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THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

GEOCHEMICAL SURVEY REPORT ON THE MERC NO. 1 AND MERC NO. 2 CLAIM GROUPS, PINCHI LAKE AREA OMINECA M.D.

(NE QUADRANT 54°, 124°)

The Merc No. 1 and Merc No. 2 claim groups are located 10 miles NNW of Fort St. James, B.C. (Lat. 54°, Long. 124°, NE). The following is a list of the claims on which the work was done and shows the amount of assessment credit requested on each claim:

Claim	Record No.	Requested Assessment Credits	Total
Merc Group No. 1:			
Merc 1-10	27766-27775	1 year each claim	10
Merc 11-20	27776-27785	1 year " "	10
Merc 21-30	27786-27795	1 year " "	10
Merc 31-40	27796-27805	1 year " "	10
			40 years
Merc Group No. 2:			
Merc 41-47	27806-27812	1 year each claim	7
Merc 48	27813		
Merc 49	27814		
Merc 50	27815		
			7 years

Work was carried out on the above claims during the period from July 6 - August 6, 1965.

REPORT BY

D.W. HEDDLE

PROFESSIONAL ENGINEER

DWH:gmc
January 25, 1966

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

GEOCHEMICAL SURVEY REPORT ON THE MERC NO. 1 AND MERC NO. 2 CLAIM GROUPS, PINCHI LAKE AREA OMINECA M.D.

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2) Plan - Geochemical Survey - Merc No. and No. 2 Claim Groups, Scale 1" = 1/4 mi. Plate PL-9.

3) Statement of Expenditures.

4) Statutory Declaration relating to Expenditures.

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

GEOCHEMICAL SURVEY REPORT ON THE MERC NO. 1 AND MERC NO. 2 CLAIM GROUPS, PINCHI LAKE AREA OMINECA M.D.

SUMMARY

The geochemical survey carried out on the Merc No. 1 and Merc No. 2 groups of claims expended a total of $4,745. It is requested that $4,000 of this sum be applied as assessment credit to all claims of Merc No. 1 Group and $700 of this be applied as assessment credit to certain claims of the Merc No. 2 Group. Affidavits on Application for Certificate of Work forms have been filed with the Mining Recorder in Smithers.

The following is a list of the claims on which the work was done and shows the amount of assessment work to be credited to claims of each group:

Claims	Record No.	Requested Assessment Credit	Total
Merc No. 1 Group:			
Merc 1-10	27766-27775	1 year each claim	10
Merc 11-20	27776-27785	1 year " "	10
Merc 21-30	27786-27795	1 year " "	10
Merc 31-40	27796-27805	1 year " "	10
			40 yrs.
Merc No. 2 Group:			
Merc 41-47	27806-27812	1 year each claim	7
Merc 48	27813	-	-
Merc 49	27814	-	-
Merc 50	27815	-	-
			7 yrs.

INTRODUCTION

General

During July and August 1965 geochemical (mercury detector) surveys were carried out in the general Pinchi Lake area. Emphasis was placed on the coverage of mineral claims overlying the Pinchi fault zone. Part of the survey included the Merc No. 1 and Merc No. 2 claim groups from which samples were collected and analyzed for mercury content.

The immediate area along the Pinchi fault zone is known to be favorable for the occurrence of mercury mineralization. At least 15 cinnabar deposits have been found along the Pinchi fault and of these, two have been economically mined. A mantle of overburden which covers extensive areas of the Pinchi fault zone is a big detriment to prospecting for additional deposits. Therefore, in order to assess the area in terms of its mercury potential, methods other than conventional prospecting must be employed. This geochemical survey was made on the basis that the mercury content of soils would indicate areas in which to localize more intensive geochemical or geophysical coverage or even targets which would warrant drilling or trenching.

