LONG LAC MINERAL EXPLORATION LIMITED

SUITE 470 - 1055 W. HASTINGS,
VANCOUVER, B.C. V6E 2E9
(604) 685-0531

GEOLOGICAL, GEOCHEMICAL AND GEOPHYSICAL REPORT

FANNY CLAIMS #1 to #3

Phillips Arm Area

Vancouver Mining Division

92 K/11W

Latitude 50° 32'

Longitude 125° 22'

Owner: F. D. Forgeron

Operator: Long Lac Mineral Exploration Ltd.

F. D. Forgeron, Ph. D.
Consultant Geologist - Geochemist
204 - 270 West First Street
North Vancouver, B.C.

October 1981

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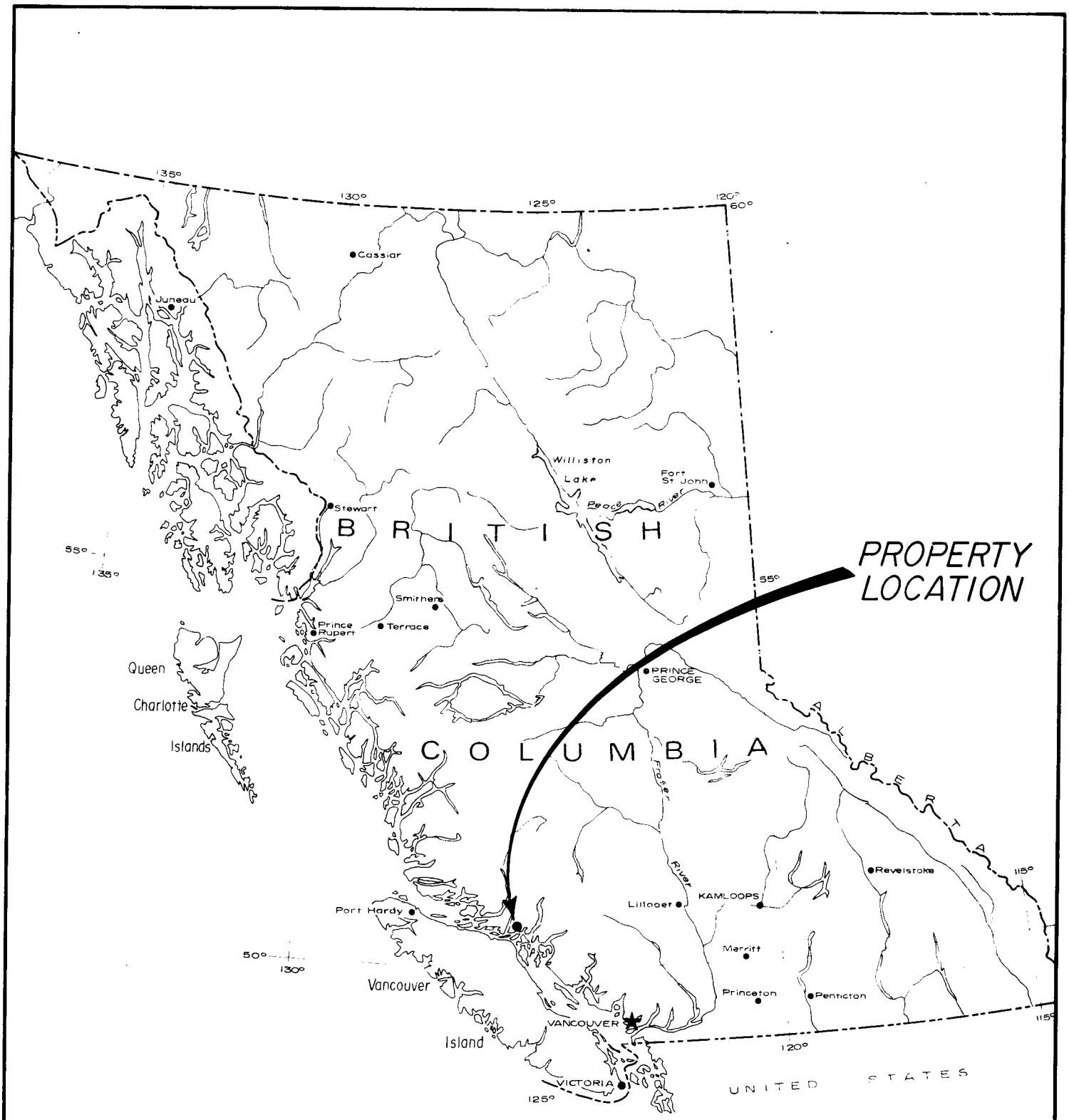


FIGURE 1

LONG LAC MINERAL EXPLORATION LTD.

FANNY PROJECT

LOCATION MAP

SCALE

Km. 100 50 0 100 200 300 400 Km.

Miles 100 50 0 200 Miles

ALTAIR drafting services ltd.

