BUVAL MINES LTD.

LAKEVIEW PROPERTY

93-L-7/10. Omineca MD, B. C.

APPRAISAL OF GEOCHEMICAL,

GEOPHYSICAL FIELDWORK

Oct. 68 - Nov. 69

REPORT PREPARED BY: N.R. LOW, B.A.Sc

CONSULTANTS: P.H. SEVENSMA, Ph.D., P. Eng.

Dolmage Campbell & Associated, Ltd.

Nov. 10, 1969

Revised: Jan 12, 1970

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Department of

Mines and Petroleum Resources

ASSESSMENT REPORT

NO 2145 MAP

LAKEVIEW CLAIMS, 93-L-7, E/2 HOUSTON, OMINECA M.D., B.C. OCT. 1968 to NOV. 1969

Introduction:

The purpose of this report is to provide a resume of activities and an assessment of results of work performed on approximately 212 claims in the Lakeview Group namely LV-1 to 197 inclusive; LV Fraction 1, and 4 to 11 inclusive; Lakeview and Lakeview 1 to 5 inclusive. Assessment work for one year was filed Sept 25, 1969 to cover claim numbers LV-1 to 12, 16, 18 to 32, 35, 37 to 56, 58 to 68, 75 to 84, 105 to 126, 128, 130, 132, 134 to 144, a total of 107 claims.

Location and Access:

The property consists of 212 claims centering about 5 miles north of Houston, B. C. (54° 29'N; 126° 36' 30'W) in the Omenica Mining District. Access is by four wheel drive truck over a 5-6 mile dirteroad which joins highway 16, 5 miles east of Houston.

Summary:

This property was optioned by Buval Mines in the Summer of 1968.

During the Fall of 1968 a program of geochem and geophysics was carried out by Manex Mining, Smithers, B. C., under the direction of Mike Beley, Geologist. Work was discontinued during the Winter and resumed in the Summer and the Fall of 1969 by Buval Mines Ltd. under the direction of N. R. Low, Mining Manager for Buval, and Matt Bell, Buval's Geologist. The engineering consultant for this project

to Nov./69 was Dr. P. H. Sevensma, P. Eng., 715-850 W. Hastings St., Vancouver, B. C. Further appraisals of the property and recommended 1970 program were prepared by Douglas D. Campbell, P. Eng., PhD., and J. A. Chamberlain, P. Eng., PhD., both of Dolmage Campbell & Associates Ltd., Vancouver, B. C.

Geochemical Surveys:

A total of 10 silt and 104 soil samples were taken by M. J. Beley, Geologist, in October and December, 1968. All samples were shipped to Vancouver Geochemical Laboratories Ltd. of North Vancouver where they were dried, extracted by using hot HNO₃ and HClO₄, and analyzed by the Atomic Absorption Spectrometers Techtron AA4 and AA5.

0.5 grams of the 80 mesh fraction were used. Soil sample locations are plotted on enclosed map LV-4.

The following tabulation lists expenses incurred for the above work.

(a) Labour

Na	<u>ne</u>	!	Days \	<u>Morked</u>		<u>Wages</u>	Total Paid
М.	J. Beley	2	days	0ct/68	:	\$75./day	\$150.
D.	Beley	2	days	0ct/68		25./day	50.
G.	Graham	3	days	0ct/68		23./day	69.
Р.	Huber	3	days	0ct/68		23./day	69.
В.	Dockrill	1	day	0ct/68		23./day	23.
В.	Raymond	2	days	0ct/68		23./day	46.

Total Labour

\$407.00

(b) Other Direct Costs

Field and camp costs \$300.

Geochem analysis 200.

Travel 250.

Misc. <u>27.</u>

Total Other Direct Costs \$777.00

Total costs to December 31, 1968 on Geochemical Work

(not including consulting fees)

\$1,184.00

In 1969, to November 10th., approximately 2400 soil samples were collected on all claim lines and in anomalous areas. Where possible all soil samples were taken in the "B" horizon using a grub-hoe. About half the samples were tested in the field by Matt Bell, Geologist, using the Jens Morgensen field kit, with a pre-prepared total heavy metal buffer, geosal, as a solvent and dithizone as an indicator. In areas where field testing produced anomalous results detailed grids were set up and samples taken at 100 foot intervals. These samples were first dried in the field in standard paper soil sampling bags and shipped to Vancouver Geochemical Laboratories in North Vancouver. Any samples that contained organic material were noted. Samples of 0.5 grams were selved in 80 mesh, extracted by using hot HNO2 and HCLO, and analyzed by the Atomic Absorption Spectrometers Techtron AA4 and AA5. A total of 1200 samples were tested by Vancouver Geochemical Laboratories Ltd. Soil sample locations are shown on attached drawing LV-12. Detailed geochem anomalous information is shown on drawings LV-16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26,230, 31, 32, 33, 34 and 35. Costs incurred are as follows:

(a) Labour (geochem)

Name	Name Days Worked		Total Paid		
M. Bell	4-1/2mth-6/18-10/30	\$1,100./mth	* \$2,475.		
H. Prescott	4-1/2mth-6/18-10/30	650./mth	* 1,465.		
L. Lord	1/2mth-8/14- 8/31	600./mth	300.		
G. Nigel	1 mth-6/29- 7/30	550./mth	550.		
C. Smith	1 mth-6/29- 7/30	550./mth	550.		
M. Beley	2 days	75./day	150.		
Total Labour (*only 50% of labour for geochem)			\$5,490.00		
(b) Other Di	(b) Other Direct Costs (geochem)				
Field and cam	p costs		4,360.00		
Geochem analy	sis		2,220.00		
Travel			1,681.00		
Misc.			121.00		
Total Other Direct Costs (geochem)			\$ 8,261.00		
Geochemical Total Costs (\$5,490. + \$8,261.)			\$16,240.00		

Geophysical Surveys:

In October 1968, M. J. Beley, Geologist of Manex Mining, made a magnetometer survey covering the main showings, using an MF-1 magnetometer. Profiles of this survey are shown on Dwg. LV-14.

