IRON MOUNTAIN PROJECT

M491

827078

ASSESSMENT REPORT

1981 PROGRAM

GEOPHYSICAL

GEOCHEMICAL, GEOLOGICAL

Lat. 50°03'N Long. 120°45'W

N.T.S. 92 1/2

NICOLA MINING DIVISION

GYPROCK I GROUP CLAIMS

TWO

BY

FOUR

TWO BY FOUR

SHORTSTUD

FIERRA # 3

Owners: Gordon Richards,
8827 Hudson Street,
Vancouver, B. C.

Operator: Chevron Canada Limited,
901 - 355 Burrard Street,
Vancouver, B. C.

Author: G. W. Laforme

January 1982

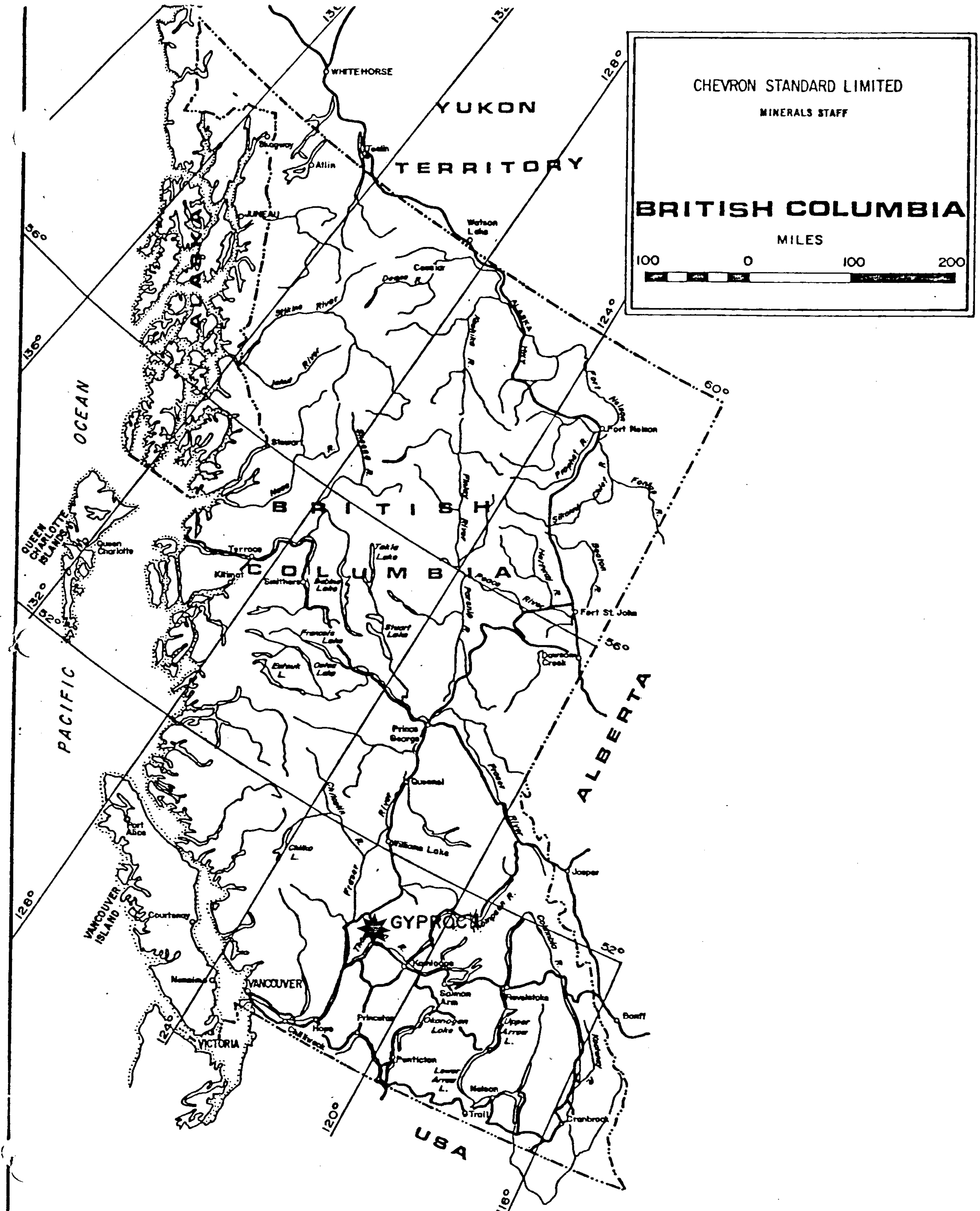
TABLE OF CONTENTS

INTRODUCTION

This report will document for assessment purposes all work carried out in 1981 on the Gyproc I Group of mineral claims located some eight kilometers south of the town of Merritt, B.C. This area is underlain by marine sediments and volcanic rocks of the Nicola formation, recognized as a volcanogenic exhalitive type massive sulphide environment.

A program of geochem soil and rock sampling along with geological mapping was carried out.

The area, generally a high rolling plateau, is classed as open range land, with fir and pine forest covering the uplands and grass in the valleys.


