2719

STREAM GEOCHEMISTRY -- KITSELAS MOUNTAIN

J. R. Woodcock

North Vancouver, B.C.

July 29, 1970

TABLE OF CONTENTS

FIGURES

Geochemical Analytical Reports

STREAM GEOCHEMISTRY -- KITSELAS MOUNTAIN

SAMPLING PROGRAM

In the last half of June, 1970 Mr. Nick Wychopen and an assistant did detailed stream sampling in Hankin Creek, Lowrie Creek, and the intervening small creeks flowing eastward into the Skeena River. At the time of sampling snow filled the upper reaches of both Hankin Creek and Lowrie Creek and thus some of the tributaries could not be sampled.

At most sites, both silt samples and water samples were taken. However at a few sites only water samples were available. A length of coloured marking tape with the sample numbers written on it has been left at each site so that the exact spot can be easily relocated. These sites are labelled as follows, e.g. N70-235L -

"N" is the letter assigned to the sampler
"70" is the year of the sampling
"235" is the sample number
"L" refers to the type of material sampled

The type of material sampled can be either silt (L), water (W), rock (R), or a gully sample (G). A gully sample is essentially a soil sample taken out of the bottom of a water course where no silt is available.

Data for each site is included on the field sample forms which are on file at J. R. Woodcock Consultants Ltd. This data includes stream dimensions, material of sample, organic content, etc.

The aerial photographs (scale approximately 1" = 3000 feet) were used in the field as a base for plotting samples. In the office a base map was compiled from these aerial photographs by merely tracing the streams on overlay paper. This base map is not corrected for photo distortion. The scale is approximately 1" = 3300 feet.

ANALYTICAL WORK

All of the silt samples were run for zinc, copper, and molybdenum. Each of these metals is plotted on a separate copy of the base map. Silver geochemical values were obtained for all of the samples taken along Hankin Creek and some samples taken along the Skeena River. However since only background values were obtained, the silver analytical work for the remaining silt samples was omitted.

Generally water samples are not as useful for geochemical work as are the silt samples but they are necessary in low areas where silts are not available. In the geochemical sampling done for the Kitselas project, silts were available at most of the small drainages. Because of the abundance of silt samples and because the sampling was done at the peak of the run-off when water would be greatly diluted, only a few of the water samples have been analyzed for pH and molybdenum. The remainder will be kept at the laboratory for a short time in case analytical work is requested.

RESULTS

When appraising the results of this geochemical program, one must be aware that during the vigorous water run-off at this time of the year, much of the fine silt which generally carries the metal values would be washed away. Thus these silts will probably have lower values than silts collected late in the summer.

Anomalous geochemical values have been obtained in four areas and these anomalous areas are of varying merit.

(A) The first area to be discussed is the area of creeks draining Kitselas Mountain and running eastward into the Skeena River. This Skeena area has moderately anomalous copper values, background molybdenum values, background silver values, and slightly above background zinc values. These geochemical values are contributed by the chalcocite-bornite mineralization which occurs in the volcanic rocks and which is the object of the present exploration investigation. The absence of molybdenum values is expected.

(B) The area of the more interestihg geochemical values occurs on the northeast side of Hankin Creek in the vicinity of the lower camp. At this place all streams for a length of about 2000 feet along Hankin Creek contain anomalous copper and molybdenum values in silt. These anomalous values show up in three large streams (sample numbers 183, 188, 192) and in the intervening short streams (sample numbers 186, 190). The type of geochemical anomalies could be indicative of porphyry copper mineralization.

The water samples taken in this area show some anomalous molybdenum values, both on the northeast and southwest sides of Hankin Creek. Thus the zone of mineralization might straddle Hankin Creek.

(C) At the head of Hankin Creek several of the small tributaries have zinc values that are somewhat higher than background. These are accompanied by background values in both copper and molybdenum. This might be formational or it might be related to the inferred porphyry copper mineralization mentioned above. However the information is too meager to place much reliance on such interpretations.

(D) At the head of Lowrie Creek, especially in the north fork, there are some slightly anomalous molybdenum values. These are accompanied by moderately anomalous zinc values (e.g. sample site 393). One must note that at the time the sampling was done these tributaries of the north fork were raging torrents with a volume of flow out of proportion to the small size of creek shown on the map. Therefore the small anomalies may be of more significance than their magnitude indicates. Molybdenum mineralization is reported from this general area and this could be the cause of the small anomalies.

CONCLUSIONS AND RECOMMENDATIONS

1. The chalcocite mineralization is indicated by moderately to low anomalous values of copper and no corresponding molybdenum values. This

type of geochemical combination appears to be restricted to the creeks that flow eastward into the Skeena River.

2. The anomalous copper values along the east side of Hankin Creek are interesting. The combination of copper and molybdenum indicates porphyry copper mineralization. The somewhat anomalous molybdenum in water occurs on both sides of Hankin Creek. Possibly the mineralized zone crosses to the southwest of Hankin Creek where it is completely covered by valley fill.

Because the writer knows nothing about the overburden conditions in this area it is impossible to make any intelligent guesses as to the grade or size. The size seems somewhat restricted -- anomalous copper values occur for 2000 feet along the northeast side of Hankin Creek. The short streams that flow into Hankin Creek from the southwest do not have particularly anomalous copper values. However they could be flowing over valley fill.

3. As stated above the anomalous copper and molybdenum values occur in three long creeks and in the intervening short creeks. This possibly indicates that the source of the metals is on the slopes of the valley and not at the headwaters of the long creeks. Further investigation of this anomalous area could include:

(A) Detailed silt sampling (approximately every 500 feet) of the three longer creeks to determine the cutoff value uphill.

(B) Prospecting of the anomalous area to find if there are any outcrops which will give an indication of the possible grade of the mineralization.

(C) If outcrops are not abundant enough to indicate the merit of the anomalous zone, then soil sampling could be done along lines parallel to Hankin Creek.

J. R. Woodcock

J. R. Woodcock

July 29, 1970

C
O
P
Y FOR Mr. Gordon F. E. White
No. 7, 821 West Pender Street
Vancouver, B. C.

July 15, 1970

Mr. Hugh Mogensen
Canadian Industrial Gas & Oil Ltd.
640 - 8th Avenue South West
Calgary, Alberta

Dear Hugh:

Enclosed are the results of the rock geochemical samples taken across the mineralized Zone A on Kitselas Mountain. The positions of the two profiles are described on the sketches. The samples are taken from the erosion surface and not from the fresh trenches.

The tuff beds appear to dip gently northwest, so the upper profile will be across beds and the lower profile will be approximately along a bed.

The metal values (ppm) are as follows:

	Cu	Zn	Ag
Ore zone	2200 to 4600	60 to 200	11 to 44
Background	2 to 18 (generally <6)	5 to 75	< 1

One can conclude from this quick orientation test that the small grab samples for geochemical analyses will indicate whether or not the sample site is in mineralization. However there is no good dispersion pattern outward from the zone to help guide one to a mineralized zone.

The results of the stream geochemistry are now plotted and a report will be issued shortly.

Yours very truly,

J. R. Woodcock

JRW:mb
cc; Peter Marshall, Canadian Industrial Gas & Oil Ltd.,
Okanagan Helicopters, Terrace, B. C.

cc: Mr. Gordon F. E. White, No. 7, 821 West Pender Street,
Vancouver, B. C.

Vancouver Geochemical Laboratories Ltd.
1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C., CANADA TELEPHONE: 604-988-2171

J. R. WOODCOCK
CONWAY CHUN

October 15, 1970

TO: Gordon P.E. White & Associates Ltd.,
No. 7 - 821 West Pender Street,
Vancouver 1, B. C.

FROM: Mr. Laurie Nicol, Supervisor Chemist
Vancouver Geochemical Laboratories Ltd.
1521 Pemberton Avenue
North Vancouver, B.C.

