MAP No. 115-J-10

ASSESSMENT REPORT
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TYPE OF WORK: Evaluation Report

REPORT FILED UNDER	Casino Silver Mines Ltd. — DOCUMENT NO. 060784
DATE PERFORMED	1967 — DATE FILED Nov. 15, 1967.
LOCATION - LAT	62° 40' N — AREA Casino Creek Area, Yukon.
LONG	138° 50' W
CLAIM NO.	~~CAT 23-6, 17-50~~ JAY 23, 90-7
VALUES	
WORK DONE BY	C.P.H. Taylor
WORK DONE FOR	
REMARKS	Interim report from drill to Cat. Road construction, drilling, [illegible] excavation. Detailed mapping of veins were discovered. [illegible] mapped by [illegible], Skarn, [illegible] Cu. Drill intersected several mineralized zones. Bulldozer trenches were excavated in the 'E' zone only area.

CASINO SILVER MINES LTD.

ENGINEERING REPORT FOR THE YEAR 1967

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CASINO SILVER MINES LIMITED

ENGINEERING REPORT FOR YEAR 1967

By: C. D. N. Taylor, P.Eng.
November 15th, 1967.

A B S T R A C T

Surface exploration of the property commenced during April and was continued throughout the season until October 31st, 1967. No further work is planned this year.

Diamond drilling and trenching in the area of the Bomber Mine confirmed the presence of highgrade silver-lead-zinc mineralization between the surface and the Mine Adit Level and also located mineralization and favourable host rock conditions in a transverse shear zone extending below the mine for 3000 feet in a southwest direction. This transversely striking shear zone must intersect the Bomber Mine shear zone at a lower elevation than that of the present adit. Since the geological features are favourable toward the formation of a wide mineralized structure at this intersection, it is proposed to prospect this lower horizon thoroughly before continuing underground exploration at the higher elevation.

Trenching, geochemical soil sampling and diamond drilling in the 'C' anomaly area near the head of Casino Creek has resulted in the discovery of large intrusions of monzonite and quartz-porphyry into the older granitic rocks. This accompanied by evidence of faulting and shearing, also the discovery by diamond drilling of sedimentary and

volcanic rocks at depth, leads to the conclusion that the formation north and northwest of the gossan deposit near the head of Casino Creek is geologically favourable for the discovery of one or more large porphyry copper ore deposits. This conclusion is supported by the presence of copper, silver and molybdenum mineralization in some of the diamond drill hole intersections, by the evidence of anomalous copper values in soil sampling, and by discoveries of copper-bearing feldspar-porphyry and diorite float; all these findings being located in or north of the gossan deposit near the head of the creek.

Exploration costs for this year to date, October 31st, 1967, amount to $100,371.46 of which $52,887.80 was spent on 4727 lineal feet of diamond drilling in 18 holes, and $31,213.79 was spent on trenching 84,361 cubic yards of overburden and bedrock.

Recommendations for next year are that the further underground exploration of vein-type silver-lead-zinc orebodies be postponed until the prices of these metals improve, and that all effort and expense be directed toward the completion of geophysical surveys over the height of land between the Bomber Mine and the Canadian Creek basin with special attention being given to an area 3700' x 2700' near the head of Casino Creek where, it is thought, a copper orebody will be discovered under the deep overburden in this area. An induced polarization geophysical survey on closely spaced gridlines is proposed for this favourable area, followed by geochemical soil sampling surveys and deep diamond drilling. It is proposed to employ a full-time Geologist for the season to direct the exploration program and to geologically map the entire property.

The estimated cash requirements for the year 1968, to implement the above exploration program, amount to $105,000.00, to be expended about as follows:

1. Geophysical grid-line I.P. Survey inclusive of line-cutting . . .	$ 19,000
2. Follow-up geochemical soil sampling survey, trenching and diamond drilling . . .	65,600
3. Completion of geophysical magnetic and electro-magnetic surveys and line-cutting . .	4,400
4. Geologist, consulting fees, engineering and assaying . . .	6,000
5. Administration and office expense . . .	10,000
	$ 105,000

CASINO SILVER MINES LIMITED

INTERIM REPORT

FOR APRIL, MAY AND JUNE, 1967

To: The President and Directors,
Casino Silver Mines Limited,
P.O. Box 130,
Whitehorse, Yukon.

From: C. D. N. Taylor, P.Eng.,
3943 Locarno Lane,
Victoria, B. C.
July 1st, 1967.

Dear Sirs:

During the first quarter of this year it was not possible to raise funds in sufficient time to purchase mining supplies and to haul them over the winter road prior to spring 'breakup'. Consequently, the underground exploration program, as recommended in my report to you of November 12th, 1966 and approved by you for commencement in March, 1967, has been postponed.

However, funds were made available in April and an early start was made with surface exploration on your property as follows:

'C' Anomaly Area: Refer to Dwg. C-1. The work was accomplished on the following Mineral Claims: CAT 23 to 26 inclusive; CAT 47 to 50 inclusive, and JOE 93, 96 and 97.

As previously reported, this area is characterized by a complete lack of rock outcrops. Last year's geophysical survey located several electro-magnetic conductors within an area 2200 feet wide by 4200 feet on strike and open at both ends. Also located last year is a very interesting geochemical silt survey copper anomaly near the head of Casino Creek. Limited follow-up trenching late last year located two veins or vein faults over two of the conductors. These veins contained interesting silver-lead-zinc values but practically no copper. The exploration work this year has been directed toward discovering the source of the anomalous copp values.

A bulldozer trenching and ditching program was started in April in order to utilize spring run-off water to remove overburden from the picket line locations of the electro-magnetic conductor anomalies. 14,700 lineal feet of ditches were constructed to collect the run-off water to where it could be directed by the bulldozers for trenching and ground-sluicing purposes. 16,000 cubic yards of trenching on conductors was accomplished and this work will cover the representation requirements on the new Mineral Claims JOE 89 to 104 for several years. The presence of galena mineralization over narrow widths was confirmed in shear zones located directly under two of the electro-magnetic conductors between Lines 28 South and 40 South, a strike length of some 1200 feet. Ground sluicing between Lines 32 South and 36 South disclosed an appreciable quantity of galena 'float' in this area. A previously unknown quartz vein between Line 16 South 450 West and Line 20 South 300 West was discovered in this manner. Deep trenching on Line 12 South located quartz porphyry intruding granitic rocks some 1800 feet west of the baseline. Also found on this line is a quartz monzonite to granite contact at a trench 900 feet west of the baseline.

The Diamond drilling of the 'C' Anomaly was started on May 27th, 1967 on a round-the-clock basis. A BBS-1 drill with standard AX size coring bits was used with the drill crews being contracted by Arsenault Drilling Company of Whitehorse. A hole was drilled at -45° under a surface vein exposure of ore at Line 32 South 1050' West. Unfortunately, this hole was lost at 203 feet, 47 feet from its objective, due to caving and swelling ground which precluded effective grouting by pumping cement. Since trenching has disclosed much the same rock conditions in all showings in this area, it was decided to

postpone further diamond drilling of the 'C' Anomalies until more information on ground conditions could be obtained by a planned geochemical soil sampling survey along the picket lines.

'C' Anomaly - Soil Sampling:

By June 14th the ground along the picket lines had thawed enough to permit auger penetration into the subsoil of from 12 to 18 inches for geochemical soil sampling purposes. The survey was conducted between Line 0 and Line 40 South (4000') inclusive. 250 soil samples were taken. These were spot checked at the Mine for total heavy metal content with the use of a Geochemical Field Kit. 186 soil samples thus selected were sent to T.S.L. Laboratories in Vancouver for assaying by the hot acid method to obtain the copper, lead and zinc values in parts per million. The results of this survey are plotted on the attached plan (see Dwg. C-1). Some very high anomalous lead and zinc values with no copper occurred between Lines 28 and 40 South in the trenched areas over the electro-magnetic conductive zones. Moderately high anomalous copper values with no more than background lead and zinc values were obtained on all lines north of Line 28 South for a distance of 2400 feet up the valley. This is in and north of the Gossan area and below electro-magnetic conductors C'-C and D'-D.

Thus it appears that our search for the copper deposit has been narrowed down to an area at the head of Casino Creek north of Line 28 South and possibly extending to the height of land between Casino Creek and Canadian Creek, a distance of about 1 mile in length and 3600 feet in width.

'C' Anomaly - Gossan:

An important find (by the bulldozer stripping of a mud-slide) is an extension of the gossan to a total length of 2200 feet over an average width of 150 feet. Mr. H. Grant Harper, an Economic Geologist Consultant from Toronto, visited the property June 8th and 9th. He made some observations and recommendations regarding the gossan area that are considered to be well worthwhile. A copy of his letter to Mr. Proctor is attached herewith. Dr. D. C. Findlay, the Resident Federal Geologist from Whitehorse, inspected the property between June 27th and 29th inclusive. He also expressed particular interest in the gossan and took several samples at various levels in one 24-foot deep trench, all in gossan, to determine progressive ages and values during the formation of the gossan.