CHEVRON STANDARD LIMITED
MINERALS STAFF
BRITISH COLUMBIA
MILES
100 0 100 200
YUKON TERRITORY
BRITISH COLUMBIA
ALBERTA
PACIFIC OCEAN
USA
WHITEHORSE
Atlin
JUNEAU
Watson Lake
Cassiar
Stikine River
Stewart
Fort Nelson
QUEEN CHARLOTTE ISLANDS
Queen Charlotte
Terrace
Kitimat
Smithers
Takla Lake
Peace River
Fort St. John
Dawson Creek
Prince George
Quesnel
Williams Lake
Jasper
Port Alice
VANCOUVER ISLAND
Courtenay
GYPROC
Kamloops
Nanaimo
VANCOUVER
VICTORIA
Hope
Chilliwack
Princeton
Salmon Arm
Revelstoke
Okanagan Lake
Upper Arrow L.
Penticton
Lower Arrow L.
Nelson
Trail
Cranbrook
Banff
Fraser River
Columbia R.
Chilko L.
56°
60°
52°
136°
132°
128°
124°
120°
116°


M491
IRON MOUNTAIN
Miles
Km.
Figure 1.
Merritt
NICOLA PROVINCIAL FOREST
RIVER
Iron Mountain
5556
Microwave
Elevation
SHORT STUD
TWO BY FOUR
FIERRO #3
BY
FOUR
Hamilton
JOEYASKA
GWEN LAKE IR 3
Trailer Park
Pumping Station
Gate
Sawmill
Burner
Mine (abandoned)
L 120
L 166
L 172
L 3075
L 3254
L 3265
L 5183
L 3242
L 4279
L 3236
L 3235
L 3766
L 1422
L 3240
L 3239
L 1889
L 6594
L 3638
L 3530
L 393
L 176
L 1227
2026
2211

LOCATION AND ACCESS

The GyprocKI Group of mineral claims is located on the northeast, east and south flanks of the summit of Iron Mountain. It is within the Nicola Mining Division and centered at 120°45'W, 50°03'N.

A good gravel road provides access to the property.

Merritt is served by the Canadian Pacific Railroad and by the paved provincial highways No. 5 and No. 8. A new highway is under construction through the Coquihalla Pass joining Merritt to Hope.

PROPERTY

The Gyproc I Group is comprised of:

Claim Name	Record No.	Lapse Date	No. of Units
Two	480 (7)	July 1984	2
By	481 (7)	July 1984	2
Four	482 (7)	July 1984	4
Two By Four	484 (7)	July 1984	8
Short Stud	667 (7)	July 1984	4
Fierro #3	997 (2)	Feb. 1982	4

Recorded Owner: Gordon Richards, Vancouver, B. C.

Until the end of the 1981 field season the entire group was held under option agreement by:

Chevron Canada Limited,
901 - 355 Burrard Street,
Vancouver, B. C. V6C 2G8

IRON MOUNTAIN PROPERTY

HISTORY

Year	Current Name	Owner or Operator	Work
1927	Leadville	Emmett Todd	Discovery of showing.
1927,28	"		Shaft sunk to 70' depth.
1929	"	Comstock of B.C. Ltd.	1000 acres of claims staked. Great plans. Nothing forthcoming.
1947	Lucky Todd	George Hunter and partners	Shaft rehabilitated. 36 tons ore shipped to Trail, yielding 67 oz Ag, 11, 819 lb. Pb, and 484 lb. Zn.
1951	"	Granby Mining Corp.	Shaft de-watered.
1966	"	?	Some work?
1968-74	Makelstin	Acoplomo Mining and Development Co.	Total of approx. > 24 mi. Magnetometer surveys > 24 mi. EM (VLF?) surveys 180 Sas. Soil surveys 586' Diamond drilling
1977	One Sixty One	Quintana Minerals Corp.	Geologic mapping.
1978			Regional 1:15,000 mapping by W.J.McMillan, B.C.D.M., due for publishing in 1979.

HISTORY

The Iron Mountain area has experienced prospecting and mineral exploration by a variety of operators since the turn of the century. Development work by Comstock of B.C. Ltd. had been done by about 1927 on the "Leadville" shaft near the summit of the mountain, where a galena "vein" had been discovered.

Work on this prospect appears to have been fairly minimal until 1947 when a further attempt was made to reopen the old "Leadville" shaft, then renamed the "Lucky Todd". Thirty-six tons of ore were shipped to Trail with net contents consisting of 67 ounces silver, 11,819 pounds lead and 484 pounds zinc.

1.86 oz/T 16.4 % .7%

Similar lithologies to the Lucky Todd shaft area occur on the Two By Four claim, approximately 2,800 meters N43^{o}E of the old "Lucky Todd" shaft. Surface stripping by bulldozer has occurred in this area, and several pits have been blasted in the exposed bedrock by previous owners.

In 1979, a grid of 100-meter line separation and 50-meter station interval was established over a part of the Gyprock Group. That portion of the grid on the Two By Four claim was soil sampled. Sixty-seven soil samples and two silt samples were collected and analyzed for Pb, Zn, Cu and Ag.

In 1980 the balance of the above grid was sampled and detailed geological mapping of the group was commenced. Two hundred seventeen samples were collected and analyzed for Cu, Pb, Zn and Ba.

1981 FIELD PROGRAM

A Moving Coils Surface PEM Survey was conducted over the property.

The grid, established in 1979 (line separation - 100 meters, station intervals - 50 meters), was expanded to cover all of the Gyproc I Group. One thousand one hundred ninety-one soil and fifty-five rock samples were collected and analyzed for Zn, Cu, Pb and Ba.

Where possible, soil samples were taken from the "B" horizon. They were packaged in gussetted kraft paper sample bags. All samples were shipped to:

Chemex Labs Ltd.
212 Brooksbank Ave.
North Vancouver, B.C.
V7J 2C1

Results are plotted on maps of scale 1:5,000. Details of analytical techniques employed are in the attached Appendix.

