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An Investigation of

THE RECOVERY OF GOLD

from Garrison Project samples

submitted by

JONPOL EXPLORATIONS

(per Kilborn Engineering)

Progress Report No. 1

Project No. L.R. 3922

NOTE:

This report refers to the samples as received.

LAKEFIELD RESEARCH
A DIVISION OF FALCONBRIDGE LIMITED
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INTRODUCTION

At the request of Mr. George Rawsthorne, Kilborn Ltd., a series of metallurgical tests was conducted with exploration drill samples from the Garrison Project of JONPOL Exploration Ltd.

The purpose of the program was to investigate the recovery of gold. A Bond Work Index was determined for the sample "1990 Compo.".

The results and direction of testing were discussed with Mr. G. Rawsthorne and Mr. P. Wilson during the course of the program.

LAKEFIELD RESEARCH

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SUMMARY

1. Head Analyses

Representative portions of the "1990 Compo." and "W-12 High As" composites were submitted for analysis. Table 1 summarizes the results of analyses and the calculated heads from tests.

Table 1 - Head Analyses

			1990 COMPO. Direct Assay	1990 COMPO. Calc. Assay	W-12 High As Direct Assay	W-12 High As Calc. Assay
Gold	Au	g/t	10.5	10.9	9.49	18.5
Silver	Ag	g/t	<2.0	-	<2.0	-
Sulphur	S(T)	%	2.39	2.28	2.93	2.81
Iron	Fe	%	7.38	-	8.51	-
Arsenic	As	%	0.39	0.38	1.13	1.13
Specific Gravity		g/cc	2.94	-	2.92	-

Representative portions of the composites were submitted for semi-quantitative spectrographic analyses. Table 2 summarizes the analyses.

Table 2 - Semi-Quantitative Spectrographic Analyses

Sample Description:	1990 COMPO.		W12- High As		
10-100	%	-	10-100	%	Si
3-30	%	Mg , Si ,Fe , Al ,Ca	3-30	%	Ca ,Mg
1-10	%	Na , K	1-10	%	K ,Fe ,Na
0.3-3	%	-	0.3-3	%	As ,Al
0.1-1	%	As ,Mn , V , Ti	0.1-1	%	Ti
0.03-0.3	%	Cr	0.03-0.3	%	W
0.01-0.1	%	W ,Ni ,Sr	0.01-0.1	%	Sr ,Cr
0.003-0.03	%	Ga ,Cu ,Zr	0.003-0.03	%	B ,Mn ,Ga ,V ,Zr ,Ni
0.001-0.01	%	B , Co	0.001-0.01		Au ,Pb ,Cu ,Co
0.0003-0.003	%	Au , Pb	0.0003-0.003	%	-
0.0001-0.001	%	-	0.0001-0.001	%	-
<0.003	%	Ag	<0.003	%	Ag
I			I		
S			S		

I- Interference prevents positive identification
S- Strong spectral lines , unable to estimate amount

Unless Specified above , the following were not detected at the approximate ppm lower limits of 0.5 Cu, Ag; 1 Mn; 5 Mg,Cr; 10 Be, Bi, Ca, Co, Ni,V; 25 Ge,Fe,Pb,Mo,Si,Sr,Sn,Ti,Zr,Tl,Pd,U,Th; 50 Al,Sb,Bi,Cd,Ga,Li,Zn; 100 As, Au,Ba,In,Na; 200 Nb,Ta,W,Rb,Pt; 300 P,Te,Y,Ce; 1000 K.

A portion of "1990 Compo." ground to a K_{80} of about 150 micrometers, in a laboratory ball mill, was screened on 65, 100, 150 and 200 mesh screens. The fractions were submitted for gold and arsenic assay. Table 3 presents the results.

Table 3 - Size Fraction Analysis : "1990 COMPO."

Target Grind K 80 : 100 Mesh

Mesh	Weight grams	Ind.Weight %	Assays Au g/t	Assays As %	% Dist. Au	% Dist. As
65	29.5	9.8	6.46	0.26	5.6	6.4
100	32.4	10.8	9.90	0.23	9.5	6.2
150	37.3	12.4	10.4	0.25	11.5	7.8
200	33.2	11.1	13.2	0.34	13.0	9.4
-200	167.6	55.9	12.2	0.50	60.5	70.1
Total	300.0	100.0	11.3	0.40	100.0	100.0

2. Bond Work Index

A Bond Work Index (Wi) was determined with the Ball Mill Grindability Test. The results were as follows:

Bond Work Index	(Imperial kWh/S.T.)	16.7
	(Metric kWh/t)	18.4
Classification size in micrometers		147
Product K_{80}, in micrometers		114
Feed K_{80}, in micrometers		1839

3. Cyanidation Testwork

Cyanidation testwork was conducted on the "1990 Compo." to investigate the effect of fine grinding. The concentration of dissolved arsenic was determined from selected test solutions.

Summary

3.1 Effect of Grind on Gold Recovery

The effect of grinding was investigated with four carbon-in-leach tests, Tests 5 to 8. Standard conditions were:

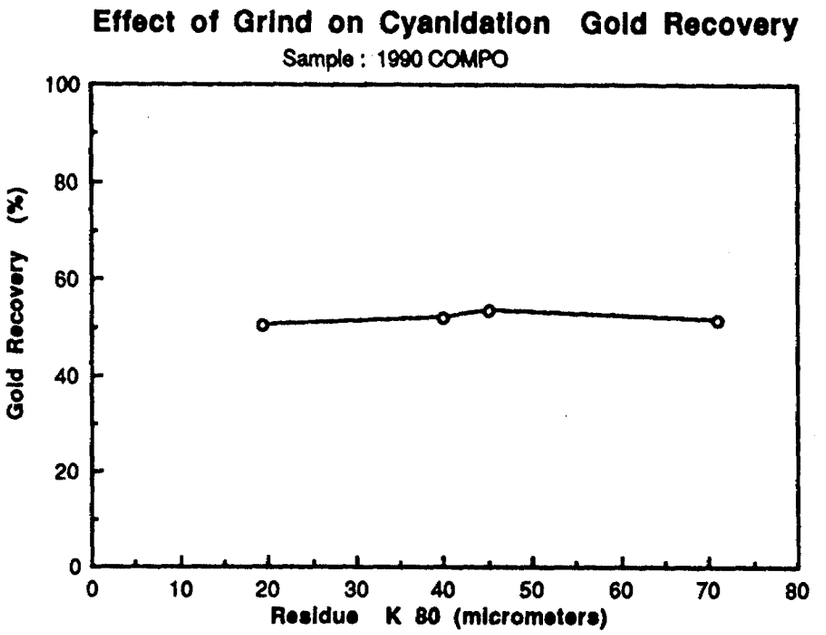
Carbon-in-leach Conditions:

Duration	-	72 hours
Carbon Concentration	-	15 g/L, based on solution volume
Carbon	-	GRC 22, preattritioned carbon
Solution Composition	-	pH 10.5-11
		NaCN 0.5 g/L
Density	-	33% solids

Gold recovery with solids ground to K_{80} - 71 micrometers, Test 5, was about 52% with 72 hours of carbon-in-leach. Finer grinding was not beneficial to leaching. About 50% recovery of the gold was achieved after 24 hours. Table 4 presents the results. Figure 1 shows the effect of grind K_{80} (micrometers) on gold recovery.

Table 4 - Summary of Grind Effect CIL Testwork , "1990 Compo."

Test No.	Res. Size Analysis K 80 micrometers	Reagent Cons. kg/t		% Extraction		72h Res. Assay Au ,g/t	Calc. Head Au ,g/t
		NaCN	CaO	24 h. Au	72 h. Au		
5	71	0.84	0.85	50.5	51.6	5.73	11.8
6	45	1.04	1.00	52.4	53.6	5.50	11.9
7	40	1.47	0.87	50.9	52.2	5.47	11.4
8	20	2.20	1.07	49.3	50.7	5.20	10.6



-Figure 1-

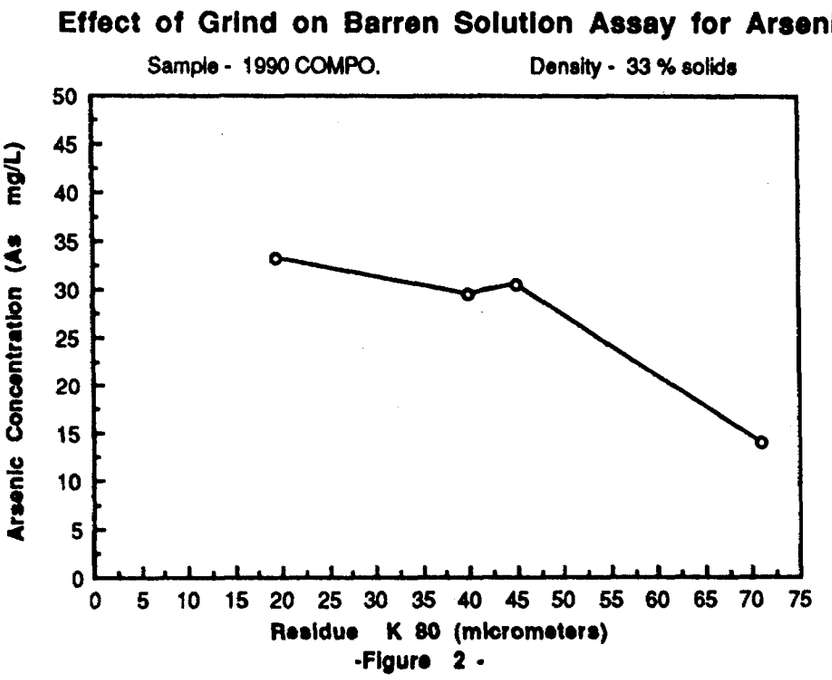
3.2 Solution Analysis for Arsenic

CIL barren solution from Tests 5, 6, 7 and 8 was analyzed for dissolved arsenic. Solution analyses were as follows:

Test	Residue Size Analyses K80 Micrometers	Barren As Assay mg/L
5	71	14.1
6	45	30.4
7	40	29.6
8	20	33.2

Figure 2 shows the effect of grind K_{80} on the concentration of dissolved arsenic.

Summary



-Figure 2 -

4. Flotation Testwork

Flotation testwork was conducted to show the following:

1. High recovery of gold, about 95% in the rougher
2. Levels of dissolved arsenic in flotation water if detected
3. That a high grade gold cleaner concentrate can be produced for smelter feed

Summary

Previously conducted flotation testwork with samples from the Garrison project and summarized in Progress Report No. 1, Project 3744, showed that high gold recoveries of 95% could be achieved. Rougher concentrate weight percent was typically greater than 20%. The presence of talc required the addition of talc depressant CMC 7LT. Dowfroth 250 was added to maintain a persistent froth.

As requested, rougher flotation conditions were selected to result in similar gold recoveries and to attempt to reduce the weight percent to about 10 percent.

4.1 1990 Compo.

The prepared composite identified as "1990 Compo." was feed for most of the flotation program. The arsenic content of about 0.4% was considered typical of the host orebody. Pyrite, the principal gold hosting mineral was the target of rougher and cleaner flotation.

4.1.1 Effect of Primary Grind

The effect of primary grinding on rougher and cleaner flotation was investigated in Tests 1-4. Flotation conditions were:

Reagent to grinding mill	Sodium Sulphide	200 g/t
Rougher Flotation Reagents	A350	75 g/t
	CMC 7LT	250 g/t
	DF 250	28-42 g/t
Rougher pH	Natural	8.3 - 8.6

The results are presented in Table 5 and Figure 3 shows the effect of grind K_{80} on rougher gold and arsenic recovery. Rougher recovery of gold, about 95%, resulted with a primary grind of K_{80} 66 micrometers. No additional tests with coarser K_{80} grinds were conducted. As requested, all additional testwork used a primary grind K_{80} of about 40 micrometers.

Figures 4 and 5 show the gold, recovery/grade curves and gold/sulphur recovery curves respectively for Tests 1-4 and Test 9.

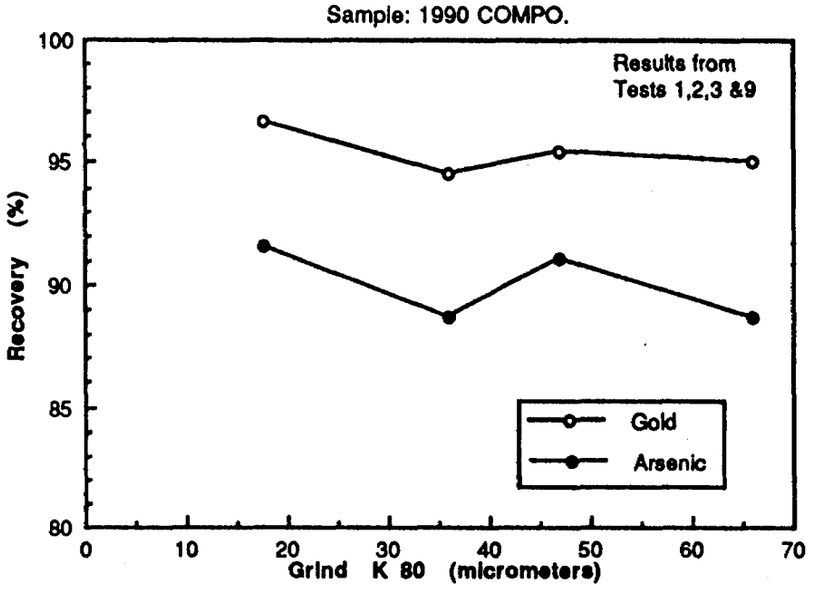
Table 5 - Effect of Primary Grind , Sample "1990 COMPO."

Test No.	Conditions	Feed K80 Micrometers	Product	Weight %	Assay Au g/t	Assay As %	Assay S(T) %	% Distribution Au	% Distribution As	% Distribution S(T)
1	Na2S(Grind) : 200g/t A 350: 75 g/t CMC-7LT: 250 g/t DF-250 : 28 g/t pH : 8.6 (Natural)	66.0	3 rd Cleaner Conc.	6.3	139	2.58	27.9	78.0	45.6	78.0
			2 nd Cleaner Conc.	7.1	131	2.88	26.1	82.6	57.1	81.9
			1 st Cleaner Conc	8.8	114	2.99	22.7	89.2	73.7	88.5
			Rougher Conc	14.5	73.7	2.18	14.9	95.1	88.7	95.5
			Rougher Tail	85.5	0.65	0.047	0.12	4.9	11.3	4.5
			Head (Calc)	100.0	11.3	0.36	2.26	100.0	100.0	100.0
2	Na2S(Grind) : 200g/t A 350: 75 g/t CMC-7LT: 250 g/t DF-250 : 28 g/t pH : 8.3 (Natural)	47.0	3 rd Cleaner Conc.	5.4	167	3.29	28.0	75.9	47.2	67.0
			2 nd Cleaner Conc.	6.4	155	3.82	27.2	84.5	65.6	78.0
			1 st Cleaner Conc	7.5	140	3.61	24.4	88.9	76.1	81.4
			Rougher Conc	14.3	78.7	2.38	15.0	95.4	91.1	95.4
			Rougher Tail	85.7	0.64	0.039	0.12	4.6	8.9	4.6
			Head (Calc)	100.0	11.8	0.38	2.25	100.0	100.0	100.0
3	Na2S(Grind) : 200g/t A 350: 75 g/t CMC-7LT: 250 g/t DF-250 : 28 g/t pH : 8.6 (Natural)	36.0	3 rd Cleaner Conc.	5.6	169	3.56	24.7	81.5	57.2	73.3
			2 nd Cleaner Conc.	6.5	158	3.97	24.8	88.9	74.6	86.3
			1 st Cleaner Conc	7.6	143	3.94	23.0	93.3	85.9	92.4
			Rougher Conc	8.6	127	3.59	20.6	94.6	88.7	94.2
			Rougher Tail	91.4	0.69	0.043	0.12	5.4	11.3	5.8
			Head (Calc)	100.0	11.6	0.35	1.88	100.0	100.0	100.0
4	Na2S(Grind) : 200g/t A 350: 75 g/t CMC-7LT: 250 g/t DF-250 : 42 g/t pH : 8.6 (Natural)	18.0	3 rd Cleaner Conc.	2.9	195	2.94	40.6	54.1	21.4	49.8
			2 nd Cleaner Conc.	4.5	156	3.37	34.8	66.9	37.8	65.9
			1 st Cleaner Conc	7.0	115	3.24	26.0	77.4	57.1	77.0
			Rougher Conc	17.8	53.6	1.87	12.1	91.4	83.3	91.0
			Rougher Tail	82.2	1.10	0.081	0.26	8.6	16.7	9.0
			Head (Calc)	100.0	10.5	0.40	2.37	100.0	100.0	100.0
4,a	Na2S : 470g/t A 350: 100 g/t CMC-7LT: 200 g/t DF-250 : 60 g/t pH : 8.6 (Natural)	Test Feed Rougher Tail From Test 4	Rougher Conc 1	4.60	4.62	-	0.41	19.0	-	8.3
			Rougher Conc 1+2	12.3	2.75	-	0.37	30.0	-	19.9
			Rougher Tail	87.7	0.90	-	0.21	70.0	-	80.1
			Head (Calc)	100.0	1.13	-	0.23	100.0	-	100.0
9	Na2S(Grind) : 200g/t A 350: 170 g/t CMC-7LT: 300 g/t DF-250 : 89 g/t pH : 8.6 (Natural)	17.5	3 rd Cleaner Conc.	7.8	99.1	2.28	22.3	77.7	44.8	77.3
			2 nd Cleaner Conc.	10.6	81.6	2.43	18.7	87.2	65.0	88.3
			1 st Cleaner Conc	16.0	58.0	2.04	13.1	93.6	82.6	93.5
			Rougher Conc	37.0	25.9	0.98	5.85	96.6	91.6	96.3
			Rougher Tail	63.0	0.54	0.053	0.13	3.4	8.4	3.7
			Head (Calc)	100.0	9.92	0.40	2.24	100.0	100.0	100.0

Summary

Flotation Rougher Recovery of Gold and Arsenic vs Grind K 80

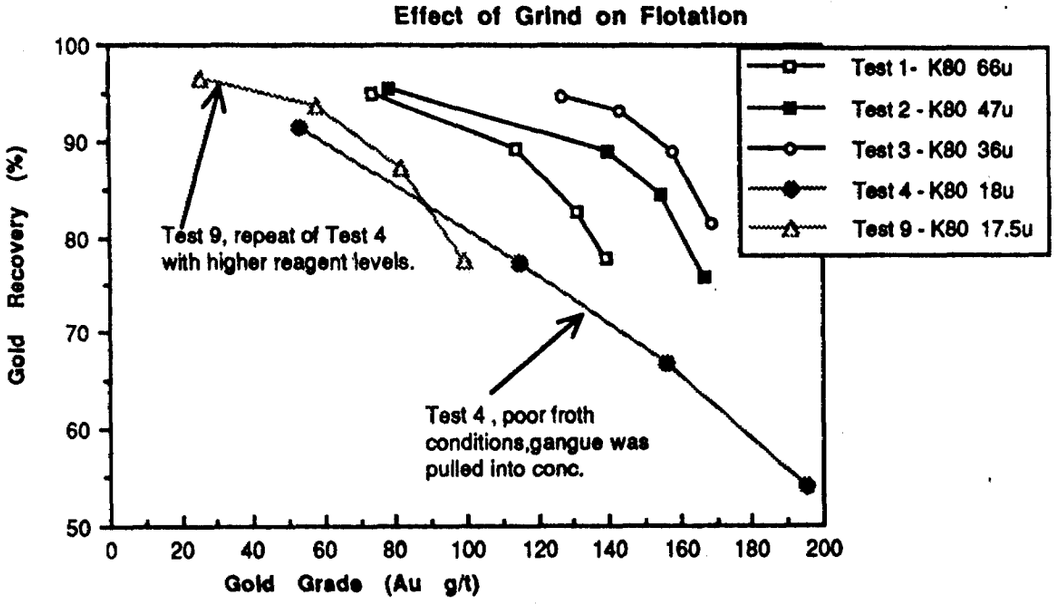
Sample: 1990 COMPO.



- Figure 3-

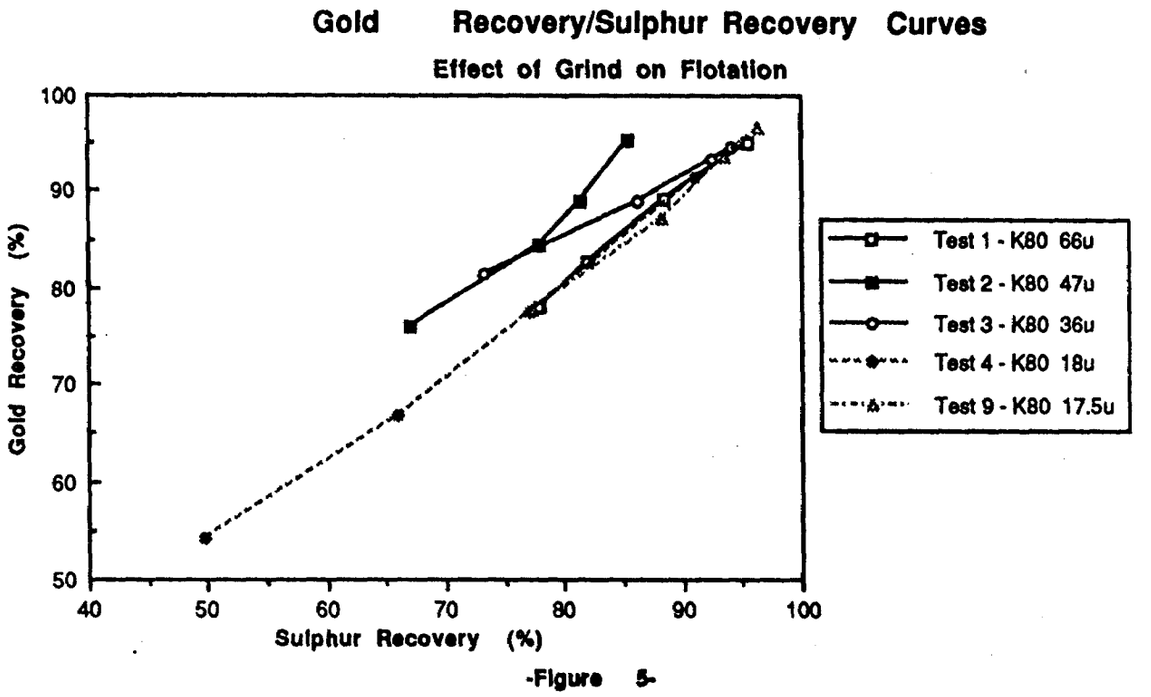
Gold - Recovery/Grade Curves

Effect of Grind on Flotation



-Figure 4 -

Summary



-Figure 5-

4.1.2 Flotation Water Analysis

Flotation waters from Test 1 and Test 2 were submitted for arsenic analyses. Both solutions assayed <0.05 mg/L. A sample of flotation water from Test 3 was analyzed by ICP for 24 elements and a separate assay for water hardness ($CaCO_3$). Table 6 summarizes the results of analyses.

Summary

Table 6 - Rougher Flotation , Water Analysis

Flotation Test - 3

Element	Detection Limit mg/L	Analysis mg/L
Al	0.2	<0.2
As	0.1	<0.1
Ba	0.05	<0.05
Be	0.01	<0.01
Ca	0.2	22
Cd	0.05	<0.05
Co	0.05	<0.05
Cr	0.05	<0.05
Cu	0.05	<0.05
Fe	0.05	<0.05
Mg	0.05	13
Mn	0.05	<0.05
Mo	0.1	<0.1
Na	0.05	62
Ni	0.05	<0.05
P	0.2	<0.2
Pb	0.1	<0.1
S	2	30
Sb	0.1	<0.1
Se	0.5	<0.5
Si	0.1	0.9
Sn	0.2	<0.2
Te	0.1	<0.1
Zn	0.05	<0.05
Hardness	As CaCO3	110

4.1.3 Effect of Sodium Silicate in Cleaning

Particles of siliceous gangue were carried into later cleaning stages and lowered gold grades. The effect of sodium silicate additions in conjunction with talc depressant CMC 7LT was investigated in Tests 11, 12 and 13. Table 7 and Figure 6 present the results.

Test results show that sodium silicate was not beneficial in depressing siliceous gangue.

Table 7 - Effect of Sodium Silicate in Cleaners - Sample "1990 COMPO."

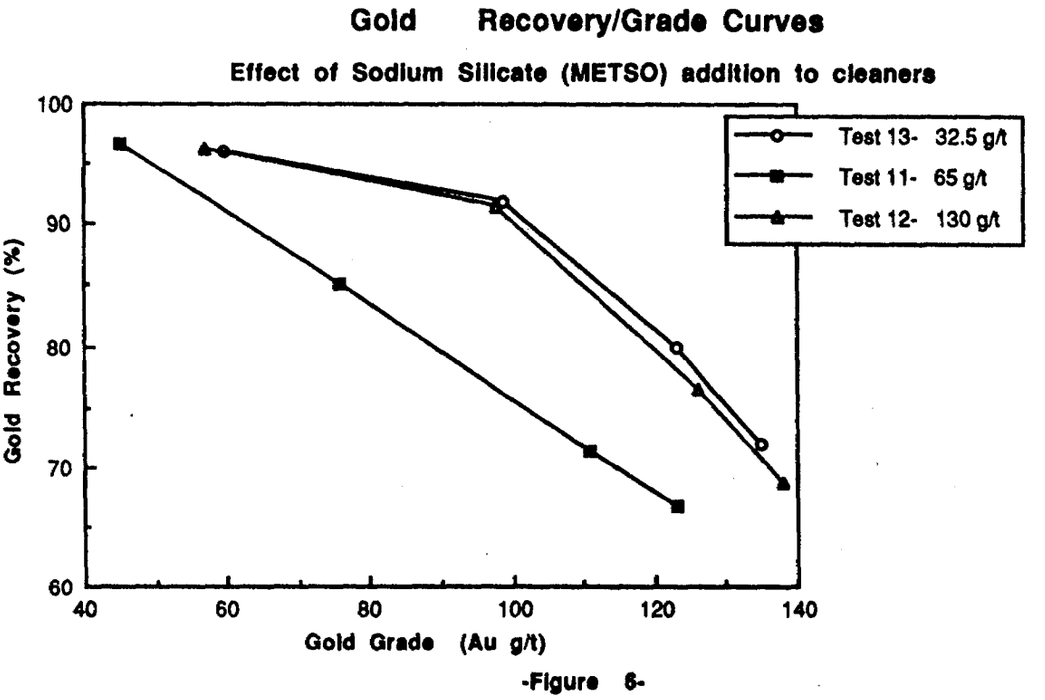
Test No.	"METSO" Sodium Silicate added to cleaners g/t	Product	Weight %	Assay Au g/t	Assay As %	Assay S(T) %	% Distribution Au	% Distribution As	% Distribution S(T)
13	32.5	3 rd Cleaner Conc.	5.8	135	1.82	28.6	72.0	28.4	71.6
		2 nd Cleaner Conc.	7.1	123	2.37	26.7	79.9	45.1	81.4
		1 st Cleaner Conc	10.1	98.8	2.85	21.0	91.9	77.5	91.9
		Rougher Conc	17.5	59.6	1.95	12.7	96.0	91.6	96.1
		Rougher Tail	82.5	0.53	0.038	0.11	4.0	8.4	3.9
		Head (Calc)	100.0	10.9	0.37	2.32	100.0	100.0	100.0
11	65.0	3 rd Cleaner Conc.	5.6	123	1.47	28.7	66.7	22.0	70.5
		2 nd Cleaner Conc.	6.6	111	1.64	26.7	71.3	29.0	77.5
		1 st Cleaner Conc	11.6	75.9	1.98	17.8	85.0	61.2	90.2
		Rougher Conc	22.2	45.1	1.57	10.0	96.6	93.1	97.3
		Rougher Tail	77.8	0.45	0.033	0.08	3.4	6.9	2.7
		Head (Calc)	100.0	10.3	0.37	2.28	100.0	100.0	100.0
12	130.0	3 rd Cleaner Conc.	5.2	138	2.03	32.7	68.8	28.1	71.7
		2 nd Cleaner Conc.	6.4	126	2.52	30.1	76.5	42.5	80.8
		1 st Cleaner Conc	9.8	97.7	3.04	22.5	91.4	79.0	92.7
		Rougher Conc	17.7	57.0	1.96	13.0	96.2	91.9	96.9
		Rougher Tail	82.3	0.49	0.037	0.09	3.8	8.1	3.1
		Head (Calc)	100.0	10.5	0.38	2.38	100.0	100.0	100.0

Conditions:

Feed K 80 = 36 micrometers
pH : Natural

Rougher	A 350 Collector	25 g/t added to each of five rougher stages
"	CMC 7LT	250 g/t added to Rougher 1 conditioning stage
"	DF 250 Frother	9 g/t added to Rougher stage 1
"	MIBC	21 g/t total added as required to rougher stages
1 st Cleaner	A 350 Collector	10 g/t
"	CMC 7LT	50 g/t
"	MIBC Frother	6 g/t

Summary



-Figure 6-

4.1.4 Effect of Potassium Permanganate on Arsenic Depression

During this phase of the testwork arsenopyrite was considered a non-gold bearing sulphide and a diluent to the final sulphide-gold concentrate. The effect of permanganate, $KMnO_4$ in depressing arsenopyrite in the cleaning stages was investigated in Test 14. Table 8 presents the results and Figure 7 shows the arsenic recovery/grade curves for Test 11 and Test 14.

Table 8 - Effect of Potassium Permanganate for Arsenic Depression in the Cleaners

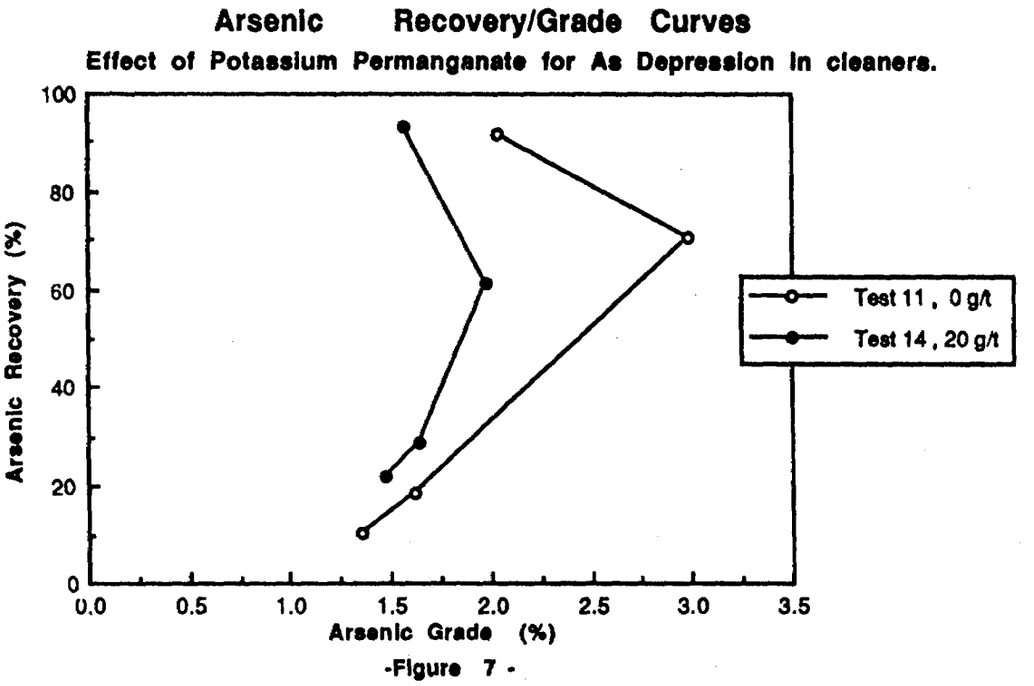
Test No.	KMnO4 Pot. Permanganate added to cleaners g/t	Product	Weight %	Assay Au g/t	Assay As %	Assay S(T) %	% Distribution Au	% Distribution As	% Distribution S(T)
11	0	3 rd Cleaner Conc.	5.6	123	1.47	28.7	66.7	22.0	70.5
		2 nd Cleaner Conc.	6.6	111	1.64	26.7	71.3	29.0	77.5
		1 st Cleaner Conc	11.6	75.9	1.98	17.8	85.0	61.2	90.2
		Rougher Conc	22.2	45.1	1.57	10.0	96.6	93.1	97.3
		Rougher Tail	77.8	0.45	0.033	0.08	3.4	6.9	2.7
		Head (Calc)	100.0	10.3	0.37	2.28	100.0	100.0	100.0
14	20	3 rd Cleaner Conc.	2.8	189	1.36	30.8	51.9	10.2	37.4
		2 nd Cleaner Conc.	4.3	151	1.62	29.6	63.1	18.5	54.8
		1 st Cleaner Conc	8.9	104	2.99	23.7	89.8	70.7	91.0
		Rougher Conc	16.9	58.3	2.04	13.3	96.0	91.8	96.8
		Rougher Tail	83.1	0.49	0.037	0.09	4.0	8.2	3.2
		Head (Calc)	100.0	10.2	0.38	2.31	100.0	100.0	100.0

Conditions :

Sample 1990 Compo
Feed K 80 = 36 micrometers

Rougher	A 350 Collector	25 g/t added to each of five rougher stages
"	CMC 7LT	250 g/t added to Rougher 1 conditioning stage
"	DF 250 Frother	9 g/t added to Rougher stage 1
"	MIBC	21 g/t total added as required to rougher stages
1 st Cleaner	A 350 Collector	10 g/t
"	CMC 7LT	50 g/t
"	MIBC Frother	6 g/t
"	Sodium Silicate	50 g/t
2nd Clnr.	Sodium Silicate	10 g/t
3rd Clnr.	Sodium Silicate	5 g/t

Summary



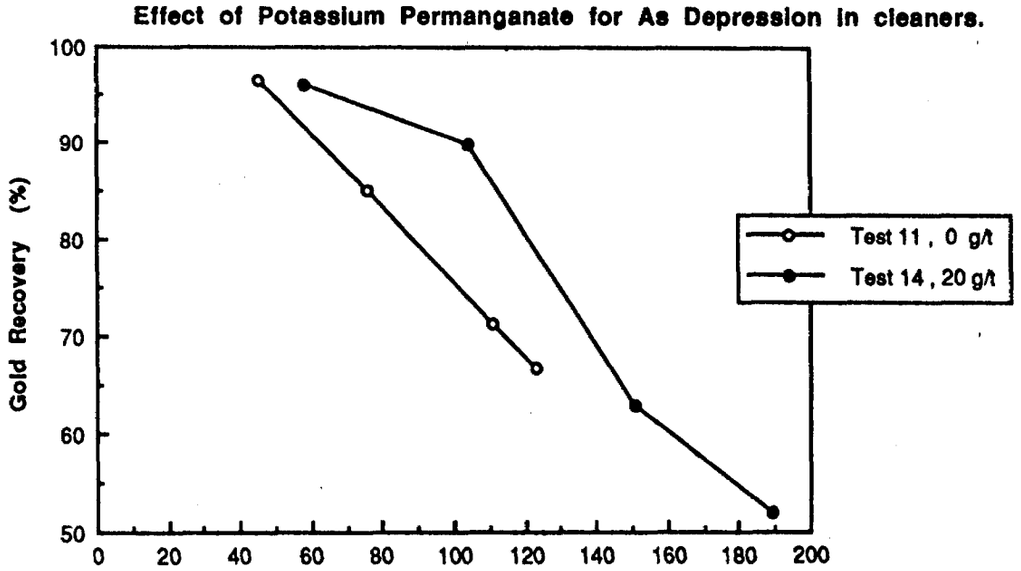
-Figure 7 -

The addition of permanganate resulted in a brittle, less persistent froth which hindered froth collection. Weight percent recovery to the third cleaner was affected resulting in lower gold and arsenic recoveries. Figure 8 shows the gold recovery/grade curves for Test 11 and Test 14. No additional testwork involving $KMnO_4$ was conducted.

