TITANIUM MINERALOGY OF BAUXITES STUDIED

The Department recently received from the University of Wisconsin a copy of a Ph.D. thesis entitled "Titanium Mineralogy of Some Bauxites," by James A. Hartman. Dr. Hartman's research was based on bauxite samples from various parts of the world, namely Arkansas, France, Jamaica, Ireland, Surinam, and Oregon. The Oregon samples came from the Salem Hills, Marion County, and consisted of high-grade bauxite float, ferruginous bauxite, clay, and basalt. Petrographic and x-ray studies of the bauxites showed that certain titanium minerals are characteristic of all of the deposits, regardless of the source rock from which they were derived.

From the economic standpoint, it is interesting to note that in the Bayer process, by which alumina is extracted from bauxite, titanium and iron remain as an insoluble residue which contains a higher percentage of TiO_2 than the beach sand deposits being worked in the United States today. Recovery of titanium from the residues has been unsuccessful so far, due in part, Dr. Hartman believes, to the incomplete knowledge of the mineralogy of the residues. With the rapid expansion of the titanium industry and the need in the future for new ore deposits, bauxite represents a potential source of the metal; but, as the author points out, it is impossible to evaluate its importance until the titanium mineralogy is more fully understood.

In his study of the clay and bauxite in the Salem Hills, Dr. Hartman found the following titanium minerals: ilmenite, leucoxene, rutile, anatase, titaniferous magnetite, and menaccanite (see below). Table 1 shows the amounts of the heavy minerals in the clay and bauxite retained on a 325 mesh screen.

TABLE 1

COMPOSITE MODAL ANALYSES OF THE HEAVY MINERALS IN OREGON BAUXITE

Rock Type	Clay		Low Grade Bauxite		Bauxite Float	
% Heavies of Sample	7.58		7.42		0.07	
	1	2	1	2	1	2
Ilmenite	54.85	4.16	75.79	5.62	57.4	0.040
Leucoxene A	0.04	Trace	1.41	0.10	3.3	0.002
Ilmenite-leucoxene A	-	-	-	-	0.4	Trace
Rutile	-	-	-	-	0.4	Trace
Anatase	-	-	-	-	0.3	Trace
Titaniferous magnetite	20.83	1.58	4.07	0.30	0.5	Trace
Menaccanite	0.02	Trace	0.02	Trace	-	-
Hematite	5.40	0.41	0.84	0.06	31.6	0.022
Magnetite	18.11	1.37	16.89	1.25	-	-
Iron sulphides	-	-	-	-	0.6	Trace
Silicates	0.55	0.04	0.94	0.07	5.0	0.004
Unidentified	-	-	-	-	0.4	Trace
Totals	99.80	7.56	99.96	7.40	99.9	0.068

Explanation

Column 1 - % of heavy minerals
Column 2 - % of total sample

Leucoxene, a cryptocrystalline alteration product of ilmenite and titaniferous magnetite, has usually been found to be anatase or less commonly, brookite or rutile when subjected to x-ray examination. As interpreted from Hartman, leucoxene has been set up as a separate mineral having a different chemical composition from that of anatase, brookite or rutile. This differentiation appears to be based primarily on the fact that analysis of

leucoxene invariably shows the presence of Fe_2O_3. Whether the Fe replaces some Ti in the crystal lattice or there is merely an intimate mechanical mixture of the two oxides has not been definitely determined. Hartman found that 200 x-ray photographs of leucoxene aggregates showed patterns that matched either anatase or rutile. The extra lines or spots present on some of the photographs coincided with the strong lines of ilmenite. It would appear, therefore, that the leucoxene identified by Hartman may be a mechanical mixture of anatase, some residual ilmenite, and a small amount of Fe_2O_3. The iron, probably derived from the breakdown of ilmenite, may be present as amorphous limonite. If this assumption is correct, it would indicate that leucoxene can not be considered a bona fide mineral species, but, rather, should be classed as one of the indefinite clay mineraloids in the same general category as bauxite and kaolinite.

According to Palache, Berman and Frondel[1], menaccanite[2] is the ferrian variety of ilmenite and Hartman finds that it occurs in the Oregon bauxites as exsolution intergrowths of hematite in ilmenite.

Table 1 shows that in the Salem Hills, ilmenite is the predominant titanium mineral in both the bauxite and the clay and, in addition, the clay contains a significant amount of titaniferous magnetite. Table 2 illustrates, in their order of abundance, the two predominant titanium minerals in the bauxites from each of the areas where samples were obtained by Hartman for study. In all areas but two (Oregon and Jamaica) the secondary titanium minerals, anatase or leucoxene, are the predominant minerals. In comparing the

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[1] Palache, Charles; Berman, Harry; and Frondel, Clifford: System of Mineralogy, vol. 1, John Wiley and Sons, New York, 1944.

[2] "Material supposedly of a high Fe_2O_3 content has been reported, but probably is a mixture."

ilmenite content of the Jamaican ore with that from Oregon (see Table 3), the significantly greater amount of ilmenite in the Salem bauxite is apparent. The geochemical factors that enabled the ilmenite to remain essentially unaltered during a laterization process sufficient to produce high-grade bauxite ore has never been satisfactorily explained.

TABLE 2

	Leucoxene	Ilmenite	Anatase	Ilmenite-leucoxene	Titaniferous magnetite
Arkansas		2	1		
Ireland	1	2			
Oregon		1			2
Jamaica		1		2	
France	1	2			
Surinam	1	2			

TABLE 3

PERCENT IN HEAVY MINERALS

Jamaica

Sample No.	Ilmenite	Leucoxene	Leucoxene-Ilmenite
1	16.35	8.89	13.75
2	9.83	1.58	2.45

Oregon

Sample No.	Ilmenite	Leucoxene	Titaniferous Magnetite
1, Ferruginous bauxite	75.79	1.41	4.07
2, Gibbsite float	57.4	3.3	0.5

Hartman states that as bauxitization progresses to that of the quality found in the high-grade float, the ilmenite fraction of the titaniferous magnetite remains fresh, whereas the magnetite alters to a whitish or brownish substance. This alteration product of the magnetite was at first believed to be leucoxene, but x-ray diffraction patterns indicated only magnetite and ilmenite. Here again, the Fe_2O_3 may be present as amorphous limonite.

In comparing the Oregon laterites with similar material from Arkansas, Ireland, Jamaica, France, and Surinam, it is interesting to note that the deposits in Oregon are unique among the group in having significant quantities

of titaniferous magnetite and menaccanite. Perhaps more remarkable, however, is the similarity of the mineral assemblages of the laterites, even though developed on different parent rock (see accompanying Table 4). In Arkansas the bauxite source is nepheline syenite; in Ireland, basalt and rhyolite; in Oregon, basalt; in France and Jamaica, limestone; and in Surinam, sedimentary clay.

TABLE 4

TITANIUM MINERALS IDENTIFIED
IN THE BAUXITES STUDIED

District	Ilmenite	Leucoxene B	Leucoxene A	Rutile	Anatase	Titaniferous hematite	Titaniferous magnetite	Menaccanite
Arkansas	x	x	x	x	x			
Oregon	x		x	x	x		x	x
Ireland	x	x	x	x	x			
Jamaica	x	x	x	x	x	x		
France	x	x	x	x	x			
Surinam	x	x	x	x	x			

x denotes identification.

Bauxite

In the strict sense of the word, bauxite is not a mineral but a rock, as it is a mixture of hydrated aluminum oxides such as gibbsite and non-crystalline cliachite, together with some iron oxide, titanium oxide, and silica. Bauxite occurs in oolitic and earthy masses. Colors range from white to tan to brown. Pure bauxite minerals sometimes have delicate tints. Low silica content as well as high aluminum oxide determines whether or not bauxite may be utilized as an ore of aluminum. The bauxite found in northwestern Oregon is high in iron oxides, and so the material has been called high-iron bauxite or ferruginous bauxite.

Bauxite often has rounded grains from shot size to marble size set in a claylike groundmass. In this form it is oolitic (shot size grains) or pisolitic (larger than shot size grains) and is readily recognized. However, some bauxite does not have this texture but is granular - both porous and compact; and is then difficult to distinguish from clay. In Oregon the shotlike material usually occurs as the upper horizon of the deposits, but in places this horizon has been eroded away. Usually, the soil derived from the breaking down of basalt to form laterite in which the high-iron bauxite occurs is a deep brick red that stains everything it contacts. This deep-red soil is a prospecting aid and when found over wide areas should be investigated.

The laterite of northwestern Oregon was formed by the chemical weathering of basalt. The basalt was decomposed by exposure to air and water and the water percolating through this "rotted" rock carried most of the silica and other minerals away, leaving aluminum, iron, and titanium oxides in relatively high percentages.

In Oregon, commercial deposits of high-iron bauxite so far have been found only in the northwestern part of the State. Deposits were first recognized, by this Department, in Washington County in 1944. In 1945 Bulletin 29 was issued and in 1956 Bulletin 46 was published, both describing ferruginous bauxite in western Oregon.

Since the initial discoveries by the Department of high-iron bauxite, Alcoa Mining Company has done extensive exploration work, mainly in Washington and Columbia Counties. Interest in these areas is still keen and undoubtedly Oregon will at sometime be a major domestic source of aluminum ore.

Most bauxite mined in the United Stated comes from Arkansas, with minor amounts from Alabama, Georgia, and Virginia. Imports are mainly from the Guianas.

In the lower Columbia River area there are three plants for the reduction of aluminum metal from aluminum oxide which is produced by treating bauxite in plants located in the Middle West and South. A large amount of the original bauxite comes from overseas and the aluminum oxide must be shipped a long distance across the country to these plants in the Northwest. Because of this, the discovery by the Department of aluminum ore so close to the reduction plants takes on an added importance.

Aluminum is used extensively in airplanes, railroad cars, machinery, electric appliances, cooking utensils, electrical conductors, building construction, foundry and metal working, and chemicals. The properties that make it so desirable are: its light weight, its high electrical and thermal conductivity, its ductility, and its resistance to atmospheric corrosion.

R. E. Corcoran

(Sent 10-5(?)-67)

FERRUGINOUS BAUXITE

Deposits of high-iron bauxite in northwest Oregon were discovered by the Oregon Department of Geology and Mineral Industries in the Tualatin Hills (Washington County) in 1943 (see index map). Following the discovery, the Department surveyed and test drilled these and several other deposits in order to determine whether they were of sufficient size and quality to warrant a full-scale investigation. Results of the preliminary survey were published in two departmental reports (Libbey, Lowry and Mason, 1944 and 1945). As a result of the reports, Alcoa Mining Company, beginning in 1945, conducted a long-range exploration and drilling program in northwestern Oregon and an inspection of adjoining parts of Washington.

Farther to the south, in the Salem Hills, the Department later carried on a program of exploratory drilling similar in scope to the work that had been done in Washington County. A report summarizing the activities in this area was also published by the Department (Corcoran and Libbey, 1956). The Salem area has subsequently been investigated by Aluminium Laboratories, Ltd., Harvey Aluminum Co., and Reynolds Metals Co.

Other deposits of ferruginous bauxite are known to occur in several widely separated areas along both sides of the Willamette Valley, but have not been explored sufficiently to determine their economic importance.

Basalt flows, basaltic breccias, and tuffs of probable Miocene age underlie most of the hilly upland areas where the bauxite deposits are known to occur (Peck, 1961). The lavas have been termed "Columbia River basalts" (Libbey, Lowry and Mason, 1945), "Salem lavas" (Mundorff, 1939), and "Stayton lavas" (Thayer, 1939), but all are probably part of the Columbia River Group as suggested by Waters (1961).

The name "ferruginous bauxite" used in referring to the aluminous laterites of northwestern Oregon was given to this material because it was believed to be the most definitive term. It should not be classified as an iron ore, and in addition, the hydrous aluminum oxides are generally in excess of the hydrous iron oxides, which would classify the rock as a bauxite. In his investigation of the Antrim, Ireland, laterites, Eyles (1952) also uses the term "ferruginous bauxite" when describing the material developed on basalt similar in composition and age to that in northwest Oregon.

The laterite has formed through chemical decomposition of the Miocene volcanic rocks during a long period of weathering. Laterization is essentially a de-silication process in which the alkalies and alkali earths are eliminated along with most of the silica. The other constituents of the parent material, chiefly iron, aluminum, and titanium oxides, remain behind as principal components of the resulting laterite.

The color of the ore varies from dark reddish brown in Washington and Columbia Counties to light yellowish brown in the Salem area. Varieties range from hard oolitic or pisolitic type characteristic of the Washington County deposits to a porous granular or earthy type found in the Salem Hills. Chemical analyses show that the better grade of ore usually contains 33-36 percent Al_2O_3, 30-33 percent Fe_2O_3, 5-7 percent SiO_2, and 5-7 percent TiO_2. High-grade gibbsite nodules are scattered through the soil zone above the bauxite section in many of the laterite areas. Nodules as much as 3 feet across are especially common in the Salem Hills area, and these residual boulders average appxoximately 55 percent Al_2O_3, 8 percent Fe_2O_3, and 3 percent SiO_2.

Results of exploration drilling in the laterite areas by private companies have never been released to the public. On the basis of widely-spaced auger holes put down by the Department in both the Tualatin Hills (Washington and Columbia Counties) and in the Salem Hills (Marion County), it is estimated that total reserves of ferruginous bauxite in Oregon probably exceed 50 million tons. This figure could be increased considerably if the cut-off point for contined silica is raised or if some of the unexplored deposits which lie outside of the main areas prove to be larger than now indicated.

According to Williams (1965) the United States is the world's largest consumer of bauxite, and yet produces only 15 percent of domestic requirements. Almost all of the bauxite mined in this country comes from Arkansas, where reserves, averaging 52 percent Al_2O_3, are estimated to be about 50 million tons. Most of the imported bauxite comes from Jamaica and Surinam, with lesser amounts from British Guiana, Haiti, and Grench Guinea. Extensive deposits now being explored in both Australia and French Guinea may eventually make up a large share of our imports.

Aluminum metal is produced in two steps requiring two distinct operations. First, bausite ore is treated by the so-called Bayer process to produce pure aluminum oxide, or alumina as it is called. The second step is the reduction of the aluminum oxide to aluminum metal by electrolysis in a cryolite bath. As a consequence, aluminum reduction plants are located near cheap and reliable sources of electric power such as in the Columbia River area where several large hydroelectric plants have been installed. At present all Bayer plants are in the Middle West or South. Thus alumina used in Northwest reduction plants must be shipped across the country or brought in by water transport.

The percentage of alumina in the ferruginous bauxites of northwest Oregon is fairly low compared to that of most imported ores. For this reason, the unit cost of producing alumina from Oregon laterites using the Bayer process would be higher than from either Arkansas deposits or foreign sources. Oregon bauxites, however, have the advantage of favorable location that would offset to a large extent their higher processing costs as they are close to several large aluminum reduction plants located along the Columbia River. The total annual metal capacity of these plants is now in excess of 340,000 tons. With the addition of the Northwest Aluminum Co. plant, which will include a Bayer processing plant as well as an aluminum reduction facility, now under construction at Warrenton, Oregon, and the extra pot lines being completed at Reynolds' Longview and Troutdale smelters, the total annual capacity will exceed 600,000 tons (see Table 1). Reduction plants in the Pacific Northwest have a total capacity of almost 880,000 tons per year and supply almost 30 percent of the United States' aluminum metal. In the next few years, planned increases in plant capacity will boost the total for the Northwest to 1,390,000 tons.*

Extensive metallurgical testing has been done on Oregon bauxite by Alcoa, and reportedly the ore is amenable to treatment by a modification of the Bayer process. Another method for treating the laterites is the Pedersen process which was originally developed on a commercial scale in Norway. In this procedure, the ore is smelted with carbon and limestone to produce pig iron or a ferroalloy and calcium-aluminate slag which is further treated to produce alumina. The U.S. Bureau of Mines in Albany, Oregon, has conducted

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* Information on production capacity supplied by Bonneville Power Administration, Department of Marketing Research.

pilot plant tests on the ferruginous bauxites of the Northwest and showed that the Pedersen process can be used successfully on these laterites to recover pig iron as well as alumina (Blake and others, 1967).

Summary

Because of location, probable extent, physical and chemical characteristics, and unit value of the ore, the Oregon deposits form the most important known reserve of low-silica aluminous ore in the United States. The following points should be emphasized:

1. The Oregon ore is low in silica and therefore may be more economically treated than clays or other aluminum silicates.
2. The iron contained in Oregon ores could be an important by-product to offset the lower alumina content compared to high-grade bauxite.
3. Location of deposits near aluminum reduction plants and the physical characteristics of deposits which permit low mining costs are especially favorable factors in any plan for commercial production from these ores.
4. In the event that imported supplies of bauxite or alumina were cut off or seriously reduced, as occurred during World War II, Oregon bauxite might very well fill a critical, perhaps crucial, need in supplying bauxite to aluminum plants.

Table 1

Capacity of Aluminum Reduction Plants Along the Columbia River

Company	Location	Year reduct. plant built	Primary annual capacity (short tons) 1-1-67	Planned
Alcoa	Vancouver, Wash.	1940	100,000	---
Reynolds Metals Co.	Longview, Wash.	1941	65,000	185,000
Reynolds Metals Co.	Troutdale, Oregon	1942	91,500	131,500
Harvey Alum. Co.	The Dalles, Oregon	1958	87,000	---
Northwest Alum. Co.	Warrenton, Oregon	under const.	---	120,000

Capacity of Other Aluminum Reduction Plants in the Pacific Northwest

Kaiser Alum. & Chem. Corp.	Spokane, Wash.	1942	193,000	---
Kaiser Alum. & Chem. Corp.	Tacoma, Wash.	1942	41,000	82,000
Alcoa	Wenatchee, Wash.	1952	125,000	175,000
Anaconda Alum. Co.	Columbia Falls, Mont.	1955	100,000	175,000
International Alum. Co.	Bellingham, Wash.	1966	76,000	228,000

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Typed Drill Logs

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

1944-5

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Dr. Nixon
Project

Hole No. 30 Location 425 feet N. 45° W. of logging road at point .26 mi. from P.R. Rd.
1850 feet N. 65° W. of Hole 61.
of sec. 34 T. 3 N., R. 3 W., County Washington

Coord. N. E.

Elev. collar 1312.98
Depth to top of bed 2
Elev. of top of bed 1311.0
Thickness of bed 10+ ?
Elev. bottom bed ?
Depth of hole 13
Elev. water table ———
Bottomed in Red clay

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Drill used Hand auger
Number men 3
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler Mason
Date hole began 6-8-44
Date hole finished 6-8-44
Shifts actually drilled ½

From	To	Thickness of sample	Sample No.	Description
0	2			Top soil
2	6			Iron mixed with red clay
6	13			Hard red clay

Remarks Hole bottomed in ore. Sample # 22-A 2' - 6'
22-B 6'-- 8'
22-C 8' -13'

WL-24b

Hole No. 30

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 31 Location 50 feet west of limonite outcrop in Hutchinson canyon.

of sec. 1 T. 2 N., R. 3 W., County Washington

Coord. N. E.

Elev. collar 1053

Depth to top of bed 9'6"

Elev. of top of bed 1043

Thickness of bed

Elev. bottom bed

Depth of hole 10'

Elev. water table

Bottomed in Limonite

****

Drill used Hand auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole began 6-8-44

Date hole finished 6-8-44

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0	3			Top soil
3	9'6"			Variegated clay (red, brown, yellow, black)
9'6"	10'			Limonite

Remarks Did not drill through limonite.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchison
Project

Hole No. 32 Location 75 feet north of Hutchison's house.

of sec. 1 T. 2N., R. 3 W., County Washington

Coord. N. E.

Elev. collar 1100

Depth to top of bed 8

Elev. of top of bed 1092

Thickness of bed 14

Elev. bottom bed 1078

Depth of hole 28

Elev. water table

Bottomed in Mottled clay

****

Drill used 2-in.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler Both

Date hole began 6/8/44

Date hole finished 7/24/44

Shifts actually drilled 3/4

From	To	Thickness of sample	Sample No.	Description
0'	4'			Top soil
4'	8'			Red clay
8'	12'			Oölitic iron (hard)
12'	13'			Yellow clay with specks of decomposed feldspar
13'	14'6"	1'6"	200	Dark red-brown clay-like material. Few oölites.
14'6"	16'6"	2'	201	Yellow, brown, clay-like material with white fragments & occas. oölites.
16'6"	17'6"	1'	202	Very few, if any, oölites.
17'6"	19'6"	2'	203	Brown and yellow brown pebbly clay-like material.
19'6"	20'0"	6"	204	No change.
20'0"	22'0"	2'	205	Mottled, varicolored, clay-like, white streaks.
22'	24'	2'	206	Same
24'	25'	1'	207	Same
25'	26'	1'	208	Clay apparently increasing.
26'	27'10"	1'10"	209	Streaked with red, white, black.
27'10"	28'	2"	210	Wetter, more clay, whiter.

Remarks Hole stopped at 28 feet when sufficient depth (without further assays) believed reached. No apparent change noted at bottom.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 34 Location On rd. 1325 feet west of Hutchinson's house.

of sec. 1, T. 2 N., R. 3 W., County Washington

Coord. N. E.

Elev. collar ± 1125

Depth to top of bed 5

Elev. of top of bed ± 1120

Thickness of bed 9 +

Elev. bottom bed

Depth of hole 14

Elev. water table

Bottomed in Red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole began 6-9-44

Date hole finished 6-9-44

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0	5			Top soil
5	14			Red clay

Remarks No iron - no sample

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 44 Location 300 feet N. 80° W. of Hole 32; 10 feet west of road

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1113.35

Depth to top of bed 22.0

Elev. of top of bed 1091.35

Thickness of bed 12 (?)

Elev. bottom bed 1079.35

Depth of hole 37

Elev. water table none

Bottomed in Weathered basalt

****
Drill used 3" auger 2" at 22 feet

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Mason

Sampler Swanson

Date hole began 9-19-44

Date hole finished 9-23-44

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0	6'			Light brown loam.
6'	12'			Reddish brown.
12'	14'	2'	A	Dark red - some gritty.
14'	16'	2'	B	Dark red, thin yellow streaks.
16'	18'	2'	C	Dark red, slightly gritty - light spots.
18'	20'	2'	D	Dark red, grittier - more white spots.
20'	22'	2'	E	Brick red - gritty - no white spots, oölites?
22'	23'	1'	S-85	Very hard, brick red, oölites.
23'	24'	1'	S-86	Similar to above.
24'	25'	1'	S-87	Similar to above.
25'	26'	1'	S-88	Hard, brick red, many oölites.
26'	27'	1'	S-89	Softer, gritty, red-brown; many oölites.
27'	28'	1'	S-90	Softer, gritty, brown with some red; oölites yellow brown at bottom.
28'	29'	1'	S-91	Gritty, yellow brown; Big oölites.
29'	30'	1'	S-92	Brick red, gritty, oölites Blue specks.
30'	31'	1'	S-93	Very hard for 2 inches; brick red; oölites.

Remarks

See next page for Hole 44 continued.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

(cont.)

Hole No. 44 Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
31'	32'	1'	S-94	Softer, brick red, oölitic.
32'	33'	1'	S-121	Soft, some oölites, red, with whit spot
33'	34'	1'	S-122	Gritty, brick red, yellow spots.
34'	35'	1'	S-123	Soft, red-yellow, no oölites, white streaks.
35'	36'	1'	S-124	Soft, red, black spots, varicolored, streaked.
36'	37'	1'	S-125	Soft, varicolored, red spots.

Remarks Hole abandoned after passing through supposed ore zone.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 45 Location 250 feet S. 75° W. of Hole 44.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1099.64
Depth to top of bed
Elev. of top of bed
Thickness of bed
Elev. bottom bed
Depth of hole 28'
Elev. water table none
Bottomed in red clay

****

Drill used 3" auger
Number men 2
Engr. in charge Mason
Mtrl. classfd. by Mason
Sampler Swanson
Date hole began 9-20-44
Date hole finished 9-23-44
Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0'	10'			Yellow-brown silty clay; very firm.
10'	12'	2'	A	Brick red, no oölites; very firm.
12'	14'	2'	B	Brick red, some yellow-white streaks.
14'	16'	2'	C	Brick red with yellow and white streaks.
16'	18'	2'	D	Same.
18'	20'	2'	E	Brick red with fewer white and yellow spots.
20'	21'	1'	S-126	Soft, brick red, black spots.
21'	22'	1'	S-127	" " " " "
22'	23'	1'	S-128	Soft, brick red, clayey.
23'	24'	1'	S-129	" " " "
24'	25'	1'	S-130	" " " "
25'	26'	1'	S-131	" " " "
26'	27'	1'	S-132	" " " "
27'	28'	1'	S-133	" " " "

Remarks Hole abandoned when ore horizon believed passed.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson - Nixon
Project

Hole No. 46 Location (Redrilled)

_____ of sec. _____ T. _____ R. _____ County _____

Coord. _____ N. _____ E.

Elev. collar 1100.56

Depth to top of bed _____

Elev. of top of bed _____

Thickness of bed _____

Elev. bottom bed _____

Depth of hole 30

Elev. water table _____

Bottomed in Alt. basalt

****

Drill used 3 inch

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Jordan

Date hole began 2/25/45

Date hole finished 2/25/45

Shifts actually drilled $2\frac{1}{2}$ hrs. (2 men)

From	To	Thickness of sample	Sample No.	Description
0'	9'			Yellow, brown, silty clay
9'	11'	2'	408	Red-brown clay. Few shots.
11'	13'	2'	409	Red-brown clay. Quite firm.
13'	15'	2'	410	"
15'	18'	3'	411	"
18'	21'	3'	412	Soft brown clay.
21'	24'	3'	413	Soft red-brown clay
24'	27'	3'	414	"
27'	30'	3'	415	Gritty, red-brown. White, red, and pink spots.

Remarks Hole abandoned when altered basalt (?) hit. Hole redrilled and sampled.

