

State Department of Geology and Mineral Industries

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Portland 1, Oregon

DIATOMITE IN THE WILLOW CREEK-TROUT CREEK AREA OF HARNEY COUNTY, OREGON

Numerous exposures of diatomite exist in the Willow Creek-Trout Creek valley in southeastern Harney County. One particular sequence of outcroppings is located on the lower flank of the hills which constitute the southern margin of the valley. These are exposed at intervals over a distance of three miles or more. Other outcroppings occur at places along the northern border of the valley, and a noteworthy exposure is located in a tributary canyon of Trout Creek a short distance west of where it leaves the main valley.

The existence of these deposits has been known for a long while, and a few articles dealing with the descriptions of contained megafossils have been published. However, and largely because of the lack of adequate base maps, no detailed geologic mapping has been undertaken and made available for either the diatomite or the neighboring terrain.

This lack of publicity together with the remoteness of location with reference to rail terminals, power facilities, and good all-weather highways has resulted in a minimum of examination by industry as compared with other Oregon diatomite occurrences. Information concerning the mining potential of the Willow Creek-Trout Creek diatomite has been therefore virtually nonexistent heretofore.

The examination reported here took place during August 1962 and was of two days' duration. The writer was accompanied in the field by Armand Bollaert, a former long-time member of the technical staff of Great Lakes Carbon at their Terrebonne and Lompoc operations and a recognized specialist in matters pertaining to the appraisal of diatomite.

Since the reconnaissance map of the Adel quadrangle by Walker, USGS (publication pending), can be anticipated to contain a comprehensive description of the geology of the area, the following comments are intended merely as an interim record of observed factors bearing on the mining potential of the diatomite.

Location. T. 38-39 S., R. 37 E., and the N. half of T. 39 S., R. 38 E. This is north of the Trout Creek Mountains and southwest from the Whitehorse Ranch headquarters. Access is by way of the Trout Creek road from the Alvord valley or by way of the Whitehorse-Denio road from the Rome-McDermitt highway (U.S. 95).

General. Practically all of the many natural exposures in the area were found to have been faced up or otherwise explored by dozer trenching. According to local informants most of this work had been done during 1960 and 1961 by prospectors believed to be residents of Burns. In many instances the cuts were quite deep and laterally extensive. Under the circumstances the diatomite was well exposed for study, and advantage was taken of the situation to the extent that visits were made to all observed workings sites.

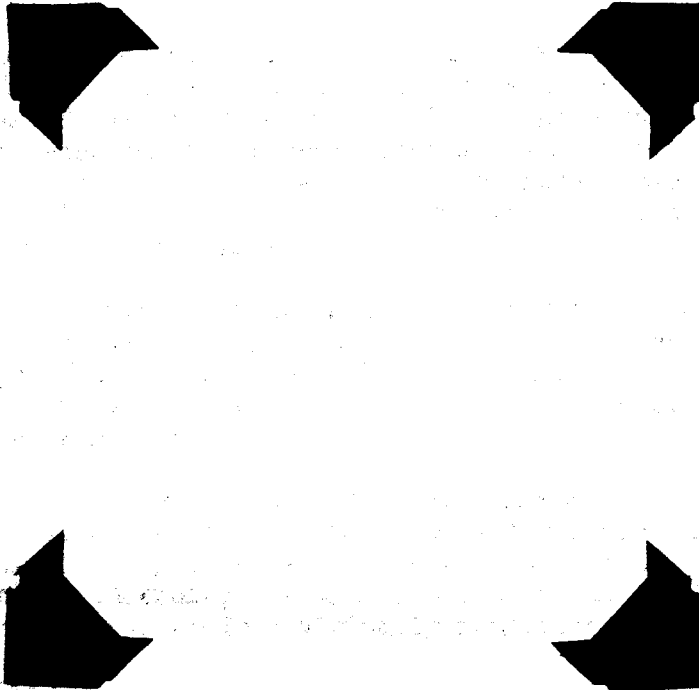
Some beds of clean, good-appearing diatomite were noted at several of the locations. For the most part, however, the diatomite tends to be contaminated with

clay and ash to the point of being of dubious commercial value. More damaging yet is the observation that the diatomite layers are interbedded at close intervals with layers of ash and clay. This condition was more pronounced at some localities than at others. Nevertheless, at no one locality was contamination-free diatomite seen in sufficient thickness to be commercially attractive from a mining standpoint under present market conditions. An interesting sidelight is that both imprints and well-preserved skeletal remains of fish were seen at several localities.

Because of the uniformity of conditions throughout the area as a whole, a review of the observations noted at each locality visited would be needlessly repetitious. Subsequent discussion is limited, therefore, to three localities that are considered typical. The description of these localities follows:

1. T. 39 S., R. 37 E., sec. 21-22, one mile south of the Deffenbaugh ranch. Good looking diatomite is interbedded at close intervals with thick ash and clay beds which effectively spoil commercial possibilities. Exposed in a face 15 to 20 feet high by a cut approximately 300 feet long. Overburden of clays and ash capped by basalt thickens with ascent of the hill into which the diatomite penetrates. This situation would soon generate operational disadvantages even if the diatomite was otherwise minable.
2. T. 39 S., R. 38 E., sec. 7-8. This is the westernmost set of workings exposed along the foothills bordering the Willow Creek-Trout Creek valley on the south. A section of 20+ feet of strata is exposed here. Throughout the lower half of the section the diatomite is interbedded with a succession of thin ash layers at very close intervals. In the upper half the intervals between ash partings is greater but still not great enough to provide beds of clean diatomite thick enough to be minable. These conditions are illustrated in the color pictures below. Lower section, left; upper, right.

3. T. 39 S., R. 38 E., sec. 1. A thick section of diatomite alternating with ash partings at close intervals exposed by a long cut extending diagonally downhill. Fossil fish with notably intact skeletons were observed most abundantly here. The picture below shows only a portion of the cut.



Conclusions. To be of commercial value for most of the important industrial uses, any given diatomite occurrence must first meet stringent specifications governing the kinds of diatoms present and their state of preservation. These are factors that can be judged only in the laboratory by specialists who are well informed with respect to processing procedures and user requirements. Otherwise, and readily observable in the field, the diatomite must be notably pure in the sense of being essentially devoid of any of the clays and sands and other non-diatomaceous materials generally associated with normal sedimentary processes. The pure diatomite must also occur in beds sufficiently thick to permit the mining of large volumes of uncontaminated crude by low-cost mining techniques. This means that non-diatomaceous interbeds must be widely spaced and sufficiently well defined to permit selective removal with a minimum of handling.

Some of the diatomite beds presently exposed in the Willow Creek-Trout Creek area look like clean material that certainly meets the second requirement and could conceivably meet the first. Other beds contain an obvious admixture of clay and ash. At all exposures, however, both kinds of diatomite are interbedded with non-diatomaceous materials at such closely spaced intervals that the minability factor is virtually nil. For this reason thicker beds of clean diatomite will have to be demonstrated to exist at some presently undisclosed locations before this area can be classed as a source area with any great mining potential.

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- 2 -

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