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CONSULTING ENGINEERS

VANCOUVER, B. C.

BACON & CROWHURST LTD.
CONSULTING ENGINEERS

January 25th, 1975.

Mr. George Loy, President,
Oriana Developments Ltd.,
417 - 402 W. Pender St.,
Vancouver, B.C.

Dear Mr. Loy:

Pursuant to your instructions, we have prepared a report concerning the two placer leases Nos. 6685 and 6707, situated at Wingdam on Lightning Creek in the Cariboo area, British Columbia.

Our report is a review of the information submitted, together with our conclusions and recommendations.

We are of the strong opinion that the use of underground methods should be discarded and an open pit approach be investigated.

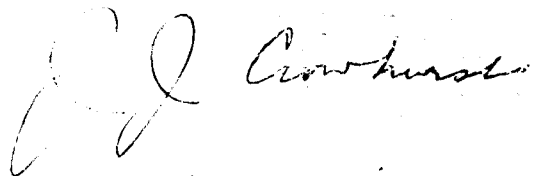
We have discussed the problems with prominent B.C. engineering consulting firms who are skilled in drainage and dewatering problems. A favourable reception was encountered; their suggested approach has been incorporated in our report.

We have satisfied ourselves that significant, and perhaps large, quantities of gold are present in the gravels.

It is recommended that the sum of \$18,700 be provided to carry out a preliminary feasibility study, with subsequent action to be dictated by the study's conclusions.

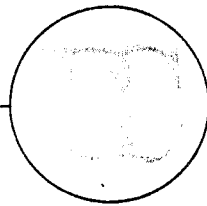
Yours truly,

BACON & CROWHURST LTD.



J.J. Crowhurst

JJC/ic



BACON & CROWHURST LTD.

1720-1055 West Hastings Street
Vancouver 1, B.C.

REPORT

on

PLACER LEASES Nos. 6685 & 6707

situated at
WINGDAM on LIGHTNING CREEK
in the
CARIBOO MINING DIVISION
BRITISH COLUMBIA

for

ORIANA DEVELOPMENTS LTD.

by

J.J. CROWHURST, P.Eng.

Vancouver, B.C.

January 25th, 1975

ACKNOWLEDGEMENTS

- (1) British Columbia Department of Mines and Petroleum Resources reports - "Wingdam" - chiefly the years 1930 to 1938 inclusive and 1960 to 1964.
- (2) Report by Earl K. Nixon, P.Eng., not dated but apparently about 1942, written for Eastern Canadian mining interests (?) - contains tables and information submitted by Mr. M. Richmond, P.Eng., formerly General Manager, Consolidated Gold Alluvials Co. at the Wingdam and adjoining Sanderson mine.
- (3) Calculations by R.F. Bowman, Vancouver, B.C.
- (4) Report by C.W.S. Tremaine, P.Eng., dated April 26, 1961.
- (5) Topographical map - scale 1" = 200 feet - McElhanney Surveying & Engineering Ltd., Vancouver, B.C.

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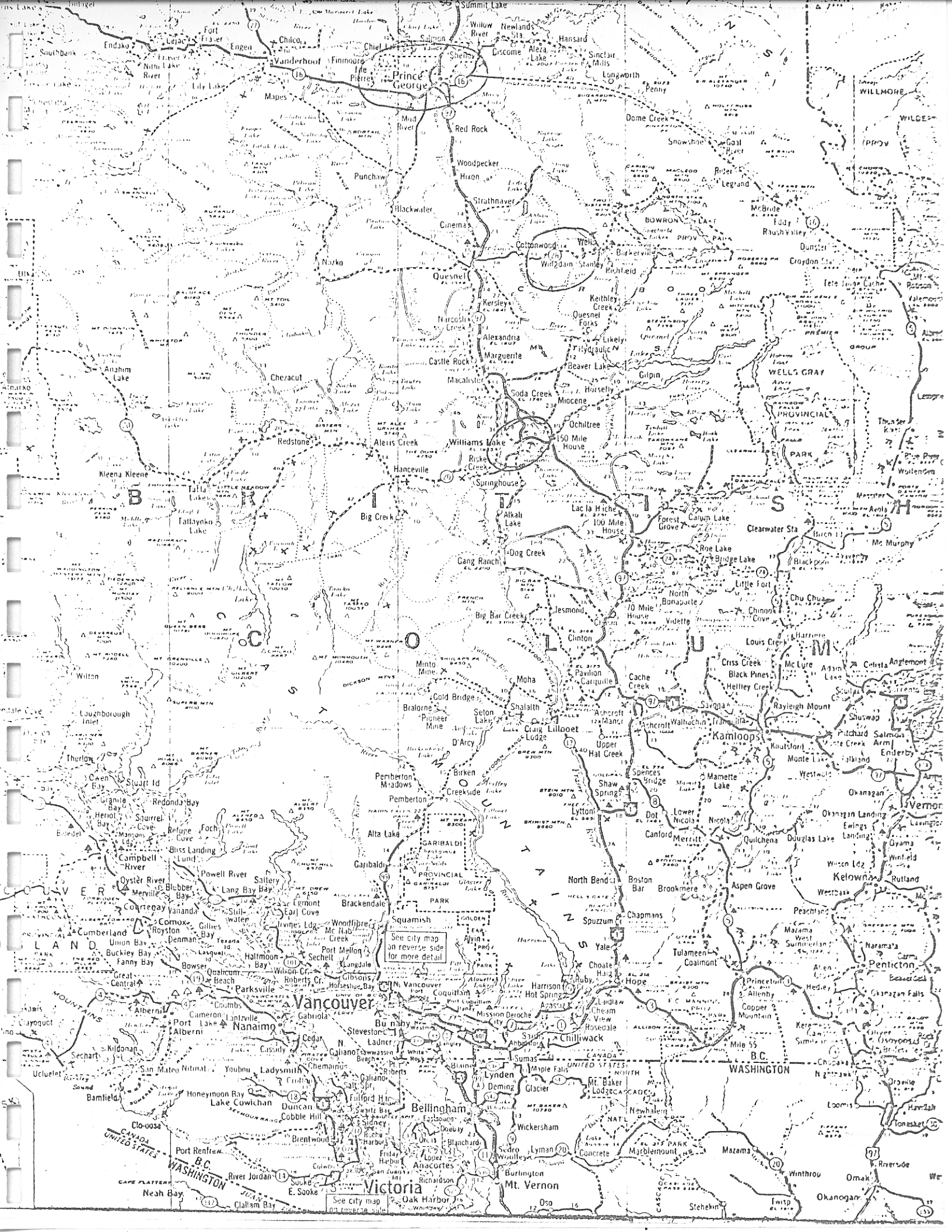
LIST OF ILLUSTRATIONS