Summary

Gold Recovery/Grade Curves

Effect of Potassium Permanganate for As Depression in cleaners.



-Figure 8-

Summary

4.1.5 Larger Scale Flotation with "1990 Compo."

A series of 10 kg rougher flotation tests was conducted to obtain rougher concentrate for additional testwork. Table 9 presents the results.

Table 9 - Summary of Larger Scale Flotation , Sample "1990 COMPO."

Test No.	Conditions	Feed K80 Micrometers	Product	Weight %	Assay Au g/t	Assay As %	Assay S(T) %	% Distribution Au	% Distribution As	% Distribution S(T)
18	A 350: 100 g/t CMC-7LT: 250 g/t DF-250 : 32 g/t MIBC:15.5 pH : 8.4 (Natural)	37.0	Rougher Conc	14.4	70.7	2.08	15.3	92.1	79.9	91.1
			Rougher Tail	85.6	1.02	0.088	0.25	7.9	20.1	8.9
			Head (Calc)	100.0	11.0	0.37	2.41	100.0	100.0	100.0

4.1.6 Effect of Rougher Concentrate Regrind

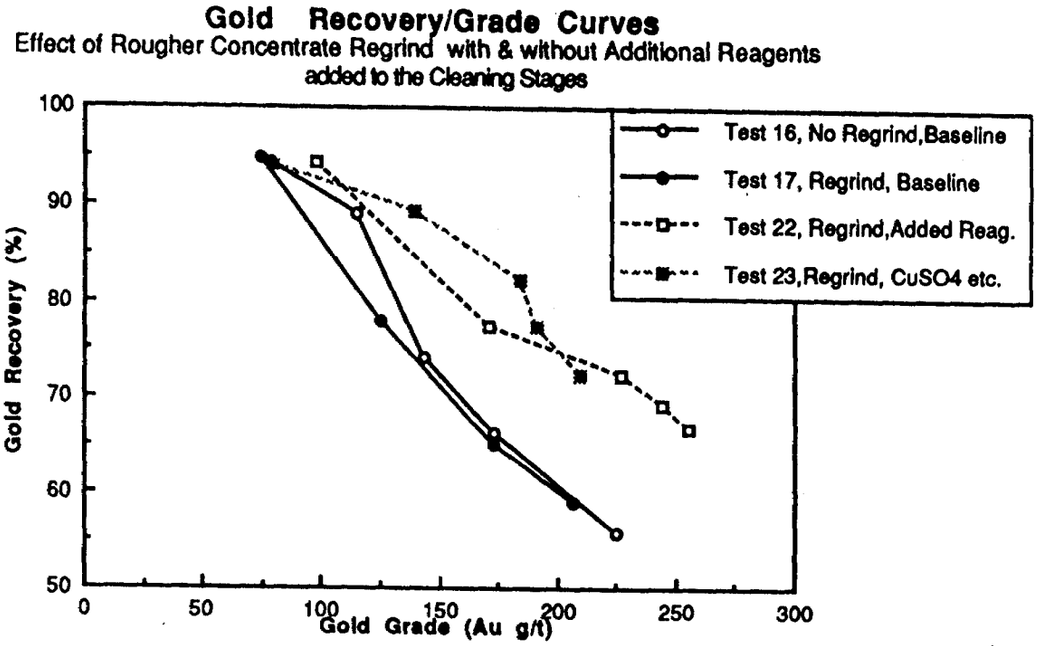
A series of tests to investigate the effect of a rougher concentrate regrind prior to cleaner flotation with and without increased reagent additions was conducted.

Table 10 summarizes the results and Figure 9 shows the gold recovery/grade curves from tests. The addition of $CuSO_4$ has shown that cleaner concentrates grading over 200 g/t Au with greater than 70% recovery can be produced. No additional testing was conducted to investigate the effect of copper sulphate on cleaning without a regrind of the rougher concentrate.

Table 10 - Effect of Rougher Concentrate Regrind and Regrind with Additional Reagents

Feed - 1990 COMPO

Test No.	Conditions	Feed K80 Micrometers	Product	Weight %	Assay Au g/t	Assay As %	Assay S(T) %	% Distribution Au	% Distribution As	% Distribution S(T)
16	A 350: 90 g/t CMC-7LT: 335 g/t MIBC : 37.5 g/t DF-250 : 12 g/t pH : 8.3 (Natural)	39.0	4 th Cleaner Conc.	2.5	225	1.90	43.9	55.7	13.2	50.8
			3 rd Cleaner Conc.	3.9	173	2.03	38.0	66.3	21.8	68.2
			2 nd Cleaner Conc.	5.3	143	2.40	32.6	74.1	36.6	72.0
			1 st Cleaner Conc	7.9	115	3.32	25.4	88.9	71.7	91.7
			Rougher Conc	12.3	78.0	2.62	16.8	94.2	88.5	94.8
			Rougher Tail	87.7	0.68	0.048	0.13	5.8	11.5	5.2
			Head (Calc)	100.0	10.2	0.36	2.18	100.0	100.0	100.0
17	A 350: 90 g/t CMC-7LT: 310 g/t MIBC : 37.5 g/t DF-250 : 12 g/t pH : 8.2 (Natural)	39.0 (Rougher Conc. K80 24.5 microns after regrind)	3 rd Cleaner Conc.	3.1	206	1.71	39.7	59.0	14.2	50.9
			2 nd Cleaner Conc.	4.1	173	1.82	35.8	65.0	64.6	68.2
			1 st Cleaner Conc	6.8	125	2.20	28.1	78.0	39.7	78.4
			Rougher Conc	13.9	74.1	2.40	15.9	94.8	89.2	90.8
			Rougher Tail	86.1	0.66	0.047	0.26	5.2	10.8	9.2
			Head (Calc)	100.0	10.9	0.37	2.44	100.0	100.0	100.0
22	Na2S: 200 g/t A 350: 150 g/t CMC-7LT: 450 g/t MIBC : 39 g/t DF-250 : 8 g/t pH : 7.9 (Natural)	39.0 (Rougher Conc. K80 21.4 microns after regrind)	4 th Cleaner Conc.	3.1	255	2.29	48.4	66.9	18.5	65.3
			3 rd Cleaner Conc.	3.3	244	2.42	47.4	69.3	21.2	69.2
			2 nd Cleaner Conc.	3.7	227	2.63	45.1	72.3	25.5	72.4
			1 st Cleaner Conc	5.3	171	2.63	34.8	77.5	36.5	81.1
			Rougher Conc	11.4	97.6	3.00	18.9	94.3	89.1	93.8
			Rougher Tail	88.6	0.76	0.047	0.16	5.7	10.9	6.2
			Head (Calc)	100.0	11.8	0.38	2.29	100.0	100.0	100.0
23	Na2S: 200 g/t CuSO4: 310 g/t A 350: 150 g/t CMC-7LT: 450 g/t MIBC : 36 g/t DF-250 : 8 g/t pH : 7.9 (Natural)	39.0 (Rougher Conc. K80 19 microns after regrind)	4 th Cleaner Conc.	3.5	209	4.58	42.2	72.4	43.0	67.7
			3 rd Cleaner Conc.	4.1	191	4.76	39.0	77.4	52.4	73.2
			2 nd Cleaner Conc.	4.5	184	5.02	37.9	82.1	56.4	77.8
			1 st Cleaner Conc	6.5	139	4.36	29.0	89.2	75.7	86.1
			Rougher Conc	12.0	79.3	2.79	16.4	94.0	89.7	90.4
			Rougher Tail	88.0	0.69	0.044	0.24	6.0	10.3	9.6
			Head (Calc)	100.0	10.1	0.37	2.19	100.0	100.0	100.0



-Figure 9-

4.1.7 Flotation Concentrate Analysis

During the on-going testing program flotation concentrate from Test 3 was selected for detailed smelter specification analysis. Preliminary analysis was conducted with a Semi-Quantitative Spectrographic analysis. Table 11 presents the results.

Table 11 - Semi-Quantitative Spectrographic Analysis (SQS) on Concentrate

Concentration Range	3rd Cleaner Concentrate
10 - 100 %	Si
3 - 30 %	Fe
1 - 10 %	As , Mg
0.3 - 3 %	K ,Ca
0.1 - 1 %	Al , Na
0.03 - 0.3 %	Ti
0.01 - 0.1 %	Mn ,Cu ,Ni ,Co
0.003 - 0.03 %	Au ,Pb ,V ,Zr
0.001 - 0.01 %	Cr
0.0003 - 0.003 %	-
0.0001 - 0.001 %	-
<0.0003 %	Ag
I	
S	

I = Interference prevents positive identification
S = Strong spectral lines, unable to estimate amount

Unless specified above, the following were not detected at the approximate ppm lower limits of 0.5 Cu, Ag; 1 Mn; 5 Mg, Cr; 10 Be, Ca, Co, Ni, V; 25 Ge, Fe, Pb, Mo, Si, Sr, Sn, Ti, Zr, Tl, Pd, U, Th; 50 Al, Sb, Bi, Cd Ga, Li, Zn; 100 As, Au, Ba In, Na; 200 Nb, Ta, W, Rb, Pt; 300 P, Te, Y, Ce; 1,000 K.

The Semi-Quantitative Spectrographic analysis was followed with the analysis of 12 elements as requested. Table 12 presents the results of analysis.

Table 12- Summary of Concentrate Analyses

Sample : 3rd Cleaner Concentrate (Test 3)

Direct Analyses

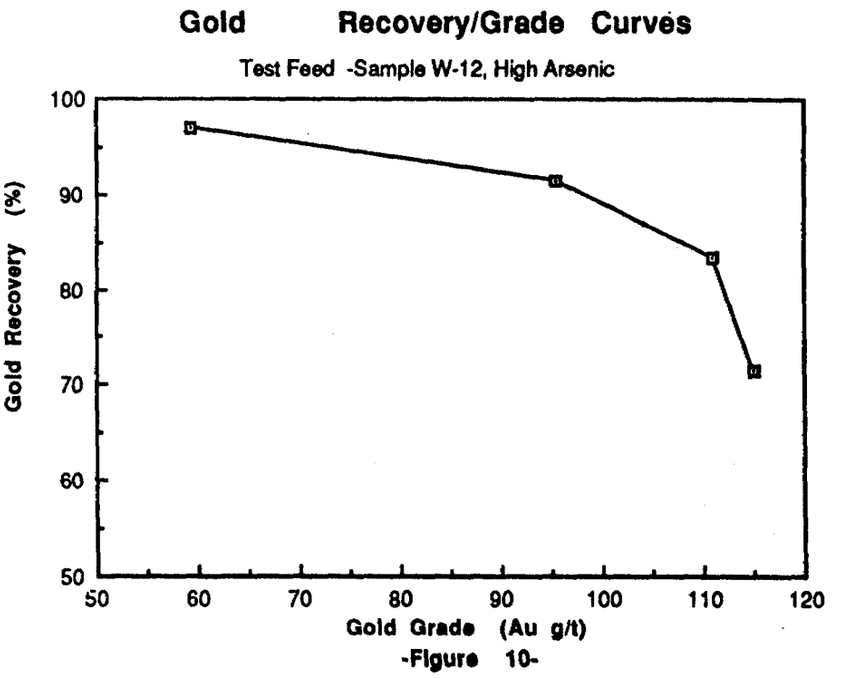
Gold	Au g/t	169
Arsenic	As %	3.56
Iron	Fe %	32.2
Lead	Pb %	0.002
Zinc	Zn %	0.01
Bismuth	Bi %	0.003
Silica	SiO2 %	15.9
Sulphur	S(T)%	24.7
Antimony	Sb %	<0.002
Selenium	Se %	<0.0003
Tellurium	Te %	<0.0003
Mercury	Hg %	0.00005

4.2 W-12, High Arsenic

Sample W-12 with a typical arsenic content of about 1.13% represents the "High Arsenic" portion of the Garrison project. A single flotation test was conducted. Table 13 and Figure 10 present the results.

Table 13 - Summary of Flotation Testwork on Sample "W- 12 , High Arsenic"

Test No.	Conditions	Flotation Feed K80 micrometers	Product	Weight %	Assay			% Distribution		
					Au g/t	As %	S(T) %	Au	As	S(T)
10	Na2S : 200 g/t A 350: 125 g/t CMC-7LT: 250g/t DF-250 : 56 g/t pH - 8.5	34.0	3 rd Cleaner Conc.	11.5	115	4.89	17.9	71.5	50.0	73.4
			2 nd Cleaner Conc.	14.0	111	5.56	16.9	83.5	67.9	84.1
			1 st Cleaner Conc	17.8	95.4	5.22	14.6	91.4	82.3	91.9
			Rougher Conc	30.3	59.4	3.45	9.0	97.0	92.6	96.5
			Rougher Tail	69.7	0.81	0.120	0.14	3.0	7.4	3.5
			Head (Calc)	100.0	18.5	1.13	2.81	100.0	100.0	100.0



-Figure 10-

5. Mineralogical Examination of Flotation Products

The identity of gangue minerals in flotation test products was investigated with X-ray Diffraction. Test products were from flotation Tests 13 and 16. The minerals talc, quartz, dolomite and calcite were persistent to the 3rd cleaner concentrate, with calcite and talc found in the 4th cleaner concentrate (Test 16). No additional mineralogy was conducted during this phase of testing. The results of the mineralogical examination are summarized and appended to this report as "Appendix 1".

CONCLUSIONS

A composite of samples from the Garrison project, 1990 Compo, grading 10.9 g/t Au and 0.39% As was subject to cyanidation and flotation to recover gold.

Ball Mill Work Index (metric) = 18.4

Cyanidation gold recovery with solids ground to K_{80} -71 micrometres was about 52%. Finer grinding was not beneficial. Gold recovery was about 50% after 24 hours. Cyanide residue assay was typically 5.5 g/t Au.

Dissolved arsenic levels in cyanide solution were about 30 mg/L from a grind K_{80} of 45 micrometers and finer.

Rougher flotation gold recovery was typically 95% at a grind K_{80} of 66 micrometers and finer. The primary grind K_{80} for most tests was 39 micrometers. Flotation after a regrind of the rougher concentrate, Test 23, resulted in a 4th cleaner concentrate grading over 200 g/t Au with 72% recovery. A locked cycle test to investigate the recirculation effect of arsenopyrite in the intermediate streams was discussed but not conducted during this phase of testing.

A second sample W-12, High Arsenic, grading 18.5 g/t Au and 1.13% As was subjected to flotation testing.

Mineralogical testwork conducted on flotation products show the gangue minerals, talc and calcite in the 4th cleaner concentrate. Additional mineralogy to identify gangue-sulphide relationships within the flotation products is recommended.

INVENTORY

The following list of samples are currently in storage at Lakefield Research:

5 boxes of test charges

3 boxes of test and assay rejects

1 drum of original sample

SAMPLE PREPARATION

On April 11, 1990, eight samples were received at Lakefield Research (our reference 9034097) from JONPOL Explorations Limited. The samples were weighed and a moisture sample removed. As per instructions from Mr. George Rawsthorne, Kilborn Ltd., the samples were air dried prior to sample preparation. The samples were identified as follows:

Sample No.	Wet Wt. kg	% H_2O	Dry Wt. kg
XC-3	58.0	5.7	54.7
E-7	59.7	7.3	55.3
E-8	72.5	5.3	68.7
E-9	64.5	5.2	61.1
W-12	63.4	5.5	59.9
W-18	66.5	3.7	64.0
W-27	64.0	3.6	61.7
W-30	66.8	4.7	63.7
	515.4		489.1

The dried blend was crushed to minus 6 mesh, a 10 kg portion removed for Bond Work testing and the remainder crushed to minus 10 mesh. The blend was identified as "1990 Compo".

A second sample was received on April 19, 1990 (our reference 9034146) from JONPOL. This sample was identified as "W-12, High As". The entire sample was crushed to minus 10 mesh and prepared into test charges, a head sample with the remainder to storage.

DETAILS OF TESTS

Project No: 3922

Product: 1990 COMPO (as received)

K 80: 2679 micrometers

Microns	Mesh	Weight Grams	% Weight		
			Ind.	Cum.	Passing
4699	4	2.5	2.5	2.5	97.5
3,327	6	7.5	7.5	10.0	90.0
2,362	8	15.5	15.5	25.5	74.5
1,651	10	16.0	16.0	41.5	58.5
1,168	14	14.1	14.1	55.6	44.4
833	20	9.0	9.0	64.6	35.4
589	28	6.9	6.9	71.5	28.5
417	35	5.3	5.3	76.8	23.2
295	48	3.8	3.8	80.6	19.4
208	65	3.0	3.0	83.6	16.4
147	100	2.8	2.8	86.4	13.6
104	150	2.1	2.1	88.5	11.5
74	200	1.8	1.8	90.3	9.7
53	270	1.5	1.5	91.8	8.2
38	400	1.0	1.0	92.8	7.2
-38	-400	7.2	7.2	100.0	-
	Total	100.0	100.0	-	-

Product: W-12 High As (as received)

K 80: 2802 micrometers

Microns	Mesh	Weight Grams	% Weight		
			Ind.	Cum.	Passing
4699	4	26.6	3.9	3.9	96.1
3,327	6	63.0	9.2	13.0	87.0
2,362	8	96.0	14.0	27.0	73.0
1,651	10	88.4	12.8	39.8	60.2
1,168	14	88.2	12.8	52.6	47.4
833	20	60.0	8.7	61.4	38.6
589	28	47.5	6.9	68.3	31.7
417	35	37.0	5.4	73.6	26.4
295	48	27.4	4.0	77.6	22.4
208	65	22.1	3.2	80.8	19.2
147	100	20.6	3.0	83.8	16.2
104	150	15.8	2.3	86.1	13.9
74	200	13.4	1.9	88.1	11.9
53	270	12.3	1.8	89.9	10.1
38	400	9.6	1.4	91.3	8.7
-38	-400	60.1	8.7	100.0	-
	Total	688.0	100.0	-	-

Product: 1990 COMPO Project No: 3922

K 80 : 1325 micrometers

Microns	Mesh	Weight Grams	% Weight		
			Ind.	Cum.	Passing
1,651	10	22.6	4.7	4.7	95.3
1,168	14	105.9	21.9	26.6	73.4
833	20	80.5	16.7	43.3	56.7
589	28	60.9	12.6	55.9	44.1
417	35	44.5	9.2	65.1	34.9
295	48	30.6	6.3	71.5	28.5
208	65	23.1	4.8	76.2	23.8
147	100	20.7	4.3	80.5	19.5
104	150	14.9	3.1	83.6	16.4
74	200	12.5	2.6	86.2	13.8
53	270	10.0	2.1	88.3	11.7
38	400	7.3	1.5	89.8	10.2
-38	-400	49.3	10.2	100.0	-
	Total	482.8	100.0	-	-

Grind Curve Size Analysis Project No: 3922

Product: Grind Curve
30 minutes/ 2 kg

K 80- 103 u

Microns	Mesh	Weight Grams	% Weight		
			Ind.	Cum.	Passing
295	48	0.0	0.0	0.0	100.0
208	65	4.3	2.5	2.5	97.5
147	100	10.7	6.1	8.6	91.4
104	150	18.8	10.7	19.3	80.7
74	200	23.0	13.1	32.4	67.6
53	270	21.6	12.3	44.7	55.3
38	400	15.3	8.7	53.4	46.6
-38	-400	81.7	46.6	100.0	-
	Total	175.4	100.0	-	-

Product: Grind Curve
45 minutes/ 2 kg

K 80- 56 u

Microns	Mesh	Weight Grams	% Weight		
			Ind.	Cum.	Passing
208	65	0.0	0.0	0.0	100.0
147	100	0.8	0.5	0.5	99.5
104	150	3.7	2.2	2.7	97.3
74	200	12.2	7.3	9.9	90.1
53	270	21.2	12.6	22.6	77.4
38	400	19.6	11.7	34.2	65.8
-38	-400	110.5	65.8	100.0	-
	Total	168.0	100.0	-	-

Product: Grind Curve
60 minutes/ 2 kg

K 80- 30 u S.G. :2.92

Microns	Mesh	Weight Grams	% Weight		
			Ind.	Cum.	Passing
74	200	2.82	2.8	2.8	97.2
53	270	6.46	6.5	9.3	90.7
40.0u		1.92	1.9	11.2	88.8
31.0		7.98	8.0	19.2	80.8
21.6		14.97	15.0	34.2	65.9
14.9		14.37	14.4	48.5	51.5
11.5		5.23	5.2	53.8	46.3
-11.5		46.25	46.3	100.0	-
	Total	100.0	100.0	-	-

Product: Grind Curve
90 minutes/ 2 kg

K 80- 20 µ S.G. :2.87

Microns	Mesh	Weight Grams	% Weight		
			Ind.	Cum.	Passing
74	200	0.00	0.0	0.0	100.0
53	270	1.03	2.1	2.1	97.9
40.0u		0.45	0.9	3.0	97.0
31.5		1.90	3.8	6.8	93.2
22		5.03	10.1	16.8	83.2
15.1		7.79	15.6	32.4	67.6
11.7		2.37	4.7	37.1	62.9
-11.7		31.43	62.9	100.0	-
	Total	50.0	100.0	-	-

Product: Grind Curve
120 minutes/ 2 kg

K 80- 8 µ S.G. :2.93

Microns	Weight Grams	% Weight		
		Ind.	Cum.	Passing
38.7u	0.17	0.3	0.3	99.7
30.0	0.48	1.0	1.3	98.7
20.9	2.30	4.6	5.9	94.1
14.4	4.25	8.5	14.4	85.6
11.1	1.31	2.6	17.0	83.0
-11.1	41.49	83.0	100.0	-
Total	50.0	100.0	-	-

Project 3922

Bond Work Index Calculation From Test Results and Established Mill Constants

Mill Constant for 10 kg (Red) Mill = 2915
Mill Constant for 2 kg(Grey) Mill = 781

	Test/Grind	Time min/2kg.	Weight grams	Prod. K 80 microns	Energy	Feed K 80 microns	Work Index kWh/t	
1	Grind	30	2000	103	11.7	1325	16.5	
2	"	45	2000	56	17.6	1325	16.6	
3	"	60	2000	30	23.4	1325	15.1	
4	"	90	2000	20	35.1	1325	17.9	
5	"	120	2000	8	46.9	1325	14.4	
6	Test1	38	2000	66	14.8	1325	15.5	
7	Test2	50	2000	47	19.5	1325	16.5	
8	Test3	55	2000	36	21.3	1325	15.3	
9	Test4	110	2000	18	43.0	1325	20.6	
10	Test5	38	2000	71	14.8	1325	16.3	
11	Test6	50	2000	45	19.5	1325	16.1	
12	Test7	55	2000	40	21.3	1325	16.3	
13	Test8	110	2000	20	43.0	1325	21.6	
14	Test9	120	2000	18	46.9	1325	22.1	
15	Test11	54.5	2000	36	21.3	1325	15.3	
16	Test12	54.5	2000	36	21.3	1325	15.2	
17	Test13	54.5	2000	37	21.3	1325	15.5	
18	Test14	54.5	2000	36	21.3	1325	15.3	
19	Test15	54.5	2000	42	21.3	1325	16.8	
20	Test16	54.0	2000	39	21.1	1325	15.9	
21	Test17	54.0	2000	43	21.1	1325	16.9	
22	Test18	100	10000	40	29.2	1325	22.3	
23	Test19	54.5	2000	39	21.3	1325	16.0	
24	Test 20	54.5	2000	39	21.3	1325	16.0	
			Estimated Work Index				16.91	Metric

BOND BALL MILL CLOSED CIRCUIT GRINDABILITY TEST

Sample: 1990 COMPO. Date: May 17, 1990

Submitted by: Jonpol Expl. (per Kilborn Eng.)

Mesh of Grind 100 Feed: 15.9 % Passing 100 Mesh

Cycle	New Feed (g)	Number of Revolutions	In Mill Product	In Mill Feed	Net Product	Net Per Revolution
1	1355	100	318	215	103	1.03
2	318	326	419	51	368	1.13
3	419	283	395	67	328	1.16
4	395	280	398	62	336	1.2
5	396	270	408	63	345	1.27
6	408	254	374	64	310	1.22
7						

Unit Volume (700mL) = 1355 g in mill: Equivalent to 1935 kg/m^3 at minus 100 mesh.

Ideal potential product = 387 g

Average of last 2 periods : 391 g : 247 % circulating load.
: 1.25 Net g minus 100 mesh per revolution

Bonds Formula:

$$Wi = 44.5 / (P1)^{0.23} \times (Gbp)^{0.82} \times (10 / \sqrt{P} - 10 / \sqrt{F})$$

Where:

Wi= Work Index (short ton basis) = 16.72

P1 = Screen size test in microns = 147

Gbp = Net grams of undersize produced per revolution of test mill = 1.25

P = Size in microns which 80 % of test product passes = 114

F= Size in microns which 80 % of test feed passes = 1839

Project No: 3822

Product: 1990 COMPO
Minus 6 Mesh Feed

Test No: B.W.I. Feed

K 80 : 1839 micrometers

Microns	Mesh	Weight Grams	% Weight		
			Ind.	Cum.	Passing
2,362	8	42.1	8.4	8.4	91.6
1,651	10	78.6	15.7	24.1	75.9
1,168	14	85.2	17.0	41.1	58.9
833	20	64.2	12.8	53.9	46.1
589	28	49.3	9.8	63.8	36.2
417	35	36.4	7.3	71.1	28.9
295	48	25.4	5.1	76.1	23.9
208	65	22.0	4.4	80.5	19.5
147	100	17.7	3.5	84.1	15.9
104	150	12.7	2.5	86.6	13.4
74	200	10.7	2.1	88.7	11.3
53	270	9.2	1.8	90.6	9.4
38	400	6.3	1.3	91.8	8.2
-38	-400	40.9	8.2	100.0	-
	Total	500.7	100.0	-	-

Product: 1990 COMPO
Product U/S

Test No: Bond Work Index

K 80 : 114 micrometers

Microns	Mesh	Weight Grams	% Weight		
			Ind.	Cum.	Passing
208	65	0.0	0.0	0.0	100.0
147	100	3.9	3.6	3.6	96.4
104	150	21.9	20.5	24.1	75.9
74	200	16.8	15.7	39.8	60.2
53	270	11.8	11.0	50.8	49.2
38	400	8.3	7.8	58.6	41.4
-38	-400	44.3	41.4	100.0	-
	Total	107.0	100.0	-	-

Test No. 1 | Project No. 3922 | April 30/90 | Operator: DWR

Flotation

Purpose: To investigate the effect of grind on gold recovery by flotation.

Procedure: After grinding, the sample was pulped in the 1 kg cell and three rougher concs floated.
Na2S (200 g/t) was added to the grind.
CMC-7LT was added to depress talc. Flotation was conducted at natural pH.
The rougher concs were combined and cleaned three times.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 38 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

Stage	Reagents added, g per tonne Na2S	A 350	CMC-7LT	DF-250		Time, minutes Grind	Cond.	Froth	pH
Grind	200					38			8.6
Rougher	-	25	250	28	large bubbles		2	4	8.7
	-	25	-	-	weak froth		2	4	8.6
	-	25	-	-			2	4	8.6
1st. Cleaner	-	-	-	-	heavy froth		1	6	8.6
2nd. Cleaner	-	-	-	-	very fine bubbles		1	3	8.4
3rd. Cleaner	-	-	-	-			1	1.5	7.8

Stage	Rougher	1st. clnr	2nd. clnr	3rd.clnr
Flotation Cell	D1-1 kg.	D1-500g	D1-500g	D1-250g
Speed, r.p.m.	2000	1000	1000	900

Metallurgical Results

Product	Weight g	%	Assays, g/t, % Au	As	S(T)	% Distribution Au	As	S(T)
3rd Clnr. Conc.	125.2	6.3	139	2.58	27.9	78.0	45.6	78.0
3rd Clnr. Tails	15.3	0.8	66.8	5.33	11.5	4.6	11.5	3.9
2nd Clnr. Tails	34.0	1.7	43.5	3.45	8.68	6.6	16.6	6.6
1st Clnr. Tails	113.2	5.7	11.6	0.94	2.74	5.9	15.0	6.9
Rougher Tails	1695.3	85.5	0.65	0.047	0.12	4.9	11.3	4.5
Head(Calc)	1983.0	100.0	11.26	0.36	2.26	100.0	100.0	100.0
Comb. Products								
2nd Clnr. Conc.	140.5	7.1	131	2.88	26.1	82.6	57.1	81.9
1st Clnr. Conc	174.5	8.8	114	2.99	22.7	89.2	73.7	88.5
Rougher Conc	287.7	14.5	73.7	2.18	14.9	95.1	88.7	95.5

Screen Analyses - Comb. Products

K 80- 66 micrometers

Mesh/ Microns	Weight grams	% Retained Ind.	Cum.	% Pass Cum.
65	0.2	0.2	0.2	99.8
100	1.2	1.2	1.4	98.6
150	4.3	4.3	5.7	94.3
200	10.6	10.6	16.3	83.7
270	16.2	16.2	32.5	67.5
400	15.2	15.2	47.7	52.3
-400	52.3	52.3	100.0	-
Total	100.0	100.0		

Test No. 2 | Project No. 3922 | April 30/90 | Operator: DWR

Flotation

Purpose: To investigate the effect of grind on gold recovery by flotation.

Procedure: After grinding, the sample was pulped in the 1 kg cell and three rougher concs floated .
Na2S (200 g/t) was added to the grind.
CMC-7LT was added to depress talc. Flotation was conducted at natural pH.
The rougher concs were combined and cleaned three times.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 50 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage	Na2S	A 350	CMC-7LT	DF-250			Grind	Cond.	Froth	pH
Grind	200						50			8.3
Rougher	-	25	250	28	large bubbles			2	4	8.3
	-	25	-	-	weak froth			2	4	8.4
	-	25	-	-				2	4	8.2
1st. Cleaner	-	-	-	-	heavy froth			1	6	8.5
2nd. Cleaner	-	-	-	-	very fine bubbles			1	3	8.2
3rd. Cleaner	-	-	-	-				1	1.5	7.8

Stage	Rougher	1st. clnr	2nd. clnr 3rd.clnr
Flotation Cell	D1-1 kg.	D1-500g	D1- 250g
Speed, r.p.m.	2000	1000	900

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
3rd Clnr. Conc.	107.0	5.4	167	3.29	28.0	75.9	47.2	67.0
3rd Clnr. Tails	21.0	1.1	96.0	6.54	23.3	8.6	18.4	10.9
2nd Clnr. Tails	21.0	1.1	49.7	3.75	7.31	4.4	10.6	3.4
1st Clnr. Tails	136.2	6.8	11.1	0.82	4.60	6.4	15.0	14.0
Rougher Tails	1704.4	85.7	0.64	0.039	0.12	4.6	8.9	4.6
Head(Calc)	1989.6	100.0	11.8	0.38	2.25	100.0	100.0	100.0
Comb. Products								
2nd Clnr. Conc.	128	6.4	155	3.82	27.2	84.5	65.6	78.0
1st Clnr. Conc	149	7.5	140	3.81	24.4	88.9	76.1	81.4
Rougher Conc	285.2	14.3	78.7	2.38	15.0	95.4	91.1	95.4

Screen Analyses - Comb. Products

K 80- 47 micrometers

Mesh/ Microns	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
65	0.0	0.0	0.0	100.0
100	0.2	0.2	0.2	99.8
150	1.3	1.3	1.5	98.5
200	4.5	4.5	6.0	94.0
270	9.8	9.8	15.8	84.2
400	11.2	11.2	27.0	73.0
-400	73.0	73.0	100.0	-
Total	100.0	100.0		

Test No. 3 | Project No. 3922 | April 30/90 | Operator: DWR

Flotation

Purpose: To investigate the effect of grind on gold recovery by flotation.

