

6533

R E P O R T

O N

THE ANNETTE CLAIMS

TERRACE, B.C.

F O R

JOHN ISIMA

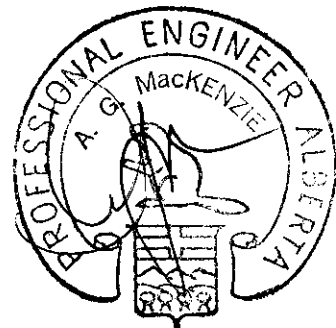
BANFF, ALBERTA

B Y

ANGUS G. MacKENZIE MINING CONSULTANTS LTD.

JULY, 1977

CALGARY, ALBERTA



ANGUS G. MacKENZIE MINING CONSULTANTS LTD.

ILLUSTRATIONS FOR ISIMA REPORT

1. Index Map (as in W. Report)
and Regional Geology (GSC)
2. Sketch map of sampling program 1977

INTRODUCTION

Angus G. MacKenzie Mining Consultants Ltd. were approached by Mr. John Isima of Banff, Alberta on March 23, 1977 regarding a mining property held by Mr. Isima in the Terrace, B.C. area. A report on the Annette Claims, made by Richard S. Westbury dated July 28, 1976 was left with us along with a number of assay certificates that post-dated the Westbury report. Mr. Isima had, apparently found by way of chemical analyses, that the fractured bedrock and the alluvial sands and gravels lying on the bedrock, contained an interesting percentage of titanium (up to 1.15%). Mr. Isima's main interest at this time was to determine whether the titanium was present as ilmenite or rutile. At the same time Mr. Isima made tentative arrangements for our firm to make an examination of the claims as soon as possible after the snow had cleared.

In the meantime the pulps from samples submitted to Loring Laboratories on sand samples collected by Mr. Isima and assayed in January 1977 were obtained and several of these were given to the Department of Energy Mines and Resources, Federal Government, who reported, in part, as follows on May 27, 1977:

"Two pulverized sand samples were submitted to ascertain whether their high titanium content was due to ilmenite or rutile. ---- a diffraction pattern was made of the residue, this reveals anatase and some rutile, but no ilmenite." ---- The entire report is appended as part of this report.

Based on this result, Mr. Isima decided to conduct a detailed sampling program on the claims and requested our firm to make an examination at the same time. A tentative date was arranged, and this report is based on this examination and the results of assays obtained from some 31 samples cut in large lots on three lines covering the exposed gravels and sands on the northern part of the Annette Claims. The examination was carried out May 14, 15, 16 and 17, 1977.

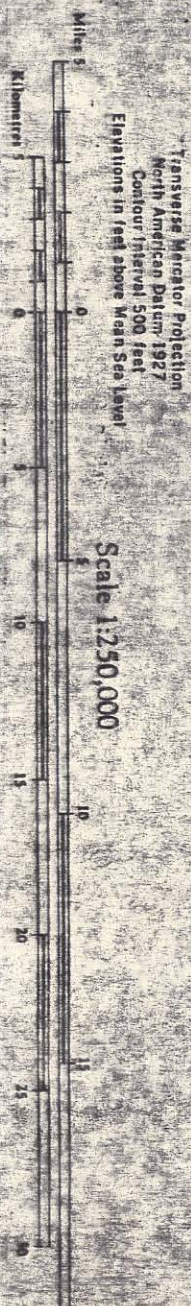






Fig 2: Local orientation map, an excerpt from NTS map 103-1

TERRACE BRITISH COLUMBIA

The approx limits of Fig 3.....

Geology from GSC map 1136A

-  Jurassic argillite, greywacke, volcs & pyroclastics
-  Triassic(?) Limestone-boulder conglomerate, pyroclastics.
-  Carboniferous White crystalline limestone.
- Intrusives.**
-  Crataceous(or later) Granodiorite of the Kleanza Creek Apophysis or lacolithic - lobe.

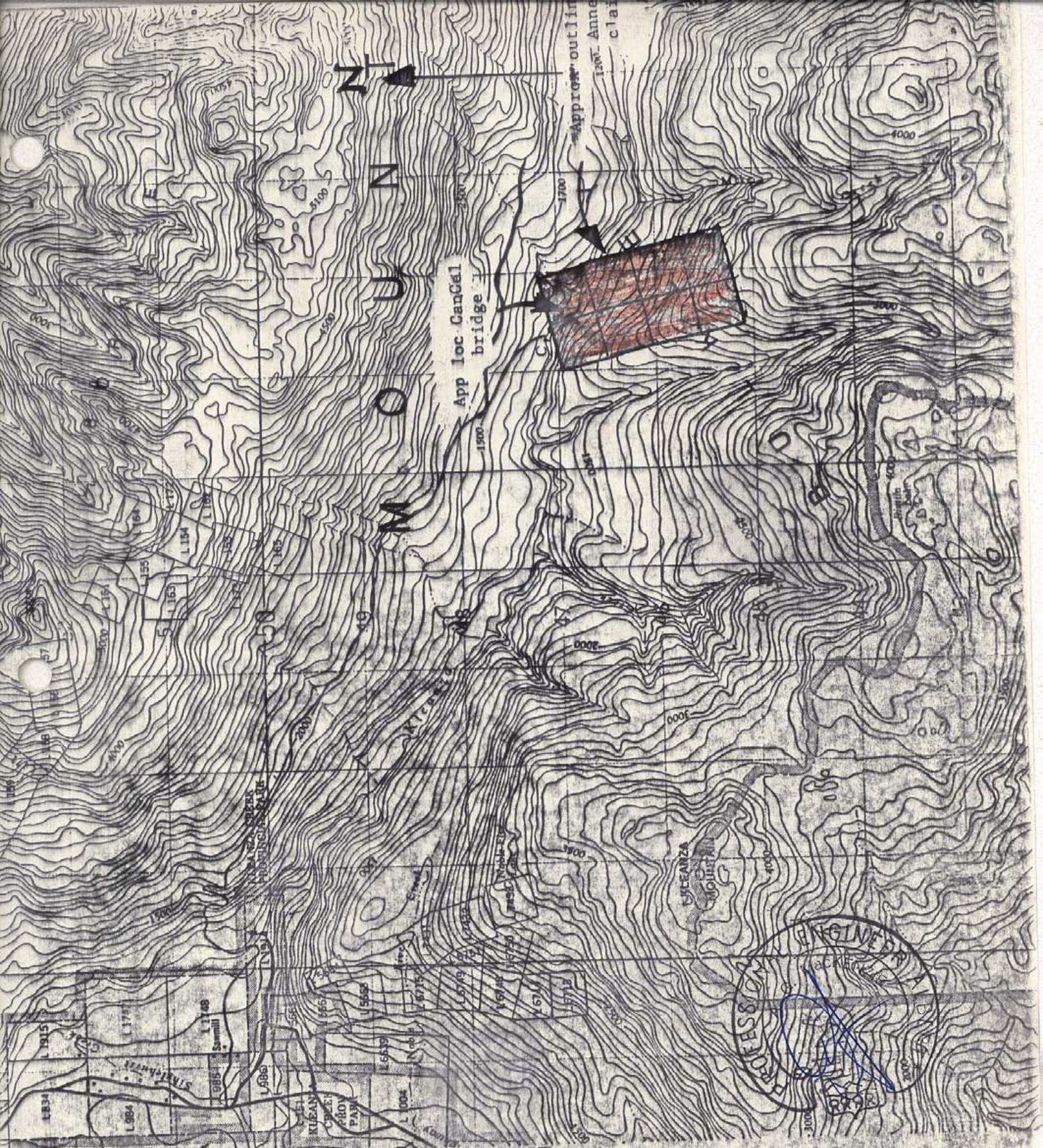
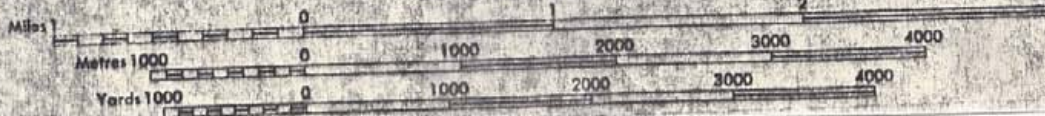


Fig 3: Location Map.