For lithological study 24 thin sections of the rock samples were prepared and stained by:

Vancouver Petrographics Ltd.
Post Office Box 39
8887 Nash Street
Fort Langley, B.C.
VOX 1J0

Mark Brewster detailed the lithological units identified by the geological mapping. Sandy McAllister examined the thin sections and described textures and alterations.

1981 FIELD PERSONNEL

The field crew consisted of:

Bill Howell (Contractor)	Party Chief
Mark Brewster	Geologist
Sandy McAllister	Geologist
Colin Bradley	Assistant
Bruce Coates	"
Paul Fagerlund	"
Derek Hodge	"
John Mill	"
Sarah Monger	"
Tim Sandberg	"
Ross Watson	"
David Arscott	Project Supervisor

STATEMENT OF COSTS

Wages		$22,005.25
Travel		1,433.90
Camp Supplies		1,948.31
Camp Provisions		1,159.40
Freight		1,233.60
Reproduction and drafting		796.49
Accommodation		2,136.10
Assays		9,372.50
Contractors:	Geophysical	16,371.00
	Geological	14,807.96
	Other	19,725.48
	Report	1,200.00
	Total	$92,189.99

WAGES

	Office	Field	Travel
Mark Brewster	14	19	2
Sandy McAllister	5	18	2
Colin Bradley	-	18	2
Bruce Coates	-	18	2
Paul Fagerlund	-	18	2
Derek Hodge	-	18	2
John Mill	-	11	2
Sarah Monger	-	18	2
Tim Sandberg	-	18	2
Ross Watson	-	18	2
David Arscott	2		

Total No. of Man Days 215

Rate $102.35/day

Total Wages $22,005.25

ASSESSMENT ALLOCATION

FOR ASSESSMENT PURPOSES KINDLY CREDIT

CLAIM NAME	UNITS	$	YEARS	TOTAL	LAPSE DATE
TWO	2	$200.00	7	$ 2,800.	July 1991
BY	2	200.00	7	2,800.	July 1991
FOUR	4	200.00	7	5,600.	July 1991
TWO BY FOUR	8	200.00	7	11,200.	July 1991
SHORT STUD	4	200.00	7	5,600.	July 1991
FIERRO #3	4	100.00	3	1,200.	-
	4	200.00	6	4,800.	Feb. 1991
				$34,000.	

TOTAL COST FOR 1981 PROGRAM	$92,189.99
ASSESSMENT CREDIT	34,000.00
Balance	$58,189.99

KINDLY CREDIT PAC WITH BALANCE OF $48,189.99 (58)

$29,095.00 to Gordon Richards
8827 Hudson St.,
Vancouver, B. C.
V6P 4N1

$29,094.99 to Chevron Canada Limited
901 - 355 Burrard St.,
Vancouver, B. C.
V6C 2G8

CONCLUSIONS

The geochemical survey shows scattered low values for Pb, Zn, Cu and Ba, with correlated and enhanced values near the Todd shaft and over very limited areas in the nearby sediments.

A geophysical survey using time domain E.M. Crone equipment produced no response.

RECOMMENDATION

No further work is recommended.

STATEMENT OF QUALIFICATIONS

I am a graduate of the University of British Columbia, Vancouver, B. C., Discipline Geology Degree, B.Sc.

I have 12 years' field experience. The work herein recorded was compiled from data obtained from members of the field crew, from geochem lab results and from the company ledger.

G. W. Laforme

G. W. LAFORME
February, 1982

G.W. Laforme did not, during the course of the program, nor has he ever, to the best of my knowledge ever visited the Iron Mtn Property – W.A.H.

REFERENCES:

June 1972	R.W. Hutchinson R.H. McMillan (Company Report)	Volcanogenic base metal Sulphides Cordilleran Region
June 1975	D.G. Leighton (Company Report)	Report on Exploration for Kuroko Type Mineral Deposits
November 1979	W.A. Howell	Iron Mountain Project 1979 Assessment Report
March 1981	W.A. Howell	Iron Mountain Project 1980 Report Geological and Geophysical Surveys
October 1981	W.J. McMillan et al	Province of British Columbia (2) Preliminary Map 47 Nicola Project - Merritt Area

APPENDIX

GEOLOGY DESCRIPTIONS

GENERAL GEOLOGY

The general geology of Iron Mountain is volcanic pyroclastics with lesser amounts of flows and intrusives of an apparently wide compositional range. Periods of less igneous activity are represented by immature clastic sediments and limestone with some rhyolite muds. Broadly, the units tend NNE-SSW ($\approx 030^{\circ}$) and from the occasional graded beds the sequence youngs to the E. These rocks are part of the Triassic Nichola Group volcanics.

DETAILED GEOLOGY (Descriptions by Mark Brewster)

1. The westernmost unit appears to be a dark pyroclastic and flow unit of dark green-grey or black tuffs and lapilli tuffs with largely monolithic, probably andesitic, and occasional crystal fragments, the lithic fragments often rimmed with chlorite. The flows are porphyritic to glomeroporphyritic (feldspar phenocrysts 2 - 3 mm.) and amygdaloidal partly filled with calcite and/or quartz, and acicular amphibole. In places the matrix has been heavily hematitized.

