

SHOPS:

The shops are equipped with machinery adequate to make any necessary repairs for the dredges, but are dirty, poorly lighted and not well arranged for easy handling of heavy material and rapid work.

It is my observation and opinion that the shops need a first class master mechanic in charge, for at the time of my visit an upper tumbler for one of the large dredges was cracked when it was being shrunk on the shaft. This occurrence I believe to have been due to lack of proper superintendence.

ROLLING STOCK:

The automobiles, trucks, tractors and wagons run but are in a general state of disrepair and, in the interest of economy of upkeep, should be replaced as rapidly as circumstances permit.

Horse-drawn vehicles are the most expensive means of transport and the horses should be disposed of as soon as they may be replaced by tractors.

THAWING:

Klondike Valley: The thawing of frozen gravels by the use of water, at atmospheric temperatures, conducted into the gravels by means of pipes which reached the bedrock, was introduced into Alaska by the writer in 1918. Since that date many improvements have been made in the layout of equipment, character of equipment for easy and speedy work, and in the methods of driving the thawing points and of testing the area after the thawing is judged to have been completed. None of these improved methods are in use in the Klondike district.

It was observed that casing was being employed in sinking the drill holes made to receive the thawing points. Inquiry of Mr. Baird, manager of the Yukon Consolidated Company, brought out the further fact that the gravels are steam-thawed before driving casing and drilling. As this is a most expensive proceeding, I asked why this method was followed and he replied that his super-

intendent of thawing reported that it could not be done otherwise in these Klondike River gravels.

Heretofore it had been found by experience that by spacing the thawing points at 50-foot intervals, the thaw would be satisfactory, and it was decided, in the interest of economy, by way of saving the cost of drilling, to increase the spacing to a 75-foot interval for the season of 1930. The digging of Dredge No.3 for the season of 1931 proves that this spacing is too great, as the thaw was not complete and the boat dug but 50% of its normal capacity for the season.

During the period September 1 to October 20, or 50 days, Canadian No.3 dug 155,800 cu. yds. - equal to 3.115 cu. yds. per day.

It was observed that there was 8 to 10 feet of frozen much in front of this dredge, but the dredgemaster reported the gravels thawed. However, the tailings piles showed but little evidence of bedrock.

When gravels are not thawed, they cannot be entirely disintegrated while passing through the screen, which means a loss of gold over the stacker, and there is a further loss if the bedrock remains so frozen that it cannot be dug.

When it was discovered this past season that the gravels were not sufficiently prepared, intermediate thawing points were placed in the center of the squares made by the previously placed points, but there was insufficient time allowable for the water to run in these extra points to make a complete thaw, and Canadian No.3 has had poorly prepared gravels to dig all season.

There is no properly prepared ground for this dredge to commence digging next season, and the drilling done this year for next season's thawing has spaced the thawing points at 75-foot intervals.

To complicate the handling of Dredge No.3, the main feed line for the thawing plant is but 75 feet from the edge of the dredge pond, and in consequence great care had to be taken with the lines so as not to tear out the

thawing plant.

It is reported that the dredging area immediately ahead of Canadian No.2 is from 60 to 75% unfrozen gravels, thus reducing the area to be thawed to from 25 to 40%, and further reported that the area dug for the season of 1931 by Canadian No.4 was completely thawed. This dredge has been digging in the Klondike River bed and in the banks adjacent thereto, and are naturally thawed by the flowing waters of the river.

It was reported to me unofficially that the approximate yardage dug for the season of 1931 by Canadian Boats Nos.2 and 3 was 1,000,000 and 800,000 cu. yds., respectively, which indicates that Dredge No.2 was also delayed by frozen or partly frozen gravels, and Dredge No.4 was probably held back by the same cause. This is far below the capacity of these dredges, which records show to have previously produced the yardage as follows:

<u>Dredge No.</u>	<u>Years</u>	<u>Length Period</u>	<u>Total Cu. Yd.</u>	<u>Cu. Yd. per Season</u>
2	1913-22	10 yrs.	16,065,539	1,606,553
3	1913-17	5 "	9,119,735	1,823,748
4	1913-22	10 "	17,260,209	1,726,020

During the foregoing periods these three dredges were operating in the naturally thawed ground of the Klondike River bed and the adjacent banks, and are herewith presented to show the average operating capacities of these dredges, and the deduction therefrom is that the gravels are not now being properly thawed and prepared for digging.