SUBJECT: Analytical procedure used to process acid soluble Cu and Zn in geochemical samples received from Mr. Gordon White.

1. Sample Preparation

(a) Geochemical soil, silt and rock samples were received in the laboratory in wet-strength 3½ x 6½ Kraft paper bags.

(b) The wet samples were dried in a ventilated oven.

(c) The dried soil and silt samples were sifted, using an 80-mesh stainless steel sieve. The plus 80-mesh fraction was rejected and the minus 80-mesh fraction was transferred into a new bag for analysis later.

(d) The dried rock samples were crushed and pulverized to minus 80-mesh. The pulverized sample was then put in a new bag for later analysis.

2. Methods of Digestion

(a) ~~1.00 gram~~ or 0.50 gram of the minus 80-mesh samples was used. Samples were weighed out by using a top-loading balance.

(b) Samples were heated in a sand bath with nitric and perchloric acids (15% to 85% by volume of the concentrated acids respectively).

Continued . . . . .

2. Methods of Digestion (Continued)

(c) The digested samples were diluted with demineralized water to a fixed volume and shaken.

3. Method of Analysis

Cu and Zn analyses were determined by using a Techtron Atomic Absorption Spectrophotometer Model AA4 or Model AA5 with their respective hollow cathode lamp. The digested samples were aspirated directly into an air and acetylene flame. The results, in parts per million, were calculated by comparing a set of standards to calibrate the atomic absorption unit.

4. The analyses were supervised or determined by Mr. Conway Chun, or Mr. Laurie Nicol and their laboratory staff.

C. Chun
VANCOUVER GEOCHEMICAL LABORATORIES LTD.

LJN/ati

Vancouver Geochemical Laboratories Ltd.

1521 PEMBERTON AVENUE NORTH VANCOUVER, B.C., CANADA TELEPHONE: 604-988-2171

J. R. WOODCOCK
CONWAY CHUN

October 15, 1970

TO: Gordon P.E. White & Associates Ltd.,
No. 7 - 821 West Pender Street,
Vancouver, 1, B. C.

FROM: Mr. Laurie Nicol, Supervisor Chemist
Vancouver Geochemical Laboratories Ltd.
1521 Pemberton Avenue
North Vancouver, B. C.

SUBJECT: Analytical procedure used to process acid soluble molybdenum in geochemical samples received from Mr. Gordon White.

1. Sample Preparation

(a) Geochemical soil, silt and rock samples were received in the laboratory in wet-strength $3\frac{1}{2}$ x $6\frac{1}{2}$ Kraft paper bags.

(b) The wet samples were dried in a ventilated oven.

(c) The dried soil and silt samples were sifted, using an 80-mesh stainless steel sieve. The plus 80-mesh fraction was rejected and the minus 80-mesh fraction was transferred into a new bag for analysis later.

(d) The dried rock samples were crushed and pulverized to minus 80-mesh. The pulverized sample was then put in a new bag for later analysis.

2. Methods of Digestion

(a) ~~1.00 gram~~ or 0.50 gram of the minus 80-mesh samples was used. Samples were weighed out by using a top-loading balance.

(b) Samples were heated in a sand bath with nitric and perchloric acids (15% to 85% by volume of the concentrated acids respectively).

Continued . . . .

2. Methods of Digestion (Continued)

(c) The digested samples were diluted with demineralized water to a fixed volume and shaken.

3. Method of Analysis

Molybdenum analyses were determined by using a Techtron Atomic Absorption Spectrophotometer Model AA4 with a molybdenum hollow cathode lamp. The digested samples were aspirated directly into a nitrous oxide acetylene flame. The results were read out on a Photovolt Varicord Model 43 chart recorder. The molybdenum values, in parts per million, were calculated by comparing a set of molybdenum standards.

4. The analyses were supervised or determined by Mr. Conway Chun, or Mr. Laurie Nicol and their laboratory staff.

Conway Chun

XXXXXXXXXXX

C. Chun

VANCOUVER GEOCHEMICAL LABORATORIES LTD.

LJN/ati

GORDON P. E. WHITE & ASSOCIATES LTD.
CONSULTING GEOLOGISTS

OFF: 688-0748
RES: 681-2673

821 WEST PENDER STREET
VANCOUVER 1, B.C.

COST - GEOCHEM. SURVEY

J.R. WOODCOCK	- SUPERV & FIELD	JUNE/JULY/70	1212.50
N. WYCHOPEN	- PROSPECTOR	JUNE 15 - JULY 2/70	960.00
J. RUZA	- HELPER	JUNE 15 - JUNE 23/70	360.00
B. GREEN	- "	JUNE 23 - JULY 2/70	200.00
			$ 2732.50

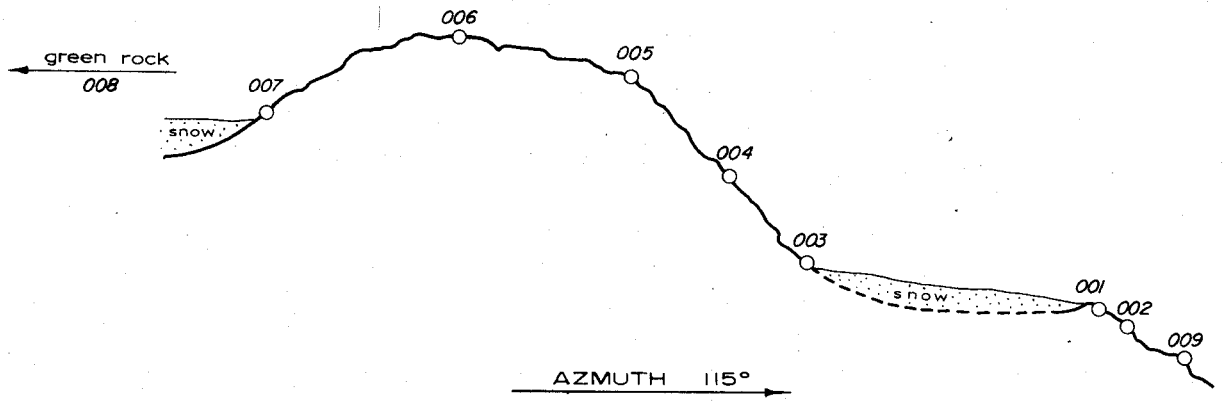
TOPOGRAPHIC CONTROL - LOCKWOOD	$ 2478.50	
ASSAYS	549.18	
DRAFTING, PRINTING, ETC.	166.99	
TYPING	12.00	$ 3206.67
TOTAL		$ 5939.17

Helicop on property $ 2200.02

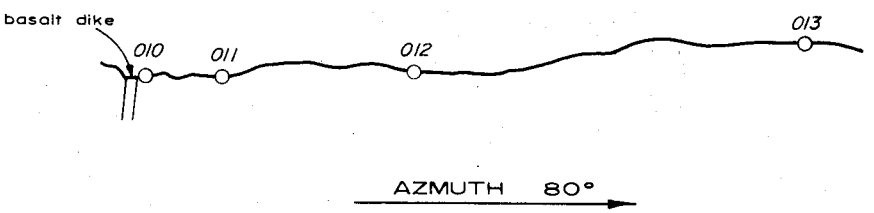
$ 8,139.17

Declared before me at the City of Vancouver, in the Province of British Columbia, this 22 day of October 1970, A.D.

A Commissioner for taking Affidavits within British Columbia or Sub-mining Recorder



ROCK GEOCHEMISTRY PROFILE UPHILL FROM UPPER TRENCH, ZONE A



ROCK GEOCHEMISTRY PROFILE ALONG HILL FROM LOWEST TRENCH, ZONE A

J. R. Woodcock

To accompany Geochemical Report by J. R. Woodcock, P. Eng., on the Gold Star B and C Groups, Kitselas Mountain, Omineca Mining Division, dated July 15, 1970.

