

ARIS SUMMARY SHEET

District Geologist, Smithers

Off Confidential: 90.02.06

ASSESSMENT REPORT 18680

MINING DIVISION: Skeena

PROPERTY: Brucejack 5  
LOCATION: LAT 56 29 00 LONG 129 59 00  
UTM 09 6260095 439438  
NTS 104A05W

CLAIM(S): Brucejack 4-5  
OPERATOR(S): Catear Res.  
AUTHOR(S): Kruckowski, E.R.; Sinden, G.  
REPORT YEAR: 1989, 26 Pages

COMMODITIES

SEARCHED FOR: Gold, Silver

KEYWORDS: Jurassic, Betty Creek Formation, Salmon River Formation, Andesite  
Sericite Schist, Pyrite

WORK

DONE: Geochemical  
ROCK 5 sample(s) ;AU,AG  
SILT 31 sample(s) ;AU,AG  
Map(s) - 1; Scale(s) - 1:5000

RELATED REPORTS: 17383

LOG NO: 0427	RD.
ACTION:	
FILE NO:	

FILMED

REPORT ON THE BRUCEJACK 4 AND 5 CLAIMS  
STEWART, BRITISH COLUMBIA  
SKEENA MINING DIVISION  
NTS 104A/5W AND NTS 104B/8E  
LATITUDE 56° 29'  
LONGITUDE 129°

BY

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CONSULTING GEOLOGIST

G. SINDEN, R.E.T.

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Calgary, Alberta  
T1Y 3L6

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

18,680

CALGARY, ALBERTA  
January, 1989

OUR FILE: 2BRJACKJAN89

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## SUMMARY

The Brucejack 4 and Brucejack 5 claims are situated about 68 kilometers north-northeast of Stewart, British Columbia. The Volcanic and sedimentary rocks of the Middle Jurassic Betty Creek and Salmon River Formations underlie the area of the claims.

During September 1988 Catear Resources Ltd. conducted an exploration program consisting of silt sediment geochemistry, rock geochemistry and prospecting on the Brucejack claims.

The program indicated slightly anomalous gold values in silt sediments and slight to moderate anomalous gold values in rock geochemical sampling.

Followup work on the Brucejack 4 and Brucejack 5 claims is required. An exploration program of prospecting, geological mapping, silt geochemical sampling and trenching is recommended.

Within the Betty Creek host rock significant mineralization has been encountered in pyritic sericitic gossan zones and quartz sulphide veins.

The area of the Brucejack Claims is east of the bonanza gold-silver discoveries at Brucejack Lake by both the Newcana Joint Venture and Catear Resources Ltd. These projects have announced the following results:

	<u>Present Reserves</u>	<u>Grade</u>	
		<u>opt Au</u>	<u>opt Ag</u>
<u>Newhawk West</u> (partially explored)	854,072	.354	22.94
<u>Catear Goldwedge</u> (partially explored)			
Golden Rocket	319,149	.80	1.12
Discovery	37,980	.63	1.08

The above gold-silver discoveries are structurally controlled, epithermal-mesothermal veins occurring in areas of syenodiorite intrusions and associated with areas of intense sericite (quartz-pyrite) alteration.

## INTRODUCTION

During September of 1988, Catear Resources Ltd. conducted an exploration program of stream sediment sampling, rock geochemical sampling and prospecting on the Brucejack 4 and Brucejack 5 claims. These claims are centred 3 kilometers northeast of Mt. Knipple and 10 kilometers north of Knipple Lake.

This report was prepared from field observations and samples collected during September 1988 as well as information from the Newcana Joint Venture and Catear's activities to the west on the Goldwedge claim.

The work was conducted by E.R. Kruckowski Consulting Ltd. personnel.

