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

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GEOCHEMICAL SURVEY REPORT  
ON THE ORA NO. 1 CLAIM GROUP, PINCHI LAKE AREA, OMINECA M.D.

(NW QUADRANT 51<sup>o</sup>, 121<sup>o</sup>)

The claims are located 20 airmiles NNW of Fort St. James, B.C. in the Omineca Mining Division. The following is a list of the names of the claims on which the work was done and shows the amount of assessment work credit to be applied to each claim:

<u>Claim</u>	<u>Record No.</u>	<u>Assessment Credits</u>	<u>Total</u>
<u>Ora Group No. 1:</u>			
Ora 1-6	28039-28044	1 year each claim	6 yrs.
Ora 7-16	28045-28054	-	-
		TOTAL:	<u>6 yrs.</u>

Work recorded in this report was done during the period from July 1st to July 5, 1965.

REPORT BY

D.W. HEDDLE

PROFESSIONAL ENGINEER

DWH:gmc  
January 20, 1966

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

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GEOCHEMICAL SURVEY REPORT  
ON THE ORA NO. 1 CLAIM GROUP, PINCHI LAKE AREA, OMINECA M.D.

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

GEOCHEMICAL SURVEY REPORT  
ON THE ORA NO. 1 CLAIM GROUP, PINCHI LAKE AREA, OMINECA M.D.

SUMMARY

The geochemical survey carried out on the Ora No. 1 claim group expended a total of \$642. It is requested that \$600 of this be applied as assessment work credits to certain claims in the Ora No. 1 claim group. The following list is a list of the names of the claims on which the work was done and shows to which claims assessment work credit should be applied. Affidavits on Application for Certificate of Work forms have been filed previously with the Mining Recorder in Smithers, B.C.:

<u>Claim</u>	<u>Record No.</u>	<u>Requested Assessment Credits</u>	<u>Total</u>
<u>Ora Group No. 1:</u>			
Ora 1-6	28039-28044	1 year each claim	6 yrs.
Ora 7-16	28045-28054	-	-
		Total:	<u>6 yrs.</u>

INTRODUCTION

General

During July and August 1965, a geochemical (mercury detector) survey was carried out in the general Pinchi Lake area. Emphasis was placed on the coverage of claims overlying the Pinchi fault zone. Part of the survey included the Ora No. 1 claim group from which samples were collected and analyzed for their 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 zone and of these two have been economically mined in the past. A large detriment to prospecting for additional deposits in the area is the thick mantle of overburden which covers a large part of the area. Therefore in order to assess the area in terms of its mercury potential, methods other than standard prospecting methods must be employed. This geochemical survey was made on the basis that the mercury content of soils would indicate areas in which to localize 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 depth or soil horizon from which samples should be taken to obtain consistent and valuable results. We had no idea of what contamination might have resulted from the former reduction plant operation at the Pinchi Lake Mine and 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.

The survey was done during the period July 1, 1965 to July 15, 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 A.M. Azzaria (Ph.D, Geological Sciences, Toronto). Azzaria did post-doctorate work at the University of California, Berkley, California under the direction of 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 in the field work.

#### Location and Access

The Ora group of claims is located 20 airmiles NNW of Fort St. James, B.C., along the Pinchi Fault zone, between Tezzeron and Pinchi Lakes. The claim group is accessible by road from Fort St. James. The latter part of the road is open only in the summer and may be considered a "jeep" road.

#### GENERAL GEOLOGY

The claim group lies along the position of the Pinchi fault zone northwest of Pinchi Lake. Much of the claim area is covered with overburden 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 limestone or in carbonatized serpentine.

The Ora claim group overlies the inferred position of the Pinchi Fault zone. To the northeast on the footwall side of the fault, the claims are underlain by a small stock of periodotite belonging to the Trembleur intrusions and to the southwest, on the hanging wall side of the fault the claims are underlain by limestone of the Cache Creek Group. Because little bedrock is exposed on the claim group, much of the geology is open to interpretation.

#### EQUIPMENT AND PRINCIPLE OF OPERATION

The high volatility of mercury and the association of small amounts of mercury with many sulfide 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 amount 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 ultraviolet 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 then pulled into the ultraviolet light chamber.

