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PRELIMINARY MEMORANDUM ON THE OCCURRENCE OF DOLOMITIC LIMESTONE IN ROGER'S CANYON ALBANY COUNTY, WYOMING

Analyses of samples of a thick limestone near the base of the Casper formation (Limestone A in previous reports) in Roger's Canyon show that over a certain area the lower part of the bed is dolomitic and carries from 15% to 20% MgO. The upper part of the bed is a high grade limestone.

The writer was asked to advance an opinion as to whether the dolomitic limestone is a local feature of limited areal extent or whether it probably persisted as a unit throughout the general area.

Field examination of sampled outcrops at points 10 and 12 along the prominent ledge south of the graded road in Sec. 3, T 16 N, R 72 W, showed the magnesian limestone to be of granular, finely crystalline texture and the overlying high grade limestone to be dense and essentially microcrystalline in texture.

None of the analyses of samples taken at point 13, only a few hundred feet south of point 12, show magnesia. Bedding planes were traced from point 13 to point 12 and it appears that the magnesian limestone at point 12 lies at the same stratigraphic position as the non-magnesian limestone at point 13. This suggests that the magnesian character is of local extent. In addition, a 40 or 50 foot face of the ledge at a point some distance south of point 13, about 500 feet SE of point 15, was examined and the entire bed there is of the dense type of limestone which analysis have shown to be non-magnesian. A single sample taken near the base of the cliff showed only .57% MgO on analysis.

SUMMARY:

(1) The magnesian limestone at points 10 and 12 appears to be of local occurrence and to be represented laterally by non-magnesian limestone.

(2) The thickness of pure non-magnesian limestone which lies above the dolomitic limestone is sufficient to warrant quarrying over the entire area where the dolomitic limestone occurs, and the proportion of magnesian limestone in the general area compared to the tonnage of non-magnesian limestone is very small.

(3) Additional analyses are necessary before the exact regional extent of the dolomitic limestone can be accurately determined.

October 5, 1943

MEMORANDUM ON ANORTHOSITE RESERVE IN SEC. 2, T. 16 N., R. 72 W.,

AND SEC. 5, T. 16 N., R. 71 W.,

ALBANY CO., WYOMING

To whom it may concern:

I am personally familiar with the geology of Sec. 2, T. 16 N., R. 72 W., and Sec. 5, T. 16 N., R. 71 W., Albany County, Wyoming. The surface of the two square miles is occupied by anorthosite and that rock extends to an unknown depth, certainly to hundreds of feet, and possibly to thousands of feet, beneath the surface.

If it be assumed that there are 50 million square feet of surface in the two sections of land, and that the weight of anorthosite is 170 pounds per cubic foot, then it may be calculated that there are 170,000,000 tons of anorthosite within 40 feet of the surface.

HORACE D. THOMAS

October 21, 1943

October 28, 1953

Mr. H. D. McBride
The Monolith Portland Midwest Co.
Laramie, Wyoming

Dear Sir:

I am submitting herewith information on the occurrence of dolomitic limestone in the Roger's Canyon area, in Sec. 3, 4, 5, 8, 9, and 10, T. 16 N., R. 72 W, northeast of Laramie, Wyoming.

Problem: Certain analyses of limestone from this area have shown a high magnesia content. It is desirable to know, therefore, if the geological occurrence of the magnesia is such that it will be unexpectedly encountered in quarrying, or whether the occurrence is such that quarrying can be carried on in such a manner as to avoid the removal of alumina-bearing dolomitic limestone.

Conclusions: The dolomitic limestone occurs as a bed lying just below a stratum of pure non-magnesian limestone, and not as scattered masses through high-grade limestone. The thickness of non-magnesian limestone above the dolomitic limestone is as much as 14 feet. By quarrying only the high-grade limestone, no magnesia-bearing rock need be excavated. The occurrence of dolomitic limestone in the area has no effect on earlier calculations of limestone reserves in the area.

General Geology: In the Roger's Canyon area the surface is occupied by limestones that dip to the west around the Casper formation. The beds dip gently to the south through most of the area but in the northern part of Secs. 5 and 8 stand vertical or dip to the north in the axis of a syncline. In an earlier report certain limestone beds are referred to as Limestones A, B, and C.