It is now the generally accepted practice in Alaska to thaw gravels two years in advance of digging same; that is, the gravels are thawed one season and allowed to stand over the following season and mellow, and are then found to dig much more readily, and better yardage thus results. This presupposes an adequate supply of water and sufficient capital to carry two years' charges before returns are made from the ground.

There is an adequate supply of water in the Klondike river and plenty of

power for pumping purposes and any plan for future preparations should provide for preparing the ground two years ahead of digging same.

DOMINION CREEK:

The thawing operations were shut down at the time of my visit to Dredges North West Nos.1 and 2, so I did not observe the plants there. It is to be assumed, however, that the plants at these areas are working more efficiently than those in the Klondike valley, as the yardage obtained here is more nearly equal to the average capacities of these dredges.

The method of operation of a thawing plant on Dominion Creek is different from the practice in the Klondike valley, for, as the ground is shallower and the gravels not so coarse and heavy, it is not necessary to drill holes in which to insert the thawing points, but the points are forced to bedrock by the aid of the jet of water issuing from the point, which washes out the hole for itself, being occasionally aided by driving with a hammer.

My observation at Dredge North West No.2, now located about three-quarters of a mile downstream from the site of the old town of Granville, was that the gravels were well thawed and the dredge was digging to capacity. Dredge North West No.1 was closed down for the winter at the time of my visit, November 1.

An old document, presumably prepared by A. C. N. Treadgold in 1928, which is headed "This synopsis is for the information of Shareholders; it is not an invitation to subscribe to shares," contains a paragraph as follows:

"In 1925 the principal companies decided to dispense with steam thawing, except in emergencies. From that date sun heat and flowing water have been substituted for steam as thawing agents, with complete success."

The water-thawing method had been in use in Alaska from 1918 onward.

The proper preparation of the ground for dredging has been stressed, as on this point hinges the ability of the dredges to dig to capacity and thus produce sufficient revenue for a successful operation. The actual cost of operation is almost a fixed amount for the season, and is therefore the same whether

800,000 or 1,500,000 cu. yds. are dug for the period, but the cost per cubic yard is reduced proportionately as the amount of gravel dug approaches the capacity of the dredge.

TESTING AND PROSPECTING:

For some number of years no systematic testing has been carried out, although a few shafts are being sunk this year on Upper Dominion to roughly outline the limit of pay.

There is expressed a lack of trust in the reliability of drill hole results and shafts only are used for testing purposes.

Present day practice in sampling frozen gravel with Keystone drills has fully demonstrated that the results obtained thereby are reliable, as has been proved by subsequent dredging.

It is believed by the present manager that approximately the full widths of both the Klondike and the Dominion valleys may be dredged at a profit, and is proceeding on these lines. Such practice might possibly be allowable if the gravels are all naturally thawed and the gravels tested when being dug, and in the event that they are not judged to pay, such an area may be dropped off; but if the gravels must be thawed at considerable expense, it should first be ascertained by testing if the value of the area will justify the expense.

If the area is properly laid out, the holes drilled for testing purposes may be subsequently used for the thawing points and the only additional cost would be that of taking the sample and calculating the result.

A rule of thumb method is now being employed, in which the gold is panned from some of the holes, drilled for thawing points, weighed and noted. No calculation for value per cubic yard is attempted, as there are no measurements of the cores taken.

It was stated to me by Mr. W. A. T. MacFarland, a former manager of the

properties, that no great reliance should be placed on any previous drilling records, as he did not believe such work to have been done by competent men.