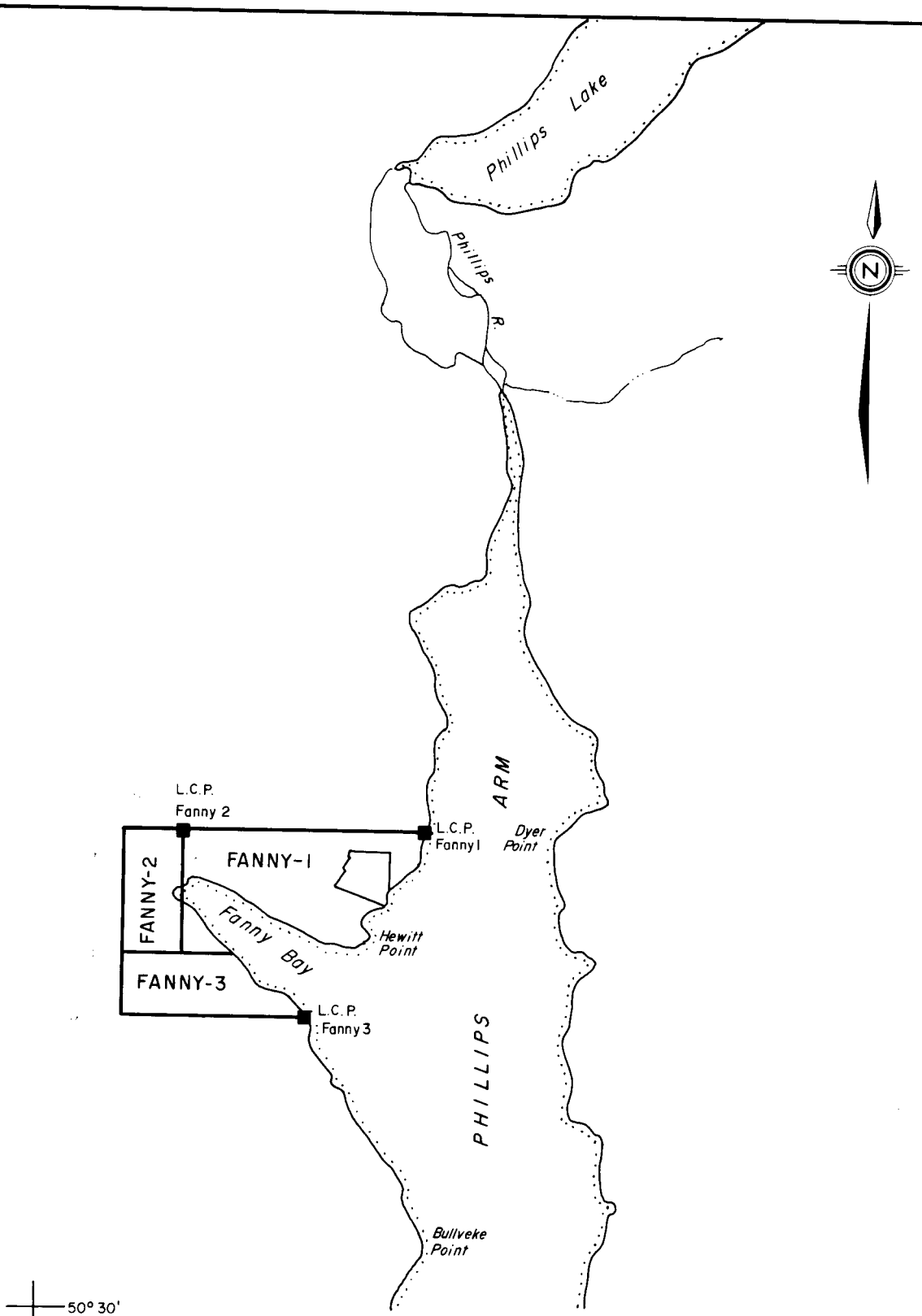


FIGURE 2

LONG LAC MINERAL EXPLORATION LTD.

FANNY PROJECT

LOCATION OF

FANNY 1,2,3-CLAIMS

Kms 0 2 Kms.

SCALE: 1:50,000

DATE: Aug. 1981

1. INTRODUCTION

Project Fanny consisted of geological mapping, geochemical surveys and magnectomer surveys on 13 units comprising the claims Fanny 1, 2 and 3. The surveys were conducted from the "M.V. Merlamac 11", a 50' converted fish boat. The surveys were carried out during the period July 11 to August 2, 1981.

2. LOCATION AND ACCESS

The property is located at Fanny Bay in Phillips Arm (Figures 1, 2) on the Bute Inlet map sheet (92K) Fanny Bay is 56km north of Campbell River. The LCP of Fanny 1 has the coordinates 53^{o} 32.1'N and 125^{o} 22.3'W.

The area is accessible by water and air. Two daily scheduled flights service two logging camps in Fanny Bay from Campbell River. A coastal freighter calls at Fanny Bay every two weeks. A general store at Blind Channel, 19km south of Fanny Bay, is accessible by small boat and stocks most day to day needs.

3. PREVIOUS WORK

Gold was produced from a number of properties in the area. Prospecting and mining activities were greatest between 1897 and 1899. The first cyanide mill in the province was located at Fanny Bay. This mill treated ore from the Doratha Morton deposit, approximately 1 mile south of the Fanny claims. Seven mines produced gold from the Shore Bay-Fanny Bay area; 5821 oz. gold was produced from 13,702 tons to give an average grade of 0.42 oz/ton. (1), During the 1930's prospecting and mining was carried out on a smaller scale.

In the early 1970's geochemical surveys were carried out over a number of properties in the Phillips Arm - Loughburough Inlet areas. The results did not appear to warrant further work.

In 1980, the writer soil sampled roads in the Fanny Bay area and located a number of anomalous copper, molybdenum and silver values. The Fanny 1 claim was staked in October 1980 on the basis of the soil results.

4. REGIONAL GEOLOGY

Fanny Bay is on Roddick's (2) Belt 1, a narrow metasedimentaly - metavolcanic belt trending northwest, more-or-less continuously for some 80km between the Gulf of Georgia and Queen Charrlotte Straits. Roddick describes seven such belts in the Bute Inlet map area. The belts are thought to be "Fault slices or grabbens along which 'horsts' of plutonic rocks were thrust upward". Faulting appears to be a dominant contact characteristic in all areas observed. These rocks are considered to be Mesozoic in age and older than the enclosing intrusives.

The stratified belts are engulfed in the coast plutonic complex composed dominantly of quartz diorite and granodiorite. The coast plutonic complex varies in age from late Jurassic to eocene (from west to east) and is composed of a large number of successive intrusions with faulting, regional metamorphism and contact metamorphism accompanying each intrusion.