2. DARK GREY TUFF: Overlying the last unit is a varied sedimentary unit characterized by a very hard siliceous dark blue-grey or black fine grained tuff. There may be euhedral or fragmental feldspar and quartz crystals and the occasional larger dark lithic fragment ($\leq$ 1 km.) including occasional Jasper fragments. Generally massive, the character changes only gradually over an outcrop. This may be an aquagene tuff. Intermittent extrusive volcanism produced several porphyritic to glomero porphyritic (feldspar xtals - 2mm.), dark grey flows and fine grained tuffs. To the south this unit thickens considerably and contains a

small pocket of purple and green mottled tuff similar to the purple-green lapilli tuff. This unit ends abruptly against an andesitic lapilli tuff.

3. <u>PURPLE-GREEN LAPILLI TUFF</u>: This is a largely andesitic (?) unit characterized by a dark-purple matrix and an abundance of dark green chlorite fragments. Fragments are generally 2 - 3 cm. but may be 4 cm.+ Chlorite fragments may show a yellow/green streaked appearance not seen in other units. Other fragments are usually dark grey/purple or red/brown, porphyritic to fine grained and angular to subangular volcanic, and occasionally jasper. Much less frequent felsic intrusive and extrusive fragments may be found, and fragments usually touch each other. Commonly the matrix and lithic fragments are very siliceous, but not the chlorite fragments. However, it may vary from being entirely chloritic to entirely silicified.

A green volcanic arkose unit appears in places near or at the top of this unit. It is poorly sorted (fragments generally $\leq$ 2mm.) and variable in thickness, and is more important to the south as the lapilli tuffs thin out and laterally progress into a more sedimentary facies. Near where this unit changes from predominantly pyroclastic to predominantly sedimentary facies there is a small pocket of <u>gypsum.</u>

~~4.~~ 3a <u>SOUTH WEST SEDIMENTS</u>: A small package of sediments lies to the south of and stratigraphically equivalent to the PURPLE GREEN LAPILLI TUFF. It consists of argillites and impure sandstones with variable amounts of crystal fragments and subrounded lithic fragments. The argillites are black and variably siliceous; the coarser sediments are mineralogically and texturally immature arkosic sandstones, medium green/grey with dark green chlorite spots. ($\simeq$ 1 mm.).

There are several basic to felsic tuff to lapilli tuff beds. Alteration of this unit makes many of the rocks difficult to identify.

This sediment unit is separated from the next unit by a thin finger of the PURPLE GREEN LAPILLI TUFF which shows a gradational change over 10 - 20 m. into the WISPY CHLORITE UNIT.

4. WISPY CHLORITE UNIT: This light green unit can be traced across the property until the south end, where it thins out against the sediment pile. It is an acidic tuff to lapilli tuff with a fine grained matrix in which are scattered without touching each other, dark green sub-angular chloritic fragments and wisps and bright red jasper fragments ($\leq$ 1cm.). Crystal fragments are usually pink feldspar and less often quartz. Although hard, this unit is not extremely siliceous.

Within this lapilli tuff are occasional gritty to argillaceous sediments (brown/grey flecked with chlorite), and an andesite (?) tuff. Overlying this unit is a massive domal rhyolite unit.

5. RHYOLITE: Variably light green/grey or cream to a dark blue/grey when fresh, it weathers a characteristic yellow rust orange and is very fractured. It appears to be a predominantly pyroclastic unit, generally lapilli tuff (6 - 7 cm.) with finer tuffs or flows. Fragments are an-

gular and poorly sorted and often difficult to see. In one place there is bedding and laths of feldspar are aligned parallel to bedding, with one large (1 cm.) rhyolite pebble, indicating some of this unit was subaqueous during deposition.

This unit has been heavily altered in areas and silicification may have made more basic rocks look like part of this unit. There are several sediment beds within this unit.

dark siliceous tuff

6. PURPLE ARKOSE: The purple arkose occurs in the SSW part of the mapped area and starts approximately where the RHYOLITE (5) unit pinches out. The PURPLE ARKOSE lies directly above the WISPY CHLORITE UNIT. Generally a red/purple silt to sandstone with occasional feldspar fragments ($\simeq$ 1mm.) and green/black chlorite flecks.

It is massive to thinly bedded, mineralogically and texturally immature (arkose) with small pods (<40m. long) of massive or bedded Jasper. There is quite frequent specularite veining and quartz veining with associated silicification.

One area of this unit is not purple but a brown/green, and it is this, together with essentially the same sediment type, which may mean that the PURPLE ARKOSE and the next unit, the GREEN GRIT, are the same unit.

7. GREEN GRIT: A rapidly southwards thickening clastic unit overlies the PURPLE ARKOSE, and the RHYOLITE (5) interfingers for several hundred metres between the ARKOSE and GRIT units. Usually a medium green/grey or blue/grey and flecked with chlorite spots (2 mm.). Fragments of quartz

and feldspar crystals are visible and the occasional red Jasper fragment.

Slight alteration by epidotization is often common along fractures and the whole rock may or may not be silicified.

A characteristic feature of this unit is the abundance of angular voids throughout up to 7 mm. which have subsequently been filled or partially filled by calcite and/or quartz.

There are minor amounts of black siliceous argillite, usually with white feldspar crystals visible in the matrix.

