

MAY 2 1940
STATE DEPT. OF GEOLOGY
& MINERAL INDS.

W. C. MORGAN LIMESTONE DEPOSIT

COOS COUNTY

Owner: W. C. Morgan, Marshfield, Oregon.

Location: NE $\frac{1}{4}$ sec. 35, T. 25 S., R. 12 W., on hillside west of South Fork of
~~Coos~~ ^{Coos} River, 250 feet above the highway.

History: The deposit was investigated by the U. S. Engineer Dept. in 1937 who report as follows: (Hodge, Edwin T., Market for Columbia River hydro-electric power using northwest minerals, section III, northwest limestones: War Dept., Corps of Engrs., U. S. Army, Office of Division Engineer, North Pacific Division, Portland, Oregon, 1938)

"A small lenticular limestone body 10 feet by 25 feet wide, and traceable for 750 feet along the strike (N. 68° to 70° E.) occurs in sandstones and shales of the Pulaski (Eocene) formation in the NE $\frac{1}{4}$ sec. 35, T. 25 S., R. 12 W., in Coos County. It is owned by W. C. Morgan, Coos Rural Route, Marshfield, Oregon. The limestone is dull gray and amorphous, with many veins and pockets of calcite, and has a top soil overburden 5 to 20 feet thick. An analysis (U.S.E.D.) sample no. 1920 -- general grab sample over an area of 20 square feet of outcrop follows:

SiO ₂	10.57	CaO.....	42.97
Al ₂ O ₃	4.27	CO ₂	33.47
Fe ₂ O ₃	2.96	Total.....	95.59
MgO.....	1.35		

"According to a test by J. J. Jones, Oregon Agricultural College Experiment Station, two surface samples contained 73.1 and 83.5 percent CaCO₃ respectively."

"This limestone has been used locally for mortar. Estimated reserves are 80,000 tons."

A check on the use of this limestone for mortar proved that the limestone came from "floater" boulders near the creek at a point about 200 yards north of the Morgan house. It was not limestone, in place.

Development. A "long time ago" someone sluiced off an area about 25 by 25 feet square and exposed that much limestone at an elevation of 250 feet above the road. Since that time, surface creep has covered the area and it has been cleaned, partially by the present interested parties. A trench, about 35 feet long has been opened into the hillside some 200 feet north of the first opening, and limestone exposed. These are the only openings that are available at present, and more than was available at the time of the U. S. E. D. survey.

Topography: The hillside is very steep, measuring the slope at 35° . There is a narrow (100 feet) bench just above the road, steep hillside for a short distance, then another narrow bench, then steep hillside to a point 250 feet above the road where there is a bench about 100 yards wide. The slope continues at a steep angle to the crest of the ridge some 200 feet above. The hillside is heavily wooded with hardwoods, having once been logged, and surface weathering has developed soil and decomposed rock to a depth of 25 or more feet.

Geology: As stated in the U.S.G.D. report, the formation is Pulaski (Eocene), the lower, and non-coal-bearing member of that series in the Coos Bay region. At the trenches, the surface material is a dull, lead-gray, coarse sandstone that weathers to exfoliated forms. This gives way to a pebble conglomerate in which the cement is partly calcareous. Some of the pebbles are limy. Under the conglomerate is the limestone, of unknown thickness. The limestone is quite "hard", that is, more resistant than the other sediment, it is exceedingly fine grained and on first inspection looks much like chert, altho analysis shows that silica is low. It is rather simple to distinguish between 85 percent lime rock, and the lower grade and barren lime material. The surface soil or creep contains numerous limestone boulders up to four feet in diameter and the small stream exposes some of these. Principal material exposed by the (very) small stream is a conglomerate with a calcareous cement.

The nature of the outcrops is such that it is impossible to secure an accurate dip and strike. The overlying sediment is massive and without apparent bedding. No good contact of sediment with limestone could be obtained. A search of the surrounding area revealed no places where a dip and strike could be obtained nearer than one-half mile. Considering the nature of the folding in this area, it was deemed that this dip and strike would be unreliable. However, a consideration of outcrop conditions at the larger exposure led me to consider a dip of about 60° ?? S. 20° E. For some reason, this checks rather closely with the U.S.G.D. strike of N. 60° - 70° E., although I cannot determine how or where they secured the reading.

Quantity and Quality: No reliable estimate can be made of the amount of limestone present, as it was impossible to determine whether the limestone was a "bed" or a lense. Consideration of the general features leads me to the following conclusion, subject to later check with development. The limestone portion of the formation is present as a bed. Its dip is slightly greater than that of the hillside. Its thickness is undeterminable, at present, but a consideration of the width of the "bench" above the upper cut, where the limestone should outcrop under the soil, would place a wild guess at 50 feet. It may be anything from 3 feet to 100 feet. It is my opinion that the bed is continuous between the two surface cuts and that it would continue down the hill. The upper limit is the "bench" mentioned above.

Samples have been submitted to the chemist at the local paper plant and they consistently run 85 percent CaCO_3 for material that is at least two feet beyond the contact. Copies of these reports are supposed to be in the Portland files of the State Department. The lower value of the U.S.E.D. samples can be explained by the fact that they must have been surface samples, as there were no cuts into the limestone, at the time they were taken. It is my opinion that the quality of the limestone would not improve "with depth".

Reported tests by the Oregon State Highway Commission indicate that the limestone has qualities suitable for road metal. The quality is too low for "paper rock" but is sufficiently high for agricultural limerock.

How the U.S.E.D. arrived at their estimate of 80,000 tons is beyond me. It must be the wildest sort of "gestimation". I could guess just as wildly but can see no reason why I further should cloud the issue with unreliable data.

Economics: It is recommended that the road building contractor be permitted to open the quarry at the upper level for road metal with the provision that should "paper rock" be found, such "paper rock" would still be the property of the owner. If there is sufficient demand, and market for which

agricultural limestone could be used, this market might be satisfied, later.

The agricultural lime situation here is peculiar. The farmer needs lime for his land. The federal government will pay the farmer a bonus for all land limed. Yet practically every venture to provide the farmer with lime has failed, not because he doesn't ~~use~~ need the lime, nor that he cannot be paid for putting it on his land, but simply that when it comes to purchasing and giving coin of the realm in exchange, he does not do it. At present the county agricultural agent is sponsoring the use of shell from the beach. It is "ground" by a crude, home-made device that crushes to pieces about one-quarter to one-half inch in size. It is reported to me, that this material is not successful, as it does not decompose. Apparently it is too coarse.

Conclusions: Heavy overburden makes accurate determinations impossible. The following is a "gestimation": (1) the limestone occurs as a bed that dips about 60° S. 20° E. Its upper limit is the bench above the upper cut, some 250 feet above the road; its lower limit is unknown. Its thickness is unknown it may range from 5 to 100 feet. Its probable width is 200 feet. No reliable estimate of quantity can be made, but the U.S.E.D. figure of 80,000 tons may be an indication of available rock. (2) Quality is about 85 percent CaCO_3 , indicating use as agricultural limestone but not as "paper rock". It is doubtful if the quality will improve. (3) Stat highway tests indicate usefulness for road metal. (4) It is recommended that it be used for road metal in order to get the quarry opened. Later use would depend upon an agricultural-lime market, or probable flux for metallurgical industries.

Report requested by J. W. Deany, Marshfield, Oregon, for S. V. Smith, 905 North 8th, Marshfield, Oregon.

Assistance: S. V. Smith accompanied the writer to the property and guided him.

Report by: Ray C. Treasher, 4/30/40.