USK
 COAST LAND DISTRICT RANGE 5
 BRITISH COLUMBIA

An excerpt from
 NTS 103-1, 9.

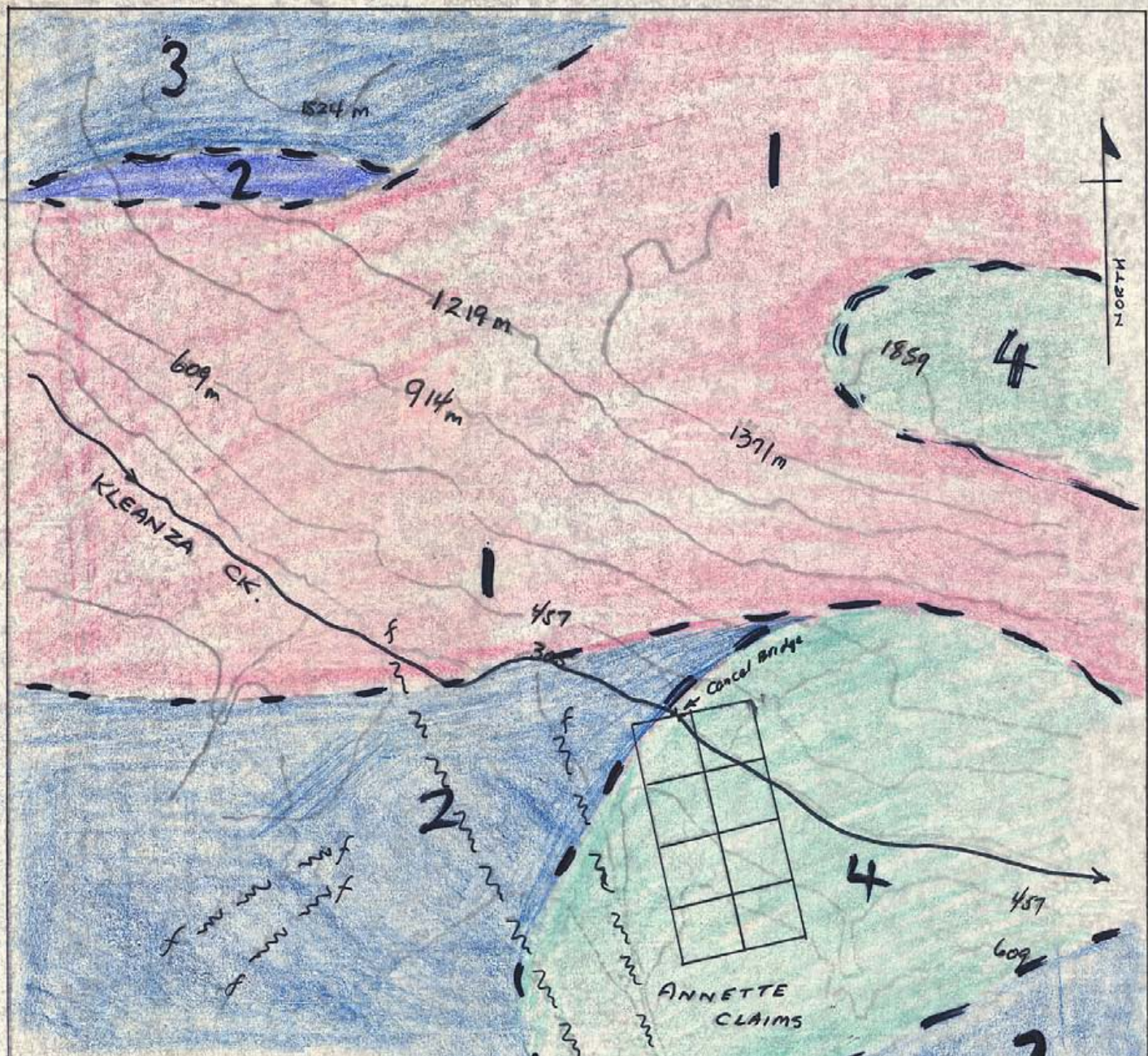
Scale 1:50,000



This Provisional Map is equivalent to a standard map in accuracy of content.

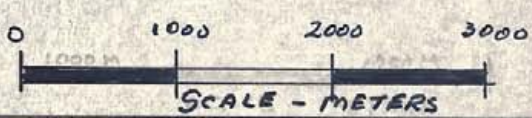
Some names on this map are not yet official. Corrections or additions are invited by the Survey and Mapping Branch.

CONTOUR INTERVAL 100 FEET
 Elevations in Feet above Mean Sea Level
 North American Datum 1927
 Transverse Mercator Projection



LEGEND

- 4 ARGILLITES, GREYWACKES ETC.
- 3 LIMESTONE, CONGLOMERATE PYROCLASTICS
- 2 WHITE CRYSTALLINE LIMESTONE (MARBLE)
- 1 GRANODIORITE
- f FAULT (Interpreted)
- - - - - GEOL. CONTACT APPX (FROM GSC 1136A)



ANGUS G MACKENZIE MINING CONSULTANTS LIMITED 9015 BAYCROFT RD. S.W. CALGARY	
FOR JOHN ISIMA	
GENERAL GEOLOGY ANNETTE CLAIMS NEAR TERRACE, B.C.	
DATE JULY/77	APPROV. AGM.
REV DEC/77	SOLE. SHOWN

LOCATION ACCESS AND STATUS OF CLAIMS

The property is located approximately 10 miles east of Terrace on Highway 16 thence east on a logging road put in by Canadian Cellulose Limited, a distance of about 5.5 to 6.0 miles. The road is well maintained up to the turn off down to the creek level, where several small mud slides have blocked access to the Annette Claims area. One can presently get to within one-half mile of the Canadian Cellulose bridge which is located at about the center of the center line of the two most northerly claims. See Index Map - Claims Location, attached as Figure 1

The claims are registered as Annette 1 to 4 recorded Nos. 130721/24 and Annette 5 to 8 recorded Nos. 13,291/94. They are located in the Omenica Mining Division and according to Mining Receipt No. 64 93438E all claims are in good standing for two years from July 22, 1976.

GENERAL COMMENTARY

Since Westbury's examination the various assays have indicated that titanium might be the mineral to be looking for, rather than copper and/or gold. With this in mind, the sampling program, already referred to, was completed and indications are that the gravels and sands overlaying the bedrock on the Northern Annette Claims do contain an appreciable amount of titanium in the form of anatase and rutile. A sketch map of the area indicating the approximate location of these samples is attached as Figure 2 in this report.

Assay reports from independent laboratories, namely Loring Laboratories Ltd. in Calgary and X-Ray Assay Laboratories of Don Mills, Ontario, on what were considered to be duplicate samples are not at all comparable. See certificates appended, Loring Labs File No. 13241 dated May 27, 1977 and X-Ray Labs File No. 1480 dated May 31, 1977.

It will be noted that Loring Labs show NO titanium for samples 2 to 19 inclusive and not less than 0.57% for the balance. Whereas X-Ray Labs show values from a low of 0.26% to a high of 0.51% on all samples. Loring reports as titanium oxide while X-Ray reports as percentage titanium metal.

