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CANEX AERIAL EXPLORATION LTD.
DIVISION OF CANADIAN EXPLORATION LIMITED
700 BURRARD BUILDING VANCOUVER 5, B. C. CANADA

Silver Titan Project
Mayo, Yukon.

27 September 1963.

Dr. D. Richard Clews
Barringer Research Limited
145 Belfield Road
REXDALE, Ontario.

Dear Dr. Clews:

Now that we have completed a number of soil sampling programmes in various locations among our claim groups, the Management Committee has suggested (with my wholehearted agreement) that I seek your advice on various problems, mainly to do with the interpretation of results, that have arisen during the summer. Frankly, I would prefer to have you here in person for 2 or 3 days so that we could go over these matters in detail, but as this seems to be out of the question, I shall do my best to put as much as possible down on paper.

The field programme was set back almost four weeks by an accidental fire which destroyed our sample storage - geochemical lab shack in mid July. We lost over 500 samples, the mercury detector, the reagents and all the results to date - quite a blow to everyone envolved here.

During the summer we carried out two quite different types of geochemical prospecting, namely, 1) reconnaissance stream sediment sampling and, 2) detailed and semi-detailed grid sampling over suspected mineralization. I shall discuss each type separately.

1) Reconnaissance Stream Sediment Sampling.

We covered about 120 square miles of country mostly using a 1000 foot sample interval up the streams, often following them up to a point close to their source. The analytical method that I was given to use was the simple cold extractable heavy metals method consisting of dithizone, toluene and acetate buffer. This is a semi-quantitative method at best, but it has managed to turn up some anomalously high samples, at least one or two of which may have some economic significance. I feel that to derive the full value of this reconnaissance programme and of the considerable amount of foots-logging the sample collection entailed we should have them run during the winter under laboratory conditions. I have noted your suggestions in your report re the elements to be analyzed for, i.e. Cu and Zn, but I have this recurrent fear - is there any way we can expect to detect (through stream sediment sampling) galena bodies which have little or no associated Cu or Zn as is not altogether uncommon in this

district? Unless I have the wrong idea about mercury aureoles, I cannot see that mercury will show up in the stream sediments unless they happen to occur quite close to a buried mercury source or else happen to contain a few specks of sphaleritean and/or galena.

2) Detailed and semi-detailed Grid Sampling.

The difficulties which have arisen here are numerous and result from the varying soil types and sampling conditions we have encountered on the various grids. When we are dealing with all"B" horizon, residual-type soils alone the mercury detector works like a charm, and the results, I feel, are quite accurate and reliable. But when we are dealing with a grid which straddles both freely-drained areas ("B" horizon) and muskeg-type areas, poorly-drained areas ("G" horizon), or simply with a grid over muskeg-type areas alone, then the mercury detector becomes an instrument of mental torture and the resulting profiles are very misleading and confusing to anyone other than the analyst himself (and even to him at times!). We have found that the background reading from an unmineralized "G" horizon sample will run three or more times that of a "B" horizon sample over equally barren ground. In addition, it is seldom that we can collect a "G" horizon soil sample without some amount of fine organic material which is not removed by screening. The resultant smoke, of course, gives the sample a higher reading than it should perhaps have. By and large, the higher the organic content of the sample the higher the reading on the scale. While this is not always the case, very seldom does an organic-rich sample run much under 1.00 on the scale (50 ppb), and often the reading will be closer to 2.00 (100 ppb). We have taken to changing the filter after every smokey sample and to flushing the pump thoroughly with fresh air in order to reduce a cumulative error which tends to creep in. When running the sample we make note of the amount of staining on the filter (from 0 to 3 in increasing order of smokiness) as well as recording the soil colour (various shades of grey and brown to black) in an attempt to evaluate better our results. But the sniffing procedure itself has many short comings which tend to make the duplication or verification of an initial reading from a sample very difficult; among them: the speed of withdrawal of the pump plunger, the speed of the expulsion of the vapour through the detector, the height (intensity) of the flame, the length of time the sample is heated, the manner in which it is heated (while rotating or not, etc.), plus the contamination factors inherent in a dirty filter or an unflushed pump.

