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| LOG NO: 1019 | RD. |
| ACTION: | |
| FILE NO: | |

JOHNSON PROPERTY DDH
DEB 1 - 8 and JUD 1 - 8 CLAIMS
FORT STEELE MINING DIVISION

49° 23' 00
115° 50' 30

December 7th and 8th 1988

G. Mason
Consulting Geologist

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

19,183

JOHNSON PROPERTY DDH
DEB 1 - 8 AND JUD 1 - 8 CLAIMS

Contents

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| Introduction | Page | 1 |
| Location | | 2 |
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MAPS

| | |
|-------------------------------|-----|
| (Contour Map of East Kootenay | (1) |
| Claims Map | (2) |
| Location of DDH Map | (3) |
| Drill Hole Vertical Section | (4) |

INTRODUCTION

A diamond drill was proposed to test the projected Sullivan Vein zone at a stratigraphic depth of 2000 feet below the Hiawatha Varve marker zone.

Johnson DDH 1-88 was collared about 200 feet stratigraphically below the Hiawatha marker. This drilling penetrated 400 feet vertically but did not reach the objective of the Sullivan vein zone.

LOCATION

The Deb 1 - 8 and Jud 1 - 8 claims and Crown granted private property Kootenay District Lot 2798, in the Fort Steele Mining Division are located at the North end of Moyie Lake. They are adjacent to Highway 3 & 95 about 10 miles south of Cranbrook, Map enclosed

The claims are located on Map 82 G5 -- copy enclosed.

.....

PLANNED EXPLORATION APPROACH

The bedded Sullivan Vein zone which is a mega deposit located 2000 feet stratigraphically below the Hiawatha Varve thin bedded laminations.

The projected location is covered with glacial till. The purpose of the exploration is to penetrate the projected Sullivan vein zone and to test for the presence of bedded sulphide ore.

This hole is conceived as a preliminary test in reaching the anticipated sulphide horizon. The hole was only completed to a depth of 400 feet (because of lack of funding). Future drilling would require deepening of the hole another 1200 feet.

RESULTS:

Detailed geological logs were prepared -- enclosed Pages 1 - 7

Johnson DDH 1-1988 0 - 400 feet:

The rocks were Aldridge formation argillite and siltstone.

A significant stratigraphic zone " I " type pyrrhotite laminations" were recognized at depths 164.2 - 165.2 feet and 225 to 234.7 feet. Enclosed is copy of report of 'I' type pyrrhotite lamination study May 27, 1968 by G. Mason.

These indicate a bedded pyrrhotite horizon in the Moyie similar to mineralization within the Sullivan vein zone. (Memo May 27, 1968. This suggests sulphide of Pb and Zn might be expected at a lower level.

There are other zones which might be varve thin bedded laminations.

No assays were done on this hole either for gold or Pb - Zn.

ASSESSMENT BREAKDOWN

| | | |
|---------------------------------|----------|---------------|
| West-Gate Diamond Drilling Ltd. | | |
| Machine 38 - Core Type NQ | 400 feet | \$8,000.00 |
| \$ 20 per foot | | |
| G. Mason Miscellaneous expenses | | <u>200.00</u> |
| | TOTAL | \$8,200.00 |

(Note:)

GERALD MASON - GEOLOGICAL EXPERIENCE

| | | |
|-------------|-----|--|
| 1935 - 1941 | | Field assistant on Geological Survey of Canada |
| 1941 - 1944 | | Cominco - Mine Geologist, Pinchi Lake Mercury Mine |
| 1945 - 1946 | | Cominco - Exploration Northern B.C. |
| 1947 - 1964 | | Cominco - Sullivan Mine Geology |
| 1964 | | Cominco - Deep drilling Pinchi Lake Mercury |
| 1965 - 1976 | | Cominco - Sullivan research exploration |
| Nov. 1976 | | Retired Cominco |
| 1977 | | Consulting geology -- Texas Gulf |
| 1978 | " " | - Nelson Price - gold, Sawmill Creek - A. Miller - Hat - barite - Imperial Oil - Frost's claims - BBX - barite claims reports to Baroid and Mountain Minerals |
| 1979 | " " | - International Marble and Stone Ltd. - Magnesite |
| 1980 | " " | - Doug Roller - Wardner - limestone - Bonn Energy - Frost's claim - GM Resources - Estella Greenwood |
| 1985 | | - Gill Claims - 700 Units - East Koot- enay Gold Field Noranda |
| 1987 | | <i>CHEVRON. LTD. DDE 2000 Minerals Corp. East of Vancouver</i> |

Gerald Mason

GERALD MASON

West-Gate Diamond Drilling Ltd.

DAILY REPORT

58-1

Date DEC. 7/88 Job JOHNSON Hole No.

Angle of Hole 90 Machine 38 Core Type NQ Location
24M.

Depth of hole at start of shift 0

Depth of hole at end of shift -72

Distance drilled 72

Core removed 72

Tests

Waiting time

Casing Used

| B | N |
|---|------------|
| | <u>NW.</u> |
| | |

Casing in hole at start of shift 0

Casing in hole at end of shift 7

Distance reamed 7

Casing shoes used (new or used) New

Cementing

Moving

Downtime

Waterline Hrs. _____ Meters _____

Other material used or lost in hole

Remarks: _____

Runner A. Potapoff Shift N Hrs. 23

Helper M. Konkin Shift N Hrs. 12

Labour _____ Shift _____ Hrs. _____

Foreman PP

Company Rep. dl

West-Gate Diamond Drilling Ltd.

DAILY REPORT

Date Dec 8/85 Job Johnson Hole No. 88-1

Angle of Hole -90 Machine 38 Core Type NQ Location _____

Depth of hole at start of shift 72

Depth of hole at end of shift 157

Distance drilled 185

Core removed 85

Tests

Waiting time

Casing Used

B

N

| | |
|--|--|
| | |
| | |

Casing in hole at start of shift

Casing in hole at end of shift

Distance reamed

Casing shoes used (new or used)

Cementing

Moving

Downtime

Waterline Hrs. _____ Meters _____

Other material used or lost in hole

Remarks: _____

Runner Pete Potapoff Shift _____ Hrs. 12

Helper JOHNSON Bill Shift _____ Hrs. 12

Labour _____ Shift _____ Hrs. _____

Foreman P.P.

Company Rep. AJ.

West-Gate Diamond Drilling Ltd.

DAILY REPORT

Date DEC 8 / 88 Job JOHNSON Hole No. 88-1

Angle of Hole -90 Machine 38 Core Type N.G. Location _____

Depth of hole at start of shift 157

Depth of hole at end of shift 277

Distance drilled 120

Core removed 120

Tests _____

Waiting time _____

Casing Used

B N

| | |
|--|--|
| | |
| | |

Casing in hole at start of shift _____

Casing in hole at end of shift _____

Distance reamed _____

Casing shoes used (new or used) _____

Cementing _____

Moving _____

Downtime _____

Waterline Hrs. _____ Meters _____

Other material used or lost in hole

Remarks: 2 HRS WATERLINE FROZEN.

Runner A. POTAPOFF Shift N Hrs. 12

Helper M. KONKIN. Shift N Hrs. 12

Labour _____ Shift _____ Hrs. _____

Foreman P.P.

Company Rep. J.J.

West-Gate Diamond Drilling Ltd.

DAILY REPORT

Date Dec 8/98 Job Johnson Hole No. 88-1

Angle of Hole -90 Machine 38 Core Type N.G. Location _____

Depth of hole at start of shift 277

Depth of hole at end of shift 3 37

Distance drilled 60

Core removed 60

Tests _____

Waiting time _____

Casing Used

B N

| | |
|--|--|
| | |
| | |

Casing in hole at start of shift _____

Casing in hole at end of shift _____

Distance reamed _____

Casing shoes used (new or used) _____

Cementing _____

Moving _____

Downtime _____

Waterline Hrs. _____ Meters _____

Other material used or lost in hole

Remarks: _____

Runner Pete Potapoff Shift _____ Hrs. 8

Helper Bill Johnson Shift _____ Hrs. 8

Labour _____ Shift _____ Hrs. _____

Foreman PP

Company Rep. J.L.

West-Gate Diamond Drilling Ltd.

