

## WASHINGTON COUNTY IRON

## HENDRICKSON

Hole	Coordinates		Depth of Over- burden	Thick- ness of Ore	Analysis			Sample Width	Sample No.
	N.	E.			Fe	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>		
1	600	4290	3'	8'	31.22	32.52	6.92		1
2	630	4250	No	Iron					
3	630	4350	8'	17.5	31.22	32.52	6.92		1
4	940	5410	13	7	16.16	29.44	28.45		2
5	2220	6110	5	8	24.24	29.28	13.38	Samples	
6	2210	6155	11	14	"	"	"	Combined	3
6-A	2190	6120	10	15	24.55	29.36	7.64	10-12'	6A-1
"					29.16	28.48	13.96	12-14	6A-2
"					31.86	25.80	5.24	14-15	6A-3
"					23.02	34.40	6.26	15-17	6A-4
"					23.42	37.52	5.82	17-19	6A-5
"					22.01	33.28	15.32	19-20	6A-6
"					24.60	32.92	6.10	20-21	6A-7
"					23.19	32.88	6.98	21-25	6A-8
"				Weighted Average	24.77	32.20	8.13		
7	1710	3780	7	14	23.80	33.12	8.30		4
8	1990	2915	4	13	23.08	35.34	7.26		5
9	2130	2670	No	Iron					
10	980	6120	9	3	12.45	29.54	40.42		6
11	1500	5200	No	Iron					
12	1400	5200	9	12	27.67	27.80	12.52		7
13	2600	5200	5	Trace	17.87	28.12	27.66		8
14	2200	5200	14	9	35.42	21.56	8.90		9

WASHINGTON COUNTY IRON

HENDRICKSON

Hole	Coordinates		Depth of Over- burden	Thick- ness of Ore	Analysis				
	N.	E.			Fe	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	Sample Width	Sample No.
15	1000	6200	10'	11'	17.60	35.96	19.94	10-16'	10
"	"	"	"	"	21.19	37.80	8.78	16-20	10-A
"			Weighted Average		19.04	36.70	15.48		
16	1925	3780	8	13	26.65	33.28	6.50	8-15	11
"	"	"	"	"	12.16	32.16	32.88	15-21	11-A
"			Weighted Average		19.96	32.76	18.68		
17	1000	6400	16	6"	No Iron Sample				
18	2600	6400	9	6'	24.99	24.64	13.38	9-15	12
19	200	5400	7	13	23.13	35.52	10.78	7-21	13
20	1650	6100	29	11 1/2'	No Iron Sample				
21	1200	6525	14	18	6.64	22.08	56.16	14-32	14
26	2200	1900	5	WI 13	24.18	34.80	6.70	13-19	18-A
"	"	"	"	"	25.07	34.60	8.16	19-22	18-B
"	"	"	"	"	<u>21.27</u>	<u>40.80</u>	<u>6.40</u>	22-26	18-C
"			Weighted Average		23.49	36.60	6.94		
27	2500	1630	16	9	6.38	26.00	55.96	16-25	19
28	2500	1490	9	2	28.88	24.96	18.36	9-11	20
29	On county road 0.27 mi. E. of highway junction on Parmele prop.		4	10	18.92	36.40	14.74	4-6	21-A
"					26.64	34.08	7.74	6-8	21-B
"					25.18	30.88	6.70	8-14	21-C
"			Weighted Average		24.22	32.62	8.52		
Cut No.1	1625	3840		6'	23.25	36.48	5.70	H <sub>2</sub> O 17.5%	P-2473
" "	"	"		3' 7"	15.81	42.92	5.74	H <sub>2</sub> O 21.2	P-2474

WASHINGTON COUNTY IRON

NELSON

Hole	Coordinates		Depth of Overburden	Thick-ness of Ore	Analysis				
	N.	E.			Fe	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	Sample Width	Sample No.
22	4130	8120	7'	15'	10.58	36.28	19.88	7-8	15-A
"					12.50	33.88	28.70	8-9	15-B
"					13.30	34.32	25.74	9-10	15-C
"					14.97	31.28	36.32	10-11	15-D
"					15.76	40.44	17.36	11-12	15-E
"					16.55	35.80	19.50	12-13	15-F
"					20.26	38.10	11.06	13-14	15-G
"					23.76	35.60	11.72	14-15	15-H
"					27.13	32.64	8.20	15-16	15-I
"					27.44	33.52	8.68	16-17	15-J
"					27.81	33.92	7.68	17-18	15-K
"					23.76	32.64	8.40	18-19	15-L
"					28.50	27.40	7.76	19-20	15-M
"					24.20	35.88	10.02	20-21	15-N
"					19.25	39.24	11.78	21-22	15-O
"			Average	7-22'	20.38	34.72	15.52		
"			Weighted Average	13-22'	24.68	34.33	9.48		
23	4130	7745	6	8	22.07	37.86	7.06	6-7	16-A
"					20.66	35.76	13.30	7-8	16-B
"					18.75	35.56	17.08	8-12	16-C
"					20.94	40.36	4.80	12-14	16-G
"					20.70	31.61	7.14	14-15	16-I
"			Weighted Average		20.03	36.46	11.71		

## WASHINGTON COUNTY IRON

## NELSON

Hole	Coordinates		Depth of Over- burden	Thick- ness of Ore	Analysis				
	N.	E.			Fe	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	Sample Width	Sample No.
24	3625	8120	17'	12'	5.93	14.68	58.58	12-17'	17-A
"					16.67	20.64	25.26	17-23	17-B
"					23.17	32.68	10.46	23-26	17-C
"					24.17	33.20	9.60	26-28	17-D
"					25.30	33.10	10.32	28-29	17-E
"			Weighted Average		12-29'	16.05	23.22	29.73	
"			Weighted Average		17-29'	20.26	26.78	17.71	
25	3620	7740			No	Iron	Sample		
35	4125	8495			No	Iron	Sample		
36	3975	8490			No	Iron	Sample		

WASHINGTON COUNTY IRON

DR. NIXON

Hole	Coordinates		Depth of Overburden	Thick-ness of Ore	Analysis			Sample Width	Sample No.
	N.	E.			Fe	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>		
30	425'	N45°W of road at point, 0.26 mi. from Pumpkin Ridge road, sec. 34, T.3 N., R.3 W.	2'	10 1/2'	22.16	26.72	19.56	2-6'	22-A
"					22.38	33.68	8.88	6-8	22-B
"					22.83	33.64	8.22	8-13	22-C
"		Weighted Average		2-13'	22.50	31.13	12.46		
"		Weighted Average		6-13'	22.70	33.65	8.41		

HUTCHINSON

31	50'W. of limonite outcrop in canyon sec. 1, T. 2N., R. 3W.	9.5'	Did Not Drill Through Ore.					
32	100'N. of Hutchinson house.	8	45	22.83	33.12	12.96	8-10'	23-A
"				32.68	25.72	8.62	10-12	23-B
"				25.91	32.88	5.28	12-13	23-C
"		Weighted Average		27.38	30.07	9.68		
33	At road fork near center of sec. 22.	4	9	13.54	28.48	16.80	4-12	24
34	On road 1325' W. of Hutchinson house.	5	9/	No Iron				

## WASHINGTON COUNTY IRON

## SCHMIDT

Hole	Coordinates		Depth of Over- burden	Thick- ness of Ore	Analysis				
	N.	E.			Fe	Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	Sample Width	Sample No.
(Sec. 3, T.1N., R.2W.)									
1	1050' E. of Schmidt's corner N. side of road.		1	8	21.36	40.40	7.72	1-9'	1
2	400' S. of Hole #1		1	15	19.93	41.52	11.34	1-6	2-A
"					18.91	42.72	7.94	6-10	2-B
"					14.24	46.32	7.48	10-16	2-C
"			Weighted Average		17.28	43.76	8.89		
3	300' west of Hole #2.		8	9	8.10	26.76	54.70	8-17	3

## CATHEY

(Sec. 34, T.2 N., R.2 W.)									
4	300' S. of Cathey gate.		2'	10'	19.65	31.04	38.94	2-7'	4-A
"					22.01	26.20	17.14	7-9	4-B
"					26.91	25.68	14.20	9-12	4-C
"			Weighted Average		22.30	28.46	27.16		
5	550' north of Cathey gate.		No	Iron					
6	750' W. of high- way on south edge Cathey property.		5'	12'	9.57	16.20	53.54	5-17'	5

Baker Herald - Friday, June 20, 1913 - No. 315, Page 1

"\$1500 NUGGET IS PICKED UP AT SUSANVILLE

"Largest find of the kind in eastern Oregon was made yesterday

"Three men bring it to this city

"George Armstrong and Dick Stuart make discovery while working in their placer mine in Dutch Gulch

"May be the largest found in the Northwest"

"Susanville, June 20 - To find a \$1500 nugget, after picking up three pieces of gold worth \$10 to \$11 each, was the good fortune which befell George Armstrong and Dick Stuart in their Dutch Gulch placer claim three miles from Susanville yesterday.

"The nugget is solid gold, no quartz being mixed with it, and weighs about six and three-quarters pounds. The gold is worth about \$17.50 an ounce.

"The men have been working the claim irregularly the past four years but have found it paying a handsome profit for the little time spent on the property. While mining by hydraulic pressure yesterday the big find was unearthed.

"The nugget is the largest ever found in Eastern Oregon and perhaps in the entire Northwest, being of solid gold. A few years ago a specimen in that same district worth \$728, and about two years ago, one was found in the Humboldt placers worth \$720.

"The two men and a companion left this morning for Austin to take the Sumpter Valley train for Baker. "

\* \* \* \* \*

Baker Herald - Friday, June 20, 1913 - No. 315, Page 5

Special to Herald

"Austin, June 20 - On their way to Baker with the \$1500 nugget the three men stopped in Austin today. When asked about the find, Armstrong said: "It was almost unbelievable yesterday when we washed that chunk out, we were so surprised. We have been working on the claim only at intervals, but we have been well repaid for our work. Three of us comprise a party, guarding the metal, and will reach Baker this evening on the Sumpter Valley. There has been a number of people to see the find, several being from Susanville and Austin. All are of the same accord that it is one of the greatest finds in Eastern Oregon."

"PICKING UP \$1,400.

"How would you like to pick up a house and lot?  
Or a small store?  
Or a four passenger automobile?  
Maybe a trip around the world?  
A nice little farm?  
A college education?  
A team of fine horses?  
A band of sheep?  
A bunch of cattle?  
Or a little library?

"That is just what George Armstrong and Richard Stuart did when they found a nugget worth \$1,408.75 near Susanville. Any of these things they could buy with the find and many more.

"While placer mining, the big piece of gold was picked up and when brought to Baker last night safely deposited in a bank after being weighed.

"This probably gives Baker County the added distinction of producing another largest nugget in the Northwest. It makes the strides of the of the placer mining in this country even greater than before--and placer mining here has given indications before that it would take the lead in the state in every way.

"In making this find and advertising Baker County as a mining community these two men have paid themselves for much work they have done in the past. It is their reward for perseverance. While it may seem easy to pick up \$1,400 there is always the unrewarded work of the years gone by that evens the so-called "luck". So they are receiving their just reward.

"However, wouldn't it be a happy little party if each of us could go out and do the same?"

\* \* \* \* \*

Oregon Daily Journal, Portland - Thursday Evening, June 26, 1913

"That \$1500 Baker County nugget will probably have the usual result in stimulating a toilsome and expensive search for other big nuggets that aren't there."

"MORE NUGGETS HERE

"That \$1,500 Baker County nugget will probably have the usual result in stimulating a toilsome and expensive search for the other big nuggets that aren't there." -- Portland Journal.

"How does the Portland Journal know that there are no more big nuggets? Large nuggets, some worth nearly \$3,000, some worth \$700, have been found in Baker County before. Why cannot there be more? Many men have searched for gold and have failed but their efforts made them better men-- better at least than those who do not try but instead scoff at those that do. The men who found the \$1500 nugget got it by systematic and persistent work. Others will do the same.

"Were the Portland Journal, usually fair and often flippant, to investigate it would find that mining in Eastern Oregon, great as it is, is only on the threshold of its possibilities. Today the figures that once startled the world are commonplace in comparison with what is being accomplished now. Baker County mines this year are to make the state greater than ever before. Baker County mines this year will make the nation wealthier.

"There are plenty of nuggets in Baker County for the man who wants them enough to work for them."

\* \* \* \* \*

# Lake Oswego remembers rich pioneer beginnings



# Iron ore brought dream of heavy industry

By **FRAN JONES**  
of The Oregonian staff

**LAKE OSWEGO** — Although residents are happy to point out that this city has many dimensions, the centerpiece remains the lake.

Its basic configuration was determined by nature, but its preeminence is due to human ingenuity.

At the end of the last ice age, a huge wall of water swept down the Columbia Gorge, the Willamette River and its tributaries.

When the water subsided, a swampy basin remained. The Clackamas Indians called it Waluga, meaning "wild swan," and the pioneers called it Sucker Lake, after the fish they caught there.

Early settlers were drawn to the area by the discovery of iron ore, but the dream to have the town become the "Pittsburgh of the West" fell under the weight of financial troubles and fluctuating markets.

One of the huge iron furnaces, completed in 1865, is preserved in George Rogers Park along the Willamette River.

When a canal was built to join the lake with the Tualatin River to accommodate log rafts, the lakeside property was not considered as choice as it is today. Most homes were clustered around what is now A Street, north of the original town.

The town grew up around a mill opened in 1847 by A.A. Durham, who named the town after Oswego, N.Y.

By the late 1920s, after the closure of major industries like the Oswego Iron Co., the town was becoming a bedroom community of Portland, and residents were beginning to appreciate the lakeside setting and its potential for recreation.

A plan by a logging company to use the lake as storage of log booms was bitterly opposed and defeated in court.

Immediately following World War II, the lake was cleaned of years of accumulated debris and the space was on. The names of Sucker Creek and Sucker Lake were formally changed to Oswego Creek and Oswego Lake.

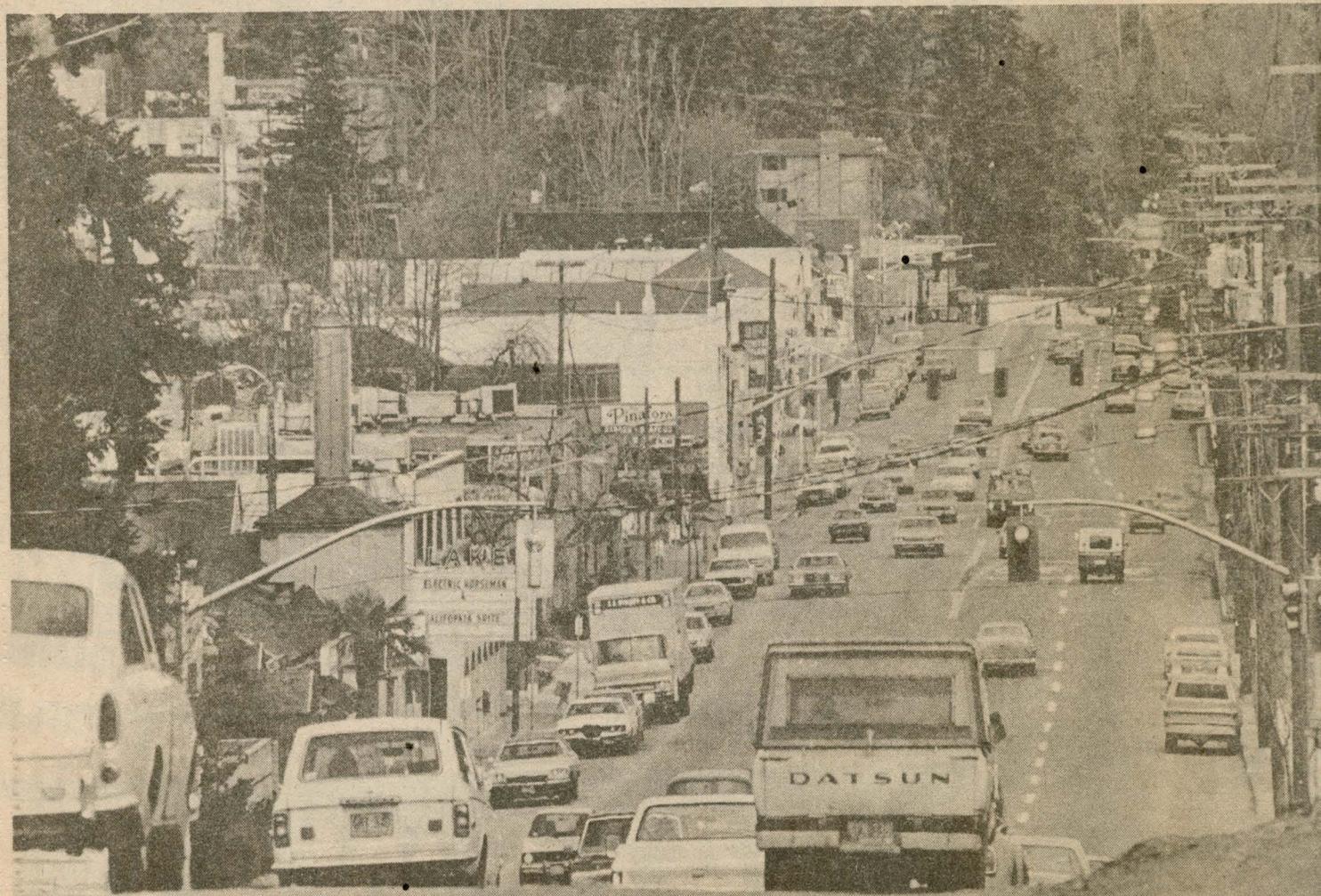
In 1941, the Oregon Iron and Steel Corp. gave the lake bed to the Lake Oswego Shorefront Committee, "to have and to hold in perpetuity," and the committee assumed operation of the lake.

Several lakeshore easements allow residents whose property does not join the lake to also enjoy its use.

Once a year, the lake is drawn down and residents repair seawalls and docks. Many owners continue the custom of planting willow trees at water's edge, further enhancing the beauty of the lake.

What was once an aftermath of nature's cataclysms, then a natural conduit for the early town's economy, has become a symbol of prestige and a favorite watery playground.

Story by **FRAN JONES**,  
photos by **BOB ELLIS**  
and **WES GUDERIAN**  
of The Oregonian staff



**BIG LITTLE TOWN** — As is true of most towns which have grown rapidly, Lake Oswego has downtown congestion and parking prob-

lems. With population of 21,500, city is no longer just bedroom community for Portland. View looks down State Street (Oregon



**MORNING STROLL** — Lake Oswego resident Jan Lightburne enjoys walk with pets Holly and Pup in George Rogers Park, which is popular haven for residents and monument to town's early dream of becoming steel center of West.

OSWEGO IRON MINE

CLACKAMAS COUNTY

Old Names: Prosser Mine; Oregon Iron Company 1865-1877; Oswego Iron Company 1877-1894.

Location:  $N\frac{1}{2}$  secs. 8 and 9, T. 2 S., R. 1 E., 2 miles due west of Oswego, in the face of the high bluff north of the riding academy and below the golf course. The outcrop of the iron bed may be traced from a point a few hundred feet west of the section line between 8 and 9 at an elevation of 325 feet, for a distance of nearly 1000 feet to the east and northeast around the face of the bluff to an elevation of 400 feet, due east of the highest point on the ridge.

History: The first iron blast furnace on the Pacific Coast was erected in 1865, the ore being derived from the Prosser Mine, and the first pig iron was cast in August 1867. This original furnace, located at Oswego, was used more or less continuously from 1867 to 1886. No production is recorded for 1886 or 1887, and a new more modern type furnace, the remains of which still stand, was constructed and started operation in 1888. The highest annual production for the old furnace was 6250 long tons in 1883, for the new furnace 10,987 long tons in 1890. No production is recorded after 1894.

Development: The mouths of three caved slopes on the ore may be seen along the outcrop; a large dump 50 feet down the hill suggests either

a loading dump or a possible low-level crosscut. According to Diller (96:511):

"The mine consists in general of three slightly converging inclines, running down the slope of the bed for nearly a thousand feet, and some of the ore has been taken out on both sides. The capacity of the mine in 1880 was estimated at 20,000 tons a year. During that year it worked only three and two-thirds months, and yielded 6,225 tons."

Geology: The iron ore is limonite, which forms an interbed 2 to 3 feet in thickness in lava, striking N. 15° E. and dipping from the surface down the slope for 200-400 feet about 20-30°, diminishing in the lower course to an average of 8-10°. It was about 1 mile long and one-half mile wide, being underlain by Columbia River lava of presumable middle Miocene age, and overlain by Boring lava, probably of Pliocene age. According to Diller (96:509):

"The underlying lava, on whose irregular surface the ore was deposited, is dark-gray basalt, and usually very vesicular, showing that at the time of its extrusion it flowed out upon the surface. It is considerably decomposed in places, and by the process of decomposition oxide of iron is liberated. This fact points to the adjacent lava slopes that surrounded the small lake or swamp in which the ore was deposited as the original source of the iron. By surface streams or chalybeate springs the iron was brought to the lake or swamp, where, under the influence of organic, chemical, or mechanical agents, it was precipitated and accumulated to form the bed of ore."

Locally overlying beds of sand were not uncommonly found, and in places contained logs, trees with their roots in place in the sand, and numerous fossil leaves. The trees were abundant and well preserved at 700 feet down the dip, varying from 5 to 6 inches to 6 feet in diameter, some of them showing bark and very little decay. Leaves submitted by Diller to F. H. Knowlton of the National Museum were determined as oak: "This is almost the same as Quercus

elaenoides Lx. but differs in having a rounded instead of an obscure acuminate apex."

Ore Deposit: The ore is low grade limonite, varying in hardness, color, and composition, owing to the varying amounts of silica and organic matter.

"From the southwest part of the outcrop down the dip 800 feet, the ore averages 38 to 45 percent of metallic iron, contains more alumina, less silica, and is soft and friable. Going east on the outcrop about 1500 feet, a hard, blackish, flinty, highly siliceous ore is found. It continues down the dip about 200 feet and is 200 to 300 feet in length. Although there is always more or less of it through the bed in streaks, in some places the whole becomes almost oolitic in appearance, and in those places it is richest. The ore ranges in thickness from 2 to 20 feet, averaging 5 to 6 feet, with the irregular depressions and elevations of the lava surface on which it was deposited." (Diller, 96:508-9)

Several analyses are given in the same report as follows:

	<u>1165</u>	<u>1167</u>	<u>1166</u>	<u>% Range</u>
Metallic iron	44.71	54.19	45.40	30 - 40
Phosphorus	0.666	0.392	0.576	0.37 - 0.67
Silica				7 - 15
Magnesia				2 - 3
Manganese				4 - 8
Lime				2 - 4
Sulphur				0.3 - 1

Specimen 1165 from pile of ore near furnace.  
Specimen 1167 from selected shippings of crystallized ore.

Report by: John Eliot Allen

References: Diller, 96:508-511; Treasher, 41:184-186; Libbey, 40:194-197;  
Allen, 41:183-184.

## Iron

Iron ore mined in Oregon has been used for a number <sup>of</sup> purposes in addition to the production of pig iron. Limonite deposits have been mined for many years to supply <sup>industrial</sup> pigments. Ore from these same deposits ~~was~~ also used <sup>been</sup> to make a sulfur-scrubber for treating producer gas. Minor amounts of magnetite have been used for ship ballasting and high density concretes .

Iron ore deposits occur in widely scattered areas of the state. By far the largest and most important are the <sup>Scappoose</sup> limonite ores found in Columbia County, in the northwestern part of the state. Numerous studies of the deposits have been made. Reports by Williams and Parks, Bell, Hotz and Wilkinson et al, are among the more important. A selected bibliography appears at the end of this section. Numerous small and scattered occurrences of iron ore, mostly magnetite, are found in many parts of the state. A compilation of these deposits appeared in the Ore-Bin published by the State of Oregon Dept. of Geology and Mineral Industries in February 1953. Data on ownership, location, a brief description and published references is included.

The Scappoose limonite deposits have been developed in the Tertiary lavas of Miocene age which <sup>at one time</sup> blanket much of this part of the state. Weathering of the flows, which apparently stood at or slightly above sea level, released iron to nearby bogs and lakes where it was precipitated <sup>TA</sup> as limonite. Apparently this process was repeated many times since individual limonite deposits have been found in successive layers of stratigraphically younger lavas. Subsequent engulfment of the area with even younger lavas and ash ~~have~~ ~~has~~ protected the limonite deposits until comparatively recent erosion has stripped away <sup>some of</sup> the overburden. Post Miocene up-arching ~~of the~~ <sup>the</sup> has elevated/lavas and inaugurated

a cycle of fairly rapid stream erosion.

The Scappoose limonite ore bodies are highly irregular in shape and their geographic and topographic distribution is varied. Exploration of several of the ore bodies has shown that they have widely varying thicknesses and curving margins. It has been suggested by Williams and Parks that some of

\_\_\_\_\_ Ira A.,  
Williams, and Parks, Henry M.; Limonite Iron Ores of Columbia County, Oregon;  
The Mineral Resources of Oregon, Vol. 3, No. 3, May 1923, Oregon Bureau of Mines.  
\_\_\_\_\_

the masses are fillings of old/sluggish stream channels and small bogs or lakes. Other ore bodies have been modified either by contemporaneous interruptions to the deposition of the ore or by subsequent faulting or erosion of the body. Overburden of from 2 to more than 20 feet in thickness, plus a thick vegetative cover have combined to make exploration of the deposits difficult. Most of the work has naturally been conducted in the vicinity of known exposures of the ore and relatively little "blind" drilling and trenching has been conducted. There is considerable geologic evidence, based largely on known occurrences, which indicates the/probable existence of additional ore bodies as yet undetected.

The following analyses have been taken from Williams and Parks (op cit).

	<u>Property</u>	<u>% Iron (dry)</u>
Sample 1	Ironcrest	49.68
2	"	53.28
3	"	56.16
10	"	48.96
7-foot face	Oregon Charcoal Iron	54.00
	<del>Colport Development Co.</del>	<del>51.00</del>

A composite sample from the Colport property had the following composition;

Loss on ignition	14.34
Silica	3.58
Alumina	7.47
Iron (dry)	51.00
Manganese	1.24
Sulphur	.025
Phosphorus	.849
Lime	TR

Twenty-five miles south of the Scappoose deposits a long since abandoned ~~mine~~ mine marks the site of Oregon's first and only source of limonite used for making pig iron. Exactly a century ago the first pig iron was smelted on the banks of the Wilam<sup>1</sup>ette River just outside of the city of Oswego. The ore from the Prosser Mine, located immediately north of Lake Oswego and approximately 2½ miles west of the ~~smelter~~ furnace, was a mixture of soft, earthy limonite with <sup>minor</sup> hard~~er~~, flint-like masses. The deposit, enclosed between a series of lava flows ~~had extended~~ cropped out along the hillside for approximately one mile. Workings down the dip developed ore for 600 feet and outcrops indicated that the deposit was at least one-half mile in width. Thickness varied from two to twenty feet.

The blast furnace produce d both pig iron and cast iron pipe during the 28 years of operation. Apparently the furnace was the limiting factor in the operation. The Census of 1880 states, in the section titled "Iron Ore West of the One Hundredth Meridian", that <sup>although</sup> the mine owners estimated that the mine had an annual capacity of 20,000 tons ~~but that~~ only 6,225 tons were required by ~~delivered to~~ the furnace in 1879.

The following analysis of the Oswego ore is given by Williams and Parks (op city)

	<u>Per Cent</u>	
Metallic iron,	30.00 to	40.00
Silica	7.00	15.00
Magnesia	2.00	3.00
Manganese	4.00	8.00
Lime	2.00	4.00
Phosphorus	0.37	0.67
Sulfur	0.3	1.00

Increasing mining costs and variations in the ore , according to Williams and Parks (op cit) led to the abandonment of the entire operation in 1894. Subsequently the mine area has seen the steady encroachment of housing development to the point where any future mining cannot be considered. The remains of the blast furnace and a "skull" from one of the last pours are now featured in a city park.

both the onshore and offshore  
The Iron content of/~~the~~ "black sands" of southwestern Oregon comprises a resource which in the future may be of considerable economic importance. Exploitation of this source is dependent upon many variables. some of which are discussed at length in the "black sands" section of this report.

Another source of iron in the state <sup>are</sup> ~~is~~ the ferruginous bauxites of which contain an average of 23% metallic iron. northwestern Oregon. Any exploitation of the various deposits for the recovery of alumina would necessarily result in a concentration of the iron content to the point where it could conceivably be considered as an economic ~~product~~ co-product. The ferruginous bauxite deposits are discussed elsewhere in this report.

Considerable interest has been shown for a number of years in the iron content of the Columbia River sands. Aside from the test drilling by the Bunker Hill Company at the mouth of the river, there has been no intensive exploration. Since the Columbia is a navigable stream there would necessarily be certain restrictions applied to any dredging operation conducted in the channel.

Scattered over the state are numerous small, highgrade pods and lenses hematite or limonite. of magnetite. A report, summarizing the basic data concerning the occurrences has been published in the Ore Bin.

\*

Anon. ,1953, Iron:State of Oregon Dept. of Geol and Min. Indust., The Ore.- Bin, vol 15 no. 2.

There has been little production from these deposits. On occasion small tonnages have been mined for special uses such as heavy aggregate. The scattered nature and apparently limited tonnage of the pods and lentils makes them of minor economic importance.

An unusual iron deposit in the Agness district of Curry County contains

a small amount of vanadium. <sup>(1942)</sup> unpublished report prepared by Allen and Lowry for the State of Oregon Department of Geology and Mineral Industries in 1942 incorporates a portion of an earlier inspection by Butler and Mitchell in 1916. Magnetite-impregnated sandstone crops out on a ridge and is bounded

Butler G.M. and Mitchell G.J., 1916 Preliminary Survey of the Geology and Mineral Resources of Curry County, Oregon, ~~State of Oregon~~ Oregon Bureau of Mines and Geology, Mineral Resources of Oregon vol 2 no 2.

by two greenstone dikes, ~~The length of the deposit has not been determined~~ approximately 100 feet apart. ~~but appears to have sufficient length~~ The outcrop is 650 feet long but no work has been done to determine the depth. Allen and Lowry assigned a probable depth of 35 feet in estimating the reserves at roughly 225,000 tons.

Analysis of a <sup>composite</sup> sample gave the following:

Fe	54.94%
S	0.114
V	0.37
TiO <sub>2</sub>	2.70
P	0.004

No vanadium minerals were identified in any of the samples taken and almost no vanadium was reported in the non-magnetic fractions after separation. The vanadium apparently is intermixed with the magnetite. Exploitation of the deposit would depend primarily upon a market for vanadiferous magnetite, since the separation of the vanadium from the iron would be difficult.

D.  
Allen, John E. and Lowry Wallace ~~G.~~, 1942, Horse Sign Butte Iron Deposit, State of Oregon Dept. of Geology and Mineral Indust. unpub report.

The small size of the deposit, plus its remote location also make any mining difficult. Insufficient detailed examination of the surrounding terrain has been conducted to rule out the possibility of additional deposits or an extension of the ~~present~~ limits of the original ore body.

ADD 1

The iron ore resources of Oregon, in terms of any future utilization, are ~~almost certainly~~ <sup>PROBABLY</sup> restricted to ~~three~~ <sup>FOUR</sup> sources: (1) the Scappoose deposits, (2) the black sands of the southwestern coastal region, and (3) the reject iron fraction from the red muds resulting from the beneficiation of ferruginous bauxite to make alumina. (4) ~~THE TOLMAN IRON DEPOSIT~~ (C)

N/34

The Scappoose deposits, as presently explored, contain far too little tonnage to make them economically attractive. Whether sufficient <sup>RESERVES</sup> tonnage could be developed with additional exploration remains to be seen. It is unlikely that all or nearly all of the potential deposits have been exposed by erosion or located with the small amount of work done to date. The high sulfur and phosphorus content of the ore is objectionable but metallurgical tests conducted <sup>at</sup> by the U.S. Bureau of Mines by Walsted showed that a satisfactory pig iron can be produced.

Walsted, J.P., 1954, Metallurgical Tests on Scappoose (Oregon) Iron Ore, U.S. Bureau of Mines, Rept. of Investig 5079.

Consideration of the black sands as a source of iron must be predicated on the concurrent marketability of ~~the~~ most of the remaining fractions. A high grade magnetite concentrate can be readily produced from the sands with comparative ease. The uneven distribution of the recoverable fractions <sup>their</sup> ~~and the~~ coupled with <sup>impose a</sup> ~~the~~ low concentration ~~is~~ a serious economic barrier during normal times. During periods of national emergency the deposits might be worked since they would yield, in addition to <sup>magnetite,</sup> ~~iron,~~ chromite, zircon, ilmenite and garnet.

Recovery of alumina from the ferruginous bauxites of northwestern Oregon would create an iron-rich co-product in the form of a red mud. Up-grading of the mud should present no/unusual problem and since the/mining and cost of transportation to the mill would be borne by the alumina fraction, the finished cost for the iron should be low. No decision to mine and process the bauxite has been announced.

The Tolman Iron deposit has a considerable tonnage of fairly high grade ore located within easy reach of both rail and highway transportation. The presence of sulfide minerals in portions of the deposit would perhaps limit its marketability.

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(more)

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The Tolman iron deposit located about 2 miles north of the town of Gold Hill, Jackson County consists of a series of lenses and stringers lying within a mineralized zone from 20 to 60 feet wide and approximately 4<sup>6</sup>500 feet in length. Winchell and Green (1903) estimated that there were 760,000 tons of ore to a depth of 50 feet. Analysis of the ore was: <sup>iron</sup> 51.63, silica 8.67, sulphur 0.208, phosphorus 0.060, titanium, none.

Winchell, H. V. and Greene, Fred T., 1903,

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The property was explored by a series of tunnels, pits and trenches in the early 1900's. A dip needle survey was conducted by Hodge (1938). A minor amount

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Hodge, E.T., 1938, Available Raw materials for a Pacific Coast iron industry, Corps of Engineers, U.S. Army, vol V, part I. pp 58-68.

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of excavation with a bulldozer was performed in 1953, ~~pp 58-68~~. An examination of the deposit was made by Ramp (1960), In his report ~~ed~~ he stated that spectrographic

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Ramp, Len, 1960, Tolman Iron Property, 2nd Supp. report, State of Oregon Dept. of Geol. and Min. Indust. unpub rept.

---

~~and field~~ analyses and field evidence suggested a possible sedimentary origin for the deposit. Much of the magnetite has a granular texture. It is interbedded with metasediments of the Applegate group (~~Palaeozoic~~ (Triassic?) including schist, argillite, quartzite, and limestone. A second deposit, the Victory Group located approximately 2 miles southeast of the Tolman, consists of amphibolite impregnated with disseminated magnetite. Unlike the Tolman, the ~~deposit~~ magnetite when magnetically concentrated contains approximately 5 percent titanium. Insufficient exploration has been conducted to appraise the reserves.

W&MR--iron--add ~~A~~ to p ~~4~~ 6

The numerous small pods and lentils of magnetite, hematite and limonite found in many parts of the state apparently contain too limited a tonnage to make them economically important. Minor amount of ore will very probably be used from time to time for special purposes discussed above. A summary of

~~all of the known iron occurrences in Oregon has been~~ published by the State of Oregon Department of Geology and Mineral Industries in the February, 1953 ~~issue~~ <sup>ORE BIN</sup>

~~of The Ore. Bin.~~ <sup>MINOR</sup> Deposits not <sup>APPEARING</sup> ~~included~~ in the list include the following:

(1) lenses and laminae of magnetite grains in Pennsylvanian clastic sediments in the Suplee area of eastern Crook County; (2) Juniper Mountain, southwest of Brogan in Malheur county. High grade pods of magnetite surrounded by diorite. of upper Triassic age. (3) Tincup Iron, in the Chetco mining district of Curry County. Small streaks of nearly massive magnetite in hornblende diorite in an area one-quarter by one-half mile.

September 4, 1941

Senator Rufus C. Holman  
United States Senate  
Washington, D. C.

Dear Senator Holman:

Just received your wire on the matter of iron exploration by the Bureau of Mines. Fine stuff--more power to you. Will be looking forward to meeting the Bureau Engineer when he comes this way.

I think you can read plainly between the lines that the action of the Bureau is being guided apparently by private interests who are not concerned about the present emergency but are looking for profits to themselves. Certainly if timing means anything, the first dollar they spend on iron exploration should be in Oregon.

I am sure you will continue to carry the ball on this iron situation because someone will have to keep prodding sayers of the Bureau of Mines, and you on the Appropriations Committee are in a better position than anyone else to do just this.

I am taking pains to advise various parties interested in the iron lands and others of the content of your wire so that they will know who has been doing some good work in Washington. You may be sure that we and all others feel most kindly on account of your effective efforts.

The same goes obviously for your work on the strategic minerals excess profits exemption, although a somewhat smaller number are affected by that matter.

Kindest personal regards,

Sincerely yours

Director

EKN:hj



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21

TEL PHONE YOUR TELEGRAMS  
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Form 16A

# Postal Telegraph

Mackay Radio

Commercial Cables



All America Cables

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THIS IS A FULL RATE TELEGRAM, CABLEGRAM OR RADIOGRAM UNLESS OTHERWISE INDICATED BY SYMBOL IN THE PREAMBLE OR IN THE ADDRESS OF THE MESSAGE. SYMBOLS DESIGNATING SERVICE SELECTED ARE OUTLINED IN THE COMPANY'S TARIFFS ON HAND AT EACH OFFICE AND ON FILE WITH REGULATORY AUTHORITIES.

SA132/3/21 SU WASHINGTON DC EARL NIXON PORTLAND ORE  
UNTURNED TO SECURE THOROUGH EXPLORATION IRON ORE DEPOSITS.

KEEP ME FULLY ADVISED GOVERNMENT WIRE COLLECT IF

NECESSARY ALL DEVELOPMENTS IN FIELD

RUFUS C HOLMAN USS

(42)..

1941 SEP 4 PM 12 47

July 14, 1941

Mr. I. A. Heusner  
P.O. Box 331  
Portland, Oregon

Dear Mr. Heusner:

Attached hereto are field notes with corresponding assay reports covering sampling on your property back of Scappoose. I personally cut all of the samples in question. The notes are a little bit sketchy but we can, without difficulty, identify the exact pit from which each came by referring to your map. You may have some difficulty, however.

I note with some chagrin that I am not able as yet to peg very closely the various types of limonite ore. I was "raided" on Lake Superior region hematite and foreign magnetite and find that I have been fooled on some of these limonite beds. Sample 17-J is a case in point. I feel certain that other iron engineers from the Lake Superior region must have been similiarly fooled at various times.

My impression in a nut-shell is that the iron analysis (dry basis) is somewhat higher than I had previously supposed. 2 or 3 percent of Fe when applied to an average of many thousands of tons makes a very great difference when the natural iron content is low.

Please bear in mind that the analyses given herewith are all "dried at 212°". This is standard practice in the Lake Superior region and will be standard with us as soon as we get to running ores in our western laboratories here. Natural iron is always a calculated analysis and is based on the moisture content. Taking a moisture sample is an operation quite distinct from the sampling that I did, so I have nothing as yet on which to base an opinion on the natural iron content. Sometime later we will take some moisture samples and then can apply an average figure to the regular dry analyses. I think I told you that Larch Brothers do a majority of the analysis work for the ores that go down the lakes to the steel furnaces.

I wanted to tell you also that we are trying to arrange for a "certified" W.P.A. project to cover the exploration of the Columbia County ores. I am prepared to ask for the expenditure of \$75,000 for this purpose. Negotiations between this Department and the Bonneville Administration are under way to determine whether the project will be set up for Bonneville sponsorship, on a

July 14, 1941

joint sponsor basis, or by this Department. We will be glad to advise you from time to time as to the progress of this movement.

The above, of course, is in addition and has nothing to do with the work of the Oregon Geological Survey which we have already started in Columbia County. Dr. W. D. Wilkinson, with a number of student geologists, has already got the mapping program under way. This will be continued until late September, and will involve (1) mapping of the geology of the entire quadrangle, and (2) investigation of the economics of the individual iron deposits.

I wish you would, on behalf of myself and this Department, express to your associates--Mr. Griffith, Mr. Cable, and others--our appreciation of your kindness in making the necessary expenditure for opening up the cuts in the iron ores near Scappoose. I think that has been very well worthwhile in affording me a yardstick on which to base certain conclusions in regard to the ores.

Thanking you, I am

Very truly yours,

EKN:vm  
encl.

Earl K. Nixon, Director

April 24, 1941

Oregon Iron Ore Development Corp.,  
Postoffice Box 331,  
Portland, Oregon.

Gentlemen:

Attn: Mr. I. A. Heusner

After going over yesterday on the property the visible evidence of iron ore deposits, I feel justified in making a suggestion to you as follows:

I would employ, say, two pick and shovel men for perhaps a couple of weeks to clean out certain of the cuts and face up certain others and do a little trail blazing--all in order that anyone interested in verifying the facts contained in your reports on the property can actually see clearly the evidence. At present, I am very much in doubt if any competent engineer, experienced along iron ore lines, would accept at its face value the representations made as to tonnage and grade. The drilling and sampling were done a good many years ago, and so the cuts and tunnels have since suffered from sloughing in of the overburden. At no place could I find a complete section of the ore yesterday, and it was only with considerable difficulty that we located some of the cuts.

From my rather substantial experience in iron exploration in the Lake Superior region covering a matter of fourteen years, I have been obliged to discount in part the statements on thicknesses of ore and analyses of the ore contained in some of the old published reports. Whether the samples were taken by an engineer familiar with iron exploration I do not know, but since I feel that you are anxious to have accurate and dependable information, I am interested in checking up on some of the facts in question. I shall be pleased to do this, if you wish, as soon as you have opened up some of the cuts so that I can personally get in and do some sampling. The samples will be run in laboratories that are running literally thousands of samples from the iron mines themselves each year.

Yours very truly,

Director

EKN:ac

April 14, 1941

Mr. C. W. Daughs  
Park Avenue Hotel  
Portland, Oregon

Dear Mr. Daughs:

I have before me your letter of April 14th and have discussed your problem briefly with Mr. Libbey with whom I believe you talked in this office.

Referring to the questions in your last paragraph, I should say that the production of pig iron in the Portland district at a cost of \$20 to \$21 per long ton must hinge on some cost factors which are not available to me, and the practicability of a local plant to utilize Scappoose ores would depend also on the competitive position of these ores with other sources of iron including foreign ores.

The cost of mining of Scappoose ores would depend on the tonnage of the individual deposits, the amount of overburden, the thickness of the ore bed itself, accessibility, method of mining, etc. If the average thickness of the ore is six to seven feet with thinner beds not uncommon and really thick beds exceptional rather than the rule, then the mining cost might vary anywhere from, say, \$1.25 to \$3.00 or \$4.00 per ton. I would want more specific information on the drilling and exploration results at your property before offering an opinion on cost of mining.

The type of reducing agent used in making the pig, that is to say, standard blast furnace coke, coke breeze, powdered coal, petroleum coke, or coke from waste wood products would have a considerable bearing on the cost of the pig. In sintering, a coke breeze or even pulverized coal that is sufficiently low in phosphorus and sulphur can often be used, but I would want some further details on the Roche-Hodson process. There is no question in my mind but that magnetic sintering would be a beautiful product to feed to an electric furnace for making electric steel.

Last summer I visited the Scrub Oaks property in New Jersey where they are turning out a high-grade magnetite for sintering and know that this development of utilizing relatively low-grade iron ores and making a very high-grade steel is in common practice. I feel, however, that as much as I would like to see these Oregon deposits developed at an early date that you must look into the question of possible competition from outside ores that could be made available to a local steel industry. I spent a good many years in the Lake Superior iron region with the Mark Hanna interests, now the iron ore producing portion of the National Steel Corporation, and realize that the matter of competition must be borne in mind.

Last summer, I developed by diamond drilling one of a number of iron deposits in Peru for the Peruvian Government within a dozen miles of a small harbor on the Pacific Ocean. That ore, or others from Chile, or possibly from Alaska might, because of labor differentials, be laid down in Portland for a cost per iron unit that would allow it to compete with the lower grade Scappoose ores. As you probably know, Bethlehem Steel Corporation has been shipping ore from their Tofo, Chile operation through the Panama Canal to Sparrow's Point, Maryland, for a good many years at a transportation cost of a little under \$3.00 per ton. Their mining cost is around \$1.00. The product runs 66-68% iron and is a beautiful Bessemer grade so far as phosphorus, silica, and sulphur are concerned.

I recite the above merely as back-ground. Will be happy indeed to sit down with you and the others interested and discuss the entire matter. We are obviously just as anxious to see Oregon investors properly advised and Oregon operations soundly planned as we are to see Oregon ores being utilized.

Respectfully yours,

Director

EKN:ac

Park Avenue Hotel,  
Portland, Ore., April 14, 1941.

Mr. Earl K. Nixon, Director,  
Oregon Dept. of Geology & Mineral Industries,  
P o r t l a n d.

Dear Mr. Nixon:

On the question of using Scappoose limonite ore  
as it comes from the mine in electric pig iron furnaces T

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On the question of using Scappoose limonite ore

E. K. N. #2

The cost of such a plant would range from \$100.00 to \$150.00 per ton of capacity.

Naturally before they would give an unconditional guarantee that their type of plant could successfully treat the Scappoose ore, they would expect to make test runs of a car-load of the ore through their pilot plant, as well as to be able to design the particular type of plant needed for the Scappoose ore.

I might add that Mr. Roche has built and operated numerous iron ore producing plants in Pennsylvania, New Jersey and New York states, as well as acting as consultant on iron ore mining and treatment for several of the large eastern steel concerns.

Mr. Hodson advises that only by bringing the Scappoose ore up to the quality in metallic iron content and purity that their process can accomplish, would it be possible to successfully produce a high grade pig iron from this ore in electric pig iron furnaces.

On the assumption that Messrs. Roche and Hodson can accomplish what they claim, with this Scappoose ore, would you consider that by using this high grade sintered product in electric pig iron furnaces, such an operation would be practical, and that a good grade pig iron could be produced for around \$20.00 to \$21.00 per gross ton here in Portland?

Yours truly,

  
C. W. Daughes

September 6, 1941

Honorable J. D. Perry  
Deer Island, Oregon

Dear Mr. Perry:

I am just in receipt of copy of letter to you from my friend, R. C. Allen, Deputy Chief of the Iron and Steel Branch of the O.P.M. in Washington. I am pleased to note your interest in the matter and feel that you may be interested in some action I am taking.

Naturally I followed the course of the bill to set up \$350,000 for drilling iron and coal in the West. Senator McNary kindly wired me when the bill passed and stated that it apparently was pegged for two projects: one in Utah and one in California. I hit the ceiling on learning that. The result was two letters: one to the director of the United States Bureau of Mines, asking him to state his position, and the other to Senator McNary. I am enclosing copies of both of these letters for your information. A copy of my letter to McNary, or rather an identical letter, went to Senator Holman also.

Holman replied by telegram on September 4th as follows:

"Have had conference with Director Sayers of Bureau of Mines relative use of recent appropriation for exploratory work on iron ore deposits. He states appropriation made was for two specific projects. One in Utah and one in California estimates for which he sent to the budget at the direct request of the President. The Senate changed the language so that there is no prohibition in the appropriation act against using this money for other localities. Sayers has agreed to have examining engineer go over Scappoose deposit and certain other deposits in Nevada and Arizona to determine order of priority for exploratory work to ascertain amount and grade of ore. Engineer will be sent to Oregon promptly and will contact you. Will probably have to secure additional appropriation. Shall leave no stone unturned to secure thorough exploration iron ore deposits. Keep me fully advised government wire collect if necessary all developments in field."

I might say that I had conferences with Holman here in Portland before he left for Washington and I think that he was wound up as tightly as he could stand on the matter. Evidently his work is getting some results. You may be sure that we will press the matter of the Bureau doing some work on the Scappoose ores just as hard as we can.

Sincerely yours,

RECEIVED  
SEP 6 1941

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

September 2, 1941

Mr. J. D. Perry  
Hall of Representatives  
Salem, Oregon

Dear Mr. Perry:

Referring to your letter of August 6, addressed to Mr. William Knudsen and letter of June 18 from Earl K. Nixon:

A Bill approved by the President on August 25 provides for \$350,000 for drilling iron ore and coal in the West. The money is appropriated to the Department of Interior, Bureau of Mines. I advise you to get in touch with Dr. R. R. Sayers, Director of the Bureau of Mines, in regard to to exploration of iron ore in Oregon.

Very truly yours,

R. C. Allen, Deputy Chief  
Iron and Steel Branch  
In Charge of Raw Materials

RCa:to



June 18, 1941

Honorable J. D. Perry  
Deer Island, Oregon

Dear Mr. Perry:

I thought you might be interested in knowing of the matter we are working on that has a possible bearing on the industrial development of Columbia and Washington Counties. Doubtless you know that we are starting our summer geological survey in the Columbia County area between July 10th and 15th. Dr. Wilkinson and our staff geologist, John Allen, with their assistants will be in the field most of the time for two and a half months.

I wanted to tell you, however, that I recently sounded out the United States Geological Survey as to whether or not they would feel kindly toward or would be interested in an actual drilling and exploration campaign covering the iron deposits--such program being carried out as a W.P.A. project, "certified" by the National Defense Commission and sponsored by this Department.

Dr. Burchard of the United States Geological Survey, as you may know, made a cursory examination of the iron deposits last summer. I discussed his findings with him before he left the country. He has now advised me that they are inclined to favor the program of development or exploration and has communicated his feeling to Mr. R. C. Allen, who is mineral adviser on iron and steel to the Office of Production Management in Washington. (I happen to know Allen personally since our acquaintance in the Lake Superior iron region.) Allen's reply to Burchard was a suggestion that I submit a proposal to him.

A week ago I submitted a proposal to Mr. Allen covering a W.P.A. project to be classified as "certified" under the National Defense Commission. I have not yet had time for a reply; will advise you promptly in the event you are interested.

Respectfully yours,

EKN:vm

Director

September 19, 1941

Mr. E. J. Griffith, Administrator  
Work Projects Administrator  
Bedell Building  
Portland, Oregon

Dear Mr. Griffith:

Mr. Heusner indicated in a brief telephone conversation today that he had talked to you about iron ore matters and that you stated your interest in the future of our ore situation.

Enclosed herewith is a brief summary got out by us recently which may be of some interest to you.

The data being sent you is not new and did not originate with this Department. It comes from reports written by various engineers, some of whom--such as, Woodbridge, Scallon, and Conklin--are well-known for their work in the Lake Superior iron region. We have had our State Geological Survey in the Scappoose iron area this last summer, mapping the geology. Later this fall we expect to try to verify as far as possible the impressions given by former engineers as to tonnage and grade of the ore.

In any event, I can say that, in my opinion, there is enough ore of medium grade indicated as present to supply a modest steel industry. Drilling and further development will probably increase the indicated tonnage. My opinion is based on reasonable familiarity with iron ores inasmuch as I spent many years in the Lake Superior region with one of the large iron and steel corporations.

If we can supply any additional data or ideas on angles in which you might be interested, please advise us.

Cordially yours,

EKN:vm

Director

encl.  
cc: I. A. Heusner

RECEIVED  
JUL 11 1941

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
THE BONNEVILLE PROJECT  
PORTLAND, OREGON

OFFICE OF THE ADMINISTRATOR

July 10, 1941

701.11  
X707

117497  
RMM:aer;rml

Mr. T. W. Page  
Iron and Steel Unit  
Office of Production Management  
Social Security Building  
Washington, D. C.

Dear Mr. Page:

With reference to your letter of June 20, 1941, to Mr. Ivan Bloch, please be advised that we have discussed this matter with Mr. Earl K. Nixon, of the State Department of Geology and Mineral Industries here in Portland, and are now holding conferences looking toward the possibility of setting up a WPA project for surveying the Columbia County iron ore deposits. We appreciate your suggestion in this matter and will do our utmost to help along the initiation of such a project.

The writer has had access to a number of private reports on certain parts of this iron ore field, and I am satisfied that a further survey with drilling and open pitting will show a very substantial body of ore more than adequate for the iron projects now proposed.

We shall keep you advised as to progress being made in setting up this project, and again appreciating your interest, we remain,

Sincerely yours,

SYSTEM PLANNING & MARKETING DIVISION

RAYMOND M. MILLER  
Senior Industrial Engineer  
Market Development Section

✓ CC Mr. Earl K. Nixon

*Mr. Nixon*

*Scappoose Iron*  
*17*

- c o p y -

OFFICE OF PRODUCTION MANAGEMENT  
Social Security Building  
Washington, D. C.

June 20, 1941

701.11  
X707  
117497  
SP&M Bloch

Mr. Ivan Bloch, Chief  
Market Development Section  
Bonneville Power Administration  
United States Department of the Interior  
Portland, Oregon

Dear Mr. Bloch:

Thank you for your letter of June 13, 1941, and the attached report concerning iron and steel in the Northwest.

There have been presented to this office a number of proposals for the initiation of an iron and steel industry in the Northwest, using ores known to occur in the Columbia River valley, and Bonneville power. All of these proposals, however, lack the necessary base of an ore supply of reasonably certain extent and quality. Before any such projects can be intelligently evaluated, more detailed work as to tonnage, grade, and localities of these ore deposits is required.

We have received a letter from Mr. Earl K. Nixon, Director, State Department of Geology and Mineral Industries, Portland, Oregon, who suggests that available WPA labor be used for the exploration of the ores in the Scappoose district. It is my impression that an expenditure for WPA projects will be made in any case and, if this be true, the use of this labor for such purpose appears to me to be highly desirable. I am informed by the WPA office here, however, that any request for such a project should originate through the State office in Oregon. It occurs to me, that your Section may be interested in the initiation of such a project.

