

92JW033
SANTA

-07
PROPERTY FILE

011780

123° 10'



SANTA PROPERTY BOUNDARY

INTRUSIVES

LIMIT OF GEOCHEMICAL AND INDUCED POLARIZATION SURVEYS DRILLING TARGET

Lake

SANTA NORTH

SANTA EAST

SANTA

50° 10'

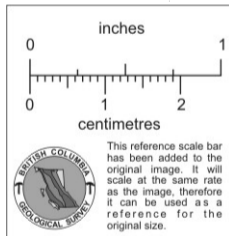
WESTSIDE ZONE

SANTA SOUTH

VOLCANICS

PENDANT

SANTA S.E.



LEGEND

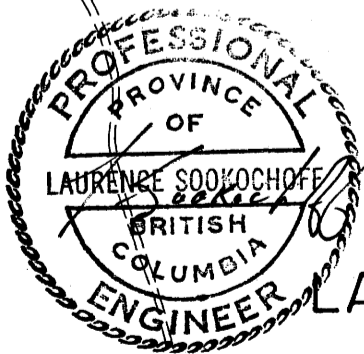
- ==== Existing road
- - - - Access Road
- Stream
- X Molybdenum anomalous zone
- //// Copper anomalous zone
- //// Zinc anomalous zone
- == Lead anomalous zone
- o Silver anomalous zone
- Area of soil sampling
- ~ ~ ~ Indicated structural trend

PROPERTY FILE

GEOLOGY

- - - Contact
- Upper Tertiary to Recent. Diacite, andesite, and basalt breccias, tuffs & flows
- Upper Triassic to Lower Cretaceous Metavolcanic rocks
- Granodiorite
- Stream Sediment Anomalous areas of Silver, Copper, Lead & Zinc (Assays not sampled for Gold)