5. WORK COMPLETED

A. Weston, A. Kaye, R. Kent and the writer carried out line cutting, staking, soil sampling, magnetometer surveys, geological mapping

and chemical analyses on claims Fanny 1, 2 and 3 (Figure 2), during the period July and August 2, 1981.

A base line was cut parallel to Fanny Bay (291^{o} Az) from Hewitt Point. Offsets were introduced to take advantage of the road which approximately parallels the baseline. Lines were blazed and flagged at 100 meter intervals at right angles and flagged at 25 meter intervals. The base line, claim lines and the coastline were used to tie in the lines. A total of 17km were cut/blazed and flagged.

Two claims were staked during the period July 20-22/81. These claims contained 5 units.

A total of 715 soil samples were collected at 25 meter intervals along the cross lines. Thirty-three rock samples were taken from sulfide bearing rock and analysed for a variety of metals (Figure 3).

Magnetometer measurements (Mcphar Model No. M - 700) were taken at 25 meter intervals along the cut lines. A total of 14km were surveyed.

Geological observations were made on all the cross lines and along the coast.

Geochemical analyses were carried out on the "M.V. Merlamac" throughout the course of the project. A total of 1640 determinations were made on the Merlamac.

6. GEOCHEMICAL SURVEYS

6.1 Soil Environment: The Fanny Bay area has a number of overburden characteristics which influence the metal dispersions at the normal soil sampling depths.

In the northeast area from lines 0 to 6 grey-green basal clay beds were observed in several areas (Figure 3). The clay beds could effectively mask or modify any metal transport in solution. Between lines 6 and 15 north of the baseline occur extensive talus deposits. While dispersions from the cliffs above would be developed in the overburden, underlying bedrock metallic sources would not be reflected in soils. Stream and road cuts suggest the talus deposits to reach 10 meters in thickness.

South of Fanny Bay the soils show a moderate to good podsol development with local peat development in low places.

6.2 Soil Sampling: An attempt was made to collect B-horizon soils where possible by digging 20-30cm with a geological pick, shovels were impractical because of roots and rocky soils. Approximately 30 percent of the soils collected where organic (A-horizon) and the remainder various mixtures of A, B and C depending on what was available. Samples of 300-500g. were placed in 10 x 23cm kraft paper envelopes.

6.3 Rock Sampling: Rock samples of 2-5kg were chipped from sulfide bearing zones of all rock types encountered. The samples were described and retained in 20 x 23cm polythene bags.

6.4 Sample Preparation and Laboratory Analyses: All soil samples were air dried and sieved to -80 mesh, oversize was discarded. Rocks were crushed to -20 mesh, a 400 g cut was taken and pulverized to -100 mesh.

Analytical work was carried out on the "M.V. Merlamac" and at the North Vancouver laboratories of Bondar-Clegg & Co. Ltd. Semi-quantitative colourimetric analyses of copper, zinc and molybdenum were carried out for all the samples from the north side of Fanny Bay on the "M.V. Merlamac" by the following procedures:

1) scoup approximately 0.5 g. sample into test tube.
2) fuse with potassium pyrosulphate.
3) bulk to 10ml with 5% HCL and dissolve melt.
4) 4 ml aliquot is tested for Mo using the thiocyanate method.
5) 2 ml aliquot is tested for Cu using the biquinoline method.
6) 2 ml aliquot is tested for Zn using the dithizone method.

At Bondar-Clegg and Company soil samples were tested for copper, silver and molybdenum. The following procedure was used:

1) weigh 0.5 g. sample into test tube.
2) digest in Laforte Aqua-Regia for 3 hours.
3) bulk and homogenize to 20% acid.
4) allow to settle 1 hour.
5) analyze by atomic absorption in comparison with synthetic and matrix samples.
6) results are permanently recorded on chart paper.
7) silver in excess of 3 ppm is reanalyzed as above but using nitric acid digestion.

Tungsten was analyzed at Bondar-Clegg using the following procedure:

1) weigh 0.2 g. sample into test tube.
2) add 2 g. carbonate-chloride-nitrate flux and heat to sinter.

3) disolve and bulk with water.

4) analyze using a thiocyanate - tri-n-butyl phosphate method.

Gold was anaylzed by fire assay preconcentration and atomic absorption analysis of the doré bead as in steps 2 - 6 above for copper, silver and molybdenum.

7 INTERPRETATION OF RESULTS

7.1 Property Geology: The Fanny Bay claims are underlain by Coast Intrusives and the belt 1 metasedimentary rocks of Roddick (1). Outcrop occurs fairly extensively along the shoreline and on cliff faces (Figure 3). The remainder of the property is covered by coastal vegetation (both first, second and third growths), river deposits, talus material and several basal clay deposits.

In the northeast corner of the property massive hornblende granodiorite and/or quartz diorite outcrops on the shoreline, this rock grades to a mixture of metasediments, coarse intrusive and quartz which is welded together by intermediate to fine intrusive (agmatite). Locally within the agmatitic assemblage are areas of intense silicification and pyritization (Figure 3).

The agmatite zone fault contacts with crystalline limestone containing bands of skarn. The calcareous rocks are in fault contact with pyritic, chloritic metasediments. These rocks have been called wackes, chlorite schists, biotite schists, quartzites, etc. based on individual appearance. From Hewitt Point (Figure 3) to line 10 on the north side of Fanny Bay the shoreline geology consists of biotite-chlorite

schists with veins and lenses of epidote and chert and less commonly quartz and crystalline limestone. Pyrite is not as common as in the more siliceous metasediments.

The north central sector of the claims is dominated by a near vertical cliff which gives the appearance of an intrusive pipe. The cliffs end in a steep talus which covers virtually all bedrock down to the Bay. The cliffs are composed of crystalline limestone and sharn. On lines 5 and 13 bedrock is pyritic metasediments the band was assumed to be continuous higher up the cliff.