No ore found upon analysis.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 47 Location 60 feet S. 60° W. of Hole 46, on old trail.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1111.03

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 13'

Elev. water table none

Bottomed in red clay

****

Drill used 3" auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Mason

Sampler Swanson

Date hole began 9-25-44

Date hole finished

Shifts actually drilled 1/4

From	To	Thickness of sample	Sample No.	Description
0'	6'			Tan, silty, clayey, firm.
6'	10'			Brown, clayey, sandy, soft.
10'	12'			Red brown, clayey, firm.
12'	13'			Dark red, clayey, firm.

Remarks

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 48 Location 350 feet N. 45° W. of Hole 44.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1122.17
Depth to top of bed 29.00
Elev. of top of bed 1093.17
Thickness of bed 16.00
Elev. bottom bed 1077.17
Depth of hole 45
Elev. water table none
Bottomed in Altered basalt?

****
3" auger.
Drill used 2" at 32 feet

Number men 2
Engr. in charge Mason
Mtrl. classfd. by Mason
Sampler Swanson
Date hole began 9-25-44
Date hole finished 9-26-44
Shifts actually drilled 2

From	To	Thickness of sample	Sample No.	Description
0'	4'			Tan, silty, firm.
4'	6'			Pink and white; silty, sandy, soft.
At	6'			Hematite cobble.
6'	8'			Brown, clayey, sandy, soft.
8'	9'			Red brown, clayey, firm; some oölites.
9'	18'			Brick red, clayey, firm; some oölites.
18'	19'			Brick red with yellow spots, clayey, firm, some oölites.
19'	20'	1'	S-135	Brick red with white & yellow spots, clayey, firm, some oölites.
20'	21'	1'	S-136	Brick red, clayey, gritty, soft magnetic oölites.
21'	22'	1'	S-137	Brick red, clayey, gritty, oölitic.
22'	23'	1'	S-138	Brick red, clayey, oölitic.
23'	24'	1'	S-139	Brick red, clayey, gritty, oölitic.
24'	25'	1'	S-140	Brick red, clayey, gritty, oölitic, pisolitic.
25'	26'	1'	S-141	Brick red, clayey, gritty, oölitic.
26'	27'	1'	S-142	Brick red, clayey, gritty, oölitic.
27'	28'	1'	S-143	Brick red, sandy, gritty, oölitic.

Remarks See next page for continuation of Hole 48.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

(cont.)
Hole No. 48 Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 45

Elev. water table

Bottomed in Altered basalt

****

Drill used 2" auger at 32'

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began Additional 12/1/44

Date hole finished 12/1/44

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
28'	29'	1'	S-144	Brick red, sandy, gritty, oölitic.
29'	30'	1'	S-145	Brick red, sandy, gritty, pisolitic; oölites very magnetic.
30'	31'	1'	S-146	Brick red, sandy, gritty, oölitic, pisolitic.
31'	32'	1'	S-147	Brick red, clayey, sandy, gritty, pisolitic; oölites not magnetic.
32'	33'	1'	S-148	Brick red, clayey, gritty, oölitic.
33'	34'	1'	S-149	Brick red, clayey, gritty, limonite lumps.
34'	35'	1'	S-150	Olive drab, clayey, oölitic.
35'	36'	1'	S-275	Red, clayey, gritty; oölites.
36'	37'	1'	S-276	Brown, sandy, gritty, non-magnetic oölites.
37'	38'	1'	S-277	Varicolored, sandy, gritty, non-magnetic oölites.
38'	39'	1'	S-278	Varicolored, sandy, non-magnetic oölites.
39'	40'	1'	S-279	Varicolored, sandy, gritty, non-magnetic oölites.
40'	41'	1'	S-280	Red, sandy, gritty, non-magnetic oölites.
41'	42'	1'	S-281	Brown, gritty, non-magnetic oölites.
42'	43'	1'	S-282	Brown, gritty, siliceous lumps?
43'	44'	1'	S-283	Brown, gritty; basalt lumps?
44'	45'	1'	S-284	Varicolored, plastic, soft.

Remarks

Hole abandoned when altered basalt believed struck.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 49 Location 12 feet north of Hole 48.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1122.00

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 7

Elev. water table none

Bottomed in dark clay

****

Drill used 3" auger

Number men 1

Engr. in charge Mason

Mtrl. classfd. by Mason

Sampler Swanson

Date hole began 9-26-44

Date hole finished 9-26-44

Shifts actually drilled 1/2 hr.

From	To	Thickness of sample	Sample No.	Description
0	6'			Tan, silty, clayey, firm.
6'	7'			Dark brown, clayey, firm.

Remarks This hole put down to check occurrence of hematite boulder at 6 feet in Hole 48. No hematite found.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 50 Location 5' west of road 350 feet N. 55 W. of hole 48.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1131.53
Depth to top of bed 30.00
Elev. of top of bed 1101.53
Thickness of bed 20.0
Elev. bottom bed 1081.53
Depth of hole 50
Elev. water table None
Bottomed in Ore

****
Drill used 3-in. auger 2-in. at 30 feet

Number men 2
Engr. in charge Mason
Mtrl. classfd. by "
Sampler Swanson
Date hole began 9/27/44
Date hole finished 1/18/45
Shifts actually drilled 14 HRS.

From	To	Thickness of sample	Sample No.	Description
0'	7'			Soft tan silty clay.
7'	8'			Firm brown silty clay
8'	10'	2'	S-151	Firm red-brown clay
10'	12'	2'	S-152	Firm brick-red clay. Few mag. oölites.
12'	14'	2'	S-153	" Some yellow spots
14'	16'	2'	S-154	"
16'	18'	2'	S-155	"
18'	19'6"	1'6"	S-156	"
19'6"	20'	0'6"	S-157	Firm varicolored clay
20'	22'	2'	S-158	Soft brick-red clay. White-yellow spots.
22'	24'	2'	S-159	Soft brick-red clay. Few oölites.
24'	26'	2'	S-160	Firm brick-red clay. Slightly oölitic.
26'	27'	1'	S-161	" Mag. oölites.
27'	28'	1'	S-162	"
28'	30'	2'	S-163	Very hard. Brick-red clay. Oölites-pisolites.
30'	32'	2'	S-164	Very hard brick-red clay. Oölites - spots.

(See next sheet)

Remarks

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 50 (con't) Location _____

_____ of sec. _____ T. _____ R. _____ County Washington

Coord. _____ N. _____ E.

Elev. collar _____

Depth to top of bed _____

Elev. of top of bed _____

Thickness of bed _____

Elev. bottom bed _____

Depth of hole 50

Elev. water table _____

Bottomed in Alt. basalt ?

****
3-in. to 30
Drill used 2-in. at 30

Number men _____

Engr. in charge _____

Mtrl. classfd. by _____

Sampler _____

Additional
Date hole ~~began~~ 12/1/44
1/18/45

Date hole finished _____

Man hours
~~Shifts~~ actually drilled 14

Remarks _____

From	To	Thickness of sample	Sample No.	Description
32'	34'	2'	S-165	Hard brick-red gritty clay. Oölit
34'	36'	2'	S-166	Hard varicolored gritty clay. Oölites and limonite.
36'	36'3"	3"	S-167	Firm red-brown gritty clay. Few oölites.
36'3"	36'6"	3"	"	Hard olive drab gritty clay. Oölites.
36'6"	38'	1'6"	S-285	Hard, brown, gritty clay. Few mag. oölites.
38'	39'	1'	286	Hard red-brown gritty. Few mag. oölites.
39'	40'	1'	287	Firm; brick-red sandy.
40'	41'	1'	288	Firm. Light brick-red, sandy. Mag. oölites.
41'	42'	1'	289	" Very few mag. oölites.
42'	43'	1'	302	Firm, light brick-red, sandy
43'	44'	1'	303	Hard, brick-red, gritty
44'	45'	1'	304	" White spots.
45'	46'	1'	305	Firm, brick-red, gritty. Shots.
46'	47'	1'	306	Hard, red-brown, yellow, gritty.
47'	48'	1'	307	" Some lumps.
48'	49'	1'	308	Firm, red-brown-yellow. Spotted.
49'	50'	1'	309	Firm, varicolored. Spotted. Olive drab.

Hole abandoned at 50 feet for lack of pipe.

WL-24b

Hole No. 50 con't.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 51 Location 200 feet due south of hole 50.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1120.50

Depth to top of bed 29.0

Elev. of top of bed 1091.50

Thickness of bed 12.0

Elev. bottom bed 1079.50

Depth of hole 42.5

Elev. water table None

Bottomed in Alt. basalt ?

Drill used ********** 3-in. auger 2-in. at 29 feet.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 9/28/44

Date hole finished 10/2/44

Shifts actually drilled 2½

From	To	Thickness of sample	Sample No.	Description
0'	7'			Soft tan silty clay
7'	10'			Soft red-brown clay
10'	15'			Soft brick-red clay
15'	18'	3'	S-168	Firm brick-red clay
18'	19'	1'	S-169	Firm brick-red clay;yellow spots.
19'	20'	1'	S-170	"
20'	21'	1'	S-171	"
21'	23'	2'	S-172	" Few mag. oölites.
23'	24'	1'	S-173	Mag. oölites."
24'	25'	1'	S-174	"
25'	26'	1'	S-175	Hard "
26'	27'	1'	S-176	" Firm. Many mag. oölites.
27'	28'	1'	S-177	Firm "
28'	29'	1'	S-178	"
29'	30'	1'	S-179	Hard "
30'	31'	1'	S-180	"

Remarks Hole abandoned when ore zone believed passed. (con't)

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 51 con't. Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in Alt. basalt ?

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
31'	32'	1'	S-181	Hard brick-red. Few mag. oölites.
32'	33'	1'	S-182	Firm red-brown; non-mag. oölites. lumps.
33'	34'	1'	S-134	Hard. "
34'	35'	1'	S-183	Firm red-brown, gritty; non-mag. oölites.
35'	36'	1'	S-184	Firm brick-red clay. Spotted-shot
36'	37'	1'	S-185	"
37'	38'	1'	S-186	" Few mag. oölites.
38'	39'	1'	S-187	Firm dark-red gritty clay. Shots.
39'	40'	1'	S-188	Firm dark-brown, spotted, gritty. Oölites.
40'	41'	1'	S-189	Firm varicolored clay, gritty; shots.
41'	42'	1'	S-190	"
42'	42'6"	6"	S-191	Olive drab at " bottom.

Remarks

WL-24b

Hole No. 51 cont.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 52 Location 300± feet due S. of hole 51.

_____ of sec. _____ T. _____ R. _____ County Washington

Coord. _____ N. _____ E.

Elev. collar 1091.07

Depth to top of bed _____

Elev. of top of bed _____

Thickness of bed _____

Elev. bottom bed _____

Depth of hole 42.5

Elev. water table None

Bottomed in Alt. basalt

Drill used ********** 3-in. auger 2-in. at 34 feet.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/2/44

Date hole finished 10/4/44

Shifts actually drilled 2¼

Remarks Hole abandoned for lack of pipe.

From	To	Thickness of sample	Sample No.	Description
0'	6'			Soft tan silty clay
6'	10'			Firm brown silty clay
10'	16'			Firm red-brown clay
16'	19'	6'	(S-192)	Firm dark-red clay
19'	22'		(")	Firm dark-red gritty clay
22'	25'	3'	S-193	"
25'	28'	3'	S-194	"
28'	30'	2'	S-195	" Few mag. oölites
30'	32'	2'	S-196	"
32'	33'	1'	S-197	"
33'	34'	1'	S-198	Firm dark-brown, gritty. Mag. oölites.
34'	35'	1'	S-199	Firm dark-brown spotted clay.
35'	35'9"	9"	S-200	"
35'9"	36'3"	6"	S-201	Firm brick-red clay.
36'3"	36'6"	3"	S-202	Firm dark-brown clay. Mag. oölites.
36'6"	37'	6"	S-203	Firm varicolored, spotted
37'	38'	1'	S-204	Firm olive-drab. Mag. oölites.
38'	40'	2'	S-210	"
40'	42'	2'	S-211	"
42'	42'6"	6"	S-212	"

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 53 Location On road 460 ± N. 75 W. of hole 50.

_____ of sec. _____ T. _____ R. _____ County Washington

Coord. _____ N. _____ E.

Elev. collar 1120.97

Depth to top of bed 24.0

Elev. of top of bed 1096.97

Thickness of bed 12.0

Elev. bottom bed 1084.97

Depth of hole 42.5

Elev. water table _____

Bottomed in Alt. basalt

Drill used ********** 3-in. auger 2-in. at 25 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/4/44

Date hole finished 10/5/44

Shifts actually drilled 7 hrs.

From	To	Thickness of sample	Sample No.	Description
0	10'			
10'	13'	3'	S-205	Tan silty clay
13'	16'	3'	S-206	Light brick-red clay. Few shots.
16'	19'	3'	S-207	Brick-red clay. Few shots.
19'	21'	2'	S-208	Brick-red clay with white & yellow spots. Oölites.
21'	22'	1'	S-209	"
22'	23'	1'	S-213	"
23'	24'	1'	S-214	Brick-red gritty clay oölites.
24'	25'	1'	S-215	"
25'	26'	1'	S-216	" Some pisolites.
26'	27'	1'	S-217	Yellow, brick-red gritty oölites-pisolites.
27'	27'6"	6"	(S-218)	"
27'6"	28'	6"	(")	Red-brown very gritty. Oölites - pisolites.
28'	29'	1'	S-219	Brick-red, gritty oölites - pisolites.
29'	30'	1'	S-220	Dark-red, gritty oölites - pisolites.
30'	31'	1'	S-221	Brick-red, white spots, gritty oölites. Varicolored lumps.

Remarks Hole abandoned when ore zone believed passed.

(Con't)

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 53 (Con't) Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
31'	32'	1'	S-222	Red-brown, sandy, gritty; oölites - varicolored lumps.
32'	33'	1'	S-223	"
33'	34'	1'	S-224	Red-brown sandy, gritty oölites.
34'	35'	1'	S-225	"
35'	36'	1'	S-226	Dark-brown sandy oölites.
36'	37'	1'	S-227	Red-brown yellow spots. Gritty oölites.
37'	38'	1'	S-228	Varicolored gritty oölites.
38'	39'	1'	S-229	Varicolored gritty
39'	40'6"	1'6"	S-230	Dark-brown, white, yellow, red, gray spots.
40'6"	42'	1'6"	S-231	Varicolored clay.
42'	42'6"	6"	S-232	"

Remarks

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 54 Location 980 feet N. 10° W. of hole 53.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1144.89

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 15

Elev. water table

Bottomed in Red clay

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began 10/7/44

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0'	4'			Yellow-brown silt.
4'	7'			Brown, white spotted silt.
7'	8'			Dark brown silty clay. White red spots.
8'	9'			Red brown silty clay.
9'	11'	2'	S-233	Brick-red clay. Yellow spots.
11'	13'	2'	S-234	Brick-red gritty clay. Oölites.
13'	14'	1'	S-235	"
14'	15'	1'	S-236	Brick red, gritty oölites, and lumps, and limonite.

Remarks Hole abandoned at 15 feet due to crooked hole. New hole (55) started 10 feet lower and 35 feet from hole 54. No ore found in 54 upon analysis.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 55 Location 35 feet N. 65° W. of hole 54.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1135.09
Depth to top of bed 8.00
Elev. of top of bed 1127.09
Thickness of bed 12.00
Elev. bottom bed 1115.09
Depth of hole 25
Elev. water table None
Bottomed in Alt. basalt

****

Drill used 3-in. auger
Number men 2
Engr. in charge Mason
Mtrl. classfd. by "
Sampler Swanson
Date hole began 10/9/44
Date hole finished 10/9/44
Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0	2'			Yellow, tan, silty clay
2'	4'			Yellow brown clay. Few Mag. oölites
4'	6'	2'	S-237	Brick red gritty clay. Mag. oölite
6'	8'	2'	S-238	Brick red gritty clay. Oölites and limonites.
8'	10'	2'	S-239	"
10'	12'	2'	S-240	"
12'	14'	2'	S-241	Red brown gritty clay. Oölites and limonite lumps.
14'	16'	2'	S-242	Dark brown clay. Few oölites and lumps.
16'	18'	2'	S-243	"
18'	20'	2'	S-244	Reddish-yellow clay. Few Mag oölites.
20'	22'	2'	S-245	"
22'	23'	1'	S-246	"
23'	25'	2'	S-247	Varicolored clay. Gray lumps.

Remarks Hole bottomed when altered basalt believed hit.

WL-24b

Hole No. 55

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 56 Location On logging road 745 feet N. 15° E. of hole 50.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1132.40

Depth to top of bed 15.00

Elev. of top of bed 1117.40

Thickness of bed 14.00

Elev. bottom bed 1103.40

Depth of hole 31

Elev. water table

Bottomed in Alt. basalt

****
Drill used 3-in. auger
2-in. at 24'

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/9/44

Date hole finished 10/10/44

Shifts actually drilled 7 hrs.

From	To	Thickness of sample	Sample No.	Description
0	7'			Tan silty clay
7'	10'			Dark brown silty clay; few shots.
10'	13'	3'	S-253	Red brown clay; few shots.
13'	15'	2'	S-254	Brick red gritty clay. Few Mag oölites.
15'	17'	2'	S-255	"
17'	19'	2'	S-256	Red brown gritty clay; oölites and limonite lumps.
19'	21'	2'	S-257	"
21'	23'	2'	S-258	Brick red, gritty, oölitic lumps.
23'	25'	2'	S-259	"
25'	27'	2'	S-260	Dark red gritty, oölitic.
27'	29'	2'	S-261	Reddish brown spotted clay.
29'	31'	2'	S-262	Varicolored soft basalt ?

Remarks Hole abandoned at 31 feet when altered basalt struck.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 57 Location On road 1100 feet N. 5° E. of hole 55.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1185.84

Depth to top of bed 28.00

Elev. of top of bed 1157.84

Thickness of bed 10.00

Elev. bottom bed 1147.84

Depth of hole 42

Elev. water table None

Bottomed in Altered basalt

****
Drill used 3-in. auger
2½-in. at 25 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/11/44

Date hole finished 10/13/44

Shifts actually drilled 8 hrs.

Remarks

From	To	Thickness of sample	Sample No.	Description
0	5'			Yellowish-tan silty clay
5'	6'			Dark-red brown clay. Few Mag oölites.
6'	10'	4'	S-248	Brick red clay. Few Mag oölites.
10'	13'	3'	S-249	"
13'	16'	3'	S-250	"
16'	18'	2'	S-251	Brick red, spotted, gritty, hard Mag. oölites.
18'	20'	2'	S-252	Brick red, gritty, hard Mag. oölites.
20'	22'	2'	S-263	"
22'	25'	3'	S-264	"
25'	28'	3'	(Sack) S-265	Dark red, gritty. Many Mag. oölites.
28'	31'	3'	S-266	Dark brown, spotted, gritty, Mag. oölites.
31'	33'	2'	S-267	"
33'	35'	2'	)	Yellowish-brown, gritty; few Mag oölites.
35	36'9"	1'9"	)S-268)	"
36'9"	38'	1'3"	S-271	Varicolored, gritty; few mag. oölites.
38'	39'	1'	S-272	"
39'	40'	1'	S-273	"
40'	41'	1'	S-274	Varicolored, spotted, gray basalt
41'	42'	1'	S-275	

Hole abandoned at 42 feet when altered basalt believed struck.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 58 Location On road at Wm. Hoard's road junction; 1400 ft. N. 40° W. of hole 57.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1229.63

Depth to top of bed 13.00

Elev. of top of bed 1216.63

Thickness of bed 13.00

Elev. bottom bed 1203.63

Depth of hole 27

Elev. water table 23'

Bottomed in Alt. basalt

****

Drill used 3-in. auger
2-in. at 15 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/12/44

Date hole finished 10/16/44

Shifts actually drilled 5 hrs.

From	To	Thickness of sample	Sample No.	Description
0	5'			Yellowish-brown silty clay
5'	7'			Dark brown clay
7'	13'	6'	S-269	Red brown, few Mag oölites
13'	15'	2'	S-270	Brick red, gritty, few Mag. oölites and pisolites
15'	16'	1'	S-276	Brick red, very gritty. Many oölites. Few pisolites.
16'	17'	1'	S-277	Brick red, very gritty. Few oolites & pisolites.
17'	17'10"	10"	S-278	"
17'10"	19'	1' 2"	S-279	Yellowish, brick red. Very gritty. Few oölites.
19'	20'	1'	S-280	Yellowish red brown Gritty. Many oölites.
20'	21'	1'	S-281	Spotted red brown. Very gritty oölites.
21'	22'	1'	S-282	Brick red. Gritty. Few oölites.
22'	23'	1'	S-283	"
23'	24'	1'	S-284	Brick red; spotty; gritty; oölites & pisolites.
24'	25'	1'	S-285	Brick red; spotted. Gritty. Few oölites.
25'	26'	1'	S-286	"
26'	27'	1'	S-287	Varicolored. Slightly gritty, basalt. ?

Remarks * Material from 20-27 ft. not tested with magnet. Hole abandoned at 27 feet when altered basalt (?) struck at 26 feet.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 59 Location On Nixon-Hutchinson road 4500 ft. from Nixon cut; 1700 ft. N. 65° W. of hole 58.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1237.24

Depth to top of bed 10.50

Elev. of top of bed 1226.74

Thickness of bed 9.50

Elev. bottom bed 1217.24

Depth of hole 25

Elev. water table None

Bottomed in Alt. basalt

****
Drill used 3-in. auger 2-in. at 10 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/16/44

Date hole finished 10/17/44

Shifts actually drilled 5 hrs.

From	To	Thickness of sample	Sample No.	Description
0	6'6"			Tan silty clay
6'6"	9'6"	3'	Jar S-265	Brick red. Limonite lumps, oölites
9'6"	10'6"	1'	S-266	"
10'6"	12'	1'6"	S-267	Reddish brown, gritty oölites Limonite lumps
12'	14'	2'	S-268	Reddish brown, gritty oölites
14'	15'	1'	S-269	Spotted reddish brown, very gritty oölites
15'	16'	1'	S-270	Spotted brown oölites
16'	18'	2'	S-271	Brick red. Few Mag. oölites
18'	20'	2'	S-272	"
20'	22'	2'	S-273	Red brown, spotted Mag oölites
22'	25'	3'	S-274	Varicolored, few Mag oölites

Remarks Material from 0 to 14 ft. not tested with magnet. Hole abandoned at 25 feet when ore zone believed passed.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 60 Location 3000 ft. SE. Nixon cut on road; 1350 ft. N. 65° W. of hole 59.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1271.13

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 42.5

Elev. water table None

Bottomed in Limonite, clay

****

Drill used 3-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10-17-44

Date hole finished 10-18-44

Shifts actually drilled 5 hrs.

Remarks

From	To	Thickness of sample	Sample No.	Description
0	4		Sacks	Yellowish-tan silty clay
4	7	3'	S-275	Red brown clay Few Mag oölites
7	10	3'	S-276	"
10	13	3'	S-277	"
13	16	3'	S-278	Brick red clay Few Mag oölites
16	19	3'	S-279	"
19	21	2'	S-282	"
21	23	2'	S-283	"
23	25	2'	S-284	"
25	27	2'	S-285	"
27	29	2'	S-286	Brick red gritty clay Many Mag oölites
29	31	2'	S-287	"
31	33	2'	S-288	"
33	35	2'	S-289	"
35	37	2'	S-290	Brick red clay Few Mag oölites
37	39	2'	S-291	"
39	41	2'	S-292	"
41	42'6"	1'6"	S-293	Yellow clay. Non-mag. oölites & limonite lumps.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 61 Location 1500 ft. SE. Nixon cut on road; 1600 ft. N. 65° W. of hole 60.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1288.18

Depth to top of bed 11.00

Elev. of top of bed 1277.18

Thickness of bed 18.00

Elev. bottom bed 1259.18

Depth of hole 30.0

Elev. water table None

Bottomed in Basalt ?

****

Drill used 3-in. auger
2-in. at 11 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/17/44

Date hole finished 10/19/44
1/18/45

Shifts actually drilled 4½ hrs.

From	To	Thickness of sample	Sample No.	Description
0	4			Yellowish-tan silty clay
4	8			Red-brown clay Few Mag oölites
8	10	2'	S-280	Brick red gritty clay Mag oölites
10	11	1'	S-281	"
11	14	3'	S-294	Dark brown, spotted, gritty. Mag oölites
14	16	2'	S-295	Dark brown, gritty Few basalt (?) lumps
16	18	2'	S-296	"
18	19	1'	S-297	Red brown, varicolored, Spotted
19	20	1'	310	Red brown spotted clay
20	21	1'	311	"
21	22	1'	312	"
22	23	1'	313	"
23	24	1'	401	Varicolored, spotted clay
24	25	1'	402	"
25	26	1'	403	"
26	27	1'	404	"

(Cont.)

Remarks

WL-24b

Hole No. 61

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson - Nixon
Project

Hole No. 61 Location (Cont.)

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 2"

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled 4½

From	To	Thickness of sample	Sample No.	Description
27	28	1'	405	Varicolored spotted clay
28	29	1'	406	"
29	30	1'	407	" Altered basalt ?

Remarks Hole abandoned at 30 feet when altered basalt believed struck.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchison
Project

Hole No. 62 Location 250 feet N. 45° W. from hole 60.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1280.0

Depth to top of bed 16.0

Elev. of top of bed 1264.0

Thickness of bed 10.0

Elev. bottom bed 1254.0

Depth of hole 27.0

Elev. water table 1269.0

Bottomed in Basalt ?

Drill used ********** 3-in. auger; coal auger at 16 ft.; ~~2-in. at 21 ft.~~

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Baldwin

Sampler Both

Date hole began 3/27/45

Date hole finished 3/27/45

Shifts actually drilled 12 man hrs.

Remarks

From	To	Thickness of sample	Sample No.	Description
0'	6'			Red-brown silty clay
6'	8'	2'	420	"
8'	10'	2'	421	Brick-red gritty clay
10'	12'	2'	422	" Few oölites.
12'	14'	2'	423	"
14'	15'	1'	424	Brick-red, very gritty; limonite lumps, oölites.
15'	16'	1'	425	Yellowish-brick-red, spotted, very gritty; oölites - limonites
16'	17'	1'	426	"
17'	18'	1'	427	"
18'	19'	1'	428	"
19'	20'	1'	429	"
20'	21'	1'	430	Brick-red, varicolored, gritty; oölites.
21'	22'	1'	431	"
22'	23'	1'	432	"
23'	24'	1'	433	Brick-red varicolored clay
24'	25'	1'	434	"
25'	26'	1'	435	Varicolored clay; olive drab streaks
26'	27'	1'	436	"

Hole bottomed at 27 feet for want of time.

