

## 3.2 Tons of Gold in 17 Years

Placer mining involves processing alluvial gravel found in stream and river beds. Whether using a gold pan, sluice box, rocker or dredge, the main principle behind placer mining is that gold is heavier than the surrounding dirt and gravel. When the gravel and dirt is agitated and washed with water, the gold settles to the bottom and is trapped while lighter material washes away.



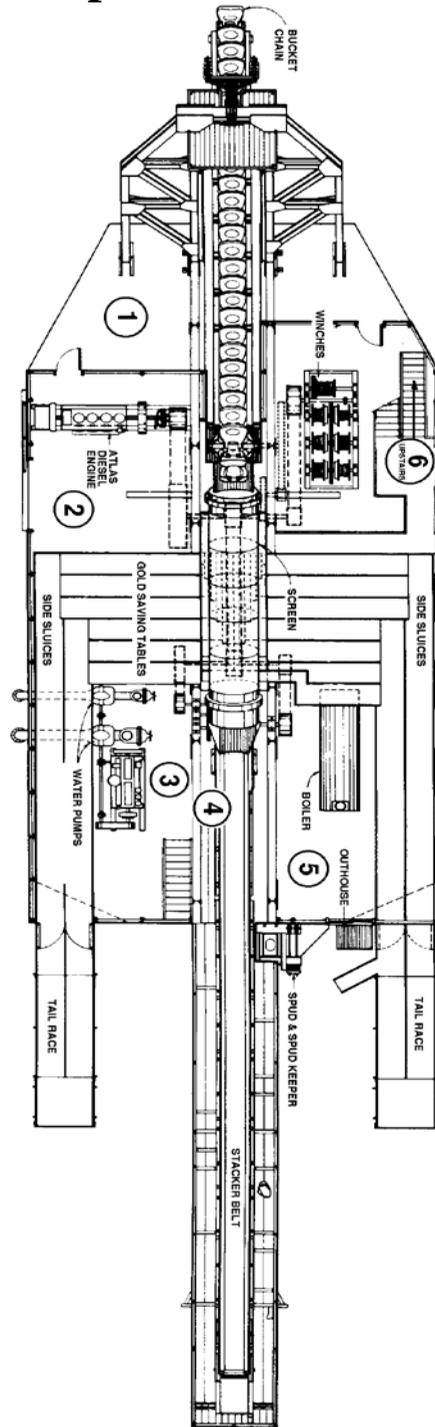
*(Lemm Collection Photo, Yukon-Charley Rivers National Preserve)*

### Constructing the Coal Creek Dredge

Dredging was the largest scale form of placer mining used in the Yukon River area. The Coal Creek dredge, running day and night, processed 2,500 times more material in a single day than a man could. In seventeen years it moved enough gravel to cover a football field nearly a mile deep and extracted 3.2 tons of gold.

The dredge was ordered in 1935, and arrived at Coal Creek that fall. The next spring, the various parts were sledged approximately 6 miles up Coal Creek where it was assembled near Cheese Creek.

## Stops on the Tour



## 1 The Bucket Line, Pontoons and Deadmen

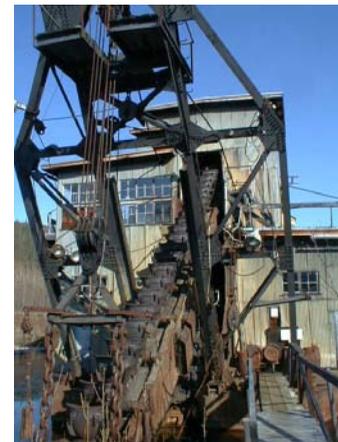


*(Douglas Beckstead, National Park Service)*

**Deadmen:** The bulldozers on the shores of the dredge pond served as anchors for the dredge. Cables running from the winches to the tractors pivoted the dredge bow from side to side. They moved the dredge forward as well, a process called stepping.

**Pontoons:** The dredge floated on compartmentalized steel pontoons. The pond, created by diverting water from Coal Creek and formed as the dredge moved forward, allowed the dredge to pivot from side-to-side. It also supplied water for the sluices to process the gravel.

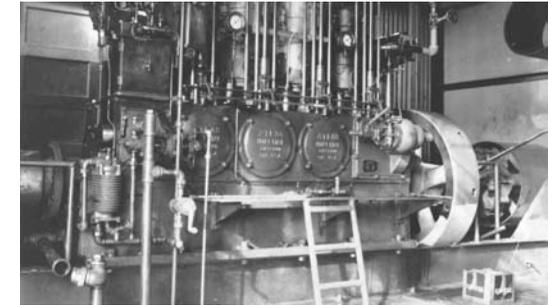
**Bucket Chain:** Each of the 62 buckets in the continuous bucket chain picked up four cubic feet of gravel with each pass. The digging ladder (the metal arm around which the bucket chain travels) could extend to 14 feet below the pond surface to the shale and granite bedrock where the gold had accumulated.



