1	7.9	
06	10.8	3.7	131.2	105.6	9.3	
07	12.9	7.2	142.2	73.7	36.0	Possible V.G.
08	4.1	2.0	73.6	0.6	1.0	Mainly clay, very little sand feed

Table 1 - Sample Weights

Sample No.	%garnet	%hematite	%sulphides	%ilmenite	%epidote	%pyroxene	%zircon group	Remarks
SBC-80-01-½H			<1	1				98 % olivine (⅓ limonitized)
								Sulphide is oxidized cubic pyrite
-02-½H		tr.	<1	3				95% olivine (⅓ limonitized)
-03-½H		tr.	1-2	3				95% olivine (⅓ limonitized)
-04-½H		tr.	0	5-8	90	<5		Epidote is mainly pale pink
								to grey zoisite, occurs
								as equant grains, sugary
								masses, and striated crystals;
								locally apple green. Unoxidized
-05-½H			0	5	90	<10		" " "
-06-½H				0.5	99			" " "
-07-½H				2-3	98			" " "
-08-½H		0.5	0.5	5-8	90			" " "
								with one grain gold 60μ

Table 2 - Mineralogy of heavy mineral concentrates.

Sample No.	Mineralogy
01 - 1/2 MD	>95% altered olivine
02 - 1/2 MD	80-90% altered olivine 10% hornblende
03 - 1/2 MD	95% altered olivine 3% tremolite
04 - 1/2 MD	90-95% altered zoisite 3-5% brown serpentine 1-2% tremolite
05 - 1/2 MD	90-95% altered zoisite 5% tremolite
06 - 1/2 MD	80% altered zoisite 10% blue-green amphibole 10% quartz (poor separation)
07 - 1/2 MD	70% altered zoisite 30% altered grey-blue amphibole
08 - 1/2 MD	80% altered zoisite 20% tremolite 1-2% mica books

Table 3 - Mineralogy of mid-density concentrates

Sample No.	Principal Clast Lithologies
01	Quartz-free rock, completely leached, unidentified.
02	Quartz-free rock, completely leached, unidentified.
03	Quartz-feldspar porphyry and dark, fine-grained argillite or tuff. Relatively fresh.
04	Quartz-free volcanic, gabbro.
05	Quartz-free volcanic, gabbro.
06	Quartz-free volcanic.
07	Hornblende gabbro.
08	Quartz-free volcanic.

Table 4 - Clast lithologies