

81-A 1141 - 10071

Geological and Geochemical Report

on the

COUGAR PROPERTY

<u>Cougar Group</u>		(75 units)
Cougar 1 & 2	2614-15	6 & 2 units
Cougar 3	2767	12 units
Cougar 4 - 6	3119-21	15, 4 & 12 units
Cougar 4 & 5	3195-96	16 & 8 units

&

<u>Anchor Group</u>		(85 units)
Cougar 6 - 11	3197-3202	18, 18, 6, 3, 20 & 20 units

Skeena Mining Division

Princess Royal Island, B.C.

103H/2W

53°03' North Latitude

128°52' West Longitude

Owned & Operated by

Coastoro Resources Limited

4085 West 29th Avenue

Vancouver, B.C. V6S 1V4

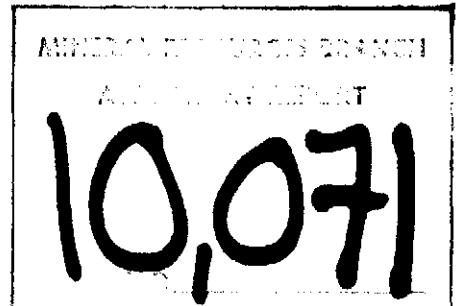
by

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December 7, 1981

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INTRODUCTION

General

At the request of R.A. Pollock, Vice President of Coastoro Resources Limited, the writer completed a preliminary evaluation of historical data pertaining to the Princess Royal Island area between June 29 and July 6, 1981.

Examination of the initial 3 Cougar claims (1,2,3) was carried out by the writer, accompanied by 2 assistants, between July 7 and 10, with transportation by helicopter from Prince Rupert, 170 km northwest of the property. The writer staked an additional 3 Cougar claims (4,5 & 6) for Coastoro at that time.

Detailed evaluation of historical data pertaining to the Surf Inlet mining area, including stereoscopic examination of air photography, was completed by the writer between July 11 and August 8, culminating in a "Report on the Cougar Property" for Coastoro dated August 8, 1981.

Between September 8 and 30, a 2-tent base camp was established on Bear Lake, with mobilization by single Otter aircraft from Prince Rupert (3 trips). A 4-man crew carried out reconnaissance prospecting and silt and soil sampling on all of the Cougar claims. A 4-man inflatable boat with a 10 horsepower outboard motor was used to ferry the sampling crews to and from the reconnaissance lines. Providing that flooding is not excessive, the tent frames and base camp will be used for exploration in subsequent years. Demobilization was by Beaver aircraft to Prince Rupert (2 trips).

Some data processing was completed between October 5 and 15, and the balance between November 12 and December 7, the date of this report. The last 96 geochemical analyses for gold were received by telephone on Dec.1.

Location & Access

As shown on Figures 1 and 2, the Cougar Property is on Princess Royal Island, the fourth largest island in B.C., in the central coastal area approximately 580 km northwest of Vancouver, 170 km southeast of Prince Rupert, and 165 km southerly of Terrace. Access is by boat to the head of Surf Inlet, 3 km westerly of the claims, or by float plane or helicopter to Bear, Cougar, or Anchor Lakes.

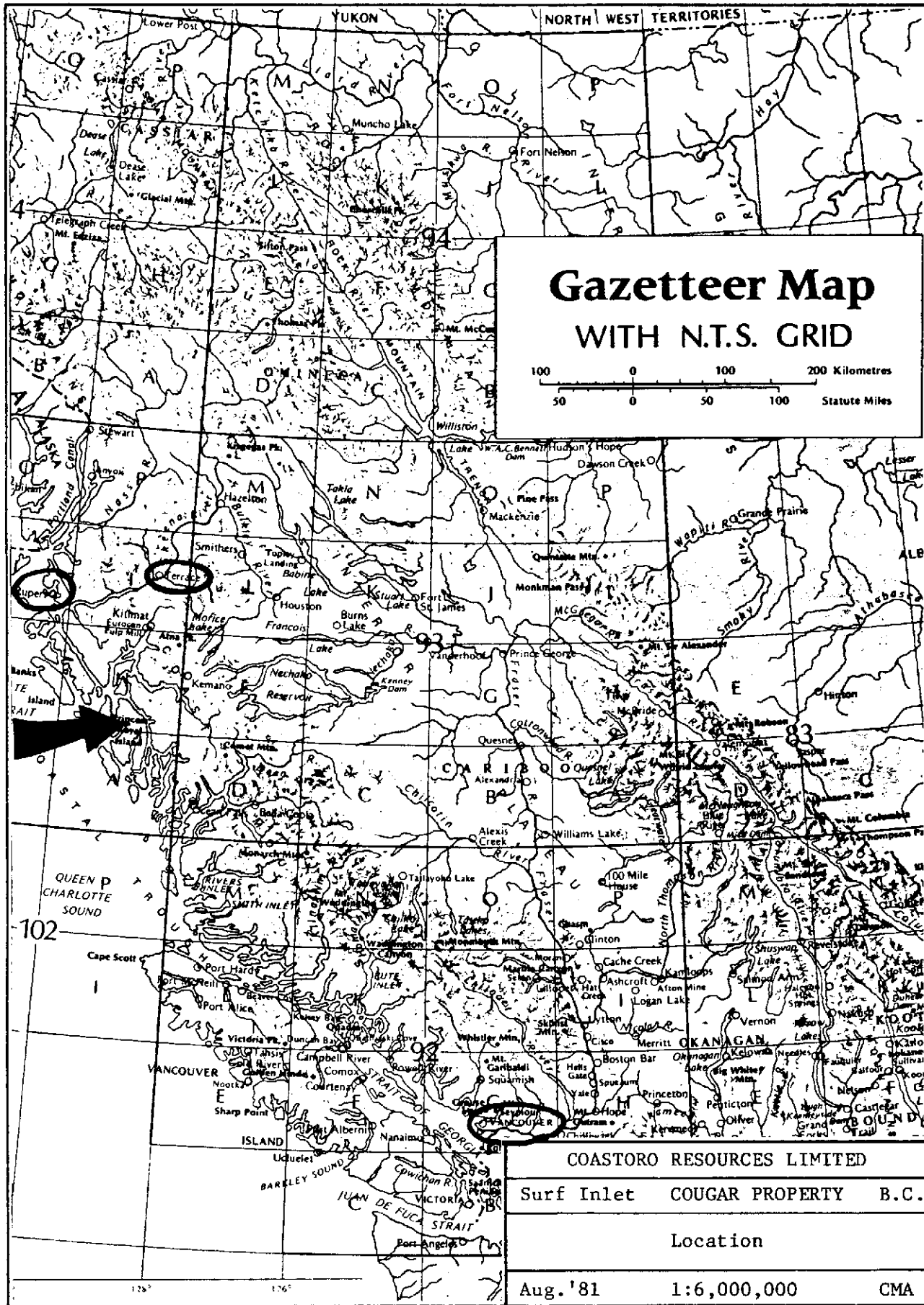
The geographic location is $53^{\circ}03'$ north latitude and $128^{\circ}52'$ west longitude.

The magnetic declination is 25.7° east, decreasing at 2.8 minutes per year.

Physiography

The Surf Inlet gold mining area is close to the western border of the Kitimat Ranges, a subdivision of the Coast Mountains and Coast Mountain Area, adjacent to the Hecate Lowland, a subdivision of the Hecate Depression and Coastal Trough. These physiographic subdivisions are part of the Western System of the Canadian Cordillera.

130° 128°

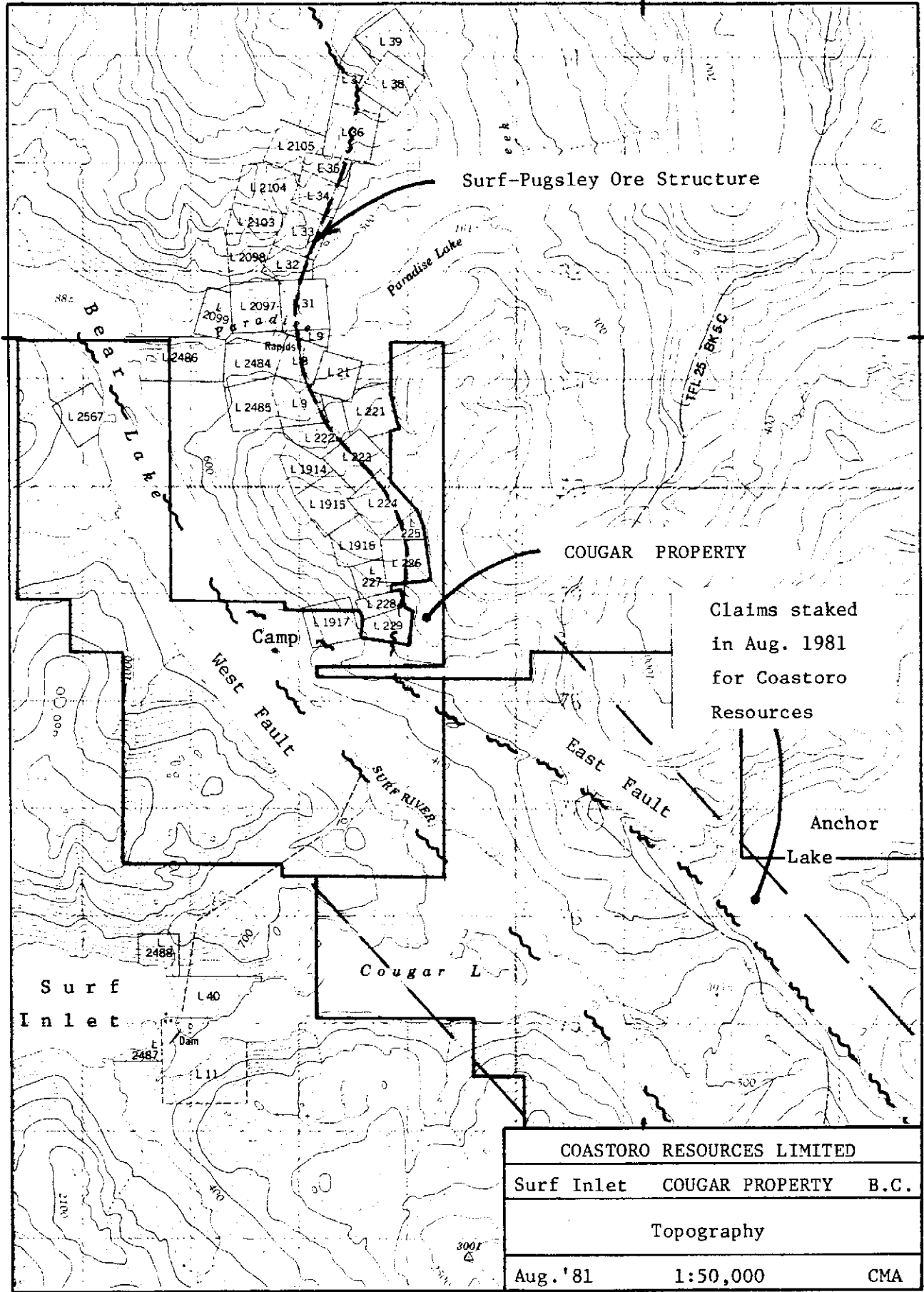


From: Atlas of B.C.
Farley, A.L. 1979

Fig. 1

128°50'

53°05'



From: NTS 1:50,000
103H/2 Butedale 1974

Fig. 2

As shown on Figure 2, southwest of Bear Lake (surface elevation about 27 m above sea level), the timbered slopes rise steeply to about 650 m on the claims, and northeast of the lake, the steep, frequently precipitous slopes rise to more than 915 m. In the Cougar and Anchor Lakes areas, the slopes are somewhat less steep, rising to 760 m ASL on the timbered ridgeline between the lakes. Anchor Lake is about 80 m ASL (52 m above Bear Lake).