Procedure: After grinding, the sample was pulped in the 1 kg cell and three rougher concs floated.
Na2S (200 g/t) was added to the grind.
CMC-7LT was added to depress talc. Flotation was conducted at natural pH.
The rougher concs were combined and cleaned three times.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 54.5 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage	Na2S	A 350	CMC-7LT	DF-250			Grind	Cond.	Froth	pH
Grind	200						54.5			7.8
Rougher	-	25	250	28	large bubbles			2	4	8.6
	-	25	-	-	weak froth			2	4	8.6
	-	25	-	-				2	4	8.6
1st. Cleaner	-	-	-	-	heavy froth			1	6	8.5
2nd. Cleaner	-	-	-	-	very fine bubbles			1	3	8.2
3rd. Cleaner	-	-	-	-				1	1.5	7.0

Stage	Rougher	1st. clnr	2nd. clnr	3rd.clnr
Flotation Cell	D1-1 kg.	D1-500g	D1-500g	D1-250g
Speed, r.p.m.	2000	1000	1000	900

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
3rd Clnr. Conc.	105.7	5.6	169	3.56	24.7	81.5	57.2	73.3
3rd Clnr. Tails	17.9	0.9	90.7	6.41	25.7	7.4	17.4	12.9
2nd Clnr. Tails	19.6	1.0	49.6	3.77	11.2	4.4	11.2	6.2
1st Clnr. Tails	19.5	1.0	13.5	0.95	3.15	1.2	2.8	1.7
Rougher Tails	1731.0	91.4	0.69	0.043	0.12	5.4	11.3	5.8
Head(Calc)	1893.7	100.0	11.6	0.35	1.88	100.0	100.0	100.0
Comb. Products								
2nd Clnr. Conc.	123.6	6.5	158	3.97	24.8	88.9	74.6	86.3
1st Clnr. Conc	143.2	7.6	143	3.94	23.0	93.3	85.9	92.4
Rougher Conc	162.7	8.6	127	3.59	20.6	94.6	88.7	94.2

Screen Analyses - Comb. Products

K 80- 36 micrometers S.G. 2.94

Mesh/ Microns	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
200	2.5	5.0	5.0	95.0
270	4.1	8.2	13.2	86.8
38.7 u	2.2	4.4	17.6	82.4
30	4.8	9.6	27.2	72.8
20	6.6	13.2	40.4	59.6
14.4	6.2	12.3	52.7	47.3
11.1	1.5	3.0	55.7	44.3
-11.1	22.1	44.3	100.0	-
Total	50.0	100.0		

Test No. 4 | Project No. 3922 | May 1/90 | Operator: JH

Flotation

Purpose: To investigate the effect of a very fine grind on gold recovery by flotation.

Procedure: After grinding, the sample was pulped in the 1 kg cell and three rougher concs floated .
Na2S (200 g/t) was added to the grind.
CMC-7LT was added to depress talc. Flotation was conducted at natural pH.
The rougher concs were combined and cleaned three times.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 110 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage	Na2S	A 350	CMC-7LT	DF-250			Grind	Cond.	Froth	pH
Grind	200						110			8.6
Rougher	-	25	250	42	poor froth cond.			2	4	8.7
	-	25	-	-	slower floating			2	4	8.6
	-	25	-	-				2	4	8.6
1st. Cleaner	-	-	-	-	heavy froth			1	6	8.6
2nd. Cleaner	-	-	-	-	slower floating			1	3	8.4
3rd. Cleaner	-	-	-	-				1	1.5	7.8

Stage	Rougher	1st. clnr	2nd. clnr	3rd.clnr
Flotation Cell	D1-1 kg.	D1-500g	D1-500g	D1-250g
Speed, r.p.m.	2000	1000	1000	900

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
3rd Clnr. Conc.	58.0	2.9	195	2.94	40.6	54.1	21.4	49.8
3rd Clnr. Tails	31.5	1.6	84.8	4.16	24.2	12.8	16.4	16.1
2nd Clnr. Tails	50.9	2.5	42.8	3.02	10.4	10.4	19.3	11.2
1st Clnr. Tails	215.7	10.8	13.6	0.97	3.06	14.0	26.2	13.9
Rougher Tails	1641.1	82.2	1.10	0.081	0.26	8.6	16.7	9.0
Head(Calc)	1997.2	100.0	10.5	0.40	2.37	100.0	100.0	100.0
Comb. Products								
2nd Clnr. Conc.	89.5	4.5	156	3.37	34.8	66.9	37.8	65.9
1st Clnr. Conc	140.4	7.0	115	3.24	26.0	77.4	57.1	77.0
Rougher Conc	356.1	17.8	53.6	1.87	12.1	91.4	83.3	91.0

Screen Analyses - Comb. Products

K 80- 18 micrometers S.G. 2.90

Microns	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
53	0.0	0.0	0.0	100.0
39.2	0.4	0.8	0.8	99.2
30.4	1.4	2.8	3.6	96.4
21.2	4.7	9.5	13.1	86.9
14.6	8.3	16.7	29.7	70.3
11.3	3.4	6.7	36.5	63.5
-11.3	31.8	63.5	100.0	-
Total	50.0	100.0		

Test No. 4a Project No. 3922 May 7, /90 Operator: D.W.R.

Purpose: To attempt to recover additional gold values by floating additional rougher concentrates from Test 4 ,rougher tailings.

Procedure: As outlined below.

Feed: 1000 grams dried Test 4 Rougher Tailings
(sample was brown in color and looked oxidized from oven drying)

Grind: As is

	Reagents added, g per tonne				Time, minutes			
Stage	CMC-7LT	DF-250	AX A350	Na2S	Grind	Cond.	Froth	pH
					0			7.8
Condition 1						5		
Rougher 1	200	60	50			1	5	8.0
			50			1	5	8.1
Rougher 2				470		1	5	9
Observations: Froth brown in color , slimey with no sulphide color.								

Metallurgical Results

Product	Weight g	Weight %	Assays, g/t Au	Assays, g/t S(T)	% Dist Au	% Dist S(T)
Rougher 1	46.3	4.6	4.62	0.41	19.0	8.3
Rougher 2	76.6	7.7	1.62	0.35	11.0	11.7
Ro Tail	876.0	87.7	0.90	0.21	70.0	80.1
Head(Calc)	998.9	100.0	1.13	0.23	100.0	100.0
Combined Products						
Rougher 1+2		12.3	2.75	0.37	30.0	19.9

Test No.5 Project No. 3922 Date: May 1/90

Purpose: To investigate the effect of grind on cyanidation (CIL) gold recovery .

Procedure: Cyanidation was carried out on the 1000 g sample for 72hrs with a carbon change at 24 hours.
The cyanide and pH levels were maintained throughout the leaching process.
The cyanide residue was filtered and washed.
The residue, carbons and 72hour preg & wash were assayed for gold .

Feed: 1000 g Jonpol -"1990 Compo." minus 10 Mesh

Solution Volume: 2030 ml Pulp Density: 33 % solids

Solution Composition: 0.5 g/L NaCN

pH Range: 10.5-11.0 with Ca(OH)2

Carbon: 15 g/L GRC 22 pre-attritioned

Grind: 38 minutes/2Kg @ 65% solids

Reagent Consumption (kg/t of cyanide feed) NaCN : 0.84 kg/t
CaO : 0.85 kg/t

Time Hours	Added, grams				Residual		Consumed		pH
	Actual		Equivalent		Grams		Grams		
	NaCN	Ca(OH)2	NaCN	CaO	NaCN	CaO	NaCN	CaO	
0.0-2.0	1.07	0.47	1.02	0.35	0.81	-	0.21	0.35	10.8-10.2
2.0-6.5	0.22	0.20	0.21	0.15	0.81	-	0.21	0.15	10.9-10.3
6.5-24.0	0.22	0.20	0.21	0.15	1.02	-	0.00	0.15	10.9-10.5
24.0-28.0	0.00	0.12	0.00	0.09	0.81	-	0.21	0.09	10.9-10.5
28.0-48.0	0.22	0.12	0.21	0.09	0.81	-	0.21	0.09	10.9-10.2
48.0-72.0	0.22	0.13	0.21	0.10	1.02	0.08	0.00	0.02	10.8-10.6
TOTAL	1.95	1.24	1.86	0.93	1.02	0.08	0.84	0.85	

Project No. 3922

Test No. 5

Results

Product	Weight g,ml	Assays g/t,mg/L Au	Distribution %
24 h Carbon	39.4	151	50.5
72 h Carbon	32.9	3.66	1.0
Barren Solution*	2800	0.002	0.05
Residue	995.3	5.73	48.4
Head (calc.)	995.3	11.8	100.0

* where <0.002 reported 0.002 mg/L used for calculation.

24 h Extraction			50.5
72 hExtraction			51.6

Screen Analyses - Cyanide Residue K 80 -71 micrometers

Mesh	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
65	0.4	0.3	0.3	99.7
100	2.4	1.9	2.2	97.8
150	6.8	5.3	7.5	92.5
200	13.9	10.9	18.5	81.5
270	16.1	12.6	31.1	68.9
400	12.5	9.8	40.9	59.1
-400	75.2	59.1	100.0	-
Total	127.3	100.0		

Test No.6 Project No. 3922 Date: May 1/90

Purpose: To investigate the effect of grind on cyanidation (CIL) gold recovery .

Procedure: Cyanidation was carried out on the 1000 g sample for 72hrs with a carbon change at 24 hours.
The cyanide and pH levels were maintained throughout the leaching process.
The cyanide residue was filtered and washed.
The residue, carbons and 72hour preg & wash were assayed for gold .

Feed: 1000 g Jonpol - "1990 Compo." minus 10 Mesh

Solution Volume: 2030 ml Pulp Density: 33 % solids

Solution Composition: 0.5 g/L NaCN

pH Range: 10.5-11.0 with Ca(OH)2

Carbon: 15 g/L GRC 22 pre-attritioned

Grind: 50 minutes/2Kg @ 65% solids

Reagent Consumption (kg/t of cyanide feed) NaCN : 1.04 kg/t
CaO : 1.00 kg/t

Time Hours	Added, grams				Residual		Consumed		
	Actual		Equivalent		Grams		Grams		
	NaCN	Ca(OH)2	NaCN	CaO	NaCN	CaO	NaCN	CaO	pH
0.0-2.0	1.07	0.67	1.02	0.50	0.81	-	0.21	0.50	11.5-10.5
2.0-6.5	0.22	0.10	0.21	0.08	1.02	-	0.00	0.08	10.9-10.4
6.5-24.0	0.00	0.16	0.00	0.12	0.61	-	0.41	0.12	10.9-10.5
24.0-28.0	0.44	0.09	0.41	0.07	1.02	-	0.00	0.07	10.8-10.6
28.0-48.0	0.00	0.11	0.00	0.08	0.81	-	0.21	0.08	11.0-10.1
48.0-72.0	0.22	0.25	0.21	0.19	0.81	0.04	0.21	0.15	10.9-10.5
TOTAL	1.95	1.38	1.85	1.04	0.81	0.04	1.04	1.00	

Project No. 3922

Test No. 6

Results

Product	Weight g,ml	Assays g/t,mg/L Au	Distribution %
24 h Carbon	32.3	193	52.4
72 h Carbon	30.4	4.00	1.0
Barren Solution	2700	0.01	0.2
Residue	1003.3	5.50	46.4
Head (calc.)	1003.3	11.9	100.0

24 h Extraction			52.4
72 h Extraction			53.6

Screen Analyses - Cyanide Residue K 80 - 45 micrometers

Mesh	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
65	0.0	0.0	0.0	100.0
100	0.3	0.2	0.2	99.8
150	1.9	1.2	1.3	98.7
200	7.4	4.5	5.8	94.2
270	15.9	9.6	15.5	84.5
400	14.2	8.6	24.1	75.9
-400	125.1	75.9	100.0	-
Total	164.8	100.0		

Test No.7 Project No. 3922 Date: May 1/90

Purpose: To investigate the effect of grind on cyanidation (CIL) gold recovery .

Procedure: Cyanidation was carried out on the 1000 g sample for 72hrs with a carbon change at 24 hours.
The cyanide and pH levels were maintained throughout the leaching process.
The cyanide residue was filtered and washed.
The residue, carbons and 72hour preg & wash were assayed for gold .

Feed: 1000 g Jonpol - "1990 Compo. minus 10 Mesh

Solution Volume: 2030 ml Pulp Density: 33 % solids

Solution Composition: 0.5 g/L NaCN

pH Range: 10.5-11.0 with Ca(OH)2

Carbon: 15 g/L GRC 22 pre-attritioned

Grind: 54.5 minutes/2Kg @ 65% solids

Reagent Consumption (kg/t of cyanide feed) NaCN : 1.47 kg/t
CaO : 0.87 kg/t

Time Hours	Added, grams				Residual		Consumed		
	Actual		Equivalent		Grams		Grams		
	NaCN	Ca(OH)2	NaCN	CaO	NaCN	CaO	NaCN	CaO	pH
0.0-2.0	1.07	0.50	1.02	0.38	0.81	-	0.21	0.38	11.6-10.6
2.0-6.5	0.22	0.05	0.21	0.04	0.81	-	0.21	0.04	10.9-10.4
6.5-24.0	0.22	0.17	0.21	0.13	0.81	-	0.21	0.13	10.9-10.4
24.0-28.0	0.22	0.12	0.21	0.09	0.81	-	0.21	0.09	10.9-10.6
28.0-48.0	0.22	0.12	0.21	0.09	0.61	-	0.41	0.09	11.0-10.0
48.0-72.0	0.44	0.23	0.41	0.17	0.81	0.04	0.21	0.13	10.8-10.6
TOTAL	2.39	1.19	2.27	0.90	0.81	0.04	1.46	0.86	

Project No. 3922

Test No. 7

Results

Product	Weight g,ml	Assays g/t,mg/L Au	Distribution %
24 h Carbon	33.4	173	50.9
72 h Carbon	30.3	4.60	1.2
Barren Solution	2770	0.002	0.05
Residue	993.2	5.47	47.8
Head (calc.)	993.2	11.4	100.0

* where <0.002 reported 0.002 mg/L Au used for calculation.

24 h Extraction			50.9
72 h Extraction			52.2

Screen Analyses - Cyanide Residue K 80 - 40 micrometers

Mesh	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
65	0.0	0.0	0.0	100.0
100	0.1	0.1	0.1	99.9
150	0.8	0.7	0.8	99.2
200	3.5	3.1	3.9	96.1
270	9.3	8.3	12.2	87.8
400	10.1	9.0	21.3	78.8
-400	88.2	78.8	100.0	-
Total	112.0	100.0		

Test No.8 Project No. 3922 Date: May 1/90

Purpose: To investigate the effect of grind on cyanidation (CIL) gold recovery .

Procedure: Cyanidation was carried out on the 1000 g sample for 72hrs with a carbon change at 24 hours.
The cyanide and pH levels were maintained throughout the leaching process.
The cyanide residue was filtered and washed.
The residue, carbons and 72hour preg & wash were assayed for gold .

Feed: 1000 g Jonpol - "1990 Compo." minus 10 Mesh

Solution Volume: 2030 ml Pulp Density: 33 % solids

Solution Composition: 0.5 g/L NaCN

pH Range: 10.5-11.0 with Ca(OH)2

Carbon: 15 g/L GRC 22 pre-attritioned

Grind: 110 minutes/2Kg @ 65% solids (Grey Mill)

Reagent Consumption (kg/t of cyanide feed) NaCN : 2.20 kg/t
CaO : 1.07 kg/t

Time Hours	Added, grams				Residual		Consumed		pH
	Actual		Equivalent		Grams		Grams		
	NaCN	Ca(OH)2	NaCN	CaO	NaCN	CaO	NaCN	CaO	
0.0-3.5	1.07	0.24	1.02	0.18	0.20	-	0.82	0.18	10.8-9.6
3.5-4.5	0.86	0.39	0.82	0.29	0.81	-	0.21	0.29	11.0-10.4
4.5-20.0	0.22	0.16	0.21	0.12	0.81	-	0.21	0.12	10.8-10.3
20.0-25.0	0.22	0.23	0.21	0.17	0.61	-	0.41	0.17	10.9 -10.5
25.0-44.0	0.44	0.11	0.41	0.08	0.81	-	0.21	0.08	10.9-9.9
44.0-72.0	0.22	0.41	0.21	0.31	0.69	0.09	0.33	0.22	10.9-10.5
TOTAL	3.03	1.54	2.88	1.15	0.69	0.09	2.19	1.06	

Project No. 3922

Test No.8

Results

Product	Weight g,ml	Assays g/t,mg/L Au	Distribution %
24 h Carbon	33.1	156	49.3
72 h Carbon	31.3	4.70	1.4
Barren Solution*	2310	0.002	0.04
Residue	993.5	5.20	49.3
Head (calc.)	993.5	10.6	100.0

* where <0.002 reported 0.002 mg/L Au used for calculation.

24 h Extraction			49.3
72 hExtraction			50.7

Screen Analyses - Cyanide Residue.K80 - 19.5 micrometers S.G. 2.76

Micrometers	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
53	0.0	0.0	0.0	100.0
40.6	0.4	0.8	0.8	99.2
31.5	1.4	2.8	3.6	96.4
22	5.0	9.9	13.5	86.5
15.1	8.2	16.4	29.9	70.1
11.7	3.1	6.2	36.1	63.9
-11.7	31.9	63.9	100.0	-
Total	50.0	100.0		

Test No. 9 Project No. 3922 May 7/90 Operator: D.W.R.

Flotation

Purpose: To investigate the effect of a very fine grind on gold recovery by flotation.

Procedure: After grinding, the sample was pulped in the 1 kg cell and three rougher concs floated .
Na2S (200 g/t) was added to the grind.
CMC-7LT was added to depress talc. Flotation was conducted at natural pH.
The rougher concs were combined and cleaned three times.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 120 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage	Na2S	A 350	CMC-7LT	DF-250			Grind	Cond.	Froth	pH
Grind	200						120			8.9
Rougher	-	25	250	42	poor froth cond.			2	8	8.9
	-	25	-	20	slower floating			2	8	8.5
	-	25	-	20				2	8	8.5
	-	25	-	-				2	8	8.5
	-	25	-	-				2	8	8.5
1st. Cleaner	-	-	-	-	heavy froth			1	10	8.6
		25	50					1	10	8.6
		20		7				1	10	8.6
2nd. Cleaner	-	-	-	-	slower floating			1	15	8.3
3rd. Cleaner	-	-	-	-				1	8	8.2

Stage	Rougher	1st.&2nd Cl	3rd.clnr
Flotation Cell	D1-1 kg.	D1-1 kg	D1-500g
Speed, r.p.m.	2100	1800	1200

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
3rd Clnr. Conc.	155.5	7.8	99.1	2.28	22.3	77.7	44.8	77.3
3rd Clnr. Tails	56.3	2.8	33.3	2.84	8.76	9.5	20.2	11.0
2nd Clnr. Tails	108.0	5.4	11.8	1.29	2.14	6.4	17.6	5.2
1st Clnr. Tails	419.0	21.0	1.40	0.17	0.31	3.0	9.0	2.9
Rougher Tails	1259.6	63.0	0.54	0.053	0.13	3.4	8.4	3.7
Head(Calc)	1998.4	100.0	9.92	0.40	2.24	100.0	100.0	100.0
Comb. Products								
2nd Clnr. Conc.	211.8	10.6	81.6	2.43	18.7	87.2	65.0	88.3
1st Clnr. Conc	319.8	16.0	58.0	2.04	13.1	93.6	82.6	93.5
Rougher Conc	738.8	37.0	25.9	0.98	5.85	96.6	91.6	96.3

Screen Analyses - Comb. Products

K 80- 17.5 micrometers S.G. 2.95

Microns	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
53	0.00	0.0	0.0	100.0
38.2	0.40	0.8	0.8	99.2
29.8	1.15	2.3	3.1	96.9
20.8	4.31	8.6	11.7	88.3
14.3	8.01	16.0	27.7	72.3
11.0	3.06	6.1	33.9	66.1
-11.0	33.07	66.1	100.0	-
Total	50.00	100.0		

Test No. 10 | Project No. 3922 | May 14/90 | Operator: DWR

Flotation

Purpose: To investigate the response of sample W-12 to flotation for gold recovery.

Procedure: After grinding, the sample was pulped in the 1 kg cell and three rougher concs floated. Na2S (200 g/t) was added to the grind. CMC-7LT was added to depress talc. Flotation was conducted at natural pH. The rougher concs were combined and cleaned three times.

Feed: 2000 grams - 10 Mesh, Sample W-12 High Arsenic

Grind: 54.5 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

Stage	Reagents added, g per tonne Na2S	A 350	CMC-7LT	DF-250			Time, minutes Grind	Cond.	Froth	pH
Grind	200						54.5			8.4
Rougher	-	25	250	28	large bubbles			2	4	8.9
	-	25	-	28	weak froth			2	4	8.6
	-	25	-	-				2	4	8.4
	-	25	-	-				2	4	8.4
	-	25	-	-				2	4	8.4
1st. Cleaner	-	-	-	-	heavy froth			1	12	8.5
2nd. Cleaner	-	-	-	-	very fine bubbles			1	6	8.4
3rd. Cleaner	-	-	-	-				1	3	8.2

Stage	Rougher	1st. clnr	2nd. clnr	3rd.clnr
Flotation Cell	D1-1 kg.	D1-1kg	D1-500g	D1-500g
Speed, r.p.m.	2000	1800	1200	1200

Metallurgical Results

Product	Weight g	Weight %	Assays, g/t, % Au	As	S(T)	% Distribution Au	As	S(T)
3rd Clnr. Conc.	230.6	11.5	115	4.89	17.9	71.5	50.0	73.4
3rd Clnr. Tails	49.7	2.5	89.9	8.12	12.2	12.0	17.9	10.8
2nd Clnr. Tails	75.1	3.8	39.0	4.33	5.82	7.9	14.4	7.8
1st Clnr. Tails	250.0	12.5	8.17	0.93	1.04	5.5	10.3	4.6
Rougher Tails	1394.8	69.7	0.81	0.12	0.14	3.0	7.4	3.5
Head(Calc)	2000.2	100.0	18.5	1.13	2.81	100.0	100.0	100.0
Comb. Products								
2nd Clnr. Conc.	280.3	14.0	111	5.46	16.9	83.5	67.9	84.1
1st Clnr. Conc	355.4	17.8	95.4	5.22	14.6	91.4	82.3	91.9
Rougher Conc	605.4	30.3	59.4	3.45	9.0	97.0	92.6	96.5

Screen Analyses - Comb. Products

K 80- 34 micrometers S.G. 2.96

Mesh/ Microns	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
200	1.78	3.6	3.6	96.4
38.7 u	5.16	10.3	13.9	86.1
30	5.55	11.1	25.0	75.0
20	7.03	14.1	39.0	61.0
14.4	6.67	13.3	52.4	47.6
11.1	1.94	3.9	56.3	43.7
-11.1	21.9	43.7	100.0	-
Total	50.0	100.0		

Observations:

Rougher flotation stages required DF-250 to sustain froth bed but too much frother reported to the cleaners making them non-selective and heavy in very fine froth which was difficult to handle.

Test No. 11 Project No. 3922 May 23/90 Operator: D.W.R.

Flotation

Purpose: To use different rougher conditions and investigate the effect of sodium silicate in the cleaner stages.

Procedure: After grinding, the sample was pulped in a 1 kg.cell and three rougher concentrates floated.
CMC-7LT was added to depress talc. Flotation was conducted at natural pH.
The rougher concs were combined and cleaned three times.
Sodium Silicate was added to the cleaner stages.

Feed: 2000 grams - 10 Mesh , 1990 COMPO
Grind: 54 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage		A 350	CMC-7LT	MIBC	DF-250	Sod. Silicate	Grind	Cond.	Froth	pH
Grind							54			8.6
Rougher	-	25	250	15	9			2	8	8.6
	-	25	-	3				2	8	8.5
	-	25	-	3				2	8	8.5
	-	25	-	3				2	8	8.5
	-	25	-	-				2	8	8.5
1st. Cleaner	-	-	50	-		50		1	10	8.8
		5		3				1	5	8.7
		5		3				1	5	8.6
2nd. Cleaner	-	-	-	-		10		1	10	8.6
3rd. Cleaner	-	-	-	-		5		1	5	8.4

Stage	Rougher	1st.&2nd Cl	3rd.clnr
Flotation Cell	D1-1 kg.	D1-500 g	D1-250g
Speed, r.p.m.	2000	1300	1100

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
3rd Clnr. Conc.	112.1	5.6	123	1.47	28.7	66.7	22.0	70.5
3rd Clnr. Tails	20.4	1.0	46.8	2.57	15.7	4.6	7.0	7.0
2nd Clnr. Tails	99.0	5.0	28.5	2.43	5.86	13.6	32.2	12.7
1st Clnr. Tails	211.5	10.6	11.4	1.13	1.52	11.7	31.9	7.0
Rougher Tails	1555.1	77.8	0.45	0.033	0.08	3.4	6.9	2.7
Head(Calc)	1998.1	100.0	10.3	0.37	2.28	100.0	100.0	100.0
Comb. Products								
2nd Clnr. Conc.	132.5	6.6	111	1.64	26.7	71.3	29.0	77.5
1st Clnr. Conc	231.5	11.6	75.9	1.98	17.8	85.0	61.2	90.2
Rougher Conc	443	22.2	45.1	1.57	10.0	96.6	93.1	97.3

Screen Analyses - Comb. Products

K 80- 36 micrometers S.G. 2.95

Microns	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
74	2.70	5.4	5.4	94.6
38.4	5.75	11.5	16.9	83.1
29.8	5.76	11.5	28.4	71.6
20.8	6.69	13.4	41.8	58.2
14.3	5.50	11.0	52.8	47.2
11.0	1.57	3.1	55.9	44.1
-11.0	22.03	44.1	100.0	-
Total	50.00	100.0		

Test No. 12 Project No. 3922 May 24/90 Operator: D.W.R.

Flotation

Purpose: To repeat Test 11 except double the sodium silicate additions in the cleaner stages. stages.

Procedure: After grinding, the sample was pulped in a 1 kg.cell and three rougher concentrates floated. CMC-7LT was added to depress talc. Flotation was conducted at natural pH. The rougher concs were combined and cleaned three times. Sodium Silicate was added to the cleaner stages.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 54 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage		A 350	CMC-7LT	MIBC	DF-250	Sod. Silicate	Grind	Cond.	Froth	pH
Grind							54			8.6
Rougher	-	25	250	15	9			2	8	8.6
	-	25	-	3				2	8	8.5
	-	25	-	3				2	8	8.4
	-	25	-	3				2	8	8.4
	-	25	-	-				2	8	8.3
1st. Cleaner	-	-	50	-		100		1	10	9.2
		5		3				1	5	8.7
		5		3				1	5	-
2nd. Cleaner	-	-	-	-		20		1	10	8.5
3rd. Cleaner	-	-	-	-		10		1	5	8.4

Stage	Rougher	1st.&2nd Cl	3rd.clnr
Flotation Cell	D1-1 kg.	D1-500 g	D1-250g
Speed, r.p.m.	2000	1300	1100

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
3rd Clnr. Conc.	104.2	5.2	138	2.03	32.7	68.8	28.1	71.7
3rd Clnr. Tails	23.1	1.2	70.0	4.72	18.60	7.7	14.5	9.0
2nd Clnr. Tails	68.3	3.4	45.6	4.02	8.29	14.9	36.4	11.9
1st Clnr. Tails	157.2	7.9	6.32	0.62	1.26	4.8	12.9	4.2
Rougher Tails	1642.8	82.3	0.49	0.037	0.09	3.8	8.1	3.1
Head(Calc)	1995.6	100.0	10.48	0.38	2.38	100.0	100.0	100.0
Comb. Products								
2nd Clnr. Conc.	127.3	6.4	126	2.52	30.1	76.5	42.5	80.8
1st Clnr. Conc	195.6	9.8	97.7	3.04	22.5	91.4	79.0	92.7
Rougher Conc	352.8	17.7	57.0	1.96	13.0	96.2	91.9	96.9

Screen Analyses - Comb. Products

K 80- 35.5 micrometers S.G. 2.95

Microns	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
74	2.58	5.2	5.2	94.8
38.4	5.59	11.2	16.3	83.7
29.8	5.63	11.3	27.6	72.4
20.8	6.79	13.6	41.2	58.8
14.3	5.92	11.8	53.0	47.0
11.0	1.54	3.1	56.1	43.9
-11.0	21.95	43.9	100.0	-
Total	50.00	100.0		

Test No. 13 Project No. 3922 May 25/90 Operator: D.W.R.

Flotation

Purpose: To repeat Test 11 except with a lower sodium silicate addition.
The addition was reduced by one half.

Procedure: After grinding, the sample was pulped in a 1 kg.cell and three rougher concentrates floated.
CMC-7LT was added to depress talc. Flotation was conducted at natural pH.
The rougher concs were combined and cleaned three times.
Sodium Silicate was added to the cleaner stages.

Feed: 2000 grams - 10 Mesh , 1990 COMPO
Grind: 54 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage		A 350	CMC-7LT	MIBC	DF-250	Sod. Silicate	Grind	Cond.	Froth	pH
Grind							54			8.6
Rougher	-	25	250	15	9			2	8	8.6
	-	25	-	3				2	8	8.5
	-	25	-	3				2	8	8.4
	-	25	-	3				2	8	8.4
	-	25	-	-				2	8	8.4
1st. Cleaner	-	-	50	-		25		1	10	8.4
		5		3				1	5	8.4
		5		3				1	5	-
2nd. Cleaner	-	-	-	-		5		1	10	8.4
3rd. Cleaner	-	-	-	-		2.5		1	5	8.2

Stage	Rougher	1st.&2nd Cl	3rd.clnr
Flotation Cell	D1-1 kg.	D1-500 g	D1-250g
Speed, r.p.m.	2000	1300	1100

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
3rd Clnr. Conc.	115.9	5.8	135	1.82	28.6	72.0	28.4	71.6
3rd Clnr. Tails	25.5	1.3	67.5	4.89	17.8	7.9	16.8	9.8
2nd Clnr. Tails	60.9	3.1	42.9	3.95	7.98	12.0	32.4	10.5
1st Clnr. Tails	147.6	7.4	5.98	0.71	1.32	4.1	14.1	4.2
Rougher Tails	1644.0	82.5	0.53	0.038	0.11	4.0	8.4	3.9
Head(Calc)	1993.9	100.0	10.90	0.37	2.32	100.0	100.0	100.0
Comb. Products								
2nd Clnr. Conc.	141.4	7.1	123	2.37	26.7	79.9	45.1	81.4
1st Clnr. Conc	202.3	10.1	98.8	2.85	21.0	91.9	77.5	91.9
Rougher Conc	349.9	17.5	59.6	1.95	12.7	96.0	91.6	96.1

Screen Analyses - Comb. Products

K 80- 37 micrometers S.G. 2.93

	Weight	% Retained		% Pass
Microns	grams	Ind.	Cum.	Cum.
74	2.85	5.7	5.7	94.3
38.2	6.21	12.4	18.1	81.9
29.8	5.32	10.6	28.8	71.2
20.8	6.50	13.0	41.8	58.2
14.3	6.39	12.8	54.5	45.5
11.0	2.23	4.5	59.0	41.0
-11.0	20.50	41.0	100.0	-
Total	50.00	100.0		

Test No. 14 Project No. 3922 May 25/90 Operator: D.W.R.

Flotation

Purpose: To repeat Test 11 with an addition of Potassium Permanganate (KMnO4) to the 1st and 2nd cleaners to depress arsenopyrite.

Procedure: After grinding, the sample was pulped in a 1 kg.cell and three rougher concentrates floated.
CMC-7LT was added to depress talc. Flotation was conducted at natural pH.
The rougher conca were combined and cleaned three times.
Sodium Silicate was added to the cleaner stages.
KMnO4 was added to the 1st and 2nd cleaner stages.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 54 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage	KMnO4	A 350	CMC-7LT	MIBC	DF-250	Sod. Silicate	Grind	Cond.	Froth	pH
Grind							54			8.6
Rougher	-	25	250	15	9			2	8	8.5
	-	25	-	3				2	8	8.5
	-	25	-	3				2	8	8.4
	-	25	-	3				2	8	8.4
	-	25	-	-				2	8	8.5
1st. Cleaner	10	-	50	-		50		1	10	9.1
		5		3				1	5	8.8
		5		3				1	5	8.6
2nd. Cleaner	10	-	-	-		10		1	10	8.5
3rd. Cleaner	-	-	-	-		5		1	5	8.5

Stage	Rougher	1st.&2nd Cl	3rd.clnr
Flotation Cell	D1-1 kg.	D1-500 g	D1-250g
Speed, r.p.m.	2000	1300	1100

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
3rd Clnr. Conc.	55.9	2.8	189	1.36	30.8	51.9	10.2	37.4
3rd Clnr. Tails	29.5	1.5	77.8	2.11	27.2	11.3	8.3	17.4
2nd Clnr. Tails	91.3	4.6	59.6	4.28	18.3	26.7	52.3	36.3
1st Clnr. Tails	159.1	8.0	7.93	0.99	1.66	6.2	21.1	5.7
Rougher Tails	1656.2	83.1	0.49	0.037	0.09	4.0	8.2	3.2
Head(Calc)	1992.0	100.0	10.23	0.38	2.31	100.0	100.0	100.0
Comb. Products								
2nd Clnr. Conc.	85.4	4.3	151	1.62	29.6	63.1	18.5	54.8
1st Clnr. Conc	176.7	8.9	104	2.99	23.7	89.8	70.7	91.0
Rougher Conc	335.8	16.9	58.3	2.04	13.3	96.0	91.8	96.8

Screen Analyses - Comb. Products

K 80- 36 micrometers S.G. 2.94

Microns	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
74	2.88	5.8	5.8	94.2
38.2	5.96	11.9	17.7	82.3
29.8	5.47	10.9	28.6	71.4
20.8	6.63	13.3	41.9	58.1
14.3	6.39	12.8	54.7	45.3
11.0	2.17	4.3	59.0	41.0
-11.0	20.50	41.0	100.0	-
Total	50.00	100.0		

Test No. 15 Project No. 3922 June 12/90 Operator: DWR

Flotation

Purpose: To repeat Test 3 with MIBC / DF250 combination as frother.