CANADIAN INDUSTRIAL GAS & OIL

KITSELAS MOUNTAIN
GEOCHEMICAL ORIENTATION

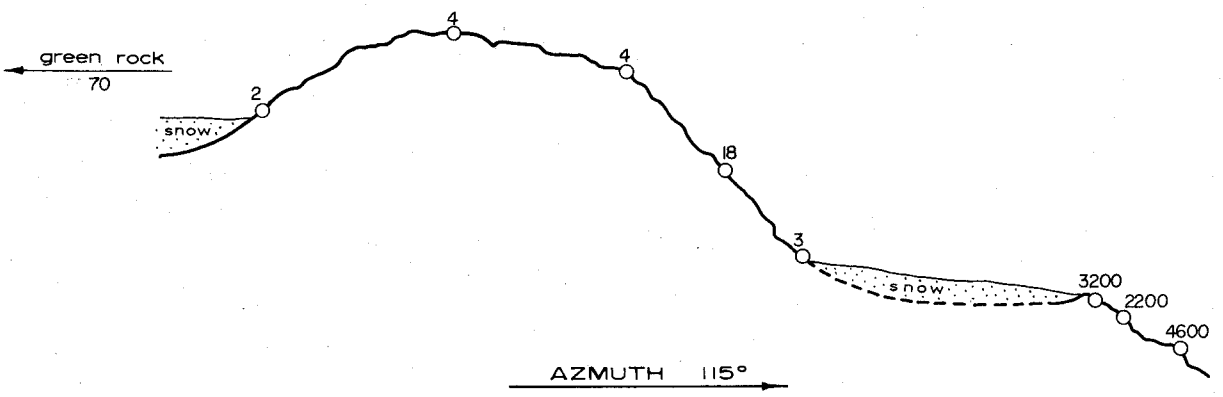
SAMPLE NUMBERS

SCALE: 1" = 40'

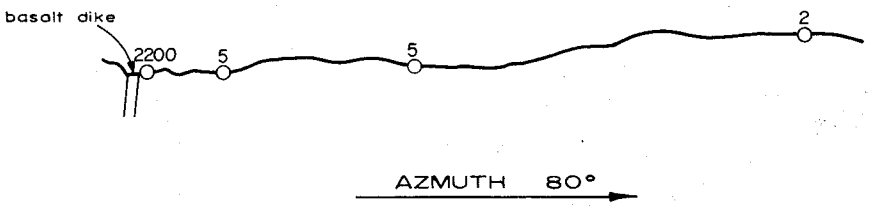
J. R. WOODCOCK CONSULTANTS LTD.

Field work by: J. R. Woodcock

July 1970



ROCK GEOCHEMISTRY PROFILE UPHILL FROM UPPER TRENCH, ZONE A



ROCK GEOCHEMISTRY PROFILE ALONG HILL FROM LOWEST TRENCH, ZONE A

J.R. Woodcock

To accompany Geochemical Report by J.R. Woodcock, P. Eng., on the Gold Star B and C Groups, Kitselas Mountain, Omineca Mining Division, dated July 15, 1970.

CANADIAN INDUSTRIAL GAS & OIL

KITSELAS MOUNTAIN
GEOCHEMICAL ORIENTATION

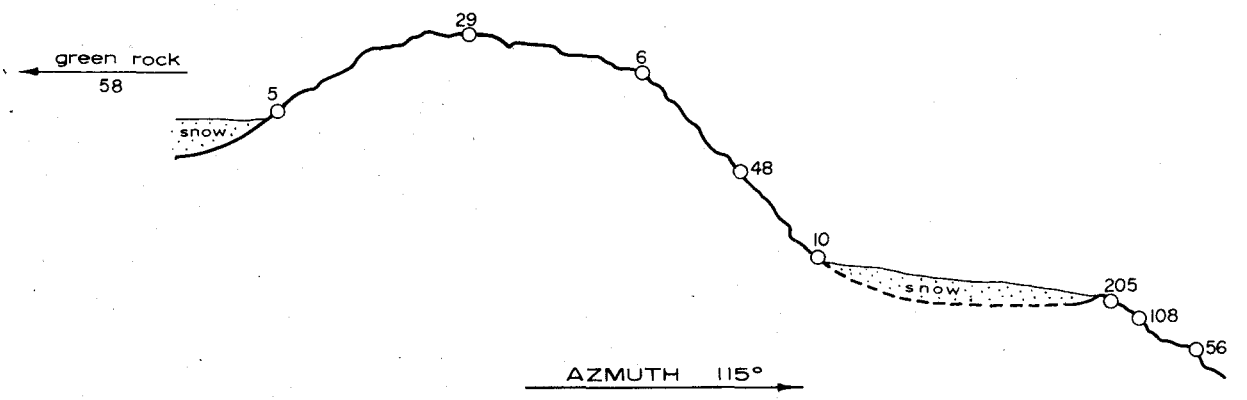
COPPER IN ROCK

SCALE: 1" = 40'

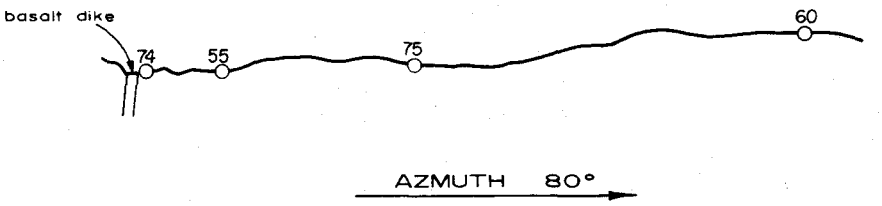
J. R. WOODCOCK CONSULTANTS LTD.

Field work by: J. R. Woodcock

July 1970



ROCK GEOCHEMISTRY PROFILE UPHILL FROM UPPER TRENCH, ZONE A



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J. R. Woodcock

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CANADIAN INDUSTRIAL GAS & OIL

KITSELAS MOUNTAIN
GEOCHEMICAL ORIENTATION

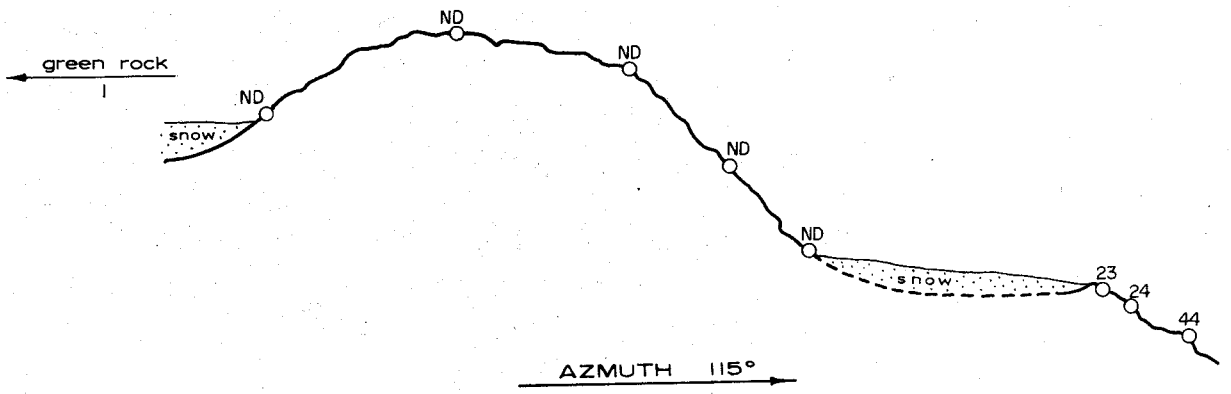
ZINC IN ROCK

SCALE: 1"=40'

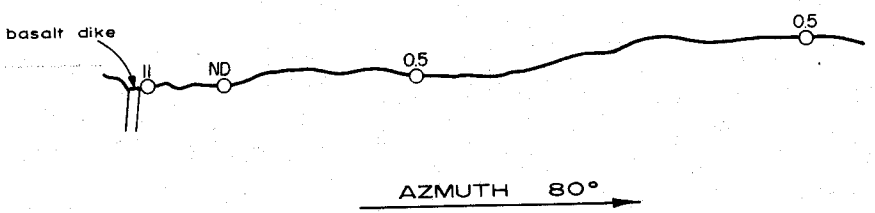
J.R. WOODCOCK CONSULTANTS LTD.

