

State Department of Geology and Mineral Industries

702 Woodlark Building
Portland, Oregon

SILICA BRICK AND TILE CO.

KLAMATH COUNTY

General: The brick weigh 2 1/2 lbs., contrasted with 6 lbs. for clay brick. The tile weigh half as much as concrete tile. Nails may be driven into the material easily and hold as well as in wood. At this date, there are no data on mechanical tests.

Ray C. Treasher,
Field Geologist,
March 21, 1941

State Department of Geology and Mineral Industries

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Log of dug well (dry) in the NE $\frac{1}{4}$ of the NE $\frac{1}{4}$, T27S, R8E, Klamath County.

Owner: H. J. Thompson
P. O. Box 26A
Chemult, Oregon

Location: 50' east of U. S. Highway 97 at north edge of Chemult.

Petrology: H. M. Dole, thicknesses estimated by owner.

Pink ash with pumice pebbles up to 1 $\frac{1}{2}$ "-----	20'
White pebble pumice (sizes up to 2", an estimated 80% minus $\frac{1}{4}$ ")-----	12'
Reddish clay containing angular lava up to pebble size (maximum of 2"). Pebbles estimated as 20% of total-----	5'
Scoriaceous lava, probably top of a flow; color: mostly reddish, then reddish brown, deep purple. Pieces up to 6"; at base, increase in size to 18"-----	13'
Massive black lava showing flow structure with small blocs of scoria incorporated in it-----	15' $\frac{1}{2}$
End of hole-----	65'

3-*quar*
Report by H. M. Dole

December 20, 1946

Chrystallite Aggregates (Pumice)

Unclassified Mining District
Klamath County

Old Names:

Silica Brick and Tile

Christy Pumice

Owners and Operators:

Omer and Dennis Wisby

P. O. Box 61
Chemult, Oregon

Mrs. H. W. (Stella) Christy
A partnership.

-Same Same

Area:

4,700 acres, held by location as placer claims.

Location:

P Claims are in Tsp's 26 and 27 ⁸R. E.

P Present quarry and siding: SW $\frac{1}{4}$, Sec. 9, T27S, R8E.

P 1 $\frac{1}{2}$ miles north of Chemult on U. S. Highway 97 and the G. N. R. R. Siding is named Silbrick.

History:

In 1940 the Silica Brick and Tile Co., C. A. Moor^e, Pres., Jordon, Mgr., manufactured pumice brick at this site.

P In 1940 Mr. H. W. Christy, Herman Loftdahl, and Enlow acquired the rights to the property. Their production was not great (an estimated total of 50 cars of pumice up to the latter part of 1945 would probably be high.)

P In December of 1945 the Wisby Brothers and Mrs. H. W. Christy took over the operation of the plant. A total of 13,000 cu. yds. were shipped during 1946 and plans are to increase this considerably in 1947.

Topography and Climate:

The quarry lies at an elevation of 4750 in a narrow N-S trending valley bounded on the east by Walker ⁴im and to the west by an unnamed escarpment. The valley gives the impression of being a graben.

FF
In the winter months several inches to several feet of snow will fall; the ground also freezes to a depth of a few inches. Neither impedes mining seriously.

Development work:

An area approximately 500' square has been cleared and the overburden removed.

Another area^a of about the same size is nearly mined out.

Geology:

As mapped by Moore (US Geological Survey Bull. #875) the holdings of this partnership lie within the area of the "Younger Pumice of Crater Lake". Howell Williams (in his map of the "Distribution and Thickness of Crater Lake Pumice") shows T27S and approximately the southern one half of T26S, R8E to lie within the 10' isopach of the pumice fall from Crater Lake. The "Older Pumice" of Moore (Nuées Ardentes of Williams) reaches and may overlap the southern limit of the holdings.

FF
The lump pumice mined covers the low ridges and hills. "Ash", evidentially derived from the weathering of the "Older Pumice", is taken from the "flats" bordering the hills and is added to each carload at a ratio of 1 "ash" to 7 lump pumice.

DD
In the cuts in the pumice no sorting is apparent--the material is uniform throughout; sand to pebbles sizes predominate (for screen analysis from this locality see U. S. Geology Survey Bull #875, samples # 1,2,3,51, 52, 150-157). The same is true of the "ash". A screen and chemical analysis of the "ash" was made available by Mr. Wisby and is given at the end of this report.