Location Map - B.C. road map Xeroxed

Following
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Lightning Creek Area

Following
'Location' Map



See city map on reverse side for more detail

See city map on reverse side

CANADA UNITED STATES

WASH. B.C. WASHINGTON

WASHINGTON

WASH. B.C. WASHINGTON

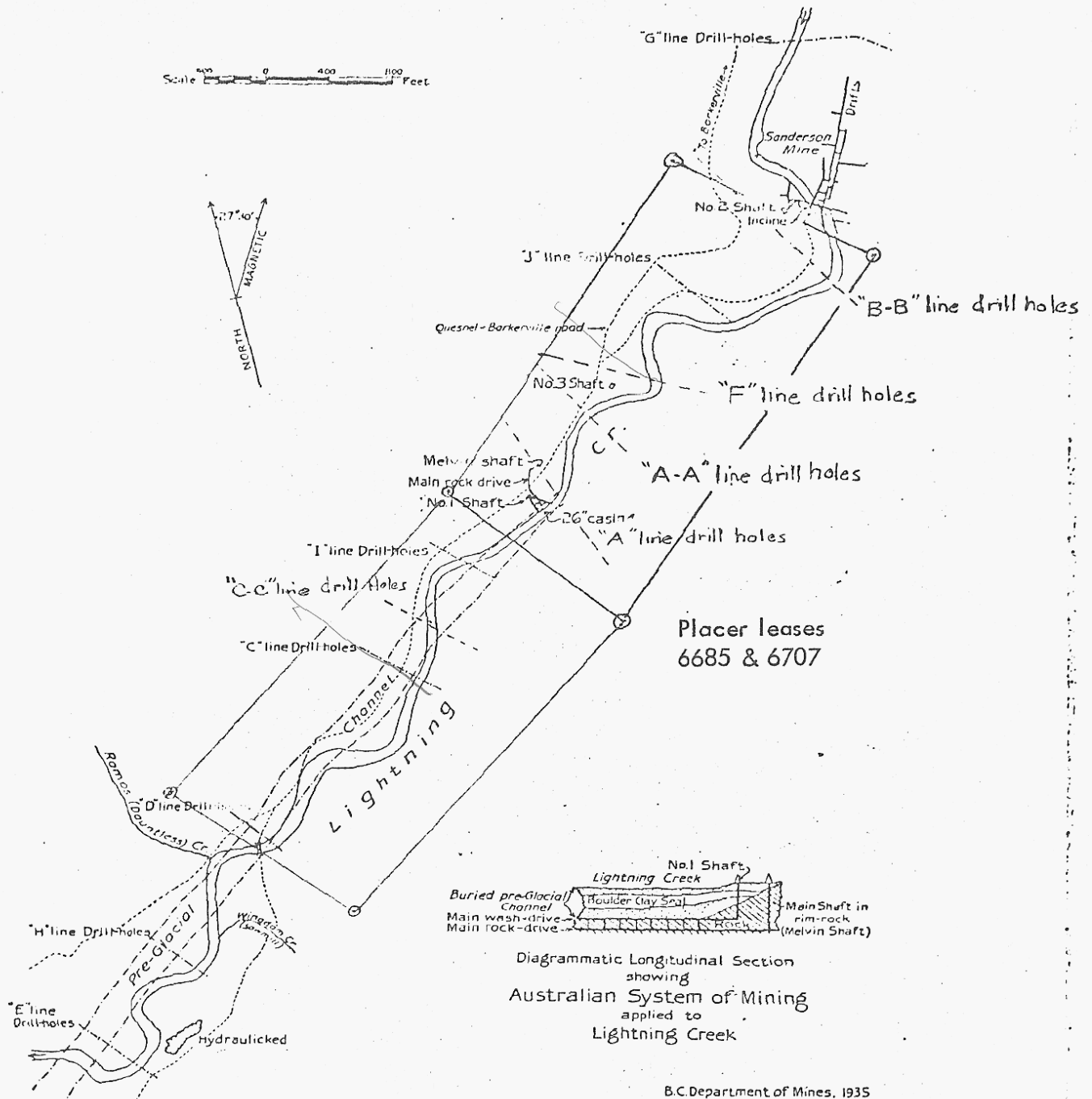
WASHINGTON

WASHINGTON

WASHINGTON

WASHINGTON

WASHINGTON



Consolidated Gold Alluvials of B.C., Ltd. Plan of Workings from Company's Map. Underground Workings are shown in Heavy Lines.

