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REPORT  
WINGDAM AND LIGHTNING CREEK  
MINING COMPANY LTD. ( N. P. L. )  
WINGDAM B. C.  
C.W. S. TREMAINE

AP. 26. 1961

C. W. S. TREMAINE  
MINING ENGINEER  
VANCOUVER, B. C.

WINGDAM & LIGHTNING CREEK MINING COMPANY

WINGDAM, BRITISH COLUMBIA

BY

C.W.S. TREMAINE  
Mining Engineer

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The property of the Wingdam and Lightning Creek Mining Company consists of 20 miles of placer leases on Lightning Creek in the Cariboo mining district in British Columbia. The leases start near the junction of the Cottonwood River and Lightning Creek and extends 20 miles up stream from here.

Included in these leases are the Melvin and Sanderson mines of the old Consolidated Gold Alluvials of B.C. at Wingdam where a substantial mining operation was carried on in the mid 1930's. It is around this section of the property that the Wingdam and Lightning Creek Mining Company plans to carry on this season's operations.

The main part of this operation will be confined to a section of the creek about one mile long which was drilled and partly developed by the old company.

Available records of the old company show that they drilled 35 holes to give six cross sections of the creek over this one mile length. This drilling shows the deep level, gold bearing gravels, to be six feet deep, to vary in width from 40 ft. to 140 ft. and to be at a very uniform depth of 165 ft. below the present creek bed. The material overlying this deep gravel is a mixture of sand and gravel, for the most part cemented with clays. The old records show that some of these holes returned exceptionally high gold values and the average value of the gold in all of the holes, was \$42.23.

In 1935, the Consolidated Gold Alluvials of B.C. started a mining

operation to recover these deep level gravels. The operation was placed under the direction of an Australian mining engineer and he laid out a development programme similar to that used successfully in Australia for many years to mine deep level gravels.

This consisted of a four compartment shaft sunk in the rim rock to a depth of 280 ft. or 60 ft. below the old creek bottom. From here tunnels or drives were driven up-stream and down-stream under the old creek bed. Raises were then driven up into the old creek bottom to remove the gold bearing gravels. In this case the up-stream drive was advanced 1500 ft. and the down-stream drive advanced 1600 ft. Three raises were driven up into the gravels and mining operations carried on in the gravels for a year and one half. 1800 cu.yds. of gravel are reported to have been removed during this period.

Water was a problem at the start of mining operations but once the gravels were drained the overlying sand and clays appears to have formed an effective barrier against the surface water and seepage was handled without undue difficulty.

The Melvin shaft headframe, shaft house and washing plant erected by the old company over 25 years ago are in very good condition. The workings, of course, are flooded but the top section of the shaft, above the water level, is in first class condition and it is quite probable that the whole of the shaft will require only minor repairs to put it in operating condition.

After careful consideration by its engineers, the Wingdam and Lightning Creek Mining Company, has decided on a programme to pump out and rehabilitate the old workings, and expects with the aid of new grouting technique, the installation of safety doors and other minor changes in mining details, to be able to successfully recover the deep level gravel in Lightning

Creek.

A detailed discussion of deep level mining operations around Wingdam is attached here to.



C.W.S. Tremaine  
Mining Engineer.

"C. W. S. TREMAINE"  
P. ENG.

C. W. S. TREMAINE  
MINING ENGINEER  
VANCOUVER, B. C.

In preparing this article facts and  
figures have been taken from:

Memoir 149 Dep't. of Mines

Annual Reports of the Minister of Mines of British Columbia

Written reports of other engineers who were on the property

when it was in operation.



C. W. S. TREMAINE  
MINING ENGINEER  
VANCOUVER, B. C.

DEEP LEVEL MINING ON LIGHTNING CREEK

IN

BRITISH COLUMBIA

BY

C.W.S. Tremaine  
Mining Engineer

Feb. 25, 1961

## DEEP LEVEL MINING AT LIGHTNING CREEK

Gold was discovered on Lightning Creek in July 1861 by Ned Cambell and his companions who opened up a rich claim from which they took 1700 ounces in three days washing. A great rush followed this discovery and, during the year, many such rich strikes were made. The activity during the early years was confined to a three mile stretch of the Creek between Stanley and Spruce Creek. In this part of Lightning Creek the gravels were loose and porous making it difficult to work even though the pay streak was only 8 to 30 ft. deep. As these shallow parts of the creek became worked out, attempts were made to work the deeper sections but most of these early attempts were unsuccessful due to the inadequacy of the pumping equipment available. It was soon realized that, if these deeper gravels were to be worked successfully, better equipment and more elaborate development would be necessary.

