

1975 Geological Report on the Doll Creek
South Property

Claims Tuku 1-16 incl. and Ali 1-10 incl.

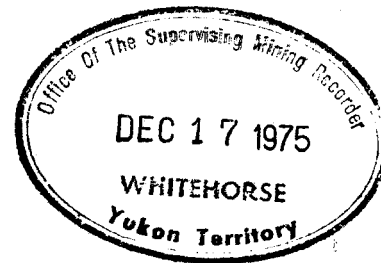
Located 12 miles NW of confluence of Wind
and Peel Rivers, Y.T.

Latitude 65°58'N Longitude 135°25'W
Dawson Mining Division 106 E 14

By J.B. Alsen & G.M. Leary, P.Eng. (B.C.)

For AMAX EXPLORATION, Inc.

Work was carried out during June 16 to
June 22, 1975



This report has been examined by the
Geological Evaluation Unit and is recom-
mended to the Commissioner to be consid-
ered as representation work in the amount of
\$4499.76

D.B. Craig

Resident Geologist or
Resident Mining Engineer

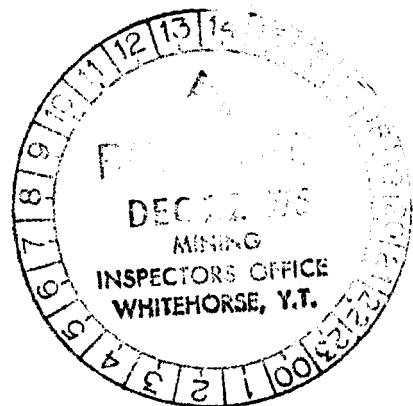
Considered as representation work under
Section 53 (4) Yukon Quartz Mining Act.

B.R. Baxter

Supervising Mining Recorder

[Signature]

Commissioner of Yukon Territory



1975 Assessment Report

TITLE	Doll Creek South Property Geological Report
AUTHORS	J.B. Alsen & G.M. Leary, P.Eng. (B.C.)
DATE	October, 1975
COMMODITY	Pb, Zn
LOCATION-Area	Southern Richardson Mountains, Y.T.
-Mining Division	Dawson
-Coordinates	Latitude 65°58'N Longitude 135°25'W
-NTS	106 E 14

AMAX EXPLORATION, INC.
Vancouver

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SUMMARY

The Doll Creek South Property of 16 Tuku and 10 Ali claims is situated 12 miles northwest of the confluence of the Wind and Peel Rivers, Y.T.

Work performed on the property in 1975 includes detailed geological mapping and sampling.

The twenty-six claims straddle a north-northeast striking mineralized fault zone in a window of Lower Cambrian micritic limestones overlain by and locally in fault contact with Middle Cambrian fine grained clastics.

Scattered showings of galena, sphalerite, barite and hydrozincite occur along fractures throughout the property in light grey vuggy and micritic limestone. The main showing consists of disseminated to massive, fracture-fault controlled galena and sphalerite.

RECOMMENDATIONS

The mineralization on the Doll South property is sparse, irregularly distributed, and limited in exposed strike length. Although geochemical results suggest possible strike extension it is thought to be of low economical potential. No further work is recommended.

INTRODUCTION

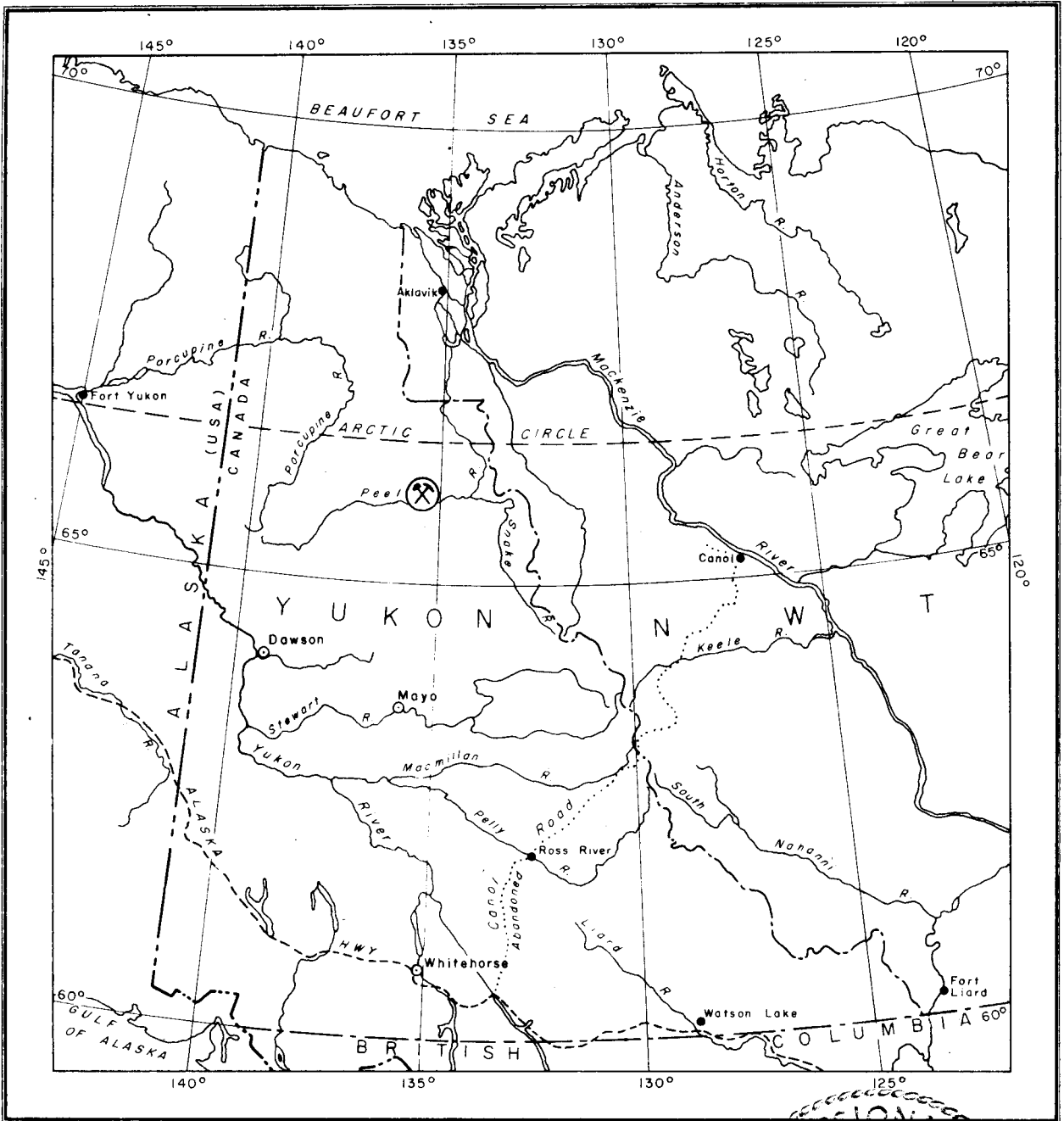
The Doll Creek South property is located in the southern Richardson Mountains, Y.T., 12 miles northwest of the confluence of the Wind and Peel Rivers (Figure 1). The property comprises a roughly rectangular north-northwest elongate block of twenty-six claims in an area of low rolling topography (Figure 2). Relative relief within the claim group is in the order of 1,000 feet with highest hills reaching 3,100 feet.

Access is by helicopter from a unnamed lake ten miles northwest of the property or from Moose and Davis Lakes 28 miles northwest of the property. All three lakes are accessible by float equipped aircraft from Mayo, Y.T. The gravel surfaced Dempster Highway crosses the Eagle Plains approximately 40 miles northwest of the Doll Creek South property.

The claims (listed below) were staked on June 24, 26, and July 4, 1974 to cover lead-zinc showings discovered as a result of a follow-up of lead silt anomalies obtained during the 1974 Yukon Pb-Zn Reconnaissance Program.

