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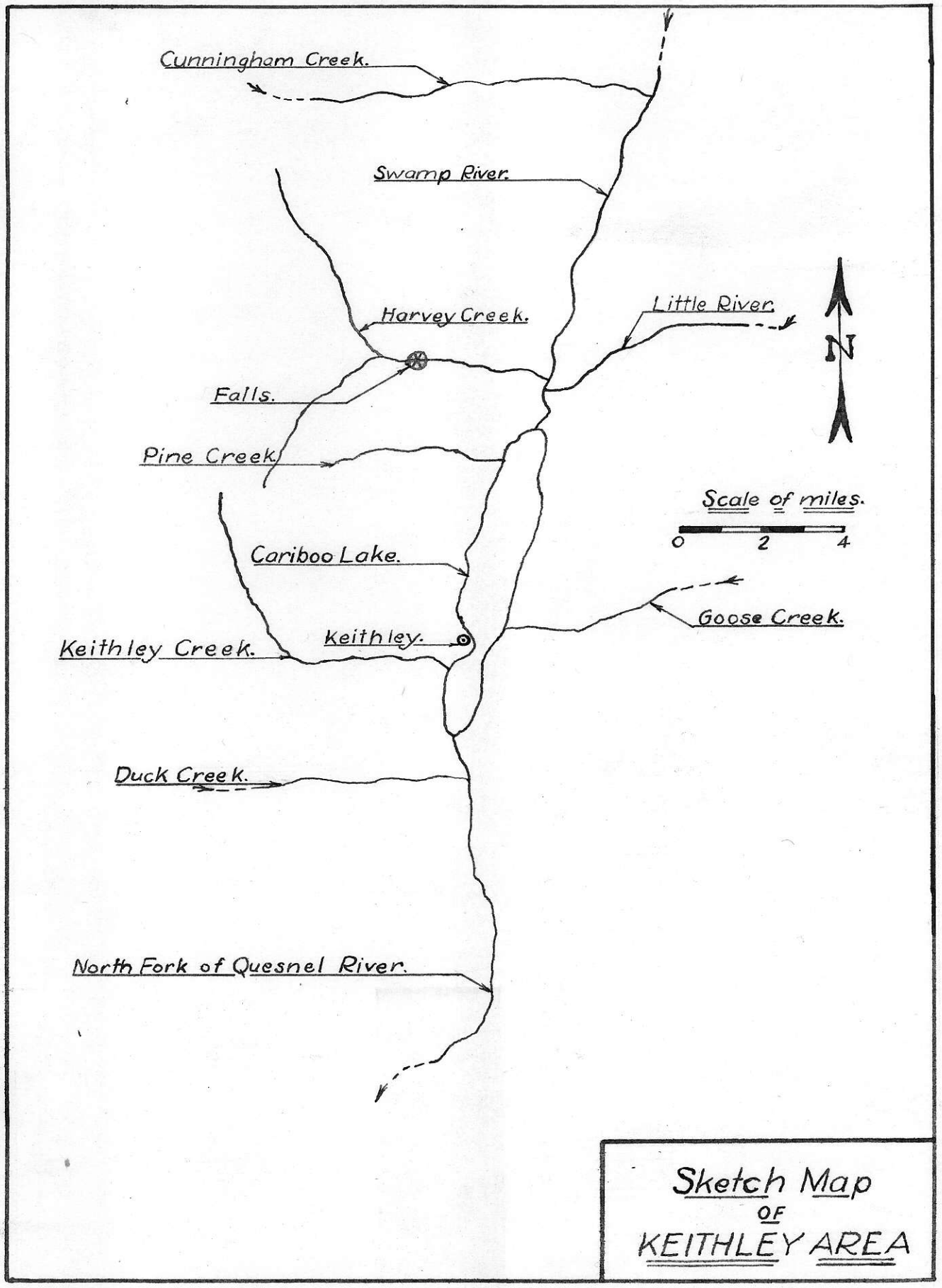
DEVELOPMENT OF HARVEY CREEK BY BURRARD PLACERS LTD.