On first glance it looks like Loring Labs forgot to throw the switch on the first 18 or 19 samples, and that there is some error in the multiplier in either the X-Ray results or Loring's.

Since analysis on all previous samples and spectographic analysis indicate a grade of better than 0.5% titanium metal, we will assume that the error in assaying as described is essentially correct and that if we take the X-Ray results for the first 18 or 19 samples and multiply them by a factor of 2, we will arrive at a figure comparable with the Loring Labs results for the balance of the samples, and obtain an average assay that is comparable to the results obtained from two composite samples sent to Loring Labs, File No. 13231 dated May 26, 1977 of 0.64% titanium (as T_1O_2), see assay certificate appended. The spectographic analysis on the same sample sent to Can-Test Labs, File No. 1860 dated June 2, 1977 gave a result of 0.5% titanium.

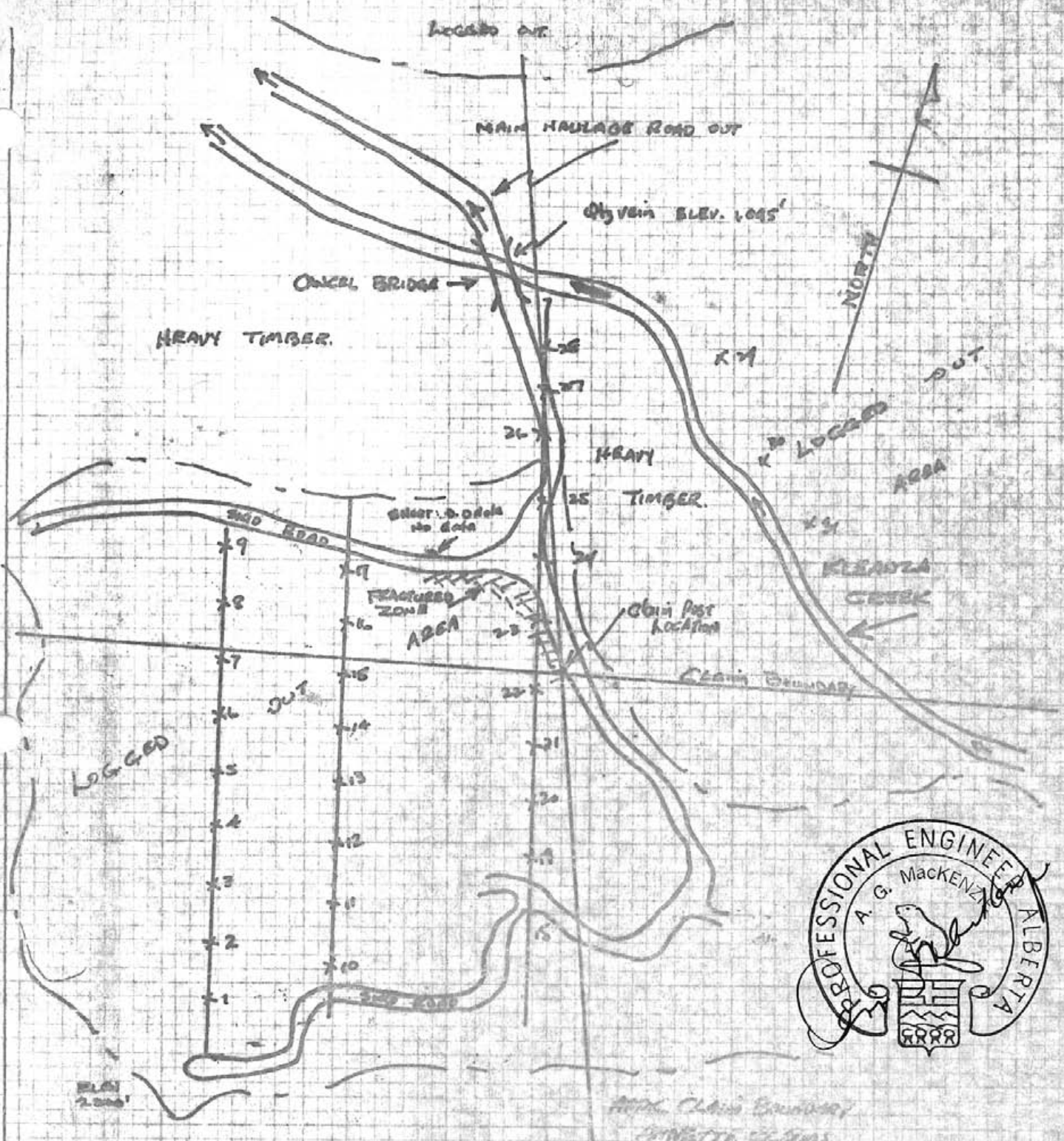
The straight arithmetic average of the 31 samples submitted to both labs and corrected as indicated is 0.72% titanium.

For the purposes of this report we will assume that this value 0.72% T_1O_2 is the content of the sands and gravels in the examined area by us.

In the meantime both labs have been requested to rerun all 31 samples.

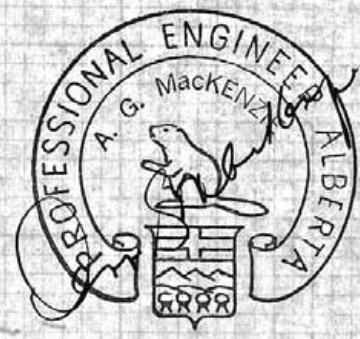
SAMPLING PROCEDURE

Mr. Isima had Gerry Vene and George Buat assisting him in the sampling program. At first, a post hole auger was tried but found to be unworkable and the sampling was done by a pick and shovel. Three main lines of sampling were



SAND & GRAVEL SAMPLE LOCATIONS
 JULY, 1937.

x - 1, 2, 3, 4 etc
 (APPX LOCATIONS)



ANGUS G. MACKENZIE
 MINING CONSULTING ENG
 CALGARY ALBERTA
 JOHN TSUMI
 SKETCH PLAN
 GRAVEL SAMPLE LOCATIONS
 ANNETTE CLAIMS - TRACES
 1937

laid out. See Figure 2. All samples were in the order of 10 lbs. in weight. Two composite samples were taken from each of the sample sites and assayed separately. These samples were taken to Calgary directly by A.G. MacKenzie and delivered to Loring Laboratories Ltd. Certificate of analysis is appended. The balance were taken to Terrace and shipped to Mr. Isima at Banff where they were split and duplicate samples sent to independent labs for analysis. The results have already been discussed, in light of their indicated values.

GENERAL DISCUSSION ON TITANIUM

Titanium has only recently become a useful metal. Its greatest use is in paint pigment. There are many other uses found for the pure oxide in such fields as in toilet articles, linoleum, white inks, coloured glass, pottery glazes and tinting artificial teeth, for dyeing leather and cloth. Metallurgically it is used as a ferrocenium titanium in high speed tool steels and in chrome steels. Many new and innovation uses are being found for titanium oxide in various industries. Titanium ore as ilmenite that contains 54% TiO_2 sells for around \$55./ton. In the form of rutile and/or anatase it currently markets for \$510.00 per stock ton guaranteed, delivery within 12 months. Titanium slag at 70% sells for \$102.00 per long ton. (E.M.J. May/77)

The ore minerals of titanium are rutile, ilmenite and titanite. These minerals are heavy and resistant to weathering and consequently are found frequently in placer operations or as placer deposits. Rutile ores as marketed contain 92 to 98% titanium oxide, while placer ilmenite usually run from 51 to 60% titanium oxide. The ore after concentration is melted in electric furnaces and the fused product is leached with sulphuric acid and the titanium oxide so produced is further purified.