<u>Name</u>	<u>Grant Number</u>	<u>Anniversary Date</u>
Ali 1-10 incl.	Y89553-Y89562 incl.	July 25, 1975
Tuku 1-16 incl.	Y89537-Y89552 incl.	July 24, 1975

Work carried out in the 1975 field season consisted of detailed geological mapping, prospecting and sampling of both the showings and surrounding claim block. Limited soil sampling was carried out in the vicinity of the best showing.

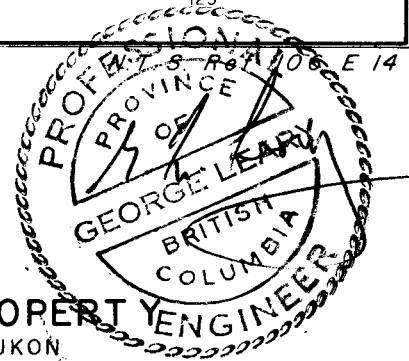


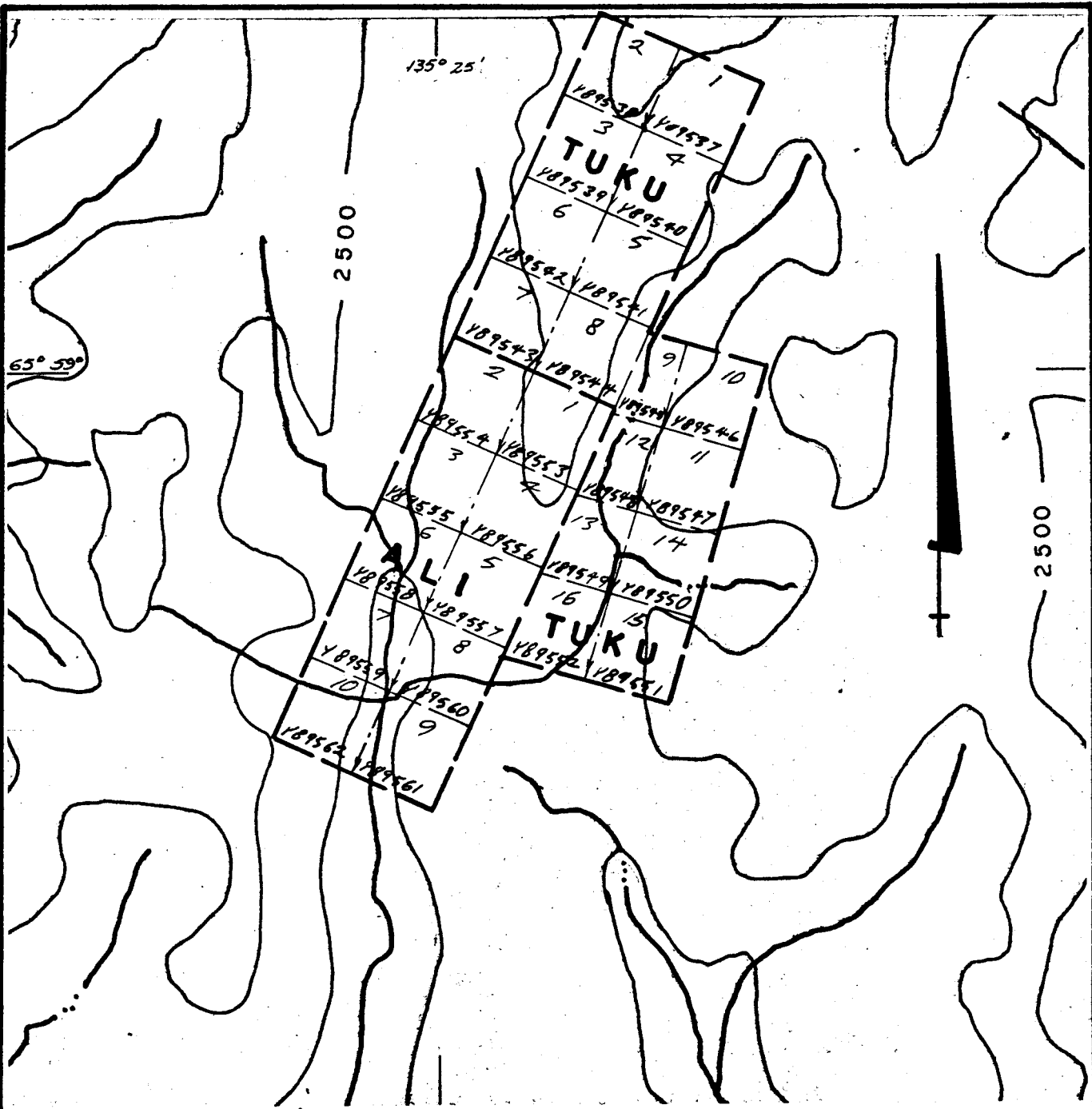
AMAX EXPLORATION INC.

DOLL CREEK SOUTH PROPERTY
 DAWSON MINING DISTRICT — YUKON

LOCATION MAP

SCALE 1" = 120 MILES



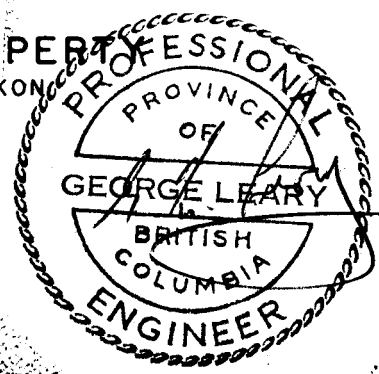


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 DAWSON MINING DISTRICT — YUKON

CLAIM MAP

SCALE 1" = 1/2 MILE



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REGIONAL GEOLOGY

The Richardson Mountains comprise a north-south trending anticlinorium cut by major north-northwest striking wrench and dip-slip faults (Figure 4).

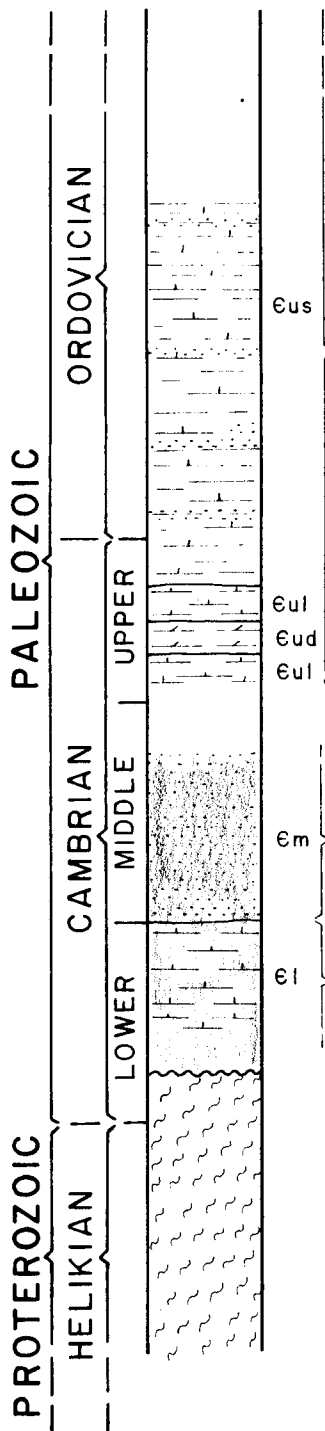
The core of the anticlinorium consists of Helikian phyllites and unconformably overlying Cambrian rocks that form an uplifted fault block bounded on both flanks by north-northwest trending nearly vertical faults. On the west side of the Richardson Mountains Lower Cambrian carbonates are exposed in several erosional windows.

Cambrian clastic and carbonate rocks and overlying Ordovician shales and turbidites in the Southern Richardson Mountains are shown in a stratigraphic column in Figure 3.