Thickness of the pumice varies from 5 feet to 15 feet and averages 10 feet. Overburden (a pumiceous soil) will average 10 inches. Below the pumice is a reddish caly containing angular fragments of lava from grit to pebble size. A dug well 1 mile south (in the NE $\frac{1}{4}$, Sec. 20, T27S, R8E) shows the clay underlying the pumice to be 5 feet thick; below this is lava.

Mining:

Open cut methods are used for the mining of the pumice.

P A 12 cu. yd. scraper is used to remove the overburden after the land has been cleared of timber and brush. Then a bulldozer pushes the pumice to a hopper which feeds into a set of ^{rolls} rolls 9" x 24". The product (-3/8") falls to the stock pile where it is picked up by a 1 cu. yd. Scoopmobile and loaded into railroad gondolas.

R A high line with a 450' working length and employing a 3½ cu. yd. bucket is being installed to increase production.

Equipment:

International ^aTD 18 ^ediesel tractor with a 9' 11" Isaccson blade.

Woolridge 12 cu. yd. scraper.

Scoopmobile with a 1 cu. yd. bucket.

1 set of rolls 9" x 24" powered by a 20 h.p. Wisconsin motor.

A "surplus" ^egenerator.

3 fairly modern homes.

1 shed 20' x 70' 1/2

A 5 car siding on the G. N. R. R., now being enlarged.

Economics:

Chrystallite Aggregates are reported to have a contract with the Myers Engineering Company of 206 S. E. Gand Avenue, Portland, Oregon to furnish a minimum of 5,000 yds. of pumice a month. The Myers Engineering Co. are to furnish all equipment necessary to produce this amount, install same and to do the marketing, advertising and what engineering that is necessary. For this they are ^{reported} to receive 60% of the profits. The length of the contract is indefinite.

All the Wisby's have to do is to get the pumice into the cars, i.e., operate the machinery and keep it in repair.

This is their (the Wisby's) first experience in mining of any sort. The elder Wisby (they are two nice fellows about 30 yrs. and 27 yrs. old) has some heavy equipment experience and the younger one is catching on fast. They are both eager, industrious, and willing but I'm afraid they are a little lacking in efficient mining practice. They apparently have no long range mining program set up and their percentage of waste on their last cut appeared to be higher than it should have been, many thousands of cu. yds. being left.

There is no reason why this shouldn't be a successful mining venture. Their location as to transportation is ideal-- being right at the junction of a highway and two railroads. Stripping costs should be at a minimum as should mining costs. Also there is plenty of "ore" in sight for many years to come.

If the Myers Engineering Co. is on the "ball" on the marketing end of the business and if they can give any good engineering advice to the Wisby's on the mining end this should be a real nice little business.

COPY: ORIGINAL
LABORATORY CERTIFICATE
HERSEY INSPECTING BUREAU
INSPECTING TESTING ENGINEERS
OAKLAND 11, CALIFORNIA

LAB: NO: 99029

SW 1/4 sec. 9, T27S., R8E.

SAMPLE: RED ASH

MARK: NONE

REPORT TO: CRYSTALITE AGGREGATES P. O. BOX 61
CHEMULT, OREGON

JUNE 7, 1946

668

IN ACCORDANCE WITH YOUR INSTRUCTIONS WE SUBMIT THE
RESULTS OF OUR EXAMINATION AND TESTS
MADE ON THE ABOVE MENTIONED SAMPLE AS SUBMITTED:

CHEMICAL ANALYSIS

Silica (SiO ₂)	66.0%
Alumina (Al ₂ O ₃)	17.18%
Iron Oxide (Fe ₂ O ₃)	4.00%
Calcium Oxide (CaO)	3.26%
Magnesia (MgO)	1.35%
Sodium Oxide (Na ₂ O)	3.84%
Potassium Oxide (K ₂ O)	1.65%
Chloride (Cl)	0.01%
Sulfate (SO ₄)	Nil
Carbonate (CO ₃)	Nil
Fluoride (F)	0.02%
Borate (B ₂ O ₃)	0.17%
Ignition Loss	2.48%
Moisture @ 110°C	0.40%
Undetermined (by difference)	0.04%
Total	100.00%