Procedure: After grinding, the sample was pulped in the 1 kg cell and three rougher concs floated .
Na2S (200 g/t) was added to the grind.
CMC-7LT was added to depress talc. Flotation was conducted at natural pH.
The rougher concs were combined and cleaned three times.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 54.5 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage	Na2S	A 350	CMC-7LT	MIBC	DF-250		Grind	Cond.	Froth	pH
Grind	200						54.5			8.7
Rougher	-	25	250	12.5	8			2	4	8.6
	-	25	-	0				2	4	8.6
	-	25	-	3				2	4	8.6
1st. Cleaner	-	-	-	-				1	6	8.5
2nd. Cleaner	-	-	-	3				1	3	8
3rd. Cleaner	-	-	-	3				1	1.5	7.8

Stage	Rougher	1st. clnr	2nd. clnr	3rd.clnr
Flotation Cell	D1-1 kg.	D1-500g	D1-500g	D1-250g
Speed, r.p.m.	2000	1000	1000	1100

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
3rd Clnr. Conc.	28.3	1.4	293	2.00	42.5	36.3	7.6	25.6
3rd Clnr. Tails	29.0	1.5	136	3.37	33.4	17.3	13.0	20.6
2nd Clnr. Tails	64.0	3.2	88.7	4.20	21.5	24.9	35.9	29.3
1st Clnr. Tails	122.0	6.1	31.1	2.11	7.75	16.6	34.4	20.1
Rougher Tails	1752.9	87.8	0.64	0.039	0.12	4.9	9.1	4.5
Head(Calc)	1996.2	100.0	11.4	0.38	2.36	100.0	100.0	100.0
Comb. Products								
2nd Clnr. Conc.	57.3	2.9	214	2.69	37.9	53.6	20.6	46.2
1st Clnr. Conc	121.3	6.1	148	3.49	29.2	78.5	56.5	75.4
Rougher Conc	243.3	12.2	89.2	2.80	18.5	95.1	90.9	95.5

Screen Analyses - Comb. Products

K 80- 42 micrometers

Mesh	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
65	0.0	0.0	0.0	100.0
100	0.0	0.0	0.0	100.0
150	0.7	0.7	0.7	99.3
200	3.3	3.3	4.0	96.0
270	8.8	8.8	12.8	87.2
400	11.3	11.3	24.1	75.9
-400	75.9	75.9	100.0	-
Total	100.0	100.0		

Test No. 16 Project No. 3922 Date: June 20 /90 Operator: DWR

Flotation

Purpose: To repeat Test 15 with collector & CMC-7LT added to the first cleaner stage.

Procedure: After grinding, the sample was pulped in the 1 kg cell and three rougher concs floated . CMC-7LT was added to depress talc. Flotation was conducted at natural pH. The rougher concs were combined and cleaned four times.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 54.5 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage	Na2S	A 350	CMC-7LT	MIBC	DF-250		Grind	Cond.	Froth	pH
Grind	-						54.5			8.4
Rougher	-	25	250	12.5	8			2	4	8.4
	-	25	-	0				2	4	8.3
	-	25	-	3				2	4	8.3
1st. Cleaner	-	-	-	-				1	5	8.2
	-	5	50	3				1	5	8.2
	-	5	-	3				1	5	8.1
	-	5	-	-	4			1	5	8.0
2nd. Cleaner	-	-	-	-				1	5	8.0
3rd. Cleaner	-	-	10	3				1	5	8.0
4th. Cleaner	-	-	25	3				1	5	7.9

Stage	Rougher	1st. clnr	2nd. clnr	3rd.clnr
Flotation Cell	D1-1 kg.	D1-500g	D1-500g	D1-250g
Speed, r.p.m.	2000	1300	1300	1100

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
4th Clnr. Conc.	50.4	2.5	225	1.90	43.9	55.7	13.2	50.8
4th Clnr. Tails	27.7	1.4	77.5	2.28	27.2	10.6	8.7	17.3
3rd Clnr. Tails	27.2	1.4	58.3	3.44	17.0	7.8	12.9	10.6
2nd Clnr. Tails	51.7	2.6	58.4	5.20	10.9	14.8	37.0	13.0
1st Clnr. Tails	88.6	4.4	12.0	1.38	1.49	5.2	16.8	3.0
Rougher Tails	1749.3	87.7	0.68	0.048	0.13	5.8	11.5	5.2
Head(Calc)	1994.9	100.0	10.2	0.36	2.18	100.0	100.0	100.0
Comb. Products								
3rd Clnr. Conc.	78.1	3.9	173	2.03	38.0	66.3	21.8	68.2
2nd Clnr. Conc.	105	5.3	143	2.40	32.6	74.1	36.6	72.0
1st Clnr. Conc	157	7.9	115	3.32	25.4	88.9	71.7	91.7
Rougher Conc	246	12.3	78.0	2.62	16.8	94.2	88.5	94.8

Screen Analyses - Comb. Products

K 80- 39 micrometers

Mesh	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
65	0.0	0.0	0.0	100.0
100	0.1	0.1	0.1	99.9
150	0.9	0.9	1.0	99.0
200	3.4	3.4	4.4	95.6
270	7.5	7.5	11.9	88.1
400	8.7	8.7	20.6	79.4
-400	79.4	79.4	100.0	-
Total	100.0	100.0		

Test No. 17 Project No. 3922 Date: July 9 1990 Operator: DWR

Flotation

Purpose: To repeat Test 16 with the addition of a regrind for the rougher concentrate prior to cleaning.

Procedure: After grinding, the sample was pulped in the 1 kg cell and three rougher concs floated. CMC-7LT was added to depress talc. Flotation was conducted at natural pH. The rougher concentrate was reground and cleaned three times.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 54.5 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage	Na2S	A 350	CMC-7LT	MIBC	DF-250		Grind	Cond.	Froth	pH
Grind	-						54.5			7.7
Rougher	-	25	250	12.5	8			2	4	8.1
	-	25	-	0				2	4	8.0
	-	25	-	3				2	4	8.1
Ro. Conc. Regrind							10			
1st. Cleaner	-	-	50	-				1	5	8.4
	-	5	-	3				1	5	8.4
	-	5	-	3				1	5	8.4
	-	5	-	-	4			1	5	8.3
2nd. Cleaner	-	-	-	3				1	5	
3rd. Cleaner	-	-	10	3				1	5	

Stage	Rougher	1st. clnr	2nd. clnr	3rd.clnr
Flotation Cell	D1-1 kg.	D1-500g	D1-500g	D1-250g
Speed, r.p.m.	2000	1300	1300	1100

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
3rd. Clnr. Conc	62.2	3.1	206	1.71	39.7	59.0	14.2	50.9
3rd Clnr. Tails	19.3	1.0	67.5	2.19	23.3	6.0	5.7	9.3
2nd Clnr. Tails	53.7	2.7	52.7	2.76	16.5	13.0	19.8	18.3
1st Clnr. Tails	142.7	7.2	25.6	2.59	4.22	16.8	49.5	12.4
Rougher Tails	1714.7	86.1	0.66	0.047	0.26	5.2	10.8	9.2
Head(Calc)	1992.6	100.0	10.9	0.37	2.44	100.0	100.0	100.0
Comb. Products								
2nd Clnr. Conc.	81.5	4.1	173	1.82	35.8	65.0	64.6	68.2
1st Clnr. Conc	135	6.8	125	2.20	28.1	78.0	39.7	78.4
Rougher Conc	278	13.9	74.1	2.40	15.9	94.8	89.2	90.8

Screen Analyses - Rougher Tail

K 80- 43 micrometers

Mesh	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
65	0.0	0.0	0.0	100.0
100	0.1	0.1	0.1	99.9
150	1.1	0.7	0.8	99.2
200	5.2	3.4	4.2	95.8
270	13.5	8.8	13.0	87.0
400	18.0	11.7	24.7	75.3
-400	115.4	75.3	100.0	-
Total	153.3	100.0		

LR-3922 , Test 17

Screen Analyses - Rougher Concentrate

K 80- 24.5 micrometers

Mesh / Microns	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
200	0.2	0.3	0.3	99.7
32.1	4.8	9.6	9.9	90.1
24.9	4.8	9.5	19.5	80.5
17.4	6.2	12.5	31.9	68.1
11.9	6.4	12.7	44.7	55.3
9.2	2.0	4.0	48.7	51.3
-9.2	25.7	51.3	100.0	-
Total	50.0	100.0		

Test No. 18 Project No. 3922 Date: July 16 /90 Operator: DWR J.H.

Flotation

Purpose: To produce 10 kilograms of rougher concentrate for metallurgical testwork.

Procedure: After grinding each 10 kg charge , the sample was pulped in the 40 liter cell.
CMC-7LT was added to depress talc. Flotation was conducted at natural pH.
The rougher concentrate from each 10 kg float was combined to a single rougher concentrate.
The rougher tailings were combined and sampled.

Feed: 80 kilograms - 10 Mesh , 1990 COMPO

Grind: 100 minutes/10 kg. @ 65% Solids in 10 kg Laboratory Ball Mill

	Reagents added, g per tonne					Time, minutes			
Stage		A 350	CMC-7LT	MIBC	DF-250	Grind	Cond.	Froth	pH
Grind						100			8.4
Rougher		25	250	12.5	8		2	5	8.4
		25	-	0	8		2	5	8.4
		25	-	3	8		2	5	8.4
		25			8		2	5	8.4
Arsenopyrite was very slow in floating . Pyrite was observered as middling in very small grains of gangue									
within the final tail. Copper Sulphate may be required to activate remaining Arsenopyrite and more middling.									
Additional CMC-7LT may have been beneficial to additional Talc rejection, which then would									
have required additional collector.									

Stage	Rougher*
Flotation Cell	40 liter
Speed, r.p.m.	1760

* Agitair Cell

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	kg	%	Au	As	S(T)	Au	As	S(T)
Rougher Conc.	11.5	14.4	70.7	2.08	15.3	92.1	79.9	91.1
Rougher Tails	68.5	85.6	1.02	0.088	0.25	7.9	20.1	8.9
Head(Calc)	80.0	100.0	11.0	0.37	2.41	100.0	100.0	100.0

Project No: 3922 MB

Product: Rougher Concentrate Test No: 18

Microns	Mesh	Weight Grams	% Weight		
			Ind.	Cum.	Passing
208	65	0.0	0.0	0.0	100.0
147	100	0.0	0.0	0.0	100.0
104	150	1.0	0.9	0.9	99.1
74	200	4.2	4.0	4.9	95.1
53	270	9.3	8.8	13.8	86.2
38	400	11.3	10.7	24.5	75.5
-38	-400	79.5	75.5	100.0	-
	Total	105.3	100.0	-	-

Product: Combined Flotation Tail Test No: 18 S.G.- 2.86

Mesh	Weight Grams	% Weight		
		Ind.	Cum.	Passing
200m	3.15	6.3	6.3	93.7
35.5µ	7.56	15.1	21.4	78.6
27.5	5.51	11.0	32.4	67.6
19.2	5.93	11.9	44.3	55.7
13.2	5.80	11.6	55.9	44.1
10.2	1.59	3.2	59.1	40.9
-10.2	20.46	40.9	100.0	-
Total	50.00	100.0	-	-

Test No. 19 Project No. 3922 Aug 27/90 Operator: DWR

Flotation

Purpose: To repeat Test 3 rougher conditions and use modified cleaner conditions.

Procedure: After grinding, the sample was pulped in the 1 kg cell and three rougher concs floated .
Na2S (200 g/t) was added to the grind.
CMC-7LT was added to depress talc. Flotation was conducted at natural pH.
The rougher concs were combined and cleaned four times.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 54.5 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage	Na2S	A 350	CMC-7LT	DF-250			Grind	Cond.	Froth	pH
Grind	200						54.5			7.8
Rougher	-	25	250	14	large bubbles			2	4	8.7
	-	25	-	7				2	4	8.7
	-	25	-	7				2	4	8.7
1st. Cleaner	-	5	100	3.5	heavy froth			1	6	8.6
	-	5	-	3.5				1	3	-
2nd. Cleaner	-	-	50	-	very fine bubbles			1	3	8.2
3rd. Cleaner	-	-	50	-	"	"		1	2.5	7.8
4th. Cleaner	-	-	100	-	"	"		1	2.5	7.7

Stage	Rougher	1st. clnr	2nd. clnr	3rd.clnr	4th.clnr
Flotation Cell	D1-1 kg.	D1-500g	D1-250g	D1-250g	D1-250g
Speed, r.p.m.	2000	1100	1100	1100	1100

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
4th Clnr. Conc.	68.2	3.4	200	2.02	41.9	62.7	17.5	62.7
4th. Clnr. Tail	12.6	0.6	111	5.43	31.9	6.4	8.7	8.8
3rd Clnr. Tails	12.3	0.6	122	9.00	25.8	6.9	14.0	7.0
2nd Clnr. Tails	20.9	1.0	115	10.3	19.4	11.1	27.3	8.9
1st Clnr. Tails	132.7	6.7	10.6	0.99	2.21	6.5	16.6	6.4
Rougher Tails	1744.0	87.6	0.80	0.072	0.16	6.4	15.9	6.1
Head(Calc)	1990.7	100.0	10.9	0.40	2.29	100.0	100.0	100.0
Comb. Products								
3rd Clnr Conc.	80.8	4.1	186	2.55	40.3	69.2	26.1	71.6
2nd Clnr. Conc.	93.1	4.7	178	3.40	38.4	76.1	40.2	78.5
1st Clnr. Conc	114	5.7	166	4.67	34.9	87.1	67.4	87.4
Rougher Conc	246.7	12.4	82.5	2.69	17.3	93.6	84.1	93.9

Screen Analyses - Comb. Products

K 80- 39 micrometers

Mesh/ Microns	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
65	0.0	0.0	0.0	100.0
100	0.1	0.1	0.1	99.9
150	0.4	0.4	0.5	99.5
200	2.9	2.9	3.4	96.6
270	7.7	7.7	11.1	88.9
400	9.5	9.5	20.6	79.4
-400	79.4	79.4	100.0	-
Total	100.0	100.0		

Test No. 20 | Project No. 3922 | Aug 28/90 | Operator: DWR

Flotation

Purpose: To repeat Test 3 rougher conditions without Na2S added to the grind and use modified cleaner conditions.

Procedure: After grinding, the sample was pulped in the 1 kg cell and three rougher concentrates were floated.
CMC-7LT was added to depress talc. Flotation was conducted at natural pH.
The rougher concs were combined and cleaned four times.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 54.5 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage	Na2S	A 350	CMC-7LT	DF-250			Grind	Cond.	Froth	pH
Grind	0						54.5			8.3
Rougher	-	25	250	14	large bubbles			2	4	7.9
	-	25	50	7	low froth level in cell			2	4	8.3
	-	25	-	7	needed frother			2	4	8.3
1st. Cleaner	-	5	100	3.5	heavy froth			1	6	8.2
	-	5		3.5				1	3	
2nd. Cleaner	-	-	50	-	very fine bubbles			1	3	7.6
3rd. Cleaner		-	-	-	"	"		1	2.5	7.6
4th. Cleaner	-	-	100	-	"	"		1	2.5	7.6

Stage	Rougher	1st. clnr	2nd. clnr	3rd.clnr	4th.clnr
Flotation Cell	D1-1 kg.	D1-500g	D1-250g	D1-250g	D1-250g
Speed, r.p.m.	2100	1200	1200	1100	1100

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
4th Clnr. Conc.	58.2	2.9	219	1.87	45.6	61.1	14.3	58.5
4th. Clnr. Tail	8.9	0.4	112	3.62	37.1	4.8	4.2	7.3
3rd Clnr. Tails	7.8	0.4	121	7.84	34.7	4.5	8.0	6.0
2nd Clnr. Tails	12.3	0.6	128	12.0	23.7	7.5	19.4	6.4
1st Clnr. Tails	84.3	4.2	20.6	1.86	4.16	8.3	20.6	7.7
Rougher Tails	1819.3	91.4	1.57	0.140	0.35	13.7	33.5	14.0
Head(Calc)	1990.8	100.0	10.5	0.38	2.28	100.0	100.0	100.0
Comb. Products								
3rd Clnr Conc.	67.1	3.4	205	2.10	44.5	65.9	18.5	65.8
2nd Clnr. Conc.	74.9	3.8	196	2.70	43.5	70.4	26.6	71.8
1st Clnr. Conc	87.2	4.4	186	4.01	40.7	78.0	45.9	78.2
Rougher Conc	171.5	8.6	105	2.95	22.7	86.3	66.5	86.0

Screen Analyses - Comb. Products

K 80- 39 micrometers

Mesh	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
65	0.0	0.0	0.0	100.0
100	0.1	0.1	0.1	99.9
150	0.4	0.4	0.5	99.5
200	3.0	3.0	3.5	96.5
270	7.1	7.1	10.6	89.4
400	10.4	10.4	21.0	79.0
-400	79.0	79.0	100.0	-
Total	100.0	100.0		

Test No. 21 Project No. 3922 Aug 31/90 Operator: DWR

Flotation

Purpose: To repeat Test 3 rougher conditions with Na2CO3 added to the grind and rougher and use modified cleaner conditions.

Procedure: After grinding, the sample was pulped in the 1 kg cell and three rougher concentrates were floated.
CMC-7LT was added to depress talc. Flotation was conducted at natural pH.
The rougher concs were combined and cleaned four times.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 54.5 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage	Na2CO3	A 350	CMC-7LT	DF-250			Grind	Cond.	Froth	pH
Grind	500						54.5			9.0
Rougher	500	50	250	21	poor froth			2	4	9.5
	-	25	50	7	good froth level in cell			2	4	9.3
	-	25	-	7	needed frother			2	4	9.3
1st. Cleaner	100	5	100	3.5	heavy froth			1	6	9.5
	-	5		3.5				1	3	-
2nd. Cleaner	100	5	50	-	very fine bubbles			1	3	9.7
3rd. Cleaner	-	2.5	-	-	"	"		1	2.5	9.1
4th. Cleaner	-	-	100	-	"	"		1	2.5	9.0

Stage	Rougher	1st. clnr	2nd. clnr	3rd.clnr	4th.clnr
Flotation Cell	D1-1 kg.	D1-500g	D1-250g	D1-250g	D1-250g
Speed, r.p.m.	2100	1200	1200	1100	1100

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
4th Clnr. Conc.	117	5.9	134	1.55	33.6	73.1	23.8	82.3
4th. Clnr. Tail	7.8	0.4	72.9	4.5	19.0	2.7	4.6	3.1
3rd Clnr. Tails	5.8	0.3	85.6	7.61	13.2	2.3	5.8	1.6
2nd Clnr. Tails	11.6	0.6	59.6	6.3	8.32	3.2	9.6	2.0
1st Clnr. Tails	82.8	4.1	25.7	2.81	2.88	9.9	30.6	5.0
Rougher Tails	1770.3	88.7	1.07	0.110	0.16	8.8	25.6	5.9
Head(Calc)	1995.3	100.0	10.8	0.38	2.39	100.0	100.0	100.0
Comb. Products								
3rd Clnr Conc.	124.8	6.3	130	1.73	32.7	75.7	28.4	85.4
2nd Clnr. Conc.	130.6	6.5	128	2.00	31.8	78.0	34.2	87.1
1st Clnr. Conc	142.2	7.1	123	2.35	29.9	81.3	43.9	89.1
Rougher Conc	225.0	11.3	86.9	2.52	20.0	91.2	74.4	94.1

Test No. 22 Project No. 3922 Date: Sept. 12, 1990 Operator: DWR

Flotation

Purpose: To investigate the effect of higher collector levels in the cleaners after rougher concentrate regrinding.

Procedure: After grinding, the sample was pulped in the 1 kg cell and three rougher concs floated. CMC-7LT was added to depress talc. Flotation was conducted at natural pH. The rougher concs were combined and cleaned four times.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 54.5 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage	Na2S	A 350	CMC-7LT	MIBC	DF-250		Grind	Cond.	Froth	pH
Grind	200						54.5			8.4
Rougher	-	25	250	12	8			2	4	8.4
	-	25	-	3	-			2	4	8.2
	-	25	-	3	-			2	4	8.2
Regrind							15			
1st. Cleaner	-	10	100	3	-			1	6	8.0
	-	10	-	3	-			1	3	7.9
	-	10	-	3	-			1	3	7.9
	-	10	-	3	-			1	3	7.8
2nd. Cleaner	-	25	50	3				1	3	7.8
3rd. Cleaner	-	5	50	-				1	3	7.7
4th. Cleaner	-	5	-	-				1	2	7.7

Stage	Rougher	1st. clnr	2nd. clnr	3rd.clnr	4th clnr
Flotation Cell	D1-1 kg.	D1-500g	D1-500g	D1-250g	D1-250g
Speed, r.p.m.	2000	1500	1500	1100	1100

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
4th Clnr. Conc.	61.1	3.1	255	2.29	48.4	66.9	18.5	65.3
4th Clnr. Tails	5.0	0.3	112.0	4.07	34.8	2.4	2.7	3.8
3rd Clnr. Tails	8.1	0.4	84.6	4.33	26.3	2.9	4.6	4.7
2nd Clnr. Tails	31.2	1.6	39.0	2.61	10.5	5.2	10.7	7.2
1st Clnr. Tails	119.6	6.0	32.7	3.33	4.81	16.8	52.6	12.7
Rougher Tails	1755.1	88.6	0.76	0.047	0.16	5.7	10.9	6.2
Head(Calc)	1980.1	100.0	11.8	0.38	2.29	100.0	100.0	100.0
Comb. Products								
3rd Clnr. Conc.	66.1	3.3	244	2.42	47.4	69.3	21.2	69.2
2nd Clnr. Conc.	74	3.7	227	2.63	45.1	72.3	25.5	72.4
1st Clnr. Conc	105.4	5.3	171	2.63	34.8	77.5	36.5	81.1
Rougher Conc	225	11.4	97.6	3.00	18.9	94.3	89.1	93.8

3922 Test No. 22

Screen Analyses - Rougher Tails

K 80- 44 micrometers

Mesh	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
65	0.0	0.0	0.0	100.0
100	0.3	0.2	0.2	99.8
150	1.9	1.1	1.3	98.7
200	8.7	5.1	6.4	93.6
270	18.3	10.8	17.2	82.8
400	18.4	10.8	28.0	72.0
-400	122.1	72.0	100.0	-
Total	169.7	100.0		

Screen Analyses - Reground Rougher Concentrate

K 80- 21.4 micrometers

Mesh	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
270	0.2	0.5	0.5	99.5
30.6	3.4	6.9	7.3	92.7
23.7	4.3	8.5	15.9	84.1
16.5	6.6	13.2	29.1	70.9
11.4	7.4	14.7	43.8	56.2
8.8	2.6	5.1	48.9	51.1
-8.8	25.6	51.1	100.0	-
Total	50.0	100.0		

Test No. 23 Project No. 3922 Date: October 5, 1990 Operator: DWR

Flotation

Purpose: To repeat test 22 with the addition of CuSO4 in the rougher and cleaning stages.

Procedure: After grinding, the sample was pulped in the 1 kg cell and three rougher concs floated. CMC-7LT was added to depress talc. Flotation was conducted at natural pH. The rougher concs were combined and cleaned four times.

Feed: 2000 grams - 10 Mesh , 1990 COMPO

Grind: 54.5 minutes/2 kg. kg @ 65% Solids in 2 kg Laboratory Ball Mill

	Reagents added, g per tonne						Time, minutes			
Stage	Na2S	A 350	CMC-7LT	MIBC	DF-250	CuSO4	Grind	Cond.	Froth	pH
Grind	200						54.5			8.7
Rougher	-	25	250	12	8	-		2	4	7.9
	-	25	-	3	-	250		2	4	8.2
	-	25	-	3	-	-		2	4	8.3
Regrind							15			8.1
1st. Cleaner	-	10	100	3	-			1	6	8.2
	-	10	-	6	-	25		1	3	7.9
	-	10	-	3	-	10		1	3	8.0
	-	10	-	3	-	10		1	3	8.0
2nd. Cleaner	-	25	50	3	-	10		1	3	7.9
3rd. Cleaner	-	5	50	-	-	5		1	3	7.9
4th. Cleaner	-	5	-	-	-	-		1	2	7.8

Stage	Rougher	1st. clnr	2nd. clnr	3rd.clnr	4th clnr
Flotation Cell	D1-1 kg.	D1-500g	D1-500g	D1-250g	D1-250g
Speed, r.p.m.	2000	1500	1500	1100	1100

Metallurgical Results

Product	Weight		Assays, g/t, %			% Distribution		
	g	%	Au	As	S(T)	Au	As	S(T)
4th Clnr. Conc.	70.1	3.5	209	4.58	42.2	72.4	43.0	67.7
4th Clnr. Tails	12.0	0.6	83.7	5.83	20.0	5.0	9.4	5.5
3rd Clnr. Tails	8.2	0.4	115.3	7.61	27.0	4.7	8.4	5.1
2nd Clnr. Tails	39.3	2.0	36.9	2.84	8.7	7.2	15.0	7.8
1st Clnr. Tails	110.4	5.5	8.8	0.94	1.70	4.8	13.9	4.3
Rougher Tails	1754.2	88.0	0.69	0.044	0.24	6.0	10.3	9.6
Head(Calc)	1994.2	100.0	10.1	0.37	2.19	100.0	100.0	100.0
Comb. Products								
3rd Clnr. Conc.	82.1	4.1	191	4.76	39.0	77.4	52.4	73.2
2nd Clnr. Conc.	90.3	4.5	184	5.02	37.9	82.1	56.4	77.8
1st Clnr. Conc	130	6.5	139	4.36	29.0	89.2	75.7	86.1
Rougher Conc	240	12.0	79.3	2.79	16.4	94.0	89.7	90.4

3922 Test No. 23

Screen Analyses - Rougher Tails

K80: 44 micrometers

Mesh	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
65	0.0	0.0	0.0	100.0
100	0.3	0.1	0.1	99.9
150	2.6	1.0	1.1	98.9
200	10.5	4.2	5.3	94.7
270	22.9	9.1	14.4	85.6
400	24.3	9.6	24.0	76.0
-400	192.1	76.0	100.0	-
Total	252.7	100.0		

Screen Analyses - Reground Rougher Concentrate

K 80- 19 micrometers

Mesh/ Microns	Weight grams	% Retained Ind.	% Retained Cum.	% Pass Cum.
270	0.0	0.0	0.0	100.0
32.6	2.0	3.9	3.9	96.1
25.3	3.1	6.1	10.0	90.0
17.6	5.7	11.5	21.5	78.5
12.1	7.2	14.4	35.9	64.1
9.4	2.3	4.5	40.4	59.6
-9.4	29.8	59.6	100.0	-
Total	50.0	100.0		

APPENDIX 1

Mineralogical Examination of Flotation Products

J. G. Davison, M.Sc.
5 September, 1990

Samples of flotation products were submitted to the mineralogy laboratory. The purpose of the examination was to determine by qualitative X-ray diffraction the relative quantity and type of diluent gangue minerals. The following samples were made available:

1. Test 3 - 3rd Cleaner Concentrate
2. Test 16 - 4th Cleaner Concentrate
3. Test 16 - 4th Cleaner Tail
4. Test 16 - 3rd Cleaner Tail
5. Test 16 - 2nd Cleaner Tail
6. Test 16 - 1st Cleaner Tail
7. Test 16 - Rougher Tail

Each sample was scanned over the primary and secondary peaks for the gangue minerals, identified as quartz, talc, chlorite, dolomite, feldspar and calcite. Pyrite was also reported.

The following results were obtained:

Sample	Mineral Distribution						
	Talc Tc	Quartz Qz	Dolomite Dol	Chorite Chl	Calcite Cct	Feldspar Fsp	Pyrite Py
Test 13							
3rd Clnr Conc.	mod	m	m	tr	m	tr	M+
Test 16							
4th Clnr.Conc.	mod	tr	tr	N.D.	m-med	tr	M+
3rd Clnr.Conc.	M	m-mod	m	m	m	m	M
2nd Clnr.Tail	M	mod	m-mod	m	ND	m	mod
1st Clnr. Tail	M	M	M	mod	ND	mod	N.A.
R.O. Tail	tr	M	M	m	ND	M	tr

Legend

M	-	major (M+ - very strong)
mod	-	moderate
m	-	minor
tr	-	trace
N.D.	-	not detected
N.A.	-	not analyzed

LAKEFIELD RESEARCH
A Division of Falconbridge Limited
Lakefield, Ontario
November 28, 1990/mo

63.6120

KILBORN

Kilborn Engineering (B.C.) Ltd., Suite 400 - 1380 Burrard Street, Vancouver, B.C., Canada V6Z 2B7
Telex: 04-507734, Telephone: (604) 669-8811, Facsimile: (604) 669-0847

November 26, 1990
Project No. 8257-15

020

Jonpol Group
500 - 455 Granville Street
Vancouver, B.C.
V6E 1V2

Attention: Mr. R.A. Pollock
Vice President

Dear Sirs:

Re: Garrison Project
Order-of-Magnitude Operating Revenue Analysis

We are pleased to submit our report entitled:

"Jonpol Group
Garrison Project
Order-of-Magnitude Operating
Revenue Analysis"

We are sending six copies of the report as agreed.

We would like to thank you for the opportunity to study this phase of the Garrison Project.

Yours very truly,

KILBORN ENGINEERING (B.C.) LTD.

P. Wilson, BSc. Eng.
Project Manager

PW/mg

cc: D. Beaumont - Kilborn (letter only)
KEL Project File

OMIP90-85
-86

JONPOL GROUP

GARRISON GOLD PROJECT

PROJECT NUMBER 8257-15

ORDER-OF-MAGNITUDE OPERATING REVENUE ANALYSIS

SUBMITTED BY:

KILBORN ENGINEERING (B.C.) LTD.
400 - 1380 Burrard Street
Vancouver, B. C.
V6Z 2B7

NOVEMBER 1990

JONPOL GROUP
GARRISON GOLD PROJECT

ORDER-OF-MAGNITUDE OPERATING REVENUE ANALYSIS

TABLE OF CONTENTS

1.0 INTRODUCTION

The Jonpol Group commissioned Kilborn Engineering (B.C.) Ltd. in April 1990 to supervise the metallurgical testwork program for their Garrison Township orebody and to provide general technical assistance as required.

The Garrison ore is a gold bearing arsenopyrite-pyrite alteration assemblage. During the period of April 1990 to September 1990 a total of twenty-three tests were conducted at Lakefield Research to evaluate the amenability of the ore to processing by either direct cyanidation or flotation. Early in the test program the ore proved to be refractory to cyanidation and the testwork focus was therefore shifted towards optimizing flotation recovery and selectivity.

Although the flotation conditions have not yet been fully optimized, the metallurgical results are considered sufficiently representative of potential plant performance to warrant an order-of-magnitude operating revenue analysis to indicate the viability of the project. The analysis only considers operating costs for the anticipated processing strategy, which involves producing a flotation concentrate in the Chadbourne milling facility followed by concentrate treatment at the Horne smelter. The purpose of this report is to present the findings of this analysis based upon this particular metallurgical sample supplied by Jonpol.

2.0 SUMMARY

Based on the operating costs and smelter contracts provided the analysis shows a maximum revenue of $15 per ton mined.

Four cases were studied and the resulting revenue ranged from a minimum $10 per ton to a maximum of $15 per ton.

3.0 CHADBOURNE CUSTOM MILLING CIRCUIT

3.1 EQUIPMENT

The grinding circuit in the custom mill consists of one 250 horsepower, 7 foot by 12 foot ball mill in closed circuit with 10 inch cyclones. The cyclone overflow feeds the flotation circuit which has Denver 100 ft^3 DR cells, 50 ft^3 Denver Sub-A cells and 40 ft^3 Agitair cells available for use.

3.2 ANTICIPATED PERFORMANCE

Based on the work index that has been determined for the Garrison ore it is unlikely that the ball mill will be capable of achieving the optimum grind of 80% passing 40 micron which was used in laboratory testwork. Assuming a ball mill feed of 80% passing 3/8 inch the mill capacity will be approximately 175 tons per day to a grind of 80% minus 75 microns. Due to the coarser grind a higher concentrate weight will be observed for at a given flotation recovery.

The laboratory test which most closely represents the potential custom mill performance is Test Number 1 in which a grind of 80% - 66 micron was used. Although this is finer that the anticipated plant grind it is the coarsest grind used in laboratory testwork, and therefore the closest basis for comparison. In addition, the head grade for Test Number 1 was

higher than the expected mining head grade and recoveries have been reduced by 1% from the test results to account for this.