8. <u>ANDESITE LAPILLI TUFFS</u>: In the centre of the map is a unit of dark green/ blue-grey or maroon andesitic lapilli tuff. Thickest 700 m. south of the summit, it thins both to the north and south, eventually pinching out. It is a massive fragmental unit. The constituents are generally dark basic, grey-black with occasional lighter felsic fragments and very occasional outcrops of a more felsic nature. Fragments are generally angular and $\lesssim$ 1 cm. and consist of both lithic and crystal types. Crystal fragments can be up to 10% of the rock and lithic fragments - 30 to 40%. Quite often there are quartz and calcite filled voids, both irregular and spherical (amygdales ?). Chloritic and Jasper fragments are also common.

There are a number of fine grained dark argillic tuffs, fine silts and gritty beds. In places there are areas on fractures and between fragments of bright red and furruginous chert.

9. <u>ANDESITE (?) FLOWS</u>: This is a small unit of light purple/red to dark purple/

green flows and tuffs to lapilli tuffs. Generally massive with subangular red and/or light green fragments. Flows are amygdaloidal and banding may be present. There are several pods of banded Jasper and Jasper quartz veins, and hematitization is variable throughout. This is a poorly defined unit and although it is similar to the PURPLE/GREEN LAPILLI TUFF, it was mapped originally as rhyolitic, and that the hematitization had given it a darker colour.

10. <u>SEDIMENTS AND TUFFS</u>: A mixed sedimentary, and felsic-basic clastic unit which interfingers with or possibly is a lateral facies change from SEDIMENTS (11). These sediments are usually sandstones and siltstones with pyroclastic fragments. There are approximately equivalent amounts within the pyroclasts of felsic and basic material.

Pyroclastic material is generally angular, lapilli tuff to fine grained tuff and may be well sorted. Basic material may be chloritic.

11. <u>SEDIMENTS</u>: This unit is predominantly sedimentary with some pyroclastic materials. Sediments are generally grey or brown sandstones, siltstones, bedded, poorly sorted and immature mineralogically. There are occasional beds of argillite and grey limestone and some of the beds are fairly calcareous. Many of the beds have occasional larger fragments of volcanic material and one bed has clastic sulphides. To the extreme north there is a small pocket of limestone which may be part of the unit or of the LIMY SEDIMENT UNIT (14a).

There are several beds of dark green or purple/brown lapilli tuffs with basic angular fragments $\leq$ 2 cm. that are chloritized and silicified in places.

12. LIGHT GREEN SILICEOUS TUFF: Although a fairly thin unit, like the RED SILTSTONE (13), it outcrops continuously across the map and both form distinctive marker units. Both these units - (12) and (13) - are to the south separated from each other by a maroon-green lapilli tuff very similar to ANDESITE LAPILLI TUFFS (8), so that it is very possible that these two units should be included as part of (8).

This is an acidic, light green, highly siliceous tuff to lapilli tuff with a fine grained matrix, set in which, without touching each other, are a number of coloured fragments, the most distinctive being chloritic and red hematite stained and/or Jasper fragments. Fragment size is <1.5 cm. and generally is $\simeq 2 - 4$ mm. and usually angular.

This unit is occasionally chloritic and at first glance looks exactly like the WISPY CHLORITE UNIT, only the latter is coarser and less siliceous.

13. RED SILTSTONE: This is a uniform, reasonably sorted dark red/purple silty sandstone. It does not appear to be well bedded and is finer grained than the PURPLE ARKOSE. It is hard without being entirely siliceous, and there may be small chlorite wisps, but these are the only fragments in this unit.

Overlying the double marker beds is a predominantly calcareous sediment sequence which has been divided into two parts. A limestone unit and a mixed limestone and calcareous clastic and pyroclastic unit.

14. GREY LIMESTONE: The limestone unit is to the south of the A fault, with a

possible small wedge immediately north of the fault, and it is separated from the marker beds by a thin unit of ANDESITE LAPILLI TUFFS (8).

It is massive, grey, fossiliferous, calcargillite to calcarenite, with a common clastic impurity of feldspar crystals. In places the limestone is coarsely crystalline, possibly due to local heating and recrystallization. It is regularly cut by thin calcite, chlorite and occasionally quartz veins. Fossils are primarily brachiopods, with a lot of bioclastic debris ($\leq$ 2 mm.). There is a minor amount of purple andesite tuff beds, which include jasper fragments and feldspar crystals, and there is a thin green/grey gritty arkose.

14a. <u>LIMY SEDIMENTS</u>: The limy sediment unit is both north and south of the A fault. To the north, this unit lies at first against the two marker beds and then nearer the A fault it becomes separated from the marker bed by a wedge of ANDESITE LAPILLI TUFF. To the south of the A fault, the LIMY SEDIMENTS are at first against the massive GREY LIMESTONE unit, but they soon become separated by a rapidly thickening wedge of rhyolite and and andesite tuffs and lapilli tuffs - (15) and (16).

Graded beds show clearly a younging eastwards, and the majority of this unit is made up of alternating impure calcarenite or calcargillite, with less frequent calcareous to non-calcareous sandstones, siltstones, greywackes and lithic-crystal tuffs. There are beds of pure blue/grey limestone (bioclastic), but their extent is limited. Fossils include brachiopods and bryozoan remains. A characteristic bed in the north is a red rounded pebble crystal tuff, and in this same area this unit has a distinctive golden colour. Argillaceous beds, including light green siliceous fine grained aquagene tuffs and cherty beds, are also present.

Pyroclastic material is largely dark purple/green andesitic tuff with occasional amygdaloidal flows. Fragmental rocks are generally lithic, with some crystal tuffs, with some beds of lapilli tuff.