To accompany report by Bacon & Crowhurst Ltd. dated 25th January 1975

SUMMARY AND CONCLUSIONS

Two placer leases, Nos. 6685 and 6707, situated on Lightning Creek at Wingdam in the Cariboo, British Columbia, and optioned by Mr. B. Wilson, cover all of the Melvin "deep lead" placer gold mine workings, and a substantial part of the Sanderson placer gold mine workings. Both of these mines have impressive records of past underground production.

Churn drilling at close intervals (15'-20' where required) was completed by experienced men in the 1930's on lines spaced approximately 500 feet apart along these leased sections of Lightning Creek.

Significant gold values were obtained and a channel 50' to 80' wide and 7' to 8' high was intersected on all lines, giving a total possible length of over 5000'. Indicated possible volume could be over 117,000 cubic yards, with a gold content in excess of \$8,000,000 at a price of gold at \$100.00 per ounce and correspondingly more at present prices. Since placer gold pay streaks are notoriously erratic, however, further drilling is required to establish definite quantities and relative positions.

The 1930 drilling was directed at the gold-bearing gravels situated on bedrock. A small part of this channel in the western lease area (2,872 cu. yds. containing 1,086 oz. gold) was mined through the Melvin workings by Consolidated Gold Alluvials Company Limited during the period 1934 to 1939.

The channel lies at an almost uniform depth of 163' and was entered by means of a shaft sunk in the adjoining rock, together with a level some 3200' in total length underneath the channel, also in rock. Raises were then driven upwards into the gravel at planned intervals to permit gravel extraction. This method was known as 'the Australian deep lead' system.

Lenses of water-saturated clay and mud silt material, locally called "slum", had interfered disastrously with other similar underground mining on the Lightning Creek gravels. One of these lenses, occupying old forgotten excavations, was unfortunately encountered in March, 1938, and the mine was flooded. Subsequent attempts to dewater the workings by other interests in the mid-1960's were finally abandoned, and no further work of any consequence has been done since.

The Sanderson mine workings were located at the east end of the leased area in gravel beds lying 120' below the creek floor, or 45' above bedrock. It is believed these gold-bearing gravels have not been delimited to the west, and hence further drilling has a good chance of success.

The Sanderson mine enjoyed profitable operation from 1934 to 1939, and closed after reserves were exhausted. 25,474 ounces of gold were extracted from 121,297 cubic yards of gravel. This would represent \$2,500,000 at a price of gold of \$100.00 per ounce, or correspondingly more at current prices.

Previous mining operations in the west section of the leases, directed at the bedrock (or deep lead) channel, failed because

significant quantities, coupled with open pit possibilities, indicate that further work, in planned stages, on these two placer leases should be undertaken.

RECOMMENDATIONS

It is recommended that preliminary investigations be undertaken, in successive stages, as follows. The commencement, and the nature, of each stage would depend upon the results of the preceding stage.

STAGE 1 - General Feasibility Study

An experienced consulting firm, with a past record of successful achievement in dewatering gravels and silts of the nature known to occur at Wingdam, should be engaged to conduct this study. The consulting firm selected should have access to drilling and earth-moving firms who could provide the necessary time and cost estimates for the study. All personnel involved should be intimately familiar with and investigate local Government requirements.

One such firm contacted by Bacon & Crowhurst Ltd. believes the work has an excellent chance of success, and has submitted a proposal.

Experienced placer operators should be consulted concurrently and methods of gold extraction planned.

The study should cover cost and time estimates concerning the following:

- (1) Flume Lightning Creek.
- (2) Relocate the road.
- (3) Dewater the placer areas.
- (4) Excavate to first gold-bearing horizon (120').
- (5) Excavate to second gold-bearing horizon (165').
- (6) Refill the excavations (concurrently with 4 and 5 above).
- (7) Release Lightning Creek.
- (8) Return the area to an aesthetically acceptable form.
- (9) Determine amount and value of presently indicated gold reserves; determine scope and nature of required preliminary exploration, such as drilling.
- (10) Determine method of excavation of gold-bearing gravels and method of washing, sluicing, etc., to recover the gold values.

Estimated Cost - Stage 1

Studies related to Items 1 to 8	\$9,000
Studies related to Items 9 and 10	<u>8,000</u>
	\$17,000
Contingencies @ 10%	<u>1,700</u>
Total	<u>\$18,700</u>

STAGE 2 - Exploration

Drilling to determine the location and size of the gold-bearing zones should be completed at 200-foot intervals in between previous drilling or as the preliminary feasibility study dictates.

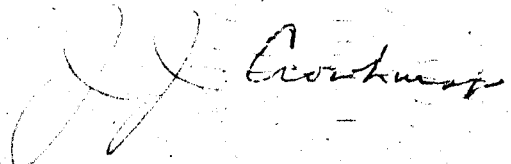
Estimated Cost - Stage 2

(a) 16 cross lines x 7 holes/line = 112 holes x 175'/hole = say 20,000' @ \$5.00/ft.	\$100,000
(b) Engineering, sampling, assaying, etc. 4 months x \$3,000/month =	12,000
(c) Evaluation of results and review of feasibility study, including interviews with Government agencies	<u>10,000</u>
	\$122,000
Contingencies @ 10%	<u>12,200</u>
Total	<u>\$134,200</u>

STAGE 3 - Dewatering, etc. and Mining

No estimate can be made at this time, pending completion of the feasibility study.

Respectfully submitted,
BACON & CROWHURST LTD.