The man now in charge of the drilling states that Klondike River gravels cannot be drilled without first thawing same. Such^a statement as this, after having drilled several thousand feet in frozen gravels on various creeks in different districts in Alaska, seems incredible and indicates something wrong in this department which at least warrants investigation.

COSTS:

The cost records of the company were not available, so that I might study and digest them, but I was verbally informed that the cost of dredging in the Klondike valley in naturally thawed gravels is four cents per cubic yard and for the frozen areas, eight cents per cubic yard, or four cents per cubic yard for thawing.

The total cost for the Dominion Creek dredges is 15 Cents per cubic yard.

These figures are stated as being all costs at Dawson, with the exception of power, which has been excluded as per advice from Ottawa, emanating, I understand, from Mr. A. C. N. Treadgold. This may be a matter of bookkeeping, for as a fact the sale of power to the City of Dawson more than pays the cost of the power plant; in fact, produces a small profit, but more properly it should be charged and later credited by subsidiary income.

The figures include all major repairs, such as new buckets, stacker belts, etc, which have considerably more life than a dredging season, so that the actual cost cannot be made without an analysis of the cost sheets and certain redistribution made of various items.

The foregoing costs compare most favorably with those of the Alaska fields, where 25 Cents is considered a good figure. The two fields should not be compared directly, however, as the Klondike field is more favorably situated, has less muck or overburden, much cheaper power, and a more abundant supply of water. However, the costs in the Klondike field may be materi-

approve of dredges and Mr. Rendell states that he is of the same point of view.

GRAVEL RESERVES:

Without complete production records and the company's maps, showing the areas now worked out, it is possible to give only a very rough estimate of the gravel reserves and their possible value. However, from my visual observation, I believe that there are sufficient reserves to warrant carrying on the business.

From outside sources I hope to get sufficient data to later present a report containing more definite estimate of the gravel reserves and possible profit.

KLONDIKE VALLEY:

Ahead of Canadian Klondike No.3 there are available 4,000,000 cu. yds. which, on account of its location and possible enrichment from the bench gravels, are expected to produce a better average value per cubic yard than the average tenor recovered by the dredges in the Klondike valley, which has been close to 13 Cents per cubic yard.

No.3 is now headed downstream, approaching the mouth of Bonanza Creek, from which point the Klondike has been dredged its full width.

Canadian Klondike Dredge No.2 is now situated about one mile downstream from the Bear Creek camp and is close to the left limit of the Klondike valley.

This dredge is headed downstream and there is a dredgeable area ahead of approximately 17,000,000 cu. yds.

This area might be assumed to carry the average value heretofore recovered, namely, 13 Cents per cubic yard, but Dredge No.3 dropped off a considerable in moving from its former location on the right limit of the valley to its present location close to the left limit. There seems to have been no reason for this, except that the value in the gravels was below working

costs. Therefore, the above estimate may be considerably reduced; by what amount can only be determined by testing.

Canadian Klondike Dredge No.4, now located on the right limit bank of the Klondike River itself, two miles from the mouth of Hunker Creek, is in the midst of a dredgeable area extending from the Bear Creek camp to Hunker Creek, which contains at least 20,000,000 cu. yds. The value is not definitely known and will, therefore, be assumed at 13 Cents. However, it is believed to have a higher tenor in the area near the mouth of Hunker Creek, which seems reasonable, for this area should have been enriched by Hunker Creek itself, further aided by the reconcentration of bench channel gravels which existed on both sides of Hunker Creek at its mouth.

From the foregoing, there is shown to be available in the Klondike valley at least 41,000,000 cu. yds. between the mouth of Hunker and Bonanza Creeks, which has been assumed to have an average value of 13 Cents per cubic yard. It is believed there will be developed that amount of the said value, as the widths assumed in estimating the areas are conservative.

