

gold - Oregon

COPY

Preliminary Report

WHALES HEAD BAY "BLACK" SAND PLACER DEPOSIT

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Foreward:

The so-called "black-sand" beach placers of Oregon extending intermittently along and adjacent to the coast line for many miles, has produced, over a period of the last sixty years a very considerable amount; in the aggregate of gold, platinum and iridium, mainly by small individual operations with only a very few large capacity operation; the whole area of the Beach deposits, both the "fore-shore" and "back beach" deposits have been subject to extensive promotional schemes, and "quack" operations, resulting in innumerable fantastic plants and processes, fore-doomed to dismal failure; many such skeletal plants are still in evidence over the area, not one of which was a practical attempt of the recovery of the values contained in the sands or, as in other cases, where large plant erections were made, the sands contained little or no values, thus resulting in the whole area of Beach Sands being condemned and discredited as a possible producer of gold and platinum.

Many excuses had to be made for such failures, amongst them the assertion the values were "coated" with various marine and vegetable substances, preventing amalgamation and causing the gold to "float" off, etc.; again the values were "locked" in other minerals and rock, preventing gravity separation and requiring grinding, etc., but in every instance that I examined, the cause of such failures was outside of such assertions and contentions, and was plainly evident to other causes, mainly ignorance of the requirements of suitable equipment and handling for the recovery of such minerals as the values contained in such material as "Black-Sands." In the three months survey that I have just completed in this area, I came across only two intelligent recovery results of the numerous individual operations, and my own sampling and testing prove these contentions and assertions absolutely erroneous for these values of gold, platinum and iridium, as contained in the beach sands are commercially recoverable by general practice methods of wet specific gravity separation and amalgamation.

I found no evidence of "coating" and only one local evidence of the gold being combined with rock matter, and this in the interior where I found some gold values contained in pistolic-iron, and a very minor occurrence. In concluding the Foreword, I can safely assert that there is no metallurgical problem in the separation and recovery of the gold, platinum and iridium values contained in the Oregon "Black-Sands."

Location:

The property under consideration and the subject of this report is known as the Whales Head Beach Placer, approximately 12 miles north of Brookings, Curry county, Oregon, and 3 miles west of state highway No. 101, from which point it is reached by dire road, the nearest large town is Crescent City, California, about 40 miles south of the property. The property consists of the whole of the foreshore of Whales Head Bay and two hundred years back therefrom along Lost Nos. 2, 3 and 4, Section 3, Twp 40 and 14 W, Currey county, Oregon, approximately 2 miles in length, together with right of ingress and egress to the property, as also the water right to all water in Whales Head Creek, dam-site and pipeline rights, etc.

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Water:

Whales Head Creek. This stream enters the property at the north end of Whales Head Bay, and in the dry season contains enough water, by dam storage, to supply a large capacity plant with one lift of approximately 40 feet to present plant location; thus amply assuring an ample supply of water to handle up to 1,000 cu. yards per day and this can be amplified by two other streams that enter the property if necessary.

Placer Deposit:

The available deposit of gold bearing "black sands" lays from the foot of the seawall to beyond the extreme low-tide water level, a varying distance approximately 600 feet depending upon the tide position, the depth of sands varying from 6 to 15 feet in depth during the summer period and varying very greatly at other seasons. During a period of about nine months of each year, there is a strip some 300 feet above the high tide level that can be worked continuously, but during the three winter months, high tides will occasionally cover this area for a few hours at a time (extreme high tide) but it is seldom that operations cannot be carried on at some point of the beach. Bedrock is composed of an impervious brown clay, the wave action having pounded it to such an extent that prevents any sands from sinking into it to a depth of more than two inches. I found no values, or sands below six inches; the bedrock inclines at a gently angle from seawall to low tide level, in places, seahorses of rock protrude up through this formation, otherwise the bedrock presents no difficult "clean up" problems.

Shoreline:

At the mouth of Whale Head Creek, and where it discharges on to the beach, the seawall slopes down to the sands and raises to the south to a height of approximately 100 feet, about half way of the property, thus providing a haulage way and suitable plant site for gravity feed and waste discharge without having to discharge onto the beach for several years.

Origin:

There are several theories as to the origin of the gold and platinum group values contined in the beach sands, but from my observations covering many miles of the interior and shoreline, as also surveys of various rivers discharging on to the shore, of this coast, it is very evident the values are the result of extensive disintegration of the serpentine formations that appear very plentifully in the interior and along the costal range of this district, in many cases extending to the coast line and out into the sea.

These values, as also the iron and chromite (of which the black sands are mainly composed) are in a very finely devided state, this not only applies to the black sands on the beaches, but to a great extent to these minerals found in the heads of various rivers, such as the Sixes and Elk, etc., proving the values were finely divided in their original deposition, although the surf and wave action has diminuated all the minerals to some extent, there being little doubt, that after the passage of the minerals down to the sea, the accumulation along the continental shelf, and the panning and churning of the surf, causing a continual motion and segregation, must constantly be causing some diminution. Whole the particles of gold, platinum and iridium, the three recoverable values, are very fine, all passing though 60 mesh the first two are well rounded, bright and shiny and solid, settle quickly, there being no flaky gold or platinum, the latter being more wheat shaped than round; the iridium is more crystalline and settles the quickest; under the glass this mineral shows very little wear, it being much harder than any of the other minerals contained in the beach sands, although there is a small percentage of silicon, airconium, etc., and possibly other harder minerals.