In 1870 six companies were back at work with improved machinery and larger pumps. Three of these companies affected their object by sinking in the bedrock at the side of the creek and then drifting into the channel. As a result of the success of these ventures activity was renewed and some more very rich ground was opened up. As there is very little boulder clay in this section of the creek, water was still a problem that required much attention. In one instance it was overcome by extensive pumping being done by several companies. At one period it is reported that there were four mines running their pumps 24 hours per day and pumping 19,972,000 gallons of water per day. Even with this difficult water situation many successful operations are reported.

In 1903 we have the first attempt to mine the deeper part of the channel below Stanley where the boulder clay is present in much greater



thickness. Cariboo Cons. Ltd., operating the La Fontaine mine, started operation in 1903. A line of bore holes to determine the depth of the channel were first put down about  $2\frac{1}{2}$  miles below Stanley and then another line was put down about 2000 ft. up-stream. The bore holes showed the bedrock to be at a depth of 165 ft. and showed the presence of a thick bed of boulder clay overlying the gold-bearing gravels. With this information in hand a working shaft was sunk 165 ft. in bedrock on the south bank of the stream and a tunnel driven to the main channel. Tunnels were then run up and down stream and in the first instance the up-stream tunnel was driven 1350 ft. From this tunnel controlled openings were made into the channel at various points to allow the water to drain out of the gravels under the overlying boulder clay. Removing this original water was a big operation requiring the pumping of up to 2,000,000 gallons per day but when the gravels were drained the average flow dropped to about 560 gallons per minute or 806,400 gallons per day. The amount pumped increased only slightly during the freshet so it is probably that the layer of boulder clay formed an impervious barrier to keep out most of the surface water. Once the drainage operation was completed there seems to have been no difficulty in removing the gold-bearing gravels in the usual manner.

The La Fontaine operated from 1903 to 1907 and, while it was not a financial success, it proved that the deep gold-bearing gravels under the boulder clay could be successfully mined. In this regard it is probably worth while to quote from the Memoir 149 of the Dep't. of Mines speaking of the La Fontaine operation " and was probably the best equipped and most efficiently operated deep-drifting mine that has been opened in the Cariboo."

In 1896 the Lightning Creek Gold Gravels and Drainage Co. Ltd. acquired control of some 20 miles of placer leases situated on lower Lightning Creek near Wingdam. From then until 1921 various attempts were made to work these

leases but from all accounts the operations as a whole were very poorly directed and the situation is probably well described by J.D. Galloway, Resident Mining Engineer, in his report of 1923 where he wrote " but no continuous, efficient development system has been carried out by the management. The results so far attained are not commensurate with the amount of money that is stated to have been spent. The repeated starting and stopping of operations have used up a lot of money, but with little to show for the necessary expenditure." During this period referred to above, there appears to have been a number of Keystone drill holes put down and the depth to bedrock established at a very uniform depth of 165 ft. below the center of the channel. Also the presence of a bed of boulder clays of varying thickness was found to over-lie the deep bedrock gravels.

In 1931 the company was reorganized under the name of Consolidated Gold Alluvials of B.C. Ltd. Under the new management new camp buildings, shops and power house were built and a programme of development started. By 1933 the operation had reached a good size with 100 men employed. Number 2 shaft ( later known as the Sanderson Mine) was unwatered and re-conditioned. The gold run on false bedrock at 123 ft. in this shaft was extensively followed up-stream and at the end of the year had reached a point 500 ft. from the shaft. At this time the workings were reported to be dry overhead, being protected by the overlying deposit of boulder clay. Work was carried on in this area for 8 years and in 1938 the working area was reported to cover 20 acres. There does not appear to have been any serious operating difficulties during this time and it was closed down in April 1939 on account of the values in the gravels having dropped to a point where it was no longer profitable to carry on mining operations. In the B.C. Minister of Mines Report of 1938 J.A. Mitchell,

Resident Mining Engineer, reporting on the operation of the Sanderson Mine states as follows: " Provided experienced men are in charge, these gravels can be safely worked without difficulty."

At the same time that the Sanderson Mine was being worked through Number 2 shaft, work was being carried on at the Melvin shaft to open up the deep bed rock gravels. By 1935 the Melvin shaft had been sunk to a depth of 280 ft. and a programme of development similar to that used in mining similar deep deposits in Australia was under way. From the bottom of the shaft, which is now 60 ft. below the channel, drifts were run up and down stream and, at regular intervals bore holes were drilled up into the channel to drain the water from the overlying gravel. By 1936 the water had been lowered to a point where it was possible to raise up from the main drift, break into the channel and start mining the gold-bearing gravels above. This work appears to have gone along without difficulty as, in 1936, the mine is reported to have produced 1,821 cu.yds. of gravel and a second entry was made into the channel. On March 22, 1938 after the third entry had been made into the channel and, after about one and one half years of working in the channel, one of the working faces broke into a weak section in the gravels, caused by earlier mining operations, and a heavy flow of clay and water broke through and flooded out the pumps. No attempt appears to have been made to rehabilitate the mine or to assess the extent of the flooding and this section of the operation was closed down.