There is, to our knowledge, only one producing titanium property in Quebec, and the titanium ore (ilmenite) is metallurgically treated at Sorel.

ANGUS G. MacKENZIE MINING CONSULTANTS LTD.

This ore contains from 35 to 40% titanium oxide. Larger deposits are reported in Russia with about 16% titanium. Black sands in Japan are said to contain ten billion tons with a content of from 20% to 30% titanium and 0.6% vanadium.

Most of the worlds supply of titanium is iron from beach sands, those of Travaucore and Quilon, India, giving over half the world production. Here the sands contain 50 to 70% ilmenite along with monazite, zircon, rutile and garnet as well as other minerals of no commercial value.

It should be noted that Quebec Iron and Titanium Corporation have reserves of around 100,000,000 tons of ilmenite containing over 82% combined iron and titanium oxides. From this resource the company operates nine smelting furnaces at Sorel, Quebec, with a daily capacity of 5,000 tons, for a production of approximately 860,000 tons titanium slag and 600,000 tons of high grade iron per year. A subsidiary company operates a metal powder plant at Tracy, Quebec and substantial expansions to this plant were made in 1974. The plant capacity was increased to 2,100,000 tons of ilmenite ore per annum. Up to December 1973 Quebec Iron and Titanium had produced 21,082,232 tons of ore. The company is owned two-thirds by Kennecott Copper Corporation and one-third by New Jersey Zinc Co.

Beach Sands in India currently supply about one-half the world production and contain up to 70% ilmenite, along with other economic minerals, such as monazite.

In other words, we are trying to show that a deposit containing titanium, in whatever form, would have to be extremely large and contain between 15 and 20 percent + Titanium (metal) in order to be competitive in today's market. The best results of the recent sampling program average only 0.72% TiO_2 .

METALLURGICAL TESTS

A bulk sample weighing approximately 125 lbs. (wet) was sent to Kipp Kelly in Winnipeg for dry separation tests. Their total report on these tests is appended.

The results of four sized tests on this 'sand' material indicate that it would be necessary to

- (a) either size the raw dry material so that only -76 or -140 mesh material was treated, or
- (b) crushing the entire feed to a -40 mesh product.

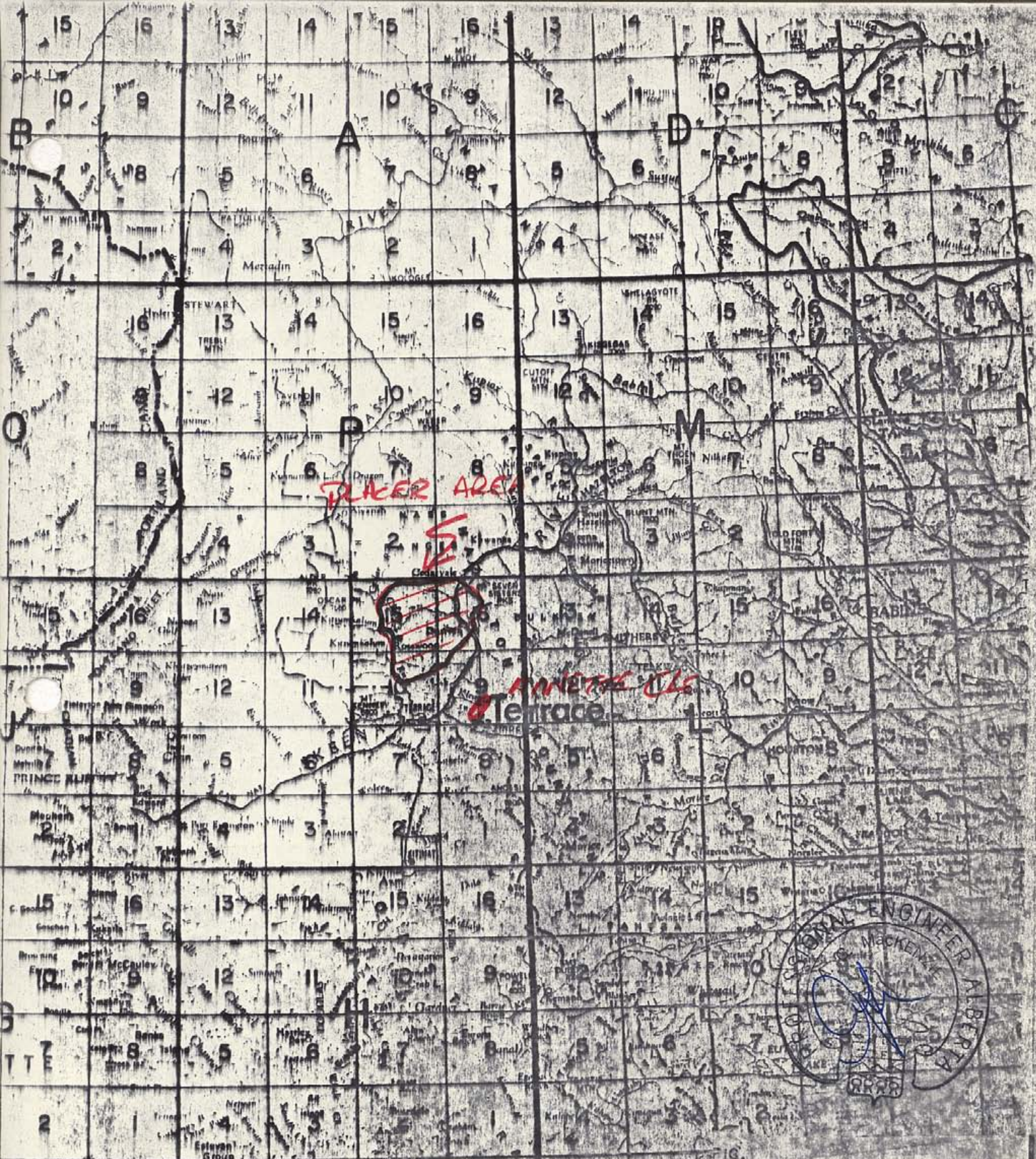
In either case the economics of sizing, one way or the other, would require the treatment of an extremely large quantity of raw material to provide a suitable concentrate. The ratio of concentration would be excessive, and the concentrate produced is highly magnetic.

No assays were run on the Kipp Kelly concentrates as the volume was too small to give a realistic result, and as pointed out above, the ratio of concentration would be prohibitive.

Another serious difficulty arises when one considers the regulations, of the B.C. Government. According to these regulations Kleanza Creek lies outside the only area in the Terrace District that is designated, as open to Placer Mining, and the type of deposit on the Annette Claims would in all probability be considered a Placer as it is made up of gravel and sand. However it must be remembered that the original staking was done on the strength of the metal content in a shear zone. Assays from this shear zone indicated up to 1.0% titanium oxide.

I rather suspect that should permission to mine this material, be asked for from the B.C. Department of Mines, that the outcome would be negative, as far as conducting any surface operations on this deposit. Whether there is any distinction between a straight gravel deposit and a placer

ANGUS G. MacKENZIE MINING CONSULTANTS LTD.



ANGUS G MACKENZIE MINING CONSULTANTS LIMITED CALGARY ALBERTA	
FOR John Isira,	
ANNETTE CLAIMS TERRACE B.C.	
Date:	Appr:
Dwg No:	Scale:

is not clear. If the area were worked as a source of clean washed gravel and/or sand and a mineral by-product extracted by whatever suitable means, would it still be considered a Placer operation?? These questions only the B.C. Government can answer and will depend entirely on their definition of a Placer and their interpretation of the definition of a Mineral (other than Gold).