Soluble Phosphate (P ₂ O ₅)	15 ppm
Soluble Potash (K ₂ O)	99 ppm
pH of ltc ₅ extract	7.6
Tri-Calcium Aluminate (calculated)	38.6%
Specific Gravity	2.484
Pyrometric Cone Equivalent	#6
Equivalent Temperature	2,282°F

TO: CRYSTALITE AGGREGATES P. O. BOX 61
 CHEMULT, OREGON
 FROM: HERSEY INSPECTION BUREAU

PAGE TWO JUNE 7, 1946

SPECTROGRAPHIC ANALYSIS

Iron -----	3.0%
Aluminum -----	5.0%
Chromium -----	0.001%
Manganese -----	0.1%
Copper -----	0.001%
Calcium e-----	3.0%
Magnesium -----	1.0%
Strontium -----	0.1%
Titanium -----	1.0%
Sodium -----	1.0%
Potassium -----	0.1%
Silicon -----	30.0%
Non-metallic elements -----	Remainder

SIEVE ANALYSIS

<u>mm</u>			
.381	Plus	#40 -----	29.7%
-.381 + .140	Minus	#40, Plus #100 -----	16.8%
-.140 + .107	Minus	#100; Plus #140 -----	5.0%
-.107 + .074	Minus	#140; Plus #200 -----	6.8%
-.074 + .065	Minus	#200; Plus #230 -----	2.9%
-.065 + .043	Minus	#230; Plus #325 -----	5.8%
-.043	Minus	#325, RIMXX XXXX -----	32.9%
		Total -----	99.9%

HERSEY INSPECTION BUREAU

SIGNED BY HERSEY.

COPY ORIGINAL
HERSEY INSPECTION BUREAU
INSPECTING TESTING ENGINEERS
OAKLAND CALIFORNIA

LAB. NO. 99036

SAMPLE: Calaveras Portland Cement; Calaveras Portland Cement combined with varying percentages of Red Ash Additive.

MARK: None

Received April 26, 1946

June 7, 1946

Report to; Chrystalite Aggregates

In accordance with your instructions we submit the results of our examination and ~~xxx~~ tests made on the above mentioned samples as submitted:

NORMAL CONSISTENCY, TIME OF SETTING
(GILLMORE TEST). SOUNDNESS TEST (5 HOURS BOILING)

Sample: Portland Cement, no additive

Normal Consistency:	24.0 per cent
Initial set:	3 hours 5 minutes
Final Set:	5 hours 25 minutes
5 Hour Boiling Test on Pat:	Satisfactory

Sample: Portland Cement, 10% Red Ash

Normal Consistency:	27.0 per cent
Initial Set:	3 hours 15 minutes
Final Set:	5 hours 50 minutes
5 Hour boiling Test on Pat:	Satisfactory

Sample: Portland Cement, 15% Red Ash

Normal Consistency:	28.5 per cent
Initial Set:	3 hours 10 minutes
Final Set:	5 hours 40 minutes
5 Hour Boiling Test on Pat:	Satisfactory

Sample: Portland Cement, 20% Red Ash

Normal Consistency:	30.0 per cent
Initial Set:	3 hours 15 minutes
Final Set:	5 hours 20 minutes
5 Hour Boiling Test on Pat:	Satisfactory

Sample: Portland Cement, 25% Red Ash

Normal Consistency:	31.5 per cent
Initial Set:	3 hours 10 minutes
Final Set:	5 hours 30 minutes
5 Hour Boiling Test on Pat:	Satisfactory

The above tests were made in accordance with the American Society for Testing Materials standard methods of testing cement;

HERSEY INSPECTION BUREAU

SIGNED BY HERSEY.

March 24th, 1941

State Department of Geology and Mineral Industries

702 Woodlark Building
Portland, Oregon

SILICA BRICK AND TILE CO.

KLAMATH COUNTY

Owner: Silica Brick and Tile Co., Francis Olds, Klamath Falls, President; Fred Jordan, Chemult, vice-president and Mgr.

Location: SW 1/4 sec. 9, T. 27 S., R. 8 E., about 2 miles north of Chemult on the Dalles-California Hwy.

Area: 80 acres, four placer claims, located by Jordan in 1939.

