

Workshop Dredge, Inangahua County.—This small Diesel-powered dredge dug the satisfactory figure of 421,500 cubic yards from which was recovered 1,180 oz. 5 dwt., which realized £11,167 11s. 1d.

Mossy Creek Dredge, Inangahua County. During the year this electrically-operated dredge, fitted with 4-cubic-foot buckets, treated 416,000 cubic yards from ground which averaged 11 ft. in depth.

Grey River Dredge, Inangahua County. This electrically-driven dredge during its first year's operation dug 4,500,518 cubic yards, from which was recovered 13,218 oz. 12 dwt., which realized £125,223. An average output of 87,500 cubic yards per week has been maintained by a crew of thirty-five men operating the dredge in ground of an average depth of 25 ft. The dredge is fitted with 16-cubic-foot buckets. The maximum digging rate has been 744 cubic yards per hour, and the all-in cost came to 3-49d. per cubic yard, expended to recover gravel of an average value of 6-68d. per cubic yard. The operations for the months of January and February were confined to digging a narrow cut along the eastern boundary of the area from the construction-site to a point south of the county road where the dredge was turned in a westerly direction and the cut opened out to about approximately 500 ft. in width. Three cuts were taken from east to west across a portion of the valley, when the transverse system of digging was altered to longitudinal digging, and a 550-ft.-wide cut was started towards the southern end of the property. The close of the year found the dredge digging about 1,600 ft. from the south boundary of the property. Except for some minor changes to machinery and gold-saving equipment which would tend to improve the mechanical and metallurgical efficiency of the dredge, no major alterations were made in the original design.

Argo Dredge, Grey County.—During the year this electrically-operated dredge, fitted with 4½-cubic-foot buckets and digging ground of an average depth of 20 ft. and employing thirteen men, recovered 2,263 oz. 13 dwt., valued at £21,075 10s. 4d., from 605,800 cubic yards.

Blackball Creek Dredge, Grey County.—This dredge, operating on ground averaging 33 ft. in depth and employing twelve men, treated 580,000 cubic yards, from which 2,209 oz. 5 dwt., valued at £22,212 10s. 7d., were recovered. The dredge is electrically operated and fitted with 5-cubic-foot buckets.

New River, Grey County.—This Diesel-powered dredge, fitted with 4-cubic-foot buckets, dug 308,045 cubic yards in the New River, which yielded 1,498 oz. 4 dwt. of gold, valued at £12,356 0s. 11d.

Neonoma Dredge, Grey County. Operating in Cockeye Creek, this electrically-operated dredge, fitted with 4½-cubic-foot buckets, dug 400,300 cubic yards, which yielded 1,199 oz. 9 dwt. of gold, worth £11,008 11s. 6d.

Bundi Dredge, Grey County.—This dredge operated on two shifts, employing fifteen men for part of the year, and dug 279,516 cubic yards for a return of 1,663 oz. 8 dwt. 23 gr., to the value of £12,224 4s. 9d. Operations ceased on 31st August, and offers were invited for the purchase of the company's plant and dredging claim soon after this date.

White's Electric Dredge, Grey County. Equipped with gold-saving apparatus suitable for the recovery of gold from the black-sand deposits at Barrytown, this electrically-operated dredge, using 4-cubic-foot buckets in 16 ft. ground, dug 335,420 cubic yards and recovered 1,458 oz. 9 dwt. of gold, which realized £11,645 12s.

Barrytown Dredge, Grey County.—The yardage treated by this dredge was 3,018,000, from which 8,928 oz. 4 dwt. 19 gr. of gold was obtained, the value being £75,032 0s. 8d. The average depth of ground worked during the period was 30 ft., using 12-cubic-foot buckets, and difficulties were experienced on part of the area dredged due to encountering buried timber. Experiments with a pilot flotation plant were carried out with the object of increasing the gold recovery, exhaustive tests being taken, but the savings effected were not commensurate with the expense incurred in treatment; consequently, the idea of utilizing the flotation process was abandoned.