DAILY REPORT

Date DEC/88 Job JOHNSON Hole No. 88-1

Angle of Hole -90 Machine 38 Core Type N.O Location CUM

Depth of hole at start of shift 337

Depth of hole at end of shift 400

Distance drilled 63

Core removed 63

Tests

Waiting time

Casing Used

B N

| | |
|--|--|
| | |
| | |

Casing in hole at start of shift

Casing in hole at end of shift

Distance reamed

Casing shoes used (new or used)

Cementing

Moving

Downtime

Waterline Hrs. _____ Meters _____

Other material used or lost in hole

Remarks: HOLE FINISHED. Pulled rods
IN TENS.

Runner A BOTAPOFF Shift N Hrs. 8

Helper M KONKIN Shift N Hrs. 8

Labour _____ Shift _____ Hrs. _____

Foreman PP

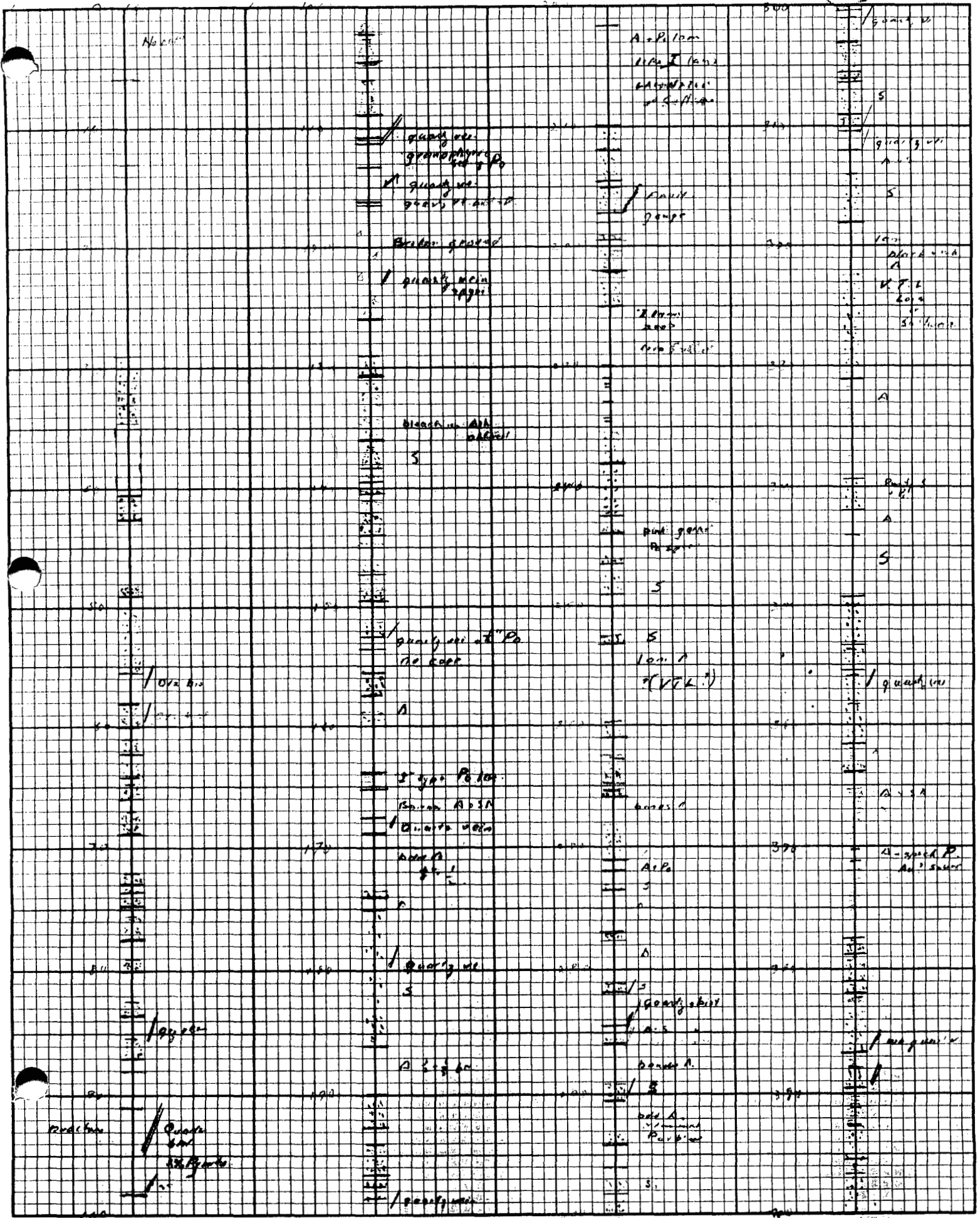
Company Rep. JJ

DDH N°1 1938

CANCHE LAC

DRILL NO DDC 748, 1938

(4)



PROGRESS REPORT ON "I" TYPE PYRRHOTITE LAMINATIONS
IMMEDIATELY UNDER THE BASE OF THE "I" SILTSTONE

This report describes a set of pyrrhotite lamination from three to nine inches below the base of the "I" siltstone. Identical pyrrhotite laminations, six stratigraphic inches thick, have been matched over a strike length of 3,000 feet and over a dip length of 1,500 feet. This laminated marker zone has been traced into areas of metamorphism and into areas of complex folding and faulting. The recognition of this marker zone or other similar ones may aid in the solution of structural problems adjoining the Sullivan Mine area.

In the Below 3900 section this is the first and uppermost of the three sets of laminations that are similar in character to the "I" type lamination (see Plate 1). The second set is in the so-called "Footwall Slates" immediately below the base of the Main Band sulphides. The third and lowest set is associated with the Black Mud zone below the "Footwall Conglomerate" and above the "Thin Bedded Footwall zone".

History

A progress report December 2, 1953 by G.F. Warning, describes the "I" type lamination zone, between the "I" and "H" siltstones. Subsequently, this zone was found to extend for a strike length of 6,000 feet from east of the Open Pit to geological cross section 70, above 3610 DN. This zone of identical pyrrhotite laminations is 1.3 feet thick at the south and is 1.9 feet thick at the north. The term "I" type pyrrhotite laminations is used to denote an identically matched zone 1.6 feet thick within the "I" laminated argillite as opposed to "varve type" laminated argillite from elsewhere.

The identical pyrrhotite laminations below the "I" siltstone bed were recognized in December 1959 in DDH 5516 and 5517 (see photograph A). One of the conditions which permitted them to be recognized was the more complete recovery of core in AXK size core holes. Nearly all subsequent coreholes through this zone immediately under the "I" siltstone intersected either matching sets of pyrrhotite laminations or altered equivalents. These laminations below the "I" siltstone were used in development mapping to stop raises right on the base of "I" in the 2850 and 2700 level stopping blocks. A suite of pyrrhotite laminated cores was kept as a guide for correlation studies. This suite includes core from the following groups of diamond drill holes:

| | | | | |
|----------|-------------------|--------------|------|--|
| DDH 5516 | 2821 DS | Sect. 27 XE | U-20 | Original type sections showing little disturbance |
| 5517 | 2821 DS | Sect. 37 XE | S-22 | |
| 5544 | 2801 DN | Sect. 21 XE | V-20 | |
| DDH 5537 | 32259 Sub X DH 3 | Sect. 65 X | O-21 | Group of holes located 800 feet south DDH 5517 |
| 5538 | 32259 Sub X DH 11 | Sect. 67 X | O-21 | |
| 5540 | 32161 Sub X DH 3 | Sect. 63 X | P-21 | |
| DDH 5646 | 2713 DH | Sect. 231 XN | U-25 | Group of holes located 700 feet east of DDH 5517 |
| 5589 | 2859 XC | Sect. 227 XE | T-24 | |
| DDH 5591 | 28207 Sub Z DH 2 | Sect. 07 X | W-19 | Group of holes located 300 feet north of DDH 5516 |
| 5592 | 28207 Sub V DH 2 | Sect. 07 X | V-19 | |
| DDH 5534 | 30116 Raise | Sect. 16 | 2-16 | Lamination altered to pyrite and light tan sphalerite 1,200 feet north of DDH 5516 |

Petrography

The pyrrhotite laminations occur between the top of the D sulphide band and the base of the "I" siltstone. This stratigraphic distance is usually between four and five feet. In many of the holes there were two sets of "I" type pyrrhotite laminations (see Plate 1). The lower set (about 0.9 feet thick) is located between 3.4 and 2.5 feet below the base of "I" siltstone. This set is similar and nearly identical in several of the holes. The recovery of this set in the core holes was not complete in all cases. The upper set of "I" type pyrrhotite laminations which is described with photographs (A,B,C,D,E) in this report, is about 0.6 feet (or 7 inches thick) and extend from 0.85 to 0.3 feet below the base of "I" siltstone in the original holes 5516 and 5517.