From at least Cambrian to Early Devonian times the site of the present Richardson Mountains was a more or less linear north-northwest trending trough possibly connected to the Selwyn Basin (Gabrielse, 1966). Its eastern margin appears to have been relatively stable whereas its western and southwestern margins fluctuated moderately. A thick assemblage of Cambrian limestones, siltstones and shales was deposited in the trough. Upper Cambrian to Devonian rocks are represented by graptolite-rich shales, siliceous shales, calcareous shales, thin limestones and bedded cherts. Local wedges of coarse clastics which contain broken benthonic fossils imply deposition of a turbidite for at least part of the Upper Cambrian to Devonian rocks (Lenz, 1972).

LITHOLOG

MINERALIZATION



Eus
Eu ROAD RIVER FORMATION
Carbonate, shale, turbidite.

Eul
Eud
Eul

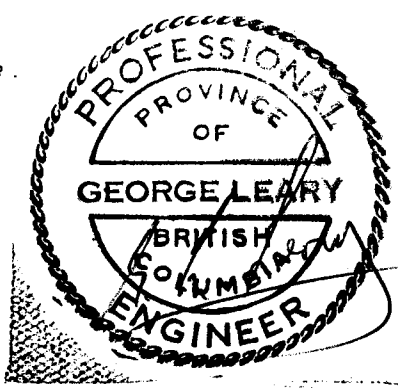
POSSIBLY DISCONFORMABLE

Em } 5,000' *Brown weathering platy siltstone, sandstone.*

PROBABLY CONFORMABLE

El } 1,200' *Light gray weathering limestone.*

ANGULAR UNCONFORMITY



DOLL CREEK NORTH AND DOLL CREEK SOUTH PROPERTIES

LEGEND

Phyllite

Dolomite

Limestone

Sandstone, siltstone, quartzite

Shale

Phyllite

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DOLL CREEK SOUTH PROPERTY
DAWSON MINING DISTRICT — YUKON

PRELIMINARY PARTIAL SECTION
SOUTHERN RICHARDSON MOUNTAINS

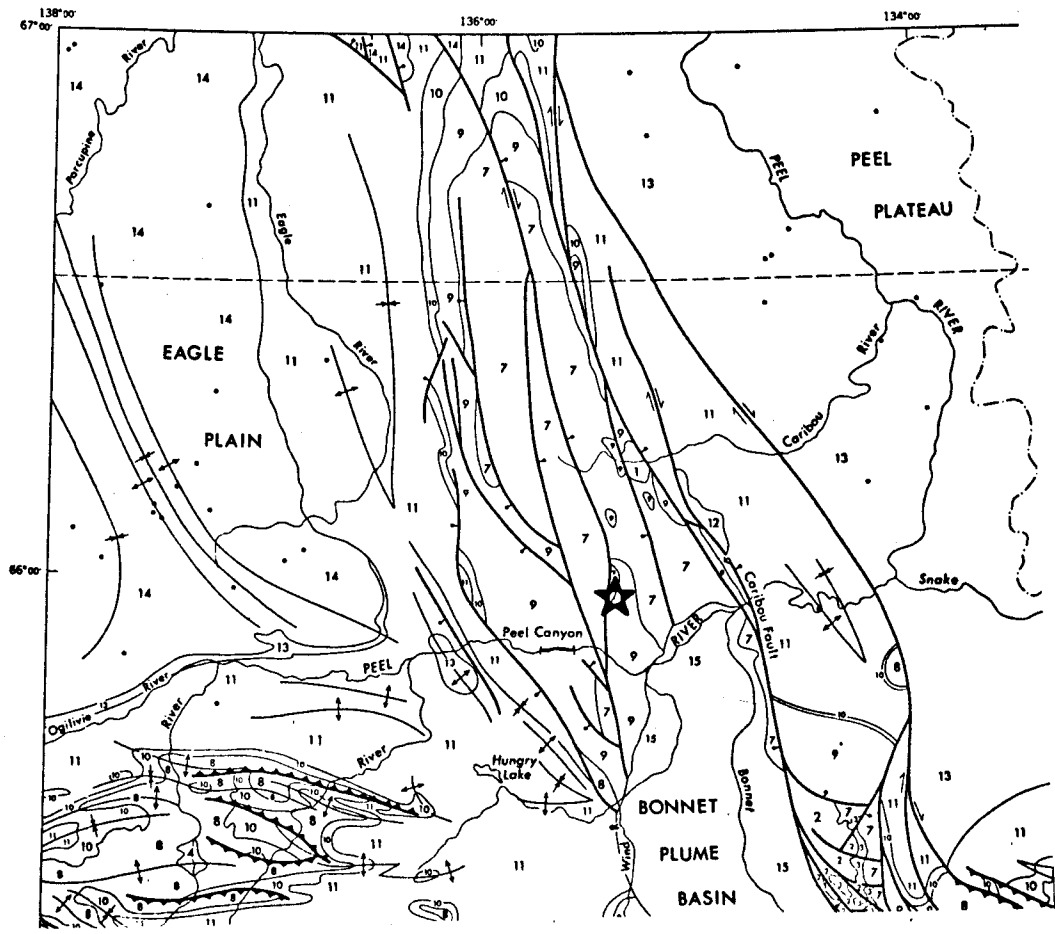
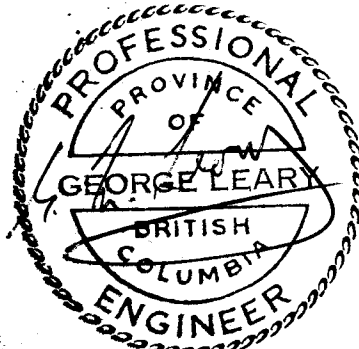
Vancouver — H. C. P.

N. T. S. Ref. 106 E 14
FIG. 3

LEGEND

- CENOZOIC**
- CRETACEOUS AND TERTIARY
UPPER CRETACEOUS AND TERTIARY
15 BONNET PLUME FORMATION: shale, sandstone, conglomerate and coal
- CRETACEOUS
UPPER CRETACEOUS
14 EAGLE PLAIN FORMATION: sandstone and shale
- MESOZOIC**
- LOWER CRETACEOUS
13 Shale and sandstone
- TRIASSIC
UPPER TRIASSIC
12 Limestone
- PALEOZOIC**
- DEVONIAN, CARBONIFEROUS AND PERMIAN
UPPER DEVONIAN, CARBONIFEROUS AND PERMIAN
11 Shale, sandstone and limestone
- DEVONIAN
LOWER AND MIDDLE DEVONIAN
10 Limestone, dolomite and shale
- CAMBRIAN, ORDOVICIAN AND SILURIAN
UPPER CAMBRIAN, ORDOVICIAN AND SILURIAN
8 Dolomite, limestone and shale
- CAMBRIAN
LOWER (mainly) and MIDDLE CAMBRIAN
7 Limestone, siltstone and conglomerate
- PROTEROZOIC**
- HADRYNIAN
6 Shale, sandstone and limestone
- 5 Mudstone, conglomerate, dolomite and iron formation
- HELKIAN
4 Sandstone, dolomite and shale
- 3 Orange dolomite
- 2 Slate and quartzite
- 1 Phyllite

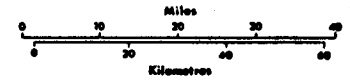
CAMBRIAN TO DEVONIAN
UPPER CAMBRIAN TO LOWER DEVONIAN
9 ROAD RIVER FORMATION: shale and limestone



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DOLL CREEK SOUTH PROPERTY
DAWSON MINING DISTRICT — YUKON

REGIONAL GEOLOGY



PROPERTY GEOLOGY

Introduction

The Doll Creek South property covers a portion of a window of Lower Cambrian light to dark grey weathering micritic limestones which are conformably overlain by Middle Cambrian fine grained clastic rocks to the east and are in fault contact with these Middle Cambrian rocks to the north, west and south.

Geological mapping was accomplished using orthographic photographs at a scale of 1" to 400'. Results are on the accompanying geological map (Figure 5).

A stratigraphic column for the property is shown in Figure 6.

Lithology

Lower Cambrian Limestone

A light to dark grey weathering micritic limestone with occasional vuggy and organic horizons is the dominant rock type on the property. Local intense jointing is prevalent with 120/90 and 010/90 the dominant orientations. Large masses of orange-pink calcite rhombohedra occur in areas of intense jointing. They are thought to be (1) of hydrothermal origin, or (2) recrystallization of discrete orange-white calcite grains within the limestone.