Very truly yours,

S/ T. W. Page  
T. W. Page  
Iron and Steel Unit

September 29, 1941

Mr. P. M. Robinson  
Portland Chamber of Commerce  
Portland, Oregon

Dear Mr. Robinson:

At Mr. Nixon's request we are sending you herewith  
"A Summary of Previous Reports on the Iron Ores of  
Columbia County, Oregon" as compiled by this Depart-  
ment.

Respectfully yours,

Secretary

vm  
encl.



# AMERICAN METAL MARKET

ESTABLISHED 1882

*The Market Authority*

111 JOHN STREET  
NEW YORK



RECEIVED  
Dec. 18th, 1941  
DEC 21 1941

STATE DEPT. OF GEOLOGY  
& MINERAL INDUS.

Mr. Earl K. Nixon, Director  
State Department of Geology and  
Mineral Industries  
702 Woodlark Building  
Portland, Oregon

Dear Sir:-

In compliance with your request of December 3rd we are pleased to enclose a copy of the October 3rd issue of AMERICAN METAL MARKET in which was published the Hauck report on the steel industry. With this we are sending the first and second Gano Dunn reports on the same subject.

These reports will give you an idea of how thoroughly AMERICAN METAL MARKET is covering the metal, iron and steel markets and the industry.

If you would like to receive the paper regularly you can authorize your subscription by signing and mailing the card attached.

Yours very truly,

AMERICAN METAL MARKET

*S. Glassford*  
Circulation Manager

SGlassford:RM

*Scappone*  
*RM*

Columbia City Ind  
Apr. 17- 42

Mr Earl K. Nixon

Woodlark Bldg

Partland Ave

Dear Mr Nixon:-

If you have not used the Calhoun County map. I left with you some time ago and have received no pay for it. would you please return to me as I need it - now. and they are hard to get. Am sorry to have my name mentioned about it - but these things cost money however small. Please let me have it as soon as possible.

Very Truly Yours  
Blueprint A. B. Morris

See copy of letter to  
John A. ...  
dated May 1, 1942

Please locate this  
map as I can  
return it.

STATE GOVERNING BOARD

W. A. STRAYER, CHAIRMAN, BAKER  
ALBERT BURCH, . . . . . MEDFORD  
L. B. MACNAUGHTON . . . . . PORTLAND



STATE DEPARTMENT OF GEOLOGY AND  
MINERAL INDUSTRIES

702 WOODLARK BUILDING  
PORTLAND, OREGON

May 1, 1942

STATE ASSAY LABORATORIES

400 E. 1 ST., GRANTS PASS

RAY C. TREASHER  
FIELD GEOLOGIST

ROBERT G. BASSETT  
ASSAYER

2102 COURT ST., BAKER

HUGH K. LANCASTER  
FIELD ENGINEER

LESLIE C. RICHARDS  
ASSAYER

EARL K. NIXON  
DIRECTOR

F. W. LIBBEY  
MINING ENGINEER

JOHN ELIOT ALLEN  
GEOLOGIST

H. C. HARRISON  
SPECTROSCOPIST

JUN 1 1942  
P.M.

May 2-42

Dear Allen:-  
This is the map I have  
been looking for. It is marked  
"Bunker Hill" in my handwritten  
Heppner loaned it to me one day  
while at your office. E. J. A.

Mr. E. Y. Dougherty  
Box 723  
Scappoose, Oregon

Dear Mr. Dougherty:

In looking for a map, we turned up one which might  
be of use to you. It is one made on October 9, 1920  
of the Bunker Hill district mostly in the SW  $\frac{1}{4}$  of  
Sec. 31 on the scale of 1 inch to 330 feet.

There is not much topography, but it does show a  
number of pits and one 144 foot tunnel. I would  
appreciate your signing and returning the enclosed  
loan slip some time when you come into town. The  
map is being sent under separate cover.

Kindest regards.

Sincerely yours,

John Eliot Allen  
Geologist

Have several maps you  
loaned me including this one  
probably. Will see you re th  
E. J. A.

JEA: jr

P.S. Did we ever lend you an old Columbia County  
map made by one A. L. Morse of Columbia City?  
We cannot find it in our files and Mr. M.  
is liable to raise H... if he doesn't get it  
back. JEA.

End

3

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WASHINGTON

Mr. Earl K. Nixon,  
State Department of Geology  
and Mineral Industries,  
702 Woodlark Building,  
Portland, Oregon.

Dear Mr. Nixon:

In reply to your letter of July 1:

So far as concerns Mr. Burchard's plans for publishing the results of the work of Mr. Hotz in the Scappoose iron ore area, it will not be duplicating future work of the Geological Survey if the Oregon Department of Geology and Mineral Industries publishes its map of the geology of the St. Helens quadrangle.

The Hotz maps are on a much larger scale than yours and comprise only the small scattered areas containing iron ore and so there would be little to add, but the Survey would appreciate having your base map and would be glad to have the geology put on by Hotz for your use.

Sincerely yours,

*G. F. Loughlin*

Chief Geologist.



RECEIVED  
AUG 4 1942

STATE DEPT. OF GEOLOGY  
& MINERAL INDS.

OFFICE OF PRODUCTION MANAGEMENT

SOCIAL SECURITY BUILDING  
WASHINGTON, D. C.

June 21, 1941

RECEIVED  
JUN 25 1941

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Mr. Earl K. Nixon, Director  
State Department of Geology  
and Mineral Industries  
702 Woodlark Building  
Portland, Oregon

Dear Mr. Nixon:

Thank you for your letter of June 3, 1941.

I am informed that the certification of WPA projects for defense purposes must come from the Secretary of War or the Secretary of the Navy. In this, the Office of Production Management takes no part. The initiation of such projects, moreover, must also originate in the State concerned.

It is my opinion that the use of WPA labor for the purpose outlined in your letter is desirable. These funds, as I understand it, will be spent in any event, and an expenditure for this purpose will be a means of obtaining information on these ore deposits without which no estimate of their utility for any contemplated pig iron or steel development in the west is possible.

Very truly yours,



R. C. Allen, Consultant  
Ferrous Minerals and Alloys

June 3, 1941

Mr. R. C. Allen, Mineral Advisor  
Office of Production Management  
~~Federal Reserve Building~~ Social Security Building,  
Washington, D. C. 4th St. and Independence Ave., S.W.

Dear Mr. Allen:

Am writing you as a result of a letter just received from Dr. E. F. Burchard following an inquiry I had made of him about the possible attitude of the Government toward a W.P.A. project for exploring iron properties in the Scappoose District of Northwestern Oregon.

The office of the Oregon Director of the W. P. A. advises me that they would look very favorably on participating in such a project if it could be arranged with proper sponsorship. It was my thought that if a strictly certified National Defense project could be arranged to carry out exploration of some of these iron deposits near Portland, that this Department might be pleased to act as sponsor. If it could not be a certified National Defense project, I doubt very much if it would be feasible to carry on.

This Department is at the moment sponsoring a non-certified Defense project for drilling and exploring chromite deposits in the Marshfield coastal area, but the limitations under such a project classification are such that the work efficiency is seriously interfered with through no fault of the local group.

Through our Governor Sprague, I have just arranged for a survey of the foundry situation and light steel castings angle in the Portland area and have found that we are in serious need both of foundry capacity and alloy steel capacity for the smaller accessory plants.

I am placing our Oregon Geological Survey this summer in the Scappoose iron district with the principal idea of gaining factual information on tonnage and grade as well as the geology of the iron deposits. We might well use as sponsor's contribution for a W. P. A. exploration project our outlay and efforts on State Geological Survey.

In brief, the Scappoose ores are limonite running in the low fifties iron dry and I judge middle forties iron natural. The moisture and loss on ignition are both high as is the phosphorus. The latter runs .5 to .8 percent. Silica and alumina each run of the order of 5%. The ore bodies are in flat lying beds from three or four to a dozen feet in thickness with an apparent average mining thickness of six or eight feet. The relief of the region is two or three hundred feet in the ore areas with the bluffs cut every which way by gulches. The ore would be admirably adapted to Mesaba type slice mining.

Some ore could be mined by stripping along the crops, but most of it would be underground work. We have estimated the delivered cost per long ton iron unit to be 5.2¢ to 7.5¢—that is, delivered to furnace on the Columbia River. This cost obviously is less than would be the case in ores from the outside. As to tonnage, there are several patches or ore areas each of which could supply anywhere from one quarter million to a million tons of the grade of ore mentioned. There might easily be an ultimate tonnage of ten or fifteen million, although we do not have exploratory records that give a proven tonnage of more than a million and a half or two million.

An inclosing herewith a copy of our Bulletin #8 "Feasibility of a Steel Plant in the Lower Columbia River Area", which was revised to September, 1940.

Nothing like enough exploration or careful sampling has been done to give an adequate idea of the economics of these Scappoose deposits. My personal conviction, based on past iron experience, is that a program of exploration followed by a detailed analysis of the economics of production—which we would be pleased to make—would be justified in the light of the present National emergency and the local demands of industry in the Columbia River Area.

If we had your assistance in the executive approval of a certified W.P.A. project, we would be pleased to sponsor the program and would immediately take steps to initiate it.

Thanking you and with best wishes, I am,

Cordially yours,

Director

EKN:ac

ccDr. E.P. Burchard

ccE. J. Griffith

State Administrator

W.P.A., Portland

000 02  
000 27

Analyses of iron ore, Oregon.

44, 45, 46 and 51, Columbia County, between Scappoose and Pisgah.  
49 and 50, Washington County, near Hillsboro.

Sample No.	(Natural)						
	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe	H <sub>2</sub> O+	TiO <sub>2</sub>	P	Mn
44A	3.44	5.14	50.87	12.73	0.60	0.86	0.33
44B	6.00	3.16	53.67	13.00	0.20	0.96	0.39
45A	7.38	3.79	50.48	12.63	0.36	0.52	0.20
45B	1.46	1.39	67.12	0.67	0.28	0.22	0.33
46	5.82	3.38	52.08	12.67	0.41	0.40	0.20
51	5.92	5.37	50.14	13.33	0.51	0.81	0.38
{ 49	0.57	29.06	28.61	20.00	8.26	0.29	0.06
{ 50	3.64	34.84	22.85	21.00	8.17	0.28	0.07

Analyses by F. S. Grimaldi, U. S. G. S.

Reported May 15, 1941.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WASHINGTON

RECEIVED  
JUN 2 1941  
STATE DEPT OF GEOLOGY  
& MINERAL IND.

May 27, 1941.

Mr. Earl K. Nixon,  
Director, State Department of Geology  
and Mineral Industries,  
702 Woodlark Bldg.,  
Portland, Oregon.

Dear Mr. Nixon:

Please accept thanks for your letter of May 5 and the bulletin on the feasibility of a steel plant in the Lower Columbia area.

Enclosed is a copy of analyses of iron ore from Columbia and Washington Counties made by a chemist of the Geological Survey on samples that I collected. In deference to the Survey regulations, it is desired that these records be regarded as confidential for your own information and not be made public until the Survey has had an opportunity to get out a memorandum on the results of last season's work on western iron ore.

As the percentage of iron was determined on a natural basis, it appears that the grade of these particular samples is slightly higher than the analyses you cite in your letter. Number 45B, which shows abnormally high iron, happens to be from a small deposit of hematite, magnetic in places, which had probably resulted from metamorphism of limonite through contact with a hot basalt intrusion or flow. It was the only deposit of this sort that I found in that area, and I would be interested to know if more is discovered. Samples 49 and 50 are from the bauxitic material that I mentioned in my letter of April 30. Apparently the material is only about half-way bauxitized and is neither a good iron ore nor a bauxite. Significant also is the high percentage of titanium oxide in the two samples.

As to the proposed prospecting of the iron ore by the W. P. A., it seems to me this might well be done as a National Defense project, as I understand there have been applications to the R. F. C. for loans for the establishment of furnaces for the electric smelting of iron ore, including that of the former Sierra Iron Co., now represented by Col. D. Earle Stewart and Frederick M. De Neffe, of Portland. While it is fairly certain that there is sufficient tonnage to supply a small electric furnace, confirmation of the extent of the reserves and their quality would probably be more reassuring to the R. F. C. and the O. P. M. than the information now available. I have just talked on the phone with our friend R. C. Allen, who is one of the mineral advisers to the O. P. M. and has a great deal to do with certifying the necessity for the building of defense plants and the investigation of mineral deposits which are proposed to be utilized. He suggests that you write him in this connection, as he is interested in several questions of this sort that have come before him lately. His address is Office of Production Management, Social Security Building, 4th St. and Independence Ave., S. W., Washington, D. C. With kind regards, I am

Yours very truly,

*E. F. Burchard*

Geologist in Charge,  
Section of Iron and Steel Metals.

Enclosure 2677527.

May 5, 1941

Mr. E. F. Burchard, Geologist in Charge  
Section of Iron and Steel Metals  
United States Geological Survey  
Washington, D. C.

Dear Dr. Burchard:

Thank you for your letter of April 30th. We are sending you under separate cover, using your enclosed frank, a copy of our bulletin on the Feasibility of a Steel Plant in the Lower Columbia Area.

Since the announcement of possible installation of additional steel capacity on the west coast by the Kaiser Corporation there has been considerable talk here about the Scappoose ores. I made a brief trip down to one of the principal areas the other day and took a few samples to check my previous judgment of what a shipping grade might be from these deposits. My tentative conclusion is that the average grade will not be as high as many of the old reports, private and otherwise, would lead one to think. Yet I am inclined to think that if this lower grade material can be utilized that there is a rather substantial tonnage of it. By "substantial" I mean possibly ten or fifteen million tons. The grade of ore that can be used will determine the tonnage, however. The natural iron will be a few points off the lower end of the scale, in the middle 40's or perhaps low 50's, and the "dry" around 51 or 52 I suspect. One channel that I took as representative of the better grade of limonite ran 56.05 iron dry, 48% natural. Do not have the other analyses yet.

Am arranging with the owner of one of the possible deposits, which is not yet tied up by anyone, to clean out their old cuts so I can do some honest-to-goodness sampling.

As to the possibility of a W.P. A. Project, we are sponsoring one at the moment on the chromite sand drilling, and it is doubtful if we could handle another. After discussing the situation with the W. P. A. some time ago, I gave up the idea of a project in Columbia and Tillamook Counties where we had thought of doing some coal exploration. This was for the reason that miners were not obtainable and could not be transferred by the W. P. A. from another area. However, if there were a National defense angle, and you could pull any strings in Washington towards getting this certified as strictly a National defense project, we might really do some business out here. Wish you would give this a little thought and drop me a line. Will check with Libbey on the bauxitic sample you left with him.

Best wishes.

Sincerely yours,

Director

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

WASHINGTON

April 30, 1941.

Mr. Earl K. Nixon,  
Director, State Department of Geology and Mineral Industries,  
702 Woodlark Building,  
Portland, Oregon.

Dear Mr. Nixon:

Your letter of April 17 was duly received and it is interesting to note that you are placing a summer field survey in Columbia County to map the area containing the iron ore deposits. I hope it will be possible to make detailed estimates of the tonnage in the deposits that are studied. This may involve some drilling to ascertain the thicknesses of the ore bodies under cover. If you do not have funds that could be devoted specifically to such a purpose, would it be possible to have it done by the WPA as has been done in Alabama under the sponsorship of the State Geological Survey? One of the important brown iron ore areas was prospected by means of test pits under the supervision of a mining engineer, and a great deal of valuable data was disclosed that has resulted in the opening of many deposits and the erection of ore washers. Also I trust that analyses of all the representative iron ores can be made as the quality has been one of the dubious points concerning the Columbia County ores.

Near Hillsboro, in Washington County, I found some material associated with the brown iron ore that appeared as if it might be bauxitic. I brought a specimen of it to your office but at that moment you were in the hospital so I left it with Mr. Libbey, and requested that it be called to your attention and if possible be analysed. If this has been done could the results be forwarded to me? Probably the quantity is not very great although it might turn out to be of some value if it proves to be sufficiently bauxitic to be a source of aluminum.

Could you send me another copy of the Report on the Feasibility of Iron and Steel Production in the Northwest Using Columbia River Hydroelectric Power, by Mr. Miller, which was issued last fall by your Department? I took my copy to a conference presided over by Dr. C. K. Leith of the Office of Production Management, a few days ago and he was so interested in it that he wished to retain it. An addressed franked label is enclosed for mailing the report.

With kind regards and thanks in advance for your courtesies, I am

Yours very truly,

*E. F. Burchard*

E. F. Burchard,  
Geologist in Charge,  
Section of Iron and Steel Metals.

Enclosure 1811055.

W

RECEIVED  
JUL 1 1941

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BONNEVILLE POWER ADMINISTRATION

PORTLAND, OREGON

June 30, 1941

IN REPLY REFER TO:

Mr. Earl K. Nixon  
Director  
State Department of Geology and  
Mineral Industries  
Woodlark Building  
Portland, Oregon

Dear Mr. Nixon:

There is enclosed herewith copy of a letter of June 20 from Mr. T. W. Page who is the associate of R. C. Allen in the iron and steel unit in the Office of Production Management.

You will note that Mr. Page suggests that Bonneville might be interested in the initiation of a WPA project to explore the iron ores of the Scappoose district. I have just talked with Libbey regarding this matter, and suggested that initiation of such a project with the WPA should be in your office, though I am quite sure that the Bonneville Power Administration would be interested in supporting your request for the performance of this work.

If you are interested in pursuing this matter further, might I suggest that you and Mr. Bloch and I meet and discuss the procedure at your earliest opportunity.

Sincerely yours,

SYSTEM PLANNING & MARKETING DIVISION

*Raymond M. Miller*

RAYMOND M. MILLER  
Senior Industrial Engineer  
Market Development Section

Enclosure

*Scappoose mine*  
*N*

- C O P Y -

OFFICE OF PRODUCTION MANAGEMENT

Social Security Building

Washington, D. C.

June 20, 1941

(701.11  
(X707  
(117497  
(SP&M Bloch

Mr. Ivan Bloch, Chief  
Market Development Section  
Bonneville Power Administration  
United States Department of the Interior  
Portland, Oregon

Dear Mr. Bloch:

Thank you for your letter of June 13, 1941, and the attached report concerning iron and steel in the Northwest.

There have been presented to this office a number of proposals for the initiation of an iron and steel industry in the Northwest, using ores known to occur in the Columbia River valley, and Bonneville power. All of these proposals, however, lack the necessary base of an ore supply of reasonably certain extent and quality. Before any such projects can be intelligently evaluated, more detailed work as to tonnage, grade, and localities of these ore deposits is required.

We have received a letter from Mr. Earl K. Nixon, Director, State Department of Geology and Mineral Industries, Portland, Oregon, who suggests that available WPA labor be used for the exploration of the ores in the Scappoose district. It is my impression that an expenditure for WPA projects will be made in any case and, if this be true, the use of this labor for such purpose appears to me to be highly desirable. I am informed by the WPA office here, however, that any request for such a project should originate through the State office in Oregon. It occurs to me, that your Section may be interested in the initiation of such a project.

Very truly yours,

S/ T. W. Page

T. W. Page  
Iron and Steel Unit



*Difference not analyzed	Z-1 (anal.) 0.793	Z-2 0.380	Z-3 0.295
	100.00	100.00	100.00

(\*) I suspect that this probably represents such elements as Cr, Ni, Co, Cu, Ti, As, Pb, and Zn.

Very truly yours,  
John Eliot Allen  
Geologist

JEA:ff

Very faint, illegible text, possibly bleed-through from the reverse side of the page.

Very faint, illegible text, possibly bleed-through from the reverse side of the page.

## NORTHERN PACIFIC RAILWAY COMPANY

N. P. DEPOT BUILDING

CARL ZAPFFE,  
MANAGER, IRON ORE PROPERTIES

BRAINERD, MINN.

March 25, 1943.

Mr. John Eliot Allen, Geologist,  
State Department of Geology and  
Mineral Industries,  
702 Woodlark Bldg.,  
Portland, Oregon.

Dear John:

I am very glad that you "took hold" in Earl's absence and sent me those carbon copies. They provided me exactly what I wanted, to check against compilations of that sort that I am working on.

In 1941 I had Earl send me three samples of Scappoose ore. I had our local iron-ore lab. analyze them, to provide dependable analyses. I sent Earl those analyses. They were marked Z-1, 2 and 3, representing typical "soft limonite", "hard limonite" as the "richest" ore, and limonite which he said had usually been taken to represent Scappoose ore. You did not include them. They are probably the only reliable ones of record. Can you find out, and write me, from which of the prospects those three samples were taken?

I see Oregon Charcoal Iron Co., Charcoal Iron Co., and Oregon Iron and Development Co. used by different people in a manner that suggests that the three are one and the same; but there is not a thing anywhere in print or in letters that would make a person safe in accepting such identity. Can you clear up that situation for me?

I thank you very much for writing me. I hope I may hear from you again. I hope to see you in Portland a few months hence.

My best regards to you.

Sincerely yours,

*Carl Zapffe*

RECEIVED  
MAR 31 1943

STATE DEPARTMENT OF GEOLOGY  
& MINERAL INDS.

## NORTHERN PACIFIC RAILWAY COMPANY

N. P. DEPOT BUILDING

CARL ZAPFFE,  
MANAGER, IRON ORE PROPERTIES

BRAINERD, MINN.

May 16, 1941.

RECEIVED  
MAY 20 1941STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Mr. Earl K. Nixon, Director,  
State Department of Geology  
and Mineral Industries,  
702 Woodlark Bldg.,  
Portland, Oregon.

Dear Earl:

I have today gotten around to studying the Gleeson letter you sent me with your letter of April 28th, about the beach-sands tests and analyses.

His statement is difficult to decipher as to how the successive steps of magnetics, electrostatic, and table methods were carried out by him. That, however, is presently not material; it is mainly interesting to know that something can be accomplished by such methods.

I want to call your attention to "Heads 1T, Cr<sub>2</sub>O<sub>3</sub> 4.9%". I think 4.9% is an error. When those Heads become fractions 1TA, B and C, with 2.2%, 10.2% and 13.1%, respectively, plus Tails 1TD with 0.0% Cr<sub>2</sub>O<sub>3</sub>, you would require beginning with more than 4.9% when the respective weights are 12.8, 53.9, 23.0 and 10.2%.

That study is most fascinating; but I fear that making something of value out of the entire deposit, is full of "ifs-and-buts". Titanium, if high grade, should find a market in Portland once electric furnaces are erected there.

I appreciate that you sent me that data.  
My thanks to you for doing that.

With best regards, I am

Sincerely yours,

Carl Zapffe

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# LERCH BROTHERS INCORPORATED

## THE IRON ORE CHEMISTS

LABORATORIES ON THE MESABA AND CUYUNA IRON ORE RANGES IN MINNESOTA

GENERAL OFFICES  
HIBBING, MINNESOTA

LABORATORIES

KEEWATIN  
NASHWAUK  
CALUMET  
BOVEY  
CROSBY

MAY 9 - 194

## ANALYSES OF IRON ORE FOR

LAB. NO.	MINE NO.		REMARKS			IRON	PHOS.	MANG.	SILICA	MOIST
		Mg <sub>o</sub>	LIME	Sulfur	Al <sub>2</sub> O <sub>3</sub>					Loss
478499	"Z" 1	.0014	00.14	.012	5.30	51.32	.558	.35	3.80	15.0
500	"Z" 2	.0022	00.08	1.009	3.34	54.40	.630	.39	2.28	14.3
501	"Z" 3	.0014	00.12	1.004	1.63	56.84	.778	.33	1.77	13.0
	"	"	"	"	"	"	"	"	"	"
		Mg <sub>o</sub>	Ca <sub>o</sub>	S	Al <sub>2</sub> O <sub>3</sub>	Fe (dry)	P.	Mn	Si <sub>o</sub>	Loss by ignition

LABORATORY  
SAMPLED BY

CROSBY

DATE

ANALYZED BY

Lerch Brothers Inc.

## NORTHERN PACIFIC RAILWAY COMPANY

N. P. DEPOT BUILDING

RECEIVED  
MAY 10 1941CARL ZAPFFE,  
MANAGER, IRON ORE PROPERTIES

BRainerd, MINN.

STATE DEP'T OF GEOLOGY  
& MINERAL INDS.

May 13, 1941.

Mr. Earl K. Nixon, Director,  
State Department of Geology and  
Mineral Industries,  
702 Woodlark Bldg.,  
Portland, Oregon.

Dear Earl:

I enclose Lerch Bros., Crosby Laboratory, analysis report dated May 9th, 1941. The samples which I submitted to Lerch Bros. I marked Z-1, Z-2 and Z-3 to identify them, but they apply to SE $\frac{1}{4}$  of Section 3, T.3N.-R.2W., Columbia County, Oregon. The descriptions which you wrote in your letter sent me apply as follows:

Z-1

Your channel sample. Typical limonite ore of Scappoose District.

Z-2

Soft limonitic ore, representing a typical and what in majority of instances has apparently been taken as a sample of "Scappoose Ore."

Z-3

Type sample of the hard limonite presumed to be the richest material in the ore bed.

These analyses tabulate like this, except that I made the calculations for "Oxides", and all else that is enumerated below Loss on Ignition:

<u>All Analyses on Dry Basis</u>	<u>Z-1</u>	<u>Z-2</u>	<u>Z-3</u>
Fe	51.32%	54.40%	56.84%
Mn	.35	.39	.33
P	.558	.630	.778
SiO <sub>2</sub>	3.80	2.28	1.77
Al <sub>2</sub> O <sub>3</sub>	5.30	3.34	1.63
CaO	.14	.08	.12
MgO	.0014	.0022	.0014
S	.012	.009	.004
Loss on Ignition	15.03	14.37	13.00
Calculated Total of Oxides	84.197	85.250	86.755
Grand Total	99.207	99.620	99.755
*Difference not analyzed	0.793	0.380	0.295
	100.00	100.00	100.00

(\* ) I suspect that this probably represents such elements as Cr, Ni, Co, Cu, Ti, As, Pb and Zn.

Moisture could not be determined from so dry a sample, but that type of ore can hardly have less than 12% and is more apt to approach 15%.

The three totals of "99% plus" indicate only little room left for anything else; but if so little were present as Pb or Zn, it would be regarded most detrimental. For ores of such origin I would anticipate, rather, the presence of Cr and Ni and possibly Co and Ti.

In so many instances Scappoose ore analyses have shown several percent of manganese. Your samples contain almost none. A manganiferous iron ore high in phos. is almost useless.

Mr. Nixon

-3-

5-13-41

The fact that alumina, silica and iron are not higher, is accounted for by the high Loss on Ignition. Loss plus Moisture is about 25% to 30%, which is a very large amount of useless material to transport.

I hope you can derive some benefit from these data. I also hope that some day some capable and well-trained fellow will study leisurely and carefully the inner history of those ores and enable one to present the ore and the area in their full and correct light. There has been too much using of old material which is incomplete, and ever too much of conjecture, that, in the light of present technology, it has become dangerous to use ~~it~~ for basing opinions on it.

With best wishes to you,

Sincerely yours,

*Carl Zappfe*

Enclosure

May 13, 1941

Mr. Carl Zapffe, Manager  
Iron Ore Properties  
Northern Pacific Ry. Co.  
Brainerd, Minn.

Dear Mr. Zapffe:

Thanks kindly for your letter of May 5th. My face is extremely red over the switching of sample numbers. It must have happened right on my desk as I put numbers in the bottles hurriedly and dictated the note to go with them just before leaving the office.

My immediate reaction would be to throw the samples out and take new ones, however in this case, judging by your letter, it seems so obvious that I merely switched the numbers. As you suggest, the 3½' channel sample contained both hard chunks and fines, the type sample of hard limonite contained virtually no fines, the other sample was characteristic of the softer phase of the "ore". Evidently I switched numbers one and three.

Referring to the iron ore on the Snake River to which you allude in the last paragraph of your letter, I have not seen it and we do not have a report on it although I have heard rumors that some work is going on. It is my belief that it is a gossan representing surface oxidation of a sulphide zone which will account for a small content of copper. As most of that country is basic igneous, it could well come in association with chrome. I happen to know that there is some chromite on the Snake River in that part of the country east of the Wallows. We expect to visit the area some time this summer. If it looks any good, we will advise you.

Cordially yours,

Director

EKN:ac

## NORTHERN PACIFIC RAILWAY COMPANY

N. P. DEPOT BUILDING

CARL ZAPFFE,  
MANAGER, IRON ORE PROPERTIESRECEIVED  
MAY 8 1941

BRAINERD, MINN.

May 5, 1941.

STATE DEPT' OF GEOLOGY  
& MINERAL INDS.

Mr. Earl K. Nixon, Director,  
State Department of Geology and  
Mineral Industries,  
702 Woodlark Bldg.,  
Portland, Oregon.

Dear Earl:

I returned to Brainerd this last Saturday. Since I visited with you I have been busy each day seeing places and talking with people who were directly engaged in the various phases of the mineral industries in the Northwest. I could have put in twice as much time, in the same manner and to great advantage; but I have many times in the last thirty years been in the Northwest in the same capacity and also doing field work, wherefore, I can now accomplish a great deal by posting myself on the various activities in the various localities. Of course, after one returns and mulls over the things he had seen and heard, it is inevitable that a number of other things should have been done and some rather obvious things had become overlooked. It was both enjoyable and interesting to have had the visit with you and it is still hard for me to believe that we should have had as much as five hours together -- and without any interruption of any kind.

I have your three samples of Scappoose iron ore which you sent with your letter of the 25th ultimo. I am going to lose no time about delivering them at Lerch Bros. Laboratory and get the analyses which I think you should have. If the specimens have been properly selected and if you have confidence in the sampling which you did, then these analyses will be worthwhile and I shall certainly be glad to have myself associated with procuring them. I do not believe that your western assay offices are qualified to make such analyses; that is not surprising, because their laboratories are not set up for quick and accurate determinations.

Mr. Nixon

-2-

5-5-41

So much about the Scappoose ore analyses that I see in print can not be used to indicate the character of these ores and their deposits. In fact, I think the available analyses are actually abused in the way they are being made use of today.

This morning I received a letter from the head of our traffic department, who says that our traffic district agent at Walla Walla had talked with two men who were prospecting for iron ore approximately 50 miles south of Lewiston, Idaho, the orebody being both in Oregon and Idaho and on both sides of the Snake River. He adds that the preliminary assays show the ore "a high grade quality carrying considerable quantity of chrome and copper ore." Do you know anything about this ore. It might help you to indicate that in one part of the letter it refers to ~~the~~ <sup>with</sup> deposit being on the middle fork of the Clearwater river near Kamiah.

With kindest regards,

Sincerely yours,

*Caro Zappfe*

P.S.

Dear Earl:

I believe you may have gotten your numbers No.1 and 3 interchanged.

Your sample No.3 is all black, hard chunks coated brown. What you describe in your letter as No.1 looks like the sample you sent me marked No.3. The description given by you for No.3 does not fit the sample marked No.3 but is exact for the sample you marked No.1. The "channel" sample you took was not all black hard chunks, was it? If not, then interchange No.1 and No.3 wherever they are used in your letter.



April 28, 1941

Mr. Carl Zapffe, Manager,  
Iron Ore Properties,  
Northern Pacific Ry. Co.,  
Brainerd, Minn.

Dear Mr. Zapffe:

Attached hereto is a copy of letter from Professor George W. Gleeson, head of the Department of Chemical Engineering, at Oregon State College. Gleeson's letter covers preliminary work on magnetic and electrostatic separation of the samples of black sand concentrates from the Oregon coastal area.

The various products of the separation, alluded to in the letter attached, are the ones you saw on my desk the other evening.

Best wishes.

Sincerely yours,

Director

EKN:ac

April 25, 1941

Mr. Carl Zapffe, Manager  
Iron Ore Properties  
Northern Pacific Ry. Co.  
Brainerd, Minn.

Dear Mr. Zapffe:

Under separate cover, we are sending you portions of ore samples, the originals of which you saw in my office on April 23rd. The descriptions are as follows:

- #1--Type sample representing the hard limonite presumed to be the richest material in the ore bed.
- #2--Type sample representing a characteristic phase of the softer limonite which in most exposures makes up a majority of what apparently has been sampled as "ore".
- #3--Channel sample of  $3\frac{1}{2}$ ' vertical length taken by myself of what I consider to be typical limonite ore of the district.

All samples come from open cuts in the hillside on the property of Mr. D. W. Price in the SE $\frac{1}{4}$  of Section 3, Township 3 N., Range 2 W., Columbia County, Oregon.

May I suggest that Sample #3, which I should say is representative of the ore in the more promising open cuts, be assayed rather completely for the iron series of determinations. Would like to have iron, silica, and phos at least on #1, and iron, silica, phos, and alumina on #2.

Your willingness to have this work done for us is much appreciated indeed because we really are cramped for funds. We shall look forward to receiving the results with much interest. It was indeed a pleasure to have had a nice chat with you and Mr. Mullen, and I hope that we can get together again at some future time when you happen to be out this way.

With best wishes, I am,

Cordially yours,

EKN:ac

Director

March 22, 1943

Mr. Carl Zapffe, Manager  
Iron Ore Properties  
Northern Pacific Railway Company  
N. P. Depot Building  
Brainerd, Minnesota

Dear Mr. Zapffe:

Mr. Nixon is still in North Carolina and is expected to return in about two weeks, so I am replying for him.

I am enclosing two different "issues" of our summary report on "Iron Ores of Columbia County, Oregon", of which you speak in your letter of March 17. I hope that this is what you wish.

I enjoyed meeting and talking with you very much and hope to see you again some time.

Very sincerely yours,

John Eliot Allen  
Geologist

JEA:ff  
Enclosure

## NORTHERN PACIFIC RAILWAY COMPANY

N. P. DEPOT BUILDING

CARL ZAPFFE,  
MANAGER, IRON ORE PROPERTIES

BRAINERD, MINN.

March 17, 1943.

Mr. Earl K. Nixon, Director,  
State Department of Geology,  
702 Woodlark Bldg.,  
Portland, Oregon.

Dear Earl:

I thank you for sending me your Bulletin No.25. I shall read it with much interest because of the excellent management you have put into planning and the executing of the work of that Department.

While glancing thru the pages, just to see the general make-up of the Bulletin, I see listed on top of page 23 "Summary Report on Iron Ores of Columbia County, Oregon." It is in typescript, so it says. I am very eager to have such a copy and will pay a typist for making a copy for me; can you arrange that for me? It so happens that I had started compiling similar data a year ago, but due to other work crowding in I was unable to get far with it at that time. I am nearing the time when I can take it up again, wherefore your document would be most helpful to me.

With my personal regards to you, I am

Sincerely yours,



RECEIVED  
MAR 22 1943

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

September 1, 1942

Mr. E. Y. Dougherty  
C/O United States Bureau of Mines  
Rollo, Missouri

Dear Mr. Dougherty:

I have been looking for some of our maps on the St. Helens area, the manuscript copy of the St. Helens quadrangle geology in particular but I am unable to find it.

In looking through the correspondence, I find a letter from you of May 2 in which you verify my remembrance that "I have several maps you loaned me."

We are very anxious to get hold of the extra quadrangle map as we are planning to publish it in the near future and I would appreciate it if you could help us hunt it up whether you have it with you or whether it is in Oscarson's office. Iverson, here in Portland, apparently knows nothing of it.

Sorry I did not get to see you before you left. Kindest personal regards

Sincerely

John Eliot Allen  
Geologist

JEA:lb

May 14, 1942

Mr. E. Y. Dougherty  
Project 905  
United States Bureau of Mines  
Scappoose, Oregon

Dear Mr. Dougherty:

In reply to yours of May 11 concerning a sampler, Jean Bowman believes she knows of an Oregon State man who took a course in geology and will look him up when she goes to Corvallis - scheduled for today. She will tell him to get in touch with you immediately.

In the meantime if I hear of anybody else, I will refer him to you.

Sincerely,

F. W. Libbey  
Mining Engineer

PWL: jr

UNITED STATES  
DEPARTMENT OF THE INTERIOR

BUREAU OF MINES  
Scappoose, Oregon  
May 11, 1942

Mr. F. W. Libbey  
702 Woodlark Building  
Portland, Oregon

Dear Mr. Libbey:

We can use a man here as sampler at \$6.00 per day; he does not have to be a technical man, but we would like some one who has had some experience around diamond or churn drills. If you happen to know of someone whom you can recommend it will not be necessary for me to see him first. He could report any time within the next week or ten days, the sooner the better.

With best regards, I am,

Yours very truly

*E. V. Dougherty*

E. V. Dougherty  
Engineer in Charge  
Project 905

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MAY 12 1942  
STATE DEPT OF GEOLOGY  
& MINERAL IND.

April 29, 1942

Mr. E. Y. Dougherty, Engineer in Charge  
Project 905  
United States Bureau of Mines  
Scappoose, Oregon

Dear Mr. Dougherty:

Referring to your letter dated April 28 and concerned with bids on bulldozing work, I telephoned Mr. Jack McDougall of the Natt McDougall Company, and Mr. Jack McDougall said that he would take a run down and talk the matter over with you.

Should you wish to contact other possible bidders, I suggest that you drop a line to Oscar Butler & Son, 4224 N. E. Alberta Street, Portland, and to Fred Christensen, 1017 S. E. Thirty-fourth Avenue, Portland.

With best regards.

Sincerely yours,

F. W. Libbey  
Mining Engineer

FWL: jr

UNITED STATES  
DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

Scappoose, Oregon  
April 28, 1942

Oregon Department of Geology and  
Mineral Industries  
702 Woodlark Building  
Portland, Oregon

Gentlemen:

Attention Mr Nixon and  
Mr. Libbey

The Bureau of Mines is soliciting bids for 300 hours of bulldozing. We have the names of 2 men here at Scappoose, but would like to have a third prospective bidder. Do you happen to know some one who would be interested? The tractor should be 75 or 80 H. P. with a minimum of 65 H P. The blade is to be adjustable to work from an angle or straight for longitudinal trenching.

Yours sincerely

*E. Y. Dougherty*

E. Y. Dougherty  
Engineer in Charge  
Project 905

Oscar Butler Ga 2690  
Fred Christensen Ea 8934  
Jack McDougall At 8316

RECEIVED  
APR 29 1942

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

## CLASS OF SERVICE

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# WESTERN UNION

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## SYMBOLS

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NA66 24 NT=NEWYORK NY 13

1942 APR 14 AM 3 49

EARL K NIXON=

WOODLARK BLDG PORTLAND ORG.

BRASSERT WISHES 3 OR. 4 SMALL SAMPLES SCAPPOOSE ORE.

YOU KNOW FROM VARIOUS CUTS OF ORE VEIN. WILL YOU SEE HE

RECEIVES THEM. REGARDS=

I A HEUSNER.

3 4. HEUSNER.

*Samples sent us by Dougherty  
received 4/18/42 - sent to  
Brassert N.Y. same date.*

May 6, 1942

Mr. Preston E. Hotz  
P.O. Box 752  
Scappoose, Oregon

Dear Pres:

Mr. Nixon just asked me to urgently request you to come in Friday afternoon and talk with him concerning your work to follow the iron survey.

We are getting more and more pressed for good men and he is very anxious to get something or other settled as well as possible with you.

I will be looking forward to seeing you myself.

Very sincerely yours,

John Eliot Allen  
Geologist

JEA: jr

May 1, 1942

Mr. Preston E. Hots  
Box 752  
Scappoose, Oregon

Dear Pres:

Thanks for your letter. I enjoyed the trip immensely and apparently most of the rest of the crew did too. I was sorry that I had to duck out when I did without saying good-bye, but Jack Stevens was in a hurry to get back. I didn't even have time to confer with you.

The next trip of the Geological Society, I think, will be over the Wolf Creek highway. At any rate, I will let you know. You should plan, however, to be in town next Friday night at the Public Service Building, 8 o'clock, for the talk on tree ring casts in central Oregon lavas and other recent volcanic physiographic features by Dr. Robert Nichols of Tufts College. Bob is working with the U.S.G.S. on the Castle Rock claims now, and I have been out with him a couple of times - he's a swell egg. You ought to meet him.

I have just sent Dougherty an old (1920) topog and workings map of the Bunker Hill property which I turned up yesterday. Hope it will be of value to you.

Kindest regards,

John Eliot Allen  
Geologist

JEA:jr

UNITED STATES  
DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY  
Box 752 Scappoose, Ore.

April 30, 1942

Dear John:

Apparently plans for the last leg of the jaunt got discombobulated. I never did see you and your party. I got the rest of the gang started down the summer road but they missed a turn and went down Sierck's Road instead of going to Scappoose direct. I waited at the Feed Mill and finally caught Scotty & her man & found out what the trouble was. I guess it was just as well we didn't stop at the last fossil locality since it was getting pretty late in the day.

I think the party was quite successful don't you? It was fun going around with the bunch.

I suppose the G.S.O.C. isn't doing much running around any more due to the gas and tire shortage. If you are planning any other trips I'd like to know about it. My Sundays are usually free & I'd like to see some other parts of the country around here. Whom would I get in touch with?

Thanks again for the fossil identifications. If I run across any more localities I'll let you know about them.

The rain this week has given me time to get somewhat caught up on my office

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

work and now if it will just clear up  
I hope to put in some time mapping out  
at Ironcrest and at Bubker Hill, the  
latter looks pretty good and the ore bed  
crops fairly well.

Well, must get on.

as ever

  
Preston E. Hotz

U.S. GEOLOGICAL SURVEY  
WASHINGTON, D.C. 20508  
DEPARTMENT OF THE INTERIOR

April 17, 1942

Mr. Preston E. Hots  
Box 752  
Scappoose, Oregon

Dear Prest:

This morning I got hold of the large-scale (2 miles to the inch) geologic map of the St. Helens quadrangle from Dr. Wilkinson. This is his office map and he does not want you to take it in the field. I do think that we could profitably spend some time together on it, however.

I have done some work on the possible faulting of the region from a more or less physiographic standpoint and find that a number of my "physiographic" faults seem to be very well substantiated by the geology, particularly by the abrupt change in elevation of the sedimentary basalt contact. If you get a chance to come in or if you come in for some other reason, do try to stop in and spend a few minutes with me. If I can possibly come, I will do so, but I don't know when that would be as yet.

Kindest regards.

Sincerely,

John Eliot Allen  
Geologist

JEA: jr

April 15, 1942

Mr. Preston E. Hets  
P.O. Box 752  
Scappoose, Oregon

Dear Prest:

Thank you for the fossil collection at which Miss Bowman is now at work. So far, she hasn't had much to say about it since they are rather small and very poorly preserved.

I was very much interested to hear about the development along the edge of the Coalport deposit. Have you given up all ideas of other means of origin than bog deposit?

The field trip is more or less definitely scheduled for Sunday, the 26th. I will let you know if there are any changes in plans. Probably we will arrive in force at the "feed mills" along about 9:30 or soon thereafter, but I will give you more exact times later.

Kindest regards,

John Eliot Allen  
Geologist

JEA: jr

RECEIVED  
APR 14 1942  
STATE DEPT OF GEOLOGY  
& MINERAL INDS.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

u  
P.O. Box 752 Scappoose, Ore  
April 11, 1942

Mr. J. E. Allen  
702 Woodlark Bldg.  
Portland, Oregon

Dear John:

I am sending under separate cover a small collection of fossils from two localities in the St. Helens quadrangle, near Scappoose. The localities are more or less completely described on the tags enclosed with the specimens.

Will you please ask Miss Bowman to identify them for me and indicate their age and position. Both localities were within 50 to 75 feet of the lower contact of the basalt.

If possible I should like to have the specimens back when you are finished with them. If you like you may hold them at the office until some future date when I can call for them.

The past week has revealed some interesting facts about the ore bed in the area you visited on Tuesday. The drill was moved down the ridge to two successive spots and found ore in both holes. A number of auger holes has shown that the ore bed pinches out very rapidly a short distance north of the road. I feel that it is probably due to the fact that we neared the edge of the bog ~~which~~ adjacent to the old highland in the Miocene. If so, it may mean that the ridge ~~along~~ which the Pisgah Home summer road follows will be barren and we may have several tongues of ore lying beneath the ridges extending to the northeast from the road. These may or may not be continuous, depending on the vagaries of erosion.

I was sorry that the plans were discombobolated Tuesday. Dougerty as yet has said nothing about it to me. Hope to see you again soon; on the G.S.O.C. trip or mebbe before. By the way, did you say that trip was scheduled for next Sunday, the 19 th., or was it the 26th?

I'll probably be seeing you before then since I will be going in to Portland again soon. I want to see the Army Engineers about getting a loan of some air fotos of the area.

Best regards,

c.c. Miss Jean Bowman

Preston E. Hotz

September 2, 1942

Mr. William F. Kett  
The Mountain Copper Company  
216 Pine Street  
San Francisco, California

Dear Mr. Kett:

I am digging out from under an accumulation of correspondence that arrived during my absence during most of August. Your communications of August 7 and 14 with enclosures have just now come to light. I very much regret this delay but presumably it has caused you no inconvenience.

Referring to your letter of August 14, we do not know where in Oregon we could obtain the ten pounds or so of fairly pure marcasite that you request. It occurs, of course, at various points in this State, but I wouldn't know how to go about getting ten pounds of a fairly pure product. My best suggestion in this regard would be that you communicate directly with the Foote Mineral Company, Philadelphia, Pennsylvania.

I feel quite discouraged over the apparent attitude of Metals Reserve Company and especially War Production Board in regard to the zinc situation. As Mr. Burch may have indicated to you, I have had some rather definite ideas on zinc developments on the Pacific coast but those who are running the zinc show did not agree with me. I went so far as to state to the Zinc Section that I did not feel inclined to encourage the production of zinc in Oregon if the concentrates had to be shipped east of the mountains for reduction. I am still of that opinion. I was thinking, of course, of the effect on the coast mines after this emergency.

I gather that there has been a decided change in the last few days in the complexion of War Production Board, that is its personnel who deal with mining problems. You may have noted that Dr. Wilbur A. Nelson now has been given very much broader responsibility as Special Assistant to the Deputy Director General for Industry Operations. His duties are outlined in the recent release dated August 28 of the American Mining Congress. I don't know to what extent production policies will be changed but I suspect there will be some changes.

We are returning herewith with thanks the data and memos which you submitted for our perusal. Please let us know at any time you think we can be of any assistance to you.

Very truly yours,

EKN:jr  
cc Mr. Burch

Director



# THE MOUNTAIN COPPER COMPANY

LIMITED

351 CALIFORNIA STREET  
216 Pine Street

SAN FRANCISCO, CALIFORNIA

TELEPHONE EXBROOK 3928

August 14th, 1942.

Earl K. Nixon, Esq.,  
Director, State Department of Geology & Mineral Industries,  
702 Woodlark Building, Portland, Oregon.

Dear Mr. Nixon:-

I finally succeeded in getting an offer to purchase Zinc Concentrates from Mr. G. Temple Bridgman, Executive Vice-President of the Metals Reserve Company. The proposal, as outlined by Mr. Bridgman, contemplates shipping to the Anaconda Company at Black Eagle and the terms are not nearly as good as I expected.

The enclosed copies of correspondence with Mr. Bridgman will explain the situation fully, that is, as it stands at the moment. Kindly return these copies after perusal.

In connection with some experimental work, I want to obtain about 10 lbs. of a fairly pure **MARCASITE** and I will appreciate it very much if you can secure this for me and have it sent by Parcels Post to 216 Pine Street, San Francisco. Doubtless there is plenty of Marcasite in California, but I don't know just where to look for it, but if you do, I would also like that information. I will of course reimburse you promptly for any expense in obtaining and forwarding me the sample of Marcasite.

Sincerely yours,

Wm. J. Kett

Encs.

c.c. to Mr. Albert Burch

RECEIVED  
AUG 15 1942

STATE DEPARTMENT OF GEOLOGY  
& MINERAL INDS.

Charge to the account of The Mountain Copper Co., Ltd.

\$

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# WESTERN UNION

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ACCOUNTING INFORMATION

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PRESIDENT

NEWCOMB CARLTON  
CHAIRMAN OF THE BOARD

J. C. WILLEVER  
FIRST VICE-PRESIDENT

Send the following message, subject to the terms on back hereof, which are hereby agreed to

San Francisco, Calif., August 6, 1942.

WHITNEY P. MEE,  
EXAMINING ENGINEER,  
METALS RESERVE COMPANY,  
WASHINGTON, D.C.

On July 31 received following telegram signed by Dewitt Smith,  
"Forwarding general terms under which the purchase of your Mattie  
Concentrate containing minimum of 43 percent zinc would be considered."

Nothing received as yet and cannot reach decision until I know general terms. Word "FORWARDING" in telegram of July 31 is ambiguous and not sure if it means immediately or presently. Please telegraph or telephone at my expense either full particulars of terms or state definitely when same can be expected here. Has definite decision been reached regarding terms you are prepared to offer? Kindly reply today without fail.

Wm. F. Kett, General Manager  
MOUNTAIN COPPER COMPANY

Copy for Mr. Earl K. Nixon  
702 Woodlark Bldg.,  
Portland, Oregon.

~~XXXXXXXXXXXXXXXXXXXX~~  
216 Pine Street

RECEIVED  
AUG 8 1942

August 7th, 1942.

Whitney P. Mee, Esq.,  
Examining Engineer,  
Metals Reserve Company,  
Washington, D.C.

STATE GEOLOGY  
& MINERAL INDUSTRY

AIR MAIL

C  
O  
P  
Y

Dear Mr. Mee:-

I thank you very much for your telegraphic advice, received to-day, to the effect that, in answer to my telegram of August 6th, an air mail letter with terms offered for purchase of Mattie Concentrates will be sent August 8th.

Doubtless the letter mentioned will reach me on Monday, August 10th, and it should enable me to arrive at a decision concerning the Mattie Project.

Since writing to Mr. de Witt Smith on July 31st, the labor situation at the Company's Hornet Mine, in Shasta County, became so serious that I was compelled to grant an increase in wages of 50¢ per man per day. This will greatly decrease, or entirely eliminate, any possible margin of profit in the proposed operation, but if your offer is sufficiently favorable, my present idea is to go ahead at once with the mill construction. I will let you hear from me promptly upon receipt of the terms.

As a matter of form, I am enclosing a confirmation of the telegram sent to you on August 6th.

Sincerely yours,

W. G. K.

Gen. Mgr.

Enc.



# THE MOUNTAIN COPPER COMPANY

LIMITED

~~351 CALIFORNIA STREET~~  
216 Pine Street

SAN FRANCISCO, CALIFORNIA

August 1st, 1942.

TELEPHONE EXBROOK 3928

Earl K. Nixon, Esq.,  
Technical Consultant,  
Material Division,  
Woodlark Building,  
Portland, Oregon.

Dear Mr. Nixon:-

A letter has come to hand from Mr. Burch with which he enclosed a copy of your proposed letter of July 31st to Dr. C. K. Leith.

Owing to the fact that I have received a telegram from Mr. H. DeWitt Smith in Washington, as per copy enclosed, I think it will be inadvisable to send your letter to Dr. Leith at the moment and have wired you to that effect.

Within the last 10 days, I have been pressing both Mr. Whitney P. Mee and Mr. Frank A. Ayer, one of the M.R.C. and the other of the W.P.B., to give me a definite answer about marketing the Zinc Concentrates. Further, Mr. T. L. Goudvis, the San Francisco Regional Technical Advisor of the Mining Branch of the W.P.B., took up the cudgels on my behalf, and altogether I feel that, until I know the terms mentioned in Mr. DeWitt Smith's telegram, further action should be delayed.

I will advise you as soon as the promised particulars are received from Washington, and in the meantime I want to thank you for your kindly interest in this matter and to assure you of my appreciation of your readiness to render real assistance.

Sincerely yours,

*Wm. J. Kett*

Enc.

CHECK SERVICE DESIRED OTHERWISE MESSAGE WILL BE SENT AT FULL RATE	
DOMESTIC	FOREIGN
FULL RATE	FULL RATE
DAY LETTER	CDE RATE
NIGHT LETTER	URGENT
SERIAL	DEFERRED
RESERVATION	NIGHT LETTER
TOUR-RATE	SHIP RADIO

# Postal Telegraph

*Mackay Radio*      *All America Cables*  
*Commercial Cables*      *Canadian Pacific Telegraphs*



CHARGE ACCOUNT NUMBER	
CASH NO.	TOLLS
CHECK	
TIME FILED	(STANDARD TIME)

Form 2

*Send the following message, subject to the Company's rules, regulations and rates set forth in its tariffs and on file with regulatory authorities*

C O P Y

F.NC 148    N.WC132    LF107W    20    GOVT-RF    WASHINGTON DC    31    1142A

L. T. Kett,

Assistant Manager, The Mountain Copper Co., 216 Pine St.

San Francisco, Calif.

FORWARDING GENERAL TERMS UNDER WHICH THE PURCHASE OF YOUR MATTIE  
 CONCENTRATE CONTAINING MINIMUM OF 48 PERCENT ZINC WOULD BE CONSIDERED.

H. DEWITT SMITH

July 31 AM 10 47

Charge to the account of The Mountain Copper Co., Ltd.

\$

CLASS OF SERVICE DESIRED	
DOMESTIC	CABLE
TELEGRAM	ORDINARY
DAY LETTER	<input checked="" type="checkbox"/> URGENT RATE
SERIAL	DEFERRED
NIGHT LETTER	NIGHT LETTER
SPECIAL SERVICE	SHIP RADIOGRAM

Patrons should check class of service desired, otherwise the message will be transmitted as a telegram or ordinary cablegram.

# WESTERN UNION

1206-B

CHECK

ACCOUNTING INFORMATION  
~~CONFIRMATION~~

TIME FILED

R. B. WHITE  
PRESIDENT

NEWCOMB CARLTON  
CHAIRMAN OF THE BOARD

J. C. WILLEVER  
FIRST VICE-PRESIDENT

Send the following message, subject to the terms on back hereof, which are hereby agreed to

San Francisco, Calif., Aug. 1, 1942.