Petrography (cont'd)

Pyrrhotite related to this set of lamination 0.8 feet below the "I" siltstone occurs in three forms (see diagram Plate 2 and photographs).

FIRST, between 0.85 and 0.55 feet below the base of "I" siltstone there are about 30 pyrrhotite laminations $\frac{1}{64}$ to $\frac{1}{32}$ inches thick. These fine laminations are planar and almost continuous with a few intermittent breaks.

SECOND, between 0.55 and 0.30 feet below the base of "I" siltstone there is a "speckled pyrrhotite laminated zone". The pyrrhotite occurs as scales or lamellae $\frac{1}{64}$ " thick and $\frac{1}{16}$ " long. These pyrrhotite scales are planar and parallel to the lower laminations but are not continuous as individual layers. They appear to be randomly distributed in space. There is a gradual decrease in numbers upwards indicating a graded bed. The term "lamination" is used for this zone, although not strictly descriptive, because they appear similar in structure to discontinuous layers within the 30 layers between 0.85 and 0.55 feet.

The "speckled type of pyrrhotite lamination" or second type, also occurs in the upper argillite waste band between the second and third sulphide bands of the B triplets.

THIRD, the pyrrhotite along the base of the "I" siltstone occurs as rounded blebs $\frac{1}{16}$ " in diameter amongst the quartz grains. This zone forms a layer $\frac{1}{8}$ to $\frac{1}{4}$ inch thick at the base of the "I" siltstone.

Variations in Distribution of Pyrrhotite Lamination

In passing to the southwest from DDH 5517 to 5537 the stratigraphic thickness of the planar and speckled type laminations diminishes from 0.85 to 0.35 feet. This represents a thinning of 35% (see Plate 2). The stratigraphic location of the thinning can be located exactly because of the "I" siltstone marker and the matching planar pyrrhotite laminations. The thinning can be explained either as an original sedimentary feature or as a tectonic or shear feature. The thinning appears to occur in the speckled laminated zone and in the massive argillite between the speckled laminated zone and base of "I" siltstone. The points of thinning are marked by discontinuous $\frac{1}{8}$ " thick massive pyrrhotite and crystalline pyrite bands. The sulphide appears to have crystallized in open spaces. This suggests the thinning is due to bedding-plane shearing.

In DDH 5534 (33116 Raise, Section 16, Block Z-16, 13072N, 5142E) the identical laminated zone one foot below "I" siltstone is present. The sulphides in the lamination are pyrite and light tan sphalerite. This suggests that the usual pyrrhotite laminations have been metamorphosed to pyrite similar to the development of pyrite in the underlying Main Band sulphide.

In DDH 5526 (3520 DN, Section 36, Block Y-12, 12975N, 4333E), and in DDH 5527 (3554 XE Section 38, 13019 N, 4320 E) an erratic sulphide band 1.2 to 0.7 feet thick made up of $\frac{1}{8}$ " bands of pyrrhotite and sphalerite occupy the stratigraphic location of the identical pyrrhotite lamination zone 1.0 feet under the "I" siltstone. This suggests that as the pyrrhotite laminated argillite zone extends to the northeast it changes to a laminated sulphide band. The assays of this band are as follows:

| | | | | | |
|----------|-----------------|-------------|----------|-----------|----------|
| DDH 5526 | 115.5° - 116.7° | 0.2 oz. Ag, | 5.7% Pb, | 15.5% Zn, | 8.5% Fe |
| DDH 5527 | 95.3° - 96.0° | 0.1 oz. Ag, | 2.0% Pb, | 13.4% Zn, | 14.3% Fe |

Interpretations

The individual planar pyrrhotite laminations $\frac{1}{64}$ " thick and extending over an area of 3,000 by 1,500 feet were deposited syngenetically with the argillite in a basin below wave base. The geometry of the individual laminations suggest that the pyrrhotite laminations were deposited as a chemical precipitate with the sedimentary material.

The speckled pyrrhotite laminated zone appears to be a graded bed and suggests that they represent planar beds that were disturbed by current action. The shape of the blebs of pyrrhotite amongst the sand grains at the base of "I" siltstone appear to have been controlled at the time of deposition of the sand.

REPORT ON "I" TYPE PYRRHOTITE LAMINATIONS UNDER
THE BASE OF THE "I" SILTSTONE

Page -3-

Interpretations (cont'd)

The erratic distribution and outline of the $\frac{1}{8}$ inch thick massive pyrrhotite and crystalline pyrite bands located at points of thinning suggest that this type of band formed in open spaces developed by shearing. This is analogous to calcite filled shears formed in a limestone bed.

The pyrite and light tan sphalerite in DDH 5534 has formed by metamorphism and local migration of sulphides from lower bands.

The erratic sulphide band in DDH 5526 and 5527 is considered to be a facies change from pyrrhotite laminated argillite to a laminated sulphide band almost massive. This point needs further study.

Submitted by C. Mason
Section Geologist, Special Projects

Approved A. C. Mason
Senior Geologist

C. Mason:bk
Sullivan Mine
May 27, 1968

cc: RMP: OEW: WTI: RGM:E;
HCM: File (6)

[Plates 1 and 2
[Photographs A, B, C, D, E

PHOTOGRAPHS - To illustrate various type sections of lamination
within one foot below the base of "I" Siltstone

- A 5516] 2821 DS Section 27 XE U-20
5517] 2821 DS Section 37 XE S-22
5544] 2801 DN Section 21 XE V-20

Original type sections showing little disturbance.
Note in DDH 5544 $\frac{1}{8}$ inch band of massive pyrrhotite
and crystalline pyrite near the base of speckled
laminated zone. This is interpreted as having developed
by bedding plane shearing movement.

- B 5537] Located 800 feet south of DDH 5517
5538]
5540]

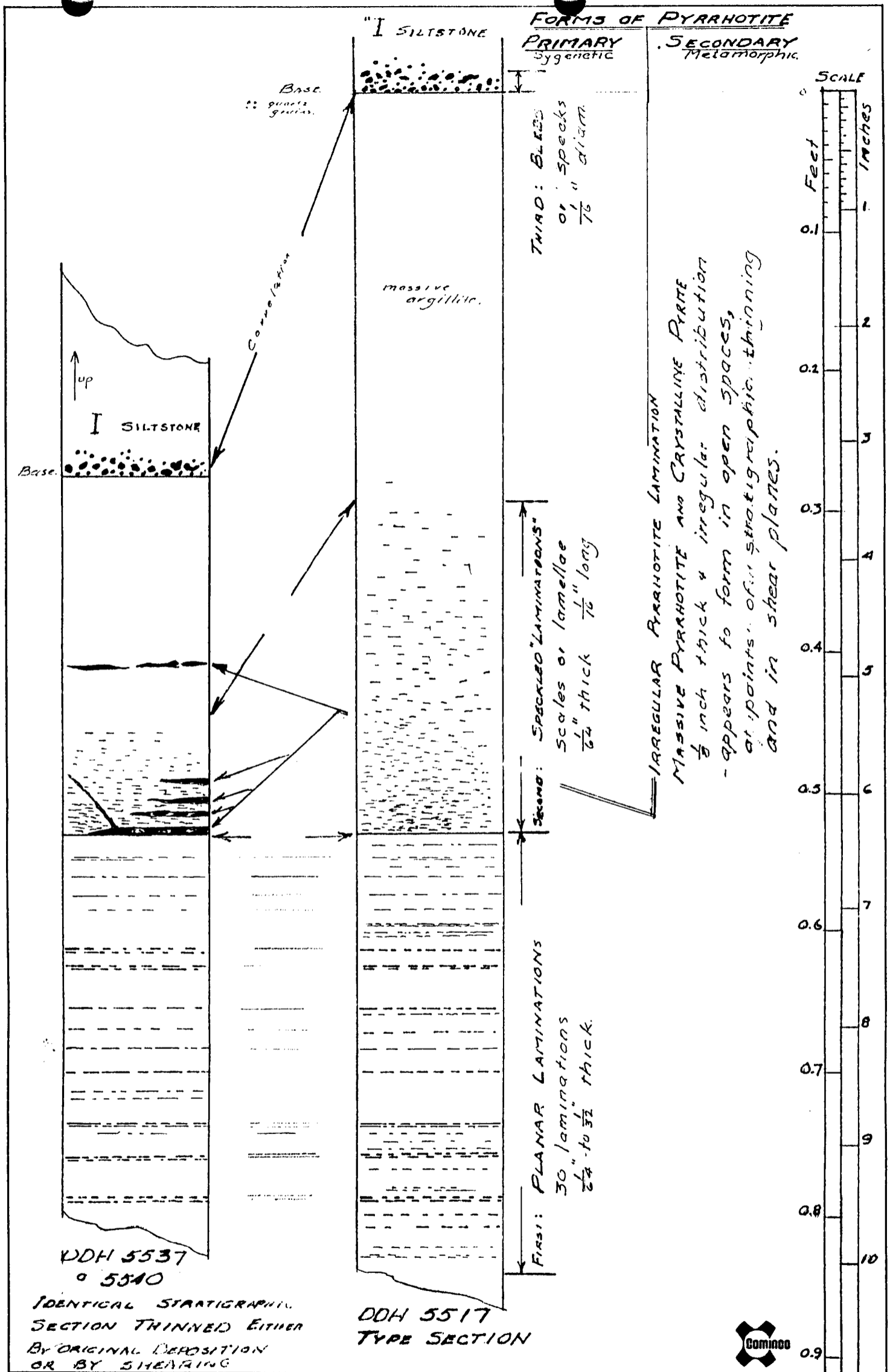
Thinner stratigraphic thickness of the "I" type lamination.
The thinning appears to have occurred in the speckled
pyrrhotite laminated zone and in the massive argillite
below "I" Siltstone.