The The survey was continued in the Fall of 1969 by M. Bell, Geologist, using an MF-1 magnetmeter and Sharpe SE 300. Both high and low frequency tilt angles were recorded from the SE 300 survey. Interpretation of EM results was done by Mr. Dick Crosby of Siegel Associates Ltd., Vancouver. (See Dwg. LV-28).

For details on Geophysical work see attached drawings LV-14, 15, 27, and 28.

Costs for the geophysical work are:

(a) Labour

Name	Days Worked	<u>Vages</u>	Total Paid	
M. J. Beley	3 days-Oct./68	\$75./day	\$ 225.	
G. Graham	3 days-Oct./68	23./day	69.	
P. Huber	1 day	23./day	23.	
B. Raymond	2 days	23./day	46.	
M. Bell	June 18-Sept. 30/69	1,100./mth	2,475.	
H. Prescott	June 18-Sept. 30/69	650./mth	1,460.	
Total La (*only 5	bour 0% of labour for geo	physics)	\$4,298	.00
(b) Other D	irect Costs			

Field and camp cost	\$1,892.
Travel	992.
Misc.	96.

2,980.00 Total Other Direct Costs (geophysics) Geophysics Total cost, (not including consulting fees) \$7,278.00

Summary of Expenditures:

Geochemical	\$16,240.
Geophys I cal	7,278.
Consulting (P. H. Sevensma, BhD)	1,587.
Total Expenditures	\$25,105.

Not included in above expenses are consulting fees by Dolmage Campbell and Associates Ltd.

A current claim map is enclosed, drawing LV-29.

Respectfully submitted,
N.R. Low, B.A.Sc., Buval Mines Ltd.

APPENDIX



MANEX MINING LTD. (N.P.L.)

SUITE-200-535-THURLOW-STREET, VANCOUVER-5, B.C. • 681-4411 20th Floor, 1055 West Hastings Street, Vancouver 1, B.C.

December 24th, 1969.

Mr. R. Low,
Buval Executive Mining
Industries Ltd.,
812 - 1177 West Hastings,
VANCOUVER 1, B.C.

Dear Mr. Low,

The following letter is a brief resume of my qualifications as they pertain to the geochemical and geophysical surveys which I carried out on the Lakeview project during 1968. I was also project geologist in charge of the diamond drilling program on Buval Mines Ltd. (N.P.L.)'s Seymour Lake project.

I am a graduate of the University of British Columbia (1965) with a major in geology and physics. I have nine years of experience in mining exploration in British Columbia; and have been active in all aspects of exploration, including drilling, blasting, surveying, geochemical surveys, geological surveys, geophysical surveys (magnetometer, induced polarization and electromagnetic), diamond drilling, mining of in-situ jade and supervision of exploration programmes.

In 1967 I joined the contract management firm of Manex Mining Ltd. (N.P.L.) as Manager to provide exploration services for mining companies working in the Smithers area. During the past three years I have personally managed field programmes and supervised the management of others.

Yours truly,

MANEX MINING LTD. (N.P.L.)

M.J. BELEY, B.Sc.

MJB.nh

I, Manton S. Bell, of Vancouver, B.C. do hereby certify that I am a graduate of Dalhousie University, Halifax, Nova Scotia, with a degree of Bachelor of Science (1962), major in geology.

I have practised my profession continuously since graduation, and until coming to Buval Mines Ltd. in 1969 have worked with Irish Base Metals in Ireland, Cassiar Asbestos Corporation Ltd. in Canada, and Conwest Exploration Ltd. in Canada and Australia. In 1963 with Tara Explorations Ltd. (exploration arm for Irish Base Metals) doing prospecting and soil sampling. In the summer and fall of 1965 with Cassiar Asbestos Corporation Ltd. at the Clinton Ck. Project as assistant geologist doing core logging, magnetic survey, and geological mapping.

In the winter and spring of 1966 I was doing property examinations for Conwest (Australia) N.L. in Queensland, and in the summer and fall of that year with Cassiar Asbestos Corporation Ltd. as Party Chief on their Kutcho Ck. Project where I was supervisor of the drilling and trenching program, and did some mapping and magnetic surveying.

Late in 1966 I was back with Conwest (AUSTRALIA) N.L. supervising a drill program in Victoria and later out to Western Australia to examine asbestos showings in the Pilbara region. In the summer of 1967 I was back in Canada prospecting in the Yukon, and mapping and staking on the Kutcho Ck. Project as Party Chief.

Early in 1968 I returned to Australia with Conwest (Australia) N.L. to do exploration for nickel in the Kalgoolie area in Western

Australia. Here I supervised auger drilling programs, induced polarization surveys, soil sampling programs, and did magnetic surveys and geological mapping myself. In the summer of 1968 I returned to Canada with Conwest Exploration Ltd. During the summer I spent one month in the Blind River area where I re-logged several drill holes, and did some mapping and structural interpretation on the uranium showing. After that I went up to the Coppermine River area to be assistant geologist on the East Coppermine River property. Here I did prospecting, mapping, magnetic survey, core-logging and generally assisted in the running of the camp.

The remainder of 1968 and the early part of 1969 was spent in Toronto with trips to New Brunswick and Quebec.

DOLMAGE, CAMPBELL & ASSOCIATES

CONSULTING GEOLOGICAL & MINING ENGINEERS

1000 GUINNESS TOWER

VANCOUVER 1, B.C.

Buval Executive Mining Industries Ltd.

LAKEVIEW CLAIM GROUP
Houston, B.C.

January 12, 1970.

Douglas D. Campbell J.A. Chamberlain

Consultants

Vancouver, Canada.

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DOLMAGE, CAMPBELL & ASSOCIATES

CONSULTING GEOLOGICAL & MINING ENGINEERS
1000 GUINNESS TOWER
VANCOUVER I. B.C.