EARL K. NIXON,  
702 Woodlark Building,  
PORTLAND, Oregon.

Telegram from DeWitt Smith indicates satisfactory arrangements for marketing zinc concentrates is probable, therefore think best to hold your suggested letter to Doctor Leith pending receipt further advices by mail.

THE MOUNTAIN COPPER COMPANY, LTD.

C O P Y for Mr. Nixon ✓

WAR PRODUCTION BOARD

1355 Market Street  
SAN FRANCISCO, CALIFORNIA

July 31, 1942.

Mountain Copper Company,  
216 Pine Street,  
San Francisco, California.

Attention: William F. Kett, General Manager

Gentlemen:-

To confirm our telephone conversation of this date, you are advised that the following telegram has been received from Mr. Whitney P. Mee, Engineer Examiner, Metals Reserve Company, Washington, D.C.:

"Retel July 30. The following wire has just been sent Mountain Copper Company by Mr. DeWitt Smith: Forwarding general terms under which the purchase of your Mattie concentrate containing minimum of 48 per cent zinc would be considered."

I shall advise you of any new developments brought to the attention of this office and would appreciate being advised of the general terms under which the purchase of your zinc concentrate will be considered by the Metals Reserve Company.

Very truly yours,

(Signed) T. L. GOUDVIS,  
Regional Technical Advisor,  
Mining Branch, WPB

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

# WESTERN UNION

(04)

SYMBOLS

- DL=Day Letter
- NT=Overnight Telegram
- LC=Deferred Cable
- NLT=Cable Night Letter
- Ship Radiogram

A. N. WILLIAMS  
PRESIDENT

NEWCOMB CARLTON  
CHAIRMAN OF THE BOARD

J. C. WILLEVER  
FIRST VICE-PRESIDENT

*B*

The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

FB180 30 DL=SANFRANCISCO CALIF 1 1025A

1942 AUG 1 AM 11 04

EARL K NIXON=

702 WOODLARK BLDG PORTLAND ORG=

TELEGRAM FROM DEWITT SMITH INDICATES SATISFACTORY ARRANGEMENTS FOR MARKETING ZINC CONCENTRATES IS PROBABLE THEREFORE THINK BEST TO HOLD YOUR SUGGESTED LETTER TO DOCTOR LEITH PENDING RECEIPT FURTHER ADVICES BY MAIL=

THE MOUNTAIN COPPER CO LTD.

*(Red mark)*

ALBERT BURCH

MINING ENGINEER

BLACK OAK RANCH, MEDFORD, OREGON  
BOX 200, R. 2

July 31, 1942

RECEIVED  
AUG 1 1942

STATE DEPARTMENT  
GEOLOGY  
& MINERAL INDS.

Mr. Earl K. Nixon  
Woodlark Building  
Portland, Oregon.

Dear Mr. Nixon:

Referring to your proposed letter regarding the Mountain Copper Company difficulties, I have had to change my plan with reference to seeing Mr. Kett in San Francisco, and I am mailing the copy to him with the request that if he wishes it sent, he telegraph directly to you.

He appears to have the matter fairly well in hand, however, having taken it up with Mr. Ayer of the Copper Division, and therefore I doubt whether it is worth while for you to send the letter to Dr. Leith. This he will determine for himself.

With kind regards I am,

Very truly yours,

*Albert Burch*

AB

*Foot. ask agent*

August 12, 1942

Mr. John R. Reynolds, Engineer in Charge  
United States Bureau of Mines  
Scappoose, Oregon

Dear Mr. Reynolds:

Thanks for yours dated August 11.

It is possible that the plane table cover has been lost on one of our projects.

Concerning the hematite float, I have with the full knowledge of Iverson written the Geophysical Division of the U.S.G.S. asking their opinion on the feasibility of a geophysical survey of that locality.

Last Sunday I passed through Scappoose on a geological trip to the area near Mist. It was a little bit late or I would have stopped for a brief call. The next time I go on such a trip, I am going to take my fishing tackle. I saw some beautiful pools on the river where I was. However, as you and I know, the looks of the pools don't mean too much.

Sincerely,

F. W. Libbey  
Acting Director

FWL: jr

UNITED STATES  
DEPARTMENT OF THE INTERIOR

BUREAU OF MINES  
Scappoose, Oregon  
August 11, 1942

~~INTERMOUNTAIN EXPERIMENT STATION~~

~~1600 EAST FIRST SOUTH STREET  
SALT LAKE CITY, UTAH~~

Mr. F. W. Libbey  
State Dep't of Geology and Mineral Industries  
702 Wood Lark Building  
Portland, Oregon

Dear Mr. Libbey

We have no record of any planetable cover ever having been on the project. I asked Hollis Dole and he said that there wasn't one on it when he took it out for the first time.

Mr. Iverson and I are going to straighten out the matter of equipment rental from you as soon as possible.

I've gone fishing a couple of times lately but havn't done any good.

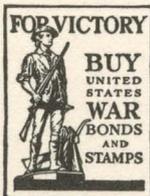
Very truly yours

*John R. Reynolds*  
John R. Reynolds  
Engineer in Charge

cc: Files

RECEIVED  
AUG 12 1942

STATE DEPT OF GEOLOGY  
& MINERAL INDS.



August 7, 1942

Mr. John R. Reynolds  
United States Bureau of Mines  
Scappoose, Oregon

Dear Mr. Reynolds:

I sent the plane table etc. to our geologist in southern Oregon and now have an inquiry as to the whereabouts of the cloth cover for the plane table. It should have accompanied the equipment when it went to Scappoose, but we have no record of it.

Have you run across it anywhere?

Sincerely,

F. W. Libbey  
Acting Director

FWL: jr

July 29, 1942

Mr. John Reynolds,  
Engineer in Charge,  
U. S. Bureau of Mines,  
Scappoose, Oregon

Dear Mr. Reynolds:

Several months ago this Department loaned to the Bureau of Mines for its use in the Scappoose District a telescopic alidade, planetable, and stadia rod. I recall distinctly the occasion when we made the loan, and we were under the impression at that time that it would be for a very brief period. We got the material back last week as a State job came up where we were obliged to use the equipment.

I assume that it would be proper to bill the Bureau of Mines for some rental on this equipment as it seems to be a legitimate expense. However, I would like to have your ideas in the matter before we render a bill.

You now have, I believe, a Y-level which is my personal property and does not belong to the Department. I had this rented for a number of months up to a year ago to a contractor, and he paid me \$15.00 a month rental for the instrument and tripod. I don't want to convey the idea that we are trying to be ornery, but would like to know if you would be willing to pay such a rental on the level, and ask your reaction to billing for use of the alidade and plane table.

Cordially yours,

Director

EKN:ac

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

# WESTERN UNION

1201

SYMBOLS

DL=Day Letter  
 NT=Overnight Telegram  
 LC=Deferred Cable  
 NLT=Cable Night Letter  
 Ship Radiogram

A. N. WILLIAMS  
 PRESIDENT

NEWCOMB CARLTON  
 CHAIRMAN OF THE BOARD

J. C. WILLEVER  
 FIRST VICE-PRESIDENT

The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

SQ WM 10 GOVT

SCAPPOOSE ORG 1107A JUL 25 1942

F W LIBBEY STATE DEPT OF GEOLOGY & MINERAL INDUSTRIES

PORTLAND ORG

RETEL . ARE USING YOUR PLANETABLE ALIDADE LEVEL AND STADIA ROD

JOHN R REYNOLDS

1108A

Charge to the account of

\$

CLASS OF SERVICE DESIRED	
DOMESTIC	CABLE
TELEGRAM	ORDINARY
DAY LETTER	URGENT RATE
SERIAL	DEFERRED
OVERNIGHT TELEGRAM	NIGHT LETTER
SPECIAL SERVICE	SHIP RADIOGRAM

Patrons should check class of service desired; otherwise the message will be transmitted as a telegram or ordinary cablegram.

# WESTERN UNION

1206

CHECK
ACCOUNTING INFORMATION
TIME FILED

A. N. WILLIAMS  
PRESIDENT

NEWCOMB CARLTON  
CHAIRMAN OF THE BOARD

J. C. WILLEVER  
FIRST VICE-PRESIDENT

Send the following telegram, subject to the terms on back hereof, which are hereby agreed to

**WANT A REPLY?**  
 "Answer by WESTERN UNION"  
 or similar phrases may be  
 included without charge.

702 Woodlark Bldg.  
Portland, Oregon  
July 24, 1942

JOHN R. REYNOLDS, FOREMAN IN CHARGE  
U. S. BUREAU OF MINES  
SCAPOOSE, OREGON

DO YOU HAVE ANY RECORD OF A LOAN OF PLANETABLE AND ALEDADE TO THE SCAPOOSE PROJECT FROM  
DEPARTMENT

THIS

F. W. Libbey  
State Department of Geology & Mineral Industries

FWL:ac  
Send nightletter

Chg. STATE DEPARTMENT OF  
GEOLOGY & MINERAL INDUSTRIES  
702 WOODLARK BLDG. - PORTLAND, ORE

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF MINES

Scappoose, Oregon

July 13, 1942

Mr. F.W. Libby  
Acting Director  
Department of Geology and Mineral Industries  
702 Woodlark Building  
Portland, Oregon

Dear Mr. Libby:

I have just recieved notice that Mr. Iverson has been appointed District Engineer for Oregon and Washington. I also understand that he will probably make his office in Portland. I suggest that you hold his trunks amd packages for him. Thank you.

Very truly yours,

*John R. Reynolds*  
John R. Reynolds  
Foreman in Charge

cc files

*Thomas R. Evans  
Re above information.*

RECEIVED  
JUL 14 1942  
STATE DEPT OF GEOLOGY  
& MINERAL INDS.

July 11 1942

F. W. Libbey

Mr. E. Y. Dougherty, Bureau of Mines, Scappoose Oregon

Dear Mr. Dougherty:

Do you know of a Bureau engineer named Iverson? The local office of the express company called us this morning in regard to a package they are holding, from Salt Lake, addressed to Mr. Iverson, Bureau of Mines, Portland. As we did not know him, we could not accept the package and they are holding it for further instructions. We told them we would let them know if we found any more information about him.

Yours very truly,

Acting director

FWL/fas

January 3, 1941

Judge Ray Tarbell  
Star Route  
Houlton, Oregon

Dear Judge Tarbell:

We are pleased at the manner in which the publicity was sent out on the proposition of the Department being obliged to forego immediate carrying out of the economic phase of our work on the Scappoose ores. So often it happens that there are misquotations and misinterpretations of our position.

I think it would be proper if you chose to do so to advise the press that some development work is being planned on the Scappoose ores by the U. S. Bureau of Mines. As you know, a representative from the Solicitors Office, Department of the Interior, has been in the Columbia County area for a couple of weeks getting releases from various property owners so that the Bureau of Mines will be free to carry out some development work.

I have written to the U. S. Bureau of Mines and inquired as to their policy on publicity and as to any details they cared to give us on their plans for sampling the ores. A communication from Chas. F. Jackson, Chief of the Mining Division, U. S. Bureau of Mines (a man whom I happen to know personally) states that "only a preliminary program of exploration is all that is contemplated and further work will depend upon results of preliminary work. The object is to ascertain for the information of the defense agencies.....as much as possible within the facilities available about the quantities and grades of needed ores and minerals that can be produced."

I am informed that appropriations are limited and that funds will be allotted from time to time for work on those deposits which warrant further expenditures. I have no details whatever on the form which the exploration will take other than that it will be a sampling program.

This Department, of course, has proffered every possible assistance to the Bureau of Mines in connection with the planned work on the Scappoose deposits. Just how soon field work will actually start, I do not know.

Knowing your interest and the interest of others in Columbia County in the proposed developments, we will be pleased to keep you advised of any information that comes to this office in regard to the U. S. Bureau of Mines' plans.

Cordially yours,

EKN:ac

Director

Scappoose, Oregon  
March 2, 1942

Mr R. K. Meade  
Dept. of Mining Engineering  
Oregon State College  
Corvallis

Dear Mr Meades:

Following up my letter of February 25th:

Please note that we shipped you 7 samples in all, numbers 1 to 7 inclusive, and that each of the samples is to be assayed for moisture, loss in ignition and iron, and reported in quadruplicate. My former letter mentioned only 5 samples.

Yours very truly,

*E. J. Dougherty*  
Engineer in Charge  
Project 905

cc: Mr Jackson  
Mr Gardner  
Mr Lorain  
Mr Nixon ✓  
Project Files

RECEIVED  
MAR 3 - 1942

STATE DEPT OF GEOLOGY  
& MINERAL IND.

M

RECEIVED  
FEB 26 1942

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Scappoose, Oregon,  
February 25, 1942

Mr R.K. Meade  
Dept. of Mining Engineering  
Oregon State College  
Corvallis.

Dear Mr Meades:

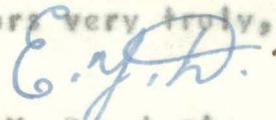
Enclosed please find original and one copy of Government Bill of Lading covering shipment by Railway Express of one can of ore samples. When you take delivery please fill out the CONSIGNEE'S CERTIFICATE OF DELIVERY and give the original to the delivering carrier. The memorandum copy is for your own records.

The samples are being sent you at the suggestion of Mr Nixon and Mr Allen of the Oregon Dept. of Geology and Mineral Industries. I understand from Mr Allen that you are not prepared to undertake more than analyses for moisture, loss in ignition and iron. Will you therefore analyze each of the five samples, enclosed in sacks in the one can, for each of these three constituents. Results should be reported on quadruplicate copies and sent to me by mail here.

We expect to be sending you some 20 more samples in cream cans but these will reach you at various times spread over a considerable interval of time. The empty can in this shipment may be returned to us by express, government bill of lading collect, at any time that suits your convenience. If you wish you can hold this can, and other shipments of several cans that will reach you from time to time, until you have enough cans to warrant making a shipment.

Your results will be very interesting and your moisture determinations may be the only ones that will be made on this project.

Yours very truly,



E. Y. Dougherty,

Engineer in Charge  
Project 905

cc: Mr Jackson  
Mr Gardner  
Mr Lorain  
Mr Nixon ✓  
Project Files

February 26, 1942

Mr. E. Y. Dougherty  
Box 723  
Scappoose, Oregon

Dear Mr. Dougherty:

I have a letter from Mrs. A. Rustad, Route 2, Box 70, Poulsbo, Washington, in which she inquires after land as follows: N.W.  $\frac{1}{4}$  of the S.W.  $\frac{1}{4}$  and the W  $\frac{1}{2}$  of the S.W.  $\frac{1}{4}$  of the S.W.  $\frac{1}{4}$  in Sec. 18, T. 3 N., R. 2 W. She says further that red ochre dirt ~~was~~ taken from a well started 5 feet down and continued further than the bottom of the well, which is about 25 feet deep.

I merely send you this information in case you begin your exploration of adjoining properties.

Kindest regards,

John Eliot Allen  
Geologist

JEA:jr

February 26, 1942

Mrs. A. Rustad  
Route 2, Box 70  
Poulsbo, Washington  
*Poulsbo*

Dear Mrs. Rustad:

There is a possibility that the region in the S.W.  $\frac{1}{4}$  of Sec. 18, T. 3.N., R. 2 W., might contain deposits of iron. Therefore, I am sending this location, together with your name, to Mr. E. Y. Dougherty in charge of exploration for the United States Bureau of Mines, now located at Scappoose, Oregon.

If the deposits at Scappoose prove to be of economic value, areas around this region will be investigated and your property would come under this classification.

Very sincerely yours,

John Eliot Allen  
Geologist

JEA: jr

RECEIVED  
FEB 25 1942

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Paulsbo, Washington

February 23, 1942

Dear Mr. Allen;

This letter is in regard to the telephone call I made to you on 17<sup>th</sup> of this month asking information on your findings in the Survey of Scappoose territory - but owing to the fact that I did not have the description of the land you were unable to supply me with any information. I may add that the reason for this inquiry is that the land may be sold in the near future. So if there is any chance of the land having a mineral deposit, it would be nice to know.

Sometime ago a sample of the dirt ~~base~~ was taken, and had it tested, ~~and~~ <sup>it</sup> was found to be oxide of iron. The dirt is the color of red ochre, and was taken from the well on the property described. The 'color'

started about 5 feet down and the  
continued further than the bottom  
of the well - which is about 25 feet  
deep. How far it goes, I don't know -  
but I thought perhaps this might  
help you in your survey, if that  
was what you were looking for.

The description of the property  
is — NW  $\frac{1}{4}$  of the SW  $\frac{1}{4}$  and the  
W  $\frac{1}{2}$  of the SW  $\frac{1}{4}$  of the SW  $\frac{1}{4}$  in  
Section 18 Township 3 North,  
Range 2 West.

If you should have any informa-  
tion on this land - would appreciate  
it very much if you would let us  
know. Thank you very much.

Sincerely,

Mrs. A. Rustad  
Route 2, Box 70  
Poulsbo, Washington

Per - J. R.

February 16, 1942

Mr. E. Y. Dougherty  
c/o U. S. Bureau of Mines  
Scappoose, Oregon

Dear Mr. Dougherty:

I spoke with Don Saturday night concerning the location of and his notes upon the "other localities" or iron float and occurrences in the St. Helens quadrangle, and he told me that he would copy out his notes and exact localities and send them to you within the next few days.

I talked with Mr. Meade about the iron assays, and he said that they were only set up to do moisture, ignition loss, and iron in his laboratory. He would be glad to do these for you but it would take, in all probability, nearly a week to get the results back to you. If you wanted moisture alone, it probably could be done in considerably less time. Most of the work is done by students in their spare time or by Dick himself, so that it is hard to get out rush orders on these things.

We can do alumina, silica, and phosphorus at the Grants Pass laboratory. I may be mistaken on the last, which may have to go to Baker. Of course the time limitation for these would probably throw it out for your use unless some special arrangement were made with the assayer, R. G. Bassett. It might be possible that Bassett could run the irons as well, and I feel sure that the Department would be glad to cooperate with the Bureau of Mines to this extent.

I will write Mr. Bassett and outline the set-up to him and let you know as soon as I hear from him.

I am holding for you the Johnson report which was left on my desk. If you would like me to mail it out to you, I would be glad to do so.

Kindest regards,

John Eliot Allen  
Geologist

JEA: jr  
cc Don Wilkinson  
cc Mr. Meade

January 23, 1942

Mr. Hollis M. Dole  
210 West L Street  
Grants Pass, Oregon

Dear Mr. Dole:

The point of this letter is to ascertain if you would be available for a job with the U. S. Bureau of Mines in connection with the exploration of the iron ores within the Seaposse area northwest of Portland.

Mr. Dougherty, Engineer of the U. S. Bureau of Mines is in charge of the work and is making headquarters at this office. He is looking for a young engineer who can run a plane table and do a certain amount of surveying. Whether or not the work would affect your draft status, if any, I cannot say definitely, but suspect that it might. I understand that the job would pay somewhere of the order of \$150-175 per month, depending upon the experience of the man. It might last six months and work is starting immediately. Please advise me if you are interested in this matter.

Very truly yours,

Director

EKN:jb

January 26, 1942

Mr. E. Y. Dougherty  
Box 723  
Scappoose, Oregon

Dear Mr. Dougherty:

I am sending under separate cover, what appears to be the only copies in existence of the original large-scale topography on the St. Helens quadrangle. The Engineers say they destroyed all of theirs and these are the only ones we had left. I hope they will be of use to you in your work.

I am also sending a copy of the Bunker Hill report which Mr. Heppner brought in to this office, also a reported iron occurrence brought in for your files:  $N\frac{1}{2}$  of the  $SW\frac{1}{4}$  of Sec. 33, T. 3 N., R. 3 W., 80 acres. Owner, Mr. C. D. Malcom, 4721 N.E. 27th Street, Portland, Oregon, phone GARfield 7514. Mrs. Malcom is anxious that you visit her property as soon as possible. I drove across it myself last year, and there is considerable thickness of very iron rich soil.

Mr. Hollis E. Dole came in this morning with a letter Nixon wrote, telling him of a possibility of work with you. Mr. Dole has had very fine geologic training, and I think would be a very valuable man for you if you can use him.

Kindest regards.

Sincerely,

John Eliot Allen  
Geologist

JEA: jr

UNITED STATES  
DEPARTMENT OF THE INTERIOR

BUREAU OF MINES  
Scappoose, Oregon  
January 28, 1942

Mr. Earl K. Nixon, Director,  
State Dept. of Geology and Mineral Industries,  
702 Woodlark Building,  
Portland, Oregon.

Dear Mr. Nixon:

I am writing Dole airmail to report. If he does so promptly Paulsen could be at your office on February 3rd at the latest; probably February 1st.

We may be able to use Orr also although apparently surveying isn't his specialty.

Since you need Paulsen I will plan his return by not later than February 3rd. If Dole cannot come I may impose upon you further to help me locate a suitable man.

I did not know that you were anxious to have Paulsen come back to the office or I would have engaged Dole at once. Many thanks for Paulsen's services. My impression of him is highly favorable.

Sincerely

*E. Y. Dougherty*

E. Y. Dougherty  
Engineer in Charge  
Project 905

11

January 28, 1942

Mr. John A. Cooper  
Mining Engineer  
Atlanta, Idaho

Dear Mr. Cooper:

I am transmitting your letter, with enclosures, of January 26 to Mr. E. Y. Dougherty, engineer of the U. S. Bureau of Mines, who is in charge of an iron ore sampling program in the Scappoose District about twenty-five miles northwest of Portland, Oregon. It is just possible that Mr. Dougherty might have something in your line.

I do not at the moment know of an operating position that is open in the State, although they come up from time to time, and I shall be pleased to keep you in mind.

Yours very truly,

Director

EKN:ac

January 27, 1942

Mr. E. Y. Dougherty  
Box 723  
Scappoose, Oregon

Dear Mr. Dougherty:

I came across Mr. Dole as a possibility for your transit work quite by accident and wrote him to get in touch with you. The next I knew he came into the office as a result of my letter. I was obliged to leave for Salem and did not learn of the outcome of your negotiation with him. There seems to be impression in this office, however, that Dole went back to Grants Pass with the idea that you could not use him so long as you could retain Mr. Paulsen. I had already indicated to Mr. Dole that if he suited you or could do the work satisfactorily, I was anxious to have Paulsen come back to this office this coming Monday as we need him. Dole, probably in a spirit of modesty, may not have conveyed that to you.

Last night Mr. Orr, a mining engineer and chemist now associated with the Charlton Laboratories, came in and intimated a desire to secure additional outside work. He stated that he would accept a full-time job. I suggested that he apply to you, and perhaps he saw you today.

In any event, I am anxious to have Mr. Paulsen return to this office as soon as you can release him because we have much for him to do here. As a matter of fact, a bunch of hurry-up spectrographic work has come in since Friday which requires considerable work in the way of preparation of samples.

I am pleased to have you use Paulsen in getting started because he is familiar with the area, but I did not intend that he could stay any length of time beyond that required for you to get a satisfactory man. There seemed to be no one on the horizon at the moment. Now I suspect either Dole or Orr is available, and one of them might suit your needs. Would you kindly then plan to release Mr. Paulsen the first of next week, if possible, or not later than the middle of the week?

Sincerely yours,

EKN: jr

Director

December 17, 1941

Judge Ray Tarbell  
Star Route  
Houlton, Oregon

Dear Judge Tarbell:

As a result of the declaration of war a week or so ago, the Governing Board of this Department and the Director have adopted a policy of giving almost the entire attention of the Department, until further notice, to mineral raw materials classed as strategic and necessary in the present war emergency. These minerals are specifically chromite, manganese, quicksilver, etc.

Under the circumstances, although we shall publish the map of the St. Helens quadrangle soon, we have decided that it is necessary for us to defer the economic report on the Scappoose ores for the time being in deference to work on other minerals.

However, we have written Washington and have made a specific plea for drilling exploration by the U. S. Bureau of Mines on these Scappoose ores. What the result will be we cannot yet say.

Sincerely yours,

Director

EKN:ac  
cc Sentinel-Mist  
St. Helens

*Wm*

August 26, 1941

Honorable Ray Tarbell  
County Judge -- Columbia County  
St. Helens, Oregon

Dear Judge Tarbell:

You may or may not have followed the course of a bill in Congress which establishes an appropriation of \$350,000 for use by the U. S. Bureau of Mines in drilling and exploring iron ores in the western states. This bill was passed by both houses in very slightly different form and has been referred to conference for ironing out of very minor details. The bill itself was sponsored by California and Utah Congressmen primarily and, we suppose, with the expectation that the majority of the money appropriated would be spent on California ores and those around Provo in Utah. I have already taken up with our Congressmen the desire of trying to get some of this money ear-marked for the development of the Scappoose ores. That was in expectation and before the bill actually passed. I am now prepared to urge more strongly than before that we get a cut out of this appropriation.

A few months ago I started wheels turning on the question of a W.P.A. project to drill and thoroughly explore the Scappoose iron ores. I took the matter up with the U. S. Geological Survey to see that the idea would have their blessing, got it, then started negotiations with the O.P.M. because they, with their relation to the R.F.C., always have a finger in the pie. In discussing the matter with the Bonneville Administration they became interested and the question of whether they or this Department would sponsor the project came under discussion. Certain legal difficulties might possibly be encountered on the Bonneville side and that matter is now under investigation. In addition to the above, I have been trying to arrange for a personal visit by an internationally known steel metallurgist in the East with the idea that his group may become interested in a plant to beneficiate the Scappoose ores.

All or none of the above ideas may become fruitful. The wheels move slowly, but we want you to know that we are doing our best to create interest in the development of your iron ores. This cannot be done by telling wild stories or making representations which might be discredited later. The writer has already gone on record as stating that in his opinion there is sufficient ore indicated in the Scappoose district to justify a modest steel industry. How much more may be developed by exploration no one knows. With a good many years personal experience in the iron mining business I am reasonably familiar with the ways which seem best to deal with the situation, and I am giving the matter constant attention.

August 26, 1941

The work of the State Geological Survey--so far the areal geologic mapping by Dr. Wilkinson--has been very constructive. On the economic angle Mr. Allen, our staff geologist, and myself will be getting into the field shortly, making further investigations, and carrying out further sampling and detailed mapping.

I am sending copy of this letter to Mr. A. L. Morris as a result of his having made inquiry of Mr. Whalley Watson, secretary of the Oregon Mining Association. Watson kindly referred Mr. Morris' request to me.

Very cordially yours,

EKN:vm

Earl K. Nixon, Director

cc: Mr. A. L. Morris  
F. Whalley Watson

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF MINES

SOUTHWEST EXPERIMENT STATION  
Box 4097  
UNIVERSITY STATION

TUCSON, ARIZONA

January 6, 1942

RECEIVED  
JAN 9 1942

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Mr. Earl K. Nixon, Director,  
State Department of Geology and Mineral Industries,  
702 Woodlark Building,  
Portland, Oregon.

Dear Mr. Nixon:

Reference is made to your letter of January 2 to Mr. Jackson.

Mr. E. Y. Dougherty has been assigned as engineer in charge of the Scappoose project. S. H. Lorain will have general supervision of the job under my direction.

Mr. Dougherty expects to arrive at Portland early next week and will be glad to call on you on arrival.

Your kind offer of assistance is appreciated.

Yours very truly,



E. D. Gardner,  
Supervising Engineer.

cc - Mr. Jackson  
Mr. Lorain  
Mr. Dougherty



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF MINES

WASHINGTON      January 9, 1942.

Mr. Earl K. Nixon, Director,  
State Department of Geology  
and Mineral Industries,  
702 Woodlark Building,  
Portland, Oregon.

Dear Earl:

Replying to your letter of January 2, regarding the Bureau's intention of conducting exploration on iron lands in the Scappoose district:

Your kind offer of cooperation is much appreciated. Perhaps you could be of most assistance in furnishing any maps which you have prepared to our project engineer. We would, of course, be glad to have you recommend contractors in the State although as far as drilling is concerned we now have quite a large list of contractors who are experienced in our work. The first phase of the program, as I think I have already written you, comprises merely surface exploration and careful sampling which probably will be followed by sub-surface exploration in the form of drilling as may be indicated by the results of the surface work and as may be possible with funds available.

We have earmarked no definite amount for this project but, as in all of our exploratory projects, have merely allocated a sum to carry on for a certain length of time. Depending upon the results of the work as it progresses, additional sums that may be available are allotted as seems justified by results obtained.

As you infer, the Scappoose work comes under the general supervision of Mr. Gardner and will be carried on under the immediate supervision of Mr. E. Y. Dougherty.

With sincere personal regards.

Yours truly,

  
Chas. F. Jackson,  
Chief, Mining Division.

RECEIVED  
JAN 13 1942

STATE DEPT.  
& MINERAL

(7)  
IRON ORES OF COLUMBIA COUNTY, OREGON  
AVAILABLE FOR IRON REDUCTION PLANT ON LOWER COLUMBIA RIVER

U. S. Bureau of Mines Engineers are now investigating iron ore deposits in Columbia County, Oregon which borders the Columbia River, northwest of Portland. This investigation has not progressed far enough to obtain any exploration results. Until such results are available, estimates must be based on previous exploration.

These deposits consist of flat-lying beds of limonite in most cases overlain by basalt of varying thickness as shown on the accompanying table. Thin streaks of hematite occur usually near the basalt. Surface mining may be used for parts of the deposits, but probably the larger proportion of the ore would need to be mined by underground methods. Transportation of the ore to a river plant would be relatively simple.

According to reports available, six iron ore properties in Columbia County have had sufficient development work done so that tonnage estimates may be made. A tabulation of much of the information in these reports and the reported estimates is given at Exhibit A, and a list of the various reports and other sources of information is given as Exhibit B.

"Developed" ore on these six properties is estimated to total 1,653,000 long tons.

"Probable" and "possible" ore as yet undeveloped, according to various estimates, will range from 3,000,000 to 11,000,000 tons, the estimates averaging at close to 6,000,000 tons.

The reports are, with a few exceptions, conservative in their estimates, and are by reputable engineers. Those estimates used in the above summary may be broken down as follows:

The calculated "developed" and "possible" ore on the six properties is as follows:

	<u>Developed</u>	<u>Possible</u>
1. Ironcrest	413,000	2,000,000
2. Oregon Charcoal Iron Co.	500,000	2,000,000
3. Colport Development Co.	540,000	1,000,000
4. Bunker Hill (Anderson)	100,000	500,000
5. Ladysmith	50,000	
10. Yankton	50,000	250,000
	<hr/> 1,653,000	<hr/> 5,750,000

The grade of the ore averages between 50 and 53% dry iron; with phosphorous content varying from 0.4 to 0.85%.

In addition to these six properties, there are seven others where thicknesses of ore have been exposed by open cuts or tunnels, although insufficient work has been done for tonnage estimation; and there are six further localities where "shot" soil or limonite float indicates the possibility of underlying ore.

All these 19 iron properties, prospects and localities are enclosed within a rectangular area eleven miles long in a north-south direction, by seven miles wide east and west. Their location with respect to highways, roads and towns is given on map "C".

Certain new evidence, derived from a study of the general geology of the region, suggests that the iron ores, heretofore generally thought to be bog iron in origin, maybe due to secondary concentration with the possible result that ore in the major iron areas may be more extensive than previously thought.

#### COAL SUPPLY

Adequate coal supply for coal-dust firing at an iron reduction plant would be available at Centralia, Washington, and near Marshfield, Oregon. Centralia is 94 miles north of Portland on a through railroad. Marshfield is on Coos Bay, a navigable inlet of the Pacific Ocean about 200 miles south of the mouth of the Columbia River. Marshfield is therefore approximately 300 miles from Portland by water, Barging of coal from Marshfield to Portland would be entirely feasible and

Centralia Coal is of subbituminous grade, but is sometimes called "black lignite". Heating value is 9,000 to 10,000 B.t.u. per pound. The field contains large reserves. Present production is mainly by leasees who supply demand for domestic heating. A small amount is marketed in Portland.

Coos Bay coal is of subbituminous grade with a heating value of about 10,000 B.t.u. per pound. There is ~~no question here of lack of~~ <sup>a large reserve</sup> reserves. Present production is small and meets the local demand for domestic heating. However two commercial

Two other possible but undeveloped sources of coal are the Molalla field about 30 miles southeast of Portland and the Upper Nehalem field about 20-25 miles west of Scappoose. The coal in both these fields is of subbituminous grade with similar characteristics to those of Coos Bay.

#### SUMMARY

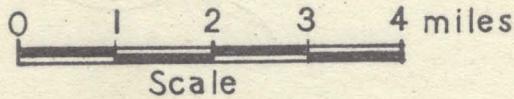
Reasons why it is believed by the State Department of Geology and Mineral Industries that the lower Columbia River is the logical place for an iron reduction plant for supply to steel foundry's are as follows:

1. Proved probable ore supply is adequate for reduction plant.
2. Location of ore supply near deep water and railroad is especially favorable as regards transporting ore to reduction plant.
3. Adequate coal supply for coal-dust firing is available either from Centralia, Washington, or Coos Bay, Oregon.
4. High grade, low phosphorous magnetite concentrates from black sand operations on the Oregon coast will be available for mixing with the limonite should this be desirable.

Previous Reports on COLUMBIA COUNTY IRON ORES  
in files of  
STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES  
1 9 4 1

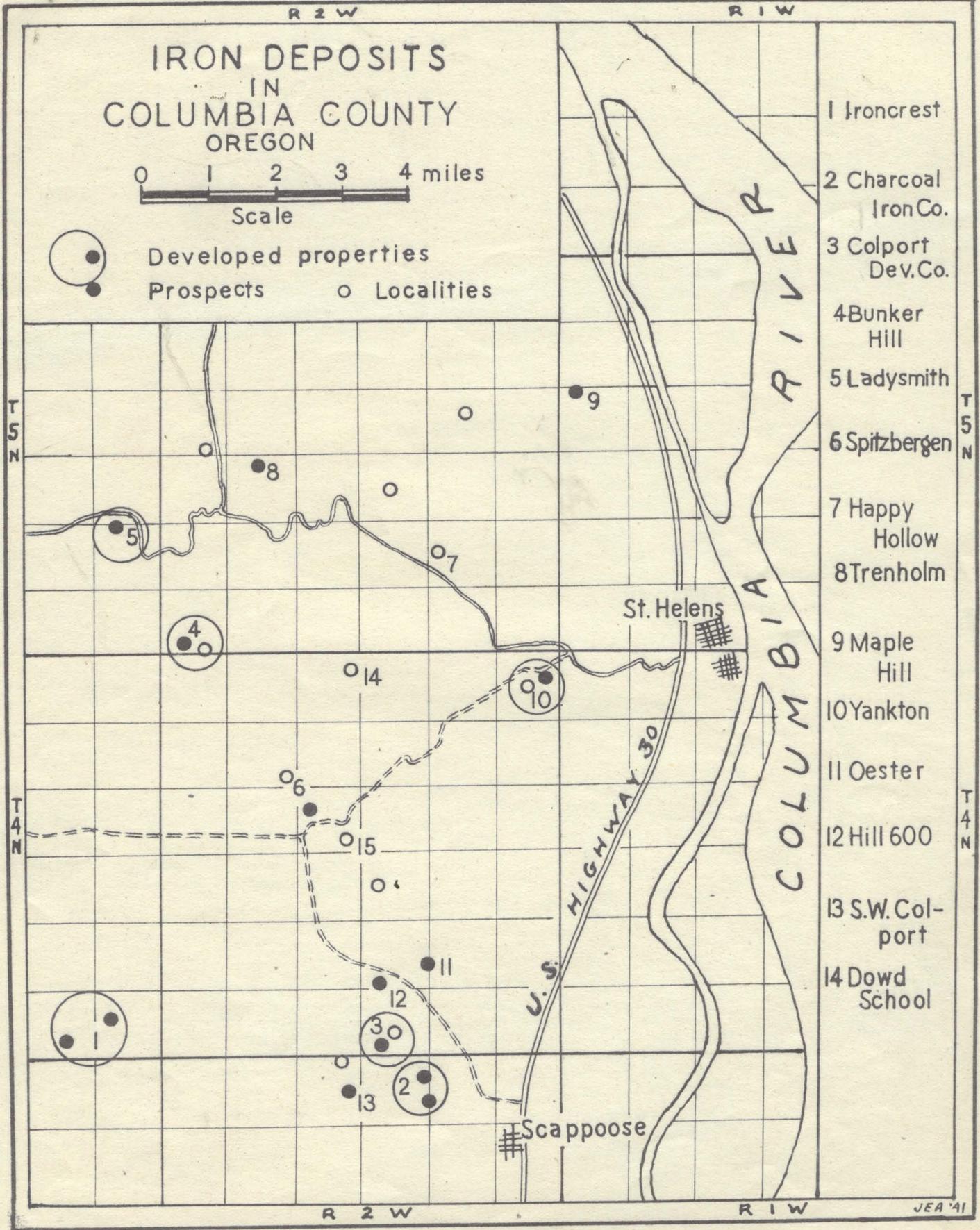
1. Woodbridge, Dwight E., "Report on Certain Iron Ore Properties in Columbia County, Oregon". 21 pp.; Dec. 27, 1922.
2. Woodbridge, Dwight E., "Letter from Duluth Ore Corporation to H. A. Heppner". 2pp.; Jan. 27, 1926.
3. Elmer, Wm. W. and Hogg, George C., "Report on the Iron Ore Deposit of the Colport Development Company, and the Possibilities of Manufacturing and Marketing a Product". 39 pp.; 5pl.; Feb. 1, 1922.
4. Miller, D. I., "Report of Iron Ore Property Owned by Charcoal Iron Company". 5 pp.; July 17, 1922.
5. Miller, D. I., "Final Report on Iron Ore Property owned by the Charcoal Iron Company". 1 p.; Aug. 28, 1922.
6. Conklin, B. M., "Synopsis of Report made by B. M. Conklin, mining engineer of Hibbing, Minnesota, on the Iron Ore Deposits of Columbia County, Oregon, to Ralph Budd, president of the Great Northern Railway Company". 4 pp.; May 26, 1922.
7. Scallon, Edward P., "Report on the Iron Crest Group of Claims". 11 pp.; 2 figs.; Jan. 26, 1920.
8. Parks, H. M., and Williams, Ira, "The Limonite Iron Ores of Columbia County". Mineral Resources of Oregon, Oregon Bureau of Mines and Geology, Vol. 3, No. 3; 44 pp.; map; 1923.
9. Crook, Dr. Walton J. (metallurgist, Stanford University). Report made in October, 1921, not available.
10. Pearson, John, "Report on Columbia County Iron Ore to H. A. Heppner". 2 pp.; Dec. 9, 1922.
11. Miller, Leo W., "Report to the Iron Ore Development Corporation". 1 p.; (tracings, blueprints, etc., not available); Nov. 10, 1925.
12. McKee, Arthur G., "Report to Oregon Charcoal Company". 3 pp.; Jan. 28, 1922.
13. Lynn, M. J., "Report to Oregon Charcoal Company". 3 pp.; July 20, 1922.
14. Heppner, H. A., "Summary of Reports made before March 1, 1922". 12 pp.; March 1, 1922.
15. Miller, Raymond M., "An Investigation of the Feasibility of a Steel Plant in the Lower Columbia River Area near Portland, Oregon". Oregon Department of Geology and Mineral Industries, Bulletin No. 8, pp. 29-33; 1940.
16. Allen, J. E., Reconnaissance Visit by Geologist of Oregon Department of Geology and Mineral Industries, Sept., 1941.

# IRON DEPOSITS IN COLUMBIA COUNTY OREGON



Developed properties  
 Prospects      Localities

- 1 Ironcrest
- 2 Charcoal Iron Co.
- 3 Colport Dev. Co.
- 4 Bunker Hill
- 5 Ladysmith
- 6 Spitzbergen
- 7 Happy Hollow
- 8 Trenholm
- 9 Maple Hill
- 10 Yankton
- 11 Oester
- 12 Hill 600
- 13 S.W. Colport
- 14 Dowd School



January 12, 1942

Senator Rufus C. Holman  
Washington, D. C.

Subject: Scappoose Iron Ores

Dear Senator Holman:

Thank you for your letter of January 6th to which you attached Dr. Sayers' letter.

We are keeping closely in touch with the Bureau of Mines on this iron development. Am just in receipt of a letter from Mr. E. D. Gardner, Supervising Engineer at the Tuscon Office, which carries the advice that a Mr. E. Y. Dougherty has been assigned as engineer in charge of the Scappoose deposit.

Dougherty, according to the letter, should arrive in Portland this week. We shall keep you further advised of developments and let you know if there is any way in which we think you could be of service.

Sincerely yours,

Director

EKN:ac

# United States Senate

COMMITTEE ON APPROPRIATIONS

January 6, 1942.

CARTER GLASS, VA., CHAIRMAN  
KENNETH MCKELLAR, TENN.  
CARL HAYDEN, ARIZ.  
ELMER THOMAS, OKLA.  
JAMES F. BYRNES, S. C.  
MILLARD E. TYDINGS, MD.  
RICHARD B. RUSSELL, GA.  
ALVA B. ADAMS, COLO.  
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JOHN H. OVERTON, LA.  
JOHN H. BANKHEAD, ALA.  
JOSEPH C. O'MAHONEY, WYO.  
HARRY S. TRUMAN, MO.  
THEODORE FRANCIS GREEN, R. I.  
FRANCIS MALONEY, CONN.  
DENNIS CHAVEZ, N. MEX.

GERALD P. NYE, N. DAK.  
STYLES BRIDGES, N. H.  
HENRY CABOT LODGE, JR., MASS.  
RUFUS C. HOLMAN, OREG.  
WALLACE H. WHITE, JR., MAINE  
CHAN GURNEY, S. DAK.  
C. WAYLAND BROOKS, ILL.

EVERARD H. SMITH, CLERK  
JOHN W. R. SMITH, ASST. CLERK

Mr. Earl K. Nixon, Director,  
State Department of Geology and  
Mineral Industries,  
702 Woodlark Building,  
Portland, Oregon.

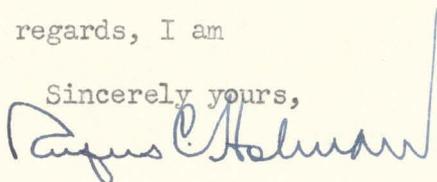
My dear Mr. Nixon:

With reference to your letter of December 13 concerning iron ore deposits in Columbia County, I am writing to transmit to you a report I have received from the Director of the Bureau of Mines in which he advises that an allotment has been made for the purpose of a preliminary program of surface trenching and sampling.

Please continue to keep me advised as progress is made on this project in the field.

With personal regards, I am

Sincerely yours,



RCH.PF

RECEIVED  
JAN 10 1942

STATE DEPT OF GEOLOGY  
& MINERAL INDS.



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF MINES

WASHINGTON

January 3, 1942.

OFFICE OF THE DIRECTOR

Hon. Rufus C. Holman,  
United States Senate.

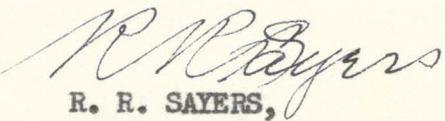
My dear Senator:

Replying to your letter of December 31, regarding the iron ore deposits in the Scappoose, Columbia County, region of Oregon:

On the basis of a preliminary study made by Mr. Johnson of the Bureau of Mines, an allotment has been made from the appropriation "Investigation of Raw Material Resources for Western Steel Production" for the purpose of a preliminary program of surface trenching and careful sampling. It is expected that this work will be undertaken just as soon as the property owners have signed agreements permitting the Bureau of Mines to do this work on their property.

It is anticipated that if results of this work are encouraging additional allotments for subsurface exploration, probably by drilling, would be warranted. It can not now be determined whether there will be sufficient balances left from this year's appropriations to undertake the additional work because a number of other Western iron ore deposits are under investigation and it obviously would not be wise to divert funds from an active drilling program where favorable results are being secured, in order to undertake a new project.

Cordially yours,



R. R. SAYERS,  
Director.

Dear Sir:

The exigencies of war time mean that we must devote the greater part of the efforts of the Department to the development of minerals which are of a strategic nature and will more or less directly benefit the war effort.

As result of this policy, we have decided that we must abandon, for the time being, the surveys being carried out in Columbia and Washington Counties of the iron resources. We will, however, within the next year, complete the work already done upon the geology of the St. Helens quadrangle and this map will be published.

We have collected and itemized a large amount of information concerning the various known iron localities. We have taken and had analyzed a number of samples from these localities, and we are better able, at the present time, to evaluate them and to assist anyone interested in them than we ever have been in the past.

It is with regret that this iron survey must be postponed but you, of course, realize that the further study of strategic minerals such as chromite, manganese, quicksilver, and antimony, and others must occupy most of our efforts.

Very sincerely yours,

*Scappone*

January 2, 1942

Mr. C. F. Jackson, Chief Engineer  
Mining Division  
U. S. Bureau of Mines  
Washington, D. C.

Dear Jack:

Mr. Muskat of the Solicitor's Office, Department of the Interior, who has been getting releases on iron lands in the Scappoose district, was in my office, and from him I learned that his work is practically wound up and that he will be leaving in a few days.

I know nothing whatever, of course, about any development plans that you may have in mind. The point of this note is merely to say that, assuming there will be contracts to let for dirt moving and perhaps drilling, we may be able to give you some help in this line because we know the contractors pretty well and the various drill outfits in the State. Possibly we could save your engineers some time by giving you any possible help in connection with getting your program started.

We would like to know, of course, off the record or otherwise, how much money has been ear marked for this investigation and any outline of plan you may have, but in any event, we are at your disposal in the matter of furnishing any possible assistance, and this offer is made without any intent on our part of trying to barge in and participate in any way. We are merely anxious that your development program get started as soon as possible and anxious to help.

If Mr. Gardner would care to write us about any matters pertaining to the development, we shall be pleased to cooperate, and merely assuming that the work might be in his charge because Johnson, who came here recently, is attached to the Tuscon office.

Kindest personal regards.

Sincerely yours,

Director

EKN: jr

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF MINES  
WASHINGTON

Mr. Earl K. Nixon, Director,  
State Department of Geology and  
Mineral Industries,  
702 Woodlark Building,  
Portland, Oregon.

December 30, 1941  
**RECEIVED**  
JAN 3 1941  
STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Dear Earl:

I am in receipt of your letter of December 22, with reference to your meeting with Mr. Muskat of the Solicitor's Office and inquiring as to the Bureau's policy regarding publicity:

It has been our policy to move in on exploration jobs with no publicity whatever if possible but with a minimum amount where it can not be avoided. On occasion when in the field I have granted interviews with the press, if with some reluctance, and in so doing have confined myself to statements as to the objective of the work we are doing.

In the present instance, a preliminary "zero level" program of exploration is all that is contemplated and further work will depend upon results of preliminary work. The objective is to ascertain for the information of defense agencies where, in what quantities, and of what grade needed ores or minerals are found and can be produced in this country.

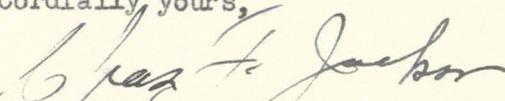
The Scappoose iron deposits are being investigated under authorization and special appropriation for the "Investigation of Raw Material Resources for Western Steel Production." The Scappoose deposits are among a considerable number of others which are being or will be investigated and since appropriations are limited, funds available will be allotted from time to time to work on those deposits which warrant further expenditures on the basis of initial disclosures. For your information, we are conducting a rather large drilling campaign in the Eagle Mountains, California, and are doing some preliminary work on deposits at Fort Apache, Arizona, and in southwestern Utah.

During the last year, we have established a Publicity Section in the Bureau of Mines which handles all our official press releases.

Your offer of cooperation is highly appreciated and our project engineer, Mr. Dougherty, will probably wish to avail himself of any information which you can give him.

With sincere good wishes for a Happy New Year.

Cordially yours,

  
Chas. F. Jackson,  
Chief, Mining Division.



December 22, 1941

Mr. C. F. Jackson, Chief Engineer  
Mining Division  
U. S. Bureau of Mines  
Washington, D. C.

Dear Jack:

I had the pleasure this morning of meeting Mr. Muskat of the Solicitor's Department who is obtaining releases on iron lands in the Scappoose District of Oregon. We are pleased, of course, to give him any assistance possible, and we shall be only too happy to cooperate in any way with you or others of the U. S. Bureau of Mines in any program of exploration of these iron lands.

Our State Geological Survey was carried out in this area this summer, and we are prepared to issue a geologic map of the St. Helens quadrangle in the next few weeks. Meantime your men can of course have full access to our maps, notes, and data.

We do not know the details of your policy on publicity but will be pleased to defer to your ideas in this regard. We have made no statement to the press about Mr. Muskat's presence here. At the proper time we suggest that you announce to the press whatever outline of your program you care to divulge because local interests and individuals are tremendously interested in the development of these lands. Our Department has given the limonite ores considerable attention and have held forth for the parties interested modest hopes of ultimate commercial production. We shall maintain a conservative policy in any publicity given out in any event and shall be guided in details by your wishes in the matter. Some publicity, however, is highly desirable, and we ask that you do not omit this angle.

With kindest regards and wishing you a Merry Christmas, I am,

Sincerely yours,

Director

EKN:ac

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF MINES

SOUTHWEST EXPERIMENT STATION  
Box 4097  
UNIVERSITY STATION

TUCSON, ARIZONA

December 8, 1941

RECEIVED  
DEC 11 1941

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Mr. Earl K. Nixon, Director,  
Oregon Department of Geology and Mineral Industries,  
702 Woodlark Building,  
Portland, Oregon.

Dear Mr. Nixon:

We are returning under separate cover by registered mail in two packages the maps and copies of reports relating to the Scappoose iron ore deposits you so kindly allowed me to borrow.

It is considerably more than the two or three weeks I told Mr. Allen we should need them, and I hope no inconvenience to you has resulted from the delay.

Thank you for the use of this material, and for the fine cooperation you and your staff gave me during my stay in Portland.

With kindest regards to yourself and the fellows in the office,  
I am,

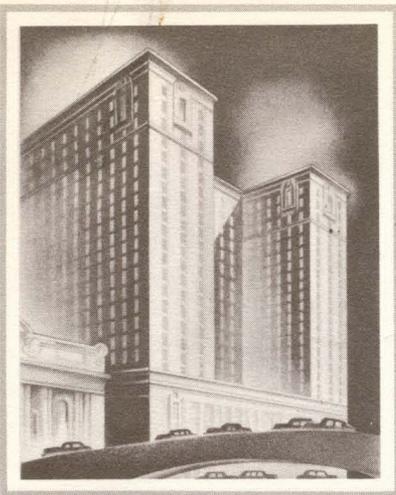
Yours very truly,

*Charles H. Johnson*  
Charles H. Johnson,  
Mining Engineer.

*Shows J.M.*

# THE COMMODORE

"NEW YORK'S BEST LOCATED HOTEL"



42ND STREET ★ RIGHT AT GRAND CENTRAL TERMINAL ★ NEW YORK CITY

Dear Earl -

Sunday -  
11/23 - 2pm

A few hurried lines prior to pulling out for Boston.

Turning over in my mind matters discussed Friday in Mr. Brant's office. Providing the cards are played properly, an iron & steel plant - can be a realization in Portland, area, especially so with Mr. B's identification in designing, construction and operation.

A 5/6 million plant requiring local capital of a million - is doubtful. Mr. B's suggestion of 1 1/2 to 2 million dollar plant, capacity of 200 tons of finished product, daily. Based on

Scappone info



# THE COMMODORE

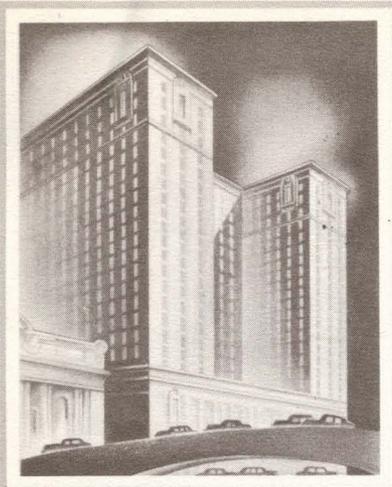
"NEW YORK'S BEST LOCATED HOTEL"

42ND STREET ★ RIGHT AT GRAND CENTRAL TERMINAL ★ NEW YORK CITY

using Scappoose ore and requiring  
150/200 thousands of local financing  
can be successfully accomplished.  
This would mean 90% O.P.M. or  
D.P.C. funds, 10% local.

The assurance given me  
at Portland, to the extent of the  
amount stated above would be forth-  
coming, providing a feasible process  
could be found, applying specifically  
to Scappoose ore.

As yet have not conveyed  
to my associates, Messrs. Griffith,  
Cabell, and Edwards, the party or  
parties preferably, making the offer.  
Preferred to make present trip



# THE COMMODORE

"NEW YORK'S BEST LOCATED HOTEL"

42ND STREET ★ RIGHT AT GRAND CENTRAL TERMINAL ★ NEW YORK CITY

Here in the East, before calling another board meeting, to have a complete picture to lay before them.

Will continue, while still here to contact parties on the foregoing subject. To be prepared, in the event some unforeseen break down should occur in negotiations on your present trip West, with Mr. Bassett. There shall be no comment to others, from me of your Portland trip. I assure you. Best wishes  
In haste  
J. H. Howard

November 14, 1941

Mr. Richard K. Meade  
Department of Mining Engineering  
Oregon State College  
Corvallis, Oregon

Dear Dick:

Thanks kindly for your letter of November 12th carrying  
assays of Scappoose ores.

I will check these with Paulsen and Allen as soon as I  
have time. Your technique sounds okay, and I have no  
suggestions at the present time.

Best wishes.