J.J. Crowhurst, P.Eng.

LOCATION AND ACCESS

The two placer mining leases Nos. 6685 and 6707, which are owned by Eileen McAlpine and which are currently under option to Mr. Barry G. Wilson, are situated approximately at 54° N Latitude, 122° W Longitude, on Lightning Creek in the Wingdam area, about 30 miles by good gravel road from Quesnel, British Columbia, Canada.

Lightning Creek flows westerly into the Cottonwood River which, in turn, joins the Fraser River about 10 miles north of Quesnel. The placer leases are a few miles upstream from the Lightning Creek-Cottonwood River junction, and are in the Cariboo Mining Division.

Quesnel, a small but developing industrial town in central B.C., is situated equi-distant between Prince George (75 miles north by road) and Williams Lake (77 miles south by road) on the paved Cariboo Highway. The road distance from Quesnel to Vancouver, B.C., along this highway, is about 425 miles. Prince George and Williams Lake are serviced by modern air facilities, including the use of jet aircraft operating on daily schedules.

The British Columbia Railroad, which originates in Vancouver, passes through Quesnel en route to Prince George and north-eastern British Columbia.

PROPERTY

The property consists of two full-sized placer mining leases, Nos. 6685 and 6707, held under the Placer Mining Act of British Columbia, and a tract of land, Parcel "A" (DD 9704-M).

The placer leases are situated in the Cariboo Mining Division. The parcel of land forms part of District Lot 446, Reference Plan "B" 4271, Cariboo District. It is understood both the leases and the land tract are in good standing at the present time, and all applicable taxes have been paid.

The two placer leases cover the Melvin bedrock channel (or "deep lead") workings in their entirety, and more than half of the Sanderson mine workings. The latter are upstream from and connected to the Melvin workings, and produced gold from a false bedrock or upper channel, through a separate shaft system.

The property, by virtue of an agreement dated the 6th day of April 1973, is under option from Eileen McAlpine, Prospector, of 3095 West 13th Avenue, Vancouver, B.C., to Barry Gregory Wilson, Contractor, formerly of 3055 West 11th Avenue, Vancouver, B.C., now of Twin Lakes, 3795 Princess Avenue, North Vancouver, B.C.

The option agreement states that Mr. Wilson may purchase the leases, and was granted immediate right of access over the lands, and the use of buildings, facilities, and materials upon the lands. Mr. Wilson was also given the right to construct any necessary buildings, etc., upon the lands. All of the above is subject to the following terms and conditions:

- (1) The purchase price of the leases is to be three hundred thousand dollars (\$300,000.00) payable as follows:
 - (a) One thousand dollars (\$1000.00) on the date of signing the agreement.
 - (b) Payment of the balance is by installments every ninety (90) days, from the proceeds of production, calculated at five per cent (5%) of the total net returns from production.
 - (c) Should no production be initiated or should less than fifteen hundred dollars (\$1500.00) be payable under (b), a minimum payment of fifteen hundred dollars (\$1500.00) total shall be made every ninety (90) days. The five per cent (5%) of net production, when applicable, is to form part of the minimum payment.
- (2) Mr. Wilson is to comply with the other standard option provisions, such as conducting work in a careful and minerlike fashion, and comply with the applicable mining laws and regulations of the Province of British Columbia. He is also to maintain the leases in good standing during the currency of this agreement.
- (3) Mr. Wilson may abandon the option at any time, providing notice is given at least thirty (30) clear days before work requirements must be filed, or rental payments made to the Provincial Government.

TOPOGRAPHY AND CLIMATE

The elevation of the valley floor varies from 3030 feet above sea level at the downstream end of the leased area to 3075 feet at the upstream end, representing a drop of about 40-45 feet per mile of stream length. The surrounding hills are tree-covered and rolling, with a relief in the vicinity of Lightning Creek of less than a thousand feet; the hill slopes are from 20° to 30° in grade.

The valley bottom is from 200 feet to 600 feet in width, and is reasonably level between the toe of opposite slopes.

An accurate topographic map with contour intervals of 10' has been prepared by the firm of McElhanney McRae & Smith, from aerial photographs.

Summer daily temperatures reach into the plus 80°F range, but nights are cool. In the winter, extreme lows of minus 35° F are encountered during some years, although surface work can be carried on year-round. The normal snowfall is quoted at about six feet total, and the precipitation about 30 inches. Winters are described as "open" until the end of the year; cold weather occurs in January and February. Spring thaw usually begins in April, and the run-off of water continues until approximately the middle of June.

DRAINAGE

A report written by Mr. E. Nixon, P.Eng. (see 'Acknowledgments') gives many details concerning water flow rates, as supplied by the Consolidated Gold Alluvial Company, for the Wingdam area. His general summary is quoted as follows:

"Lightning Creek, with minor gulch tributaries, flows westward the length of the property to a point just below, where it joins Cottonwood River. Most of the tributaries are short, not more than three or four miles long, and debouch into Lightning Creek drainage at points high on the valley sides. Ramos Creek, as an example, starts about two miles north of the town of Wingdam and furnishes water for fire protection and domestic use at the mine location from a dam where the creek passes over the north rim of the valley. At flood stage, May or June, Lightning Creek is estimated to have a maximum flow of 1500 cu. ft. per second. At the time of the writer's visit, about August 1st, it was a brook five or six yards wide and a foot deep, carrying not more than 100 second feet. Although the normal snowfall is heavy, the spring thaw is alleged to be perhaps a month along before rains come to augment flood conditions. Drift marks along the bed of Lightning Creek indicated its normal flood crest to be not more than four or five feet above present low-water stage. If the gradient for the eighteen miles ranges between 25 feet and 70 feet per mile, judging by map contours and statements by two engineers, there is sufficient stream velocity under flood stage conditions to carry off a tremendous volume of water without the creek spreading out very much over the

pervious gravels beyond the limits of the silt-sealed creek bed proper. A water gauge was maintained at Wingdam for a number of years, but the records are not available.