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INTRODUCTION

On December 18th, 1969, the writers were requested by Mr. Ray Low, Managing Director of Buval Executive Mining Industries Ltd., to carry out an examination of the Lakeview Claim Group, located in the Houston area, B.C., and to submit recommendations for a 1970 work program. The company turned over to the writers geological records and reports on the property, including the following:

- 1. Examination Report Lakeview Group 93L-7, E/2, by P.H. Sevensma, Ph.D., P.Eng., October 9, 1968.
- 2. 1969 Recommended Program, by P.H. Sevensma, Ph.D., P.Eng., May 28th, 1969.
- 3. Appraisal of 1969 Field Work, Lakeview Property 93-L-7/10, by P.H. Sevensma, Ph.D. P.Eng., November 10th, 1969.
- 4. Lakeview Group, by N.R. Low, August, 1959.
- 5. Harvest Queen Mining Co. report by A.D. Tidebury, 1955.
- 6. Magnetometer, E.M. and Geochemical maps of the property.
- 7. Miscellaneous claim and location maps.

One of the writers (J.A. Chamberlain) visited the property on January 9th, 1970, in the company of Buval's geologist, Matt Bell. In addition, the writers are familiar with the geology of the area and have drawn on this knowledge in making the present assessment. They have also made use of all pertinent published information on the area.

LOCATION AND ACCESS:

The property presently consists of approximately 200 mineral claims centering on Wilson Lake (54°29'N; 126° 36'30"W). Access is by a 5-mile truck road trending westward from Knockholt on the C.N. line in the Bulkley River valley, or from the Summit Lake road which joins Highway 16 at the Houston bend. (Figures 1, 2).

CLAIM STATUS:

The legal status of the Lakeview claims was not investigated during the preparation of this report but it was accepted by the writers that the claims are all in good standing as stated by the owners.

DOLMAGE, CAMPBELL & ASSOCIATES

CONSULTING GEOLOGICAL & MINING ENGINEERS
1000 GUINNESS TOWER
VANCOUVER I.B.C.

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SUMMARY

The Lakeview property consists of approximately 200 mineral claims located seven miles north of Houston in the Omineca Mining District, B.C. The claims are underlain principally by acid volcanic rocks of Mesozoic age. Large areas of the property are covered by overburden.

The main area of interest is a zone of mineralization west of Wilson Lake. This zone has been explored underground to a depth of at least 50 feet by early workers and consists of a series of north-trending chalcopyrite-bearing fractures which occur within an envelope of hematitized and epidotized wallrocks. One drill hole put down by the Harvest Queen Mining Company in 1955 intersected 4.5 feet (true width) of material grading 7.7 percent copper and 5 ounces of silver per ton at a vertical depth of 100 feet. Two other holes reportedly did not reach the ore zone.

Buyal Exec. Ltd. has carried out geochemical and magnetometer surveys over a large part of the claim group as well as an E.M. survey over the main showings. Assessment of this data indicates that the known mineralized zone should be tested by diamond drilling and that buildozer stripping should be carried out on two clearly—defined copper anomalies elsewhere on the property. In addition, limited follow-up geochemical surveys should be undertaken in two other possibly anomalous areas.

The total cost of the recommended work, a large part of which is contingent upon early results, is estimated at \$187,750.00 (see Conclusions). The cost of the first phase is estimated at \$27,750.00.

A significant tonnage of copper-silver ore has been indicated by the surface trenching and limited drilling done to date but no real value can be placed on this possible ore until it is confirmed by further work.

HISTORY

According to the records of the B.C. Minister of Mines for 1926, the Lakeview claims were originally known as the Three Lakes claim group. This group was staked and was owned since about 1910 by the Wilson Brothers of Telkwa, B.C.

In 1917 and 1918 the Tonapah Mining Company carried out surface stripping and sank three shallow shafts on the property. The workings were dewatered and sampled by Cominco Ltd. in 1929. In 1955 three holes were drilled by the Harvest Queen Mining Co., and fairly extensive bulldozer stripping was carried out by various companies including Copper Ridge Silver Zinc Mines Ltd. and Plateau Metals Ltd.

The property was taken over by Buval Mines Ltd. in 1968 and that company carried out magnetometer, E.M. and geochemical surveys. Most of the old work on the property centered around Lakeview Claims 1-5, inclusive, west of Wilson Lake. The present Lakeview claim group surrounds the original property and consists of an irregularly shaped block of some 200 located mineral claims. Buval Mines Ltd. changed its name to Buval Executive Mining Industries Ltd. in October, 1969.

GEOLOGICAL SETTING

REGIONAL:

The region is underlain principally by a thick succession of volcanic and sedimentary rocks of Mesozoic age. The sediments, which are moderately to isoclinally folded, consist of greywacke, silistone, mudstone, sandstone and conglomerate. The volcanic rocks range in composition from basalts through andesites to rhyolites, and include a variety of tuffaceous and flow breccia beds.

In places, these rocks have been intruded by stock-like bodies of quartz monzonite. The stocks are commonly a mile or so in diameter, and rudely circular in plan. The region south of Topley is underlain by gently dipping andesitic to basaltic volcanics generally thought to be of Tertiary age.

PROPERTY:

The rocks exposed on the upper part of the Lakeview claim group, west of Wilson Lake, are mainly acid volcanics and tuffs. These flows are underlain by quartzites and other stratified rocks which are intermittently exposed at lower elevations on the same hillside. An early report by an unknown author states that "Some evidence exists which indicates that, in sections along strike at least, other minor beds of basic greenstone exist. These seem to be intensely metamorphosed, and contain much epidote."

P.H. Sevensma (Reference #1, Introduction) summarized the geology of the Lakeview property as follows:

"The claims are underlain by volcanics of the Hazelton type. The Lakeview hill is a triangular shaped dome between a number of pronounced lineaments running WNW, ENE, NE and NNW. The heavy timber cover of the immediate area has precluded detailed mapping and it is not known whether any intrusives occur on or near the property."

Mapping of the main mineralized zone by Buval Exec. Ltd. geologist Mr. Matt Bell indicates that the principal rocks here are acid tuffs and rhyolites which have been moderately to intensely hematitized and epidotized. They are locally cut by a system of northwest-trending vertical dykes. The dykes are basic in composition and average about five feet in width. Surface weathering has created a fairly extensive gassan zone in which the primary sulphides can be found as sparse relicts. (See subsequent section on Sulphide Occurrences.)