Cordially yours,

Director

EKN:ac

October 30, 1941

Mr. Richard K. Meade  
Department of Mining Engineering  
Oregon State College  
Corvallis, Oregon

Dear Dick:

Thanks for your letter of October 28th.

I am sure that I did not misunderstand you the other evening, and you may be certain that you did not give me the wrong impression. I discussed this briefly yesterday with George Gleeson and asked him to clear you up on it.

We would be very pleased to have you undertake to run irons, at least for the present, on a bunch of samples that we have already taken of the Scappoose ores and others that we shall take in the future. We will deliver these samples to you the next time a car goes to Corvallis. We have no equipment here for proper drying and preparation of pulp samples so we will be pleased to make an arrangement whereby you would do that work and also run the samples for iron. We would ask you, then, to prepare pulps in the amount of about a teacupful--not less--for each sample, then, when I have had a chance to talk over the needs of the job with John Allen, I will ask you to forward to Lerch Brothers, consulting chemists at Hibbing, Minnesota, certain pulps on which I will ask for composit analysis for phosphorus, silica, alumina, et cetera.

After you have got going, I will suggest that you also run samples for loss on ignition. In this connection I might suggest that you address an inquiry, if you do not already have full information, to Crowell and Murray, (consulting chemists for the Lake Superior iron ore association), Perry Paine Building, Cleveland, Ohio, for any questions you may have on techniques on the iron series of determinations.

Since some of our preliminary work will be the identification of types, we will enjoy receiving promptly the dry iron analysis of the various samples. I confess I have not yet got my eyes open to certain limonite types present in the Scappoose ores.

I understand then that you will undertake to dry carefully under a water bath arrangement the samples as you receive them, then crush, pulverize, and pulp each one and run each for iron.

You will keep a record of the cost, and we will reimburse you according to some arrangement to be worked out between you and me. We are quite pleased with your willingness to undertake this work because it would somewhat embarrass our laboratories to undertake these iron samples along with their other analytical duties. With best wishes, I am

Cordially yours,

cc: George Gleeson

OREGON STATE COLLEGE  
SCHOOL OF ENGINEERING AND INDUSTRIAL ARTS  
CORVALLIS, OREGON

DEPARTMENT OF  
MINING ENGINEERING

October 28, 1941

RECEIVED  
OCT 30 1941

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

IN REPLY PLEASE ADDRESS

FILE NO.

Mr. Earl K. Nixon  
State Department of Geology and Mineral Industries  
702 Woodlark Building  
Portland, Oregon

Dear Mr. Nixon:

Yesterday evening at the interesting meeting of the Oregon Section of the A.I.M.E., I mentioned that this department would be pleased to cooperate with you on the analysis of the iron properties which I understand the State Department is sampling. Because of the late hour and hurried greetings, I am not sure that I conveyed the correct impression regarding this cooperation.

First, our present equipment would permit us to prepare samples for analysis, that is, quartering, steam drying, and pulverizing. Second, we are prepared to run total iron, water, and insolubles. If the occasion demands, we can also set up for phosphorous determination.

Now, I personally cannot do the actual analysis work, mainly because I am extremely busy as it is, but I had thought that it might be more economical for you if this analysis work could be done on a cooperative basis in the form of a project using student labor.

You may feel that student work is too inaccurate for your requirements, but from a monetary standpoint, I believe their work could be brought within practical limits. I would personally supervise the work and choose only students who are both capable and conscientious.

My only desire in this undertaking is to try to make this department indispensable to the State of Oregon.

Respectfully yours,

*Richard K. Meade*

Richard K. Meade,  
Department of  
Mining Engineering

V

STATE GOVERNING BOARD

W. H. STRAYER, CHAIRMAN, BAKER  
ALBERT BURCH . . . . MEDFORD  
E. B. MACNAUGHTON . PORTLAND



STATE ASSAY LABORATORIES

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ASSAYER

2102 COURT ST., BAKER

HUGH K. LANCASTER

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JOHN ELIOT ALLEN  
GEOLOGIST

JAMES A. ADAMS  
METALLURGICAL CHEMIST

H. C. HARRISON  
SPECTROSCOPIST

STATE DEPARTMENT OF GEOLOGY AND  
MINERAL INDUSTRIES

702 WOODLARK BUILDING  
PORTLAND, OREGON

October 8, 1941

Mr. H. Cowes  
Multnomah Hotel  
Portland, Oregon

Dear Mr. Cowes:

I understood from Mr. Stewart that he and you expected to call at this office yesterday, but either you were unable to come or I slipped in some manner.

I would be glad to discuss with you and Mr. Stewart the contents of your letter of September 25 and other matters of mutual interest. Under the circumstances I shall delay answering your letter in detail until I find whether or not you will be able to drop in to this office for a chat during your stay here.

Sincerely yours,

Earl K. Nixon,  
Director

EKN:me

cc to Mr. Stewart

*WPA  
Sum*

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF MINES

WASHINGTON

September 25, 1941.

OFFICE OF THE DIRECTOR

Mr. Earl K. Nixon, Director,  
State Department of Geology and  
Mineral Industries,  
702 Woodlark Building,  
Portland, Oregon.

RECEIVED  
SEP 29 1941

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Dear Mr. Nixon:

Replying to your letter of September 15 transmitting a statement, summary, map and two bulletins regarding iron ore deposits of Columbia and Washington counties, Oregon:

These data are much appreciated and have been indexed as official records of the Strategic Minerals Investigations of the Bureau of Mines.

They will receive further consideration in connection with the investigations of iron ore of the Pacific Coast.

Very truly yours,

*R. R. Sayers*  
R. R. SAYERS,  
Director.

*(Red mark)*

September 15, 1941

Dr. R. P. Sayers, Director  
United States Bureau of Mines  
Washington, D. C.

Subject: Scappoose Iron Ores of Oregon.

Dear Doctor Sayers:

Thank you for your letter of September 9th in which you suggest that you furnish you information on the iron deposits of northwestern Oregon.

Some preliminary data in boiled-down form are attached hereto. This is in the nature of a summary of information.

Under-separate cover we are sending two bulletins: one, by the old Bureau of Mines and Geology of Oregon covering in some detail the deposits in question; the other, a report of this Department bearing on the feasibility of an iron and steel industry on the Columbia River and containing references to and estimates of three of the principal local deposits at pages 29 to 32.

These deposits, although not known to be large at one time--60 or 70 years ago--furnished the raw material for the first "iron industry" on the Pacific Coast, namely, old Oswego Charcoal Iron Plant located near Portland. This plant produced for a number of years.

Our point in earnestly soliciting your kindly consideration of these ores in any plan for exploration by the Bureau is because they are very accessible--virtually on deep water---and, in our opinion, would supply raw material to a modest iron and steel industry here on deep water.

With best wishes, I am

Sincerely yours,

EKN:vm  
encl.

Director

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF MINES  
WASHINGTON

September 9, 1941.

OFFICE OF THE DIRECTOR

Mr. Earl K. Nixon, Director,  
State Department of Geology and  
Mineral Industries,  
702 Woodlark Building,  
Portland, Oregon.

RECEIVED  
SEP 13 1941

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

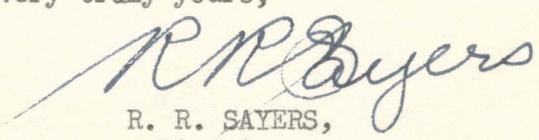
Dear Mr. Nixon:

Replying to your letter of August 28, regarding  
the Scappoose iron ores of northwestern Oregon:

The Bureau of Mines welcomes information from  
any source regarding iron ore deposits that might con-  
tribute to the ore supply of a steel plant in the west.

The Bureau would therefore be glad to receive  
more information in regard to the deposit to which you  
refer. For your possible use in reporting upon the  
deposit, a form is enclosed indicating certain facts  
which the Bureau desires to know in regard to the larger  
iron ore deposits of the western states.

Very truly yours,

  
R. R. SAYERS,  
Director.

Enclosure 2700264

Oregon State Department of Geology and Mineral Industries.

702 Woodlark Building  
Portland, Oregon

September 15, 1941.

Some 19 properties in Scappoose District. Iron.

Various groups.

Oregon Columbia and Washington.

By main highway out of Portland, Oregon, near Columbia River (just 30 minutes from Portland)

Supplied ores for the first Pacific Coast iron production. Considerable development; no recent shipments.

No shipments in past 50 years.

Various. Various. Flat.

Open cuts; short adits; many churn drill holes.

Present workings show beds of limonite, averaging around 5 to 8 feet in thickness, increasing to reported 20 or 30 feet locally.

Show average 50-53% Iron dry; high phosphorous; from many drill holes and channel samples.

Summary of reports as submitted herewith.

XXXXXXXXXXXXXXXXXXXX

Governor Sprague ✓  
cc: Senator McNary ✓  
Senator Holman ✓  
Hon. James W. Mott ✓  
Hon. Walter M. Pierce ✓  
Hon. Homer D. Angell ✓  
Mr. W. D. B. Dodson ✓  
Grants Pass Office ✓  
Baker Office ✓

August 28, 1941

Dr. R. R. Sayers, Director  
United States Bureau of Mines  
Washington, D. C.

AIR MAIL

Subject: Western Iron Drilling.

Dear Doctor Sayers:

It is my understanding that the recent Congressional appropriation of \$350,000 for exploration of western coking coals and iron ores is principally pegged for expenditure on three projects, namely, a coal project at Mt. Pleasant, Utah, an iron project at Bull Valley, Utah, and drilling of the Eagle Mountain deposit in California.

I wish herewith to state a most vigorous objection to your omission of the exploration of the Scappoose iron ores of northwestern Oregon from your program.

The basis of my request that you definitely peg the Oregon ores for attention is TIMING.

The Eagle Mountain deposit in California, located 160 miles inland from Los Angeles, will require the building of a 50-mile branch line railroad. If ear-marking of Federal funds for this investigation, which may lead to the development of the Eagle Mountain ores for possible use in the present emergency, is defensible then I am completely uninformed as to the facts in the matter.

Within a dozen miles of deep water on the Columbia River are deposits of medium grade iron ores sufficient to justify a modest steel industry. Anyone challenging the above statement must, in order to substantiate his opinion, have more facts than we do.

If the desire of the Federal agencies is to develop ores for use several years from now, expecting the emergency to continue and increase for some time, then the justification of the investigations mentioned in our first paragraph is there. Also, on the basis of cost we estimated (1940) the cost per long-ton unit of iron from the Eagle Mountain property to a tide-water plant near Portland to be 7.35 cents as against a somewhat lower cost for the nearby Oregon ores.

I would appreciate a statement of your position in the matter of ear-marking a sum of not less than \$75,000 for drilling and development of the Scappoose iron ores of northwestern Oregon. Thanking you, I am

Sincerely yours,

EKN:vm

Director

WPA  
2/2/41

October 8, 1941

Mr. H. Cowes  
Multnomah Hotel  
Portland, Oregon

Dear Mr. Cowes:

I understood from Mr. Stewart that he and you expected to call at this office yesterday, but either you were unable to come or I slipped in some manner.

I would be glad to discuss with you and Mr. Stewart the contents of your letter of September 25 and other matters of mutual interest. Under the circumstances I shall delay answering your letter in detail until I find whether or not you will be able to drop in to this office for a chat during your stay here.

Sincerely yours,

Earl K. Nixon,  
Director

EKN:me

cc to Mr. Stewart

September 5, 1941

Mr. D. Earle Stewart  
2528 N. E. 47th Avenue  
Portland, Oregon

Dear Mr. Stewart:

Attached hereto is assay of the iron sinter you brought in recently. The report came in this morning's mail. I have not as yet received the bill.

I had hoped that the iron would be a little higher and that the phosphorous would be a little lower. Evidently the process does not reduce the phosphorous content in the original ore.

Cordially yours,

EKN:vm  
encl.

Director

P.S. The original assay certificate is on file in our office.  
E.K.N.

# COPY

LERCH BROTHERS INCORPORATED  
The Iron Ore Chemists  
HIBBING MINNESOTA

Laboratory: Hibbing, Minnesota  
September 2, 1941

For: State Department of Geology  
and Mineral Industries  
702 Woodlark Building  
Portland, Oregon

(Stewart Sample)

Analysis (Dried at 100° C.)	Percent
Iron - - - - -	65.36
Phosphorus - - - - -	.684
Manganese - - - - -	.37
Silica - - - - -	6.85
Alumina - - - - -	3.18
Lime - - - - -	.59
Magnesia - - - - -	.48
Insoluble Iron - - - - -	.12



# HOTEL TERMINAL

60 MARKET ST. · SAN FRANCISCO · CALIFORNIA

 DRIVE IN GARAGE

July 31 - 1941

*Call Miller at Bancroft*

RECEIVED  
AUG 2 1941

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Earle N. Nixon  
State Geologist  
Portland Oregon.

Dear Mr Nixon,

Had letter from Mr DeNeffe my attorney in Washington D.C. and he advises me that R.L. Allen is back on the job in a much stronger position than when he resigned. He now stands next to Biggers, and over Hauck and Hackett.

Wish you would, if you consider it ethical to do so, write him in regard to our proposition a letter from you will carry weight with Allen. He is now handling our Proposal to The O.P.N. Has always been and is now very favorable to us, and will



## HOTEL TERMINAL

60 MARKET ST. · SAN FRANCISCO · CALIFORNIA

 DRIVE IN GARAGE

do all in his power to help us to establish these furnaces at Vancouver. He is open minded and feels about like you do about the ore situation. If there is at least two or three million tons in sight the expenditure is justified.

I know Allen will be glad to hear from you for he mentioned you many times to me while there,

altho I have only known him a few weeks I feel he is my friend and is quite fond of me.

yours truly

Charles Stewart

will be in Portland  
this week and thence  
to The National Capitol DCS

July 24, 1941

Mr. D. Earle Stewart  
2528 N. E. 47th Avenue  
Portland, Oregon

Dear Mr. Stewart:

The following is in reply to your letter of July 18th.

I have stated--and you may quote me on this--that I believe the Columbia County limonite ores may be classed as important deposits. I have been doing considerable sampling personally on some of these deposits in recent weeks and find that the grade is a little higher than I had suspected. I have been sending my samples up-to-date to Lerch Brothers, Incorporated, Hibbing, Minnesota, because they are in the habit of running the iron series regularly. Most of these western laboratories are not equipped or in the habit of running iron ores, so I prefer a laboratory that is doing it every day. My samples have been running between 51 and 56 percent iron "dry", and the phos runs from 0.5 to 0.9 percent. My samples so far have been vertical channel cuts of flat-lying ore beds, 5 to 8 feet thick; have not yet sampled in the Mt. Pisgah District where the ore is said to be considerably thicker at some points.

I have stated that, in my opinion, the actually "proved" ore in the district may be placed at  $1\frac{1}{2}$  to 2 million tons. This is based on old drilling and open cuts, but I feel that further exploration, carried out the way we do it in the Lake Superior region, will show a much greater ultimate tonnage in beds of minable thickness. I would not be at all surprised if the district ultimately produces ten million or fifteen million tons of ore that would average around 52 to 54 percent iron "dry" (44 to 48 percent iron natural) and around 0.6 to 0.8 percent in phos.

One point that particularly irks me is that the idea seems to be prevalent that a perfectly tremendous tonnage of iron ore must be present to justify additional steel capacity. In the present emergency a "few million tons" with additional tonnage in the "possible" class is all we need to justify a steel plant. If that is correct, then the Columbia County deposits, in my opinion, will qualify.

When you consider that these deposits, which are well adapted to orthodox Mesaba type slice-mining method, that at least 20% of the ore would be open-pit type, and that all of them are virtually within ten minutes ride from deep water with short-barge haul to the largest domestic supply of cheap electricity, I don't know what more you could ask for for justifying serious consideration of a modest steel industry.

July 24, 1941

If ores of high iron and low phos are desired to sweeten them, they are available. I examined some of the latter type in northern California two weeks ago, and there are others.

If we can help you at any time by supplying any information that we have, please call on us.

Cordially yours,

EKN:vm

Earl K. Nixon, Director

RECEIVED  
JUL 19 1941

D. EARLE STEWART, C.E.-E.M.

PORTLAND, OREGON

2528 NE 47th Ave.

July 18, 1941

IRON ORE  
LANDS

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Mr. Earl Nixon  
Department Geology and Mines  
State of Oregon  
Woodlark Building  
Portland, Oregon

Dear Mr. Nixon:

A few days ago I called in your office and discussed with you matters pertaining to iron ore in Columbia and Washington Counties in the State of Oregon.

As I told you at that time, I had discussed with Mr. Allen of the OPM matters pertaining to ore supplies and called his attention to a press dispatch where you had been quoted as to the feasibility of an iron industry on the Pacific Coast and had also made the statement that, in your opinion, there was a sufficient supply of ore of a quality to justify an electric smelting plant that would produce around 500 tons daily for from 20 to 40 years, that had been thoroughly explored and tested.

In the event you were not misquoted in this matter, it would be of great benefit to me to have a personal letter from you setting out your opinions and from what sources they came.

As you know, Dr. E. F. Burchard, of the USGS, Department of Interior, made a quick reconnaissance of this field last November and I have seen copies of his report and he verifies your statement to the press, only he puts it a little stronger. If you were to address a letter to the USGS, Department of Interior, Attention Dr. E. F. Burchard, he will gladly give you any information as to his findings while here.

I have had several interviews with Dr. Burchard in the past three months and while his report will not appear in the 1941 Year Book, he is perfectly willing that we, of Oregon, shall have the benefit of it, in any way connected with the Defense Programme.

Dr. Burchard holds you in very high regard and recognizes your ability as an iron ore expert, as does our mutual friend, Mr. Allen, late of the OPM. So I feel that such a letter as I have proposed will carry a great deal of weight with the OPM and also the Defense Plant Corporation, as they are both closely allied.

Yours truly,

*Earle Stewart*

*I understand Mr Allen will  
be called back to his post  
in the O.P.M.*

DES:BG

November 14, 1941

Mr. W. D. B. Dodson  
333 Senate Office Building  
Washington, D. C.

Dear Mr. Dodson:            Re: Scappoose Survey-U.S.B.M.

Your letters of October 29th, one referring to the Bureau of Mines' engineer visiting Scappoose, and the other referring to an expected visit by H. A. Brassert, arrived while I was away on a field trip.

As to the former, I wish to advise that Mr. Johnson, a U. S. Bureau of Mines engineer, attached to the Tucson, Arizona station, spent four or five days here the week before last examining the Scappoose deposits. We gave him full cooperation, which he seemed to appreciate very much, and accompanied him in the field throughout his stay, submitting maps, estimates, and geological data obtained for the most part as a result of our State geological survey work in the Scappoose area this summer. Before leaving we tried to impress Johnson with the angle that extremely large tonnage was an important factor here-- what we are looking for and what we believe exists is sufficient tonnage for a modest industry, and we are inclined to think that he went away satisfied on the tonnage angle.

I received a long distance call from H. A. Brassert yesterday indicating that he will be out here in about a week from now.

As you probably know, Mr. Heusner, interested with Franklin D. Griffith and Mr. Cabell of the Highway Commission in some of the Scappoose ores, has been on a trip to Washington and New York to see what can be done about a beneficiation or a steel plant. You may have seen Heusner. I think he has not returned here because he would have called on me. If anything develops on the steel plant angle, I shall immediately advise you.

Sincerely yours,

EKN:ac  
cc Portland C. of C.

Director

# PORTLAND CHAMBER OF COMMERCE

PORTLAND, OREGON,

824 S. W. FIFTH AVENUE

Washington, D. C., October 29, 1941

MEMBER  
OF  
CHAMBER OF COMMERCE  
OF THE  
UNITED STATES OF AMERICA

RECEIVED  
CABLE ADDRESS: PORTOREGON  
ATWATER 9411  
NOV 3 1941

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Mr. Earl K. Nixon, Director  
State Department of Geology and Mineral Industries  
Woodlark Building  
Portland, Oregon

Dear Earl:

In a recent letter you wrote here, you spoke that you expected a visit soon from H. A. Brassert, the steel engineer.

I am keenly interested in results of such a visit. If there are any developments, of an encouraging nature or in directions where I may aid at this end of the line, I would be very much concerned in learning as quickly as possible what has taken place.

The way developments for Iron and Steel on the Pacific Coast are going now, we have nothing tangible, as I see it from this end, except the Schnitzer plant. This is a good project, proposed entirely upon a scrap operating basis and merits the support of all of us. On the other hand, the 60,000 tons a year proposed production and based entirely upon scrap does not reach our major problem of producing from ores.

Enormous funds have been voted for Columbia Steel and Bethlehem for coast plant expansions and smaller funds for other concerns. In a movement of this character, it is clear that the companies that are operating and have the courage to go ahead are the ones which get aid for heavy expansion. Until we can get some strong movement in the Portland or Oregon area, it appears we cannot expect strong assistance from OPM.

I went into the whole situation many times with Henry J. Keiser's field man, Chad F. Calhoun, and for a period they were ready to go ahead on some reasonable basis. However, after this group asked for \$150,000,000 for a four-point program and this was reported adversely by OPM, the Keiser interests seem to have forgotten the steel proposal. Have you learned of any revival of their interest there. I was told confidentially that Republic Steel would be the practical operating concern through which Keiser proposed to proceed. You were close enough to that concern to know in all likelihood whether this report is accurate.

A real steel program would be of vast importance to our territory. I have been defeated so often in my various efforts, that I would appreciate a better steer.

Sincerely yours,

*Dod*

W. D. B. DODSON

September 19, 1941

Mr. W. D. B. Dodson  
333 Senate Office Building  
Washington, D. C.

Subject: Iron Ores.

Dear Dod:

Thank you for your letter of September 15th.

I should say that there really is urgent need for drilling of the iron deposits in the Scappoose area. As I have indicated to you during our conversations in Portland, the old reports on the Scappoose ores were mainly made by engineers from the Lake Superior region who were pretty badly spoiled by the tonnages and grades of ores with which they had worked for many years and the Oregon deposits didn't look very good to them. I can appreciate their feelings because I was one of them myself for many years. Under the circumstances, they were unwilling to place much credence in the local tonnages in the "probable" and "possible" classifications. They had some justification for that, too, because the origin of these ores has never been very well understood.

I think that our work this summer has got the answer on this origin, and it is somewhat more favorable so far as tonnage goes than the ideas of tonnage could have been, based on the former conceptions of origin. The matter is important enough to justify a short paragraph here.

We now have considerable information on the old erosion surface and pre-lava flow drainage. What actually happened was that some of those old drainage depressions were filled with lava and, due to differential hardness of the rocks, the pre-existing basins or valleys are now the basalt-filled ridges. The iron evidently was not of lagoon origin, as originally supposed, but is really a replacement of the lower part of the basalt flows and we have good evidence of it. Water channels for the transportation of iron in solution are present in the form of vesicles and other aquifers. Therefore, there is a perfectly good chance that in the middle of these ancient depressions, now the lava-capped ridges, there are somewhat enhanced thicknesses of the medium-grade iron ore which would not be apparent except by drilling in the middle of the ridges. I, therefore, give more credence than I did before to the reports of 20 or 30-foot thicknesses at some point away from the outcrop, that is to say, inside the hills.

So far the Bureau of Mines' engineer, who, we understood, was to check on the ores, has not arrived. If he has, he has not called on us. If he does, we would like to guide him around and present up-to-date information.

How far to the southeast these iron deposits may reasonably go, we cannot yet say. We can say, however, that, inasmuch as the origin of the iron is being leached from the basalt capping, it may continue in patches some distance to the southeast. That will have to be determined by further exploration.

Sincerely yours,

EKN:vm

Earl K. Nixon, Director

# PORTLAND CHAMBER OF COMMERCE

PORTLAND, OREGON,

MEMBER  
OF  
CHAMBER OF COMMERCE  
OF THE  
UNITED STATES OF AMERICA

824 S. W. FIFTH AVENUE

CABLE ADDRESS: PORTOREGON  
ATWATER 9411

September 15, 1941

Mr. Earl K. Nixon, Director  
Bureau of Geology and Mineral Industries  
702 Woodlark Building  
Portland, Oregon

RECEIVED  
SEP 19 1941  
STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Dear Earl:

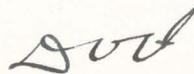
Thanks for your carbon of the 13th ins. written to Senator McNary on the subject of Scappoose iron ore deposits.

I am very glad to get this summary and tabulation. There has been a tremendous lot of discussion here on the available ore supply in that range of hills. I have argued, based upon Dwight Woodbridge's report of many years ago, that iron ore will be found anywhere from Salem to the Nehalem Valley, at a level of from 600 to 1,000 feet above the river. The seam of ore is not thick but it apparently has quite a variation in thickness at different places.

I have been working with Senator McNary on the matter of having some substantial funds made available for more thorough prospecting of these iron ores. As a matter of fact, we did not discover the appropriation made for iron ore and coal exploratory work until the thing was through. Then, they claimed the appropriation was for specific work in Utah and California. McNary says that we can get a share of that appropriation or insist on another. He asked me something of the worthwhile character of the exploratory work around Scappoose. I told him it was a place where there was the most urgent need for the work particularly drilling. Your figures furnished today will be of tremendous help. Many thanks for sending me a copy of this.

I have not heard further from Larsen nor Church on the zinc electrolytic reduction plant. I think we have put such pressure on Church that he is bound to go through on some program, either approving what we have urged or disapproving and giving reasons for the latter. Would appreciate your keeping me up to date on this since W.F. Draper is here anxiously waiting.

Sincerely yours,



W.D. B. Dodson



# PORTLAND CHAMBER OF COMMERCE

PORTLAND, OREGON,

MEMBER  
OF  
CHAMBER OF COMMERCE  
OF THE  
UNITED STATES OF AMERICA

824 S. W. FIFTH AVENUE

Washington, D C, Aug. 30th, 1941

CABLE ADDRESS: PORTOREGON  
ATWATER 9411

Mr EarlK Nixon, Director

State Dept. Geology and Mineral Industries,  
702 Woodlark Bland., Portland.

RECEIVED  
SEP 4 1941

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Dear Earl:

Have your carbon of 28th inst. re survey of Oregon iron.

I did not know about the item for coking coal and iron exploratory work until the bill had passed, and the Senator called my attention to it. Going into the record it was clear that the purpose presented to the appropriating agency was for Utah and California work. However, as you suggest in your letter to the Senator, if the essence of the effort is to secure accurate and more complete data on immediately available sources of iron in the Western territory, Scappoose and the Tuata-tin range of hills generally, offer the best opportunity.

After you took the matter up with the Senator, he asked me about the extent and verity of these ores. I gave him information, to the effect that there was a potential of some size, and enough proven work to warrant taking serious consideration. He is pressing to attain this. Hope we can win. Told him of Dwight Woodbridge's superficial exploratory work for the Weyerhauser interests many years ago, and his conclusion that there had been a very large deposit from 600 to 1,000 foot elevation; that erosion as usual had taken a good portion, and that nothing except careful exploratory work would prove the quantity yet available. Also mentioned the old Oswego operations, and surface operations, including the church drilling on the Milton Creek Development Co and the Cabell-Heusner holdings.

Aid him every way possible to get a share of this total fund.

Yours,

*Sud*

*A*

September 13, 1941.

Honorable Charles L. McNary  
United States Senator  
Washington, D. C.

AIR MAIL

Subject: Scappoose Iron Deposits.

Dear Senator McNary:

Please refer to Mr. Nixon's letter of September 11th on the above subject.

Enclosed you will find the summary of information on the probable extent of iron deposits in northwestern Oregon as Mr. Nixon promised to send you.

Respectfully yours,

Secretary to Mr. Nixon

encl.

cc: W. D. B. Dodson

September 11, 1941

Honorable Charles L. McNary  
United States Senator  
Washington, D. C.

Subject: Scappoose Iron Deposits.

Dear Senator McNary:

I appreciate very much indeed your telegram of September 10th in regard to your discussions with Senator Adams of Colorado on the appropriations for the possible drilling of iron deposits in Oregon.

I read your telegram at a meeting of our Governing Board today and indicated your recent action in the matter.

I am informed that the U. S. Bureau of Mines is prepared to send to Oregon promptly one of their engineers who will examine the deposits with us for the purpose of determining priorities of exploration of the various known iron deposits in the West.

Our geologist has prepared, as requested in your wire of September tenth, a summary of our information on the probable extent of iron deposits in northwestern Oregon, and these data are being placed in final form for transmission to you.

With kindest regards, I am

Sincerely yours,

EKN:vm

Director

cc: W. D. B. Dodson

CLASS OF SERVICE

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# WESTERN UNION

(24)

SYMBOLS

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- NT = Overnight Telegram
- LC = Deferred Cable
- NLT = Cable Night Letter
- Ship Radiogram

R. B. WHITE  
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CHAIRMAN OF THE BOARD

J. C. WILLEVER  
FIRST VICE-PRESIDENT

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CA150 188 GOVT 1/150=SN WASHINGTON DC 10 951A

941 SEP 10 AM 7 25

HON EARL K NIXON, DIRECTOR=

STATE DEPT OF GEOLOGY AND MINERAL INDUSTRIES

702 WOODLARK BLDG PORTLAND ORG=

THIS INFORMATION IS AN AFTERMATH OF CONTENTS OF MY WIRE OF SEPTEMBER 2ND TOUCHING THE APPROPRIATION FOR EXPLORATION OF COAL AND IRON DEPOSITS IN WESTERN STATES. UPON THE RETURN OF SENATOR ADAMS OF COLORADO WHO HAD CHARGE OF THE APPROPRIATION BILL IN THE SENATE I CONFERRED WITH HIM AND HE STATED THERE WAS NO LIMITATION UPON THE APPROPRIATION OF \$350,000 FOR THIS WORK. WHILE THE HOUSE HEARINGS ATTEMPTED TO LIMIT THIS SURVEY TO PROJECTS IN TWO STATES, THIS LIMITATION WAS EXPRESSLY DENOUNCED BY THE APPROPRIATIONS COMMITTEE OF THE SENATE. TODAY IN A CONFERENCE WITH DR. SAYERS OF THE BUREAU OF MINES HE STATED THAT THIS PROVISION HAS BEEN REMOVED BY SENATOR ADAMS AND THAT SURVEYS WOULD BE MADE IN OTHER STATES WHERE DATA WAS AVAILABLE THAT THERE WERE PROSPECTS OF COAL AND IRON DEPOSITS. I SUGGEST THAT YOU ADVISE ME OF THE PROBABLE EXTENT OF THE IRON ORE DEPOSITS IN=

END SHEET 1.

2 \$350,000.

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RECEIVED AT

PORTLAND, ORE., 403 S.W. BROADWAY  
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1941 SEP 3 AM 11 55

HON EARL K NIXON=

DIRECTOR STATE DEPT OF GEOLOGY AND MINERAL INDUSTRIES 702

WOODLARK BLDG=

LETTER RECEIVED I STATED TO DR SAYERS THAT THE LANGUAGE OF THE  
ACT WOULD PERMIT AN UNRESTRICTED USE BY THE BUREAU OF MINES  
OF FUNDS RECENTLY APPROPRIATED FOR EXPLORATION OF COAL AND  
IRON IN WESTERN STATES. HOWEVER IN THE HOUSE HEARINGS TWO  
PROJECTS IN UTAH AND ONE IN CALIFORNIA WERE EXPRESSLY CHOSEN FOR  
THE APPROPRIATION. I AM EXPECTING SENATOR ADAMS OF COLORADO  
WHO HAD THE BILL IN THE SENATE AND HELD THE HEARINGS TO RETURN  
IN A FEW DAYS AND I SHALL DISCUSS THE MATTER WITH HIM CONCERNING  
THE LIMITATION AND EXPENDITURE OF THE MONEY THANKS FOR YOUR  
LETTER. KINDEST REGARDS=

CHAS L MCNARY USS.

RECEIVED  
SEP 3 1941

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

5

August 28, 1941

Honorable Charles L. McNary  
United States Senator  
Washington, D. C.

AIR MAIL

Dear Senator McNary:

I very much appreciate your wire covering your discussion with Dr. Sayers, director of the United States Bureau of Mines, in regard to their use of \$350,000 recently appropriated to them for exploration of coal and iron in the western states.

My copy, which presumably is a copy of the bill in question at page 42 and 43, paragraph 36, states in effect that the money is for exploration "of iron ores and limestone and coking coals essential to expanding steel production in states in which such deposits may exist.....".

There is nothing in the part of the bill sent me that would indicate that by law the \$350,000 is pegged for expenditure on the three projects in question, although it is my understanding that the bill was sponsored primarily by California and Utah interests. I might say in this connection that the Mt. Pleasant, Utah, coal investigation and the Bull Valley, Utah, investigation in my opinion would primarily favor the U. S. Steel Corporation because their big plant, which serves the West Coast, is at Provo, Utah. If this is true, I don't see why the U. S. Steel should not spend its own money rather than that of the government to explore the deposits in question.

The Eagle Mountain iron ore in California is located about 160 miles inland from Los Angeles, and it is my understanding that this deposit is owned by the Southern Pacific. In any event, "exploitation of this deposit requires construction of a 50-mile branch rail line over an easy route from the mine southward to the Southern Pacific, or over an equal distance to the Atchison, Topeka and Santa Fe to the north. Transportation cost for the approximately 200-mile rail haul, should be about \$1.90 per ton to San Pedro docks provided sufficient tonnage were moved to justify such a rate. Year-round operation is possible."

The above quotation is from page 35 of our report, Bulletin No. 8, "The Feasibility of a Steel Plant in the Lower Columbia River Area". The author of this is Raymond M. Miller, now metallurgist with the Bonneville Power Administration.

My point in quoting the above is to indicate how perfectly absurd it would be to contemplate the drilling and exploration of an iron deposit 160 miles inland from Los Angeles where a 50-mile branch line railroad will have to be built if timing means anything in present emergency. It seems to me that the action of the Bureau of Mines in planning to drill the Eagle Mountain deposit and let remain idle a deposit on deep water such as we have in Oregon (although it is of modest size) is

August 28, 1941

quite indefensible. If you press the matter with Director Sayers and any other powers-that-be, I feel that your argument based on timing would leave no come-back. Your position should be strongly taken. Sayers' position would be that the Scappoose ores aren't large enough. As a matter of fact, they are large enough to supply a modest industry, and he has no legitimate facts on which to base a statement to the contrary.

If you will follow this up, I feel that you have a very legitimate base on which to demand a substantial part of the \$350,000 fund for exploration. May I suggest that you ask for at least \$75,000--preferably \$100,000-- be ear-marked for drilling and development of the Scappoose ores.

For your information, I have invited Mr. H. A. Brassert (builder of the Herman Goering steel plant in Germany and others and doubtless the outstanding steel metallurgist in the world) to visit Portland and look into the steel plant situation soon. Brassert has promised to arrive here September 7th or 8th. Something may come out of this conference which will give you some added ammunition. I shall, of course, convey it to you promptly. I shall send you copies of any communications I direct to the director of the U. S. Bureau of Mines, Dr. Sayers, pertaining to the ear-marking of some of these funds for drilling in Oregon. I feel rather strongly about this situation and expect to do all I can to alter the plan of the Bureau of Mines.

Let me thank you again for your very fine work on all these matters. Please depend on me to give any possible help I can at any time you care to ask.

With kindest regards, I am

Sincerely yours,

EKN:vm

Earl K. Nixon, Director

cc: Governor Sprague

STATE DEPARTMENT OF GEOLOGY AND  
MINERAL INDUSTRIES

~~329 S W OAK STREET~~  
PORTLAND, OREGON  
702 WOODLARK BUILDING

August 28, 1941

Honorable Charles L. McNary  
United States Senator  
Washington, D. C.

AIR MAIL

Dear Senator McNary:

I very much appreciate your wire covering your discussion with Dr. Sayers, director of the United States Bureau of Mines, in regard to their use of \$350,000 recently appropriated to them for exploration of coal and iron in the western states.

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My point in quoting the above is to indicate how perfectly absurd it would be to contemplate the drilling and exploration of an iron deposit 160 miles inland from Los Angeles where a 50-mile branch line railroad will have to be built if timing means anything in present emergency. It seems to me that the action of the Bureau of Mines in planning to drill the Eagle Mountain deposit and let remain idle a deposit on deep water such as we have in Oregon (although it is of modest size) is

quite indefensible. If you press the matter with Director Sayers and any other powers-that-be, I feel that your argument based on timing would leave no come-back. Your position should be strongly taken. Sayers' position would be that the Scappoose ores aren't large enough. As a matter of fact, they are large enough to supply a modest industry, and he has no legitimate facts on which to base a statement to the contrary.

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For your information, I have invited Mr. H. A. Brassert (builder of the Herman Goering steel plant in Germany and others and doubtless the outstanding steel metallurgist in the world) to visit Portland and look into the steel plant situation soon. Brassert has promised to arrive here September 7th ~~and~~ <sup>or</sup> 8th. Something may come out of this conference which will give you some added ammunition. I shall, of course, convey it to you promptly. I shall send you copies of any communications I direct to the director of the U. S. Bureau of Mines, Dr. Sayers, pertaining to the ear-marking of some of these funds for drilling in Oregon. I feel rather strongly about this situation and expect to do all I can to alter the plan of the Bureau of Mines.

Let me thank you again for your very fine work on all these matters. Please depend on me to give any possible help I can at any time you care to ask.

With kindest regards, I am

Sincerely yours,

Earl K. Nixon, Director

EKN:vm

cc Governor Sprague

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RB65 120 DL GOVT=SU WASHINGTON DC 447PM 28=

1941 AUG 28 PM 3 22

HON EARL K NIXON DIRECTOR, STATE DEPT OF GEOLOGY

AND MINERAL INDUSTRIES=

702 WOODLARK BLDG=

LETTER RECEIVED AND HAVE DISCUSSED THE SITUATION WITH DR SAYERS DIRECTOR BUREAU OF MINES. HE STATES THAT AN APPROPRIATION OF \$350,000 WAS DECLARED IN RECENT APPROPRIATION BILL TO COVER COAL INVESTIGATION AT MTPLEASANT, UTAH, AND IRON INVESTIGATIONS AT BULLVALLEY UTAH, AND EAGLEMOUNTAIN CALIFORNIA. I LOOKED AT THE HOUSE HEARINGS AND IT APPEARS THAT THIS MONEY WAS ASKED FOR ~~\$750,000~~. THE EXPLORATION OF THESE THREE PROJECTS. I URGED THE DIRECTOR TO MAKE DRILLINGS FOR IRON ORES IN COLUMBIA COUNTY OREGON, AND HE MAY HAVE SOME FUNDS FOR THAT PURPOSE. IF MORE IS NEEDED, I WILL ASK THE ADDITIONAL APPROPRIATION AS I BELIEVE AN EXPLORATION SHOULD BE HAD OF THE IRON DEPOSITS IN THIS PORTION OF OREGON REGARDS=

CHARLES P MCNARY USS.

RECEIVED  
AUG 28 1941

STATE DEP'T OF GEOLOGY  
& MINERAL INDS.

\$350,000 \$350,000.

n

cc: Senator Holman  
Representative Angell  
" Pierce  
" Mott.

August 16, 1941

Honorable Charles L. McNary  
United States Senator  
Washington, D. C.

AIR MAIL

Dear Senator McNary:

I was most pleased indeed to receive your wire Friday advising me that the Senate had passed the bill covering appropriation for drilling of iron ores in the West by the U. S. Bureau of Mines.

I shall prepare for submission to the Bureau, as you suggested, some memoranda outlining reasons, which are sound in my opinion, why the Bureau should give attention to the Columbia County, Oregon, deposits if they receive the funds in question.

For your information, I had a discussion in this office day before yesterday with Dr. D. F. Hewett, administrative geologist and right-hand man of Dr. Mendenhall, director of the United States Geological Survey. Hewett works very closely with Charles F. Jackson of the Bureau of Mines in whose hands the Bureau's exploration problems fall. (Jackson is an old and personal friend of mine.) Hewett told me that the Bureau would probably be asked to drill the Ship Mountain iron deposit in California. My point in relating this is that I have considerable knowledge of the Ship Mountain deposit. It is 270 miles inland and is located in the desert. Development of this deposit and the placing of it in production will doubtless take two or three years, possibly more.

If time means anything to the government in connection with this emergency, we have the best possible argument for giving attention to these Columbia County ores, all of which are located within 30 minutes of deep water transportation. The difficulty is convincing anyone that the ores have importance. You have my word that they do richly deserve exploration and my opinion that they should supply ore for a modest steel industry in the light of present information. Further necessary drilling may show substantial tonnage. Again thanking you, I am

Sincerely yours,

Director

P.S. I will send you copy of data submitted to the Bureau of Mines.  
E.K.N.

R A D I O G R A M

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EARL K NIXON DIR STATE DEPT OF GEOLOGY AND MINERAL INDUSTRIES=  
702 WOODLARK BLDG=

YESTERDAY THE SENATE PASSED A BILL MAKING SUPPLEMENTAL  
 APPROPRIATIONS FOR NATIONAL DEFENSE WHICH CONTAINED THE  
 FOLLOWING PROVISION "INVESTIGATION OF RAW MATERIAL RESOURCES FOR  
 WESTERN STEEL PRODUCTION BY THE BUREAU OF MINES \$350,000. THE  
 BILL NOW GOES TO CONFERENCE. I SHALL BE GLAD TO URGE THE BUREAU  
 TO EXPLORE AND STUDY DEPOSITS IN THE COLUMBIA COUNTY AS  
 SUGGESTED IN YOUR LETTER. IT WOULD BE HELPFUL IF YOU WOULD  
 WRITE TO THE BUREAU. KINDEST REGARDS=

CHARLES L MCNARY USS

\$350,000

TO SEND A MESSAGE TELEPHONE ATWATER 6484 OR ANY POSTAL TELEGRAPH OFFICE.  
FOR MESSENGER TELEPHONE POSTAL TELEGRAPH OR RING POSTAL CALL BOX.

July 23, 1941

Senator Charles L. McNary

Salem, Oregon

Dear Senator McNary:

We learn from the July 10th issue of the magazine "Iron Age" that a bill has been appropriated in the Senate which would set up an appropriation of \$350,000 for use by the U. S. Bureau of Mines-----"The \$350,000 appropriation in the Senate-approved bill provides: 'For all expenses to enable the Bureau of Mines to investigate by sub-surface exploration, the amount and quality of certain iron ores, limestone and coking coals essential to expanding steel production in the States of California, Colorado, Utah, Wyoming and all other states in which such deposits exist.'"

We haven't any further information on this bill, but from the above it appears that it must have been sponsored by Congressmen from states other than Oregon. Although the statement reads "and all other states in which such deposits exist," which would include Oregon, it seems plain that the authors of the measure had California, Colorado, Utah, and Wyoming particularly in mind.

The lower Columbia River area is in need at the present time particularly of additional electric steel capacity. This Department has been giving special attention to the limonite ores of Columbia County. At the present time, we have our Oregon Geological Survey working near Scappoose. In addition we have been negotiating with the Bonneville Administration on the subject of one of us, or both jointly, sponsoring a certified W. P. A. project for the drilling and exploration of these ores. However, if through your efforts the U. S. Bureau of Mines could be induced to carry out the exploration under the appropriation covered by the bill mentioned above, that might suit us better than anything else. Would there not be a way of ear-marking, say, \$75,000 for exploration of these deposits under the bill?

The Columbia County iron ores may be classified as important deposits. From the standpoint of tonnage and grade they would, in my opinion, supply a modest steel industry for the lower Columbia. The failure of private interests to secure Federal loans to develop such an industry has been caused by lack of exploratory information to prove that sufficient ore is present.

Is there anything you could do to guarantee for Oregon a share of any money that is appropriated for the exploration of western iron deposits?

Count on us for any possible assistance in furnishing data. We all realize thoroughly and sincerely appreciate the many ways in which you are aiding this State.

Thanking you, I am,

Respectfully yours,

Director

EKN:ac  
cc Washington, D.C.

"The \$350,000 appropriation in the Senate-approved bill provides:

"For all expenses to enable the Bureau of Mines to investigate by sub-surface exploration, the amount and quality of certain iron ores, limestone and coking coals essential to expanding steel production in the States of California, Colorado, Utah, Wyoming and all other states in which such deposits exist."

P. 109, THE IRON AGE, July 10, 1941.

H. A. Heppner  
Synopsis of Report Made by B. M. Conklin,  
Mining Engineer of Hibbing, Minnesota, on the Iron Ore  
Deposits of Columbia County, Oregon, to Ralph Budd, Pres-  
ident of the Great Northern Railway Company - Report  
Dated May 26, 1922.

-----  
CONCLUSIONS

1,000,000 tons of iron ore has already been uncovered and farther explora-  
tion will undoubtedly show up more, how much is impossible to determine  
at this time.

-----  
The cost of producing this ore, mining, transporting and delivering same  
to Portland, Oregon, will be about \$3.00 per ton.

-----  
No market exists on the Pacific Coast for any considerable amount of ore  
at this time.

The use of Charcoal made from Douglas Fir is impractical.

-----  
Construction of plant for fir charcoal and blast furnace will cost anywhere  
from \$600,000.00 to \$700,000.00.

-----  
Use of coke now being made by the Pacific Coast Steel Company in their  
cupalos and open hearth furnaces in preference to charcoal made from fir.

-----  
It is doubtful whether these deposits can be worked profitably as long as  
the southern pig iron can be made available for foundries on the west coast  
at prices which are below those which can be made for locally manufactured  
pig iron.

-----  
It is possible to compete with southern pig iron if the electric direct  
smelting process is developed commercially as there is a tremendous water  
power available in the vicinity of Portland.

If pig iron can be produced locally at less cost than the Southern pig iron can be purchased there is ample market to absorb the production of a plant of from 100 to 200 tons capacity.

- - - - -

Mr. B. M. Conklin examined this field in April, 1922, at request of Mr. Ralph Budd, and did not find exposed the tremendous ore deposits that was reported to him to exist in this field. He found four properties upon which some development work has been done, namely -

Iron Crest	with about	500,000 tons
Colport	" "	300,000 "
Bunker Hill	" "	150,000 "
Ladysmith	" "	50,000 "
Total amount of ore uncovered		<u>1,000,000</u> "

All of this ore seems to be about the same grade 50% dried iron and 35 to 40% natural.

The Dwight E. Woodbridge's report is incorporated into Mr. Conklin's report and Mr. Conklin agrees with Mr. Woodbridge that ore is of lateritic origin, limonitic in character, carrying excessive aluminum. Believes that systematic ~~limonitic in character~~ method of exploration will disclose considerable more tonnage.

Residual deposits follows higher elevations where erosion has not been complete enough to penetrate basaltic mangle. Little or no stripping seems to be necessary to reach this ore, and due to the peculiar situation of these ore deposits small mobile equipment can be used for mining it. Southern coke costs \$22.00 per ton delivered at San Francisco, therefore, pig iron can not be made for \$20.00 in Portland.

Pig iron cannot be produced today on the Pacific Coast using local ores, fluxes and fuel and compete with the Birmingham, Alabama District, which is now selling pig iron there for \$17.00 per ton.

Chinese pig iron sold on Pacific Coast for \$23.00 per ton. Pacific Coast Steel Company believes that it has a monopoly of the iron and steel industry on the Pacific Coast and intends to continue to control situation, and to let fee owners carry the burden.

Mr. Martin's plans are at standstill, and may not mature at all. He is not making as much progress with his charcoal furnace enterprise as he expected, and is making a canvass for more funds to carry his work on, and at least \$500,000.00 more is needed to install a furnace of 100 ton capacity.

- - - - -

Mr. D. E. McLaughlin's examinations in Europe and in the United States leads him to conclude that charcoal from fir wood of the west coast is much too fragile and that indifferent melting results are obtained from its use. Electric furnaces are used successfully in Sweden and at Biroult, California, and the same can be done at Portland.

The pig iron produced by this process is better than that produced from charcoal and commands better prices, but before such enterprise can be profitably installed much more iron ore tonnage must be developed.

Note - No cognizance has been taken by any mining engineer so far of the coking coal believed to exist in the Nehalem Valley of the West or opposite slope of the same range on which this iron ore is found. They speak of Birmingham coke which may later be replaced by coke from the coal fields of Vancouver Island and Alaska because very little is actually known about the Nehalem Valley coal deposits at this time.

There was incorporated also in Mr. Conklin's report a synopsis of Dr. Welton J. Crook's report of examination by him in the fall of 1921 for the Pacific Coast Steel Company, and from which the following extracts are taken -

"Ironcrest" Field

- 1 - The ore is a soft limonite with small amount of hard ore mixed in.
- 2 - The tonnage in sight in the "Ironcrest" field is minimum 113,000 tons, maximum 250,000 tons.

- 3 - Three miles of railroad to build.
- 4 - Expenditure of \$5000.00 to \$10000.00 needed to explore property completely by systematic drilling.

"Bunker Hill Field"

- 1 - Ore same as at Ironcrest.
- 2 - Minimum tonnage 440,000 tons, maximum 50,000 tons.
- 3 - Three miles of railroad to build.
- 4 - Apparently ~~maxth~~ not worth exploring further as entire body is probably now uncovered
- 5 - Property deceptive, preliminary seems to show too much ore.

"Ladysmith"

- 1 - Ore same
- 2 - Ore body appears to be too small to have any commercial value
- 3 - Five miles of railroad needed. It is unfortunately situated.
- 4 - No value as source of iron ore.

*Wash County  
Iron*

May 6, 1944

Mr. John W. Leitzel  
2038 SW Third Street  
Portland, 1, Oregon

Dear Mr. Leitzel:

This Department wishes to put down three or four shallow auger holes on your property, the Schmidt farm, now rented to Mr. Cathey. These holes would be only about 3 inches in diameter, and probably not over 25 or 30 feet deep. They would be for the purpose of prospecting the iron ore, which outcrops on the farm. The holes would be filled in after they were drilled and no damage to the land would result. We would appreciate it if you would write us a letter giving us permission to put down these auger holes.

Very truly yours,

F. W. Libbey  
Acting Director

FWL:ff

May 4 - 1944.

Dear Sir;

Am sending you  
John Sitzel's address  
as you requested.

J. W. Seitzel,

2038 S. W. 3<sup>rd</sup> St.,

Portland - Oregon.

Sincerely

Columbus Schmidt

Hillsboro Ore.

Rec. no. 1.

Cathy

Memo prepared for  
E.K.N. on  
Washington County  
Iron Ore

April 21, 1944

MEMORANDUM

Flat-lying ~~high~~ bauxitic iron ore occurs in northern Washington County within 25 or 30 miles of the center of Portland and the Alcoa aluminum reduction plant. This material may be lateritic in ~~Oregon~~ <sup>Oregon</sup> and may be widespread. Very incomplete information indicates large tonnage with the possibility that it may be estimated in millions of tons. There is a probability that surface mining methods will be applicable. Preliminary sampling at two deposits indicates an average as follows:

Iron	25 %
Alumina	32
Silica	14
Phosphorus	.128
Titanium	2.17

This average is from four samples, one of which apparently was near the top of the ore and contained considerable clay. This sample assayed as follows:

Iron	14 %
Alumina	23
Silica	38
Phosphorus	.098
Titanium	1.93

This sample raised the silica average. The average silica for the other three samples was only 6 percent.

We have learned of experiments conducted by a Dr. Pedersen in 1927 to treat similar material using an electric furnace. He used the following raw materials:

280,500 kg. iron ore	and required:
94,600 kg. coke	7,800 kg. electrodes, and
188,200 kg. bauxite	823,300 kw.-hr.
181,800 kg. limestone	

He obtained:

" 203,500 kg. pig iron  
254,900 kg. aluminate slag from which with 81.5 percent extraction he got 90,750 kg. of alumina. His iron ore and bauxite were low in silica so it was not necessary to reduce the silica to get an easily soluble calcium aluminate slag. Our work covers the siliceous and ferruginous bauxites, in which case we must reduce the silica to produce a 30 percent ferrosilicon and in so doing we also reduce some alumina and titania to make a more valuable ferro-alloy."

The U. S. Bureau of Mines is now conducting experiments along the same general lines in treating high iron siliceous bauxites of Arkansas. It is believed that in both processes two final products may be obtained depending on the amount of silica in the raw materials. I believe the Bureau of Mines method produces ferro-silicon (because of high silica products) and alumina, while Dr. Pedersen using low silica materials produced pig iron and alumina. The alumina is produced from the calcium aluminate slag by means of leaching with sodium carbonate solution containing a small amount of sodium hydrate. Carbon dioxide is used to precipitate aluminum hydrate and sodium carbonate with some sodium hydrate is regenerated and recirculated. The aluminum hydrate is calcined to produce anhydrous alumina.

There is a market for both pig iron and alumina within trucking distance of the deposits. There would be a peacetime demand for pig iron by many iron and steel foundries in Oregon and Washington.

Washington County  
Aerial Photos



STATE DEPARTMENT OF GEOLOGY  
AND MINERAL INDUSTRIES

702 WOODLARK BUILDING  
PORTLAND 5, OREGON

October 18, 1944

Other photos  
returned 10/18/44  
to Mr Lawrence Bix  
628 Pittock Bldg

Aerial Photographs Retained

Gales Cr. quad.

<u>No. of photo</u>	
40 - 3423	4189
3426	6014
3429	6017
3432	6020
3435	
3438	
3441	
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3872	
3875	
3878	
3881	
3901	
3916	
3919	
4174	
4177	
4180	
4183	
4186	

St. Helens quad.

<u>No. of photo</u>	
40 - 3274	
3111	
2958	

Hillsboro quad.

