

ELECTRIC METALLURGICAL CO.

AVERAGE ANALYSIS OF HOLES DRILLED ON PROPERTY OF GRANTS PASS LIME

PRODUCTS COMPANY

Lynch Bros. Seattle Drillers

December 1947  
January 1948

<u>Hole Number</u>	<u>CaO</u>	<u>MgO</u>	<u>SiO2</u>	<u>R2O3</u>	<u>PHOS.</u>
1	97 96	.84	.50	.22	.023
2	98 12	.88	.18	.11	.0177
3	90 58	.69	7.40	.49	.025
4	85 65	.71	12.29	.82	.033
5	97 31	.63	1.37	.28	.0156
Average of 5 holes	93 92	.75	4.35	.38	.027

No 5 Hole 185 deep from floor down.

No 1 - No 2 Holes 385 feet each.

No 3 Hole 200 feet last 4 - 5 feet heavy Selica and stopped.

200 feet into Cave and Crevice.

No 4 Hole 100 feet N and E Hole No 3. 12 to 15 feet at 195

In good limestone 210 Hole stopped. 225 feet.

*Bert McNair*

Portland, Oregon  
April 29, 1948

Report on Marble Mountain Limestone  
Deposit near Grants Pass, Oregon,  
owned by A. A. Muck & Son

By Robert D. MacAfee

**Introduction:**

The following report on the limestone deposit on Marble Mountain covers the writer's inspection and study made, first when making an overall study of limestone deposits in the northwest for Freeport Sulphur Company and a more detailed study when retained by owners. It incorporates the U. S. Army Engineers' report on the area compiled by Dr. Hodges, and also detailed data on adjoining Pacific Portland Company quarry which is operating. A general market survey by Mr. Wm. Derry, Industrial Engineer for Pacific Gas and Electric Company is attached.

**Location and Ownership:**

Marble Mountain is located about three and a half miles south of the hamlet of Wilderville, which is nine miles southwest of Grants Pass in Southern Oregon. See attached general township map.

**The description is specifically:**

Government Lots 4, 5, 6, and 7 covering  
W $\frac{1}{2}$  of W $\frac{1}{2}$  of Section 30, Township 37 S.,  
Range 6 W. W. N. in Josephine County,  
Oregon, making a total of <sup>(140)</sup> 160 acres.

This property comprising approximately 160 acres, covers a main part of the limestone deposits on Marble Mountain, as well as its apex, and is owned by A. A. Muck & Sons of Portland, Oregon, having been located in 1906, and held since that date.

Adjoining on the north, the Beaver (now Pacific) Portland Cement Company have a quarry which is in active 800' ton a day operation.

The Beaver quarry is used to supplement and sweeten the limestone used in their cement plant at Gold Hill, and to fill orders in the northwest for limestone used in the paper industry. The description of this quarry, costs

Hole  
Name

1

2

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4

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0-5

of mining, average analysis, etc., are set forth in attached report taken from Dr. Hodges' compilation referred to above. Also, description is given in Oregon State Department of Geology bulletin No. 14C. Vol. 11, Section 1 on pages 161-164.

### Transportation:

Paved highway runs from Grants Pass to Wilderville, and a gravelled road following old railroad grade runs to property along Cheney Creek. A new road is being put in on property eliminating steepest grades to the main limestone faces by Mr. Muck where quarry site will be located. This road will be wide enough to allow moving in of shovels, compressors, and other necessary quarry equipment without difficulty.

A standard broad gauge railroad runs from Grants Pass to Wilderville and a private spur runs to Marble Mountain which serves the Beaver quarry. This road is the California-Oregon Coastline Railroad, and uses equipment of the Southern Pacific Lines. It is under lease to Portland Cement Company, who use the Marble Mountain siding for loading their limestone. The limestone is brought down the mountain side from the quarry to the railroad by a car tram.

A car tram will be installed to bring limestone from the Muck quarry down the mountain thence by truck to the railroad siding at Wilderville. The tram will be about 1200' long from 2600' el. down to 1700' el. The plant site at Wilderville is also advantageous for the location of crushing plant with material flow through it by gravity. (See attached flow sheet). The line from Wilderville to Grants Pass is a public carrier and rates attached to Oregon points are from Wilderville.

### Geology, Analysis and Tonnages:

Limestone from several places on property was burned in 1898 by local people using wood-fired kilns, but since 1906, when Mr. Muck and partners acquired ground, they have only prospected and opened up the various faces without doing anything commercially. They have had several offers to sell but did not want to let the property go.