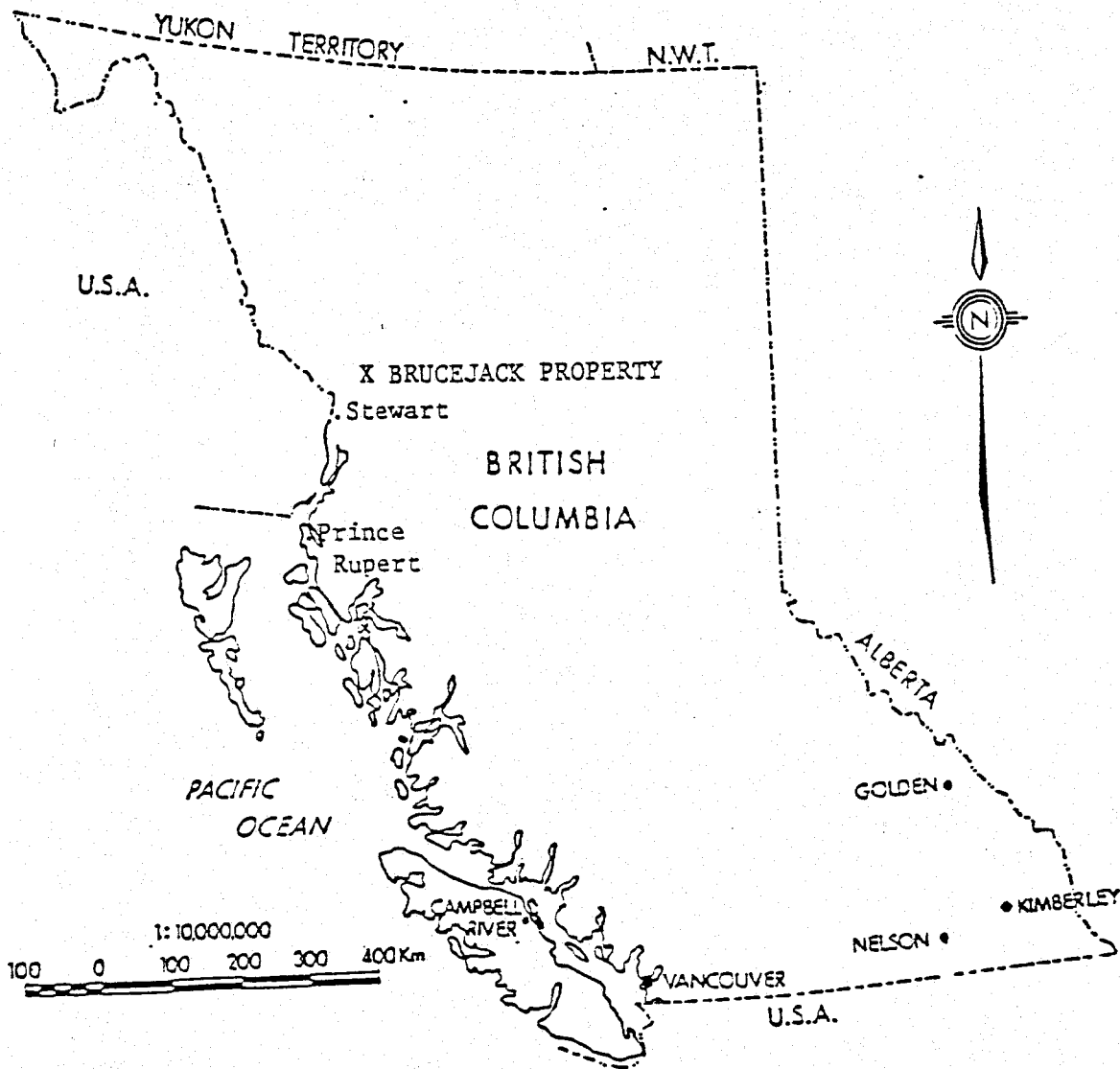
Loring Laboratories Ltd. of Calgary, Alberta performed all geochemical analysis.

### Location, Access and Physiography

The Brucejack 4 and Brucejack 5 claims are located in Northwestern British Columbia, 68 kilometers north-northeast of Stewart, British Columbia in the Skeena Mining Division, NTS 104A/5W and 104B/8E (Figure 1).

The property is situated 10 kilometers north of Knipple Lake and/or 3 kilometers northeast of Mt. Knipple at latitude  $129^{\circ} 59'$ , longitude  $56^{\circ} 29'$ .

At present access is by helicopter based in Stewart, British Columbia. A 38 kilometer summer road extending from Stewart, British Columbia to the Tide Lake Airstrip can be used to reduce mobilization/demobilization expenses (approximately 25 kilometers south-southwest of the Brucejack 4 and 5 claims).



CATEAR RESOURCES LTD.

FIGURE 1

PROPERTY INDEX MAP

The terrain is extremely rugged and steep with elevations ranging from 4100 feet to 6800 feet. Vegetation is limited to thin brush and minor hemlock.