Field work by: J. R. Woodcock

July 1970



ROCK GEOCHEMISTRY PROFILE UPHILL FROM UPPER TRENCH, ZONE A



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J. R. Woodcock

To accompany Geochemical Report by J.R. Woodcock, P. Eng., on the Gold Star B and C Groups, Kitselas Mountain, Omineca Mining Division, dated July 15, 1970.

CANADIAN INDUSTRIAL GAS & OIL

KITSELAS MOUNTAIN
GEOCHEMICAL ORIENTATION

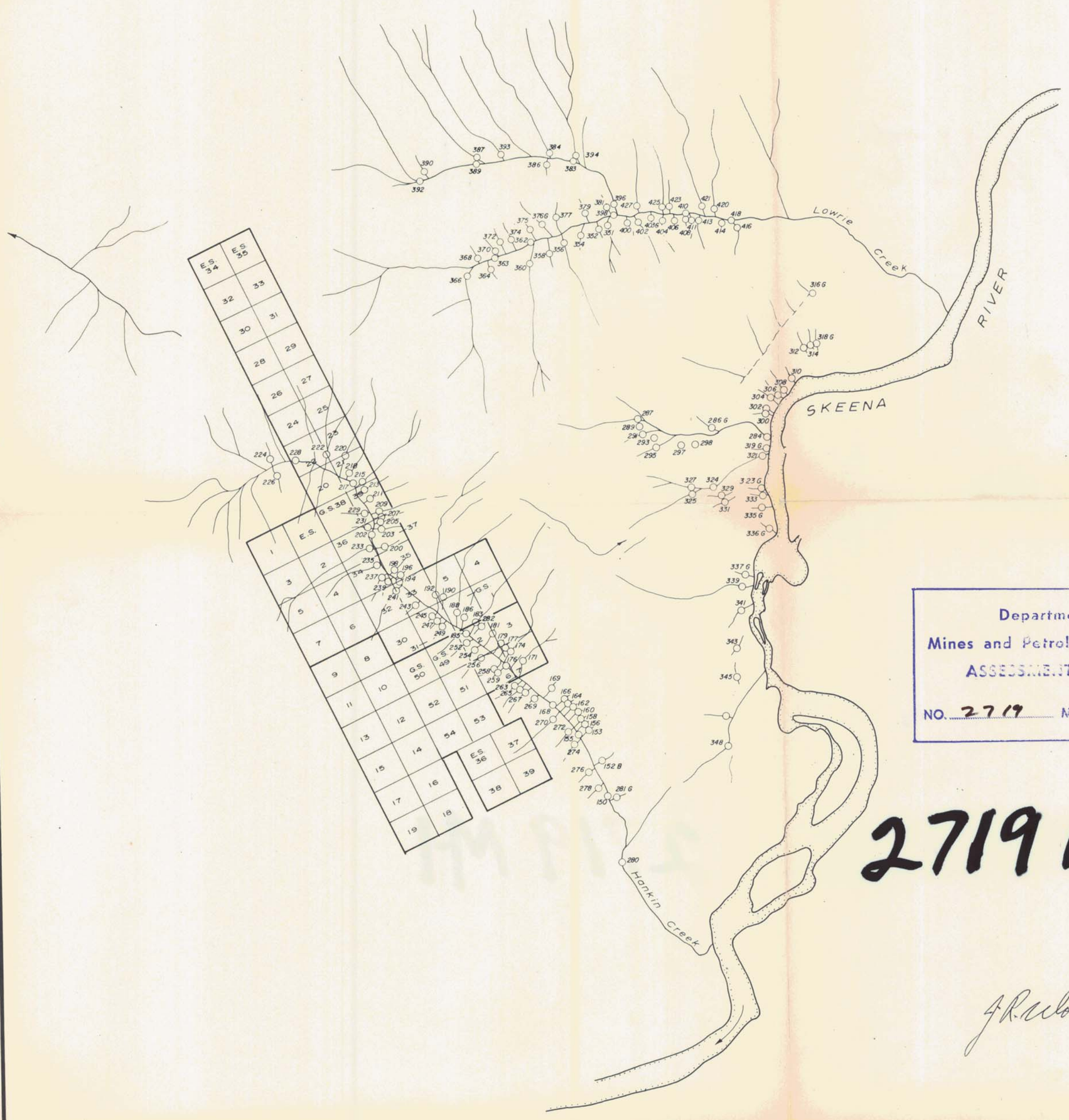
SILVER IN ROCK

SCALE: 1" = 40'

J.R. WOODCOCK CONSULTANTS LTD.

Field work by: J. R. Woodcock

July 1970



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2719 MAP #1

2719 M-1

LEGEND

◊ 336 — SAMPLE SITE & SILT SAMPLE NUMBER (Number appears on ribbon in field as N 70-336 L)

323 G — SAMPLE CONSISTS OF SOIL FROM BOTTOM OF GULLEY. (no silt available)

To accompany Geochemical Report by J.R. Woodcock, P.Eng., on the Gold Star B and C Groups, Kitselas Mountain, Omineca Mining Division, dated July 29, 1970.

FIG. 1

CANADIAN INDUSTRIAL GAS & OIL

KITSELAS MOUNTAIN

SILT SAMPLE NUMBERS

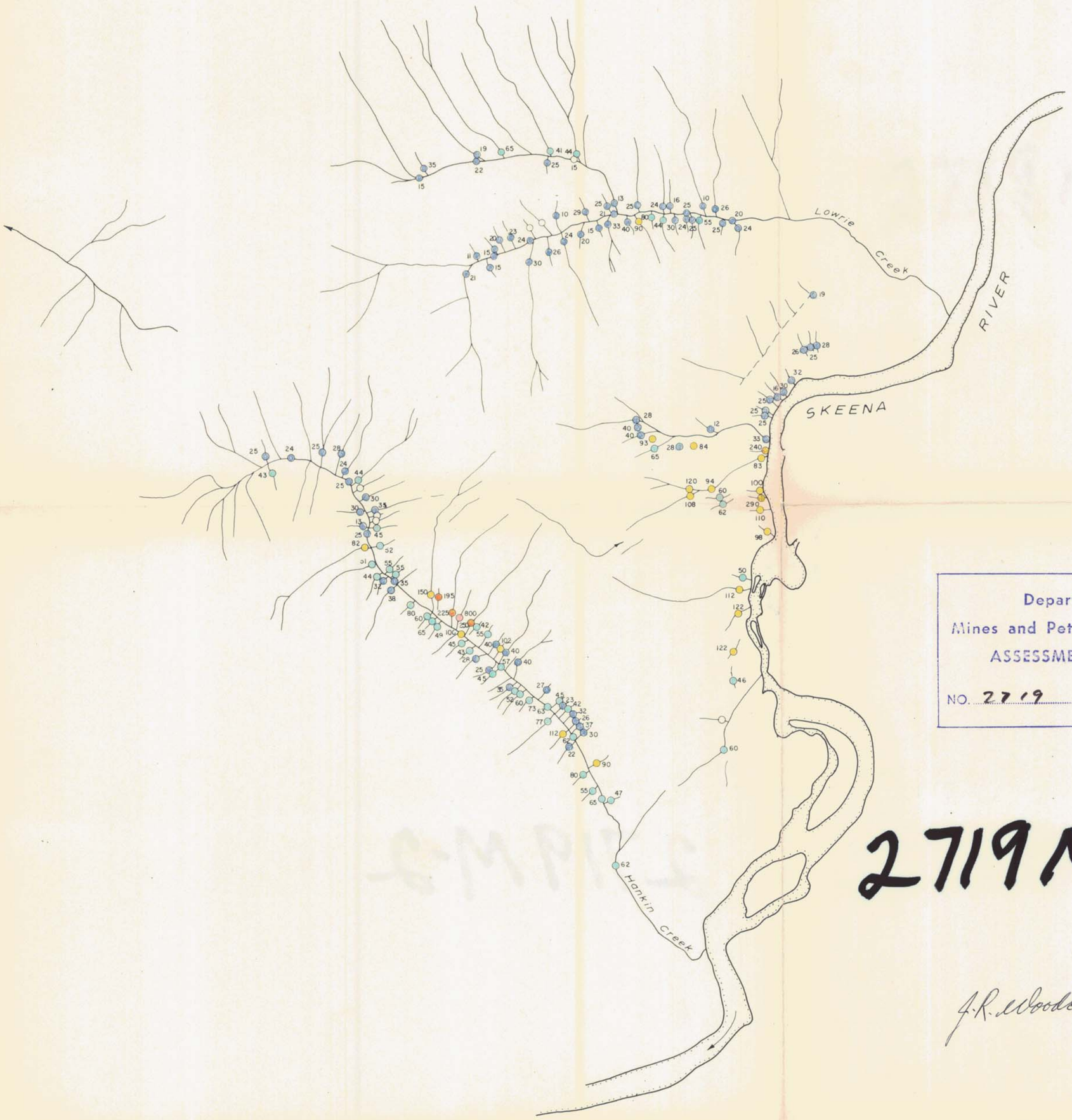
SCALE
Approx. 1" = 3300'