Helicopter Anomaly: Helicopter Mineral Claim No. 4252.
(See Dwg. No. H-1)

The diamond drill was moved to the Helicopter anomaly on June 1st. Hole No. H-1 was collared on Line 8 North 3540' West at -45° drilling S 50° W along the picket line to intersect the conductors at 150' below surface as per Dr. S. S. Szetu's recommendation. This hole was drilled to 235 feet. The drill core and drilling water was lost between 182 and 184 feet in what appeared to be a mud seam. However, this is located correctly to be the downward extension of a "C" vein of massive galena found in the surface trenching above. The galena may have been too soft to be cored by the Ax size standard tools. Since there was no drill water return due to shattered rock formation, it was not possible to get a sludge sample of this vein intersection. The hole was grouted unsuccessfully and was finally stopped at 235 feet, 65 feet from its objective of the 300 feet required to intersect the second conductive zone to the west.

'B' Anomaly Diamond Drilling: Airport Nos. 1 and 2 Mineral Claims. (See Dwg. No. B-1)

The diamond drill was moved to the Bomber anomalies on June 9th. A series of four holes were drilled at -40° along Line 6 North in order to cross-section the shear zone over the mine workings from 340' West to 300' East of the baseline. In preparing the drill stations for this work, the bulldozer uncovered a new vein, called the No. 6 Vein, for a strike length of almost 100 feet, parallel to and lying 155 feet east of the No. 1 Vein. This vein on surface assayed 11.9 ounces silver per ton, 36.5% lead, and trace only in zinc and copper. This sectional diamond drilling intersected four vein structures at various elevations from 75 to 110 feet below surface which is about halfway between the surface showings and the mine adit level vein intersections. Core recoveries from the sulphide intersections varied from nil to 80% maximum. Sludge samples were taken when possible; however, the ground was generally very shattered and part or all the sludge and drilling water was lost in some of the holes even after successive pumping of grouting cement. The results of this drilling are as follows:

Hole No.:	Collar Loc. :	Intersection From:	To:	True Width:		Assays Oz.Ag./T:	%Pb.:	%Zn.:	%Cu.:
B-2	340W	115'	120'	3.5'	Core	44.7	12.4	Tr	2.04
		120	130	6.5	Core	36.5	6.5	Tr	0.81
		166	175	6.0	Sludge	45.1	13.6	Tr	0.06
		175	179½	2.0	Sludge	35.4	12.5	Tr	0.01
		179½	183½	1.0	Sludge	33.0	10.3	Tr	0.01
B-3	200W	140½	144½	3.0	Core	21.5	8.5	0.01	Tr
		144½	153½	5.5	Core	8.7	3.7	Tr	Tr
		153½	155½	1.5	Core	8.5	8.0	Tr	0.03
		188	201	9.0	Sludge	20.0	12.2	6.3	0.15
B-4	20E	75'	100'	20.0	Sludge	0.16	Tr	Tr	Tr
B-5	200E	Collar	165'	No Sulphides					

The above drilling with standard AX Core is relatively inexpensive on a per footage drilled basis. However, when one takes into account the loss of drill core in the sulphide intersections, it is expensive drilling indeed. Sludge samples were taken whenever possible but these are not considered to be too reliable because they may have been 'salted' by drill water agitation, the galena sulphides being so much softer than the wallrock in most cases. I believe that the only answer to successful diamond drilling and good core recovery through sulphides in this type of formation is the use of wire line equipment, preferably in a size larger than AX.

Conclusions:

All geological arguments regarding the Casino Creek property now point to the theory that the many geophysical conductors mapped to date consist of related sub-parallel vein faults. These vein faults extend for several thousands of feet and, intermittently, will contain massive sulphide mineralization over narrow widths within the comparatively wide shear zones occasioned by the vein faults. Major ore occurrencies, of much greater width and possibly of porphyry type mineralization, are to be expected in locations between or adjacent to oblique veins or shearing connecting the sub-parallel veins.

In the 'C' Anomaly area we have a gossan 2200 feet long by 150 feet wide occupying an oblique position between subparallel vein faults A'-A, B'-B, and C'-C (refer to Dwg. C-1). Also, north of the gossan area, anomalous geochemical copper values occur between conductors B'-B, C'-C, and D'-D, where the creek in this area swings to an oblique position more or less interconnecting these sub-parallel conductors. The possibility exists that there may be a wide mineralized

structure bordered on three sides by the creek and the gossan and open to the northwest toward the roof pendant on the mountain which separates Casino Creek from Canadian Creek. This theory can be checked by diamond drilling and/or by a program of overburden drilling and geochemical soil sampling on a 100-foot grid pattern.

Interim Recommendations:

Since there is insufficient time remaining this season to complete an overburden drilling and geochemical soil sampling program on a 100-foot grid pattern over the interesting area, I would suggest a limited diamond drilling exploratory program about as follows: (refer to Dwg. C-1)

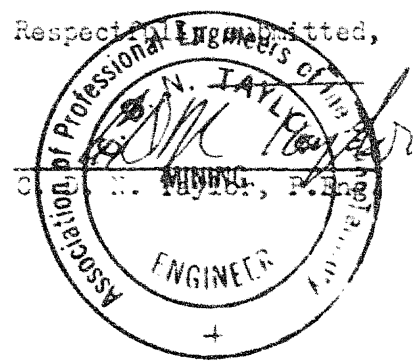
1. Drill a deep diamond drill hole, possibly 750 feet vertical, at location C-2 on the map. This hole will be started in gossan in the bottom of the deepest trench at 1430' South, 1000' West. Any intersection of sulphides in this hole should be assayed for copper, molybdenum, silver, and gold.

2. If the above hole, C-2, makes ore at depth, continue drilling the gossan in this area on a definite pattern to delineate the orebody. If hole C-2 does not make ore at depth, move the drill to the lower end of the gossan at Line 2400' South, 50' West, C-3 on the plan.

3. If hole C-3 makes ore, start a grid system of drilling in that area. If hole C-3 does not make ore, try location C-4 on the map at Line 4 North, 700' West, to check the source of high copper on the geochemical silt survey results, or, drill a hole at C-5 on Line 12 South, 60' West, to check the structure connecting sub-parallel conductors B'-B, C'-C, and D'-D.

I would recommend also that about 600 cubic yards of exploratory trenching be accomplished on the most northwesterly of the electro-magnetic conductors located in the Canadian Creek basin. This work will be sufficient to cover representation work requirements for one year on CAT Nos. 71 to 82 Mineral Claims for a period of one year.

Respectfully submitted,



C. N. Taylor, P. Eng.

July 1st, 1967.

CASINO SILVER MINES LIMITED

INTERIM REPORT FOR PERIOD

JULY TO OCTOBER, 1967

To: The President and Directors,
Casino Silver Mines Limited,
P.O. Box 130,
Whitehorse, Yukon.

From: C. D. N. Taylor, P.Eng.,
3943 Locarno Lane,
Victoria, B. C.
November 15th, 1967.

Dear Sirs:

A description of the exploration work done on your property during the first half of the season is covered by my report to you dated July 1st, 1967. The attached report is for the period July 1st to October 31st, 1967, and includes a summary of the surface exploration work for the entire season. There will be no further work done on the property during November and December, 1967.

DIAMOND DRILLING

12 Diamond Drill Holes totalling 3438 lineal feet of drilling were drilled in the gossan area of the 'C' Anomaly on Mineral Claims CAT 24 and 28, and JOE 96. (See Dwgs. C-2 and C-4).

D.D.H. No. C-2: This hole was drilled vertically in the bottom of a 25-foot deep trench in gossan near the top end of the deposit. The formation was almost entirely a very leached, shattered, quartz monzonite which was heavily mineralized with pyrite in bands and in scattered disseminations. A fine-grained, even-textured, greenish-brown, calcareous siltstone was intersected between 175 and 186 feet, also from 304' to the end of the hole at 320 feet. This siltstone cored well, however, it swells and disintegrates when exposed to air and drilling water. The hole caved in this material and could not be

recovered by grouting, so it was not possible to test the underlying formation to the designed depth of hole to 750 feet. Long sections of this core were split and assayed. Only a few specks of residual chalcopyrite were observed. The quartz monzonite assayed up to 0.01% copper and 0.16 oz. silver per ton. The siltstone assayed only a trace in copper.