HUTCHINSON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 32 Elev. of top of bed 1092 Depth of hole 28

Elev. collar 1100 Thickness of bed 14 Elev. of water table ---

Depth to top of bed 8 Elev. bottom bed 1078 Bottomed in Mottled clay

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0	(Collar) Elev. 1100 ft.					
	8						
P-2455		2	22.83	33.12	12.96	----	----
	10						
P-2456		2	32.68	25.72	8.62	----	----
	12						
P-2457		1	25.91	32.88	5.28	----	----
	13						
P-2538		1'6"	21.80	34.08	4.78	20.20	----
	14'6"						
P-2539		2	24.16	37.24	5.00	21.22	----
	16'6"						
P-2540	17'6"	1	22.80	42.12	5.34	20.80	
P-2541		2	22.36	42.00	4.00	20.80	
	19'6"						
P-2542	20	0'6"	23.48	30.08	5.62	21.80	
P-2543		2	25.26	26.12	12.44	30.60	
	22						
P-2544		2	23.03	27.64	18.64	34.04	
	24						
		4					
P-2548	28		19.95	26.48	25.50	31.80	
Bottom (Elev. 1072 ft.)							
Weighted average of 14 ft. of ore			24.84	33.54	7.62	----	

HUTCHINSON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 32 Elev. of top of bed 1092 Depth of hole 28

Elev. collar 1100 Thickness of bed 14 Elev. of water table ---

Depth to top of bed 8 Elev. bottom bed 1078 Bottomed in Mottled clay

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0	(Collar) Elev. 1100 ft.					
	8						
P-2455		2	22.83	33.12	12.96	----	----
	10						
P-2456		2	32.68	25.72	8.62	----	----
	12						
P-2457		1	25.91	32.88	5.28	----	----
	13						
P-2538		1'6"	21.80	34.08	4.78	20.20	----
	14'6"						
P-2539		2	24.16	37.24	5.00	21.22	----
	16'6"						
P-2540	17'6"	1	22.80	42.12	5.34	20.80	
P-2541		2	22.36	42.00	4.00	20.80	
	19'6"						
P-2542	20	0'6"	23.48	30.08	5.62	21.80	
P-2543		2	25.26	26.12	12.44	30.60	
	22						
P-2544		2	23.03	27.64	18.64	34.04	
	24						
		4					
P-2548	28		19.95	26.48	25.50	31.80	
Bottom (Elev. 1072 ft.)							
Weighted average of 14 ft. of ore			24.84	33.54	7.62	----	

HUTCHINSON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 32 Elev. of top of bed 1092 Depth of hole 28

Elev. collar 1100 Thickness of bed 14 Elev. of water table ---

Depth to top of bed 8 Elev. bottom bed 1078 Bottomed in Mottled clay

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0	(Collar) Elev. 1100 ft.					
	8						
P-2455		2	22.83	33.12	12.96	----	----
	10						
P-2456		2	32.68	25.72	8.62	----	----
	12						
P-2457		1	25.91	32.88	5.28	----	----
	13						
P-2538		1'6"	21.80	34.08	4.78	20.20	----
	14'6"						
P-2539		2	24.16	37.24	5.00	21.22	----
	16'6"						
P-2540	17'6"	1	22.80	42.12	5.34	20.80	
P-2541		2	22.36	42.00	4.00	20.80	
	19'6"						
P-2542	20	0'6"	23.48	30.08	5.62	21.80	
P-2543		2	25.26	26.12	12.44	30.60	
	22						
P-2544		2	23.03	27.64	18.64	34.04	
	24						
		4					
P-2548	28		19.95	26.48	25.50	31.80	
Bottom (Elev. 1072 ft.)							
Weighted average of 14 ft. of ore			24.84	33.54	7.62	----	

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No.	45	Elev. of top of bed	- - -	Depth of hole	28
Elev. collar	1099.64	Thickness of bed	- - -	Elev. of water table	- - -
Depth to top of bed	- - -	Elev. bottom bed	- - -	Bottomed in	Red clay

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0	(Collar) Elev. 1099.64 ft.					
	10						
P-2863		2	6.33	24.12	56.48	20.00	11.40
	12						
P-2864		2	6.23	21.92	61.36	22.20	10.80
	14						
P-2865		2	5.99	20.72	59.20	22.30	9.82
	16						
P-2866		4	6.10	21.44	60.68	23.30	10.04
P-2867							
	20						
P-2904		2	5.22	21.48	62.62	23.80	9.43
	22						
P-2906		3	4.77	19.72	62.64	24.00	9.61
	25						
P-2909		3				25.40	
Bottom	28						

Elev. 1071.64'

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 45 | Elev. of top of bed - - - | Depth of hole 28

Elev. collar 1099.64 | Thickness of bed - - - | Elev. of water table - - -

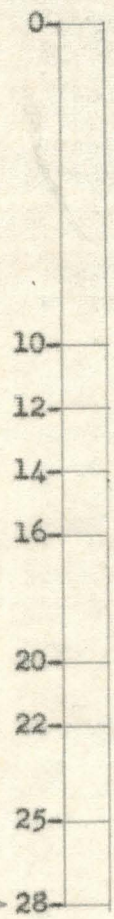
Depth to top of bed - - - | Elev. bottom bed - - - | Bottomed in Red clay

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0	(Collar) Elev. 1099.64 ft.					
	10						
P-2863		2	6.33	24.12	56.48	20.00	11.40
	12						
P-2864		2	6.23	21.92	61.36	22.20	10.80
	14						
P-2865		2	5.99	20.72	59.20	22.30	9.82
	16						
P-2866 P-2867		4	6.10	21.44	60.68	23.30	10.04
	20						
P-2904		2	5.22	21.48	62.62	23.80	9.43
	22						
P-2906		3	4.77	19.72	62.64	24.00	9.61
	25						
P-2909		3				25.40	
Bottom	28						

Elev. 1071.64'

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No.	45	Elev. of top of bed	- - -	Depth of hole	28
Elev. collar	1099.64	Thickness of bed	- - -	Elev. of water table	- - -
Depth to top of bed	- - -	Elev. bottom bed	- - -	Bottomed in	Red clay



Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
P-2863		2	6.33	24.12	56.48	20.00	11.40
P-2864		2	6.23	21.92	61.36	22.20	10.80
P-2865		2	5.99	20.72	59.20	22.30	9.82
P-2866		4	6.10	21.44	60.68	23.30	10.04
P-2867							
P-2904		2	5.22	21.48	62.62	23.80	9.43
P-2906		3	4.77	19.72	62.64	24.00	9.61
P-2909		3				25.40	

HUTCHINSON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 48 Elev. of top of bed 1093.17 Depth of hole 45

Elev. collar 1122.17 Thickness of bed 16 Elev. of water table - - -

Depth to top of bed 29 Elev. bottom bed 1077.17 Bottomed in Alt. basalt ?

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0-	(Collar) Elev. 1122.17 ft.						
P-2930	20-	1	6.55	23.52	55.80	28.20	11.52	1.91
P-2931	21-	1	6.55	27.72	55.46	29.10	11.38	
P-2932	22-	1	6.77	25.12	56.60	28.10	9.94	
P-2933	23-	1	9.88	33.28	45.66	27.70	13.05	
P-2934	24-	1	11.40	30.04	38.30	24.50	14.54	
P-2935	25-	1	11.10	31.60	38.42	26.30	14.98	
P-2936	26-	1	12.55	33.36	30.84	31.20	15.48	
P-2937	27-	1	16.32	35.20	22.84	18.20	18.37	3.95
P-2938	28-	1	17.76	37.04	17.60	17.00	20.08	3.34
P-2939	29-	1	21.09	36.64	9.90	15.90	19.73	3.18
P-2940	30-	2	21.54	41.28	5.40	18.00	23.55	3.81
P-2942	32-	2	21.87	36.60	5.32	21.75	21.79	4.30
P-2944	34-	1	22.87	36.08	4.92	26.80	22.18	5.72
P-3201	35-							
P-3202	36-							
P-3203	37-	4	26.83	36.00	6.26	22.34	22.99	5.07
P-3204	38-							
P-3205	39-							
P-3206	40-							
P-3207	41-	5	19.83	42.68	6.48	21.71	23.59	4.60
P-3208	42-	1	18.30	43.16	4.62	20.04	25.22	3.66
P-3209	43-							
P-3210	44-	1	21.38	34.82	15.12	29.18	19.47	4.00
	45-							
	Bottom (Elev. 1077.17 ft.)							
	Weighted aver. 16 ft.(29-45)		22.41	38.79	6.80	21.83	22.62	4.55

HUTCHINSON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 48 Elev. of top of bed 1093.17 Depth of hole 45

Elev. collar 1122.17 Thickness of bed 16 Elev. of water table - - -

Depth to top of bed 29 Elev. bottom bed 1077.17 Bottomed in Alt. basalt ?

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0	(Collar) Elev. 1122.17 ft.						
P-2930	20	1	6.55	23.52	55.80	28.20	11.52	1.91
P-2931	21	1	6.55	27.72	55.46	29.10	11.38	
P-2932	22	1	6.77	25.12	56.60	28.10	9.94	
P-2933	23	1	9.88	33.28	45.66	27.70	13.05	
P-2934	24	1	11.40	30.04	38.30	24.50	14.54	
P-2935	25	1	11.10	31.60	38.42	26.30	14.98	
P-2936	26	1	12.55	33.36	30.84	31.20	15.48	
P-2937	27	1	16.32	35.20	22.84	18.20	18.37	3.95
P-2938	28	1	17.76	37.04	17.60	17.00	20.08	3.34
P-2939	29	1	21.09	36.64	9.90	15.90	19.73	3.18
P-2940	30	2	21.54	41.28	5.40	18.00	23.55	3.81
P-2942	32	2	21.87	36.60	5.32	21.75	21.79	4.30
P-2944	34	1	22.87	36.08	4.92	26.80	22.18	5.72
P-3201	35							
P-3202	36							
P-3203	37	4	26.83	36.00	6.26	22.34	22.99	5.07
P-3204	38							
P-3205	39							
P-3206	40							
P-3207	41	5	19.83	42.68	6.48	21.71	23.59	4.60
P-3208	42	1	18.30	43.16	4.62	20.04	25.22	3.66
P-3209	43							
P-3210	44	1	21.38	34.82	15.12	29.18	19.47	4.00
	45							
	Bottom (Elev. 1077.17 ft.)							
	Weighted aver. 16 ft.(29-45)		22.41	38.79	6.80	21.83	22.62	4.55

HUTCHINSON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 48 Elev. of top of bed 1093.17 Depth of hole 45

Elev. collar 1122.17 Thickness of bed 16 Elev. of water table - - -

Depth to top of bed 29 Elev. bottom bed 1077.17 Bottomed in Alt. basalt ?

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0	(Collar)	Elev. 1122.17 ft.					
P-2930	20	1	6.55	23.52	55.80	28.20	11.52	1.91
P-2931	21	1	6.55	27.72	55.46	29.10	11.38	
P-2932	22	1	6.77	25.12	56.60	28.10	9.94	
P-2933	23	1	9.88	33.28	45.66	27.70	13.05	
P-2934	24	1	11.40	30.04	38.30	24.50	14.54	
P-2935	25	1	11.10	31.60	38.42	26.30	14.98	
P-2936	26	1	12.55	33.36	30.84	31.20	15.48	
P-2937	27	1	16.32	35.20	22.84	18.20	18.37	3.95
P-2938	28	1	17.76	37.04	17.60	17.00	20.08	3.34
P-2939	29	1	21.09	36.64	9.90	15.90	19.73	3.18
P-2940	30	2	21.54	41.28	5.40	18.00	23.55	3.81
P-2942	32	2	21.87	36.60	5.32	21.75	21.79	4.30
P-2944	34	1	22.87	36.08	4.92	26.80	22.18	5.72
P-3201	35							
P-3202	36							
P-3203	37	4	26.83	36.00	6.26	22.34	22.99	5.07
P-3204	38							
P-3205	39							
P-3206	40							
P-3207	41	5	19.83	42.68	6.48	21.71	23.59	4.60
P-3208	42	1	18.30	43.16	4.62	20.04	25.22	3.66
P-3209	43							
P-3210	44	1	21.38	34.82	15.12	29.18	19.47	4.00
	45							
Bottom (Elev. 1077.17 ft.)								
Weighted aver. 16 ft.(29-45)			22.41	38.79	6.80	21.83	22.62	4.55

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No.	52	Elev. of top of bed	- - -	Depth of hole	42.5
Elev. collar	1091.07	Thickness of bed	- - -	Elev. of water table	- - -
Depth to top of bed	- - -	Elev. bottom bed	- - -	Bottomed in	Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0	(Collar) Elev. 1091.07 Ft.					
	16						
P-3025		6	6.20	25.48	58.14	22.70	11.63
	22						
P-3026		6	5.68		60.24	24.50	9.30
	28						
P-3028		2	7.10		54.10	25.55	10.90
	30						
P-3029		3	8.38		51.82	26.15	10.80
	33						
P-3031		1	11.77		42.10	26.65	13.47
	34						
P-3032		3				29.64	14.95
	37						
P-3037		5'6"				33.63	16.07
Bottom	42'6"						

Elev. 1048.57'

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 52 | Elev. of top of bed - - - | Depth of hole 42.5

Elev. collar 1091.07 | Thickness of bed - - - | Elev. of water table - - -

Depth to top of bed - - - | Elev. bottom bed - - - | Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0	(Collar) Elev. 1091.07 ft.					
	16						
P-3025		6	6.20	25.48	58.14	22.70	11.63
	22						
P-3026		6	5.68		60.24	24.50	9.30
	28						
P-3028		2	7.10		54.10	25.55	10.90
	30						
P-3029		3	8.38		51.82	26.15	10.80
P-3031	33	1	11.77		42.10	26.65	13.47
	34						
P-3032		3				29.64	14.95
	37						
P-3037		5'6"				33.63	16.07
Bottom	42'6"						

Elev. 1048.57'

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 52 | Elev. of top of bed - - - | Depth of hole 42.5

Elev. collar 1091.07 | Thickness of bed - - - | Elev. of water table - - -

Depth to top of bed - - - | Elev. bottom bed - - - | Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0	(Collar) Elev. 1091.07 ft.					
	16						
P-3025		6	6.20	25.48	58.14	22.70	11.63
	22						
P-3026		6	5.68		60.24	24.50	9.30
	28						
P-3028		2	7.10		54.10	25.55	10.90
	30						
P-3029		3	8.38		51.82	26.15	10.80
	33						
P-3031		1	11.77		42.10	26.65	13.47
	34						
P-3032		3				29.64	14.95
	37						
P-3037		5'6"				33.63	16.07
Bottom	42'6"						

Elev. 1048.57'

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No.	54	Elev. of top of bed	- - -	Depth of hole	15
Elev. collar	1144.89	Thickness of bed	- - -	Elev. of water table	- - -
Depth to top of bed	- - -	Elev. bottom bed	- - -	Bottomed in	Red clay

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0 (Collar) Elev. 1144.89 ft.					
	9					
P-3083	10				23.00	10.53
	11					
P-3084	4				21.84	15.69
Bottom	15					

Elev. 1129.89'

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No.	54	Elev. of top of bed	- - -	Depth of hole	15
Elev. collar	1144.89	Thickness of bed	- - -	Elev. of water table	- - -
Depth to top of bed	- - -	Elev. bottom bed	- - -	Bottomed in	Red clay

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0 (Collar) Elev. 1144.89 ft.					
	9					
P-3083		10			23.00	10.53
	11					
P-3084		4			21.84	15.69
Bottom Elev. 1129.89'	15					

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 54 Elev. of top of bed - - - Depth of hole 15

Elev. collar 1144.89 Thickness of bed - - - Elev. of water table - - -

Depth to top of bed - - - Elev. bottom bed - - - Bottomed in Red clay

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0 (Collar) Elev. 1144.89 ft.					
	9					
P-3083	10				23.00	10.53
	11					
P-3084	4				21.84	15.69
Bottom	15					

Elev. 1129.89'

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 55 Elev. of top of bed 1127.09 Depth of hole 25

Elev. collar 1135.09 Thickness of bed 12.00 Elev. of water table ---

Depth to top of bed 8.00 Elev. bottom bed 1115.09 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0-	(Collar elev. ft.)						
	4-							
P-3087						21.10	14.79	
	6-							
P-3088			19.87	34.00	18.48	18.02	19.40	3.64
	8-	4						
P-3089		2	24.03	36.44	10.40			
	10-							
P-3090		6	27.04	34.36	5.06	17.70	22.20	6.66
	16-							
P-3093		4	26.42	30.96	8.88	24.10	19.91	5.07
	20-							
P-3095		2	26.18	29.08	17.54			
	22-	3				32.73	17.20	
	23-							
P-3097		2				33.50	16.18	
	25-							
Bottom (elev. 1110.09')								
Weighted Aver. 12 ft. of ore (8'-20')			26.33	35.24	7.22			

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 55 Elev. of top of bed 1127.09 Depth of hole 25

Elev. collar 1135.09 Thickness of bed 12.00 Elev. of water table ---

Depth to top of bed 8.00 Elev. bottom bed 1115.09 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0- (Collar elev. ft.)						
	4-						
P-3087					21.10	14.79	
	6-						
P-3088		19.87	34.00	18.48	18.02	19.40	3.64
	8- 4						
P-3089	2	24.03	36.44	10.40			
	10-						
P-3090	6	27.04	34.36	5.06	17.70	22.20	6.66
	16-						
P-3093	4	26.42	30.96	8.88	24.10	19.91	5.07
	20-						
P-3095	2	26.18	29.08	17.54			
	22- 3				32.73	17.20	
	23-						
P-3097	2				33.50	16.18	
	25-						
Bottom (elev. 1110.09')							

Weighted Aver. 12 ft. of ore (8'-20')

26.33	35.24	7.22	

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 55 Elev. of top of bed 1127.09 Depth of hole 25

Elev. collar 1135.09 Thickness of bed 12.00 Elev. of water table ---

Depth to top of bed 8.00 Elev. bottom bed 1115.09 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0-	(Collar elev. ft.)						
	4-							
P-3087						21.10	14.79	
	6-							
P-3088			19.87	34.00	18.48	18.02	19.40	3.64
	8-	4						
P-3089		2	24.03	36.44	10.40			
	10-							
P-3090		6	27.04	34.36	5.06	17.70	22.20	6.66
	16-							
P-3093		4	26.42	30.96	8.88	24.10	19.91	5.07
	20-							
P-3095		2	26.18	29.08	17.54			
	22-	3				32.73	17.20	
	23-							
P-3097		2				33.50	16.18	
	25-							
Bottom (elev. 1110.09')								

Weighted Aver. 12 ft. of ore (8'-20')

26.33	35.24	7.22	

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 56 Elev. of top of bed 1117.40 Depth of hole 31

Elev. collar 1132.40 Thickness of bed 14.00 Elev. of water table ---

Depth to top of bed 15.00 Elev. bottom bed 1103.40 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0-	(Collar elev. ft.)						
	10-							
P-3098		3				22.30	9.58	
	13-							
		2						
	15-							
P-3099		4 6				22.70	16.40	
P-3100			26.75	38.84	8.60			
	19-							
P-3102		4	22.16	39.68	4.00	20.65	23.23	3.40
	23-							
P-3104		6	25.37	33.60	5.54	26.86	19.35	5.40
	29-							
P-3107		2	22.76	24.88	24.00	35.10	16.32	
	31-							
Bottom (elev. 1101.40')								
Weighted aver. 14 ft. of ore (15'-29')			24.84	36.83	5.97			

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 56 Elev. of top of bed 1117.40 Depth of hole 31

Elev. collar 1132.40 Thickness of bed 14.00 Elev. of water table ---

Depth to top of bed 15.00 Elev. bottom bed 1103.40 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0-	(Collar elev. ft.)						
	10-							
P-3098		3				22.30	9.58	
	13-							
		2						
	15-							
P-3099		4 6				22.70	16.40	
P-3100			26.75	38.84	8.60			
	19-							
P-3102		4	22.16	39.68	4.00	20.65	23.23	3.40
	23-							
P-3104		6	25.37	33.60	5.54	26.86	19.35	5.40
	29-							
P-3107		2	22.76	24.88	24.00	35.10	16.32	
	31-							
Bottom (elev. 1101.40')								
Weighted aver. 14 ft. of ore (15'-29')			24.84	36.83	5.97			

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 56 Elev. of top of bed 1117.40 Depth of hole 31

Elev. collar 1132.40 Thickness of bed 14.00 Elev. of water table ---

Depth to top of bed 15.00 Elev. bottom bed 1103.40 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0-	(Collar elev. ft.)						
	10-							
P-3098		3				22.30	9.58	
	13-	2						
	15-							
P-3099		4 6				22.70	16.40	
P-3100			26.75	38.84	8.60			
	19-							
P-3102		4	22.16	39.68	4.00	20.65	23.23	3.40
	23-							
P-3104	26-	6	25.37	33.60	5.54	26.86	19.35	5.40
P-3107		2	22.76	24.88	24.00	35.10	16.32	
	31-							
Bottom (elev. 1101.40')								
Weighted aver. 14 ft. of ore (15'-29')			24.84	36.83	5.97			

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 57 Elev. of top of bed 1157.84 Depth of hole 42

Elev. collar 1185.84 Thickness of bed 10.00 Elev. of water table ---

Depth to top of bed 28.00 Elev. bottom bed 1147.84 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0- (Collar elev. ft.)						
	6-						
P-3113		4			21.40	10.73	
	10-						
P-3114		6			23.70	10.50	
	16-						
P-3116		6			25.10	12.81	
	22-						
P-3119		6			21.30	18.90	
	28-						
P-3121		5	22.70	34.00	11.66	20.34	6.21
	33-						
P-3123		5	22.38	31.44	16.22	19.48	5.42
	38-						
P-3125		3				18.80	
P-3128	41- 42-	1				11.80	
Bottom (elev. 1143.84')							
Weighted aver. 10 ft. of ore (28'-38')		22.54	32.72	13.94	---	19.91	5.81

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 57 Elev. of top of bed 1157.84 Depth of hole 42

Elev. collar 1185.84 Thickness of bed 10.00 Elev. of water table ---

Depth to top of bed 28.00 Elev. bottom bed 1147.84 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0- (Collar elev. ft.)						
	6-						
P-3113		4			21.40	10.73	
	10-						
P-3114		6			23.70	10.50	
	16-						
P-3116		6			25.10	12.81	
	22-						
P-3119		6			21.30	18.90	
	28-						
P-3121		5	22.70	34.00	11.66	20.34	6.21
	33-						
P-3123		5	22.38	31.44	16.22	19.48	5.42
	38-						
P-3125		3				18.80	
P-3128	41- 42-	1				11.80	
Bottom (elev. 1143.84')							
Weighted aver. 10 ft. of ore (28'-38')		22.54	32.72	13.94	---	19.91	5.81

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 57 Elev. of top of bed 1157.84 Depth of hole 42

Elev. collar 1185.84 Thickness of bed 10.00 Elev. of water table ---

Depth to top of bed 28.00 Elev. bottom bed 1147.84 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0- (Collar elev. ft.)						
	6-						
P-3113		4			21.40	10.73	
	10-						
P-3114		6			23.70	10.50	
	16-						
P-3116		6			25.10	12.81	
	22-						
P-3119		6			21.30	18.90	
	28-						
P-3121		5	22.70	34.00	11.66	20.34	6.21
	33-						
P-3123		5	22.38	31.44	16.22	19.48	5.42
	38-						
P-3125		3				18.80	
P-3128	41- 42-	1				11.80	
Bottom (elev. 1143.84')							
Weighted aver. 10 ft. of ore (28'-38')		22.54	32.72	13.94	---	19.91	5.81

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 58 Elev. of top of bed 1216.63 Depth of hole 27

Elev. collar 1229.63 Thickness of bed 13.00 Elev. of water table 23'

Depth to top of bed 13.00 Elev. bottom bed 1203.63 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0- (Collar elev. ft.)						
	7-						
P-3129	6					17.06	
	13-						
P-3130	6	25.10	32.28	9.46		21.42	4.78
	19-						
P-3135	5	23.38	35.24	6.12		22.34	5.74
	24-						
	3 2	22.60	34.32	12.62		19.05	
	26-						
	27-						
Bottom (elev. 1202.63')							
Weighted aver. 13 ft. of ore (13'-26')		24.05	33.73	8.67			

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 58 Elev. of top of bed 1216.63 Depth of hole 27

Elev. collar 1229.63 Thickness of bed 13.00 Elev. of water table 23'

Depth to top of bed 13.00 Elev. bottom bed 1203.63 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0-	(Collar elev. ft.)						
	7-							
P-3129		6					17.06	
	13-							
P-3130		6	25.10	32.28	9.46		21.42	4.78
	19-							
P-3135		5	23.38	35.24	6.12		22.34	5.74
	24-	2	22.60	34.32	12.62		19.05	
	26-	3						
	27-							
Bottom (elev. 1202.63')								
Weighted aver. 13 ft. of ore (13'-26')			24.05	33.73	8.67			

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 58 Elev. of top of bed 1216.63 Depth of hole 27

Elev. collar 1229.63 Thickness of bed 13.00 Elev. of water table 23'

Depth to top of bed 13.00 Elev. bottom bed 1203.63 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0- (Collar elev. ft.)						
	7-						
P-3129	6					17.06	
	13-						
P-3130	6	25.10	32.28	9.46		21.42	4.78
	19-						
P-3135	5	23.38	35.24	6.12		22.34	5.74
	24-						
	3 2	22.60	34.32	12.62		19.05	
	26-						
	27-						
Bottom (elev. 1202.63')							
Weighted aver. 13 ft. of ore (13'-26')		24.05	33.73	8.67			

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 59 Elev. of top of bed 1226.74 Depth of hole 25