*(NPS)*

## 2 The Atlas Diesel Engine

The four-cylinder Atlas diesel engine provided power to operate the large drive belt attached to the overhead drive shaft. This drive shaft sent power to the bucket chain, screen, stacker and winches. A smaller gasoline engine located on the deck near the Atlas ran an air compressor used to start the main engine.



*(Bill Lemm Collection, Yukon-Charley Rivers National Preserve)*

## 3 The Water Pumps and the Caterpillar Engine

The water pumps drew water from the dredge pond that was sprayed into the screen where the water separated the gold from the dirt and gravel. The pump intakes are outside the dredge behind the engine. Originally a smaller Atlas engine powered the pumps. It was replaced with the Caterpillar engine in the 1970s.



*(Bill Lemm Collection, Yukon-Charley Rivers National Preserve)*

*Climb up the ladders at the back of the dredge to the screen and stacker*

## 4 The Screen, Stacker and Sluice Boxes

**Screen.** The large round barrel-like apparatus to the left is the screen. It rotates while jets of water sprayed the dredged material separating large rocks from the smaller gravel, sand and gold. The smaller material fell through holes in the screen while larger rocks continued on to the stacker.

**Stacker.** The stacker, extending to the right, is a long conveyor belt that carried the larger gravel and rocks out beyond the stern of the dredge and deposits them in semi-circular piles called tailings. The name "tailings" is in part because the stacker resembles a tail on the back of the dredge.

The screen and stacker are both controlled by the winchman in the winchroom on the deck above. If the winchman saw a large rock in a bucket, he would ring a bell notifying the crew to be alert for it as it came through the screen and onto the stacker belt.

**Sluices.** The smaller gravel, sand and gold fell through holes in the screen and dropped onto sluices where water carried the material over wooden frames with slats called *riffles*. Gold, the heaviest material,



*(Douglas Beckstead, National Park Service)*

**Starboard Side Sluices**

settled out and was trapped by the riffles. Ninety percent of the gold recovered by the dredge was caught directly below the screen. Mercury was added to the sluices to form an amalgam as it combined with the fine gold separating it from the fine dirt and sand. The lighter gravel, sand and dirt went out the tail races and washed into the pond behind the dredge. Every ten days or so, the crew stopped the dredge for several hours to perform a cleanup where the gold and amalgam was collected from the sluices and retorted to recover the gold.

## 5 The Wood-Fired Steam Boiler and Spud

**Boiler.** During the first year of dredging on Coal Creek, steam points were used to thaw the permanently frozen gravel so the buckets could dig through it. Steam points are hollow pipes driven into the permafrost. Small slits at the bottom allows steam from the boiler to escape thawing the gravel. Within the first few years of operation, Gold Placers learned that cold water was as effective as steam -- and a lot less expensive. Steam points were converted to supply cold water in the same way as they did steam. The boiler then supplied heat for the dredge and stacker to prevent them from freezing in the late fall. Steam points were only used to break up the frost initially when the dredge started each spring.



*(George Beck Collection, Yukon-Charley Rivers National Preserve)*

**Hauling the spud, 1935**

**Spud.** Directly behind the boiler, toward the stern of the dredge, is a door through which you can view the spud. The bottom of this hollow steel pillar is shaped like a dolphin's snout. The spud is the only part of the dredge that touches the bottom of the pond. It serves as a pivot point about which the dredge rotates as it digs. To turn the dredge from side to side, winches pull cables anchored to deadmen on the shore (see Point 1 above). To move the dredge forward, the spud is raised with cables controlled in the winch room and the dredge is pulled forward.

The dredge operated 7 days a week, 24 hours a day. An "outhouse" is located to the left of the door you are now looking out.

*Go up the stairs at the front (bow) of the dredge on the starboard (right) side.*

## 6 The Winch Room

The winch room is the control center for the dredge. From here, the winchman operated a series of levers that control the depth of the digging ladder. The winchman also controlled the bow and stern cables that move the dredge side-to-side. The digging ladder itself did not move side-ways, instead the entire dredge pivoted around the spud. The bucket line made several passes across the digging face picking up gravel until it chewed several feet into the bedrock. Then the dredge moved, or stepped, forward to begin the process once again. On cool days the winchroom with its wood stove was a warm, dry spot on the dredge.



# Coal Creek's Gold Boat:

*A Self-Guided Tour of the Coal Creek Dredge*



*Bill Lemm Collection, Yukon-Charley Rivers National Preserve*

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