#### PROCEDURES IN SAMPLING AND ANALYSIS

Sampling was done along lines controlled by chain and compass survey. Samples were collected along three lines. One of these was the location line of the claim group and the other two lines were parallel to the location line and about 1,000' on either side of it. Samples were taken at approximately 1,000-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, B.C. Samples were allowed to dry at room temperatures as heating to temperatures approaching 100° C might 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 are considered to be anomalous. Readings expressed in parts per billion are plotted on a 1" = 1/4 mi. plan and have been contoured where applicable.

#### RESULTS

The results are shown on Plate PL-7. Of the 35 samples analyzed, only four show an anomalously high mercury content. Of these four samples two are in the 300+ ppb range and two are in the 100+ ppb range. It should be pointed out that no two contiguous samples show high values, and that the samples which do show higher mercury content are quite scattered.

It is recommended that the locations from which these samples were obtained should be resampled and re-analyzed. If anomalous results are repeated, sampling should be done on a much smaller grid, possibly 100' intervals, over the general anomalous location. If results warrant, the sampling should be extended to locations beyond the claim boundaries. Any anomalous pattern resulting from resampling or more detailed sampling may warrant future stripping or diamond drilling depending on the thickness of overburden in the area of interest.

#### ATTACHMENTS:

- (1) Plan - Pinchi Lake Area - General Geology and Claim Location, Scale 1" = 6 mi. Plate PL-11.
- (2) Plan - Geochemical Survey - Ora No. 1 Claim Group - Scale 1" = 1/4 mi. Plate PL-7.

Attachments: (continued)

- (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 20, 1966

Distribution: Mining Recorder (Smithers) (2) ✓  
Western Exploration (Trail) (2)

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

1965 GEOCHEMICAL SURVEY EXPENDITURES  
ORA NO. 1 CLAIM GROUP - OMINECA M.D.

SALARIES

1 Exploration Geologist (L.M. Azzaria) soil analysis and supervision for 5 days (July 1-5, 1965) at \$45/day	\$ 225
2 Field Assistants (E.W. Batchelor and G.E. Paulus) for 5 days (July 1-5, 1965) at \$30/man-day	300

TRANSPORTATION

Truck Rental for 5 days at \$100/month	67
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EQUIPMENT

Rental of Lemaire mercury detector for 5 days at \$10/day	50
TOTAL:	<u>\$ 642</u>

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

Endorsed by:

G. Hamson  
G. Hamson  
Branch Accountant

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

[Signature]  
A Commissioner for taking Affidavits for British Columbia

CANADA  
PROVINCE OF BRITISH COLUMBIA  
TO WIT:

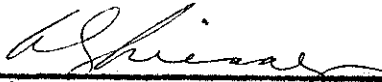
STATUTORY DECLARATION RELATING TO EXPENDITURES ON A GEOCHEMICAL SURVEY OF CERTAIN MINERAL CLAIMS THE PROPERTY OF THE CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA LIMITED

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 of Canada 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.