DOMINION VALLEY:

Upper Dominion - North West Dredge No.1 is just above the mouth of Caribou Creek, said to be on Claim No.25 below Upper Discovery and estimated by Mr. Baird to have three seasons' digging ahead of it.

North West Bredge No.2 is situated about three-quarters of a mile downstream from Granville. This dredge is 2.5 miles above the junction of Dominion and Sulphur Creeks, to which point it is generally believed with certainty the values will extend.

W. E. Thorne estimated in 1911 that Dominion Creek from Gold Run to Sulphur contained 400 acres, evaluated at a net value of \$3,049 per acre. Approximately $33\frac{1}{3}\%$ of this area has been now worked, there at present remaining 266 acres, with a net value of \$911,300. An equal amount might be estimated to the junction of Dominion and Australia Creeks.

Indian River: This is the lower valley of Dominion Creek, but is so named below the junction of Dominion and Australia Creeks. From the junction to the Yukon River it is approximately 35 miles. There has been but little information obtained on the possibilities of this stream since the date of Mr. Thorne's report in 1911, in which he states as follows: "Very little prospecting has been done on account of the thawed gravel and too much water preventing the prospectors from reaching bedrock. Evidence of pay over a part of the area at least is very good, as by reference to the map one can see a number of feeders, all of which carry some gold. Indian River offers the best showing for an immediate producer that I have seen in the Yukon country outside of the Klondike River."

This area can only be determined by prospecting, but is of large potential value and capable of containing large reserves, and a campaign should be laid out for its development in the near future, so that same may be worked or dropped if not found to be of value.

Sulphur Creek: There has been nothing in the nature of development on this creek since 1911; therefore, Mr. Thorne's report will again be quoted:

Length	34,412 feet
Average depth pay	12 "
Average width pay	1,120 "
Cubic yards gravel	17,142.394 -
Value per cubic yard	\$0.60
Gross value	\$10,285,436

Mr. Thorne believed these gravels would be best worked with steam shovels, but it is the writer's opinion that they may be worked to better advantage with dredges, and it is expected thereby to increase the net profit. There is now available the machinery of two small dredges, a part of the equipment taken over from the Yukon Gold Company, which would be rebuilt at Sulphur Creek.

Some prospecting should be carried out before definitely proceeding with this program. It may be here noted that Mr. Baird stated the production from Golden Run Creek to have been a very close approximation to

the estimate made in Mr. Thorne's report of 1911.

From the foregoing figures it may be seen that the properties still contain large potential areas and that one area at least, namely, Sulphur Creek, will probably justify equipment in a comparatively short time.

PROFITS:

My information, with respect to this season's operations, is that the output has been approximately \$700,000 and that the operating costs were \$500,000, which includes some heavy charges for reconditioning the dredges and payments on old accounts - leaving an operating profit of \$200,000. A study of the data for the season would be necessary to make any accurate deductions.

It is my opinion that this figure may be substantially increased next season, with the present equipment brought up to capacity and with a further expectancy that Canadian Klondike Dredge No.3 will get better pay as it gets further downstream and closer to the mouth of Bonanza Creek.

I do not know that any prospecting has been done in this area, but this area should have been enriched by the reconcentration of bench channel gravels, for it is opposite Jackson Gulch and the high level gravels crossed the valley to the right limit of the Klondike at about this point.

With one more dredge operating on Sulphur Creek, the production could probably be brought to \$1,200,000 per season.

It will be necessary in the near future to plan for some production to replace North West No. ¹/₂, which is estimated to have but three more seasons' work ahead. It is my understanding that this dredge had a very good season and produced more than its proportionate share of the season's returns.

LOCAL OPINION AND COMMENTS AT DAWSON:

An opinion often expressed by government officials, bankers, merchants and others is that if Mr. Treadgold returns to the Klondike in charge of the company's operations, the business is doomed to failure.

TWEET AND PETERSON TRACT:

There is a small tract of unworked high grade gravels near the mouth of Gold Run Creek, on which Mr. Bair estimates there is enough value to warrant the reconstruction of the small dredge now at the head of Gold Run. This should be investigated.