Elev. collar 1237.24 Thickness of bed 9.50 Elev. of water table ---

Depth to top of bed 10.50 Elev. bottom bed 1217.24 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0-	(Collar elev. ft.)						
	6'.6"-							
P-3143		5'.6"					17.15	
	10'.6"-							
P-3145		1'.6"	27.14	33.40	5.32			
	12-							
P-3146		4	26.48	37.28	5.70	19.94	20.82	6.21
	16-							
P-3149		4	24.15	28.80	13.56	25.92	19.00	6.88
	20-							
P-3151		5				29.82	15.37	
	25-							
Bottom (elev. 1212.24')								
Weighted aver. 9.5 ft. ore (10'.6"-20')			25.60	33.09	8.95			

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 59 Elev. of top of bed 1226.74 Depth of hole 25

Elev. collar 1237.24 Thickness of bed 9.50 Elev. of water table ---

Depth to top of bed 10.50 Elev. bottom bed 1217.24 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0- (Collar elev. ft.)						
	6'.6"-						
P-3143		5'.6"				17.15	
	10'.6"-						
P-3145		1'.6"	27.14	33.40	5.32		
	12-						
P-3146		4	26.48	37.28	5.70	19.94	20.82	6.21
	16-						
P-3149		4	24.15	28.80	13.56	25.92	19.00	6.88
	20-						
P-3151		5				29.82	15.37	
	25-						
Bottom (elev. 1212.24')							
Weighted aver. 9.5 ft. ore (10'.6"-20')		25.60	33.09	8.95			

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 59 Elev. of top of bed 1226.74 Depth of hole 25

Elev. collar 1237.24 Thickness of bed 9.50 Elev. of water table ---

Depth to top of bed 10.50 Elev. bottom bed 1217.24 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0- (Collar elev. ft.)						
	6'.6"-						
P-3143	5'.6"					17.15	
	10'.6"-						
P-3145	1'.6"	27.14	33.40	5.32			
	12-						
P-3146	4	26.48	37.28	5.70	19.94	20.82	6.21
	16-						
P-3149	4	24.15	28.80	13.56	25.92	19.00	6.88
	20-						
P-3151	5				29.82	15.37	
	25-						
Bottom (elev. 1212.24')							
Weighted aver. 9.5 ft. ore (10'.6"-20')		25.60	33.09	8.95			

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 60 Elev. of top of bed - - - Depth of hole 42.5

Elev. collar 1271.13 Thickness of bed - - - Elev. of water table - - -

Depth to top of bed - - - Elev. bottom bed - - - Bottomed in Limonite clay

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0 (Collar) 1271.13 ft. elev.					
	4					
P-3153		3				10.52
	7					
P-3154		3				10.74
	10					
P-3155		3				11.28
	13					
P-3156		3				11.72
	16					
P-3157		3				11.36
	19					
P-3158		6				11.80
	25					
P-3161		6				12.83
	31					
	35					
P-3166		4				12.62
	39					
P-3168		2				11.61
	41					
P-3169		1'6"				12.49
Bottom → Elev. 1228.63'	42'6"					

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 60 Elev. of top of bed - - - Depth of hole 42.5

Elev. collar 1271.13 Thickness of bed - - - Elev. of water table - - -

Depth to top of bed - - - Elev. bottom bed - - - Bottomed in Limonite clay

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0 (Collar) Elev. 1271.13 ft.					
	4					
P-3153		3				10.52
	7					
P-3154		3				10.74
	10					
P-3155		3				11.28
	13					
P-3156		3				11.72
	16					
P-3157		3				11.36
	19					
P-3158		6				11.80
	25					
P-3161		6				12.83
	31					
	35					
P-3166		4				12.62
	39					
P-3168		2				11.61
	41					
P-3169		1'6"				12.49
Bottom →	42'6"					

Elev. 1228.63'

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 60 Elev. of top of bed - - - Depth of hole 42.5

Elev. collar 1271.13 Thickness of bed - - - Elev. of water table - - -

Depth to top of bed - - - Elev. bottom bed - - - Bottomed in Limonite clay

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0	(Collar) Elev. 1271.13 ft.					
	4						
P-3153		3					10.52
	7						
P-3154		3					10.74
	10						
P-3155		3					11.28
	13						
P-3156		3					11.72
	16						
P-3157		3					11.36
	19						
P-3158		6					11.80
	25						
P-3161		6					12.83
	31						
	35						
P-3166		4					12.62
	39						
P-3168		2					11.61
	41						
P-3169		1'6"					12.49
Bottom	42'6"						

Elev. 1228.63'

NIXON

HUTCHINSON PROJECT

(1944-5)

1. Keys to logs.
2. ORIGINAL Logs of holes 30, 31, 32, 34, 44-61.
3. Dip needle survey.

KEYS TO BE USED IN CONNECTION WITH HUTCHINSON DRILL LOGS

COLOR

KEY No 1 →

A. Tan
B. Yellow
C. Brown
D. Dark brown
E. Red brown
F. Dark red
G. Brick red
H. Brick red with white spots
I. Brick red with yellow spots
J. Varicolored
K. OLIVE DRAB
L. " " WITH RED SPOTS

TEXTURE

1. Earthy
2. Silty
3. Clayey
4. Sandy
5. Gritty
6. Oölitic
7. Pisolitic
8. Hard
9. VERY HARD
10. FIRM
11. SOFT
12. DRY
13. DAMP
14. MAGNETIC

SLIGHTLY 4
VERY 4

KEY No 1.

COLOR

Key No. 2

Light A
Dark A

A. Tan
B. Yellow
C. Brown
D. Dark Brown
E. Red Brown
F. Dark Red
G. Brick Red
H. White Spots
I. Yellow Spots
J. Red Spots
K. Varicolored
L. Olive Drab
M. Gray

TEXTURE

1. Earthy
2. Silty
3. Clayey
4. Sandy
5. Gritty
6. Oölitic
7. Pisolitic
8. Shots
9. Lumps
10. Soft
11. Firm
12. Hard
13. Dry
14. Damp
15. Magnetic
16. Nonmagnetic
17. LIMONITE
18. BASALT

Slightly 7
Very 7

KEY NO. 3

Color

A. Tan
B. Yellow
C. Brown
D. Red
E. Brick Red
F. White Spots
G. Yellow Spots
H. Red Spots
I. Black Spots
J. Brown Spots
K. Blue Spots
L. Orange Spots
M. Pink Spots
N. Olive Drab
O. Grey
P. Blue
Q. Black
R. Varicolored
S. Banded
T. Mottled

Light D
Dark D

Few C
Many G

Very few H
Very many H

Texture

1. Earthy
2. Sandy
3. Silty
4. Clayey
5. Gritty
6. Plastic
7. Soft
8. Firm
9. Hard
10. Shots
11. Oolites
12. Pisolites
13. Lumps
14. Solid
15. Dry
16. Damp

Composition

20. Hematite
21. Limonite
22. Magnetite
23. Basalt
24. Sandstone
25. Magnetic
26. Non-magnetic

Slightly 7
Very 7

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Dr. Nixon
Project

Hole No. 30 Location 425' N-45°W of logging rd. at point .26 mi. from P.R.Rd.
1850 FT N65W OF HOLE 61
Sec. 34 T. 3N R. 3W County Washington

Coord.

Elev. collar 1312.23

Depth to top of bed 2

Elev. of top of bed 1310.0

Thickness of bed 10+?

Elev. water table

Depth of hole 13

Cumulative depth 627

Bottomed in Red clay

****

Drill used Hand Auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole begun 6-8-44

Date hole finished 6-8-44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	6				Iron mixed w. red clay
6	13				Hard red clay

Remarks:

Sample # 22-A 2'-6'
22-B 6'-8'
22-C 8'-13'

Hole No. 30

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HUTCHISON-NIXON
Project

Hole No. 30 Location (REDRILLED)

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed 2'

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" TO 4" COAL AUGER 4'

Number men 2 & 6' 2

Engr. in charge MASON

Mtrl. classfd. by

Sampler JORDAN

Date hole began 2-25-44

Date hole finished

Shifts actually drilled 11 HRS

From	To	Thickness of sample	Sample No.	Description
0	2	—		1-D-C
2	4	2'	P 3390 416	E-11-8 (D-B-13)
4	5	1'	3391 417	E-11-8 (D-B-13)
5	7	2	3392 418	E-11-12-9

Remarks HOLE ABANDONED AT 7' WHEN ½ OF 2" AUGER BROKE OFF AND LODGED IN BOTTOM OF HOLE

YL-24b

Hole No. 30

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 31 Location 50' West of limonite outcrop in Hutchinson CANyon

Sec. 1 T. 2N R. 3W County Washington

Coord.

Elev. collar 1053

Depth to top of bed 9'6"

Elev. of top of bed 1043

Thickness of bed —

Elev. water table —

Depth of hole 10'

Cumulative depth 637

Bottomed in limonite

****

Drill used Hand auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole begun 6-8-44

Date hole finished "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	9'6"				Varigated clay (red, brn, yellow & black)
9'6"	10'				limonite

Remarks: Did not drill thru limonite

Sample?

Hole No. 31

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 32 Location 75 N. of Hutchinsons house

Sec. 1 T. 2N R. 3W County Washington

Coord.

Elev. collar 1100

Depth to top of bed 8

Elev. of top of bed 1092

Thickness of bed 14

Elev. water table —

Depth of hole 13'

Cumulative depth ~~150~~

Bottomed in ~~Yellow clay~~

****

Drill used Hand auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole begun 6-8-44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	4				Top soil
4	8				Red clay
8	12				Oölitic iron (hard)
12	13				Yellow clay w. specks of decomposed feldspar
					↓ SEE LOG ON ANOTHER PAGE
					(CONT)

Remarks:

Sample # 23-A 8'-10' (P-2455)
" 23-B 10'-12' (P-2456)
" 23-C 12'-13' (P-2457)

Fe	Al_2O_3	SiO_2
22.83	33.12	12.96
32.68	25.72	8.62
25.91	32.88	5.28

Hole No. 32

P-2457

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson (see oil drill logs)
Project

Hole No. 32 continued Location

Sec. 1 T. 2 N R. 3 W County Washington

Coord.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table —

Depth of hole 28'

Cumulative depth

Bottomed in Mottled Clay

****

Drill used 2"

Number men 2

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole begun 7-24-44

Date hole finished 7-24-44

Shifts actually drilled ½

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
13	14'-6"	JAR	200		DARK RED BROWN CLAY-LIKE MTRL-FEW
14'-6"		JAR	201		YEL BROWN CLAY LIKE MTRL WITH WHITE EG
—	16'-6"	—	—	—	AND OCCASIONAL OOLITES
16'6"	17'6"	"	202		very few if any
17'6"	19'-6"		203		brown, pebbly
—	—	—	—		clay-like material
19'-6"	20'-0"	JAR	204		NO CHANGE
20'-0"	22'-0"	JAR	205		MOTTLED-VARICOLORED CLAY LIKE-WHITE STREA
22'-0"	24'-0"	JAR	206		"
24'-0"	25'-0"	~~Sack~~ JAR	207		"
25'-0"	26'-0"	SACK	208		CLAY APPARENTLY INCREASING
26'-0"	27'-10"	SACK	209		GETTING MORE STREAKED WITH RED-WHITE-BLACK
27'-10"	28'-0"	SACK	210		GETTING WETTER MORE CLAY-WHITE

Remarks:

HOLE DEEPENED TO DETERMINE NATURE OF MTRL. BELOW ORE. HOLE STOPPED AT 28'-0" WHEN SUFFICIENT DEPTH (WITHOUT FURTHER ASSAYS) REACHED NO APPARENT CHANGE NOTED AT BOTTOM

Hole No. 32C

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 34 Location On rd. 1325' W. of Hutchinsons house

Sec. 1 T. 2N R. 3W County Washington

Coord.

Elev. collar ± 1125

Depth to top of bed 5'

Elev. of top of bed ± 1120

Thickness of bed 9+

Elev. water table

Depth of hole 14

Cumulative depth 677

Bottomed in Red clay

****

Drill used Hand Auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 6-9-44

Date hole finished "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	5				Top soil
5	14				Red clay

Remarks:

No iron - no sample

Hole No. 34

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

1100
'8
HOLE 32 1092

HIGH-ALUMINA IRON

Project

(HUTCHINSON)

Hole No. 44 Location 300' N 80° W OF HOLE 32. 10' W OF ROAD

of sec. T. R. County WASHINGTON

Coord. N. E.

Elev. collar 1113.35

Depth to top of bed 22.0

Elev. of top of bed 1091.35

Thickness of bed 12

Elev. bottom bed 1079.35

Depth of hole 37'

Elev. water table NONE

Bottomed in WEATHERED BASALT

****

Drill used 3" AUGER 2" AT 2.2'

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 9-19-44

Date hole finished 9-23-44

Shifts actually drilled 4 1/2

Remarks HOLE ABANDONED METER PASSING INTO SUPPOSED ORE ZONE

From	To	Thickness of sample	Sample No.	Description
0	6			LIGHT BROWN LOAM.
6'	12'			REDDISH BROWN
12'	14	2'	'A'	DARK RED - SOME GRITTY
14'	16'	2'	'B'	DARK RED - THIN YELLOW STREAKS
16'	18'	2'	'C'	DARK RED SLIGHTLY GRITTY - LT. SPOTS
18'	20'	2'	'D'	DARK RED - GRITTIER MORE WHITE SPOTS
20'	22'	2'	'E'	BRICK RED - GRITTY - NO WHITE SPOTS, OOLITES ?
22'	23'	1'	S-85	VERY HARD - BRICK RED - OOLITES 9 - 9 - 6
23'	24'	1'	S-86	SIMILAR TO ABOVE
24	25	1'	S-87	" " "
25'	26'	1'	S-88	HARD - BRICK RED - MANY OOLITE
26'	27'	1'	S-89	SOFTER - GRITTY - RED-BROWN MANY OOLITES
27'	28'	1'	S-90	SOFTER - GRITTY - BROWN WITH SOME RED, OOLITES YEL BR
28'	29'	1'	S-91	GRITTY - YELLOW BROWN. (A BIT) BIG OOLITES
29'	30'	1'	S-92	BRICK RED - GRITTY - OOLITES BLUE SPECKS
30'	31'	1'	S-93	VERY HARD FORE". BRICK RED, OOLITES
31'	32'	1'	S-94	SOFTER - BRICK RED OOLITIC
32	33'	1'	S-121	SOFT - SOME OOLITES RED WITH WHITE SPOTS NO OOLITES
33'	34'	1'	S-122	GRITTY - BRICK RED - YELLOW SPO
34'	35'	1'	S-123	SOFT - RED - YELLOW - NO OOLITES WHITE STREAKS
35'	36'	1'	S-124	SOFT - RED - BLACK SHOTS VARICOLORED - STREAKED
36'	37'	1'	S-125	SOFT - VARICOLORED RED SPOTS.

Hole No. 44

L-24b

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

Hole No. 45 Location 250 FT S 75° W OF HOLE 44 ~~DID NEEDLE STA B~~

of sec. T. R. County WASH

Coord. N. E.

Elev. collar 1099.64

Depth to top of bed —

Elev. of top of bed —

Thickness of bed —

Elev. bottom bed —

Depth of hole 28'

Elev. water table NONE

Bottomed in RED CLAY

****

Drill used 3" AUGER

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 9-20-44

Date hole finished 9-23-44

Shifts actually drilled 4½ 1

From	To	Thickness of sample	Sample No.	Description
0	10'	—		YELLOW-BROWN SILTY CLAY VERY FIRM
10'	12	2'	'A'	BRICK RED - NO OÖLITES VERY FIRM
12'	14	2'	'B'	BRICK RED - SOME YELLOW-WHITE STREAKS
14	16	2'	'C'	BRICK RED WITH YELLOW AND WHITE STREAKS
16	18	2'	'D'	" " "
18	20	2'	'E'	BRICK RED - FEWER WHITE & YELLOW SPOTS
20'	21	1'	S-126	SOFT - BRICK RED - BLACK SHOTS
21'	22	1'	S-127	" " " " "
22'	23'	1'	S-128	SOFT, BRICK RED - CLAYEY
23'	24	1'	S-129	" " " "
24	25	1'	S-130	" " " "
25	26'	1'	S-131	" " " "
26	27'	1'	S-132	" " " "
27	28	1'	S-133	" " " "

Remarks HOLE ABANDONED WHEN ORE HORIZON BELIEVED PASSED

WL-24b

Hole No. 45

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

Hole No. 46 Location 400'± N60°W± FROM HOLE 44

of sec. T. R. County

Coord. N. E.

Elev. collar 1100.56

Depth to top of bed —

Elev. of top of bed —

Thickness of bed —

Elev. bottom bed —

Depth of hole 19'

Elev. water table NONE

Bottomed in RED CLAY

****

Drill used 3" AUGER

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 9-25-44

Date hole finished

Shifts actually drilled "

From	To	Thickness of sample	Sample No.	Description (KEY No. 1)
0'	8'	—	—	A-2-3-10
8'	16'	—	—	D-3-10
16'	19'	—	—	E-3-10 WITH FEW RED STREAKS

Remarks HOLE ABANDONED WHEN NO ORE FOUND AT 19 FT. HOLE 47 TO BE DRILLED 10' HIGHER

WL-24b

Hole No. 46

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HOCHSON-NIXON
Project

Hole No. 46 Location (REDRILLED) (NOTE: IGNORE SAMPLE NO'S IN INK WHEN TYPING)

of sec. T. R. County

Coord. N. E.

Elev. collar 1100.56

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 30

Elev. water table —

Bottomed in ALTERED BASALT

****

Drill used 3"

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler JORDAN

Date hole began 2-25-45

Date hole finished 2-25-45

Shifts actually drilled 2 1/2 HRS (2 MEN)

From	To	Thickness of sample	Sample No.	
0	9	—	—	YELLOW-BROWN SILTY CLAY
9	11	2'	3382 408	RED-BROWN CLAY. FEW SHOTS
11	13	2'	3383 409	RED BROWN CLAY QUITE FIRM
13	15	2'	3384 410	"
15	18	3'	3385 411	"
18'	21	3'	3386 412	SOFT BROWN CLAY
21	24	3'	3387 413	SOFT RED-BROWN CLAY
24	27	3'	3388 414	"
27	30	3'	3389 415	GRITTY RED BROWN, WHITE, RED & PINK SPOTS

Remarks HOLE ABANDONED WHEN ALT BASALT(?) HIT. HOLE REDRILLED AND SAMPLED NO ORE FOUND UPON ANALYSIS

WL-24b

Hole No. 46

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

Hole No. 47 Location 60 FT S 60° W OF HOLE 46
ON OLD TRAIL

of sec. T. R. County WASHINGTON

Coord. N. E.

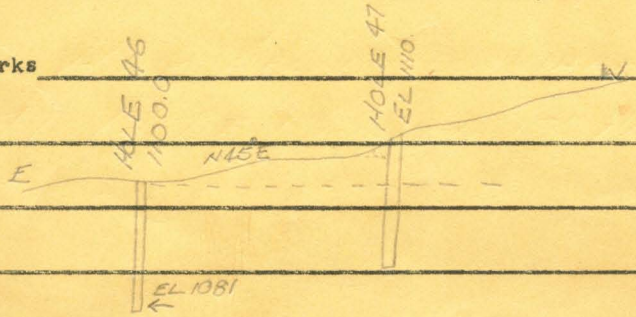
Elev. collar 1111.03
Depth to top of bed —
Elev. of top of bed —
Thickness of bed —
Elev. bottom bed —
Depth of hole 13'
Elev. water table NONE
Bottomed in RED CLAY

****

Drill used 3" AUGER
Number men 2
Engr. in charge MASON
Mtrl. classfd. by "
Sampler SWANSON
Date hole began 9-25-44
Date hole finished
Shifts actually drilled 1/2

From	To	Thickness of sample	Sample No.	Description (KEY NO 1)
0'	6'			A-2,3-10
6'	10'			C-3,4-11
10'	12'			E-3-10
12'	13'			F-3-10

Remarks



WL-24b

Hole No. 47

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

Hole No. 48 Location 350 FT. N45°W HOLE 44

of sec. T. R. County WASHINGTON

Coord. N. E.

Elev. collar 1122.17

Depth to top of bed 29.00

Elev. of top of bed 1093.17

Thickness of bed 16.?

Elev. bottom bed 1077.17

Depth of hole 45.

Elev. water table NONE

Bottomed in ALT. BASALT?

****

Drill used 3" AUGER 2" AT 32'

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 9-25-44

Date hole finished 9-26-44

Shifts actually drilled "2"

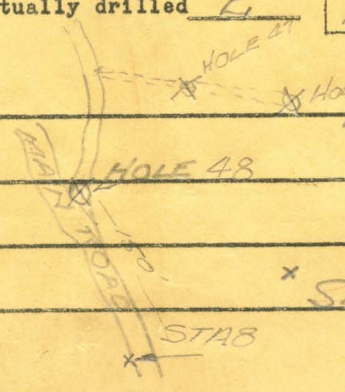
From	To	Thickness of sample	Sample No.	Description (KEY No 1)
0'	4'	—	—	A-2-10
4'	6'	—	—	PINK & WHITE, 2, 4, -11
AT	6'			HEMATITE COBBLE
6'	8'			C-3, 4-11
8'	9'			E-3, 10, SOME OÖLITES
9'	18'			G-3, 10, " "
18'	19'			I, 3, 10, " "
19'	20'	1'	S-135	H, I, 3, 10 " "
20'	21'	1'	S-136	H, I, 3, 5, 6 — OÖLITES SOFT VERY MAGNETIC
21'	22'	1'	S-137	H, I, 3, 5, 6, 10
22'	23'	1'	S-138	G, 3, 6, 10
23'	24'	1'	S-139	G, 3, 5, 6, 10
24'	25'	1'	S-140	G, 3, 5, 6, 7, 10
25'	26'	1'	S-141	G, 3, 5, 6, 10
26'	27'	1'	S-142	G, 3, 5, 6, 10 DRIER
27'	28'	1'	S-143	G, 4, 5, 6, 10 DRIER

(SEE NEXT SHEET)

Remarks

HOLE 48 HOLE ABANDONED WHEN DRILL APPARENTLY STRUCK ALTERED BASALT

× SEE NEXT SHEET



WL-24b

Hole No. 48

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HOTCHINSON

Hole No. 48 CON'T Location

of sec. T. R. County WASH

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 45

Elev. water table —

Bottomed in ALT BASALT

****

Drill used 2" LONGYEAR LK32

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began ADDITIONAL 12-1-44

Date hole finished 12-1-44

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description (KEY NO 1)
28'	29'	~~1'~~	S-144	G, 4 5, 6, 8, DRY
29'	30'	1'	S-145	G, 4, 5, 6, 7, 8 OÖLITES VERY MAGNET
30'	31'	1'	S-146	G, 4, 5, 6, 7, 8 DAMPER
31'	32	1'	S-147	G, 3-4, 5 6, 7, 8 OÖLITES NOT MAGNET
32'	33'	1'	S-148	I 3-4, 5, 6, 10
38'	34'	1'	S-149	I, 3, 5 (RED-YELLOW PISOLITES) 10 LIMONITE foam
34'	35	1'	S-150	L, 3, 6, 11 DAMP
35	36	1'	S275	(KEY NO 3) D-B, 4, 5, 11, 16
36	37	1'	276	C-D, 2 5, 8, 16, 26-11
37	38	1'	277	B-C H-G, 2 5, 16, 26-11, 8
38	39	1'	278	B-C, H-G, 2, 9, 10, 26-11, 15
39	40	1'	279	B-C-H, I G, 2, 8, 10, 26-11, 15
40	41	1'	280	D-C-H, 2, 5, 9; 26-11, 15
41	42	1'	281	C-E-L 5, 8, 26-11, 16
42	43	1'	282	C-E-L* 5, 9, 16 siliceous ? limonite ?
43	44	1'	283	C-E H-G, 5, 8, 16, (23-13?)
44	45	1'	284	D-B-C F G H I G7, 16 R (CHALCEDONY?)

Remarks * ORANGE LUMPS OF SILICEOUS MTRL

HOLE ABANDONED WHEN ALT. BASALT BELIEVED STRUCK

VARICOLORED

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

Hole No. 49 Location 12 FT N ~~OF~~ FROM HOLE 48

_____ of sec. _____ T. _____ R. _____ County WASH

Coord. _____ N. _____ E.

Elev. collar 1122.00

Depth to top of bed –

Elev. of top of bed –

Thickness of bed –

Elev. bottom bed –

Depth of hole 7

Elev. water table NONE

Bottomed in DARK CLAY

****

Drill used 3" AUGER

Number men 1

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 9-26-44

Date hole finished 9-26-44

Shifts actually drilled 1/2 HR

From	To	Thickness of sample	Sample No.	Description (KEY NO.)
0	6'	–	–	A-2-3, 10
6'	7	–	–	0, 3, 10

Remarks THIS HOLE PUT DOWN TO CHECK OCCURRENCE OF HEMATITE BOULDER AT 6 FEET IN HOLE 48 - NO HEMATITE FOUND

WL-24b

Hole No. 49

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

Hole No. 50 Location 5' WEST OF ROAD 350 FT N55W OF HOLE 48.

of sec. T. R. County WASH

Coord. N. E.

Elev. collar 1131.53

Depth to top of bed 30.00

Elev. of top of bed 1101.53

Thickness of bed 20.0

Elev. bottom bed 1081.53

Depth of hole 50

Elev. water table NONE

Bottomed in ORE

****

Drill used 3" AUGER 2" AT 30

Number men 4

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 9-27-44

Date hole finished 1-18-45

Shifts actually drilled ~~22~~ 14

From	To	Thickness of sample	Sample No.		Description
0'	7'	—	—	A	TAN SILTY CLAY ~~SOFT~~
7'	8'	—	—	C	FIRM BROWN SILTY CLAY ~~FIRM~~
8'	10'	2'	S-151	E	FIRM RED BROWN, CLAY
10'	12'	2'	S-152	G	FIRM BRICK RED CLAY FEW MAG. OOLITES
12'	14'	2'	S-153	G	" SOME YELLOW SPOTS
14'	16'	2'	S-154	H	"
16'	18'	12"	S-155	H	"
18"	19-6	1-6"	S-156	H	"
19-6"	20'	0'-6"	S-157	J	FIRM VARICOLORED CLAY.
20'	22'	2'	S-158	A	SOFT BRICK RED CLAY, WHITE-YELLOW SPOTS
22'	24'	2'	S-159	G	SOFT BRICK RED CLAY FEW OOLITES
24	26'	2'	S-160	G	FIRM BRICK RED CLAY SLIGHTLY OOLITIC
26'	27	1'	S-161	G	" MAGNETIC OOLITES
27	28'	1'	S-162	G	"
28'	30	2	S-163	G	VERY HARD BRICK RED CLAY-OOLITES-PISOLITES
30	32	2	S-164	G	VERY HARD BRICK RED CLAY OOLITES, SPOTS

(SEE NEXT SHEET)

Remarks ~~HOLE BOTTOMED IN~~ WHEN ORE ~~ZON~~ ~~ALTERED BASALT~~ STRUCK.