D.D.H. No. C-3: The drill was moved next to a location near the bottom end of the gossan in an attempt to intersect this interesting formation at a lower horizon, possibly beneath the siltstone. A vertical hole here was mostly in quartz porphyry and quartz diorite to a depth of 301 feet. No monzonite or siltstone was intersected and the formation was less pyritized. The rock was quite shattered and there was no drill water recovery, even after grouting, so no sludge samples could be taken. There was visible ground-up sulphide mineralization between 47.6 and 51.6 feet; however, only 10% of the core was recovered from this section which assayed trace only in copper, lead, zinc and silver. A three-foot section of replacement sulphides in quartz diorite between 75 and 78 feet assayed 25.7 ounces silver per ton, 14.9% lead, 16.7% zinc, 0.27% copper, and 0.026% molybdenum. The balance of the hole to 301 feet was in an extrusive rock of possibly volcanic origin. The rock was logged as quartz porphyry and granite porphyry which had numerous remnants or inclusions of hard, brittle diorite.

The above ore intersection in a favourable host rock formation appeared to be important enough to continue drilling in this area. A grid system of drilling for the entire length of the gossan was laid out. However, only five more holes in gossan were drilled because it became apparent soon that the gossan was of a transported,

sedimentary type, possibly marking a contact between granitic rocks and later intrusive rocks. The gossan is not a residual type of iron capping overlying an orebody.

D.D.H. Nos. C-4 and C-9: These vertical holes were drilled 100' east and west, respectively, of Hole C-3 in an altered granitic formation containing no sulphide mineralization.

D.D.H. No. C-9A: This is an angle hole drilled from the C-9 location. This hole intersected mineralized granite porphyry between 122.5' and 183'. The last 8 feet of this intersection was badly shattered; no sludge and only 15% of the core was recovered. A sample of this core, between 176' and 179' assayed 4.0 oz. silver per ton, 2.4% lead, 0.4% zinc, 0.03% copper and 0.02% molybdenum. This intersection is 70 feet N 40° W of the ore intersection in Hole C-3. Incidentally, these two intersections represent a vein which showed no electro-magnetic reaction on the geophysical survey. It is on strike with electro-magnetic conductor C'-C which is mapped 2000 feet to the north and is also on strike with a vein structure located by trenching near the creek some 1200 feet southerly.

D.D.H. No. C-13A: This hole was drilled at -45° some 400 feet west of hole C-9 in order to intersect a quartz vein on a contact between granitic rocks and quartz porphyry found by surface trenching. Leached, lightly mineralized quartz porphyry was cored between 146 feet and 211 feet. Of this, there was only 40% core recovery and no sludge return over the last 6 feet which assayed 0.04 oz. gold per ton, 4.74 oz. silver per ton, 4.5% lead, 0.7% zinc, and 0.22% copper. No molybdenum was observed.

D.D.H. No. C-21: This is a vertical hole drilled 160 feet due east of hole C-2 in an effort to explore the formation beneath the monzonite and siltstone found in hole C-2. This hole, however, was in leached, chloritized granite porphyry for almost its entire length. It was drilled to a depth of 398 feet where it caved beyond recovery by grouting. Two feet of the core, from 354 to 356 feet, were fairly well mineralized with pyrite and chalcopyrite but no lead or zinc. This two feet of core assayed 3.26% copper, 0.24 oz. gold per ton, and 0.68 oz. silver per ton. It must be assumed that there is a fault or contact between holes C-21 and C-2.

D.D.H. Nos. C-22, 23 and 24: These are all angle holes north of the gossan deposit but adjacent to it. They were drilled to check electro-magnetic conductors mapped from a recent Ronka E.M. 16 survey to be described later. All three holes were in quartz monzonite for their entire lengths of 294, 358 and 309 feet respectively. Each hole intersected a wide, leached, heavily pyritized alteration zone from 83.5 to 194', 88.5 to 193', and from 52 feet to 309 feet respectively. Out of 15 samples of split core representing these mineralized sections, all of them returned sub-marginal assays in gold and silver up to 0.22 ounces per ton in precious metals. One hole, No. C-23, had a chalcopyrite intersection from 189 to 193 feet assaying trace in gold, 0.16 oz. silver per ton, and 0.27% copper. No galena or molybdenum was visible. It is thought that all three of the holes might have overshot the conductor which may exist at depth.

DIAMOND DRILL HOLE CORE RECOVERY

Hole No.:	Total Depth	Area and Formation :	Mineralized From:	To:	Core Recovery in feet:	Core Recovery percent:
C- 1	203'	Conductor, Granitic	-	-	191'	(95%)
C- 2	320'	C gossan, Monzonite	186'	264'	78'	100%
		Quartz Porphyry	264	304	40'	(100%)
C- 3	301'	C gossan, Dioritic	47.6	51.6	0.5	11%
		Quartz Porphyry	75	83	6.5	81%
		Dioritic	83	116	27	67%
C-4	502'	C gossan, Granitic	-	-	502	100%
C- 9	198'	C gossan, Porphyry	-	-	198	100%
C- 9A	237'	C gossan, Porphyry	73	76	3	100%
		Quartz Porphyry	92	98	6	100%
		Granite Porphyry	117	183	61	93%
C-13A	219'	C gossan, Porphyry	116	219	89	(87%)
C-21	398'	C gossan, Porphyry	323	356	29	(88%)
C-22A	294'	Conductor Monzonite	83	194	109	97%
C-23A	358'	Conductor Monzonite	89	193	98	90%
C-24A	309'	Conductor Monzonite	9	278	222	82%
C-25	95'	C Area Monzonite	22	41	12	(64%)
C-25A	207'	C Area Monzonite	-	-	201	97%
	3641'	'C' Anomaly Area				
B- 2	197'	B Anomaly Granitic	115	130	9'	60%
		Porphyry	168	180	6	(50%)
B- 3	286'	B Anomaly Cr. Porph	140	159	6	32%
		Quartz Porphyry	189	201	8	66%
B- 4	203'	B Anomaly Granitic	88	93	3	60%
B- 5	165'	B Anomaly Granitic	-	-	135	81%
	851'	'B' Anomaly Area				
H- 1	235'	H. Anomaly Granitic	-	-	227	(96%)
	4727	Lineal Feet Total Drilling.		Incomplete Holes		(7)
			Holes Complete to designed depths			11

One may note from the above that diamond drill hole core recovery is generally poor in all the formations of this area except the quartz monzonite. Drilling costs this season amounted to $11.20 per lineal foot using a B.B.C.-1 Drill and A size bits. In order to get better recovery with the same sized drill it may be necessary to advance B size casing almost the entire lengths of the holes while coring with the A size tools inside the B rod. This will almost double the cost of drilling.

GEOPHYSICAL SURVEY

After six diamond drill holes through the gossan had been completed, it was decided to re-check this area with a geophysical survey using a Ronka E.M.-16 instrument.

Cana Exploration Consultants Limited of Toronto accomplished this survey in a period of two days using a picket line interval of 200 feet and taking readings on 50 foot centres.

The results of this survey show (see Dwg. C-2) conductors as follows:

Line 14 South	-	Conductor at	750' West
			1100' West
			1350' West
Line 15 South	-	Conductor at	700' West
Line 16 South	-	Conductor at	420' West
Line 18 South	-	Conductor at	370' West
Line 20 South	-	Conductor at	330' West
Line 22 South	-	Conductor at	2808' West

Of the above, all the conductors north of the gossan were drilled as described elsewhere in this report.

TRENCHING

'C' Anomaly Area: (Refer to Dwg. C-3) JOE 93 Mineral Claim.

A long trench was excavated on Line 34 South to check the electro-magnetic conductor B'-B in an area where only float galena had been observed during ground sluicing in the spring. (See report dated July 1st, 1967). A narrow galena vein was found in a wide shear zone at a depth of 8 feet in the trench. A chip sample across the shear zone on the conductor assayed 0.04 oz. gold and 5.72 oz. silver per ton, 0.2% lead, 3.3% zinc, and 0.01% copper. A character sample of the best intersection of ore in place assayed 0.02 oz. gold and 9.8 oz. silver per ton, 26.6% lead, 11.5% zinc, and trace copper. The above sampling was done by R. J. Cathro, P. Eng., of Archer, Cathro and Associates, Consulting Geologists, of Whitehorse, Yukon.

'B' Anomaly Area: (Refer to Dwgs. B-1 and B-2) Mineral Claims Airport Nos. 3, 6, 7, and 8.

The long electro-magnetic conductor which was mapped below the Bomber Mine anomalies and which strikes obliquely across the formation between Line 0 and Line 3600' South was prospected by 14 bulldozer trenches, 11 of which were excavated into bedrock. Each trench disclosed an iron and manganese-stained shear zone in granite gneiss and granodiorite at the exact location of the mapped conductor. Six of these trenches intersected a quartz porphyry vein or dyke within the shear zone and up to seven feet in width. Sulphide mineralization within and adjacent to the quartz porphyry is noted as follows:

Sample:	Trench:	Description
#4200	#32	Quartz porphyry stained with azurite and minor malachite. 6 feet width, 0.25% copper.
20-B	20	Pyritized quartz porphyry 4 feet wide in a 30-foot shear zone. Character sample of the pyritized porphyry, 5.70 oz. silver per ton, trace lead, and trace copper.
24	24	Pyritized quartz porphyry 3 feet wide in a 50 foot shear zone. Character sample, 3.92 oz. silver per ton, trace lead, and 0.37% copper.
#4179	25	Character sample of 4 inches of steel galena in quartz porphyry. 86.9 oz. silver per ton, 59.6% lead, 1.2% zinc, and 0.60% copper.