Massive $\frac{1}{8}$ inch pyrrhotite lamination in DDH 5537 and
5538 is interpreted to have developed along bedding
plane shears.

- C 5537] Comparing the thinning of the stratigraphic section
5538]
5540]
5517]
5544]

- D 5546] Located 700 feet east of DDH 5517
5589]

- E 5591] Located 300 feet north of DDH 5516
5592]








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|------------|------|------------|------|
| Drawn by: | | Traced by: | |
| G. MASON | | | |
| Revised by | Date | Revised by | Date |
| | | | |
| | | | |
| | | | |
| | | | |

"I" TYPE PYRRHOTITE LAMINATIONS IMMEDIATELY BELOW THE BASE OF THE I SILTSTONE

DIAGRAM OF THE ORIGINAL TYPE SECTION

Scale: Full Scale. Date: MAY 14, 1968 Plate: 2

LEGEND

-  Q, S, SA
massive to faintly lam.
usually.
-  SA, A
faintly to well lam.
-  LAMINATED SULPH.
-  CONGLOMERATE
-  "I" TYPE PYRR.
LAMINATIONS
in argillite.

NOTE ANGULAR UNCONFORMITY AT THE BASE OF THE F.W. CONG. MAY BE A LARGE TIME BREAK.

Large slump folds with an amplitude of 70' feet occur below the unconformity. "P. + Aspy I type laminations" from below the unconformity are eroded & deposited in the F.W. Congl.

LOCATIONS OF IDENTICAL "I" TYPE PYRRHOTITE LAMINATIONS IN ARGILLITE

Estimated dips of original sedimentary basins:

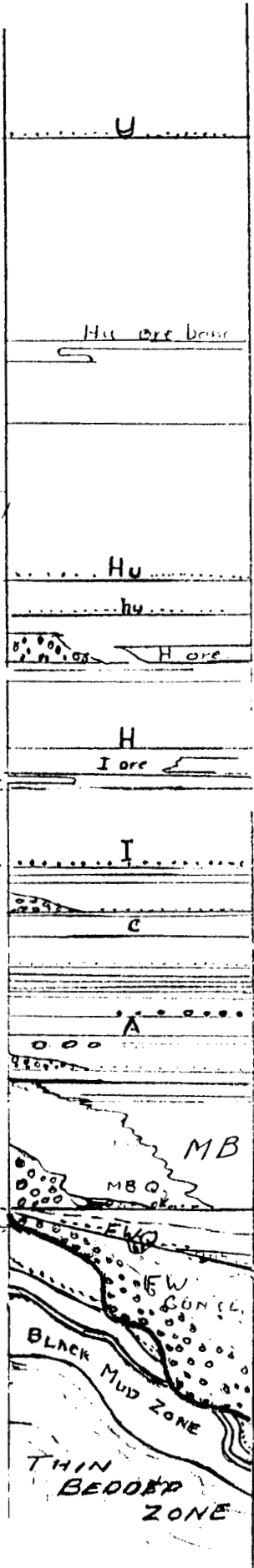
2°

Laminated arg between 1 & 4 siltstns.

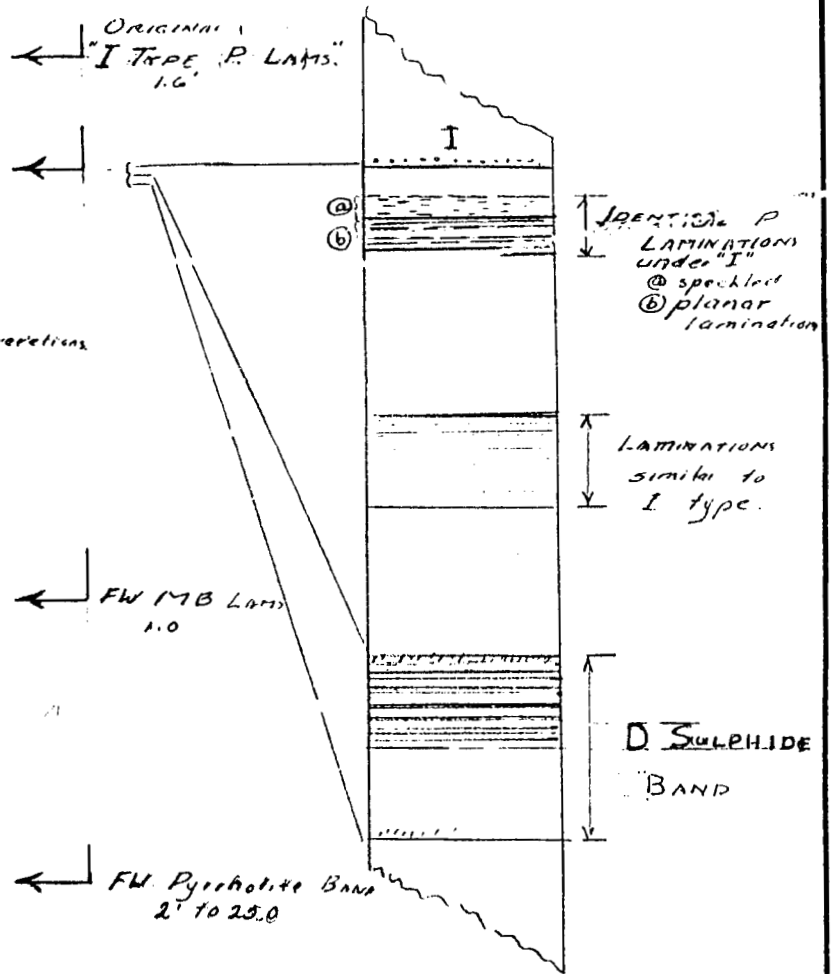
3°

Unconformity DIP 75°

DIPS 5°



Scale 1" = 40'