Our work with the Lemaire mercury detector was, to some extent, experimental. Little or no information was available with respect to the best soil horizon or depth to sample. We had no idea of what contamination might have resulted from the former reduction plant operation at the Pinchi Lake Mine or how widespread such contamination might be. The Lemaire detector in its present form does not distinguish between metallic mercury in the soil (halo effect) or possible cinnabar particles in the soil which may have been transported over considerable distances. We are currently conducting laboratory studies in an attempt to clarify some of the unknown factors which might aid in interpreting survey results. These studies will include experiments pertaining to the mode of occurrence of metallic mercury in soils and the nature of soil fractions which might provide the best and consistent conditions for concentration. Post-doctorate research work along the general lines described above is now being done under Cominco sponsorship by Dr. L.M. Azzaria at McGill University.

The survey was done during the period from July 6, 1965 to August 6, 1965 under the supervision of D.W. Heddle (U.B.C. 1949) Cominco Senior Exploration Geologist and registered B.C. Professional Engineer. Field supervision and analyses were carried out by Dr. L.M. Azzaria (Ph.D. Geological Sciences, Toronto). Dr. Azzaria did post-doctorate work at the University of California, Berkley, under H.E. Hawkes, one of the foremost authorities in the development of mercury detector work. E.W. Batchelor and G.E. Paulus, third year Geology students assisted Azzaria in the field work.

Location and Access

The Merc claim groups are located 10 miles NNW of the village of Fort St. James. From the south shore of Pinchi Lake the claims extend southeasterly along the Pinchi fault zone. Access to the claims can be made by road from Fort St. James. Part of the road can be considered as accessible only by jeep and open only in the summer months.

GENERAL GEOLOGY

The claim group lies along the position of the Pinchi fault zone extending southeasterly from the south shore of Pinchi Lake. The claims are largely drift covered and the exact position of the fault zone can only be inferred.

In general, the northeastern margin of the Pinchi fault zone represents the contact between closely folded stratified Permian rocks on the southwest and Mesozoic formations and Jura-Cretaceous Omineca granitic intrusions on the northeast. It seems probable that the fault zone marks the site of major thrust-faulting from the southwest and that Permian rocks have moved up with respect to the Mesozoic formations. Intense faulting occurs in the Permian rocks within the fault zone. There, the more important faults trend north and northwest and dip steeply west and southwest.

The orebodies at the Pinchi Mine and numerous smaller mercury deposits occur along the Pinchi fault zone in sheared and brecciated Permian limestones or in carbonatized serpentine.

The Merc 1 and 2 claim groups lie along the inferred position of the Pinchi fault zone. Most of the claim area is covered with overburden, leaving much of the geology open to interpretation. To the northeast on the footwall side of the Pinchi fault it is believed that the claims are underlain by volcanics of the Takla Group, although very little outcrop is exposed. To the southeast, on the hanging wall of the fault, outcrop is practically non-existent, but in all probability Permian limestones of the Cache Creek group underlie the mantle of overburden.

EQUIPMENT AND PRINCIPLE OF OPERATION

The high volatility of mercury and the association of small amounts of mercury with many sulphide deposits has suggested that extensive mercury halos may exist around sulphide deposits. The halo developed from mercury deposits should be particularly amenable to detection by soil analyses. Our Lemaire mercury detector technique, with a sensitivity (5 parts per billion), well below the average abundance of mercury in rocks and soils, can be used to detect the small amounts of mercury that may indicate hidden ore deposits.

The Lemaire detector works on a basically simple principle. The mercury contained in the sample is vaporized in a closed chamber by a heat source which may consist of a torch or small furnace. The mercury vapor is drawn into a light chamber which houses an ultra-violet light. The reading obtained from a microammeter is a measurement of the amount of light absorbed by the mercury vapor which is proportional to the amount of mercury in the sample.

A modification was made to the standard Lemaire detector by L.M. Azzaria, J.M. Bryan, A.R. Allen and R. Wilson of the Cominco Technical Research Center and the Instrument Shop at Trail, B.C. Commercially available detectors are sensitive to several specific substances as well as to smoke and dust in general. The Cominco modification consisted essentially of the addition of a gold wire filter in the vapor circuit by means of which the mercury was trapped on the gold and contaminating vapors were expelled.