~~HOLE ABANDONED AT 50 FT FOR~~ LACK OF PIPE

Hole No. 50

WL-24b

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

Hole No. 50 CONT Location

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 50

Elev. water table

Bottomed in ALT BASALT?

****

Drill used 3" TO 30
2" AT 30

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began ADDITIONAL 12-1-44 1-18-45

Date hole finished

Shifts actually drilled WARD LOGS 14

From	To	Thickness of sample	Sample No.	Description
32'	34'	2'	S-165	HARD BRICK RED ~~GRITTY~~ CLAY, OOLITES
34'	36'	2'	S-166	HARD VARICOLORED GRITTY CLAY, OOLITES & LIMONITE
36'	36'-3"	3"	S-167	FIRM RED & BROWN GRITTY CLAY, FEW OOLITES
36'-3"	36'-6"	3"	"	HARD OLIVE DRAB GRITTY CLAY, OOLITES
36'-6"	38'	1-6"	S-285	HARD BROWN GRITTY FEW MAG OOLITES
38	39	1'	286	HARD RED BROWN GRITTY FEW MAG OOLITES
39	40	1'	287	FIRM BRICK RED, SANDY
40	41	1'	288	FIRM LIGHT BRICK RED SANDY, MAG OOLITES
41	42	1'	289	" VERY FEW MAG OOLITES
42	43	1'	302	FIRM LIGHT BRICK RED SANDY
43	44	1'	303	HARD BRICK RED, GRITTY
44	45	1'	304	" WHITE SPOTS
45	46	1'	305	FIRM BRICK RED GRITTY, SHOTS
46	47	1'	306	HARD, RED-BROWN YELLOW GRITTY
47	48	1'	307	" SOLAE LUMPS
48	49	1'	308	FIRM RED BROWN YELLOW SPOTTED
49	50	1'	309	FIRM VARICOLORED, SPOTTED, OLIVE DRAB

Remarks

HOLE ABANDONED AT 50 FT FOR LACK OF PIPE.

50 CON'T

Hole No. 50 CONT

WL-24b

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HOTCHINSON

Hole No. 51 Location 200 FT DUE SOUTH OF HOLE 50

of sec. T. R. County WASH

Coord. N. E.

Elev. collar 1120.50

Depth to top of bed 29.0

Elev. of top of bed 1091.50

Thickness of bed 12.0

Elev. bottom bed 1079.50

Depth of hole 42.5

Elev. water table NONE

Bottomed in LKT BASALT

****

Drill used 3" AUGER 2" AT 29'

Number men 4

Engr. in charge MASON

Mtrl. classfd. by

Sampler SWANSON

Date hole began 9-28-44

Date hole finished 10-2-44

Shifts actually drilled 2½

From	To	Thickness of sample	Sample No.	Description
0	7	-	-	SOFT TAN SILTY CLAY
7	10	-	-	SOFT RED BROWN CLAY
10	15	-	-	SOFT BRICK RED CLAY
15	18	3	S-168	FIRM BRICK RED CLAY YELLOW SPOTS
18	19	1'	S-169	FIRM BRICK RED CLAY YELLOW SPOTS
19	20	1'	S-170	"
20	21	1'	S-171	"
21	23	2'	S-172	" FEW MAG. OOLITES
23	24	1'	S-173	" MAG OOLITES
24	25	1'	S-174	"
25	26	1'	S-175	HARD "
26	27	1'	S-176	FIRM " MANY MAG OOLITES
27	28	1'	S-177	FIRM "
28	29	1'	S-178	"
29	30	1'	S-179	HARD "
30	31	1'	S-180	"

(CON'T)

Remarks ~~ALTHOUGH ORE APPARENTLY BOTTOMED AT 32 FT. THERE MAY BE GOOD ORE FROM 32-42', OR AT LEAST FOR PART OF THIS DISTANCE.~~ HOLE ABANDONED WHEN ORE ZONE BELIEVED PASSED.

WL-24b

Hole No. 51

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

Hole No. 51 Location

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in ALT. BASALT

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
31	32	1'	S-181	HARD BRICK RED FEW MAG OOLITES
32	33	1'	S-182	FIRM RED BROWN NON-MAG OOLITES, LUMPS
33	34	1'	S-134	HARD "
34	35	1'	S-183	FIRM RED BROWN GRITTY NON MAG OOLITES
35	36	1'	S-184	FIRM BRICK RED CLAY SPOTTED - SHOTS
36	37	1'	S-185	"
37	38	1'	S-186	" FEW MAG OOLITES
38	39	1'	S-187	FIRM DARK RED GRITTY CLAY, SHOTS
39	40	1'	S-188	FIRM DARK BROWN SPOTTED GRITTY, OOLITES
40	41	1'	S-189	FIRM, VARICOLORED CLAY GRITTY SHOTS
41	42	1'	S-190	"
42	42'6"	6"	S-191	OLIVE " DRAB AT BOTTOM

Remarks SCHOOL HOUSE IS S 67° W OF HOLE 51

WL-24b

Hole No. 51 CONT

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

Hole No. 52 Location 300± FT DUE S OF HOLE 51

of sec. T. R. County

Coord. N. E.

Elev. collar 1091.01

Depth to top of bed —

Elev. of top of bed —

Thickness of bed —

Elev. bottom bed —

Depth of hole 42.5

Elev. water table NONE

Bottomed in ALT BASALT

****

Drill used 3" AUGER 2" WT 34'

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 10-2-44

Date hole finished 10-4-44

Shifts actually drilled IIII IIII 21

Remarks

From	To	Thickness of sample	Sample No.	Description
0'	6'	—	—	SOFT CLAY
6'	10'	—	—	FIRM CLAY
10'	16'	—	—	FIRM CLAY
16'	19	6	S-192	FIRM CLAY
19'	22		"	FIRM GRITTY
22	25	3'	S-193	
25	28	3'	S-194	
28	30	2'	S-195	FEW M
30	32	2	S-196	
32	33	1	S-197	
33	34	1'	S-198	FIRM DA GRITTY - MAG OOLITES
34	35	1'	S-199	FIRM DARK BROWN SPOTTED CLAY
35	35'-9"	9"	S-200	"
35'-9"	36'-3"	6"	S-201	FIRM BRICK RED CLAY
36'-3"	36'-6"	3"	S-202	FIRM DARK BROWN CLAY, MAG OOLITES
36'-6"	37'	6"	S-203	FIRM VARICOLORED SPOTTED
37'	38'	1'	S-204	FIRM OLIVE DRAB
38	40	2'	S-210	MAG. OOLITES
40	42	2'	S-211	"
42	42-6"	6"	S-212	"

Description

HARD BRICK RED
FEW MAG OOLITES
FIRM. RED BROWN
NON-MAG OOLITES, LUMPS
HARD "
FIRM RED BROWN GRITTY
NON MAG OOLITES
FIRM BRICK RED CLAY
SPOTTED - SHOTS
"
" FEW MAG OOLITES
FIRM DARK RED GRITTY
CLAY, SHOTS
FIRM DARK BROWN
SPOTTED GRITTY OOLITES
FIRM. VARICOLORED
CLAY GRITTY SHOTS
"
" OLIVE DRAB AT BOTTOM

NO ORE FOUND UPON ANALYSIS

HOLE ABANDONED FOR LACK OF PIPE

WL-24b

Hole No. 52

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

Hole No. 53 Location ON ROAD 460± N75W OF HOLE 50

of sec. T. R. County WASHINGTON

Coord. N. E.

Elev. collar 1120.97

Depth to top of bed 24.0

Elev. of top of bed 1096.97

Thickness of bed 12.0

Elev. bottom bed 1084.97

Depth of hole 42.5

Elev. water table —

Bottomed in ALT BASALT

****

Drill used 3" AUGER 2" AT 25 FT

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 10-4-44

Date hole finished 10-5-44

Shifts actually drilled "

TYPE ON NEXT PAGE →

Remarks HOLE ABANDONED WHEN ORE ZONE BELIEVED PASSED

From	To	Thickness of sample	Sample No.	Description
0	10	—	—	
10	13	3	S-205	TAN SILTY CLAY
13	16	3	S-206	LIGHT BRICK-RED CLAY FEW SHOTS
16	19	3	S-207	BRICK-RED CLAY FEW SHOTS
19	21	2	S-208	BRICK RED CLAY WITH WHITE-YELLOW SPOTS OOLITES
21	22	1'	S-209	"
22	23	1'	S-213	"
23	24	1'	S-214	BRICK RED GRITTY CLAY OOLITES
24	25	1'	S-215	"
25	26	1'	S-216	" -SOME PISOLITES
26	27	1'	S-217	YELLOW-BRICK RED GRITTY OOLITES, PISOLITES
27	27-6"	6"	S-218	"
27-6"	28'	6"	"	RED BROWN VERY GRITTY, OOLITES-PISOLITES
28	29	1'	S-219	BRICK RED, GRITTY, OOLITES-PISOLITES
29	30	1'	S-220	DARK RED GRITTY, OOLITES-PISOLITES
30	31	1'	S-221	BRICK RED, WHITE SPOTS GRITTY, OOLITES, VARICOLORED
31	32	1'	S-222	RED BROWN, SANDY, GRITTY OOLITES VARICOLORED
32	33	1'	S-223	" "
33	34	1'	S-224	RED BROWN SANDY GRITTY OOLITES
34	35	1	S-225	"
35	36	1	S-226	DARK BROWN, SANDY, OOLITES

(CONT)

WL-24b

53

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

Hole No. 53 CONT Location

of sec. T. R. County WASH

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
36'	37'	1'	S-227	RED BROWN, YELLOW SPOTS, GRITTY, OOLITES
37	38'	1'	S-228	VARICOLORED, GRITTY, OOLITES
38	39	1'	S-229	VARICOLORED, GRITTY
39	40'-6"	1'-6"	S-230	DARK BROWN, WHITE YELLOW, RED, GRAY SPOTS
40-6"	42	1'-6"	S-231	VARICOLORED CLAY
42	42-6	6"	S-232	"

Remarks

WL-24b

Hole No. 53 Cont

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

Hole No. 54 Location 980' N 10° W — OF BLUE 53

of sec. T. R. County WASHINGTON

Coord. N. E.

Elev. collar 1144.89

Depth to top of bed —

Elev. of top of bed —

Thickness of bed —

Elev. bottom bed —

Depth of hole 15 ft

Elev. water table —

Bottomed in RED CLAY

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began 10-7-44

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0'	4'		—	YELLOW-BROWN SILT,
4'	7'		—	BROWN, WHITE SPOTTED SILT
7'	8'		—	DARK BROWN, SILTY CLAY WHITE, RED SPOTS
8	9'	—	—	RED BROWN SILTY CLAY
9	11	2	S-233	BRICK RED CLAY, YELLOW SPOTS
11	13	2	S-234	BRICK RED GRITTY CLAY OOLITES
13	14	1	S-235	"
14	15	1	S-236	BRICK RED, GRITTY, OOLITES-LUMPS-LIMONITE

Remarks HOLE ABANDONED AT 15 FT. DUE TO CROOKED HOLE. NEW HOLE (55) STARTED 10 FT LOWER AND 35 FT FROM 54. NO ORE FOUND IN 54 UPON ANALYSIS

WL-24b

Hole No. 54

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project
HOTCHINSON

Hole No. 55 Location 35 FT N 65° W OF HOLE 54

____ of sec. ____ T. ____ R. ____ County WASH

Coord. N. E.

Elev. collar 1135.09

Depth to top of bed 8.00

Elev. of top of bed 1127.09

Thickness of bed 12.00

Elev. bottom bed 1115.09

Depth of hole 25

Elev. water table NONE

Bottomed in ALT. BASALT

****

Drill used 3" LOGER

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 10-9-44

Date hole finished 10-9-44

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0	2	—		YELLOW-TAN SILTY CLAY
2	4	—		YELLOW BROWN CLAY FEW MAG. OOLITES
4	6	2	S-237	BRICK RED GRITTY CLAY MAG. OOLITES
6	8	2	S-238	BRICK RED GRITTY CLAY OOLITES AND LIMONITE
8	10	2	S-239	"
10	12	2	S-240	"
12	14	2	S-241	RED BROWN GRITTY CLAY OOLITES AND LIMONITE LUMPS
14	16	2	S-242	DARK BROWN CLAY FEW OOLITES & LUMPS
16	18	2	S-243	"
18	20	2	S-244	REDDISH-YELLOW CLAY FEW MAG. OOLITES
20	22	2	S-245	"
22	23	1	S-246	"
23	25	2	S-247	VARICOLORED CLAY GRAY LUMPS

Remarks HOLE BOTTOMED WHEN ALTERED BASALT BELIEVED HIT.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

Hole No. 56 Location ON LOG ROAD 795 FT N 15° E OF HOLE 50

of sec. T. R. County WASHINGTON

Coord. N. E.

Elev. collar 1132.40

Depth to top of bed 15.00

Elev. of top of bed 1117.40

Thickness of bed 14.00

Elev. bottom bed 1103.40

Depth of hole 31

Elev. water table —

Bottomed in OLIVINE BASALT

****

Drill used 3" AUGER 2" AT 24'

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 10-9-44

Date hole finished 10-10-44

Shifts actually drilled 7 HRS

From	To	Thickness of sample	Sample No.	Description	
0	7	—	—	TAN SILTY CLAY	
7	10	—	—	DARK BROWN SILTY CLAY FEW SHOTS	
10	13	3	S-253	RED BROWN CLAY FEW SHOTS	
13	15	2	S-254	BRICK RED GRITTY CLAY FEW MAG OOLITES	9
15	17	2	S-255	"	7-9
17	19	2	S-256	RED BROWN GRITTY CLAY OOLITES & LIMONITE LUMPS	7-9
19	21	2	S-257	"	6-9
21	23	2	S-258	BRICK RED GRITTY, OOLITIC LUMPS	9
23	25	2	S-259	"	4
25	27	2	S-260	DARK RED GRITTY, OOLITIC	4
27	29	2	S-261	REDDISH BROWN-SPOTTED CLAY	
29	31	2	S-262	VARICOLORED, SOFT BASALT?	?)

Remarks HOLE ABANDONED AT 31' WHEN ALTERED BASALT STRUCK

WL-24b

Hole No. 56

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

Hole No. 57 Location ON ROAD 1100 FT N 5° E OF HOLE 55

of sec. T. R. County WASH

Coord. N. E.

Elev. collar 1185.84

Depth to top of bed 28.00

Elev. of top of bed 1157.84

Thickness of bed 10.00

Elev. bottom bed 1147.84

Depth of hole 42

Elev. water table NONE

Bottomed in ALT BASALT

****

Drill used 3" AUGER 2" AT 25'

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 10-11-44

Date hole finished 10-13-44

Shifts actually drilled 8 HRS

Remarks HOLE ABANDONED AT 42 FT WHEN ALT. BASALT BELIEVED STRUCK

From	To	Thickness of sample	Sample No.	Description
0	5	-	-	YELLOWISH-TAN SILTY CLAY
5	6	-		DARK RED BROWN CLAY FEW MAG. OOLITES
6	10	4	S-248	BRICK RED CLAY FEW MAG. OOLITES
10	13	3	S-249	"
13	16	3	S-250	"
16	18	2	S-251	BRICK RED, SPOTTED, GRITTY, HARD MAG. OOLITES
18	20	2	S-252	BRICK RED, GRITTY, HARD MAG OOLITES
20	22	2	S-263	"
22	25	3	S-264	"
25	28	3	S-265	DARK RED, GRITTY MANY MAG. OOLITES
28	31	3	S-266	DARK BROWN, SPOTTED, GRITTY, MAG. OOLITES
31	33	2	S-267	"
33	35	2	S-268	YELLOWISH BROWN, GRITTY FEW MAG OOLITE
35	36'-9"	1'-9"		"
36'-9"	38	1'-3"	S-271	VARICOLORED, GRITTY FEW MAG OOLITES
38	39	1'	S-272	"
39	40	1'	S-273	"
40	41	1'	S-274	VARICOLORED, SPOTTED, GRAY BASALT?
41	42	1'	S-275	

Hole No. 57

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project
HUTCHINSON

Hole No. 58 Location ON ROAD AT WM. HOARD'S ROAD JUNCTION 1400 FT N 40° W OF HOLE 57

of sec. ____ T. ____ R. ____ County WASH

Coord. N. ____ E. ____

Elev. collar 1229.63

Depth to top of bed 13.00

Elev. of top of bed 1216.63

Thickness of bed 13.00

Elev. bottom bed 1203.63

Depth of hole 27

Elev. water table 23'

Bottomed in ALT BASALT

****

Drill used 3" AUGER, 2" AT 15 x

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 10-12-44

Date hole finished 10-16-44

Shifts actually drilled 5 HRS x

From	To	Thickness of sample	Sample No.	Description
0	5		—	YELLOWISH-BROWN SILTY CLAY
5	7			DARK BROWN CLAY
7	13	6'	S-269	RED BROWN FEW MAG OOLITES
13	15	2'	S-270	BRICK RED, GRITTY, FEW MAG OOLITES & PISOLITES
15	16	1'	S-276	BRICK RED VERY GRITTY MANY OOLITES FEW PISOLITES
16	17	1'	S-277	BRICK RED, VERY GRITTY FEW OOLITES & PISOLITES
17	17'-10"	10"	S-278	"
17'-10"	19'	1'-2"	S-279	YELLOWISH BRICK RED VERY GRITTY FEW OOLITES
19	20	1'	S-280	YELLOWISH RED BROWN GRITTY MANY OOLITES
20	21	1'	S-281	SPOTTED RED BROWN VERY GRITTY, OOLITES
21	22	1'	S-282	BRICK RED, GRITTY FEW OOLITES
22	23	1'	S-283	"
23	24	1'	S-284	BRICK RED, SPOTTED GRITTY OOLITES & PISOLITES
24	25	1'	S-285	BRICK RED, SPOTTED, GRITTY FEW OOLITES
25	26	1'	S-286	"
26	27	1'	S-287	VARICOLORED SLIGHTLY GRITTY BASALT?

Remarks MATERIAL FROM 20-27 FT NOT TESTED WITH MAGNET
HOLE ABANDONED AT 27 FT WHEN ALT. BASALT(?) STRUCK AT 26 FT.

WL-24b

Hole No. 58

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

Hole No. 59 Location ON NIXON HUTCHINSON ROAD 4500' FROM NIXON CUT 1700 FT N65°W OF HOLE 58

of sec. T. R. County

Coord. N. E.

Elev. collar 1237.24

Depth to top of bed 10.50

Elev. of top of bed 1226.74

Thickness of bed 9.50

Elev. bottom bed 1217.24

Depth of hole 25

Elev. water table NONE

Bottomed in ALT BASALT

****

Drill used 3" AUGER 2" AT 10 FT

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SHANNON

Date hole began 10-16-44

Date hole finished "10-17-44

Shifts actually drilled 5 HRS

From	To	Thickness of sample	Sample No.	Description
0	6'-6"	—		TAN SILTY CLAY
6'-6"	9'-6"	3'	J&R S-265	BRICK RED. LIMONITE LUNDS, OOLITES.
9'-6"	10'-6"	1'	S-266	"
10'-6"	12'	1'-6"	S-267	REDDISH BROWN, GRITTY OOLITES. LIMONITE LUNDS
12'	14	2'	S-268	REDDISH BROWN, GRITTY OOLITES
14	15	1'	S-269	SPOTTED REDDISH BROWN VERY GRITTY OOLITES
15	16	1'	S-270	SPOTTED BROWN, OOLITES
16	18	2'	S-271	BRICK RED. FEW MAG. OOLITES
18	20	2'	S-272	"
20	22	2'	S-273	RED BROWN, SPOTTED MAG. OOLITES
22	25	3'	S-274	VARICOLORED, FEW MAG OOLITES

Remarks MATERIAL FROM 0 TO 14 FT NOT TESTED WITH MAGNE

HOLE ABANDONED AT 25 FT WHEN ORE ZONE BELIVED PASSED

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

1271
42
M-20

Hole No. 60 Location 3000 SE NIXON CUT ON ROAD
1350 FT. N 65° W OF HOLE 59

of sec. T. R. County WASH

Coord. N. E.

Elev. collar 1271.13 x

Depth to top of bed —

Elev. of top of bed —

Thickness of bed —

Elev. bottom bed —

Depth of hole 42.5

Elev. water table NONE x

Bottomed in LIMONITE CLAY

****

Drill used 3" AUGER

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 10-17-44

Date hole finished 10-18-44

Shifts actually drilled 1 1/2 HRS

From	To	Thickness of sample	Sample No.	Description
0	4	—	— SLUGS	YELLOWISH-TAN SILTY CLAY
4	7	3'	S-275	RED BROWN CLAY FEW MAG OOLITES
7	10	3'	S-276	"
10	13	3	S-277	"
13	16	3'	S-278	BRICK RED CLAY. FEW MAG. OOLITES
16	19	3'	S-279	"
19	21	2'	S-282	"
21	23	2	S-283	"
23	25	2'	S-284	"
25	27	2'	S-285	"
27	29	2'	S-286	BRICK RED GRITTY CLAY MANY MAG OOLITES
29	31	2'	S-287	"
31	33	2	S-288	"
33	35	2'	S-289	"
35	37	2'	S-290	BRICK RED CLAY FEW MAG OOLITES
37	39	2'	S-291	"
39	41	2'	S-292	"
41	42-6"	1-6"	S-293	YELLOW CLAY. NON-MAG (OOLITES & LIMONITE LOAM)

Remarks START 1:45 0-4 10 MIN START

" 1:56 4-7 8 MIN START 2

" 2:05 7-10 10 MIN

" 2:16 10-13 10 MIN HOLE BOTTOMED AT 42-6"

" 2:27 13-16 10 MIN FOR LACK OF PIPE

WL-24b

Hole No. 60

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

Hole No. 61 Location 1500 FT SE NIXON CUT ON ROAD
1600 FT N65W OF HOLE 60

of sec. T. R. County WASH

Coord. N. E.

Elev. collar 1288.18

Depth to top of bed 11.00

Elev. of top of bed 1277.18

Thickness of bed 18.00

Elev. bottom bed 1259.18

Depth of hole 30.0

Elev. water table NONE

Bottomed in BASALT

****

Drill used 3" AUGER
2" AT 11 FT

Number men 2

Engr. in charge NELSON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 10-17-44

Date hole finished 10-19-44
1-18-45

Shifts actually drilled 4½ HRS

From	To	Thickness of sample	Sample No.	Description
0	4	—	—	YELLOWISH TAN SILTY CLAY
4	8	—	—	RED-BROWN CLAY. FEW MAG OOLITES
8	10	2	S-290	BRICK RED GRITTY CLAY MAG OOLITES
10	11	1'	S-291	"
11	14	3'	S-294	DARK BROWN, SPOTTED, GRITTY. MAG OOLITES
14	16	2'	S-295	DARK BROWN GRITTY FEW BASALT(?) LUMPS
16	18	2	S-296	"
18	19	1	S-297	RED BROWN, VARICOLORED, SPOTTED
19	20	1'	310	RED BROWN SPOTTED CLAY
20	21	1'	311	"
21	22	1'	312	"
22	23	1	313	"
				(CON'T ON

Remarks STARTED 10-5 0-4 5 MIN HOLE ABANDONED AT 18 FT
2-10 4-7 10 MIN WHEN BASALT STRUCK FEARFUL
7-20 7-10 10 MIN TO 23 FOR ANALYSIS.

INDICATED

WL-24b

Hole No. 61

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HIGH-ALUMINA IRON

Project

HUTCHINSON

Hole No. 61 Location 1500 FT SE NIXON CUT ON ROAD
1600 FT N65W OF HOLE 60

of sec. T. R. County WASH

Coord. N. E.

Elev. collar 1288.18

Depth to top of bed 11.00

Elev. of top of bed 1277.18

Thickness of bed 18.00

Elev. bottom bed 1259.18

Depth of hole 30.0

Elev. water table NONE

Bottomed in BASALT

****

Drill used 3" AUGER
2" AT 11 FT

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler SWANSON

Date hole began 10-17-44

Date hole finished 10-19-44
1-18-45

Shifts actually drilled 4½ HRS

From	To	Thickness of sample	Sample No.	Description
0	4	—	—	YELLOWISH TAN SILTY CLAY
4	8	—	—	RED-BROWN CLAY. FEW MAG OOLITES
8	10	2'	S-280	BRICK RED GRITTY CLAY MAG OOLITES
10	11	1'	S-281	"
11	14	3'	S-294	DARK BROWN, SPOTTED, GRITTY. MAG OOLITES
14	16	2'	S-295	DARK BROWN GRITTY FEW BASALT(?) LUMPS
16	18	2'	S-296	"
18	19	1'	S-297	RED BROWN, VARICOLORED, SPOTTED
19	20	1'	310	RED BROWN SPOTTED CLAY
20	21	1'	311	"
21	22	1'	312	"
22	23	1'	313	"
				(CON'T ON)

Remarks STRIKES 0-4 5 MIN HOLE ABANDONED AT 30 FT
2-10 4-7 10 MIN WHEN BASALT STRUCK TO DRILL
7-20 7-10 10 MIN TO OBTAIN ANALYSIS.