Water supply is plentiful as several glacial run-off streams cross the property.

#### Property Ownership

The property consists of two 12-unit staked claims (Figure 2).

<u>Name</u>	<u>Record No.</u>	<u>Units</u>	<u>Record Date</u>
Brucejack 4	5853	12	Feb. 11, 1987
Brucejack 5	5854	12	Feb. 11, 1987

Catear Resources holds a 50% working interest in the property.

#### Previous Work

The work history of the property is short and recent. Glacial and snow cover made the property unexplorable until recently.

1987: Catear Resources Ltd. conducted an exploration program consisting of rock geochemical sampling, stream sediment sampling and prospecting. Slightly anomalous gold values were found in areas of sericite alteration.

#### Personnel and Operations

E.R. Kruckowski Consulting Ltd. personnel conducted the 1988 exploration program. Work was executed from a tent camp located on Todd Creek and utilized a Bell 206 Jet Ranger helicopter for transportation to and from the project area. Supplies for the program were purchased in Stewart, B.C.





Personnel:

D. Keller, Geologist  
G. Sinden, Geological Technologist  
B. Touzan, Geological Assistant  
T. Devine, Geological Assistant  
S. Weirs, Cook

Work consisted of stream sediment sampling, rock geochemical sampling and prospecting. During the work program 31 stream sediment samples and 5 rock geochemical samples were collected. Geochemical analysis were performed by Loring Laboratories Ltd. of Calgary, Alberta.

## GEOLOGICAL SURVEYS

### Regional Geology

The Brucejack 4 and Brucejack 5 claims are in the Stewart area, east of the Coast Crystalline Complex and within the western boundary of the Bowser Basin. Rocks in the area belong to the Mesozoic Hazelton Group and have been intruded by plugs of both Cenozoic and Mesozoic age.

At the base of the Hazelton Group is the lower Lower Jurassic Marine (submergent) and non-marine (emergent) volcanoclastic Unuk River Formation. This is overlain at steep discordant angles by a second, lithologically similar, middle Lower Jurassic volcanic cycle (Betty Creek Formation), in turn overlain by an upper Lower Jurassic dacitic lapilli tuff horizon (Mt. Dilworth Formation). Middle Jurassic non-marine sediments with minor volcanics of the Salmon River Formation unconformably overlie the above sequence.

The oldest rocks in the area belong to the lower Lower Jurassic Unuk River Formation which forms a north-northwesterly trending belt extending from Alice Arm to the Iskut River. It consists of green, red and purple volcanic breccia, volcanic conglomerate, sandstone and siltstone with minor crystal and lithic tuff, limestone, chert and coal. Also included in the sequence are pillow lavas and volcanic flows.

In the property area the Unuk River Formation is unconformably overlain by middle Lower Jurassic rocks from the Betty Creek Formation. The Betty Creek Formation is another cycle of trough-filling submarine pillow lavas, broken pillow breccias, andesitic and basaltic flows, green, red, purple and black volcanic breccia, with self erosional conglomerate, sandstone and siltstone, and minor crystal and lithic tuffs, chert, limestone and lava.

The upper Lower Jurassic Mt. Dilworth Formation consists of a thin sequence varying from black carbonous tuffs to siliceous massive airfall lapilli tuffs and felsic ash flows. Minor interbedded sediments and limestone are present in the sequence. Locally pyritic varieties form strong gossans.

The Middle Jurassic Salmon River Formation is a late to post volcanic episode of banded, predominantly dark coloured, siltstone, greywacke, sandstone, intercalated calcarenite, minor limestone, argillite, conglomerate, littoral deposits, volcanic sediments and minor flows.

According to E.W. Grove, the majority of the rocks from the Hazelton Group were derived from the erosion of andesitic volcanoes subsequently deposited as overlapping lenticular beds varying laterally in grain size from breccia to siltstone.

D. Alldrick's work has shown several volcanic centres in the property area. Lower Jurassic volcanic centres in the Unuk River Formation are located in the Big Missouri Premier area, and in the Brucejack Lake area. Volcanic centres within the Lower Jurassic Betty Creek Formation are in the Mitchell Glacier and Knipple Glacier areas.