The continual erosion of the values in the higher formations, along this part of the Oregon coast, and their final discharge into the sea, and on to the continental shelf

where surf action takes effect, has resulted in an off-shore permanent body of Black Sand concentrate, that is practically arrested in about 50 feet of water or less during mean tides; this is demonstrated by soundings and surveys at various points off shore; by both government and private interest; it also being demonstrated that surf action has little or no effect below a depth of sixty feet, this tending to hold all matter towards the shore, and resulting in the known body of black sand. At extreme high tides, the wave action reaches down to this submerged bank of sands and carries and deposits part of same on the beach; in this manner replenishing the available supply of every winter high tide period, and providing practically an inexhaustible supply of black sands. As the tides vary in surf action during the early spring a panning action takes place that causes very considerable concentration at various points; these occurrences are not in any regular form, but where they do take place, very high values are encountered and \$30 to \$40 per cu. yd. values have been known to occur in this manner in considerable yardage, and it is the remnants of these tides and pannings that gives the values to the strip of summer sands. The lighter surf action of the summer months tends to dilute the sands to the values demonstrated by my testing and sampling.

Sampling:

This work was confined to the summer strip of seawall sand, covering an area of approximately one and a quarter miles by three hundred feet, to mean fall tide level, and to an average depth of 4 feet; this was done firstly by pan sampling, followed by bulk sluicing of yardage over a five foot sluice box, covered with burlap and square wire netting; this equipment being fed water from the sea bank at various points; the equipment used, while crude and lacking amalgam plate, was satisfactory for preliminary testing under the circumstances, and while there was some loss of values, the recovery was approximately \$1.50 per cu. yd. over the area tested of this four feet of top sand representing the value of the sands after dilution by the summer tides to this depth, at which point rubble is encountered down the bedrock hindering dilution and causing some concentration resulting in two summer stratas of sand; the lower consisting of high grade in rubble and the upper low grade in fine sand with a ratio of approximately 2 1/2 tons to the cubic yard, and practically all of which will pass 1/4 mesh; while the lower deposit will average plus 60 mesh, the minus 1/4 mesh being a concentrate of the three minerals of value, with a ratio of approximately 5 tons to the cubic yard, had my testing included this lower strata, the average would have been much higher, but it requires considerable additional equipment to test this lower deposit, than I could obtain in the time I had.

Recommendation:

Additional testing and sampling should be done down to bedrock, and especially over the area intermittently covered by the surf, as this part of the area is available during twelve hours of the day; on the ebb and flow of the tides, this to give the mean value of the whole of the area, and while the yardage and values vary at different seasons, this will safely demonstrate what can be expected for yardage operation and also to some extent the best method of extraction and recovery, it will necessitate the use of small portable pump equipment, sluice boxes capable of being easily moved and set up, as it will be necessary to follow the ebb and flow of the tide over a large part of the property; then, at the satisfactory conclusion of this survey I would suggest the erection of a pilot plant of about 105 cu. yds. capacity, at a suitable location along the shoreline, where ample storage is available, preferably about midway of the property, the plant to consist of the usual wet trommel and screening equipment, automatic feed control, to ten 30 inch by 10 feet sluice boxes equipped with 4 ft. or longer amalgam plates, and necessary clean up materials and equipment; also suitable gathering equipment and trucks for the transportation of sands from beach to plant, which might consist of 1/3 cubic yard light power shovel and two Chevrolet dump trucks; dam built on Whale Head creek, piped through 6 inch pipe, approximately 3/4 miles to surge tank, and lifted about 40 feet to plant supply tank; plant to be fully housed, etc., some camping accommodations will also be necessary with existing dam and road contracts, for the building of same. The cost and installation of such plant should not exceed

above \$20,000 nor require above seven men to operate.

Conclusion:

In conclusion, this preliminary report I would point out and stress the constant supply of gold, platinum bearing sands, practically a perpetual deposit and inexhaustible for many years; a property on which operations can be carried on the year round, although this district is subject to heavy rain fall, yet the property is protected to a great extent from the gales usual to this coast, as makes operations further to the north impossible at certain seasons, Whales Head Bay is fairly well protected the year around.

From the results of such an operation over a year the ultimate capacity can be arrived and the average value demonstrated for there will be a critical point of both, as well as to the rate of gathering and water supply. In my opinion, the high and low tide deposits throughout the year will average in value much more than \$2 per cubic yard, but as the highest values are deposited and are available during the winter months, this average can be considerably brought up by excessive gathering and storing during the high tide periods of the winter months, this was very clearly demonstrated by the operation of the Cape Blanco Mining Co., who handled over 300,000 cubic yards through their small plant in less than three years, their heads running as high as \$40 per tin in storm periods to \$1.75 in late fall; had they been equipped for extensive gathering and sufficient storage, their recovery would have been much higher.

At a minimum value of \$1.50 per cu. yd. and given such plant as suggested above, a year's operation would not only cover all the costs incurred, but yield a satisfactory operation profit as well, therefore, I very strongly recommend the possibilities of a stable and profitable operation for this property, if given the proper equipment and handling.

Appended: January, 1941.

Since the attached Preliminary Report was written in 1937, the increased demand for Chromite has brought the Oregon beachsands into demand for their Chromium content; and considerable research is being conducted for the recovery of same by various institutions and some satisfactory processes have been devised and will be put into operation this year on a commercial scale.

The sands referred to in the attached report contain approximately 38 per cent Chromite, very finely divided and practically free from the other materials contained. This should be taken into consideration, as well as the gold, platinum, etc., contents.

R.W.H.