In short, we have just about reached the end of our tethers with this instrument. Perhaps after reading the questions below and digesting the enclosed sets of results you will be able to offer some advice before we lose all faith in mercury detectors.

a) Short of some form of mechanical separation of the organic fraction prior to the heating process, is there some way to reduce the obvious effect of the organic material on the detector - or even a way to gauge better this effect so as to be able to deduct an arbitrary number of parts per billion from the scale reading for a very smokey sample (3)

and so many ppb for a (2) smokiness, and so on?

b) Does the organic material tend to gather more mercury than an inorganic silt in the same relative position in relation to a source of mercury vapours? I am thinking now of a mercury source buried by (say) 30 feet of glacial till, morrainal material and muskeg. Would the near-surface organic peat-like muck contain more mercury than a similarly positioned layer of silt surrounded above and below by organic material?

c) Is there an alternative, equally sensitive but more accurate and reliable method for determining the mercury content of soils that could be substituted for the mercury detector method? The Ward and Bailey (1960) method can be used to determine "as little as 2.5 ppm of mercury", but surely the Russians have developed a more sensitive method, one not effected by the minor organic content of the soil samples.

I have enclosed the results from semi-detailed and detailed grids over Area "A" and from a semi-detailed grid over Area "B-1". In Area "A" a strong resistivity high occurs at E7 + 50/4 + 50 (north) - line E8 was the cable line - on strike with a line of strong resistivity lows and over the predicted intersection of this structural system with the top of the south-dipping Hector-Calumet Quartzite (an excellent host rock). The small map shows the location of this geophysical anomaly in relation to the mercury and CX heavy metals profiles. To pinpoint better the anomaly, detailed sampling at 10-foot intervals was undertaken on lines E7,8, and 9. The results tend, if anything, to cloud rather than clarify the issue. You will notice that the CX heavy metals profiles seldom compliment the mercury profiles. The lone high sample occurred at E2 / 7 + 00 where there is evidence of a spring having brought quantities of silt to surface. We shall be sinking a number of pits to bedrock (20 to 30 feet of overburden expected) along the E7 / 4 + 80 - E9 / 5 + 00 trend which parallels the trend of the resistivity high as soon as the muskeg freezes up. We expect to find a vein fault system dipping moderately steeply to the southeast which, we hope, will be heavily mineralized. The dip could account for the displacement of the geophysical and geochemical anomalies by 50 feet.

The "B-1" area was sampled to test a northeast - trending resistivity low which crosses the grid about 200 - 250 feet south of the baseline (which it roughly parallels). Lines 7, 8, 9 and 10 are 200 feet apart and the baseline trends N48°E. This group of results illustrates well the type of "organic interference" we have been experiencing.

We would greatly appreciate your comments and suggestions on how to improve our result reliability and also on how better to interpret the results that we already have. Will you please return the sheets of results and the map when you have finished with them?

Yours sincerely,

David L. Seymour

700 BURRARD BUILDING

Typed Vancouver Office
September 30, 1963.

DLS:mhd

P.S. I am sending this letter to Canex's Vancouver Office for typing and copy-making purposes.

Encl. - 1 map and 6 sheets of results.

cc: D. L. Seymour
Noranda Exploration Co. Ltd.
Homestake Mining Company
Kerr-Addison Gold Mines Ltd.
Silver Titan Mines Limited
Canex Aerial Exploration Ltd.

EXPLANATION

Mercury detector profile

E18 — 200 ppb. Hg.

150

100

Heavy metals profile — E16 — 50

0

470

460

Resistivity contours (in log ohm-cm)

TN

34°

Baseline no. 2

(no sample)

570

560

550

540

Baseline no. 1 N55°E

E12

E10

E8

E6

E4

E2

8+00

7+00

6+00

5+00

4+00

3+00

2+00

1+00

Cable

7+50 line (uncut)

LEO — LEO no. 1

Fr. — LEC no. 2

SCALE

1 inch to 200 feet

0 200 400 600 800 1000 feet

SILVER TITAN PROJECT

MAYO YUKON

Galena Hill Properties
Area "A"

MERCURY (TOTAL) AND HEAVY METAL (Cx) PROFILES

(plotted over Resistivity "High")

Sampled by	M.O. Hampton, J.S. Brock & D.L. Seymour
Analyses by	D.L. Seymour
Compiled by	D.L. Seymour

NORANDA EXPLORATION CO. LTD.