West of line 14 the intrusive is rusty with disseminated pyrite and chalcopyrite. A fault block (?) of crystalline limestone occurs in the granodiorite on line 15, 50 meters south of the shoreline this limestone is near a large shear zone containing massive pyrite up to 3 meters thick. A tunnel was driven some 128 meters under this shear. The underground workings did not appear to intersect the zone. The contact with either agmatite lies to the north of the metasediments but cannot be defined.

The north end of line 14 appears to be a fault contact zone between the metasediments and intrusive. In this area a steep walled stream valley is cut into the cliff face giving near continuous outcrop. Intrusives and metasediments occur in intensely sheared contact with each other. There was no other outcrop observed in the area and the contact was assumed to be orientated as drawn on Figure 3.

The south shore of the bay has a contact between the intrusive and crystalline limestone - Skarn near line 14. The contact appears to trend NNE at this location and is probably connected to or offset from the

contact described on the north end of line 14.

To the east of Line 14 crystalline limestone and skarn outcrop to the delta on which the LCP for Fanny 3 is located. On the south side of Fanny Bay mafic dikes are common whereas none were observed on the north shore even though the orientation would suggest their presence on the north shore. The general difference in lithology combined with the possible truncation of dikes suggest that Fanny Bay may be a fault zone with unknown displacement.

7.2 Magnetometer Results: The magnetometer results are plotted on Figure 4. A Mcphar Model No. M-700 magnetometer was used. The local daily variation was within 100 gammas on a base station which, in view of the pertinent contrast, was not considered enough to alter the instrument settings. On the south side of Fanny Bay the magnetometer data is considered suspect in some places, particularly line 15; part of the reason is due to tough bush conditions which resulted in the instrument being knocked about. Rechecking the results by a cross line traverse indicated the values to be in the correct range.

The dominant magnetic feature is a narrow but intense magnetic high which runs east-west near the crystalline limestone - siliceous metasedimentary contact. North of Fanny Bay the linear character of the high is persistent between lines 4 and 11. The east end of the magnetic high is immediately south of an old working (probably the Amethyst) which contains copper, silver, molybdenum and gold. Attendent if not coincidental geochemical anomalies are present in the area (Figures 5,6,7).

7.3 Soil Results: Copper, zinc and molybdenum were colourmetrically analyzed on site with the purpose of immediate follow-up on anomalies. Upon completion of the analyses north of Fanny Bay, it became apparent that zinc was not a diagnostic metal so no further zinc tests were made and the data are not presented. Both molybdenum and copper showed strong contrast. The molybdenum results by colourimetric methods were not sufficiently precise at low levels so were repeated by atomic absorption. Copper results by colourimetry were sufficiently reproducible to use in combination with atomic absorption. The time lag in getting analytical data resulted in completion of field work before the analytical work was completed, copper analyses south of Fanny Bay were, therefore, analyzed by atomic absorption.

Copper is sporadically anomalous throughout the property. A more-or-less continuous anomaly occurs at the base of the cliffs north of Fanny Bay. Another anomally occurs near the head of Fanny Bay on the south side. In both these instances the soils have ready access to solutions from nearby pyritic rocks. Environmental factors, discussed above, suggest that soil data north of Fanny Bay is not definitive and can only be used in qualitative sense. On the south side of Fanny Bay copper results indicate some potential near the head of Fanny Bay but otherwise values are near background.

Molybdenum is approximately coincident with copper and the most distinctive anomalies occur between 800 and 900N on lines 2 and 3, between lines 4 and 6 - 400 N to 600 N, on line 13 between 400 S and 600 S, and near the head of Fanny Bay on the south side. Small flecks of molybdenite were observed in massive pyrite lenses near the head of Fanny

Bay otherwise was not identified. The molybdenum anomaly on Line 13 South is in crystalline limestone and skarn near the contact with granodiorite, a possible skarn association is the probably source of this anomaly.

Silver is generally low throughout the property. A silver anomaly parallels the magnetic high near the north end of the property and may be significant in a qualitative manner. On the western boundary of Fanny 3 a distinct silver anomaly occurs with coincident copper and molybdenum. There is no apparent explanation for this anomaly.

7.4 Economic Geology: The Fanny Bay claims lie on a metasedimentary - metavolcanic belt within or adjacent to which occur 20 precious metal showings, over a strike length of 30km.

The geological setting of the gold deposits is faults and shear zones in the stratified rocks, in the intrusives near the contact with stratified rocks and in the contact zones. Gold universally occurs with quartz which contain sulphides. The quartz veins are known to attain widths of up to 6 meters (White Pine). Shear zones containing quartz veins attain widths of up to 30 meters (Doratha Morton) and 10 meters at the Enid-Julia. The two above mentioned deposits lie 1 and 2 miles, respectively, south of the Fanny claims.

The average grade of 7 mines worked in the area is 0.42 oz/ton Au and 0.3 oz/ton Ag. Much of the mining was done by following high grade leads. Obviously, substantial dilution would be possible to increase reserves and overall gold recovery. The mined tonnage (13,702 tons) therefore, does not reflect the gold potential of the area.

At Fanny Bay there are 4 reported showings in the B.C. Dept. Mines Mineral Inventory; these showings, the Amethyst, Monte Cristo, Galena and Blue Bird are gold-silver-copper-lead-molybdenum associated with quartz-pyrite zones in metasediments and intrusive rocks. There has been no recorded production from any of these showings. During the 1981 program many small workings in addition to the above were encountered. Silver and gold values were found in a number of locations(Figure 3).

Exploration for gold deposits in the area should take the following factors into consideration:

1) All gold showings contain copper, copper is extensively distributed throughout the area in soils.
2) Copper as determined in soils may not pin point the bedrock sources because of extensive talus cover and basal clay beds.
3) Outcrop is sparce except along the shoreline and on cliffs.
4) Previous prospecting has been intensive and new discoveries will probably not be found in outcrop.
5) Magnetometer data indicates a strong magnetic linear under the talus on the north side of Fanny Bay. Gold-silver-copper mineralization has been found in close association with this linear.