There are various intrusives in the area. The granodiorites of the Coast Plutonic Complex largely engulf the Mesozoic volcanic terrain to the west. East of these (in the property area), smaller intrusive plugs range from quartz monzonite to granite to highly felsic; some are, likely, related late phase offshoots of the Coast plutonism, others are synvolcanic and tertiary. Double plunging, northwesterly-trending synclinal folds (Mitre syncline, Dilworth syncline, Spider anti-cline) of the Salmon River and underlying Betty Creek Formations dominate the structural setting of the area. These folds are locally disrupted by small east-overthrusts (Tippy Lake, Knipple Lake) on strikes parallel to the major fold axis, cross-axis steep wrench faults which locally turn beds, selective tectonization of tuff units, and major northwest faults which turn beds.

### Local Geology

According to E.W. Grove on maps titled Geology of the Unuk River - Salmon River - Anyox map area - two separate rock units are encountered on the property both of Middle Jurassic age. The oldest rocks are from the Betty Creek Formation which are composed of green, red, purple and black volcanic breccia, conglomerate, sandstone and siltstone. The younger rocks of the Salmon River Formation unconformably overlies the Betty Creek Formation. The Salmon River Formation includes siltstone, greywacke, sandstone, some calcarenite, minor limestone, argillite, conglomerate and littoral deposits.

The limited reconnaissance program indicates that the area within the claims are underlain by green clastic volcanics variably altered to sericite and chlorite schists in several locations. The schists are pale grey to green with locally abundant pyrite. These zones appear as bright yellow to dull orange gossan zones.

The area of the Brucejack claims is east of the bonanza gold-silver discoveries at Brucejack Lake by both the Newcana Joint Venture and Catear Resources Ltd. These projects have announced the following results:

	<u>Present Reserves</u>	<u>Grade</u>	
		<u>opt Au</u>	<u>opt Ag</u>
<u>Newhawk West</u> (partially explored)	854,072	.354	22.94
<u>Catear Goldwedge</u> (partially explored)			
Golden Rocket	319,149	.80	1.12
Discovery	37,980	.63	1.08

The above gold-silver discoveries are structurally controlled, epithermal-mesothermal veins occurring in areas of syenodiorite intrusions and associated with areas of intense sericite (quartz-pyrite) alteration.

The presence of sericite schists with weak quartz veining and locally intense pyrite mineralization make the Brucejack 4 and 5 claims excellent exploration targets for gold-silver mineralization.

## GEOCHEMICAL SURVEYS

### Rock Geochemistry

Five (5) rock geochemical samples were collected from the Brucejack 4 and 5 claims during July of 1987. A 3-4 pound sample of unweathered material was selected on the basis of mineralization or alteration.

The samples were shipped to Loring Laboratories Ltd. of Calgary, Alberta where they were crushed, split and ground to a -80 mesh. The samples were then analyzed using standard geochemical methods for Au and Ag.

Results of the survey indicated weakly to moderately anomalous gold values and low silver values (See Figure 3).

### Silt Geochemistry

A total of 31 silt samples were collected, placed in Kraft Sample Bags and shipped to Loring Laboratories Ltd. of Calgary, Alberta where they were dried, crushed, split and ground to a 80 mesh. The samples were analyzed for Au and Ag using standard geochemical methods.

Results of the survey indicate weakly anomalous gold values and low silver values. The sample sites are shown on Figure 3.

CONCLUSIONS

1. The Brucejack Claims are underlain by volcanic and sedimentary rocks of the Betty Creek and Salmon River Formations.
2. A rock geochemical and silt geochemical program has indicated weak to moderately anomalous gold and silver values.
3. The area of the Brucejack Claims is east of the bonanza gold-silver discoveries at Brucejack Lake by both the Newcana Joint Venture and Catear Resources Ltd. These projects have announced the following results:

	<u>Present Reserves</u>	<u>Grade</u>	
		<u>opt Au</u>	<u>opt Ag</u>
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The above gold-silver discoveries are structurally controlled, epithermal-mesothermal veins occurring in areas of syenodiorite intrusions and associated with areas of intense sericite (quartz-pyrite) alteration.

The presence of intense pyrite mineralization in areas of sericite alteration make the area an excellent exploration target.

4. An exploration program consisting of prospecting, silt geochemistry, geological mapping, rock geochemistry and trenching is recommended for the property.