Timber, Water, Power, Climate

Some easily accessible timber was logged from the flat valley areas immediately east of Bear Lake during the early 1900s, related to construction of the Surf and Pugsley mines. Cedar and hemlock to 1.2 m in diameter are common on the timbered slopes, although by far the majority of conifers are less than 0.4 m. Above 500 m elevation, scrub cedar, juniper, and pine become increasingly prevalent. For mining purposes, there is a plentiful supply of timber.

Abundant fresh water is available from the three major lakes, Bear, Cougar, and Anchor, both for exploration and for milling purposes. In addition, numerous small creeks should provide adequate water for diamond drilling in many areas remote from the lakes.

Power for the Surf and Pugsley mines was obtained from a low head (27m) hydro plant located at the outlet of Cougar Lake into the ocean at the head of Surf Inlet. The outlet was dammed to raise the level of Cougar and Bear Lakes. The plant reportedly has been dismantled. The 52 m head between Anchor and Cougar Lakes appears to offer greater potential for additional hydro power generation.

The Surf Inlet gold area has a mean annual precipitation in excess of 350 cm, including about 1 m of snow. Temperatures, typical of coastal B.C., are moderate. Exploration and mining may be conducted readily throughout the year.

History

The first claims staked in the Skeena Mining Division were those associated with the discovery of gold-bearing quartz float from the veins of the Surf and Pugsley mines, which adjoin the Cougar claims on the north. The Belmont Canadian Mines Limited (name changed to Belmont-Surf Inlet Mines Limited) constructed a 300 tpd concentrator, and, between 1917 and mid-1926 when the mill was dismantled, mined and milled 836,500 tons of ore which yielded 322,297 oz Au, 176,734 oz Ag, and 5,244,772 lb Cu. The price of gold was \$20.67 per Troy ounce, and, with a reported gold recovery of 92%, the ore grade, or head grade, was approximately 0.42 oz Au/T (14.4 g Au/t).

Commencing in 1930, Princess Royal Gold Mines Limited (name changed to Surf Inlet Consolidated Gold Mines Limited) re-evaluated the Surf and Pugsley mines, and, following the increase in the price of gold to \$35.00/oz in 1934, installed milling equipment with an initial capacity of 25 tpd. Equipment additions increased the throughput to 50 tpd, and then to more than 100 tpd. Between 1935 and the end of 1942, when wartime restrictions, in particular a critical shortage of skilled labour, forced closure of the mine, an additional 166,500 tons reportedly were milled. The head grade appears to have dropped to about 0.37 oz/T (12.7 g Au/t), plus recovered values in Ag and Cu.

After the war, in 1946 and 1947, additional underground tunneling and diamond drilling was carried out in the Pugsley mine workings. No other significant exploration work appears to have been done in the area since that time. Following name changes to Surf Inlet Consolidated Mines Limited and Western Surf Inlet Mines Limited, a merger with Matachewan Consolidated Mines Limited was effected in 1965.

When the writer examined the Cougar claims for Coastoro in early July, 1981, two surface diamond drills were being employed to test the 30- to 90-m wide Surf and Pugsley shear structures for additional ore: either large tonnage/low grade ore mineable by open pit techniques, or small tonnage/high grade ore mineable by underground stoping techniques (as in the previous operation). Cominco Limited is the operator for the three joint venture partners, Cominco, Placer Development Limited, and Matachewan Consolidated Mines Limited.

Although the area covered by the existing 14 Cougar claims undoubtedly was prospected thoroughly in the early 1900s, the writer was unable to find any description of such activity. The Cassie adit, only 250 m on strike from the Cougar claims reportedly was driven on auriferous pyritic quartz veining typical of the Surf and Pugsley mines ore structure which can be traced for more than 6 km on strike to the north.

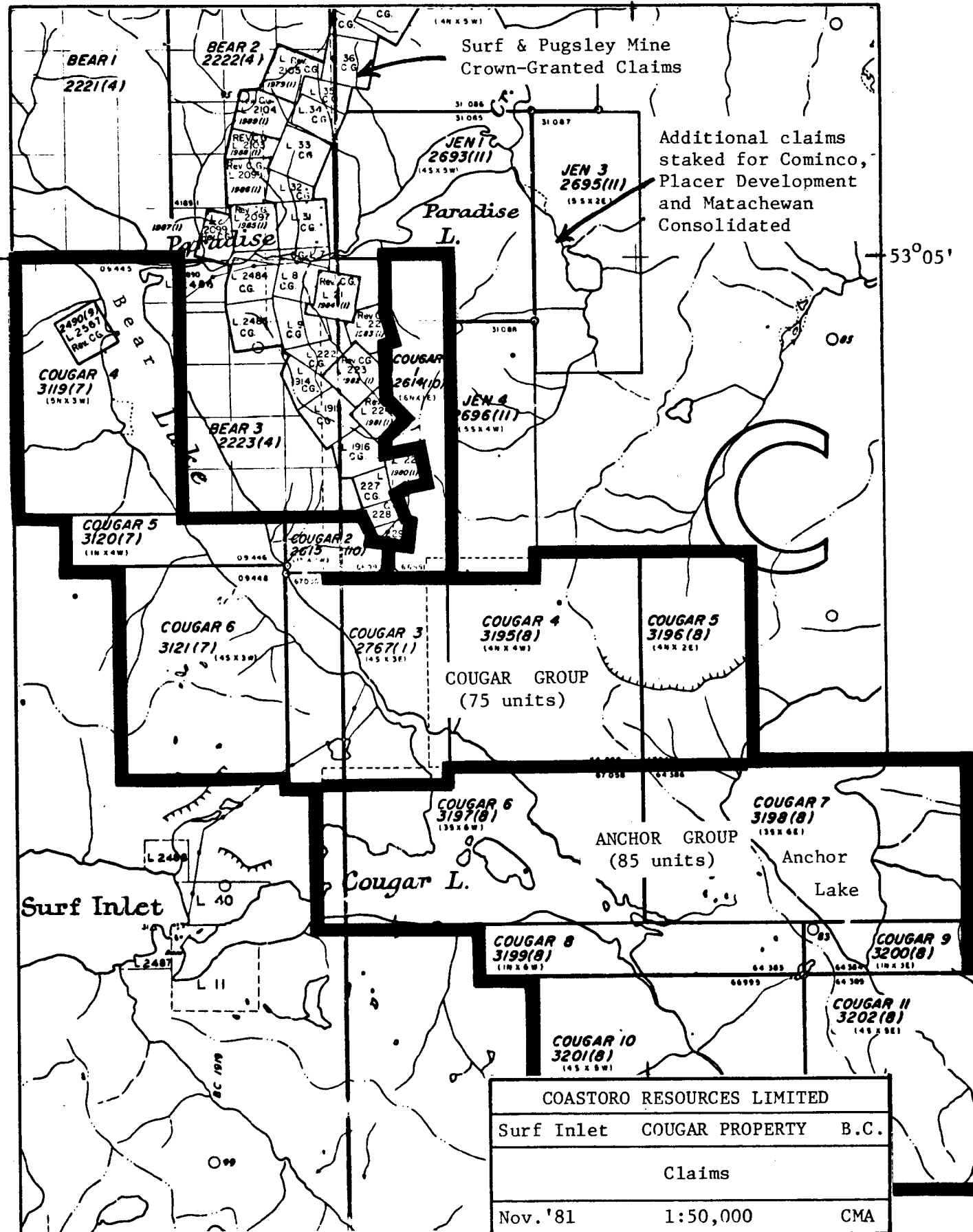
Property

Figure 3 shows the 14-claim Cougar Property totalling 160 units in two groups, Cougar (75 units) and Anchor (85 units). All claims have been transferred to the operator, Coastoro Resources Limited. Three claim numbers (4,5 & 6) unfortunately were duplicated by the contract claim staker; however, different record numbers effectively distinguish between the claims.

The located mineral claims are tabulated below, and current expiry dates will be extended by application of the assessment work described in this report:

<u>Group</u>	<u>Claim Name</u>	<u>Units</u>	<u>Record Number</u>	<u>Record Date</u>	<u>Expiry Date</u>
Cougar	Cougar 1	6	2614	Oct.1/80	Oct.1/84
	Cougar 2	2	2615	Oct.1/80	Oct.1/84
	Cougar 3	12	2767	Jan.16/81	Jan.16/84
	Cougar 4	15	3119	Jul.10/81	Jul.10/82
	Cougar 5	4	3120	Jul.10/81	Jul.10/82
	Cougar 6	12	3121	Jul.10/81	Jul.10/82
	Cougar 4	16	3195	Aug.31/81	Aug.31/82
	Cougar 5	8	3196	Aug.31/81	Aug.31/82
		<u>75</u>			
Anchor	Cougar 6	18	3197	Aug.31/81	Aug.31/82
	Cougar 7	18	3198	Aug.31/81	Aug.31/82
	Cougar 8	6	3199	Aug.31/81	Aug.31/82
	Cougar 9	3	3200	Aug.31/81	Aug.31/82
	Cougar 10	20	3201	Aug.31/81	Aug.31/82
	Cougar 11	20	3202	Aug.31/81	Aug.31/82
		<u>85</u>			

128° 50'



From: B.C. Claim Map M 103H/2W

Fig. 3

Work Done

Geological and geochemical work completed by the writer consisted of more than 20 km of reconnaissance prospecting, including 20 silt samples, 2 soil samples, and 3 rock geochem samples. In addition, 5 reconnaissance soil lines totalling 6 km were run, from which 35 silt and 94 soil samples were collected, plus 3 rock geochem samples. In total, 157 samples were collected. Air photo linears were plotted on 5 photographs at a scale of 1:20,000 by the writer using stereoscopic examination. A base camp with two 9'x12' wall tents, connected with a kitchen and shower area, was established on Bear Lake.

GEOLOGICAL AND GEOCHEMICAL SURVEYS

General

The steepest and highest slopes on the Cougar Property inevitably are well-exposed bedrock areas. Scattered cliffs also occur on most steep, timbered slopes; and bedrock is moderately abundant along the channels of the larger run-off creeks, especially in areas with steep gradients. Outcrop is relatively scarce on all other timbered slopes. Overall, the bedrock exposure averages about 10 to 15%.

The effects of continental glaciation during the Pleistocene epoch appear to be restricted to rounded mountain peaks, rounded boulders in the creek beds, and possibly a general thin mantle of glacial sand, with some gravel. Because of the inevitable thick, organic root mat, no exposures of sand and gravel that could be identified positively as glacial in origin were identified, even along the banks of the larger creeks. No eskers or moraines were observed.

