

State Department of Geology and Mineral Industries

1069 State Office Building
Portland 1, Oregon

Malheur and Harney Counties

EAGLE PICHER (diatomite)

By Howard C. Brooks, June 11, 1986

The following information is from newspaper articles, an Environmental Impact Statement by the U. S. Bureau of Land Management and a talk by Roger Malone, Minerals Division President, to DOGAMI staff and board members at the plant on June 3, 1986.

Owner: Eagle Picher Industries Inc., Minerals Division, P. O. Box 12130, Reno, Nevada 89510 (the head office is in Cincinnati, Ohio).

Location: The treatment plant is at Hope Siding, 7 miles west of Vale in northern Malheur County. It is situated on 300 acres of private land adjacent to U. S. Highway 20 and the Union Pacific Railroad. A site on Vines Hill near the plant will be used at certain times for stockpiling ore.

The mine is in the Otis Creek drainage basin on the Harney - Malheur County line about 65 miles west of the plant site (see attached maps). From Juntura travel 8.5 miles west via U. S. Highway 20 then about 9 miles northerly via gravelled county road. The company has about 12,000 acres of claims and leases in the area. Federal, State and private ownerships are involved. Federal land is covered by both lode and placer claims. County conditional use permits have been acquired for 3 mine sites and a service

center as follows:

Mill Gulch	960 acres	-pit will be mined for 20 years or more.
Sagebrush Flat	920 acres	
Beede Desert	1040 acres	
Puma Claims	<u>160</u> acres	service center
3080 acres total		

History, Development and Personnel: The diatomite deposits in Otis Basin were first described by W. N. Moore (1934, 1937) who visited the area initially in 1930. At that time numerous claims had been located and some prospecting done including drilling. Since then the deposits have been examined and sampled by several prominent mining companies. There was no production prior to the acquisition of the properties by Eagle Picher.

Plant construction began in May 1985 and was near completion June 3, 1986. Malone said start-up was planned for mid-June. Natural gas has been piped to the plant site. A rail transport agreement has been signed with Union Pacific Railroad. Cost to build the plant was estimated at \$13,000,000 when construction began. Construction is being financed in part by industrial revenue bonds and an Urban Development Action Grant (UDAG) which came to the city of Vale for economic development and was loan to the company. Ted Stroebel is general manager. Andy Visocan is plant and mine manager under Stroebel. The plant will employ 30 to 35 people year-round. About 10 employees will work at the mine from June 1 until mid-September. Twelve truck drivers will haul ore to the plant year-round.

Geology: As mapped by Green and others (1972) the deposits in the Otis Basin area are part of a sedimentary sequence of late Miocene and early Pliocene age which consists mainly of well consolidated to semi-consolidated tuffaceous sediments and tuffs and agglomerate(?). These sedimentary deposits are part of the Juntura and Drewsey Formations of Shotwell (1963). Basalt flows of two different units overlie the sedimentary sequence, one of late Miocene-early Pliocene age and the other of Pliocene age. Basalts of the earlier unit may interfinger with the sedimentary deposits locally. Rocks of the younger unit were included in the Drinkwater Basalt of Bowen, Gray and Gregory (1963).

The maximum thickness of the diatomite beds is about 500 feet in the central part of the basin; the diatomite feathers out between underlying and overlying tuffs within about 10 miles in all directions (Moore, 1934 AIME paper). The diatomite bearing area is about 10 miles in diameter although much of that area contains no commercial grade diatomite. The diatomite bearing section is comprised of beds pure diatomite up to 125 feet thick separated by partings of ash and clay ranging from less than one inch to several inches thick. The scarcity of impurities suggest that the diatomite was deposited during a time interval when there was little or no volcanic activity in the area.

In most places the diatomite is either exposed or covered by a thin mantle of soil and rock debris. Most of the pure diatomite is white although some high grade material is buff colored. Because of its tendency to

turn to powder when exposed the diatomite rarely outcrops prominently. The predominant diatom species of the Celatom is Melosira Granulata Curvata.

Mining and Treatment of the Diatomite: Mining was initiated in summer 1985 in the Mill Gulch Mine site. Production mining will be done by open pit, utilizing bulldozers (ripper equiped) and scrapers at 140,000 to 150,000 bank cubic yards of diatomite per year. Because moisture content of the ore ranges from 8 percent to 50 percent by weight the ore will be stockpiled at the mine site and allowed to air dry during the warm months from late spring to early fall. Stripping and some waste removal will be done during the balance of the year. Stockpiled ore will be loaded via front-end loaders into highway-type belly dump tractor trailers at a rate averaging about 430 cubic yards per day for transport to the processing plant or the stockpile site on Vines Hill.

Waste discard at the mill, amounting to 30,000 to 33,000 cubic yards per year, will be trucked back to the mine site and used in reclamation of the land. Mining will normally occur one year prior to mill consumption. All mine and haul equipment will be diesel powered. Drilling and blasting will normally not be necessary.

Treatment of the diatomite will involve mainly drying and calcining the ore. The mill circuit is totally enclosed to prevent escape of dust to the atmosphere or working areas. The heart of the plant is a rotary kiln 10 feet in diameter and 120 feet long which is to be fired by natural gas. Some products require simple calcining, others

require flux calcining of the ore followed by air separation. Soda ash will be used to tie up the iron present in the flux-calcined ore to produce a snowy white product. If the soda ash is not added the product may be pink. Initially about 50 percent of the product will be shipped in bulk and 50 percent in bags by rail and trucks. The plant will operate 24 hours per day, 7 days per week. Plant controls are computer operated.

The annual disturbance at the mine site will probably be six acres per year for the first 5 years. All mined areas will be reclaimed and seeded with crested wheat grass or other grass and brush species as agreed upon by Eagle Picher, the U. S. Bureau of Land Management and Oregon Department of Fish and Wildlife. Mine plans have been established for up to 20 years of operation. Malone indicated that reserves may be as much as 5 times that amount.

Product Uses: The product will, marketed under the trade name Celatom and will be used mainly as filter-aid in the clarification of liquids including beverages, sugar liquors and corn syrups.

References:

Bowen, R. G., Gray, W. L., and Gregory, D. C., 1963,
General geology of the northern Juntura Basin: Chapter
2 in Shotwell, J. A., 1963, The Juntura Basin: studies
in earth history and paleocology: Am. Philos. Soc.
Trans., v. 53 (new series), pt. 1, 77 p.

Greene, R. C., Walker, G. W., and Corcoran, R. E., 1972,
Geologic map of the Burns quadrangle, Oregon:
U. S. Geol. Survey Misc. Geol. Investigations Map
I-680

Moore, B. N., 1934, Diatomite and pumice in eastern Oregon:
AIME Contribution no. 73

Moore, B. N., 1937, Nonmetallic mineral resources of eastern
Oregon: U. S. Geological Survey Bull. 875