## RECOMMENDATIONS

### 1. Prospecting

All structural features on the property should be carefully prospected in order to evaluate the mineral potential. As well, all gossaned zones should be checked for all minerals associated with the gold, particularly arsenopyrite and tetrahedrite.

### 2. Detailed Silt Geochemistry

Sampling should be conducted every 50 meters along stream beds on the property.

### 3. Geological Mapping

The property should be mapped in order to define potential host rocks for epithermal deposits.

### 4. Rock Geochemistry

A rock geochemistry survey should be conducted over gossaned zones, sericite schists and quartz veining.

### 5. Trenching

Trenching would be conducted in areas of newly discovered mineralization to obtain fresh samples for assaying as well as evaluation for indicator minerals.



STATEMENT OF EXPENDITURES

Personnel

G.D. Keller, Geologist	1 day @ \$250/day	\$ 250.00
G. Sinden, Geological Technologist	1 day @ \$200/day	200.00
B. Touzin, Geological Assistant	1 day @ \$150/day	150.00
T. Devine, Geological Assistant	1 day @ \$150/day	150.00
S. Weir, Cook	1 day @ \$150/day	150.00

Food

\$23 per day x 5 mandays 115.00

Camp Rental

\$28.75 per day x 5 mandays 143.75

Geochemical Analysis

5 rock samples @ \$15/sample	75.00
31 silt samples @ \$15/sample	465.00

Helicopter

1.7 hours @ \$600.30/hr. 1,020.51

Communications/Expediting Costs 50.00

Equipment Rental 70.00

Report 500.00

TOTAL \$3,339.26

REFERENCES

GROVE, E.W., 1986

Geology and Mineral Deposits of the Unuk River-Salmon River-Anyoz Area, British Columbia Ministry of Energy, Mines and Petroleum Resources, Bulletin No. 63.

KRUCHKOWSKI, E.R.; SINDEN, G., 1988

Report on the Brucejack 4 and 5 Claims, Stewart, British Columbia, Skeena Mining Division, NTS 104A/5W and NTS 104B/8E, Latitude 56°29', Longitude 129°59'.

CERTIFICATE

I, EDWARD R. KRUCKOWSKI, Geologist, residing at 23 Templeside Bay, N.E., in the City of Calgary, in the Province of Alberta, hereby certify that:

1. I received a Bachelor of Science degree in Geology from the University of Alberta in 1972.
2. I have been practising my profession continuously since graduation.
3. I am a member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta.
4. I am a consulting geologist on behalf of Catear Resources Ltd.
5. This report is based on a review of reports, documents, maps and other technical data on the property area and on my experience and knowledge of the area obtained during programs in 1974 - 1988.

Date

August 26/89

E.R. Kruckowski, B.Sc.

CERTIFICATE

I, GORDON W. SINDEN, currently residing at #2607, 123 - 10 Avenue S.W., Calgary, Alberta T2R 1K8, hereby certify that:

1. I am a geological technologist and have practised my profession since 1977.
2. I am a graduate of the Northern Alberta Institute of Technology (1977) in Mineral Resources Technology.
3. I am a Registered Engineering Technologist with the Alberta Society of Engineering Technologists.
4. This report is based on a review of reports, documents, maps and other technical data on the property area and on my experience and knowledge of the area obtained during programs in 1982 - 1988.

April 26, 1989  
Date

Gordon Sinden  
Gordon W. Sinden, R.E.T.

APPENDIX I  
ANALYTICAL INFORMATION

LABORATORY: Loring Laboratories  
Calgary, Alberta

MESH SIZE: -80/stream sediments  
-80/rocks

EXTRACTION: For Au/Ag: Fire assay fusion,  
cupellation and acid  
dissolution of precious  
metal beads.

ANALYSIS: Atomic absorption

APPENDIX II  
ROCK GEOCHEMICAL ANALYSIS

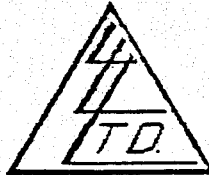
To: CATEAR RESOURCES LTD.,  
400, 255 - 17th Avenue S.W.,  
Calgary, Alberta T2S 2T8

File No. 31952

Date November 24, 1988

Samples Rock

TODD CREEK PROJECT



ATTN: Ed Kruchkowski

# Certificate of Assay LORING LABORATORIES LTD.

Page # 2

SAMPLE NO.