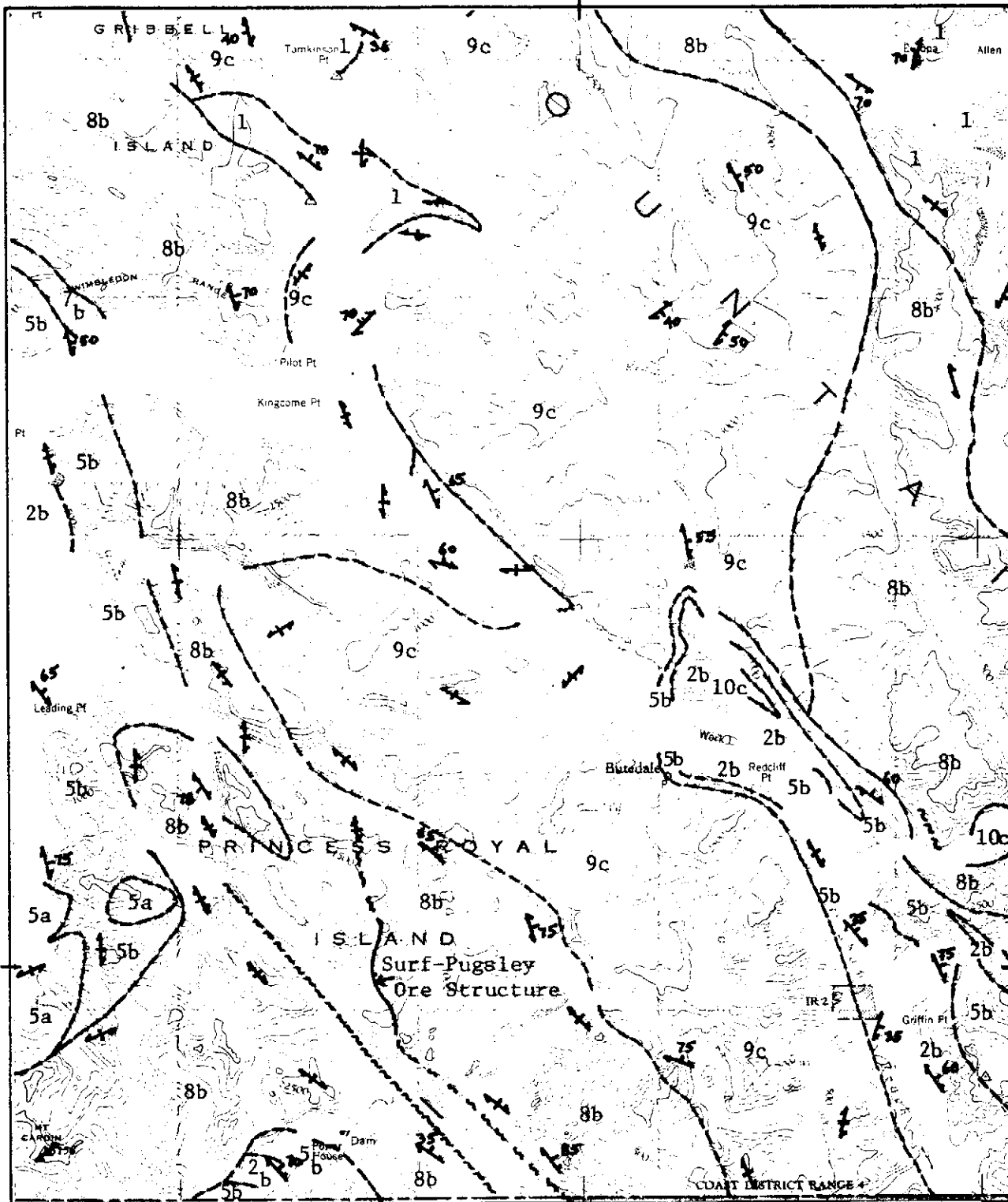
Ferrohumic podzolic soils were poorly to moderately developed in all timber-covered areas. A thick (0.1 to 0.3 m), root-matted organic layer made sampling the B zone quite difficult using a grubhoe; however, the samplers preferred using grubhoes over bail-type soil augers. At lower elevations, the B-zone soil layer occurred at depths from 0.3 to 0.4 m, while at higher elevations with steeper gradients, the B zone occurred at 0.1 to 0.2 m depths. Flat areas generally were water-saturated. At higher elevations with scrub conifer growth, and close to bedrock the soil development was poor. Sufficient silt normally was present in the numerous small creeks to justify taking stream sediment samples.

Geology

The principal source of regional geology information is GSC Paper 70-41 by J. A. Roddick. Figure 4 was prepared from the map (23-1970) which accompanies the Paper.

Princess Royal Island is near the western boundary of the 200-km wide Coast Crystalline Belt, and is comprised principally of plutonic rocks of early to middle Cretaceous age. Moderately dark hornblende-biotite quartz diorite (unit 8b) prevails in the claims area: both massive and gneissic varieties occur, and sphene and

128°45'



129°00'

45'

COAST DISTRICT RANGE 3

30'

COASTORO RESOURCES LIMITED		
Surf Inlet	COUGAR PROPERTY	B.C.
Regional Geology		
Aug. '81	1:250,000	CMA

From: NTS 1:250,000 1963
 103 H Douglas Channel

LEGEND

STRATIFIED ROCKS		PLUTONIC ROCKS (Age of formation and intrusion unknown)
CENOZOIC	QUATERNARY PLEISTOCENE AND RECENT <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">12</div> Alluvium and glacial deposits	<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">10</div> 10a, mainly biotite quartz monzonite; 10b, biotite hornblende quartz monzonite; 10c, leucoquartz monzonite or granite; 10d, aplitic, garnetiferous quartz monzonite
	UPPER MIOCENE (?) <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">11</div> Basalt flows (pillows common)	<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">9</div> Granodiorite: 9a, biotite only; 9b, biotite hornblende; 9c, hornblende biotite; 9d, sheared granodiorite and gneiss; 9e, fine-grained, even textured granodiorite
MESOZOIC	JURASSIC MIDDLE JURASSIC HAZELTON GROUP <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">4</div> Greenstone, siliceous tuff, calcareous and micaceous quartzite, breccia, greywacke, argillite, slate	<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">8</div> Quartz diorite: 8a, biotite hornblende; 8b, hornblende biotite; 8c, hornblende-chlorite; 8d, hornblende only; 8e, quartz diorite and abundant gneiss
	LOWER JURASSIC (?) OR UPPER TRIASSIC (?) <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">3</div> Greenstone, chlorite schist	<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">7</div> Diorite: 7a, biotite hornblende; 7b, hornblende and hornblende-biotite <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">6</div> Gabbro
PALEOZOIC	PERMIAN (?) AND/OR OLDER <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">2</div> Mainly metasediments: 2a, hornblende-biotite-plagioclase amphibolite and schist; biotite schist (locally garnetiferous), kyanite-staurolite-almandine mica schist, sericite-epidote schist, sillimanite-quartz-plagioclase gneiss, graphitic schist, quartzite, crystalline limestone; conglomerate; lit-par-lit gneiss, agmatite and minor granitic rock; 2b, mainly thinly laminated micaceous quartzite; crystalline limestone, skarn, schist; 2c, mainly massive to thick bedded crystalline limestone; 2d, mainly thin bedded crystalline limestone, skarn, intercalated quartzite and schist	<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">5</div> Basic complexes: 5a, gabbro-diorite-migmatite complex; 5b, gneissic diorite-migmatite complex
	<div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 10px;">1</div> Granitoid gneiss, gneissic quartz diorite, rusty fine grained gneiss and schist, migmatite; minor garnet-sillimanite-biotite schist, crystalline limestone, diopsidic skarn, garnet-staurolite-kyanite schist; 1a, agmatite	

From: GSC Map 23-1970
J.A. Roddick

- Geological boundary (approximate or assumed)
- Limit of alluvium
- Bedding (horizontal, inclined, vertical)
- Foliation (horizontal, inclined, vertical, dip unknown).
- Anticline
- Fault (approximate, assumed)

epidote are common. Hornblende-biotite granodiorite (unit 9c) comprises the somewhat younger Butedale pluton about 8 km northeast of Bear and Cougar Lakes.

The oldest rocks in the area are Permian or older metasediments comprised of thin-bedded impure quartzites with interlayers of quartz-feldspar-biotite schist or silty limestone, conglomerate, sandstone, and argillite (unit 2b). Exposures are found near Butedale on the northeast coast of the island, at a few locations on the northwest coast, and near the head of Surf Inlet. The metasediments occur as large screens or islands in complex basic plutonic rocks.

The oldest plutonic rocks are basic complexes that encompass the above metasediments: a gabbro-diorite-migmatite complex (unit 5a), and a gneissic diorite-migmatite complex (with no gabbro) (unit 5b). The latter type is more common on Princess Royal Island, and is characterized by epidote and chlorite, and by numerous metasedimentary screens. "The diorite phase has clearly formed by granitization of metasedimentary and metavolcanic rock."

While the geology of the Surf and Pugsley mines is fairly well documented, there is no publically available data pertaining specifically to the Cougar claims area. Nevertheless, it is apparent that the fault structure which hosts the ore zones of the Surf and Pugsley mines persists southward onto the Cougar claims, and the geological setting is similar. Figure 5 shows the geological plans and cross sections of the Surf and Pugsley mines from the 1948 CIM publication "Structural Geology of Canadian Ore Deposits".

A large, complex fault zone is the principal feature of the mine area, and the fault has been traced on the ground for approximately $4\frac{1}{2}$ km. Examination of recent air photography (1978) by the writer indicates that the zone persists for at least an additional 2 km to the north, and also may persist for an additional 6 km, or more, to the south.

A screen of metasediments and metavolcanics "which here is composed mainly of quartz diorite and bordering gneisses" (unit 5a?) is "best preserved in the north Surf workings", and grades into "paragneiss and injection gneiss" further south in the Pugsley workings. Roddick states that "the screen of hornblende gneiss is 1,000 to 2,000 feet (300 to 600 m) wide."

In the mine area the fault zone is "broadly convex toward the west", and consists of "two or more parallel or subparallel shear zones from a few inches to 30 feet (0.1 to 9 m) thick." In places the faults are 150 to 200 feet (45 to 60 m) apart, and crossovers or loop structures are common. The average dip is 45° west.

Vein quartz was introduced into receptive areas of the fault system, often related to warps or bends in the fault zone. Individual veins vary from 100 to 1,000 feet (30 to 300 m) in length, and 2 to 40 feet (0.6 to 12 m) in thickness. Gold values are confined to pyrite which occupies up to 25% of the vein material (by volume).

The first stage of quartz-pyrite vein mineralization was seamed by a later quartz-pyrite-chalcopyrite stage which carried most of the gold values. Gold occurs over a vertical interval of more than 3300 feet (1000 m), and the deposit has not been delimited at depth. Ankerite sometimes occurs in major amounts, and calcite, chlorite, and molybdenite occur in minor amounts.