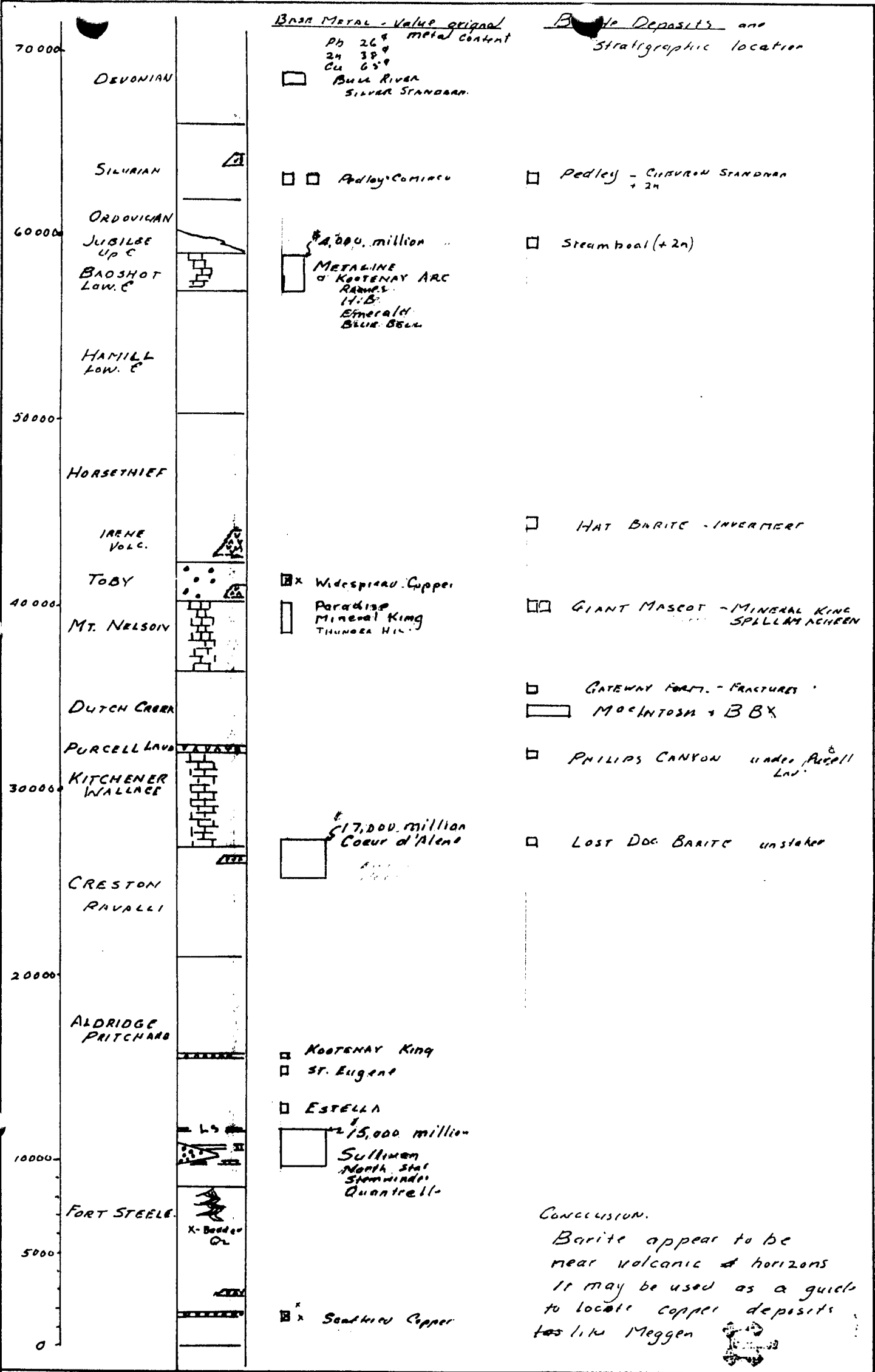
Scale 1" = 2'

The Consolidated Mining and Smelting Company of Canada Limited

| | | | |
|-------------------------|-------|-------------|-------|
| DRAWN BY: G. MINSON. | | TRACED BY: | |
| REVISED BY: | DATE: | REVISED BY: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |

IDENTICAL "I" TYPE PYRRHOTITE LAMINATIONS RELATED TO THE SULLIVAN VEIN HORIZON.

SCALE: AS SHOWN. DATE: MAY 14, 1968. PLATE: 1



CONCLUSION.
 Barite appear to be near volcanic horizons
 It may be used as a guide to locate copper deposits
 as like Meggen

| | | | |
|-----------------------|------|------------|------|
| Drawn by: G. MASON | | Traced by: | |
| Revised by | Date | Revised by | Date |
| | | | |
| | | | |
| | | | |
| | | | |

COMPOSITE STRATIGRAPHIC COLUMN
 From Coeur d'Alene to north Windermer
 70,000' from Precambrian to DEVONIAN
 Relative position of ore zones Cu Pb Zn and
 of some barite deposits

Scale: 1:2500 Date: Aug. 21, 1978 Plate: 8

JOHNSON
N°1-88

DIAMOND DRILL GEOLOGICAL LOG

40 SCALE

OBJECTIVE: To test extension Sullivan Vein zone.
 LOGGED BY: G. MASON. DATE: Sept. 1988

SAMPLED: No assays
 COMPOSITES: Gerald Mason

Color Plot & Dips Ore Classes & Aver.

PROPERTY: JUD-1-8 DEB-1-8
 SECT.:
 LAT.:
 DEP.:
 ELEV.:
 BEAR.: —
 SLOPE: -90°
 LENGTH 400 feet
 H.C. 400 V.C. 0

| From | To | Discard: | | Reason: | ANGLE Core Bedding | |
|------|----------|----------|----|--|--------------------|-------|
| | | From | To | | FT. | Angle |
| 0 | 6.0 feet | | | No core. | | |
| 6.0 | 29.0 | | | laminated arg. $\frac{1}{8}$ " - $\frac{1}{2}$ " 13° → Siltstone 14° → lam. argillite @ 21° $\frac{2mm}{2}$ pyrite along bedding. | 7' | 70° |
| 29.0 | 34.5 | | | massive Siltstone with minor 6 inch bands Arg. | 16 | 70° |
| 34.5 | 40.5 | | | (7 feet casing) Silty arg. | 21 | 63 |
| 40.5 | 42.5 | | | Siltstone | 23 | 60 |
| 42.5 | 46.5 | | | Argillite with 6 inch band Siltstone. | 26 | 65 |
| 46.5 | 49 | | | Argillite 48° → 0.8 Siltstone. | | |
| 49 | 55.5 | | | 1.0 ft Argillite → massive Argillaceous Siltstone to Siltstone (?) | 49 | 62 |
| 55.5 | 60 | | | Argillite with 2 inch vein white quartz $< 20^\circ$ & smaller $\frac{1}{4}$ " vein white quartz 58° → Siltstone with 2 inch quartz vein ($< 17^\circ$) + biotite. | | |
| 60 | 62.2 | | | Argillite 61° → Siltstone. | | |
| 62.2 | 64.2 | | | 0.6 Argillite → Siltstone | | |
| 64.2 | 66 | | | 0.4 Argillite → Siltstone | | |
| 66 | 69 | | | no Argillite 67° → Siltstone | | |
| 69 | 73 | | | massive Argillite to silty argillite 72° → Siltstone | | |
| 73 | 73.6 | | | Argillite 73.3° → Siltstone | | |
| 73.6 | 74.8 | | | Argillite 74.4° → Siltstone | | |
| 74.8 | 77.5 | | | Argillite 75.5° → 2.0 Siltstone. | | |
| 77.5 | 80 | | | A. 79° → S | | |
| 80 | 83.6 | | | A 82.5° → S | | |
| 83.6 | 88.0 | | | A 85.5° → S | | |
| 88 | 91 | | | 2 inch quartz vein 88.3° → A. | | |

chlorite lam }
on bedding } 98 60°

ABBREV. USED
 A = argillite
 SA = silty argillite
 AS = argillaceous siltstone
 S = siltstone
 Q = quartzite

Core Size
 NX
 Hole No. JOHNSON 1-1988 Page 1
 Date Dec. 1988 Start Dec. 1988 Finish Dec. 1988

DIAMOND DRILL GEOLOGICAL LOG

40 SCALE

OBJECTIVE: _____
 LOGGED BY: _____ DATE: _____
 SAMPLED: _____ COMPOSITES: *Charles Mason*

Color Plot & Dips Ore Classes & Aver.