<u>No. of photo</u>	
40 - 2758	3124
2761	3125
2830	3126
2833	3127
2932	3130
2933	3131
2934	3132
2935	3133
2936	3134
2937	3135
2938	3136
2941	3139
2947	3254
2970	3257
2976	3260
2979	3261
2982	3262
2983	3263
2984	3266
2985	3281
2986	3284
2987	3285
2988	3286
2991	3287
3083	3290
3086	3293
3089	3296
3092	3297
3095	3298
3098	3299
3101	
3118	
3119	
3120	
3121	
3122	
3123	

# Aerial Photos Wanted Retained

Gales Cr. quad.    St. Helens quad.    Hillsboro quad

No. of photo	40-3274	40-2758	40-3284
40-3423			3285 ✓
3426	-3111	2761	3287 ✓
3429	2958	2830	3290
3432		2833	3293
3435		2932	3296 ✓
3438		2935	3299 ✓
3441		2938	<del>5670</del>
3469		2941	<del>5683</del>
3472		2947	
3475		2970	
3478		2976	
3481		2979	
3484		2982	
3637		2985	
3640		2986	
3646		2988	
3649		2991	
3676		3083	
3679		3086	
3682		3089	
3694		3092	
3869		3095	
3872		3098	
3875		3101	
3878		3118	
3881		3121	
3901		3124	
3918		3127	
4174		3130	
4177		3133	
4180		3136	
4183		3139	
4186		3254	
4189		3257	
6014		3260	
6017		3263	
6020		3266	
<del>6288</del>		3281	
<del>6291</del>			
<del>6276</del>			

*Washington County  
Iron*

November 22, 1944

Mr. E. E. Guerber  
Route 1, Box 124  
Hillsboro, Oregon

Dear Mr. Guerber:

Your letter dated November 20 addressed to our Department, Salem, has been received.

Under separate cover I am sending you complimentary copy of our G.M.I. Short Paper No. 12 which describes results of our investigations on deposits of high-iron bauxite in Washington County. You will note on page 17 results of our work on the Schmidt farm, which is in the general area you mention in your letter. We were not able to do sufficient drilling to outline tonnage definitely, but the quality of material on this farm was very good compared to other areas sampled.

If this Department can supply any further information, please feel free to call upon us.

Yours very truly,

F. W. Libbey  
Director

FWL: jr

R. 1, Box 124, Hillsboro, Ore.

Nov. 20, 1944

Oregon State Mineralogy Dep't

Salem, Ore.

Dear sirs:

Recently the Oregon State Mineralogy Dep't made a survey in the vicinity of Sec. 3 and 4, 1N, 2W, and Sec. 33 and 34, 2N, 2W in Washington County.

Because of the fact that a certain company is trying to obtain options or leases for mineral rights in these sections, I am wondering if the information of the results of that survey is obtainable to property owners in this vicinity. My farm is in Sec. 4, 1N, 2W.

Thanking you for any informati~~o~~n, I am

Very truly yours,

*E. E. Guerber*

E. E. Guerber

RECEIVED  
NOV 22 1944  
STATE GEOLOGY  
& MINERAL INDS.

# COPY

LERCH BROTHERS INCORPORATED  
The Iron Ore Chemists  
General Offices  
HIBBING, MINNESOTA

Analyses of Iron Ore for: State Dept. of Geology and Mineral Industries.

<u>Lab No.</u>	<u>Mine No.</u>	<u>Remarks</u>	<u>Iron</u>	<u>Phos.</u>	<u>Mang.</u>	<u>Alum.</u>
53411	17-A		46.74	.846		
12	17-B		36.69	.740		18.19
13	17-C	About 8' inside portal of short tunnel.	51.03	.775		
14	17-D	Channel cut 6'6"	54.03	.956		
15	17-G	Cut beside trail 6'4"	52.97	.952		
16	17-G	Horseshoe cut	54.76	.986		
17	17-H	Lower 2'	55.08	1.028		3.33
18	17-I	6'3"	54.51	1.017		4.04
19	17-J	Lower Grade	56.70	.847		2.24
20	17-F	Horseshoe cut lower 21'	55.24	.845	.55	2.91
21	17-E	Horseshoe grab sample 2'			8.84	

Laboratory: Hibbing

Date: June 28, 1941

Analyzed by: LERCH BROTHERS, INC.

C  
O  
P  
Y

Washington County, Iron Ore.

No.	Fe%	Mn.%	SiO2%	Al2O3%	Ca%	Mg%	P%	S%
1	51.22	3.21	8.5	14.68	0.00*	0.34	0.1370	0.055
2	48.12	2.85	4.85	11.72	0.00*	0.48	0.0970	0.092
3	55.96	3.19	3.67	10.33	0.00*	0.75	0.0920	0.082
4	44.13	2.13	2.71	8.23	0.00*	0.61	0.0000	0.002
5	55.41	1.14	2.90	6.12	0.00*	0.71	0.0006	0.001
6	56.87	2.31	3.70	4.26	0.00*	0.61	0.0010	0.006
7	48.62	1.80	1.98	4.12	0.00*	0.27	0.0060	0.007
8	41.72	3.13	2.61	2.75	0.00*	0.38	0.0005	0.050
9	12.29	4.46	4.71	10.12	0.00*	0.82	0.0060	0.560
10	39.95	3.61	2.11	3.33	0.00*	0.92	0.0003	0.410
	454.29	27.83	37.74	75.66	0.00	5.89	0.3404	1.265

Columbia County

1	52.37	0.28	3.40	1.80	0.00*	0.540	0.2441	0.055
2	55.61	0.19	4.30	1.70	0.00*	0.040	0.3993	0.040
3	52.70	0.25	5.10	2.13	0.00*	0.001	0.1228	0.030
4	52.37	3.00	3.70	3.10	0.00*	0.004	0.7024	0.003
5	49.34	2.01	2.92	2.61	0.00*	0.054	0.6583	0.023
6	49.23	0.10	8.30	5.12	0.00*	0.055	0.1247	0.006
7	46.98	0.32	5.41	2.90	0.00*	0.007	0.4141	0.008
8	51.91	0.36	4.70	3.60	0.00*	0.006	0.5072	0.007
9	50.2	1.63	2.66	2.51	0.00*	0.057	0.4462	0.052
10	51.64	2.01	3.77	1.05	0.00*	0.034	0.5163	0.056
11	50.97	1.55	2.21	1.60	0.00*	0.047	0.1212	0.076
12	43.8	0.61	4.20	1.41	0.00*	0.054	0.0055	0.003
	607.12	12.31	50.67	29.23	0.00	0.899	4.2621	0.359

*Scaffowse  
Jm*

Average Analyses of Iron Ores

Washington County

Total of 10 analyses

	<u>Iron</u>	<u>Mn</u>	<u>SiO2</u>	<u>Al2O3</u>	<u>Mg</u>	<u>P</u>	<u>S</u>
Total (10)	454.29	27.83	37.74	75.66	5.89	.3404	1.265
Less #9	12.29	4.46	4.71	10.12	.82	.0060	.560
TOTAL of 9 sam.	442.00	23.37	33.03	65.54	5.07	.3344	.705
Av. of 9 samp.	49.11	2.60	3.67	7.28	.56	.0372	.078

Apparently Sample #10 is out of line since the total of the given analyses of that sample is 50.3303 percent as against a total of the average of 63.3352 percent. The iron in #10 might be 49.95 instead of 39.95.

I am therefore eliminating sample #10 also. Then we have.

	<u>Iron</u>	<u>Mn</u>	<u>SiO2</u>	<u>Al2O3</u>	<u>Mg</u>	<u>P</u>	<u>S</u>
9 Samples	442.00	23.37	33.03	65.54	5.07	.3344	.705
Less #10	39.95	3.61	2.11	3.33	.92	.0003	.410
Total 1-8	402.05	19.76	30.92	62.21	4.15	.3341	.295
Ave. 1-8	50.26	2.47	3.87	7.78	.52	.042	.037

Mineral Composition of Ore

50.26	Fe	71.80	Fe2O3
2.47	Mn	3.91	MnO2
3.87	SiO2	3.87	SiO2
7.78	Al2O3	7.78	Al2O3
0.52	Mg	.85	MgO
0.042	P	.10	P2O5
.037	S	.037	S
23.368	O	0.000	O
88.347		88.347	

Igni-			
tion	11.653	11.653	Ignition Loss, etc.
	100.000	100.000	

Average analyses of Columbia County Ores.

Total of 12 samples.

	<u>Fe</u>	<u>Mn</u>	<u>SiO2</u>	<u>Al2O3</u>	<u>Mg</u>	<u>P</u>	<u>S</u>
	607.12	12.31	50.67	29.23	.899	4.2621	.359
Average	50.59	1.026	4.22	2.44	.075	.3552	.03

Mineral Composition of Ore.

50.59	Fe	72.27	Fe2O3
1.026	Mn	1.623	MnO2
4.220	SiO2	4.22	SiO2
2.440	Al2O3	2.44	Al2O3
.075	Mg	.125	MgO
.355	P	0.813	P2O5
.030	S	.03	S
<hr/>		<hr/>	
58.736	%	81.521	%
22.782	Oxygen	0.00	Oxygen
18.48	Ignition	18.48	Ignition loss (?)
100.000	%	100.000	%

There is seen a difference of 18.48 percent, but calculating the iron as fully hydrated to limonite the water of hydration would be 11.77 percent. This leaves a shortage of 6.71 percent.

This shortage can be

- (1) a solid not determined (insolable?)
- (2) moisture not fully evaporated at the beginning
- (3) hydration of manganese and magnesium
- (4) carbonates " " "

However, we will assume that the ore when sintered would be 81.52 percent of the moisture-free ore and that no phosphorus or sulphur is driven off in the sintering process.

Also, in the same manner the Washington County ore would sinter to 88.35 percent.

Each sinter would then have the following composition:

.8835 Washington Co.		.8152 Columbia	
Fe	56.89		62.60
Fe2O3	81.27		88.65
MnO2	4.42		2.00
SiO2	4.38		5.18
Al2O3	8.81		3.00
MgO	.96		.154
P2O5 (P)	.0475	(P)	.434 1.00
S	.042		.036
	<u>99.996</u>		<u>100.020</u>

The maximum allowance of manganese in #2 Foundry pig iron is 1.5 percent and the minimum is 1.0 percent. For phosphorus it is 0.25 and 0.0, for sulphur 0.05 and 0.0, silicon 3.75 and 1.50, carbon 4.00 and 3.50.

The percentage of each element in pig becomes

	Max.	Min.
Fe	90.5	94.0
Mn	1.50	1.00
Si	3.75	1.50
P	.25	0.0
S	.05	0.0
C	4.00	3.50

#### Washington County

$$\frac{.905}{.5689} = 1.591 \quad \text{and} \quad \frac{.94}{.5689} = 1.6523 \text{ units of ore per unit of pig.}$$

#### Columbia County

$$\frac{.905}{.626} = 1.446 \quad \text{and} \quad \frac{.94}{.626} = 1.500 \text{ units of ore to units of pig.}$$

The phosphorus would be in Washington County ore after allowing for some losses of iron in the slag.

$$1.600 \times .0475 = .076 \quad \text{and} \quad .079 \text{ percent}$$

and in Columbia county

$$1.45 \times .434 = .63 \quad \text{and} \quad 1.51 \times .434 = .655 \text{ percent}$$

If we take 3 units of Washington County sintered ore and one unit of Columbia County ore we will have a pig iron with phosphorus as follows:

Pig iron with maximum impurities

Washington County	3 x .076	=	.228
Columbia County	1 x		<u>.63</u>
	4 units		.858
	1 units		.215 percent Phos.

Pig iron with minimum impurities

Wash. County	3 x .079		.237
Columbia County	1 x .655		<u>.655</u>
	4 units		.892
	1 unit		.223 percent P.

We are in each case below the maximum allowance of phosphorus in the pig iron (25%)

RECEIVED  
DEC 18 1941

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

SUBJECT: Iron Ores of Columbia Co. Ore.

Summary of material contained in old files and letters.

1/5/20

Development work by Finley and Heppner Bros.

Loc: 12-15 miles southwest of Scappose  
Kind: 3 or 4 tunnels and 15 open cuts on hillside within  
60 feet of top of hill exposed flat lying deposit  
of limonite.

Samples: By Bureau of Mines and Geology  
24 average over 50% iron  
High phosphorus content but no detrimental sulphur  
Ore occurs over 2 or 3 townships

6/6/21

Iron ore bounded by T 6 N on North  
R 5 W on West  
T 3 N on South  
Columbia River on East

9/28/21

Samples from property some mile and a half north of Scappose.

<u>Samp. No.</u>	<u>% Fe</u>
1	52.53
2	51.50
3	50.99
4	50.47

Smith Emery Co. analysis of 24 iron samples: 11/3/19  
Ave. 53.48 - Low - 48.96% High - 58.80%

F. Von Eschen, Prof. Chem., Willamette Univ. to Mr. C. Hayden

Claim lies 4 mi. due west of Salem in the Eola Hills, Polk Co.

3/23/18 - Fe 38%  
4/9/18 - Fe 42%

5/3/20

Giltner operation - 1 mi. NW of Columbia City  
4 open cuts - east slope of hill 40' below top.

*Scappose Iron  
File*

Cut #1 - 4 1/2 ft. - 29.06 Fe  
 2 - 4 1/2 " - 34.40 "  
 3 - 7 " - 36.08 "  
 4 - 9 1/2 " - 31.14

Lerch Bros. Lab., Duluth Minn. 10/31/19 to H. A. Heppner

Samp. No.	Fe	P	Si	Mn	Al	Ca	Mg	S	Ig
	57.65	.412	3.80	.44	2.20	.06	.08	.012	10
Finley Construction Co. 1200 ft along S. side of Sec. 35 T. 4 N R 3 W 10/18									
Open cut #8 Bottom Dirt Sides	53.2 28.8	.40						.09	
Open cut #7 Sides	35.5								
Hard ore in bottom	63.8	.41						.06	
Cut Holes #6 5-5-5-2-1	46.1 32.4 47.7 52.6	.34 .39 .41						.11 .11 .08	
Montana Assay Office 10-11/18									
Tunnel #1 #2 Prospect Dirt Tunnel #3	54.8 56.6 46-52 56.8								
Bogardus Testing Lab. Seattle, Wash. 6/19									
Mixed dirt & hard ore near surface									
#1	54.6	.417	2.2	No.		Tr.		.008	15.00
#2	52.6	.333	3.4	No		Tr.		.011	15.2
#3	55.2	.40	2.4	No		Tr.		.019	15.1
Charcoal Iron Co. Columbia Co. Iron 9-23-21									
Sample No.									% Fe
1 M - 5 ft on side of cut of old tunnel									52.53
2 M - 4'-2" Lower half of wide cut									51.50
3 M - 4'-8" Upper half of " "									50.99
4 M - 7'-3" in North cut									50.47

STATE DEPARTMENT OF GEOLOGY AND  
MINERAL INDUSTRIES

~~122 S W OAK STREET~~  
PORTLAND, OREGON  
702 WOODLARK BUILDING

MEMORANDUM TO: EARL K. NIXON  
Wessley Paulsen (notes)

June 17, 1941

El. -- 530' at Spar Tree (Page 4)

El. -- 750' at Cut  
Shot soil encountered at 650' El.  
Cut to Tree N. 71 E.

Cut -- Description: 4' x 4' hole -- about 5' deep.  
It is not certain whether or not the ore at this point is in place. Color deepens toward bottom of pit to wine red. Top of bed has massive limonite.

Samples -- At Cut #1. 17-A -- Red banded ore -- 5'2" x 2" channel.  
17-B -- 7" bottom of channel -- yellow ocher and limonite apparently with high  $Al_2O_3$  -- segregated from sample above will probably run 35% Fe. Below this sample is a grey to red ferruginous clay.

(Page 5)

Location and Ownership: Cut #1. Cut about 1000' S. 70 W. from Spar Tree used in recent logging. Well up on north slope. Owner -- Mr. Heusner (?). Sections 2 and 3.

Section of orebody at Cut #1: (from top down)

3" yellow ocher and limonite included in and forming top of section.  
9" hard, black, brittle limonite mixed with softer distinctly limonite ore  
3' typical soft red limonite  
1' yellow limonite and ocher softer and more clayey

Note: Above 5' are included in one sample -- 7" forming sample 17-B is adjacent to sample above.

Photos taken on iron sampling trip June 17, 1941.

(Page 6)

#1 -- Cut #1  
#2 -- Tunnel  
#3 -- Cut #2 (as designated on map)  
#4 -- "  
#5 -- "  
#6 -- "  
#7 -- "  
#8 -- "  
#9 -- At long cut near tunnel  
#10 -- " " " " "

Earl K. Nixon  
Wessley Paulsen

COPY

June 17, 1941  
Iron Ore.

Sample 17-C - Cut #2

Location: North of Spar Tree, El. 552'

Section Sampled: From top of drift to bottom of ore

Description: A yellow limonite layer 6"-8" or over - quite clayey and lies at bottom of ore band immediately on top of red clay which is member underlying ore bed.

The top of the channel is ore which may go a few inches into the roof but no considerable distance judging by beds at portal. One could easily get a full section here.

\*\*\*\*\*

Sample 17-D - Cut #3

Location: 100' above road, 1000' west of Spar Tree. El. 520' (to be corrected)

Sample cut 6'6" long, 2" x 1" - total width of ore body

(Location corrected - 1200' NE of Spar Tree - north side of Gulch)

Description: Top half of sample is reddish limonite with a streak of hard ore at the top, bottom half yellow ocher with limonite bands.

(Note:) Sample 17-D is in two bags tied together.  
Estimate - 6'5" of 55% Fe (E.K.N.)

\*\*\*\*\*

Horseshoe Cut -

Location: (see map) El. 430' - 2:20 P.M.

Sample 17-E - Manganese grab sample

Sample 17-F - Lower 2' of clayey limonite contains some chunks of hard ore in yellowish matrix.

Sample 17-G - Top 4½' - Normal type ore. Section is disturbed. Bottom limit of ore uncertain.

Cut badly sluffed on account of recent rains - since workmen faced it up. It would require a couple of men with a wheelbarrow to get a satisfactory ore section at back of face. (mucking)

\*\*\*\*\*

Earl K. Nixon  
Wessley Paulsen

June 17, 1941  
Iron Ore.

# COPY

Cut No. 2 -- (designated on map).  
El. 500' (3:00 P.M.)

(Page 9)

Location: Large cut beside trail.

Sample 17-G -- 6'6" -- contains hard streak at top. Contains considerable hard ore at bottom. Quite homogeneous top to bottom. Bottom of bed uneven -- sample in thickest place. Shale overlies ore.

Sample 17-H -- 2'2" -- apparently lower grade than sample above, of which it is a continuation. More sandy, evidently lower grade ore, or may not be within ore bed. Red clayey bottom lies next below.

General description: Face shows minor faulting with mud seams at breaks, also general slumping.

-----

Cut near Tunnel -- El. 510' (4:20 P.M.)

(Page 10)

Sample 17-I -- 6'3" thick.

General -- Cut near tunnel -- ore opened for 30' on north side of Gulch (near bottom). Shows a consistent bed of reddish limonite about 6' thick. Sample cut 6'4". Bottom of bed uneven. Top of ore uncertain. Total thickness may easily be 7 $\frac{1}{2}$ ", however, believe excess over 6' would be lower grade, not over 50% iron.

Sample 17-J -- 1'4" -- lower grade bottom ore.

November 18 1941

Mr. D. Earl Stewart,  
2528 NE 47th Avenue,  
Portland, Oregon.

Dear Sir:

At the request of Mr. Nixon, we are enclosing bill of  
Lerch Bros. Inc., of Hibbing, Minn., for determinations made  
on the sinter sample sent them Aug. 26th, and also enclose the  
original analysis report, under date of September 2, 1941.

Will you please handle this matter direct?

Yours very truly,

for Earl K. Nixon.

fas/

encl. 2

## LABORATORIES

BIWABIK  
ELCOR  
VIRGINIA  
ALBANY LOC.  
HIBBING  
MAHONING LOC.

## LERCH BROTHERS INCORPORATED

THE IRON ORE CHEMISTS

LABORATORIES ON THE MESABA AND CUYUNA  
IRON ORE RANGES IN MINNESOTA

## LABORATORIES

KEEWATIN  
NASHWAUK  
CALUMET  
BOVEY  
CROSBY

HIBBING, MINN., October 1, 1941

IN ACCOUNT WITH **State Dept. of Geology  
and Mineral Industries  
Portland  
Oregon**

CUSTOMER ORDER NO. OR ACCT.

LABORATORY

Scranton

TERMS: 30 DAYS NET

FROM		TO		INCLUSIVE	
1	SAMPLES	September 1		September 30	
8	DETERMINATIONS		@		
1	ALUMINA INCLUDED		@	\$1.00	EA. EXTRA \$1.00
1	LIME		@	\$1.00 each	1.00
	MAGNESIA		@		
	SULPHUR INCLUDED		@		EA. EXTRA
	LOSS OR GAIN BY IGNITION INCLUDED		@		EA. EXTRA
	COMPOSITE SAMPLES MADE		@		
1	H. F. Iron		@	74¢ each	.74
1	Total Phos.		@	68¢ each	.68
1	Fusion Manganese		@	93¢ each	.93
1	H. F. Silica		@	93¢ each	.93
1	Fusion Alumina		@	93¢ each	.93
1	Iron on Insol. Material		@	54¢ each	.54

TELEPHONE SERVICE

TOTAL

\$6.75

COPY

LERCH BROTHERS INCORPORATED

Hibbing, Minnesota

Laboratory: Hibbing, Minnesota

September 2, 1941.

For State Department of Geology & Mineral Industries  
702 Woodlark Building, Portland

(Stewart Sample) (Sinter)

Iron	65.36
Phosphorous	.684
Manganese	.37
Silica	6.85
Alumina	3.18
Lime	.59
Magnesia	.48
Insoluble Iron	.12

Analyzed by Lerch Bros. Inc.

ESTABLISHED 1892

# LERCH BROTHERS INCORPORATED

LABORATORIES

BIWABIK  
ELCOR  
VIRGINIA  
ALBANY LOC.  
HIBBING  
MAHONING LOC.

## THE IRON ORE CHEMISTS

LABORATORIES ON THE MESABA AND CUYUNA  
IRON ORE RANGES IN MINNESOTA

GENERAL OFFICES  
CORNER N. ST. LOUIS AVE.  
AND GRANT STREET

HIBBING, MINNESOTA

September 3, 1941

RECEIVED  
SEP 5 1941

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

LABORATORIES

KEEWATIN  
NASHWAUK  
COOLEY  
CALUMET  
BOVEY  
CROSBY

State Department of Geology  
and Mineral Industries  
702 Woodlark Building  
Portland, Oregon

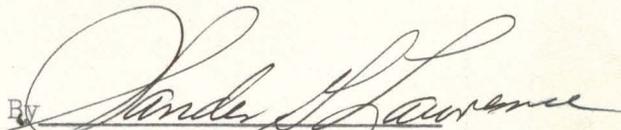
Attention: Mr. Earl K. Nixon  
Director

Gentlemen:

We are enclosing the report on the analysis of the  
sinter sample which you sent to us on August 26.

Very truly yours,

LERCH BROTHERS INCORPORATED

By   
Asst. Gen. Mgr.

Sander G. Lawrence:FA

Enc. 1

Air Mail



air mail postage = 66 cents

August 26, 1941

Lerch Brothers, Incorporated  
Hibbing, Minnesota

AIR MAIL

Gentlemen:

We are sending you herewith, via air mail, a sample of iron sinter which we ask you to run for

- Iron
- Phos
- Silica
- Al<sub>2</sub>O<sub>3</sub>
- CaO
- MgO
- Mn

Please report this to us, sending duplicate sheets and mark the analysis slip and the bill "Stewart Sample". I would be pleased to have you send the analysis report by air mail.

Thanking you, I am

Very truly yours,

EKN:vm

Director

June 23, 1941

Lerch Brothers  
Hibbing, Minnesota

AIR MAIL

Gentlemen:

We are sending you several pumped-down samples of iron ore for analysis. The samples are all numbered 17 and lettered from "A" to "J" inclusive. Please run each for iron and phosphorous.

Please run Sample 17-B, Sample 17-F, Sample 17-H, Sample 17-J, and Sample 17-I also for alumina.

Please run Sample 17-E also for manganese.

I suggest that you hold rejects for a few weeks at least, as we may wish to make some composites later.

Please date the bill for this work after July 1st but send us the analysis results as soon as they are available.

Very truly yours,

EKN:vm

Director

LABORATORIES  
BIWABIK  
ELCOR  
VIRGINIA  
ALBANY LOC.  
HIBBING  
MAHONING LOC.

ESTABLISHED 1892

# LERCH BROTHERS INCORPORATED

## THE IRON ORE CHEMISTS

LABORATORIES ON THE MESABA AND CUYUNA IRON ORE RANGES IN MINNESOTA

GENERAL OFFICES

HIBBING, MINNESOTA

LABORATORIES  
KEEWATIN  
NASHWAUK  
CALUMET  
BOVEY  
CROSBY

MINERAL

ANALYSES OF IRON ORE FOR STATE DEPT OF GEOLOGY AND INDUSTRIES

LAB NO.	MINE NO.	REMARKS	IRON	PHOS.	MANG.	SILICA	ALUM.	MOIST
53411	17A		46.74	846				
17	17B		36.69	740			18.19	
13	17C	ABOUT 8' INSIDE PORTAL OF SHORT TUNNEL	51.03	775				
14	17D	CHANNEL CUT 6' 6"	54.03	956				
15	17G	CUT BESIDE TRAIL 6' 4"	52.97	952				
16	17G	HORSESHOE CUT	54.76	986				
17	17H	LOWER 2'	55.08	1.028			3.33	
18	17I	6' 3"	54.51	1.017			4.04	

LABORATORY HIBBING

DATE

JUN 28 1941

SAMPLED BY

Unknown

ANALYZED BY

Lerch Brothers Inc.

LABORATORIES

BIWABIK  
ELCOR  
VIRGINIA  
ALBANY LOC.  
HIBBING  
MAHONING LOC.

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MINERAL

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LAB NO.	MINE NO.	REMARKS	IRON	PHOS.	MANG.	SILICA	ALUM.	MOIST
53419	17J	LOWER GRADE	56.70	847			2.24	
20	17F	HORSESHOE CUT LOWER 2'	55.24	845	.55		2.91	
21	17E	" GRAB SAMPLE 2'			8.84			

LABORATORY HIBBING

DATE

JUN 28 1941

SAMPLED BY

Unknown

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CROSBY

RECEIVED  
JUN 5 1941

STATE DEPT  
& MINERAL IND.

June 3, 1941

State Department of Geology  
and Mineral Industries  
702 Woodlark Building  
Portland, Oregon

Gentlemen:

Attention: Earl K. Nixon

The following is the analysis of sample received from you  
by us:

Iron-----	56.26
Phos.-----	.816
Silica-----	2.81
Alumina-----	2.57
Loss on Ignition--	12.30

*Price Paid 5  
6.5 cent*

Very truly yours,

LERCH BROTHERS INCORPORATED

By Sander G. Lawrence  
Assistant Gen. Mgr.

Sander G. Lawrence:FA

Air Mail

May 26, 1941

Lerch Bros. Inc.,  
Analytical Chemists,  
Hibbing, Minnesota.

Gentlemen:

We are mailing you under separate cover one sample (in two separate tubes which you may mix together before quartering) of low-grade iron ore, which we ask you to run for iron, phos., silica, alumina, and loss on ignition.

Other samples will follow as we are doing some exploration in the Scappoose District and are putting our State Geological Survey in the area this summer.

I haven't much idea as yet as to how many samples will be forthcoming, so I am not in a position to ask that you give us a discount for quantity. If it turns out as it very likely will that we will have a substantial amount of the iron series, I will request that you do a little better by us. Am sure you will be fair in any event.

Would appreciate your sending the assay results by airmail if you will be kind enough to do so, also make out your bills for the assaying in triplicate.

Very truly yours,

Director

EKN:ac  
Airmail

April 30, 1941

Mr. D. W. Price,  
Scappoose, Oregon.

Dear Mr. Price:

I rather regret to say that it appears that I won our little wager of one cigar on the iron ore sample. I estimated 54-55%. It assayed 56.05% metallic iron.

This, you will recall, was a  $3\frac{1}{2}$ ' channel sample of the open cut from which someone else had obtained an assay of a much greater thickness that ran 61.93% iron. The part that I sampled, in my opinion, is the sweetener for the rest of the cut, therefore I suspect that a true sample of a mining thickness, say, 7' or 8' would run considerably lower than 56% iron.

On the basis of this, I am more than ever convinced that you are justified in facing up some of your old cuts so that we can get some more accurate information on what the average mining grade would be.

Sincerely yours,

Director

EKN:ac

Price Sample Ek

# Certificate of Chemist

REFERENCE NO.  
3111

COMMODITY	DETERMINATION	%
Limonite Sample No. 3	Iron - dry basis *	56.05
	Iron - as presented	47.90

*Handwritten note:*  
How are prices  
from New Price  
based next  
to copper?

\* Dried at 100° C.

For Account of:

State Dept. of Geology & Mineral Ind.  
Woodlark Bldg.  
City

This is to certify, that we have analyzed the above mentioned commodity.

CHARLTON LABORATORIES,  
701 Stevens Building.

Portland, Oregon, May 2, 193 41

By Vernon C. Bushnell  
Chemist

RECEIVED  
AUG 14 1942

JOHN F. BEEDE  
METALLURGICAL ANALYSES AND ASSAYING  
410 N.W. THIRD AVENUE  
PORTLAND, OREGON

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

August 12, 1942.

Mr. Earl K. Nixon, Director,  
Oregon State Department of Geology  
and Mineral Industries,  
Woodlark Building,  
Portland, Oregon.

Dear Sir:

The following results are herewith reported upon the  
sample submitted for analysis:

MINERAL SAMPLE:

MARKING: Project 905

CHARACTER: Crude Iron Ore, Limonite

<u>COMPONENT</u>	<u>PERCENT.</u>
IRON, (Fe),	51.62
SILICA, (SiO <sub>2</sub> ),	4.22
PHOSPHORUS, (P),	.683
SULPHUR, (S),	.62
MANGANESE, (Mn),	.31
ALUMINA, (Al <sub>2</sub> O <sub>3</sub> ),	1.77
CALCIUM OXIDE, (CaO),	1.00
MAGNESIUM OXIDE, (MgO),	.82
TITANIUM OXIDE, (TiO <sub>2</sub> ),	4.85
CHROMIUM, (Cr),	.00
NICKEL, (Ni),	.00
COMBINED WATER, plus 105 deg. C.,	11.51
LOSS ON IGNITION, plus 105 deg. C.,	12.05
ORGANIC MATTER, VOLATILES, ETC., plus 105 C., (by diff.)	.54
MOISTURE, (superficial), minus 105 deg. C.,	1.80
CARBON DIOXIDE, Not Determined.	

REMARKS: Moisture was determined in air-dry sample as received,  
as noted above, Subsequent determinations were all  
made on dry-weight at 105 degrees Centigrade.

By John F. Beede

JFB/m

JOHN F. BEEDE  
METALLURGICAL ANALYSES AND ASSAYING  
410 N.W. THIRD AVENUE  
PORTLAND, OREGON

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MOISTURE, (superficial), minus 105 deg. C.,	1.80
CARBON DIOXIDE, Not Determined.	

REMARKS: Moisture was determined in air-dry sample as received,  
as noted above. Subsequent determinations were all  
made on dry-weight at 105 degrees Centigrade.

By

*John F. Beede*

ANALYSIS OF SAMPLE OF SINTERED SCAPPOOSE LIMONITE

by

JOHN W. BEEDE, PORTLAND, OREGON

Fe	51.62
SiO <sub>2</sub>	4.22
P	.683
S	.62
Mn	.31
Al <sub>2</sub> O <sub>3</sub>	1.77
CaO	1.00
MgO	.82
TiO <sub>2</sub>	4.85
H <sub>2</sub> O (comp)	105
	11.51
	1.80
Loss Ignition	12.05
Organic (Estimated)	0.5%



STATE DEPARTMENT OF GEOLOGY  
AND MINERAL INDUSTRIES

702 WOODLARK BUILDING  
PORTLAND 5, OREGON

PRESS RELEASE NO. 65

FOR IMMEDIATE RELEASE

JULY 10, 1944

GOVERNOR ANNOUNCES NEW ORE DISCOVERY

Investigations by the State Department of Geology and Mineral Industries during the past two months have disclosed sizable deposits of high-alumina iron ore or high-iron bauxite over a considerable area in northern Washington County, Oregon.

The occurrences are in separate flat-lying deposits, 5 to 15 feet thick, usually overlain by several feet of silty soil. Probably surface mining methods would be applicable in all deposits so far examined. Accurate estimates of tonnage available may not be made in the absence of thorough exploration and sampling.

Chemical analyses indicate that the ore will average 20 to 25% iron, 25 to 35% alumina, 6 to 12% silica, and .15% phosphorus. It is interesting to note that some iron ore deposits occurring near Scappoose only a few miles farther north in Columbia County are relatively low in alumina and high in phosphorus compared to the Washington County ore.

According to the Department, there are no commercial operations treating this type of ore in the United States, but similar material in Norway has been successfully reduced in electric furnaces on a commercial scale to produce a high-grade pig iron and a calcium aluminate slag. The slag is further treated

chemically to produce alumina. The Department feels that from a metallurgical standpoint the Washington County ores may be successfully treated to produce pig iron and alumina. Whether or not the ores may be treated profitably remains to be proved but indications are that profitable operation is feasible.

It should be borne in mind, states the Department, that while two commercial products may be produced from this ore, chemical processes are always expensive which fact reduces the value of the ore in the ground.

The deposits are very favorably situated as regards transportation, post-war labor supply, and markets. Low-cost electric power from Bonneville will be an important factor in putting these deposits into production. Markets for both pig iron and alumina exist in both the lower Columbia River and the Puget Sound areas.

A preliminary report describing some of the deposits will soon be issued by the State Department.

May 1, 1944

Subject: Pedersen Alumina Process

This writing complies with your telephone request for information on the Pedersen process for production of alumina.

The process is now old art, the patents being granted in 1925 and admitted to patent in practically every country in the world in 1925, 26, or 27. Although it is known that some recent researches have been conducted using the basic principles of the process, there are no publications of recent date which refer to the process as such. It would be obvious that the U.S.B.M. and others in their reviews of the various well known methods for making alumina would have covered the elements of the Pedersen method. However, a quite complete search of current literature failed to reveal any reports on the results of recent studies.

The process consists essentially of the smelting of a mixture of iron ore, coke, lime and aluminous material to produce a molten calcium aluminate slag. It is reported that this slag contains from 30 to 50% alumina and 5 to 10% silica. The slag is crushed and leached with hot sodium carbonate-hydroxide solution. Calcium carbonate and silica are thrown down as a sludge and the alumina is placed in solution as sodium aluminate. The leaching operations are patented in an additional series of world patents granted to Pedersen in 1927. The sodium aluminate solution is treated to throw the aluminum down as the hydrate after which it is calcined in the usual manner. The alkaline solution is then recycled with make up and is used to leach additional quantities of slag.

The process was placed in commercial operation in Norway in 1928, and was checked by the Bureau of Mines in cooperation with the Aluminum Company of America at the same time. The U.S.B.M. study was reported in A.I.M.M.E. Tech. Pub. 112, 1928.

Pedersen's work, as originally intended, produced a pig iron. However, with ratios of silica to iron of 1:4 and reduction in situ, an iron silicon alloy may be produced. This alloy is not the usual composition of ferrosilicon and perhaps should not be referred to as such. This modification of Pedersen's process is attributed to Koritschoner and Hansgirg and is covered in both British and French patents in 1924.

Electric furnace operation is generally preferred for smelting, but blast furnace operation has been accomplished. (U.S.B.M. experimentation was blast furnace adaptation.)

It might be mentioned that prior to Pedersen's process and after its discovery, there have been numerous patents granted for fusion processes to produce an aluminous slag. Practically every alkaline earth has been used with temperatures from sintering to fusion. Prepared alkalis as well as natural have been given preference. A review of other processes as compared to Pedersen's appears to emphasize but one difference

and that is the simultaneous production of pig iron. The writer fails to recognize any distinct advantage of the iron production as originally specified since iron ore and bauxite were used in the charge. However, if circumstances were reversed and a relatively high alumina clay accompanied an iron ore in a mixture which could be satisfactorily fluxed, there appears to be the distinct advantage of alumina as a by-product of pig iron production or vice versa.

The control of the process lies in the proper proportioning of ore and flux to form such calcium aluminate compounds as will between themselves form eutectics which will have low fusion temperatures. This stated condition would be relegated by the writer to the blast furnace procedure and should not be a criterion for electric furnace smelting.

Details of the process may be found in the several patents, the early publications concerning the process, or the reports from the U.S.B.M. Although the literature is somewhat revealing, the writer is of the opinion that check testing for any charging composition as well as for certain steps in the process would be advisable prior to any plant design or decisions as regards feasibility of the operation.

Essentially, the advantages of the Pedersen process are two. (a) The flux (lime) accomplishes two purposes in that it enables iron smelting at the same time that it produces calcium aluminates which may be leached. (b) The process is one of the several which recirculates the alkali leaching agent, the disposal of the silica being accomplished along with precipitation of calcium from the leach liquor. It would appear (since the alkaline leach liquors must be carbonated) that electric furnace smelting should have an advantage over the blast furnace in the higher concentration of  $\text{CO}_2$  in the furnace gases, the same being used to carbonate the leach solution to throw down the lime. The pH range is so lowered at complete carbonation that the silica is precipitated. The writer is of the opinion that rather rapid agitation would be required in the carbonation step to produce a granular silica which could be filtered from the alkaline carbonate solution. Such details are not stressed in the literature.

The process undoubtedly has some bugs in it which are not described. The rather complex and complicated series of compounds which form from combinations of calcium, aluminum, and silicon are rather well known, the complete study having been accomplished in connection with the preparation of Portland cement, particularly the high alumina, early set cements. In fact, by-product slag cement from furnace operation is not uncommon. It may be anticipated that careful regulation and control would have to be exercised to produce the proper calcium aluminate for optimum leaching and prevent the formation of insoluble aluminosilicate compounds. Further, the silica will have to be precipitated in total, although this control is not so difficult but does limit the hydroxide alkalinity of the leach solutions which in turn affects leaching efficiency. No mention is made of possible recirculation of the precipitated carbonate although it has undoubtedly been found that it is impossible to separate the silica from the sludge. There is no reason why such material could not be disposed of as agricultural lime in this part of the country.

In conclusion, it would appear to the writer that although this process would naturally be limited in those locations where iron production is extensive, in such locations as the Pacific coast where the opposite is true, it would appear to have possibilities. This statement is even more true under the circumstances of cheap electric power. It is perhaps unnecessary to call attention to the horizontal integration which would be required through iron ore, coke, and limestone production. Fortunately, the process appears to be one for which suitable pilot plant data could be acquired on relatively

small scale and in an inexpensive manner so that proper preliminary data could be accumulated which would be dependable and applicable to the local raw materials.

The writer will be pleased to investigate the process further or abstract the details as described in the literature if requested to do so.

Respectfully submitted,

/s/ George W. Gleeson

Head  
Chemical Engr. Department

Addenda: It is assumed that the other processes of Pedersen are not of interest. At hand is a translation of his writings in Teknisk Ukeblad which covers his acid leaching process. Reference is also made to the work of Tome (U.S.P. 906,338) for the preparation of ferro silicon or silicon by carbon reduction from calcined kaolin. This process is a straight reduction and does not include fluxing.

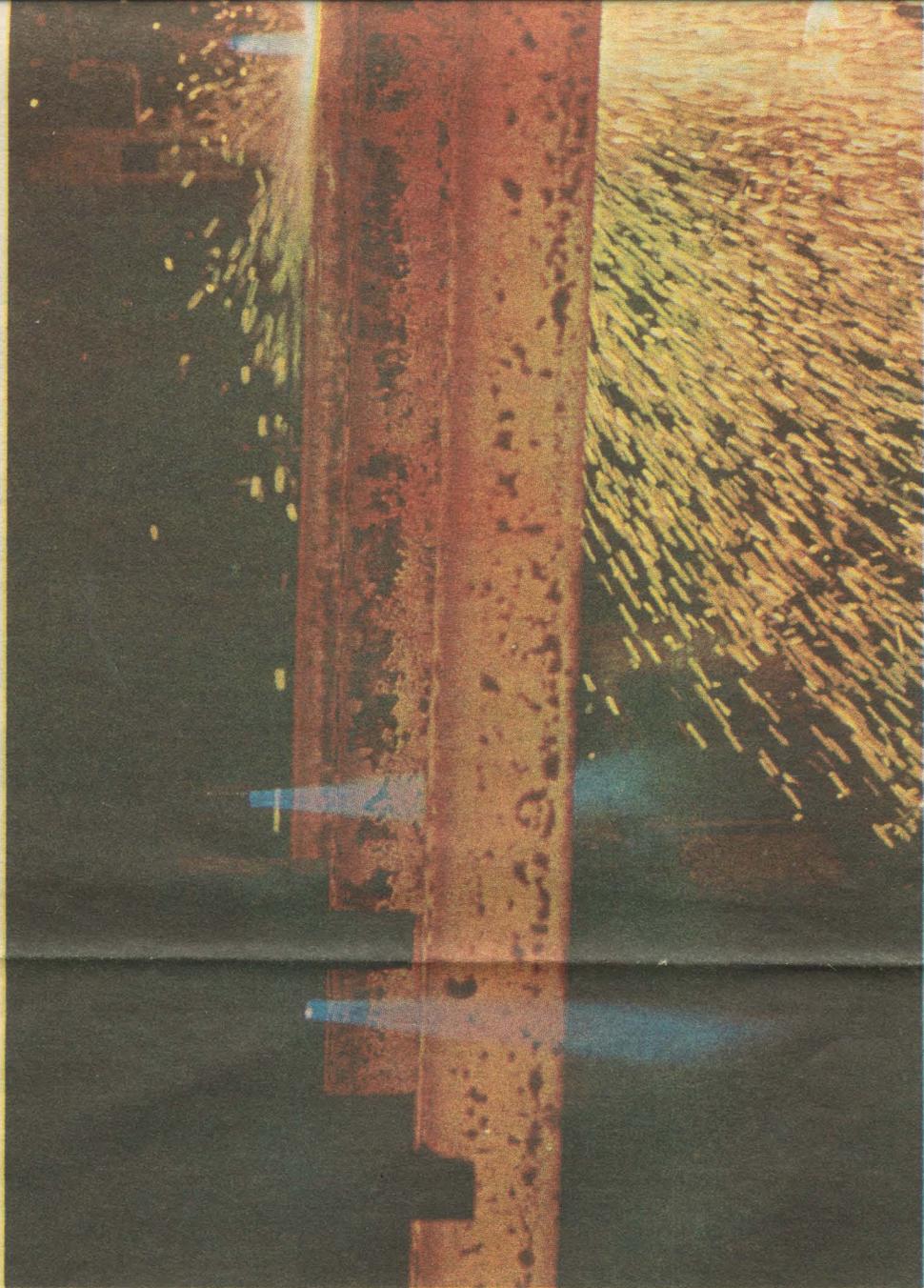
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## Let the sparks fly . . .

Steel flowing from a continuous casting machine at Cascade Steel Rolling Mills in McMinnville is automatically cut into long billets by gas torches (right). The billets, 4½ inch square, are later rolled into reinforcing bars and fence posts. Below, workers protected by heavy clothing from the heat and sparks insert the nozzle of an oxygen line into the furnace. The mill has been operating at full capacity making the bars and fence posts. Owners claim it is the lowest-cost mill in the West.

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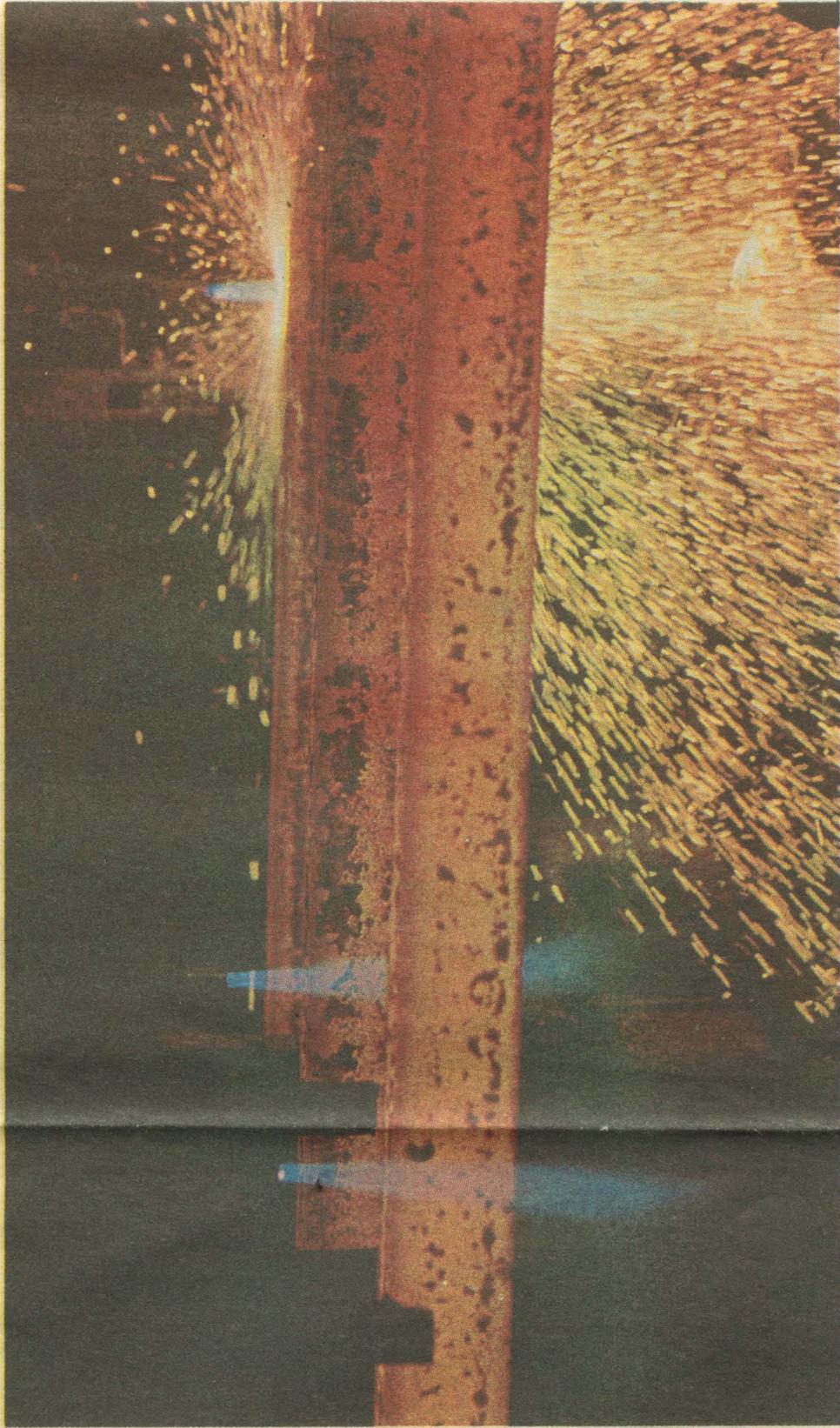
Statesman-Journal photos by Jill Cannefax



# Cascade Steel rolling into better times

sparks fly . . .

om a continuous casting machine at the De Steel Rolling Mills in automatically cut into long billets (right). The billets, 4½ inches thick, later rolled into reinforcing bars. Below, workers protect the bars from the heat and sparks flying from an oxygen line into the mill has been operating at full capacity; the bars and fence posts. This is the lowest-cost mill in the



Statesman-Journal photos by Jill Cannefax

# ade Steel rolling into better times

**BY WALT PENK**  
Of the Statesman-Journal

**McMINNVILLE** — The sign at the entrance to Cascade Steel Rolling Mills here says: "The Recycle Company."

The castoffs of a consumer society — car bodies, kitchen stoves, refrigerators, already smashed into pieces — arrive by truck and railroad as raw material. The rusty shreds are piled high outside within view of the nearby rolling countryside.

At one time these discards of the good life were abandoned in the country or were covered in a landfill. But now, many go to good use.

**THE PILED** scrap is moved to

one of two electric furnaces in the open-ended melt shop. Fast-moving overhead cranes scream warning whistles as 15-ton batches of metal are put in the open furnaces.

By industry standards this is a small mill, making utilitarian reinforcing bars to give strength to concrete. Yet when a furnace cover is slowly moved open and the scrap is loaded, the 30-foot high sparks make the tough workers look puny and vulnerable. Bob Crume, melt shop superintendent, admitted he still gets a thrill from the show.

Sparks and hot blasts from the 3,000-degree Fahrenheit heat of the furnace force the sweaty men to wear heavy protective jackets, hard

hats and gloves.

**THE FURNACE** is one of the few places where automation hasn't fully taken over. Here men push oxygen hoses with long nozzles to the top of the molten steel to burn off impurities. They also shovel in lime to separate impurities, and carbon and manganese to strengthen the steel.

After the scrap is melted by the 250 to 300 volts of electricity flowing through the furnace's carbon electrodes, the furnace is tilted and the bright yellow liquid is poured into a transport ladle. One of the overhead crane operators again screams his warning whistle and lifts the ladle up and over to a high platform at the

end of the casting machine.

**A WORKER** smashes open a pouring orifice and the metal flows into a trough, to emerge below as three continuous ribbons  $4\frac{1}{2}$  inches square. Automation then takes over — gas torches, run by computers, cut the moving bars, called billets, into 26-foot lengths of 1,700 pounds each.

Scale, a flaky film of oxide formed as the moving billets cool, drops into a swiftly flowing channel of water below and is washed to a settling basin. The cooled blue-grey billets are stacked high outside awaiting the journey to the reheat furnace.

**THE REHEAT** furnace, completely replaced this year, is rated

the most modern in North America, said Bob Stockwell, rolling mill superintendent. This was confirmed by Walter Rudin, technical advisor from Bricemont Controls, Pittsburgh. The gas-heated furnace, which heats the billets to around 2,300 degrees Fahrenheit, is controlled by a computer in Pittsburgh. The computer was manufactured by Bricemont.

One man operates the reheat furnace from a glass-enclosed room with a computer terminal and several television screens monitoring areas inside the furnace. Here the air is free of dust, and there are no ear-piercing noises.

**THE COMPUTER** keeps tabs on each billet's temperature. If it isn't correctly heated to around 2,300 F, it is pushed aside from the moving furnace belt and returned to the belt when it is ready. Besides affording better quality control, the new heavily insulated furnace uses less energy. It replaced a furnace that required four men per shift.

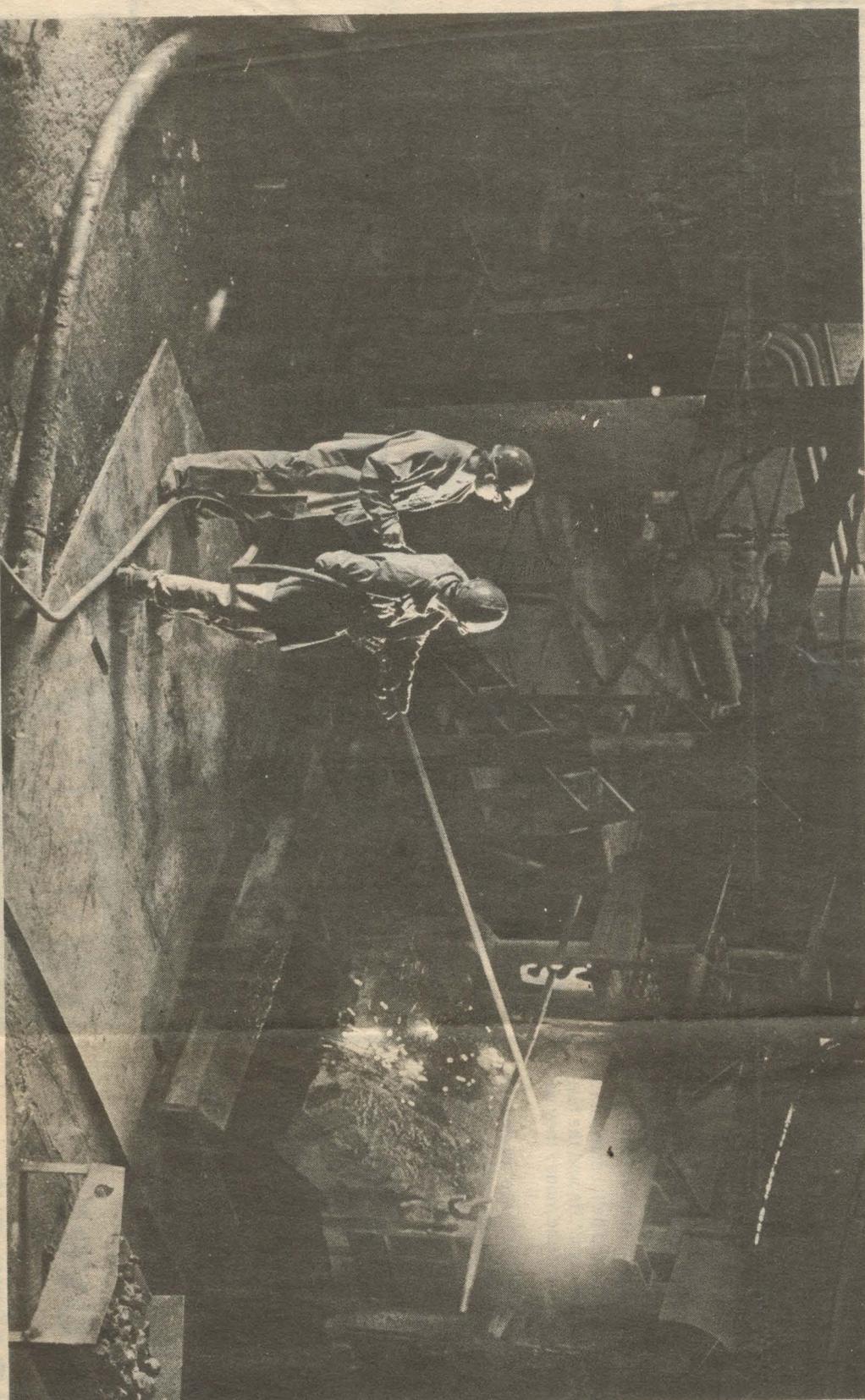
The glowing red billets move on conveyors from the reheat furnace to the long rolling mill, passing through a series of rollers that squeeze the sides to the desired size. One 26-foot billet will end up as 2,000 feet of  $\frac{1}{2}$ -inch reinforcing bars (called rebars).