CONCLUSIONS AND RECOMMENDATIONS

Based on the prevailing world market requirements, it appears that the titanium content of the gravels and rock on the Annette Claims is too low to become an economic entity. The consideration of the retention of washed gravel for alternate disposal is another matter, but it too has definite market limitations and a low unit price f.o.b. the mine site.

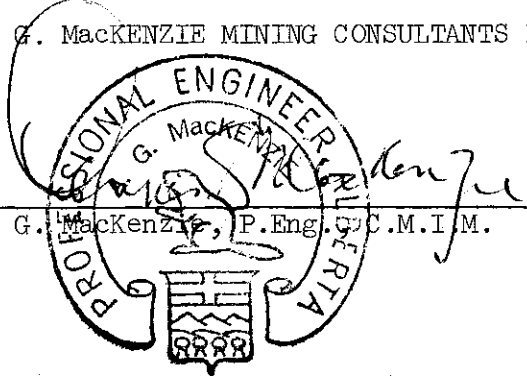
From the standpoint of regional and local geology, the area is interesting and should receive more careful prospecting, but this would entail a fairly large program to be conducted outside and surrounding the present Annette Claims. A purely grass roots type of reconnaissance venture. Our considered recommendations for the gravel in the Annette Claims simply boils down to the cold hard fact that the contained mineral of interest titanium is not present in sufficiently high enough quantity to make the prospect viable. We would suggest therefore that, for the present, and until higher values can be located in the area, all work in connection with the possible production of these gravels for titanium be suspended.

As previously suggested the area is structurally interesting and it is now, more or less, opened up by access roads, etc. that wider search be made for other mineralization. The potential for a good copper-gold prospect seems to be the best bet. Areas of major faulting should be closing prospected and some attempt made to put together a structural picture of the

area. Any further work should be predicated only on positive results from the suggested area survey.

ANGUS G. MacKENZIE MINING CONSULTANTS LTD.

PROFESSIONAL ENGINEER
G. MacKENZIE
Angus G. MacKenzie, P.Eng. C.M.I.M.

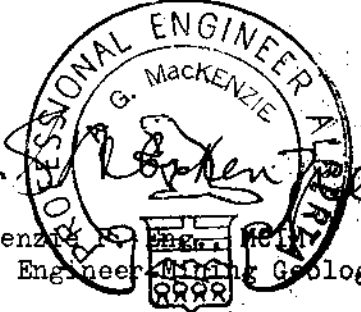


ANGUS G. MacKENZIE MINING CONSULTANTS LTD.

6. I have made this report at the request of
Banff, Alberta.

Mr. John Isima of

Angus G. MacKenzie



Angus G. MacKenzie, P.Eng.
Consulting Mining Engineer Mining Geologist

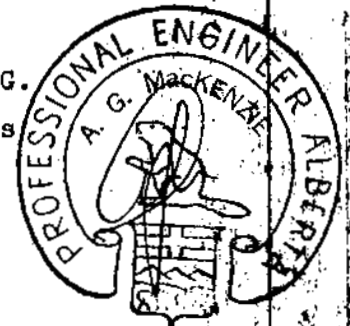
Calgary, Alberta.

DECLARATION OF QUALIFICATIONS

OF

ANGUS G. MACKENZIE. P. ENG., MCIM.

1. I, Angus G. MacKenzie hereby certify that I am a Consulting Mining Engineering - Mining Geologist. I am a graduate (B.E) in Mining and Metallurgy of Nova Scotia Technical College, Halifax, Nova Scotia and I have taken Post - Graduate economic Geology at Dalhousie University.
2. I have spent the past thirty five years in the Minerals Industry as a Mining Engineer and/or Mining Geologist and have maintained responsible positions in these fields at mining properties in Newfoundland, Nova Scotia, Quebec, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia, the Yukon and Northwest Territories. I have also had considerable experience in the United States, Mexico and Southeast Asia.
3. I am a Registered Professional Engineer in the Province of Alberta and have held memberships and/or licenses to practice from Associations of Professional Engineers in the Yukon, Manitoba, Saskatchewan, Nova Scotia, Quebec and British Columbia. I was also registered in the State of Colorado, U.S.A.
4. I have no personal interest, directly or indirectly, in the property herein reported on nor in the securities of ANY CONNECTED COMPANY and/or its associated companies, nor do I expect to receive any such interest.
5. This report is the direct result of an examination by Angus G. MacKenzie Mining Consultants Ltd. and a review of all reports and other pertinent information, on the property.



ANGUS G. MacKENZIE MINING CONSULTANTS LTD.

Angus G. MacKenzie
MINING CONSULTANTS LTD.

9015 BAY CROFT RD. S.W.
CALGARY, ALBERTA T2V 0S6

Evaluation - Exploration - Feasibility - Development - Production

December 16, 1977

Please note that in addition to the time charged on next page - the following times were taken from my daily diary.

		<u>TIME DAY</u>
March	One meeting in office with Isima discussing reports etc.	0.25
April 22.	Set up samples and took to University and Dept Energy for exact identification	0.50
April 26	Made up estimate costs and contract for Isima, checked samples / Ottawa.	0.50
May 2	Reply to Isima letter / contract. Checked Dept Energy for sample analysis sent results to Isima mineral, Anatase.	0.25
May 13	Preparations for trip to Terrace via Banff	0.25
May 14	Left for Banff / Terrace at 5.30 am arrived Terrace 11.30 pm 18hrs day	1.75
May 15.	Annette Claims 12 hrs	1.50
May 16.	" " 14 hrs	1.75
May 17	Leave Terrace for Calgary Via Banff 18 hrs	1.75
May 26	Review Assays, X - Ray Lab	0.25
May 26	" " Loring Lab, Titanium Market research.	0.25
May 28.	Compare assays two labs statistically	0.25
Aug 15.	Review Kipp Kelly preliminary and Final results metallurgical tests	1.0
Sept. 2,3,4	Report compilation and finalization Mailed to Isima.	3.0
	Total	<u>13.75 days</u>

NOTE Isima only charged for a total of -----6 days

Including Report compilation extra time spent on this project and NOT charged.

= 7.75 DAYS

Angus MacKenzie
16 Dec 1977

August 18, 1977

LABORATORY REPORT SUMMARY

TEST SERIES: 1315
 CUSTOMER: John Isine
 MATERIAL: Sands

Material received was very damp, therefore drying was necessary. After drying, the material was screen sized to the following.

SCREEN ANALYSIS

	<u>WEIGHT</u>	<u>DENSITY</u>	<u>PERCENT</u>
+2 m	46 lbs.	76.1	44.1
-8 + 16 m	13 lbs.	89	12.5
-16 + 30 m	12 lbs. 3 oz.	66.2	11.7
-30 + 56 m	11 lbs. 4 oz.	60.3	10.8
-56 + 76 m	7 lbs. 14 oz.	57.9	7.5
-76 + 140 m	6 lbs. 4 oz.	55.3	5.9
-140 m	7 lbs. 14 oz.	53.1	7.5
TOTAL	104 lbs. 7 oz.		100.0

Tests were run on the screened fractions with the following results.

1315-A - MATERIAL: -30 + 56 mesh fraction
 RESULTS: No concentration of free metal. Finer crushing needed to release the metal. ✓

1315-B MATERIAL: -56 + 76 mesh fraction
 RESULTS: slight concentration of free metal. Sample should be crushed to its releasing point. ✓

1315-C MATERIAL: -76 + 140 mesh fraction
 RESULTS: Excellent concentration of free metal although some sand coloured magnetic particles reporting in the tailings product. Closer sizing may remedy this. ✓

1315-D MATERIAL: -140 mesh fraction
 RESULTS: Much the same as 1315-C. Magnetic material reporting in the tailings product and in the cyclone discharge.