PPB  
Au

PPM  
Ag

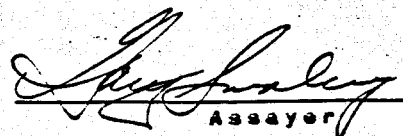
"Rock Samples"

Geochemical Analysis

TC-160A	15	0.2
251A	10	1.7
390A	15	0.1
422A	5	0.5
TGASR- 8	20	0.4
55	10	1.0
TGBSR-500	20	0.5
501	NIL	0.4
503	10	0.4
504	160	1.0
505	80	2.3
506	25	0.6
507	90	6.1
TGGSR-240	NIL	0.2
TGDSR- 40	10	0.1
240	10	0.1
325	10	0.2
TGGR- 1	20	0.3
2	70	0.5
3	790	0.7
4	+1000	1.2
5	110	1.5
BEGR- 1	205	0.2
2	10	0.1
3	20	0.1
BESSR-142	NIL	0.3
200	5	0.1
TGRF- 1	NIL	0.2
2	NIL	0.5

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  
are made in advance.

  
Assayer



APPENDIX III  
SILT GEOCHEMICAL ANALYSIS

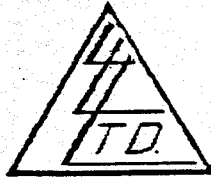
To: CATEAR RESOURCES LTD.,  
400, 255 - 17th Avenue S.W.,  
Calgary, Alberta T2S 2T8

File No. 31951

Date November 22, 1988

Samples Soil

PROJECT: TODD CREEK



ATTN: Ed Kruchkowski

# Certificate of Assay

## LORING LABORATORIES LTD.

Page # 6

SAMPLE NO.	PPB Au	PPM Ag
TCPS- 5	10	0.3
6	10	0.3
7	10	0.4
8	10	0.3
9	15	0.3
10	20	0.2
11	5	0.3
12	10	0.3
13	10	0.5
14	10	0.4
BEGS- 1	5	0.1
2	5	0.2
3	10	0.1
4	15	0.1
5	NIL	0.2
6	5	0.1
7	10	0.1
8	10	0.1
9	15	0.1
10	10	0.1
11	10	0.1
12	10	0.1
13	20	0.1
14	15	0.1
15	10	0.1
16	5	0.1
17	10	0.2
18	20	0.2
BESS- 1	10	0.2
2	20	0.3
3	25	0.2
4	15	0.2

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  
are made in advance.

*Ed Kruchkowski*  
Assayer

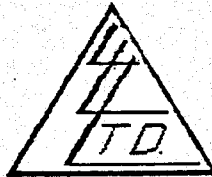
To: CATEAR RESOURCES LTD.,  
400, 255 - 17th Avenue S.W.,  
Calgary, Alberta T2S 2T8

File No. 31951

Date November 22, 1988

Samples Soil

PROJECT: TODD CREEK



ATTN: Ed Kruchkowski

# Certificate of Assay LORING LABORATORIES LTD.

Page # 7

SAMPLE NO.

PPB  
Au

PPM  
Ag

BESS- 5	10	0.1
6	10	0.1
7	20	0.1
7 A	5	0.1
8 A	10	0.1
9	25	0.2
10 B	10	0.2
11	20	0.1
11 A	15	0.1

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  
are made in advance.

Assayer



BRUCEJACK 4 (5853)



ICEFIELD

ICEFIELD

BRUCEJACK 5 (5854)

WEAKLY PYRITIC,  
GOSSANED  
ROCKS

Helicopter  
Drop-off  
Point

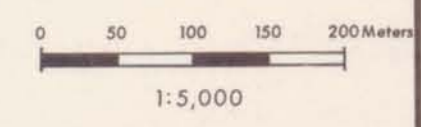
ICEFIELD

SERICITIC  
SCHISTS  
HIGHLY  
PYRITIC

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

18,680

ICEFIELD



LEGEND

- Traverse
- LCP (Legal Corner Post)
- x Silt Sample Site
- Rock Geochemical Site
- GEOCHEMICAL ASSAY RESULTS
- 10,0,1 Au-ppb,Ag-ppm
- Creek & Direction of Drainage

Helicopter  
Drop-off  
Point

CATEAR RESOURCES LTD.

BRUCEJACK 4 & 5  
SAMPLE LOCATION MAP

Scale: 1:5000	By:
Date: April, 1989	Revised: Figure: 3