Within this unit are horizons in which there are massive sulphide (pyrite) clasts up to 1.5 cm., usually in a dark green/grey gritty arkosic bed.

Their sediment facies and rapid alternating indicates a fairly high energy environment in which there were frequent changes in current velocity and material supply, and it seems likely that a shallow basin or shelf had developed, during a quiescent volcanic period, which deepened to the south, allowing for a quieter environment in which limestone (14) could be deposited.

15. SOUTH EAST RHYOLITE: This is a thick taco-shaped body of rhyolite overlying the GREY LIMESTONE. To the north it pinches out between the two limestone units, and to the south it pinches out between the underlying andesite lapilli tuff (16) and the overlying GREY LIMESTONE. Commonly a blue-grey to green fine grained siliceous rock, often very uniform, without evidence of fragments and only a few feldspar phenocrysts, and there are no quartz eyes, so that this may be a more intermediate volcanic. Feldspar phenocrysts, when present, may be up to 5 mm. long, and in the larger crystal sizes may show a parallel orientation. The rhyolite changes abruptly into a basic pyroclastic unit.

16. ANDESITE LAPILLI TUFF: This is a dark grey-purple and mottled green, angular, lithic and crystal tuff to lapilli tuff. The rock may be

entirely chloritic or siliceous but commonly has a silicified matrix and chloritic fragments. Some of the dark lithic fragments have porphyritic feldspar, and there are occasional fragments ($\leq$ 2 cm.).

Fw Bx unit somewhat close to Vent

There are occasional beds within this unit of green volcanic siltstone to coarse sandstone, with lesser amounts of black silicated argillite and green/grey fine grained aquagene tuff, commonly bedded and graded (tops to SE).

The andesitic lapilli tuffs interfinger with and grade into a small sedimentary package (16a) which shows similar rock types as seen in the lapilli tuffs but shows a cyclic nature in the sequence of beds.

16b. The very SE corner of the map shows the beginning of another rhyolite sequence, in which there is a bed of black argillite. Part of this rhyolite has been intensely altered to a bleached sericitized, clay altered rock type very similar to the altered rock on the top of Iron Mountain.

another Vent?

17. COTTAGE CHEESE LAPILLI TUFF: A rather irregularly shaped unit of lapilli tuff overlies part of the LIMY SEDIMENT UNIT. It is grey/green with fragments $\leq$ 1 cm. making up to 60% of the rock set in a finer grained calcareous matrix. Fragments are subangular to subrounded and may be chloritic. Some areas are fine grained tuffs.

18. RHYOLITE DYKE AND FLOWS: This is a distinctive hummock just to the east of the access road on the north side of the mountain, and it is a rhyolitic intrusive and possibly some extrusive material (as flows).

Rhy Dome?

There is no fragmental material. Throughout, the unit is a light grey-green, highly siliceous matrix with quartz eyes ($<$1mm.). It weathers characteristically a cream-grey, with parallel rusty brown streaks, possibly a flow banding or fine jointing related to cooling. cf. unit 15

On the south end of this hummock is a classic example of hexagonal columnar jointing, of the same rock type, and possibly representing a dyke for the surrounding rhyolite flows and RHYOLITIC MUDS (19).

= aquagene tuff (R. tuff overlying a R. dome)

19. RHYOLITE MUD: Partly surrounding and overlying the RHYOLITE DYKE AND FLOWS is an extensive area of very uniform aquagene tuff. It is a very fine grained argillic rhyolite mud varying in colour from green to black and it is highly siliceous.

Fragments are not common, but chloritic fragments and quartz eyes (10%) do occur, and there are a few beds of andesitic tuff to lapilli tuff (fragments $\leq$ 1 cm.).

20. PURPLE ANDESITE BRECCIA: The green rhyolitic muds grade into a green grey lapilli tuff (20a) with fragments $\leq$ 1 cm. and up to 40% chloritic fragments, and this is probably the unhematitized part of the ANDESITE BRECCIA. The ANDESITE BRECCIA is a deep purple with fragments up to 9 cm., although more commonly $\leq$ 5 cm., which make up 70% of the rock and are set in a very dark purple matrix. Most fragments appeared to be andesitic pyroclastics and flows, but there were sedimentary and crystal fragments also.

21. RED LIMESTONE: One outcrop of a red, highly fossiliferous (reef) hematite

stained limestone. extends considerable distance to the South along the E body of the FIR STUD claim.

D. DIORITE: These occur as small bodies (maximum ≃ 350 m.) of medium to coarse grained stocks. Generally fairly irregular in outline, these intrusions have caused local hornfels contact metamorphism.

J. JASPER: The jasper on Iron Mountain typically occurs in discontinuous pods and thin beds up to 15 m. long and several metres thick. Usually thinly bedded (≤ 0.75 cm.) and very often brecciated to various degrees, there may also be some pre-lithification slump features. The main jasper "horizon" is not confined to any one unit or boundary between units. It does broadly run along strike and is generally stratigraphically above the WISPY CHLORITE UNIT. Although it appears to transgress this unit to the north, this may be another jasper horizon below the WISPY CHLORITE UNIT (like the jasper west of the WISPY CHLORITE at the old antennae site). IE 2 periods or more of mineralization? in keeping with multiple Rhy. doming.

There are several other jasper occurrences both above and below the main horizon which would indicate that the hydrothermal activity occurred intermittently through the basic volcanics and that the rhyolites mark the end of a volcanic phase and with it the jasper deposition.