In conclusion, from an economic standpoint the area has potential for tonnages of precious metals at mining grades. The most immediate target in the area is the magnetic linear north of Fanny Bay. Electromagnetic and/or induced polarization surveys should be instituted as a next phase of exploration followed by trenching and diamond drilling.

8.0 CONCLUSIONS

1. Geochemical soil surveys are useful only in a qualitative manner on the Fanny claims north of Fanny Bay. South of Fanny Bay soil response is more definitive.

2. Magnetometer surveys are definitive in outlining potential structural and lithological zones with gold potential.

3. Gold, silver, molybdenum and copper are anomalous in bedrock at a number of locations on the Fanny claims.

4. Molybdenum is anomalous in limestones south of Fanny Bay, although tungsten has not been found to date, the potential for skarn deposits should be followed-up.

5. Information found to date on the Fanny claims is thought to warrant a further program of geophysics and trenching.

9.0 REFERENCES

2. Roddick, J.A.: Notes on the Stratified Rocks of Bute Inlet Map-Area. GSC Open File 480

1. Stevenson, J.S.: 1947 Lode-Gold Deposits South-western British Columbia. BCDM Bulletin 20-Part IV.

Appendix I

Statement of Qualifications

1. I am a consulting geologist-geochemist, residing at 204 - 270 West First Street, North Vancouver, B.C.

2. I have the following University Degrees:

   B.Sc (Geology) St. F.X. University, 1957

   M.Sc (Geology) Carleton University, 1962

   Ph.D. (Geochemistry) Manchester University, 1966

3. I have practised my profession continuously for the past 16 years throughout continental North America, the Middle East and the Far East.