The limestone beds are massive and thick, dipping

steeply striking N. 30° East and running from 100' to 500' wide and are of unknown depth. Croppings on the mountain side offer a face of possibly 300' in width with 50' backs to start on, which will increase in ratio of 1 to 2 from starting face as quarry is mined as limestone rises to several hundred feet above site. The site lies advantageously for getting tonnages out rapidly and at low costs. The grade from overall samples taken seems to have remarkably little variation. There are three prominent quarry sites opened to some extent. See map.

The upper one which shows the lowest phosphorous content will be developed first. This site was sampled by U.S. Army Engineers as noted in Dr. Hodges review attached, and is listed as deposit "B" (see map) with following average analysis:

CaO	MgO	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	CO <sub>2</sub>	
55.88%	0.33%	0.01%	0.31%	0.00%	42.00%	$\frac{3}{0.1}$

Similar sample taken by MacAfee from above face and analysed by Electro Metallurgical Company (Union Carbide) ran:

CaO	MgO	Al <sub>2</sub> O <sub>3</sub>	and	P	CO <sub>2</sub>
55.59%	0.43%	0.10%	Fe <sub>2</sub> O <sub>3</sub>	0.003%	43.95%

Pacific Carbide Company made analysis of a 50 lb. sample and averaged phosphorous 0.0055%. These general samples show this face to be extremely high grade and pure. The material meets all qualifications for metallurgical grade of lime and also carbide use, and can be classed as premium quality. The tonnage that shows is large and a survey is being made to block it in definite limits, also for exact detailed sampling. These results are attached.

The next face which has been opened is a little lower in elevation than above and has been opened for a width of over 100 feet. It is noted in Dr. Hodges report as body "c" (See map).

U. S. Army Engineers sample on this block are as follows:

CaO	MgO	Al <sub>2</sub> O <sub>3</sub>	FeO <sub>3</sub>	SiO <sub>2</sub>	P.	CO <sub>2</sub>
54.06%	0.41%	1.72%	0.06%	0.04%	.01%	43.99%

Pacific Carbide analysis on Phosphorous was: 0.011%

While the phosphorous content is a little higher than upper site, this is very high grade and massive Br. Hodges estimates 12,000,000 tons can be blocked out on above site. Present detailed survey and sampling results are attached.

The third limestone showing located in Section 25 (See map) had a kiln on it in early days. The tonnage that can be developed is largely due to its being at lower elevation. It is not planned to work this face at present.

Analysis from general sample across face by Electro Met. Co. is as follows:

CaO	MgO	Al <sub>2</sub> O <sub>3</sub> and Fe <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	P.	Ign. loss or CO <sub>2</sub>
54.83%	0.45%	0.25%	0.64%	.014%	60%

The phosphorous content seems to be a little higher on this sample. Others are down to .002%. All the limestone exposed is a clear grey to mottled lighter grey, even, fine-grained, hard, and brittle material. The mottled appearance, according to H. D. Jones, being caused by an admixture of light-colored aragonite in places. Wall rocks are metamorphic sedimentaries of greenstone. Limestone is classified as Jurassic age and as of Galice Series with greenstone being of older age, possibly Triassic. As shown by geologic map some serpentine lenses show on contacts also.

From exposed sections the tonnages that can be figured are large. Dr. Hodges gives a figure of 40,000,000 that can be developed. From my survey, possible tonnages can be computed at 12,000,000 minimum.

Limestone generally shows different grades in various stratas or beds. The interesting and attractive feature of this deposit is the remarkably even analysis shown by the samples taken in the different sections. This is due to the massive character and thickness of stratas.

In the Beaver quarry the deposit is somewhat different, being more stratified with a fault cutting through on East side giving a width on one side of it of 100 feet, where limestone is very high grade 22 + 600%.

This section is being mined exclusively for paper rock, while the main body is a little lower grade running 82%  $\text{CaCO}_3$  which is used for cement-plant sweetener. This deposit, however, is not continuous with the Muck deposit and is of different character. The old Beaver Portland Company tried for years to acquire the Muck property and they hold deposits farther south in Section 31.

#### General Uses and Standards:

In limestone deposits the impurities contained, in addition to the Calcium Carbonate ( $\text{CaCO}_3$ ) content, affect the uses that limestone is suitable for. Most deposits carry an excess of some one or more of these elements. The following table gives the limits allowable for the high-grade metallurgical uses. If the analysis is within these limits, it is classed as premium, and will meet the various standards necessary for any use.