The operation of the modified Lemaire detector essentially consists of two steps. In the first step the sample is heated by a small electric furnace at 800° - 900° and the mercury is vaporized and collected on the gold filter, while interfering vapors are exhausted. In the second step the gold is heated by a second electric furnace to revaporize the mercury which is than pulled into the ultra-violet light chamber.

PROCEDURE IN SAMPLING AND ANALYSIS

Sampling was in most cases done along lines controlled by chain and compass survey. In some cases the samples were taken at chained intervals along claim location lines. Samples were taken along old logging roads where they traversed the claim area. Most of the samples were taken at 500-foot intervals.

The soil development varies considerably from one locality to another within the general Pinchi Lake area. The A and B soil horizons are usually confined to within a foot of the surface and are followed by unmodified glacial material. The initial samples were taken below the A1 horizon generally at a depth of 6" to 12" below the surface. In some cases deeper resampling was done to check high readings indicated in the initial survey.

Analyses were done in a field laboratory in Fort St. James. Samples were allowed to dry at room temperature as drying at higher temperatures would cause the loss of some mercury. The dry samples were sieved to -100 mesh size. A one gram sample of the -100 mesh fraction was then processed in the modified Lemaire mercury detector as described in the preceding section of this report. The detector reading was then referred to a standard curve to obtain the mercury content of the sample expressed in parts per billion (ppb).

In this survey all samples yielding 70 ppb or less were considered to be normal for the area or within the background range. Samples yielding more than 70 ppb mercury are considered to be anomalous.

Readings expressed in parts per billion are plotted on a 1" = 1/4 mile plan and have been contoured where applicable. In contouring the mercury content of the soils only the results from the initial sampling (at a depth of one foot or less) were considered. In areas where information is sparse, contouring is open to various interpretations.

RESULTS

Results of the geochemical survey of the Merc No. 1 and No. 2 claim groups are shown on Plate PL 9. The survey indicated a number of anomalous areas on the Merc claim group. It should be noted here that contouring represents only the values from the initial sampling (at a depth of one foot or less).

Towards the end of the field season most of the stronger anomalies were resampled at a greater depth (1'-2½'). Most of the analyses from the resampled locations were done in Trail at the end of the season. Results of the deeper sampling indicate values in the background range (70 ppb or slightly higher). Although the apparent conflicting results between the shallow and the deeper sampling tend to discredit the validity of the anomalies, one cannot overlook the possibility that they have some significance.

Perhaps the high values obtained in the shallower sampling result from surface contamination by "fallout" from the former reduction plant operation at the Pinchi Mine, although it is not clear why contaminating material would not be more uniformly distributed. A pattern as indicated by our survey might be caused by an erratic distribution of contaminating vapors or dusts from the reduction plant. If our results can be attributed to contamination from the plant, perhaps the erratic pattern may have resulted from the selective absorption of contaminating vapors in the atmosphere by certain types of vegetation.

On the other hand the apparent conflicting results between the shallow and deeper sampling may be brought about by some poorly understood mechanism concentrating mercury from an underlying deposit only in the upper soil horizon, leaving the deeper soils somewhat deficient in mercury. If such a mechanism does exist, the anomalies indicated in our initial survey are meaningful and warrant further detailed investigation.

More detailed work is necessary to arrive at possible answers to problems in this type of survey. It is recommended that the anomalous areas be covered by more detailed sampling (possibly on a 100-foot grid). Samples should be collected from both the A soil horizon and from depths of one to two and one-half feet. If either type of sampling gives a systematic pattern of anomalies, stripping or drilling would be warranted as an ultimate test.

ATTACHMENTS:

(1) Plan - Pinchi Lake Area - General Geology and claim location, Scale 1" = 6 mi. Plate PL-14.

(2) Plan - Geochemical Survey - Merc No. 1 and No. 2 Claim Groups, Scale 1" = 1/4 mi. Plate PL-9.

(3) Statement of Expenditures.

(4) Statutory Declaration relating to Expenditures.

Report by: D. W. Heddle

D.W. Heddle
Professional Engineer

DWH:gmc
Trail Expl'n Office, Western District
January 25, 1966
Distribution: Mining Recorder (Smithers) (2) ✓
Western Expl'n, Trail (2)

THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
TRAIL, B.C.