ECONOMIC GEOLOGY

STRUCTURE:

P.H. Sevensma in a brief description of the geology of the Lakeview property (Reference #1, Introduction) made the following comment on structure:

"Lying in the Hazelton volcanics, in a highly productive mineral area, near the Topley intrusive and at what appears to be the focal point of a number of pronounced intersecting lineaments, the geological location is highly favourable."

A geological map of the main mineralized zone on a scale of 1 =40' by Mr. Matt Bell shows the existence of a set of northwest-trending fractures, parallel to the basic dykes mentioned in the preceding section. A second set of steeply dipping, north-trending fractures is more closely related to sulphide mineralization.

Another report states that the vein system appears to be an en-echelon arrangement of lenses, with the structural axis approximating N30E and the individual lens axes being N40E. Slickensides are in evidence.

SULPHIDE OCCURRENCES:

The B.C. Minister of Mines Report for 1926 describes the main zone of interest on the Lakeview property as a "heavy zone of specular hematite showing copper pyrites" over an exposed length of about 300 feet. The report goes on to describe similar mineralization occurring 1,000 feet to the north as a probable continuation of the same zone. A sample taken across a width of 6 feet at this north "extension" assayed:

Au - Tr. Ag - 2 oz./ton Cu - 4%

A report by A.D. Tidebury (1955) states that the main mineralized zone at Lakeview "shows a thickness of 20 feet and contains an appreciable amount of copper minerals." The report goes on to state that the gangue minerals are hematite and quartz in a ratio of about 10:1. Where the hematite-quartz ratio increases, chalcopyrite is more abundant. "At present, the vein system is in evidence for a strike length of 900 feet. Limited stripping indicates that this length can be assumed to be in excess of 1,400 feet, with no positive sign of termination."

Information on the three holes drilled by the Harvest Queen Mining Co. on the main Lakeview zone in 1955 is incomplete. Hole No. 1 was drilled into the hill from the road about 100 feet east of the "Southwest Zone" in the vicinity of the old A Shaft. This 20 degree down-hole intersected a zone of low grade mineralization from 8 to 21 feet, which was not assayed, and an ore zone between 91.5 and 96.0 feet which assayed as follows:

Cu - 7.7%

Ag - 5.0 oz./ton

Zn - 0.6

Pb - nil

Au - 0.03 oz./ton

The above are zone is apparently the nearly vertical downward extension of the main surface are shoot, intersected 45 feet below the bottom of the old shaft, or about 90 feet below surface.

Harvest Queen's second hole was collared on the road about 100 feet east of the B and C shafts, some 310 feet northeast of the first hole. It was drilled on a similar bearing (approximately N70°W) into the hill, with a presumed dip of -20°. According to the A.D. Tidebury report, "the drilling was terminated due to reaming shell failure and weather, some 20 feet short of the anticipated intersection at a depth of 128 feet."

Harvest Queen's No. 3 hole appears to have been drilled between holes 1 and 2, but little other information is available. A note on one drill plan states that the hole was drilled to 108 feet, "short of the zone by 20 feet."

A description of the showings by P.H. Sevensma (Reference No. 1, Introduction), states that the main zone extends for some 1,000 to 1,500 feet, and consists of mineralized fractures trending N40°E, with near vertical dips. The mineralization is characterized by patches and lenses of hematite, chalcopyrite and minor sphalerite "up to at least six feet wide." Intense silica and epidote alteration is evident near the mineralized zone.

Assays, other than those given above, of samples over stated widths were reported by Tidebury to be:

	<u>Cu %</u>	Ag oz/ton	
Hangingwall (3')	1.5		
Vein (3')	4.4	0.2	
Footwall (3")	0.4	-	

Grab samples from the various dumps have resulted in spectacular assays, particularly in copper. For present purposes, these have little value and are not included in this report. To illustrate, one of the writers (J.A. Chamberlain) obtained a specimen from one of the old adits on the main part of the showing during his visit to the property. This sample consists of approximately 20% chalcopyrite, plus some pyrite, in highly altered rhyolite. Obviously, this specimen would assay something on the order of five percent or more copper. To include such spat assays in the report would serve little useful purpose and could be highly misleading.

MAGNETOMETER AND E.M. SURVEYS:

The Government aeromagnetic survey of the area indicates generally low magnetic relief in the range of 5,000 to 5,500 gammas. A ground survey, using a line spacing of 800 to 2,500 feet and a station spacing of 100 feet, was carried out in 1969. The ground survey covered an area of some 1½ square miles centering on Wilson Lake and included the main mineralized zone. Several isolated magnetic highs occur some 400 feet off the strike of the main zone. Two weaker anomalies may be associated with the mineralization. Several high roadings were obtained north of Wilson Lake and these have been interpreted by Buval geologist, Mr. Matt Bell, as forming a single linear anomaly some 3,000 feet long, striking east-west.

An E.M. survey, using a Sharp SE 300 instrument was completed over the mineralized zone in October, 1969, by Mr. Bell. The line spacing was 200 feet, with raadings taken every 100 feet. Crossovers on lines 12N, 14N and possibly 16N may be related to sulphides, particularly on line 12N east of the base line about 150 feet. No other E.M. effects were disclosed by the survey.

GEOCHEMICAL SURVEY:

A geochemical soils survey for copper and zinc was carried out over the entire claim group during 1969. The line spacing used was on the order of 2,500 feet, with a 200 foot sample interval. Anomalous copper zones were in some cases checked in a follow-up sampling program using a 400 foot line spacing and a 100 foot sample interval.

A frequency diagram prepared by Mr. Bell suggests that the distribution of copper values is lognormal. About 12 percent of the total samples assayed 60 or more parts per million copper, and these were considered to be distinctly anomalous. On this basis, several copper anomalies occur within the surveyed area. The most obvious of these are listed below, not necessarily in order of importance:

- 1. The main zone of showing on Line K. Values up to 350 ppm Cu occur downslope from the main zone. The anomalous values suggest that the mineralized zone is about 1,000 feet long.
- 2. Line C near the southwest end (95-1005) shows the presence of a consistent copper anomaly of moderate strength over an area some 2,000 feet long by 500 feet wide.
- 3. Line C (60-65S) shows a second, weaker copper anomaly over a much smaller area.