Constituents	Percentages
$\text{CaCO}_3$	97%
$\text{CaO}$	54.32%
$\text{MgO}$	0.5 to 1.5% if uniformly distributed
FeOxides	0.035 to 0.5%
$\text{Al}_2\text{O}_3$	0.2-1.0%
$\text{SiO}_2$	1.2-3.0% if uniformly distributed
$\text{TiO}_2$	0.03-0.5
P <sub>2</sub> O <sub>5</sub>	.004-.015
Impurities	3.0 minus
S	Trace

The physical requirements are: (1) That in blasting and handling, the rock shall retain a lump form and produce little sand or dust; (2) That rock be not too dense nor coarsely crystalline and (3) That it burn to a high calcium (less than .5%  $\text{MgO}$ ) lime.

The Muck deposit shows it to be well within the minimum standards hence, ideal. The grade for Carbide limestone has been hard to maintain in W. W. as low phosphorous deposits worked have been depleted and new ones are, in many cases, too isolated from railroad or ocean transportation to develop with any reasonable outlay. Those producing have been unable to fill Oregon's demand. The Pacific Carbide Company need 100 tons of this grade daily to make 50 tons of Carbide grade burned lime. Electro Metallurgical Company need 150 tons for the same use. Both companies would be willing to fill these daily needs from Marble Mountain due to the low phosphorous content which at upper face runs from 0.005% to .01% as against 0.015% that is best that they can get from present sources in Eastern Oregon. Carbide grade must

have very low phosphorous content and brings premium prices.

The paper industry requires a high grade pure limestone on 94% or better, taken as lump material of 5" to 18". About 300 lbs of limestone is used per ton of pulp and total market in N.W. is now 120,000 tons yearly. On agricultural limestone, ground to minus 10 mesh, Oregon's needs are well over 200,000 tons yearly. These demands and the various other uses are detailed in the attached general report on N.W. limestones by MacAfee and also the report by Mr. Wm. Derry. The main fact is that the market demand is not being met, and that limestone is one of the four basic products that must be produced for industry to progress in N.W. Thus, increasing production is essential.

Burned lime has always commanded a premium price in the West above the U.S. national average of \$7.50 per ton. This has been due to freight differential, and lack of adequate modern kilns to supply demand. With facilities available to furnish lime a definite market is here that will be profitable and continually increase in size. The Stauffer Chemical Company distributes a large daily tonnage through their northern states, retail outlets, and have expressed their interest in handling the plants distribution.

In summation, the tonnage of limestone needed with the known steadily increasing demands in post war period both in manufacture and agriculture is in excess of 500,000 tons in N.W. as shown by Derry's Market Survey.

#### Program

Mr. Muck has read into property and is getting it completed and surfaced. He has shovels, bulldozers, compressors, trucks and tools on hand, for the mining side.

A tramway and crushing plant with adequate storage bins must be installed. Estimates on this equipment, also flow sheets and costs are attached herewith. The plan is for 500 tons production per day, which, with a 5-day operating week, will produce 150,000 tons per year. This amount can be disposed of without carrying any large stock pile and plant layout and distribution is so designed.

There has been a successful development of a small lime burning furnace worked out by Utah Lime Stone Company, this is known as the Ellernan kiln. These kilns are being used in direct competition with rotarys there, and have been successful. They can be installed in small units of 5 to 10 ton capacity at an installation cost of \$1,000 per ton. One operator per shift can handle several as they are continuous and are oil fired. It is planned to put in 15 tons capacity as a trial pilot plant at a later date and to increase them as needed. Costs of burning lime are shown in enclosed breakdown.

The equipment and material on hand furnished by Mr. Mack represents an investment of \$50,000 exclusive of property value. The preparation, crushing plant, and operating capital, will represent an additional investment of \$75,000.

#### Costs and Sales:

As shown by cost sheets, herein, the mining and preparation of various grades of limestone including sizing, ready for shipment, will average 90 cents per ton. Amortization of investment distributed over 4 years at the rate of minimum production of 130,000 tons per year, will be 96 cents per ton. The overall costs as computed ave. \$1.86 per ton that is given above is for raw limestone production. The selling prices f.o.b. plant range from \$1.60 for paper rock, \$2.50 to \$4.50 for agriculture use with specialized products still higher so it is safe and conservative to estimate a minimum net ave. profit of \$1.04 per ton for all material marketed. This would amount to \$136,000 per year on a 5-day week production schedule of 500 tons per day.