No tests carried out on the largest screen sized samples, as the releasing point of this material is around 65 mesh.

Larger samples will be needed to determine capacities and true appearance of the concentrate.

B. Paulsen
 B. Paulsen
 Technical Assistant

BP/dl

Certified expenditures by Angus G. MacKenzie Mining Consultants Ltd.
for examination of Annette Claims, near Terrace B.C. May 14, 15,
16, 17, 1977.

TRANSPORTATION.

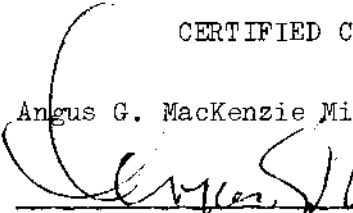
Calgary - Terrace - property Return

1909.7 miles at 20¢ per mile -----	\$381.94
Hotels & Motels -----	\$ 56.70
Gas & Oil -----	\$ 98.60
Professional Services -----	
Field 4 days @ \$300/day -----	\$1200.00
Report Compilation -----	\$300.00

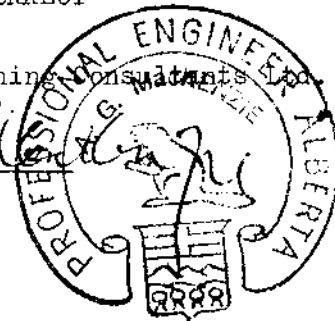
Total. \$2037.24

CERTIFIED CORRECT

Angus G. MacKenzie Mining Consultants Ltd.



President.



ANGUS G. MacKENZIE MINING CONSULTANTS LTD.

APPENDICES

OUR FILE 8-8-1

YOUR FILE _____

ADDRESS YOUR REPLY

TO Mining Recorder



P. O. Box 340,
Smithers, B. C.
December 2, 1976

Mr. John Isima
Box 1525,
Banff, Alberta

Dear Sir:

Enclosed are work numbers 21606 to 21621 covering the
Annete 1/4 and Annette 5/8 mineral claims.

Yours truly,

B. McLeod

for
A. W. MILTON
Mining Recorder

/bm
Enc.

Mining Division **OMNECA**

Mining Receipt No. **93438E** Amt **\$160.00**

Name of group
(if any)

Group notice No.

Date recorded

NG
w Jul 22/76

P	D	S	G	PR	PS
Physical	Drilling	Legal Survey (Single Claim)	Geological Survey	Prospecting	Legal Survey (Perimeter)
X					
X					

CREDIT
Work and rental recorded in _____ applied as a year work.

Work No. (s)	O/L in \$	Name(s) of Claim(s)	Number of Units	Record No. (s)	Month of Record	Penalty Fee(s) (\$)	No. of Year(s)	Each Claim
21606/13		Annete 1/ 4		130721/24	Jul		2	
21614/21		Annette 5/8		131291/94	Sep		2	

Work* No. (s) Rental (\$)

* One work number represents work to the value of \$200.

To: Mr. John Isima,
 P. Box 1525,
 Banff, Alberta TOL 0C0



File No. 13231
 Date May 26, 1977
 Samples Bulk

Certificate of
ASSAY of
LORING LABORATORIES LTD.

SAMPLE No.	OZ./TON GOLD	% T102
"Bulk Sample"		
Sample A	Trace	0.64
Sample B	Trace	0.64
Spectro on smaller sample to follow		
I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES . . .		

Rejects Retained one month.
 Pulp Retained one month
 unless specific arrangements
 made in advance.


 Licensed Assayer of British Columbia



can test ltd.

1650 PANDORA STREET, VANCOUVER, B.C. V5L 1L6 • TELEPHONE 254-7278

Telex 04-507737

Loring Laboratories Ltd.

SEMI QUANTITATIVE SPECTROGRAPHIC ANALYSES CERTIFICATE

629 Beaverdam Road N.E.

File No. **1860 G**

Calgary, Alberta

Date **June 2, 1977**

We hereby Certify that the following are the results of semi quantitative spectrographic analyses made on ore pulp samples submitted.

		1	2	3	4	5	Sample Identification
Aluminum	Al	5.					Sample 1: Small Bulk
Antimony	Sb	ND					
Arsenic	As	ND					
Barium	Ba	0.1					
Beryllium	Be	ND					
Bismuth	Bi	ND					Sample 2: File 13231
Boron	B	ND					
Cadmium	Cd	ND					
Calcium	Ca	3.					
Chromium	Cr	0.007					
Cobalt	Co	ND					Sample 3: P.O. 1203
Copper	Cu	0.01					
Gallium	Ga	ND					
Gold	Au	Trace ✓					
Iron	Fe	5.+					
Lead	Pb	ND					Sample 4: Sample 5:
Magnesium	Mg	3.					
Manganese	Mn	0.3 ✓					
Molybdenum	Mo	0.003					
Niobium	Nb	ND					
Nickel	Ni	0.005					Sample 5: Percentages of the various elements expressed in these analyses may be considered accurate to within plus or minus 35 to 50% of the amount present.
Potassium	K	2.					
Silicon	Si	Matrix ✓					
Silver	Ag	Trace					
Sodium	Na	3.					
Strontium	Sr	0.07					Semi-quantitative spectrographic analytical results for gold and silver are normally not of a sufficient degree of precision to enable calculation of the true value of ores. Therefore, should exact values be required, it is recommended that these elements be assayed by the conventional Fire Assay Method. Quantitative and Fire Assays may be carried out on the retained pulp samples.
Tantalum	Ta	ND					
Thorium	Th	ND					
Tin	Sn	ND					
Titanium	Ti	0.5 ✓					
Tungsten	W	Trace					Silicon, aluminum, magnesium, calcium and iron are normal components of complex silicates.
Uranium	U	ND					
Vanadium	V	0.05					
Zinc	Zn	ND					
Zirconium	Zr	0.03					

MATRIX — Major constituent
 MAJOR — Above normal spectrographic range
 TRACE — Detected but minor amounts
 N.D. — Not detected
 * — Suggest assay (above 0.3%)

All results expressed as Percent
 Note: Pulps retained one week.

ALL REPORTS ARE THE CONFIDENTIAL PROPERTY OF CLIENTS. PUBLICATION OF STATEMENTS, CONCLUSION OR EXTRACTS FROM OR REGARDING OUR REPORTS IS NOT PERMITTED WITHOUT OUR WRITTEN APPROVAL. ANY LIABILITY ATTACHED THERETO IS LIMITED TO THE FEE CHARGED.

CAN TEST LTD.

Spectroscopist

To: Mr. John Isima,
P.O. Box 1525,
Banff, Alberta TOL 0C0



File No. 12600
Date January 11, 1977
Samples Sand

Certificate of
ASSAY of
LORING LABORATORIES LTD.

SAMPLE No.	% TiO ₂
<u>"Sand Samples"</u>	
Sample # 1	.73
Sample # 2	1.10
Sample # 3	.75
Sample # 4	.90
Sample # 5	.92
Sample # 6	.91
Sample # 7	1.15
Sample # 8	1.10
Sample # 8F	.74

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

[Signature]
Licensed Assayer of British Columbia

Rejects Retained one month.
Pulps Retained one month
unless specific arrangements
made in advance.



File No. 13241
 Date May 27, 1977
 Samples Bulk Samples

To: Mr. John Isima,
 P.O. Box 1525,
 Banff, Alta.
 T01 0C0

Certificate of
 ASSAY of
 LORING LABORATORIES LTD.