(SIGNATURE INDICATED)

WL-24b

Hole No. 61

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HUTCHISON - NIXON
Project

IGNORE INKED NUMBERS

Hole No. 61 Location (CON'T)

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 2"

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled "

From	To	Thickness of sample	Sample No.	Description
23	24	1'	~~3374~~ 401	VARICOLORED, SPOTTED CLAY
24	25	1'	3375 402	"
25	26	1'	3372 403	"
26	27	1'	3377 404	"
27	28	1'	3378 405	"
28	29	1'	3379 406	"
29	30	1'	3380 407	" ALTERED BASALT?
			3381	

Remarks HOLE ABANDONED AT 30' WHEN ALT BASALT RECEIVED STUCK

WL-24b

Hole No. 61

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

IGNORE RED No's

HUTCHY

Project

Hole No. 62 Location 250' N 45° W FROM HOLE 60

of sec. T. R. County

Coord. N. E.

Elev. collar 1280.0

Depth to top of bed 16.0

Elev. of top of bed 1264.0

Thickness of bed 10.0

Elev. bottom bed 1254.0

Depth of hole 27.0'

Elev. water table 1269.0

Bottomed in BASALT?

****

Drill used 3" AUGER

Number men 2 (Coal augered at 14' & 21')

Engr. in charge MASON

Mtrl. classfd. by BOWMAN

Sampler BOSH

Date hole began 3-27-45

Date hole finished 3-27-45

Shifts actually drilled 1 (MAY 12 HRS)

Remarks

From	To	Thickness of sample	Sample No.	Description
0	6	—	—	RED BROWN SILTY CLAY
6	8	2	P-3466 420	"
8	10	2	421	BRICK RED GRITTY CLAY
10	12	2	422	" FEW OÖLITES
12	14	2'	423	"
14	15	1'	424	BRICK RED, VERY GRITTY LIMONITE LUMPS, OÖLITES
15	16	1'	425	YELLOWISH - BRICK RED, SPOTTED, VERY GRITTY OOLITES, LIMONITE
16	17	1'	426	"
17	18	1'	427	"
18	19	1'	428	"
19	20	1'	429	"
20	21	1'	430	BRICK RED, VARICOLORED, GRITTY, OÖLITES
21	22	1'	431	"
22	23	1'	432	"
23	24	1'	433	BRICK RED VARICOLORED CLAY
24	25	1'	434	"
25	26	1'	435	VARICOLORED CLAY OLIVE DRAB STREAKS
26	27	1'	436	"

HOLE BOTTOMED AT 27' WHAT OF TIME.

Hole No. 62

WL-24b

Hole No.

DIP NEEDLE SURVEY -
HUTCHINSON LOCALITY

Mason
Swanson
9/19/44

Sta.	Location	Dip Needle Readings N-S (w)*	N-S	E-W (w)*	E-W	Dir. Giving 90° Dip	Description
1	Road S. of house	22°S	11½°S	50°E	41½°W	N 47°W	On road south and "below" Hutchinson house.
2	200' N. Sta. 1	20°S	11°S	50½°E	40°W	N 48°W	On road
3	200' N. Sta. 2	22°S	14°S	55½°E	41½°W	N 48°W	On road
4	200' N. Sta. 3	23½°S	14½°S	55½°E	48°W	N 48°W	On road
5	200' N. Sta. 4	23½°S	13½°S	39½°E	49½°W	N 47°W	On road opposite Hutchinson house.
6	100' N. Sta. 5	22½°S	12½°S	39°E	50½°W	N 50°W	On road, opposite Hole 32.
7	200' N. Sta. 6	21½°S	11°S	42°E	48°W	---	On road
8	200' NW Sta. 7	22°S	11½°S	36°E	56½°W	---	On road
9	200' NW Sta. 8	24½°S	14°S	45½°E	51°W	---	On road
10	200' NW Sta. 9	23°S	14½°S	41½°E	48½°W	N 50°W	On road
11	200' NW Sta. 10	23½°S	13°S	50°E	48½°W	N 48°W	On road
12	200' NW Sta. 11	23½°S	14°S	41°E	46°W	N 52°W	On road

*"w - side" facing S and E.

Remarks: Traverse started at point believed to be below iron horizon and continued over known ore body. Needle oriented by Brunton to magnetic N-S and E-W.

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 30 | Elev. of top of bed ~~1311.0~~ 1306.98 | Depth of hole 13

Elev. collar 1312.98 | Thickness of bed ~~11~~ 7 | Elev of water table - - -

Depth to top of bed ~~2~~ 6 | Elev. bottom bed ? | Bottomed in ~~red clay~~ ORE

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0	(Collar) Elev. 1312.98 ft.						
	2							
P-2452		4	22.16	26.72	19.56	- - -	- - -	- -
	6							
P-2453		2	22.38	33.68	8.88	- - -	- - -	- -
	8							
P-2454		5	22.83	33.64	8.22	- - -	- - -	- -
Bottom (Elev. 1299.98 ft.)	13							

Weighted average ~~11~~ 7 ft. of ore (~~2~~ 6-13')	~~22.50~~ 22.70	~~31.13~~ 33.65	~~12.46~~ 8.41	- - -	- - -	- -

HOLE 30

HUTCHINSON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 32 Elev. of top of bed 1092 Depth of hole 28

Elev. collar 1100 Thickness of bed 14 Elev. of water table ---

Depth to top of bed 8 Elev. bottom bed 1078 Bottomed in Mottled clay

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0	(Collar) Elev. 1100 ft.					
	8						
P-2455		2	22.83	33.12	12.96	----	----
	10						
P-2456		2	32.68	25.72	8.62	----	----
	12						
P-2457		1	25.91	32.88	5.28	----	----
P-2538	13	1'6"	21.80	34.08	4.78	20.20	----
	14'6"						
P-2539		2	24.16	37.24	5.00	21.22	----
	16'6"						
P-2540	17'6"	1	22.80	42.12	5.34	20.80	
P-2541		2	22.36	42.00	4.00	20.80	
	19'6"						
P-2542	20	0'6"	23.48	30.08	5.62	21.80	
P-2543		2	25.26	26.12	12.44	30.60	
	22						
P-2544		2	23.03	27.64	18.64	34.04	
	24						
		4					
P-2548 Bottom (Elev. 1072 ft.)	28		19.95	26.48	25.50	31.80	

Weighted average of 14 ft. of ore	24.84	33.54	7.62	----

TYPED COPIES OF SECTIONS THROUGH HOLES

HUTCHISON-NIXON PROJECT

(1944-5)

Be 2070

[H]CHISON FERRUGINOUS BAUXITE PRO[J]T

Drill Hole No. 44 | Elev. of top of bed 1091.35 | Depth of hole 37'

Elev. collar 1113.35 | Thickness of bed 12 | Elev. of water table - -

Depth ~~of~~ to top of bed 22.0 | Elev. bottom bed 1079.35 | Bottomed in Weath. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0	(Collar) Elev. 1113.35 ft.						
	12							
P-2858	14	2	6.66	25.32	56.48	21.60	10.54	1.11
P-2859	16	2	6.77	26.20	55.74	22.20	10.87	2.2
P-2860	18	2	8.66	26.20	50.86	22.40	12.52	2.7
P-2861	20	2	11.99	32.08	39.40	23.70	14.84	2.2
P-2862	22	2	15.20	36.12	26.44	20.10	16.73	
P-2869		4	22.87	34.00	11.50	16.30	20.51	2.7
	26							
P-2873		3	23.87	32.40	4.98	18.40	23.84	3.49
	29							
P-2876		2	18.21	43.00	7.48	19.85	24.79	3.49
	31							
P-2878		3	20.98	35.92	10.24	23.23	21.66	4.45
	34							
		2	- - -	32.36	16.88	- - -	- - -	
P-2901	36	3	21.57	32.56	17.94	31.56	19.61	3.18
	37							
	Bottom (Elev. 1076.35 ft.)							
	Weighted average 12 ft. of ore (22'-34')		21.87	35.58	8.89	19.15	22.34	3.46

Hole 44

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 45 | Elev. of top of bed - - - | Depth of hole 28

Elev. collar 1099.64 | Thickness of bed - - - | Elev. of water table - - -

Depth to top of bed - - - | Elev. bottom bed - - - | Bottomed in Red clay

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0	(Collar) Elev. 1099.64 ft.					
	10						
P-2863		2	6.33	24.12	56.48	20.00	11.40
	12						
P-2864		2	6.23	21.92	61.36	22.20	10.80
	14						
P-2865		2	5.99	20.72	59.20	22.30	9.82
	16						
P-2866 P-2867		4	6.10	21.44	60.68	23.30	10.04
	20						
P-2904		2	5.22	21.48	62.62	23.80	9.43
	22						
P-2906		3	4.77	19.72	62.64	24.00	9.61
	25						
P-2909		3	- - -	- - -	- - -	25.40	
Bottom 1071.64 Elev. 1071.64'	28						

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 46 | Elev. of top of bed - - - | Depth of hole 30

Elev. collar 1100.56 | Thickness of bed - - - - | Elev. of water table - -

Depth of top of bed - - | Elev. bottom bed - - - - | Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0 (Collar) Elev. 1100.56 ft.						
	9						
P-3382		2					
	11						
P-3383		2					
	13						
P-3384		2					
	15						
P-3385		3					
	18						
P-3386		3					
	21						
P-3387		3					
	24						
P-3388		3					
	27						
P-3389		3	- - -		- - -	+ 25% (Spec. analysis)	
Bottom (Elev. 1070.56')	30						

HOLE 46

HUTCHINSON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 48 Elev. of top of bed 1093.17 Depth of hole 45

Elev. collar 1122.17 Thickness of bed 16 Elev. of water table - - -

Depth to top of bed 29 Elev. bottom bed 1077.17 Bottomed in Alt. basalt ?

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0–	(Collar) Elev. 1122.17 ft.						
P-2930	20–	1	6.55	23.52	55.80	28.20	11.52	1.91
P-2931	21–	1	6.55	27.72	55.46	29.10	11.38	
P-2932	22–	1	6.77	25.12	56.60	28.10	9.94	
P-2933	23–	1	9.88	33.28	45.66	27.70	13.05	
P-2934	24–	1	11.40	30.04	38.30	24.50	14.54	
P-2935	25–	1	11.10	31.60	38.42	26.30	14.98	
P-2936	26–	1	12.55	33.36	30.84	31.20	15.48	
P-2937	27–	1	16.32	35.20	22.84	18.20	18.37	3.95
P-2938	28–	1	17.76	37.04	17.60	17.00	20.08	3.34
P-2939	29–	1	21.09	36.64	9.90	15.90	19.73	3.18
P-2940	30–	2	21.54	41.28	5.40	18.00	23.55	3.81
P-2942	32–	2	21.87	36.60	5.32	21.75	21.79	4.30
P-2944	34–	1	22.87	36.08	4.92	26.80	22.18	5.72
P-3201	35–							
P-3202	36–							
P-3203	37–	4	26.83	36.00	6.26	22.34	22.99	5.07
P-3204	38–							
P-3205	39–							
P-3206	40–							
P-3207	41–	5	19.83	42.68	6.48	21.71	23.59	4.60
P-3208	42–	1	18.30	43.16	4.62	20.04	25.22	3.66
P-3209	43–							
P-3210	44–							
	45–	1	21.38	34.82	15.12	29.18	19.47	4.00
	Bottom (Elev. 1077.17 ft.)							
	Weighted aver. 16 ft.(29-45)		22.41	38.79	6.80	21.83	22.62	4.55

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 50 | Elev. of top of bed 1101.53 | Depth of hole 50 ft.

Elev. collar 1131.53 | Thickness of bed 20 ft. | Elev. of water table - -

Depth to top of bed 30 ft. | Elev. bottom bed 1081.53 | Bottomed in ore

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss		TiO_2
	0	(Collar) Elev. 1131.53 ft.							
	20								
P-2954		4	6.10	22.76	57.94	27.25	10.26		
	24								
P-2956		3	10.43	27.28	44.30	25.13	13.47		2.84
	27								
P-2958		5	18.04	36.20	15.94	15.26	20.91		
	30								
P-2960		2	19.38	42.72	5.54	- - -	- - -		
	32								
P-2961		4	23.70	39.20	5.76	19.90	23.92		4.45
	36								
P-2963	36'-6"	6"	20.87	41.00	6.14	17.30	23.44		
P-3211	38	2'-6"	18.06	38.40	11.48	19.40	21.52	21.66	5.31
P-3212	39		- - -	- - -	- - -	19.85	20.82		
P-3213	40	2	21.61	37.88	7.50	19.90	21.54	21.53	5.55
P-3214	41		- - -	- - -	- - -	20.40	20.94		
P-3215	42	1	22.49	34.68	8.70	22.20	19.04		4.18
P-3304	43	1	23.04	36.92	3.64	- - -	23.65		- -
P-3305	44	1	21.25	34.36	4.00	- - -	24.11		- -
P-3306	45	1	22.26	34.72	7.70	- - -	20.04		- -
P-3307		4	19.01	39.76	5.76	- - -	24.60		- -
P-3311	49	1	22.48	34.96	8.52	- - -	21.96		- -
Bottom (Elev. 1081.53 ft.)	50								
Weighted average 20 ft. of ore (30'-50')			21.00	38.46	6.82	- - -	- - -		- -

HOLE 50

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HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 52 | Elev. of top of bed - - - | Depth of hole 42.5

Elev. collar 1091.07 | Thickness of bed - - - | Elev. of water table - - -

Depth to top of bed - - - | Elev. bottom bed - - - | Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0	(Collar) Elev. 1091.07 Ft.					
	16						
P-3025		6	6.20	25.48	58.14	22.70	11.63
	22						
P-3026		6	5.68		60.24	24.50	9.30
	28						
P-3028		2	7.10		54.10	25.55	10.90
	30						
P-3029		3	8.38		51.82	26.15	10.80
	33						
P-3031		1	11.77		42.10	26.65	13.47
	34						
P-3032		3	- - -		- - -	29.64	14.95
	37						
P-3037		5'6"	- - -	- - -	- - -	33.63	16.07
Bottom	42'6"						

Elev. 1048.57'

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 53 | Elev. of top of bed 1096.97 | Depth of hole 42.5

Elev. collar 1120.97 | Thickness of bed 12.0 | Elev. of water table - -

Depth to top of bed 24.0 | Elev. bottom bed 1084.97 | Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0	(Collar) Elev. 1120.97 FT.						
	10							
P-3058		3				22.60	9.98	
	13							
P-3059		3				23.20	11.00	
	16							
P-3060		3				23.70	10.35	
	19							
P-3061		5				27.92	14.70	
	24							
P-3065		4	23.48	33.28	9.90	16.35	21.20	5.07
	28							
P-3069		5	23.44	39.36	6.50	19.04	22.37	5.87
	33							
P-3074		3	22.27	33.28	15.84	25.80	19.02	
	36							
P-3077		3	- - -	- - -	- - -	32.30	16.15	
	39							
P-3080		3-6	- - -	- - -	- - -	31.74	15.38	
	42-6							
	Bottom (Elev. 1078.97)							
Weighted average 12 ft. of ore (24'-36')			23.16	35.81	9.97	19.83	21.14	- - -

HOLE 53

HUTCHINSON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 54 Elev. of top of bed - - - Depth of hole 15

Elev. collar 1144.89 Thickness of bed - - - Elev. of water table - - -

Depth to top of bed - - - Elev. bottom bed - - - Bottomed in Red clay

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0 (Collar) Elev. 1144.89 ft.					
P-3083	9 to 11	10			23.00	10.53
P-3084	11 to 15	4			21.84	15.69
Bottom	15					

Elev. 1129.89'

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 55 Elev. of top of bed 1127.09 Depth of hole 25

Elev. collar 1135.09 Thickness of bed 12.00 Elev. of water table ---

Depth to top of bed 8.00 Elev. bottom bed 1115.09 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0	(Collar elev. 1135.09 ft.)						
	4							
P-3087			---	---	---	21.10	14.79	
	6							
P-3088			19.87	34.00	18.48	18.02	19.40	3.64
	8	4						
P-3089		2	24.03	36.44	10.40	---	---	
	10							
P-3090		6	27.04	34.36	5.06	17.70	22.20	6.66
	16							
P-3093		4	26.42	30.96	8.88	24.10	19.91	5.07
	20							
P-3095		2	26.18	29.08	17.54	---	---	
	22	3	---	---	---	32.73	17.20	
	23							
P-3097		2	---	---	---	33.50	16.18	
	25							
Bottom (elev. 1110.09')								

Weighted Aver. 12 ft. of ore (8'-20')

26.33	35.24	7.22	

HOLE 55

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 56 Elev. of top of bed 1117.40 Depth of hole 31

Elev. collar 1132.40 Thickness of bed 14.00 Elev. of water table ---

Depth to top of bed 15.00 Elev. bottom bed 1103.40 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0	(Collar elev. 1132.40 ft.)						
	10							
P-3098		3	---	---	---	22.30	9.58	
	13							
		2						
	15							
P-3099		6	---	---	---	22.70	16.40	
P-3100		4	26.75	38.84	8.60	---	---	
	19							
P-3102		4	22.16	39.68	4.00	20.65	23.23	3.40
	23							
P-3104		6	25.37	33.60	5.54	26.86	19.35	5.40
	29							
P-3107		2	22.76	24.88	24.00	35.10	16.32	
	31							
	Bottom (elev. 1101.40')							
	Weighted aver. 14 ft. of ore (15'-29')		24.84	36.83	5.97	---	---	

HOLE 56

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 57 Elev. of top of bed 1157.84 Depth of hole 42

Elev. collar 1185.84 Thickness of bed 10.00 Elev. of water table ---

Depth to top of bed 28.00 Elev. bottom bed 1147.84 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0	(Collar elev. 1185.84 ft.)						
	6							
P-3113		4				21.40	10.73	
	10							
P-3114		6				23.70	10.50	
	16							
P-3116		6				25.10	12.81	
	22							
P-3119		6				21.30	18.90	
	28							
P-3121		5	22.70	34.00	11.66	- - -	20.34	6.21
	33							
P-3123		5	22.38	31.44	16.22	- - -	19.48	5.42
	38							
P-3125		3					18.80	
	41							
P-3128	42	1					11.80	
Bottom (elev. 1143.84')								
Weighted aver. 10 ft. of ore (28'-38')			22.54	32.72	13.94	---	19.91	5.81

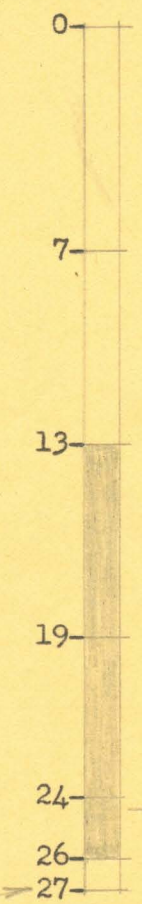
HOLE 57

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 58 Elev. of top of bed 1216.63 Depth of hole 27

Elev. collar 1229.63 Thickness of bed 13.00 Elev. of water table 23'

Depth to top of bed 13.00 Elev. bottom bed 1203.63 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
		0 (Collar elev. 1229.63 ft.)						
		7						
P-3129		6					17.06	
		13						
P-3130		6	25.10	32.28	9.46		21.42	4.78
		19						
P-3135		5	23.38	35.24	6.12		22.34	5.74
		24					---	
P-3140		2	22.60	34.32	12.62			
		26					19.05	
		27						
Bottom (elev. 1202.63')								
Weighted aver. 13 ft. of ore (13'-26')			24.05	33.73	8.67			

HOLE 58

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 59 Elev. of top of bed 1226.74 Depth of hole 25

Elev. collar 1237.24 Thickness of bed 9.50 Elev. of water table ---

Depth to top of bed 10.50 Elev. bottom bed 1217.24 Bottomed in Alt. basalt

Sample No.	Profile of Hole (1 inch = 6 feet)	Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0 (Collar elev. 1237.24 ft.)						
	6'-6"						
P-3143	9'-6" 5'-6"					17.15	
P-3144	10'-6"						
P-3145	12 1'-6"	27.14	33.40	5.32	---	---	
P-3146	16 4	26.48	37.28	5.70	19.94	20.82	6.21
P-3149	20 4	24.15	28.80	13.56	25.92	19.00	6.88
P-3151	5	---	---	---	29.82	15.37	
	25 Bottom (elev. 1212.24')						
	Weighted aver. 9.5 ft. ore (10'-6"-20')	25.60	33.09	8.95	---	---	

HOLE 59

HUTCHISON-NIXON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 60 | Elev. of top of bed - - - | Depth of hole 42.5

Elev. collar 1271.13 | Thickness of bed - - - | Elev. of water table - - -

Depth to top of bed - - - | Elev. bottom bed - - - | Bottomed in Limonite clay

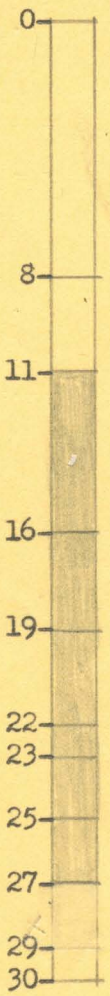
Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss
	0	(Collar) Elev. 1271.13 ft.					
	4						
P-3153		3					10.52
	7						
P-3154		3					10.74
	10						
P-3155		3					11.28
	13						
P-3156		3					11.72
	16						
P-3157		3					11.36
	19						
P-3158		6					11.80
	25						
P-3161		6					12.83
	31						
P-3164		4	11.46	25.50	44.00		13.48
	35						
P-3166		4					12.62
	39						
P-3168		2					11.61
	41						
P-3169		1'6"					12.49
Bottom Elev. 1228.63'	42'6"						

CHISON FERRUGINOUS BAUXITE PRO T

Drill Hole No. 61 | Elev. of top of bed 1277.18 | Depth of hole 30.0

Elev. collar 1288.18 | Thickness of bed ~~18.00~~ 16 | Elev. of water table - -

Depth ~~of~~ To top of bed 11.00 | Elev. bottom bed ~~1259.18~~ 1261.18 | Bottomed in basalt ?

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
		0 (Collar) Elev. 1288.18 ft.						
		8						
P-3170		3	- - -	- - -	- - -	- - -	15.43	- -
		11						
P-3172		5	25.62	25.76	8.62	- - -	20.86	7.53
		16						
P-3174		3	24.21	36.84	7.80	- - -	21.99	6.24
		19						
P-3312		3	22.06	37.00	5.44	- - -	23.29	- -
		22						
P-3315		1	22.37	36.76	7.22	- - -	21.84	- -
		23						
P-3375		2	25.68	28.32	13.04	- - -	15.99	- -
		25						
P-3377		2	25.57	29.32	12.96	- - -	16.34	- -
		27						
P-3379		2	23.77	30.08	16.48	- - -	15.99	- -
		29						
P-3381			- - -	- - -	+ 40.0% (spec.)		- - -	- - -
		30						
Bottom (Elev. 1258.18 ft.)								
Weighted average ~~18~~ 16 ft. of ore (11'-~~29~~ 27')			~~24.41~~ 24.49	~~31.25~~ 31.40	~~9.72~~ 8.88	- - -	~~19.92~~ 20.41	- -

HOLE 61

HUTCHISON FERRUGINOUS BAUXITE PROJECT

Drill Hole No. 62 | Elev. of top of bed 1264.0 | Depth of hole 27.0

Elev. collar 1280.0 | Thickness of bed 10.0 | Elev. of water table 1269.0

Depth to top of bed 16.0 | Elev. bottom bed 1254.0 | Bottomed in basalt (?)

Sample No.	Profile of Hole (1 inch = 6 feet)		Fe	Al_2O_3	SiO_2	Moisture	Air Dried Ignition Loss	TiO_2
	0	(Collar) Elev. 1280.0 ft.						
	14							
P-3470	15	1	11.10	22.53	44.88	- - -	13.48	3.86
P-3471	16	1	22.20	28.19	20.60	- - -	18.70	4.01
P-3472		3	29.71	28.40	7.06	- - -	18.49	4.34
	19							
P-3475		3	27.11	32.18	5.76	- - -	19.05	6.27
	22							
P-3478		4	26.57	31.50	13.84	- - -	17.75	3.69
	26							
P-3482	27	1	24.56	29.85	18.20	- - -	17.59	3.86
Bottom (Elev. 1253.0 ft.)								
Weighted average 10 ft. of ore (16-26)			27.67	30.77	9.38	- - -	18.36	4.66

Hole 6

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18286 Date July 8, 1955

Spectrographic Laboratory Number _____ Sample received from Hollis Dole

17137
"A"

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

   Titanium, iron

2. Elements present in concentrations 10% - 1%.

   - - - - -

3. Elements present in concentrations 1% - 0.1%.

   Silicon, aluminum, magnesium, manganese

4. Elements present in concentrations 0.1% - .01%.

   Zirconium, vanadium

5. Elements present in concentrations .01% - .001%.

   Chromium, cobalt

6. Elements present in concentrations below .001%.

   Copper, nickel

Thomas C. Matthews, Spectroscopist

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18281 Date June 17, 1955

Spectrographic Laboratory Number _____ Sample received from H. M. Dole
16911
Nonmag. resid.