The persistence of this conductive shear zone which is associated with a mineralized quartz porphyry vein dyke is considered to be important in that it strikes obliquely across the formation south of and below the sub-parallel Bomber Mine veins. There may be some relation at their intersection which will be in a heavily overburdened area between Line 6 South 200 West and Line 12 South 800 West. It is planned to prospect this area by geochemical soil sampling over a grid on 100-foot centres.

EXPLORATION COSTS

Exploration costs for the year 1967 to date October 31st, are as follows:

Surface Diamond Drilling, A.Q.W.L.:	$ 46,977.67	
Fuel and distributable costs	5,910.13	
4727 Lineal Feet in 18 drill holes		$ 52,887.80
Cost per lineal foot $11.19		
Trenching and overburden removal	$ 29,052.09	
Plus distributable costs	2,161.70	
84361 cubic yards excavated		$ 31,213.79
Cost per cubic yard $0.37		
Assaying		1,498.96
Geochemical Survey, 'C' Anomaly Area		760.34
Geophysical Survey, 'C' Anomaly Area		325.50
Engineering and Consultant Fees and Expense		2,987.03
Administration		10,698.04
Total Exploration Costs		$100,371.46

CONCLUSIONS

Cross-sectional diamond drilling of the Bonber veins has confirmed the presence of highgrade galena ore located mid-way between the surface showings and the underground ore intersections. The long geophysical electro-magnetic conductor mapped south of the above workings and at a much lower elevation was prospected by follow-up trenching, to disclose galena mineralisation with some copper in quartz porphyry within a transverse shear zone. This discovery is of geological significance in that the two mineralised shear zones are converging on strike and, at a lower elevation than the present mine workings, may intersect to form an orebody of greater width potential. Thus this favourable area below the mine should be prospected thoroughly prior to undertaking further underground exploration at the lower elevation of the present mine workings.

The geological information gained from this year's exploratory program on the 'C' anomaly area near the head of Casino Creek is of far greater importance. The geochemical soil sampling program followed by diamond drilling and trenching has narrowed the search for a copper-silver deposit to a comparatively small area located to the north and west of the gossan deposit. In this area we have discovered a large intrusive deposit of quartz monzonite contacting a granitic formation on surface and intersecting rocks of volcanic and sedimentary origin at depth. This favourable geological situation may lead to the discovery of one or more porphyry copper type orebodies. In this regard, I would refer you to the appendix of this report where the characteristics of this property are compared to those typical of economic porphry copper deposits found elsewhere in North America.

Thus one must conclude that the occurrence on this property of large tonnage porphyry copper deposits containing minor values in gold and silver are a distinct possibility.

[illegible]

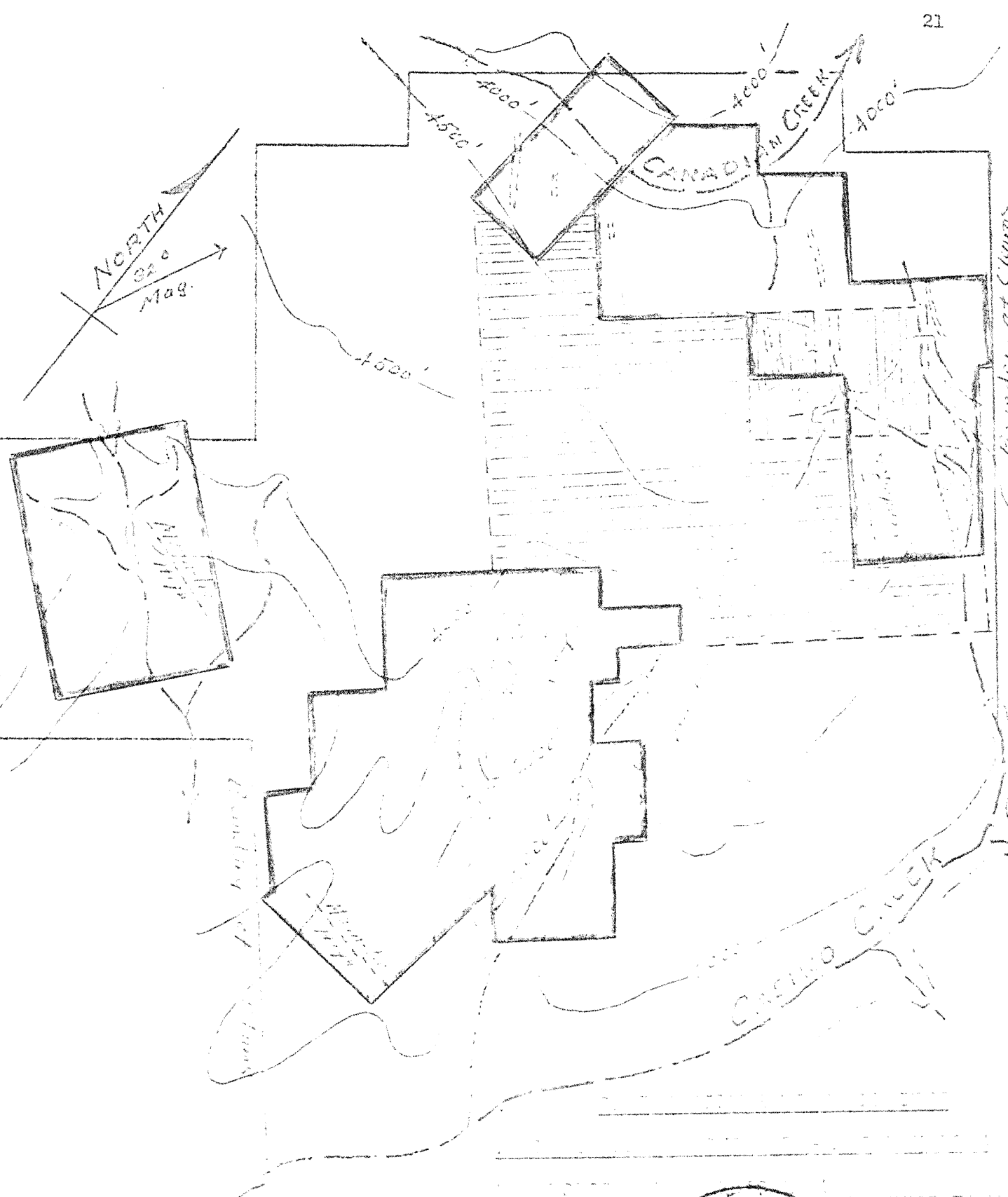
Since the economic potential of large tonnage porphyry copper deposits is much greater than that of other types of ore deposits, and since the prices of silver, lead and zinc are expected to improve during the next two years, I would recommend that the underground development of the galena (silver-lead-zinc) veins be postponed and that expenditure of $105,000.00 be made entirely on surface exploration about as follows: (refer to map attached - 'Proposed Geophysical Surveys',

1.	Grid line induced potential or similar electrically induced survey on grid lines spaced 100' apart in two directions over an area 3700' long by 2700' wide northwest of the gossan deposit at the head of Casino Creek; 38 miles of gridline @ $500.00 ...	$ 19,000
2.	Allowance for follow-up bulldozer trenching and geochemical soil sampling surveys ...	15,600
3.	Allowance for deep diamond drilling, 2000' @ $25.00 ..	50,000
4.	Geophysical magnetic and electro-magnetic surveys to cover the unsurveyed area between the Bomber anomalies and the Canadian Creek basin. Picket lines to be cut at 400' centres and readings to be taken at 100' intervals: 11 miles @ $400.00 .	4,400
5.	Geologist to direct the above work and to complete the geological mapping of the entire property: four months @ $1,000.00 ...	4,000
6.	Engineering and assaying ...	2,000
7.	Office and Administration ...	10,000
	Total Recommended Exploration Expense - 1968 ...	$105,000

Respectfully submitted,

Association of Professional Engineers of the Yukon Territory
D. N. TAYLOR
MINING
ENGINEER

D. N. Taylor, P.
November 26th, 1968



Proposed 2-M. Survey 1968

Proposed 2-M. Survey 1968

0 1/4 1/2

1/2 mi. : 1"

Association of Professional Engineers of the Yukon Territory
C. D. N. TAYLOR
MINING
ENGINEER

APPENDIX

References: 'Some Features Pertinent in the Exploration of Porphyry Copper Deposits', by S.E. Jerome.

'Geological Variations of Geological Significance in Porphyry Copper Deposits', by S.E. Jerome.