PROPERTY: _____ SECT.: _____ LAT.: _____ DEP.: _____ ELEV.: _____ BEAR.: _____ SLOPE: _____ LENGTH H.C. _____ V.C. _____

| From | To | Discard: | Reason: |
|-------|-------|----------|---|
| 91.0 | 98.3 | | Mixed fracture filled quartz + minette (biotite) with disseminated pyrite 1 to 2% by volume. 92-92 ^s coarse biotite and disseminated Pyrrhotite quartz vein < 25° @ 98.0 biotite bands < 35° |
| 98.3 | 102.1 | | A $\frac{101.3}{\rightarrow}$ S } banding separation is vague. |
| 102.1 | 104.6 | | A $\frac{102.6}{\rightarrow}$ S } |
| 104.6 | 109 | | A $\frac{106}{\rightarrow}$ S } |
| 109 | 110.8 | | A |
| 110.8 | 111.2 | | white quartz vein. |
| 111.2 | 113.3 | | granophytic sediment (?) finegrained trace Pyrrhotite < 50° |
| 113.3 | 116.2 | | massive argillite $\frac{3}{4}$ quartz vein < 50° |
| 116.2 | 116.6 | | white quartz vein with traces biotite and pyrrhotite. < 1% |
| 116.6 | 126 | | Broken ground $1\frac{1}{2}$ inch fragments - Argillite 123 $\frac{1}{2}$ inch quartz vein < 23 @ 125 traces pyrite |
| 126 | 130.7 | | laminated A $\frac{129}{\rightarrow}$ S 1/2" stone. |
| 130.7 | 136 | | A $\frac{131}{\rightarrow}$ S 1/2" STONE. with mottled bleaching albite, chlorite in $\frac{1}{4}$ " veinlets. |
| 136 | 138.3 | | A $\frac{136.6}{\rightarrow}$ S |
| 138.3 | 139.4 | | A \rightarrow S \rightarrow A |
| 139.4 | 140.4 | | 0.3 A $\frac{139.2}{\rightarrow}$ S |
| 140.4 | 144 | | A $\frac{141.3}{\rightarrow}$ 0.2 S \rightarrow A $\frac{142}{\rightarrow}$ S |
| 144 | 147.3 | | 0.8 A $\frac{144.8}{\rightarrow}$ 0.2 S \rightarrow A $\frac{146.3}{\rightarrow}$ S |
| 147.3 | 147.7 | | white quartz vein with traces biotite. |

Angle Core & hold in

109^s = 52°

[short 112 = 42]

118.2 = 55

127.8 = 60

Core Size _____
 Hole No. JOHNSON No. 1988 Page 2
 Date Dec. 1988 Start Dec. 1988 Finish Dec. 1988

DIAMOND DRILL GEOLOGICAL LOG

40 SCALE

OBJECTIVE:

SAMPLED:

LOGGED BY:

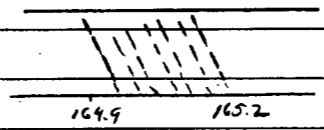
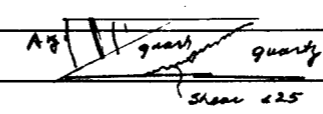
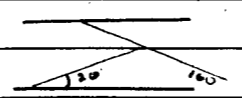
DATE:

COMPOSITES:

Pearl Mason

Color Plot & Dips Ore Classes & Aver.

PROPERTY: SECT.: LAT.: DEP.: ELEV.: BEAR.: SLOPE: LENGTH H.C. V.C.

| From | To | Discard: | Reason: | | | | | |
|------------------|------------------|----------|--|-------------|-------------|---|-----------------------|---|
| 147 ⁵ | 149 ⁵ | | A ^{148.7} → S ^{149.0} → A ^{149.5} S. | | | | | 147 ⁷ = 70 |
| 149 ⁵ | 152 ⁵ | | A ^{151.4} → ± 0.5 S | | | | | |
| 152 ⁵ | 153 ⁵ | | quartz vein with 1/2" pyrrhotite | 152.5 = 240 | 153.5 = 247 | quartz vein | pyrrhotite | BOHRICOIDAL PYRRHOTITE cut off ?? by quartz vein. |
| 153 ⁵ | 155 ⁵ | | (2.0' short of core) | | | | | |
| 155 ⁵ | 157 ⁹ | | massive SILTSTONE WITH MINOR SA & A. | | | | | |
| 157 ⁹ | 164 ⁹ | | massive A ^{158.7} → S ^{159.4} lam A. | | | | | 159.7 = 62 |
| 164.9 | 165.2 | | BLACK Argillite with Pyrrhotite specks along laminations. | | | | | 163 = 60 |
| | | | These are similar type but <u>not identical</u> to "I TYPE PYRRHOTITE LAMINATIONS IMMEDIATELY UNDER TO BASE OF "I" SILTSTONE AT THE SULLIVAN MINE" Memo May 27, 1968 G. MASON. | | | | | |
| | | | This suggests that <u>Sullivan type mineralization was active in this area</u> | | | | | |
| | | | | | |  | | |
| 165 ² | 167 ⁶ | | 1/2 - 3/4 inch bands A and minor AS. | | | | | 167.4 = 60 |
| 167 ⁶ | 169 | | 1.4 feet quartz vein + cubic pyrite contact 167 ⁶ 223 | | |  | | 170.4 = 65 |
| 169 | 174 | | bands 1/2 & 1/4" inch A ^{173.1} → Siltstone | | | | | 171.5 = 66 |
| | | | 1/4" band biotite shear. | | |  | | |
| | | | 1/2" vein pyrite 220 & 160 | | | | | |
| | | | | | | | | 168.6 = 68 |
| 174 | 186 | | A bands irregular traces pyrite. ¹⁷⁵ → S irregular mottled as if albite | | | | | |
| | | | few 0.6 bands A. | | | | | |
| | | | @ 179.3 1" quartz vein. | | | | | |
| 186 | 192.7 | | A bands 1/2" mesh & 1/2" lam dark Arg. | | | | | 193 = 60 |
| | | | ¹⁹⁰ → SILTSTONE WITH 1" bands A. | | | | | |
| 192.7 | 196 ⁶ | | A bands ¹⁹⁴ → 0.4 S ^{194.4} → bands A ^{194.7} → S ^{195.3} → A with 1/2" lam ^{195.8} → S | | | | | |

Core Size

Hole No. JOHNSON 1-1988 Page 3

Date Start Finish


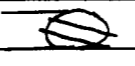
DIAMOND DRILL GEOLOGICAL LOG

40 SCALE

OBJECTIVE:
 LOGGED BY: _____ DATE: _____
 SAMPLED: _____ COMPOSITES: *Cerald Mason*

Color Plot & Dips Ore Classes & Aver.

PROPERTY: _____ SECT.: _____ LAT.: _____ DEP.: _____ ELEV.: _____
 BEAR.: _____ SLOPE: _____ LENGTH: _____
 H.C. _____ V.C. _____

| From | To | Discard: | Reason: |
|-------|-------|----------|--|
| 196.6 | 197.7 | | massive A ^{197.1} → massive fine grained Q |
| 197.7 | 198.5 | | A ^{198.6} 0.4' S. |
| 198.5 | 201.7 | | A ^{195.5} 6.2' S @ 199.5 1 inch quartz vein ← 27' 201.7 = 60' |
| 201.7 | 210 | | Argillite with faint laminations and incipient Pyrochloite bands like the I LAMINATION zones at the SULLIVAN MINE. 203.5 = 67 Refer to G. MASON REPORT MAY 1968 208 = 63 |
| | | | 203.5 - 203.8 speckled Pyrochloite laminations ^{203.3} all parallel P ₀ laminations |
| | | | 204.9 - 205.7 traces Pyrochloite (speckled) |
| | | | 206 - 206.6 1/2" discontinuous P ₀ laminations |
| | | | @ 207.6 1/2" band Pyrochloite |
| | | | 208.5 - 208.65 Argillite with speckled Pyrochloite laminations |
| 210 | 212 | | massive Siltstone with 1/2" band of A. 212 = 65 |
| 212 | 214.6 | | band of A ^{212.5} → Siltstone @ 214 A band with flame structure  |
| 214.6 | 217.2 | | A ^{215.1} → Siltstone 227 = 65 |
| | | | @ 217.2 Fault plane minor < 30°  |
| 217.2 | 218 | | crushed Arg. - fault gouge. |
| 218 | 219.6 | | laminated A ²¹⁹ → S |
| 219.6 | 222 | | A with 0.2 band S ^{220.7} → SILTSTONE |
| 222 | 225 | | A ^{222.5} → massive S |
| 225 | 238 | | A with scattered traces Pyrochloite disseminated @ 230 similar to Sullivan I lam zone May 1968 231-231.4 232-232.1 233.3-233.5 |
| | | | 234.7 → S → A and S. |

Core Size
1X
 Hole No. _____ Page _____
 JOHNSON 1-1988 4
 Date _____ Start _____ Finish _____

DIAMOND DRILL GEOLOGICAL LOG

40 SCALE

OBJECTIVE:

LOGGED BY:

DATE:

SAMPLED:

COMPOSITES:

Cerald Mason

Color Plot & Dips

Ore Classes & Aver.