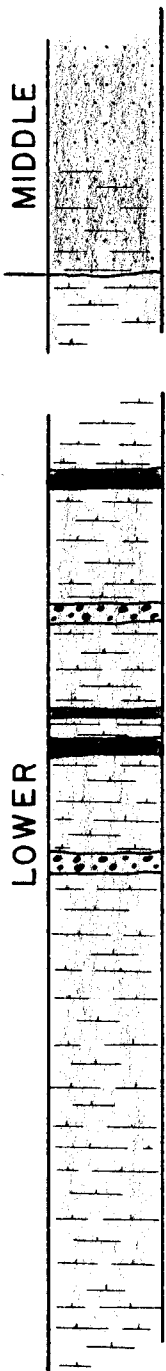
A few organic horizons at least 15 feet thick were noted in the northern portion of the map area. They consist of spheroids up to 3 cm in diameter which occasionally exhibit concentric laminations of dark and light calcareous layers with limonitic interfaces. It is probable that these spheroids

LITHOLOG

MINERALIZATION

PALEOZOIC

CAMBRIAN



MESS

Brown weathering platy siltstone, sandstone ± shale >100'

CONFORMABLE

L&E bml

L&E vml

L&E bml

L&E bml

L&E vml

L&E mi

Micritic limestone, light grey to dark grey; locally with organic material (L&E bml); and moderately vuggy (L&E vml). >1,400'

■ MINOR GALENA

■ MINOR ZINC

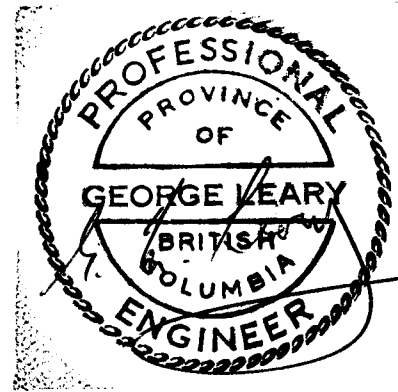
Siltstone, sandstone

Shale

Limestone

Vuggy

Organic material



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DOLL CREEK SOUTH PROPERTY

DAWSON MINING DISTRICT — YUKON

STRATIGRAPHIC COLUMN

SCALE 1" = 200'

Vancouver —

H.P.

N.T.S. Ref. 106 E 14

FIG. 6

represent concentric algal growths about a nucleus such as a skeletal or rock fragment.

Middle Cambrian Siltstone

Buff to orange weathering fine grained limonitic Middle Cambrian siltstone form rubbled, flaggy exposures on the periphery of the window of Lower Cambrian limestone. Quartz, feldspar, muscovite and up to 30 per cent limonite are the main components of this unit.

Structure

Two northerly trending dipslip faults truncate the Lower Cambrian limestone. They are thought to cause the major relief in the central map area. A third eastwest-trending fault, also truncates these rocks in the southern portion of the map area.

Uplift in Late Cambrian (pre-Franconian) time (Gabrielse, 1966) produced a regional westerly dip in the Cambrian rocks. The gentle easterly dip of the Lower Cambrian limestone within the property is probably the result of local adjustment along the two northerly trending faults.

Local intense jointing in the Lower Cambrian micritic limestones is probably also related to these faults with 120/90 and 010/90 the dominant orientations.

MINERALIZATION

Scattered showings of galena, barite and hydrozincite occur along fractures throughout the property in light grey vuggy micritic limestone. The main showing consists of fracture-fault controlled disseminated, and massive galena,

sphalerite, minor chalcopyrite and pyrite with associated barite and siderite in a gossanous up to 70 foot wide fault zone which strikes slightly east of north. Mineralization is exposed 300 feet along strike. An assay sample across twelve feet of sheared grey limestone returned 3.0% lead and 6.4% zinc. Another assay taken across 17 feet of well fractured light grey micritic limestone returned 0.24% lead and 0.16% zinc.

Figure 5 depicts the detailed geology and location of the main showing and assay results.

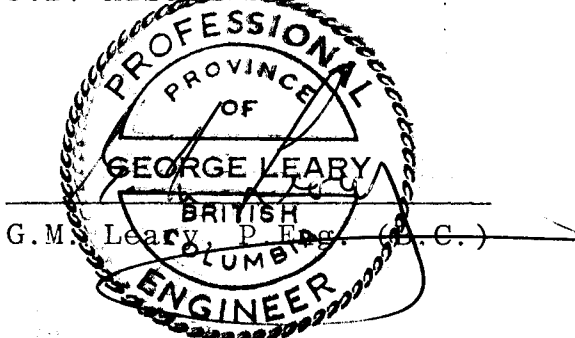
GEOCHEMISTRY

Thirty-nine soil samples were collected along four east-west lines at approximately 150 to 250 foot intervals (see Figure 5) in an attempt to establish continuity of the mineralization along strike in an area devoid of outcrop. Samples were analyzed for the following elements: Mo, Cu, Ni, Co, Mn, Fe, Ag, Zn and Pb.

Anomalous zinc values (>500 ppm) and lead values (>50 ppm) were recorded at the east end of the four lines. The anomalies may be attributed to scattered mineralization in nearby outcrops of limestone.

J.B. Alsen

J.B. Alsen



REFERENCES

Gabrielse, H.

1966: Tectonic Evolution of the Northern Canadian
Cordillera; C.J.E.S., v. 4, p. 271-296.

Lenz, A.C.

1972: Devonian History of Northern Yukon and Adjacent
District of Mackenzie; Bull. of Can. Pet. Geol.,
v. 20, p. 321-361.

APPENDIX III

LIST OF CLAIMS

<u>NAME</u>	<u>GRANT NUMBER</u>	<u>ANNIVERSARY DATE</u>
ALI 1-10 incl.	Y89553-Y89562 incl.	July 25, 1977
TUKU 1-2	Y89537-Y89538	July 24, 1976
3-9 incl.	Y89539-Y89545 incl.	July 24, 1977
10-11	Y89546-Y89547	July 24, 1976
12-13	Y89548-Y89549	July 24, 1977
14-15	Y89550-Y89551	July 24, 1976
16	Y89552	July 24, 1977

APPENDIX IV

ASSAY AND GEOCHEMICAL PROCEDURES

Assay

<u>Sample Number</u>	<u>% Cu</u>	<u>% Zn</u>	<u>% Pb</u>	<u>oz/T Ag</u>	<u>Length</u>
52110	0.02	6.40	3.00	0.33	12 feet
53901	0.01	0.16	0.24	0.08	17 feet

BURNABY LABORATORY - 2225 SPRINGER AVE. - BURNABY 2, B.C.

DATE OCT 1971 TYPE SAMPLES SILT/SOIL/ROCK
 PROJECT 671 LOCATION _____
 REQUESTED BY T. HITCHINS DISPOSITION OF REJECTS _____