1965 GEOCHEMICAL SURVEY EXPENDITURES
MERC NO. 1 AND MERC NO. 2 CLAIM GROUPS, PINCHI LAKE AREA, OMINECA M.D.

SALARIES

1 Exploration Geologist (L.M. Azzaria) soil analysis and supervision for 31 days (July 6 - August 6, 1965) at $45/day	$ 1,395
2 Field Assistants (E.W. Batchelor and G.E. Paulus) for 31 days (July 6 - August 6, 1965) at $30/man-day	1,860
1 Senior Exploration Geologist (D.W. Heddle, P. Eng.) supervisory trip for 10 days @$60/day $ 600; Report preparation 3 days at $60/day 180	780

EQUIPMENT

Rental of Lemaire mercury detector for 31 days at $10/day	$ 310

TRANSPORTATION

Truck rental 30 days @$400/month	$ 400
TOTAL:	$ 4,745

D.W. Heddle
D.W. Heddle
Professional Engineer

Endorsed by:

Geo Hamson
G. Hamson
Branch Accountant

This is Exhibit "A" to the Statutory Declaration of D.W. Heddle, declared before me the 31 day of January A.D. 1966.

A Commissioner for taking Affidavits for the Province of British Columbia.

CANADA	)	STATUTORY DECLARATION RELATING TO EXPENDITURES ON A GEOCHEMICAL SURVEY OF CERTAIN MINERAL CLAIMS THE PROPERTY OF THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED
PROVINCE OF BRITISH COLUMBIA	)	
TO WIT:	)	

I, DUNCAN W. HEDDLE, Professional Engineer, of the City of Trail, in the Province of British Columbia, DO SOLEMNLY DECLARE:

1. That I am the person who prepared a geochemical report as the result of surveys carried out of certain mineral claims, the property of The Consolidated Mining and Smelting Company Limited, situated in Omineca Mining Division.

2. That copies of the said report are being filed with the Mining Recorder in Smithers.

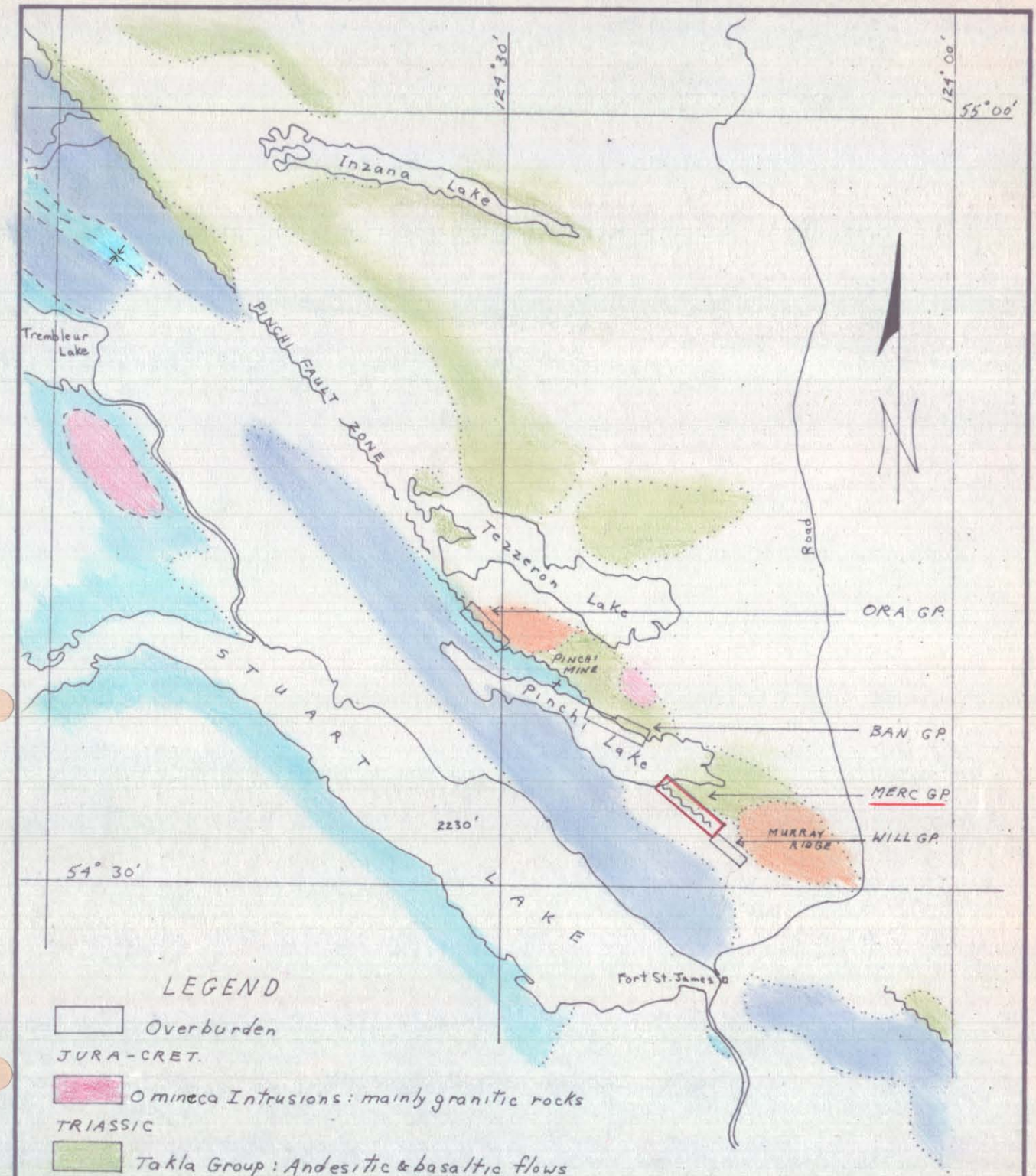
3. That attached hereto and marked with the letter "A", upon which I have signed my name at the time of declaring hereof, is a statement of expenditures incurred in connection with the geochemical survey of the said claims showing in addition the dates during which those making the said survey performed their work.