The following characteristics which are typical of economic porphyry copper deposits elsewhere in North America, have been discovered on Casino Silver Mines Limited property:

1. Stratigraphically there is an anticlinal fold related to the roof pendant or dome which makes up the height of land separating Casino Creek from Canadian Creek.
2. Host rocks of granite, granite gneiss and argillite have been intruded by granodiorite, monzonite and quartz porphyry. All the above rock formations have been located on the property in this and last year's diamond drilling programs.
3. Faulting and shattered zones in the intrusives and the invaded rocks. This is very evident in all of the drilling done on the property, especially so in the gossan area.
4. Lead, zinc and copper sulphides with associated gold and silver values occur in fissures in and adjacent to the intrusives. Examples of this on the property are the Helicopter Vein, the six Bomber Veins and three sets of '0' [illegible] conductors in which galena fissures occur with copper, gold and silver values.
5. Replacements, fissure fillings and disseminations of primary copper minerals occur in the silicified zone surrounding the intrusive. Examples of this at the property are: (a) Chalcopyrite found in siderite and [illegible] in the [illegible]; and (b) Chalcopyrite found replacing [illegible] in the drill holes [illegible] and [illegible].

6. Under arid conditions and a moderate rate of erosion, oxygenated ground water coming in contact with pyrite becomes rich in ferric sulphate and sulphuric acid. These strong oxidizers dissolve copper from its primary sulphides above the water table and precipitate it at or below the water table where the solutions become dilute. This is quite evident at the Bomber Mine where there is no copper in the vein formations on surface but up to 3.5% copper is found in the vein intersections underground below the water table some 165' below surface. Also in Hole 0-2, under the gossan of the 'O' Anomaly, there is a 300' thickness of leached, heavily pyritized quartz monzonite containing only a few specks of residual chalcopyrite. Hole 23A has the same condition to a depth of 199 feet and yet Hole 0-21 nearby has 3.26% copper at 356 feet depth.

7. Molybdenum is usually found in locations corresponding to locations of porphyry copper orebodies along with iron sulphides and limonite in stringers and gossans. The magnetite is commonly destroyed by hypogene and supergene alteration. The iron minerals and molybdenum are evident in many of the drill holes under the gossan of the 'O' anomaly. Magnetic iron has been observed only in trenches above and west of the 'O' anomaly conductors and at the southwest part of the property in diamond drilling the 'L' anomaly last year.

8. Gold and silver values are related to primary porphyry copper orebodies. Silver is present in much greater amounts, usually with lead and zinc, in fault veins and fissures adjacent to porphyry copper deposits. At the Bethlehem property both gold and silver values in gossans are in the Bomber Mine, and lower grades of silver

mineralization in the galena at the Helicopter Vein and the 'C' anomaly veins some 3000 feet to the east and west respectively. Low gold values occur in all the mineralization found on the Casino Creek side of the property. North of the Divide, on the Canadian Creek side of the property, appreciable gold and tungsten values occur in a placer deposit which is located so high up in the cirque that there is no doubt whatever that gold-tungsten veins, fissures or breccias must occur near the height of land between the two creeks.

9. Lead and zinc minerals characterize the fringe zone of porphyry copper orebodies and lead may be found somewhat further out on the district fringes than is zinc. At the Casino property, near the southeast fringe of the monzonite intrusive, drill hole C-3 and trench No. 16-A intersected relatively high lead and zinc values whereas at the Helicopter showing, some 6000 feet to the west, there are high lead values in the veins but no zinc.

10. Cobalt, molybdenum and vanadium occur as trace elements in most economic porphyry copper deposits. This is so at Casino as evidenced by two semiquantitative spectrographic analyses of 'C' anomaly mineralization and 'C' anomaly gossan.

Regardless of the above characteristics, the most convincing features pointing toward the discovery of a large tonnage, porphyry copper type orebody on the Casino property are as follows:

1. The geochemical silt sampling survey of 1966 shows relatively high anomalous copper values in the upper headwaters of Casino Creek.

2. The geochemical soil sampling survey of 1967 shows high anomalous copper values, with only [illegible] in lead and zinc,

picket line locations in and north of the gossan deposit near the head of Casino Creek. Sampling locations south of the gossan deposit assayed generally high in lead and zinc with background values only in copper.

3. Mineralized feldspar-porphyry and diorite float rocks have been found upstream and northwest of the gossan deposit at the head of Casino Creek. These mineralized specimens assayed 0.22% copper and 0.53% copper respectively. (Refer to Mr. Harper's letter dated June 20th, 1967, attached herewith.)

H. GRANT HARPER, P.Eng.

ECONOMIC GEOLOGIST

314 HERDON AVENUE

WILLOWDALE, ONTARIO

MEMBER C.I.M.M.
S.A.C.
BOARD OF TRADE

BA. 5-7412

June 20, 1967

Mr. Leo I. Proctor,
President,
Casino Silver Mines Limited,
Whitehorse,
Yukon Territory.

Dear Mr. Proctor:

I do wish to thank you for your kindness to me during my recent trip to the Yukon. Flying up Hunker Creek and Bonanza Creek gave me a perfect bird's eye view of the old Klondike gold diggings ... a view that few Canadians will ever get. The subsequent trip to the Casino Silver Property was very informative to me. I was particularly interested in seeing how Yukoners use natural forces to help them conquer the rugged terrain and permafrost. In this respect your ditches and bulldozer lines were real eye-openers. Thank you again for a pleasant and informative day.

Possibly you and Mr. Taylor may wish to have a record of my observations of your property. All of the basic information came from you and Mr. Taylor.

On June 7th I was able to examine the surface showings on the Lower Vein System, the [illegible] area on Casino Creek, the Casino Creek [illegible] anomaly, the [illegible] Creek [illegible] and the Dominion Creek

gold-tungsten placer. I was unable to go underground on the Bomber Vein System and there was insufficient time to see the Helicopter Vein System.

The Bomber Group is a typical silver, lead, zinc, vein fault system, structurally comparable to the Keno Hill and the Slocan, B.C. systems. The fault system is very broad -- to date the underground workings indicate a width of 600 ft. and the zone may well prove to be wider when underground drilling is done. The vein fault system has been traced along strike for a length of at least 600 ft. and I predict with confidence that the vein fault system will continue along a rise in both directions for several hundreds of feet more. Within the lateral bounds of the vein fault system is a series of echeloned and braided tension faults whose rough pattern is crudely predictable and which carry rich pods of silver, lead, zinc, and copper. Significantly, copper and zinc were found in interesting quantities only underground, having been weathered and leached out of all surface exposures.

To my mind, the best way to explore and develop the Bomber vein fault system is to follow the lead provided by Dr. D.C. Bates, who has provided you with excellent geophysical advice, and Dr. F.W. Boyle, of the Geological Survey of Canada, who has built on the ideas on Keno Hill I already mentioned. It is foolish to follow the lead unless one has provided. But the principle to search for the richest ore in the vein fault system with its natural irregularities and [illegible] is the recommendation to be [illegible]

conductors carry valuable mineral. Incidentally, Drs. Boyle and Szetu and I were all graduate students together at the University of Toronto some 15 years ago.

Having located a conductor which coincides with a geochemical anomaly, I would establish the presence of economically interesting values by minimal amounts of [illegible] and/or diamond drilling. A potentially economic area should be developed as quickly as possible by underground line drifts and lateral drill holes. Wherever possible underground workings should be straight and in solid rock to reduce timbering costs.

The C Anomaly Area on [illegible] Creek is a vein fault system similar to the Bomber group but the mineralization found to date is less abundant than in the Bomber system. A drill hole on the C Anomaly failed to reach its target because of the caving ground. At the time of my visit, the drill had been moved to the Bomber Group and the first hole was starting. It is my opinion that the Bomber system should have drill priority over the C Anomaly Area.

The C Anomaly Area was located by a [illegible] electro-magnetic survey and it consists of a series of [illegible] faults which in places carry silver lead values, [illegible]. However, one must expect lower values at surface because all of the zinc and copper will be weathered [illegible] the amount of [illegible] and [illegible] present, some of the [illegible] may be [illegible] away. [illegible]

[illegible]

[illegible]

The C Anomaly Area should be soil sampled before further drilling is done.

A geochemical survey of the stream sediments of all of the creeks and pups draining the Casino Silver property was made by Dr.Sheetu. Most of the results, naturally, were unimportant, but a 6600 ft. length of Casino Creek produced a remarkably strong copper anomaly, the source of which has never been determined. A search was made up the bed of Casino Creek, secondary copper mineralization was found and certainly, clues as to the cause of the geochemical copper anomaly have been determined.