J.R. WOODCOCK CONSULTANTS LTD.

Field sampling by: W. Wychopen
Analyses by: Vancouver Geochemical Laboratories Ltd.
Interpretation by: J.R. Woodcock.

June - July 1970

J.R. Woodcock



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO. 2719 MAP #2

LEGEND

- 0 - 40 PPM CU.
- 41 - 80
- 81 - 160
- 161 - 320
- > 320

2719 M-2

To accompany Geochemical Report by J.R. Woodcock, P.Eng., on the Gold Star B and C Groups, Kitselas Mountain, Omineca Mining Division, dated July 29, 1970.

FIG. 2

CANADIAN INDUSTRIAL GAS & OIL

KITSELAS MOUNTAIN

COPPER IN SILT

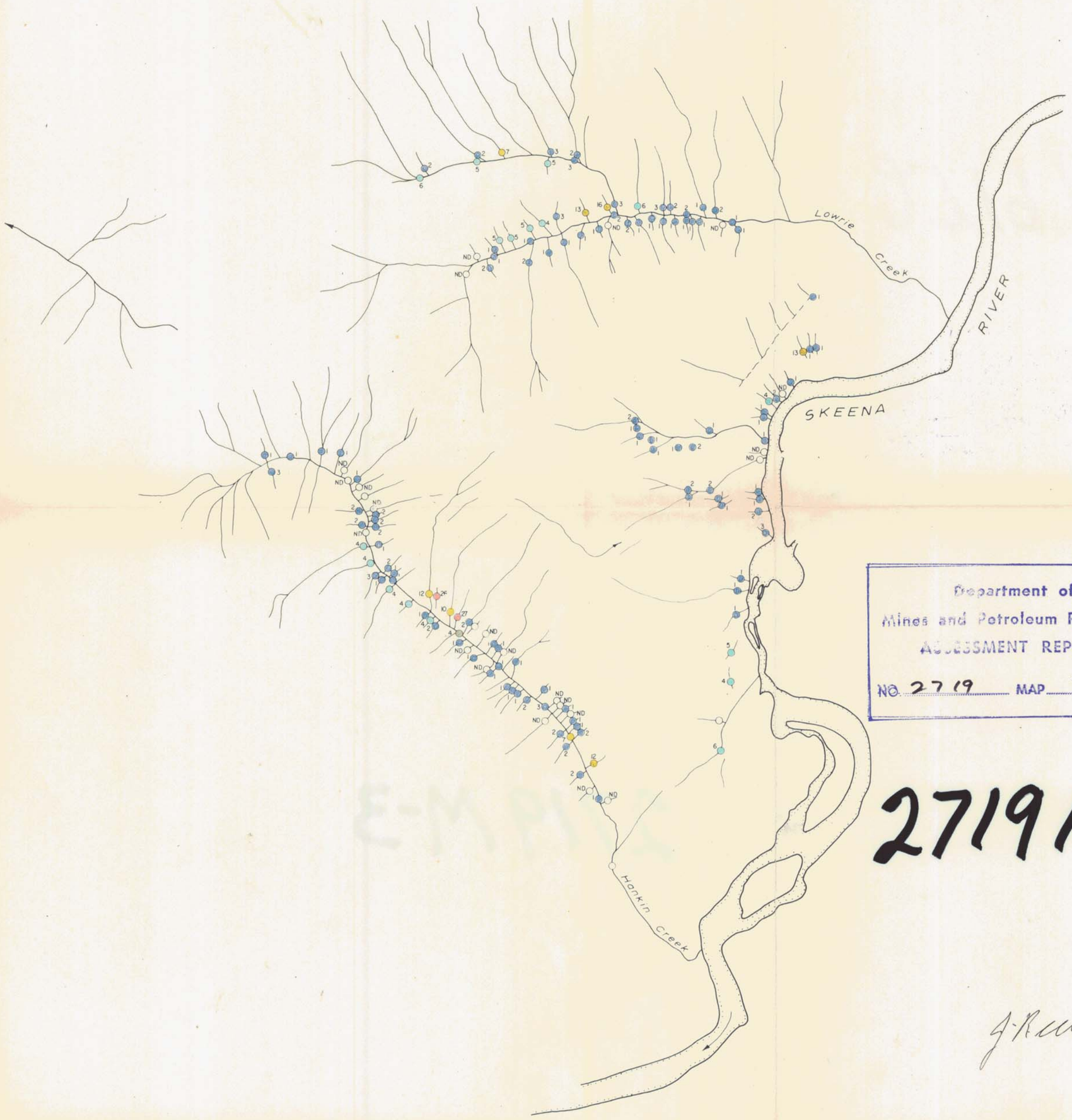
SCALE
Approx. 1" = 3300'

J.R. WOODCOCK CONSULTANTS LTD.

Field sampling by : W. Wychopen
Analyses by : Vancouver Geochemical Laboratories Ltd.
Interpretation by : J.R. Woodcock.

June - July 1970

J.R. Woodcock



2719 M-3

LEGEND

- 0 - 3 PPM MO.
- 4 - 6
- 7 - 12
- 13 - 25
- 26 - 50

To accompany Geochemical Report by J.R. Woodcock, P.Eng., on the Gold Star B and C Groups, Kitselas Mountain, Omineca Mining Division, dated July 29, 1970.