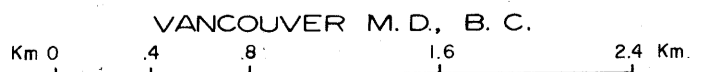
NORTH AIR MINES
- IN PRODUCTION -

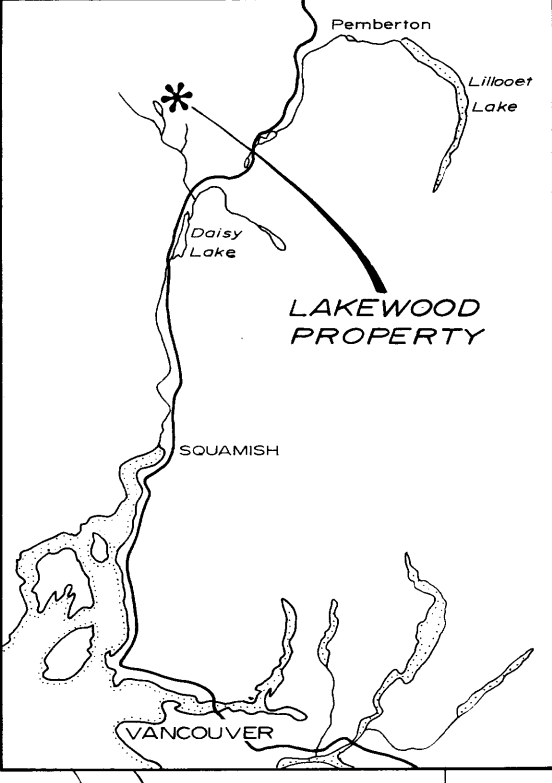
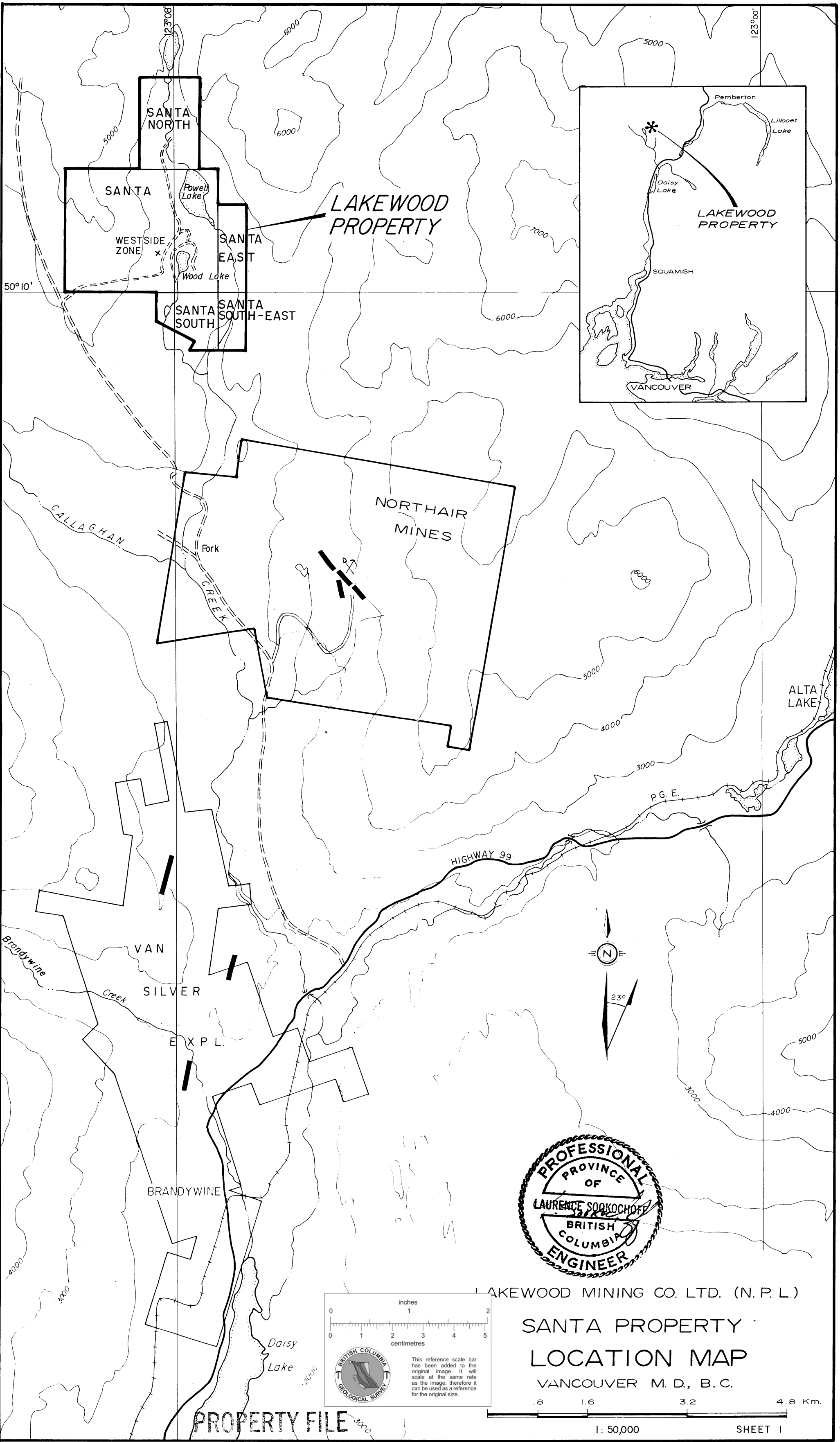


LEAD, ZINC,
GOLD, SILVER

LAKWOOD MINING CO.
LTD. (N.P.L.)

SANTA PROPERTY
STREAM SEDIMENT ANOMALIES

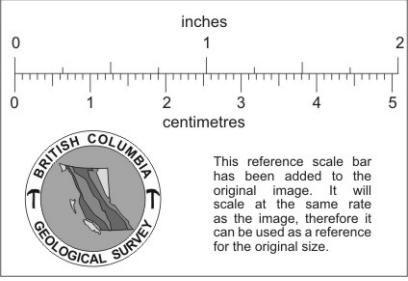




LAKEWOOD MINING CO. LTD. (N.P.L.)