PROPERTY:

SECT.:

LAT.:
DEP.:
ELEV.:

BEAR.:

SLOPE:

LENGTH

H.C.

V.C.

| From | To | Discard: | Reason: | |
|------------------|------------------|----------|--|-------------|
| 238 | 242 ³ | | massive S. | |
| 242 ³ | 244 | | 1/2 inch bands A ^{243.5} → 0.7 massive Siltstone with ^{several} pink garnets 1/16 inch diameter | |
| 244 | 246 ⁴ | | 1/2 inch band A and 1 mm specks Pyrrhotite. ^{245.3} → SILTSTONE. | |
| 246 ⁴ | 249 | | A ^{246.3} → 1.3 S | 249.5 = 65° |
| 249 | 253 ² | | band A ^{252.5} → 0.7 S | 257 = 65° |
| 253 ² | 261 | | Laminated A 1" bands [check for ^{v.v.t.} wavy type lamination] ^{259.2} → SILTSTONE. | |
| 261 | 266 | | 0.5' massive A ^{261.5} → S ^{264.6} → A ^{265.4} → S | |
| 266 | 271.1 | | A in bands 1 to 2 inches wide ^{268.1} → S | 268.3 = 60 |
| 271.1 | 272 | | 1/2 inch bands A with grains pyrrhotite 1 mm with some Silty Arg bands 0.5 feet grains of biotite 1mm. or biotitic alteration after Pyrrhotite (?) | 271.1 = 64 |
| 272 | 273.4 | | A ²⁷³ → 0.4 S | |
| 273.4 | 277 | | A ^{277.3} → 0.7 S | |
| 277 | 281.8 | | Silty A and A ²⁸¹ → 0.8 S | |
| 281.8 | 283.6 | | QUARTZ VEIN with streaks biotite (suggest texture of biotite mineral dyke.) | |
| 283 ⁶ | 286 | | massive A → S | 286.5 = 70 |
| 286 | 290 ⁵ | | banded A ^{289.1} → S @ 290° with 1/2" white quartz vein < 27° | |
| 290 ⁵ | 294 ¹ | | banded A and laminated A | 292.3 = 62 |
| | | | (292 ³ - 293 brownish argillite with finely disseminated Pyrrhotite on divide.) | |
| | | | ²⁹³ → 0.3 banded 1/4" - 1/2" black silicified A? (not termalinite?) + pyrrhotite → S | |
| 294 ¹ | 298 ² | | A with four 1/2" bands ²⁹⁷ → Siltstone - slight breccia at base | |

Core Size

Hole No. JOHNSON 1-1988-5
Date Start Finish

DIAMOND DRILL GEOLOGICAL LOG

40 SCALE

OBJECTIVE:

SAMPLED:

LOGGED BY:

DATE:

COMPOSITES:

Cerald Maxon

Color Plot & Dips

Ore Classes & Aver.

PROPERTY:

SECT.:

LAT.:
DEP.:
ELEV.:

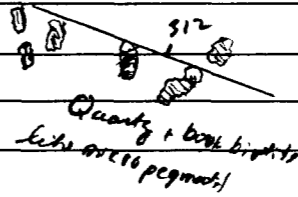
BEAR.:

SLOPE:

LENGTH

H.C.

V.C.

| From | To | Discard: | Reason: | |
|------------------|------------------|----------|---|--|
| 298 ² | 300 ² | | 0.6A ²⁹⁸ → S | 299' = 470 |
| 300 ² | 303 | | 0.8A ³⁰¹ → S gray @ 302 ³ $\frac{3}{8}$ " white quartz vein $\angle 27$ with blobs pyrrhotite 2% by volume Siltstone bleached white 302-303 | 305.6 = 465 |
| 303 | 305 ⁶ | | 0.6A ^{303.6} → S with bands of argillite siltstone bleached white 0.3' at base. | 309 = 465 |
| 305 ⁶ | 306 ⁶ | | 0.4A ³⁰⁶ → S gray with 0.2 white at base. | |
| 306 ⁶ | 309 | | 0.2A ^{306.8} → S gray with 0.2 bleached white at base. | |
| 309 | 310.3 | | 0.3A ^{309.3} → S | |
| 310.3 | 312 | | WHITE QUARTZ VEIN - (books of brown biotite 311.7-312) Contact 310.3 = 23 312 = 20 |  |
| 312 | 318 | | Argillite with 4 inches SA - (S?) ³¹⁴ → S. | |
| 318 | 331 | | laminated black and white Arg. note 322.2 - 322.4 $\frac{1}{16}$ " black & white lam. suggest maybe V.T.L. varve type laminations i.e. "Lais" or "Sullivan" located adjacent Sullivan Oregon in Meadowbrook area. | |
| | | | ^{322.4} → S. lstone and Quartzite | |
| | | | @ 335 - 335.4 chlorite and biotite shear zone $\angle 35$ | 332.4 = 461 |
| 331 | 338 ² | | banded A - with few laminations ^{336.5} → S | 333' = 70' |
| 338 ² | 342 | | A ^{339.5} → S with rusty stained zone and calcite vein $\frac{1}{8}$ " inch along bedding. | 341 = 60 |
| | | | @ 340.3 - 340.8 traces disseminated Pyrrhotite | |
| 342 | 349 ² | | A ³⁴⁴ → SILTSTONE WITH bands 0.1 and 0.2 A. | 363 = 65 |
| 349 ² | 353 ² | | 0.8A ³⁵⁰ → S with white bleaching at base | |
| 353 ² | 355 ⁵ | | 0.4A ^{353.6} → S | |
| 355 ⁵ | 361 ⁵ | | 0.5A ³⁵⁶ → S @ 358.5 0.2 Arg. @ 360-361.5 0.7 Arg. | |
| | | | @ 357.8 Three $\frac{1}{2}$ " quartz veins $\angle 22$. | |

Core Size

Hole No.

Date

Page

6

Finish

Start

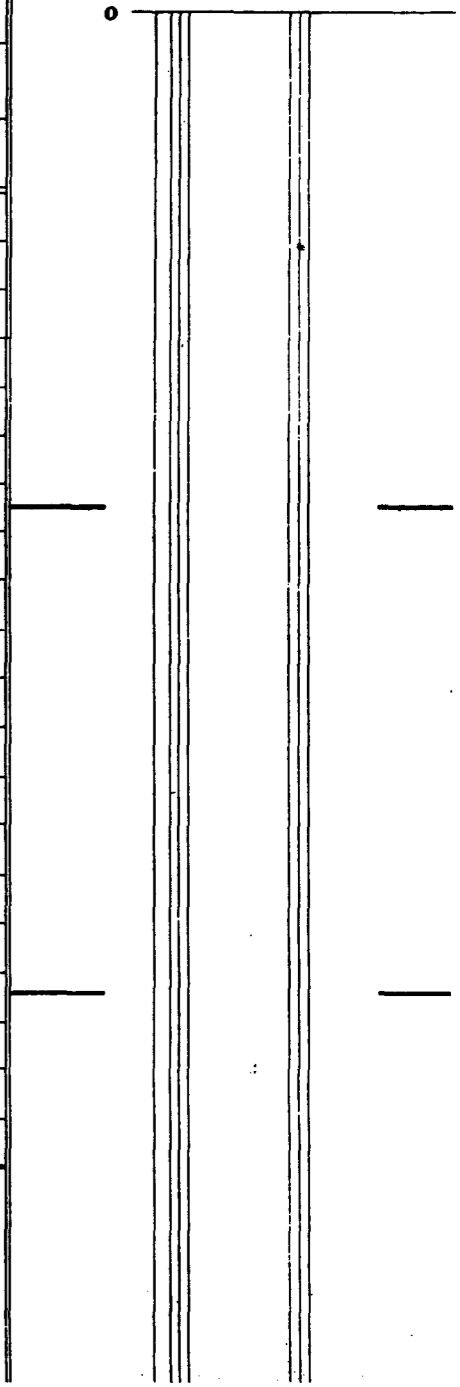
DIAMOND DRILL GEOLOGICAL LOG

40 SCALE

| | | |
|------------|----------|--------------------------|
| OBJECTIVE: | SAMPLED: | |
| LOGGED BY: | DATE: | COMPOSITES: |
| PROPERTY: | SECT.: | LAT.: DEP.: ELEV.: |
| | | BEAR.: |
| | | SLOPE: |
| | | LENGTH H.C. V.C. |