ND. : NONE DETECTED

FIG. 3

CANADIAN INDUSTRIAL GAS & OIL

KITSELAS MOUNTAIN

MOLYBDENUM IN SILT

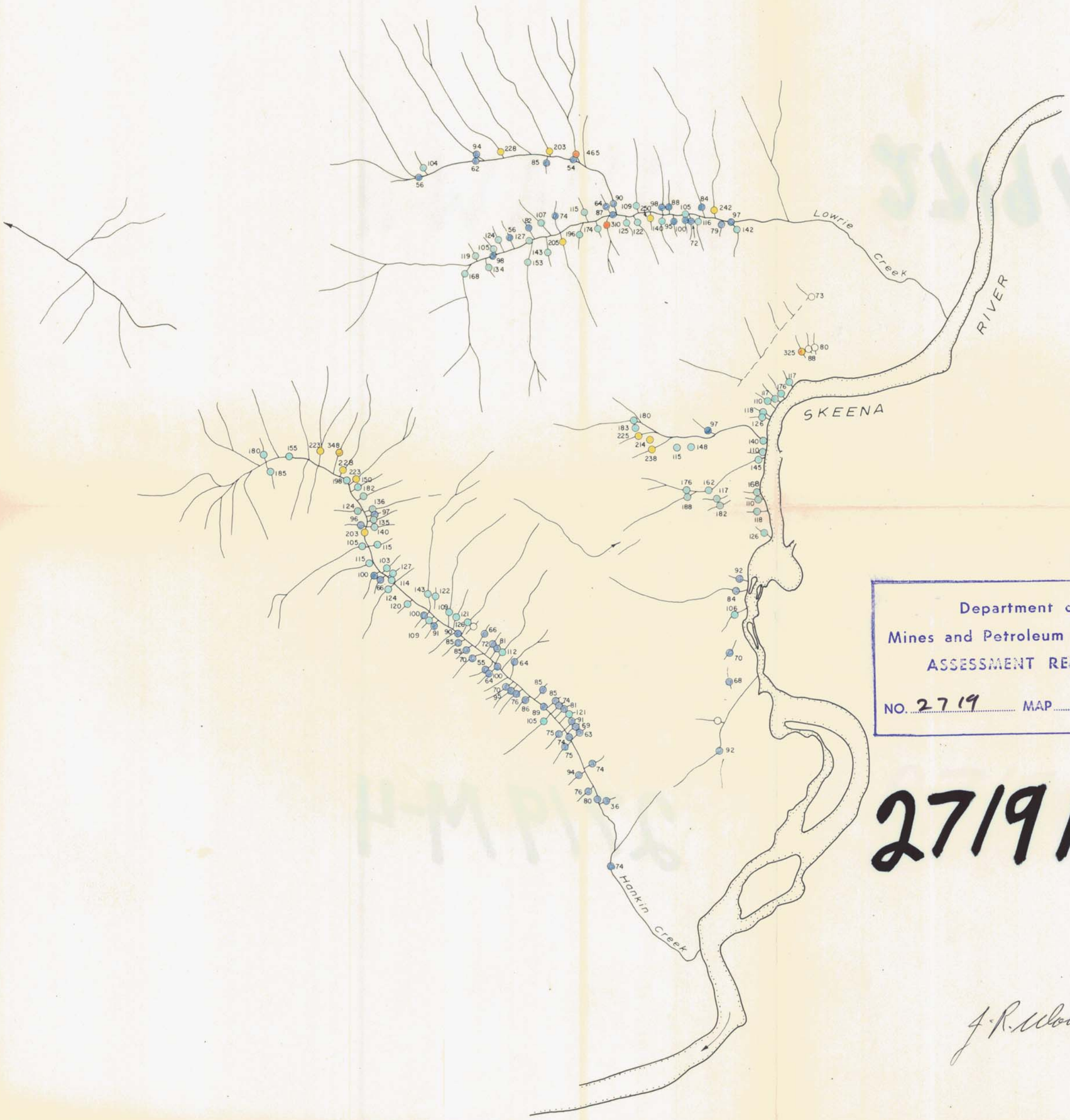
SCALE
Approx. 1" = 3300'

J.R. WOODCOCK CONSULTANTS LTD.

Field sampling by : W. Wychopen
Analyses by : Vancouver Geochemical Laboratories Ltd.
Interpretation by : J.R. Woodcock.

June - July 1970

J.R. Woodcock



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2719 MAP #4

2719 M-4

LEGEND

- 0 - 100 PPM ZN.
- 101 - 200
- 201 - 300
- > 300

To accompany Geochemical Report by J.R. Woodcock, P.Eng., on the Gold Star B and C Groups, Kitselas Mountain, Omineca Mining Division, dated July 29, 1970.

FIG. 4

CANADIAN INDUSTRIAL GAS & OIL

KITSELAS MOUNTAIN

ZINC IN SILT

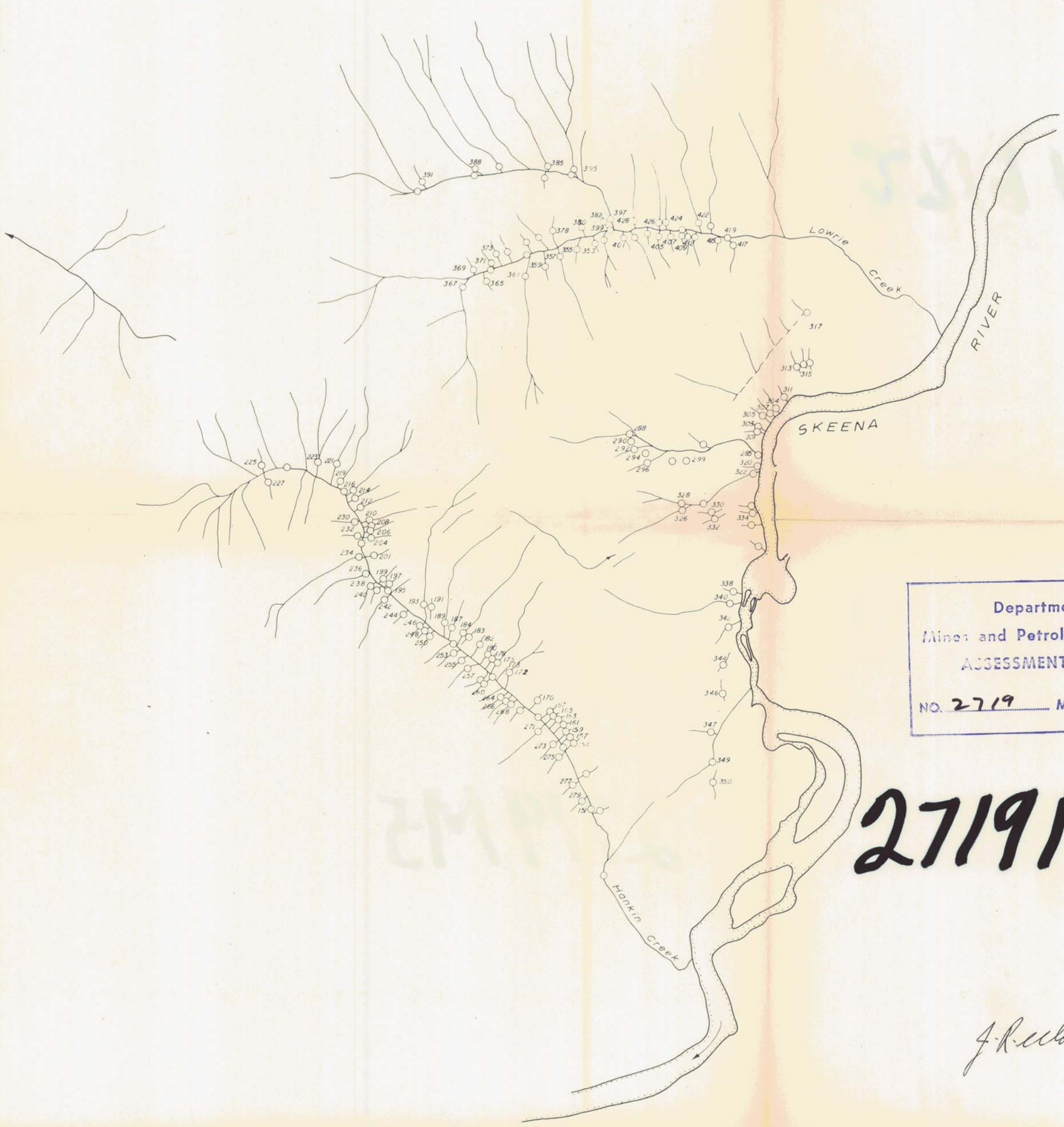
SCALE
Approx. 1" = 3300'

J.R. WOODCOCK CONSULTANTS LTD.