Cunningham Creek.
Swamp River.
Harvey Creek.
Little River.
N
Falls.
Pine Creek.
Scale of miles.
0 2 4
Cariboo Lake.
Goose Creek.
Keithley.
Keithley Creek.
Duck Creek.
North Fork of Quesnel River.
Sketch Map
OF
KEITHLEY AREA

W.B.

1. INTRODUCTION.

(a). History of Keithley area.

Keithley, B.C., is situated on the west shore of Cariboo Lake, about four hundred and fifty miles north of Vancouver. It is reached by a road branching off the Cariboo Highway at the 150-Mile House. The Keithley area, drained by rivers and creeks running into Swamp River, Cariboo Lake, and the North Fork of the Quesnel River, has long been noted for the extent and richness of its placer deposits. Such creeks as Keithley Creek, Harvey Creek, and Cunningham Creek have been eclipsed only by the world-famous Lightning and Williams Creeks in the Barkerville area thirty miles to the west, and were consistent producers in the days of the Cariboo Gold Rush. In the old days, access was difficult and transportation costs high, with the result that only the richest ground could be worked, and a lot of ground that today is being worked profitably was left untouched. As an example of these high costs, records show that drifters working on Harvey Creek had to take out one ounce per set per man per day to make expenses. The average set in the old drifts was about four feet by five feet by four feet long, or about four and one-half cubic yards, so that with a three-man crew in each drift, the ground had to run about twelve dollars per yard to be profitable. Ground of lower value was left, and it is on this ground that modern hydraulic methods are being used. The usual method is to go over the old workings, removing

the timbers, and washing the creek out from rim to rim. The difficulties connected with the working of these creeks by large scale hydraulicking will be particularized for Harvey Creek and the operations of Burrard Placers Limited.

(b). Harvey Creek - location, past history and recent work.

Harvey Creek runs from the west into Swamp River about a mile above Cariboo Lake. The country is fairly rugged, but with numerous basins and small plateaus, and, being well timbered, it forms an excellent watershed which holds snow until well into summer. One of the usual problems of hydraulic operations is the shortage of water in the hot summer months of July and August, and in a normal year, operations are frequently curtailed during August at least. Usually however, rainfall over the Harvey Creek watershed is sufficient to provide water continuously through the summer. The camp is located at the falls, about three miles above the mouth of the creek, and is about twelve miles by trail from Keithley. Supplies are brought up Cariboo Lake by boat, and packed from the mouth of Harvey Creek.

Harvey Creek was being worked at about the same time as Williams Creek, and was almost as rich. Not very much is known of its history, although there are available one or two maps and cross sections showing the extent of the old workings. The most interesting facts

are those concerning the richness of some of the workings. One stretch of ground averaged one thousand dollars per square foot of bedrock cleaned up. Another stretch went eighty-five ounces to the set or about three hundred dollars to the cubic yard. Although present operations do not as yet uncover fabulous values like these, still the knowledge that such values have been obtained in the past does a great deal to maintain interest in placer mining.

Recent work, in summary, has not accomplished a great deal due to difficulties which will be mentioned in detail later. However, a good start had been made, with a dam, pipeline, and monitor completely set up and in operation, and with a continually advancing line of sluice boxes working upstream toward the falls. It is the opinion of experienced engineers that Harvey Creek is one of the toughest mining propositions in B.C., but in a year or so, the company expects to have overcome all problems, and settle down to steady production.