In 18 years with recorded production, between 1916 and 1942, more than 1.0 million

GEOLOGY - Surf & Pugsley Mines

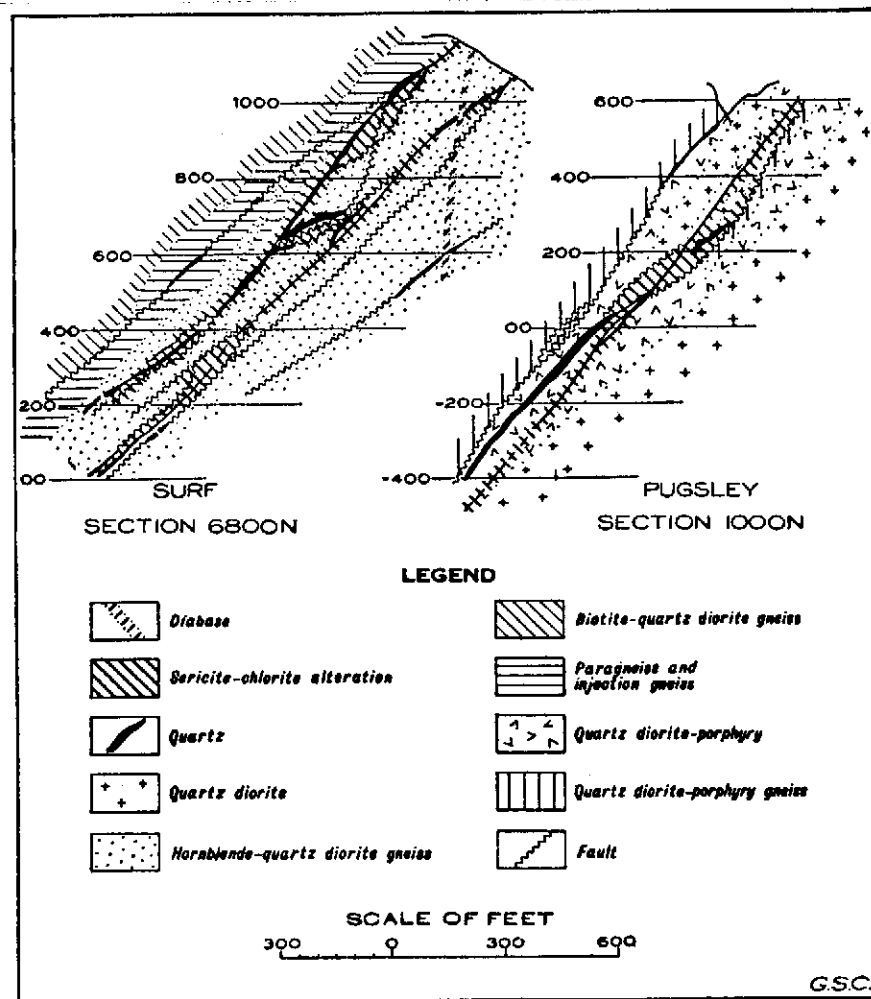
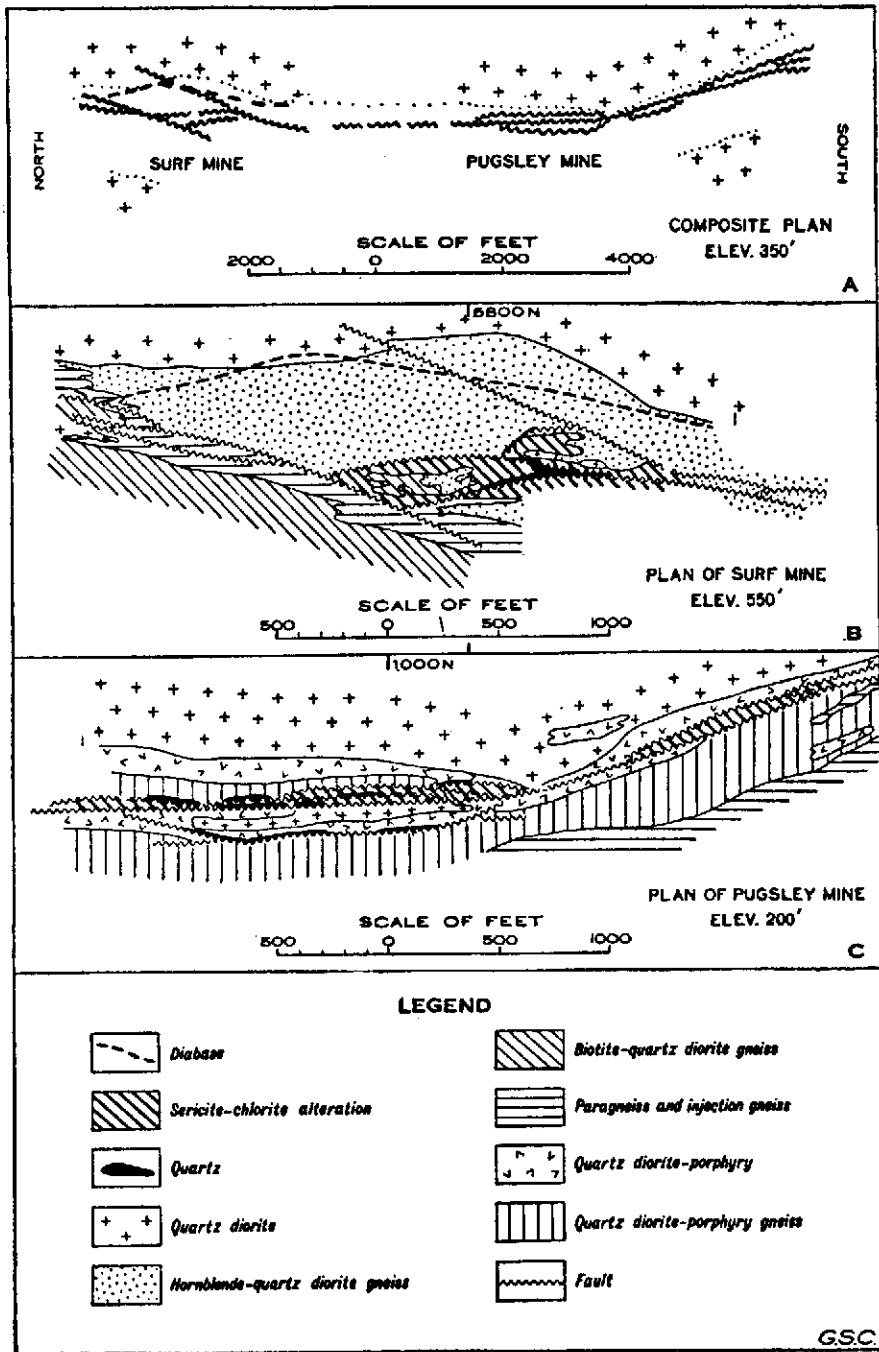


Fig. 5

-11-

tons averaging in the order of 0.41 oz Au/T (14 g Au/t) were mined and processed. Payment also was received for silver and copper values: about 0.2 oz Ag/T (7 g Ag/t) and 0.32% Cu were recovered (mill recoveries for these elements are not known). From an exploration geochemistry standpoint, more than 3000 ppm Cu in the quartz veins should make copper an excellent pathfinder for gold mineralization.

The 20 km of reconnaissance prospecting, including silt, rock, and soil sampling, completed by the writer did not add significantly to the geological picture. The traverses and geochemical data are shown on Figure 6 in the pocket of the report. Hornblende-biotite quartz diorite varied from all degrees of gneissosity (weak to strong) to massive.

An iron-stained andesite dyke dipping vertically, and striking $350^{\circ}/170^{\circ}$ was observed on line A at 400 m: rock geochem sample R-6 contained 57 ppm Cu, much higher than the 5 to 10 ppm Cu typical of the quartz diorite. Quartz float at this location carried no significant values - rock geochem sample R-4.

Rock geochem sample R-1, from a 0.2 m boulder of pyritic vein quartz from the creek at the south end of the Surf-Pugsley Ore Structure contained 5110 ppb Au (0.15 oz/T) and only 7 ppm Cu. The extension of this vein onto the Cougar Property is worthy of detailed investigation.

Barren-looking white quartz with minor pyrite, rock geochem sample R-3, in a 0.1 m wide fracture-filling in massive quartz diorite at 800 m on line B contained no significant values. The strike was $85^{\circ}/265^{\circ}$, and dip 75° south.

Strongly sheared, altered, and silicified quartz diorite from the East Fault, rock geochem sample R-2, did not contain anomalous copper or gold values.

Similarly, barren-looking quartz float at 975 m on line A, rock geochem sample R-5, contained no interesting values.

Air Photo Linears

Figure 7, in the pocket of the report shows the linears that appear on air photographs of the Surf Inlet area when viewed stereoscopically. Both major and minor fractures, joints, shears, and faults are represented by the linears. N-S and E-W linears prevail, followed by ENE-WSW, ESE-WNW and NNW-SSE directions.

The location of the productive Surf-Pugsley Ore Structure is indicated, and is represented by weak to moderate "linears". The 45° west dip of the structure, coupled with elevation changes in the order of 900 m (3000 ft), and a general convex westerly shape, results in a somewhat deceptive, sinuous configuration. The most productive area on the structure appears to be characterized by an increased fracture density; and it may be significant that the area on the Cougar Property east and southeast of the base camp shows a similar increased fracture density.

The East Fault, along the south west shore of Anchor Lake, is defined by strong linears. Rock geochem sample R-2, from sheared and altered quartz diorite on this structure, contained no significant gold or copper values. The East Fault crosses or merges with the Surf-Pugsley Ore Structure in an area of high fracture density about 1 km easterly of the base camp on Bear Lake. Northwesterly of this junction,

the East Fault appears to split into several branches which merge with the West Fault between 0.5 and 2.5 km northerly of the base camp.

The West Fault under Bear and Cougar Lakes, similar to the East Fault, may or may not be associated with quartz veining and gold mineralization; however, the obvious parallelism of the Surf-Pugsley Ore Structure and the West Fault is intriguing. In conjunction with diamond drill testing of other targets in the area, the writer recommends that two or three holes be drilled across the West Fault (Bear Peninsula - 450 m, Surf River - 150 m, Cougar Island - 450 m).

Silt and Soil Sampling

Reconnaissance soil sample traverses were run in timber-and overburden-covered areas between the West and East Faults to attempt to locate other areas of gold mineralization southeast of the established Surf-Pugsley Ore Structure. B-zone soil samples (previously described) were taken at 50-m intervals on 5 horizontally chained compass lines lettered A to E, totalling 6 km in length. Changes in the direction of the lines were made whenever necessitated by local topographic conditions (principally cliffs). Silt samples were taken from streams intersected by the lines. Flooding and an extensive recent timber "blowdown" made it extremely difficult to run reconnaissance lines southeast of Cougar Lake. Since more than 3000 ppm Cu were recovered at the Surf and Pugsley mines, it was logical to analyse all geochemical samples for copper, in addition to gold. A total of 94 soil samples and 35 silt samples were collected.

The analytical techniques employed by Bondar-Clegg, and the individual geochemical analyses for Cu and Au are included in Appendix I. Figure 6, in the pocket of the report, shows the reconnaissance lines and analyses, including those from the writer's 20 km of reconnaissance prospecting. Graphical statistical calculations are shown in Appendix II.

In general, both Cu and Au geochemical values are unusually low for this more or less typical Coast Range quartz diorite environment. Even more surprising, is the fact that very similar silt and soil values were obtained by Cominco personnel over the productive area of the Surf-Pugsley Ore Structure (personal discussion with A. Frieze, Cominco Project Geologist). In spite of the low magnitude of the geochemical values, anomalous areas have been indicated which definitely warrant follow-up prospecting and sampling. In the writer's opinion, no other exploration technique has equivalent potential for locating gold mineralization worthy of diamond drill testing. All anomalous Cu and Au values should be checked carefully in the field.

Detailed VLF-EM surveying, employing the Jim Creek, Washington transmitter (18.60 k Hz), could assist in defining the location of quartz veining in overburden-obscured areas, and all grids should be surveyed. A trial detailed magnetometer survey also would indicate whether this exploration technique were useful in targetting mineralized quartz veins.

Silt sample 1, near the base camp, yielded a strongly anomalous 225 ppb Au. Additional sampling upstream should be completed to attempt to locate the source of the values. Silt samples also should be taken in the larger creek immediately south that drains the Surf-Pugsley Ore Structure.