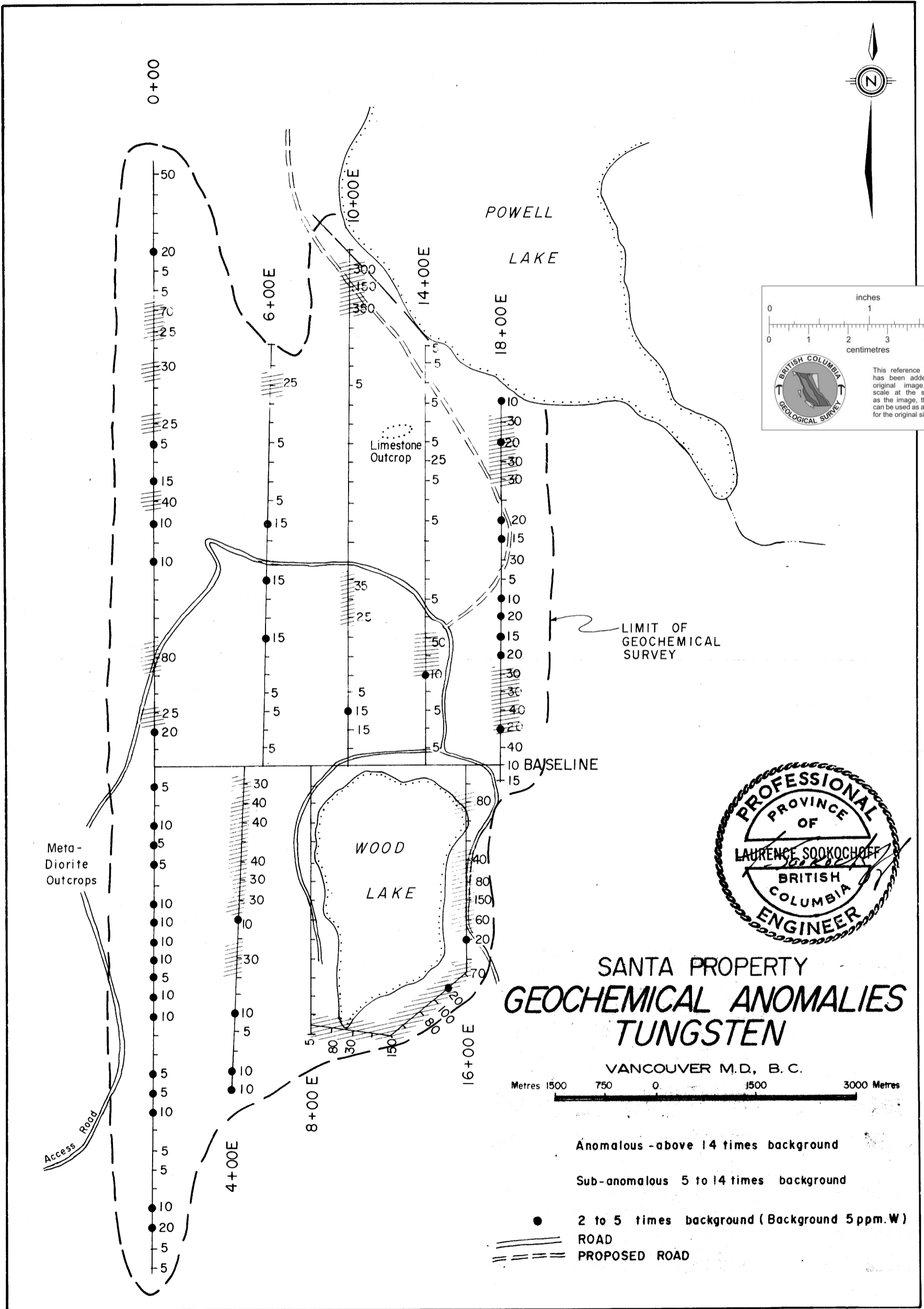
**SANTA PROPERTY
LOCATION MAP**

VANCOUVER M. D., B. C.