4. The Fanny Project was carried out directly under my supervison during the period July 11 - August 2, 1981.

F.D. Forgeron, Ph.D

Consultant Geologist-Geochemist

APPENDIX 2

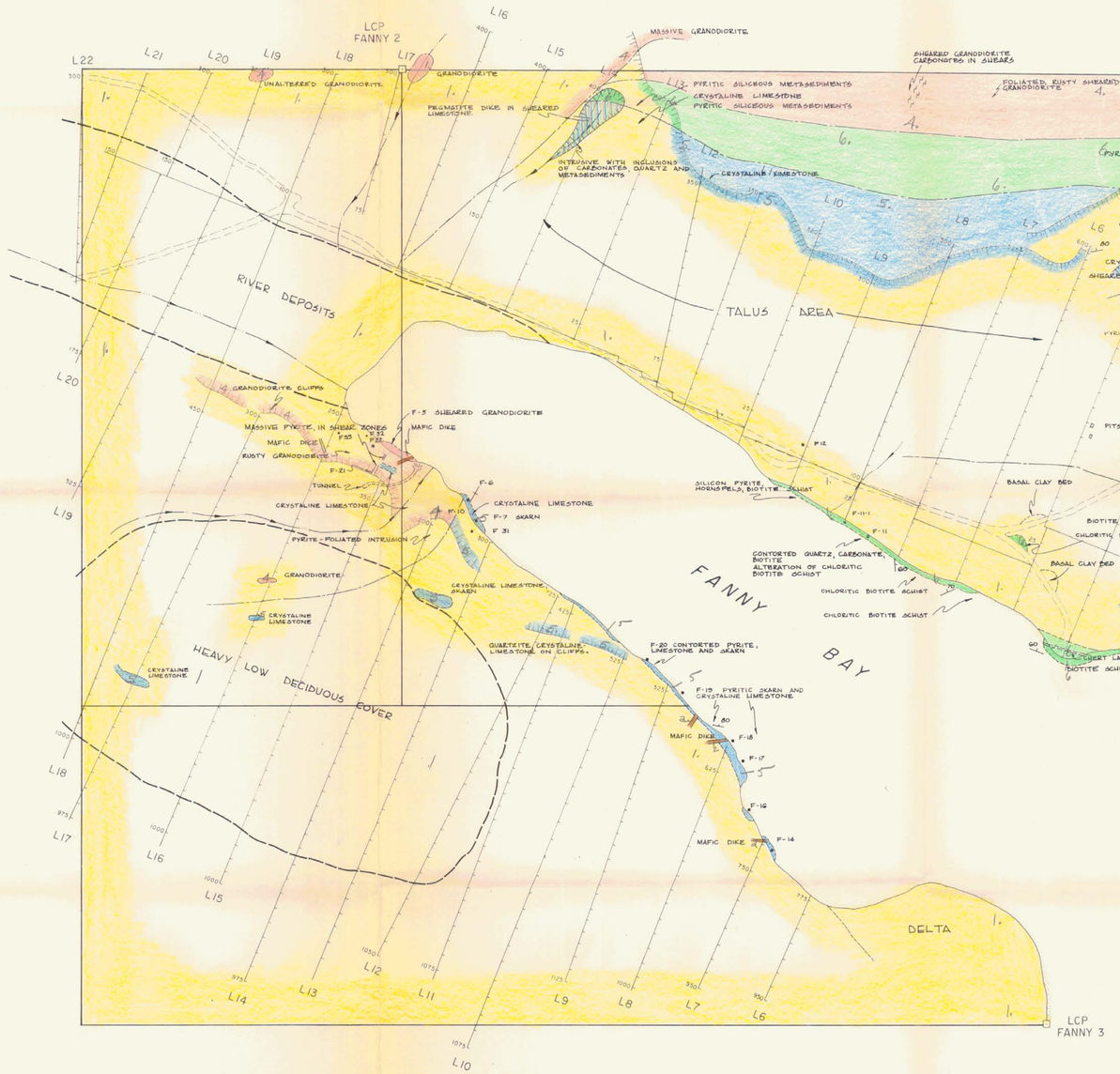
Statement of Expenditures

Fanny 1, 2, 3

1.	Wages:			
	A. Weston	23 days @ $72/day =	1,556.00	
	R. Kent	23 days @ $55/day =	1,265.00	
	A. Kaye	23 days @ $47/day =	1,081.00	
				$3,902.00
2.	Rental of "M.V. Merlamac II" with F.D. Forgeron 23 days @ $500/day			11,500.00
3.	Food	92 man days @ $10/M.D.		920.00
4.	Analytical			
	(soil) Cu, Mo, Ag	650 x $3.58 =	2,327.00	
	(rock) Au	23 x 5.25 =	120.75	
	(rock) W	11 x 2.75 =	30.25	
	(rock) Cu, Mo, Ag	10 x 5.08 =	50.80	
				2,528.80
5.	Report (Clerical, Draughting, Writing)			3,504.99
			TOTAL	22,355.79

TABLE OF ROCK GEOCHEMICAL RESULTS

SAMPLES IN PPM	#	Cu	Mo	Ag	W	Au FA
PYRITIC CHL. SILIC. MS	F-1			0.5		370
PYRITIC INTRUSIVE	F-2					25
" "	F-3					30
SKARN	F-4	44		0.3	N	15
BIOTITE SCH, SILIC.	F-7	2			N	10
PYRITIC M.S.	F-8			0.8		60
" "	F-9-1	8		0.6		40
PYRITE, QTZ.	F-9-2	10		93		6950
PYRITIC M.S.	F-9-3	9		0.2		40
PYRITIC INTRUSIVE	F-10					30
PYRITIC BIO. SCH.	F-11				2	35
CARB., BIO. SCH.	F-11-1				2	15
PYRITIC QTZITE	F-12		0.2			10
" "	F-13				E	
SKARN ROCK	F-14				E	
" "	F-16				E	
" "	F-17				E	
" "	F-18				E	
" "	F-19				E	
" "	F-20				E	
MASSIVE SULPHIDE	F-21					<5
" "	F-22					5
RUSTY M.S.	F-23	68	10	0.2		15
" "	F-24	230	13	0.5		10
QTZ-CARB-PY E.L.	F-25	4500	850	5.2		90
PYRITIC M.S.	F-26	280	8	0.6		15
MASSIVE SULPHIDE	F-27	17000	90	22.0		280
SHEARED M.S.	F-28	7300	150	12.0		45
MASSIVE SULPHIDE	F-29	>20000	1500	>30.0		6200
PYRITIC M.S.	F-30			0.3		20
PYRITIC INTRUSIVE	F-31	212	5	0.7		
" "	F-32	217	11	0.4		
SKARN	F-33	97	29	0.3		



LEGEND

- ROAD
- CONTACT INFERRED, DEFINED
- ADIT
- ROCK SAMPLE
- TRENCH
- PIT

YELLOW	1	QUATERNARY
BROWN		MAFIC DIKE
STRIPED PINK, GREEN	3	MIXED ASSEMBLAGES
PINK	4	INTRUSIVE: GRANODIORITE, QUARTZ DIORITE
BLUE	5	CRYSTALINE LIMESTONE, SKARN
GREEN	6	METASEDIMENTS: BIOTITE SCHISTS, QUARTZITE, PYRITIC SCHISTS, WACKES.

FIGURE 3

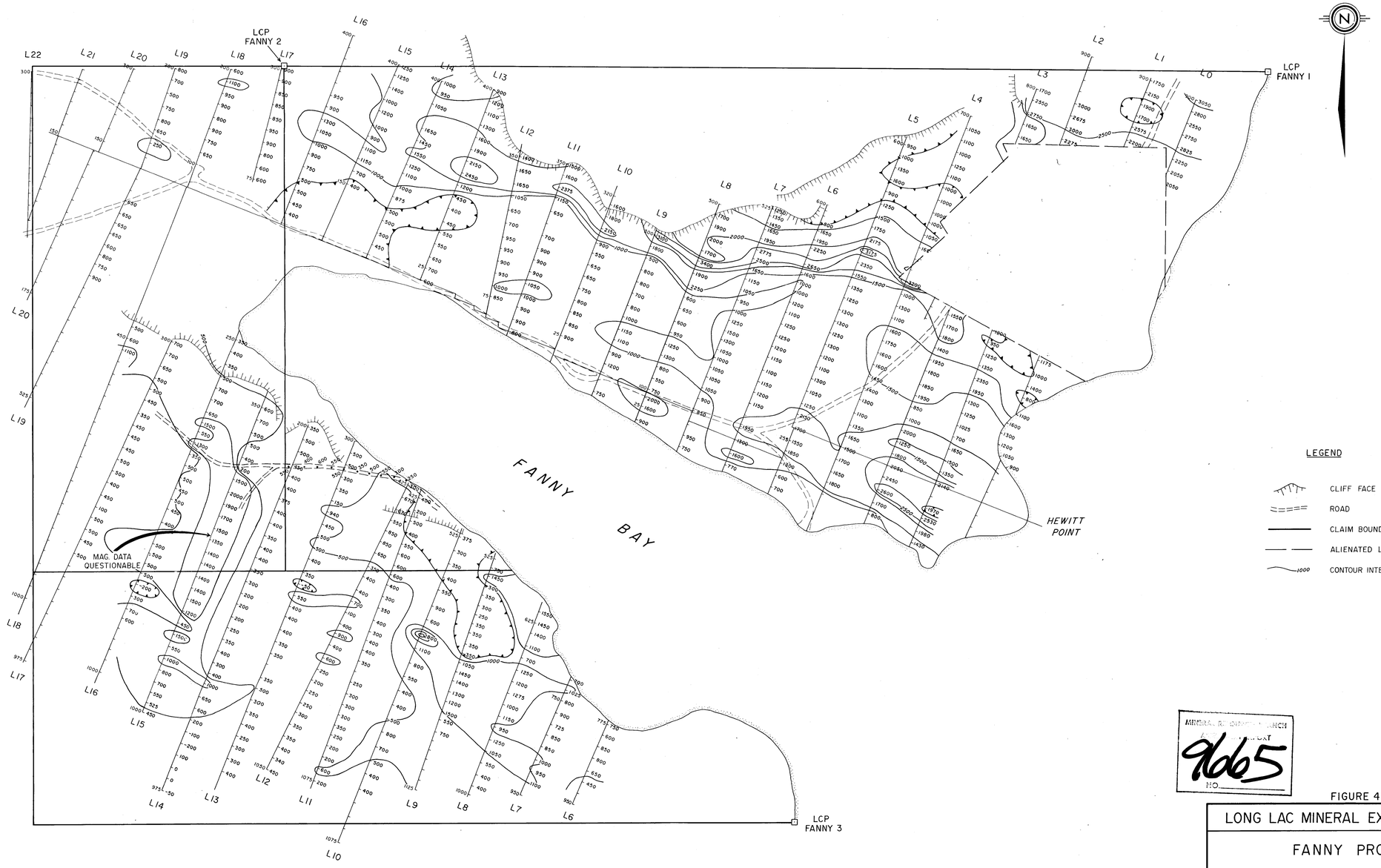
LONG LAC MINERAL EXPLORATION LTD.