The mill also makes flat and round pieces. In a separate building, up to 1,800 fence posts are formed per hour by automated machinery. The posts emerge at the end of the line, all painted and banded.

**AT A TIME** when many steel mills are on limited production or shut down, Cascade is running at capacity, said Harold White, executive vice president. It also is making a profit. Competition comes from mills in Seattle and Utah, and from overseas firms, he said.

At the end of last year the 70-acre plant had 434 employees, including 326 hourly-wage manufacturing workers. It is the major employer for McMinnville.

**LAST YEAR** electric power, purchased from McMinnville Water &



NEIGHBORING TRACTS  
(Probably Ore Bearing)

Investigation has been made and survey sufficiently extended as shown on Map No. 2 to show that the Nolan tract, lying north of Earlywine tract, has sufficient elevation to carry the ore deposit on about 5 acres of its extent; that the Kraemer tract should carry the deposit for most of its area and the deposit should be found on about 5 acres of Schipp tract. The Watts & Price 20 acres, lying north of Columbia location of the Colport Company, should carry the deposit, but it is doubtful if the 40 acre tract of Weeks estate, lying north of Columbia claim, carries sufficient of the ore deposit to be worth of much consideration.

The 400 acre area, outlined in green on Map No. 1 as Chapman Timber Co. ground, was studied in a reconnaissance and about 250 acres were found to have sufficient elevation to carry the ore bed if it is continuous to the south and east of Oregon Charcoal Company holdings.

Northwest of Colport holdings ownership has not been determined by the writers and the ground is not worthy of consideration as an ore bearing area, so far as the known ore bed is concerned.

recommended that conclusive investigation be made to show the best type of retort to use, the actual output possible at a given cost, and the market possibilities for the tar produced, based on as definite offers as can be obtained.

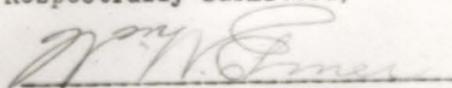
If as low a phosphorous iron is made as is used in the Portland market today, there is no question that a profit commensurate with the size of the enterprise can be realized from the beginning of operations.

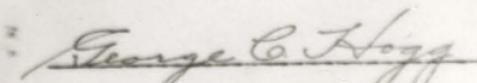
If a pig iron is made with the use of Colport ores alone a 1.40 to 1.60% phosphorous content in the iron will be the result and the marketing without refining by basic process will be more difficult.

Summing up in a few words the facts as determined, let us say there is here a developed deposit having a life, on the basis considered, of 15 to 16 years.

A probable market for 50 tons per day of high phosphorous iron can be developed, and if charcoal bi-products can be sold to take care of 50% of the charcoal cost, which seems assured, a net profit of \$1,300,000 will be made in 16 years, in which time the original investment will have been returned to the shareholders in interest charged in these pages against operation.

Respectfully submitted,



  
Consulting Engineers.

Portland, Ore.  
February 1, 1922.

## NATURE OF DEPOSIT.

The ore is a hydrated iron oxide or brown ore having approximate analysis of a true limonite, lying in a bed of reasonable continuity where developed thus far, with a dip of 3.5% to 7.5% from the horizontal as shown on Map No. 2 and cross sections.

The deposit is residual and was derived from the breaking down and leaching of the older overlying basalts or Columbia lavas, remains of which in all stages of alteration are to be seen in the hills to the west and southwest of the property and in an unaltered form on North Fork of Scappoose Creek. As developed in work thus far done the dip of the deposit is shown to be in a northeasterly and southeasterly direction.

The bed is overlain with clay of varying thickness from a few feet at the points where the deposit is cut on its outer edges to an extreme depth of 140 feet as shown in Drill Hole No. 5. In the cuts and Drill Holes where the ore has been found the bed is underlain by iron-bearing clay - material of the same character as that immediately above the deposit.

Drill Hole No. 15 was drilled to a depth of 41 ft. below the proper position for the ore bed and finished in solid basalt. Hole No. 13 was drilled 7 ft. into basalt. Neither of these holes showed ore and it is a reasonable assumption that there is no bed occurring in a horizon at lower elevation than the developed bed in the ground thus far prospected.

NEIGHBORING IRON ORE PROPERTY  
PARTIALLY DEVELOPED.

Lying south of the property of this Company are the holdings of the Oregon Charcoal Iron Company shown outlined in red on Map No. 1 as taken from the prospectus of that Company.

Of this area the county records show that the Mary A. Dwyer tract and the Reynard tract are held under option by the members of the Oregon Charcoal Iron Company, while the remaining area is listed as O. and C. land and is apparently held by lode location under the mining laws of the United States. This property is partially developed and our investigation indicates that the deposit here developed is the same as that developed by Colport Development Company.

### LOCATION OF PROPERTY.

As shown on map No. 1 the property lies in Sec. 34, T.4 N., R.2 W., and Sec. 3, T.3 N., R.2 W., Willamette Meridian, Oregon, about 2-1/2 miles westerly from the town of Scappoose, which is on the Portland-Astoria branch of S.P. and S. Ry., 20 miles north of Portland.

NEIGHBORING IRON ORE PROPERTY  
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Respectfully submitted,

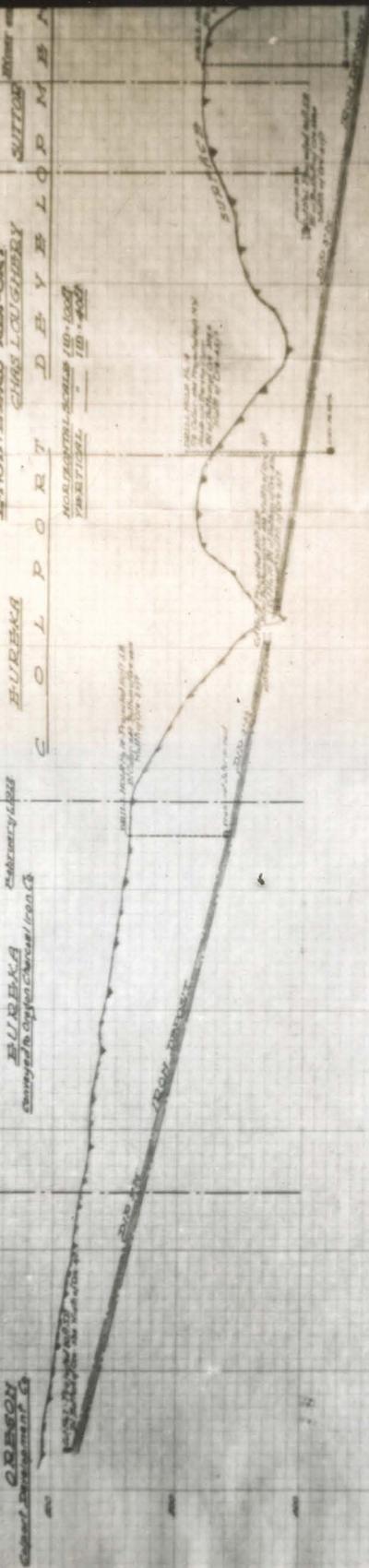


  
Consulting Engineers.

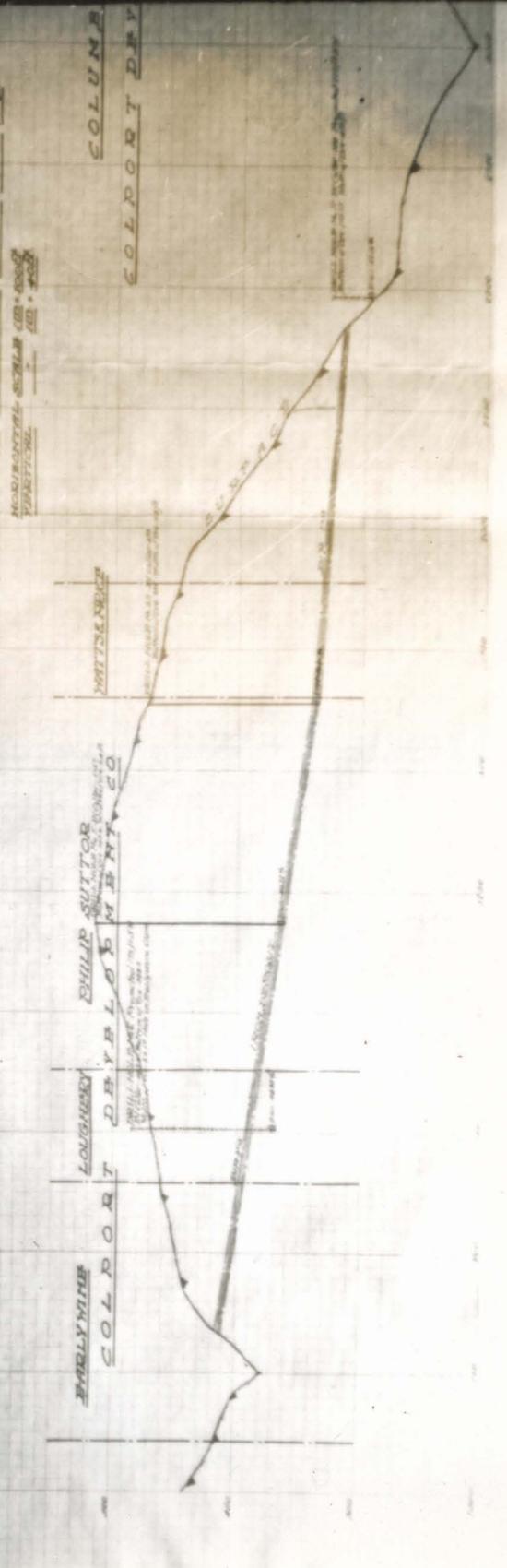
Portland, Ore.  
February 1, 1922.

**CROSS-SECTION OF**

**COLPORT DEVELOPMENT COS PROSPECTY - LOOKING WEST**  
**SHOWING DRILL-HOLES AND OPEN-CUTS ALONG LINE B-B' TO ACCORDING**  
**ENGINEERS' REPORT**



**CROSS-SECTION - LOOKING NORTH**  
**SHOWING DRILL-HOLES AND OPEN-CUTS ALONG LINE B-B'**

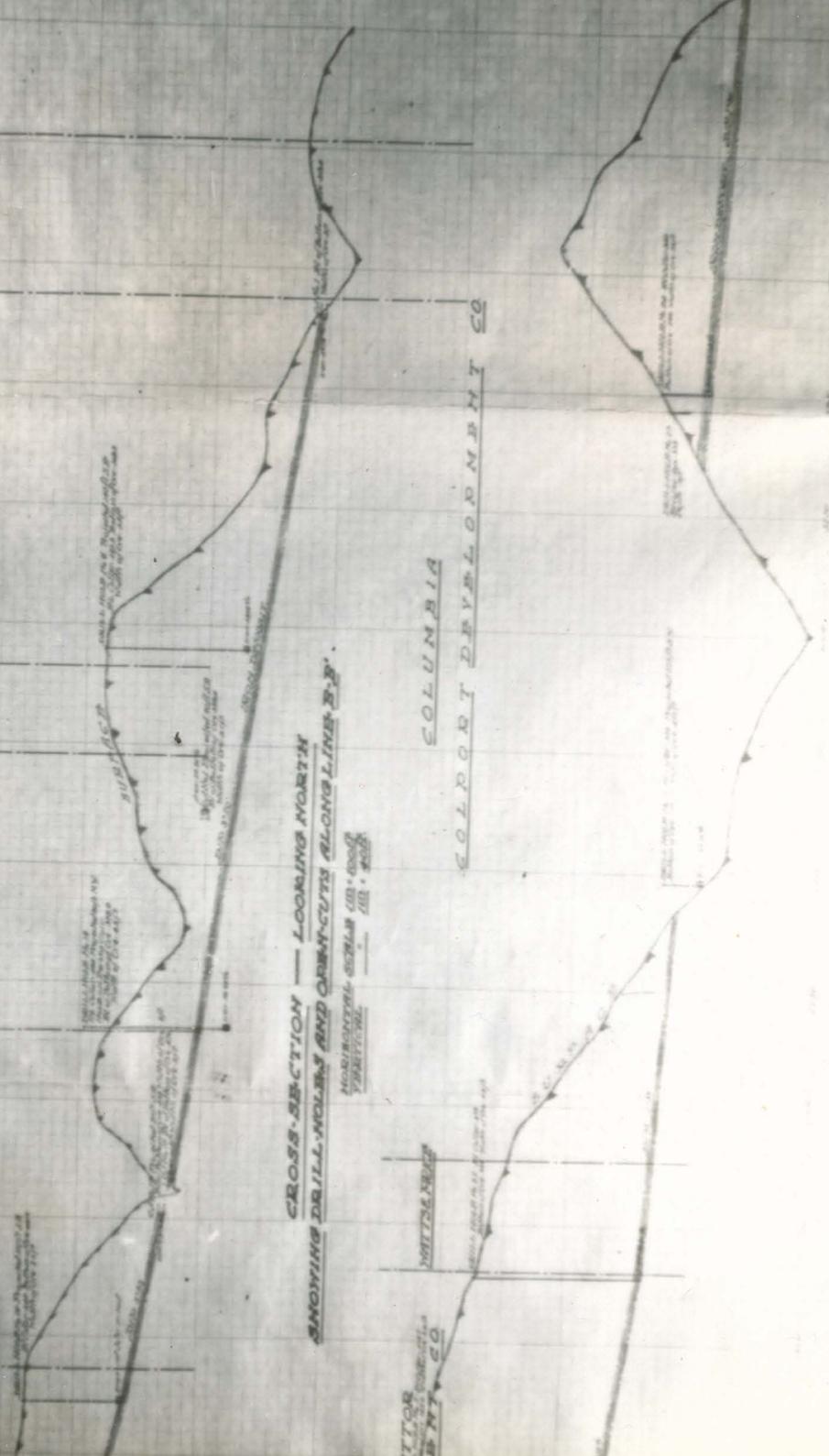


CROSS-SECTION

COLUMBIA DRILLING AND DEVELOPMENT CO'S SAGRENTY - LOOKING WEST  
SHOWING DRILL-HOLE AND ORE-CUTS ALONG LINE A-A' TO ACCOMPANY

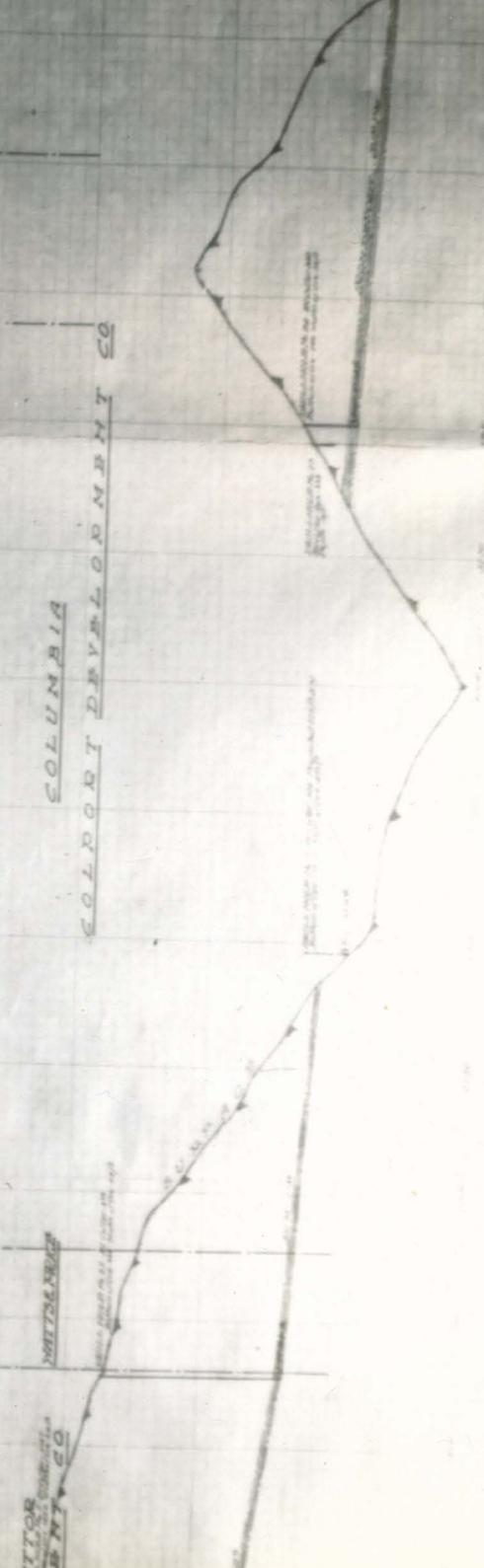
ENGINEERS' REPORT  
CHAS. LOUGHERY  
SUITOR  
M B M B M T C O

VERTICAL SCALE 100' = 1" HORIZONTAL SCALE 100' = 1" (SEE PLAN)



CROSS-SECTION - LOOKING NORTH  
SHOWING DRILL-HOLE AND ORE-CUTS ALONG LINE B-B'

VERTICAL SCALE 100' = 1" HORIZONTAL SCALE 100' = 1" (SEE PLAN)





WEST ST. HELENS

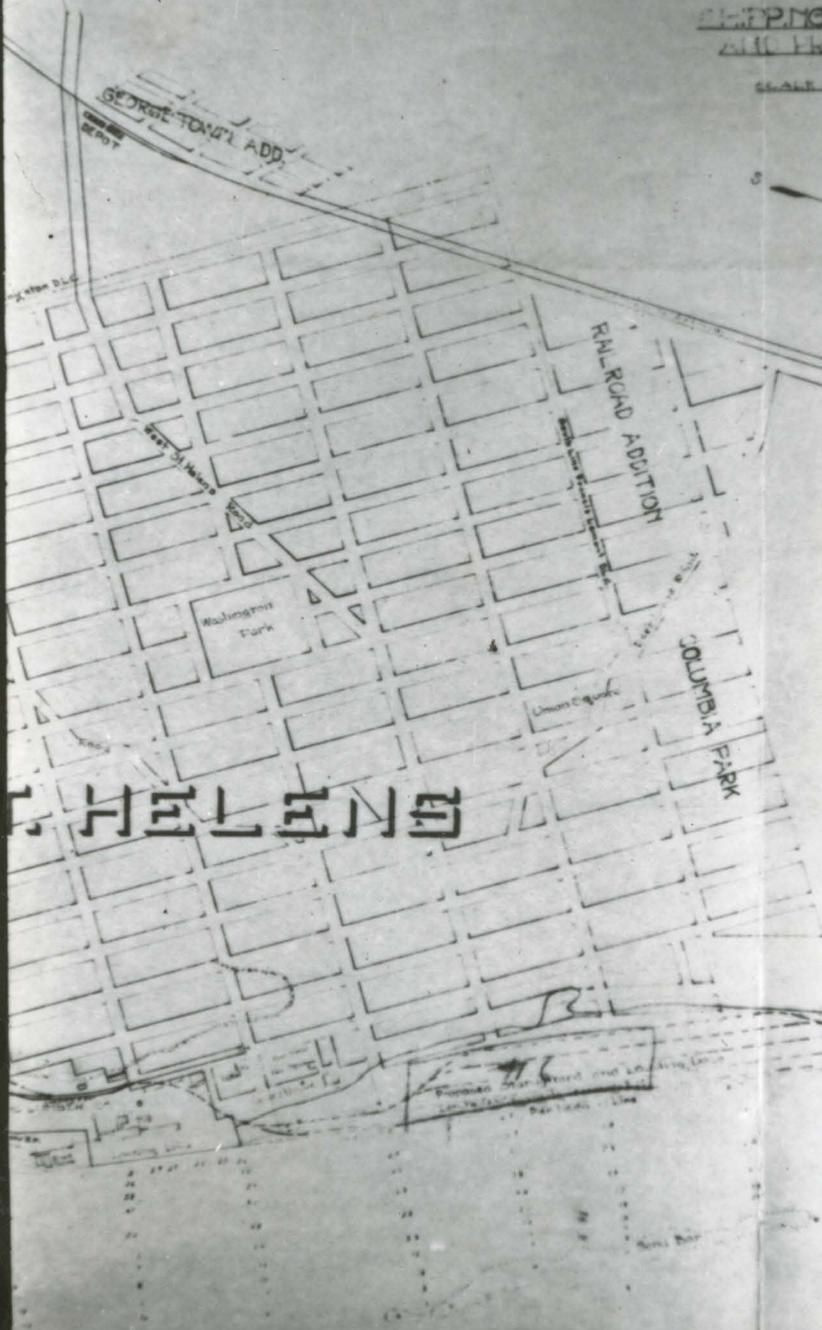
# ST. HELENS DOCK & TERMINAL

MAP SHOWING  
SLIPPING FACILITIES BY RAIL & WATER  
AND PROPOSED RAILROAD EXTENSIONS  
ST. HELENS CRI.

SCALE 1:5000

DATE 1914

Drawn by [illegible]



### Distances from Coast to Main Lumber

- St. Helens Lumber Co. to main Columbia 1.5 MI.
- Island Lumber Co. 1.5 MI.
- Columbia County Lumber Co. to main 1.5 MI.

### Distances between Mills

- St. Helens Lumber Co. & Columbia Co. 1.5 MI.
- St. Helens Lumber Co. & Island Lumber Co. 1.5 MI.
- Island Lumber Co. & Columbia County Lumber Co. 1.5 MI.

### Lengths of Docks & Berths at Mill

- St. Helens Lumber Co. Dock 300' wide at 2.5'
- Island Lumber Co. Dock 300' wide at 2.5'
- Columbia County Lumber Co. Dock 300' wide at 2.5'
- St. Helens Dock & Berthing Co. Dock 300' wide at 2.5'
- St. Helens Lumber Co. Dock 350' wide at 2.5'
- Island Lumber Co. Dock 350' wide at 2.5'
- Columbia County Lumber Co. Dock 350' wide at 2.5'
- St. Helens Dock & Berthing Co. Dock 350' wide at 2.5'
- Distance from Mill to Dock 1.5 MI.
- St. Helens Lumber Co. 1.5 MI.

# ST. HELENS

COLUMBIA PARK

COLUMBIA RIVER

MAP No. 3

PLATON P&S

PROPOSED SMELTER SITE  
#1

PROPOSED SMELTER SITE  
#2

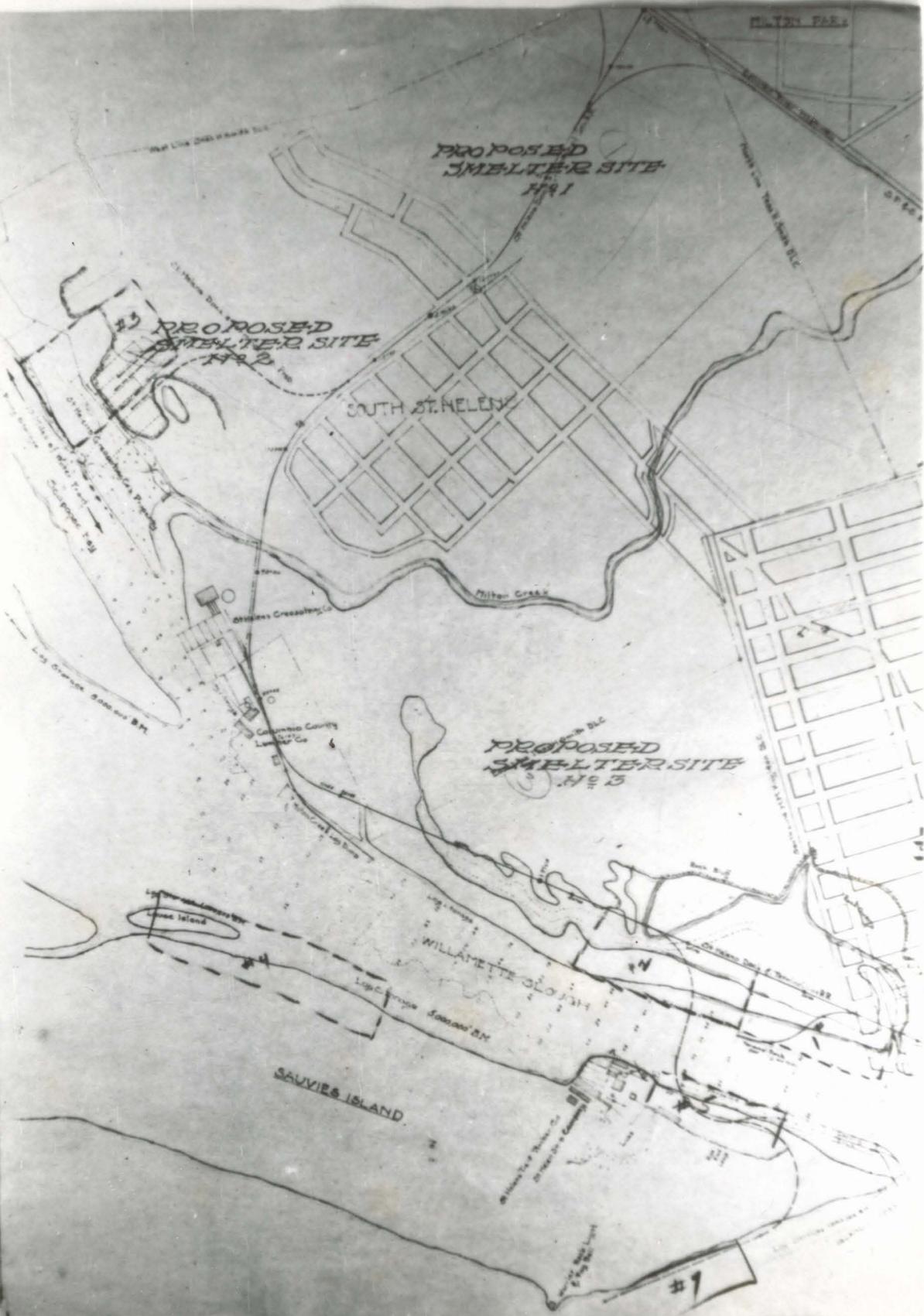
SOUTH ST. HELEN

PROPOSED SMELTER SITE  
#3

WILLAMETTE GLOUGH

SAUVIE ISLAND

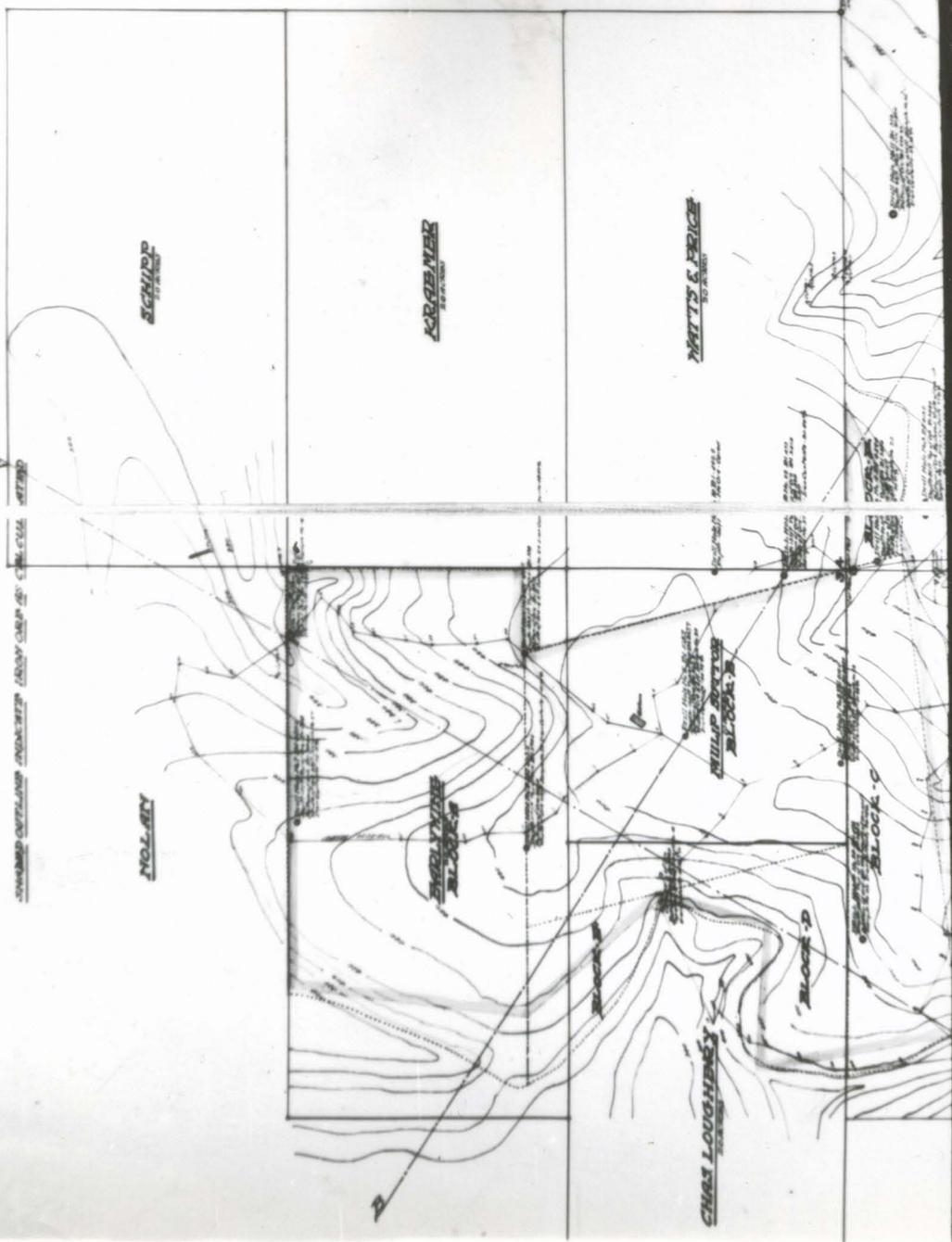
#7

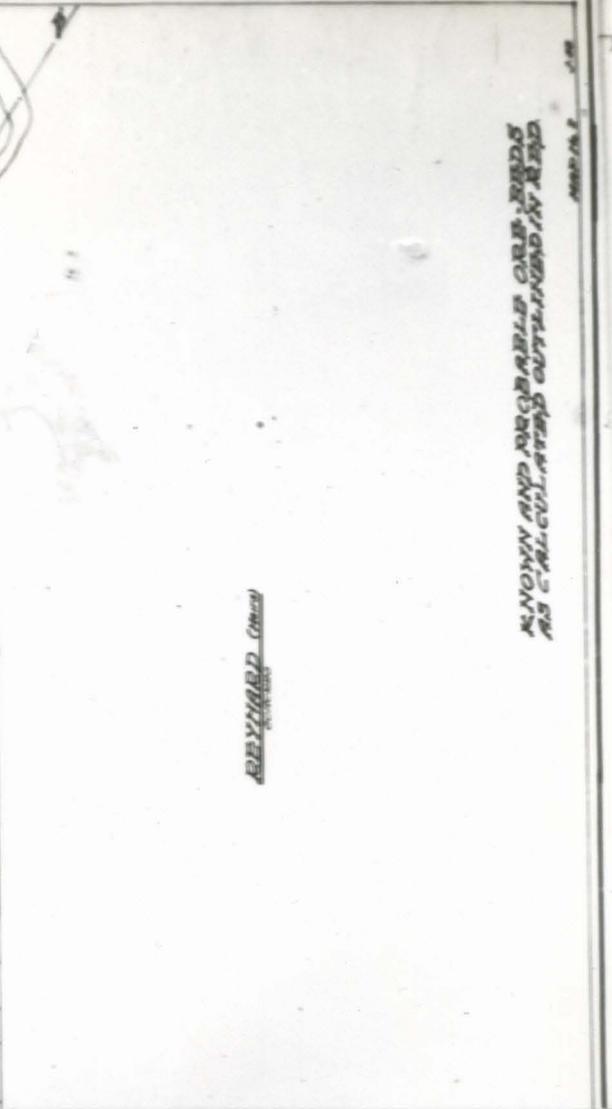
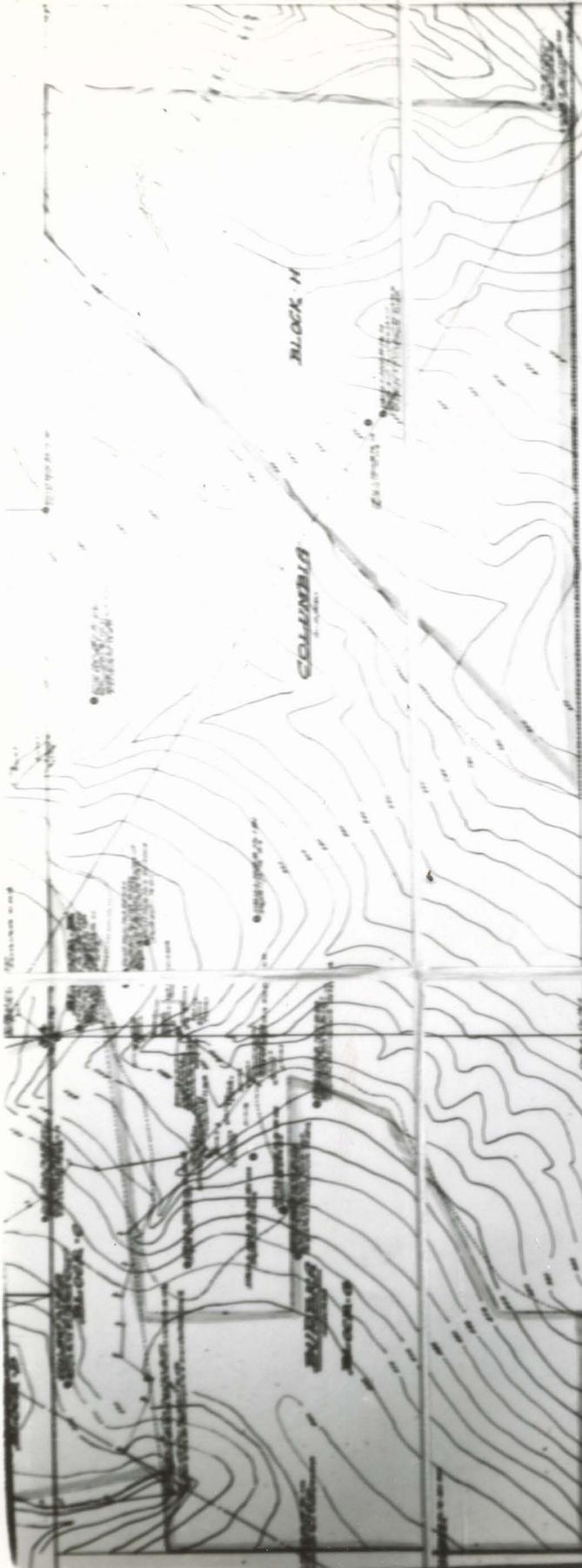


**SHOWING TOPOGRAPHY, LOCATION OF DRILL HOLES, OPENINGS, AND TUNNELS - COLUMBIA COUNTY, ORE. TO ACCOMPANY ENGR'S REPORT.**

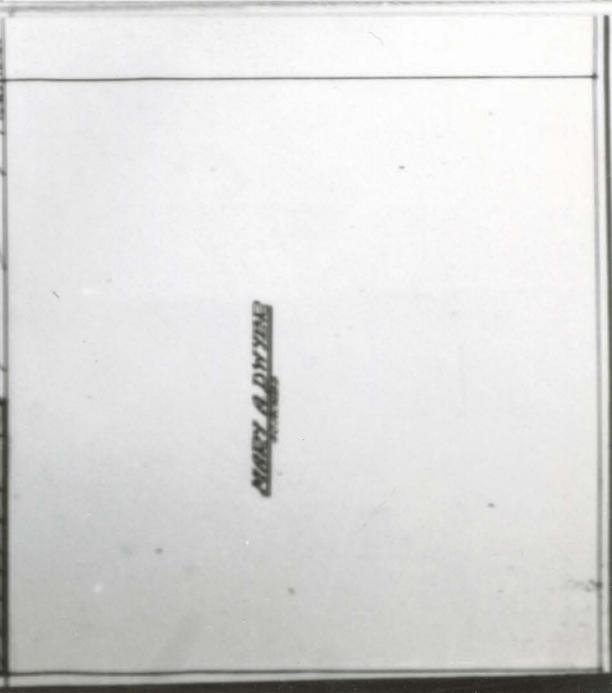
WATER AND POWER ENGINEERING COMPANY

STANDARD OUTLINE AND WATER AND POWER ENGINEERING COMPANY





**BRYAN**



**BRYAN**

KNOWN AND AVAILABLE ORB. REFS.  
AS COLLECTED OUTSTANDING REFS.

W 10  
W 13

Chrysler  
4000

**COLPORT  
CO**

Mercury Dealer  
4000  
(Mercury - Oldsmobile)

Executive Motor  
4000  
(Mercury - Oldsmobile)

Chrysler Timber Co  
4000  
Mineral Rights  
reserved by  
Chrysler

**OVER-CON  
LEONCO**  
by Charles S. Longenecker

M.C. Evans  
4000

Chrysler Timber Co  
4000  
Mineral Rights  
reserved by  
Baker & Baker Inc

Chrysler Timber Co  
4000  
Mineral Rights  
reserved by  
Baker & Baker Inc

Chrysler Timber Co  
4000  
Mineral Rights  
reserved by  
Chrysler

M.C. Evans  
4000

J.B. Whitman  
4000  
Mineral Rights  
reserved by  
Whitman

Chrysler Timber Co  
4000  
Mineral Rights  
reserved by  
Chrysler

Y.C.P.  
4000

Y.C.P.  
4000

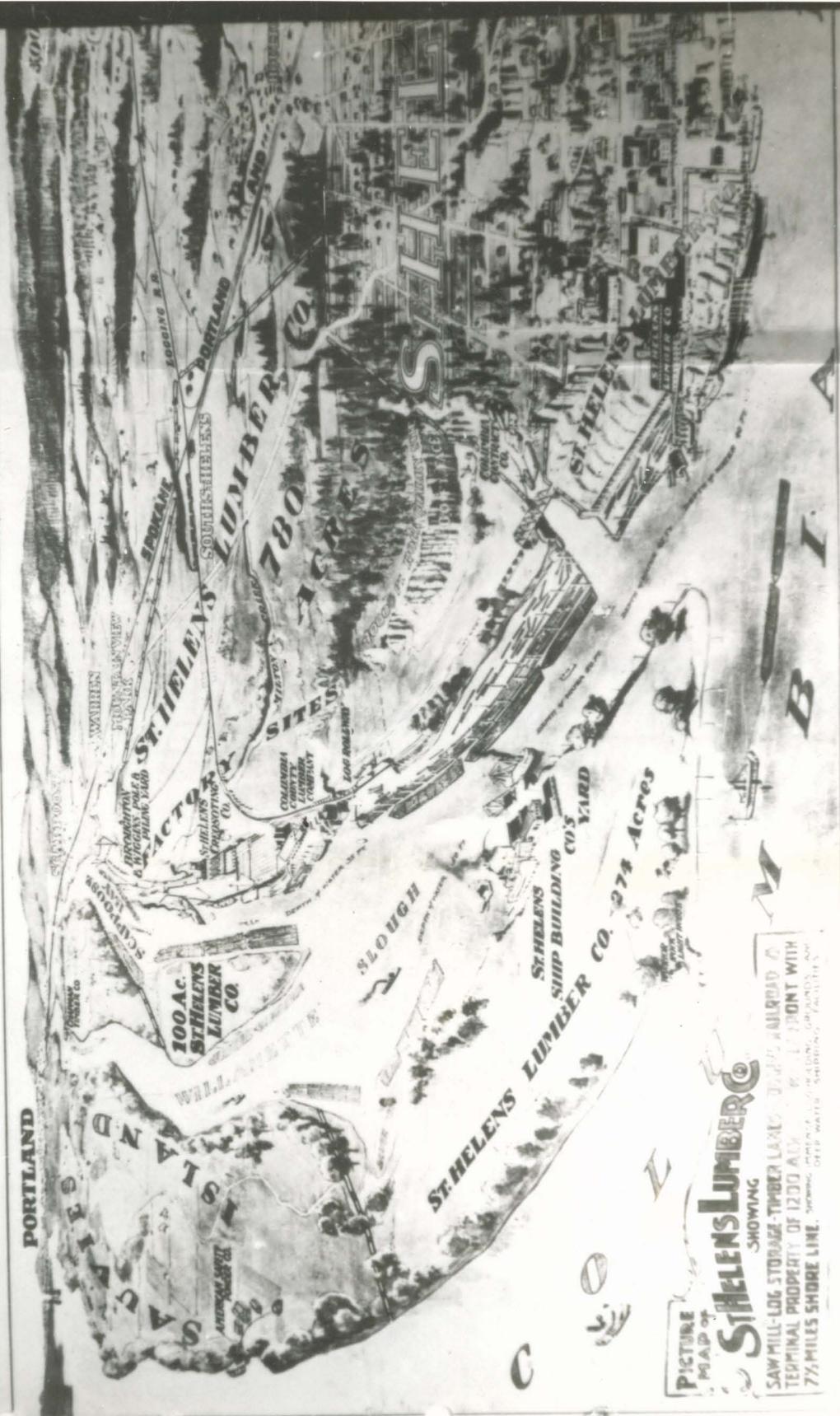
Victor  
1000

N 1

10

NAP No. 1





PICTURE  
 MAP OF  
**ST. HELENS LUMBER CO.**  
 SHOWING  
 SAWMILL-LOG STORAGE-TIMBER LAYERS-TRUCKS-RAILROAD  
 TERMINAL PROPERTY OF 1200 ACRES-7 1/2 MILES FRONT WITH  
 7 1/2 MILES SHORE LINE. SHOWING OTHER WATER SHEDDING FACILITIES.

Price Sample by EKN Taken Apr 25, 1941

Fe (dry) 56.05%

" (Natural) 47.90

I.A.  
Mr. Heuser  
P.O. Box 331  
Portland.

Columbia  
County

REPORT OF IRON ORE PROPERTY  
OWNED BY  
OREGON CHARCOAL IRON COMPANY.

The ore lands covered by this report consist of 290 acres near the town of Scappoose, Oregon, about 22 miles north of Portland. Of these 290 acres approximately 20 acres comprising the extreme N.E. corner of the body have been carefully prospected by cutting the outcrop and by drill holes. The outcrop has also been cut in three places along a face of approximately 500 feet in the forty acre tract immediately S.W. of the above mentioned prospect, but the continuity between these two known occurrences has not yet been established by drill holes.

The ore, wherever found, has all the characteristics of a true vein. It occurs immediately under an overburden of ferruginous clay, the line of demarkation being indicated by a capping of hard crystalline ore, differing from the main seam in its physical rather than its chemical composition. Underlying this cap ore and merging into it, is the main portion of the vein in which the ore occurs as granular crystals cemented together with a very finely divided form of ore. Under this and merging into it the vein consists of the finely divided form of the ore alone, which is compacted into a dense mass resembling clay upon casual inspection. The proportion of these three forms of ore varies somewhat in the different exposed faces, and there is an apparent tendency for the very finely divided form of ore in the bottom of the vein to give way to the granular form above it, as the vein retreats under the cover. In general, the band of hard crystalline ore in the top varies from 6 inches to 18 inches in thickness and the finely divided ore in the bottom from 18 inches to 30 inches, the rest of the vein being formed of the granular ore. All of these three forms of ore have practically identical chemical composition, and are unmixed with foreign matter, wherever the vein has been exposed except in the two instances mentioned below of occurrences of small pockets of white horse in the seam.

A typical analysis of this vein is as follows: Metallic Iron, 54.60%; Insoluble Matter, 3.60%; Silica, 2.80%; Alumina, 1.95%; Phosphorus .95%; Manganese, .16%. The above analysis is of a large sample taken from top to bottom of the vein in No. 1 cut. Other samples and analyses show a phosphorus content ranging from .65% to .85%, and manganese from .03 to .61%. An average of the analyses made to date give a phosphorus content of .80% and a manganese content of .34%.

The thickness of the vein varies from 4 feet to 9 feet with an average thickness over the 20 acres of nearly 7 feet. This would give a recoverable tonnage of approximately 500,000 tons of ore on the 20 acres now prospected. The strike of the vein is approximately southeast and northwest, and it dips to the northeast at an inclination of approximately 4.5 feet in the hundred. Throughout the 20 acres prospected, there is no irregularity of bedding and the vein was encountered at its proper horizon in all cases. The maximum cover on this 20 acres was about 150 feet but farther west the hill rises faster than the vein and the cover will increase in thickness.

The thickness of cover precludes any possibility of mining in an open cut. On the other hand the occurrence of the vein is such that it lends itself readily to mining by either the long wall or room and pillar system, and the problem of recovering the ore is comparatively simple. The mine can readily be opened so that all drainage and all haulage will be down grade to the mine mouth.

The ore is a high grade limonite and will smelt readily in the blast furnace. No crushing or washing will be necessary or desirable and as the vein occurs at an elevation of approximately 600 feet above the valley floor, and within a quarter of a mile of the railroad, the ore can be delivered on cars for a very low figure.

Of the 270 acres comprising the rest of the 290 acre tract, nothing can be said except that if the vein is continuous and regular, it will underlie most of this property. There are outcrops in three places on a forty acre tract adjoining the 20 acres that have been prospected and it is proposed to develop the continuity of the vein in this direction at once by further drilling. Until this is done, it can only be said that there is a strong probability of finding the ore on a large part of the total acreage. There are, however, several ravines intersecting the property, which will eliminate all possibility of finding the ore where these occur. In the absence of an exact survey, it can not be said just what acreage is thus cut out of the total of 290 acres, but in all probability not in excess of 20 per cent.

Summarizing briefly the above, the property consists of a known tonnage of 500,000 tons of high grade Limonite ore, easily mined and readily smelted, that can be put on board cars at a very low figure, with a strong probability that further prospecting will develop a much larger tonnage. When smelted, the resulting pig iron will have a phosphorus content of 1.50 to 1.75 percent, and a manganese content of about .50 percent. The cost of opening the mine will be low, as it will be opened in ore, without dead work; the equipment will be simple and inexpensive, and all necessary timbers can be obtained on the property.

A more detailed report follows:

LOCATION -- The property in question consists of the following tracts: The N.W.  $\frac{1}{4}$  of the S.W.  $\frac{1}{4}$  of the N.W.  $\frac{1}{4}$  of Sec. 2, comprising 10 acres; the South half of the N.E.  $\frac{1}{4}$ , Sec. 3 comprising 80 acres; the Southeast  $\frac{1}{4}$  of the N.W.  $\frac{1}{4}$  Section 3 comprising 40 acres; the North half of the S.W.  $\frac{1}{4}$  Section 3 comprising 80 acres; The N.W.  $\frac{1}{4}$  of the S.W.  $\frac{1}{4}$  Section 3 comprising 40 acres; and the S.W.  $\frac{1}{4}$  of the S.W.  $\frac{1}{4}$  Section 3 comprising 40 acres, all in Township 3 North, Range 2 West, and totalling 290 acres. These tracts body up into a solid body as shown on the accompanying map. Some of these tracts are owned in fee and others are now under patent.

TOPOGRAPHY -- The property occupies the slopes and top of the hills immediately adjacent to the valley of the Columbia River, about one and one-half miles west of the town of Scappoose, Columbia County, Oregon, and about 20 miles north of Portland. These hills rise steeply from the valley floor and the ore body outcrops at an elevation of about 600 feet above the

valley level. After leaving the level valley of the Columbia the topography is very rugged, consisting of a series of spurs running westwardly and intersected by deep canyons, with precipitous sides and covered with a heavy undergrowth. A good deal of the original timber still remains, to afford a source of supply for mine timber. These hills are supposed to be the result of erosion of a plateau, and represent a capping of basalt on the lower sedimentary rocks which are exposed on the sides of the hills above the valley floor. The iron ore occurs under the basalt, which has been broken down into a clay, but it is not known whether the stratum immediately underlying the ore body is basalt or of sedimentary origin.

HISTORY -- The ore vein was first discovered some 30 years ago, and at that time was prospected to the extent of having a prospect tunnel driven into it for some 30 feet. Nothing was done about its further development until the past two years, at which time the development was actively undertaken. This original discovery was made at Cut No. 3 on the accompanying map. The next step in the development consisted in cutting the outcrop at Cuts Nos. 1 and 2, facing up about 100 feet and opening a new tunnel at Cut No. 3 and cutting the outcrop at Cut No. 3, and the Horseshoe Cut. After the continuity of the outcrop had thus been established over a considerable area drill holes were put down at holes Nos. 1, 2, and 3, about 300 feet back from the outcrop, to develop the uniformity of the vein as it went into the hill. This work was done by Dr. E. W. Lazell, an engineer of Portland, and his report on these holes has been adopted in making this report. At the time of beginning the investigation covered by this report the development consisted of the above items, as shown on the map: Viz: Cuts Nos. 1, 2, 3, and 4, and the Horseshoe Cut, and Holes Nos. 1, 2, and 3. In addition to this, and indicative of the extent and uniformity of the vein, a cut had been made on an adjoining acreage shown as Discovery Cut on the map, and a number of cuts and tunnels into the ore outcrop, on the opposite side of the valley and about one-quarter mile northwest from Discovery Cut. The additional investigation up to the time of this report consists in drilling Holes Nos. 4, 5, 6, and 7 and cutting the outcrop at Cuts Nos. 7, 7, and 8. A series of levels had already been run over the ore body where exposed, and the survey made for the purposes of this report was tied into the former survey and consisted in locating the new holes and establishing the elevation of the ground surface, from which data the depth of drilling to reach the ore could be determined. In every case the actual depth of hole checks within 2 feet of the computed depth showing the absolute regularity of the deposit. Over the 20 acres covered by this report the vein has been cut at intervals of not exceeding 350 feet. There have been no blank holes. The vein has been reached in each case within 2 feet of its computed location, and there is no indication at any point that this deposit consists of pockets or is other than a true vein.

PROSPECTING AND SAMPLING -- The prospect holes were all put down with a churn drill. Holes Nos. 1 to 6 inclusive were drilled by hand, but a light gasoline drill was used on Hole No. 7 and all subsequent holes. The drill bit was  $3\frac{1}{2}$  inches wide and drilled a hole about 4 inches in diameter. Wash samples of the sludge from the faller were made until it was evident that the ore body was reached, and then generous samples were taken from the bailer at each foot or two feet advanced, carefully dried over a fire to drive off the excess moisture without driving off the water of crystal-

lization, and delivered to the chemist for preparation and analysis. It is not certain to what extent the analysis of the ore sample obtained in this way differs from the true analysis of the ore body, for the sample is subjected to the washing action of the water used with the drill, which has a tendency to wash the clay out of the ore, and the action of the drill, bailer and rope in knocking the clay overburden from the sides of the hole into the ore body. These two actions are opposite in their effect and it is impossible to judge exactly of the net result. The results of these samples have been accepted as correct for the purposes of this report and checked by the similarity of the analysis with those of samples from the exposed faces at widely separated points.

Drill Holes -- The logs of the drill holes are as follows:

	<u>NO.</u>	<u>OVERBURDEN</u>	<u>DEPTH</u>	<u>VEIN</u>	<u>% IRON</u>	<u>% INSOLUBLE</u>
Hole	1	Clay	75 ft.	10 ft.	40.78	
"	2	"	75 "	9 "	59.63	
"	3	"	147 "	9 "	55.00	
"	4	"	58 "	4 "	51.50	6.42
"	5	"	39 "	6 "	47.50	6.82
"	6	"	125 "	4½ "	50.90	6.87
"	7	"	12 "			
		Rock	18 "		40.05	15.35
		Clay	122 "			

In Hole No. 1 it is probable that some of the overburden was included in the sample so that the thickness of the vein was increased at the expense of the iron content. In hole No. 7 it is possible that the low iron content was due to the change in the method of drilling the hole which may have caused overburden to set into the sample and which was changed again after this hole had been drilled. A face sample was taken from an exposed face on the property not covered by this report adjoining this acreage on the north, which showed metallic iron 47.50 and insoluble 8.13, so that it is not necessarily due to clay carried into the ore from the overburden that the iron content is low in some of the holes. At the same time there is no indication of progressive lowering of the iron content as the vein advances in any direction, and it is to be presumed that such deviations from the typical analysis, if not due to admixture of clay overburden, merely mark local inclusion of clay horses that are not of serious importance. It is impossible to sink test pits into the ore body through the heavy overburden, and any method of drilling will necessarily leave the same uncertainty that now exists as to whether the few instances of lowering of iron content are due to the action of the drill or to local changes in the character of the ore.