The concentrate weight percent and adjusted recoveries from Test 1 were used as the basis for the analysis. The four cases evaluated correspond to the flotation products presented below:

Test 1 Test Products

		Weight Percent to Concentrate	Adjusted Gold Recoveries(%)
Case A	- Rougher concentrate	14.5	94
Case B	- 1st Cleaner concentrate	8.8	88
Case C	- 2nd Cleaner concentrate	7.1	82
Case D	- 3rd Cleaner concentrate	6.3	77

4.0 ORDER-OF-MAGNITUDE OPERATING REVENUE ANALYSIS

Mining, transportation, custom milling and smelting costs were supplied by Jonpol and these formed the cost basis of the economic analysis.

Order-of-magnitude operating revenues were calculated for each case. The results of the analysis are summarized in Table 4.0-1 and the overall revenue per ton is presented in Figure 4.0-1. As can be seen Case B, which involves cleaning the rougher concentrate once, yields the highest revenue of $15 per ton.

Table 4.0-1

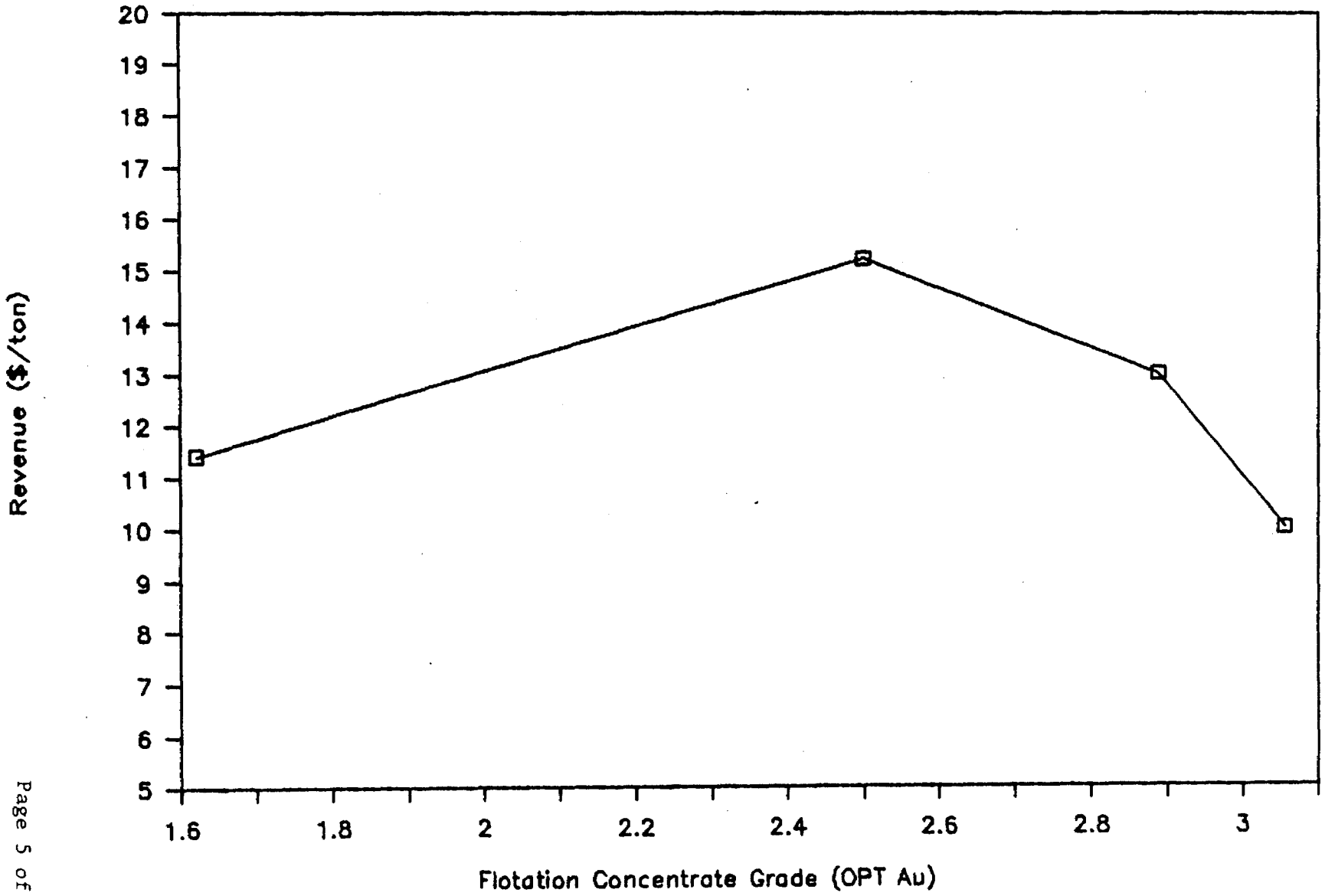
JONPOL GROUP - GARRISON TOWNSHIP
ORDER - OF - MAGNITUDE
CUSTOM MILLING AND SMELTING OPERATING REVENUE ANALYSIS

Mining Costs					
Production Rate (SDT per day)		175			
Moisture Content (%)		2			
Production Rate (SWT per day)		178.5			
Unit Mining Cost ($/SDT)		$30.00			
Contract Mining Cost ($ per day)		$5,355			
Onsite Labour Cost ($ per day)					
Mechanic 5/7 X	$175 per shift	$125			
Electric. 5/7 X	$175 per shift	$125			
Geologist 5/7 X	$195 per shift	$139			
Ventilation Power 8 kwh/t @ .08$/kwh		$114			
1) Daily Mining Cost		$5,859			
Truck Loading Costs					
Onsite Labour Cost ($ per day)					
Loader Op. 5/7 X	$140 per shift	$100			
Loader Cost 5/7 X	$432 per shift	$309			
2) Daily Truck Loading Cost		$409			
Transportation Costs					
Daily Trucking Tonnage (SWT)		178.5			
Unit Transportation Cost($/ton/mile)		$0.07			
Trucking Distance (miles)		60			
3) Daily Trucking Cost ($)		$750			
Milling Costs					
Unit Milling Cost ($/SDT)		$16.00			
4) Daily Milling Cost ($)		$2,800			
Flotation Performance		CASE A	CASE B	CASE C	CASE D
Feed Grade (OPT Au)		0.25	0.25	0.25	0.25
Au Recovery to Concentrate (%)		94	88	82	77
Weight to Concentrate (%)		14.5	8.8	7.1	6.3
Daily Concentrate Production (SDT)		25.375	15	12	11
Assays Gold (OPT Au)		1.6	2.5	2.9	3.1
Arsenic (%)		2.2	3	2.9	2.6
Contained Gold (troy ounces)		41	39	36	34
Arsenic (lbs.)		1117	924	716	573
Smelting Charges					
Treatment Charge @ $160.00 per SDT concentrate		$4,060	$2,464	$1,988	$1,764
Penalties	$2.30 per .1% As over 0.30% As	$1,109	$956	$737	$583
Refining Charge @	$5.00 per oz Au	$206	$193	$179	$168
5) Daily Smelting Cost ($)		$5,375	$3,613	$2,905	$2,516
TOTAL DAILY COSTS ($) (1+2+3+4+5)		$15,191	$13,430	$12,721	$12,332
Smelter Payment					
Accountable Au(oz)	95.00% of gold	39	37	34	32
Gold Price	$440 $/ounce				
TOTAL DAILY PAYMENT ($)		$17,190	$16,093	$14,996	$14,081
TOTAL DAILY REVENUE ($)		$1,999	$2,663	$2,274	$1,749
REVENUE ($/TON)		$11.42	$15.22	$13.00	$9.99

Figure 4.0-1

JONPOL GROUP

Net Revenue Versus Concentrate Grade



5.0 SENSITIVITY ANALYSIS

In order to assess the effect of change to some of the analysis variables sensitivity analyses have been performed on the following elements:

Gold Price
Operating Costs
Concentrate Grade
Head Grade

Case B was used as the zero percent change case.

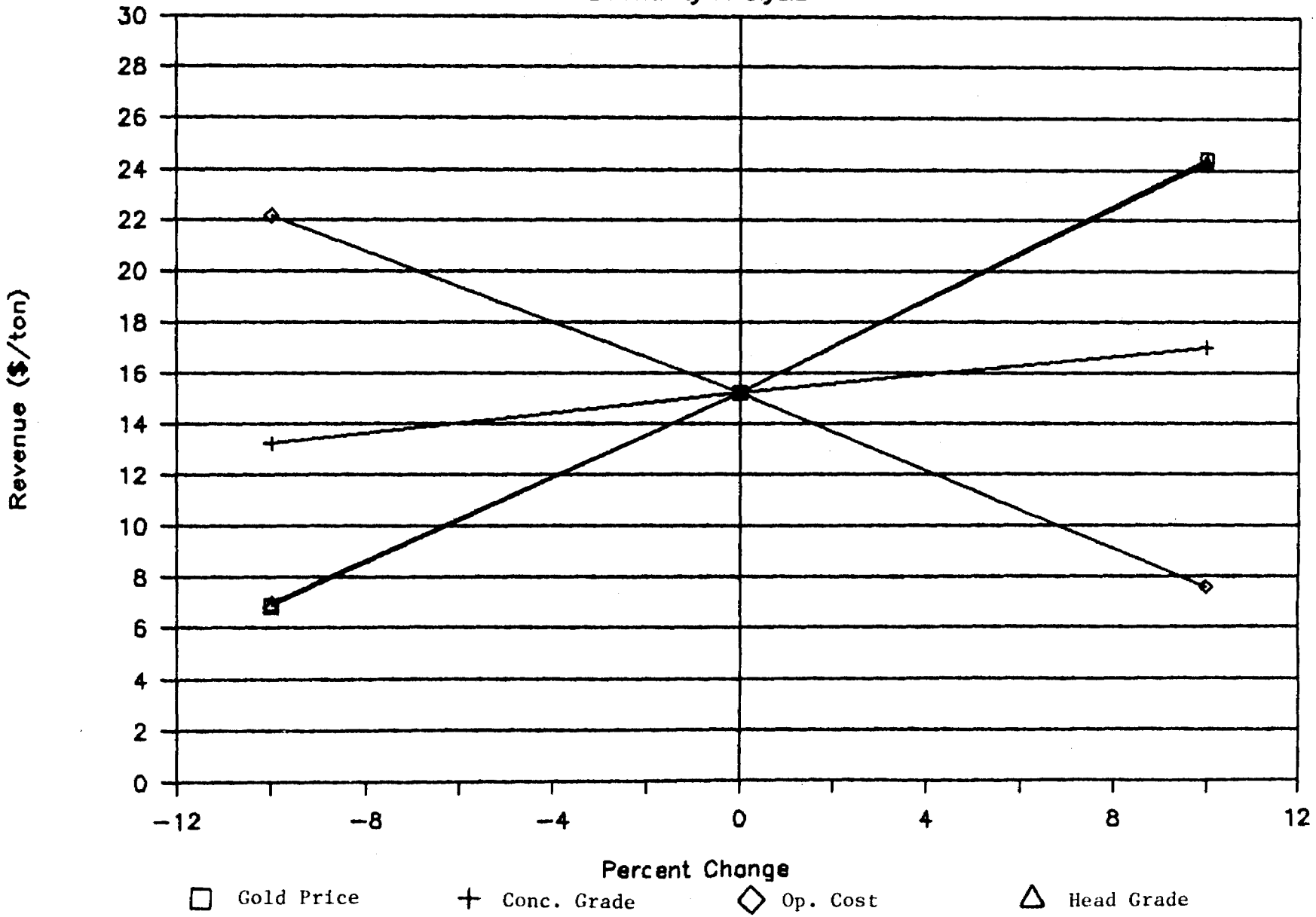
The results of these analyses are shown in Figure 4.0-1 overleaf and indicate the project is most sensitive to head grade and gold price.

The next most sensitive variable is operating cost while flotation concentrate grade is the least sensitive variable.

Figure 5.0-1

GARRISON GOLD PROJECT

Sensitivity Analysis



BASIS OF ORDER-OF-MAGNITUDE
OPERATING REVENUE ANALYSIS

1) Gold Price - $440 Canadian.

2) All costs and revenues presented in Canadian funds.

3) Mining costs - $30.00 per short wet ton as provided by Jonpol.

4) Trucking costs - $.07 per short wet ton per mile as provided by Jonpol.

5) Mining and stockpiling/truck loading conducted on a five day per week basis.

6) Mechanic and electrical work one shift per day, five days per week.

7) Truck demurrage costs have not been included.

8) Loader operator works one shift per day, five days per week.

9) It is assumed that the Chadbourne mill is capable of reproducing the Lakefield metallurgical results.

10) Milling costs - $16.00 per short dry ton as supplied by Jonpol.

11) Horne Smelter contract as supplied by Jonpol.

12) Head Grade of .25 OPT Au as supplied by Jonpol.

63.6120
2 of 2

D.D.H. GEOMANAGEMENT LTD.

030

REPORT ON THE

GARRISON GOLD PROJECT

GARRISON TOWNSHIP

DISTRICT OF COCHRANE

ONTARIO

LATITUDE 48 DEGREES 30' 58" NORTH
LONGITUDE 79 DEGREES 57' 11" WEST
N.T.S. 32 D/12

WITH SPECIAL REFERENCE TO A

DIAMOND DRILL PROGRAM

DURING THE DESIGNATED PERIOD OF

DECEMBER 10, 1990 TO FEBRUARY 15, 1991

FOR

JONPOL EXPLORATIONS LTD.
AND
T. AND H. RESOURCES LTD.
420 -111 Richmond St. West,
Toronto, Ontario
M5H 2G4

BY

D. A. HOWARD, M.Sc., P.Eng.

D.D.H. GEOMANAGEMENT LTD.

FEBRUARY 14, 1991

OMIP90-85
-86

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ILLUSTRATIONS

SUMMARY

The Garrison Gold Project, located in Garrison Township, District of Cochrane, northeastern Ontario has recently been expanded to include gold exploration zones not only within the Munro Fault Zone on the north but also within the Porcupine-Destor Fault Zone on the south.

During the designated period, Bradley Bros. Limited drilled a total of 6,348 feet of B.Q. sized core. Drilling started on January 5, 1991 and finished on January 30, 1991.

Results from hole H 91-1 have indicated that the J.D. Zone extends westerly beyond the former Newfield claims onto the claims of the former Hastings ground and thus, opens approximately one-half mile of strike length for further exploration drilling.

Results of holes H 91-2, H 91-3 and H 91-4 have strongly suggested that gold is fracture controlled and has been deposited within a stressed brittle host of syenitic intrusive rocks within the Porcupine-Destor Fault Zone.

These results suggest two important exploration guides with respect to the Garrison Gold Project. Firstly, the known gold mineralization in the Munro Fault Zone is associated with altered komatiitic flow rocks along and in proximity to the contact with the "Northwall Metavolcanic Rocks". Secondly, the association of gold with syenitic intrusive rocks, initially proposed by Satterly (1949), has been demonstrated. The significance of this latter association is that there could be an, as yet, undefined gold resource within the Porcupine-Destor Fault Zone within claims of the Garrison Gold Project.

The limited drill program herein described is the first work by Jonpol Explorations Ltd./T. & H. Resources Ltd. on the claims of the expanded property. In light of the results of these 1991 holes, further exploration drilling is warranted.

INTRODUCTION

Jonpol Explorations Ltd./T. & H. Resources Ltd., 420 - 111 Richmond St. West, Toronto, Ontario, M5H 2G4 requested D.D.H. Geomanagement Ltd., 422 - 470 Granville St., Vancouver, B.C., V6C 1V5 to manage a diamond drill program on the Hastings and Wright-Hargreaves portion of the Garrison gold project in Garrison Township, District of Cochrane, Ontario. D.D.H. Geomanagement Ltd. has been involved with the exploration of the property since June 1987 and the writer has been associated with the project since that time.

The subject of this report will be restricted to the B.Q. diamond drill program undertaken during the designated program period.

LOCATION AND ACCESS

The Garrison Gold Project covers a portion of both the Munro Fault Zone (M.F.Z.) and the Porcupine-Destor Fault Zone (P.D.F.Z.) in Garrison Township, District of Cochrane, northeastern Ontario. The property is 40 kilometres (25 miles) north of Kirkland Lake, 35 kms (22 miles) east of Matheson and 100 kms (62 miles) east of Timmins, Ontario (Figure 1). Coordinates of the property are 48 degrees, 30' 58" north latitude and 79 degrees 57' 11" west longitude. The N.T.S. area is 32 D/12.

Access is via Highway 101 as the property is immediately south of the Highway (Figure 2). During 1988, a 0.8 km (0.5 mile) gravel road was constructed allowing 2-wheel drive access.

Topographically, the elevations on the property range from 950 to 1,000 feet (289 to 305 m) with swamp and covered areas between hummocks of clay rimmed outcrop. Esker and sandy soil areas are covered by jackpine and balsam while the wet areas are covered with spruce, cedar and tag alder.

PROPERTY AND TITLE

The Garrison Gold Project comprises several properties which have been acquired since 1985 such that the current property has been expanded to that shown in Figure 2. The following claims are controlled by Jonpol Explorations Ltd. as to an undivided 64.3 % and by T. & H. Resources Ltd. as to an undivided 35.7 %:

(a) Garrcon - patented claims L26120, L26121, L26122, L26341, L26342, L26343, L26344, L26345, L38949, L38950 and L38951;
(b) Linton/Hobbs - patented claims L26384, L26385, L26075, L26076, L30576, L26116(L40273), L26074 and L859679;
(c) Brydges - patented claims L25803, L25804, L25805, L25937, L25938, L25939, L25940, L25941 and L25942;
(d) Newfield - patented claims L26435, L26436, L26437, L39428, L39429, L43702, L44331, L44332, L26434, L26433, L26432,

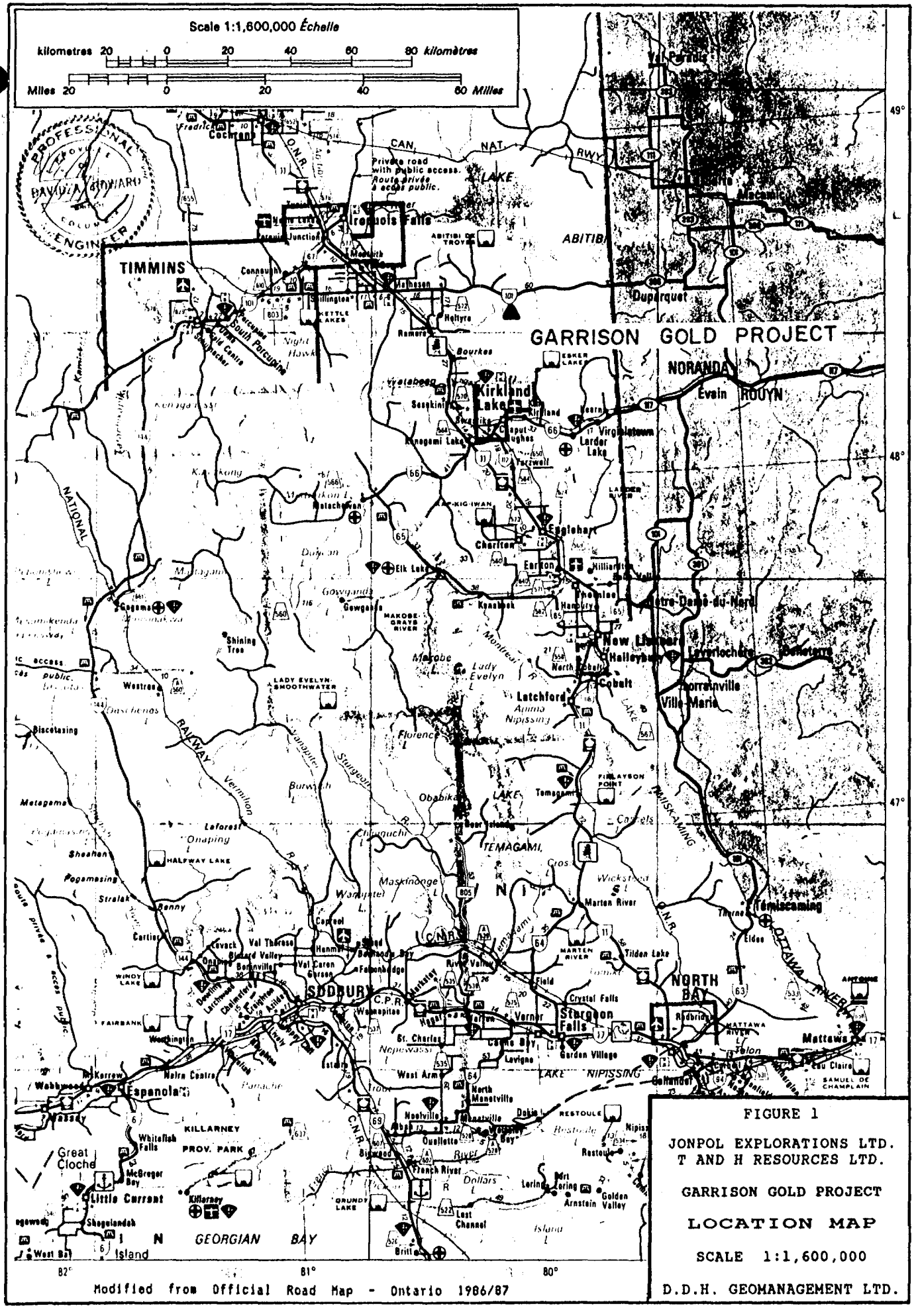


FIGURE 1

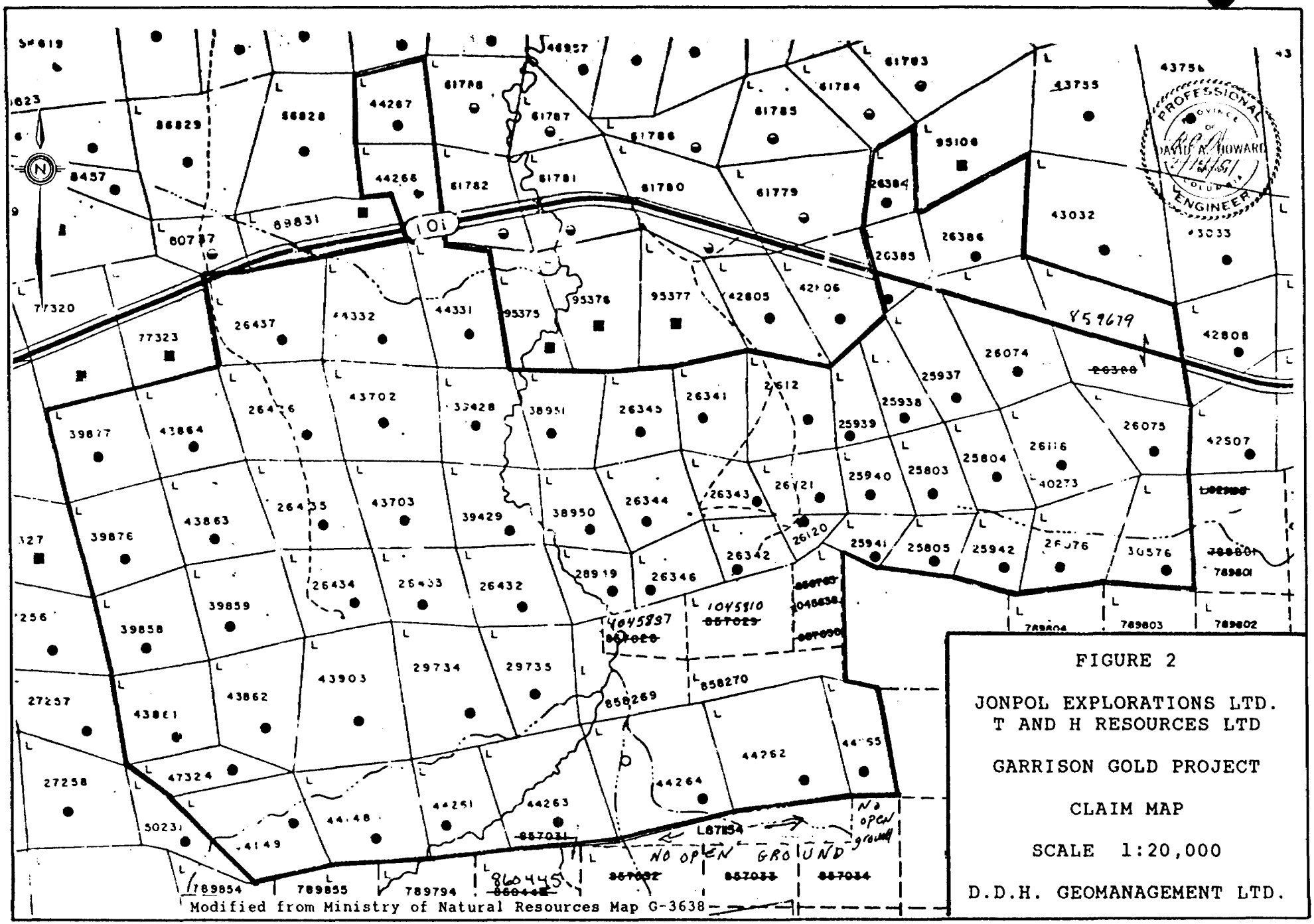
JONPOL EXPLORATIONS LTD.
T AND H RESOURCES LTD.

GARRISON GOLD PROJECT

LOCATION MAP

SCALE 1:1,600,000

D.D.H. GEOMANAGEMENT LTD.


101
PROFESSIONAL ENGINEER
DAVID A. HOWARD
FIGURE 2
JONPOL EXPLORATIONS LTD.
T AND H RESOURCES LTD
GARRISON GOLD PROJECT
CLAIM MAP
SCALE 1:20,000
D.D.H. GEOMANAGEMENT LTD.
NO OPEN GROUND
Modified from Ministry of Natural Resources Map G-3638

L29734 and L29735. Jonpol Explorations Ltd. and T. & H. Resources Ltd. in the same proportion have concluded an option to earn a 100 % interest in the following claims:

(a) Hastings - L39858, L39859, L39876, L39877, L43861, L43862, L43863 and L43864;
(b) Wright-Hargreaves - L43903, L44148, L44149, L44261, L44262, L44623, L44624, L44625, L44626, L44627 and L47324;
(c) Other staked claims - L858269, L858270, L1045810, L1045837 and L1045838.

HISTORY

According to Satterly (1949), the former properties known as Newfield, Garrcon, Brydges, Linton, Hastings and Wright-Hargreaves where drilled in the period 1935 to 1946. Some additional work in the form of drilling was undertaken by Long Lac Mineral Exploration Ltd. in 1983 on the former Wright-Hargreaves claim L43903 and by Kerr Addison Mines in 1983 on the former Garrcon claims L26344 and L26343. The following work has been completed on the Jonpol/T. & H. property (Newfield, Garrcon, Brydges and Linton-Hobbs) since 1985:

Surface drilling
- (a) 236,452 feet of B.Q.
- (b) 2,120 feet of 3" diameter air track;

Underground
- (a) 605 feet - 22'x9' vertical shaft,
- (b) 607 feet - 5'x7' cross-cut,
- (c) 485 feet - 5'x7' drifting in the J.P. Zone,
- (d) 11,970 feet - AXT diamond drilling,
- (e) bulk sampling of 79 rounds;

Metallurgical testing - Lakefield Research, Ontario.

PURPOSE OF THE DESIGNATED DRILL PROGRAM

Results to date on the Jonpol/T. & H. property (Newfield, Garrcon, Brydges and Linton-Hobbs) indicate the following:(see Figure 3)

(1)
The Garrison gold project investigated some 2.2 miles (3.5 kms) of strike length along the Munro Fault Zone in which metakomatiitic volcanic rocks host gold-albite-sericite-pyrite mineralization;

(2)
Surface drilling has indicated five (5) gold shoots along one mile of strike length. Of the total of 199 holes, some 92% have intercepts less than 1,000 feet of depth. The five zones from west to east are J.D., J.P., R.P., Garrcon West and Garrcon East which have a mineral inventory to a depth of 1,000 feet of
513,800 tons at 0.28 opt gold over 11 feet width (> 0.15 opt gold)
or
1,050,200 tons at 0.18 opt gold over 10 feet width (> 0.08 opt Au);

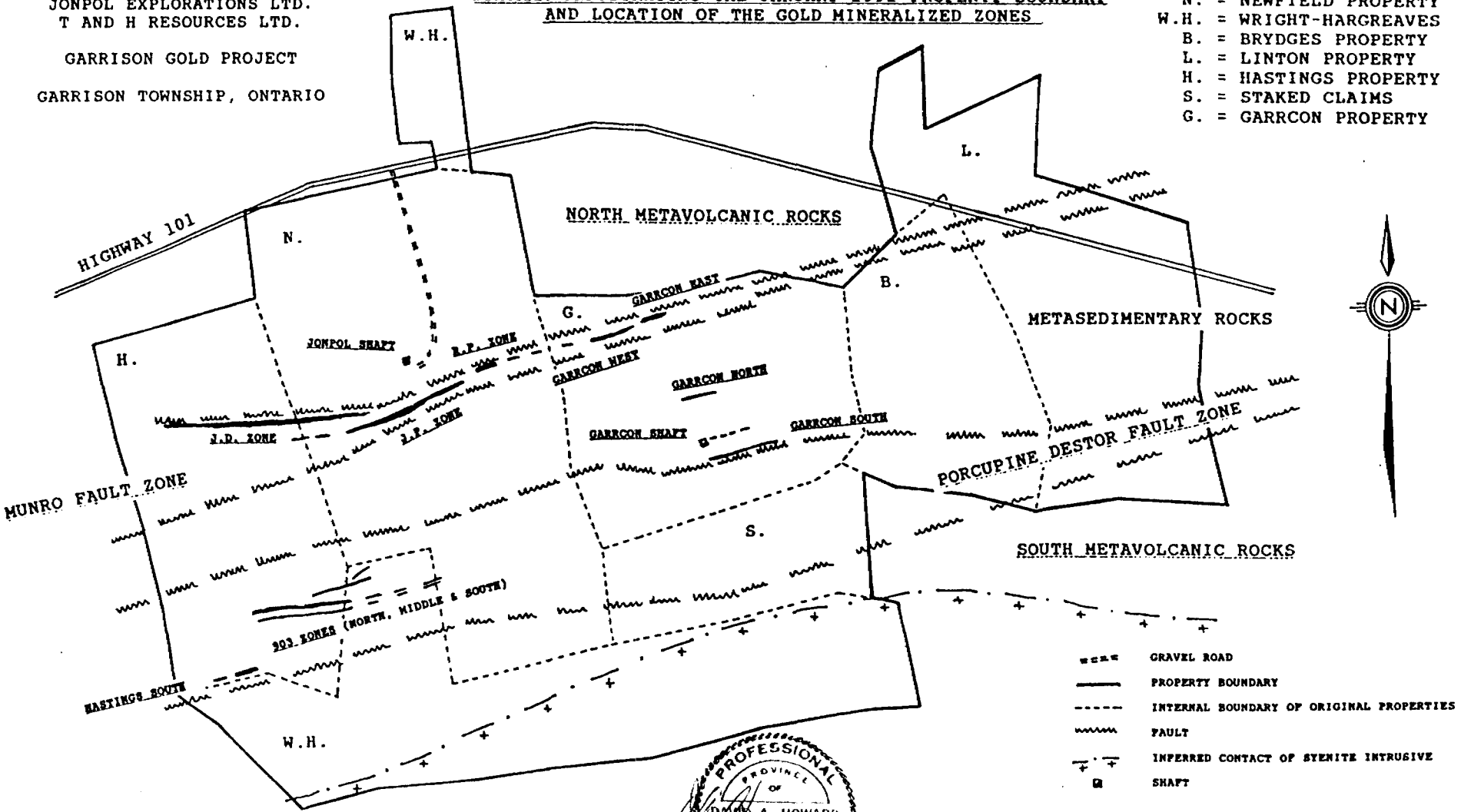
JONPOL EXPLORATIONS LTD.
T AND H RESOURCES LTD.

GARRISON GOLD PROJECT

GARRISON TOWNSHIP, ONTARIO

DIAGRAM ILLUSTRATING THE JANUARY 1991 PROPERTY BOUNDARY AND LOCATION OF THE GOLD MINERALIZED ZONES

N. = NEWFIELD PROPERTY
W.H. = WRIGHT-HARGREAVES
B. = BRYDGES PROPERTY
L. = LINTON PROPERTY
H. = HASTINGS PROPERTY
S. = STAKED CLAIMS
G. = GARRCON PROPERTY



PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
DAVID A. HOWARD

(Geology modified after Satterly (1949))

SCALE
1:24,000 or 1" = 2000'

D.D.H. GEOMANAGEMENT LTD. January 1991

FIGURE 3

(3)
Other zones within the Garrcon but not within the Munro Fault Zone which are not included in the above mineral inventory, are Garrcon North with 166,800 tons at 0.16 opt gold and the Garrcon Shaft/South zone with 102,800 tons at 0.18 opt gold;
(4)
Metallurgical testing has shown that the material from the Munro Fault Zone gives 50 % recovery with direct cyanidation. Flotation concentrates contained 95 % of the contained gold in the rougher concentrate which when cleaned could produce cleaner concentrates in the 4 to 8 opt gold range. Pressure oxidation/cyanide leach tests of the concentrate recovered 99% of the contained gold suggesting a potential gold recovery of 95 % using that system. Arsenic content ranges from 0.3 to 0.4 % As in the underground bulk sample rounds.