1: 50,000 SHEET 1

PROPERTY FILE



PROPERTY FILE

Open file

Geological Report
on the
SANTA PROPERTY
for
LAKEWOOD MINING CO. LTD. (N.P.L.)
Vancouver M.D. 92J 3E

DEPT. OF MINES AND PETROLEUM RESOURCES		
Rec'd MAR 01 1979		
<i>TC</i>		

PROPERTY FILE

October 16, 1978
Vancouver, B.C.

L. Sookochoff, P.Eng.
Consulting Geologist

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Geological Report

on the

SANTA PROPERTY

Part A

SUMMARY AND CONCLUSIONS

The Santa property of Lakewood Mining Co. Ltd. consists of 35 units situated 100 kilometers north of Vancouver and within three kilometers northwest of the Northair property.

Access has been provided by a recently constructed 6.5 kilometer road.

Portions of the claim area were formerly stream and soil sampled in 1973 resulting in scattered and localized copper, lead and zinc anomalies. Follow-up exploration by Lakewood Mining revealed the presence of significant tungsten anomalies of up to 60 times background or 350 ppm W. in the Wood Lake - Powell Lake area.

The property is underlain mainly by a pendant of metavolcanic and metasedimentary rocks containing northwesterly, northerly and northeasterly trending fault zones.

Three and a half kilometers to the southeast on Northair's Callaghan Creek property and within the same pendant, three mineralized ore zones occur in a northwesterly structure.

Preliminary trenching on the property revealed near surface stocks and dykes of metadioritic rocks in various stages of alteration. Abundant transitional zones of hydrothermal alteration within metadiorites and pyritic chlorite-sericite zones are indications of potential mineral zones.

Two drill holes on the Westwood zone intersected metadiorite which contained light to heavy disseminations of pyrite throughout in addition to occasional disseminations of chalcopyrite. A three foot section of D.D.H. 2 assayed .39% Cu., .11% Pb, .42 oz Ag/ton and .017 oz Au/ton.

In addition to the anomalous tungsten geochemical values, anomalous nickel values were also found to occur on the property.

Limited exploration on the Santa claims to date has indicated that the property merits a continuing exploration program. Work to date revealed that the potential of the property exists in:

1. Porphyry coppers mineralization as indicated from the results of assays from drill holes on the Westwood zone.
2. Contact metamorphic mineralized zones containing tungsten - as indicated by the general geology of the area (limestone and diorite intrusives) as well as the localized high tungsten soil anomalies.
3. Widespread tungsten mineralization (possibly within a younger intrusive) as indicated by the continuous anomalous areas around Wood Lake and along the east edge of the survey area to Powell Lake.
4. Possible zones of massive sulphides (volcanogenic?) as reflected by the geochemical and geophysical surveys on the westside zone, 250 meters west of Wood Lake.

RECOMMENDATIONS

It is recommended that a two stage exploration program, of initially percussion drilling followed by an I.P. Survey, a geochemical survey and diamond drilling be conducted on the Santa Property.

It is also recommended that Lakewood Mining Co. Ltd. allocate the sum of \$71,500 for the completion of the recommended program.

Respectfully Submitted



Laurence Sookochoff, P.Eng.
Consulting Geologist

October 16, 1978
Vancouver, B.C.

Geological Report

on the

SANTA PROPERTY

Part B

INTRODUCTION

At the request of C. Boitard of Lakewood mining Co. Ltd., the writer prepared this report on the results of work completed during the 1977 exploration season. A geological examination of the property was also carried out on the property on September 29 and 30, 1977.

Additional pertinent information was obtained from government and other public publications.