No.	Sample	pH	Mo	Cu	Ni	Co	Mn	Fe	Ag	Zn	Pb	Pb	No.
01	5 NPL 1	7.2	2	24	32	16	400	2.2	0.6	130	30	43	01
02	2		2	16	28	14	340	1.7	0.4	106	28	38	02
03	3		6	24	32	18	560	2.1	0.6	98	60	70	03
04	T4		2	50	18	30	6000	710.0	1.6	24	76	22	04
05	55		2	24	30	16	1160	2.5	.8	320	24	60	05
06	6		2	16	20	12	4100	1.1	.4	190	52	12	06
07	7		2	20	16	6	1360	0.3	.4	104	16	14	07
08	8		2	22	34	14	400	2.8	.6	98	12	24	08
09	59		2	20	26	14	200	2.2	.4	82	24	26	09
10	T9		2	56	26	48	4100	710.0	2.8	940	26	560	10
11	510		4	20	30	12	200	2.1	.4	98		36	11
12	11		4	20	28	14	260	2.2	.4	82		36	12
13	12		2	26	36	16	360	2.6	.6	112		44	13
14	L13		2	20	36	16	360	2.0	.4	100		34	14
15	14		2	16	30	14	400	2.3	.4	110		36	15
16	15		2	20	40	16	400	2.5	.6	100		38	16
17	16		2	26	44	18	200	2.7	.6	108		28	17
18	17		2	16	34	16	200	2.4	.4	98		30	18
19	18		2	20	40	14	260	2.5	.4	122		42	19
20	19		2	16	34	12	200	2.3	.6	96		36	20
21	20		2	16	30	14	180	2.7	.6	94		34	21
22	21		2	16	24	14	160	2.1	.4	52		28	22
23	22		2	16	34	16	200	2.8	.4	88		30	23
24	23		2	20	36	18	760	2.8	.6	104		34	24
25	24		2	16	30	14	520	1.9	.4	204		50	25
26	25		2	14	26	14	740	1.6	.6	210		50	26
27	26		2	20	18	8	760	0.4	.4	530		18	27
28	27		2	20	34	20	1000	2.8	.4	470		48	28
29	28		2	20	23	14	500	2.0	.6	320		60	29
30	29		2	12	16	14	5000	2.8	.6	370		12	30
31	30		2	18	24	14	1000	2.4	.6	88		24	31
32	31		2	20	26	14	120	2.2	.6	92		30	32
33	32		2	20	30	18	280	2.6	.6	98		38	33
34	33		2	16	30	14	220	2.5	.4	80		30	34
35	34		2	14	26	14	180	2.4	.4	92		40	35
36	35		2	20	20	14	620	0.8	.4	152		20	36
37	36		2	26	20	6	700	0.8	.4	110		32	37
38	37		2	16	30	20	500	2.9	.6	84		32	38
39	38		2	20	28	12	700	2.5	.4	88		28	39
40	G 22		52	240	38	12	280	1.9	.6	116		110	40

COMMENT:

DATE SAMPLES RECEIVED _____
 DATE REPORTS MAILED _____
 ANALYST _____

AMAX EXPLORATION INC. ANALYTICAL REPORT

BURNABY LABORATORY - 2225 SPRINGER AVE. - BURNABY 2, B.C.

DATE OCT 1975 TYPE SAMPLES SOIL/SILT/ROCK
 PROJECT 671 LOCATION _____
 REQUESTED BY T. HITCHINS DISPOSITION OF REJECTS _____

No.	Sample	pH	Mo	Cu	Ni	Co	Mn	Fe	Pb	Zn	Pb		No.
01	SNPS 39		2	20	26	16	300	2.8	.4	82	20		01
02	40		2	20	12	6	240	0.5	.2	50	8		02
03	41		2	18	14	6	660	0.5	.2	34	12		03
04	42		2	22	22	10	1000	0.5	.4	92	8		04
05	43		2	18	23	14	680	2.1	.4	720	80		05
06	44		2	18	32	18	2200	3.1	.8	2200	660		06

Procedures for Collection and Processing
of Geochemical Samples

Analytical Methods for Ag, Mo, Cu, Pb, Zn,
Fe, Mn, Ni, Co and W in sediments and soils;
Mo, Cu, Zn, Ni and SO_4^{--} in waters.

Amax Exploration, Inc.
Vancouver Office.

September 1970

SAMPLE COLLECTION

Soils

B horizon material is sampled and thus organic rich topsoil and leached upper subsoil are avoided. Occasionally organic rich samples have to be taken in swampy depressions.

Samples are taken by hand from a small excavation made with a cast iron mattock. Approximately 200 gms of finer grained material is taken and placed in a numbered, high wet-strength, Kraft paper bag. The bags are closed by folding and do not have metal tabs.

Observations as to the nature of the sample and the environment of the sample site are made in the field.

Drainage Sediments

Active sediments are taken by hand from tributary drainages which are generally of five square miles catchment or less. Composite samples are taken of the finest material available from as near as possible to the centre of the drainage channel thus avoiding collapsed banks. More than one sample is taken if marked mineralogical or textural segregation of the sediments is evident.

Some 200 gm of finer material is collected unless the sediment is unusually coarse in which case the weight is increased to 1 kg. Samples are placed in the same type of Kraft paper bag as are employed in soil sampling. Water samples are taken at all appropriate sites. Approximately 100 mls are sampled and placed in a clean, screw sealed, polythene bottle. Observations are made at each site regarding the environment and nature of the sample.

Rock Chips

Composite rock chip samples generally consist of some ten small fragments broken from unweathered outcrop with a steel hammer. Each fragment weighs some 50 gms. Samples are placed in strong polythene bags and sealed with non-contaminating wire tabs. Samples are restricted to a single rock type and obvious mineralization is avoided.

Soil, sediment and rock samples are packed securely in cardboard boxes or canvas sacks and dispatched by road or air.

Rossbacher Laboratory

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE.,
BURNABY, B. C.
CANADA
TELEPHONE: 299-6910
AREA CODE: 604

iii

April 30, 1974

SUMMARY OF SOME ANALYTICAL TECHNIQUES CURRENTLY IN USE AT ROSSBACHER LABORATORY

A ANALYTICAL TECHNIQUES FOR GEOCHEMICAL SAMPLES

SAMPLE PREPARATION

Packages of samples are opened as soon as they arrive at the laboratory and the bags placed in numerical sequence in an electrically heated sample drier (maximum temperature 70°C).

After drying soil and sediment samples they are lightly pounded with a wooden block to break up aggregates of fine particles and are then passed through a 35 mesh stainless steel sieve. The coarse material is discarded and the minus 35 mesh fraction replaced in the original bag providing that this is undamaged and not excessively dirty.

Rock samples are exposed to the air until the outside surfaces are dry; only if abnormally wet are rocks placed in the sample drier. Rock samples are processed in such manner that a fully representative 1/2 g. sample can be obtained for analysis. The entire amount of each sample is passed through a jaw crusher and thus reduced to fragments of 2 mm. size or less. A minimum of 1 kg. is then passed through a pulverizer with plates set such that 95% of the product will pass through a 100 mesh

screen. Where samples are appreciably heavier than 2 kg the material is split after jaw crushing by means of a Jones splitter. After pulverizing the sample is mixed by rolling on paper and is then placed in a Kraft paper bag.

SAMPLE DIGESTION

Digestion tubes (100 x 16 mm) are marked at the 5 ml level with a diamond pencil. Tubes are cleaned with hot water and concentrated HCl. 0.5 g samples are weighed accurately, using a Fisher Dial-O-Gram balance, and placed in the appropriate tubes.

To each of the samples thus prepared are added 2 ml of an acid mixture comprising 15% nitric and 85% perchloric acids. Racks of tubes are then placed on an electrical hot plate, brought to a gentle boil ($\frac{1}{2}$ hour) and digested for $4\frac{1}{2}$ hours. Samples unusually rich in organic material are first burned in a porcelain crucible heated by a bunsen burner before the acid mixture is added. Digestion is performed in a stainless steel fume hood.

After digestion tubes are removed from the hot plate and the volume is brought up to 5 ml with deionized water. The tubes are shaken to mix the solution and then centrifuged for one minute. The resulting clear upper layer is used for Cu, Mo, Pb, Zn, Ag, Fe, Mn, Ni and Co determination by a Perkin-Elmer 290B atomic absorption spectrophotometer. Analytical procedures are given on the following pages.

ANALYTICAL PROCEDURES

Silver

1. Scope - This procedure covers a range of silver in the sample from less than .5 to 1000 ppm
2. Summary of Method - The sample is treated with nitric and perchloric acid mixture to oxidize organics and sulphides. The silver then is present as perchlorate in aqueous solution. The concentration is determined by atomic absorption spectrophotometer.
3. Interferences - Silver below 1 gamma/ml is not very stable in solution. Maintaining the solution in 20% perchloric prevents silver being absorbed on the glass container. Determination must be completed on the same day as the digestion.