- 4. Lines B and A show numerous anomalous segments which have so far not been tested by detailed sampling.
- 5. Scattered copper anomalies elsewhere in the claim group may suggest certain areas for follow-up sampling.

CONCLUSIONS AND RECOMMENDATIONS

The existence of the main copper-silver-bearing zone on the Lakeview property is confirmed by the geochemical survey carried out by Buval Executive Mining Industries Ltd. The dimensions of the zone remain largely unchanged from earlier estimates by P.H. Sevensma: i.e. that the zone is on the order of 1,000 feet in length. Weak magnetic anomalies occur in conjunction with the known sulphides, but these may well be fortuitous as chalcopyrite-hamatite-quartz-epidote assemblages would not be expected to register as magnetic disturbances. The zones of known mineralization may be partly reflected in the detailed E.M. survey, but the correlation is weak at best.

Little useful information can be expected from the application of additional surface techniques on the main mineralized zone at Lakeview. Assessment of the available data indicates that a limited drilling program should be undertaken on this known target to test continuity and grade both laterally and vertically.

Holes should be drilled from locations east downslope) of the mineralized zones on bearings parallel to the Manex grid lines; i.e. approximately N55°W. The following holes are recommended with priorities as indicated:

	COLLAR	BEARING	DIP	LENGTH	PRIORITY
Line 4N	1+00E	N55°W	-45°	4001	
Line 6N	1+00E		an .	400'	1
Line ION	2+00E		H	400	1
Line 4N	2+00E	n	tt .	500'	2
Line 6N	2+00E	8	şı	500'	2
Line 12N	2+00E	H	an .	4001	2
Line 14N	2+00E	8	. #	4001	2
Line 2N	1+00E	31	Ħ	400'	2
Line 8N	2+00E	SI	\$4	500'	2
Line 14N	2+00E (?)	£1	& ,	400'	3
Line 16N	2+00E (?)	ti	61	4001	3
Line 0	1+00E (?)	ŧ	# .	400'	3
		Total foo	otage:	5,100 ft.	

If negative results should be obtained in the first priority drilling, the program should be terminated at that point. Drilling contracts should be set out with this possibility in mind. Conversely, encouraging results could call for implementation of the second and, possibly, the third priority drilling. The program should be carried out under the direction of a geologist experienced in this type of deposit. Results should be plotted in both plan and sections as they are received, and subsequent drilling should be predicated and adjusted to take advantage of the latest information. Wire-line should be used to facilitate core recovery.

The geochemical anomaly defined on line C (95-1005) should be investigated by judicious bulldozer stripping, particularly towards the up-slope (west) side of the anomalous area. The extent of this work will be determined by results and local depth of overburden. The second anomaly on line C (60-655) should also be investigated in this manner.

The possible geochemical anomalies on lines A and B should be tested by follow up sampling as was done on line C.

Second and third stage stripping and drilling on lines A, B and C should be implemented if warranted by results of earlier work. A summary of requirements and cost estimates for the first and subsequent contingent stages is given below:

RECOMMENDATIONS:

PHASE 1:

Diamond Drilling AQ wireline Main zone 1,	200'
@ \$10.00:	\$12,000.00
Bulldozer Stripping, 15 days @ \$250.00	•
(line C):	3,750.00
Provision for Assaying:	1,000.00
Geochemical follow-up Soils survey,	
(Lines A, B):	3,000.00
Geological supervision, capping, sampling	3,500.00
Administration, Transportation, Equipment, S	upplies 2,000.00
Contingencies:	2,500.00
Sub-total:	\$27,750.00

PHASE II:

Diamond Drilling: AQ Wireline: Line C Diamond Drilling: AQ Wireline Main zor Provision for assaying: Dulldozer Stripping Lines A, B. 20 days (Geological Supervision, Mapping, Sampl Topographic Mapping of Claim Group, 1" Administration, Transportation, Supplies: Contingencies:	\$ 20,000.00 27,000.00 2,000.00 5,000.00 4,000.00 7,000.00 5,000.00 8,000.00	
	Sub-total:	\$ 78,000.00
PHASE III:		
Diamond Drilling: AQ Wireline Main Zor Diamond Drilling: AQ Wireline Lines A, Assaying, Sampling, Mapping: Management, Transportation: Geological Mapping: Contingencies:		\$ 12,000.00 40,000.00 5,000.00 10,000.00 5,000.00
	Sub-total:	\$ 82,000.00
	TOTAL:-	\$187,750.00

Respectfully submitted,
DOLMAGE CAMPBELL & ASSOCIATES LTD.

Douglas D. Campbell, P.Eng., Ph.D.