PROPERTY

The Santa property is comprised of four contiguous claim blocks totaling 35 units. Data on the claims is as follows:

<u>Claim Name</u>	<u>Units</u>	<u>Record No.</u>	<u>Expiry Date</u>
Santa	20	64 (12)	December 22, 1979
Santa North	6	76 (3)	March 22, 1980
Santa East	3	77 (3)	March 22, 1980
Santa Southeast	2	75 (3)	March 22, 1980
Santa South	4	78 (3)	March 22, 1980

LOCATION, ACCESS AND TOPOGRAPHY

The property is situated 100 kilometers north of Vancouver between Callaghan Creek and the Soo River. The Northair property which is in production is within three kilometers to the southeast.

Access is via a newly constructed 6.5 kilometer road intersecting a secondary road thirteen kilometers from Highway 99 and three kilometers north of Daisy Lake.

The topography is of gentle slopes and steep bluffs with elevations up to 1,700 meters a.m.s.l. Local relief is 700 meters.

WATER AND POWER

Water for all phases of the exploration and development program would be available from lakes and streams within the confines of the property.

Diesel-electric power would be required for the initial phases of the exploration program.

HISTORY OF THE AREA

From the original discovery of the Brittania ore deposits in 1888 (48 kilometers north of Vancouver) and subsequent exploration and production from 1902, the general area has been intensively explored for similar economic ore zones which may be contained within pendant rocks of the Coast Range Intrusives and structurally controlled by large scale fault or shear zones. Many small high grade, or larger low grade prospects have since been discovered, however only one mine, which has recently come into production, has resulted.

The Northair Mines property has reported production of 300 tons per day. The ore zone is three kilometers southeast of the Santa southern boundary. The Cheakamus property of Van Silver Exploration Ltd. located 6.5 kilometers south of Northair Mines is being re-examined by Cominco Ltd.

PROPERTY HISTORY

The Santa claims cover an area formerly known as the FASS claim group on which, in 1973, the Caltor Syndicate had carried out a preliminary stream and soil sampling program. The sampling of the drainage system indicated sporadic anomalous zones with more consistent correlative anomalies on the present Santa North claim. The localized area covered by the soil geochemical survey did not reveal any significant anomalies although the southern and eastern portion of the grid indicated an increasing mineral content. A general northeasterly and northwesterly structural trend is reflected by possible mineralized shear zones.

Upon the staking of the Santa claims in 1976 the stream and soil samples were analyzed for the molybdenum content. The stream samples indicated an anomalous zone along the centre of the Santa North claim (11-70 ppm in a background of 3 ppm) as well as an anomalous zone below the southern lake on the Santa claim (21-25 ppm). The samples taken from the grid between the lakes on the Santa claim revealed only sporadic anomalous samples with the highest 15 ppm in a background of 2 ppm.

A recently completed I.P. survey over a localized area of the West side zone disclosed an anomalous area. Dave Mark, geophysicist states that as the survey was only over a limited area, the results were difficult to interpret, however a 10% frequency effect was considered anomalous. Two significant anomalous zones, one of which was a localized 50% frequency effect with a correlative resistivity low and anomalous silver geochem, were located. The second anomalous zone consisted of three spot I.P. highs of 50% frequency effect over three adjacent grid lines. There is good correlation between the silver, lead, zinc and copper soil results and the I.P. anomalies.

REGIONAL GEOLOGY

The property lies in an area underlain mainly by plutonic rocks of the Coast Crystalline Complex. Gneiss, migmatite and regionally metamorphosed sedimentary and volcanic rocks form discontinuous northwest trending belts. Pendants of metavolcanic and metasedimentary strata, generally elongated northerly to northwesterly and of variable size are enveloped by the plutonic and migmatitic rocks.

Schistosity in the pendants is usually parallel or subparallel with contacts which may be expressed as shear zones or faults. Narrow northwest trending zones of deformation with intervening areas of well preserved original texture appears to be prevalent.

The three mineralized zones on Northair's property occur within a roof pendant of Lower Cretaceous metavolcanic rocks. The orebodies lie in a steeply-dipping vein-type structure varying from one to over five meters wide and with a known lateral extent of 1,300 meters. Vertical extension is in the order of 160 meters.