2. GENERAL PROBLEMS.

A study of the plans of the old workings revealed that the old channel went around the north end of the falls, and was about seventy feet deeper than bedrock at the falls. Apparently the old channel had been filled in either by a large rock slide, or, as later proved to be the fact, by glacial outwash. Close examination revealed the two rims of the channel both above and below the falls,

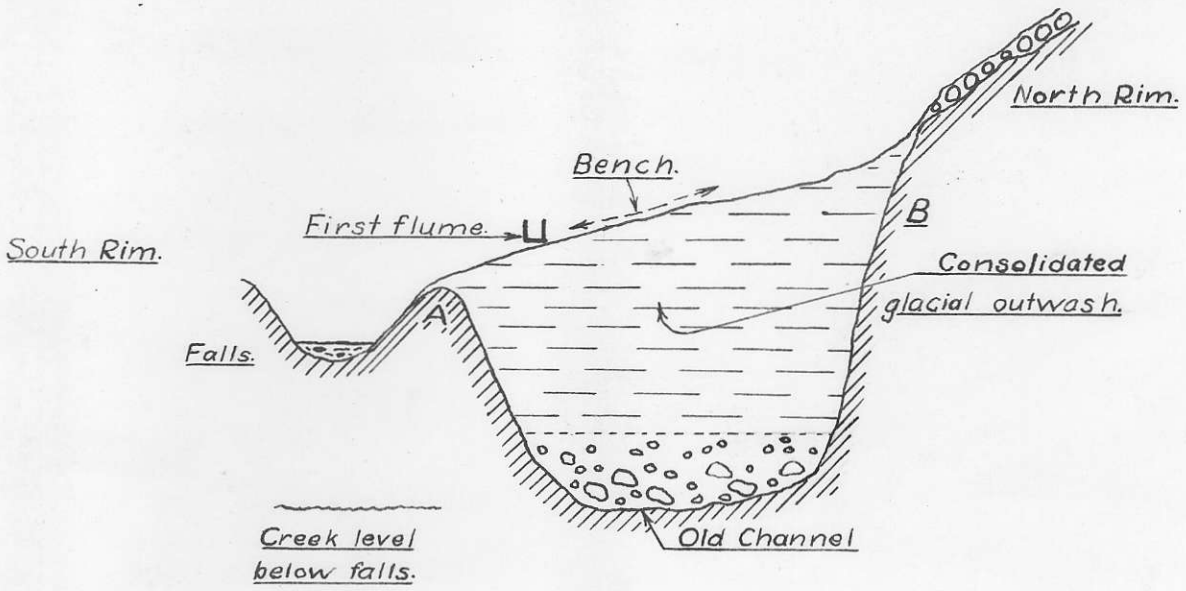
with evidences of glacial material between, so it was planned to turn the creek back into the old channel and let it cut down as far as possible without further help. The proposal was, first, to carry a flume from upstream along the hillside to a point between the rims below the falls, and turn the water loose to cut back along the old channel; and second, to build a larger dam and flume well upstream and carry a pipeline down to where the cut to the old channel was being made. In this way, natural forces would be clearing out the overburden from the old channel while hydraulicking equipment was being set up. The first difficulty was that the old channel was filled with fine, closely packed, tough material, with a top layer of thirty or forty feet of slum. The slum was very hard to cut, but eventually went out. Then the next bed was a tough rubbery clay which was even harder to cut. Fortunately, there was a boulder line above the slum which provided material to cut into the rubbery clay and eventually this clay was eliminated. Below the clay were unconsolidated sands and gravels which broke down rapidly and were easily carried out. The pipeline and monitor were set up during this time, and as soon as the cut was deep enough for the creek to go through the monitor speeded the operations considerably. The next difficulty arose when the water began to go down after the snow went. The tailings would not carry out completely and began to fill the whole creek below the falls and for some distance downstream. While there was

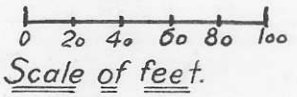
still plenty of water for piping, there was not enough to keep the tailings cleared out below. So a third step in development became necessary since it was now apparent that bedrock could not be reached immediately below the falls, due to the piling up of the tailings. About a thousand feet below the falls the creek was running on bedrock, so it was decided to start putting in sluice boxes there, and continue them both ways, upstream to reach the falls on bedrock, and downstream to maintain a dump. The major portion of the work is now concentrated on this third step, and when the sluice boxes reach to the falls, the company anticipates no further difficulty.