Samples high in dissolved solids, especially calcium, cause high background absorbance. This background absorbance must be corrected using an adjacent Ag line.

Silver AA Settings P.E. 290

Lamp - Ag

Current 4 ma position 3

Slit 7 A

Wavelength 3281A Dial 287.4

Fuel - acetylene - flow - 14

Oxidant - air - flow - 14

Burner - techtron AB_51 in line

Maximum Conc. 3 to 4x

Calibration

1. Set 1 gamma/ml to read 40 equivalent to 20 gamma/gm
Factor $\frac{1}{2}$ x meter reading
Check standards
4, 10, 20, 40 ppm Ag in sample
2. Set 15 gamma/ml to 100 equivalent to 100 ppm
Check standards
40, 100 ppm
Factor directly in ppm Ag
3. Rotate burner to maximum angle
Set 10.0 gamma/ml Ag to read 100
Check standards
100, 200, 400, 1000 ppm Ag
Factor 10x scale reading
4. Samples higher than 1000 ppm should be re-analyzed by assay procedure
5. Background correction for sample reading between 1 to 5 ppm
Calibrate AA in step 1
Dial wavelength to 300 (peak)
Read the samples again
Subtract the background reading from the first reading

Standards

1. 1000 gamma/ml Ag - 0.720 gm Ag_2SO_4 dissolved in 20 mls Hx10_3
and dilute to 500 mls
2. 100 gamma/ml Ag - 10 mls of above + 20 mls HClO_4 , dilute to
100 mls

3. Recovery spiked standard

5 gamma/ml Ag - 5 mls 100 gamma/ml dilute to 100 mls with
"mixed" acid

Working AA Standards

Pipette .2, .5, 1, 2, 5, 10 mls of 100 gamma/ml and 2, 5 mls 1.000 gamma/ml dilute to 100 mls with 20% HClO₄. This equivalent to 4, 10, 20, 40, 100, 200, 400, and 1000 ppm Ag in the sample .50 gm diluted to 10 mls.

Recovery Standard

Pipette 2 mls of .5 gamma/ml Ag in mix acids into a sample and carry through the digestion. This should give a reading of 20 ppm Ag + original sample content.

Follow the general geochemical procedure for sample preparation and digestion.

For low assay Ag, the same procedure is used. Ag is then calculated in oz/ton.

$$1 \text{ ppm} = .0292 \text{ oz/ton}$$

conversion factor

$$\text{oz/ton} = .0292 \times \text{ppm Ag}$$

Zn Geochemical AA Setting

Lamp Zn

Current 8 #3 Slit 20A

Wave length 2133 Dial 84.9

Fuel - Acetylene Flow 14

Oxidant - Air Flow 14

Burner - P.E. short path 90°

Range

0 - 20 gamma/ml Factor 4x - 0 to 400 ppm

0 - 50 gamma/ml Factor 10x - 0 to 1000 ppm

For Waters - Burner AB- 51 in line 1 gamma/ml read 100 to give 0
to 1000 ppb

High Zn Burner Boling in line. Wavelength 3075. Dial 250 Slit 7A

Fuel 14 Air 14.5

0 to 1000 gamma/ml read 0 to 20 Factor 400 x

Pure Standard 10,000 gamma/ml

1 gm Zn dissolved, H₂O, HCl, HNO₃, HClO₄, fumed to HClO₄ -
make up to 100 mls H₂O

1000, 100 gamma/ml and 100 ml by dilution in 20 % HClO₄

0 to 200 gamma/ml Zn use combined Cu, Ni, Co, Pb, Zn standards

Pipette

1, 2, 3, 5, 8, 10 mls of 10,000 gamma/ml - dilute to 100 mls
with 20% HClO₄ to give

100, 200, 300, 500, 800, 1000 gamma/ml Zn for high standards

Co Geochemical AA Setting

Lamp - 5 multi element

Current 10 #4 Slit 2A

Wavelength 2407 Dial 133.1

Fuel - Acetylene Flow 14

Oxidant - Air Flow 14

Burner - AB 51 in line

Range

0 - 10 gamma/ml read 100 Factor 2 x reading to 200 ppm

0 - 20 gamma ml read 100 Factor 4 x reading to 400 ppm

Burner at maximum angle

0 - 100 gamma/ml read 100 Factor 20 x reading to 2000 ppm

0 - 200 gamma/ml read 100 Factor 40 x reading to 4000 ppm

Standards - 1000 gamma/ml

1.000 gm cobalt metal dissolved in HCl, HNO₃, and fumed into
HClO₄, dilute to 1 liter

Pipette

1, 2, 10, 20 mls into 100 ml vol flasks diluted to mark
with 20% HClO₄

This gives

10, 20, 100, 200 gamma/ml Co

Mixed - combination standards of Cu, Ni, Co, Pb, Zn

of

1, 2, 5, 10, 20, 30, 50, 80, 100, 150, 200 gamma/ml are used
for calibration

Mn Geochemical AA Setting

Lamp Multi element Ca, Ni, Co, Mn Cr

Current 10 #4 Slit 7A

Wave length 4030.8 Dial 425.2

Fuel - Acetylene Flow 14.0

Oxidant - Air Flow 14.0

Burner - P.E. short path (or AB 50)

Range

0 - 100 gamma/ml Factor 20x - 0 to 2000 ppm

0 - 200 gamma/ml Factor 40x - 0 to 4000 ppm

Burner 90°

0 - 1000 gamma/ml Factor 200x - 0 to 20,000 ppm

0 - 2000 gamma/ml Factor 400x - 0 to 40,000 ppm

EDTA Extraction - use AB 51 in line

0 - 20 gamma/ml Factor 4x - 0 to 400 ppm

Standards

Fisher 10,000 gamma/ml (ml)

10x Dilution 1000 gamma/ml

Pipette

.5, 1, 2, 3, 5, 8, 10, ml of 1000 gamma/ml

2, 3, 5, 8, 10, 15, 20 ml of 10,000 gamma/ml dilute to 100

mls with 20% HClO₄. This gives

5, 10, 20, 30, 50, 80, 100, 200, 300, 500, 800, 1000, 1500,

2000 gamma/ml.

Mo Geochemical AA Setting

Lamp ASL H/C Mo

Current 5 #5 Slit 7A

Wavelength 3133 Dial 260.2

Fuel - Acetylene Flow 12.0 to give 1" red feather

Oxidant - Nitrous oxide Flow 14.0

Burner - AB 50 in line

Caution read the operation using N₂O and acetylene flame at
end of general AA procedure

Range

0 - 10 gamma/ml Factor 2x - 0 to 200 ppm

Rotate burner to max. angle

0 - 50 gamma/ml Factor 10 x 0 to 1000 ppm

0 - 100 gamma/ml Factor 20 x 0 to 2000 ppm

Standards 1000 gamma/ml

Dissolve .750 gms MoO₃ (acid molybdic) with 20 mls H₂O, 6
lumps NaCH, when all dissolved, add 20 mls HCl, dilute to 500 mls
100 gamma/ml - 10 x dilution

Pipette

.2, .5, 1, 2, 3, 5, 8, 10 mls of 100 gamma/ml

2, 3, 5, 8, 10 mls of 1000 gamma/ml add 5 mls 10% AlCl₃
and dilute to 100 mls with 20% HClO₄

This gives

.2, .5, 1, 2, 3, 5, 8, 10, 20, 30, 50, 80, 100 gamma/ml Mo

Fe Geochemical AA Setting

Lamp - Fe

- Do not use multi element Fe

Current 10 #4 Slit 2A

Wavelength 3440.6 Dial 317.5

Fuel - Acetylene Flow 14.0

Oxidant - Air Flow 14.0

Burner - PE Short Path 90°

Range

0 - 5000 gamma/ml 0.1 x % - 0 to 10.0%

0 - 10,000 gamma/ml 0.2 x % - 0 to 20.0%

Higher Fe - 10 x dilution

Standards 10,000 gamma/mlWeigh 5.000 gms iron wires, into beaker, add H₂O, HCl, HNO₃,HClO₄, heat to HClO₄ fumes. Add HClO₄ to 100 mls + 100 mlsH₂O, warm, dilute to 500 mls