On burned lime plant planned later the breakdown of costs including the \$1.86 per ton mining, crushing and amortization write-off attached gives \$6.25 per ton. As shown by market price, burned lime in the West has averaged from \$11.00 per ton to \$24.50 present price for high grade material or \$17.50 average selling price, f.o.b. plant; less production costs of \$6.25 and adding \$1.25 per ton for amortization of investment on kilns hydrator, etc. A profit of \$10.00 per ton is left which on a 15 ton per day rate is 5,000 tons a year burned lime operation to start. This tonnage would show a possible \$50,000 net return yearly. One and a half tons of raw limestone are needed to produce 1 ton of lime.

Attached are cost figures (for burning) of 50 representative operating lime plants in the U.S. compiled

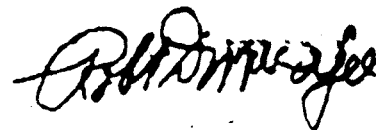


by Mr. Dohrer of Kennedy Van Saun Company. These burning costs vary from \$4.25 per ton down to \$2.50 giving an average of \$3.50. In above estimates this average cost is doubled for safety so it is well within operating range in the west.

Independent cost estimates on limestone production are attached herewith by Mr. Dohrer consulting engineer of Seattle with Kennedy Van Saun Mfg. and Engineering Company who has made examination study of the property. Mr. Dohrer has recently completed two large plants in the Northwest, both in Washington. Mr. Dohrer's estimates on costs per ton are considerably lower than the ones estimated by MacAfee in this report.

#### Suggestion:

The Marble Mountain deposit of limestone can be put into production in a few months, or as soon as crushing plant and tram are installed and completed. On a 500 ton per day schedule, a ready sale is assured. The needs in the northwest are growing, and are not being met, due to difficulty in finding raw material of high grade quality in an economically advantageous location. Added investment needed will be \$75,000 to put in complete plant. This investment can be amortized in 4 years or sooner if desired. Year around operation is assured in southern Oregon due to favorable climatic conditions. Thorough investigation has been conducted on all phases. State Bureau of Geology, Bonneville Administration Engineers, and outside consulting engineers have inspected deposits and verified quality and grades. Market surveys and assurances of sales have been conducted, which leads to the conclusion that this operation can be classed as a basic and essential one that will fill a need that is not being met to date in Oregon, Northern California, and Southern Washington industries.



## MEMORANDUM REPORT

Re: Grants Pass Lime Products, Inc. - Limestone  
 Sec. 30, T37S, R6W, W.M.  
 Wilderville, Oregon

October 29, 1957

From: R. L. Anderson

This property was presented by Mr. O. W. Sorensen, Vice President of Uranium Corporation of America, 527 Failing Building, Portland 4, Oregon. The property is under 99-year lease--about 90 years yet to run--to Grants Pass Lime Products, Inc., the stock of which is all owned by Mr. and Mrs. Muck and Mr. and Mrs. Conley. The ground is held as unpatented mining claims, there being seven Terry claims, eight Portland Rock claims, eight Carly Ann claims, and eight Virginia claims. Only two of the latter are not completely under control of Mr. Muck and one other closely associated individual. The claims cover the following:

The  $W\frac{1}{2}$  of the  $W\frac{1}{2}$  of Section 30, T37S, R6W, WM,  
 The  $E\frac{1}{2}$  of Section 25, T37S, R7W, WM,  
 The  $SW\frac{1}{4}$  of Section 25, T37S, R7W, WM.

According to Mr. Sorensen, the property can be delivered for a total price of about \$350,000.

The property was inspected alone October 7, 1957. It is reached by proceeding along the Redwood Highway 199 ten miles from Grants Pass to Wilderville, thence two miles up the Applegate River southeasterly, thence about three miles up Cheney Creek on County road, thence three miles southeasterly up private, well-graded road to the quarry.

The property immediately lost part of its value upon the realization that the California and Oregon Coast Railway track had been taken out not only down Cheney Creek but also all the way to Grants Pass. This necessitates an eighteen mile truck haul.

The quarry already opened by Grants Pass Lime Products exposes lime across 200 feet and about 150 feet vertically. The beds immediately adjacent to, and above, a 14-foot porphyritic sill have been the major source of production. Sampling by the writer indicates as expected that this is the purest lime. A 23-foot sample assayed 54.4% CaO, equivalent to 97.1% CaCO<sub>3</sub>. A sample of thirty pieces taken from a pile which had been hauled down the hill and sized assayed 54.1% CaO. The three other samples were 52.7%, 53.7%, and 53.2%.