FANNY PROJECT

SURFICIAL GEOLOGY

100 0 100 200 300
SCALE IN METRES

P.M.D.	SCALE: 1:4000~	DRAWN BY: ALTAIR	DATE: AUG. 1981



N

LEGEND

- CLIFF FACE
- ROAD
- CLAIM BOUNDARY
- ALIENATED LAND BOUNDARY
- 1000 CONTOUR INTERVAL 500 GAMMAS

MINERAL RESOURCES BRANCH
REPORT
9665
NO.

FIGURE 4

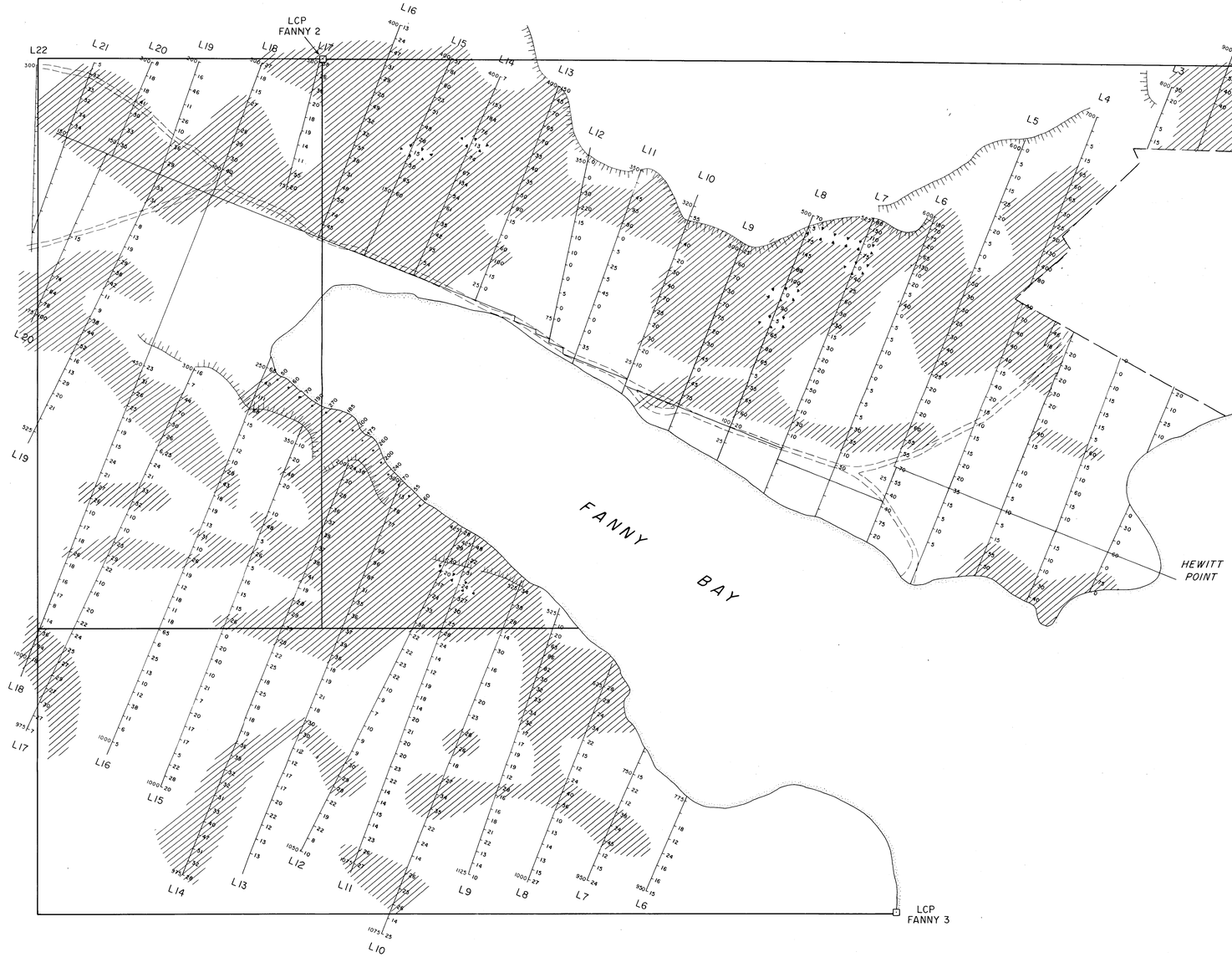
LONG LAC MINERAL EXPLORATION LTD.