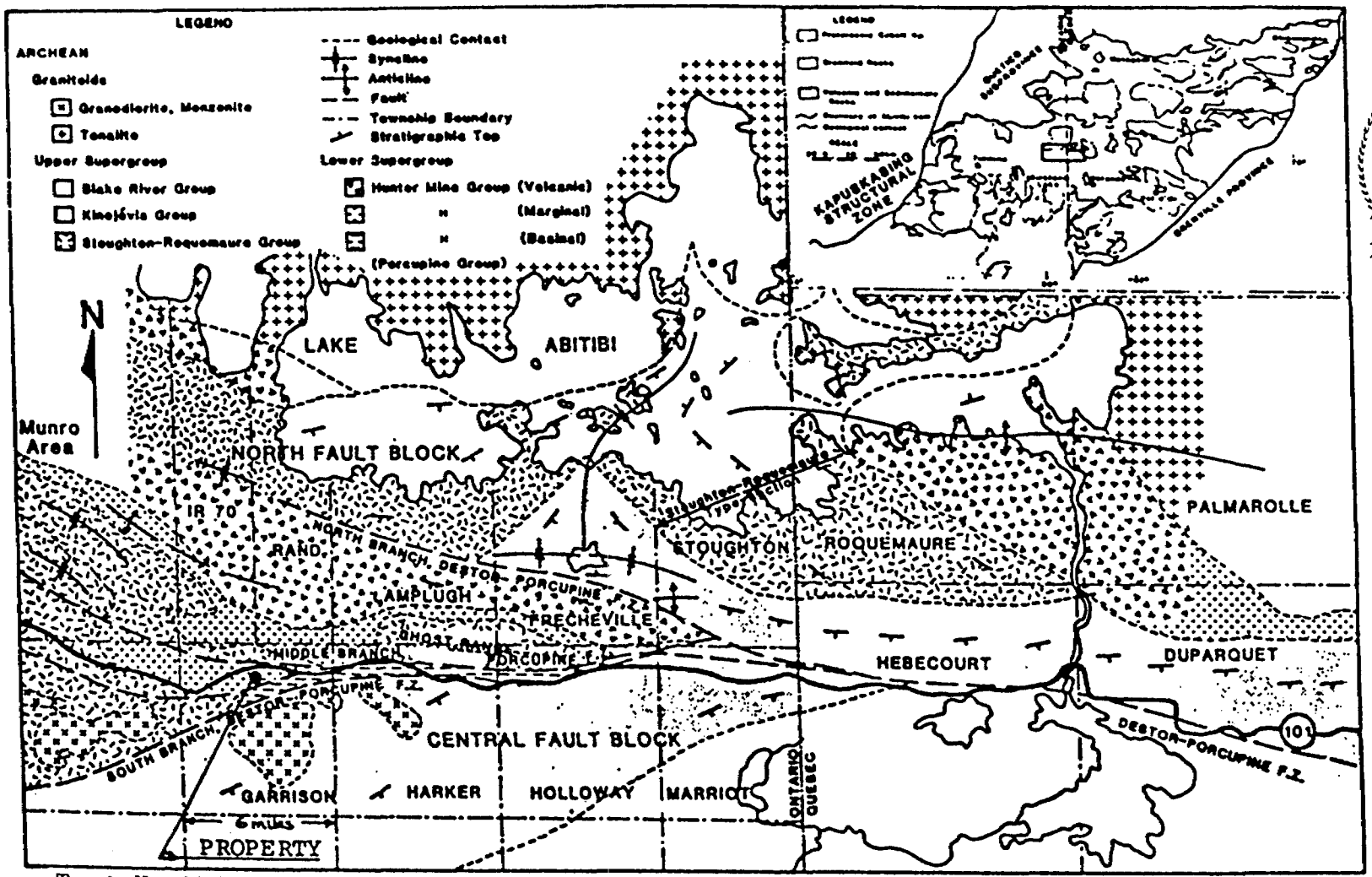
Recently, Jonpol/T. & H. concluded an option agreement with Lac Minerals Ltd. which expanded the existing property and allows Jonpol/T. & H. the opportunity to investigate the westerly indicated extension of the J.D. Zone onto the Hastings ground (specifically claims L39876 and L43863) and to investigate the gold zone mentioned by Satterly (1949) which zone was at that time inferred to be associated with syenitic intrusive rocks in the Porcupine-Destor Fault Zone. As of the current date, the "903" zone is under one ownership for the first time, ie., claims L43862 (formerly Hastings), claim L43903 (formerly Wright-Hargreaves) and claim L29734 (formerly Newfield) (see Figure 3).

The purpose of hole H 91-1 was to test for the westward continuation of the J.D. Zone while the purpose of holes 91-2, 91-3 and 91-4 was to test the association of gold within syenitic intrusive fracture systems. If gold is shown to exist in two distinct geological settings, i.e., gold with albite-sericite altered komatiitic flows in the Munro Fault Zone and gold within fracture or shear systems in syenitic intrusive rocks in the Porcupine-Destor Fault Zone, the current drill program will have been successful in showning that there is further potential for increasing the gold mineral inventory for the Garrison Gold Project.

REGIONAL GEOLOGY

The regional geology along the M.F.Z. and P.D.F.Z. has been taken from Jensen (1986 and 1981), Jensen and Langford (1985), MERQ-OGS (1983) and Satterly (1949).

The Garrison gold project is located along the M.F.Z. which is located immediately north of the P.D.F.Z. within metavolcanic rocks of the Abitibi subprovince of the Superior Province of the Canadian Pre-cambriam (Archean age)(see Figure 4). The Porcupine-Destor and the Kirkland Lake-Larder Lake Fault Zones form the north and south



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GARRISON GOLD PROJECT
GARRISON TWP
ONTARIO

FIGURE 4

REGIONAL GEOLOGY MAP

Scale 1:400,000 approx.

(After Jensen (1986) Fig. 5.7, p. 76)

PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO
DAVID A. HOWARD

limits of an Archean megacauldron. Volcanic rocks were formed during cycles of volcanism that consisted of komatiiitic volcanism followed by tholeiitic, calc-alkalic and ultimately by alkalic volcanism. The property lies on the north side of the megacauldron, the core of which contains 20,000 feet of Kinojevis Group tholeiitic volcanic rocks overlain by the Blake River Group. A group of mafic to felsic sodic alkalic flows and sills, conglomerate, wacke and siltstone occur along the P.D.F.Z. which constitute the Porcupine-Destor Complex. To the north of the P.D.F.Z. are rocks of the Stoughton-Roquemaure Group which is composed of ultramafic to basaltic komatiitic and Mg-rich tholeiite flows. Also present on the north are pillowed and massive calc-alkalic basalts as well as cherty tuff and iron formation of the Hunter Mine Group which has been assigned an age of 2,710 +/- 2 million years. The later two Groups are intruded by ultamafic to mafic sills, quartz feldspar porphyry and stocks of syenodiorite, monzonite, granodiorite and syenite.

PROPERTY GEOLOGY

The general geological setting for the Garrison Gold Project is taken from Satterly (1949) (see Figure 5). The main structural features of the property are the M.F.Z. and P.D.F.Z. both of which traverse the claims at an attitude of about 070 degrees (N 70E).

To the north of the M.F.Z. are generally non-schistose basaltic komatiite and tholeiite flows which in Figure 5 are shown as the "Northwall Metavolcanic Rocks". Within the M.F.Z., there are a sequence of schistose metamorphosed ultramafic flows that have been largely folded, contorted, sheared and intruded by porphyritic and non porphyritic syenite, dark basaltic, biotite lamprophyre and quartz diabase(?) dykes. Between the M.F.Z. and P.D.F.Z. occur a generally shattered but non-sheared fine-grained grey-green to pinkish red sandstone type sedimentary rock which in the literature is referred to as greywacke or arkose depending on the colour and local specularite content. The P.D.F.Z. to the south of the "Metasedimentary Rocks" in Figure 5 contains rocks which are similar to those observed in the M.F.Z. with the exception of a lack of preserved olivine peridoite cumulate portions of komatiitic flows and and absence of gold associated with sodic-potassic alteration of the komatiitic flows to produce the albite-sericite-carbonate-pyrite-gold mineralization found in the M.F.Z. The same types of rocks appear to have intruded the P.D.F.Z. as are found in the M.F.Z. To the south of the P.D.F.Z. occur less foliated tholeiitic appearing rocks with a high magnetic susceptibility which are thought to be Fe-rich tholeiites of the Kenojevis Group. The proximity of the large Garrison syenite stock may in time prove to have played more of a role in the local geology than is known at present.

FIGURE 5

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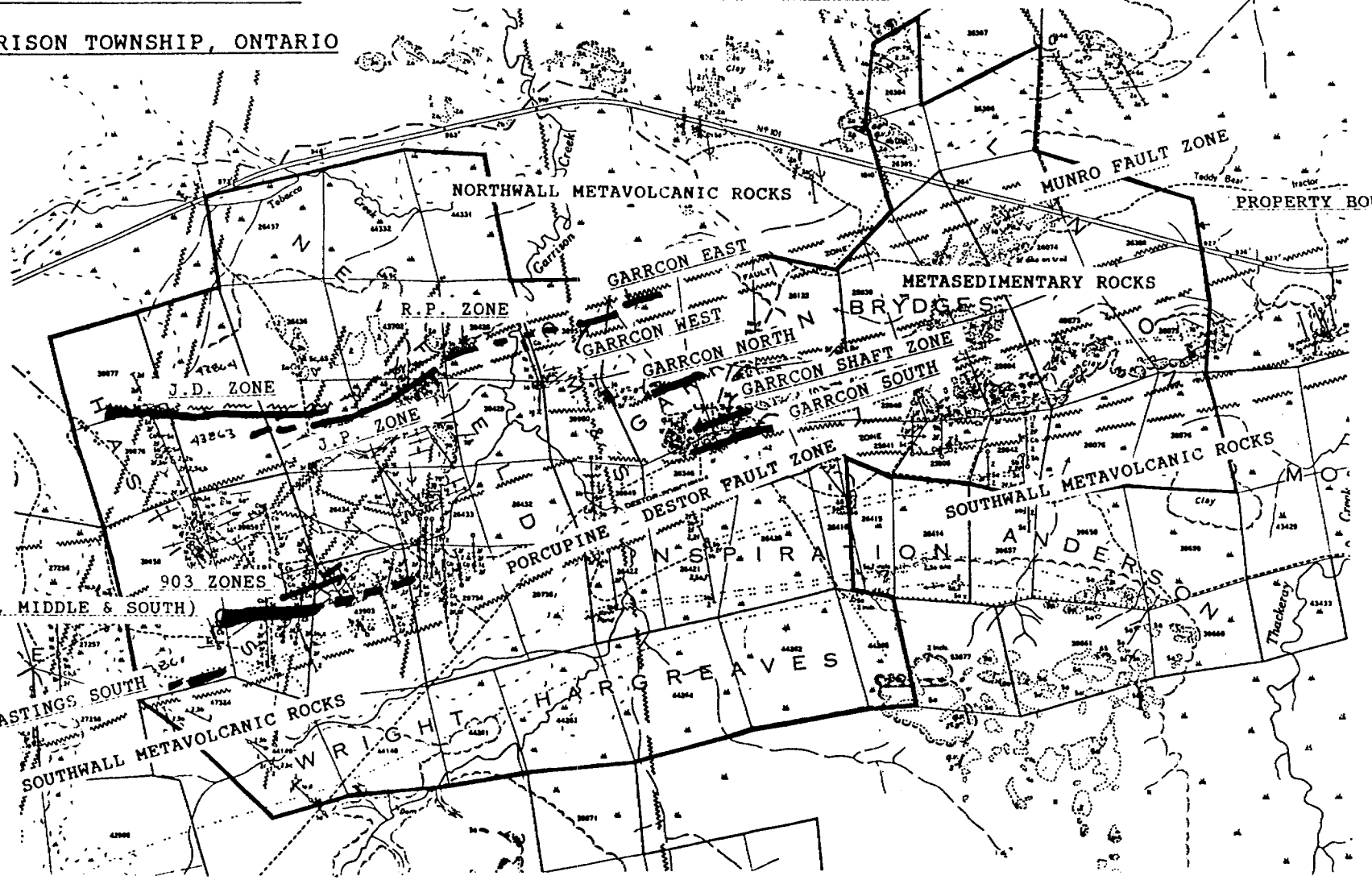
GARRISON GOLD PROJECT

GARRISON TOWNSHIP, ONTARIO

DIAGRAM ILLUSTRATING THE JANUARY 1991 PROPERTY BOUNDARY
AND LOCATION OF THE GOLD MINERALIZED ZONES



GEOLOGY BASE AFTER SATTERLY (1949)

D.D.H. GEOMANAGEMENT LTD. Jan. '91

SCALE 1:24,000 or 1" = 2000'

Rock type descriptions used in this report are outlined below.

T	"Tholeiite" (could be a basaltic komatiite)
Chl-K	Dark green chloritized komatiite flows with spinifex testure - relatively undeformed.
Chl-S-T	Chlorite-sericite-minor talc schist with a characteristic olive green colour.
C-S-M	Carbonate-sericite-mariposite assemblage with an apple green colour, relatively undeformed to weakly schistose, usually does not contain buff dykes.
C-M-S	Carbonate-mariposite-sericite schist with a stockwork texture and an emerald green colour, contains buff dykes which may be brecciated.
Chl-T	Chlorite-talc-carbonate assemblage, variably foliated from relatively undeformed to schistose, dark green colour.
A	Albite-sericite-carbonate-pyite gold bearing assemblage, referred to as albitite but actually an alteration phase of the original komatiite flow.
C-S-M	Carbonate-sericite-chlorite assemblage, variably foliated with hardness of 5.
S	Dark green to black talc-chlorite-carbonate assemblage either foliated or brecciated showing original komatiite flow and spinifex texture.
O-P	Black to dark green olivine peridotite with relect olivine or serpentite pseudomorphs, cumulate portion of original komatiite flow, spinifex texture, includes non olivine pyroxenitic komatiite.
MS	Metasedimentary rocks including fine-grained well sorted sandstones, argillites and siltstones, colours vary from grey-green (ferrous iron) to pink (ferric iron), disseminated pyrite and specularite locally common.

BD	"Buff dyke" - term applied to a sericitized fine-grained rock with sharp dyke-like boundaries, generally with disseminated pyrite, restricted generally to mariposite-bearing host rocks.
SD	Syenite dyke - fine-grained pink to orange to reddish coloured felsic intrusive rock.
BSD	Biotite syenite dyke - fine-grained syenite intrusive rock with either biotite or chloritized biotite. Chilled margins are common. Locally the chilled margins have been altered to a "buff dyke" appearing rock with mariposite flakes when the host rock is mariposite-bearing.

DRILL PROGRAM DURING THE DESIGNATED PERIOD

During the period from January 5 to 30, 1991, Bradley Bros. Limited, P.O. Box 2367, Rouyn-Noranda, Quebec, J9X 5A9 completed the following B.Q. diamond drill holes using a Boyles 25-A:

HOLE NO.	LINE at STATION	BEARING (azimuth)	DIP	LENGTH (feet)
H 91-1	L10 W at 41 N	180	-65	1,365
H 91-2	L 4 W at 8 N	000	-60	1,509
H 91-3	L 6 W at 8 N	000	-60	1,509
H 91-4	L 8 W at 8 N	000	-60	1,965
(Note: Hastings grid system used)				
		Total footage drilled		6,348

The dates for each hole and the claim number on which the hole was drilled is outlined below:

HOLE NO.	DATE STARTED	DATE FINISHED	CLAIM NO.
H 91-1	Jan. 05, 1991	Jan. 11, 1991	L43863
H 91-2	Jan. 11, 1991	Jan. 16, 1991	L43862
H 91-3	Jan. 16, 1991	Jan. 22, 1991	L43862
H 91-4	Jan. 22, 1991	Jan. 30, 1991	L43862

The drill holes are plotted on Figure 6 which shows their relative location and their relationship to the respective claims.

RESULTS OF DRILLING

Assay results are outlined below. (See Appendix A for Drill Hole Logs and Appendix B for Assay Certificates)

HOLE NO.	INTERVAL (feet)	WIDTH (feet)	GOLD (opt)	REMARKS
H 91-1	1006 - 1021	15.0	0.021	Chl-S-T with 1.5' of A
	including 1016 - 1017.5	1.5	0.051	A
	1171 - 1181	10.0	0.157	Chl-T with 5.0' of A
	including 1173.5-1178.5	5.0	0.279	A
H 91-2	335 - 344	9.0	0.015	SD
	572 - 576	4.0	0.039	SD in C-S-M
	653 - 668	15.0	0.025	Grey syenite porphyritic
	674 - 679	5.0	0.054	Pink syenite porphyritic
	699 - 718	19.0	0.084	Pink syenite porphyritic
	including 712 - 715	3.0	0.417	Visible Gold
H 91-3	281 - 292	11.0	0.033	BSD
	692 - 701	9.0	0.056	Bleached C-M-S
	922 - 927	5.0	0.032	SD
	1363 - 1368	5.0	0.028	SD
	1442 - 1465.5	18.5	0.057	Grey BSD
	including 1442 - 1447	5.0	0.099	

H 91-4	476 - 484	8.0	0.094	SD
	1029 - 1055	26.0	0.052	SD
	including 1040 - 1045	5.0	0.133	

The results obtained in hole H 91-1 (see Figure 7) indicate that there is gold in the proximity to the Northwall Metavolcanic Rocks in the location expected for the J. D. Zone on its western projection from past drilling on the former Newfield ground. Since there is a paucity of drilling in the expected position of the J.D. Zone to the west of the Newfield-Hastings boundary, the exploration potential should be considered as open. Further drilling along this zone is warranted.

Results obtained in holes H 91-2, 91-3 and 91-4 indicate a different type of gold mineralization. Instead of gold being associated with hydrothermally altered komatiitic flows, the results in these holes indicate that the gold is associated with an intrusive syenitic rock type where structual conditions have shattered the more brittle host. It is interesting to note that the grades in the syenitic host tend to increase with depth but the data are too few to allow this conclusion at this time. Further drilling is warranted to define the gold exploration potential of this indicated association.

Respectfully submitted,

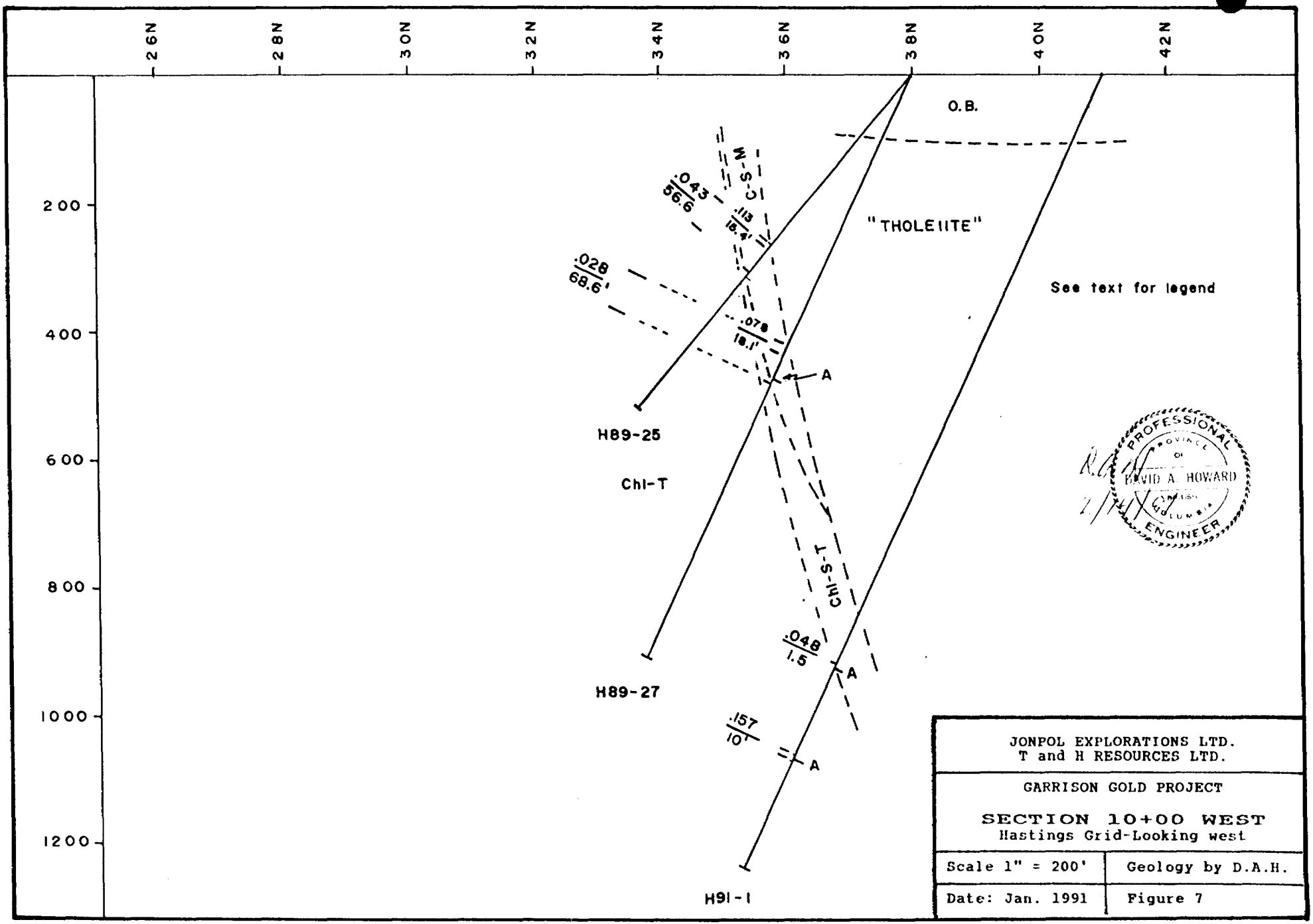
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA DAVID A. HOWARD

2/14/91

D. A. Howard, M.Sc., P.Eng.

D.D.H. GEOMANAGEMENT LTD.

February 14, 1991



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GARRISON GOLD PROJECT

SECTION 10+00 WEST
Hastings Grid-Looking west

Scale 1" = 200'	Geology by D.A.H.
Date: Jan. 1991	Figure 7

REFERENCES

Jensen, L.S. (1981) Gold Mineralization in the Kirkland Lake - Larder Lake Areas; In Genesis of Archean Volcanic Hosted Gold Deposits: Ontario Geological Survey Miscellaneous Paper 97, pp. 59 - 65.

Jensen, L.S. (1986) Mineralization and Volcanic Stratigraphy in the Western Part of Abitibi Subprovince; Chapter 5 in Volcanology and Mineral Deposits: Ontario Geological Survey, Miscellaneous Paper 129, pp. 69 - 87.

Jensen, L.S. and Langford, F.F. (1985) Geology and Petrogenesis of the Archean Abitibi Belt in the Kirkland Lake Area, Ontario: Ontario Geological Survey, Miscellaneous Paper 123, 130p.

Satterly, J. (1949) Geology of Garrison Township: 58th Annual Report of the Ontario Department of Mines, Volume LVIII, Part IV, 1949.

OTHER

MERQ-OGS (1983) Lithostratigraphic Map of the Abitibi Sub-Province: Ontario Geological Survey/Ministere de L'Engergie et des Ressources, Quebec, 1:5,000,000, cataloged as Map 2484 in Ontario and DV 83-16 in Quebec.

D.D.H. GEOMANAGEMENT LTD.

CERTIFICATION

I, David A. Howard, of the City of Vancouver, Province of British Columbia, hereby certify as follows:

1. I am a geologist residing at 9040 Glenallan Gate, Richmond, B.C. and employed by D.D.H. Geomanagement Ltd., with an office at 422 - 470 Granville Street, Vancouver, B.C., V6C 1V5.

2. I am a registered Professional Engineer of the Province of British Columbia, certificate number 8276. I graduated from Montana State University in 1964 with a B.Sc. in Earth Science and from the University of Washington in 1967 with a M.Sc. in Geology.

3. I have practised my profession continuously since June, 1966.

4. I am author of this report which is based on personal supervision of the described drill program and from data contained in the files of D.D.H. Geomanagement Ltd., government publications and other reports.

5. I hold shares in the common stock of Jonpol Explorations Ltd. and of T. & H. Resources Ltd.

6. This report may be utilized for development of the property, provided that no portion may be used out of context in such a manner as to convey a meaning which differs from that set out in the whole.

7. Consent is hereby given to Jonpol Explorations Ltd. and to T. & H. Resources Ltd. to use or reproduce this report or any part of it for the purposed of development of the property, or related to the raising of funds.

Dated at Vancouver, B.C., this 14th day of February, 1991.

PROFESSIONAL ENGINEER PROVINCE OF DAVID A. HOWARD

David A. Howard, M.Sc., P.Eng.

D.D.H. GEOMANAGEMENT LTD.

APPENDIX A

DRILL HOLE LOGS

(H 91-1,
H 91-2,
H 91-3,
H 91-4)

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE Jan 10, 1991 PAGE: 1 OF 3

HOLE H-91-1 DIP -65° AZMIUTH 180 LOGGED BY D.A. Howard

CORE SIZE BQ TOTAL FOOTAGE 1365 DIP TEST (YES)/NO

DIP FOOTAGE AND DEGREE 3½ - 66° 200m-62° 398-60° LOCATION LINE 10W at 41N

CASING LEFT IN HOLE: (YES)/NO CASING FOOTAGE 111

DRILL TIME: START JAN 5/91 FINISH ~~JAN~~ 11/91 MECHANICAL TIME

MISCELLANEOUS PROBLEMS Corrected from meters to imperial

Series D.

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY	
0-111'	Overburden			
111-928	Pale green, v.f.g., massive, rarely foliated H=5.5 Tholeiite, Minor 2% carb veining assoc. w/ local brecciation Locally slightly magnetic Tr py			
	Foliation near contact 45° (well developed-aligned chl flakes) 876-928			
	Contact 45° sharp (2" 2% carb vein)	924-928	4779	.002
		928-932	4780	.006
		932-936	4781	N.I
928-1021	Dark olive green to grey green, well foliated (40° but variable - some open folding) H=4.5-5 chl-carb ± sericite schist w/ minor talc. Variable py content nil - ±1% both v.f.g and coarsely xtlln. Local narrow irregular/brecciated sections of purple tan ab/ser(?) near upper contact. Contact zone also mod brecciated w/ ½% carb cement and rare 1/16" py veinlets Non magnetic	936-940	4782	N.I
		940-942.5	4783	.002
		942.5-946	4784	N.I
		946-951	4785	.002
		951-956	4786	.074
		956-961	4787	.006
		961-966	4788	.016
		966-971	4789	.005
		971-976	4790	.005
		976-981	4791	.003
		981-986	4792	.002
		986-991	4793	.002
		991-996	4794	.004
		996-1001	4795	.005
		1001-1006	4796	.004
	942.5-951 High sericite content nil py.			
	966-1001 1-2% f.g. py along foliation mostly cubic type.			
	1016-1017.5 Dark purple tan N=6 ab/ser type assemb. w/ 4-5% f.g. py. Darker than typical ab/ser assemb. Contact 65°			

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/12/91 PAGE: 2 OF 3

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY	
		1006-1011 4794	.010	
	1017.5- 1021 Sharp increase in chl - 16° band of gb/ser assem 1020.5- 1021.5 1-2% f.g. py. Same darker colour as above. less than 1% py for entire interval	1011-1016 4798	017	
		1016-1017.5 4799	051	045
		1017.5-1021 4800	.028	
	1021 Contact 75° sharp parallel to foliation	1021-1026 4801	N.I	
1021 -	Dark green, locally, brecciated (qu/carb cement and frags), locally, well foliated (20-50°) Chl-Talc schist Bo-e to dis py. H= 4-4.5 Qu/Carb sections harder 4.5-5. Non magnetic. Contains narrow sections of relatively undeformed U.M. which are usually magnetic	1050-1055 4802	.006	
		1070-1075 4803	.002	
	1088- 1094 Undeformed dark green U.M. , mod. mag. Tr + dis py. Sharp contact @ 70° +35°, may be a mafic dyke	1088-1094 4804	N.I	
		1094-1099 4805	.002	
		1099-1104 4806	.004	
		1104-1109 4807	.002	
	1094-1099 50% qu/carb veins @ 30° Tr py along fol. in chl-Talc schist.			
		1138-1141 4808	.006	
	1099- 1141 Dark grey green v.f.g. featureless U.M. - looks like undeformed mafic well Tholeiite. Tr dis py. H = 5 Upper contact 36° lower contact 50° both sharp.	1141-1146 4809	.004	
		1146-1151 4810	.004	
		1151-1156 4811	.006	
		1156-1161 4812	.007	
		1161-1166 4813	.007	
		1166-1171 4814	.008	
		1171-1173.5 4815	023	
	1141- 1173.5 Chl-Talc schist 40% qu/carb bands/frags up to 1% fine dis py.	1173.5-1178.5 4816	.274	.280/.282 (.279)
		1178.5-1181 4817	.046	
		1181-1186 4818	.019	
		1186-1191 4819	.010	
	1173.5- 1178.5 Mod. light purple tan f.g. H=5 (felsite appearing) ab/ser/carb assemb. w/ 8-10% fine gr. py (pyritohedrons) also a few chl flakes. Contacts 40° sharp.			
	1178.5- 1188 Chl-Talc. Rapid decrease in dis py from 1% to bar to b, 1188			

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/13/91 PAGE: 3 OF 5

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY	
		1254-1257 4820	N.I	
	1257-1265 Pinkish green, micro brecciated, hematitized chl-carb-gte assemb. Hn 4.5-5.5 Tr t dis py. Mod qz/carb veining Ragged grad. contacts. Prob a interflow sed.	1257-1262 4821	.002	
		1262-1267 4822	.002	
		1267-1272 4823	N.I	
		1272-1277 4824	.002	
		1277-1282 4825	N.I	
		1282-1287 4826	N.I	
	1267-1282 Qz/carb vein / breccia zone @ 20-50° Bore Tr f.g. dis py.			
	1287 Spinifex texture			
	1322-. Shear zone minor gouge w/ qz t. 3' section of reddish brown brecciated biotite Syenite dyke. Syenite contains qz t. 2% v.f.g. dis py. 1335-1339- all syenite. Locally weakly magnetic	1322-1325.5 4827	.002	
		1325.5-1330 4828	.002	
		1330-1335 4829	N.I	
		1335-1339 4830	.003	
	Contact			
1339-1364.8	1339-1364.8 Dark green t. black. Mainly talc. schist. High carb content. N.I py. mod magnetic. Hn 1-4			
	EOH 1364.8 (416 m)			

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/14/91 PAGE: 1 OF 10

HOLE H91-2 DIP -60 AZMIUTH 0° LOGGED BY D.A.H.

CORE SIZE BQ TOTAL FOOTAGE 1509 DIP TEST YES/NO

DIP FOOTAGE AND DEGREE 819'-62° 656 = 62° 1509 = 62° LOCATION L 4+00W & 8+00N Hastings Grid

CASING LEFT IN HOLE: YES/NO CASING FOOTAGE 92'

DRILL TIME: START 1/11/91 FINISH 1/16/91 MECHANICAL TIME

MISCELLANEOUS PROBLEMS

Secies D

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY
0-92	Overburden	92-95 4831 95-100 4832 100-105 4833	N.I .003 N.I
92-160	Dark green, soft (H=1-4) weakly foliated (60-80°) v.f. grained, blocky to massive Chl-Carb-Talc assemb. w/ numerous hairline carb - qu/carb veinlets. + a few narrow band. of purplish pink to reddish pink chl-bio v.g. syenite. All contact irregular. Syenite contains up to 1% f.g. dis py. Chl/Carb/Talc assemb. only a trace. Magnetic Only textural feature is a rare questionable sandy section suggesting that the rx are metased's. 134' - 2" chl gouge zone @ 45°		
	160 Contact 60° .5' hornfels zone		
160-189	Dark greyish green f.g. equigranular biotite/chlorite diorite dyke. Both gnts fresh appearing Tr dis py. H= 5.5-6 magnetic		
	189 Contact 50° sharp. Includes .5' brecciated hornfels contact zone. Some hematite alt.		

H91-2

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/14/91 PAGE: 2 OF 10

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY
189-462	Dark green, mod. soft (H= 4-4.5), rarely foliated, massive to blocky, slightly grainy appearing locally vuggy, weakly carbonated. Chl-Tal±Carb assemb. (prob. a meta sed.) Tr f.g. py usually assoc. w/ fracture w/ or w/o Qtz/carb min. magnetic.	184-189 4834	.003
		189-194 4835	.002
		194-197 4836	N.I
	186-197. Very vuggy. Vugs coated w/ hematite stained carbonate. Section contains Tr-0.5% v.f.g. py + some specularite.		
	225-230 Dark grey v.f.g. biotite lamp dyke upper contact 70° lower C. = 40 Upper contact frozen, lower a shear	230-235 4837	.002
	230-235 1-2% f.g. py along light grey band. (foliation?) @ 50° Mod. vuggy.		
	280-294 Darker green to blk v.f.g. sed? w/ Tr-0.5% f.g. dis py. Slightly hornf. Upper contact 40° Lower ground.	289-294 4838	.002
		335-339 4839	.015
	339-351 Purplish green, v.f.g. chl-bio syenite dyke w/ 1-1.5' section of reddish syenite. Tr v.f.g. dis py. Contacts ± 45° broken.	339-344 4840	.016
		344-348 4841	N.I
		348-351 4842	.002
		351-356 4843	N.I
	367-368 Blk v.f.g. bio lamp dyke, Tr dis py Irreg. contacts		
	360→ More talcose H= 3-4 (some 1)		
	435-437 Purple spikld grey fine to med gr. bio lamp? dyke w/ 0.5% cubic py. Upper contact 30° Lower contact 40°	435-437 4844	.002
	462 Contact - Gradational - First occurrence of brecciation.		