Bedding at the northeast exposure strikes N10E and dips 60SE. The porphyry sill exposed at the floor of the quarry strikes N20E and dips 60SE. A shale footwall exposure at the NW end of the quarry strikes N30E and dips 30SE. These give the general attitude of the bedding.

Sunshine samples have been plotted on the accompanying sketch and their true lengths perpendicular to the dip are shown. They are tabulated below.

	Feet	Calculated	%	%		
	Cut	CaO	CaCO <sub>3</sub>	Insol.	R <sub>2</sub> O <sub>3</sub>	%F
SM 509	120	52.7	94.1	2.5	1.0	
510	100	53.7	95.9	0.6	1.0	
511	23	54.4	97.1	0.6	1.0	
512	15	53.2	95.0	1.2	1.2	
513	Grab from Pile	54.1	96.6	0.6	0.5	

Electro Metallurgical Company apparently had Lynch Bros. of Seattle drill five holes on the property during December and January of 1947 and 1948. Their lines were good but the phosphorus is too high in every case. Their results are tabulated below.

Hole No.	Depth	CaCO <sub>3</sub>	MgO	SiO <sub>2</sub>	R <sub>2</sub> O <sub>3</sub>	P
1	385	97.96	.84	.50	.22	.023
2	385	98.12	.88	.18	.11	.018
3	200	90.58	.69	7.40	.49	.025
4	225	85.65	.71	12.29	.82	.033
5	185	97.31	.63	1.37	.28	.016
Ave.		93.92	.75	4.35	.38	.027

Sampling by the Army Engineers and by MacAfee are reported from upper and from lower outcrops but which of these corresponds with the Electro sampling and with Sunshine sampling is not clear because of the absence of Lt. Hodges' map. The results follow, showing very slight phosphorus at the upper face.

	CaO	MgO	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	CO <sub>2</sub>	P
Upper Face:							
Army	55.85	0.33	0.01	0.31	0.06	42.00	
Electro	55.39	0.43	---	0.10---		42.95	0.003
Pacific Carbide							0.0055
Lower Face:							
Army	54.06	0.41	1.72	0.06	0.04	43.99	0.01
Pacific Carbide							0.011

#### Conclusions:

Sunshine sampling results indicate that high-grade limestone is available at the property but that its true thickness is 23 feet perpendicular to the dip into the hill. Most of this bed has been mined which will necessitate starting a new quarry floor. To achieve 40 feet horizontally of mineable high-grade limestone bed, 120 feet horizontally of shale, two porphyry sills, and a poor limestone bed would need to be removed. This would give an additional 30 feet of elevation on the good bed. The next bench 30 feet lower would necessitate removing 160 feet for another 40 feet of good lime.

Most of the deposit is not as high-grade as represented, is too poor for burning and carbide use. The really good bed will become increasingly more expensive to produce. The removal of the railroad is a further deterrent.

#### Recommendation:

This deposit is not thought to warrant further consideration at present.

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

2033 First Street  
Baker, Oregon

1069 State Office Building  
Portland 1, Oregon

239 S.E. "H" Street  
Grants Pass, Oregon

REQUEST FOR SAMPLE INFORMATION

The State law governing analysis of samples by the State assay laboratory is given on the back of this blank. Please supply the information requested herein as fully as possible and submit this blank filled out along with the sample.

Your name in full Damon L. Leonard

Post office address Box 0, North Plains, Oregon

Are you a citizen of Oregon? yes Date on which sample is sent July 2, 1957

Name (or names) of owners of the property Leonard & Associates

Are you hiring labor? no Are you milling, or shipping ore? no

Name of claim sample obtained from The Rock

Location of property or source of sample (If legal description is not known, give location with reference to known geographical point.)

County Washington Mining District \_\_\_\_\_

Township 3 N. Range 2 W. Section 29 quarter section SE 1/4 of SE 1/4

How far from passable road? on Name of road Skyline Blvd.

	Channel (length)	Grab	Assay for	Description
Sample no. 1	_____	_____	Silica, iron, aluminum, titanium	100 ft. west of and 400 ft. north
Sample no. 2	_____	_____	_____	_____

(Samples for assay should be at least 1 pound in weight)

(Signed) Damon L. Leonard

DO NOT WRITE BELOW THIS LINE - FOR OFFICE USE ONLY - USE OTHER SIDE IF DESIRED

Sample Description Bauxite.