OPEN CUTS -- Analyses of the ore outcrop are as follows:

<u>LOCATION</u>	<u>VEIN THICKNESS</u>	<u>PERCENT OF IRON</u>
No. 1 Cut	7 feet	53.45
" 2 "	8½ "	54.67
" 3 "	6 "	54.04
Horseshoe Cut		53.25

No. 1 Cut consists of an open cut about 6 feet wide and extending into the vein about 10 feet. At No. 2 Cut the outcrop is faced up over a space of some 25 feet in width and in the centre of this space a tunnel has been driven into the ore for a distance of approximately 25 feet. At No. 3 Cut, in addition to the tunnel now filled up, made 30 years ago, the outcrop has been faced up for a distance of 100 feet and a tunnel has been run into the ore vein for a distance of 25 feet. In this tunnel is found one of the two occurrences of white horse encountered, consisting of a small clay pocket intersecting the vein in a horizontal plane. The tunnel was carried some 6 feet beyond this clay pocket to find out whether it increased or disappeared, with the result that the clay had almost entirely vanished. The other occurrence was a small clay pocket in the exposed face of No. 3 Cut adjacent to the old tunnel. The Horseshoe Cut is a cut about 8 feet wide and extending into the vein a distance of 15 feet. At No. 4 Cut the vein is merely faced up at the outcrop and no further development has been done.

ANALYSES -- All of the analyses in this report were made in the Commercial Laboratory of Dr. E. W. Lazell, Portland, Oregon, except the typical analysis given in the open paragraphs of this report, which was made in the commercial laboratory of David Hancock, Birmingham, Alabama. A sample of the ore has also been completely analysed showing no Titanium, a trace of Sulphur and negligible quantities of the oxides of calcium and magnesium. No determination has yet been made for copper and zinc.

QUANTITY - The tonnage indicated on the area of 20 acres which has been prospected up to date is based on a vein thickness of 7 feet which is an average of all known faces on the acreage. Assuming that it takes 11 cubic feet of this ore in place to make a ton and allowing for 90% recovery there is a tonnage per acre of approximately 25,000 tons or a total tonnage of 500,000 tons in sight. There is an additional tonnage on the remaining 270 acres that cannot yet be estimated. It is recommended that the drilling be extended gradually into this unknown territory so that this area can be proven up, as it is to be expected that this further exploration will develop a large additional tonnage of ore. The ore body as developed to this point is a fine body of ore of a somewhat limited tonnage. When the ore is proven to occur on several or all of the other forties, the total tonnage will be largely increased with the possibility if the ore is continuous over the entire acreage of a total of several million tons of ore.

CONCLUSION -- This investigation was undertaken to find the defects, if any, existing in this ore body, and the attempt was made to locate the drill holes where the vein would be most likely to disappear. The fact that in spite of this critical examination there has been found no lack of continuity in the ore body and only the slight lowering of grade in the holes indicated herein, points to the continuity and uniformity of the vein. Every facility for carrying on this investigation has been accorded by the owners of the property, who have apparently welcomed an impartial investigation of their property. This report represents the status at this date, and is to be supplemented by a further report upon the conclusion of these investigations.

Respectfully submitted,

D. I. Miller, M. E.

Portland, Oregon  
July, 17, 1922

SINCE THIS REPORT WAS MADE, THE TOTAL ACREAGE ACQUIRED IS 403 ACRES, AND  
150 ACRES DEVELOPED BY CUTS AND BORINGS.

FINAL REPORT ON IRON ORE PROPERTY  
OWNED BY  
OREGON CHARCOAL IRON COMPANY

Since writing my first report dated July 17, 1922, on the above properties, the drilling has been prosecuted continuously up to date of August 5, 1922, at which time my investigations were terminated.

During this time a small blank area was located on the East side of the 20 acres tract, outlined by Holes 8, 9, and 15, and comprising not to exceed four acres. There is some indication that this blank area is the result of a minor disturbance, and as it is surrounded by good holes, this disturbance cannot extend into the proven territory. In order to develop whether this blank area would interfere with the mining of the ore, a hole was put down at Hole No. 16, where the tunnel would most probably be located. This hole was exceedingly satisfactory showing entire regularity of formation and nine feet of high grade ore. The only significance of this blank area then is, that the amount of ore in sight is lowered correspondingly.

On the other hand, on the forty immediately southwest of this twenty acre tract, drill hole No. 32 was put down about 100 feet back from the outcrop of the ore at this point. This hole also was entirely regular and developed about five feet of good ore. The outcrop here has been cut at intervals for a distance of about 800 feet and an area has thus been developed nearly equal to the amount cut out by the blank area above referred to.

At this time, after completing the exploration to the Eastward, it was decided to drill holes at 200 feet intervals Westward from the proven 20 acres, and following this decision Hole No. 21 was put down, developing nine feet of good ore, also Hole No.        in the extreme Northwest corner of this forty went through thirteen feet of good ore. These two holes were in ravines where the cover was under 100 feet in depth. Elsewhere in this forty the drilling would be in cover of nearly 200 feet and for that reason results would be arrived at very slowly.

It was now felt that enough additional known area had been developed to counterbalance the loss due to the blank area on the East side, and again indicate a known tonnage of 500,000 tons. Since this figure had been adopted as one that easily justified the erection of a furnace, and since further drilling would yield results very slowly on account of the heavy cover, at my suggestion my investigation was terminated at this point.

As a result of my investigation we have developed a known tonnage of at least 500,000 tons of this high grade ore, with a probability that ~~further~~ future drilling to the West will show a still greater tonnage, as set forth in my original report of July 17, 1922.

Respectfully submitted,

(Signed)

D. I. Miller, M. C.

Chicago, Illinois  
August 28, 1922

ARTHUR G. MCKEE

January 28, 1922

Oregon Charcoal Iron Company  
Portland  
Oregon

Gentlemen:

At the request of Mr. Martin I came to Portland and during the past week have investigated your plan to build a blast furnace, and as the result of these investigations I wish to make the following observations and comments.

I visited the ore deposit near Scappoose and as a result of the examination there I wish to say that the ore body which I examined and sampled gives every reasonable evidence of being very extensive, of an excellent quality, and should be very easily mined.

This deposit is in the form of a bed of thickness approximately 7 to 10 feet, the top 6 inches being hard brittle ore,  $3\frac{1}{2}$  or 5 feet below this being composed of nodules and fine material intimately mixed. Four to six feet below this is of a fine texture similar to the well-known Mesabi deposits.

I sampled the ore at different points where it is exposed, and Dr. Lazell of Portland reports the analyses of these samples as per attached memorandum.

It will be noted that the ore is a Limonite; that it has an average iron content of 50 to 54% and that on account of its Limonite structure the content of dross is very low, and the total of Silica and Alumina being from 4 to 8%. This should make a very easily reducible ore, and the fuel consumption should be lower than is usually the case for an ore of this iron content.

The sulphur content is within reasonable limits and the phosphorus is low enough for the manufacture of foundry iron and also for the manufacture of basic open hearth steel, should it be decided upon later.

On account of the availability of enormous quantities of timber in the neighborhood of the mine, it will, doubtless, be easy to secure the necessary cord wood or slab wood from which to make charcoal.

I have not been able to get accurate information regarding the cost of charcoal at the blast furnace, but from the information secured it seems reasonable to expect that the necessary fuel can be provided at a cost of \$9.00 a ton, and it is altogether likely that a considerably lower cost can be secured by the installation of retort equipment so that the by-products can be saved and marketed to advantage.

On account of the use of charcoal fuel and the very low content of silica

and alumina in the ore, the amount of limestone required for flux will be very low and in spite of the fact that limestone will probably cost about \$4.00 a ton delivered at the furnace, the necessary flux per ton of iron produced should not be more than 50¢ to 75¢.

From the above information it is likely that the cost of one ton of pig iron will be approximately as follows:

1 Ton of Charcoal.....	\$9.00
2 Tons of Iron Ore @ \$1.00.....	2.00
300 Lbs. of Limestone.....	.75
Conversion cost.....	4.00
Incidentals, Sales, Overhead...	.75

In the above figures I believe that I have made ample provision for all of the cost of iron with the exception of interest on the capital invested and obsolescence.

Before coming to Portland I made as careful inquiry as possible regarding the consumption of pig iron in the territory tributary to Portland but was unable to get information which seemed sufficiently accurate, and since coming to Portland I have made careful inquiry with the result that I am satisfied that the production of the proposed furnace, viz: 50 to 60 tons per day, or 15,000 to 18,000 tons per year can be readily sold in this territory without supplying all of the imperative demand. It is undoubtedly true that, as pig iron is made available here, other industries requiring pig iron will be developed and the demand should grow rapidly in advance of the production available.

In order to foster such new industries I would suggest that the price of pig iron be kept materially below the cost of coke iron at Chicago or Birmingham, plus the freight from point of manufacture to Portland.

In regard to the price at which iron can be sold here, it is reasonable to expect that this will normally be somewhat less than the Birmingham price, plus the freight from point of manufacture to Portland. At the present time coke iron at Birmingham is selling at \$16.50 and the freight by water is approximately \$15.00. Local foundrymen advise me that they are paying approximately \$35.00 for Birmingham pig iron at the present time.

It is a fact that occasional shipments of Belgian pig iron are arriving at Portland in ballast, and are sold at about \$27.00 per ton, and the amount of these shipments is very much less than the present abnormally low consumption, so that these small amounts result only in a temporary recession from the practically standard price of \$35.00.

It seems reasonable to expect that the output of the furnace can be sold for a long time to come at a price of from \$25.00 to \$27.00 per ton and this price should be effective in bringing to Portland many new and useful industries, and at the same time the profit which would be realized from the sale of the output of the furnace at this price should make a very handsome return on the investment in a blast furnace plant.

As the market develops an additional furnace should be installed, and as the investment in ore lands would not be increased materially, and the developing expenses would be absorbed in the original financing of the enterprise, the percentage of profits on the total amount invested would be very materially increased.

I have made careful search to discover, if possible, any reason why the proposed enterprise will not be successful in every particular and must admit that I have been unable to find any such reason, and it is my personal belief that the progressive people of Portland will reap a satisfactory profit from investing in this enterprise, and will at the same time be starting an industry which will be of untold value to Portland and the entire Northwest.

Yours very truly,

Arthur G. McKee

AGMc:S

M. J. LYNN

July 20, 1922

M r. A. W. Martin  
Managing Director  
Oregon Charcoal Iron Company  
Portland, Oregon

Dear Sir:

Complying to your request of July 6th I have spent several days looking over your company's iron ore property located at Scappoose, and beg to report to you as follows:

I find a brown Limonite ledge or seam of ore, extending through the hill and running southwest, with about four and one-half percent, rise looking southwest; the average thickness of ledge about 7 feet.

There is now about 20 acres that is proven up by cuts and drill holes, positively known to obtain ore of the following analyses in natural state:

	IRON CONTENT	
	%	%
(Samples	53.25	54.00
(from	54.04	54.67
(cuts		Average of 53.99

Samples secured from drill holes through the ledge at seven places, spaced about 250 feet apart; looking East, West, North, and South, and striking ore at or near the expected level, showing the ledge to be continuous. Method of drilling used was the ordinary churn or gravity system, raise and drop.

ANALYSES TAKEN ARE AS FOLLOWS:

	%	%	%	Average
(Samples)	47.50	55.00	46.78	50.19
(from )	51.50	40.05		
(Drill )	50.90	59.63		
(Holes )				

The lower average analyses for the drill holes can be easily explained by the insolubles raveled down in test holes caused by the whipping of rope and drill in the course of operation, and will in all probability, check closely with cut analyses as shown above. The general average of the total 11 samples taken is found to be 51.6 percent, or 1.86 efficiency per ton of iron.

The general physical appearance of this ore is as follows: There is about 6 inches of medium, hard ore on top, and next under this there is about 4 feet 6 inches granular ore, ranging in state of divisions from 2 inches to 1/2 inch size. Directly under this there is about 2 feet 6 inches, ranging in size from 1/2 inch to 1/8 inch, and then finally footing out on clay bottom.

This prospective work of cuts and drill work represents an acreage of about 20 acres, and in ore tonnage represents 672,000 tons of 1.86 efficiency ore, equivalent to 361,290 tons of pig, or 11 years, 277 days operating of furnace at 90 tons per day, working 350 days in the year.

There are several small cuts entered on other parts of the property that show the same ore at the expected levels, which go to show without a doubt to be the same ledge or vein, and as there are 380 acres total, assuming the balance of 360 acres to average 50 percent, of like ore bearing ledge I can very conservatively say there is 40 years' operating for two 90-ton furnaces, 350 days each year.

VALUATION OF ORES -- The value of an ore of iron depends upon many conditions. Three conditions at least may be considered essential, the absence of any one of which may prove fatal to an ore otherwise desirable. These three requirements are richness, accessible location, and suitable composition.

I find this ore deposit to qualify 100% on the above stated requirement for general foundry work.

During my 30 years of furnace and mine operation in the south and Lake Superior District I firmly believe from an economical point of view this property will prove as good as any, and superior to many of the above stated districts.

I am told that charcoal is offered delivered at furnace for \$6.00 per 100 bushels: Limestone at \$4.00 per ton, and your ore at 85¢ per ton.

Having checked out the above figures I am convinced you can produce pig iron at the following price per ton:

100 Bushels Charcoal	\$6.00
1.86 Tons Ore at 85¢	1.58
Limestone	.27
Conversion	2.50
Sales, Tax & Overhead	<u>.65</u>
	\$11.00

Should you in times of depression have to sell your product as low as \$25.00 per ton, you will then have left very good returns on your investment, and should you decide to recover vapors from wood distillation you can safely expect \$5.64 total returns per cord of wood, which represents \$5.28 not additional return per ton of iron.

In conclusion I recommend you place one blast furnace in operation at your earliest convenience, and additional unit and chemical plant construction can be taken care of while you are in operation.

It is my firm belief that with both furnaces operating you will find ready sale for the entire output, and your operations will prove a grand success from the start.

Very truly yours,

M. J. Lynn  
Superintendent of Furnaces  
Cleveland-Cliffs Iron Company  
Marquette, Michigan

REPORT TO THE  
IRON-ORE DEVELOPMENT CORPORATION

Portland, Oregon  
November 10, 1925

Mr. George F. Heusner, President  
Iron-Ore Development Corporation  
Portland, Oregon

Dear Sir:

Pursuant to your instructions of May 8th last to do the requisite surveying and prospecting for iron-ore on your properties west of the portion previously proved by Messrs. D. I. Miller, E. W. Lazell, and M. J. Lynn, I beg to report this work is now complete and I am handing you herewith tracings, blueprints, etc., explanatory of the results obtained.

It was my understanding that since the acreage previously developed proved a true blanket of ore, your desire was that the area to West thereof be similarly prospected to prove the continuity and quality of the ore body. This work was started on May 16 and halted November 7 as the continuity of the ore body seemed clearly established and further development at this time could but incur a needless expense.

The new area developed consists of approximately 100 acres and a casual estimate of the ore underlying same based on 11 cubic feet to the ton, I would place at approximately 3,000,000 tons.

The work was all done with a power churn drill, 8 holes being driven and the ore being encountered at the proper elevation in each case and samples of the sludge of each foot of bailings submitted to Dr. E.W. Lazell's commercial laboratory with the analysis as shown herein, which, with the exception of Hole #6 seems to bear out all previous analyses. I will say in this connection that the samples submitted were necessarily more or less contaminated with clay from above, due to the whipping of drilling lines and the analysis for iron would therefore be reduced slightly: probably as much as 3% could be added to your iron content due to this cause. In addition to the 8 holes drilled I ordered a facing made on the north side of the property designated as Cut #8. This shows a 5½ foot face of the same character of ore, a channel sample of which is now with Dr. Lazell for analysis and the result of which you will later receive.

Respectfully submitted,

Leo W. Miller  
C.E. & M.E.

P.S. Dr. Lazell has just reported 54.67% as the iron content in Cut #8.  
L.W.M.

Dr. Lazell later reports officially on the above 56.11%.

Received November 12, 1925 (Attached hereto)

E. W. LAZELL, Ph. D.  
Chemical & Efficiency Engineer  
537 Railway Exchange Bldg.  
Portland - Oregon

November 11, 1925

Mr. George Heusner  
Portland  
Oregon

Dear Sir:

I report the determination of iron in a sample  
of iron ore submitted by you:

Lab. #23118

Iron.....56.11%

Respectfully submitted,

E. W. LAZELL

(In duplicate)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BONNEVILLE POWER ADMINISTRATION  
PORTLAND, OREGON

IN REPLY REFER TO:

May 2, 1942

*Iron*

Mr. Earl K. Nixon  
Department of Geology and  
Mineral Industries  
706 Woodlark Building  
Portland, Oregon

Dear Mr. Nixon:

I am enclosing a copy of some information we have on the Zeballos iron ore deposit which we discussed with M. D. Curran the other day. Little was known about it at the time this was received, but subsequently the Province has examined it, making a downward revision of the tonnage estimate.

The low sulphur and phosphorus with high iron place it high among potential sources of high purity iron, and if Ventures, Ltd. would sell at a reasonable price the stuff should make an excellent sponge.

Sincerely yours,

SYSTEM PLANNING & MARKETING DIVISION

*Raymond M. Miller*

RAYMOND M. MILLER  
Sr. Industrial Engineer  
Market Development Section

Enclosure

RECEIVED  
MAY 5 - 1942  
STATE DEPARTMENT OF  
& MINERAL IND.

*(Handwritten mark)*

COPY  
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Bureau of Mines  
Division of Metallic Minerals  
Ore Dressing and  
Metallurgical Laboratories

CANADA DEPARTMENT OF  
MINES AND RESOURCES  
MINES AND GEOLOGY BRANCH

OTTAWA, August 25th, 1939.

SAMPLE OF Iron Ore

DESCRIPTION

RECEIVED FROM J. G. Williams  
ADDRESS A. W. Ford & Co., Limited  
Zeballos, B. C.

<u>Assay No. 4013</u>	Silica (SiO <sub>2</sub> )	-	2.01%
	Iron (Fe)	-	68.90
	Calcium Oxide (CaO)	-	0.68
	Magnesium Oxide (MgO)	-	0.60
	Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> )	-	0.75
	Titanium Oxide (TiO <sub>2</sub> )	-	0.11
	Phosphorus (P)	-	Trace.
	Vanadium (V)	-	None detected.
	Gold (Au)	-	Trace.

SIGNED R. R. Rogers  
for  
Chief Chemist

COUNTERSIGNED P. S. Parsons  
Chief of Division

TTM/AEL/HWW

COPY  
eah

Office of  
the Chief  
Bureau of Mines

DEPARTMENT OF MINES & RESOURCES

MINES & GEOLOGY BRANCH

Ottawa,  
August 31st/39

Mr. J. G. Williams  
A. W. Ford & Co. Ltd.,  
Zeballos, B. C.

Dear Sir:-

Referring to your letter of July 24th, I wish to advise that the sample you shipped to us was not received until August 9th. This sample represents a high-grade iron ore and the results of our analysis is enclosed herewith.

This ore should be worth about \$7.00 per ton f.o.b. Atlantic ports. We do not know where you could market this ore to better advantage. There are no large blast furnaces on the Pacific coast and your ore would either have to be shipped to the Orient, to European ports, or as mentioned above, to the Atlantic coast, possibly Philadelphia.

It is suggested that you take the matter up with the representative of the British Metals Corporation (Canada) Limited, in Vancouver, or write their head office in the Dominion Square Building, Montreal, Quebec.

Yours very truly,

CSP:GWH

---

W. B. Timm  
Chief, Bureau of Mines.

A DEPOSIT OF MAGNETITE IRON ORE  
IN THE ZEBALLOS AREA

At a distance of some four and one half miles from Zeballos, up the Zeballos River and across from the Privateer Mine, is a large deposit of magnetite. This deposit is located in the vicinity of the Twin Peaks. Its lowest outcrop is at an altitude of some 2400 feet. It can be traced to an altitude of some 2750 feet to the top of the ridge and over the other side. Very roughly, its width is about 400 feet, its length some 3000 feet and its depth as shown by lowest and highest outcrops, some 350 feet, giving a volume of some 420,000,000 cubic feet. At 7 cubic feet per ton (Pure Magnetite contains 6.4 cubic feet per ton) this gives 60,000,000 tons. These figures are very rough as they were obtained from a very superficial examination.

This deposit appears in the contact zone between an intrusive granodiorite rock and a white crystalline limestone.

Few inclusions were noticed in the body of the deposit; one or two narrow tongues of granodiorite or granodiorite dykes appear near one side of it.

Several assays ran by the Zeballos River Assay Office gave:- Iron 59 to 60% Sulphur 0.06% Phosphorus 0.02%.

An analysis on a sample of ten pounds sent to the Department of Mines and Resources at Ottawa was as follows:-

Silica (SiO <sub>2</sub> ) .....	2.01%
Iron (Fe) .....	68.90%
Calcium Oxide (CaO).....	0.68%
Magnesium Oxide (MgO).....	0.60%
Aluminum " (Al <sub>2</sub> O <sub>3</sub> ).....	0.75%
Titanium " (TiO <sub>2</sub> ).....	0.11%
Phosphorus (P) .....	Trace
Vanadium (V) .....	None detected.

As shown by the above analysis, this deposit is remarkably free from detrimental impurities and is suitable for the production of a high grade pig iron.

/s/ C. C. Camp

Member: Canadian Institute of  
Mining and Metallurgy.  
Professional Engineers  
of B. C.

**H. A. BRASSERT & COMPANY**  
REPORTING - CONSULTING - CONSTRUCTING - OPERATING  
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NEW YORK · CHICAGO · LONDON

E. L. IVES  
EXECUTIVE VICE PRESIDENT

*Iron*

June 12, 1940.

Oregon Department of Geology  
and Mineral Industries,  
702 Woodlark Building,  
Portland, Oregon.

Gentlemen:

We are returning herewith  
originals and copies of two reports on  
magnetite properties in British Columbia.

The Porcher Island reports  
are for the departmental files; the original  
of the Zaballos report is to be returned to  
Mr. Dodson of the Portland Chamber of Commerce.

Very truly yours,

*Earl K. Nixon*  
EARL K. NIXON

EKN:JH

Encs.

# PORTLAND CHAMBER OF COMMERCE

PORTLAND, OREGON,

824 S. W. FIFTH AVENUE

CABLE ADDRESS: PORTOREGON

ATWATER 9411

MEMBER  
OF  
CHAMBER OF COMMERCE  
OF THE  
UNITED STATES OF AMERICA

RECEIVED  
DEC 3 1940

December 2, 1940

STATE DEPT OF GEOLOGY  
& MINERAL INDS.

Mr. Earl K. Nixon  
Dept. of Geology and Mineral Industries  
702 Woodlark Building  
Portland, Oregon

Dear Mr. Nixon:

Colonel E. V. Potvin, a well known and highly respected business man of Lewiston, Idaho, who has a real estate and insurance office there, has sent a few samples from an iron deposit, which he has informed us recently was picked at random from a very large ledge located on the Snake River.

He explains that the property is now accessible by small boat line plying out of Lewiston and is also accessible by an old wagon road. He expressed the opinion that this iron deposit also contains copper, gold, silver and some chromium and advises that in the event you desire to have your representatives look at the property he can arrange for transportation. It seems that the boat line goes above the deposit about 65 miles, stays there over night and returns the next day, therefore, should you want one of your men to accompany Colonel Potvin to look at this property on the Oregon side of the river, he could leave Lewiston one day and return the next.

Yours sincerely,

*Arthur J. Farmer*  
s.

Arthur J. Farmer  
General Manager

AJF

s

*John*

# PORTLAND CHAMBER OF COMMERCE

## PORTLAND, OREGON,

MEMBER  
OF  
CHAMBER OF COMMERCE  
OF THE  
UNITED STATES OF AMERICA

824 S. W. FIFTH AVENUE

CABLE ADDRESS: PORTOREGON  
ATWATER 9411

January 9, 1940

RECEIVED  
JAN 10 1940  
STATE DEPT OF GEOLOGY  
& MINERAL IND.

Mr. Earl K. Nixon, Director  
Department of Geology and Mineral Industries  
Oregon Building  
Portland, Oregon

Dear Earl:

C. W. Daughs of The Dalles, who called on you briefly with respect to a new process for producing iron from ores, has given me a copy of his correspondence with New York parties.

I am enclosing a copy of the correspondence, including cost estimates as furnished me by Mr. Daughs.

In addition, I am having a business man call upon these people in New York soon for the purpose of trying to determine whether we could safely consider the new plan.

As you are an experienced iron and steel man and no doubt have grievous apprehension about new processes such as this I thought you should have this data in your files, which I am offering you with the consent of Mr. Daughs.

Sincerely yours,

*W D B Dodson*

W. D. B. DODSON  
Executive Vice-President

WDBD-e  
Incl.

*File "Dodson" Steel -  
direct reduction process.*

✓

MINERALS REDUCTION CORPORATION  
22 East Fortieth Avenue  
New York City, N.Y.

June 28, 1939

Mr. C. W. Daugh  
1205 Elm Street  
The Dalles, Oregon

Dear Mr. Daugh:

Many thanks for your letter of June 24th and I note you and your associates own a considerable acreage of iron ore a short distance northwest of Portland. Are these what are known as the Scappoose Iron District properties? If you care to give us the name, would be very interested in getting in contact with the Eastern parties who have leased your properties on a royalty basis, with the understanding they would do further exploration work. It is quite possible our Process might make your properties much more attractive.

We have had recent correspondence with Mr. D. Earle Stewart of Portland, Oregon, who is trying to work up something on a steel plant for the Pacific Northwest - possibly this may include your properties.

We are very interested in the possible establishment of an ore reduction and steel plant near Portland and believe that vicinity could readily absorb all the finished steel a relatively small plant could make and still leave room for other plants near San Francisco or Los Angeles.

In our opinion, however, it is out of the question to consider a standard blast furnace plant using coke for any of these locations. A complete plant to produce 600,000 tons of finished steel per year from 40% pig iron and 60% scrap would cost over thirty million dollars. Possibilities of Far Eastern and Middle Western U. S. competition would make such an investment very hazardous.

It is, however, entirely practical and feasible to start off with a low temperature gaseous reduction process, such as the "Hodson-Hirsch" method, and gradually build up quite a major steel industry - using local ores and fuel. Fortunately, the process is not dependent on high grade coking coal and no limestone flux is used. Any form of fuel that can be gasified - oil fields crude heavy oils and residues, natural gas, lignites, shales, petroleum coke, soft or hard coals, are all equally applicable to the new process and less than one-sixth of such fuel is needed as compared to standard blast furnace practice. Sulphur or ash content of such fuels does not affect the product. It is quite possible to make high grade finished steel with our reduction process, using entirely local Pacific Coast raw materials, at several dollars per ton below even the best costs at Chicago, Utah or Pittsburgh.

Mr. C. W. Daugh

Would very much appreciate any information or data you might be able to give us of your own and of any Southern California iron ore deposits. We believe our Process has a great future for it in the Pacific States having mineral ores and it is particularly attractive where cheap electric power is also available.

We will be glad to contact the firm here in New York whose name you have kindly given us.

Very truly yours,

MINERALS REDUCTION CORPORATION

Frank Hodson, President

MINERALS REDUCTION CORPORATION  
22 East 40th St. New York

August 9, 1939

Mr. C. W. Daughs  
1205 Elm Street  
The Dalles, Oregon

Dear Mr. Daughs:

We are obliged for your letter of August 2nd, and in reply would state the "Hodson-Hirsch" Process of gaseous low temperature reduction of mineral ores is the result of over 15 years experimental and practical work by my associate, Dr. Paul A. Hirsch, and myself, during which time some thousands of tests have been run on all kinds of ores, and with coal, coke, peat, petroleum coke, producer and natural gases, pitch and other forms of fuel and reducing agents. The work was completed about a year ago and simple rugged steel works plant designed to do the actual reducing operations. We have actually gone a very long way beyond the purely experimental stage and the process has had the full endorsement of practically all the leading technical engineers and metallurgists who have investigated and checked it.

The smallest pilot plant we would care to consider installing would cost something between \$20,000.00 and \$25,000.00 and would make about 4 to 5 tons per day. A plant for 50-60 tons per day would only cost between \$60,000.00 and \$70,000.00 and this is really the size we would prefer to see installed.

With coal say at \$3.00 per ton and iron ore (60-65% iron) at \$4.00 per ton, it is feasible and practical to reduce West Coast magnetite ores to iron powder and then melt the resultant iron powder in an electric melting furnace at a total cost of under \$15.00 per ton of steel in ingot form - in all probability nearer \$12.00 in the larger plant. This would be the highest quality steel, similar to "Armco" iron.

The lowest cost I know for pig iron in a very large plant here in the East, with low cost raw materials and where full credit can be taken for gas, by-products, etc. is \$13.00 per ton. Most plant costs will be nearer \$16.00 per ton for pig iron. This pig iron also is only 93% iron; our product would be 98-99%.

In my opinion it would be asinine to even consider the huge investment necessary to build a standard blast furnace on the Pacific Coast. This would be subject to fierce competition from the firms you name and also to Indian, and later possibly, to Far Eastern competition. The only solution is a process such as ours, not dependent on high grade coking coal or high quality ore, that can be started for a very modest initial capital investment and gradually built up into an important major industry. Los Angeles would be an excellent location and we can make full use of the available natural gas, both for heat and reduction.

We decided not to approach Franklin Flick & Co. until we had something a little more definite from your people to put forward. Capital is available here provided say 75% is guaranteed from the interested parties out there. In some cases, financial friends of ours, who are sold on our process, have expressed a willingness to go 50-50 with any really good development we recommend.

We are willing to cooperate fully on the engineering and metallurgical end, and would also like to become personally associated with such a plant.

Very truly yours,

MINERALS REDUCTION CORPORATION

Frank Hodson, President

MINERALS REDUCTION CORPORATION  
22 East 40th Street, N.Y.

September 22, 1939

Mr. C. W. Daughs  
1205 Elm Street  
The Dalles, Oregon

Dear Mr. Daugh:

Your letter of September 14th was received in Mr.  
Hodson's absence.

As Mr. Hodson is in Canada on a very important negotia-  
tion, and is not expected back in New York until after the first of  
October, we will have to hold this matter up until he returns.

As soon as we have definite news for you we will im-  
mediately communicate with you.

Very truly yours,

MINERALS REDUCTION CORPORATION

John Lindsey, Secy to  
Frank Hodson, President.

Mr. Dodson did not return until first of November.

NEW YORK N Y 1247 PM

November 8, 1939

C W DAUGHS  
1205 ELM STREET

CONFIDENT FIFTY PERCENT TOTAL CAPITALIZATION IMMEDIATELY AVAILABLE  
HERE PROVIDED FIRM OFFER FROM RESPONSIBLE PARTIES AND AN ACCEPTABLE  
PROPOSITION FORTHCOMING

HODSON MINERALS REDUCTION

MINERALS REDUCTION CORPORATION  
500 Fifth Avenue, New York

November 11, 1939

Mr. C. W. Daughs  
1205 Elm Street  
The Dalles, Oregon

Dear Mr. Daughs:

We confirm telegram answering briefly your letter of November 8th, as follows:

COMPLETE FURNACE EQUIPMENT ERECTED SIXTY TONS PRODUCT PER DAY APPROXIMATELY SIXTY THOUSAND DOLLARS EXCLUDING BUILDING STOP WORKING CAPITAL FIFTY THOUSAND WRITING

We are very pleased to hear you have taken prompt action with Mr. Heysner in Los Angeles and have succeeded in getting the three prominent gentlemen mentioned in your letter of October 31st to agree to undertake half the financing of the plant.

The costs we have indicated do not cover anything for mining as we have assumed the ore would be delivered to us at a fixed price. It also does not cover building to house the plant as this might be anything. We will need something between 80 to 100 ft. long x 60 ft. wide with small crane facilities at one end. If necessary, this could be a small runway or wall crane. Some old foundry or similar building can no doubt be rented with option of purchase.

On separate sheets we are attaching estimates of costs. These would be subject to some minor revisions when we know more of the nature of the ores to be reduced and when we know what fuel can be best applied. Coal seems expensive and not too high a quality and 15¢ gas is also not cheap as gas goes. We can, however, very well use crude petroleum residues or crude oil. Send us details of cost and materials available.

We would undertake complete responsibility for design, erection and metallurgical engineering for the plant and find the necessary skilled operators to run it for the company. Dr. Hirsch and I would be willing to act as Consulting Metallurgists to the whole project for whatever time you wanted us to operate. We think this would be for at least a year.

One of us might also be willing to act on your directorate, particularly if we find part of the capital here.

We are willing to license our Process on a flat tonnage royalty of product, or we might consider taking a block of stock and merely a nominal royalty per ton. In general, the straight royalty would be based on something between 5 and 7½% of the selling price of product.

We quite agree and recognize your services in putting this thing together will be fully taken care of and no doubt the method outlined by you can be worked out later. If you have any suggestions on this please put them forward.

In order to raise our capital here we will need full information from you on the proposed backers, the source of ores, analysis and cost of ores delivered at plant site, and the general proposed set-up. Any written confirmation you can secure of the willingness of the three gentlemen to invest, subject to our providing an equal amount, should be given. We are not at all interested in anything that is even remotely connected with selling stock, but we are vitally interested with a few good substantial associates on the Pacific Coast in putting down a commercial plant for ore reduction, and we know the very handsome monetary returns we can expect from such a plant.

On separate sheets we give list of possible products that can be made and estimated profit per ton on each, assuming normal working conditions and raw materials. Some of the higher grades of product mentioned would call for a little higher initial cost of plant than the lower, but we believe the plant expenditure put forward would cover everything.

Merely as a guide, we may say on some other Eastern projects, in which we expect to become associated, we have been offered a continuing 25 to 35% stock interest to become metallurgically interested in the development and operation of plants under our Process. In such cases we expect to waive tonnage royalty payments, except for a merely nominal sum per year. In some cases actual capital invested will be given preferred stock to be redeemed by 25% of all profits, and of course common voting stock similar to what we receive. This is quite agreeable to us and perhaps gives a better measure of protection for the actual cash invested.

Our idea would be to start off in a small modest plant, making the simplest kind of a saleable product, possibly with a small electric furnace to make billets, charcoal iron or forging bars, but without an initial rolling or finishing mill. When costs and product are proved, which should not take more than six months from the date of inception of company, we could then decide on the future extensions and policy.

There is a splendid opportunity right now to get this project started and we can assure you it can be made into a very large and successful business undertaking.

Yours very truly,

MINERALS REDUCTION CORPORATION

Frank Hodson, President

MINERALS REDUCTION CORPORATION  
500 Fifth Avenue, New York

November 15, 1939

Mr. C. W. Daugh  
1205 Elm Street  
The Dalles, Oregon

Dear Mr. Daugh:

Further to our letter of yesterday, we are attaching hereto estimate of cost of pilot plant for production of 5,000 lbs. of iron ingots per hour, also estimated cost of production.

We await any further news from you and assure you of our willingness to cooperate in every way.

Yours very truly,

MINERALS REDUCTION CORPORATION

Frank Hodson, President

MATERIALS TO BE PRODUCED IN "HODSON-HIRSCH" PROCESS FROM PACIFIC  
COAST IRON ORES

1. REMELTING BASE IRON PRODUCT. The cheapest and simplest product that can be made by the "Hodson-Hirsch" Process is a product for remelting in cupola furnaces used to make cast iron or in open-hearth and electric furnaces making steel. We do not have recent figures of the quantity of iron or steel melted in such furnaces in the Pacific Coast states or in the states west of the Rockies, but it probably exceeds a million tons a year. We would put the native ore through a very quick, inexpensive reduction process, remove sulphur and part of the other impurities and make a compressed sintered product of reduced iron and partially reduced iron. The exact ratios of reduced to unreduced iron in this product would be decided after we had checked available ores and markets for products.

This would be a new metallurgical product we could afford to sell well under the selling price of pig iron and, if necessary, near to the price of heavy melting scrap. Once introduced, we expect a large market for it and profits would run from \$5.00 to \$12.00 per ton, depending upon the grade of product made.

2. PURE SPONGE IRON BASE for melting in electric or open hearth furnaces. This would be a wholly reduced product, carbon free and is one of the best melting bases known. Present price is around \$43.00 per ton, c.i.f. New York for Swedish imported material, but the high cost prohibits extensive sales. We can sell in competition with "Armco" ingot iron remelting scrap - used for manufacture of alloy steels - and at a selling price of from \$20.00 to \$30.00 per ton, f.o.b. plant, could ship to any plant west of Pittsburgh and make a very good profit.

All our output from the initial plant could very well be taken up by Items 1 and 2, and I believe these markets would readily absorb up to 1,000 tons a day or more for an average profit of at least \$10.00 a ton. Pig iron sells on the Pacific Coast for \$26.50 per ton and charcoal pig iron costs \$30.34 per ton at Chicago.

3. CONVERTING REDUCED IRON PRODUCT TO STEEL. This would then be a continuous hot process with an electric or other type melting furnace as a finishing unit. The product would be ingots, slabs or billets of any desired grade of steel, ready for rolling or subsequent fabricating. Re-rolling billets, slabs, etc. sell for \$34.00 per ton, Cleveland, Buffalo, Duluth or Detroit, forging quality \$40.00 to \$42.00, f.o.b. plant. "Armco" iron billets usually command a premium of \$8.00 to \$12.00 per ton over these prices and we can readily make this quality. To these prices must be added freight. Cost to us will run something between \$15.00 and \$22.00 per ton, depending on base costs of raw materials, size of plant, etc.

A small second hand merchant rolling mill could be installed at a cost of between \$20,000.00 and \$25,000.00, capable of handling our ingots or billets and of making soft steel bars or standard shapes, selling on the Pacific Coast at 4¢ per lb. Cost of rolling should not exceed \$12.00 per ton. Cold finished steel bars sell on the Pacific Coast for from 6.80¢ to 8.55¢ per lb. This would call for additional equipment over the small merchant mill.

All these fabricated lines of steel are used in large quantities in the Pacific Coast states and a much larger margin of profit can be obtained than in remelting products.

Prices given are current base quotations from "Steel" and "Iron Age".

ESTIMATE OF COST OF PILOT PLANT FOR PRODUCTION OF 5,000 LBS. OF IRON INGOTS PER HOUR FROM 10,000 LBS. OF POWDERED IRON ORE, WITH COAL OR CARBON AS REDUCING MEDIUM.

Proposed location of plant  
Los Angeles, Cal.

DESCRIPTION OF MACHINERY

1. Reduction furnace, feed pipes, supports, ladders and air preheater, including inlets and outlets.	\$15,500.00
2. Recuperator furnace, stack, burners, etc.	2,500.00
3. Cold air blower and motor	500.00
4. Buell Collector and supports.	2,500.00
5. Piping from furnace to collector and pipe line from collector to preheater	1,000.00
6. Coal pulverizer, incl. motor.	3,000.00
7. Coal collector and supports	300.00
8. Mixer, feeders with 2 motors with reducers and speed regulators, covered hoppers, 2 elevators with 2 motors and speed reducers, screw conveyor, control gear, chains, etc.	3,500.00
9. Platform for mixer and feeder mechanism	750.00
10. Blower for auxiliary feed pipes with auxiliary coal feed, incl. motor	350.00
11. Floor plates	200.00
12. Thermometer control	1,200.00
13. Switchboard and wiring	750.00
14. Switches, starters, etc.	500.00
15. Foundations, channels, concrete blocks	1,500.00
16. Laboratory equipment	1,500.00
17. Insulating material	1,200.00
18. Cleaning and separating equipment	2,500.00
19. Erection	<u>3,000.00</u>

CARRY FORWARD 42,250.00

	BROUGHT FORWARD	\$42,250.00
Contingencies		5,000.00
Fire insurance and workmen's compensation insurance during erection		500.00
Supervision, design, overhead, etc.		<u>12,500.00</u>
	Total	\$60,250.00

Note: Building not included  
Traveling expenses not included  
(It is presumed that concentrated ore is available in powdered form)

If an electric furnace is required, add \$25,000.00.

Estimated net cost of reduced iron powder - per ton \$11.274.

Cost of electric melting of hot reduced powder iron - per ton \$3.00.

MINERALS REDUCTION CORPORATION

500 Fifth Avenue

NEW YORK

D) COMPUTATION OF COST OF LABOR FOR PRODUCING 2100# OF IRON POWDER IN A PLANT PRODUCING 60 TONS OF IRON INGOTS PER DAY - 18,000 TONS PER 300 DAY YEAR

<u>Description</u>	<u>No. Men</u>	<u>HRS. per day</u>	<u>rate per hr.</u>	<u>Cost per day</u>	<u>Cost per ton</u>
Handling material	2	10	\$0.60	\$12.00	\$0.20
Plant operation	3	8	0.80	19.20	0.32
Operator Helpers	6	8	0.60	28.80	0.40
Handling finished product	2	10	0.60	12.00	0.20
Chemist	<u>1</u>	10	1.00	<u>10.00</u>	<u>0.17</u>
TOTAL LABOR	14			\$82.00	\$1.37
Contingencies - 10%				<u>8.20</u>	<u>0.14</u>
				\$90.20	\$1.51
Accident insurance					0.45
Management and office, \$12,000 per year					<u>0.66</u>
TOTAL LABOR, MANAGEMENT, OFFICE EXPENSE					<u>\$2.62</u>

E) ESTIMATED COST OF MELTING 2100# OF HOT IRON POWDER INTO 2000# of iron ingots

<u>KWH used per ton</u>	<u>Cost of power per KWH</u>	<u>Total cost of Power</u>	<u>Cost of labor per ton</u>	<u>Total cost of melting</u>
300	\$0.0075	\$2.25	\$0.75	\$3.00

SEE NEXT PAGE FOR SUMMARY OF COSTS

PLANT PRODUCING 60 TONS OF IRON INGOTS - 18,000 TONS PER 300  
DAY YEAR FROM POWDERED IRON ORE

SUMMARY OF COSTS OF PRODUCING ONE TON OF IRON  
INGOTS

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Cost of Material	\$9.94
Cost of labor and management	2.62
Cost of power purchased	0.175
Fixed charges	<u>0.352</u>
Cost for 1 short ton of iron powder	13.087
Less credit for steam	<u>1.92</u>
	\$11.167
Cost of melting	<u>3.00</u>
Net Cost of Iron Ingots	<u>\$14.167</u>

Note: These costs are based on assumption that powdered iron concentrates are available

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MINERALS REDUCTION CORPORATION  
500 FIFTH AVENUE  
NEW YORK

MINERALS REDUCTION CORPORATION  
500 Fifth Avenue, New York

November 16, 1939

Mr. C. W. Daughs  
1205 Elm Street  
The Dalles, Oregon

Dear Mr. Daughs:

I find I have several letters of yours to acknowledge - November 8, 10 (2) and 11th, but you will have since received ours of November 15th enclosing estimate of pilot plant, based on recent quotations for material. The figures given are all on the high side and once the plant is in regular operation I believe costs can be materially reduced from those indicated.

We have allowed 10,000 lbs. of ore to produce 5,000 lbs. of reduced iron powder on the assumption the iron content will be 51 to 52%. If the ore is concentrated to higher iron content, then increase output accordingly. Loss of iron during process should be between 2 and 3% only.

Flux. No flux is necessary in the actual reduction process and if we go on to convert the reduced iron to molten steel, little or no flux beyond possibly a few pounds of limestone per ton of steel will be needed. The ore itself may contain enough flux and we may keep this in with the reduced iron.

Fuel. For initial operation of plant we would probably prefer to use coal in order to keep the varients as low as possible. Later on we can work out a simple method of making a suitable reducing gas from available sawdust waste and "hog fuel" instead of coal.

Nature of Ore. Magnetite is, of course, the simplest and easiest form of iron ore to reduce as it can be cheaply concentrated magnetically to high iron, low gangue content. However, hematite, limonite and the carbonate or sulphide ores of iron also readily respond to inexpensive treatment by our Process. We have an excess of waste hot gases and the available heat in these can always be used to drive off moisture in, say, limonite ore.

#### REMOVAL OF IMPURITIES

Sulphur is the easiest of all impurities to remove, irrespective of whether originally present in ore, coal or fuel used, and the removal can be practically 100%.

Sulphur present in the ore exists as a sulphide of iron. The initial reaction in the furnace, when oxygen is present in the form of iron oxide and in the oxygen of the air or gas, is strongly oxidizing for a brief period of time. With finely pulverized ore and at the existing temperature, the sulphur (in whatever form it may be present) has a great affinity for oxygen and burns to form sulphur dioxide gas. This remains as a gas (either elemental sulphur, SO<sub>2</sub>

or  $SO_3$  gas) and is carried out in the gaseous stream after the metallic iron powder has been precipitated.

Temperatures are much too low and the time element (seconds only) too short to permit either chemical or physical combination of sulphur and iron. It is immaterial to us, on account of above named conditions, what the sulphur content is in either fuel, gas or ore. In some cases in treating iron pyrite or pyrrhotite ores, the burning of this sulphur with oxygen can be made the main source of heat for the iron reduction.

In a blast furnace or any molten smelting process, conditions are entirely different, as molten iron will most readily chemically absorb sulphur present in gases and fuel, so the resultant pig iron is always much higher in sulphur than the original iron ore.

#### REMOVAL OF PHOSPHORUS AND EARTHY IMPURITIES IN ORE

This usually exists in ore in the form of tri-calcium phosphate and the initial crushing of ore to fine size and subsequent sudden heat of reaction tends to still further break down its particle size. The bulk of the phosphorus present, on account of its smaller size, can be carried off with the exhaust gases. Any larger particles that might come down with the iron can be removed by magnetic concentration of the iron (which would only be necessary with very high phos. ores), or it can be slagged off in the usual way during the final melting of the reduced iron powder. The same principles apply to excess of silica, alumina, or other earthy "gangue" impurities in the ore.

In a blast furnace some of these impurities always combine with the molten pig iron, as does carbon. That is why total "foreign" matter in pig iron, carbon, silicon, sulphur, phosphorus, etc. usually runs 5 to 7%, with only the balance iron.

Carbon. Carbon only combines with iron if it is molten or if a long period of contact between the iron and carbon exists. Our temperatures are  $10000^{\circ}$  F. below the molten temperatures; there is no contact of iron and carbon and the time factor is instantaneous. Pure iron, carbon free, is therefore produced and this is the simplest and most valuable metallurgical form of iron for any subsequent use.

Ores and fuels, therefore, that would be rejected by any steel concern looking to blast furnace reduction can be used by the "Hodson-Hirsch" Process and a higher grade of finished steel made therefrom.

We are glad to know who your associates are and look forward to receiving some definite plan from you, with the necessary preliminary assurances as to capital available.

Yours very truly,

MINERALS REDUCTION CORPORATION

Frank Hodson, President

PITTSBURGH ELECTROMELT FURNACE CORPORATION - PITTSBURGH, PA.

September 14, 1937

Mr. C. W. Daughs  
Box 656  
The Dalles, Oregon

Dear Sir:

Replying to your September 7th letter we are listing below a cost estimate based on the production of pig iron, using your ore and cost figures you have given us. The cost estimate, of course, covers only the cost of furnacing the ore. It does not cover the cost of pigging same nor overheads on equipment other than the furnace itself.

We note that you are figuring on ore being delivered at \$1.00 or less per ton. While we are not completely familiar with the mining costs in your district, it appears that this is a very favorable figure.

The following is a cost estimate per ton of molten pig iron at the furnace spout.

2 tons of ore @ \$1.00 per ton	\$2.00
.4 tons coke @ 9:50 per ton	3.80
.5 tons limestone @ \$5.00 per ton	2.50
Power 3000 KWH @ \$.0025	7.50
Electrodes 18 lb. @ .08 per lb.	1.44
Repairs and maintenance	1.00
Labor	4.00
Depreciation, amortization, etc.	<u>1.00</u>
Total	\$23.24

In making up the foregoing estimate you will notice that we have figured on 3000 KWH per ton and have also figured on a little higher electrode consumption than mentioned in our September 3rd letter. This would, of course, take care of extra requirements due to the ore being limonite.

While the labor item we have shown might be sufficient to cover cost of labor for pigging, it might be well for you to figure in one or two additional men. We assume that you would figure on pigging in sand as the tonnage would be a little small for a pig casting machine.

To the above you would also want to add the general overheads on your building and other equipment together with overheads for supervision, sales expense and other items. You are correct in your assumption that by 50 ton furnace we mean one having capacity to produce approximately 50 tons of pig iron per twenty-four hours.

We will look forward to your further word.

Very truly yours,  
PITTSBURGH ELECTROMELT FURNACE CORP.  
H. H. Watson, Sales Department

PITTSBURGH ELECTROMELT FURNACE CORPORATION

PO Box 1257, Pittsburgh, Penna, USA

July 1, 1938

Mr. C. W. Daugh  
1205 Elm Street  
The Dalles, Oregon

SUBJECT: ELECTRIC SMELTING FURNACES

Dear Sir:

Replying to your 6-25-38 favor, we note attractive smelting rates have now been announced for Bonneville power and, as you say, the time is now approaching when an electric iron ore smelting plant will doubtlessly be getting underway in the Bonneville-Portland district.

Gangueless limonite would run about 60% iron and 14% water; gangueless magnetite would run about 72% iron. The use of the limonite, of course, has the disadvantage that its water must be driven off. Limonite reduces readily-its water of hydration begins to pass off at about 850° F.

A 10,000 K.v.a. iron smelting furnace would be about the largest size that one would want to build as a single unit. Such a furnace would have a capacity of about 90 tons of pig iron, say running 4% carbon and 1 to 1½% silicon, per 24 hours. A larger single furnace could, of course, be built with multiple electric substation and control equipment, that is, a large body with 3 - 10,000 K.v.a. substations would have a capacity of about 270 tons of pig iron per day. An alternate would be a large body with 3 - 6666 K.v.a. substations (for 180 tons per day).

It would take some little time to work up a proposition on a 10,000 K.v.a. electric smelter but as an approximate figure, until all this can be gone into in detail, we might say that our British associates price a 10,000 K.v.a. unit at about 40,000 pounds. We should have details on the characteristics of the power supply, plan for utilizing the gases, etc. to go into this project in detail. A 10,000 K.v.a. furnace, using for example 2500 K.w.h.s per ton of pig iron, will give off about 90,000 cu. ft. of 280 B.T.U. per cu. ft. gas per hour which could be used in an open hearth, employed for decarbonizing the pig iron or this gas could be used for preheating the charge - on which basis a Bessemer converter plant could be used for decarbonizing the molten pig iron when tapped.

Until everything could be gone into in detail about two-thirds of a million dollars would be estimated as a preliminary rough figure for installing an electric furnace smelting plant to have a capacity approximating 200 tons of pig iron per day.

A steel foundry could vary quite a bit in cost but presumably \$150,000.00 would be ample for a foundry shipping 200 tons of castings a month. You will note suggested typical lay-out for a steel foundry at the top of page 42 of the catalog. In addition to the furnace itself, the main equipment that will be required will consist of a couple traveling cranes, annealing oven, sand blast, core ovens, sand mixer, ladles, flasks, tumblers, grinding and cutting equipment, etc.

In like manner a rolling mill department for the production of say 2000 tons of merchant and reinforcing bars per month could be put into operation at a figure approximately \$250,000.00. This plant would probably cold melt steel scrap and receive molten steel as well from the smelting furnace department - after de-carbonization in either Bessemer or open hearth.

You will find on page 22 of the enclosed catalog a cost estimate for making billet size ingots from cold scrap charges using a "PT" size furnace. The two major pieces of equipment in the merchant bar mill department, in addition to the electric steel furnace, would consist of heating furnace equipment and the merchant mill itself. The merchant mill would, of course, be motor driven and while it is not customary to electrically heat ingots for rolling, some consideration would have to be given to that on the basis of the low power costs that would be available.

One gets into quite costly rolling mill equipment as contrasted with bar mill equipment when one considers making tin plate.

We some years ago went into the matter of rolling mill equipment for making sheets but it will take some search of our files to locate all that material so that I am unable to send it on to you as of today. As I recall we at that time got a price of \$400,000.00 on a sheet mill including about 1500 H.P. of various motors such as for roll drive, tilting drive, etc. The equipment consisted of 3 high plate mill, 2 high sheet mill roll stand and 2 high cold mill roll stand together with approach and tilting tables, levelers, etc. This equipment was to weigh about 1200 tons. It was suggested for use with a size "PT" furnace which was to be used to turn out about 2000 tons of slabs a month. The heating furnaces that were suggested were to cost about \$25,000.00. There were three furnaces consisting of a continuous pair furnace, a batch type sheet furnace and a continuous pusher type slab heating furnace. This was a project that the Chinese war killed off.

The pig iron furnace could be furnished to also be adaptable for making 4 to 6% carbon ferro-chromium, lower carbon ferro-silicon-chromium, ferro-manganese, silico-manganese, ferro-silicon and even carbide. All these products as well as phosphoric acid we believe will be made within a few years in the Bonneville-Portland district.

We also anticipate that the smelting of sulphide ores to mattes will be started and in other instances electric operations analogous to non-ferrous oxide ore blast furnace working will be put into operation.

The 3-7-38 steel magazine (at hand) quotes:

LAKE SUPERIOR ORE GROSS TON, 51 $\frac{1}{2}$ %  
Lower Lake Ports

Old Range Bessemer	\$5.25
Mesabi Nonbess	4.95
High Phosphorus	4.85
Mesabi Bessemer	5.10
Old Range Nonbess	5.10

We might add that typical charge per ton of pig for an electric iron smelting furnace would be about 2 tons of ore, 800 pounds of limestone and 900 pounds of coke and coke breeze or the equivalent. A furnace of 10,000 K.v.a. capacity could be expected to require about 3 man hours labor per ton of electric pig iron.

It, of course, would require a vast amount of engineering study to go into a plant project such as you outline in proper engineering detail and if a firm of consulting engineers are to be retained to do this work would say that we are associated with W. E. Moore & Company of this city, who have had a vast amount of experience in smelting plant, steel works and foundry operations - we therefore would suggest that the matter of plant lay-out and arrangement be referred to them for their experience would be most valuable in developing the most economic arrangement of all the various plant equipment items.

