Geological & Geochemical Exploration Report
KLONX CLAIM GROUPS
SHEET NO. 116-C-2
64° 2' N - 140° 48' W.
Miller Creek, Sixtynille River Area, Yukon
J. F. V. MILLAR, P. ENG.

This report has been examined by the Geological Evaluation Unit. Approved as to technical worth by:

RESIDENT GEOLOGIST

Approved as to cost in the amount of: $ 6,633.95

RESIDENT MINING ENG.

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

COMMISSIONER OF YUKON
## INDEX

**KLONX CLAIMS,**  
**DAWSON CITY MINING DISTRICT**  
**YUKON TERRITORY**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>PROPERTY</td>
<td>1</td>
</tr>
<tr>
<td>GENERAL INFORMATION</td>
<td>2</td>
</tr>
<tr>
<td>GEOLOGY</td>
<td>4</td>
</tr>
<tr>
<td><strong>1965 PROGRAM</strong></td>
<td>6</td>
</tr>
<tr>
<td>Outline</td>
<td>6</td>
</tr>
<tr>
<td>Equipment</td>
<td>7</td>
</tr>
<tr>
<td>Cost</td>
<td>7</td>
</tr>
<tr>
<td>GEOLOGICAL &amp; GEOCHEMICAL SURVEYS</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>8</td>
</tr>
<tr>
<td>Geological Surveys</td>
<td></td>
</tr>
<tr>
<td>Table of Formations</td>
<td>9</td>
</tr>
<tr>
<td>Geological Information</td>
<td>9</td>
</tr>
<tr>
<td>Interpretation</td>
<td>9</td>
</tr>
<tr>
<td>Geochemical Survey</td>
<td></td>
</tr>
<tr>
<td>Technique</td>
<td>10</td>
</tr>
<tr>
<td>Evaluation</td>
<td>11</td>
</tr>
<tr>
<td>APPENDIX</td>
<td></td>
</tr>
<tr>
<td>Atlas Testing Laboratories Ltd. - Soil Sample Results</td>
<td></td>
</tr>
<tr>
<td>MAPS</td>
<td></td>
</tr>
<tr>
<td>No. 1 - Map Showing Location KLONX GROUP, Sixtymile Area</td>
<td></td>
</tr>
<tr>
<td>No. 2 - Plan of Region Reconnaissance for Geological and Geochemical Base</td>
<td></td>
</tr>
<tr>
<td>No. 3 - Claim Map of KLONX GROUP, showing claims staked &amp; those to be retained.</td>
<td></td>
</tr>
<tr>
<td>No. 4 - (In Envelope) KLONX MERCURY PROSPECT - Geological and Geochemical Survey.</td>
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INTRODUCTION

This report is made as a result of an exploration evaluation program carried out between July 28th and August 19th, 1965.

The exploration consisted of geological reconnaissance and a geochemical program.

PROPERTY

A total of 36 mineral claims were located during May, 1965, to cover the area indicated to be favourable. They were located in a block four wide and eight long with an additional 4 claims on the upper west end. The mineral claims were recorded on the 29th day of May, 1965, as follows:

- Klonx 1 - 8
- Klonx 9 - 16
- Klonx 21-28
- Klonx 29-36
- Klonx 37-40

76564-76571
76572-76579
76580-76587
76588-76595
76596-76599

The property is located along the centre and left limit of Miller Creek from one mile to three and one half miles from the mouth of Miller Creek at the Sixtymile River. It lies approximately 42 miles due west of Dawson City, at a latitude of 64° 2' W, longitude 140° 48' W and elevation 2000 - 3750 feet, a.s.l.

A summer gravel road provides access from the claim group to Dawson City via the Sixtymile road from Alaska. An adequate airstrip for summer or winter supply is located on Glacier Creek, 4 miles east by road from the property. Another airstrip that could be used to accommodate larger aircraft is located at Boundary, Alaska, ten miles northwest of the property.