During discussion with Jay Hodgson this summer, he indicated that many of the jasper horizons associated with Japanese massive sulphide deposits overlie a feeder zone of heavy specularite veining. Such a situation appears to occur on Iron Mountain. In the SW corner of the area mapped there is an area in which many of the outcrops have specularite veins from $\ll$ 1 mm. to 0.75 m. These veins are rarely present above the major jasper horizon and have often caused heavy alteration (sericitization, silicification and some epidotization) in the rocks below the PURPLE ARKOSE.

It is also possible that the PURPLE ARKOSE is the same as the GREEN GRIT but that it was deposited during heavy ferrigenous silica hydrothermal activity.

V. VOLCANIC VENT: There is one 50 m. wide resistant plug, bounded on the southeast by a fault, and on most of the other sides by steep faces. It forms a steep-sided hummock and is crudely circular. It is a volcanic breccia with fragments in excess of 7 cm., both igneous and pyroclastic nature with a finer matrix. Its dip into the mountain is unknown.

FRAGMENTAL SULPHIDES: Further evidence of mineralization of a strataform massive sulphide type comes from the presence with the LIMY SEDIMENT UNIT (14a) of beds with clasts of pyrite up to 1.5 cm. - variably rounded, and occasionally bedded. There are, however, no clasts of basic metal sulphides. Nor has it been possible from the available information to determine any direction in which the fragments become larger.

STRUCTURE

The Iron Mountain sequence appears to be broadly striking SSW-NNE, although to the north this changes to SW-NE. It appears to be result of a gentle fold. The beds dip generally to the east. However, within the volcanics, bedding is less reliable, with more variation. Perhaps 50% of the readings indicate bedding dips to the east and, often within 50 - 100 m. of each other, another reading for an opposite dip, so it would appear that there is small scale folding as well.

The beds dip moderately steeply, 56^{0} - 90^{0} in the south and more gently in the north (30^{0} - 60^{0}), and occasional trough cross-bedding and grading indicate a younging to the east.

A major fault (A) cuts the entire sequence of rocks, and it would appear to have been downthrown on the south side, but the amount of movement is not known.

A second smaller fault (B) further south shows a movement possibly on the north side. If this is the case, then the Lucky Todd and ST(1) vein would appear to be in a small downthrown block. There also appears to be some transform movement along these faults which has lead to some drag folds developing along the fault.

MINERALIZATION

Iron Mountain has been so named because of the extensive hematite and specularite mineralization (already described) which has occurred near the top of the mountain and on which in the past a large amount of blasting has occurred.

Galena, sphalerite, barite and occasionally copper mineralization is present in three places as what appear to be veins. The major vein (the Lucky Todd) was 2 m. wide and located at a rhyolite-sediment contact. This was worked during 1927-28, when sample yields gave:

Ag	1 - 2 oz.
Pb	8 - 18%
Zn	2 - 3 %.

The other two veins have been trenched in the past and samples taken from these gave the following results:

	ST 2	SAMPLE NO. SM 198	ST 1	SAMPLE NO. SM 58
Cu	184		1,050	
Pb	>10,000		>10,000	
Zn	>10,000		8,750	
Ba	>10,000		>10,000	

These veins are spaced across the property and do not lead to large anomalous soil assay zones. The veins are within rhyolites or, in the case of ST 2, in sediments (14a?).

Copper (malachite, azurite) occurs as minor mineralization in heavily altered silicified and sericitized zones. Some of these zones exist around the diorite intrusions, and mineralization is related to these. Elsewhere the copper has no obvious explanation.

ALTERATION

CHLORITIZATION: This has taken place extensively within many of the basic tuffs and lapilli tuff fragments, and less often through the entire rock. It has also occurred with fragments in the more acidic tuff and lapilli tuff units, notably the WISPY CHLORITE UNIT and the LIGHT GREEN SILICEOUS TUFF. In several places chlorite veins were noted and the diorite stocks usually show chlorite alteration. The entire belt of Nicola rocks have been metamorphosed so that the use of chlorite-sericite alteration zones, common near other polymetallic deposits, as an indicator is not possible. Not so in Iron Mtn Volcanics see section below

SERICITIZATION AND SILICIFICATION: This has occurred in a number of discrete areas, often as a zone around the diorite intrusions, where in addition to the above, there is some copper mineralization.

Hydrothermal, iron-rich solutions have heavily altered parts of the country rock cut by specularite veins. The extent of alteration is such that it is often not possible to recognize the rock type any longer.

This type of alteration has also occurred very near an andesite intrusive. ?? Silicification is more intense than that associated with the specularite veining, and there is also some copper mineralization (malachite). It is not certain whether the intrusive and the alteration are related.

CLAY ALTERATION: This has taken place in two places, one on the top of Iron Mountain near the micro-wave tower and the other at ≃ 38 N and 63E

(SE corner of the map). In both cases a rhyolitic unit has been bleached, with some iron staining and probably also sericitization and silicification. The alteration is, however, very limited (one outcrop in each case). typical of Kuroko style vent alteration & fumarolic activity) , wdl

SILICIFICATION: There is a broad division NE-SW, west of which varying degrees of silicification are common and east of which it is essentially absent. In addition to this there is an area in which heavy silicification occurs quite frequently. This last area is closely associated with the jasper horizon and perhaps represents silica precipitation due to pressure and temperature drop at the exit of the hydrothermal system which led to the formation of the major jasper horizon. ie a VENT !! , wdl

STATEMENT OF QUALIFICATIONS

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I am a graduate of the University of Manchester (B.Sc. (Hon.) 1981) and have worked in mineral exploration for three summer seasons.