Area "A" - Detailed Grid

Divide by 2 for ppb ↓

SAMPLE REPORT

DATE 24 Sept 63

SAMPLE No.	PLACE	LOCATION	WIDTH	PER CENT	TYPE	SAMPLED BY
7/5+40	gyblk	(1) V.S.S.	1.35			1.35
5+30	Hgyblk	(1) S.S.	.90	.90		1.00
5+70	gyblk	(1) S.S	1.40			1.40
5+10	gyblk	(2) S	1.50			1.50
5+00	gyblk	(2) S.	1.45			1.45
4+90	gyblk	(2) S	1.45			1.45
4+80	gyblk	(2) S	2.00	2.00		2.00
4+70	gyblk	(2) S	1.80	1.90		1.85
4+60	mdgyblk	(1) S.S.	1.55			1.55
4+50	Hgyblk	(1) S.S	1.45			1.45
4+40	gyblk	(2) S.	1.60			1.60
4+30	mdgyblk	(1) S.S.	1.45			1.45
4+20	mdgyblk	(3) V.S	1.50			1.50
4+10	mdgyblk	(1) S.S	1.35			1.35
4+00	mdgyblk	(3) V.S	1.60			1.60
3/ 6+00	blk	(3) V.S.	2.35?	1.20		1.80
5+90	gyblk.bms	(2) S	1.50			1.50
5+80	gyblk	(3) V.S	1.35			1.35
5+70	blk	(3) V.S	1.75			1.75
5+60	mdgybms	(1) S.S	1.25			1.25
5+50	gyblk	(2) S	1.75			1.75
5+40	gyblk	(2) S	1.65			1.65
5+30	mdgyblk	(3) V.S.	1.70			1.70
5+20	mdgyblk	(2) S	1.40			1.40
5+10	gyblk	(1) S.S	1.25	1.25		1.25
5+00	gyblk	(3) V.S	2.10	2.20		2.15
4+90	gblk	(3) V.S.	1.80			1.80
4+80	gyblk	(2) S	1.50			1.50
4+70	mdgyblk	(1) S.S.	1.30			1.30
4+60	mdgy gyblk	(1) S.S.	1.30			1.30

NORANDA EXPLORATION CO. LTD.

Area A detailed Grid

Divide by (2) for Appln

SAMPLE REPORT

DATE 25th Sept 1963

SAMPLE No.	PLACE	LOCATION	WIDTH	PER CENT	TYPE	SAMPLED BY
5+70	sylvite	(2) S	.75	1.15	1.05	1.00
5+60	sylvite	(3) V S	.75	2.05	1.60	1.20
5+50	sylvite	(3) V S	1.10	1.75	1.50	1.45
5+40	sylvite	(1) S S	.90	1.00		0.95
5+30	sylvite	(3) V S	1.25	1.55	1.50	1.45
5+20	sylvite	(3) V.S.	1.25	1.35		1.30
5+10	sylvite	(3) V S.	1.60	1.70	1.50	1.60
5+00	sylvite	(3+) V V S	1.40	1.90	1.60	1.65
4+90	sylvite	(3) V S.	1.50	1.40		1.45
4+80	sylvite	(3) V S.	1.50	1.40		1.45
4+70	marsylvite	(3) V S	1.40	1.10		1.25
4+60	sylvite	(3) V S	1.70	1.35		1.50
4+50	sylvite	(3) V S	1.30	1.20		1.25
4+40	sylvite	(3) V S	1.50	1.50		1.50
4+30	sylvite	(3) V S	1.55	1.65		1.60

1M-MP

NORANDA EXPLORATION CO. LTD.

Area "A" Grid

(N.R. = no reaction!)