The prominent ledges formed by Limestone A, several hundred feet south of the Roger's Canyon road in Sec. 3 (sample point. 10-14) is made up of an upper part of dense limestone which analyses have shown to be free of magnesia. The lower part is finely crystalline, has a granular appearance, and erodes more readily so that the dense limestone above forms overhanging cliffs in places. Analyses have shown this granular rock to carry considerable magnesia. The contact between the pure limestone and the magnesian limestone is sharp.

To the southeast toward the dolomitic limestone is replaced by non-magnesian limestone so that in the southern part of Sec. 3 and on into Sec. 11 the entire thickness of Limestone A is dense limestone which is apparently non-magnesian.

In the northwestern part of Sec. 3, north of the Roger's Canyon road, Limestone A also shows an upper dense non-magnesian part and a lower finely-granular dolomitic part. In a draw in the northeast corner of Sec. 4 the upper non-magnesian part is estimated to be from 30 to 40 feet thick.

To the southward, Limestone A forms [illegible] as along the Boyer's Canyon road through Sec. 4. Ordinarily only the upper pure limestone part is exposed but in two places, one near the east line of the section and one near the west line (sample point 19), granular dolomitic limestone is exposed. At the latter point, 44 feet of non-magnesian limestone overlies the dolomitic limestone.

Except for the exposures described in Secs. 3 and 4, Limestone A lies below the surface, because of the westward dip of the Chanac formation. The considered limestone exposures over most of Sec. 4 and in Secs. 5, 8, 9, and 10, represent outcrops of Limestone B and Limestone C, which lie stratigraphically above Limestone A. No analyses of Limestone B have been made.

Limestone reserves: In the earlier report on limestone reserves in the area, dated Sept. 9, 1943, the estimated tonnage of limestone underlying Secs. 3, 4, and 5, was placed at over 300,000,000 tons. This figure is not affected by the occurrence of dolomite in Limestone A because the thickness used in the calculations involving that bed was 30 feet, whereas it is known that at least 44 feet of pure limestone lies above the dolomitic limestone at sample point 19. The 30-foot thickness used is representative of the non-dolomitic part.

Consequently, the estimates of 300,000,000 tons of limestone underlying Secs. 3, 4, and 5 and the 90,000,000 tons of marketable limestone in these sections are not affected by the presence of dolomitic limestone underlying Limestone A.

Although no detail mapping was undertaken in Secs. 8, 9, and 10, reconnaissance has shown that Limestones A, B, and C underlie these three sections, as well as another limestone which lies stratigraphically below Limestone A and others which lie stratigraphically above Limestone C. Furthermore, Limestone A is apparently made up of a greater thickness of non-magnesian limestone here than to the north. The total tonnage of limestone underlying Secs. 8, 9, and 10 is, therefore, greater than that underlying Secs. 3, 4, and 5, and exceeds 300,000,000 tons, perhaps reaching 500,000,000 tons.

Because of broad dip-slopes on the surfaces of limestones in Secs. 9 and 10, and because of stratigraphic exposures when the beds stand vertically in Sec. 8, the amount of strippable limestone in the three sections appears to exceed that in Secs. 3, 4, and 5, and can be estimated at 40,000,000 tons.

Summary: Limestone A, where exposed in the northern part of Sec. 3 and in Sec. 4, T. 16 N., R. 73 W., is made up of an upper pure limestone part and a lower dolomitic limestone part. In the southern part of Sec. 3 and to the southward the entire thickness of Limestone A appears to be non-magnesian.

In most places the thickness of the pure limestone part is great enough to warrant quarrying. The production of only magnesium-bearing

limestone can be avoided by (1) quarrying only the upper more limestone bed or (2) quarrying in the northern part of Sec. 3 where there is no dolomitic limestone.

There is a total reserve of over 300,000,000 tons of non-magnesian limestone in Secs. 3, 4, and 5, and an estimated reserve of 500,000,000 tons in Secs. 8, 9, and 10. There is an estimated total stripping reserve of 30,000,000 tons in Secs. 3, 4, and 5, and of 40,000,000 tons in Secs. 8, 9, and 10.

Very truly yours,

Horace D. Thomas