Field sampling by : W. Wychopen
Analyses by : Vancouver Geochemical Laboratories Ltd.
Interpretation by : J.R. Woodcock.

June - July 1970

J.R. Woodcock



LEGEND

337 SAMPLE SITE & WATER SAMPLE NUMBER
(Number appears on ribbon in field as N70-337W)

2719 M-5

To accompany Geochemical Report by J.R. Woodcock, P. Eng., on the Gold Star B and C Groups, Kitselas Mountain, Omineca Mining Division, dated July 29, 1970.

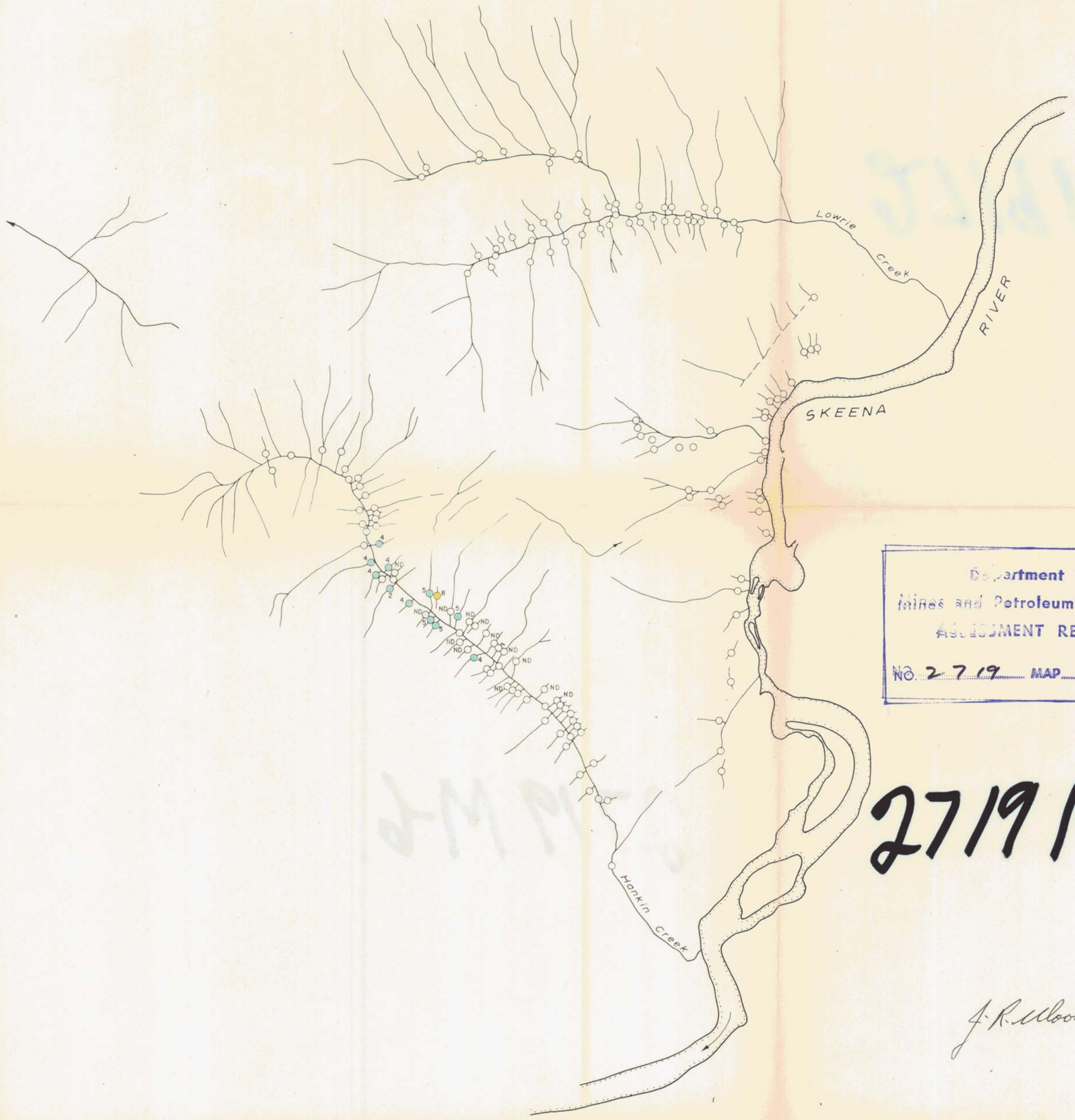
FIG. 5

CANADIAN INDUSTRIAL GAS & OIL
KITSELAS MOUNTAIN
WATER SAMPLE NUMBERS
SCALE
Approx. 1" = 3300'

J.R. WOODCOCK CONSULTANTS LTD.

Field sampling by: W. Wychopen
Analyses by: Vancouver Geochemical Laboratories Ltd.
Interpretation by: J.R. Woodcock.
June - July 1970

J.R. Woodcock



2719 M-6

LEGEND

- < 1 ppb Mo
- 2-5 ppb
- 6-10 ppb
- 11-20 p.p.b.
- > 20 p.p.b.

To accompany Geochemical Report by J.R. Woodcock, P.Eng., on the Gold Star B and C Groups, Kitselas Mountain, Omineca Mining Division, dated July 29, 1970.

FIG. 6

CANADIAN INDUSTRIAL GAS & OIL

KITSELAS MOUNTAIN

MOLYBDENUM IN WATER

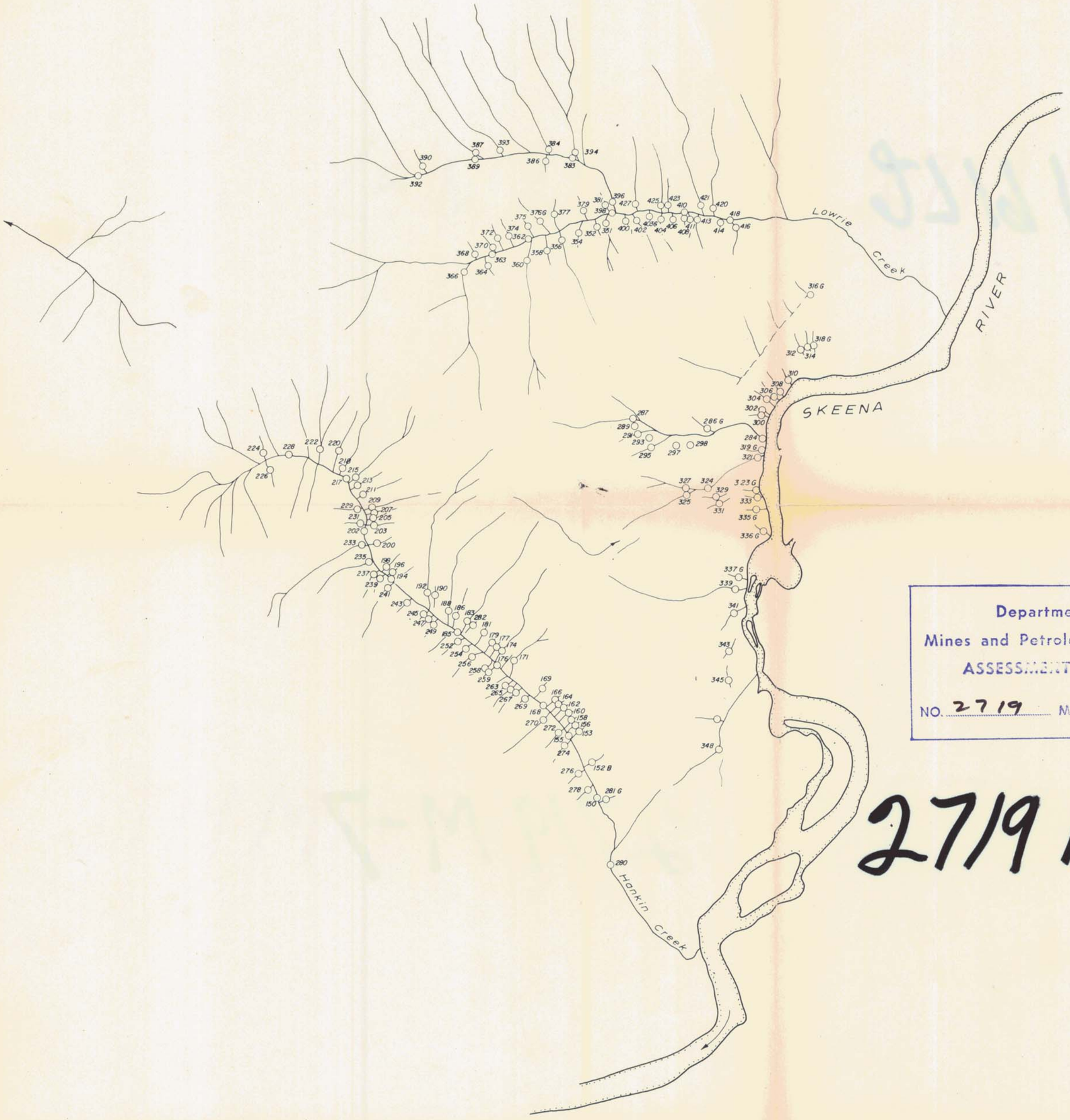
SCALE
Approx. 1" = 3300'