- Line A. Very weak Cu and Au soil values at 950 m likely are associated with mineralization from the strike extension of the Surf-Pugsley Ore structure. Prospecting, grid soil sampling, and VLF-EM surveying should be completed in this area, which coincides with a high density of air photo linears.
- Line C. Weakly and moderately anomalous Cu soil and silt values between 300 and 400 m, plus some anomalous Au silt values, are very interesting, and should be followed up with prospecting, grid sampling, and VLF-EM and magnetometer surveying. A strong northwest trending linear, plus a general high density of air photo linears, both of which extend 1000 m southeasterly to line E, suggest that significant bedrock mineralization may be present.
- Line E. Only a few soil samples were taken on this line, that was controlled and terminated by difficult topography. The moderately and strongly anomalous Au silt values are very interesting, particularly since they may originate from the same structure as the anomalous values on line C. The Cu values are extremely low. Prospecting, grid sampling, and VLF-EM surveying should be completed.
- Line D. Weakly anomalous Au silt and soil values at 50 m and 200 m, respectively, are of interest because they could represent an additional 500 m strike extension of the previous zone.

COSTS

Wages

C.M. Armstrong, P.Eng. Consulting Engineer Jul.6-15, Sep.17-30, Oct.5, 7, 15, Nov.12-13, 17, 24-26, 28-30, Dec.1-7 37 days @ \$350 =	\$12,950.00
D. Baxter Sep.20-Oct.1 12 days @ \$150 =	1,800.00
Ashworth Explorations Ltd. P. Michaels, R. Garcia Sep.23-29 14 mandays @ \$200 =	<u>2,800.00</u>
	\$17,550.00

Transportation

Vancouver Island Helicopters Jul. 7 & 10 Bell - Long Ranger 4.3 hr @ \$541 =	2,326.30
CP Air Vancr/Pr Rup/Vncr Jul. 7, 10, Sep: 23, 29 \$586.30 + \$588.60 =	1,174.90
Trans-Provincial Airlines Sep. 22, 24 Dehav'd Otter 720 mi @ \$3.05 =	2,196.00
North Coast Air Services Sep. 29, 30 Dehav'd Beaver 440 mi @ \$2.10 + \$75 standby =	999.00
Personal vehicle Jul. 6, 14, Sep. 16-17, Oct. 5, 26, Nov. 7, 10, 17, 25, Dec. 2, 3, 7. 443 km @ \$0.30 =	132.90
4x4 truck rental IH 1210 - 3/4 T Sep. 20 - Oct. 1 12 days @ \$50 =	600.00
Car rental Oct. 1 Budget	27.02
Taxis, ferries	136.65
Fuel	<u>313.71</u>
	7,906.48

Base Camp

Lumber, nails, etc.	888.34
Rental 4-man, 2-tent camp, including: wall tents, tarps, generator, space heaters, water heater, freezer, pump, cots, stoves, utensils, lights, tools, chainsaw, inflatable boat & motor (10 hp)	1,200.00
Fuel	286.71
Food	658.43
Supplies consumed and supplies/equipment left at site	<u>290.75</u>
	3,324.23

\$28,780.71

Communications

Personal telephone (long distance) 247 min @ \$0.85 = 209.95
Mobile telephone rental 100.00
calls 74 min @ \$1.10 = 81.40

391.35

Accommodation Sep. 20, 21, 29 Pr. Geo. & Pr. Rup.

153.70

Analyses Bondar-Clegg

1,234.80

Other Costs

Air photographs, courier, maps, typing, copying,
freight, miscellaneous

791.85

Total exploration expenditure on Cougar Property
applicable for assessment work credit

\$31,352.41

Distribution of Costs

Cougar Group Jun. 22 - Aug. 8 \$ 8,900
Sep. 8 - Dec. 7 11,000

\$19,900

Anchor Group Sep. 8 - Dec. 7

11,400

\$31,300

BIBLIOGRAPHY

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- B.C. Department of Mines and Petroleum Resources. "Landforms of British Columbia, A Physiographic Outline", Bulletin No.48, S.S. Holland, 1964.
- B.C. Minister of Mines Reports: 1902-pp.H51-53, 1912-pp.K100-103, 1914-pp.K150-151, 1915-p.K69, 1916-p.K50, 1917-pp.F38-42, 1918-pp.K45-46, 1919-N40-41, 1920-pp.N37-38, 1921-p.G40, 1922-p.N43, 1923-p.A45, 1924-p.B45, 1925-p.A66, 1926-pp.A68-69, 1930-p.A70, 1933-pp.A37,A41, 1934-pp.B5-6, 1935-p.B25, 1936-pp.B3,B57, 1937-pp.B3,B57, 1937-pp.B3,B42, 1938-p.B26, 1939-pp.A67-68, 1940-p.A53, 1941-pp.A54-55, 1942-p.A54, 1946-p.A85, 1975-p.E 174.
- Gill, J.E. & Byers, A.R. "Surf Inlet and Pugsley Mines", Structural Geology of Canadian Ore Deposits, pp. 99-104, CIM, 1948.
- G.S.C. Summary Report, 1921, Part A, pp. 29A-34A.
- "Coast Mountains Project", Report of Activities, May to October 1965, Paper 66-1, J.A. Roddick, A.J. Baer, W.W. Hutchison, edited by S.E. Jenness, 1966.
- "Douglas Channel-Hecate Strait Map-Area, B.C.", Paper 70-41, Map 23-1970, J.A. Roddick, 1970.

Air Photographs	1:20,000	BC 78119	83- 90= 8 179-188=10	109-116=8 195-200=6	1978
Claim Map	1:50,000	M 103H/2W			
Mineral Inventory Map	1:250,000	Douglas Channel		103H & part of 103G	
National Topographic Series	1:50,000	Butedale		103H/2	1974
	1:250,000	Douglas Channel		103H	1963
	1:500,000	Queen Charlotte Is-Bella Bella			103 SE 1977

CERTIFICATION

I, CHRISTOPHER MACKENDRICK ARMSTRONG of the City of Vancouver, Province of British Columbia, do hereby certify:

THAT I am a practicing Geological Engineer residing at 4085 West 29th Avenue, Vancouver, British Columbia, V6S 1V4, Canada.

THAT I am a registered Professional Engineer in good standing in the Provinces of British Columbia and Ontario.

THAT I received the degree of B.Sc. in Geological Engineering from Queen's University, Kingston, Ontario in 1960, and practiced my profession continuously in the period between leaving university in 1959 and returning to university in 1966.

THAT I enrolled in the Department of Mineral Engineering at the University of British Columbia in 1966, and in the period to 1969 completed course work and research work requirements in an M.A.Sc. program, specializing in bacterial-acid leaching systems; thesis writing was not completed; post graduate courses in economic geology and North American geology also were taken and completed.

THAT since leaving university in 1969, I have practiced my profession both as a Geological Engineer and as a Specialist-Advisor in ambient temperature-pressure leaching systems.

THAT the following is a true record of my employment and experience:

- 1957 4 mos. Junior Geologist. Noranda Mines Ltd. Noranda, Quebec.
- 1958 4 mos. Party Chief. Hollinger North Shore Exploration Co. Ltd. New Quebec and Labrador.
- 1959-1961 2 yrs. Assistant Geologist. Pickle Crow Gold Mines Ltd. Pickle Crow, Ontario. Teck Corporation Ltd.
- 1961-1962 1 yr. Assistant Geologist. Willroy Mines Ltd. Manitowadge, Ontario.
- 1962-1964 2 yrs. Chief Geologist. Metal Mines Ltd. Werner Lake, Ontario. Consolidated Canadian Faraday.
- 1964-1966 2 yrs. Chief Geologist. Tegren Goldfields Ltd. Kirkland Lake, Ontario. Teck Corporation Ltd.
- 1967 ½ yr. Project Geologist. McLeese Lake property, B.C. Geophysical Engineering & Surveys Ltd. Teck Corporation Ltd.
- 1969-1970 1 yr. Laboratory Manager, Chief Geologist, and Consulting Engineer. S. M. Industries Ltd. Vancouver, B.C.
- 1970-1981 11 yrs. Independent Consulting Engineer. Canada, U.S.A., and Mexico.

THAT I do not have any interest, direct, indirect, or contingent, in the securities or properties of COASTORO RESOURCES LIMITED.

THAT This report is based on the writer's examination of the Cougar Property on July 7 to 10, 1981, on evaluation both of historical data and of recent air photographs of the area (1978), and on exploration of the property from September 22 to 30, 1981.



Dated at Vancouver this
7th Day of December, 1981

C. M. Armstrong, P.Eng.
Consulting Engineer

APPENDIX

I

Analyses - Bondar-Clegg & Company Limited



BONDAR-CLEGG & COMPANY LTD.

130 PEMBERTON AVE., NORTH VANCOUVER, B.C. V7P 2R5 PHONE: (604) 985-0681 TELEX: 04-352667

Geochemical Lab Report

REPORT: 121-3397

FROM: C.M. ARMSTRONG

SUBMITTED BY: C.M. ARMSTRONG

DATE: 14-NOV-81 PROJECT: COUGAR

ELEMENT	LOWER DETECTION LIMIT	EXTRACTION	METHOD	SIZE FRACTION	SAMPLE TYPE	SAMPLE PREPARATIONS
Cu	1 PPM	HNO ₃ -HCL HOT EXTR	Atomic Absorption	-100	OTHER	CRUSH, PULVERIZE -100
Au	5 PPB	AQUA REGIA	Fire Assay AA	-100	SOILS & ROCKS	SEIVE -80

REPORT COPIES TO: C.M. ARMSTRONG
BONDAR-CLEGG & COMPANY

INVOICE TO: C.M. ARMSTRONG

REMARKS: SILTS-21-3401

DETECTION LIMITS FOR GOLD

20 gram sample: 5 PPB.
10 gram sample: 10 PPB.
1 gram sample: 100 PPB.

Sample Wt. 20 g. unless otherwise stated.

NOTE:

Check concentration/sample weight ratio
for effective detection level.



130 PEMBERTON AVE., NORTH VANCOUVER, B.C. V7P 2R5 PHONE: (604) 985-0681 TELEX: 04-352667

Geochemical Lab Report

REPORT: 121-3397

PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Au PPB	NOTES	SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Au PPB	NOTES
A-0+50		7			B-3+50		4		
A-1+00		3			B-4+00		7		
A-1+50		3			B-4+50		8		
A-2+00		2			B-5+00		4		
A-2+50		1			B-5+50		2		
A-3+00		2			B-6+00		2		
A-3+50		1			B-6+50		1		
A-4+00		7			B-7+00		6		
A-4+50		3			B-7+50		4		
A-5+00		1			B-8+50		3		
A-5+50		1			B-9+00		1		
A-6+00		2			B-9+50		6		
A-6+50		1			B-10+00		3		
A-7+00		4			B-10+50		4		
A-7+50		4			B-11+00		3		
A-8+00		16			B-11+50		8		
A-8+50		6			B-12+50		4		
A-9+00		8			B-13+50		3		
A-9+50		12			B-15+50		9		
A-10+00		7			B-16+00		10		
A-10+50		7			B-0+50W		13		
A-11+00		4			B-1+00W		9		
A-11+50		13			B-2+00W		4		
A-12+00		3			B-2+50W		11		
B-0+50		6			B-3+00W		7		
B-1+00		6			B-3+50W		4		
B-1+50		8			C-1+50		18		
B-2+00		17			C-2+00		10		
B-2+50		8			C-2+50		7		
B-3+00		9			C-3+00		26		



130 PEMBERTON AVE., NORTH VANCOUVER, B.C. V7P 2R5 PHONE: (604) 985-0681 TELEX: 04-352667

Geochemical Lab Report

REPORT: 121-3397

PAGE 2

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Au PPB	NOTES	SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Au PPB	NOTES
C-3+50		13			D-9+00		8		
C-4+00		24			E-2+50		ND		
C-4+50		8			E-3+00		ND		
C-5+50		8			E-4+00		2		
C-6+00		6			S0-1		50		
C-6+50		3			S0-2		8		
C-7+00		9			R1		7	5110	
C-8+00		11			R2		9	20	
C-8+50		4			R3		4	20	
C-9+00		7			R4		4	ND	
C-9+50		4			R5		3	5	
C-10+00		6			R6		57	ND	
C-10+50		3							
C-11+00		2							
D-1+00		2							
D-1+50		ND							
D-2+00		1							
D-2+50		3							
D-3+00		1							
D-3+50		1							
D-4+00		2							
D-4+50		1							
D-5+00		1							
D-5+50		1							
D-6+00		1							
D-6+50		6							
D-7+00		6							
D-7+50		3							
D-8+00		3							
D-8+50		1							



BONDAR-CLEGG & COMPANY LTD.