3. METHOD OF ATTACK.

(a). First step - first flume and cut.

The first step was to turn the creek back into its old channel and so remove the overburden with the least expense. To get the creek into the old channel it was necessary to start below the falls, and make a cut, deeper than the creek level above the falls right through the old channel to above the falls. This was done by building a small dam and running a small flume from far enough upstream to carry past the falls, high enough on the hillside to reach the bench on top of the old channel (see sketch). Then the water in the flume started to groundsluice a cut in the old channel. The flume was only a small one, two feet by two feet and carried just enough water to start the cut. This was later augmented by the monitor stream.





Rim
B.

The Pit - looking downstream, after the creek's channel was turned.

Rim A - between falls and old Channel.

SECTION AT FALLS
LOOKING UPSTREAM.

W. B.

(b). Second step - dam, flume, and pipeline.

After the small flume had been finished and the cut started, a large impounding dam was built farther up the creek. This dam is a self loading timber dam, faced with planks, and partially dirt-filled. Then fourteen hundred feet of flume was built from the dam, with about four-tenths percent grade, followed by a penstock and twenty-five hundred feet of thirty inch pipe. The flume is three feet wide and three feet high, and the penstock is six feet square and ten feet high. The pipe joints are simply lap joints with burlap packing, with a few expansion joints at intervals. The whole pipeline is securely loaded down, and anchored at all bends. Several hundred feet of smaller pipe from two feet to sixteen inches in diameter follow the thirty inch pipe with suitable reducers, and a final reducer to the twelve inch monitor inlet. The monitor is a large one, of the usual type, with twelve inch inlet and nine inch nozzle. The barrel is about fourteen feet long, with a sixteen foot jockey box or counterbalance. The deflector is the outside type, fitted on the nozzle, since the niggarhead type of deflector is apt to be dangerous in such a large size monitor. The monitor is anchored to a heavy twelve inch timber eight feet long, which is braced, loaded down with rock, and finally anchored by a cable and winch arrangement. The total fall on the pipeline is around two hundred and fifty feet and this gives the monitor a discharge of

approximately twelve thousand gallons per minute.

(c). Third step - sluice boxes.

It became necessary to move downstream and start building a line of sluice boxes when the tailings began to pile up below the cut. At a point about a thousand feet below the falls, the creek was running on bedrock, so here the boxes were started. First, a small bypass flume was built to carry the creek past the working point so the boxes could be put in easily. However, the impossibility of keeping all the water out of the creek bottom soon became apparent, and the work was much slower and more difficult than had been anticipated. Old tunnels carried a great deal of water that could not be picked up in the bypass flume, and the constant flow from these drifts hampered the work by floating the boxes and filling the bottom of the creek bed with fine material. Various sorts of makeshift drains were resorted to in a final attempt to carry most of the water past the sluice line, but often it was a case of doing the best possible under impossible conditions. The 5% grade necessary was hard to maintain due to the floating tendency of the boxes, which were heavily loaded down to prevent them rising. The boxes were of heavy construction, five feet wide, five feet high and twelve feet long, requiring roughly five hundred board feet of lumber - three hundred and sixty feet of two by twelve planks, one hundred and fifteen feet of four by six timbers, and twenty-five or thirty feet of one inch material

for braces.

4. CONCLUSION.

The main problems in development were:- first, to get the creek turned into the old channel; and second, to reach bedrock by working from below the pit. Conditions were such that the overcoming of these problems meant a great deal of hard work, much of which was preliminary to the actual working, and apparently wasted. However, as previously stated, it is the opinion of qualified engineers who have examined the property, that the placer grounds of Harvey Creek are some of the most difficult to work in B.C. The management is to be commended for the excellent progress made under the trying conditions. Latest reports give a total of some twelve hundred feet of boxes put in since the middle of July, and next year the company expects to be in a sufficiently advanced stage of development to start steady production.