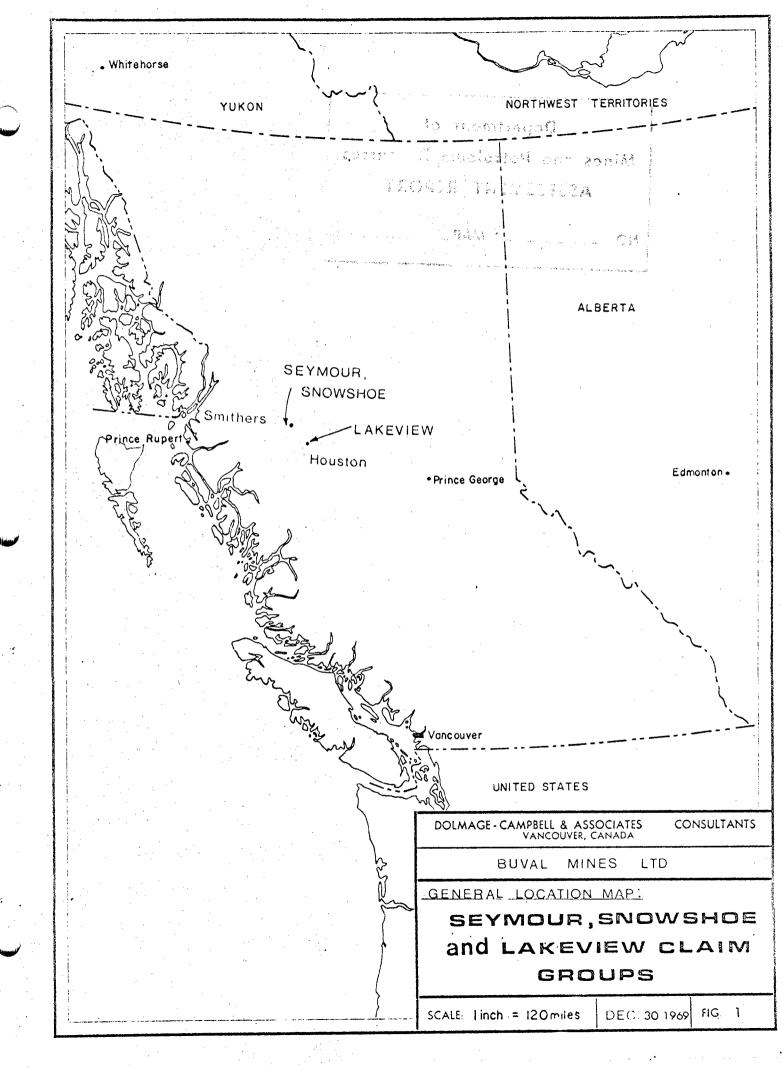
J.A. Chamberlain, PEng., Ph.D.

CERTIFICATE

- 1, Joseph A. Chamberlain of West Vancouver, Canada, do hereby certify that:
- 1. I am a consulting geological engineer.
- I am a graduate of the University of British Columbia,
 (B.A. Honours Geology, 1955) and of the Harvard University,
 (M.A. Ph.D., in Structural and Economic Geology, 1957) 1958)
- 3. I am a registered Professional Engineer of the provinces of Ontario and British Columbia.
- 4. From 1952 until the present, I have been engaged in regional geological studies, mining and mining exploration, engineering geology, and geological research fro various companies and government institutions. I was Geologist and Research Scientist for the Geological Survey of Canada for nine years specializing on the geology of nickel, copper and uranium.
- 5. I have personally visited the Lakeview property on January 9th, 1970.
 I have studied all available geological maps reports and assays dealing with the Lakeview Claim Group in the preparation of this report.
- 6. I have not received nor do I expect to receive any interest directly or indirectly in the Lakeview claims, or in Buval Executive Mining Industries Ltd., or any affiliated company.

Respectfully submitted,
DOLMAGE CAMPBELL & ASSOCIATES LTD.

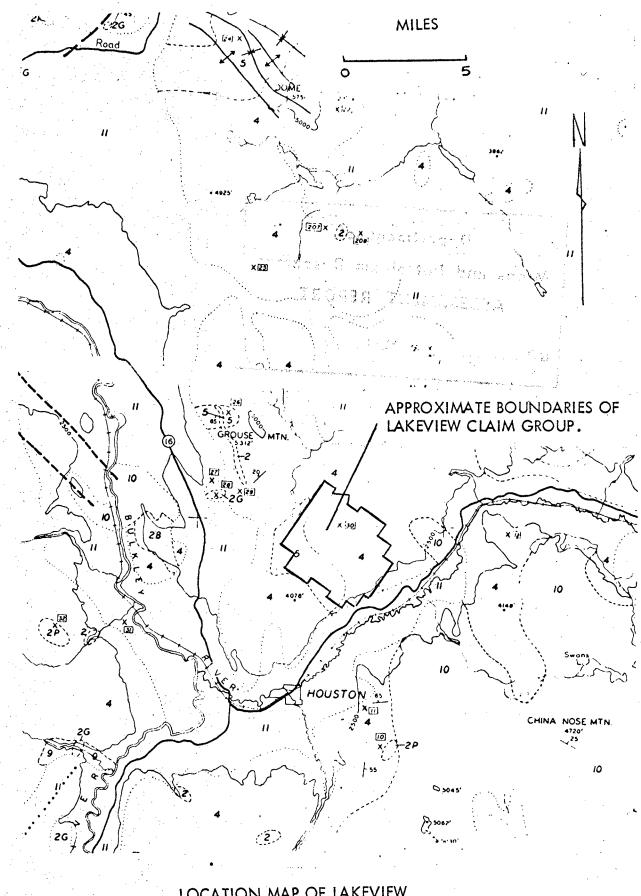
J.A. Chamberlain, P.Eng. Ph.D.



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

NO 2145 MAP #

and b



LOCATION MAP OF LAKEVIEW CLAIM GROUP, SMITHERS AREA, B.C.

Department of Mines and Petroleum Resources ASSESSMENT REPORT
NO. 2145 MAP # 2

BUVAL MINES LTD.

LAKEVIEW PROPERTY

93-L-7/10, Omineca M.D. B.C.

APPRAISAL of 1969 Fieldwork

1. INTRODUCTION

After an examination of this property, the writer recommended a program detailed in the attached appendix.

The property covers a showing of Copper and Zinc,

NW of Wilson Lake where in previous drilling some good Copper

values were reported, as 4.5' of 7.7% Copper. The available

material on the dumps of old trenching and drifting indicates

a deposit with hematite, sphalerite and chalcopyrite in epidote

and skarn like material.

A recently published G.S.C. Aeromagnetic map indicates a fairly strong relief, suggesting a bedrock of volcanics and intrusives.

The purpose of the 1969 initial fieldwork was to locate any possible targets of significant interest; no geological mapping of any consequence has been carried out in the area.

References are:

Unpublished report by A.D. Tidsbury, 1955.

G.S.C. map # 671 A. Houston, B.C.

G.S.C. map # 631 A, Fort Fraser, B.C.

2. FIELDWORK

The results of the 1969 fieldwork are recorded on the attached maps. All interpretations must be considered preliminary until such time as a geological reconnaissance of the property has been completed and integrated maps have been prepared showing the relation of the observed features to the topography and thegeology, and making full use of the available aeromagnetic data.