130 PEMBERTON AVE., NORTH VANCOUVER, B.C. V7P 2R5 PHONE: (604) 985-0681 TELEX: 04-352667

Geochemical Lab Report

REPORT: 121-3401

FROM: C.M. ARMSTRONG

SUBMITTED BY: C.M. ARMSTRONG

DATE: 14-NOV-81 PROJECT: COUGAR

ELEMENT	LOWER DETECTION LIMIT	EXTRACTION	METHOD	SIZE FRACTION	SAMPLE TYPE	SAMPLE PREPARATIONS
Cu	1 PPM	HNO3-HCL HOT EXTR	Atomic Absorption	-80	SOILS	SEIVE -80
Au	5 PPB	AQUA REGIA	Fire Assay AA	-80	SILTS	RETENTION OF REJECTS

REPORT COPIES TO: C.M. ARMSTRONG
BONDAR-CLEGG & COMPANY

INVOICE TO: C.M. ARMSTRONG

REMARKS: SOILS AND RX ON 121-3397

DETECTION LIMITS FOR GOLD

20 gram sample: 5 PPB.
10 gram sample: 10 PPB.
1 gram sample: 100 PPB.

Sample Wt. 20 g. unless otherwise stated.

NOTE:

Check concentration/sample weight ratio
for effective detection level.



130 PEMBERTON AVE., NORTH VANCOUVER, B.C. V7P 2R5 PHONE: (604) 985-0881 TELEX: 04-352667

Geochemical Lab Report

REPORT: 121-3401

PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Au PPB	NOTES	SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Au PPB	NOTES
A-2+50		3	15		E-1+00		1	40	
A-4+00		3	5		E-1+50		1	75	
A-7+00		5	5		E-2+00		1	20	
A-8+00		4	10		E-2+50		1	75	
A-9+50		5	5		E-3+50		2	10	
B-8+00		2	5		Si-01		12	225	
B-14+00		8	10		Si-02		10	5	
B-14+50		7	15		Si-03		3	10	
B-15+00		5	10		Si-04		5	10	
B-16+50		6	10		Si-05		4	ND	
B-17+00		14	5		Si-06		14	5	
B-17+50		6	15		Si-07		2	ND	
B-18+00		8	10		Si-08		10	ND	
B-18+50		8	5		Si-09		5	ND	
B-19+00		9	10		Si-10		5	ND	
B-19+50		68	10		Si-11		13	ND	
B-20+00		69	15		Si-12		16	ND	
B-1+50W		6	15		Si-13		17	ND	
B-2+00W		3	20		Si-14		7	ND	
B-2+80W		1	10		Si-15		3	15	
C-0+50		7	10		Si-16		10	ND	
C-1+00		7	10		Si-17		11	ND	
C-3+20		26	15		Si-18		7	ND	
C-4+00		17	30		Si-19		6	ND	
C-5+00		7	15		Si-20		4	ND	
C-7+50		5	10						
D-0+50		1	25						
D-9+50		4	15						
D-10+00		1	25						
E-0+50		5	40						

BONDAR-CLEGG & COMPANY LTD.

130 PEMBERTON AVE., NORTH VANCOUVER, B.C. V7P 2R5 PHONE: (604) 985-0681 TELEX: 04-352667

Geochemical Lab Report

FORM 101 (REV. 11-80)
SUBMITTED BY: C. ARMSTRONG

DATE: 08-DEC-81 PROJECT: NONE GIVEN

ELEMENT	LOWER DETECTION LIMIT	EXTRACTION	METHOD	SIZE FRACTION	SAMPLE TYPE	SAMPLE PREPARATIONS
CU	5 PPB	AQUA REGIA	Fire Assay AA	-100	PREPARED PULP	AS RECEIVED; NO SP

REPORT COPIES TO: C.M. ARMSTRONG
BONDAR-CLEGG & COMPANY

INVOICE TO: C.M. ARMSTRONG

REMARKS:

DETECTION LIMITS FOR GOLD
20 gram sample: 5 ppb.
10 gram sample: 10 ppb.
1 gram sample: 100 ppb.

Sample Mt. 20 g. unless otherwise stated.

NOTE:

Check concentration/sample weight ratio
for effective detection level.



130 PEMBERTON AVE., NORTH VANCOUVER, B.C. V7P 2R5 PHONE: (604) 985-0681 TELEX: 04-352667

Geochemical Lab Report

SAMPLE NUMBER	ELEMENT UNITS	AG PPB	NOTES	SAMPLE NUMBER	ELEMENT UNITS	AG PPB	NOTES
A-0+00		ND		B-3+00		ND	
A-1+00		ND		B-4+00		ND	
A-1+00		ND		B-4+50		ND	
A-2+00		ND		B-5+00		ND	
A-2+00		ND		B-5+50		ND	
A-3+00		ND		B-6+00		ND	
A-3+00		ND		B-6+50		ND	
A-4+00		ND		B-7+00		ND	
A-4+00		S		B-7+50		ND	
A-5+00		ND		B-8+00		ND	
A-5+00		ND		B-9+00		ND	
A-6+00		ND		B-9+50		ND	
A-6+00		ND		B-10+00		ND	
A-7+00		ND		B-10+50		ND	
A-7+00		ND		B-11+00		ND	
A-8+00		ND		B-11+50		ND	
A-8+00		ND		B-12+00		ND	
A-9+00		LG		B-13+00		ND	
A-9+00		LG		B-13+50		ND	
A-10+00		S		B-14+00		ND	
A-10+00		ND		B-0+50W		ND	
A-11+00		ND		B-1+00W		ND	
A-11+00		S		B-2+00W		ND	
A-12+00		ND		B-2+50W		ND	
B-0+00		ND		B-3+00W		ND	
B-1+00		ND		B-3+50W		ND	
B-1+00		S		C-1+00		ND	
B-2+00		ND		C-2+00		ND	
B-2+00		ND		C-2+50		ND	
B-3+00		ND		C-3+00		ND	



BONDAR-CLEGG & COMPANY LTD.

130 PEMBERTON AVE., NORTH VANCOUVER, B.C. V7P 2R5 PHONE: (604) 985-0681 TELEX: 04-352667

Geochemical Lab Report

SAMPLE NUMBER	ELEMENT UNITS	AU PFB	NOTES	SAMPLE NUMBER	ELEMENT UNITS	AU PFB	NOTES
C-3+00		ND		D-9+00		ND	
C-4+00		ND		E-2+50		ND	
C-4+50		ND		E-3+00		ND	
C-5+00		ND		E-4+00		ND	
C-6+00		ND		SO-1		ND	
C-6+50		ND		SO-2		ND	
C-7+00		ND					
C-8+00		ND					
C-8+50		ND					
C-9+00		ND					
C-9+50		ND					
C-10+00		ND					
C-10+50		ND					
C-11+00		ND					
D-1+00		ND					
D-1+50		ND					
D-2+00		15					
D-2+50		ND					
D-3+00		ND					
D-3+50		ND					
D-4+00		ND					
D-4+50		ND					
D-5+00		ND					
D-5+50		ND					
D-6+00		ND					
D-6+50		15					
D-7+00		ND					
D-7+50		ND					
D-8+00		ND					
D-8+50		ND					

APPENDIX

II

Graphical Statistical Calculations

C. M. ARMSTRONG, P.Eng.
CONSULTING ENGINEER
4085 West 29th Avenue
Vancouver, B.C., Canada
(604) 224-7678 V6S 1V4

GEOCHEMISTRY

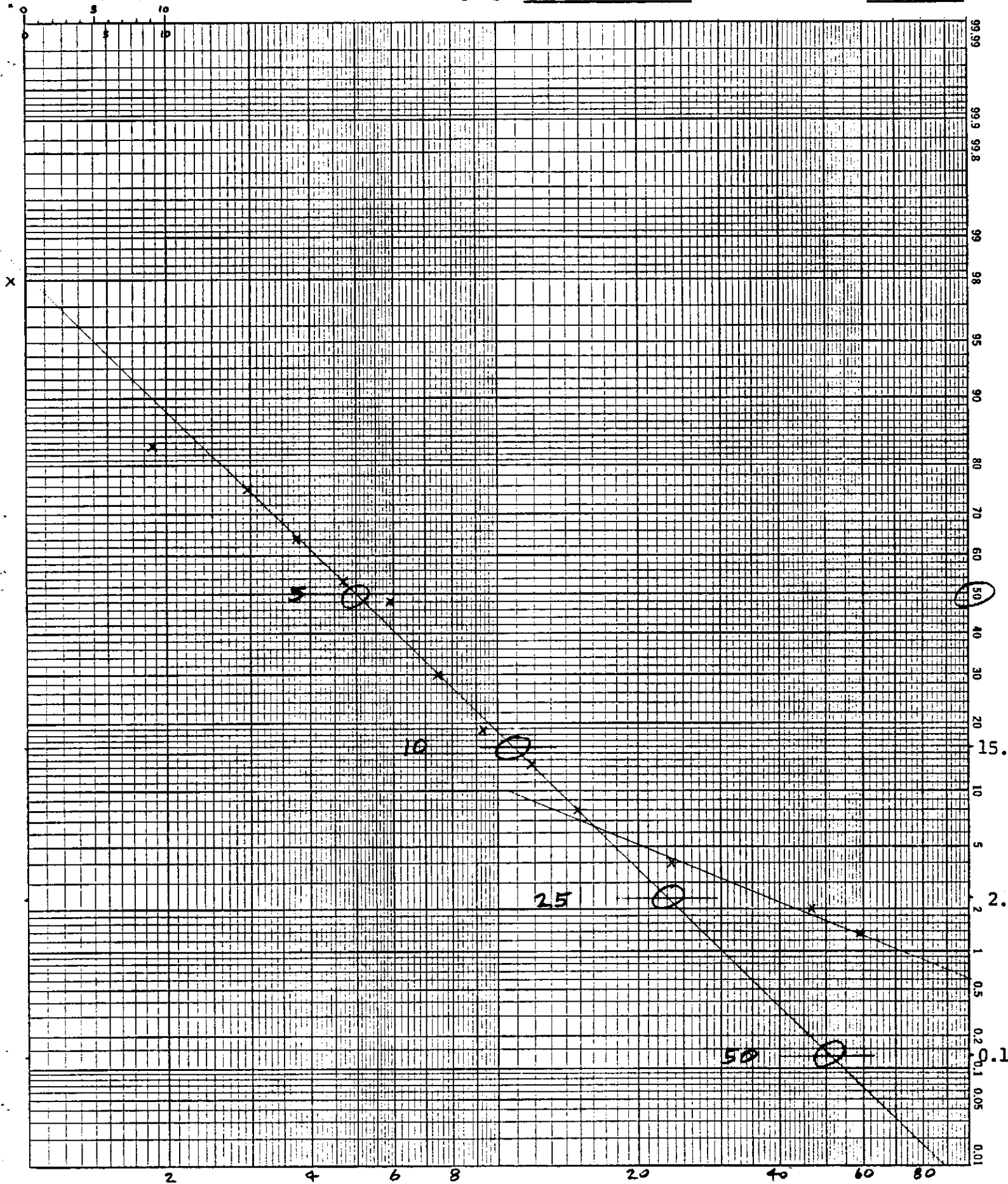
Statistical Analysis Graph

Property Cougar

Date Nov. 1981

Company Coastoro

Element Cu



C. M. ARMSTRONG, P.Eng.
Consulting Engineer

GEOCHEMISTRY

Statistical Analysis Calculations

4085 West 29th Avenue
Vancouver, B.C. V6S 1V4
Canada (604) 224-7678

Property Cougar

Date Nov. 1981

Company Coastoro

Element Au

$75/5 = 15$

Lognormal distribution

R = ratio of highest to lowest value = $225/5 = 45$
w = width of classes & $\log w = 0.05, 0.1$ or 0.2
n = number of classes