Ngahere Dredge, Grey County. A new dredge erected by the Railways Department's engineering staff for the Ngahere Gold Dredging, Ltd., was completed and had a trial run by the last month of this year. An area containing a large proved yardage of payable ground situated north of the Grey River and opposite Ngahere will give many years of dredging. The following details of the dredge were kindly supplied by the company's manager:—

Construction: All steel. Electrically operated. The pontoon dimensions are: Length, 170 ft.; width, 72 ft.; depth, 12 ft.; and there are twenty-eight water-tight compartments; total weight of hull, 600 tons. The digging-ladder is 142 ft. 4 in. long between centres and weighs 187½ tons, the weight with rollers and bottom tumbler being 241 tons. The normal digging depth is 70 ft. at 45 degrees, and the maximum is 75 ft. at 48 degrees. These depths are below water-level. The dredge will dig to 104 ft. when carrying a bank of 29 ft. The buckets are 18-cubic-feet capacity, and there are ninety-five on the band, discharging at the rate of twenty-two per minute. The buckets pins are 8 in. diameter, and the working weight of the band is 215 tons. The screen is 9 ft. diameter and 52 ft. 6 in. in length overall, and makes 5-92 revolutions per minute. Perforations: Five bands 1½ in. to 7⁄16 in., 1 band ¾ in. to ½ in., one band ¼ in. to 1 in. The stacker ladder is 203 ft. between centres, and the conveyor belt 44 in. in width. The dredge is spud operated with two spuds each weighing 53 tons. Gold saving is effected by short riffle tables discharging into Bendelari jigs, of which there are twelve four-hutch primaries. Concentrates from primary jigs is pumped to two secondary jigs, the first two hutches of which discharge to amalgamating plates, the remaining two hutches in each being in closed circuit. The total water-pumping capacity provided is 14,650 gallons per minute. The total motor horse-power provided is 1,573. The principal units are—Main Drive: Two 250 horse-power, one each side, driving through Vulcan hydraulic couplings and Richardson gear-boxes. Ladder Hoist: One 250 horse-power, driving through Richardson reduction gear-box. Mooring-winch: One 80 horse-power, driving through Richardson reduction gear-box. Screen: One 100 horse-power, driving through Richardson reduction gear-box. High-pressure Pump: One hundred and seventy horse-power direct coupled. Low-pressure Pump: One hundred horse-power direct coupled. Hopper Pumps: Sixty horse-power direct coupled. Jigs: Two 40 horse-power and two 7½ V-belt drives. Smaller motors operate cranes, footbridge, concentrate, and saveall pumps. The complete total weight of the dredge is estimated at 2,855 tons.

Maori Gold Dredge, Westland County.—Maori Gold, Ltd., formerly Maori Gully (Kokiri) Gold Dredging Co., Ltd., acquired and tested an area at Callaghan's, south of Kumara, and re-erected the Nevis Diesel-electric dredge, which was purchased, dismantled, and transported from the Nevis Valley, Otago, to its present site. The re-erection was practically completed by the end of 1939.

Rimu Dredge, Westland County.—Operating in ground of an average depth of 53 ft., this electrically-driven dredge, fitted with 12-cubic-foot buckets, handled a total of 2,334,721 cubic yards for a return of 9,955 oz. 16 dwt. of gold, which realized £94,185.

Kanieri Dredge, Westland County.—Despite breaks in dredging-time due to encountering old workings, with a subsequent lowering of water-level and renewals of plant, 4,776,000 cubic yards were dredged and 14,700 oz. 2 dwt. 14 gr. of gold were recovered, which realized £124,279 9s. 11d.

Arahura Dredge, Westland County.—Dredge-construction was completed by the New Zealand Railways Department's engineering staff by the end of July, and on 1st August digging commenced. By the end of the year 1,600,000 cubic yards had been dug and treated for a recovery of 5,553 oz. 10 dwt. of gold, valued at £49,124 0s. 5d.

Okarito Five-mile Beach Dredge, Westland County.—A volume of 310,638 cubic yards of black sand were dredged for a return of 1,244 oz., which realized £10,096.

Gillespie's Beach Dredge, Westland County.—A broken working year due to the general overhaul of the dredge and attaching of auxiliary pontoons resulted in smaller yardage and decreased returns. Altogether, 546,636 cubic yards of material were treated for a return of 1,174 oz. 4 dwt., which realized £11,036 7s. 8d.

DREDGE-CONSTRUCTION.

The *Arahura, Ngahere, and Maori Gold Dredges* were completed during the year, and the first mentioned added to the total gold-production for 1939.

The *Snowy River Dredge* is well advanced and will be in operation during 1940.