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November 1981

IRON MOUNTAIN

THIN SECTIONS

SM-74 Dark grey dacite fragmental flow.
Alteration products: chlorite, epidote and carbonate.

SM-114 Brown calcareous andesite lapilli tuff.
Alteration products: hematite, carbonate and chlorite.
The clasts represent a range in volcanic textures as well as in lithologies.

MB-199 Rhyolite tuff.
Alteration products: hematite, carbonate, and chlorite.
Numerous opaques (pyrite) occur within the matrix and in places appear to be replacing feldspar fragments in this framework supported tuff.

MB-244 Rhyolite fragmental flow.
Alteration products: chlorite and some hematite.
Angular volcanic fragments are moderately spaced within a uniform rhyolite matrix.

MB-282 Dark purple and green lapilli tuff (K-poor).
Alteration products: chlorite and hematite.
Clasts are very irregular angular volcanic fragments.
The rock is heavily chloritized.

MB-208 Highly altered tuff (K-poor).
Alteration product: saussurite.
Uniform and highly altered rock exhibits a relict pyroclastic texture. No K-feldspar is present.

BC-71 Rhyolite fragmental flow.
Alteration product: chlorite and carbonate.
Wisps of chlorite as seen in handspecimen are chloritized areas around fragments.

TS-63 Highly altered grey-green flow or crystal tuff (K-poor).
Alteration products: chlorite, epidote and carbonate.

TS-97 Grey-green tuff (K-poor).
Alteration products: carbonate, epidote and chlorite.
A highly altered tuffaceous matrix contains a few scattered plagioclase phenocrysts.

TS-216 Green highly siliceous flow rock (K-poor).
Alteration products: chlorite, carbonate and hematite.
Glomero-phenocrysts and small plagioclase crystals in the matrix are preferentially oriented and define the flow texture in this sample.

TS-231 Flow banded rhyolite porphyry.
Alteration products: carbonate, chlorite and epidote.

TS-240 Flow banded rhyolite.
Alteration products: hematite, carbonate and sericite.
Weak banding is visible.

PF-7 Purple andesite - basalt fragmental flow.
Alteration products: carbonate, chlorite, epidote and hematite.
Epidote and chlorite lined vesicles are filled with carbonate.
Subrounded lithic fragments and subhedral phenocrysts are contained in a matrix that exhibits flow textures around some of the crystals.

PF-38 Diorite.
Alteration products: chlorite, sericite, carbonate and epidote.

PF-42 Porphyritic diorite.
Alteration products: carbonate, sericite and chlorite.
Large pyroxene phenocrysts occur throughout the diorite and are rimmed by amphibole.

PF-73 Rhyolite crystal tuff.
Alteration products: chlorite and sericite.

PF-84 Purple rhyolite lapilli tuff.
Alteration products: chlorite, carbonate, hematite and sericite.
The volcanic clasts span a wide range of textures and compositions.

PF-91 Light grey lapilli tuff (K-poor).
Alteration products: carbonate, sericite and chlorite.
Irregularly shaped fragments are often altered previously to chlorite.

PF-107 Fine grained chlorite porphyry (probably a dyke rock).
Alteration products: chlorite and epidote.
Garnets occur within highly altered areas.

PF-124 Pale purple grey highly altered lapilli tuff.
Alteration product: sericite.

PF-131 Rhyolite lapilli tuff.
Alteration product: sericite.

PF-186 Brecciated vitric tuff in contact with andesite crystal tuff.
Alteration products: sericite, carbonate and chlorite.

PF-188 Dark grey andesite lapilli tuff.
Alteration products: carbonate chlorite and epidote.

PF-205 Diorite.
Alteration products: chlorite, epidote and carbonate.
The diorite is locally brecciated and probably represents a dyke rock.

S. G. McAllister

January, 1982

Dec. 9/81

GEOCHEMICAL PREPARATION
and
ANALYTICAL PROCEDURES

1. Geochemical samples (soils, silts) are dried at 80°C for a period of 12 to 24 hours. The dried sample is sieved to -80 mesh fraction through a nylon and stainless steel sieve. Rock geochemical materials are crushed, dried and pulverized to -100 mesh.

2. A 1.00 gram portion of the sample is weighed into a calibrated test tube. The sample is digested using hot 70% $HClO_4$ and concentrated HNO_3. Digestion time = 2 hours.

3. Sample volume is adjusted to 25 mls. using demineralized water. Sample solutions are homogenized and allowed to settle before being analyzed by atomic absorption procedures.

4. Detection limits using Techtron A.A.5 atomic absorption unit.

Copper	-	1 ppm
Molybdenum	-	1 ppm
Zinc	-	1 ppm
* Silver	-	0.2 ppm
* Lead	-	1 ppm
* Nickel	-	1 ppm
Chromium	-	5 ppm

* Ag, Pb & Ni are corrected for background absorption.

5. Elements present in concentrations below the detection limits are reported as one half the detection limit, i.e. Ag - 0.1 ppm.

BARIUM:

A 0.20 gm sample is digested with a mixture of $HF-HClO_4 - NHO_3$ acids to dryness. The baked residue is leached with 25 ml of 10% HCl with NaCl added to reduce ionization effects in the A.A. flame. Analysis is by AAS using a $N_2O-C_2H_2$ gas mixture.