$n = \frac{\log R}{\log w} = \frac{1.65}{0.1} = 17$

$\frac{1.18}{0.1} = 12$

Class		Mid-pt	Frequency	Calculation						
Limits	log	log x	Count	Total f	%	$\Sigma\%$	t*	ft	ft ²	f(t+1) ²
4.68	0.67	ND	+ 9.1	103	68.21	99.97				
5.89	0.77	0.72		11	7.28	31.76				
7.41	0.87	0.82								
9.33	0.97	0.92								
11.75	1.07	1.02		16	10.60	24.48				
14.79	1.17	1.12								
18.62	1.27	1.22		11	7.28	13.88				
23.44	1.37	1.32		2	1.32	6.60				
29.51	1.47	1.42		2	1.32	5.28				
37.15	1.57	1.52		1	0.66	3.96				
46.77	1.67	1.62		2	1.32	3.30				
58.88	1.77	1.72								
74.13	1.87	1.82								
93.33	1.97	1.92		2	1.32	1.98				
117.5	2.07	2.02								
147.9	2.17	2.12								
186.2	2.27	2.22								
234.4	2.37	2.32		1	0.66	0.66				
295.1	2.47	2.42								
371.5	2.57	2.52								
467.7	2.67	2.62								
588.8	2.77	2.72								
741.3	2.87	2.82								
933.3	2.97	2.92								
1175	3.07	3.02								
1479	3.17	3.12								
1862	3.27	3.22								
2344	3.37	3.32								
2951	3.47	3.42								

151 99.97 ✓

b = 5
b + 1s = 15
b + 2s = 30
b + 3s = 60

x₀ = assumed mean =

c = cell interval = 0.1

*t = $\frac{x - x_0}{c}$

C. M. ARMSTRONG, P.Eng.
CONSULTING ENGINEER
4085 West 29th Avenue
Vancouver, B.C., Canada
(604) 224-7678 V6S 1V4

GEOCHEMISTRY

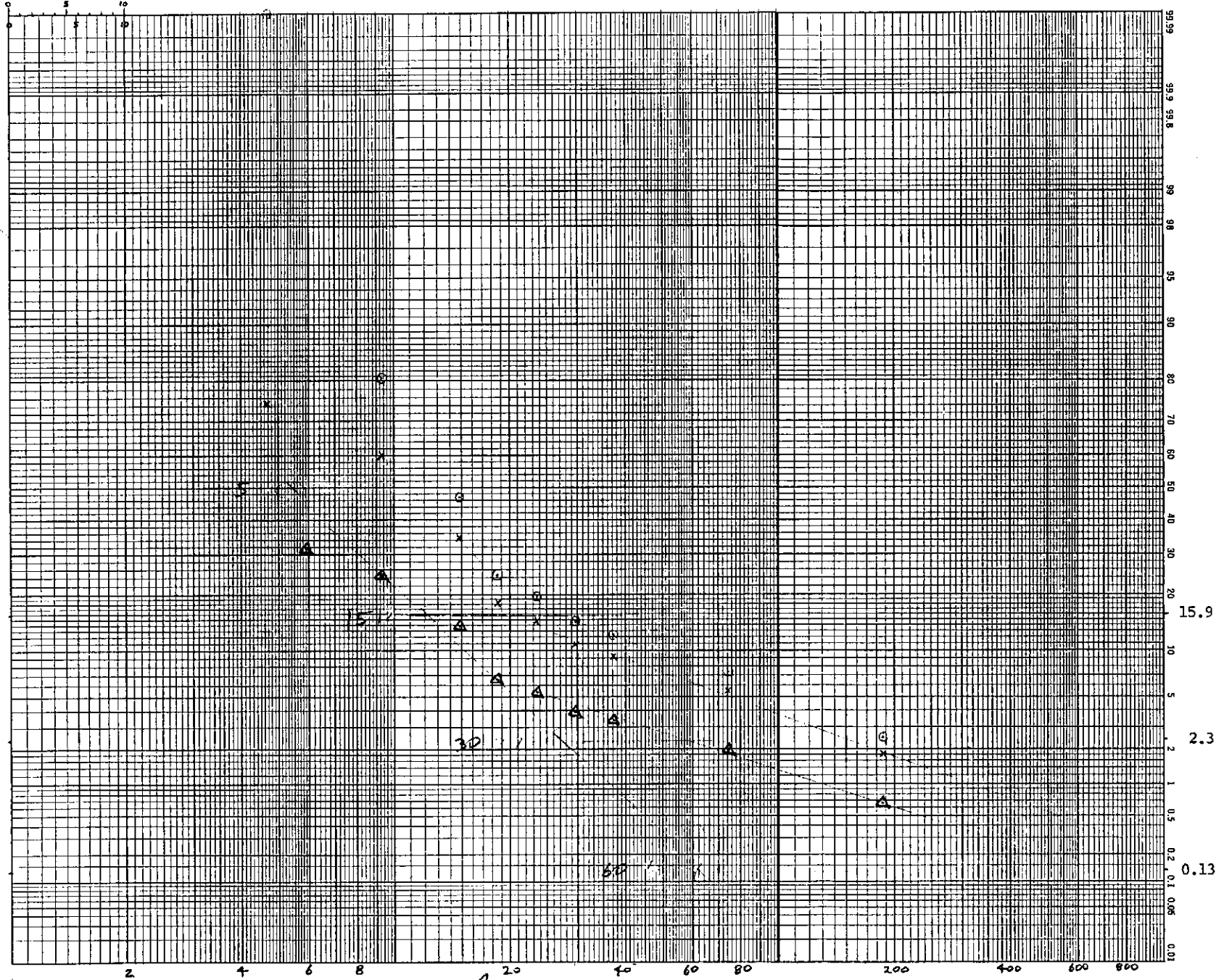
Statistical Analysis Graph

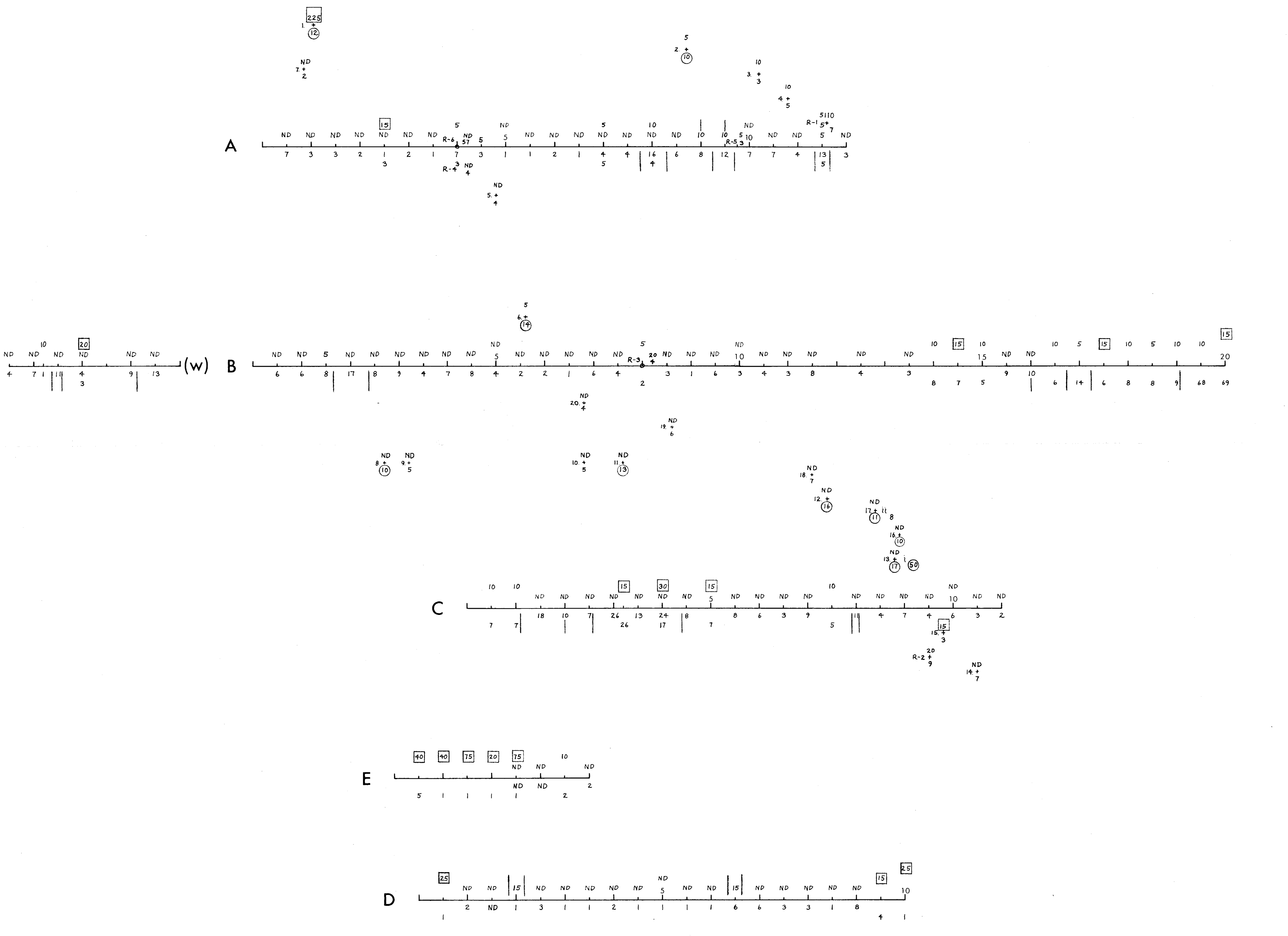
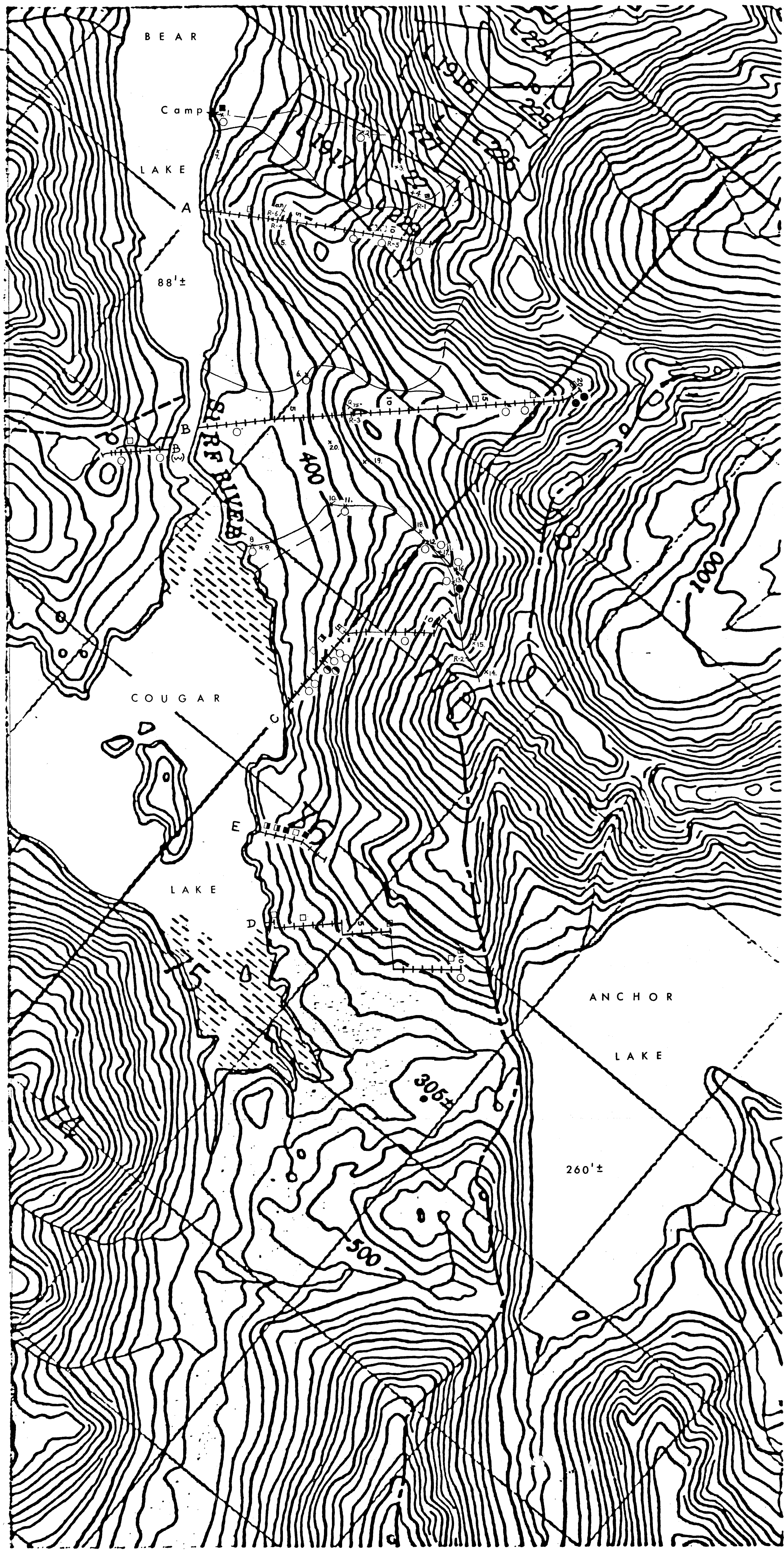
Property Cougar