PROPERTY GEOLOGY

The Santa claims predominantly cover a northwesterly elongated pendant of metavolcanics (greenstone) with minor metasediments. The greenstone is in contact with a granodioritic phase of the Coast Intrusives a mile to the northeast. A northwesterly trending contact with recent volcanics passes through the southwest corner of the property.

In a 1973 report on the area now covered by the Santa claims the following is noted: a dark dioritic rock containing erratic pyrite occurs over much of the west soil grid area, with some outcrops of intermediate volcanics on the southern part of the grid; to the east of the grid north trending cliffs are composed of fine-grained cross bedded sedimentary rocks; in the southern part, the rocks are largely intermediate volcanics containing abundant pyrite and epidote.

In the Wood Lake area are outcrops metavolcanics along with dioritic intrusives altered to variable degrees.

The general area appears to have been subjected to intense structural deformation as evident from the many occurrences of fault zones as interpreted on the ground and from air photos. This, in addition to the variable intrusives and sediments resulted in differential structural and hydrothermal metamorphism.

Diorites range locally from unaltered hypidiomorphic granular as in the southwood area to gneissic or schistose as in the eastwood area. Superimposed alteration is also

variable and ranges from propylitic to a light degree of phyllic (westwood).

The metavolcanic and metasediment pendant in the Wood Lake area is intruded by diorites resulting in alternating degrees of contact metamorphism. Hydrothermal metamorphism is also present as indicated by occasional occurrences of chalcopyrite.

A feldspar porphyry outcrops along the west side of Wood Lake. The porphyry contains subhedral to euhedral feldspar crystals within a dark green chloritic matrix. Pyrite disseminations are common throughout the matrix.

The relationship of the porphyry to the intrusives or sediments is undetermined at this time.

Outcrops of crystalline limestone occur 500 meters north of the north end of Wood Lake. Pyrite and grossularite garnets in addition to tremolite are associated with the limestone.

One hundred meters southwest of the limestone are outcrops of pyritized meta-andesite in contact with an altered diorite also pyritized.

Pyrite is ubiquitous in variable degrees with no preference for rock type although pyrite does occur to a greater degree within chlorite-sericite schists.

Other significant alteration or indicator minerals are epidote, quartz veinlets and silicification, chlorite bands and veinlets, bleached zones and pink feldspar. However, from the information available to date, a specific alteration pattern was not established.

WORK COMPLETED AND RESULTS OF THE 1977 EXPLORATION PROGRAM

During the 1977 exploration season, Lakewood Mining constructed 6.5 kilometers of access road to Wood Lake. The road originated at the secondary road paralleling Callaghan Creek on the east. A base camp was established at Wood Lake.

Three diamond drill holes were drilled in the Wood Lake Area. Particulars are as follows:

<u>D.D.H.</u>	<u>Location</u>	<u>Depth</u>
1.	Westwood	'365 feet'
2.	Eastwood	'120 feet'
3.	Westwood	'149 feet'

D.D.H. 1 intersected a diorite to 234 feet which was moderately to heavily altered with moderate pyrite throughout. Occasional chalcopyrite disseminations also were present throughout. From 234 to 365 feet an admixture of metadiorite and porphyry with light to moderate disseminations was intersected.

D.D.H. 2 on the Eastwood zone consisted essentially of a diorite gneiss with only light alteration.

D.D.H. 3 on the Westwood zone was within essentially a diorite, however, general alteration and associated pyrite of a greater degree in addition to localized sections of copper-lead mineralization were evident.

Results of assays from sections of D.D.H. # 2 were as follows:

<u>Drill Hole No.</u>	<u>Section</u> <u>'footage'</u>	<u>Length</u> <u>'feet'</u>	<u>Assay</u>			
			<u>% Cu</u>	<u>% Pb</u>	<u>oz Ag/ton</u>	<u>oz Au/ton</u>
D.D. 2	43.6-45	1.4'	.06		.10	.003
	78.5-80.5	2.0'	.46	.10	.48	.016
	80.5-81.5	1.0'	.26	.14	.32	.018

MINERALIZATION

In addition to pyrite which is found throughout the area, mineralization consists of: chalcopyrite occurring as disseminations and blebs in association with pyrite in meta-iorites and metasediments; galena occurring in a quartz vein at the Westwood showing and also occurring in association with pyrite and chalcopyrite in D.D.H. # 3 at the Westwood showing; scheelite occurring rarely as blebs within quartz and quartz-carbonate veinlets.