Page # 1

SAMPLE No.	OZ./TON GOLD	% T102	Corrected %	% Mn
#2	Trace	-	0.94	.03
#3	Trace	-	0.94	.04
#4	.002	-	1.02	.02
#6	Trace	-	0.76	.03
#7	Trace	-	0.98	.02
#8	Trace	-	0.76	.02
#9	Trace	-	0.64	.02
#10	Trace	-	0.60	.02
#11	Trace	-	0.72	.04
#12	Trace	-	0.76	.03
#13	.002	-	0.58	.02
#14	Trace	-	0.58	.04
#15	Trace	-	0.62	.02
#16	Trace	-	0.76	.03
#17	Trace	-	0.58	.03
#19	Trace	-	0.58	.03
#20	Trace	.57	0.52	.01
#21	Trace	.60	0.76	.03
#22	Trace	.58	0.70	.03
#23	Trace	.61	0.72	.03
#24	Trace	.60	0.74	.02

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

[Signature]

Licensed Assayer of British Columbia

Rejects Retained one month.
 Pulps Retained one month
 unless specific arrangements
 made in advance.

To: Mr. John Isima,
P.O. Box 1525,
Banff, Alta,

File No. 13241
 Date May 27, 1977
 Samples Bulk Samples



Certificate of
ASSAY of
LORING LABORATORIES LTD.

Page # 2

SAMPLE No.	OZ./TON GOLD	% T102	Corrected	% Au
#25	Trace	.56	0.60	.03
#26	Trace	.66	0.62	.04
#27	Trace	.58	0.68	.03
#28	Trace	.61	0.64	.02
#31A	Trace	.56	0.74	.03
#31B	Trace	.62	0.72	.03
#32	Trace	.57	0.74	.04
#35	.002	.59	0.66	.03
<u>N.G. #1</u>	<u>.005</u>	<u>.82</u>	0.74	.02
<u>N.G. #2</u>	Trace	.61	0.88	.03

(31 Samples)

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE
 ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES

Rejects Retained one month.
 Pulps Retained one month
 unless specific arrangements
 made in advance.

[Signature]

Licensed Assayer of British Columbia

X-RAY ASSAY LABORATORIES

LIMITED

45 LESMILL ROAD

DON MILLS ONTARIO M3B 2T8

445-5755

Certificate of Analysis

NO. 1522 PAGE 1 of 1

TO: Mr. John Isima
P.O. Box 1525,
Banff, Alta. T0L 0C0

RECEIVED June 15/77

INVOICE NO. 1522

SAMPLE(S) OF 40 pulp on hand SUBMITTED TO US SHOW RESULTS AS FOLLOWS:

Sample	%Mn	Sample	%Mn
May 26/77			
#1	0.09	22	0.13
#2	0.10	23	0.11
3G	0.09	24	0.11
G	0.09	25	0.11
G-1	0.09	26	0.11
		27	0.13
		28	0.11
May 31/77			
2	0.09	35	0.13
2A	0.09	No Tag	0.09
3	0.10		
4	0.06		
6	0.10		
7	0.10		
7A	0.09		
8	0.09		
9	0.11		
10	0.10		
11	0.12		
12	0.09		
13	0.10		
14	0.12		
15	0.10		
16	0.09		
16A	0.10		
16B	0.11		
17	0.10		
19	0.12		
20	0.10		
21	0.11		

X-RAY ASSAY LABORATORIES LIMITED

DATE June 17/77.

CERTIFIED BY A. Hume

ASSAYERS - ANALYTICAL CHEMISTS - SPECTROGRAPHERS

X-RAY ASSAY LABORATORIES

LIMITED

45 LESMILL ROAD

DON MILLS ONTARIO M3B 2T8

445-5755

Certificate of Analysis

NO.

1434

PAGE

1 of 2

John Isima
P.O. Box 1525,
Banff, Alta. T0L 0C0

May 26/77

1434

5sand

Sample	%Ti	Au oz/ton
#1	0.41	nil
G	0.41	nil
3G	0.42	nil

X-RAY ASSAY LABORATORIES LIMITED

DATE

May 31/77.

CERTIFIED BY

S. Nivens

ASSAYERS - ANALYTICAL CHEMISTS - SPECTROGRAPHERS



MEMORANDUM

NOTE DE SERVICE

TO / À Dr. H. Bielenstein

FROM / DE A. G. Heinrich

SUBJECT / OBJET Mineralogical Analysis

SECURITY CLASSIFICATION / DE SÉCURITÉ
OUR FILE - N/RÉFÉRENCE 77-XR-17
YOUR FILE - V/RÉFÉRENCE
DATE May 27, 1977

Two pulverized sand samples were submitted to ascertain whether their high titanium content was due to ilmenite or rutile. This was not determinable in the whole rock because the titanium X-ray diffraction lines are masked by those of the silicate matrix. The samples were predominately quartz, feldspars and micas, and the removal of these silicates with hydrofluoric acid concentrated the titanium fraction. A diffraction pattern was made of the residue; this revealed anatase and some rutile, but no ilmenite. It is possible that some of the titanium is present as a silicate, (for example, sphene, CaTiSiO_5) which would be destroyed by the acid. A heavy mineral fractionation of the sand would be required to determine the presence of titanosilicates.

A. G. Heinrich

AFH/ijg *asth*

X-RAY ASSAY LABORATORIES

LIMITED

45 LESMILL ROAD

DON MILLS ONTARIO M3B 2T8

445-5755

Certificate of Analysis

NO.

1520

PAGE

1 of 1

Mr. John Isima,
Box 1525,
Banff, Alta.

June 15/77

1520

1 pulp on hand

Sample

#1

Titanium is found in the magnetic portion of sample thus indicating that it is present as titaniferous Magnetite.

X-RAY ASSAY LABORATORIES LIMITED

DATE

June 17/77.

CERTIFIED BY

A. Hewson

X-RAY ASSAY LABORATORIES

LIMITED

45 LESMILL ROAD

DON MILLS ONTARIO M3B 2T8

445-5755

Certificate of Analysis

NO. 1480 PAGE 1 of 1

TO. Mr John Isima
Box 1525,
Banff, Alta.

RECEIVED May 31/77

INVOICE NO. 1480

SAMPLE(S) OF 31 Sand

SUBMITTED TO US SHOW RESULTS AS FOLLOWS:

Sample	%Ti	Au ppb	Sample	%Ti	Au ppb
2	0.47	x	28	0.32	x
2A	0.37	x	35	0.33	x
3	0.47	x	No Tag	0.37	x
4	0.51	x			
6	0.38	x			
7	0.49	x			
7A	0.44	x			
8	0.38	x			
9	0.32	x			
10	0.30	x			
11	0.36	x			
12	0.38	x			
13	0.29	x			
14	0.29	x			
15	0.31	x			
16	0.38	x			
16A	0.37	x			
16B	0.36	x			
17	0.29	x			
19	0.29	x			
20	0.26	x			
21	0.38	x			
22	0.35	x			
23	0.31	x			
24	0.32	x			
25	0.30	x			
26	0.31	x			
27	0.34	x			

31 Samples

Note: x = less than 30 ppb Au.

X-RAY ASSAY LABORATORIES LIMITED

DATE June 16/77.

CERTIFIED BY S. H. H. H.