J.R. WOODCOCK CONSULTANTS LTD.

Field sampling by : W. Wychopen
Analyses by : Vancouver Geochemical Laboratories Ltd.
Interpretation by : J.R. Woodcock.

June - July 1970

J.R. Woodcock



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2719 MAP #7

2719 M-7

LEGEND

336 — SAMPLE SITE & SILT SAMPLE NUMBER (Number appears on ribbon in field as N 70-336 L)

323 G — SAMPLE CONSISTS OF SOIL FROM BOTTOM OF GULLEY. (no silt available)

FIG. 1

CANADIAN INDUSTRIAL GAS & OIL

KITSELAS MOUNTAIN

SILT SAMPLE NUMBERS

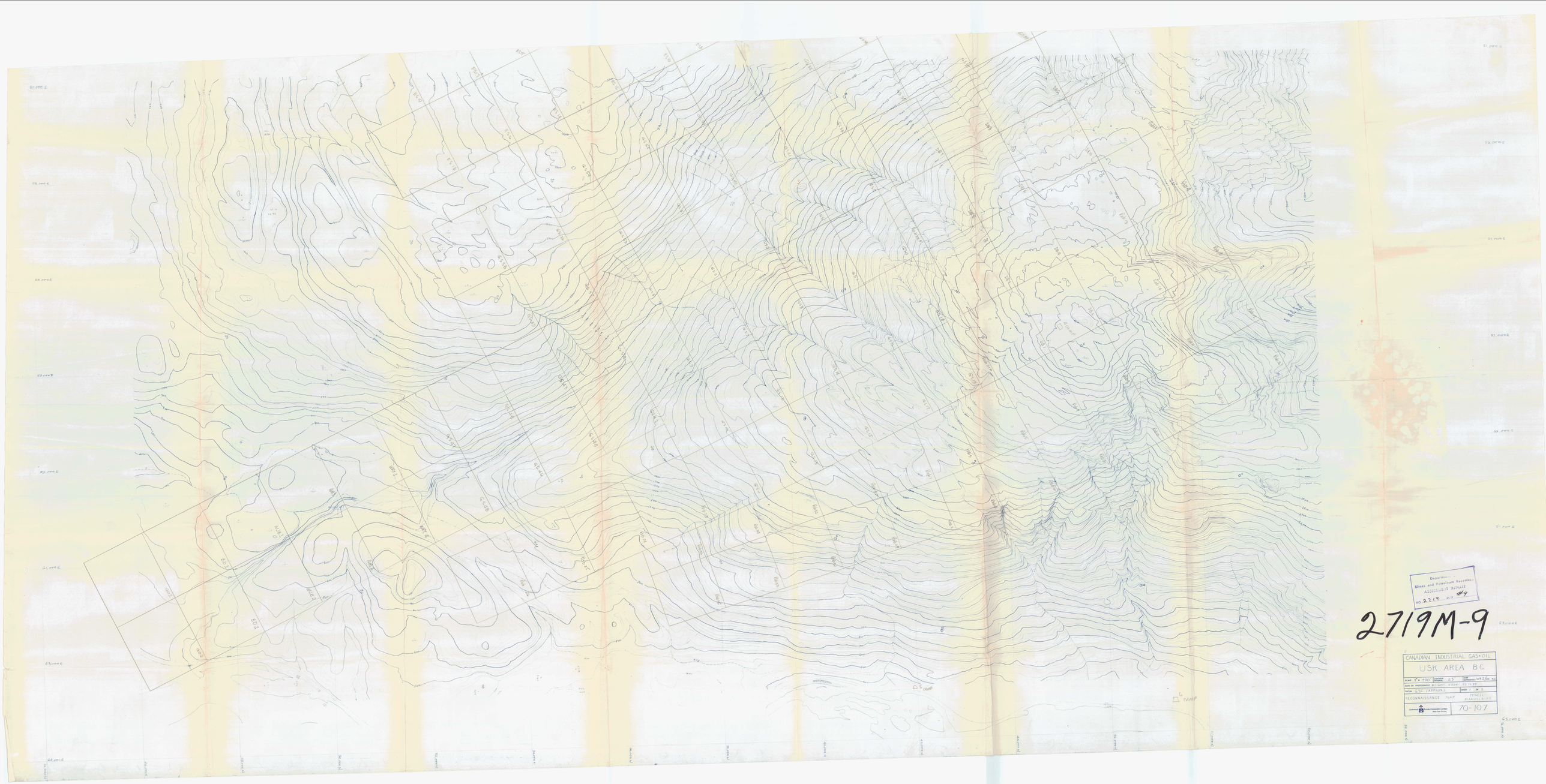
SCALE
Approx. 1" = 3300'

J.R. WOODCOCK CONSULTANTS LTD.

Field sampling by : W. Wychopen
Analyses by : Vancouver Geochemical Laboratories Ltd.
Interpretation by : J.R. Woodcock.

June - July 1970

2719 M-8
USK AREA B.C.
SCALE: 1" = 400'
CONTOUR INTERVAL 25'
MAP REFERENCE 103I/10E 9W
DATE OF PHOTOGRAPHY B.C. GOVT. 5304 - 86 TO 88
DATUM G.S.C. (APPROX.)
SHEET 2 OF 2
RECONNAISSANCE MAP
PENCIL MANUSCRIPT
Lockwood Survey Corporation Limited
West Coast Division
70-107
Gold Star, Eastern Star, etc.
Omineca M.D.
Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 2719 #8
49,000 E
51,000 E



2719M-9

CANADIAN INDUSTRIAL GAS • OIL

USK AREA B.C.

SCALE 1" = 400' CONTOUR INTERVAL 25'	MAP REFERENCE 103 I/6E 7W
DATE OF PHOTOGRAPH AUGUST 1969	FILE 70-39
DATUM G.S.C. (APPROX.)	SHEET 1 OF 3
RECONNAISSANCE MAP	PENTEL MANUSCRIPT

Loram Maintenance of Way Canada Limited — West Coast Division

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