Proceeding up Casino Creek [illegible] of the copper anomalies, our party which included yourself and Mr. Taylor, began prospecting the float in the bed of the creek. Most of the float is angular pieces of granite. [illegible] dull green coloured float was found and finally a piece of this contained some copper stain. As we proceeded up the creek the pieces of dark coloured, copper stained rock [illegible] more abundant. This rock, a dark coloured porphyry, finally became more abundant than the granite float. Near the headwaters of Casino Creek, where the porphyry is most abundant, the copper stain is no [illegible] but occurs predominantly as [illegible] disseminations throughout the porphyry. [illegible] which may be secondary or [illegible] [illegible] broken only one of the [illegible] [illegible]

intrusive diorite. This rock is less abundant than the feldspar porphyry. A weathered sample of the diorite assayed 0.53% copper. A third rock sample which contained only stain and none of the black sooty mineral, assayed 0.01% copper. I cannot tell if there is any chalcocite mineralization in this area but in view of the gold placer in the adjoining Canadian Creek, chalcocite and gold mineralization should be looked for.

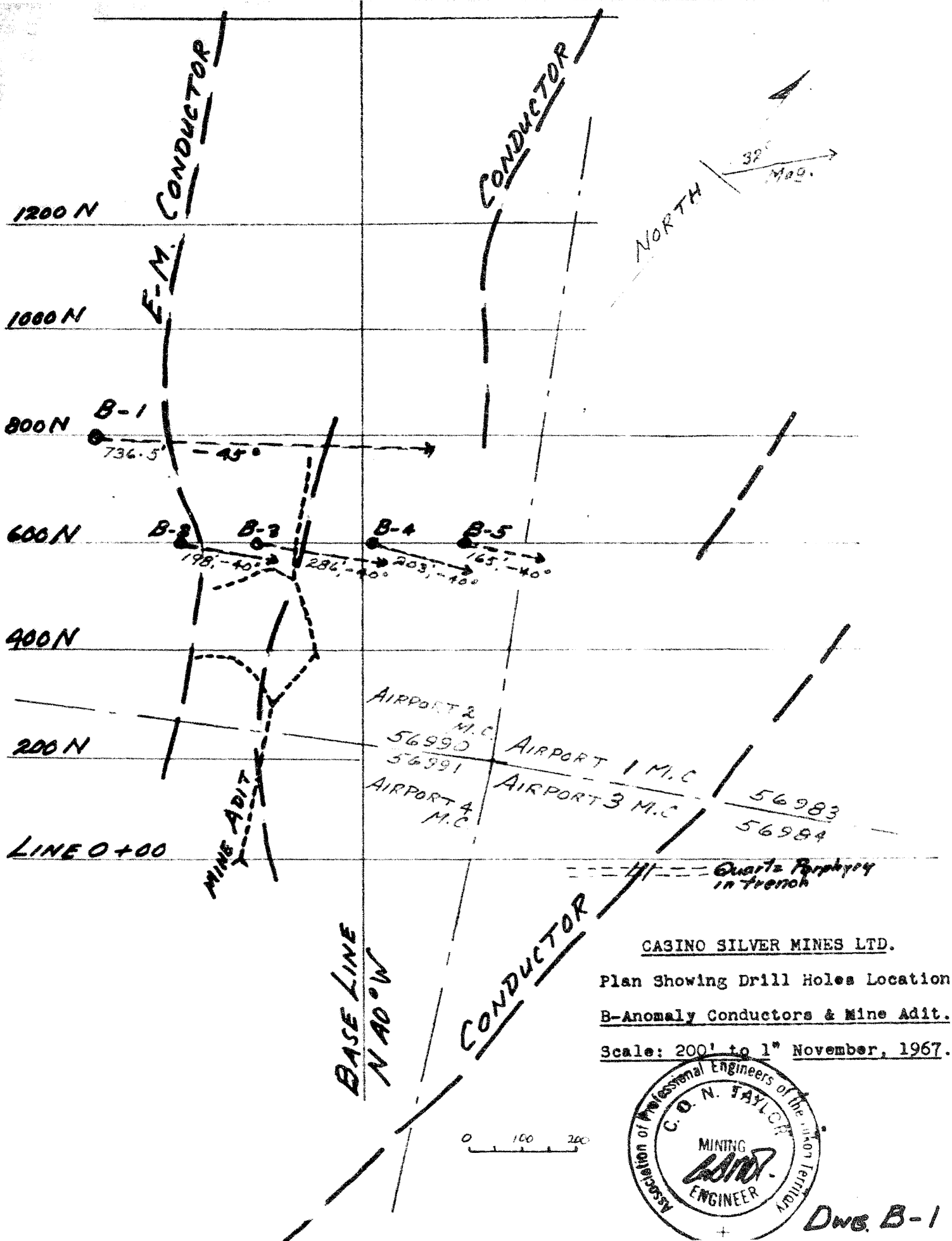
I recommend that the headwaters of Casino Creek be thoroughly prospected and soil sampled on a grid pattern to try and delimit the area of copper mineralization. This work should likely be followed by Instaneous Polarization Surveys (McPhar type) to outline diamond drill targets.

A second possible source for the copper geochemical anomaly is located on a pup of Casino Creek. It consists of a gossan, or burn, at least 300 ft. long and 150 ft. wide. The burn occurs in an area of quartz monzonite rock but may include some sedimentary facies. Fragments of partially weathered quartz monzonite from within the burn carry disseminated pyrite. There is a large trench, about 15 ft. deep, in the heart of the gossan. Nowhere has any base metal value been located in the gossan. The gossan may be caused by pyrite alone and have no metal content. On the other hand the gossan is very deeply weathered and I personally would not be satisfied until I had a deep drill hole under it. Gossans of this size and degree always are deserving of a drill test.

Mr. Proctor, it was a pleasure to meet you, it was fascinating to see how experienced people operate in the Yukon and I sincerely hope that my observations may assist you in some small way.

Yours truly,

HCH:p. H.Grant Harper



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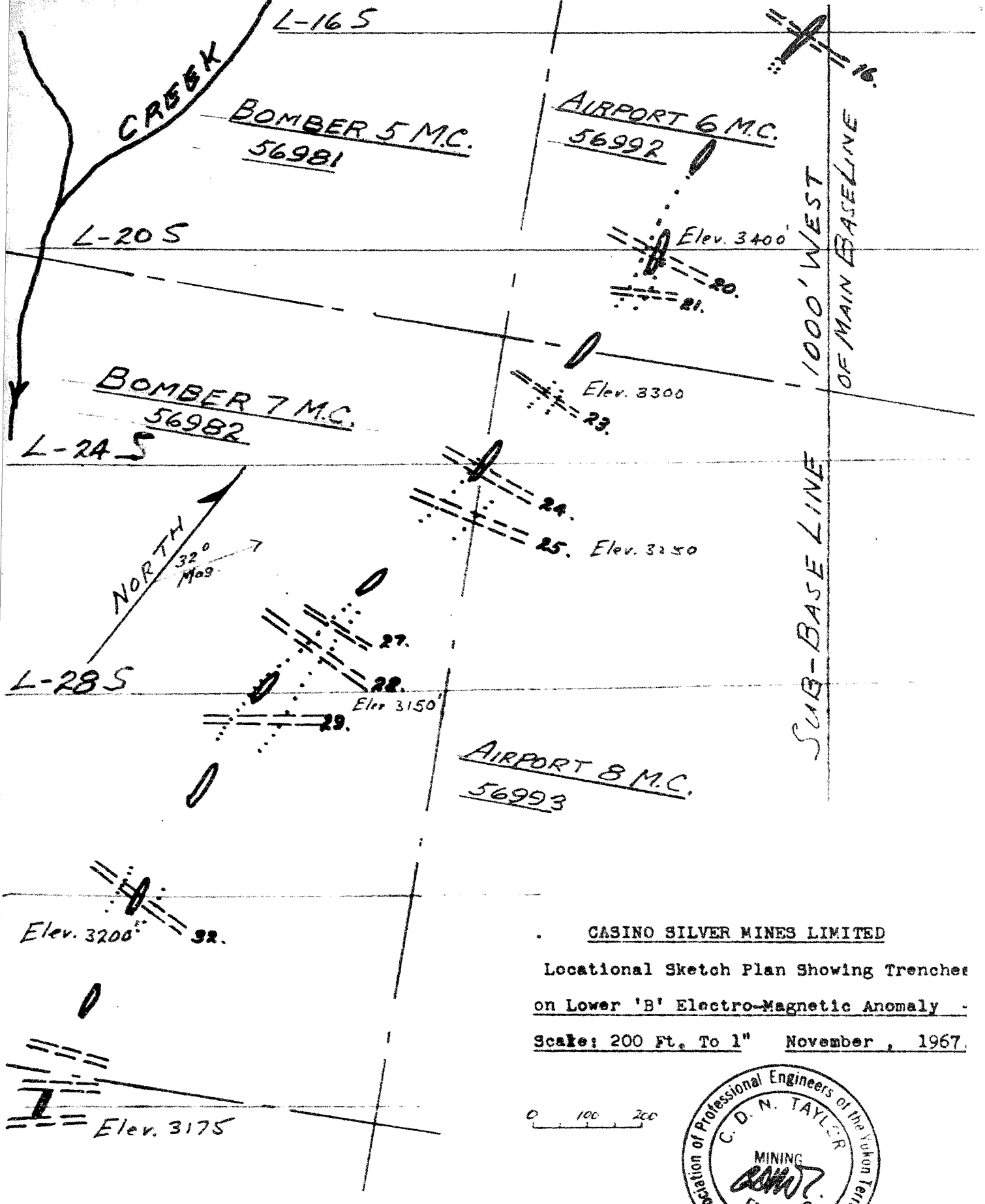
Plan Showing Drill Holes Location

B-Anomaly Conductors & Mine Adit.