Trusting that the foregoing will prove of help and looking forward to cooperating with you in every possible way, we are

Yours very truly,

PITTSBURGH ELECTROMELT FURNACE CORPORATION

W.E. Lewis, Asst. Sales Manager

PITTSBURGH ELECTROMELT FURNACE CORPORATION

Pittsburgh, Pennsylvania  
July 11, 1938

Mr. C. W. Daugh's  
1205 Elm Street  
The Dalles, Oregon

Dear Sir:

Replying to your 7/7/38, would say that as per Mr. Watson's 7/3/37, four electric iron smelters of about two tons per hour of pig iron capacity each would be expected to approximate \$300,000.00 installed and in operation including the building of the transformer rooms, furnace foundations and the working platform but there would, of course, be an appreciable amount of additional expense for arranging to handle the charge into the furnace and for ladle car and other equipment to convey the pig iron when tapped away to the next step and for buildings, charge unloading, etc.

The equipment Mr. Watson gave preliminary estimate price on would require lining, roof ring and roof for while you could operate the equipment open top we believe the roofed top type of electric pig iron furnace would be more desirable in a number of ways.

We will look forward to cooperating with you as this matter progresses and to being of assistance and aid to you in every possible way. Unfortunately, most of the details of a plant of this sort have to be worked out for each individual application but perhaps that is not so strange when one considers that scarcely any two steel plants or even foundries are particularly alike in regard to arrangement of buildings and equipment.

Yours very truly,

PITTSBURGH ELECTROMELT FURNACE CORP.

W. E. Lewis, Asst. Sales Manager

WESTINGHOUSE  
Electric and Manufacturing Company  
309 S. W. 6th Avenue

Portland, Oregon  
September 16, 1937

Mr. C. W. Daugh  
Box 656  
The Dalles, Oregon

Dear Sir:

Your letter dated August the 28th directed to our factory at Piggsburgh, Penna. has been referred to us for acknowledgment.

To the best of our knowledge, we do not know of any furnace builder at the present time selling any arc furnace for your particular application. In most cases it has been found that the blast furnace is the more economical process to use. There have been arc furnaces built for this purpose, but we have heard nothing as to whether they have been successful or not.

Our representatives at Pittsburgh, Penna. are checking both the Swindell Dressler Corp. and the Pittsburgh Engineering Company to determine whether either of these furnace builders would be interested in the development of a furnace for this application.

Just as soon as we have a commitment from them we will let you know.

Very truly yours,

A. J. Flechsig  
INDUSTRIAL DIVISION

July 14, 1938

Mr. C. W. Daughs  
1205 Elm Street  
The Dalles, Oregon

Dear Sir:

Replying to your 7-8-38, would say that when limonites and magnetites having phosphorous contents so high as to give about a 1.5% phosphorous content in the pig iron are smelted, it will be necessary to go to dephosphorizing procedures similar to those used in England and on the Continent to remove the phosphorous - elimination of phosphorous down to about .04% will be necessary for a steel works.

Two procedures are available for the dephosphorizing; namely,

- (a) Talboting
- (b) Bessemerizing

(a) Talboting is customarily performed in a tilting open hearth furnace but with Bonneville rates the electric furnace would doubtlessly be preferred. For 180 tons of pig iron per day, probably 3 - 2.5 ton per hour smelters would be installed together with a mixer for holding the molten pig iron tappings from the three smelters. The electric Talboting furnace would be fed from the mixer. The electric Talboting furnace would hold about 70 tons and tap say 35 tons every 4½ to 5 hours. This furnace would operate considerable portions of the time with power off. In general, shops use about 25% of low phosphorous iron ore and millscale and 6% lime in cutting the phosphorous from say 1.50% to .04%. English shops figure this type of dephosphorizing work to cost about \$3.00 per ton, I understand. There is no metal loss in this process - in fact there is usually a little gain by reason of the iron taken up from the iron ore.

(B) Basic Bessemerizing is customarily employed where the phosphorous content of the pig iron is somewhat above 1.5%. 2.5% phosphorous is a quite common basic bessemer iron - you would need to add phosphate rock to your charge to boost the phosphorous content to this amount. Irons as high as practically 3% silicon are successfully handled by this process which is generally carried out at the rate of about 3 blows per hour. The metal loss, however, runs from 10 to 15% depending upon conditions so that the writer doubts that this process would have merit in your case unless low phosphorous ore for dephosphorizing in the Talbot process was only attainable at a prohibitive cost figure - this presumably would not be the case on the West Coast.

In regard to the view at the bottom of page 29 of the catalog, would say that the furnace shown in melting steel scrap of perhaps .06% average Phosphorous content for casting steel ingots for rolling so that there is, of course, no comparison between the amount of dephosphorizing done in the case of that type of work as versus the amount of dephosphorizing that would have to be done where one had an ore that brought the phosphorous content of the pig iron thru at about 1-1/2%. The illustration at the bottom of page 29 shows a type of practice that formerly was dephosphorizing to the extent of .02 to .03% but the

way people are running furnaces today on small incots, that is so fast, I doubt that even that much dephosphorizing is being accomplished in most cases. The speeding up of melting in these electric furnace operations, while it does not particularly aid in making the operations dephosphorizing, seems however to peculiarly eliminate a little sulphur - by reason of its being actually fumed off under the intense heat.

As the writer understands, quite a little thought has been put to the using of Washington Scappoose limonites, which are said to be about .85% of phosphorous but no one has been able to suggest a less expensive way for dephosphorizing the pig iron when made than going to an adaption of English basic Talboting practice which presumably, if the pig iron was made for about \$20.00 a ton, would add something like perhaps \$4.00 per ton to the cost of the dephosphorized metal. However, the Talboting furnace in addition to dephosphorizing the metal, taps it out as steel so that the Talboting cost really embraces the steel making and the dephosphorizing cost.

Trusting that the foregoing will prove helpful, we are

Yours very truly,

PITTSBURGH ELECTROMELT FURNACE CORP.

W. E. Lewis, Asst. Sales Manager

PITTSBURGH ELECTROMELT FURNACE CORPORATION

Pittsburgh, Pa. November 20, 1939

Mr. C. W. Daughs  
1205 Elm Street  
The Dalles, Oregon

Dear Sir:

Thank you for your 11-10-30. We are enclosing, herewith, copy of our 7-14-38 which discusses dephosphorizing Scappose limonite pig iron containing around 1.50% phosphorous. You will note that there is no domestic analogous practice and it was suggested that Talboting electric furnace equipment be installed. This process, however, would require obtaining a large amount of low phosphorous iron ore to effect decarbonization and dephosphorization and I am not informed just where this would be most economically obtainable.

There have been investigations, I believe, into the cost of bringing low phosphorous ore by boat from Chile to the Portland district. Some of this ore is coming as far north as Bethlehem, Pa. via canal.

As the abstraction of oxygen from iron in a smelting process is fundamentally a reducing operation, practically all the phosphorous, as far as I know, must be considered to come thru the furnace retained in the pig iron product.

We note with interest that you are working with Mr. Hodson on a 50-60 ton plant and that the iron powder product of the process would be melted in a ELECTROMELT arc furnace and converted into various grades of ingot steel. This work could be carried on on a continuous basis with the iron powder feed mechanically and continuously into the furnace.

In regard to the mill equipment, would advise that this was listed as follows and does not include foundation bolts and washers; motors, controllers, or any other electrical equipment; pipes or valves; buildings, cranes and furnaces, erection, etc.;

- 1 - Mill approach table consisting of 16 rollers.
- 2 - Tilting tables each consisting of 20 rollers.
- 1 - 28" and 19" x 48" Three-high plate mill consisting principally of
  - 1 - Three-high roll stand complete with rolls.
  - 1 - Three-high pinion stand complete with pinions.Necessary shoes, spindles, and coupling boxes.
- 1 - 800 H.P. gear reduction drive with extension shafts.
- 1 - Leveler approach table consisting of 11 rollers.
- 1 - Sheet leveler, capacity 3/4" x 36".
- 2 - 100 ft. plate conveyors
- 1 - 3/4" x 100" plate shear
- 1 - shear gauge for plate shear
- 47 -Caster plates, each plate containing 8 casters
- 1 - 30" x 42" Two-high sheet mill roll stand with necessary shoes, spindles, and coupling boxes.
- 1 - 26" x 42" Two-high cold mill roll stand with necessary shoes, spindles, and coupling boxes.
- 1 - 42" Sheet leveler
- 1 - Squaring shear
- 1 - Sheet doubler

This proposition was up in 1934 and a present day price might be nearer \$500,000.00. The motor list for the plate and sheet mills totaled approximately 1400 H.P. of which the largest single item was an 800 H.P. roll drive.

We shall look forward to your further advices and to cooperating.

Yours very truly,

PITTSBURGH ELECTROMET FURNACE CORP.

W. E. Lewis, Asst. Sales Manager

PIGMENT SHIPPED

Sent to  
Journal 10/14/45 -

Shipments of limonite iron ore amounting to 1,000 tons were recently made from Scappoose, Oregon, to the Williams Paint Company, Emeryville, California. The material will be used mainly as the base of paint to be used in painting railroad cars. The deposit from which the limonite was mined is the Ironcrest property, on Buck Mountain, 9 miles west of Scappoose, and is owned by A. A. Muck and associates.

*Iron*

May 8, 1961

Mr. James R. Miller  
David H. Sutherland & Company  
Cascade Building  
Portland, Oregon

Dear Mr. Miller:

This is in response to your letter of May 4 in which you address several questions to me.

I will answer your questions in the order in which you list them in your letter.

- (1) The Columbia County iron ore deposits should probably be regarded as the nucleus for any proposed pig iron plant in the Portland area. Ore from high-grade deposits elsewhere in the State might be tributary to such an operation provided they were satisfactorily located as regards transportation. It would be my opinion that satellite sources would develop only after the establishment of a plant and the creation of a steady market which would encourage operators to open up the deposits. Location of these deposits would probably be the magnetic iron sands from the mouth of the Columbia and southwestern Coos County and from small magnetite bodies located in Jackson County and Baker and Malheur counties.
- (2) I am not in a position to know which one of the various direct reduction processes would be most adaptable to the iron ores of Oregon. What I do know of these processes has been gleaned from the literature and it would be my opinion that almost any of them would be satisfactory but that it would depend upon pilot plant results.
- (3) I would have to make the same comments as for question (2) but add that there is insufficient operating experience available to me to comment on the relative merits and costs of the various direct reduction processes.
- (4) Inasmuch as pilot and full size test plants are either under construction or on stream in various parts of the country,

I would suggest sending shipments of local ores to some of these plants for evaluation. If you could get good results from these pilot plant operations, it could be that you could build a plant of production size and design it so that additional units could be added if need be.

- (5) I think that an area close to tide water and near the Scappoose iron deposits would be the best location for a plant. That would mean, then, that a suggested location would be Scappoose, St. Helens, or North Portland. I think that you would be in a position to make a study to determine location for plant site better than we in the Department of Geology and Mineral Industries.
- (6) The bauxite occurs as a lateritic deposit covering certain areas of the Columbia River basalts. The iron ore occurs, according to the U.S. Geological Survey, at the top of the third flow below the laterite. That would mean that if the iron was mined it may or may not be in the area of the ferruginous bauxites. To the best of my knowledge the ferruginous bauxites do not occur with the bog iron ores of the Scappoose deposits. On the other hand, the ferruginous bauxites do contain a fairly high percentage of iron oxides. If and when the bauxites are mined for the making of alumina, I think it would be entirely feasible to recover pig iron, especially if the Pedersen process is used.

I hope that this will answer to your satisfaction the questions you have asked.

Sincerely yours,

Hollis M. Dole  
Director

HMD:jr

Phone: CAPITOL 8-9718  
CAPITOL 8-9703  
CYPRESS 2-3220

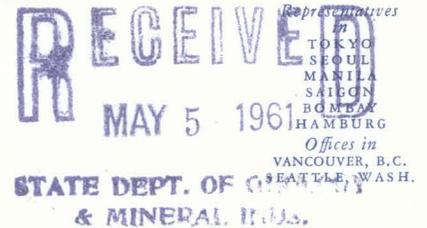
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MAIN OFFICE  
CASCADE BUILDING  
PORTLAND 4, OREGON, U.S.A.

May 4, 1961

CABLE ADDRESS: "SUTHERLAND"  
TELETYPE PD-626



Dr. Hollis M. Dole, Director  
Dept. of Geology & Mineral Industries  
State Office Building  
Portland, Oregon

Dear Dr. Dole:

We would very much appreciate your candid opinions regarding the potentials for a pig iron plant in the Portland area, if a market could be found for a 100 tons per day output, which we understand would be the minimum feasible size plant. The existing published reports on the iron potentials are familiar to us. What we desire is a letter commentary updating and summarizing those reports.

In your opinion:

1. What principal deposits do you feel should be tied into such an undertaking, and where are they located.
2. Which of the processes, Krupp-Renn, Strategic-Udy, or others (including Albert Greene's electric furnace ideas) would seem to be most feasible as a whole, presuming the availability of low cost electric power.
3. What, in your opinion, would be the smallest size plant (of the recommended type) that could be built and be economic; and what would you estimate the cost to be for same.
4. Would you recommend that a pilot plant be built first; and if so, what size, and what do you estimate the cost for this preliminary undertaking would be.
5. What would, in your opinion, be the best location for the production plant relative to the deposits and selling the output locally as well as shipping by rail and ocean transportation.
6. Do you think it would be economically possible, either in the mining or in the pig iron process, to recover the bauxite content in the iron ores as a by-product for possible upgrading to sell to the local aluminum industry or for export.

If you feel hesitant about venturing definite opinions to some of these questions, it would be appreciated if you would,

Dr. Hollis M. Dole, Director      - 2 -  
Dept of Geology & Mineral Industries  
Portland

May 4, 1961

in those instances, at least make an approximation. We are prepared to devote considerable time on our part to try to tie all the necessary factors together and possibly bring such an industry to Oregon. But initially, we have to rely mainly on informed people such as yourself to provide us basic facts from which we can gain some concept of how we should best proceed.

An early reply will be very much appreciated.

Very respectfully,

DAVID H. SUTHERLAND & CO.



James R. Miller

JRM/mk

Comments on Miller letter re iron ore

1. The Columbia County iron ore deposits should probably be regarded as the nucleus for any proposed pig iron plant in the Portland area. Ore from high grade deposits elsewhere in the state might be tributary to such an operation provided they were well located with respect to transportation. Such satellite ~~deposits~~ sources would develop<sup>only</sup> after the establishment of a plant and the creation of a steady market which would encourage operators to open up the deposits.
  
2. There is insufficient operating experience available to make any comment on the relative merits and costs of the various direct-reduction processes.
  
3. Same comments as for section 2
  
4. Pilot and full-size test plants are either under construction or on stream in various parts of the country. Test shipments of local ores could undoubtedly be sent to some of these plants for evaluation. If a plant is built it should be of production size and designed so that additional units can be added.
  
5. With a man on first and third and a .300 batter up with two away, two strikes, three balls, score tied, top of the ninth, a light drizzle—where does the center fielder stand? Ans. Scappoose.
  
6. Any sale of co-product bauxite would be dependent upon existence of red mud plant in immediate vicinity. Assuming presence of such a plant the sale of physically beneficiated bauxite would seem likely. Economics uncertain but it would probably be worthwhile saving bauxite for sale to a red mud plant.

*Sum*

June 30, 1959

Mr. C. W. Daughs  
1215 N.W. John Avenue  
Pendleton, Oregon

Dear Mr. Daughs:

Thank you for your very comprehensive letter of June 27 relating to the iron situation.

Here is a typical analysis of the ferruginous bauxite from Washington and Columbia counties and also from the Salem Hills area of Marion County. The Washington and Columbia county deposits are largely controlled by Alcoa, with some minor acreages held by other parties. In the Salem area, Harvey Aluminum Company has optioned most of the known area underlain by ore, and at the present time they are conducting some additional field exploration.

We hope you find the enclosed list of iron properties of interest and we wish to thank you for calling our attention to the two areas which you mentioned in your letter. Over the past four or five years the State has been combed rather thoroughly by several major iron and steel companies who have been looking for deposits of sufficient size to justify their exploiting them.

Sincerely yours,

Ralph S. Mason  
Mining Engineer

RSM:lk  
Encl.

1215 NW John Avenue  
Pendleton, Oregon  
June 27th, 1959.

Mr. Ralph S. Mason  
Mining Engineer  
Dept. of Geology & Mineral Industries  
State Office Building  
Portland, Oregon

Dear Mr. Mason:

In the March issue of Ore-Bin, I think there was a brief mention of an inquiry your department had received about iron ore in Oregon, which reminded me to write you about the following:

About 40 miles south of Burns there is a peak named Iron Mountain, and in Malheur County is another peak named Ironside Mountain. In years past I had several times planned to take a look at those peaks, more out of curiosity rather than expecting to find mountains of iron ore. It occurs to me the old-timers must have seen enough iron on the slopes to cause them to name them as they did. However, I never got around to making the trip.

I used to visit with an old prospector in Baker, and during one of these visits he told me that along Bully Creek, which is in the Ironside area, there are large mounds of a dark red material which he thought was limonite ore. In your list of publications I do not see anything which might refer to these two iron ore outcroppings. In any event, if your department has not investigated these outcroppings recently, in view of the value now placed on low grade iron ore (25% Fe), I think it would be well worth your doing so.

If this iron averages 25% Fe and is free of impurities such as phosphorous and titanium, and there are geological indications a substantial tonnage of such grade can be proved by drilling, such deposits would be of great value towards eventually establishing an integrated steel plant in this State, say on the upper Columbia.

To substantiate my views about the present value of low grade iron ore, I own a few shares of Jones & Laughlin Steel Corp., which entitles me to a copy of its annual report to stockholders. In this report reference is made to its iron ore mining operations in "up state" New York, but the report did not contain any details about the operation. So I wrote Mr.

Fiedler, Chief Geologist, for certain information about the operation, and following are his replies: Mining - open pit; character of ore - magnetite, free of impurities; average iron content of mine run ore, 23% Fe. Ore is beneficiated to an average of 63% Fe, requiring an average of three tons of mine-run to produce one ton of the upgraded product, indicating an average net recovery of 21%. The product is, of course, pelletized before feeding into furnaces.

This operation has one important advantage over high grade (50% to 55%) Minnesota ore, which Jones & Laughlin also use, in that mining and shipping are an all-year round operation, an all rail short haul from mine to mill at Pittsburgh. This operation produces approximately 1,000,000 tons upgraded ore annually.

Of course, you have read a lot about the Minnesota Taconite ore averaging 25% to 30% Fe. The large Erie Mining Co.'s operation 75 miles north of Duluth, shows a net recovery of a fraction over 21% to produce 64% upgraded product. This operation produces 7,500,000 tons upgraded ore annually.

As a result of my exchange of letters with Mr. Fiedler of Jones & Laughlin, I prepared a brief, and following are some of the items covered, which I trust you will find of interest.

The Dalles area offers the greatest advantages for a steel plant location in this Northwest area, and in my analysis I considered Puget Sound. With completion of the 27-foot navigation channel from Vancouver to Bonneville dam, The Dalles will become a deep seaport and head of navigation for ocean freighters east of the Cascade Mountains barrier.

Few people recognize the far-reaching economic impact this will have on eastern Washington, eastern Oregon, northern Nevada, northern Utah, Idaho, western Montana, western Alberta, and eastern British Columbia. As you of course know, this location offers the lowest electric power rate in the country. It has natural gas, brought in from the San Juan field of northwestern New Mexico, and also another gas line from northeastern British Columbia and adjoining Alberta; unlimited low cost water supply, excellent rail and highway transportation, and water as already mentioned.

Bituminous coal is available from nearby Washington fields, from southeastern British Columbia, Wyoming and Utah. British Columbia coal averages 63% fixed carbon; Washington, Wyoming, Utah coals 45% to 50%. Distance via rail from British Columbia field to The Dalles approximately 500 miles, considerably shorter than from Wyoming and Utah.

Western Montana has extensive reserves of high grade iron ore as well as low grade, near rail transportation, distance to The Dalles approximately 600 miles. It would be a downhill haul the entire distance, and due to the fact that the railroads are greatly in need of west-bound tonnage to provide some loading for the heavy west-bound empty car movement, a very low rate per long ton can be depended upon.

NEVADA: Since end of World War II mines in western Nevada have been shipping annually an average of 800,000 long tons of high grade ore to Japan via port of Stockton, at a price of \$8.00 per ton shipside.

About eight years ago, as near as I can recall, Southern Pacific ordered a geological survey made of its land grant property in Utah, Nevada, California, Arizona, New Mexico - about 5,000,000 acres. Several years later a progress report appeared in the Saturday Evening Post, and one item mentioned, that I recall, was that there were geological indications of an extensive deposit of iron ore in Nevada, but location was not mentioned. About eight months ago, S. P. announced it is drilling its lands in the Lovelock area of Pershing County, northwestern Nevada. It stated up to that date a reserve of 60,000,000 tons had been proven (grade not mentioned); drilling was continuing and indications were the orebody extended beyond S. P. lands.

Ore from the area of Nevada where shipments to Japan originate, and this S. P. ore reserve, would be within reasonable transportation cost of a mill at The Dalles.

ALASKA: There are several very large deposits of iron ore along the "inside" waterways between Ketchikan and Haines, but unfortunately all, except one, contain a high percentage of titanium which causes a great deal of trouble in smelting ore containing this element. Removing it by beneficiation, so far, has not been successful, except if the titanium is in the form of sphene. So far, only one property has been found to contain titanium in this form.

On Prince of Wales Island is a property originally located as copper claims. It is high grade Magnetite, 50% to 55% FE, Copper 1% to 2%. Removal and salvaging the copper would be a simple operation, and in the process the iron would be upgraded to over 60%. Water route distance Juneau to Seattle via inside passage, 875 nautical miles; distance Juneau to The Dalles via direct open sea to the Columbia, 1075 miles.

Being a deep seaport, The Dalles could also draw on foreign sources for ore, viz.: Venezuela, Ecuador, Peru, Chile. All of these contain immense reserves of ore all high grade, and

all near tidewater. Bethlehem has for years been importing ore from Chile for its Pennsylvania plants.

MARKET FOR STEEL PRODUCTS: In 1957 the seven Western States, Washington, Oregon, California, Arizona, Nevada, Utah, Idaho, provided a market for slightly over 7,000,000 tons. Of this, eastern mills supplied approximately 40% - 2,800,000 tons, and foreign sources 2.4%, principally from Japan, Germany, Belgium, Scandinavian countries. The 1958 imports were considerably larger.

A plant at The Dalles would be within economical transportation cost to the markets of western Montana, western Alberta, all of British Columbia, Alaska, Hawaii, and applying the same per capita consumption of steel products to these areas as to the seven Western States, would mean a total market in 1957 in the entire area in which a plant at The Dalles would be at no disadvantage in competition, of over 8,000,000 tons, of which, based on percentages above, would mean eastern mills supplied 3,200,000 tons, and foreign sources say 200,000 tons.

California, of course, is the principal Pacific Coast market for steel. Approximately 80% of its population and industry are located within a 100 mile radius of San Francisco Bay, Stockton, Los Angeles and San Diego harbors. A Dalles plant would have available rail transportation to serve this market, but would make use of the much lower water rates to the several California harbors. Water route distance The Dalles to San Francisco Bay, 700 nautical miles; to Los Angeles harbor, 1050 miles; rail distance to the Bay about 900 miles, and distance from Geneva to the Bay and to Los Angeles is also about 900 miles.

The area described has an annual increase in population and industry of between 5% and 10%, which means a corresponding increase in steel consumption.

There are three methods that I know of, and have some detailed information about them, for smelting iron ore without the use of coke and limestone. All have been put through years of testing, and are now offered under license by the responsible concerns which own them. When a steel plant is built in this Northwest area, it will undoubtedly be under one of these methods. Capital investment required to build an integrated plant of any one of these methods, would be about one-third the cost of a standard type blast and open hearth furnace type plant.

The Mexican Steel Syndicate has under construction a plant of 500 tons daily capacity of high grade electric steel, being constructed under plans and specifications of one of

the above methods. Canadian interests have just recently contracted to have a similar plant (but lesser capacity), built in Quebec. The Mexican plant will use electricity and crude oil; the Canadian plant will use electricity and coal.

If you have it available, I would like you to furnish me an analysis of the Ferruginous-bauxite material. I have no idea what the percentage of iron is in it, but if it is, say, not less than 25% average and is free of phosphorous and titanium, I may want to send it to Mr. Fiedler, Chief Geologist, Jones & Laughlin, asking for his opinion as to how this material would respond to beneficiation, raising iron content say to a minimum of 50%.

I believe several years ago Alcoa shipped two or three carloads of this material to its testing plant in Pittsburgh, with the view to working out a practical method of separating the bauxite from the iron. Anyway, approaching it from the angle of making use of the iron instead of the bauxite, would be a much simpler problem.

If you do decide to make an examination of the two ore outcroppings previously referred to, I would appreciate a copy of your report, for if it is reasonably favorable, I want to forward it to contacts I have in the East, owners of extensive iron ore properties, suggesting they send their geologist to make an examination.

Awaiting your reply,

Yours truly,

C. W. Daugh



*Iron*

April 10, 1959

Mr. C. R. Grems  
Grems Manufacturing Company  
5635 South 6th Street  
Klamath Falls, Oregon

Dear Mr. Grems:

Thank you for your inquiry of April 9, concerning a deposit of iron ore.

Other things being equal, ore containing 55 percent iron would be considered of commercial grade. It should be pointed out, however, that the presence of phosphorus and arsenic may render an otherwise high grade ore relatively valueless since these elements are not wanted in iron ores used for making iron and steel. Other factors that must be considered are the cost of mining, size of the deposit, distance from rail, and distance from rail-head to market.

We would like to suggest that if your deposit occurs in Oregon we will be happy to analyze a representative sample for you and report the percentages of iron, phosphorus, and arsenic present. If you wish to avail yourself of our free analytical service please fill out one of the blanks enclosed and return it with the sample, which should weigh at least one pound and preferably should consist of numerous small pieces taken from many points across the surface of the deposit.

At the present time there is a market for iron ore in Japan and a considerable quantity of ore is moving through Portland from inland areas. The David H. Sutherland Company, Cascade Building, Portland, is an import-export firm which is handling shipments of this type.

Sincerely yours,

Ralph S. Mason  
Mining Engineer

ESM:lk  
Encl.

COPPER AND ALUMINUM  
LIQUID FOILS  
PERMAPHANE CLEAR  
LIQUID COATING  
PLASTIC PROTECTIVE  
COVER



## GREMS MANUFACTURING CO.

*Sole Manufacturers of*

PERMALUME & LAMINITE

TELEPHONE TU 4-5428

5635 So. 6th St.

KLAMATH FALLS, OREGON

April 9, 1959

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OTHERWISE WE WILL EXCHANGE  
THE GOODS OR REFUND MONEY

Department of Geology & Mineral Industries  
1069 State Office Building  
Portland 1, Oregon

Gentlemen,

We are enclosing a copy of spectrographic analysis on a material that we think could be commercial iron ore, and is located approximately 150 miles from here in Oregon.

Will you kindly advise me if 55% iron content may be commercial, and if so, advise of possible ore buyers?

Very truly yours,

GREMS MANUFACTURING CO.

*C. R. Grems*  
C. R. Grems

CRG:vd

enc:

RECEIVED  
APR 10 1959  
STATE DEPT. OF GEOLOGY  
& MINERAL INDS.

# Reed Engineering

620 South Inglewood Avenue  
Inglewood 1, California

July 22, 1958

Mr. C.R. Guans (Grems)

## SPECTROGRAPHIC ANALYSIS Approximate Values

	Pounds per Ton	Value per Ton	Percentage
Nickel	2	\$1.40	.1
Copper	trace	--	--
Manganese	trace	--	--
Lead	trace	--	--
Iron	1100	\$22	55
Sodium	5	3¢	.25
Magnesium	3	5¢	.15
Lithium	trace	--	--
Barium	trace	--	--
Calcium	6	4¢	.3
Strontium	1	4¢	.05
Potassium	trace	--	--
Aluminum	4	5¢	.2
Silicon, Water, Oxygen	879	--	43.9
Specific Gravity	4.36		
Magnetism	none		
Radioactivity	none		

Note: Value per ton is an estimated value for raw ore, not for refined metal.

*J. M. Reed*  
ASSAYER

January 17, 1957

Mr. T. E. Arnold  
P.O. Box 629  
Bryn Mawr, Pennsylvania

Dear Mr. Arnold:

In answer to your letter of December 29, 1956, I have collected some information concerning possible iron deposits in the Northwest which may be of interest to you. The following is a tabulation of petrographic analyses from "History and Petrography of the Basalts of Oregon," by Harold N. Fisk, University of Oregon, 1931. This is a Master's Thesis from which I have selected only those reports showing the highest iron content. It is not known whether these samples are representative of any great quantity of similar lavas in each area.

1. Tygh Ridge, Wasco County, Oregon  
Elevation 1450 feet

Augite . . . . .	25%
Labradorite and andesine . . . . .	45
Magnetite . . . . .	20
Hematite . . . . .	5
Volcanic glass . . . . .	5

2. Columbia River basalt 1360 feet back of Wishram, Washington.  
Cascade Series 9.8 miles from Sisters towards Creek Lake, Oregon.  
Clarno formation, head of Lytle Creek near Prineville, Crook  
County, Oregon.

Augite . . . . .	20%
Anorthite . . . . .	60
Magnetite . . . . .	20

3. Lava flow - sec. 2, T. 18 S., R. 13 E., south of Skookum Creek,  
Deschutes County, Oregon.

Augite . . . . .	15%
Diopside . . . . .	10
Andesine . . . . .	45
Magnetite . . . . .	20
Volcanic glass . . . . .	10

P.S. - Inc. Ore bin Feb., 53.

4. 14 specimens from Heceta Head, Lane County, Oregon.  
2 specimens from Cascades near Three Sisters area, Deschutes  
County, Oregon.

Augite . . . . .	27%
Olivine . . . . .	26
Labradorite . . . . .	28
Magnetite . . . . .	19

5. Columbia River basalt, 15 localities both east and west of Cascades.  
Two samples of Clarno basalt from Coyote and Dry creeks, location  
unknown.

Augite . . . . .	30%
Anorthite . . . . .	20
Labradorite . . . . .	30
Magnetite . . . . .	15
Chlorite . . . . .	5

6. 10 coast basalts - Heceta Head, Lane County, Oregon.  
5 Columbia River basalts along Columbia River, Clackamas and  
Hood River counties, Oregon

Augite . . . . .	20%
Labradorite (basic) . . . . .	30
Labradorite (acid) . . . . .	32
Magnetite . . . . .	15
Volcanic glass . . . . .	3

7. Basalt at quarry near Ellendale  $2\frac{1}{2}$  miles west of Dallas, Polk  
County, Oregon.

Augite . . . . .	25%
Labradorite . . . . .	45
Magnetite . . . . .	15
Volcanic glass . . . . .	15

The Tygh Ridge section, page 123 of the thesis, was sampled and studied from top to bottom. Whether this represents a series of flows or one flow is not apparent, neither is the vertical distance between samples indicated. A description of the samples is shown in the following table.

	<u>Plagioclase</u>	<u>%</u>	<u>Augite</u>	<u>Magnetite</u>	<u>Glass</u>
Top	Bytownite	40%	50%	6%	4%
	Bytownite	40%	50%	5%	5%
	Bytownite	61%	36%	2%	1%
	Bytownite	57%	40%	1%	2%
	Bytownite	53%	40%	2%	5%
	Labradorite	58%	30%	2%	10%
	Labradorite	40%	40%	8%	12%
	Labradorite	40%	40%	10%	10%
	Labradorite	45%	35%	10%	10%
	Labradorite	45%	35%	10%	10%
	Labradorite	40%	35%	13%	12%
	Labradorite	40%	40%	15%	5%
	Labradorite	30%	20%	10%	40%
	Labradorite	45%	30%	10%	15%
	Lab-Andesine	45%	25%	25%	5%
Bottom	Andesine	45%	40%	10%	5%

A report entitled "Iron-Bearing Deposits in Washington, Oregon, and Idaho," Resource Report No. 5, by Carl Zapfe, can be obtained for \$2.50 by writing Mr. Chester K. Sterrett, Raw Materials Survey, Portland Chamber of Commerce, 824 S.W. 5th Avenue, Portland 4, Oregon. I believe that this report will be of interest to you in that in addition to describing residual laterites containing high iron, it describes many other known occurrences of iron ore.

In relation to the vast quantities of basaltic lavas ranging from Eocene through Pleistocene, the sampling has been entirely inadequate to evaluate the possibility of commercial iron in the basalts. It is hoped that within the next year that this Department can begin a study of the basic lavas and intrusives in the Coast Range of Oregon. Frequently samples of unusual character are submitted to this office for identification. Only recently we received a basalt sample from the Coast Range which contained abundant augite crystals up to one inch across. Other unusual occurrences, possibly some of high iron could possibly occur.

Sincerely yours,

H. G. Schlicker  
Geologist

T. E. ARNOLD

P. O. BOX 629  
BRYN MAWR, PA.

*Iron*  
*Has No action*

January 30, 1957

Dr. H. D. Schliker,  
Geologist,  
State of Oregon,  
Dep't of Geology and Mineral Industries,  
1069 State Office Building,  
Portland 1, Oregon.

Dear Dr. Schliker:

Thank you for your letter of January 17th last, giving data on the various basalts of Oregon that contain appreciable quantities of magnetite. It would appear some of the basalts might contain sufficient magnetite to constitute a low grade iron ore?

As suggested the booklet covering the various iron deposits in Oregon will be acquired, as it is felt it will contain much useful information.

In the last paragraph of your letter you mention many unusual types of basalt are presented to your office. By any chance did any of them contain graphite? If so they would be of interest, as graphite might be an indicator of other minerals?

If my plans work out on schedule I will be in the West in about two months or less, probably with headquarters in Seattle and/or Vancouver, so would be in a position to visit Oregon and look into some of the various occurrences you mention.

Very truly yours,

T. E. Arnold

*See additional  
correspondence in  
1956 "Iron" file*

*Magnetite*

October 2, 1957

Mr. Al Goodman  
Dayville  
Oregon

Dear Mr. Goodman:

This is to acknowledge receipt of your letter of September 27 inquiring concerning the magnetite ore you have on your property.

A copy of your letter is being sent to Mr. N.S. Wagner, field geologist at Baker. Sometime either Mr. Wagner or Mr. Howard Brooks of our office in Baker will call to investigate the occurrence and advise you.

Sincerely yours,

Hollis W. Dole  
Director

HMD: jr  
cc N.S. Wagner

Sept. 27, 1957  
Al Goodman  
Dayville, Oregon

Mr. Hollis Dole,

We have Magnetite or Lodestone at a depth of 60 feet, it is so strong that it has magnetized the casing in our well. Also all over the surface of the ground a magnet will pick up particules of iron.

Could you tell us how to go about finding out the amount that is here. If it would pay to be worked? Who makes those tests and is it expensive?

Our location is 10 miles east of Dayville and 13 miles west of Mt Vernon. We own the first house on Widows Creek east side and own the ground up Widows creek for a mile.

Sinceraly yours,

*Al Goodman*

*sent copy to  
10-2-57*

RECEIVED  
OCT 2 1957

STATE DEPT. OF GEOLOGY  
GENERAL INDC.

*Magnetite*

May 28, 1957

Mr. Gilbert Wandell  
Box 65  
Oakland, Oregon

Dear Mr. Wandell:

We are interested to learn that you have limited quantities of magnetite ore for sale. From time to time there is a demand for this material for ship ballasting but at the moment we are not aware of any buyers. There has been also considerable interest in shipments of high grade iron ore to Japan.

If you would care to give us some additional information concerning the quantities which you could produce and the analysis of the ore, we would be happy to get in touch with some of the exporters who are currently looking for iron ore. If you have not had your ore analyzed we would like to suggest that our free analysis service is at your disposal; and we are enclosing two sample information request blanks, one of which should be filled out completely and submitted with the sample. For best results the samples should be taken across the deposit and should be composed of numerous small chips and at regular intervals rather than one or two large pieces. A minimum of a pound is required for our laboratory procedures.

Sincerely yours,

Ralph S. Mason  
Mining Engineer

RSM:lk  
Encl.

Gilbert Wandell  
Box 65  
Oakland, Oregon

May 23, 1957

Oregon State Dept. of Geology  
and Mineral Industries  
1069 State Office Building,  
Portland, Oregon

Dear Sirs:

I have been referred to you by the United States  
Department of the Interior Geological Survey for  
information as to possible buyers of limited amounts of  
magnetite ore. This can also be in the form of concentrates.

Sincerely,

*Gilbert Wandell*

RECEIVED  
MAY 27 1957

STATE DEPT. OF GEOLOGY  
& MINERAL INDS.



W. S. ATKINS & PARTNERS

CONSULTING ENGINEERS

WOODCOTE GROVE · ASHLEY ROAD · EPSOM · SURREY · ENGLAND

TELEPHONE: EPSOM 6140  
TELEX: 2-3497  
CABLES: KINSOPAR, EPSOM, SURREY

In your reply please quote

Your reference is

24th February 1964

Ralph S. Mason Esq.,  
Mining Engineer,  
Department of Geology and Mineral  
Industries,  
1069, State Office Building,  
Portland 1,  
OREGON.

Dear Mr. Mason:

Thank you for your letter of the 20th February. I am afraid it is a little early for us to pass on to you information regarding the ironsands scheme in New Zealand. We are at present in the course of preparing a Feasibility Study and we have not yet gathered much information which would be of interest to you. However, be assured that we shall be pleased to discuss our findings with you when we are in a position to do so. In the meantime should any of your personnel be in England we should be delighted to see them.

Yours sincerely,

M.D.J. BRISBY

February 20, 1964

Mr. Graham Swanston, Secretary  
The New Zealand Steel Investigating Company  
P.O. Box 2492  
Wellington, New Zealand

Dear Mr. Swanston:

Our attention has been called to the proposed ironsands program which is being undertaken by your organization. We are greatly interested in this work since a somewhat similar investigation of some of our coastal ferruginous sands has just gotten underway. Steadily growing interest in offshore mineral deposits, other than gas and oil, has prompted a comprehensive study of submarine mining methods and local and national laws and regulations pertaining to such operations.

We would be very appreciative of any information you might wish to give us relative to your undertaking. We are particularly interested in the type of mineralization, tenor of the ore, location, regulations and laws governing extraction and beneficiation, and lease rentals and royalty schedules. We realize that certain information which we are requesting may be unavailable at this time, but anything you can give us will be of great help in formulating plans for future activity here.

Sincerely yours,

Ralph S. Mason  
Mining Engineer

RSM:lk

February 20, 1964

Mr. M. D. J. Brisby  
W. S. Atkins and Partners  
Woodcote Grove  
Ashley Road  
Epsom, Surrey, England

Dear Mr. Brisby:

Our attention has been called to the proposed ironsands program which is being undertaken by your organization. We are greatly interested in this work since a somewhat similar investigation of some of our coastal ferruginous sands has just gotten underway. Steadily growing interest in offshore mineral deposits, other than gas and oil, has prompted a comprehensive study of submarine mining methods and beneficiation techniques.

We would be very appreciative of any information you might wish to give us relative to your undertaking. We realize that certain information which we are requesting may be unavailable at this time, but anything you can give us will be of great help in formulating plans for future activity here.

Sincerely yours,

Ralph S. Mason  
Mining Engineer

RSM:lk

# Battelle Memorial Institute

5 0 5   K I N G   A V E N U E   C O L U M B U S ,   O H I O   4 3 2 0 1

AREA CODE 614, TELEPHONE 299-3191

February 17, 1964

Mr. Ralph S. Mason  
Mining Engineer  
Department of Geology and  
Mineral Industries  
State of Oregon  
1069 State Office Building  
Portland 1, Oregon

Dear Ralph:

It was good to hear from you. A brief explanation of my failure to even call you last month is in order.

I arrived in Portland before dawn on January 23, after an all night flight from Columbus; crawled in the sack until just before noon; dashed to a luncheon attended by Pacific Power and Light people; was picked up after the luncheon for a trip to Vancouver; and did not get back until after quitting time that evening. Friday, the 24th, was divided among the Museum of Science and Industry, Techtronics, Reed College, a luncheon, the United States National Bank, and a trip to Hillsboro to talk to Palmer Torvend. I left before dawn on Saturday morning, and I have not recovered yet. Next time I am in town, I promise you we will have lunch together.

With reference to your questions about New Zealand, here is some information put together for me by Hal Lownie, of our staff.

"Since 1961, Battelle has been providing research and advisory services in connection with the development of a New Zealand steel industry based on titanium-bearing ironsands. The proposed industry appears viable, and has much better than an even chance of entering the construction stage during 1965.

"The following agency is our sponsor:  
The New Zealand Steel Investigating Company  
Post Office Box 2492  
Wellington, New Zealand.

# Battelle Memorial Institute

Mr. Ralph S. Mason

-2-

February 17, 1964

"Mr. Graham Swanston (at the Wellington address) is Secretary of the company, which is an agency of the Government. Inquiries should be directed to Swanston. He has available for distribution a printed abstract of the last report of NZSIC. This report contains some information on the deposits, mining, and beneficiation, but this information may be inadequate for your purposes. There are a number of detailed reports on the ironsands themselves, but these are 'work in progress' and are usually closely held. A suitable appeal to Mr. Swanston, however, might smoke out some detail that we are not cleared to divulge.

"To augment and extend Battelle's research and advisory services as the project moves toward construction, a combine of two English companies has recently been put under contract to provide specific engineering. The selection of the method of mining is a responsibility of this engineering group, which currently is preparing their recommendations. The appropriate contact with this firm is as follows:

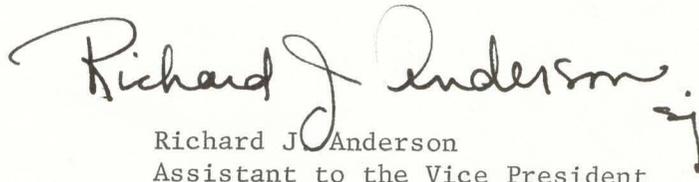
Mr. M. D. J. Brisby  
W. S. Atkins and Partners  
Woodcote Grove  
Ashley Road  
Epsom, Surrey, England.

"Mr. Brisby and some of his associates working on the mining problem just passed through the United States en route from New Zealand to England.

"New Zealand has a somewhat unique position with respect to mining rights. Perhaps you could question Swanston about this. In the case of ironsands, all deposits have been tied up by the Government for use and exploitation as the Government sees fit."

If we can be of any further assistance, don't hesitate to ask.

Cordially yours,

  
Richard J. Anderson  
Assistant to the Vice President

RJA:spj

Air mail

February 6, 1964

Mr. Richard J. Anderson  
Battelle Memorial Institute  
Columbus, Ohio

Dear Dick:

Sorry I did not get to see you during your recent visit. We are busily engaged in trying to sell our share of the Pacific to industry. Have just learned that Battelle is doing the brain work for the upcoming New Zealand black sands venture. Can you tell me, without divulging anything confidential, what type of mining operation is to be employed and what the name and address are of the New Zealand governmental agency responsible for administering coastal mining operations of this type?

We are making a comparative study of the rules and regulations of the various states having offshore or coastal mining operations. Anything you can provide will be deeply appreciated.

Sincerely yours,

Ralph S. Mason  
Mining Engineer

RSM:lk

**THE NEW ZEALAND  
STEEL INVESTIGATING COMPANY  
LIMITED**

Shell House, The Terrace, Wellington  
Post Office Box 2492  
Telephone 70-804  
Telegrams: Steelsands, Wellington

2 March 1964

Department of Geology and Mineral Industries,  
1069 State Office Building,  
Portland 1,  
Oregon,  
U.S.A.

(Attention: Mr Ralph S. Mason)

Dear Mr Mason,

We were interested to receive your letter of 20 February and to learn of your enquiries into local ironsands deposits.

The New Zealand scheme is at the stage where two associated firms of professional engineering consultants, McLellan and Partners and Atkins and Partners, London, are drawing up a detailed scheme for the establishment of an industry. A team from the consultants has recently completed local investigations. To give you some background to the New Zealand proposal, I am forwarding by separate cover and second-class airmail, a copy of the published report of the Investigating Company. Enclosed is a copy of a paper which was prepared for the United Nations Symposium at Prague in November of last year. Also attached is a copy of the press statement which announced the appointment of consultants. You will see that the Battelle Memorial Institute of Columbus, Ohio, have been retained as metallurgical advisers. In selecting consultants we were concerned that the organisation involved was free of any technical or financial interest in any specific direct reduction process. We also preferred that for work of this nature the organisation concerned should not be interested in the manufacture or sale of equipment.

You mention in your letter that you are studying submarine mining methods. We have little information on this aspect, although we are aware that submarine methods for mining titaniferous ironsand are used at Ariake Bay in Japan. Any information you readily have available could be of interest.

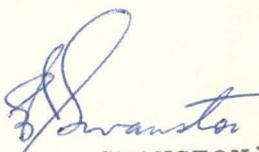
Regarding the mineralisation of the New Zealand deposits, I am not qualified to give you a technical description. The geological work was carried out by Mr D. Kear, New Zealand Geological Survey, Otara Research Station, Otara Road, Otahuhu, Auckland. The ironsands deposit to be exploited is on Government owned land at the north head of the Waikato River. Some years ago the area was planted in pine trees to consolidate the sands. Mining is likely to involve about 50 to 70 acres a year. After magnetic separation the tailings may be returned or else used to build up adjoining land. These details are at present being investigated. A royalty will be payable to the Government as owners of the land.

I am enclosing a copy of the Iron and Steel Industry Act, 1959. Under this legislation the Government invested in the Investigating Company. The Act also confers certain powers on the Crown.

*arrange  
ref.* x  
In the attached publication by J. Luke, 1955, the 'Iron Ore Resources of New Zealand', you will find some further information. I would be inclined to treat some of the figures with caution. Thus you will see that the Waikato beach and dune were believed to contain approximately 7% titanomagnetite, whereas when actually drilled this deposit was found to average about 18% concentrate.

If there is any further information which I can supply, please do not hesitate to let me know.

Yours sincerely,

  
(G. R. SWANSTON)  
Secretary

Encl:

# Laid-off Gilmore workers suffer in poor job market

By **BOB OLMO**  
of The Oregonian staff

When the 1980 American business scrapbook is finally pasted together, layoffs will take up many of its pages.

Items pressed on those sheets may be small, large, from across the country, or as close to home as Gilmore Steel's Direct Reduction Division on North Rivergate Boulevard, where 140 workers were laid off, the last leaving the plant in June.

The Gilmore layoffs capture the core of what job termination means in the summer of 1980, a summer still staggering under the batterings of recession, inflation and an unemployment rate in Oregon that jumped to 9.1 percent in June, far above the national average of 7.7 percent.

Former Gilmore workers have had to grab what few jobs are around. Some are dissatisfied with the work they found, considering it a come-down. Others haven't found work and are living on unemployment insurance. A few cling to hopes that they may get

overseas assignments, in Germany, in Saudi Arabia. "I was a tool-room clerk at Gilmore, working for \$9.15 an hour," said Jim Harris. "I'm now working at Tube Forgings of America, making \$8.10. I have to drive a greater distance to work and, with gasoline prices being what they are, that's pretty tough. In the last couple of weeks, I haven't been eating very well."

Harris tried to make a joke out of his words. But the laughter that trailed that statement sounded like it was bouncing on a high-tension wire.

Anger is part of the predicament in which the workers find themselves. They seem to need a punching bag on which to take out their frustration. And what easier patsy than the plant they feel is the cause of all their woes.

"I can't name one person who wants to give credit to the company," said Scott Piercey, a former Gilmore load driver, when he was asked if a Gilmore job-finding program had helped him.

Piercey took a \$2.50-an-hour cut in accepting a new job, which he describes resentfully as "the pits — it takes no brains to work here."

Gilmore announced last November that it was closing its Direct Reduction Division, where the company took iron-ore slurry and reduced it to iron-ore pellets, which later were used in the steel fabrication process. The DRD, as the division was called, was operated on natural gas. Its closure became inevitable, the company said, when the price of Canadian gas needed to keep it alive became prohibitive.

Under a gentlemen's agreement between labor and management, Gilmore hired Claude L. Field, an employment consultant, in February to try to ease workers into new jobs.

Field had helped guide workers through a previous massive layoff mess — when International Paper Co. shut down its sawmill in Amboy, Wash., in the summer of 1979, laying off 440 workers.

Still processing jobs in a run-down trailer house in the shadow of the silenced Gilmore plant, Field said the going is tougher this summer than last.

"Nobody's running any want ads this time," said Field. "It's a different ballgame this time. In trying to find jobs, it's one here, one there."

Contacts were made with close to 200 area firms, but the job pickings were slim, he said. His records show that jobs have been found for 30 hourly employees and 11 salaried workers, with a possibility that those totals may be boosted by three or four soon. The company reportedly is trying to end Field's



DAILY GRIND — Jeff Nevels, 21, who was laid off by Gilmore Steel, works as a grinder at Tube Forgings of America, 5200

N.W. Front Ave. Nevels is making at Gilmore, but he

Oregon Steel Mills, a division of Gilmore. If that happens, Conlan said, another 150 workers will be out of jobs.

Mike Botkin, who was an electrician at Gilmore and is now unemployed, said that when the layoffs were first announced, workers checked with state agencies to see what, if anything, could be done by the agencies to ease the layoff blow.

"We found that no help is available, other than getting unemployment benefits," Botkins said.

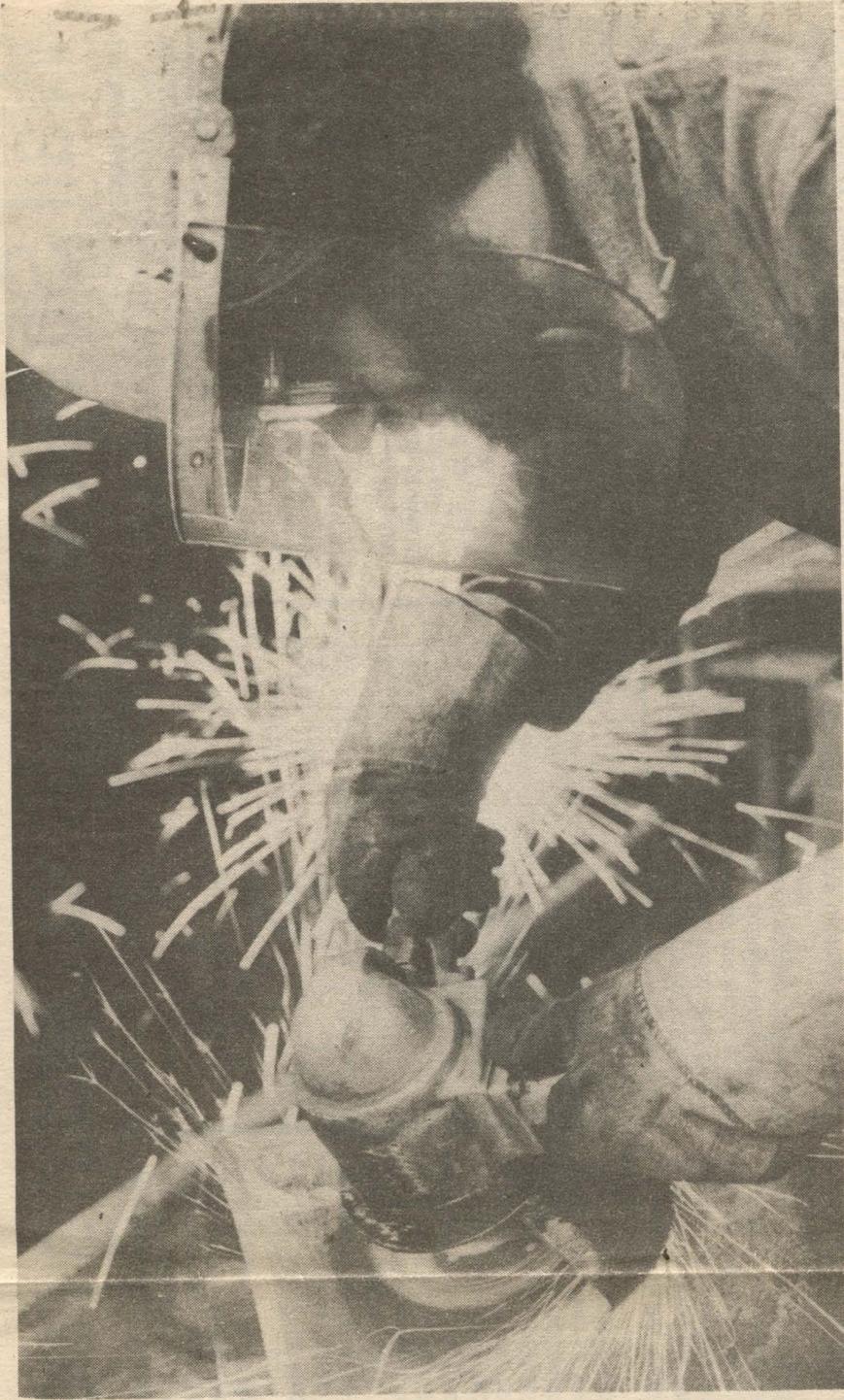
Several weeks ago, labor leaders and workers attended what they referred to as a "layoff conference" in Portland to discuss possible legislation to aid workers involved in future layoffs.

Harris and other workers are reaching for the brass ring on the employment merry-go-round.

"I'm waiting for a job in Saudi Arabia. They're building a steel plant there and they are going to need crews. But it probably won't happen for another 18 months," said Harris, who is holding on to his Portland job until that materializes.

Field said that contacts were made with Saudi





DAILY GRIND — Jeff Nevels, 21, who was laid off by Gilmore Steel, works as a grinder at Tube Forgings of America, 5200

N.W. Front Ave. Nevels is making \$2 an hour less than he was making at Gilmore, but he said he is happy he has a job.

Staff photo by JOEL DAVIS