Color Plot & Dips Ore Classes & Aver.

| From | To | Discard: | Reason: |
|-------|-------|----------|---|
| 361.5 | 363.8 | | A <u>363.3</u> → 0.5 S. |
| 363.8 | 377.5 | | bands of A and Silty A <u>377</u> → 0.5 S @ 370.2 - 371.2 A with specks 0.5 mm P in laminations & with fractures filled with pyrite This should be assayed for Au in ppb. as the source rock for placer gold. i.e. Palmer Bre |
| 377.5 | 378.9 | | 0.3A <u>377.8</u> → S |
| 378.9 | 381 | | A + SA <u>378.3</u> → S |
| 381 | 382 | | 0.3 A → 0.5 |
| 382 | 386.8 | | 0.6 A <u>382.6</u> → S with contacted bands (a) A @ 382.3' 382.6' 382.9' @ 386.6 1/4" thick white quartz vein L26 |
| 386.8 | 389.6 | | banded A <u>387.9</u> → 1.7 S 1/4" thick quartz vein L30 |
| 389.6 | 396.3 | | massive A → S @ 392.8 0.2 band A |
| 396.3 | 400 | | banded A <u>397.5</u> → S. |
| | | | END |



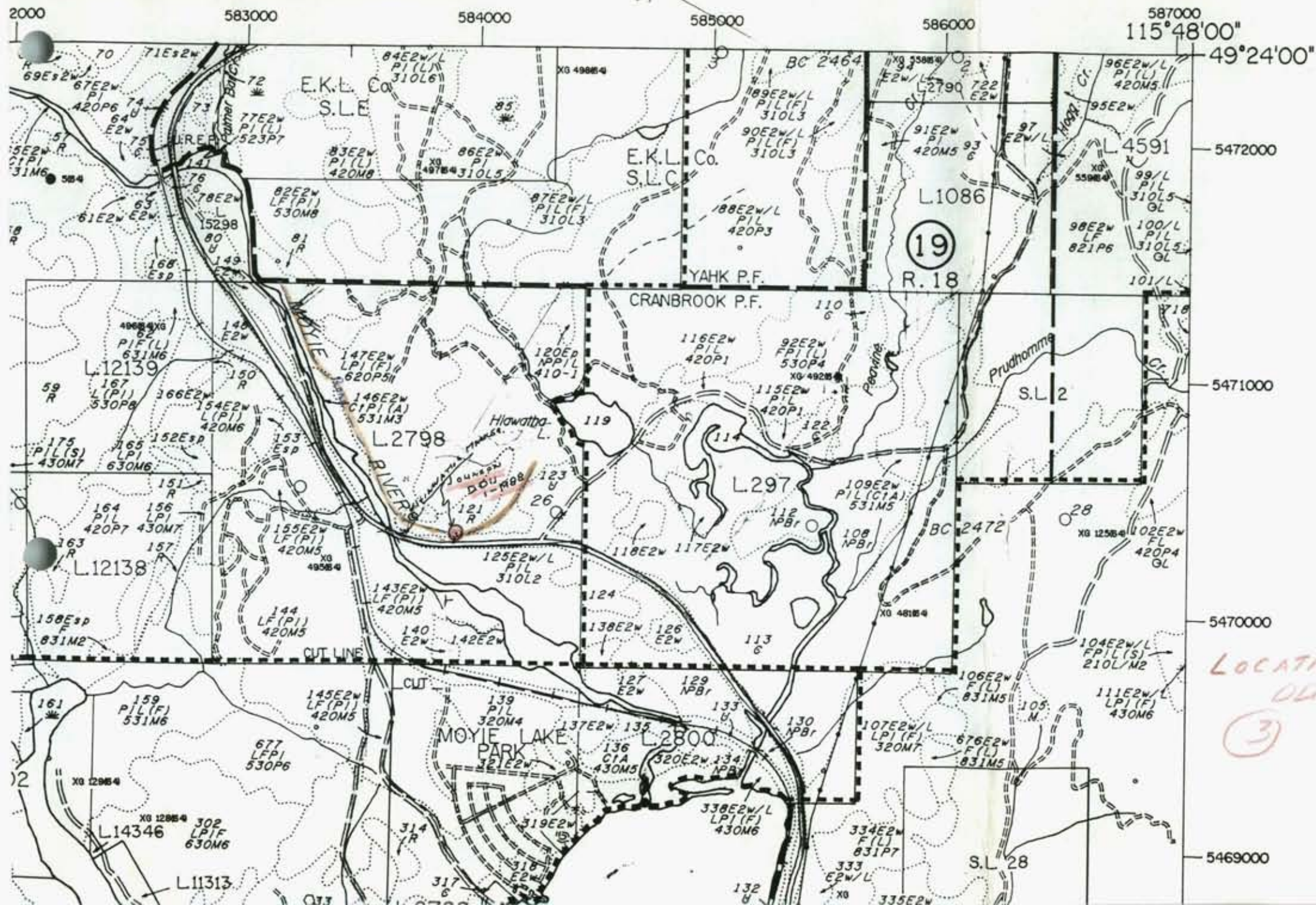
| | |
|----------------|-------------------|
| Core Size | |
| NX | |
| Hole No. | Page |
| JOHNSON 1-1988 | 7 |
| Date | Start Finish |
| | |

FOREST COVER MAP SERIES

0 500 1000 1500 METERS

SCALE 1:20 000

820.031



FOREST C

I. FOREST LAND

A. FOREST LAND (FORESTED)

SPECIES COMPOSITION
Species are listed in their order of predominance. Major species are listed first followed by minor species in brackets.

SPECIES SYMBOLS

- | | |
|--------------------------|-----------------------|
| F - Douglas-fir. | Pl - Lodgepole pine. |
| C - Western red cedar. | Py - Yellow pine. |
| H - Hemlock. | L - Larch. |
| B - Balsam (True fir). | Ct - Cottonwood. |
| S - Spruce. | D - Red alder. |
| Sb - Black spruce. | Mb - Broadleaf maple. |
| Cy - Yellow cedar. | Bt - Birch. |
| Pw - Western white pine. | A - Aspen. |
| Pa - Whitebark pine. | |

AGE CLASS CODES

| CODE | LIMITS (years) |
|------|----------------|
| 1 | 1-20 |
| 2 | 21-40 |
| 3 | 41-60 |
| 4 | 61-80 |
| 5 | 81-100 |
| 6 | 101-120 |
| 7 | 121-140 |
| 8 | 141-250 |
| 9 | 251+ |

HEIGHT CL

| CODE | HEIGHT CL |
|------|-----------|
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |

STOCKING CLASS CODES

| CODE | APPLIES TO | LIM No. of trees/ha |
|---------------|---------------|--|
| 0 | all immature* | N |
| 1 | all mature* | ≥76/ha, 2' |
| 2 | all mature | <76/ha, 2' |
| Subclass to 2 | 3 | mature, with leading species ≥31V/ha, 17.5 cm+ stems 7.5 cm+ d.b.h. |
| | 4 | PI <31V/ha, 17.5 cm+ stems 7.5 cm+ d.b.h. |

| | All deciduous species: PI, Pa. |
|----------|--------------------------------|
| Immature | 1-80 yrs. |
| Mature | ≥81 yrs. |

SECONDARY ELEMENTS

- L - Multi-layered stand.
- S - Separate silviculture description is available in the data base.
- V - Veteran component.

ENVIRONMENTALLY SENSITIVE AREA (E.S.A.)

| CONSTRAINT CLASS | E.S.A. CATEGORY | |
|------------------|-----------------|------------------|
| | Es | Areas having ser |
| | Ep | Areas having ser |
| | Ec | |

LOCATION
ODM MAP
③