3. APPRAISAL

a) Geochemical Work

In view of the nearly 1000 samples available, a statistical analysis is required to determine the significance of the results. Backgrounds are at present estimated as follows:

Cu: 5-30ppm Zn: 50-150ppm Pb: 5-20ppm

Some areas may have a different background, i.e.

Cu: 1-15ppm Zn: 25-100ppm

Consistent Zn of 150-1000ppm and Cu of over 100ppm are believed to be significantly anomalous in this.area.

The contaminated showing - area exhibits the highest values, which are low compared to other showing areas known by the writer elsewhere. Highest values are:

Cu, 350ppm, sample no. 345

Zn, 2600ppm, sample no. 949

Reconnaissance soils around the showings are not as high as in some other areas on the claims.

All high areas therefore warrant detailed analysis.

The two SE lines, "A" and "B", show several areas of up to about 2500' long with Zinc in the 150-500ppm range and occasional Copper over 100ppm.

As terrain conditions are too imperfectly known, these features cannot yet be properly evalued. On line "B", samples 828 and 829 show a coincidence of Cu + Zn and a magnetic high over 800 gammas, and there is some suggestion that this zone extends to line "A", sample 764 and to line "C", sample 475, but due to the 3000' spacing, this correlation is as yet hypothetic.

As the showing area is related to a magnetic high also, the above feature is rated as target no. 1.

All other areas on lines "A" & "B" where ten to fifteen consecutive samples show significant Zinc, warrant close investigation.

Geological mapping, additional soil sampling and magnetic fill-in work are justified in all these areas.

Other isolated highs also warrant additional investigation, an important part of which should be the attempt to correlate the ground-magnetics with the aeromagnetic data. Geological mapping is again essential in these areas to evaluate these geochemical highs properly.

b) Magnetic Work

The showing area exhibits about background values, but is located a few hundred feet NW of highs of about 400-500 gammas above "background".

Interpretation of the large reconnaissance survey can only be made by using the aeromagnetic maps. This is mainly a matter of preparing the proper maps, to determine the probable trends.

Geochemical highs on or near magnetic highs could be the most significant, but this is by no means certain yet.

Once the probable trends have been derived from the ground magnetics in conjunction with the aeromagnetics, a hypothesis regarding the probable trends of geochemically high zones may be made.

For the latter work, geochemical maps showing the topography features are indispensable.

4. CONCLUSIONS

The 1969 field program has given reasonable to significant encouragement. Subject to further study of aeromagnetic maps, the following conclusions are drawn:

a) Some of the claims in the NW part of the group may be relinquished as geochemical results have been negative. These negative results do not guarantee that there is no anomaly somewhere between the wide spaced lines, but this probability is low if the overburden is relatively thin.

- b) Do more detailed work (mapping, geophysics and soil sampling) in the showing area and near the isolated highs throughout the central part of the property.
- c) Conduct detailed follow-up work as priority 1 and 2 in the geochemically positive areas along lines "A", "B" and "C", with emphasis on the sample nos. 828 and 829 on line "B" and their E-W extension.

A more detailed program and a field cost estimate of this work should be prepared after completing further study, and integration with other data, of the 1969 field results.

5. RECOMMENDATIONS

Specific recommendations for immediate office work are, in sequence:

- 1. Prepare a statistical analysis of the soil sample results.
- 2. Enlarge 1:50,000 topo map to 1" = 2000' to use as a base map.
- 3. Enlarge 1"=1 mile (1:63,360) aeromagnetic map to exactly the same scale of 1"=2000'.
- 4. Plot all geochemical survey lines as accurately as possible on a clear copy of base map 2.
- 5. Outline all detailed grids on the same clear copy as information 4.
- 6. Blow 1"=2000 clear copy up to 1" 1000' maps as required.
- 7. Prepare 1"=200' maps of all detailed grids, including topo contours derived from maps 6.

8. Prepare sepias of maps 7 to show on separate copies:

Sample numbers Cu plot Zn plot Magnetics, where available

- 9. Prepare sepias of maps 6 for the same purpose as under 8 and include a sepia for Pb where available or necessary.
- 10. Prepare a photogeological study on a copy of base map 2.
- Integrate all results on one or more copies of base map
 and develop a work-hypothesis for further field work.
- 12. Be certain to keep the originals of maps 2 and 3 without any alterations or additions for possible future use.
- 13. Draw up details of the 1970 field program, which should, in general, include:

Geological mapping (for grid-orientation), 1"=1000'
Linecutting in geochemically active areas (200' grids)
Geological mapping

Prospecting

Detailed soil sample programs in grid areas (include assays for Pb)

Magnetic surveying, stations 50' apart at the most.

Detailed magnetics near highs, or lows, or geochemical peaks (lines 50' apart, 25' stations?)

Bulldozer trenching

Geological mapping of trenches.

EM or IP may be indicated by the above

It is likely that the above work will uncover one or more targets of interest requiring drilling.

All evidence based on old and somewhat unreliable data suggests that the original showing warrants drilling, especially in view of the 4.5' of 7.7% Cu reported by A.D. Tidsbury in a 1955 drill-hole and numerous good copper assays reported from the old workings.

6. SUMMARY

Geochemical field work has indicated several target areas with about the same characteristics as the area of the original copper showing.

Extensive areas of from 200-500ppm Zn containing smaller areas of from 100-200ppm Cu are therefore good exploration targets.

Detailed work on the original showing is recommended and is expected to lead to a good drill-target.

A detailed engineering analysis of the results of the field work is recommended to determine a priority of targets for detailed mapping, soil-sampling, magnetics and stripping.

Zinc is the most highly anomalous metal on this property, but is generally centered on several areas with what are believed to be significant Copper values in this environment.

Geological mapping is the first requisite for further efficient exploration of this property.

Respectfully submitted,

P.H. Sevensma, Ph.D., P. Eng.

P.H. SEVENSMA CONSULTANTS LTD.

November 10, 1969

BUVAL MINES LTD.

REPORT on EXAMINATION of the

LAKEVIEW GROUP, 93-L-7, E/2 Houston, Omineca M.D., B.C.