Lightning Creek, as is commonly the case, seems to have silted or sealed its bed tightly so that under normal conditions there is a minimum of seepage into the underlying gravel. This has been the writer's experience in other parts of the country; and mine reports of the former operation at Wingdam bear out our prediction that, with the creek diverted or flumed, the channel gravels below, once drained, can be maintained in a relatively "dry" and safe state without undue expense for pumping. What the yearly saturation is from snow and rain water in terms of gallons at a given point in the channel cannot easily be calculated; but if a section of the valley gravels, say a mile at a time were flumed or drained or both, the resulting pumping rate after drainage should be of the order of 200 to 300 (U.S.) gallons per minute from the deeper part of the channel. The 'dry season' pumping rate at Wingdam was about 20 million (Imp.) gallons per month, or a little over 500 (U.S.) gallons per minute - when the channel was not nearly drained nor the creek flumed."

HISTORY

In 1860, the first important gold placer discoveries in the Cariboo area, in central British Columbia, were made at Quesnel Forks, Keithley Creek and Antler Creek. In 1861, the celebrated Williams, Crouse, Lowhee and Lightning Creek placer deposits were found. On Lightning Creek, gold was discovered by Ned Campbell in July, 1861. In three days' washing, he and his companions recovered 1700 ounces. Early activity was confined to a three-mile stretch between Stanley and Spruce Creeks, upstream from Wingdam.

The news spread rapidly and very soon thousands of men made their way into the general area despite the almost total lack of trails, let alone roads. Gold placer areas were found in other parts of British Columbia during the ensuing five years. It should be noted, however, that the total placer gold production in the Cariboo to 1962 is recorded as \$51,000,000, a far larger amount than any other placer area in the Province. 1863 was the year of greatest development and output of the Cariboo.

The Cariboo continued to prosper, although activity steadily declined in the other areas of B.C. Hydraulic mining was introduced to the area in 1879. The Cariboo Trail was placed in service, first following a water route from Vancouver to Lillooet and thence-forward via a wagon road passing through Clinton en route to Lightning Creek and Barkerville. Subsequently, the Royal Engineers built a road through exceedingly difficult terrain from Yale to Clinton, enabling wagons to be hauled the entire distance from Yale.

The early Cariboo (and Lightning Creek) placer mining was by hand-methods on the bars and the low benches. Later, companies were formed to cope with the larger financial risks involved, and much gold was recovered by drift-mining deep bedrock gravels from shafts sunk below creek level, and by the use of hydraulic and/or dragline dredges.

Lightning Creek Gold Mines Limited (formerly Lightning Creek Gold Gravels and Drainage Company Limited) acquired 21 miles of Lightning Creek, in 1899 (?), in the vicinity of Wingdam, by consolidation of various properties and operated intermittently for many years.

In 1931, Consolidated Gold Alluvials of B.C. Ltd. acquired these leases. This company also bought the La Fontaine Mine, which was 1½ miles below the settlement of Stanley and about 13 miles up-stream from Wingdam. LaFontaine had operated from 1903 to 1907 and, while it was not a financial success, it had been demonstrated that the deep gold-bearing gravels could be drained and mined by workings in the adjacent and underlying bedrock.

Various attempts had been made by the Lightning Creek Company to work the Wingdam area between 1896 and 1921 but, from contemporary accounts, the operations were badly managed and unsuccessful. During some of these attempts, for example, a drainage adit (location unknown) had been driven and several shafts had been sunk but a horizontal branch drive from one of these shafts had broken into water-bearing gravels ("slum") causing flooding and abandonment of further work.

In 1931, the new company, Consolidated Gold Alluvials, reconditioned the Sanderson shaft and spent 1932 and 1933 in exploration and preparation for mining the false bedrock deposits, at 120 feet below the surface. In the fall of 1933, unsuccessful attempts were made to drain the No. 1 shaft area (now Melvin).

Control of the company passed in 1934, to English interests, who decided to use an Australian method to extract gold from the deep No. 1 shaft channel and to continue to place the Sanderson in production. Commencing in 1935, therefore, about 3000 feet downstream from the Sanderson main shaft, the Jones shaft, sunk many years before in bedrock, was enlarged to four compartments and sunk to 280 feet. This shaft was renamed the Melvin shaft. From the bottom of this shaft, drives were made in the bedrock upstream and downstream about 60 feet vertically below the gold-bearing gravel channel for a total distance of 3200 feet. The channel gravels were drained by drill holes and, at the end of 1936, the first raise was driven up into the gravels.

During 1937 and 1938, a total of 1086 ounces of gold valued at \$34,250.00, was recorded as production from the Melvin shaft workings.

On March 22nd, 1938, however, the Melvin workings were flooded by an inrush of water and saturated clay-bearing gravels ("slum"). This inrush was caused by No. 1 downstream raise breaking through into old workings with subsequent subsidence. No one was injured, but the mine was abandoned, and no attempts at dewatering were made until many years later. A concrete plug was placed in the connecting shaft between

the Melvin and Sanderson workings, so as to permit continued operation in the latter mine.