Based on the experience of mines which have operated in the Lightning Creek area, it would seem that it is quite safe to say that the deep bedrock gravels in the Lightning Creek can be safely mined provided the operation is well supplied with pumping equipment, is closely directed and under the control of experienced personnel.

The early day miners worked successfully without the protection of the boulder clay cover and, while pumping was a problem, they were still able to carry on some very profitable operations.

La Fontaine operated for 4 years with workings extending over 1350 ft. up-stream under the protection of the boulder clay cover. They also went so far as to break into and drain some old workings without any reported difficulties.

The Sanderson Mine operated successfully for a number of years and covered an area of over 20 acres without any apparent difficulties. It is quite true that the Sanderson Mine was not on bedrock but it was under the boulder clay at a depth of 125 ft. and working conditions here should be little different than at 165 ft. depth on bed rock.

The operation at the Melvin property was, unfortunately, not carried to a successful conclusion. However, in assessing this property, it must be recognized that a lot of underground work was carried out between 1933 and 1938.

The major parts of this work were: The down-stream drive was driven 1600 ft. and the up-stream drive was driven 1500 ft. The gravels were effectively drained and three entries made into them. Mining operations were carried on in the gravels for about 1½ years. This represents a lot of work and it seems that maybe the flooding of the mine has taken on a greater significance than is justified and, thus, has been allowed to overshadow some of the important work that was accomplished during this period. The flooding of the mine does not appear to have been due to a failure of the mining system. It was more likely due to an error of judgement in failing to recognize the probable extent of the old workings around number one shaft and to keep the new workings away from



this area or provide special safety measures to take care of a break through or other dangerous occurrences.

Mr. Campbell MacKenzie, the mining engineer who was responsible for laying out the development work and who was general manager from 1934 until June 1937, when called back to report on the flooding, had the following to say. "Bad as the situation is I see no need to refer to it as a catastrophe. The recovery of the mine is not an insuperable operation, as the word would convey. The real catastrophe, in my mind, is the inexcusable delay in carrying out the necessary work of getting the mine back into working order again."

During the course of the development of the Melvin property, a connection was made between the workings of the Melvin and the Sanderson mines. It is interesting to note that, when the Melvin shaft was flooded out, the Sanderson workings were not affected. The water was kept out of the Sanderson workings with a pump which handled 500 gallons of water per minute. Work was carried on in the Sanderson mine for over one year after the flooding of the Melvin shaft.

For some time past the company has been looking into the use of some type of stabilizing agent to use in connection with this mining operation. A substance called Cyanamid A M 9 shows promise of producing the desired results. R.C. Clough Engineering Company has been engaged to make some field tests with this material. If it produces the expected result, it will be possible to use this material to seal off any zone of weakness or to stabilize pillars between working areas or even stabilize and make impervious the bed of the creek.

After careful consideration of all the available information the Wingdam and Lightning Creek Mining Company has decided to re-open the Melvin Mine.

The first operation will be to pump out the old workings which are quite extensive. On the question of water and slum coming in through the old break through it is thought that after standing for 25 years there is a good chance that the boulder clay has washed down into, and sealed off at least partly and probably wholly the area of the old break through. If, after pumping is started, it is found that this is not the case then the area will be stabilized with grouting pumped into the area through drill holes from the surface.

When the old workings have been de-watered and cleaned out the old entries into the channel will be sealed off to ensure against future trouble from this area. Once this has been done and the gravel bed drained entries will be driven up into the channel and mining operations carried on.