X-RAY ASSAY LABORATORIES

LIMITED

45 LESMILL ROAD

DON MILLS ONTARIO

445-5755

Certificate of Analysis

NO. 1434

TO. John Isima
P.O. Box 1525,
Banff, Alta. T0L 0C0

Page 2 of 2

RECEIVED May 26/77

INVOICE NO. 1434

SAMPLE(S) OF 2 sand

SUBMITTED TO US SHOW RESULTS AS FOLLOWS:

Element	Sens*	CONCENTRATION	
		# 2	G-1
Antimony (4)	ND	ND	ND
Arsenic (4)	ND	ND	ND
Beryllium (2)	FT	FT	FT
Bismuth (2)	ND	ND	ND
Cadmium (4)	ND	ND	ND
Cerium (5)	ND	ND	ND
Columbium (4)	ND	ND	ND
Chromium (4)	ND	ND	ND
Cobalt (3)	FT	FT	FT
Copper (1)	FT	FT	FT
Gallium (2)	FT	FT	FT
Germanium (1)	ND	ND	ND
Iron (2)	M	M	M
Lead (2)	FT	FT	FT
Lithium (4)	ND	ND	ND

Element	Sens*	CONCENTRATION	
		# 2	G-1
Manganese (1)	T	T	TL
Mercury (4)	ND	ND	ND
Molybdenum (3)	FT	FT	FT
Nickel (1)	FT	FT	FT
Silver (1)	ND	ND	ND
Tantalum (5)	ND	ND	ND
Thorium (3)	ND	ND	ND
Tin (2)	FT	FT	FT
Titanium (2)	LM	LM	LM
Tungsten (4)	ND	ND	ND
Uranium (3)	ND	ND	ND
Vanadium (2)	FT	FT	FT
Yttrium (3)	ND	ND	ND
Zinc (4)	T	T	T
Zirconium (4)	T	T	T

LEGEND

Key To Symbols

H - 10% plus	L - 0.1-1%
MH - 5-15%	TL - 0.05-0.5%
M - 1-10%	T - 0.01-0.1%
LM - 0.5-5%	FT - 0.01% or less
	ND - Not detected

*Sensitivity

(limit of detection)

1- 0.0005-0.001%
2- 0.001-0.005%
3- 0.005- 0.01%
4- 0.01 - 0.05%
5- 0.05 - 0.1%

Note: Better sensitivities can be obtained with special techniques, if and when required.

X-RAY ASSAY LABORATORIES LIMITED

DATE May 31/77.

CERTIFIED BY *A. Newman*

K I P P K E L L Y L I M I T E D

LABORATORY REPORT

DATE August 15, 1977CUSTOMER John IsinaTEST NO. 1315-ATYPE OF MACHINE MC-1 Mineral ConcentratorDECK COVER No. 2 FAN SIZE 13 DUCT DIA. 13FEED ARRANGEMENT VibratoryMISC. APPARATUS NoneMATERIAL Sands - containing titanium and goldPHYSICAL DESCRIPTION -30 + 56 mesh at 60 lbs./cu.ft.SETTINGS ON MACHINE StandardFAN SPEED Not Taken P.M.STATIC P. AT HOOD .5"AIR SPEED 215 R.P.M.AIR VOLUME 965 C.F.M. H.P. @ MOTOR 1

SEPARATION	WEIGHT	DENSITY LBS./CU.FT.	PER CENT
HEAVY END	6 oz.	86.7	3.5
LIGHT END	4 lbs. 12 oz.	56.9	44.2
DUST	2 oz.	44	1.2
DECK LOAD	5 lbs. 8 oz.	76.8	51.1
TOTAL	10 lbs. 12 oz.		100.0%

REMARKS: Definitely a concentration of heavy ore. Valuable metals are not released. Results should improve in the finer screen fractions. Deck load contains high percentage heavy ore.

B. PAULSON

K I P P K E L L Y L I M I T E D
LABORATORY REPORT

DATE August 15, 1977

CUSTOMER John Isaacs TEST NO. 1315-B

TYPE OF MACHINE MC-1 Mineral Concentrator

DECK COVER Porvair FAN SIZE 13 DUCT DIA. 13

FEED ARRANGEMENT Vibratory

MISC. APPARATUS None

MATERIAL Sands - containing titanium and gold

PHYSICAL DESCRIPTION -56 + 76 mesh at 57 lbs./cu.ft.

SETTINGS ON MACHINE Standard

FAN SPEED _____ R.P.M. STATIC P. AT HOOD 1

AIR SPEED 160 R.P.M. AIR VOLUME 720 C.F.M. H.P. @ MOTOR _____

SEPARATION	WEIGHT	DENSITY LBS./CU.FT.	PER CENT
HEAVY END	1.5 oz.	82.4	1.3
LIGHT END	4 lbs. 0 oz.	96.3	54.5
DUST	1 oz.	--	.9
DECK LOAD	3 lbs. 4 oz.	74.9	43.3
TOTAL	7 lbs. 6.5 oz.		100.0

REMARKS: Insufficient free metal to form a zone. The heavy end was not allowed to discharge so the heavy sample was scraped off the deck.
Capacity - 300 lbs./hour.

NOTE: Test was not run at maximum capacity.

K I P P K E L L Y L I M I T E D

LABORATORY REPORT

DATE August 16, 1977

CUSTOMER John Isima

TEST NO. 1315-D

TYPE OF MACHINE MC-1 Mineral Concentrator

DECK COVER Porvair FAN SIZE 13 DUCT DIA. 13

FEED ARRANGEMENT Vibratory

MISC. APPARATUS None

MATERIAL Sands - containing titanium and gold

PHYSICAL DESCRIPTION -140 mesh at 53 lbs./cu.ft.

SETTINGS ON MACHINE all standard

FAN SPEED R.P.M.

STATIC P. AT HOOD .4"

AIR SPEED 80 R.P.M.

AIR VOLUME 360 C.F.M.

H.P. @ MOTOR

SEPARATION	WEIGHT	DENSITY LBS./CU.FT.	PER CENT
HEAVY END	.234 oz.	200	.22
LIGHT END	3 lbs. 14 oz.	49	58.36
DUST	13 oz.	48	9.41
DECK LOAD	2 lbs. 2 oz.	66	32.01
TOTAL	6 lbs. 10.234 oz.		100.00

REMARKS: As only a very small amount of metal formed a zone on the deck, it could not be discharged. Magnetic material reporting in the light end discharge and in the cyclone discharge. This magnetic material is sand coloured which suggests that the valuable metal has not been released. Closer sizing may have improved separation

B. PAULSON

K I P P K E L L Y L I M I T E D

LABORATORY REPORT

DATE August 15, 1977

CUSTOMER John Isima TEST NO. 1315-C

TYPE OF MACHINE MC-1 Mineral Concentrator

DECK COVER Forwafr FAN SIZE 13 DUCT DIA. 13

FEED ARRANGEMENT Vibratory

MISC. APPARATUS None

MATERIAL Sands - containing titanium and gold

PHYSICAL DESCRIPTION -76 + 140 mesh at 55 lbs./cu.ft.

SETTINGS ON MACHINE Standard

FAN SPEED Not Taken R.P.M. STATIC P. AT HOOD 4"

AIR SPEED 100 R.P.M. AIR VOLUME 450 C.F.M. H.P. @ MOTOR Not Taken

SEPARATION	WEIGHT	DENSITY LBS./CU.FT.	PER CENT
HEAVY END	.162 oz.	approx. 200	.17
LIGHT END	2 lbs. 5 oz.	40	40.92
DUST	.25 oz.	---	.28
DECK LOAD	3 lbs. 5 oz.	67.6	58.63
			100.00

REMARKS: Pure metal zone formed at the heavy end of the deck, but would not discharge. A much cleaner heavy end discharge would result if more headfeed was on hand. This zone of metal was recovered from the deck with a magnet. Note that the small amount of sand in the heavy end discharge sample would not be present if sufficient headfeed was on hand to form a zone of metal and discharge it. Sand coloured magnetic material reporting in the light end discharge. Closer sizing may improve separation.

B. PAULSON