AND I MAKE this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of the Canada Evidence Act.

DECLARED before me at the Municipality of Tadanac, in the Province of British Columbia, this 31 day of January, A.D. 1966.

D. W. Heddle

A Commissioner for taking Affidavits for British Columbia



LEGEND

- Overburden

JURA-CRET.

- Omineca Intrusions: mainly granitic rocks

TRIASSIC

- Takla Group: Andesitic & basaltic flows agglomerates, tuffs & sediments
- Trembleur Intrusions: Mainly pyroxenite

PERMIAN - Cache Creek Gp.

- Varied sediments and greenstone
- Mainly massive limestone.

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 716 MAP #1

The Consolidated Mining and Smelting Company of Canada Limited

DRAWN BY:		TRACED BY:	
REVISED BY	DATE	REVISED BY	DATE

PLAN - PINCHI LAKE AREA - GENERAL GEOLOGY AND CLAIM LOCATION - TO ACCOMPANY GEOCHEMICAL REPORT BY D.W. HEDDLE, P. ENG. ON THE MERC NO. 1 AND MERC NO. 2 CLAIM GROUPS, PINCHI LAKE AREA, OMINECA M.D. DATED JANUARY 25, 1966.

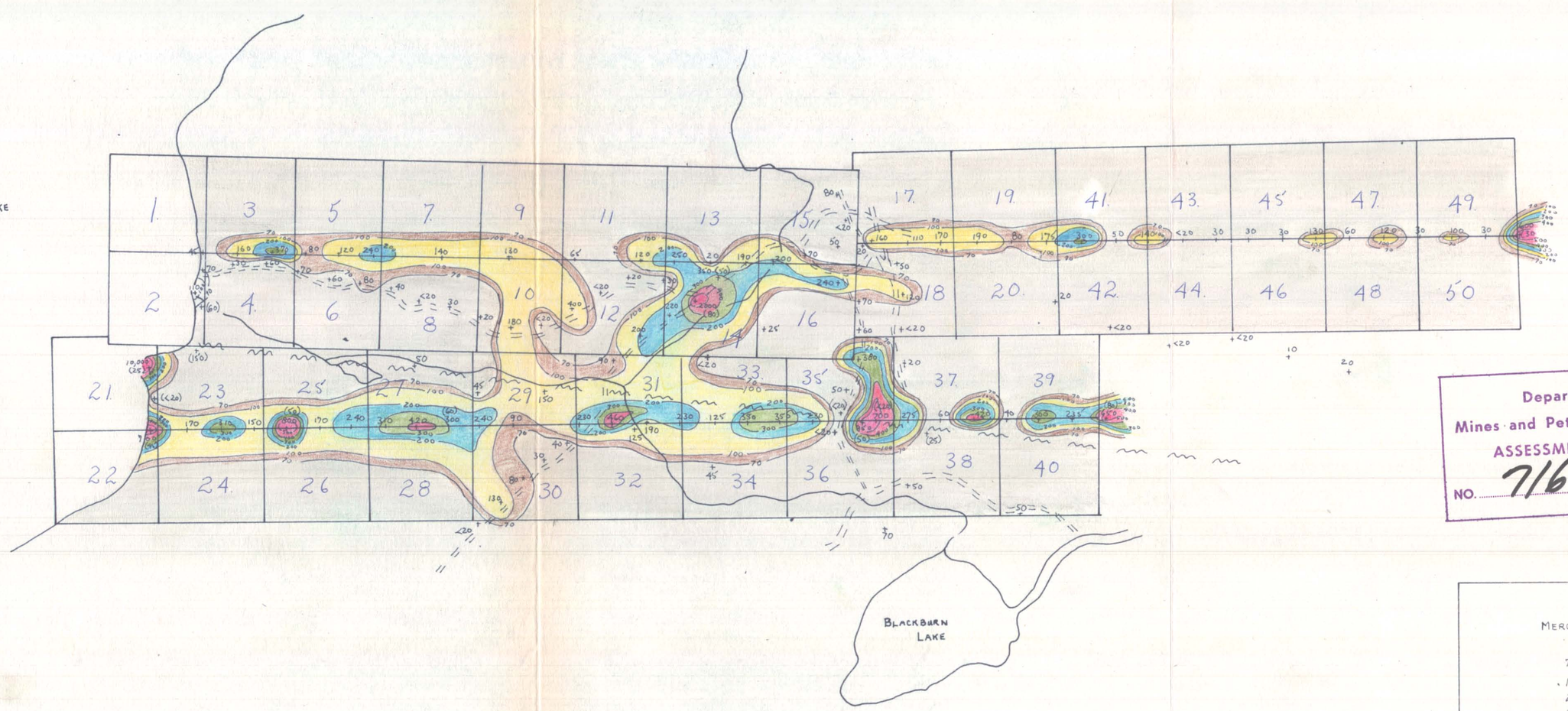
D. W. Heddle

SCALE: 1" = 6 mi | DATE: Jan 25/66 | PLATE: P.L. 14

HUGHES OWENS - 190M - 2500 - 6-65

COMINCO 210-0610

12 copies.



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 716 MAP #2

716 (M1)

LEGEND

MERCURY CONTENT OF SOILS (p.p.b.)

- 0 - 70
- 70 - 100
- 100 - 200
- 200 - 300
- 300 - 400
- 400 - 500
- 500 +

+ Sample location
130 etc - Mercury content in p.p.b. (Near surface samples)
(400) etc - Mercury content in samples taken at a depth of 1' from surface or deeper.
~~~ - Inferred position Pinchi Fault.
= = = - Road

The Consolidated Mining and Smelting Company of Canada Limited

DRAWN BY:		TRACED BY:	
REVISED BY	DATE	REVISED BY	DATE

GEOCHEMICAL SURVEY - MERC #1 & #2 CLAIM GROUPS

To accompany geochemical report by D. W. Heddle P. Eng. on the Merc #1 & #2 claim groups, south of Pinchi Lake, Omineca M.D.
D. W. Heddle dated Jan 25, 1966.

SCALE: 1" = ¼ mi | DATE: Jan 23/66 | PLATE: PL 9
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