The property is held by J. F. V. Millar of Calgary, Alberta.
GENERAL INFORMATION

The Sixtymile River headwaters in Alaska, close to the Yukon border. It flows in a wide arc, northeasterly, then easterly and finally southeasterly to empty into the Yukon River about 36 miles south of Dawson City. Throughout its course there is only one short section in which cinnabar was recovered in quantity in placer mining operations. This occurrence lies in a short fan extending east from the mouth of the valley of Miller Creek, 52 miles up the Sixtymile from it's mouth.

Miller Creek was the richest placer creek of the number of northern tributaries of the Sixtymile in this section that were heavily mined during the Klondike Gold Rush. Mining has continued almost continuously to the present day. Miller Creek was mined continuously from its mouth up about 5 miles. A left limit bench and old channel were mined semi-continuously up about 4 miles, by hydraulicing - bulldozer mining and deep lead mining, respectively. Cinnabar was recovered in the placer operations in the creek as far back as 1900. The cinnabar content increased noticeably from the mouth up about 1.5 miles, at which point it rapidly decreased. Conversely, the coarseness of the cinnabar particles increased noticeably. Material up to 2 inches in diameter was reported at this point in the channel.

Cinnabar was found in the bench channel up to about the same distance. The cinnabar was reportedly fresher in the channel than in the creek workings. This channel is reportedly from 80 to 100 feet wide and fairly straight in direction indicating a period of egrading stream action. The depth of the old channel (and therefore the residual gravel overburden as the area was not glaciated during the Pliocene) varies from 70 feet on the Klonx No. 1 claim to 5 - 6 feet on the Klonx # 5 and 6 claims. At the 'Medby' Camp on the Klonx # 5 claim, a small creek flows from the
north on a southeasterly course into Miller Creek. Several shafts were sunk on the creek close to the location line of the lower claim group. These shafts were reportedly on the northside of the channel and recovered cinnabar. The exact location of the termination of the cinnabar float is the cat mining cut just west of the 'Medby' Camp.

Cinnabar was not recovered above this point, nor was any recovered in the gravels of Bedrock Creek, the next creek southwest. Glacier Creek lies immediately north of Miller Creek and over a shallow divide. Most sources agree that no cinnabar was recovered from Glacier Creek but one source maintained that minor amounts were obtained from the right limit about half way up the creek.

The cinnabar was obvious in placer clean up operations, where it concentrated with the gold and black sand. However, in the shafts on the channel of Miller Creek it is reported that pieces of cinnabar could be picked from the pay streak. Pieces were reported from the 'Medby' camp up to 2" in diameter.

The above information was acquired from 1953 - 1955 by J. F. V. Millar while in the area and is based on old reports and personal communication with local operators.

It appears probable that a cinnabar deposit of some unknown dimensions and grade existed somewhere in the valley of Miller Creek, only a short distance above the Medby camp. While some downstream migration is possible, the deposit was probably in a zone fanning slightly upstream from this point.

From a comparison of the topography now and at the time of the development of the old channel, it seems that erosion has been moving from north to south with the major movement downstream from the confluence of
the old channel and the present channel. No cinnabar was found in the lateral south tributaries of Miller Creek. The indication would be that the cinnabar and therefore the favourable zone, lies on the left-limit (north side) of Miller Creek.

To further delimit the favourable area, the lack of any significant cinnabar on Glacier Creek would suggest that the deposits lay well down the north slope of Miller Creek.

To recapitulate then, the analysis of data available indicates that a deposit of cinnabar existed on the north slope of the valley of Miller Creek, approximately a mile and a half from the mouth.

To follow up the theory a block of 36 mineral claims were located to cover the favourable area, and a reconnaissance geological and geochemical survey was run to check the feasibility of the hypothesis.

GEOLOGY

The Miller Creek area is underlain mainly by a complex of silicified schists derived from both clastic sediments and possibly limestone. This was intruded by a quartz feldspar porphyry with a contact lying roughly north and south and cutting across about at station 32 on the pace and compass traverse. Overlying all rocks and extending at least one mile up Miller Creek from its mouth, is an andesite flow of late or middle Tertiary age. The andesites extend from Bedrock Creek down to well below the mouth of Gold Creek.