H91-2

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/14/91 PAGE: 3 OF 10

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY
462 - 481	Transition / Contact zone	462-466 4845	N.I
		466-470 4846	.005
	Dark green mottled purplish red, v.f.g. well brecciated (syenite frags in chl/carb cement - frags partially rounded) Chl-Carb ± Talc assemb. H variable. Tr dis py. Very magnetic v.f.g. specularite common.	470-475 4847	.002
		475-479 4848	.002
		479-481 4849	.006
	481 Contact 30° sharp - sheared		
		481-486 4850	.007
481 - 497	Green to dark green, well foliated (35-40°) Mod hard (H = 4.5-5) chl-carb schist w/ irregular inclusions of purplish chl-bio syenite (?) Tr - 0.5 % py along foliation in schist and dis. in syenite. Non magnetic except near upper cont. Lower contact gradational into mariposite bearing unit.	486-491 4851	.002
		491-494 4852	.002
		494-497 4853	.003
	497 Contact - Gradational	497-502 4854	.004
		502-506 4855	N.I
497 - 528	Emerald Bright green well foliated (50° but variable) Mariposite - carb schist with numerous qu/carb veins (½" - 2") H = 5 Qu/carb veins barren of sulphide. Tr dis. py in schist, Non magnetic	506-509 4856	N.I
		509-511 4857	N.I
		511-516 4858	.002
		516-519 4859	.002
		519-522 4860	.002
		522-525 4861	N.I
		525-528 4862	N.I
	509-511 Massive Qu/carb vein @ 40° Tr f.g. py at contacts		
	518-522 Pinkish red v.f.g. meta sed band w/ feather type bands of mariposite Bare trace dis py.		
	522-528 Qu/carb vein, irreg. contacts, numerous feathery inclusions of mariposite material nil sulphides		
	528 Contact Irreg. Qu/carb vein		

H91-2

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/15/91 PAGE: 4 OF 10

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY	
		528-533 4863	.002	
528-579	Apple green, v.f.g. finely foliated (30-50°), locally vuggy Mariposite-carb schist. Mariposite finer grained than in emerald green var. H: 4.5-5 Vugs coated w/ hematite stained carb. N.I py. Tr graphite (slicks // to foliation) Tr py in a few vugs w/ Mn oxides 557-563	550-554 4864	N.I	
		554-557 4865	.002	
		557-560 4866	N.I	
		560-563 4867	N.I	
	570-579 Sericite rich section (yellow green cast) Tr - 0.5% v.f.g. dis py.	563-567 4868	.002	
		567-572 4869	.002	
		572-576 4870	.041	.037
		576-579 4871	.002	
	579 Contact Irreg. qu/carb vein			
		579-584 4872	.002	
579-643	Bright emerald green, well foliated (kink banded) v.f.g., fairly hard H: 5, Mariposite-carb schist w/ a few bands of buff dyke material (parallel to foliation) also a few narrow <6" reddish meta sed? bands. Qu/carb veining common 1/2 to 6" Tr py. (rare)	584-587 4873	.004	
		587-589 4874	N.I	
		589-594 4875	N.I	
		594-599 4876	.002	
		599-604 4877	.002	
		604-609 4878	.004	
		609-614 4879	.002	
		614-619 4880	.005	
		619-624 4881	.003	
		624-629 4882	.002	
		629-634 4883	N.I	
		634-639 4884	.002	
		639-643 4885	.002	
	587-588.5 Grey qu vein(?) Tr dis py.			
	643 Contact Irregular @ 90° sharp.			

N91-2

DIAMOND DRILL LOG

PROPERTY Guerrier Gold Project TOWNSHIP Guerrier

DATE 1/15/91 PAGE: 5 OF 10

FOOTAGE	DESCRIPTION	ASSAY NO.		ASSAY	
643-674	Light grey to pinkish grey v.f.g to med grained locally porphyritic (feldspar phenos) feldspar porphyry w/ numerous qz/carb veins (1/2"–8") or clots - some non parallel contacts. Well fractured w/ mariposite and/or chl along fractures. H = 6+ Tr – 0.5% f.g. dis py Locally vuggy w/ minor carb and/or qz lining vugs. No chill margins	643-648	4886	.004	
		648-653	4887	.006	
		653-658	4888	.016	
		658-663	4889	.033	024
		663-668	4890	.020	
		668-671	4891	.005	
		671-674	4892	.003	
	674 Contact Gradational (Colour change only)				
674-723	Light pink to pinkish red to pinkish grey v.f.g. to med grained, locally porphyritic (feldspar phenos) feldspar porphyry or felsite. Essentially the same unit as above except for colour. Slightly less Qu/carb veins/clots, slightly more fractured and blocky and locally vuggy. H = 6+ V.G. present - several pin head blebs. along fracture. Fracture sometimes coated w/ mariposite/chl. Tr – 0.5% f.g. dis py. May be slightly more than in interval 643-674 VG @ 714	674-679	4893	.042	.065
		679-684	4894	.006	
		684-689	4895	.005	
		689-694	4896	.002	
		694-699	4897	.008	
		699-704	4898	.019	
		704-709	4899	.014	.084/19
		709-712	4900	.010	
		712-715	4901	.430	404 417
		715-718	4902	.043	
		718-721	4903	.004	.23/6
		721-723	4904	.002	
	723 Contact - Irreg. non chill but tight not parallel to foliation.				
723-736.5	Bright emerald green mariposite - carb schist w/ a couple of narrow buff dyke sections. N.I py in mariposite section, ± 1% coarse (1/8") cubes in buff sections. H = 5 - 5.5 20% qz/carb veins, 20% buff Fol = 50°	723-726	4905	N.I	
		726-732	4906	.004	
		732-736.5	4907	N.I	
	732-734 Porp (chl phenos) felsite dyke N.I py				
	736.5 Contact 60° sharp				

H91-2

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/16/91 PAGE: 6 OF 10

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY	
736.5 - 795.5	Mixed grey, l. greenish grey to reddish brown v.f.g., locally granular, locally vuggy, some carbonate, chloritic, hematitic meta sediment 3-4% specularite along fractures plus some dis (almost an iron fm.) Tr - 0.5% f.g. dis py. Mod blocky. H: 5-5.5 Strongly magnetic Weak foliation @ ± 40°	736.5-740	4908	N.I
		740-745	4909	N.I
		745-750	4910	N.I
		750-755	4911	N.I
		755-760	4912	N.I
		760-765	4913	.004
		765-770	4914	.004
		770-775	4915	N.I
775	Contact 70° sharp	775-780	4916	N.I
		780-785	4917	.002
		785-790	4918	.002
		790-795.5	4919	.006
795.5 - 994	Bright emerald green, well foliated (20-40°) locally vuggy (slightly hematitic stained carb filling) H: 5.5-6 magnesite - carb schist w/ minor qu/carb veining. N.I to tr py except where noted. No magnetite	795.5-800	4920	N.I
		800-805	4921	.007
		805-810	4922	N.I
		810-815	4923	020 .019
		815-817	4924	.002
	795.5 - 817 Mixed zone of M/carb and hematitic stained felsite ? dyke material. Some buff dyke material also. Tr - 1% f.g. py. Some questionable graphite - (blk coloration parallel to foliation)			
		951-956	4925	N.I
	951 - 994 70% qu/carb vein - very irreg. contacts, minor buff frags parallel to fol in M/carb	956-961	4926	.002
		961-966	4927	N.I
		966-971	4928	N.I
		971-976	4929	N.I
		976-981	4930	N.I
994	Contact Qu filled breccia	981-986	4931	N.I
		986-991	4932	N.I
		991-994	4933	N.I

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DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/16/91 PAGE: 7 OF 10

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY	
994 - 1154	Mixed wide bands of pale olive green and pinkish red v. f. g. weakly foliated (45-50°) mod. granular hard H=6, non calcareous meta sed. Musc chl and/or mariposite grains. 1-2% specularite in reddish sections, nil in greenish sections Tr di py	994-999	4934 .004	
		999-1004	4935 .002	
		1004-1009	4936 .013	.020
		1009-1014	4937 .002	
		1014-1019	4938 .002	
		1019-1024	4939 .002	
		1024-1029	4940 .002	
		1029-1034	4941 .002	
		1034-1039	4942 .003	
		1039-1044	4943 .002	
		1044-1049	4944 .062	
		1119-1124	4945 .003	
		1124-1129	4946 .002	
		1129-1134	4947 .002	
		1134-1139	4948 .003	
		1139-1144	4949 .002	
		1144-1149	4950 .003	
	1154 Contact 55° sharp.	1149-1154	4951 .008	.010
		1154-1159	4952 .002	
1154 - 1282	Bright emerald green, well foliated (40-50°) locally intensely deformed (pull apart texture) Mariposite - Carb. schist. w/ numerous feathery and narrow buff sections. Tr di fine py. Several hematite alt. sections in upper part of unit. Section interlayered with variable coloured wide bands of meta sed as noted below.	1159-1164	4953 .006	
		1164-1169	4954 .004	
		1169-1174	4955 .002	
		1174-1179	4956 .004	
		1179-1184	4957 .005	
		1184-1189	4958 .009	.008
	1189 - 1219 Nil py	1219-1224	4959 .004	
		1224-1229	4960 .004	
	1219 - 1234 Some sericite banding (mostly hairline) (yellow green) Tr py.	1229-1234	4961 .002	

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DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 11/17/91 PAGE: 8 OF 10

FOOTAGE	DESCRIPTION	ASSAY NO.		ASSAY
		1234-1239	4962	.002
	1239- Contact · sharp @ 30°	1239-1244	4963	.002
	1229- 1254.5 Pale greenish tan f.g. grainy non foliated meta sed. H= 5.5 mod siliceous Bare to dis py. A few chl flakes, nil meripositc.			
	1254.5- Contact Irreg (penetrative) w/ Meripositc schist. nil py. from 1254.5- 1263	1262-1267	4964	.002
		1267-1271	4965	.002
		1271-1274	4966	N.I
		1274-1277	4967	.002
	1263- Contact - Irregular.	1277-1282	4968	.002
	1262- 1271 Medium brown f.g. grainy meta sed	1282-1287	4969	.002
	Tr v.f.g. dis py, 1-2% v.f.g. specularite on fractures. Non magnetic.	1287-1293	4970	N.I
		1293-1298	4971	N.I
		1298-1301	4972	N.I
	1271-1282 Mixed zone, some brecciation of M/carb schist and greenish pink meta sed of chl-bio syenite.	1301-1306	4973	N.I
	Weakly defined foliation @ 60° (alignment of chl a/f.c. meripositc flakes. Non magnetic Tr dis py.	1306-1311	4974	N.I
	More chl rich near contact.	1311-1316	4975	.002
		1316-1321	4976	.002
	1282 Contact 70° sharp.			
1282- 1405	Med to dark green, highly deformed foliation (variable - hooked loadings) H= 4.5 Chl-Carb Schist · non magnetic, Tr dis f.g. py.			
		1351.5-1355.5	4977	.002
	1293- 1301 Dark grey v.f.g. finely porphyritic (rounded white 1/16" phenos - absorbed feldspar?) basic dyke. mod. magnetic, Tr dis f.g. py.	1355.5-1360	4978	N.I
		1360-1365	4979	N.I
	1301- 1310 Purple to pinkish v.f.g., weakly fol. (50°) meta sed (?) w/ chl flakes - may be felsite or syenite. non mag. Tr py			
	1316- 1328 Minor meripositc present			
	1351.5- 1355.5 Mottled grey and red v.f.g. intensely fractured H= 6 meta sed. Tr v.f.g. dis py and specularite non mag.			

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DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/17/91 PAGE: 9 OF 10

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY
	1374-1378 Bright red, mod. brecciated, v.f.g. hard H=6+ cherty meta sed or iron formation Non mag. ±1% v.f.g. dis py. Contacts 60°	1365-1370 4980	.002
		1370-1374 4981	.002
		1374-1378 4982	.005
		1378-1381 4983	.002
		1381-1384 4984	.002
	1384-1388 - Same as above I.F more speculorite. contacts = 60°	1384-1388 4985	N.I
		1388-1391 4986	.002
		1391-1395 4987	.002
	1388-1405 Mixed zone of I.F + chl/carb schist Bare to py in chl/carb sections, Tr-0.5% f.g. dis py + 1-2% speculorite in I.F sections. Entire section well brecciated.	1395-1400 4988	N.I
		1400-1405 4989	N.I
		1405-1410 4990	.005
		1410-1415 4991	.002
		1415-1420 4992	N.I
	1405 Contact 40° sharp.	1420-1424 4993	.002
		1424-1429 4994	N.I
1405-1417	Dark reddish brown, v.f.g. granular, hard H=6 chl-bio syenite / basic dyke. Mod. magnetic. Tr dis py Mod qz/carb veining 1/16-1/4" Has chill margins	1429-1434 4995	.002
		1434-1439 4996	.003
		1439-1441.5 4997	.003
	1417 Contact 60° sharp.	1441.5-1445 4998	.007
		1445-1450 4999	.005
		1450-1453 5000	.002
1417-1441.5	Dark green, well foliated (60°) chl-Talc schist (H=1-3) locally very talcose. + massive. Mod magnetic. Tr dis py.		
	1420-1424 Dark red brown v.f.g. granular, hard H=6 chl-bio syenite, mod mag. Tr dis py 1-2% fine gr speculorite - mostly along fractures.. Chill contacts @ 50°		
	1424-1441.5 Mixed zone of chl-talc, undeformed U.M. and syenite dyke like above. Tr + dis py.		
	1441.5 Contact sharp 45°		
1441.5-1453	Dark purplish grey v.f.g Hard H=6, granular, mod. magnetic bio syenite / basic dyke. Tr-0.5% v.f.g. dis py. Very little qz/carb veinings. Chill margins		
	1453 Contact 30° sharp.		

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DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/17/91 PAGE: 10 OF 10

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY
1453 - 1470	Green well foliated (45-50°) highly contorted, relatively hard (H= 4.5-5) chl-carb schist w/ a few sections of hematite stained material, plus a few narrow buff sections. Tr dis f.g. py assoc w/ hematite sections remainder n/l.	1453-1458 12351	.019
	1470 Contact - gradational		
1470 - 1509	Emerald green, well foliated (±30°) mariposite-carb. ± sericite schist. A few feathery buff frags. Sericite noted by yellowish hands, Tr dis py H= 4.5-5. A few red hematitic sections		
	EOH 1509 (460 metres)		

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/18/91 PAGE: 1 OF 8

HOLE H91-3 DIP -60 AZMIUTH 0° LOGGED BY OAH

CORE SIZE BQ TOTAL FOOTAGE 1509 (460m) DIP TEST YES/NO

DIP FOOTAGE AND DEGREE 60°@98', 62°@312' 60°@656' 63°@1509 LOCATION L 8+00W & 8+00N

CASING LEFT IN HOLE: YES/NO CASING FOOTAGE 92'

DRILL TIME: START 1/16/91 FINISH 1/22/91 MECHANICAL TIME

MISCELLANEOUS PROBLEMS Broken drive shaft near end of hole

Series D

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY	
0-92'	Overburden			
92				
92-410	Dark green, soft (H= 1-3), locally weakly fol. (50°) v.f.g, blocky to massive Chl-Carb-Talc assemb. w/ numerous hairline qz/carb veinlets. No obvious textures indicative of original rock type. Tr dis f.g. py			
	132-133.5 Pinkish red chl-bio syenite dyke. 2-3% f.g. dis py. Hematite alt. at qz/carb vein 130-135. also slightly more py. Contacts 35° Weakly magnetic	130-135 5001	N.I	
	276-292 Dark red brown, v.f.g. massive, equigranular chl-bio syenite dyke w/ chill margins. Tr f.g. dis py. Very magnetic Contacts 50° Strong hematite alt. at contacts within syenite. Talc-chl heavily sheared at contacts	276-281 5002 281-287 5003 287-292 5004	.002 .010 .058	060/063
	310-410 Harder var, (H=3-4) probably less talc. almost appears like an undeformed U.M. except it is probably a meta sed. Locally py up to 1%.			
	390-410. Contains very hematitic (red) sections - as part of a transition zone with unit below - decreasing chl and increasing carbonate.			
410	Gradational - last occurrance of chl.			

H91-3

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 11/18/91 PAGE: 2 OF 8

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY
410-662	Pale apple green, only locally foliated (near top of hole), f.g., locally granular appearing, mod hard (H=4.5-5) massive Mariposite (?)-carb assemblage. May include minor chl. Contains a few thick (6'-3') qz/carb veins and rare narrow (<1/4") ones. Locally slightly vuggy Tr. dis. py. Non magnetic.		
	410-497 Mod. strong Hematite(?) alt. (Pinkish cast) slightly magnetic - Part of transition zone. mentioned in above unit.		
	465-468 Bull qz/carb vein @ 30° N.I py.		
	469-475 Bull qz/carb vein @ 60° contains inclusions of wall rock plus a couple of graphitic (?) bands N.I py except in inclusions.	469-475 5005	002
	499-508 Bull qz/carb vein breccia contact Numerous inclusions of wall rx. N.I py	499-504 5006 504-508 5007	.011 016
	508 → Becoming well foliated ±60°		
	556-614 Mod. strong sericite development Yellowish green colour. Locally more py up to 1% Narrow section of emerald green mariposite between 591-596	556-561 5008 561-566 5009 566-571 5010 571-576 5011 576-581 5012 581-586 5013	N.I .002 N.I .009 .022 N.I
	614-638 Highly contorted chl banding, N.I py.	586-591 5014 591-596 5015 596-601 5016 601-606 5017 606-610 5018 610-614 5019 614-619 5020	005 .006 .003 .002 .002 .002 .002
	662 Contact Gradational - Increase in emerald green colour.	620-655 5021 655-660 5022 660-662 5023	008 N.I .002

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DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/18/91 PAGE: 3 OF 8

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY		
		662-667 5029	.003		
662-721	Bright emerald green, locally well foliated (variable) w/ more massive bright apple green sections, mod hard (H=5) mariposite-carb schist, rare dis py. Some sericite rich (yellow brown) sections.	667-672 5025	.002		
		672-677 5026	.002		
		677-682 5027	.002		
		682-687 5028	.004		
		687-692 5029	.004		
		692-696 5030	.039	.048	.044
	680-696 Weak bleaching, hematite alt. very minor mariposite - very weakly foliated (45°) Tr dis py, slightly vuggy	696-701 5031	.065	058/073	.065
		701-705 5032	N.I		
		705-709 5033	.002		
		709-712 5034	N.I		
		712-715 5035	.008		
	701-712 Pale pinkish red hematitic, non foliated granular meta sed (?) Could be a f.g. syenite except it is too granular and has no relics. Mod vuggy, tr dis py. Vugs filled w/ carb.	715-718 5036	.058	050	
		718-721 5037	.002		
		721-726 5038	.002		
		726-730 5039	N.I		
		730-735 5040	N.I		
	719-721 Andesitic red unit - same as above.	735-740 5041	N.I		
		740-745 5042	N.I		
	721 Contact 35° sharp	745-750 5043	N.I		
		750-755 5044	N.I		
721-817	Dark green, v.f.g. relatively massive, mod. hard (H=5-5 w/ a few v. narrow sections talcose H=1) rarely foliated (45°) chl-carb assemb. Tr dis py. 1-2% speculaite - mostly on hairline fractures. Non magnetic.	755-760 5045	.002		
		760-765 5046	N.I		
		765-770 5047	.002		
		770-775 5048	.002		
		775-780 5049	N.I		
		780-785 5050	N.I		
		785-790 5051	.002		
		790-795 5052	.002		
		795-800 5053	N.I		
	799-800 Brownish red f.g. syenite(?) dyke @ 45° Tr dis py + speculaite magnetic.	800-805 5054	N.I		
		805-810 5055	N.I		
	810-813 Syenite - same as above. Broken contacts	810-813 5056	N.I		
		813-815 5057	.002		
	815 Contact - 45°				

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DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/19/91 PAGE: 4 OF 8

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY
		815-818 5058	.002
815-847	Bright emerald green, mod hard (4.5-5) well foliated (40-50°) Mariposite-carb schist w/ massive qu/carb veins. Upper contact show strong hematite coloration - non magnetic Bare trace dis py.	818-823 5059	.002
		823-828 5060	N.I
		828-833 5061	N.I
		833-838 5062	N.I
		838-843 5063	N.I
		843-847 5064	N.I
	828-838 Massive qu carb vein w/ tan felsite(?) inclusions near lower contact. Contact irreg @ 45° N.I. sulphides		
	847 Contact sharp 0°	847-852 5065	.002
		852-857 5066	.002
847-875.5	Light pinkish brown to reddish brown v.f.g. porphyritic (feldspar phens 1-2mm) feldspar porphyry. Intensely fractured, some narrow qu/carb veining, nil metics, hard (H=6) Tr to 0.5% f.g. dis py. Lower contact zone (2-3') contains feathery bands of mariposite. Unit looks like gold bearing porp in H91-2 Good chill margins	857-862 5067	N.I
		862-867 5068	N.I
		867-872 5069	.002
		872-875.5 5070	N.I
	875.5 Contact - sharp 90°		
875.5-907	Bright emerald green, mod hard (4.5-5) well foliated. (60-80°) Mariposite-Carb. schist w/ some 6"-8" qu/carb veins Essentially nil py	875.5-880 5071	.002
		880-885 5072	N.I
		885-890 5073	N.I
		890-895 5074	.002
		895-898 5075	.002
		898-903 5076	N.I
		903-907 5077	.003
	903-907 Strong hematite alt along foliation plus strong py ≈ 1% occurs in bands 1/2 - 4" in width. Red syenite(?) 905-906 - Alt section same color as syenite(?)		
	907 Contact		
907-922	Dark green, blk & white banded f.g. hard (H=4.5-5) well foliated (30-50°) biot.tc-chl-carb schist Bare tr dis py.	907-910 5078	N.I
		910-913 5079	N.I
		913-918 5080	N.I
		918-922 5081	.004
	910-913 Red brown, v.f.g. equigranular, brecciated (qu/carb cement) syenite (?) w/ 1% v.f.g. dis py.		
	922 Contact broken.		

H91-3

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/20/91 PAGE: 5 OF 8

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY	
922-970	Red brown, v.f.g. granular, hard (H=6), very blocky syenite / meta sed. No distinctive features. Tr - 1% v.f.g. dis py. Core recovery in interval less than 50%. Locally very vuggy. Non magnetic	922-927 5082	.035	.030/.032
		927-932 5083	.005	
		932-937 5084	.008	
		937-942 5085	.014	
		942-950 5086	.019	.022
		950-960 5087	N.I	
		960-965 5088	.003	
		965-970 5089	.005	
	970 Contact 65° sharp parallel to f.l.			
970 - 993.5	Dark green to blk, mod well foliated (45°) soft (H=1-3) chl-talc ± carb schist. Mod. magnetic, Tr f.g. dis py, minor specularite along foliation.	970-975 5090	N.I	
		975-980 5091	N.I	
		980-985 5092	N.I	
		985-990 5093	N.I	
		990-993.5 5094	N.I	
	993.5 Contact 40° sharp (Vuggy at contact)	993.5-996 5095	.002	
		996-1000 5096	.002	
		1000-1005 5097	.002	
993.5-1089	Pinkish tan to reddish brown to tannish green, somewhat mottled, v.f.g. micro brecciated very hard (H=6) syenite or meta siltstone. Contains narrow bands of chl-carb schist near contact, which would suggest an intrusive origin. Author thinks it a syenite. Some sections (1048-1071) resemble greenish var of ab/ser. assemb in J.P zone. Micro fracture surfaces coated w/ f.g. specularite. (1-3%) Tr - 2% v.f.g. dis py - Content highly variable. Possible chill margin at top contact.	1005-1010 5098	.002	
		1010-1015 5099	N.I	
		1015-1020 5100	.006	.003
		1020-1025 5101	.002	
		1025-1030 5102	.002	
		1030-1035 5103	.003	
		1035-1040 5104	.002	
		1040-1045 5105	N.I	
		1045-1050 5106	.002	
		1050-1055 5107	.002	
		1055-1060 5108	.002	
		1060-1065 5109	.002	
		1065-1070 5110	.002	
		1070-1072 5111	.002	
	1072-1080 Talc green well foliated (60°) soft (H=2-4) chl ± mariposite - carb schist (lighter colour than typical chl-carb / mar-carb schist) N.I sulphides	1072-1076 5112	N.I	
		1076-1080 5113	.002	
		1080-1085 5114	.002	
		1085-1089 5115	.002	
	1089 Contact 75° sharp - parallel to foliation			

HQ1-3

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/28/91 PAGE: 6 OF 8

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY	
1089 - 1116	Green, well foliated (40° uniform), mod hard (H=5) chl-carb schist. Chl partings very thin - mostly carb (qtz) Bare tr. dis. py.	1089-1094 S116	N.I	
	1116 Contact 40° sharp - parallel to fol.	1111-1116 S117	.002	
		1116-1121 S118	.002	
1116 - 1300	Pinkish brown to reddish brown, v.f.g., granular-micro brecciated, very hard (H=6) syenite or mafic siltst. Very similar to unit (993.5-1089) except it is more reddish and greenish tan sections are missing	1121-1126 S119	.002	
		1126-1131 S120	.002	
		1131-1136 S121	.012	.019
		1136-1141 S122	.003	
		1141-1146 S123	N.I	
	Include angular xenoliths of chl-carb schist (rare) which suggests an intrusive origin. Some section have a salt+pepper texture due to finely dis. specularite	1146-1151 S124	N.I	
		1151-1156 S125	.014	.010
	Non magnetic. Tr - 1% v.f.g. dis. py Rare 1/4" clot. of cpy on vuggy fractures. Locally vuggy. Rare sections appear slightly porphyritic. Rhomb's look like partially absorbed feldspar - semi-calcd.	1156-1161 S126	N.I	
		1161-1166 S127	.002	
		1166-1171 S128	N.I	
		1171-1176 S129	N.I	
		1176-1181 S130	N.I	
	Some micro fractures coated w/ dis specularite.	1181-1186 S131	.002	
	Locally very blocky - possible core loss	1186-1191 S132	.007	.008
		1191-1196 S133	.003	
		1196-1201 S134	N.I	
	1274.3 - 1276.4, 1277.5 - 1278 1279.2 - 1281.2 Chl-carb schist bnd @ 70° N.I - Tr py.	1201-1206 S135	N.I	
		1206-1211 S136	N.I	
		1211-1216 S137	N.I	
	1216 - 1227 70% core loss (11')	1216-1227 S138	N.I	
		1227-1232 S139	N.I	
		1232-1237 S140	.002	
		1237-1242 S141	N.I	
		1242-1247 S142	.008	
		1247-1252 S143	.009	.610
		1252-1257 S144	.002	
		1257-1262 S145	.003	
		1262-1267 S146	.002	
		1267-1272 S147	.003	
		1272-1277 S148	.003	
		1277-1282 S149	.013	.016
		1282-1287 S150	.003	
		1287-1292 S151	.003	
		1292-1296 S152	.002	
	1296 - 1300 30% core loss Dark red v.f.g. syenite (?) at contact - may be chill margin	1296-1300 S153	.062	
	1300 Contact 50° sharp			

H91-3

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/22/91 PAGE: 7 OF 8

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY	
1300 - 1377	Green to emerald green, well foliated (60-70) relatively hard (H=4.5-5) mariposite-carb schist w/ some buff inclusions. Nor both contacts the mariposite/carb schist grades into a cht-carb assemb. Contains a few narrow zones w/ minor dis specularite on foliation planes. Essentially nil py.	1300-1305 S154	.002	
	1353-1377 Predominantly purplish red, med fol v.f.g meta sed/syenite. with 2-3% specular. and up to 1% v.f.g. dis py. Most likely a meta sed.	1353-1358 S155	002	
		1358-1363 S156	N.I	
		1363-1368 S157	.024	.026
		1368-1373 S158	.005	
		1373-1377 S159	.007	
	1377 Contact 40° sharp.			
1377 - 1509	Dark green to black, soft (H=1-3) locally moderately foliated (40°), locally massive chl-Talc schist - locally a massive biotite-Talc schist which is commonly pyritic (0.5-1% v.f.g. dis py) - May be a undeformed U.M. 1442 - 1465.5	1377-1380 S160	.002	
		1380-1383 S161	.007	
		1383-1387 S162	.007	
		1387-1390 S163	N.I	
		1390-1393 S164	N.I	
		1393-1396 S165	N.I	
	1380-1387 Dark purplish brown, v.f.g, hard (H=7 med. microbrecciated syenite dyke. 1% v.f.g. dis py some dis specularite non magnetic. Tr cpy. Upper contact 60° Lower contact 40° Questionable chill margins			
	1390-1393 Same as above @ 40° but slightly mag.	1419-1424 S166	.004	
	1416-1429 Dark grey, v.f.g. hard (H= 4.5-5) qtl. biot.t. dyke locally like biotite talc schist described above. Minor py along a few fractures. mod. magnetic.			
	1442-1465.5 See above - Slightly harder and less qtl. Py - 0.5-2%	1442-1447 S167	.092	.100/.106
		1447-1452 S168	.027	
		1452-1457 S169	.002	
	1465.5-1486.5 Dark greenish grey w/ a few reddish patches, v.f.g. equigranular hard (H=6) Chl-bio. Syenite dyke w/ questionable chill margins. Tr v.f.g. dis py, Very magnetic. Top contact 50° Lower contact 60°	1457-1460 S170	.061	
		1460-1463 S171	.017	
		1463-1465.5 S172	.063	.060

H91-3

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/23/91 PAGE: 8 OF 8

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY
	1486.5 - 1490.5 Horiz. var described above syen dyke. Only, tr py	1465.5-1470 5173	.002
		1470-1475 5174	.002
		1475-1480 5175	N.I
		1480-1484 5176	N.I
	1490.5 - 1509 Soft (H=1) chl-Talc schist, intensly hairline fractured, carb filled fractures, Non foliated ie Soapstone Tr. f.s. dis py.	1484-1486.5 5177	N.I
		1486.5-1490.5 5178	.004
		1490.5-1495 5179	N.I
		1495-1500 5180	N.I
		1500-1505 5181	N.I
		1505-1509 5182	N.I
	EOH 1509' (460m)		

DIAMOND DRILL LOG

PROPERTY Gaccisea Gold Project TOWNSHIP Gaccisea

DATE 1/24/91 PAGE: 1 OF 7

HOLE H91-4 DIP -60° AZMIUTH North LOGGED BY O.A.H.

CORE SIZE BQ TOTAL FOOTAGE 1965' (599m) DIP TEST YES/NO

DIP FOOTAGE AND DEGREE 60° @ 656' 61° @ 105' 62° @ 1312 LOCATION L 8W A 8+00N

CASING LEFT IN HOLE: YES/NO CASING FOOTAGE 95'

DRILL TIME: START 1/23/91 FINISH 1/30/91 MECHANICAL TIME

MISCELLANEOUS PROBLEMS

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY	
0-95	Over burden			
95-171	Dark green, soft (H= 1-3) friable, weakly foliated (45°) chl-talc schist w/ a few narrow bands (1-2') of questionable banded iron formation (non magnetic) or meta-sed. Chl-talc quite magnetic, rare dis. f.g. py			
	BIF - Tr-1% py 2-3% specularite + some red banding	161.5-164	5183	N.I
		164-169	5184	N.I
	161.5-169 ? Iron fm.			
	171 Contact 50° sheared			
171-350	Mod. dark green, v.f.g. / massive, non fol. non magnetic, epidote bearing (Alteration fracture fillings), meta volcanic - Looks like Tholeiite. H=4.5 Tr dis f.g. py. / locally vuggy w/ vugs coated w/ hematitic carb. - 2-3% epidote veinings.			
		297-302	5185	N.I
		302-307	5186	N.I
		307-312	5187	N.I
		312-317	5188	N.I
		317-322	5189	N.I
		322-327	5190	N.I
		327-332	5191	N.I
		332-337	5192	N.I
	247-350 Sharp increase in hematitic (red)/carb/spec. veining and increase in f.g. dis py to 1-3% Section mod. magnetic			

H91-4

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/25/91 PAGE: 2 OF 7

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY	
		337-342 5193	N.I	
		342-347 5194	N.I	
		347-350 5195	N.I	
	350 Contact	350-355 5196	N.I	
		355-360 5197	.002	
350-420.5	Mixed to mottled dark green, green, purplish red, grey and buff, v.f.s. to f.s. locally brecciated very hematitic meta sediment. Locally weakly foliated (alignment of porphyroblasts (cream colour)) @ 50°, H= 4.5-5. Large % of fractured coated w/ f.g. specularite ± py. Tr - 2% f.g. py. Minor qu/carb veining. May correlate w/ Lac's felsitized units - locally may have originally been a syenite but it is doubtful. Locally, specularite w/ to 3-4% - mostly on fractures	360-365 5198	N.I	
		365-370 5199	N.I	
		370-375 5200	.014	
		375-380 5201	.008	
		380-385 5202	.004	
		385-390 5203	.011	
		390-395 5204	.002	
		395-400 5205	.004	
		400-405 5206	.002	
		405-410 5207	.010	
		410-415 5208	.003	
		415-420.5 5209	N.I	
	383-386 Several narrow brecciated band of apple green marposite-carb assemb. supported by qu/carb veining			
	391-393 Qu/carb cemented breccia frags. mafic meta sed + a couple marposite/carb from above. Py same as enclo unit. A very local feature massive,			
420.5 495.5	Pale apple green f.s., weakly foliated (± 40°) mod. hard (H=5) Marposite-Carb assemb. w/ narrow sections of emerald green well f.l. (40-50) in lower part of section. Essentially nil py. A few 4-6" qu/carb veins	472-476 5210	.002	
		476-480 5211	.076	.074
		480-484 5212	.120	.116/.118 (.112)
		484-489 5213	.002	
		489-495.5 5214	004	
	476-484 Purple red, f.s., equigranular, non f.l, mod. fractured Syenite dyke or meta-sed. no definite textures. 1-2% f.s. dis py + a few hairline veinlets 1-2% specularite on some fractures Contacts 40°			
	484-495.5 Mixed zone of emerald green m/c schist syenite - M.S., and apple green m/c assemb. Tr - 1% dis py.			
	495.5 70° irreg., vuggy, somewhat grad.			