Divide by 2 for ppb

SAMPLE REPORT

DATE 31 August 1963

SAMPLE No.	PLACE	LOCATION	WIDTH	PER CENT	Cx Heavy metals TYPE	SAMPLED BY
2 1+50	sy blk	(2) smoke	1.10	.95	(3) ~~N.R.~~	1.00
2+00	sy blk	(2) smoke	.80		N.R. ~~(3)~~	.80
2+50	sy blk	(2) smoke	.75		N.R. ~~(2)~~	.75
3+00	sy blk	(2) smoke	.85		N.R. ~~(2)~~	.85
3+50	sy blk	(2) smoke	.80		N.R. ~~(2)~~	.80
4+00	sy blk	(2) smoke	.75		N.R. ~~(2)~~	.75
4+50	sy blk	(2) smoke	1.50	1.30	N.R. ~~(2)~~	1.20
5+00	med brn buff	(0)	.50		(1) ~~N.R.~~	.50
5+50	dark brn	(1) S. smoke	.60		(1) ~~(1)~~	.60
6+00	dark brn	(0)	.50		(1) ~~(1)~~	.50
6+50	blk	(3) V smokey	1.70	1.00	N.R. ~~(3)~~	1.35
7+00	med rusty buff	(0)	.50		(12) ~~(1)~~	.50
4 1+50	sy blk	(1) S smoke	.60		N.R ~~(1)~~	.60
2+00	sy blk	(3) V smokey	.70		(1) ~~(1)~~	.70
2+50	sy blk	(1) S. smoke	.60		N.R. ~~(1)~~	.60
3+00	blk	(2) Smoke	1.20		(1) ~~(1)~~	1.20
3+50	blk	(3) B.C. v smokey	1.45		N.R ~~(3)~~	1.45
4+00	blk	(3) B.C. V smokey	1.75		N.R ~~(3)~~	1.75
4+50	blk	(3) V smokey	1.50	1.60	N.R. ~~(3)~~	1.55
5+00	med brn	(0)	.55	.85	N.R. ~~(2)~~	.70
5+50	blk	(3) V smokey	1.25		N.R.	1.25
6+00	blk	(3) V smokey	2.40	1.75	(2)	2.10
6+50	blk	(3) V Smokey	1.50	~~1.60~~ 1.90	N.R	1.90
7+00	sy blk	(2) smokey	1.25		N.R.	1.25
6 2+00	dk ~~med~~ brn	(2) Smoke	.55		(1)	.55
2+50	dk brn.	(2) smoke	.50		(2)	.50
3+00	dk brn	(2) smoke	.75		(1)	.75
3+50	blk	(3) V Smoke	1.00		(2)	1.00
4+00	gy blk	(2) smoke	.90		(1)	.90
4+50	dk brn	(1) S smoke	.80		(3)	.80
5+00	med gy	(1) S smoke	.70		N R	.70
5+50	blk.	(3) V Smokey	.95		N R	.95
6+00	sy blk.	(2) smoke	1.00		NR.	1.00

1M-MP

NORANDA EXPLORATION CO. LTD.

Divide by 2 for ppb

AREA "A" GRID

SAMPLE REPORT

DATE 1st September 1963

SAMPLE NO.	PLACE	LOCATION	WIDTH	PER CENT	Cx TYPE	SAMPLED BY
					Heavy Metals	
6+50	blk	(3) B.C.V. smoky	1.00		NR	1.00
7+00	blk.	(3) V. smoky	.50		NR	.80
7+50	brn blk	(1) smoky	.75		(1)	.75
EB 2+00	sybrn blk	(3) V. smoky	.75		NR	.75
2+50	sybrnblk	(3) V. smoky	.95		(3)	.95
3+00	sybrnblk	(3) V. smoky	1.00		NR	1.00
3+50	syblk	(3) V. smoky	.85		NR	.85
4+00	blk	(3) V. smoky	1.40		N.R.	1.40
4+50	blk.	(3) V. smoky	1.90	1.90	NR	1.90
5+00	blk.	(3) V. smoky	2.20	1.90	2.20 NR	2.20
5+50	redsybrn.	(1) S. smoky	.75		(2)	.75
6+00	redbrn	(1) S. smoky	.65		(2)	.65
6+50	syblk.	(3) V. smoky	1.25		(1)	1.25
7+00	sybrn.	(1) S. smoky	.70		(2)	.70
7+50	syblk	(3) V. smoky	1.00		(1)	1.00
JD 2+50	redsybrn	(1) Smoke	.75		(1)	.75
3+00	blk	(3) V. smoky	1.50		(3)	1.50
3+50	redsy	(1) S.S.	1.00		(1)	1.00
4+00	redsybrn	(1) S.S.	1.05		(2)	1.05
4+50	sybrn.	(3) V.S.	.90		(1)	.90
5+00	sybrn.	(2) S	.95		(2)	.95
5+50	syblk.	(3) V.S.	1.25		NR	1.25
6+00	syblk.	(3) V.S.	2.25	2.00	(1)	2.10
6+50	syblk.	(3) V.S.	1.50		NR	1.50
7+00	syblk.	(3) V.S.	1.45		(1)	1.45
7+50	syblk.	(1) S.S.	1.45		(1)	1.45
8+00	Syblk	(2) S.	1.50		(1)	1.50
E12 2+50	syblk	(1) S.S.	.90		(2)	.90
3+00	redbrn	(0) —	.65		(3)	.65
3+50	syblk.	(3) V.S.	.95		NR	.95
4+00	blk	(3) V.S.	2.30	2.00 1.40	(1)	2.25
4+50	brnblk.	(3) V.S.	1.85		N.R.	1.65
5+00		Not taken	—		—	—