The small quartz veins found throughout the schist section have been considered as the source of the extensive placer gold deposits of the area.

The cinnabar is found in the placers and is of the red-pink variety and is quite fresh having but little weathered. Due to its extreme softness, it
would be probable that it would not travel very far without disintegrating. It is often found with calcite vein material. The ground rock with which it is associated appears to be a pale brown siliceous schist. One large specimen of cinnabar had a speck of free gold in the thin lamination of siliceous schist adhering to it.

From the preliminary geological examination, the regional attitude of the schistosity, and possibly the primary structures, is $345^\circ - 355^\circ$ magnetic with variable dips but predominantly towards the east.

The cinnabar float found in the 'Medby' Camp Creek area is quite coarse, while the float found in the placers at the mouth of the creek was quite fine - with the largest being about $1/4$ inch diameter. The very fine cinnabar is found throughout the lower part of Miller Creek.

Cinnabar is generally related genetically to vulcanism, and found in fractured or sheared zones, or in highly porous formations lying below impervious trap formations. The rock types themselves vary from quartzites, shales, limestones, intrusives, serpentines to gneisses and schists. The main criteria are the volcanic activity, a zone of high porosity lying below a zone of very low porosity. At Miller Creek, the andesites at the mouth, extending upstream and downstream on the Sixtymile are evidence of vulcanism. There is little information as to the rock porosity but it would be probable that the quartz feldspar porphyry would be a dense rock and that the adjoining schists might be high in porosity.

Evidence of a shear or breccia zone lying in this same contact area is the depression followed by the 'Medby' Camp Creek and a mineralized spring up the shallow valley. The aerial photos show a topographic lineament that conforms to this attitude and infers an easterly dip to the zone. The mineral springs are also common in mercury ore zones.
1965 PROGRAM

The 1965 program was conducted by the following persons:

James F. V. Millar, Mining Engineer, 1954 - 12th St. S.W., Calgary, Alberta.
D. C. Dale, Junior Geologist, 2311 - 17A St. S.W., Calgary, Alberta.
G. C. Short, Prospector, 931 - 19th Ave. S.W., Calgary, Alberta.
J. R. Good, Driller, Carstairs, Alberta.
W. Badyk, Helper, 3 Galway Crescent, Calgary, Alberta.
M. A. Millar, Helper, 1954 - 12th St. S.W., Calgary, Alberta.

Base camp was established at the cabins of J. Lynch, Glacier Creek, on July 29th. On July 29th, Badyk, M. Millar, Good and Dale commenced cutting baseline and cross lines with a chainsaw. A preliminary tour of the upper area was made and geological mapping commenced. Andesite was noted along the upper ditch and to the northwest the ryolite porphyry showed up. Ryolite porphyry was found along valley of the Sixtymile River by the mouth of Miller Creek.

July 30th. Line cutting crew continued, tags were affixed to claim posts and soil sampling was commenced along ditch. Due to the nature of cinnabar, all samples were taken from bedrock.

July 31st. Pace and compass survey was made from Medby Upper Camp along the road crossing the property and all old placer shafts were tied into the survey map. A sluice was set up at 5.36 shaft muck pile in an attempt to recover cinnabar content from the muck.

August 1st. Pace and compass line was surveyed in down Miller Creek. Crew consisting of M. Millar and Badyk continued testing each shaft muck pile. Dale tied in geology to survey. Good taking soil samples.

August 2nd. Continuation of August 1st program.

August 3rd. A trip was made to Dawson City for supplies by Millar and Short. Due to mail strike essential supplies for the mercury tester had to be sent by air to Dawson from Nevada. On the return trip area samples were taken from Dawson City to base camp. Balance of crew continuing with geology, sampling, etc. as on August 1st and 2nd.

August 4th. Good in hospital. Dale, Short and Millar traversed north and south ridge of Miller Creek mapping in geology and taking soil samples for background purposes.

August 5th. Mapping completed upstream from road crossing Miller Creek at Medby Upper Camp. Testing of muck piles completed. Final samples taken on control lines.