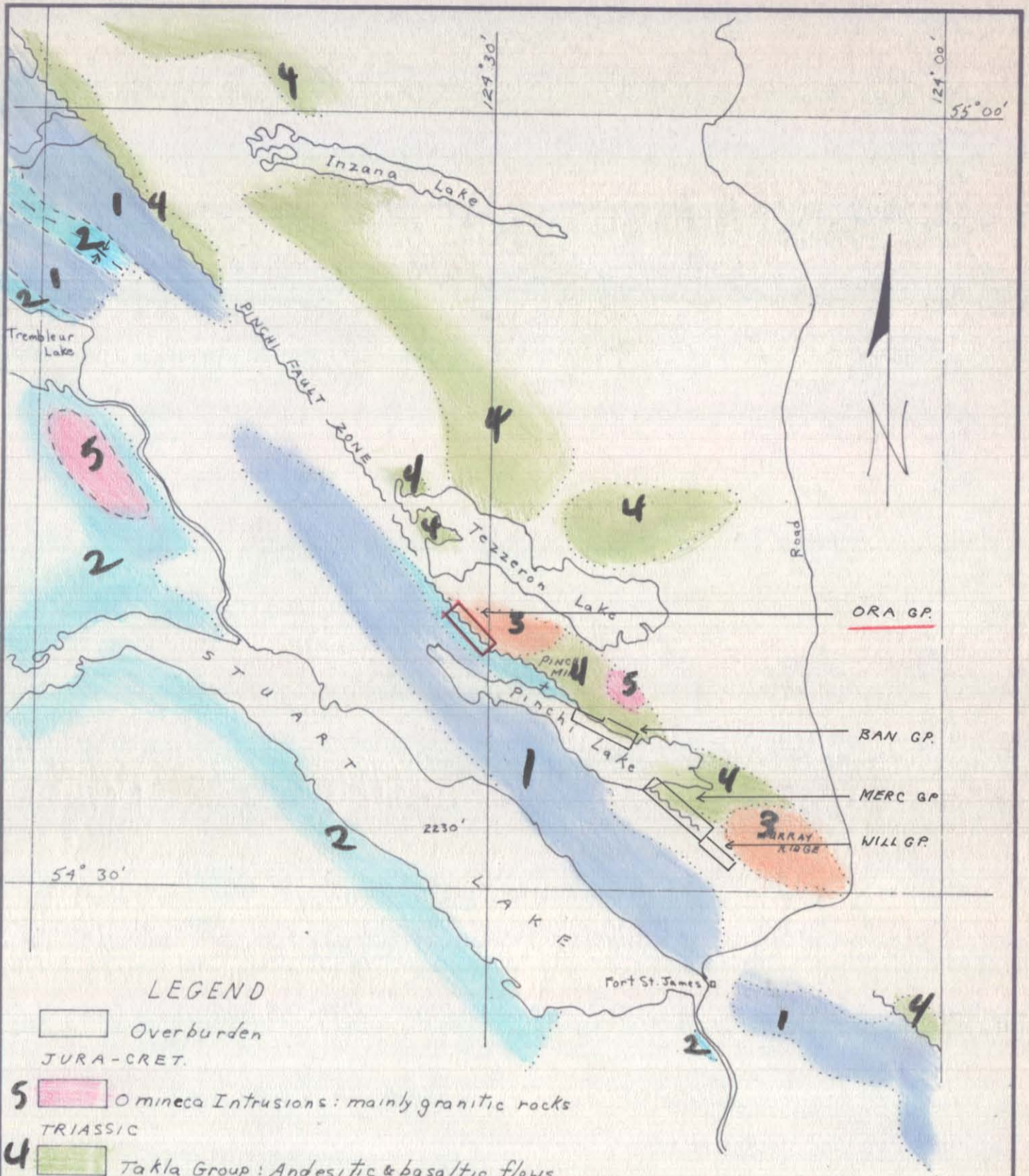
AND I MAKE this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of the Canada Evidence Act.

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

  
A Commissioner for taking Affidavits for British Columbia.

*D. W. Heddle*





**LEGEND**

- Overburden
- JURA-CRET.**
- 5**  Omineca Intrusions: mainly granitic rocks
- TRIASSIC**
- 4**  Takla Group: Andesitic & basaltic flows  
agglomerates, tuffs & sediments
- 3**  Trembleur Intrusions: Mainly pyroxenite
- PERMIAN - Cache Creek Gp.**
- 2**  Varied sediments and greenstone
- 1**  Mainly massive limestone.

**Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT**

**NO. 720 MAP #1**

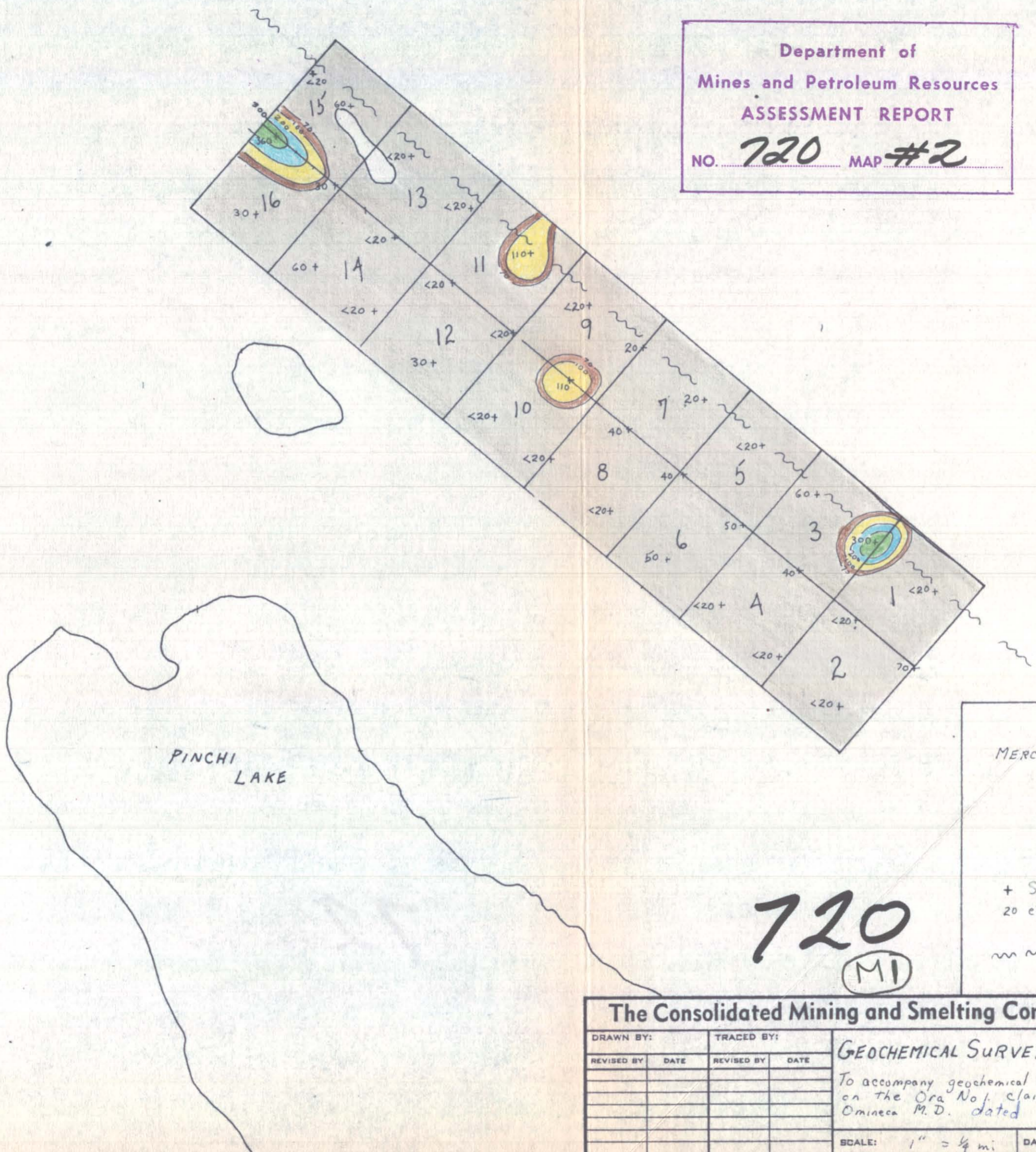
**The Consolidated Mining and Smelting Company of Canada Limited**

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 Ora No 1 claim  
group, Pinchi Lake area, Omineca M.D., dated JAN 20, 1966  
*D.W. Heddle*

SCALE: 1" = 6 mi      DATE: Jan 25/66      PLATE: P.L.11

Department of  
Mines and Petroleum Resources  
**ASSESSMENT REPORT**  
NO. **720** MAP **#2**



**LEGEND**

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

- 0 - 70
- 70 - 100
- 100 - 200
- 200 - 300
- 300 - 400

+ Sample location  
20 etc. - Mercury content of soils (p.p.b.)  
(samples taken near surface)  
~~~~ - Inferred position Pinchi fault

**720**  
**MI**

**The Consolidated Mining and Smelting Company of Canada Limited**

|                    |       |                 |       |                                                                                                                                                                                                                        |
|--------------------|-------|-----------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DRAWN BY:          |       | TRACED BY:      |       | <b>GEOCHEMICAL SURVEY - ORA No 1 CLAIM GROUP</b><br>To accompany geochemical report by D.W. Heddle, P. Eng.,<br>on the Ora No. 1 claim group, northwest of Pinchi Lake<br>Omineca M.D. dated JAN. 20, 1966 D.W. Heddle |
| REVISED BY:        | DATE: | REVISED BY:     | DATE: |                                                                                                                                                                                                                        |
|                    |       |                 |       |                                                                                                                                                                                                                        |
|                    |       |                 |       |                                                                                                                                                                                                                        |
|                    |       |                 |       |                                                                                                                                                                                                                        |
|                    |       |                 |       |                                                                                                                                                                                                                        |
| SCALE: 1" = 1/4 mi |       | DATE: Jan 18/66 |       | PLATE: P.L. 7                                                                                                                                                                                                          |