FANNY PROJECT

MAGNETIC INTENSITY

100 0 100 200 300
SCALE IN METRES

	PLAN SCALE: 1:4000 ~	DRAWN BY: ALTAIR	DATE: AUG. 1981



N

LEGEND

- CLIFF FACE
- ROAD
- CLAIM BOUNDARY
- ALIENATED LAND BOUNDARY
- ANOMALOUS COPPER OUTLINE IN SOIL > 25 ppm

FIGURE 5

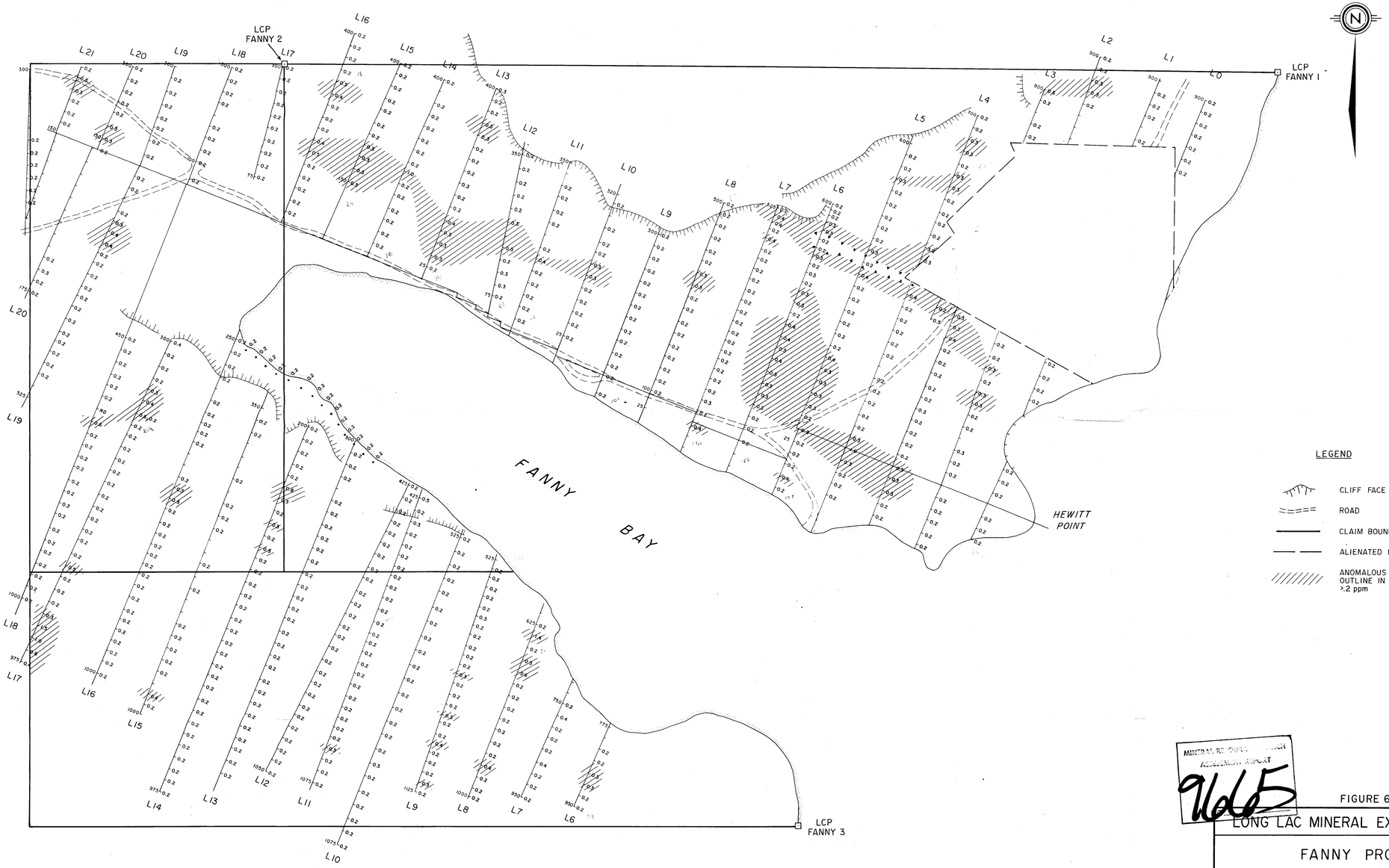
LONG LAC MINERAL EXPLORATION LTD.

FANNY PROJECT

COPPER (ppm)

100 0 100 200 300
SCALE IN METRES

	SCALE:	DRAWN BY:	DATE:
Ph.D	1:4000~	ALTAIR	AUG. 1981



LEGEND

- CLIFF FACE
- ROAD
- CLAIM BOUNDARY
- ALIENATED LAND BOUNDARY
- ANOMALOUS SILVER OUTLINE IN SOIL >.2 ppm

FIGURE 6

LONG LAC MINERAL EXPLORATION LTD.

FANNY PROJECT

SILVER (ppm)

100 0 100 200 300

SCALE IN METRES

SCALE:	DRAWN BY:	DATE:
1:4000~	ALTAIR	AUG. 1981

N

LEGEND

- CLIFF FACE
- ROAD
- CLAIM BOUNDARY
- ALIENATED LAND BOUNDARY
- ANOMALOUS MOLYBDENUM OUTLINE IN SOIL > 3 ppm

FIGURE 7

LONG LAC MINERAL EXPLORATION LTD.

FANNY PROJECT

MOLYBDENUM (ppm)

100 0 100 200 300
SCALE IN METRES

	SCALE:	DRAWN BY:	DATE:
Phil	1:4000~	ALTAIR	AUG. 1981