August 6th. Mercury Detector lab was set up in cabin in Lynch camp. All personnel involved in grinding samples, sample preparation, testing and recording results.

August 7th. Completed running all samples to date and appear to have found a good picture of anomalous zone.
August 8. Johannus cat acquired to strip areas of anomalies. Dale continuing mapping. Further samples taken by crew from stripped area.

August 9th. Cat work, mapping, sampling and testing continued.

August 10th. - August 19th - continuation of August 9th program.

Aug. 10th. - Millar and Short leave property.

August 19th - balance of crew leave property.

Mapping of results of geochemical sampling tied in to geology and conclusions made over fall and winter season.

Total line cutting involved in program estimated at seven miles.

Equipment

The following is a list of equipment used during the 1965 program:

Type 5V Mercury Detector - Lemaire Instruments - Reno, Nevada; complete with modified propane burner and gas, 10 steel sample bulbs, sample scoops, 0.2 liter manual air pump with built in filter, filters, stainless steel catalytic coil.

Pickup truck.

Float equipped Cessna 180 for mobilization and demobilization.

Portable chain saw.

Atlas Copco Cobra Rock Drill.

Camp equipment, and normal prospecting and mapping equipment.

Winky Diamond Drill

D-7 Cat (rented)

Sluicing equipment (acquired from Ole Medby).

Cost of Program

May 12 - 18th (staking and some soil sampling and geology)

Labour, $350.00

Cessna, Calgary, Glacier Creek, rtn.  26:35 hours  795.50

Rental, Bell 47G-2 helicopter  86.00

Food and lodging  468.25

$1,349.75
July 29 - August 19

Labour

Millar, J. Sr. Engineer on property, @ $125/day
   July 28-Aug. 10, 14 days $ 1750.00
Dale, D. Jr. Geologist, on property 19 days
   @ $22.50/day 427.50
Short, G. Prospector, 14 days @ $22.50 315.00
Good, J., Driller, 15 days @ $22.50 337.50
Badyk, W., Helper, 19 days @ $12.50 237.50
Millar, M., Helper, 23 days @ $10.00 230.00

$3,297.50

Lodging  233.54
Food  393.65
Misc. Labour  114.85
Fuel  368.13
Equipment repairs  128.23
LeMaire Mercury Detector and lab equipment  299.20
Vehicle rental  180.15
Cat work, 5 days, 8/hr/day @ $35/hr  1,400.00

1,437.40

Mobilisation:
Cessna, 13 hrs. @ $30/hr. (3 crew members) 390.00
Truck, 2574 mi. @ 10¢ (3 crew) 257.40

Demobilisation:
Cessna, 13 hrs. @ $30/hr. (2 crew members) 390.00
Truck, 2574 mi. @ 10/ml. (2 crew members) 257.40
2 Greyhound fares @ $71.30 each (2 crew) 142.60

1,437.40

Medical Costs, Good-J.  29.00
Assay- Atlas Testing Labs  47.00
Filing, recording work, etc.  678.50

678.50

Total expenditure on Kloux claims, excepting reports and maps $10,306.90

GEOLOGICAL & GEOCHEMICAL SURVEYS

Control

The basic control was through the use of a slashed and chained base line commencing at the creek bottom, cutting through Medby's camp and extending to the ridge between Miller Creek and Glacier Creek. The
total length of the baseline is nearly 6000 feet. Flagged cross lines were then put in at right angles to the main baseline from the 0 point to 2400 feet north. The ridge line was surveyed and run to follow the height of land to take advantage of the few bedrock exposures.

**Geological Surveys**

**Table of Formations**

- **Volcanic flows** - basaltic and andesitic - probably mid Tertiary

- **Intrusive** - Quartz porphyry - several phases noted with considerable variation in grain size - material weathers to a yellow crumbly porous rock.

- **Gneiss & schist** - although this was differentiated in the field, in general they seem to be all true schists derived from sedimentary rocks. The type of mica, the proportion and the crystal size varies widely even in a few feet. The silicification generally found to be higher in the Camp creek area is sugary, or as small lenses of quartz.