In the meantime, the Sanderson had been placed in profitable production on a continuous basis, extracting the false bedrock gravel horizon. It is recorded that over 25,000 ounces of gold, valued at \$785,000.00 (gold - \$35.00/ounce), were produced during the years 1934 to 1939 inclusive. The mine was then closed and the workings allowed to fill with water.

In the early 1960's, the Wingdam and Lightning Creek Mining Co. Ltd., a Vancouver-based company, acquired control of several of the Consolidated Gold Alluvial leases, including the two under consideration in this report in the Wingdam area. Their objective was to re-open the Melvin workings and to resume mining in the deep lead gravels of Lightning Creek.

A grout plug was successfully injected into the No. 1 downstream raise by means of several drill holes from the surface, and the Melvin shaft dewatered by the end of 1962. During 1963, rehabilitation of the main drifts, raises and sub-level cross-cuts was undertaken. Gravel in the planned working areas was drained by drilling 3-inch percussion holes, mainly from the drifts in bedrock.

This work continued until September 1964, when work ceased and the mine was allowed to flood. It is believed the rehabilitation costs were excessive; this fact and re-evaluation of the mining problems dictated closure of operations.

GEOLOGY AND GRAVEL DESCRIPTION

With reference to the Consolidated Gold Alluvials operation, the Report of the B.C. Minister of Mines for 1935, states as follows:

"Wingdam is situated close to the edge of the southwestern limb of an anticline into which the Precambrian Cariboo series is folded. The actual contact of the latter series with the unconformably-overlying Mesozoic argillites occurs on Lightning Creek, about 1½ miles downstream from Wingdam. The rocks of the Cariboo series in this region consist of argillites, quartzites, and conglomerates. On the left bank of Lightning Creek, about half a mile downstream from No. 1 shaft, quartzites and conglomerates of the Cariboo series are intruded by quartz-feldspar dykes. It is evident that intrusion took place prior to the jointing in the Precambrian rocks, because the jointing passes through the dykes.

On Mosquito Creek, about 3 miles below Wingdam, Mesozoic argillites are intruded by hornblende diorite. Mineralized quartz veins occur in the rocks of the Precambrian Cariboo series exposed on Pinegrove Creek, Ramos Creek, on the left bank of Lightning Creek below Wingdam, and in the Melvin shaft. Similar veins are also exposed in the Mesozoic rocks on Lightning Creek above Mosquito Creek and in the hydraulic pit of Slade-Cariboo Placers Limited. There is therefore abundant evidence of a source for the formation of Tertiary bedrock placer deposits.

In the immediate vicinity of Wingdam, Lightning Creek is contained in a steep narrow valley, and 1 mile below Wingdam enters a canyon some miles in length. Immediately above and below Wingdam

it is evident that the creek crosses and recrosses its buried pre-Glacial channel, the bedrock of which has been proved by drilling to lie at a depth of about 165 feet below the creek.

Below the mouth of Mosquito Creek, however, the evidence supports the view that in Tertiary times Lightning Creek may have occupied an entirely different channel from that of the course of the present creek, which flows northwesterly from this point. Above Wingdam the valley gradually widens to one of subdued relief and great width at Beaver Pass House. Upstream from the latter point the valley again becomes narrow and steep at and above Stanley.

Apart from the superficial post-Glacial placer concentrations, two distinct types of placer deposits occur on the company's property in immediate proximity to Wingdam: (a) A deposit of possibly inter-Glacial age, underlying the top boulder-clay, and occurring at a depth of 120 feet below the surface. This consists of highly auriferous washed gravels, in which are many large boulders and pieces of slide-rock of purely local origin, while some of the smaller boulders are not local. Up to the present the workings and Keystone-drilling have not revealed a false bedrock underlying this deposit, which is believed to be quite unique in this district. It has been extensively mined, and particulars of sampling carried out by the writer, including further details, are given later in this report. It has proved far more important than there was formerly any reason to suppose. The gold, which is fairly coarse, is flat and well worn. (b) The bedrock gravels of the pre-Glacial channel which lie buried at a depth of about 165 feet below the creek."

It should be noted that churn drilling subsequently demonstrated that the valley constriction at Wingdam is mainly topographic and was probably formed by the slump of a large mass of glacial debris lying against the south hillside. The bedrock profile demonstrates a normal (1000 feet plus) width between back rim limits, as is present farther upstream on Lightning Creek.

During the deposition periods following the various stages of erosion, thick beds, or lenses, of very fine silt or mud were deposited in the Lightning Creek channel. These could have been caused and localized by intermittent blocking of the main channel by late ice, or by slides of gravel into the channel from the side valley slopes. These lenses are locally termed "slum" and, when water-saturated, flow extremely easily through small openings. The disastrous underground mining problems were caused by breaking unexpectedly into these lenses, with subsequent caving and flooding of the workings.

In summary, two types, or layers of gold-bearing gravel, have been explored and worked by previous operators and a third possibility is present:

- (1) The Sanderson mine, consists of inter-glacial age washed gravels extending over an area of from 25-30 acres, at a depth of about 120 feet. Many boulders and pieces of slide rock are incorporated, and the 'pay' horizon represents a false bedrock condition. Values were of the order of 0.144 ounces of gold recovered per cubic yard.
- (2) The Melvin mine, consists of a pre-glacial channel lying on bedrock, at a depth of 165 feet. No boulders are reported, and values amounted to 0.373 ounces of gold recovered per cubic yard.

(3) Intermediate layers exist, as intersected by churn drilling carried out during the 1920's. The information is scanty, however, and no further exploration has been carried out.