Date Nov. 1981

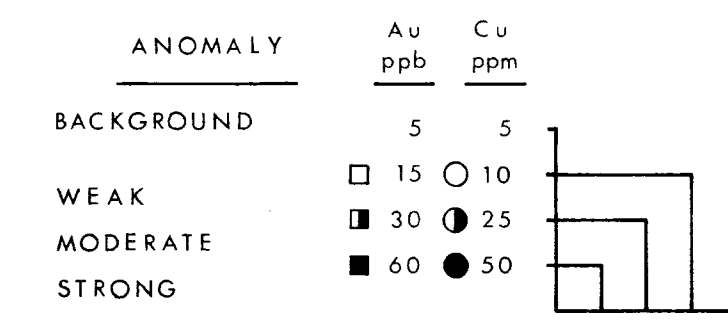
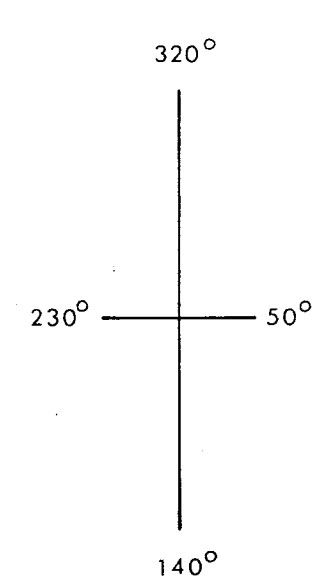
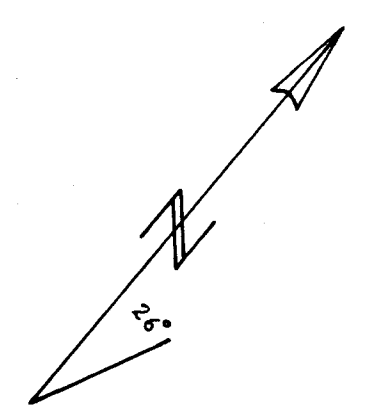
Company Coastoro

Element Au

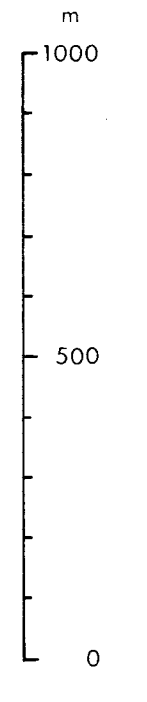
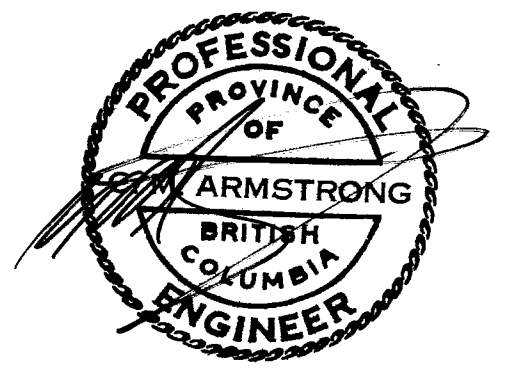




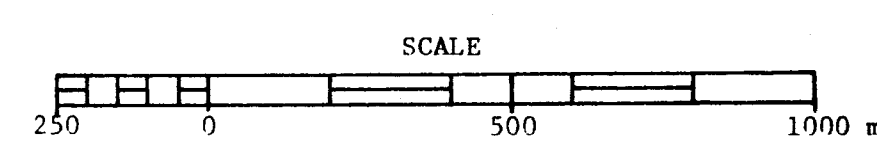
Au 45
 30
 15
 Soil + IV
 Cu 15



10071

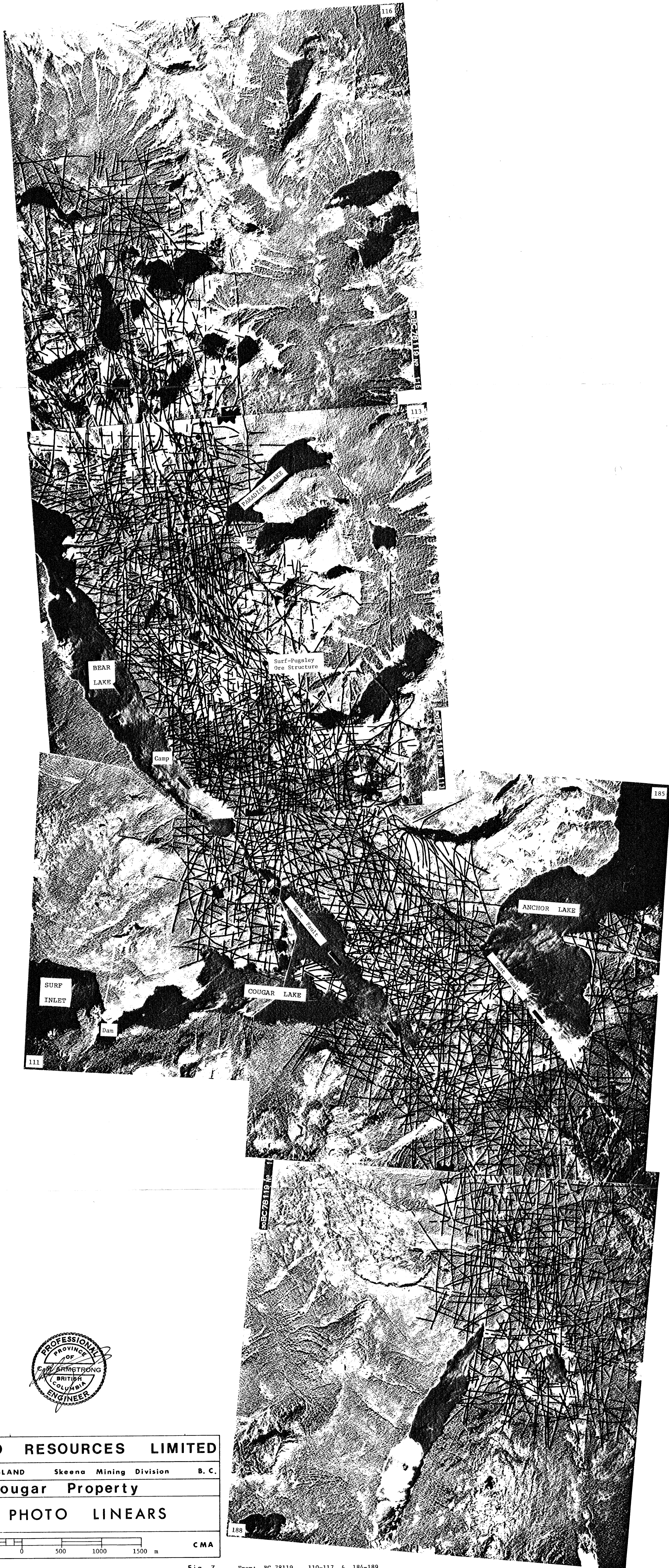


From: NTS 103 H / 2 1974
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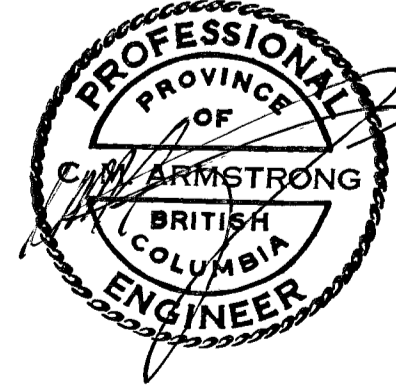


COASTORO RESOURCES LIMITED
 PRINCESS ROYAL ISLAND Skeena Mining Division B. C.
Cougar Property
GEOCHEMISTRY
 Nov. '81 CMA

Fig. 6



MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
10,071



COASTORO RESOURCES LIMITED			
PRINCESS ROYAL ISLAND	Skeena Mining Division	B. C.	
Cougar Property			
AIR PHOTO LINEARS			
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Fig. 7 From: BC 78119 110-117 & 184-189