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

   Titanium, iron

2. Elements present in concentrations 10% - 1%.

   Silicon

3. Elements present in concentrations 1% - 0.1%.

   Magnesium, manganese, aluminum

4. Elements present in concentrations 0.1% - .01%.

   Zirconium

5. Elements present in concentrations .01% - .001%.

   Chromium, vanadium

6. Elements present in concentrations below .001%.

   Copper, barium, nickel

Thomas C. Matthews, Spectroscopist

T C Matthews

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18280 Date June 17, 1955

Spectrographic Laboratory Number _____ Sample received from H. M. Dole
15796

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.
   Titanium, iron

2. Elements present in concentrations 10% - 1%.
   Silicon, aluminum

3. Elements present in concentrations 1% - 0.1%.
   Magnesium, manganese

4. Elements present in concentrations 0.1% - .01%.
   Zirconium, tin, chromium

5. Elements present in concentrations .01% - .001%.
   Vanadium

6. Elements present in concentrations below .001%.
   Copper, barium, nickel

Thomas C. Matthews, Spectroscopist

T C Matthews

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18282 Date June 17, 1955

Spectrographic Laboratory Number _____ Sample received from H. M. Dole

16912
Nonmag. resid.

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

   Titanium, iron

2. Elements present in concentrations 10% - 1%.

   Silicon, aluminum (low)

3. Elements present in concentrations 1% - 0.1%.

   Magnesium, manganese

4. Elements present in concentrations 0.1% - .01%.

   Zirconium

5. Elements present in concentrations .01% - .001%.

   Chromium, vanadium

6. Elements present in concentrations below .001%.

   Copper, barium, nickel

Thomas C. Matthews, Spectroscopist

T. C. Matthews

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18283 Date June 17, 1955

Spectrographic Laboratory Number _____ Sample received from H. M. Dole

16913
"A"

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

   Titanium, iron

2. Elements present in concentrations 10% - 1%.

   Silicon, aluminum

3. Elements present in concentrations 1% - 0.1%.

   Magnesium, manganese

4. Elements present in concentrations 0.1% - .01%.

   Zirconium

5. Elements present in concentrations .01% - .001%.

   Chromium, vanadium

6. Elements present in concentrations below .001%.

   Copper, barium, nickel

Thomas C. Matthews, Spectroscopist

T. C. Matthews

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18284 Date June 17, 1955

Spectrographic Laboratory Number _____ Sample received from H. M. Dole

17089
"A"

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.
   Titanium, iron

2. Elements present in concentrations 10% - 1%.
   Silicon

3. Elements present in concentrations 1% - 0.1%.
   Aluminum, magnesium, manganese

4. Elements present in concentrations 0.1% - .01%.
   Zirconium

5. Elements present in concentrations .01% - .001%.
   Chromium, vanadium, strontium

6. Elements present in concentrations below .001%.
   Copper, barium, nickel

Thomas C. Matthews, Spectroscopist

T. C. Matthews

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18285 Date July 8, 1955

Spectrographic Laboratory Number _____ Sample received from Hollis Dole

17136
"A"

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

   Titanium, iron

2. Elements present in concentrations 10% - 1%.

   Aluminum

3. Elements present in concentrations 1% - 0.1%.

   Silicon, magnesium, manganese

4. Elements present in concentrations 0.1% - .01%.

   Zirconium, vanadium

5. Elements present in concentrations .01% - .001%.

   Chromium, cobalt

6. Elements present in concentrations below .001%.

   Copper, nickel

Thomas C. Matthews, Spectroscopist

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18287 Date July 8, 1955

Spectrographic Laboratory Number _____ Sample received from Hollis Dole

17138
"A"

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

   Titanium, iron

2. Elements present in concentrations 10% - 1%.

   - - - - -

3. Elements present in concentrations 1% - 0.1%.

   Silicon, magnesium, manganese

4. Elements present in concentrations 0.1% - .01%.

   Aluminum, zirconium, chromium, vanadium

5. Elements present in concentrations .01% - .001%.

   Cobalt

6. Elements present in concentrations below .001%.

   Copper, nickel

Thomas C. Matthews, Spectroscopist

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18288 Date July 8, 1955

Spectrographic Laboratory Number _____ Sample received from Hollis Dole

17139
"A"

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

   Titanium, iron

2. Elements present in concentrations 10% - 1%.

   Aluminum

3. Elements present in concentrations 1% - 0.1%.

   Silicon, magnesium, manganese

4. Elements present in concentrations 0.1% - .01%.

   Zirconium, vanadium

5. Elements present in concentrations .01% - .001%.

   - - - - -

6. Elements present in concentrations below .001%.

   Chromium, copper, nickel

Thomas C. Matthews, Spectroscopist

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18289 Date July 8, 1955

Spectrographic Laboratory Number _____ Sample received from Hollis Dole

17140
"A"

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

   Titanium, iron

2. Elements present in concentrations 10% - 1%.

   - - - - -

3. Elements present in concentrations 1% - 0.1%.

   Silicon, aluminum, magnesium, manganese

4. Elements present in concentrations 0.1% - .01%.

   Zirconium, vanadium

5. Elements present in concentrations .01% - .001%.

   - - - - -

6. Elements present in concentrations below .001%.

   Chromium, copper, nickel

Thomas C. Matthews, Spectroscopist

STATE DEPARTMENT OF GEOLOGY
AND MINERAL INDUSTRIES
1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18291 Date July 14, 1955

Spectrographic Laboratory Number _____ Sample received from Hollis Dole

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

   Titanium, iron

2. Elements present in concentrations 10% - 1%.

   - - - - -

3. Elements present in concentrations 1% - 0.1%.

   Silicon, aluminum, magnesium, manganese

4. Elements present in concentrations 0.1% - .01%.

   Vanadium

5. Elements present in concentrations .01% - .001%.

   Zirconium

6. Elements present in concentrations below .001%.

   Chromium, copper, barium, strontium, nickel

Thomas C. Matthews, Spectroscopist

STATE DEPARTMENT OF GEOLOGY
AND MINERAL INDUSTRIES
1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18292 Date July 14, 1955

Spectrographic Laboratory Number _____ Sample received from Hollis Dole

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

   Titanium, iron

2. Elements present in concentrations 10% - 1%.

   - - - - -

3. Elements present in concentrations 1% - 0.1%.

   Silicon, aluminum, magnesium, manganese

4. Elements present in concentrations 0.1% - .01%.

   Calcium, sodium, vanadium

5. Elements present in concentrations .01% - .001%.

   Zirconium, chromium, strontium

6. Elements present in concentrations below .001%.

   Copper, barium, nickel

Thomas C. Matthews, Spectroscopist

STATE DEPARTMENT OF GEOLOGY
AND MINERAL INDUSTRIES
1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18293 Date July 14, 1955

Spectrographic Laboratory Number _____ Sample received from Hollis Dole

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

   Titanium, iron

2. Elements present in concentrations 10% - 1%.

   Aluminum

3. Elements present in concentrations 1% - 0.1%.

   Silicon, magnesium, manganese

4. Elements present in concentrations 0.1% - .01%.

   Calcium, vanadium, strontium

5. Elements present in concentrations .01% - .001%.

   Zirconium, chromium

6. Elements present in concentrations below .001%.

   Copper, barium, nickel

Thomas C. Matthews, Spectroscopist

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18295 Date July 17, 1955

Spectrographic Laboratory Number _____ Sample received from Hollis Dole

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

   Titanium, iron

2. Elements present in concentrations 10% - 1%.

   - - - - -

3. Elements present in concentrations 1% - 0.1%.

   Silicon, aluminum, magnesium

4. Elements present in concentrations 0.1% - .01%.

   Sodium, manganese, zirconium, chromium, vanadium

5. Elements present in concentrations .01% - .001%.

   Calcium

6. Elements present in concentrations below .001%.

   Copper, barium, nickel

Thomas C. Matthews, Spectroscopist

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18296 Date July 17, 1955

Spectrographic Laboratory Number _____ Sample received from Hollis Dole

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

   Titanium, iron

2. Elements present in concentrations 10% - 1%.

   Aluminum

3. Elements present in concentrations 1% - 0.1%.

   Silicon, magnesium

4. Elements present in concentrations 0.1% - .01%.

   Sodium, manganese, zirconium, vanadium

5. Elements present in concentrations .01% - .001%.

   Calcium

6. Elements present in concentrations below .001%.

   Chromium, copper, barium, nickel

Thomas C. Matthews, Spectroscopist

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18298 Date July 17, 1955

Spectrographic Laboratory Number _____ Sample received from Hollis Dole

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

   Titanium, iron

2. Elements present in concentrations 10% - 1%.

   Aluminum

3. Elements present in concentrations 1% - 0.1%.

   Silicon, magnesium

4. Elements present in concentrations 0.1% - .01%.

   Sodium, manganese, zirconium, vanadium

5. Elements present in concentrations .01% - .001%.

   Calcium

6. Elements present in concentrations below .001%.

   Chromium, copper, barium, nickel

Samples P-18290 and P-18297
were too small to run.

Thomas C. Matthews, Spectroscopist

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

~~1069 WOODLARK BUILDING~~ 1069 State Office Bldg.
PORTLAND 5, OREGON

June 17, 1955

Sample submitted by Prof. Edwin Roedder
Department of Mineralogy
University of Utah
Sample received on Salt Lake City, Utah

Analysis by:

Assayer

Analysis requested

Lab. No.	Sample Marked	Results of Analysis	Remarks
		TITANIUM TiO_2	
P-18280	No. 15796	47.68 %	
18281	16911	48.90	
18282	16912	46.46	
18283	16913	45.91	
18284	17089	47.58	
18285	17136	42.36	
18286	17137	46.91	
18287	17138	46.70	
18288	17139	41.69	
18289	17140	45.36	
18290	17141	39.26	
18291	17225	46.35	
18292	17226	44.90	
18293	17231	29.38	
18294	17236	27.17	
18295	17304	42.14	
18296	17305	41.25	
18297	17309	46.96	
18298	17543	38.70	

~~The Department did not participate in the taking of this sample and assumes responsibility only for the analytical results.~~

PROJECT CONTROL SHEET

Project: VEALL PLACE LATERITE Date: 10/1952

Owner: PAUL R. HENDRICKS, SALEM

Location: SEC 35 T. 8 S R 3W

Reason for project: TO TEST POSSIBLE MEANS OF REDUCING IRON & SILICA.

Log of project: 20' CHANNEL SAMPLE OF 6' SECTION OF LATERITE EXPOSED IN EAST BULLDOZER CUT TAKEN BY F. I. BEUIER 10/20/52. SAMPLE (P-13634) CRUSHED & SPLIT. HALF OF SAMPLE GROUND THRU 48 MESH.

PCS-47

WASHING TEST

Bevier Sample Salem Laterite from East Bulldozer Cut George Veall Place
November 1952

Product	Weight grams	% Weight	Analysis			Remarks
			Al_2O_3	Fe	SiO_2	
Heads P-13634	500	100	39.72	15.52	18.42	Original sample taken by Mr. Bevier. Put through Department laboratory pulverizer. Head sample washed in gold pan, slimes decanted.
Slimes P-13681	397	79.4	41.09	14.74	18.68	Natural drying.
Sands P-13729	94	18.8	41.77	15.52	15.44	30.5% +80 mesh, 69.5% -80 mesh.
Magnetic fraction (from sands) P-13728	7.4	1.5	35.81	24.61	15.38	Used hand magnet. Magnetic fraction contained much ~~iron~~ non-magnetic material.
Loss	1.5	0.3				

Spectrographic Analysis

P-13681

Elements Present

Concentrations over 10%:
Silicon (low), aluminum

Concentrations 10% - 1%:
Iron

Concentrations 1% - 0.1%:
Titanium, manganese

Concentrations 0.1% - .01%:
Magnesium, calcium, sodium, vanadium

Concentrations .01% - .001%:
Zirconium, copper, nickel, barium, strontium

Concentrations below .001%:
Chromium

Petrographic Analysis

Magnetic separate - 80 mesh: P-13728

Largely magnetite with limonite coating minor constituents: translucent yellowish-brown clay mineral, partially altered feldspars, and quartz (two grains seen).

Nonmagnetic - 80 mesh: P-13729

Minerals detected:

Gibbsite - fairly abundant
Feldspar
Ilmenite
Limonite-stained particles (not identified)
Cliachite(?) (amorphous clay mineral)
Quartz (two grains seen - represents very small percentage of sample)
Also reddish-orange translucent, whispy appearing mineral which is amorphous(?)

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November 1952

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P-13681

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Concentrations 10% - 1%:
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Magnesium, calcium, sodium, vanadium

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Zirconium, copper, nickel, barium, strontium

Concentrations below .001%:
Chromium

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Feldspar
Ilmenite
Limonite-stained particles (not identified)
Cliachite(?) (amorphous clay mineral)
Quartz (two grains seen - represents small percentage of sample)
Also reddish-orange translucent, whispy appearing mineral which is amorphous(?)

Petrographic Analysis

Sample P-13634, Bevier

Magnetic separate - 80 mesh:

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Nonmagnetic - 80 mesh:

Minerals detected:

Gibbsite - fairly abundant
Feldspar
Ilmenite
Limonite-stained particles (not identified)
Cliachite(?)(amorphous clay mineral)
Quartz (two grains seen - represents small percentage of sample)
Also reddish-orange translucent, whispy appearing mineral which is amorphous(?)

VEAL LATERITE PROSPECT

Petrographic Analysis

Sample P-13634, Bevier

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Largely magnetite with limonite coating minor constituents: translucent yellowish-brown clay mineral, partially altered feldspars, and quartz (two grains seen).

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Minerals detected:

Gibbsite - fa
Feldspar
Ilmenite
Limonite-stained particles (not identified)
Cliachite(?)(amorphous clay mineral)
Quartz (two grains seen - represents small percentage of sample)
Also reddish-orange translucent, whispy appearing mineral which is amorphous(?)

Original Drill Logs

SCHMIDT-CATHEY FERRUGINOUS BAUXITE PROJECT

1944

State of Oregon
Department of Geology
and Mineral Industries

Washington Co. Iron
Coal Exploration

Hole No. 2

Sheet

Schmidt-
Project

Sec. 3 T 1N R 2W

County

Hole No. 2

Location 400' S. of hole #1

Coordinates

Elev. ground (collar) 365

Depth to top of ~~coal~~ iron 1

Elev. of top of ~~coal~~ iron 364

Thickness of ~~coal~~ iron 15

Elev. water table

Depth of hole 17

Cumulative depth 29

Bottomed in Soft yellow clay

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5-11-44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	10				Hard oölitic iron
10	16				Lighter colored ore
16	17				Lt. yellow clay w. some oöl

Sample P-2349 (#2A) 1' to 6' { SiO_2 11.34, Fe 19.93, Al_2O_3 41.5 }

P-2350 (2B) 6' - 10' { SiO_2 7.94, Fe 18.91, Al_2O_3 42.72 }

P-2351 (2C) 10' - 16' { SiO_2 7.48, Fe 14.24, Al_2O_3 46.32 }

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.

State of Oregon
Department of Geology
and Mineral Industries

Washington Co. Iron
~~Coal~~ Exploration

Schmidt-Gathey
Project

Hole No. 3

Sheet

Sec. 3 T 1N R 2W

County Wash

Hole No. 3

Location 300' W. of Hwy #2

Coordinates

Elev. ground (collar) 368

Depth to top of ~~coal~~ iron 8

Elev. of top of ~~coal~~ iron 360

Thickness of ~~coal~~ iron 9

Elev. water table

Depth of hole 19

Cumulative depth 48

Bottomed in Dark grey clay + basalt

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5-11-44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	8				Lt. brn. clay
8	17				Red clay w. some oolites
17	19				Dark grey clay w. basalt pebbles ← not sample

Suggest Deepening - W.D.L. F.W.L. thinks well to do so.

P-2352 (Sample # 3) (8'-17')

SiO_2 54.70
Fe 8.10
Al_2O_3 26.76

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.

State of Oregon
Department of Geology
and Mineral Industries

Washington Co. Iron
~~Coal~~ Exploration

Schmidt Cathey
Project

Hole No. 4

Sheet 1

Sec. 34 T 2N R 2W

County Wash

Hole No. 4

Location 300' S. of Cathey's Gate

Coordinates

Elev. ground (collar) ± 590

Depth to top of ~~coal~~ iron 2

Elev. of top of ~~coal~~ iron 588

Thickness of ~~coal~~ iron 10

Elev. water table

Depth of hole 13

Cumulative depth 61

Bottomed in Lt. brn. sdy. clay

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5-11-44

Date hole finished 5-12-44

Shifts actually drilled

Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	9				Oölitic iron
9	12				Lt. brn. clay w. oölites
12	13				Lt. brn. sdy. clay.

4-B
SiO2 17.14
Fe 22.01
Al2O3 26.2

4-C
14.20
26.91
25.68

Sample P-2357 (#4A) 2-7
P-2358 (4B) 7-9
P-2359 (4C) 9-12

4-A
SiO2 38.94
Fe 19.65
Al2O3 31.04

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.

State of Oregon
Department of Geology
and Mineral Industries

Washington Co. Iron
Coal Exploration
Cathey
Project

Hole No. 5
Sheet

Sec. 34 T 2N R 2W
County Wash.

Hole No. 5
Location 550 N of Catheys gate

Coordinates
Elev. ground (collar) 650
Depth to top of coal —
Elev. of top of coal —
Thickness of coal
Elev. water table
Depth of hole 16
Cumulative depth 77
Bottomed in Brn. clay

Drill used Hand auger
Number men 2
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun 5-12 44
Date hole finished
Shifts actually drilled
Diam. casing ____ Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Topsoil
3	16				Brn. to reddish brn clay

No iron No sample

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.

State of Oregon
Department of Geology
and Mineral Industries

Washington Co. Iron ~~Coal~~ Exploration

Schmidt Cathey
Project

Hole No. 6

Sheet

Sec. 34 T 2N R 2W

County Wash

Hole No. 6
Location 750' W of Hwy on S. edge of Cathey property
Coordinates
Elev. ground (collar) ± 575
Depth to top of ~~coal~~ iron 5'
Elev. of top of ~~coal~~ iron 570
Thickness of ~~coal~~ iron 12
Elev. water table
Depth of hole 19
Cumulative depth ~~80~~ 98
Bottomed in DK. red clay

Drill used Hand auger
Number men 2
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun
Date hole finished
Shifts actually drilled
Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	5				Top soil
5	17				Red clay w. decomposed oölites
17	19				Dark red clay

Sample P-2360 (± 5') 5' - 17'

SiO_2 53.54
Fe 9.57
Al_2O_3 16.20

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

~~Tidewater~~ Area

Washington Co. - N.W.
Project

Hole No. 33 Location At rd. fork near center of sec. 22

Sec. 22 T. 3N R. 3W County Washington

Coord.

Elev. collar ±1575

Depth to top of bed 4

Elev. of top of bed ±1571

Thickness of bed 9

Elev. water table

Depth of hole 13

Cumulative depth 663

Bottomed in Red clay

****

Drill used Hand Auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 6-9-44

Date hole finished " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	4				Top soil
4	13				Red clay w. scattered oolites
	"				

Remarks:

Sample #24
4'-12'

Hole No. 33

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite

Project

Hole No. 1 Location Rosedale Friends Church

NE-SE of sec. 28 T. 8 S. R. 3 W. County Marion

Coord. N. E.

Elev. collar 750 map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 7/28/54

Date hole finished 7/29/54

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
12' 0"	14' 0"	2' 0"	107	Yellow,brown,white spots,black spots,earthy,clayey,very damp.
14' 0"	16' 0"	2' 0"	108	Yellow,brown,white spots,red spots earthy,clayey,very damp,black spot
16' 0"	18' 0"	2' 0"	109	Yellow,brown,varicolored,red spots black spots,pink spots,earthy, clayey,soft,very damp.
18' 0"	20' 0"	2' 0"	110	Yellow,brown,varicolored,red spots black spots, pink spots,earthy, clayey,soft,very damp.

Remarks Note: Hole approximately 5' below top of knoll. Notch cut into east side of hill approximately 20' below surface of hole and 150' east of it. Notch about 3' deep on one side. Dug out material shows gibbsite chunks up to 1' plus bauxitic soil. No fresh or weathered basalt noted.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 2 Location (Cont.)

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled 3 hrs.

From	To	Thickness of sample	Sample No.	Description
21'6"	24'0"	2'6"	85	
24'0"	26'0"	2'0"	86	
26'0"	28'0"	2'0"	87	
28'0"	30'0"	2'0"	88	
30'0"	32'0"	2'0"	89	
32'0"	34'0"	2'0"	90	Olive drab,clayey,hard ribs.
34'0"	36'0"	2'0"	91	Same as above.
36'0"	38'0"	2'0"	92	Dark yellow,clayey,plastic,firm.
38'0"	40'0"	2'0"	93	Same as above.

Remarks Hole nearly filled with water, making sample recovery difficult.

WL-24b

Hole No. 2 cont.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 11 Location Tex Perry

¼ cor 20/29 of sec. 29 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler

Date hole began Deepened 5-25-54, 7-28-54, 9-3-54.

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
7'0"	9'0"	2'0"	94	Yellow brown, hard, dry, gritty.
9'0"	9'6"	0'6"	95	Same as Sample No. 94.
9'6"	11'0"	1'6"	96	Yellow brown, earthy, gritty, soft, damp,
11'0"	13'0"	2'0"	97	Yellow, brown, yellow spots, red spots white spots, earthy, gritty, soft, damp
13'0"	15'0"	2'0"	174	Yellowish brown, earthy, gritty, slightly clayey, hard, slightly damp.
15'0"	17'0"	2'0"	175	Yellowish brown, slightly reddish, earthy, gritty, slightly clayey, hard, slightly damp.
17'0"	19'0"	2'0"	176	Same as No. 175, somewhat clayeyer.
19'0"	21'0"	2'0"	177	

Remarks Note: Hit water again at 13'0".

WL-24b

Hole No. 11

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 13 Location Continued 3-2-54

of sec. T. R. County Marion

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled 2 hrs.

From	To	Thickness of sample	Sample No.	Description
10' 0"	12' 0"	2' 0"	P-16334 80	Yellow brown, earthy, few pisolites, firm, damp.
12' 0"	14' 0"	2' 0"	335 81	Yellow brown, earthy, few pisolites, firm, damp.
14' 0"	16' 0"	2' 0"	336 82	Yellow brown, earthy, few pisolites, firm, damp.
16' 0"	18' 0"	2' 0"	337 83	Brown, earthy, pisolites, yellow spot red spots, black spots, damp.
18' 0"	20' 0"	2' 0"	338 84	Brown, earthy, pisolites, yellow spot red spots, black spots, damp.

Remarks

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 14 Location Hill 850 - Don Jones

NE-SW of sec. 29 T. 8 S. R. 3 W. County Marion

Coord. N. E.

Elev. collar 850 map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 7/28/54

Date hole finished 7/28/54

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0' 0"	2' 0"	2' 0"	0	Soil.
2' 0"	4' 0"	2' 0"	98	Yellow brown,earthy,gritty,soft,dr
4' 0"	6' 0"	2' 0"	99	Yellow brown,light red,earthy, gritty,soft,dry.
6' 0"	8' 0"	2' 0"	100	Yellow brown,light grey,earthy, soft,slightly damp,clayey.
8' 0"	10' 0"	2' 0"	101	Yellow brown,light red,slightly varicolored,clayey,slightly plasti soft,slightly damp.
10' 0"	12' 0"	2' 0"	102	Yellow brown,varicolored,red,grey, clayey,slightly plastic,soft, slightly damp.
12' 0"	14' 0"	2' 0"	103	Yellow brown,light grey,light red, clayey,slightly plastic,soft, slightly damp.
14' 0"	16' 0"	2' 0"	104	Yellow brown,varicolored,light red grey,yellow spots,very clay, slightly plastic,soft,damp.
16' 0"	18' 0"	2' 0"	105	Yellow brown,mottled,grey,black spots,very clayey,plastic,soft, ~~slightly damp~~ very damp.
18' 0"	20' 0"	2' 0"	106	Yellow brown,mottled,grey,many black spots,very clayey,plastic, soft,very damp.

Remarks

WL-24b

Hole No. 14

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite

Project

Hole No. 15 Location Hill 1000 (Ted Schroeder property - R. E. Hanson rents)

NW-SW of sec. 30 T. 8 S. R. 3 W. County Marion

Coord. N. E.

Elev. collar 1000 map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 7/29/54

Date hole finished 8/19/54

Shifts actually drilled 3

From	To	Thickness of sample	Sample No.	Description
2' 0"	4' 0"	2' 0"	111	Yellow brown,earthy,gritty,soft, dry (chunks of gibbsite).
4' 0"	6' 0"	2' 0"	112	Yellow brown,earthy,gritty,soft, dry (hard strikes)
6' 0"	8' 0"	2' 0"	113	Yellow brown,earthy,gritty,soft, dry (hard strikes)
8' 0"	10' 0"	2' 0"	114	Yellow brown,light red,earthy,grit slightly clayey,slightly hard, slightly damp. slight
10' 0"	12' 0"	2' 0"	115	Yellow brown,light red,earthy,grit slightly clayey,slightly hard, slightly damp.
12' 0"	14' 0"	2' 0"	116	Yellow brown,light red,earthy, slightly gritty,slightly clayey, slightly hard,slightly damp.
14' 0"	16' 0"	2' 0"	117	Yellow brown,light red,earthy, slightly gritty,slightly clayey, slightly hard,slightly damp.
16' 0"	18' 0"	2' 0"	118	Yellow brown,light red,earthy, gritty,clayey,firm,damp.
18' 0"	20' 0"	2' 0"	119	Yellow brown,light red,earthy, gritty,clayey,firm,damp.
20' 0"	22' 0"	2' 0"	140	Yellow brown,light red,earthy, gritty,clayey,firm,very damp.
22' 0"	24' 0"	2' 0"	141	Yellow brown,light red,earthy, gritty,clayey,firm,very damp.

Remarks Note: Hole approximately 200' horizontally and 4' vertically north of the top of the knoll. Very numerous chunks of gibbsite in uppermost 2' of soil.(Had more trouble getting auger past them than ever before.)

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 16 Location Grabenhorst property

NW-SE of sec. 30 T. 8 S. R. 3 W. County Marion

Coord. N. E.

Elev. collar 975 map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 7/30/54

Date hole finished 8/5/54

Shifts actually drilled 2

From	To	Thickness of sample	Sample No.	Description
2' 0"	4' 0"	2' 0"	120	Yellow brown,earthy,gritty,firm,dr
4' 0"	6' 0"	2' 0"	121	Yellow brown,earthy,gritty,firm, dry, hard going.
6' 0"	8' 0"	2' 0"	122	Yellow brown,earthy,gritty,firm, dry, hard going.
8' 0"	10' 0"	2' 0"	123	Yellow brown,slightly red, earthy, gritty,slightly clayey,firm,dry.
10' 0"	12' 0"	2' 0"	124	Yellow brown,earthy,gritty,slightl clayey,firm,dry.
12' 0"	14' 0"	2' 0"	125	Yellow brown red, varicolored,blac spots,red spots,brown spots,earthy
				slightly gritty,clayey,slightly fi slightly damp.
14' 0"	16' 0"	2' 0"	126	Yellow brown,slightly red,red spot black spots,earthy,gritty,slightly
				clayey,firm,slightly damp.
16' 0"	18' 0"	2' 0"	127	Yellow brown,slightly red,red spot black spots,earthy,gritty,slightly
				clayey,firm,slightly damp.
18' 0"	20' 0"	2' 0"	128	Yellow brown,slightly red,red spot black spots,earthy,gritty,slightly
				clayey,firm,slightly damp.
20' 0"	22' 0"	2' 0"	129	Yellow brown,slightly red,red spot black spots,white spots,banded,
				varicolored,earthy,clayey,slightly gritty,slightly firm,slightly damp
22' 0"	24' 0"	2' 0"	130	Yellow brown,red,red spots,black spots,white spots,yellow spots,
				banded,varicolored,earthy,very cla slightly gritty,slightly firm, slightly damp.