PAST PRODUCTION

The following tables have been taken from the report written by Earl K. Nixon, referred to previously, on the Wingdam area. It is stated the figures were verified by personal communication or taken from records kept by Mr. A.M. Richmond, Consulting Engineer, the General Manager in charge of Consolidated Gold Alluvials during 1938 and earlier years. The annual reports of the company and staff records were also consulted.

GOLD PRODUCED DURING CONSOLIDATED GOLD ALLUVIALS OPERATION

<u>Period</u>	<u>Sanderson Mine</u>		<u>Melvin Mine</u>		<u>Total</u>		<u>Year</u>
	<u>Ounces</u>	<u>Value \$</u>	<u>Ounces</u>	<u>Value \$</u>	<u>Ounces</u>	<u>Value \$</u>	
July - Dec.	312.3	9,396.02	-	-	312.3	9,396.02	1934
Calendar Yr.	2,498.2	76,787.31	-	-	2,498.2	76,787.31	1935
do	6,800.1	211,141.90	-	-	6,800.1	211,141.90	1936
do	7,305.8	223,158.58	667.0	21,200.96	7,972.8	244,359.54	1937
do	6,627.1	204,997.35	419.4	13,049.49	7,046.5	218,046.86	1938
To Apr. 30	<u>1,930.6</u>	<u>59,474.33</u>	<u>-</u>	<u>-</u>	<u>1,930.6</u>	<u>59,474.33</u>	<u>1939</u>
Total	<u>25,474.1</u>	<u>784,955.49</u>	<u>1,086.4</u>	<u>34,250.45</u>	<u>26,560.5</u>	<u>819,205.94</u>	
Average per oz.		\$30.61		\$31.53		\$30.84	

The same report quotes the following:

<u>Year</u>	<u>Cu. Yds.</u>	<u>Value</u>	<u>Value per Cu. Yd.</u>	<u>Price Au per oz.</u>	<u>Fineness based on Au @ \$35/oz.</u>	<u>Content oz. Au per cu. yd.</u>
1936	47,780.8	\$211,141.90	4.42	31.05	887	0.142
1937	52,151.2	223,640.26	4.29	30.55	873	0.140
1938 1st Qtr.	<u>21,364.6</u>	<u>103,000.00</u>	<u>4.82</u>	<u>30.93</u>	<u>884</u>	<u>0.156</u>
TOTAL	121,296.6	\$537,782.16	\$4.43	\$30.81*	880	0.144

* Average 1934 to 1939 inclusive.

This production is said to have resulted from mining over a total area of about 28 acres, but gold production apparently resulted from about 15 acres of this.

MELVIN MINE (Deep Channel)

<u>Year</u>	<u>Cu. Yds.</u>	<u>Value</u>	<u>Value per Cu. Yd.</u>	<u>Price Au per oz.</u>	<u>Fineness based on Au @ \$35/oz.</u>	<u>Content oz. Au per cu. yd.</u>
1937	1,821.8	\$21,200.96	11.64	31.79	980	0.366
1938	<u>1,050.0</u>	<u>13,049.49</u>	<u>12.43</u>	<u>31.11</u>	<u>889</u>	<u>0.399</u>
TOTALS & AVERAGES	2,871.8	\$34,250.45	\$11.93	\$31.53	901	0.378

Mr. Richmond estimated that mining in the upstream part of the channel in the Melvin Mine averaged \$10.93 per cu. yd. (0.346 oz. Au/cu. yd.) but the downstream section showed \$33.40 per cu. yd. (1.059 oz. Au/cu. yd.) It would seem that very little of the total was extracted from the downstream section. The average width in both was estimated at about 25 feet; the channel varied from 6 feet to 60 feet in width. The average height mined was 7½ feet.

The gold recovered from both the Sanderson and the Melvin workings is described as "heavy", but not particularly "coarse" or "nuggety". Pieces weighing more than one pennyweight (1/20th of 1 troy ounce) were rare. A great deal of the gold occurred as colours, weighing of the order of 1/10th of a cent to one cent (gold at \$35 per ounce). Although, therefore, a certain amount of fine gold was reported from both the Sanderson and the Melville areas, it is stated in the B.C. Minister of Mines Report for 1935 that the majority of the gold was readily recoverable. All gravels were carefully washed on a shaking screen, and the minus one inch material passed over two sluice flumes. A centrifugal gold recovery machine was used to clean the riffle products. The separation procedure was, therefore, relatively simple and inexpensive.

TOTAL POTENTIAL VALUE - GOLD @ \$100/ounce
 WHODAM - "DEEP" CHANNEL
 (based on churn drill hole information)

<u>Drill Line</u>	<u>Channel Width (ft.)</u>	<u>Channel Area (sq. yds.) (7½' high)</u>	<u>Block</u>	<u>Block Area (sq. yds.)</u>	<u>Block Length (ft.)</u>	<u>Block Volume (cu. yds.)</u>	<u>Average Value \$/cu. yd. (Au=\$100/oz.)</u>	<u>Block Cross Value</u>
D	70	58.33						
C	58	48.33	D-C	53.33	1235	21,954	141.79	\$3,112,900
CC	86	71.67	C-CC	60.00	360	7,200	48.93	352,300
			CC-I	61.67	560	11,512	21.84	251,400
I	62	51.67						
A	70	58.33	I-A	55.00	750	13,750	125.20	1,721,500
AA	72	60.00	A-AA	59.17	520	10,256	120.85	1,239,400
F	64	53.33	AA-F	56.67	480	9,067	40.15	364,000
J (a)	80	66.67	F-J	95.00	870	27,550	28.41	782,700
J (b)	84	70.00						
BB	120	100.00	J-BB	115.34	420	16,568	12.25	203,000
TOTALS & AVERAGES					5195	117,857	68.11	\$8,027,200

Note - (1) Blocks are within churn drill hole intersections, i.e. no allowance for possible extensions has been considered.