Scale: 200' to 1" November, 1967.

Association of Professional Engineers of the Yukon Territory
C. O. N. TAYLOR
MINING ENGINEER

Dwg. B-1



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Locational Sketch Plan Showing Trenches on Lower 'B' Electro-Magnetic Anomaly - Scale: 200 Ft. To 1" November , 1967.

Association of Professional Engineers of the Yukon Territory
C. D. N. TAYLOR
MINING ENGINEER

Dwg. B-2

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PLAN OF 'C' ANOMALY AREA SHOWING GEOLOGY, GEOPHYSICAL CONDUCTORS AND GEOCHEMICAL SOIL SAMPLING RESULTS

PARTS PER MILLION COPPER - LEAD - ZINC.

SCALE: 200 FT. TO 1 INCH JULY, 1967

DWG. C-1

Assay Order

Copper - Lead - Zinc

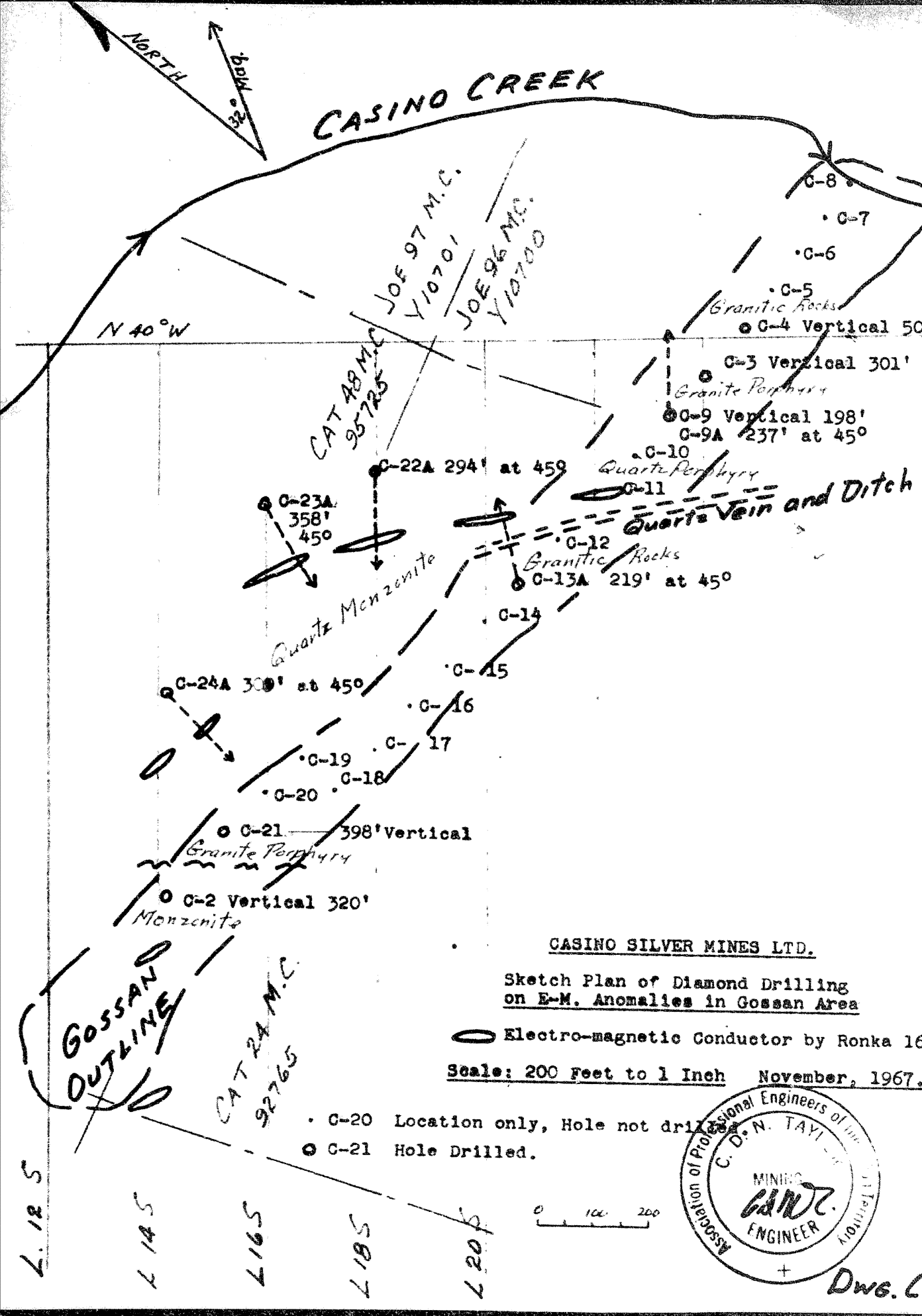
Underlined if 250 p.p.m. or anomalous, as follows:

380 - 42 - 250 or

140 - 460 - 160

CONDUCTIVE E.-M. VEIN FAULTS WITH GALENA MINERALIZATION.

Registered Professional Engineers of Ontario — J. R. TATE — MINING — ENGINEER



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Sketch Plan of Diamond Drilling
on E-M. Anomalies in Gossan Area

Electro-magnetic Conductor by Ronka 16

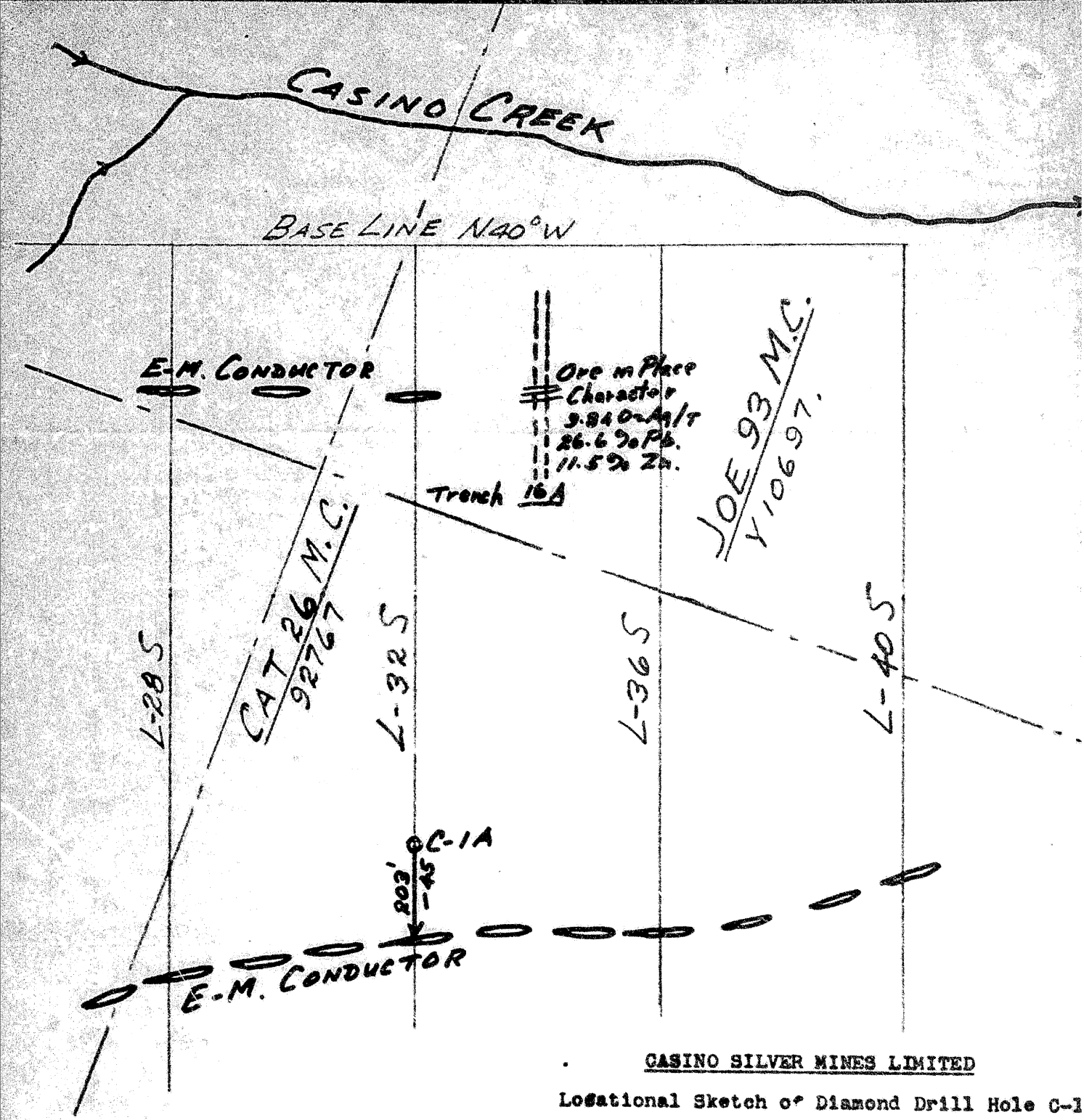
Scale: 200 Feet to 1 Inch November, 1967.