**Geological Information**

The general paucity of outcrop in the claim area necessitates some reliance on inferential evidence from deep-lead bedrock tailings or from bedrock remnants exposed in the continuous dredge tailings in the creek bottom. The whole claim group was traversed and being non-glaciated often the residual soil and muck had the odd piece of rock that when recorded provided fair data, particularly regarding the volcanic outline. The bulldozer trenching exposed a good section of bedrock for detailed mapping.

**Interpretation**

The volcanic flows represent a late period of intense volcanism during mid Tertiary times, the equivalent of which may be found throughout western British Columbia.

A fairly wide variety of basalts and andesites were noted in outcrops and in the alluvial and eluvial mantle.

The volcanics apparently covered, in part at least, a proterozoic
schist-gneiss complex exposed throughout the upper parts of Miller and Glacier Creek. The most important structure of the claim group is a fine to medium grained quartz porphyry intrusive in which fracturing was noted particularly in the northwest border zone. Although no zones of truly heavy shearing were noted the exposures in all of the bulldozer trenches showed medium fracturing and silicification. It is felt that it is in these zones that the cinnabar mineralization will be found.

**Geochemical Survey**

**Technique**

The geochemical survey was specifically directed toward the location of a mercury halo that commonly surrounds cinnabar and other hydrothermal base metal deposits. The general purpose of the survey was to prospect the remainder of the claim group and the immediate area for other possible cinnabar occurrences.

The technique employed is sampling of rock, not soil, due to the relative mobility of Hg in primary gaseous solution, as compared to the relative immobility of Hg in aqueous solution. The rock samples were collected in the field from traverses from the flagged cross lines and the slashed base line. These were brought to the base camp laboratory at Glacier Creek for analysis.

The sample treatment was as follows:

1. **dry**
2. **crush**
3. **screen to -80 mesh**
4. **measurement of suitable sample size - governed by Hg content and required testing in the favourable zone.**
5. **heating**
6. **collecting the mercurous oxide gas**
7. **Measurement of Hg gas content of measured volume.**

The basic value of such a survey is a relative rather than quantitative comparison. The regional background was found to be nil on the scale used for
the close survey of the favourable area. However, on a fine determination the regional background was found to be less than 0.01 p.p.m. For the purposes of evaluating the anomalous zone, a local background was calculated and it was found on a frequency distribution that 90% lie below 100 p.p.b. and 80% lie below 50 p.p.b. An arbitrary 100 p.p.b. was used as background in the anomalous area.

Evaluation

Over 1000 determinations were run during the program. (Due to the hundreds of nil or low samples, they are not shown on the plan - only in the anomalous area are such samples shown). An attempt was made to calibrate these results with a commercial soil sampling test (see Appendix - Atlas Testing) but the commercial lab gave much higher Hg content. In any event, the relative values were felt to be of more importance.

The bulldozer trenching exposed a series of sections having anomalous Hg content up to the 1000 X background in a fractured quartz porphyry intrusive, close to the contact of the intrusive and a siliceous schist.

Stripping to the south, downhill, was impossible due to permafrost.
Northern Explorations,
Room 311 - 67, 8th Avenue, S.W.,
CALGARY, ALBERTA

Lab No. 1001

Dear Sir:

The following are the results of the soil samples submitted May 25, 1965.

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<tr>
<th>Sample No.</th>
<th>Mg. p.p.m.</th>
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<td>1.</td>
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### Sample No. | Hg p.p.m.
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21. | 2
22. | 3
23. | 2
24. | 2
25. | 5
26. | 8
27. | 8
28. | 2
29. | 2
30. | 2
31. | 8
32. | 2
Glacier Creek | 5
Rock No. 1. | 10
Rock No. 2. | 100
Rock No. 3. | 1000
Rock No. 4. | 100

The three rock samples actually contained far more than 100 p.p.m.
The method used precluded an accurate analysis in these high ranges.
Therefore they are reported at 100 p.p.m.

Yours very truly,

ATLAS TESTING LABORATORIES LTD.

J.O. Garner,
Head Assayer.

JOG/bb