Pipette

1, 5, 10, 20, 30, 50, 80 mls 10,000 gamma/ml dilute to 100
mls with 20% HClO₄ to give100, 500, 1000, 2000, 3000, 5000, 8000 gamma/ml to be
equivalent to .2, 1.0, 2.0, 4.0, 6.0, 10.0%, 16.0% Fe in geochem
sample

Ni Geochemical: AA Setting

Lamp P.E. H/C. Ni or multi element Cu, Ni, Co, Mn, Cr

Current 10 #4, Slit 2A

Wave length 3415 Dial 312.5

Fule - Acetylene Flow 14.0

Oxidant - Air Flow 14.0

Burner AB 51 in line

Range

0 - 20 gamma/ml Factor 4x - 0 - 400 ppm

0 - 100 gamma/ml Factor 20x - 0 - 2000 gamma

45° 0 - 200 gamma/ml Factor 40x - 0 - 4000 ppm

0 - 500 gamma/ml Factor 100x - 0 - 10,000 ppm

Ni in waters and very low ranges

Wave length 2320 Dial 113

Range 0 - 5 gamma/ml Factor 1x - 0 - 100 ppm

Standards 10,000 gamma/ml

1.000 gm pure Ni metal dissolved in HCl, HNO₃, HClO₄ to
perchloric fumes, dilute to 100 ml H₂O

1000 gamma/ml and 100 gamma/ml Successive 10x dilutions in 20% HClO₄

1, 2, 5, 8, 10 mls of 100 gamma/ml

2, 5, 8, 10 mls 1000 gamma/ml

2, 5, 8, 10 mls 10,000 gamma/ml - dilute to 100 mls in 20%

HClO₄. This gives

1, 2, 5, 8, 10, 20, 50, 80, 100, 200, 500, 800, 1000 gamma/ml

Combined Standards - Cu, Ni, Co, Pb, Zn is used as a working
standard

Cu Geochemical AA Setting

Lamp Single Cu or

5 multi element

Current 10 for multi element #4 Slit 7A

4 for single #3 Slit 7A

Wavelength 3247 Dial 280

Burner Techtron AB 51 (For Cu in natural waters)

P.E. Short Path (For geochem)

Fuel Acetylene Flow 14

Oxidant Air Flow 14

Range

0 - 5 gamma/ml Factor 1x to 100 ppm (for low Cu)

0 - 20 gamma/ml Factor 4x to 400 ppm

Burner 90°

0 - 200 gamma/ml Factor 40x to 4000 ppm

Wavelength 2492 Dial 147

Burner in line

Range

0 - 1000 gamma/ml Factor 200x to 20,000 ppm

0 - 2000 gamma/ml Factor 400x to 40,000 ppm

Higher range than 40,000 ppm requires 10x dilution

Standards

10,000 gamma/ml

1.000 gm metal powder, H₂O, HCl, HNO₃ until dissolved, addHClO₄ , fume dilute to 100 mls

1000 gamma/ml 10x dilution above in 20% HClO₄

2000 gamma/ml 20 mls 10,000 gamma/ml - dilute to 100 mls in
20% HClO₄

100 gamma/ml 10x dilution 1000 gamma/ml dilute to 100 mls in
20% HClO₄

200 gamma/ml 10x dilution 2000 gamma/ml dilute to 100 mls in
20% HClO₄

Pipette

1, 2, 3, 5, 8, 10 mls 100 gamma/ml - dilute to 100 mls with
20% HClO₄ to give 1, 2, 3, 5, 8, 10 gamma/ml

Combined standards Cu, Ni, Co, Pb, Zn

1, 2, 5, 10, 20, 30, 50, 80, 100, 150, 200 gamma/ml

Pb Geochemical AA Setting

Lamp ASL H/c Pb

Current 5 ma Slit 7A

Wave length 2833 Dial 208

Fuel - acetylene Flow 14

Oxidant - air Flow 14

Burner AB 51 in line

Range

0 - 20 gamma/ml to read 0 to 80. Factor 5x 0 to 500 ppm

0 - 200 gamma/ml to read 0 to 80. Factor 50x 0 to 5000 ppm

Standards - 10,000 gamma/ml

1.000 pure metal, dissolved in HNO₃, fumed to HClO₄ make up to 100 mls in 20% HClO₄

1000 gamma/ml and 100 gamma/ml Successive 10x dilutions in 20% HClO₄

Pipette

1, 2, 5, 8, 10 mls 100 gamma/ml

2, 5, 8, 10, 20 mls 1000 gamma/ml dilute to 100 mls in 20%

HClO₄ this gives

1, 2, 5, 8, 10, 20, 50, 80, 100, 200 gamma/ml

Combined Standards Cu, Ni, Co, Pb, Zn, are used as working standards

W in Soils and Silts

Reagents and apparatus

Test tubes - pyrex disposable

Test tubes - screw cap

Bunsen Burner

Flux - 5 parts Na_2CO_3

4 parts NaCl

1 part KNO_3 pulverized to -80 mesh

7% SnCl_2 in 70% HCl

20% KSCN in H_2O

Extractant - 1 part tri-n-butyl phosphate

9 parts carbon tetrachloride

Standards

1000 gamma/ml W

.18 gms $\text{Na}_2\text{WO}_4 \cdot 2\text{H}_2\text{O}$ dissolved in H_2O , make up to 100 mls

100 gamma/ml, 10 gamma/ml by dilution

Standardization

Pipette .5, 1, 2, 3, 5, 8, 10 ml of 10 gamma/ml

and 1.5, 2 mls of 100 gamma/ml - dilute to 10 mls

continue from step #4

Artificial colors - Nabob pure Lemon Extract, dilute with 1:1 ethanol and water to match. Tightly seal these for permanent standards

Procedure

1. Weigh 1.0 gram sample, add 2 gm flux, mix

2. Sinter in rotary for 2 to 3 minutes (Flux dull red for one minute)
3. Cool, add 10 mls H_2O , heat in sand bath to boiling, cool, let sit overnight
4. Stir, crush, and mix. Let settle
5. Take 2 ml aliquot into screw cap test tube
6. Add 7 mls $SnCl_2$, heat in hot water bath for 5 minutes ($80^\circ C$)
7. Cool to less than $15^\circ C$
8. Add 1 ml 20% KSCN, mix (if lemon yellow; compare color standard 10x)
9. Add $\frac{1}{2}$ ml extractant, cap, shake vigorously 1 minute
10. Compare color

Molybdenum in Water Samples

1. Transfer 50 mls to 125 separatory funnel
2. Add 5 ml .2% ferric chloride in conc HCl
3. Add 5 mls of mixed KSCN and SnCl₂
4. Add 1.2 mls isopropyl ether, shake for 1 minute, and allow phases to separate
5. Drain off water
6. Compare the color of extractant

Standardization

Pipette 0, .2, .5, 1, 2, 3, 4, 5, mls of 1 gamma/ml and 1, 1.5, 2, mls of 10 gamma/ml dilute to 50 mls with demineralized H₂O, and continue step #2.