(2) Calculations not made by Bacon & Crowhurst Ltd.

ORE POTENTIAL

(1) MELVIN SHAFT AREA

The late Mr. A.M. Richmond, General Manager for Consolidated Gold Alluvials in the 1930's, who was regarded by the mining industry in British Columbia as a capable and conservative engineer, is reported to have stated in his summary report for the first quarter of 1938 that "most encouraging results are being obtained from the workings of the Melvin deep channel gravel (near No. 1 downstream raise), the gold values averaging from 1.0 to 2.3 ounces per cubic yard of gravel and bedrock mined". It is to be noted the workings were flooded immediately thereafter.

Just before the workings were flooded, Mr. Richmond reportedly submitted the following approximate estimates for quantities of gravel still in place, but developed for mining:

Locality	Channel Dimensions - ft.			Au Content Oz. per cu. yd.	Cubic Yards	Value in \$ \$30 net per oz. Au sold
	Length	Width (avg.)	Height (avg.)			
No. 1 Upstream workings	530	30	7½	1.50 to 2.00	4,400	198,000 - 264,000
Downstream	<u>273</u>	<u>30</u>	<u>7½</u>	<u>1.50 to 2.00</u>	<u>2,275</u>	<u>102,000 - 136,000</u>
Totals	803	30	7½	1.50 to 2.00	6,675	300,000 - 400,000
No. 3 - No. 4 Downstream Raise Area					<u>10,000</u>	<u>200,000 - 200,000</u>
Grand Totals					<u>16,675</u>	<u>500,000 - 600,000</u>

Mr. Richmond, therefore, estimated the reserves (at shutdown) to be mined would average (say) $\frac{\$550,000}{16,675}$ or \$32.98 per cu. yd. for gold at \$30.00 per ounce. This would increase to $\frac{100}{30} \times \$32.98$ or \$109.90 per cu. yd. for gold at \$100 per ounce.

(2) SANDERSON MINE AREA

Since this mine reportedly shut down because no mineable economic ore reserves remained, it is reasonable to assume there is little or nothing left in the immediate area at the false bedrock horizon, i.e. 120' below the valley floor. The possibility of other deposits at the same general horizon has not been fully explored.

(3) INTERVENING AREAS

During the 1930's, churn drilling was carried out by Consolidated Gold Alluvials, on cross-lines spaced at approximately five hundred foot intervals along Lightning Creek. These lines extended from the LaFontaine mine workings (upstream from the Sanderson mine) to about one thousand feet westerly (or downstream) from the western boundary of the two placer leases considered in this report. The records of this drilling and other drilling carried out earlier have been made available.

An analysis of this work has been made by others concerning the particular nine cross-lines cutting across the two leases (see accompanying table). These lines are spaced at intervals varying from 360' to 870' with the exception of the most westerly pair, which are 1235' apart. A price of gold of \$100 per ounce was used for easy reference.

The analysis consists of a calculation of possible quantities and values in the "deep lead" zone, with the assumption that the channel and the gold content would be continuous between the lines. The average cross-section area of each block between lines and its gold

content were obtained by averaging the two end cross-section areas and their gold content. No allowance was made in this particular calculation for extensions outside of drill holes considered to be within the channel; this addition would add probably 15% to 20% to the figures. It was considered that the drilling was done properly by experienced men under capable supervision and that the results can be accepted as documented. Partial cutting of high gold values was incorporated in the calculation; Bacon & Crowhurst has checked the approximate arithmetic.

Although it must be noted that gold is very seldom distributed evenly through placer gravels for the distance of about one mile in question (or for that matter from one cross-line to another 500 feet away), it is noteworthy that significant values worthy of attention were obtained on each and every cross-line at bedrock, and the old channel can be reasonably plotted in strike, or plan.

In addition, the calculations correlate approximately with actual mining extraction for those sections worked during 1937 and early 1938.

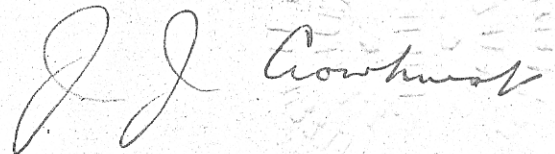
For these reasons, the calculation was deemed to be of sufficient interest to warrant its inclusion in this report.

In summary, it is felt that not enough drilling has been completed to arrive at an ore estimate at this time, but sufficient values have been reported, in our opinion, to indicate that substantial quantities of gold are present.

CERTIFICATE

I, John James Crowhurst, DO HEREBY CERTIFY THAT:

1. I am a practising mining engineer with Bacon & Crowhurst Ltd., 1720 - 1055 W. Hastings St., Vancouver, B.C.
2. I am a graduate of the University of British Columbia and have been granted the degree of Bachelor of Applied Science.
3. I have been practising my profession as a mining engineer for 32 years.
4. I am a member of the Association of Professional Engineers of British Columbia, Registration No. 2120.
5. I nor any member of my firm have directly or indirectly received or expect to receive any interest direct or indirect in the property of the company or any affiliate.

A handwritten signature in cursive script that reads "J.J. Crowhurst". The signature is written in dark ink and is positioned to the left of a faint circular stamp.

J.J. Crowhurst, P.Eng.

Vancouver, Canada.
January 25th, 1975.