Anomalous values of nickel and tungsten occur throughout the property however the source of the values was not determined from the exploration on the property to date. Some of the more significant nickel values in the soil occur in the area of the Roadside showing (580 ppm N.), North Swamp area (420 ppm N.) and Westwood showing (650 ppm N.)

On an established background of five ppm. tungsten, a number of geochemical anomalies were located on the property. The more significant anomalies are along the west and south of Wood Lake where values of up to 150 ppm. W. occur in addition to an area along the southwest shore of Powell Lake where three contiguous values ranging from 150 to 350 ppm. W. occur.

In the recently completed surveys on the West side area, two anomalous, generally correlative lead, zinc, silver and copper soil geochem zones were outlined.

RECOMMENDED EXPLORATION AND DEVELOPMENT PROGRAM

It is recommended that the exploration program on the Santa property be conducted in two stages.

The initial stage would be designed to test the prime anomalous zones as determined by the 1978 exploration program. 650 meters of percussion drilling should be sufficient to delineate prime targets for follow-up exploration.

The second stage would be comprised of: a diamond drill program to test specific target areas, as determined by the percussion drill program, for geology and depth extension of mineralization; an I.P. survey and a geochemical survey to determine the possibility of extensions to the known anomalous zones.

ESTIMATED COST OF RECOMMENDED EXPLORATION PROGRAMStage I

Percussion drilling 650 meters @ \$18	\$11,700.00 ✓
Road work and drill site preparation - allow	3,000.00 ✓
Assaying and field expenses	3,800.00 ✓
Engineering and supervision	4,000.00 ✓
Stage I Total	<u>\$22,500.00</u>

Stage II

Diamond drilling - 800 meters @ \$60	24,000.00 ✓
Associated support costs	4,000.00 ✓
Line cutting - grid 15 km @ \$200	3,000.00 ✓
I.P. Survey - 15 km @ \$600	9,000.00 ✓
Geochemical survey - 15 km	3,000.00 ✓
Engineering, supervision and reports	6,000.00 ✓
Stage II Total	<u>\$49,000.00</u>

It is estimated that Stage I of the exploration program would take one month to complete.

Respectfully submitted



Laurence Sookchoff, P.Eng.
Consulting Geologist

October 16, 1978
Vancouver, B.C.

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- Roddick, J.A. Vancouver North, Coquitlam and Pitt Lake Map-Area, British Columbia, Memoir 335, Geological Survey of Canada, 1965.
- Woodcock, J.R. Geochemical Report on the Fass Mineral Claims, October 4, 1973.
- James, H.T. Brittania Beach Map-Area, B.C. Memoir 158, 1929.
- Canadian Mining Journal, March 1977 p.p. 47-53.

CERTIFICATE

I, Laurence Sookochoff, of the City of Vancouver, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geologist with Pan-American Consultants Ltd. of 2602 - 1055 West Georgia Street, Vancouver, B.C.

I further certify that:

1. I am a graduate of the University of British Columbia (1966) and hold a B.Sc. degree in Geology.
2. I have been practising my profession for the past twelve years.
3. I am registered with the Association of Professional Engineers of British Columbia.
4. The information for the accompanying report is based on a personal examination of the Santa property on September 29 and 30, 1977 and from published materials as cited under references.
5. Neither I nor Pan-American has direct or indirect interest in the property described herein, or in the securities of Lakewood Mining Co. Ltd. or any of its affiliates.

October 16, 1978
Vancouver, B.C.

Laurence Sookochoff, P.Eng.
Consulting Geologist