This equivalent to

1, 4, 10, 20, 40, 60, 80, 100, 200, 300, 400 ppb Mo

Artificial color - Nabob orange extract dilute with 1:1 H₂O to methanol to match. Seal tightly

SnCl₂ - 15% in .15% HCl

300 gm SnCl₂ . 2H₂O + 300 mls HCl, until SnCl₂ dissolved
dilute to 2 liters

KSCN - 5% in H₂O

Mixed SnCl₂ - KSCN

3 parts SnCl₂ to 2 parts KSCN

Water Samples Run for AA

1. Cu - 2 gamma/ml reads 80 scale therefore 1 unit = 25 ppb
2. Zn - 1 gamma/ml reads full scale therefore 1 unit = 10 ppb
3. Ni - 2.5 gamma/ml reads 50 scale therefore 1 unit = 50 ppb

Burner: long slot techtron burner in line

Sulphate in Natural Waters

1. Pipette 0.5 ml sulphate reagent mix into a colorimetric tube
2. Add 5 ml water sample and mix
3. Read at 343 $m\mu$ against a demineralized water blank
4. Read again at 400 $m\mu$ and subtract from sulphate reading
5. Calculate ppm sulphate from the graph

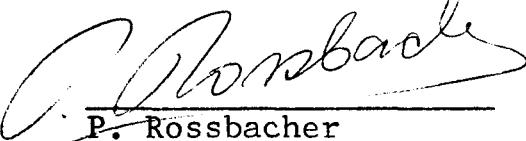
Reagent

Dissolve 54 grams red mercuric oxide (J.T. Baker 2620- Can Lab) in 185 ml 70% perchloric acid and 20 ml H_2O , shake for one hour. Add 46.3 grams ferric perchlorate $[Fe(ClO_4)_3 \cdot 6H_2O]$ (GFS 39) and 47 grams aluminum perchlorate $[Al(ClO_4)_3 \cdot 3H_2O]$ (GFS 2) Add 400 ml water to dissolve, let settle overnight, decant into bottle and make to 1 liter

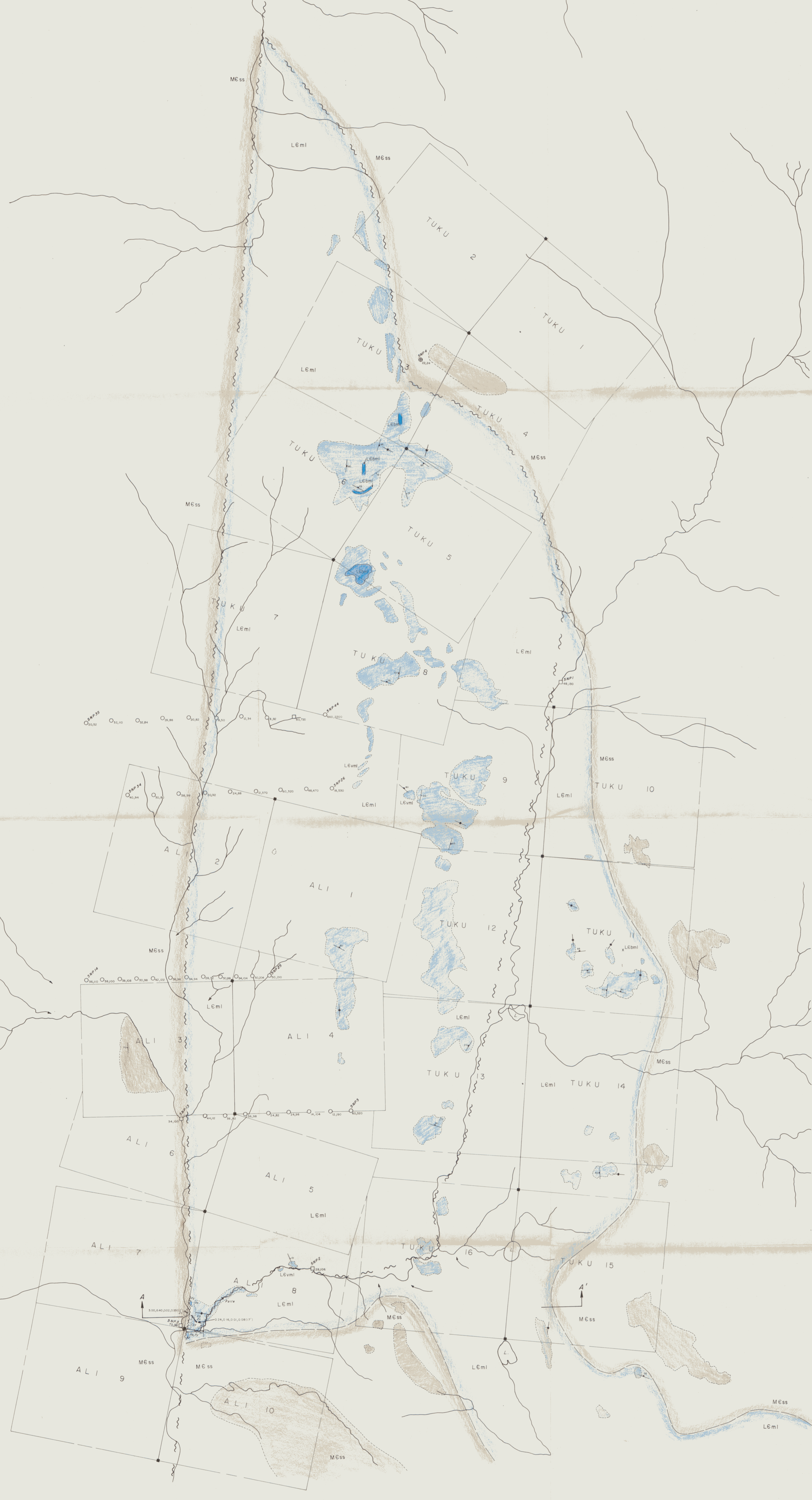
pH MEASUREMENTS

Soil and drainage sediment samples are dampened with water in a glass beaker to a pasty consistency. Demineralized water is used for this purpose as it has a low buffer capacity and thus does not influence the pH of the sample. Measurement is made with a Fisher Acument pH meter. Electrodes are stored in buffer overnight. A 30 minute warm up time is allowed for the instrument each morning. A 10 ml aliquot is taken from water samples for pH measurement.

ROSSBACHER LABORATORY



P. Rossbacher



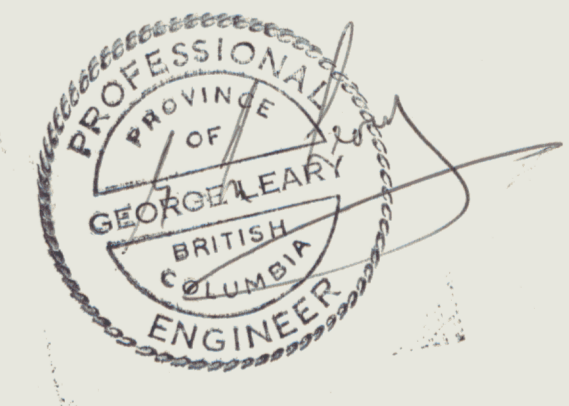
LEGEND

- MIDDLE CAMBRIAN**
 MEss Siltstone and fine grained clastics.
- LOWER CAMBRIAN**
 LEml Micritic limestone, light grey to dark grey, locally with organic material (blue); and moderately vuggy (LEvml).

SYMBOLS

- Outcrop.
- Suboutcrop or boulder.
- Geological contact (defined, approximate).
- Fault.
- Bedding attitude.
- Jointing attitude (inclined, vertical).
- Soil sample site, sample number; p.p.m. Pb, Zn.
- Silt sample site, sample number; p.p.m. Pb, Zn.
- Rock chip sample site, sample number; p.p.m. Pb, Zn.
- Continuous chip sample location; %Pb,Zn,Cu,Ag (footage).
- Claim post, claim location line.
- Claim boundary.
- Stream.

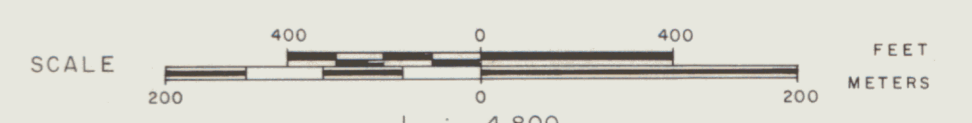
NOTE —
 For geochemical determination values other than Pb or Zn see APPENDIX II



AMAX EXPLORATION INC.

DOLL CREEK SOUTH PROPERTY
 DAWSON MINING DISTRICT — YUKON

GEOLOGICAL MAP



CROSS-SECTION A - A'
 LOOKING NORTH

To accompany "1975 GEOLOGICAL REPORT ON THE DOLL CREEK SOUTH PROPERTY" by J. B. Aisen and G. M. Leary.