Equipment: Processing plant 28 feet by 32 feet; curing kiln 20 feet by 64 feet; warehouse 30 feet by 70 feet. The processing plant houses rolls to crush pumice to 1/8 inch mesh--they handle 35 yds. per shift; Success hoist, mixer, and tamper; the tamper molds 10 brick, at a rate of 6,000 per shift. The tile tamper will handle 380 tile 8 in. by 8 in. by 16 in.

Operation: Pumice is dug from a pit 50 feet from the plant and moved by wheelbarrow. Pumice is fed into the rolls, by hand, as needed, and crushed 1/8 inch size--no screen. It is shovelled into a skip, 10 parts of pumice to 1 part of cement which is added at this point. The skip rises about 20 feet and automatically dumps into the mixer, where water and "solution" are added, automatically. The water proportion is 2 gal. for a mix--in summer time 4 gal. of water and "solution" are used to make up for excessive evaporation before the brick are tampered. The mixture discharges by a chute into the tamper where the brick are made. The green brick are removed to the curing kiln where they air dry and cure for 24 hours. After air drying, they are ready for use.

Tile are manufactured at the rate of 380--8 X 8 X 16-- per day. Smaller sizes are produced at a proportionately higher rate. The tile air-dry for 3 days as contrasted with 1 day for brick.

Transportation: Gr. N. R. R. runs past the plant. A side track is contemplated this summer. S. P. R. R. is contacted at Chemult, 2 miles south. At present, all materials are trucked to Chemult. The Dalles-California Highway also runs by the plant.

Geology: The pumice is part of the great Crater Lake pumice deposit and lies at the northeast edge of William's Nuées Ardentes where Willaims estimates its thickness as 35--45 feet. Pumice fragments average 1/4 in. in size. Some of the material is in the nature of a lithic tuff scattered in the pumice. A 70 foot well passed thru pumice into red scoria and the bottom 10 feet was again in pumice. The water is "ice cold", year round.

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Ray C. Treasher,
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Jordan claims: the brick have tensile and compressive strength equal or better than clay brick; when given a "wash" they are impervious to moisture; they withstand spalling tests; with his "secret solution" mortar the brick may be bonded to wood, metal, and glass; that the brick have passed U. S. Bureau of Standards tests. Proof of these statements awaits the results of tests.

Transportation to Portland from Chemult, 244 miles, \$1.90 per 1000. Truck haul averages \$1 a 1000 over frt. rates.

Prices f.o.b. the plant are:

Common brick	\$16 per 1000
#1 Select common	\$20 per 1000
Face brick	\$25 per 1000
Building Tile 8in X 8in X 1 1/2in	\$22 per 1000

A special "secret process" wash is put on face and fancy brick.

The Company plans on a novelty brick for fire place, etc, use Mr. Olds is anxious to develop other uses for the pumicite.

I have a very strong hunch that the "secret process" solution that bonds the pumicite is sodium silicate. The reason is that Jordan, in mentioning that the brick could be bonded to wood, etc., said that he would have to mix the mortar out of pumice and his "secret", but that it all could be dry, ready to be mixed with water, at the construction point. Sodium silicate should act as a bond for this silicious material and sodium silicate can be purchased in powder form.

I believe that this operation has considerable promise and is worthy of any help we can give them. Mr. Olds is the new Fish and Game Commissioner.

Ray C. Treasher,
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March 21, 1941

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Report by: N. S. Wagner
Date exam: February 20, 1947

MEMORANDUM REPORT

CRYSTALLITE AGGREGATES (Pumice) UNCLASSIFIED DISTRICT KLAMATH COUNTY

This report is designed to supplement green paper report under same name by H. M. Dole, February 20, 1946.

Foreword:

Substantial progress has been in connection with the re-organization of the company and the expansion of mining facilities since the Dole report was made. Pertinent changes and developments are noted hereafter;

Ownership:

The reported Myers Engineering Co. contract mentioned in the Dole report has evidently been consummated as Mr. D. A. Zweigart of the Myers Co. was on the property supervising installation of large capacity equipment. Zweigart was introduced to me as "of the Myers Engineering Co. which is handling our distribution", and the Myers Engineering Co. card given me by Zweigart features "Chemault Pumicite" in large red letters.

Development:

Routine production is evidently maintained from the old pit and from such pumice as must necessarily be removed in connection with the setting up of the equipment at the new pit as five very large semi's came while I was there and I counted six gondolas on the railroad siding. The trucks were not loaded out due to a breakdown of something in the plant---and also possibly due partly to the fact that Christy dropped everything to devote a full unbroken stretch of four hours with me. Whatever, the emphasis of activity at the property centers not on the current production, but instead, upon the new plant setup.