1M-MP

NORANDA EXPLORATION CO. LTD.

AREA A GRID

Divide by 2 for ppb

SAMPLE REPORT

DATE 15 Sept 1963

SAMPLE No.	PLACE	LOCATION	WIDTH	PER CENT	Cu. TYPE	SAMPLED BY
12 5+50	[illegible] blk	(3) V.S.	1.75		Heavy Metals N.R.	1.75
6+00	blk.	(3) V.S.	1.85		(2)	1.85
6+50	blk.	(3-4) V.S.	2.30	2.10	(2)	2.20
7+00	blk	(3) V.S.	1.50		N.R.	1.50
7+50	syblk.	(3) V.S.	1.75	1.60	N.R.	1.60
8+00	blk.	(2) V.S.	1.50		(1)	1.50

1M-MP

AREA B-1

Divide by 2 (approx) ↓

				2nd	1st	Average
Line 7/B L	medgy	②	S		1.05	1.05
0+50S	ltbrn	①	S S	1.20	1.00	1.10
1+00	medgy	②	S.	1.50	1.75	1.60
1+50	medgy	①	S S		1.50	1.50
2+00	medgy	①	S S		1.50	1.50
2+50	medgy	②	4.S	1.75	1.95	1.85
South-east ↓ 3+00	medgy	①	S. S		1.40	1.40
3+50	dkgy	③	V.S.	2.50	2.30	2.40
4+00	medgy	②	S	1.80	1.90	1.85
Line 8/B. L.	medgy	①	S.S		1.50	1.50
0+50	medgy	②	S	2.00	2.00	2.00
1+00	medgy	③	V.S.	{2.80} {3.10}	2.35	2.75
1+50	medgy	①	S.S.	2.00	2.00	2.00
2+00	medgy	②	S	1.50	1.50	1.50
2+50	medgy	②	S		2.00	2.00
3+00	dkgy	③	V.S.		2.70	2.70
3+50	dkgy	③	V.S.		2.65	2.65
4+00	medgy	②	S		2.25	2.25
Line 9/B L.	medgy	②	S		1.25	1.25
0+50	ltgybrn	①	S.S		1.20	1.20
1+00	ltgybrn	⓪	–		.90	.90
1+50	ltbrn	⓪	–	.60	.80	.70
2+00	ltbrn	⓪	–	.50	.70	.60
2+50	dkbrn	③	V.S	2.30	2.00	2.15
3+00	medgy	①	S.S.	{1.25} {1.00}	1.80	1.35
3+50	dkgy	③	V.S.	2.40	2.40	2.40
4+00	dkbrngy	③	V.S	2.10	2.30	2.20
LINE 10/B L.	medgy	①	S.S		1.10	1.10
0+50	ltbrngy	①	S.S		.80	.80
1+00	ltbrngy	⓪	—		.50	.50
1+50	medgy	①	S.S.		1.10	1.10
2+00	medgy	①	S S		1.00	[illegible]
2+50	medgy	①	S.S.	1.75	1.46	1.60
3+00	medgy	⓪	—	.85	.65	[illegible]
3+50	medgy	①	S S.	1.00	1.20	[illegible]
4+00	medgy	①	S.S		1.00	1.00