. C-20 Location only, Hole not drilled.

C-21 Hole Drilled.

Association of Professional Engineers of the Province of British Columbia
C. D. N. TAYLOR
MINING ENGINEER

Dwg. C



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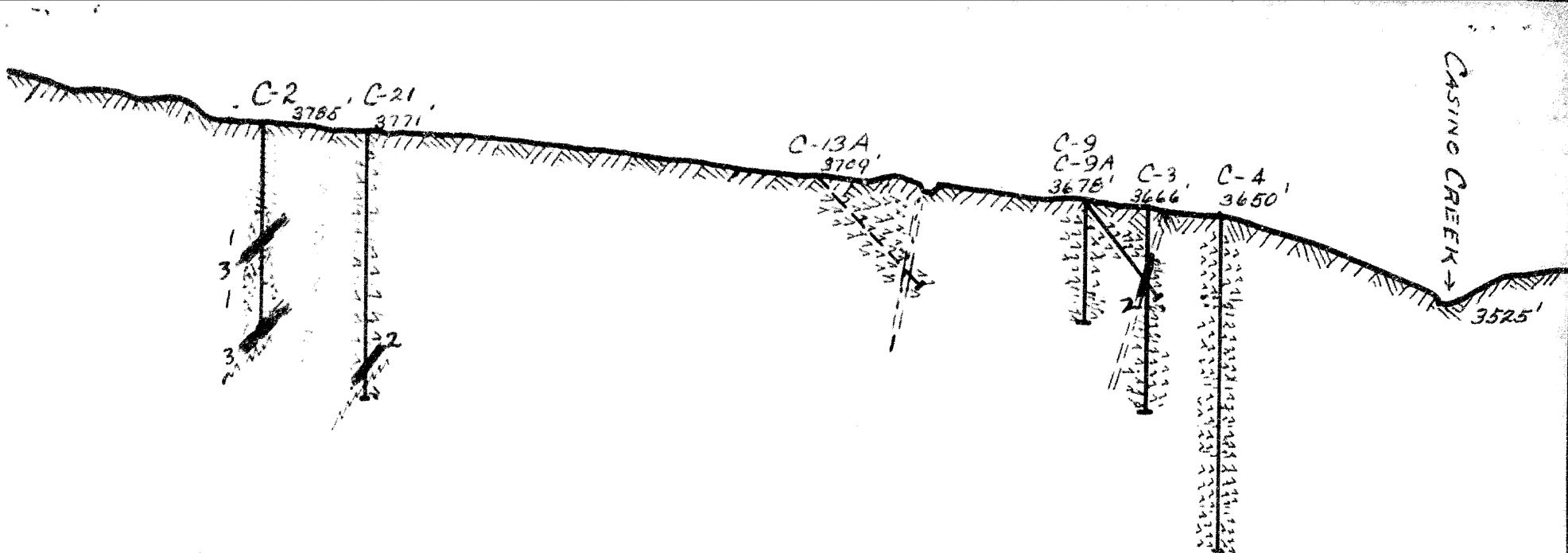
Locational Sketch of Diamond Drill Hole C-1 and Trench 16A on South-east 'C' Anomalies

Scale 200 Ft. to 1 Inch. November, 1967

0 100 200

Association of Professional Engineers of [illegible]
C. D. N. TAYLOR
MINING ENGINEER

Dwg. C-3



LONGITUDINAL SECTION UNDER GOSSAN AREA.
LOOKING DUE NORTH

LEGEND:

1 Disseminated Sulphides Sub-Ore Grade
2 Massive Ore.
3 SILTSTONE, Calcareous.
MONZONITE
Quartz-PORPHYRY
Granite and Diorite Phases.
Assumed Faulting

0 100 200

CASINO SILVER MINES LIMITED

GEOLOGICAL SECTION UNDER GOSSAN DEPOSITE

'C' ANOMALY AREA SHOWING DIAMOND DRILLING

Scale: 200ft. to 1" November, 196

Refer to Dwgs. C-1 and C-2

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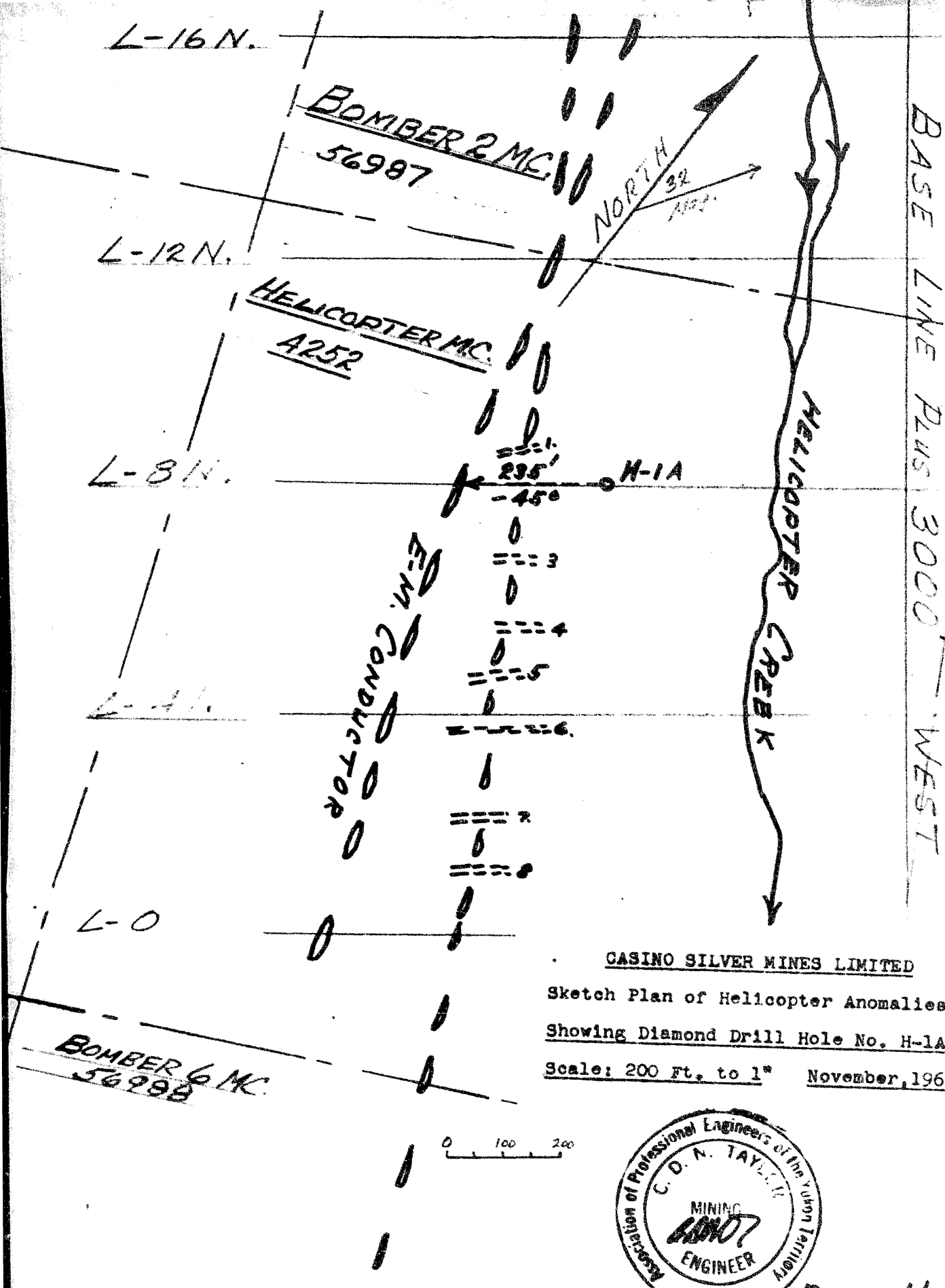
C. D. N. TAYLOR
MINING ENGINEER

C-4



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Sketch Plan of Helicopter Anomalies

Showing Diamond Drill Hole No. H-1A

Scale: 200 Ft. to 1" November, 196

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C. D. N. TAYLOR
MINING
ENGINEER

Dwg. H-