Sample number	GOLD		SILVER		SILICA	IRON	ALUMINA	TITANIUM
	oz./T.	Value	oz./T.	Value	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>
P-21495 No. 1	---	--	---	--	2.68%	29.88%	41.54%	1.30%

Fe: 20.90%

Report issued \_\_\_\_\_ Card filed \_\_\_\_\_ Report mailed 7-16-57 Called for \_\_\_\_\_

2033 First Street  
Baker, Oregon

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Post office address Box G, North Plains, Oregon

Are you a citizen of Oregon? yes Date on which sample is sent July 2, 1957

Name (or names) of owners of the property Leonard & Associates

Are you hiring labor? no Are you milling or shipping ore? no

Name of claim sample obtained from Meacham

Location of property or source of sample (If legal description is not known, give location with reference to known geographical point.)

County Washington Mining District \_\_\_\_\_

Township 2 N. Range 3 W. Section 3 Quarter section SE 1/4 of NW 1/4

How far from passable road? 100 ft. Name of road Pumpkin Ridge

	Channel (length)	Grab	Assay for	Description
Sample no. 1	<u>(P-5547-11)</u>	<u>X</u>	<u>TiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub> Fe<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub></u>	

Sample no. 2 \_\_\_\_\_  
(Samples for assay should be at least 1 pound in weight)

(Signed) Damon L. Leonard

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Sample Description Bauxite.

Fe: 6.08%

Sample number	GOLD		SILVER		SILICA	IRON	ALUMINA	TITANIUM
	oz./T.	Value	oz./T.	Value	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>
P-21496 No. 2	---	--	---	--	3.62%	8.69%	55.26%	1.42%

Report issued \_\_\_\_\_ Card filed \_\_\_\_\_ Report mailed 7-16-57 Called for \_\_\_\_\_

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Your name in full Damon L. Leonard

Post office address Box G, North Plains, Oregon

Are you a citizen of Oregon? Yes Date on which sample is sent June 16, 1957

Name (or names) of owners of the property Damon L. Leonard & Associates

Are you hiring labor? no Are you milling or shipping ore? no

Name of claim sample obtained from Meacham

Location of property or source of sample (If legal description is not known, give location with reference to known geographical point.)

County Washington Mining District \_\_\_\_\_

Township 2 N. Range 3 W. Section 3 Quarter section SW 1/4 of NE 1/4

How far from passable road? 100 ft. Name of road Pumpkin Ridge

	Channel (length)	Grab	Assay for	Description
Sample no. 1	<u>(P-5547-10)</u>	<u>X</u>	<u>Aluminum, iron, titanium, silica</u>	

Sample no. 2 \_\_\_\_\_  
(Samples for assay should be at least 1 pound in weight)

(Signed) Damon L. Leonard

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Sample Description Bauxite.

Sample number	GOLD		SILVER		SILICA	IRON	ALUMINA	TITANIUM
	oz./T.	Value	oz./T.	Value	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>
<u>P-21429 (5547-10)</u>	<u>---</u>	<u>--</u>	<u>---</u>	<u>--</u>	<u>1.56%</u>	<u>11.79%</u>	<u>41.30%</u>	<u>1.46%</u>

Report issued \_\_\_\_\_ Card filed \_\_\_\_\_ Report mailed 7-16-57 Called for \_\_\_\_\_

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County Washington Mining District \_\_\_\_\_

Township 2 N. Range 3 W. Section 3 Quarter section SE 1/4 of NW 1/4

How far from passable road? \_\_\_\_\_ Name of road Pumpkin Ridge

	Channel (length)	Grab	Assay for	Description
Sample no. 1	<u>(P-5547-12)</u>	<u>X</u>	<u>Alumina, iron titanium, silica</u>	

Sample no. 2 \_\_\_\_\_  
 (Samples for assay should be at least 1 pound in weight)

(Signed) Damon L. Leonard

DO NOT WRITE BELOW THIS LINE - FOR OFFICE USE ONLY - USE OTHER SIDE IF DESIRED

Sample Description Bauxite.

Fe: 11.17%

Sample number	GOLD		SILVER		SILICA	IRON	ALUMINA	TITANIUM
	oz./T.	Value	oz./T.	Value	SiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>
P-21428 (5547-12)	---	---	---	---	3.82%	15.97%	50.36%	1.70%

Report issued \_\_\_\_\_ Card filed \_\_\_\_\_ Report mailed 7-16-57 Called for \_\_\_\_\_