The railroad siding has been increased to 15 car capacity. Eight metal loading bunkers of 80 yards capacity each are to be installed and these reportedly have been completed and were shipped from Portland the same day that I was there. A triple drum slackline hoist powered by a 150 horse gas engine had already been set up. This is geared to make one 450' trip in one minute. The present bucket is 3½ yards capacity, but a larger one is to be used.

Pit run pumice weighs 1450 lbs. per yard due largely to moisture content. Plans call for immediate construction of a Scott type drier to reduce this weight to between 800 and 900 lbs. per cubic yard.

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Present plans call for immediate duplication of this quarry and plant set-up at another site as soon as this one is completed. For such production it is claimed that signed contract on which token money has been paid calls for delivery of 4000 cars at the rate of 20 cars per day to the San Francisco region. Christy told me this and later mentioned the details again in the presence of Zweigart. Zweigart in turn told Christy that a contract was in the offing with Kaiser for 1456 carloads for the Portland area. Kaiser supposedly is planning to use pre-fabricated forms for monolithic structures, having bought the patent from the gent in Texas whose houses were featured in Life magazine about a year ago.

Long range plans call for serious consideration of the idea of mining the pumice by means of pipes and suction,-----somewhat on the reverse of hydraulicking. Christy claims to have successfully experimented with this idea several years ago at which time he moved large volumes of pumice 260 feet through a 3" pipe. The general plans consist of mounting a "monitor" or a flexible intake pipe, on a motorized chassis and to mine by sweeping the foot of a bank of pumice previously loosened by a small dozer working ahead of the "monitor". Under moderate suction it is believed that a very large flow of pumice can be maintained through an eight inch pipe. According to Christy other advantages than mere transportation of materials are to be had. In discussing the Harold's Club difficulties in drying, Christy stated that his experiments had showed that heat alone will not successfully dry pumice---that a substantial forced draft in addition is necessary to prevent moisture laden air from recondensing on the tremendous amount of surface area existant in a batch of pumice. Moisture removal is best accomplished under a high vacuum under lab conditions. In practice this is not feasible, but suction mining and intra-plant transportation of pumice by air on some such order as is used with diatomite at Qualite would materially assist in drying and would reduce the burden on any drying plant.

1946 production figures given me differ markedly from those in the Dole report. The Dole report records a 13,000 cu. yd. production for that year. Christy told me that 800 cars averaging 74 yds. were shipped during 1946. This amounts to 59,200 yards. The figure so impressed me that I calculated it out in front of him and we discussed it for quite some time so I doubt that I could be in error on account of misunderstanding. Yet at the same time, and in spite of the number of trucks calling at the plant, the old working pit didn't impress me as being that big. Unless there is another working pit which I didn't see, Dole's figures would look to be more nearly the correct ones. Still 800 cars at 74 yds. average with half of them being at \$1.00 per yard and half at \$1.50 per yard were officially given to me as the 1946 production record for the Non-Metallic Survey. Though the production here has been obviously large scale as compared to the producing plants I visited around Bend, still the figures given me seem excessive and I suggest that the Portland office make direct inquiry regarding a re-statement of said production on the grounds that existing Departmental production figures are contradictory due probably to typographical errors or to some such excuse.

Regarding Christy, the line he peddles is obviously to be discounted. He contradicted himself on several of the things he told me. However, I do caution against discounting him too much. The major important points evidently told to Dole as pending and recorded by him on his confidential sheet as "reported" items have materialized. The siding is enlarged, the new plant is being installed

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along the lines previously outlined, and the Myers Engineering Company is supervising the installation and has furnished at least some of the equipment. Christy may be given to unreliable and visionary talk, but none-the-less this particular operation does seem to be going ahead on a strong basis.

Of the 1946 production, an estimated 30% of it was handled by truck and 70% by rail. Truck deliveries have reached as far as Vancouver, Washington and Reading, California. Rail deliveries have gone as far as Bellingham, Washington, and King City, California. Rail rates to Seattle are reported at \$0.25/100; to Frisco, \$0.27; and to King City, \$0.34.

Informants:

Zweigart and Christy

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