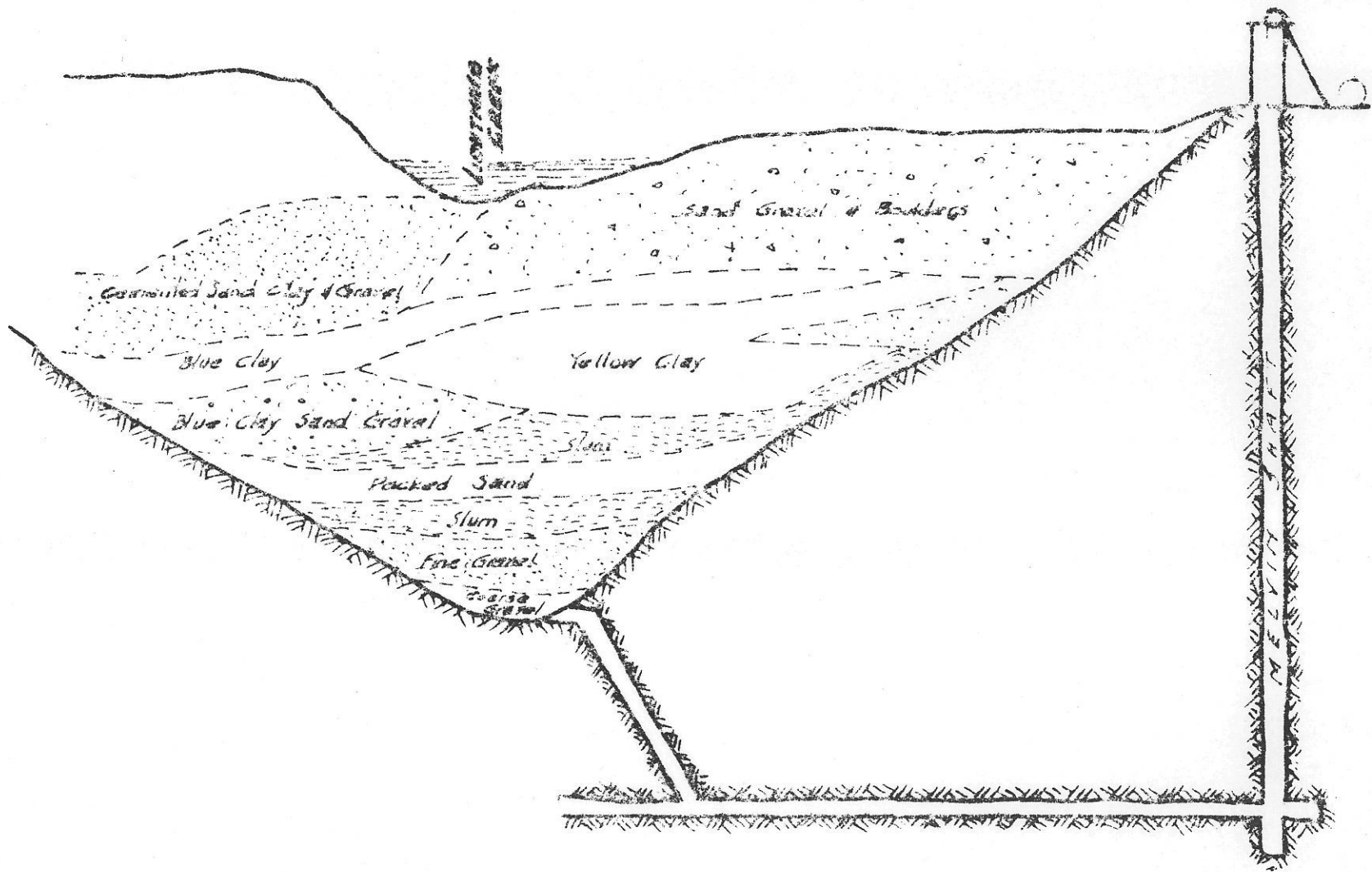
Some changes in mining methods will be made such as the placing of a steel, water tight door at the entrance to each working place so that the working place can be sealed off in case of difficulties.

With these safety doors, with adequate pumping equipment, the use of grouting where necessary and with a competent operating staff who will have the benefit of the experience of the past operations we feel that the Melvin property can be put back into operation to recover the gold in the deep gravels of Lightning Creek.



"C.W.S. TREMAINE"  
P. ENG.





SECTION THROUGH  
MELVIN SHAFT and LIGHTNING CREEK

APRIL 26 1961

B. C. S. JORMAN

# C. G. A. OF B. C. LTD.

MEMO

WINGDAM MINE.  
WINGDAM, B.C.

TO:

DATE:

FROM:

RECOVERY PLANT

SUBJECT:

Test made April 9th, 1936.

*(2 days run of mine)*

Expanded metal screens only used in the sluice boxes,  
no blanket or matting used.

925 cars equivalent to 467 cubic yards sluiced.

Sluiced gravel concentrated 2101 to 1 in sluice boxes

6 cubic feet of minus  $\frac{1}{2}$ " concentrate obtained

5 cubic feet of minus  $\frac{1}{8}$ " or 757 pounds put through the  
Lorenson machine

Specific gravity of concentrate - 2.43

Concentrate nearly all black sand.

Practically no plus  $\frac{1}{2}$ " in the sluice boxes.

Time required to run the machine - 12 minutes

Gold recovered - 53.97 ounces Troy

Complete time of recovery until bullion was weighed and  
sealed ready for shipment - 4 hours.

Two men employed in the recovery.

*Lorenson*