Some years ago Mr. Treadgold had an option on this property, which later expired during his absence. Subsequently Mr. Baird obtained an option on the property for the Big Creek Mining Company at about half the price to Treadgold, the purchase price to be paid from ten per cent of the gross bullion as produced. After this agreement had been made. Mr. Treadgold returned to the Klondike and, hearing of this, saw the owners, who broke their agreement with the Big Creek Company upon payment by Treadgold of one-half the original price to Treadgold, and subsequently the remaining half was paid to Tweet and Peterson by the Yukon Company. It is understood that Treadgold says this is his personal property, and, when North West Dredge No.2 reached the line of this property, would not allow it to proceed, and it was turned downstream, leaving it as an isolated piece of valuable ground.

COAL CREEK:

In my supposed character as a visiting engineer looking for properties, I was presented with numerous prospects, both lode and alluvial, among which was Coal Creek, a tributary of the Yukon River, some 120 miles downstream from Dawson and in Alaskan territory.

When the property was presented, I was informed that certain substantial sums had been received by the owners from Mr. Treadgold by way of payments to keep the option alive, but for which Treadgold had no equity in the property. They stated that they would like to conclude the business with Mr. Treadgold but had waited so long that it seemed useless to delay longer, and therefore offered the business.

I am informed that some \$70,000 was paid to the intermediary and the owners.

One of the owners gave me for inspection a report written by Frank R. Short for the Yukon Gold Company in August, 1914, which is summarized as follows:

Physical Conditions:

Dredging ground from Yukon: 8 miles upstream
 Stream flow: 300 to 10,000 miners inches
 Valley average width: 1200 feet and bedrock flat
 Bedrock: slates and conglomerates
 Gravel: medium without boulders
 Average depth of gravel: 8 feet
 Muck: 1 to 15 feet
 Ground 80% frozen

Estimate of Value:

Length 24,000 feet; width 240 feet; depth 14 feet		
Yardage: 3,100,000 cu. yds.		
Value: 65¢ per cu. yd.; gross value:		\$2,015,000
* Working cost: estimated at 35¢		<u>1,085,000</u>
	Working profit	930,000
Estimated cost moving Yukon No.3	\$60,000	
" " Diesel plant	40,000	
Purchase Price	<u>300,000</u>	<u>400,000</u>
	Net Profit	<u>\$ 530,000</u>

*Cost includes thawing with steam

CONCLUSIONS AND RECOMMENDATIONS:

Whereas it is difficult to present a definite concrete evaluation of the properties, with the limited data and facilities placed at my disposal, it is my opinion, after having noted the progress made this season under adverse conditions and a visual survey of the equipment and possible dredgeable areas, that the business may be made the source of a substantial income, sufficient to pay a good rate of interest on present capitalization, for a long term of years.

Therefore it is recommended that a complete survey be made, which should specifically include a study of up-to-date thawing methods, as upon economic and efficient thawing depends the whole proposition of profits. Further,

adequate prospecting should be provided, for, as Canadian Klondike No.3 has but a short life ahead of it, unless it be turned back upstream after finishing at the mouth of Bonanza. If this is to be the case, the dredging downstream should be so arranged that it shall leave a dredgeable area for the return. In any event, it is necessary to make these plans soon, so that the dredge will not get into a pocket.

North West Dredge No. 2¹ has but a short life ahead of it, and preparations by way of prospecting, stripping and thawing should be commenced at once, at whatever may be the new location for this dredge. Ostensibly, Sulphur Creek is indicated, but this will have to be proved before re-erecting a dredge there.

It is to be remembered that a year has only 180 days in the Klondike and any delay of a week here equals two weeks there; this is with special reference to being ready to start the necessary drilling for the thawing plants in the Klondike valley at the earliest possible moment.

Respectfully submitted,

Eugene A. Dawson.

New York, N.Y.,
December 18, 1931.



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