OCT. 15,1968

1. INTRODUCTION

On October 9, 1968, the writer visited briefly the showings on the Lakeview claims, seven miles North of Houston, B.C., in the company of Mr. D. Low, Mr. R. Low and Mr. M. Beley, Geologist.

The trip was made from Smithers by helicopter to Wilson Lake and thence on foot. Light snow was falling at the time, with low visibility.

2. PROPERTY

The group consists of the six old Lakeview claims, viz

Lakeview, and Lakeview 1-5, surrounded by the more recent LV 1-36 claims,

tag numbers 938611 to 938646.

At the time of writing, the previous history of these claims has not yet been investigated in detail by the writer.

Access is by a truckroad from Knockholt, on the C.N. line in the Bulkley River valley, to Wilson Lake, or from the secondary Summit Lake road which cuts off the Houston bend of Highway 16.

The claims centre on the showings at 54° 29'N and 126° 36' 30"W. Elevations vary from 3,300' at Wilson Lake to 4,400' at the summit of the Lakeview hill. The area is covered by good timber; water is abundant.

3. HISTORY

Not investigated in detail.

± 1910 - Staked by the Wilson Brothers, early settlers.

1917, 1918- Considerable work by Tonopah Mining Company, including stripping and 3 shafts.

- 1929 Dewatering and sampling by Cominco Ltd.
- 1954-56 Miscellaneous examinations and assays; correspondence with Britannia Mining & Smelting Co.
- 1956-1968 -Miscellaneous activities, including stripping by bulldozer a few years ago. No details available at this time.

4. GEOLOGY

The claims are underlain by volcanics of the Hazelton type.

The Lakeview hill is a triangular shaped dome between a number of pronounced lineaments running WNW, ENE, NE and NNW. The heavy timber cover of the immediate area has precluded detailed mapping and it is not known whether any intrusives occur on or near the property.

Lying in the Hazelton volcanics, in a highly productive mineral area, near the Topley intrusive and at what appears to be the focal point of a number of pronounced intersecting lineaments, the geological location is highly favorable.

5. SHOWINGS

The main known mineralized zone extends for some 1,000' - 1,500' and consists of N40°E shears and fractures with a near vertical dip in the volcanics.

The mineralization consists of patches and lenses, up to at least 6' wide, of hematite, chalcopyrite and minor sphalerite. There is no galena.

Excellent grades have been reported, and on the dumps of old workings, the writer observed enough good grade copper ore to accept the available old assays.

Assays on the writer's grab sample of ore grade material are not yet available at the time of writing.

Reported assays with widths are as follows:

1954, A.D. Tidsbury, check samples of Dirom and Gilleland.

	<u>w</u>	Ag.	Cu.	Zn.	Au.
HW	. 3'		1.5	_	
Vein	3'	0.2	4.4		
FW	31		0.4	•	-
East end pit	?	0.8	1.3	2.9	
Dump at shaft	?	7.9	5.7	0.9	· •
West end dump	?		9.3	 .	-
1954, Owner, 1	F.S. Short, s	amples to.	Britannia (G	rab samples	Jean dump)
1.	**************************************	2.20	9.40	tr.	tr.
2	?	20.62	6.20	2.50	0.16
3	?	8.56	12.40	tr.=	0.04
4	?	2.62	11.80	tr.	0.005
Date and author	or unknown, 5	0 "informa	tive" sample	s on 1,400'	length:
Average	3.5'?	4.0	3.6	Present	?
A.D. Tidsbury	estimate:				
Dump	250 tons	9.0	7.0	?	?
Drillhole, SW	end 41'	5.0	7.7	0.6	0.03
· ·	21½'	Estimate	d low grade		
Rumored					

5.000' to SW ? 20.0 14.0 (Location unknown)

In summary, there is a zone 1,400' long, open at both ends with abundant hematite: - chalcopyrite mineralization of commercial grade, and higrade widths up to 6'. Intense silica and epidote alteration of the volcanics is evident near the mineralized zone.

6. EVALUATION

The mineralization is reminiscent of the Craigmont type and a brief examination, without the benefit of whatever scattered and unreliable

information may be available, indicates that this is an outstanding prospect which warrants an extensive and detailed investigation by . visual, geochemical and geophysical mapping.

7. RECOMMENDED PROGRAM

- 1. Topographical map of a 12 square mile area at a scale of 1" = 1.000'.
- 2. Airphoto geological analysis.
- 3. Geological reconnaissance mapping.
- 4. Geochemical stream silt and reconnaissance soil sampling (along claim lines).
- 5. Reconnaissance magnetic survey, preferably airborne.
- 6. Follow-up geophysics by methods suggested by the results of methods 1 5.
- Core drilling of mineralized zone and of other attractive targets discovered by methods 1 - 6.

A detailed cost estimate will require additional study. A preliminary estimate of justified field cost, including a minimum of 5,000' of well spotted drilling is as follows:

Geological investigations		\$30,000.00
Drilling, 5,000'	@ \$12.00	60,000.00
Contingency, 10%	tingency, 10%	10,000.00
	Total	\$100,000.00

8. SUMMARY AND RECOMMENDATIONS

A zone about 1,400; long and open at both ends contains hematite-chalcopyrite-(sphalerite)-silver-(gold) mineralization of around 5% Cu. with appreciable silver over widths up to at least 4' to 6'. No information is available on the extent of indicated low grade mineralization in the 0.5 - 1% Cu. range.

The geological environment is highly favorable.

A two-stage preliminary program is recommended to consist of geological office and field investigations to be budgeted at no less than \$30,000.00.

A minimum drill-program, which should not be started until the first stage is completed, will require at least 5,000' on this outstanding showing, and \$60,000.00 should be budgeted for this work. The geological investigation of stage 1 may well lead to a significant increase of this amount.

Including contingencies, not less than \$100,000.00 should be available for further investigation of this occurence of commercial grade mineralization, which has a good probability of being available in commercial tonnages as well.

Respectfully submitted,

P.H. Sevensma, Ph.D., P. Eng.

Sevensma