H91-4

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/25/91 PAGE: 3 OF 7

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY	
495.5 - 512.5	Dark green to blk, well foliated (40-50°) highly contorted, mod. hard (H. 4.5), locally brecciated Chl-Carb schist - high qu/carb content. Tr dis py. Weakly magnetic. 1-2% dis specularite	508.5-512.5 5215	.002	
	512.5 Contact 70° sharp.	512.5-516 5216	N.I	
512.5 - 615	Mod. dark green, v.f.g., massive, non foliated, mod magnetic, meta volcanic - looks like Tholeiite. Most fracture coated w/ f.g. specularite plus dis. Higher concentration near upper contact. Tr - 1% f.g. py also concentrated near upper contact. (512.5-526)	516-521 5217 521-526 5218 526-531 5219	N.I N.I N.I	
	510-601 Thin banded (carb) locally highly contorted Chl-Talc-carb schist - locally appears to be original thin bedding, occasional isoclinal. Contains numerous narrow 2"-2' band of f.g. red brown syenite(?) Enclosing Tholeiite like material becomes more talcose (soft) near both contacts. - Suspect unit only an alt. equivalent of the enclosing tholeiite unit. Syenite dykes contain Tr - 0.5% dis py.			
	615 Contact 60° sharp 2' syenite dyke @ contact	613-615 5220	N.I	
615 - 699	Dark green, well foliated, banded, soft (1-3) Chl-Talc-Carb schist. Fol. = 0-40 - highly contorted locally vuggy - hematite stained carb filled. 2-3% specularite Tr. f.g. dis py. Contains a number of red. brown v.f.g. syenite dykes. w/ 1% f.g. dis. py.	645-647.5 5221	N.I	
	645-647.5 red brown syenite 1% py			
	661-666.5 " " " "	661-666.5 5222	N.I	
	686-691 Red brown slightly porphyritic, vuggy f.g. syenite Tr f.g. dis py Contacts 45°	686-691 5223 691-695 5224	N.I N.I	
	699 Contact. Gradational - decrease talc increase carb + chl. increase in foliation bandings i.e. same parent rock.			

H91-4

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/26/91 PAGE: 4 OF 7

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY
699-904	Green, well foliated (30-40°) mod hard (4.5-5) Chl-Carb schist grading int. a emerald green mariposite-chl-carb schist about 720' Narrow (1/2" to 6") qu/carb veining common in mariposite var. Buff dyke frags commonly assoc. w/ qu/carb veining at contacts N.I to bare to py. Non magnetic.	754-757 5225	N.I
		757-761 5226	N.I
		761-764 5227	N.I
		777.5-781.5 5228	N.I
	754-761 Pink, f.g. slightly porphyritic, well brecciated, multi qu/carb veined syenite dyke 0.5-1% f.g. dis py. T. Contact 70° Lower irreg. vuggy.	822-824 5229	.002
	761-764 White massive qu/carb vein, a few feathery inclusions of M schist	839-844 5230	N.I
		844-849 5231	N.I
	777.5-781.5 Pinkish grey, f.g. equigranular chl bio syenite dyke. Tr-0.5% f.g. dis py.	849-854 5232	N.I
		854-858 5233	.002
		858-863 5234	.002
	781.5-821 Predominantly chl-carb schist N.I Mariposite grad. contacts N.I py.		
	822-824 Light grey brecciated siliceous (?) band, non mag 0.5 v.f.g. py.	895-900 5235	N.I
		900-904 5236	N.I
	839-858 50% buff dyke material w 1% f.g. py.		
	895-904 Sharp increase in dis py to upt. 1% also mottled buff dyke frags / bands		
	904 Contact 60° sharp.		

H91-4

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 11/26/91 PAGE: 5 OF 7

FOOTAGE	DESCRIPTION	ASSAY NO.		ASSAY
904 - 938	Mottled dark green, reddish brown, dark tan, wh.tk v.f.g., intensely brecciated, some slickensides, hard (5-6) meta volcanic (?) w/ included brecciated v.f.g. syenite (?) and/or meta sed. A very complex appearing unit. 1-3% f.g. dis py plus a few hairline pyrite veinlets and/or clots. Non magnetic. 2-5% v.f.g. specularite on most hairline fractures. A very massive hard unit.	904-908	5231	.002
		908-912	5238	.003
		912-916	5234	.002
		916-921	5240	N.I
		921-926	5241	002
		926-931	5242	.002
		931-936	6243	N.I
		936-938	5244	N.I
	904-913 90% pinkish red syenite (?) meterial extreme microbrecciation. Possible ab/ser alt. in a few narrow zones.			
	938 Contact 50 sharp.	938-941	5245	N.I
		941-945	5246	.030
938-950	Dark green and white, well foliated (±40°) w/ some isoclinal foldings, brecciated (chl/carb cement - angular frags) w/ included red syenite clots/ bands relatively hard (H = 4.5-5), massive Chl-Carb schist 0.5-2% v.f.g. dis py locally concentrated along foliation Locally, weakly magnetic.	945-950	5247	N.I
	950 Contact 60° sharp.			
950-984	Brick red, v.f.g., intensely shattered, microbrecciated granular hard (H=6) syenite /(meta sed.?) w/ bands of chl-carb schist like above. Tr - 8% v.f.g. dis py - conc. in syenite Locally vuggy	950-955	5248	.002
		955-960	5249	.002
		960-964	5250	N.I
		964-969	5251	N.I
		969-973	5252	.002
		973-981	5253	002
		981-984	5254	.002
	950-964 95% syenite 4-8% py.			
	964-973 Mainly chl-carb schist Tr-1% py			
	973-984 Mainly syenite dc			
	984 Contact 60° sharp Chill margin			

.026

H91-4

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/22/91 PAGE: 6 OF 7

FOOTAGE	DESCRIPTION		ASSAY NO.	ASSAY		
984 - 1029	Dark green to blk, well foliated (30°) near upper contact to more massive near lower contact, soft (H = 1-3) chl-talc ± carb schist Tr dis f.s. py. - slightly more near contacts.		984-989	5255	N.I	
			989-994	5256	N.I	
			994-999	5257	N.I	
			999-1004	5258	.002	
			1004-1009	5259	N.I	
			1009-1014	5260	N.I	
			1014-1019	5261	N.I	
			1019-1024	5262	N.I	
			1024-1029	5263	N.I	
	1029 Contact 40° sharp.					
1029 - 1080	Pinkish brown to salmon, f.g. equigranular, very locally slightly porphyritic (feldspar phenos) hard (H=6) syenite. 1 - 3% v.f.s. dis py. Mod. fractured, a few py hairline veinlets. Minor chl alt. assoc w/ fractures. No qu/carb veining	s	1029-1032	5264	.039	.043
		s	1032-1035	5265	.018	
		s	1035-1040	5266	.008	
		s	1040-1045	5267	.108	151/138
		s	1045-1050	5268	.051	.044
		s	1050-1055	5269	.039	
		s	1055-1060	5270	.018	
		s	1060-1065	5271	.014	
		s	1065-1070	5272	.008	
			1070-1075	5273	.018	
			1075-1080	5274	.009	
	1080 Contact 30° sharp					
1080 -	Dark green to black, rarely foliated (40-50) locally, massive, soft (H = 1-3) w/ harder sections commonly pyritic, locally intensely broken chl-Talc schist - locally soapstone. Intruded (?) commonly by narrow 1-3' dark f.g. syenite (pyritic) dykes. Carb. rich near upper contact. Unit cut by numerous small (?) faults.		1080-1085	5275	.002	
			1085-1089	5276	.003	
			1089-1094	5277	.002	
			1094-1096	5278	016	.012
			1096-1100	5279	.008	
			1100-1104	5280	.003	
			1104-1109	5281	.002	
			1109-1114	5282	N.I	
			1114-1119	5283	.002	
			1119-1124	5284	N.I	
	1094 - 1104 Brecciated syenite dyke & chl-Talc-carb schist					
	1119 - 1124 Dark purplish green v.f.g. syenite dyke @ 45° Tr dis py magnetic					
	1166 - 1212 - Intensely broken, poor core recovery Probable fault zone. - minor chl gouge at 1210 - 1212					
	1212 - 1217 Harder chl-Talc schist H = 2-3 1 - 2% f.g. py.		1212-1217	5285	N.I	
	1225 → More massive Chl-Talc H = 2-3 Very little sulphide. Mostly chl					

Ave. 0.041

Ave 0.133

0.051/26'

H 91-4

DIAMOND DRILL LOG

PROPERTY Garrison Gold Project TOWNSHIP Garrison

DATE 1/29/91 PAGE: 7 OF 7

FOOTAGE	DESCRIPTION	ASSAY NO.	ASSAY
	1479 – 1571 Dark green, v.f.g. equigranular hard (H. 4-4.5) meta volcanic - Essentially identical to Tholeiite in north wall of Munro F. 2. Contacts gradation over 5–10' Chl-Talc assemb. essentially a alteration package of this unit. Tr – 0.5% f.g. dis py. Very massive. Rare qz/carb vein (⅛–½")		
	1571 → Harder var. (H. 3-4) of the Chl-Talc assemb. Mostly Chl. Rarely foliated No qz/carb veining		
	1650 → H = 4.5-5 to 1740		
	1740 – 1965 H = 3-4 Local areas of brecciation angular frags, rx cement.		
	1886 – 1965 Same as interval 1479-1571 "Tholeiite"		
	EOH 1965		

APPENDIX B

ASSAY CERTIFICATES

Swastika Laboratories

A Division of Assayers Corporation Ltd.

Assaying - Consulting - Representation

Established 1928

Inv. No. 24077

Assay Certificate

1W-2068-RA1

Company: **JONPOL EXPL. LTD.**

Date: JAN-17-91

Project:

Attn:

Copy 1. HOLD COPY
2. SUITE 420,111 RICHMOND ST. W. TORONTO,
3. M5H 2G4

We hereby certify the following Assay of 49 CORE samples submitted JAN-15-91 by J. POLLOCK.

1191-1

Sample Number	Au oz/ton	Au Check oz/ton	Au 2nd oz/ton
4779	0.002		
4780	0.006		
4781	Nil		
4782	Nil		
4783	0.002		
4784	Nil		
4785	0.002		
4786	0.075	0.074	
4787	0.006		
4788	0.016		
4789	0.005		
4790	0.005		
4791	0.003		
4792	0.002		
4793	0.002		
4794	0.004		
4795	0.005		
4796	0.004		
4797	0.010		
4798	0.017		
4799	0.051	0.045	
4800	0.028		
4801	Nil		
4802	0.006		
4803	0.002		
4804	Nil		
4805	0.002		
4806	0.004		
4807	0.002		
4808	0.007	0.006	

Au was determined using 1 AT fusions

Certified by Donna Gardner

P.O. Box 10, Swastika, Ontario P0K 1T0

Telephone (705) 642-3244 FAX (705) 642-3300

Swastika Laboratories

A Division of Assayers Corporation Ltd.

Assaying - Consulting - Representation

Established 1928

Assay Certificate

1W-2068-RA1

Company: **JONPOL EXPL. LTD.**

Date: JAN-17-91

Project:

Attn:

Copy 1. HOLD COPY
2. SUITE 420,111 RICHMOND ST. W. TORONTO,
3. M5H 2G4

We hereby certify the following Assay of 49 CORE samples submitted JAN-15-91 by J. POLLOCK.

Sample Number	Au oz/ton	Au Check oz/ton	Au 2nd oz/ton
4809	0.004		
4810	0.004		
4811	0.006		
4812	0.007		
4813	0.007		
4814	0.008		
4815	0.023		
4816	0.274	0.280	0.282
4817	0.046		
4818	0.019		
4819	0.010		
4820	Nil		
4821	0.002		
4822	0.002		
4823	Nil		
4824	0.002		
4825	Nil		
4826	Nil		
4827	0.002		

Au was determined using 1 AT fusions

Certified by Donna Gardner

P.O. Box 10, Swastika, Ontario P0K 1T0
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Established 1928

Inv. No. 24084

Assay Certificate

1W-2084-RA1

Company: **JONPOL EXPLORATIONS.**

Date: JAN-18-91

Project:

Copy 1. HOLD FOR PICK UP.

Attn: JOHN POLLOCK.

2. TORONTO

We hereby certify the following Assay of 76 CORE samples submitted JAN-17-91 by .

Sample Number	Au oz/ton	Au Check oz/ton	Au 2nd oz/ton
4828	0.002		
4829	Nil		
4830	0.003		
4831	Nil		
4832	0.003		
4833	Nil		
4834	0.003		
4835	0.002		
4836	Nil		
4837	0.002		
4838	0.002		
4839	0.015	0.014	
4840	0.016	0.016	
4841	Nil		
4842	0.002		
4843	Nil		
4844	0.002		
4845	Nil		
4846	0.005	0.005	
4847	0.002		
4848	0.002		
4849	0.006		
4850	0.007		
4851	0.002		
4852	0.002		
4853	0.003		
4854	0.004		
4855	Nil		
4856	Nil		
4857	Nil		

Certified by Donna Gardner

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Assay Certificate

1W-2084-RA1

Company: **JONPOL EXPLORATIONS.** Date: JAN-18-91

Project: Copy 1. HOLD FOR PICK UP.

Attn: JOHN POLLOCK. 2. TORONTO

We hereby certify the following Assay of 76 CORE samples submitted JAN-17-91 by .

Sample Number	Au oz/ton	Au Check oz/ton	Au 2nd oz/ton
4858	0.002		
4859	0.002		
4860	0.002		
4861	Nil	Nil	
4862	Nil		
4863	0.002		
4864	Nil		
4865	0.002		
4866	Nil		
4867	Nil		
4868	0.002		
4869	0.002		
4870	0.041	0.037	
4871	0.002		
4872	0.002		
4873	0.004		
4874	Nil		
4875	Nil		
4876	0.002		
4877	0.002		
4878	0.004		
4879	0.002		
4880	0.005		
4881	0.003	0.002	
4882	0.002		
4883	Nil		
4884	0.002		
4885	0.002		
4886	0.004		
4887	0.006		

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Assay Certificate

1W-2084-RA1

Company: **JONPOL EXPLORATIONS.**

Date: JAN-18-91

Project:

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Attn: JOHN POLLOCK.

2. TORONTO

We hereby certify the following Assay of 76 CORE samples submitted JAN-17-91 by .

Sample Number	Au oz/ton	Au Check oz/ton	Au 2nd oz/ton
4888	0.016		
4889	0.033	0.029	
4890	0.020		
4891	0.005		
4892	0.004		
4893	0.042	0.065	
4894	0.006		
4895	0.005		
4896	0.002		
4897	0.008		
4898	0.019		
4899	0.014		
4900	0.010		
4901	0.430		0.404
4902	0.043		
4903	0.004		

Certified by Donna Gardner

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Inv. No. 24109

Assay Certificate

1W-2104-RA1

Company: JON POL EXPLORATIONS

Date: JAN-23-91

Project:

Attn:

Copy 1. HOLD
2. STE 420--111 RICHMOND ST W. TORONTO
3. M5H 2G4

We hereby certify the following Assay of 66 CORE samples submitted JAN-18-91 by .

Sample Number	Au oz/ton	Au check oz/ton
4904	0.002	
4905	Nil	
4906	0.004	0.004
4907	Nil	
4908	Nil	
4909	Nil	
4910	Nil	
4911	Nil	
4912	Nil	
4913	0.004	0.004
4914	0.004	
4915	Nil	
4916	Nil	
4917	0.002	
4918	0.002	
4919	0.006	
4920	Nil	
4921	0.007	
4922	Nil	
4923	0.020	0.019
4924	0.002	
4925	Nil	
4926	0.002	
4927	Nil	
4928	Nil	
4929	Nil	
4930	Nil	
4931	Nil	
4932	Nil	
4933	Nil	

Au was determined using 1 AT fusions

Certified by R Landin

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1W-2104-RA1

Company: **JON POL EXPLORATIONS**

Date: JAN-23-91

Project:

Attn:

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2. STE 420--111 RICHMOND ST W. TORONTO
3. M5H 2G4

We hereby certify the following Assay of 66 CORE samples submitted JAN-18-91 by .

Sample Number	Au oz/ton	Au check oz/ton
4934	0.004	
4935	0.002	
4936	0.013	0.020
4937	0.002	
4938	0.002	
4939	0.002	
4940	0.002	
4941	0.002	
4942	0.003	
4943	0.002	
4944	0.002	
4945	0.003	
4946	0.002	
4947	0.002	
4948	0.003	
4949	0.002	
4950	0.003	
4951	0.008	0.010
4952	0.002	
4953	0.006	
4954	0.004	
4955	0.002	
4956	0.004	
4957	0.005	
4958	0.009	0.008
4959	0.004	
4960	0.004	
4961	0.002	
4962	0.002	
4963	0.002	

Au was determined using 1 AT fusions

Certified by R Candini

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1W-2104-RA1

Company: **JON POL EXPLORATIONS**

Date: JAN-23-91

Project:

Attn:

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2. STE 420--111 RICHMOND ST W. TORONTO
3. M5H 2G4

We hereby certify the following Assay of 66 CORE samples submitted JAN-18-91 by .

Sample Number	Au oz/ton	Au check oz/ton
4964	0.002	
4965	0.002	
4966	Nil	
4967	0.002	
4968	0.002	
4969	0.002	

Au was determined using 1 AT fusions

Certified by R. Landin

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Inv No. 24127

Assay Certificate

1W-2116-RA1

Company: **JON POL EXPLORATIONS**

Date: JAN-24-91

Project:

Attn:

Copy 1. HOLD
2. STE#420-111 RICHMOND ST W, TORONTO
3. M5H 2G4

We hereby certify the following Assay of 83 CORE samples submitted JAN-21-91 by .

Sample Number	Au oz/ton	Au check oz/ton	Au 2nd oz/ton
4970	Nil		
4971	Nil		
4972	Nil		
4973	Nil		
4974	Nil		
4975	0.002		
4976	0.002		
4977	0.002		
4978	Nil		
4979	Nil		
4980	0.002		
4981	0.002		
4982	0.005	0.008	
4983	0.002		
4984	0.002		
4985	Nil		
4986	0.002		
4987	0.002		
4988	Nil		
4989	Nil		
4990	0.005	0.006	
4991	0.002		
4992	Nil		
4993	0.002		
4994	Nil		
4995	0.002		
4996	0.003		
4997	0.003		
4998	0.007	0.009	
4999	0.005		

Au was determined using 1 AT fusions

Certified by Donna Gardner

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1W-2116-RA1

Company: **JON POL EXPLORATIONS**

Date: JAN-24-91

Project:

Attn:

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2. STE#420-111 RICHMOND ST W, TORONTO
3. M5H 2G4

We hereby certify the following Assay of 83 CORE samples submitted JAN-21-91 by .

Sample Number	Au oz/ton	Au check oz/ton	Au 2nd oz/ton
5000	0.002		
5001	Nil		
5002	0.002		
5003	0.010		
5004	0.058	0.060	0.063
5005	0.002		
5006	0.011		
5007	0.015	0.012	
5008	Nil		
5009	0.002		
5010	Nil		
5011	0.009		
5012	0.022		
5013	Nil		
5014	0.005		
5015	0.006		
5016	0.003		
5017	0.002		
5018	0.002		
5019	0.002		
5020	0.002		
5021	0.008	0.007	
5022	Nil		
5023	0.002		
5024	0.003		
5025	0.002		
5026	0.002		
5027	0.002		
5028	0.009		
5029	0.004		

Au was determined using 1 AT fusions

Certified by Donna Gardner

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Company: **JON POL EXPLORATIONS**

Date: JAN-24-91

Project:

Attn:

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2. STE#420-111 RICHMOND ST W, TORONTO
3. M5H 2G4

We hereby certify the following Assay of 83 CORE samples submitted JAN-21-91 by .

Sample Number	Au oz/ton	Au check oz/ton	Au 2nd oz/ton
5030	0.039	0.048	
5031	0.065	0.058	0.073
5032	Nil		
5033	0.002		
5034	Nil		
5035	0.008		
5036	0.058	0.050	
5037	0.002		
5038	0.002		
5039	Nil		
5040	Nil		
5041	Nil		
5042	Nil		
5043	Nil		
5044	Nil		
5045	0.002		
5046	Nil		
5047	0.002		
5048	0.002		
5049	Nil		
5050	Nil		
5051	0.002		
12-851	0.019	0.018	

Au was determined using 1 AT fusions

Certified by Donna Gardner

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1W-2150-RA1

Company: JONPOL EXPLORATIONS

Date: JAN-30-91

Project:

Attn: JOHN POLLOCK

Copy 1. hold copy
2. 420--111 Richmond St. W. Toronto
3. M5H 2G4

We hereby certify the following Assay of 132 CORE samples submitted JAN-25-91 by JOHN POLLOCK.

Sample Number	Au oz/ton	Au check oz/ton	Au 2nd oz/ton
5052	0.002		
5053	Nil		
5054	Nil		
5055	Nil		
5056	Nil		
5057	0.002	0.002	
5058	0.002		
5059	0.002		
5060	Nil		
5061	Nil		
5062	Nil		
5063	Nil		
5064	Nil		
5065	0.002		
5066	0.002	0.002	
5067	Nil		
5068	Nil		
5069	0.002		
5070	Nil		
5071	0.002		
5072	Nil		
5073	Nil		
5074	0.002		
5075	0.002		
5076	Nil		
5077	0.003		
5078	Nil		
5079	Nil		
5080	Nil		
5081	0.004		

Au was determined using 1 AT fusions

Certified by Donna Gardner

P.O. Box 10, Swastika, Ontario P0K 1T0
Telephone (705) 642-3244, FAX (705) 642-3300

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Assay Certificate

1W-2150-RA1

Company: JONPOL EXPLORATIONS
Project:
Attn: JOHN POLLOCK

Date: JAN-30-91

Copy 1. hold copy
2. 420--111 Richmond St. W. Toronto
3. M5H 2G4

We hereby certify the following Assay of 132 CORE samples submitted JAN-25-91 by JOHN POLLOCK.

Sample Number	Au oz/ton	Au check oz/ton	Au 2nd oz/ton
5082	0.035	0.030	0.032
5083	0.005		
5084	0.008		
5085	0.014		
5086	0.019	0.022	
5087	Nil		
5088	0.003		
5089	0.005		
5090	Nil		
5091	Nil		
5092	Nil		
5093	Nil		
5094	Nil		
5095	0.002		
5096	0.002		
5097	0.002		
5098	0.002		
5099	Nil		
5100	0.006	0.003	
5101	0.002		
5102	0.002		
5103	0.003		
5104	0.002		
5105	Nil		
5106	0.002		
5107	0.002		
5108	0.002		
5109	0.002		
5110	0.002		
5111	0.002		

Au was determined using 1 AT fusions

Certified by Donna Gardner

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1W-2150-RA1

Company: JONPOL EXPLORATIONS

Date: JAN-30-91

Project:

Attn: JOHN POLLOCK

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2. 420--111 Richmond St. W. Toronto
3. M5H 2G4

We hereby certify the following Assay of 132 CORE samples submitted JAN-25-91 by JOHN POLLOCK.

Sample Number	Au oz/ton	Au check oz/ton	Au 2nd oz/ton
5112	Nil		
5113	0.002		
5114	0.002		
5115	0.002		
5116	Nil		
5117	0.002		
5118	0.002		
5119	0.002		
5120	0.002		
5121	0.012	0.019	
5122	0.003		
5123	Nil		
5124	Nil		
5125	0.014	0.010	
5126	Nil		
5127	0.002		
5128	Nil		
5129	Nil		
5130	Nil		
5131	0.002		
5132	0.007	0.008	
5133	0.003		
5134	Nil		
5135	Nil		
5136	Nil		
5137	Nil		
5138	Nil		
5139	Nil		
5140	0.002		
5141	Nil		

Au was determined using 1 AT fusions

Certified by Donna Gardner

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1W-2150-RA1

Company: JONPOL EXPLORATIONS

Date: JAN-30-91

Project:

Attn: JOHN POLLOCK

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3. M5H 2G4

We hereby certify the following Assay of 132 CORE samples submitted JAN-25-91 by JOHN POLLOCK.

Sample Number	Au oz/ton	Au check oz/ton	Au 2nd oz/ton
5142	0.008		
5143	0.009	0.010	
5144	0.002		
5145	0.003		
5146	0.002		
5147	0.003		
5148	0.003		
5149	0.013	0.016	
5150	0.003		
5151	0.003		
5152	0.002		
5153	0.002		
5154	0.002		
5155	0.002		
5156	NIL		
5157	0.029	0.026	
5158	0.005		
5159	0.007		
5160	0.002		
5161	0.007		
5162	0.007		
5163	NIL		
5164	NIL		
5165	NIL		
5166	0.004		
5167	0.092	0.100	0.106
5168	0.027		
5169	0.002		
5170	0.061		
5171	0.017		

Au was determined using 1 AT fusions

Certified by Donna Gardner

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Assay Certificate

1W-2150-RA1

Company: JONPOL EXPLORATIONS
Project:
Attn: JOHN POLLOCK

Date: JAN-30-91

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2. 420--111 Richmond St. W. Toronto
3. M5H 2G4

We hereby certify the following Assay of 132 CORE samples submitted JAN-25-91 by JOHN POLLOCK.

Sample Number	Au oz/ton	Au check oz/ton	Au 2nd oz/ton
5172	0.063	0.060	
5173	0.002		
5174	0.002		
5175	Nil		
5176	Nil		
5177	Nil		
5178	0.004		
5179	Nil		
5180	Nil		
5181	Nil		
5182	Nil		
5183	Nil		

A91-4

Au was determined using 1 AT fusions

Certified by Donna Gardner

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Assay Certificate

1W-2175-RA1

Company: **JON POL EXPL.**
Project:
Attn: JOHN POLLOCK

Date: FEB-01-91
Copy 1. HOLD COPY FOR PICK-UP
2. SUITE 420-111 RICHMOND ST.W. TORONTO

We hereby certify the following Assay of 102 CORE samples submitted JAN-29-91 by JOHN POLLOCK.

Sample Number	Au oz/ton	Au check oz/ton	Au 2nd oz/ton
5184	Nil		
5185	Nil		
5186	Nil		
5187	Nil		
5188	Nil		
5189	Nil	Nil	
5190	Nil		
5191	Nil		
5192	Nil		
5193	Nil		
5194	Nil		
5195	Nil		
5196	Nil		
5197	0.002		
5198	Nil		
5199	Nil		
5200	0.014	0.014	
5201	0.008		
5202	0.004		
5203	0.011		
5204	0.002		
5205	0.004		
5206	0.002		
5207	0.010		
5208	0.003		
5209	Nil		
5210	0.002		
5211	0.076	0.074	
5212	0.120	0.116	0.161
5213	0.002		

Au was determined using 1 At fusions

Certified by L Landin

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Assay Certificate

1W-2175-RA1

Company: JON POL EXPL.
Project:
Attn: JOHN POLLOCK

Date: FEB-01-91
Copy 1. HOLD COPY FOR PICK-UP
2. SUITE 420-111 RICHMOND ST.W. TORONTO

We hereby certify the following Assay of 102 CORE samples submitted JAN-29-91 by JOHN POLLOCK.

Sample Number	Au oz/ton	Au check oz/ton	Au 2nd oz/ton
5214	0.004		
5215	0.002		
5216	Nil		
5217	Nil		
5218	Nil		
5219	Nil		
5220	Nil		
5221	Nil		
5222	Nil		
5223	Nil		
5224	Nil	Nil	
5225	Nil		
5226	Nil		
5227	Nil		
5228	Nil		
5229	0.002		
5230	Nil		
5231	Nil		
5232	Nil		
5233	0.002		
5234	0.002		
5235	Nil		
5236	Nil		
5237	0.002		
5238	0.003	0.002	
5239	0.002		
5240	Nil		
5241	0.002		
5242	0.002		
5243	Nil		

Au was determined using 1 At fusions

Certified by R Gandin

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1W-2175-RA1

Company: JON POL EXPL.
Project:
Attn: JOHN POLLOCK

Date: FEB-01-91
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We hereby certify the following Assay of 102 CORE samples submitted JAN-29-91 by JOHN POLLOCK.

Sample Number	Au oz/ton	Au check oz/ton	Au 2nd oz/ton
5244	Nil		
5245	Nil		
5246	0.030	0.026	
5247	Nil		
5248	0.002		
5249	0.002		
5250	Nil		
5251	Nil		
5252	0.002		
5253	0.002		
5254	0.002		
5255	Nil		
5256	Nil		
5257	Nil		
5258	0.002		
5259	Nil		
5260	Nil		
5261	Nil		
5262	Nil		
5263	Nil		
5264	0.039	0.043	
5265	0.018		
5266	0.008		
5267	0.108	0.152	0.138
5268	0.051	0.044	
5269	0.039		
5270	0.018		
5271	0.014		
5272	0.008		
5273	0.018		

Au was determined using 1 At fusions

Certified by R Candini

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1W-2175-RA1

Company: JON POL EXPL.
Project:
Attn: JOHN POLLOCK

Date: FEB-01-91
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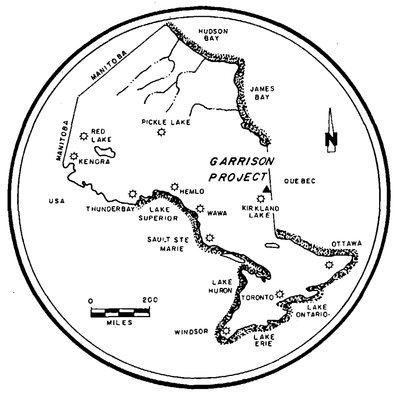
We hereby certify the following Assay of 102 CORE samples submitted JAN-29-91 by JOHN POLLOCK.

Sample Number	Au oz/ton	Au check oz/ton	Au 2nd oz/ton
5274	0.009		
5275	0.002		
5276	0.003		
5277	0.002		
5278	0.010	0.012	
5279	0.008		
5280	0.003		
5281	0.002		
5282	Nil		
5283	0.002		
5284	Nil		
5285	Nil		

Au was determined using 1 At fusions

Certified by K Cardin

P.O. Box 10, Swastika, Ontario P0K 1T0
Telephone (705) 642-3244. FAX (705)642-3300



LEGEND

"T"	"Tholeiite" (Chemically a basaltic komatiite)
Chl-K	Dark green chloritized komatiite flows with spinifex texture - relatively undeformed.
Chl-S-T	Chlorite - sericite - minor talc schist with a characteristic olive green colour.
C-S-M	Carbonate - sericite - mariposite assemblage with an apple green colour, relatively undeformed to weakly schistose, usually does not contain buff dykes.
C-M-S	Carbonate - mariposite - sericite schist with a stockwork texture and an emerald green colour, contains buff dykes which may be brecciated.
Chl-T	Chlorite - talc - carbonate assemblage variably foliated from relatively undeformed to schistose, dark green colour.
A	Albite - sericite - carbonate - pyrite gold bearing assemblage, referred to as albitite but actually an alteration phase of the original komatiite flow which locally has a north wall margin showing incomplete replacement of chlorite. ..... indicates alteration boundary.
C-S-Chl	Carbonate - sericite - chlorite assemblage, variably foliated with hardnest of 5. May be a boundary assemblage of the chlorite-talc-carbonate assemblage.
S	Dark green to black talc-chlorite-carbonate assemblage either foliated or brecciated showing original komatiite flow and spinifex texture.
O-P	Black to dark green olivine peridotite with relict olivine or serpentite pseudomorphs, cumulate portion of original komatiite flow, spinifex texture, includes non olivine pyroxenitic komatiite.
MS	Metasedimentary rocks including fine-grained well sorted sandstones, argillites and siltstones, colours vary from grey - green (ferrous iron), disseminated pyrite and specularite (hematite) locally common.
BD	"Buff dyke" - term applied to a sericitized fine-grained rock with sharp dyke-like boundaries, generally with disseminated pyrite, restricted generally to mariposite-bearing host rocks. See comment below under BSD.
SD	Syenite dyke - fine-grained pink to orange to reddish coloured felsic intrusive rock.
BSD	Biotite syenite dyke - fine-grained syenite intrusive rock with either biotite or chloritized biotite. Chilled margins are common. Locally the chilled margins have been altered to a "buff dyke" appearing rock with mariposite flakes when the host rock is mariposite-bearing.
○ 87-9	1987 Diamond Drilling
⊕ H91-1	1991 Diamond Drilling

JONPOL EXPLORATIONS LTD. T & H RESOURCES LTD.	
GARRISON GOLD PROJECT	
DRILL HOLE LOCATION MAP SHOWING VERTICAL PROJECTION OF GEOLOGY	
GARRISON TOWNSHIP	
DATE: February, 1991	SCALE: 1" = 200'
REVISION:	FIGURE NO.
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