Remarks

Note: Check sample 30 and 31 (taken in road cut by radio tower). Samples from 6' 0" - 12' 0" appeared somewhat pisolitic - many small chips and shots of gibbsite.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 17 Location Hill 925 (north of McDougall)

C-NW¼ of sec. 19 T. 8 S. R. 3 W. County Marion

Coord. N. E.

Elev. collar 925 map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 8/6/54

Date hole finished 8/6/54

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
2' 0"	4' 0"	2' 0"	131	Yellow brown,earthy,gritty,firm,dr (numberous chunks of gibbsite)
4' 0"	6' 0"	2' 0"	132	Yellow brown,earthy,gritty,firm,dr (pisolitic?)
6' 0"	8' 0"	2' 0"	133	Yellow brown,light red,earthy,grit firm,dry.
8' 0"	10' 0"	2' 0"	134	Yellow brown,light red,earthy, slightly clayey,gritty,firm,dry (last pod somewhat lighter colored
10' 0"	12' 0"	2' 0"	135	Tan,light red,earthy,slightly clay slightly gritty,slightly firm, slightly damp.
12' 0"	14' 0"	2' 0"	136	Tan,light red,white spots,yellow spots,red spots,black spots, slightly varicolored,earthy,clayey slightly gritty,slightly firm, slightly damp.
14' 0"	16' 0"	2' 0"	137	Tan,blue,black,mottled,spotted, yellow spots,black spots,blue spot earthy,clayey,slightly gritty, slightly firm,slightly damp.
16' 0"	18' 0"	2' 0"	138	Brown,blue,black,mottled,spotted, yellow spots,black spots,blue spot earthy,clayey,slightly gritty, slightly firm,slightly damp.
18' 0"	20' 0"	2' 0"	139	Brown,blue,black,mottled,spotted, yellow spots,black spots,blue spot earthy,clayey,slightly gritty, slightly firm,slightly damp.

Remarks Note: 0' 0" - 2' 0" contained much gibbsite float.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 18 Location Hill 800 (Cunningham)

SE-SE of sec. 28 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used Iwan 3"

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 8/19/54

Date hole finished 8/23/54

Shifts actually drilled 2

From	To	Thickness of sample	Sample No.	Description
2'0"	4'0"	2'0"	142	Yellow brown,earthy,gritty,slight hard,dry, chunks gibbsite
4'0"	6'0"	2'0"	143	Yellow brown,earthy,gritty,slight hard,dry chunks gibbsite
6'0"	8'0"	2'0"	144	Yellow brown,earthy,gritty,slight hard,dry chunks gibbsite
8'0"	10'0"	2'0"	145	Yellow brown,earthy,gritty,slight hard,dry chunks gibbsite
10'0"	12'0"	2'0"	146	Yellow brown,slightly red,white spots,yellow spots,black spots, mottled,earthy,slightly clayey, slightly gritty,slightly plastic, firm,slightly damp.
12'0"	14'0"	2'0"	147	Yellow brown,slightly red,white spots,yellow spots,black spots, mottled,earthy,clayey,slightly gritty,slightly plastic,firm,damp
14'0"	16'0"	2'0"	148	Yellow brown,slightly red,white spots,yellow spots,black spots, mottled,earthy,clayey,slightly gritty,slightly plastic,firm, slightly damp.
16'0"	18'0"	2'0"	149	Yellow brown,red,white spots,yell spots,red spots,black spots,brown spots,green spots,blue spots,oran spots,pink spots,varicolored,mott earthy,clayey,silty,plastic,firm, slightly damp.
18'0"	20'0"	2'0"	150	Same as Sample No. 149.

Remarks Note: Material in bottom 4' very varicolored with a generally reddish purple hue.

Very definitely in weathered basalt.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 19 Location Hill 809 (Van Cleeve)

C-NW¼ of sec. 34 T. 8 S R. 3W County Marion

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used Iwan 3"

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 8/23/54

Date hole finished 8/30/54

Shifts actually drilled 2

From	To	Thickness of sample	Sample No.	Description
2'0"	4'0"	2'0"	151	Brown red,black spots,earthy, slightly clayey,gritty,slightly plastic,firm,pisolites,slightly damp.
4'0"	6'0"	2'0"	152	Same as Sample No. 151.
6'0"	8'0"	2'0"	153	Yellow red,black spots,blue spots yellow spots,slightly varicolored spotted,earthy,slightly clayey, gritty,firm,few pisolites,slightly damp.
8'0"	10'0"	2'0"	154	Red brown,black spots,brown spots earthy,slightly clayey,gritty,firm few pisolites,slightly damp.
10'0"	12'0"	2'0"	155	Same as Sample No. 154.
12'0"	14'0"	2'0"	156	Red brown,black spots,brown spots earthy,slightly clayey,slightly gritty,slightly firm,few pisolites slightly damp.
14'0"	16'0"	2'0"	157	Yellow brown,yellow spots,black spots,green spots,earthy,slightly clayey,slightly gritty,soft, slightly damp.
16'0"	18'0"	2'0"	158	Yellow brown,light green,mottled, varicolored,earthy,clayey,soft, plastic,damp.
18'0"	20'0"	2'0"	159	Yellow brown,light grey,mottled, varicolored,earthy,clayey,soft, plastic,damp.

Remarks

WL-24b

Hole No. 19

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 20 Location Sherman Property

C-NW¼ of sec. 27 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 715 Map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used Iwan 3"

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 8/31/54

Date hole finished 8/31/54

Shifts actually drilled 1 + 1

From	To	Thickness of sample	Sample No.	Description
2'0"	4'0"	2'0"	160	Yellow brown,yellow spots,red spo earthy,black spots,gritty,firm,dr
4'0"	6'0"	2'0"	161	Yellow brown,white spots,yellow spots,red spots,black spots,earth gritty,firm,dry.
6'0"	8'0"	2'0"	162	Red brown,white spots,yellow spot red spots,black spots,earthy,grit firm,dry.
8'0"	10'0"	2'0"	163	Red brown,light yellow,white spot yellow spots,red spots,black spot varicolored,earthy,slightly claye slightly gritty,firm,slightly dam
10'0"	12'0"	2'0"	164	Red brown,light yellow,white spot yellow spots,red spots,black spot varicolored,earthy,clayey,firm, damp.
12'0"	14'0"	2'0"	174A	Reddish brown,clayey,earthy,soft, very damp,somewhat varicolored.
14'0"	16'0"	2'0"	175A	Reddish brown,clayey,earthy,soft, varicolored,red-black-yellow-whit specks,very damp.
16'0"	18'0"	2'0"	176A	Reddish brown,yellowish brown,var colored,mostly black streaks,red- orange-yellow-white specks (gibb. clayey,very damp.
18'0"	20'6"	2'0"	177A	Same as above except for yellowis brown,gritty,gibbsite lumps at 20 depth.

(Hole deepened 9/22/54)

Remarks 2 good sized chunks of pisolitic material were found in nut orchard at Sherman place. Last pod of material at 20' depth had to be coal augered because of hardness. Material was dark yellowish-brown, not varicolored, and contained numerous small gibbsite nodules. Went down approximately 6" farther. Last pod was taken separately to be checked on T.A.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 21 Location Hendricks Property

NW-NW of sec. 35 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 8/31/54

Date hole finished 9/3/54

Shifts actually drilled 2

From	To	Thickness of sample	Sample No.	Description
2'0"	4'0"	2'0"	165	Red brown,earthy,gritty,hard,dry.
4'0"	6'0"	2'0"	166	Yellow brown,yellow spots,earthy, very gritty,very hard,gibbsite lumps,dry.
6'0"	8'0"	2'0"	167	Red brown,yellow spots,red spots, blue spots,varicolored,earthy, gritty,firm,dry.
8'0"	10'0"	2'0"	168	Red brown,lavenderish,varicolored, spotted,earthy,slightly clayey, gritty,firm,dry.
10'0"	12'0"	2'0"	169	Red brown,slightly varicolored, slightly spotted,earthy,gritty, hard spots,slightly hard, lumps gibbsite,dry.
12'0"	14'0"	2'0"	170	Yellowish brown,slightly red,somewh varicolored,earthy,slightly clayey slightly gritty,firm,slightly damp.
14'0"	16'0"	2'0"	171	Upper foot is yellowish-brown like previous 2 feet. Lower foot is reddish with white and black segre- gations,clayey,fairly soft,plastic damp.
16'0"	18'0"	2'0"	172	Brownish-red,white spots,black spo somewhat varicolored,clayey,firm, damp.
18'0"	20'0"	2'0"	173	Reddish-brown to yellowish-brown, usual spots,somewhat vari.,clayey, soft,damp.

Remarks

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 22 Location Mendenhall Property

SW-SW of sec. 22 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 680 Map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 25'0"

Elev. water table

Bottomed in Yellow clay?

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 9/22/54

Date hole finished 9-28-54

Shifts actually drilled 12½ hrs.

From	To	Thickness of sample	Sample No.	Description
2'0"	4'0"	2'0"	178	Brownish red, hard, earthy, gritty, dry, numerous chunks gibbsite.
4'0"	6'0"	2'0"	179 2X	Same as above only harder and mor chunks of gibbsite, gritty, dry.
6'0"	8'0"	2'0"	180	Grayish brown to reddish brown, so black clots, somewhat varicolored,
				fewer chunks gibbsite, earthy, grit dry.
8'0"	10'0"	2'0"	181 1X	Same as above only harder and mor tan colored, more gibbsite chunks,
				granular variety instead of porce lanous, gritty, dry, not as varicolo
10'0"	12'0"	2'0"	182	Same as above, perhaps not quite so gritty, slightly damp.
12'0"	14'0"	2'0"	183 1X	Reddish brown, gritty, earthy, sligh damp, slightly clayey.
14'0"	16'0"	2'0"	184 2X	Same above. Somewhat more vari-colored.
16'0"	18'0"	2'0"	185	Same as above.
18'0"	20'0"	2'0"	186 1X	Same as above.
20'0"	22'0"	2'0"	187	Same as above.
22'0"	24'0"	2'0"	188 1X	Same as above.
24'0"	25'0"	1'0"	189	Somewhat more tan colored than above; less gritty, more clayey,
				quite damp.

Remarks Note: Hole is due west of unused telephone pole on Russell property (pole and south side of house exactly line up). Bearing on fir tree at SW corner of county road zigzag = S 35 W. Distance from pole to hole = 98 feet 4 inches.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 23 Location On long, flat topped ridge in fir trees

SE¼ of sec. 22 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 635 (Map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9/28/54

Date hole finished 10/8/54

Shifts actually drilled 3

T.D. =

From	To	Thickness of sample	Sample No.	Description
0'	2'0"			Top soil,firm
2'0"	4'0"	2'0"	190	Reddish,gritty,earthy,dry,much gibbsite (porcelanous).
4'0"	6'0"	2'0"	191	Same as above.
6'0"	8'0"	2'0"	192	Same as above,not quite as gritty less hard drilling.
8'0"	10'0"	2'0"	193	Medium grayish brown,firm,earthy, slightly gritty,dry.
10'0"	12'0"	2'0"	194	Dark reddish brown,somewhat more yellowish brown near bottom,fairl
				hard,firm,earthy,dry,gritty -almo pisolitic.
12'0"	14'0"	2'0"	195	Yellowish brown,hard,firm,earthy, dry,somewhat gritty.
14'0"	16'0"	2'0"	196	Dark yellow brown,earthy,slightly gritty,damp,slightly clayey.
16'0"	18'0"	2'0"	197	Same as above,damper,somewhat clayeyer.
18'0"	20'0"	2'0"	198	Same as above.
20'0"	22'0"	2'0"	264	Same as above,still very gritty.
22'0"	24'0"	2'0"	265	Same as above,still very gritty.
24'0"	26'0"	2'0"	266	Same as above,black streaks,less gritty,somewhat redder near botto
26'0"	28'0"	2'0"	267	Same as 266
28'0"	30'0"	2'0"	268	Damper but still somewhat gritty.
30'0"	32'0"	2'0"	269	Somewhat grayer,white streaks,bla streaks,clayey,damp,slightly grit

Remarks

WL-24b

Hole No. 23

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 26 Location Hill 650

Cent. NE¼ of sec. 21 T. 8 S. R. 3 W. County Marion

Coord. N. E.

Elev. collar 650 Map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 12/20/54

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
2'0"	4'0"	2'	300	Reddish-brown, slightly clayey,da slightly earthy, gritty (gibb.),
4'0"	6'0"	2'	301	Same as above.Upper 1' contains much gibb. chunks.Lower 1' pisoli
6'0"	8'0"	2'	302	Reddish-brown to brownish-red, fairly hard,earthy,slightly claye very gritty (gibb.),slightly damp
8'0"	10'0"	2'	303	Brownish-yellow,very hard,very gritty,hit water at 9'.
10'0"	12'0"	2'	304	Same as above. Water in hole.
12'0"	14'0"	2'	305	Same as above.
14'0"	16'0"	2'	306	Same as above.
16'0"	18'0"	2'	307	Same as above.
18'0"	20'0"	2'	308	Same as above.

Remarks Note:- Water table (perched?) encountered at 9 feet. Had to bail constantly to keep water down. Only partially successful. Situation worsened last 2 feet and made further sampling invalid.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 27 Location K. G. Cowman Property

SE-SE of sec. 22 T. 8 S. R. 3 W. County Marion

Coord. N. E.

Elev. collar 600 Map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
2'0"	4'0"	2'	309	Yellowish-brown, fairly hard, earth somewhat gritty, fairly dry.
4'0"	6'0"	2'	310	Yellowish-brown, some white spots, Also red & black, gritty, fairly dr earthy, slightly clayey.
6'0"	8'0"	2'	311	Yellowish-brown, earthy, slightly gritty, slightly clayey, spotted, slightly damp.
8'0"	10'0"	2'	312	Same as above. Somewhat clayer an damper. Less earthy & gritty.
10'0"	12'0"	2'	313	Same as above.
12'0"	14'0"	2'	314	Same as above. Hit water.
14'0"	16'0"	2'	315	Same as above. Much red and white streaks, very clayey & damp.
16'0"	18'0"	2'	316	Same as above. Quite varicolored, damp, clayey.
18'0"	20'0"	2'	317	Varicolored, clayey & damp as above

Remarks

WL-24b

Hole No. 27

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. Cut Location Highway cut S. Commercial and Vista Ave.

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began 9-23-53

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
3'	6'	3	48	Brick red-clayey-hard.
6	9	3	49	Red-brown-yellow spots-red spots-clayey-hard-dry.
9	13	4	50	Olive drab-red-brown-white spots-yellow spots-red spots-black spots orange spots-pink spots-clayey-har vesicular.

Remarks Top section of dark brown vesicular basalt about 2' thick not sampled. Channel cut.

WL-24b

Hole No. Cut

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Schmidt
Project

Hole No. 1 Location 1050 E. of Schmidt's corner on N. side of road.

Sec. 3 T. 1 N. R. 2 W. County Washington

Coord.

Elev. collar Assumed 390

Depth to top of bed 1

Elev. of top of bed 389

Thickness of bed 8

Elev. water table

Depth of hole 12

Cumulative depth 12

Bottomed in red clay - basalt pebbles.

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/9/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3	2			Road cut. 1' top soil; 2' hard iron.
3	6'6"				Hard oölitic iron.
6'6"	9'				Iron mixed with red clay
9	12				Red clay with oölites and basalt pebbles

Remarks:

P-2348 (Sample No. 1)

SiO_2 7.72

Fe 21.36

Al_2O_3 40.40

Hole No. 1

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Schmidt
Project

Hole No. 2 Location 400 ft. S. of Hole No. 1.

Sec. 3 T. 1 N. R. 2 W. County Washington

Coord.

Elev. collar 365

Depth to top of bed 1

Elev. of top of bed 364

Thickness of bed 15

Elev. water table

Depth of hole 17

Cumulative depth 29

Bottomed in soft yellow clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/11/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	10				Hard oölitic iron
10	16				Lighter colored ore
16	17				Light yellow clay with some oölites.

Remarks:

SAMPLES:		SiO_2	Fe	Al_2O_3
P-2349 (No. 2A) 1' - 16'		11.34	19.93	41.52
P-2350 (No. 2B) 6' - 10'		7.94	18.91	42.72
P-2351 (No. 2C) 10' - 16'		7.48	14.24	46.32

Hole No. 2

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Schmidt
Project

Hole No. 3 Location 300 ft. W. of Hole No. 2

Sec. 3 T. 1 N. R. 2 W. County Washington

Coord.

Elev. collar 368

Depth to top of bed 8

Elev. of top of bed 360

Thickness of bed 9

Elev. water table

Depth of hole 19

Cumulative depth 48

Bottomed in dark gray clay and basalt.

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/11/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	8				Light brown clay
8	17				Red clay with some oölites.
17	19				Dark gray clay with basalt pebbles. Not sampled.

Remarks:

P-2352 (Sample No. 3) 8' - 17'

SiO_2 54.70

Fe 8.10

Al_2O_3 26.76

Hole No. 3

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Cathey
Project

Hole No. 4 Location 300 ft. S. of Cathey's gate.

Sec. 34 T. 2 N. R. 2 W. County Washington

Coord.

Elev. collar ± 590

Depth to top of bed 2

Elev. of top of bed 588

Thickness of bed 10

Elev. water table

Depth of hole 13

Cumulative depth 61

Bottomed in light brown sandy clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleavor

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/11/44

Date hole finished 5/12/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	9				" Oolitic iron
9	12				Light brown clay with " oolites.
12	13				Light brown sandy clay

Remarks:

		SiO_2	Fe	Al_2O_3
SAMPLES:	P-2357 (No. 4A) 2'-7'	38.94	19.65	31.04
	P-2358 (No. 4B) 7'-9'	17.14	22.01	26.2
	P-2359 (No. 4C) 9'-12'	14.20	26.91	25.68

Hole No. 4

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Cathey
Project

Hole No. 5 Location 550 N. of Cathey's gate.

Sec. 34 T. 2 N. R. 2 W. County Washington

Coord.

Elev. collar 650

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 16

Cumulative depth 77

Bottomed in brown clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/12/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	16				Brown to reddish brown clay

Remarks:

No iron. No sample.

Hole No. 5

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Cathey
Project

Hole No. 6 Location 750 ft. W. of highway on S. edge of Cathey property.

Sec. 9 T. 2 N. R. 2 W. County Washington

Coord.

Elev. collar ± 575

Depth to top of bed 5'

Elev. of top of bed 570

Thickness of bed 12

Elev. water table

Depth of hole 19

Cumulative depth 88

Bottomed in dark red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	5				Top soil
5	17				Red clay with decomposed oölites.
17	19				Dark red clay

Remarks:

P-2360 (Sample No. 5) 5' - 17'

SiO_2 53.54

Fe 9.57

Al_2O_3 16.20

Hole No. 6

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Schmidt
Project

Hole No. 1 Location 1050 E. of Schmidt's corner on N. side of road.

Sec. 3 T. 1 N. R. 2 W. County Washington

Coord.

Elev. collar Assumed 390

Depth to top of bed 1

Elev. of top of bed 389

Thickness of bed 8

Elev. water table

Depth of hole 12

Cumulative depth 12

Bottomed in red clay - basalt pebbles.

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/9/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Road cut. 1' top soil; 2' hard iron.
3	6'6"				Hard oölitic iron.
6'6"	9'				Iron mixed with red clay
9	12				Red clay with oölites and basalt pebbles

Remarks:

P-2348 (Sample No. 1)

SiO_2	7.72
Fe	21.36
Al_2O_3	40.40

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Schmidt
Project

Hole No. 2 Location 400 ft. S. of Hole No. 1.

Sec. 3 T. 1 N. R. 2 W. County Washington

Coord.

Elev. collar 365

Depth to top of bed 1

Elev. of top of bed 364

Thickness of bed 15

Elev. water table

Depth of hole 17

Cumulative depth 29

Bottomed in soft yellow clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/11/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	10				Hard oölitic iron
10	16				Lighter colored ore
16	17				Light yellow clay with some oölites.

Remarks:

SAMPLES:		SiO_2	Fe	Al_2O_3
P-2349 (No. 2A) 1' - 16'		11.34	19.93	41.52
P-2350 (No. 2B) 6' - 10'		7.94	18.91	42.72
P-2351 (No. 2C) 10' - 16'		7.48	14.24	46.32

Hole No. 2

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Schmidt
Project

Hole No. 3 Location 300 ft. W. of Hole No. 2

Sec. 3 T. 1 N. R. 2 W. County Washington

Coord.

Elev. collar 368

Depth to top of bed 8

Elev. of top of bed 360

Thickness of bed 9

Elev. water table

Depth of hole 19

Cumulative depth 48

Bottomed in dark gray clay and basalt.

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/11/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	8				Light brown clay
8	17				Red clay with some oölites.
17	19				Dark gray clay with basalt pebbles. Not sampled.

Remarks:

P-2352 (Sample No. 3) 8' - 17'

SiO_2 54.70

Fe 8.10

Al_2O_3 26.76

Hole No. 3

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Cathey
Project

Hole No. 4 Location 300 ft. S. of Cathey's gate.

Sec. 34 T. 2 N. R. 2 W. County Washington

Coord.

Elev. collar ± 590

Depth to top of bed 2

Elev. of top of bed 588

Thickness of bed 10

Elev. water table

Depth of hole 13

Cumulative depth 61

Bottomed in light brown sandy clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/11/44

Date hole finished 5/12/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	9				oolitic iron
9	12				Light brown clay with oolites.
12	13				Light brown sandy clay

Remarks:

		SiO_2	Fe	Al_2O_3
SAMPLES:	P-2357 (No. 4A) 2'-7'	38.94	19.65	31.04
	P-2358 (No. 4B) 7'-9'	17.14	22.01	26.2
	P-2359 (No. 4C) 9'-12'	14.20	26.91	25.68

Hole No. 4

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Cathey
Project

Hole No. 5 Location 550 N. of Cathey's gate.

Sec. 34 T. 2 N. R. 2 W. County Washington

Coord.

Elev. collar 650

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 16

Cumulative depth 77

Bottomed in brown clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/12/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	16				Brown to reddish brown clay

Remarks:

No iron. No sample.

Hole No. 5

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Cathey
Project

Hole No. 6 Location 750 ft. W. of highway on S. edge of Cathey property.

Sec. 34 T. 2 N. R. 2 W. County Washington

Coord.

Elev. collar ± 575

Depth to top of bed 5'

Elev. of top of bed 570

Thickness of bed 12

Elev. water table

Depth of hole 19

Cumulative depth 88

Bottomed in dark red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	5				Top soil
5	17				Red clay with decomposed oölites.
17	19				Dark red clay

Remarks:

P-2360 (Sample No. 5) 5' - 17'

SiO_2	53.54
Fe	9.57
Al_2O_3	16.20

Hole No. 6

Hole #27

P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe	Fe_2O_3: TiO_2 LOI	Al_2O_3: TiO_2
18492	309	2'0" - 4'0"	37.00	5.54	5.70	19.60	LOI = 23.72	
18117	310	4'0" - 6'0"	31.43	6.54	4.48	23.52	23.92	
18118	311	6'0" - 8'0"	30.60	6.98	3.72	24.40	23.81	
18119	312	8'0" - 10'0"	30.17	7.33	3.96	24.30	23.78	
18040	313	10'0" - 12'0"	31.10	6.90	2.68	24.20	LOI = 24.72	
18120	314	12'0" - 14'0"	32.51	6.32	3.20	23.40	24.51	
18041	315	14'0" - 16'0"	29.48	6.67	6.44	23.86	LOI = 23.99	
18121	316	16'0" - 18'0"	27.92	7.43	9.00	23.97	21.38	
18493	317	18'0" - 20'0"	31.05	6.54	10.00	22.42	LOI = 20.35	
		Av.	31.25	6.69	5.46	Fe_2O_3 33.3	23.28	
			(by diff)					

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite

Project

Hole No. 27 Location K. G. Cowman Property

SE-SE of sec. 22 T. 8 S. R. 3 W. County Marion

Coord. N. E.

Elev. collar 600 Map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
2'0"	4'0"	2'	309	Yellowish-brown, fairly hard, earth somewhat gritty, fairly dry.
4'0"	6'0"	2'	310	Yellowish-brown, some white spots, Also red & black, gritty, fairly dr earthy, slightly clayey.
6'0"	8'0"	2'	311	Yellowish-brown, earthy, slightly gritty, slightly clayey, spotted, slightly damp.
8'0"	10'0"	2'	312	Same as above. Somewhat clayer an damper. Less earthy & gritty.
10'0"	12'0"	2'	313	Same as above.
12'0"	14'0"	2'	314	Same as above. Hit water.
14'0"	16'0"	2'	315	Same as above. Much red and white streaks, very clayey & damp.
16'0"	18'0"	2'	316	Same as above. Quite varicolored, damp, clayey.
18'0"	20'0"	2'	317	Varicolored, clayey & damp as above

Remarks

WL-24b

Hole No. 27

Hole # 26

P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe	Fe_2O_3: TiO_2	Al_2O_3: TiO_2
18116	300	2'0" – 4'0"	17.95	3.27	33.12	11.82		2.68
18110	301	4'0" – 6'0"	31.88	5.08	16.88	17.02		36.00
18111	302	6'0" – 8'0"	20.79	8.60	8.32	25.52		6.9
18112	303	8'0" – 10'0"	33.24	7.46	4.46	22.87		24.82
18038	304	10'0" – 12'0"	35.85	6.10	4.04	20.22	LOI = 25.10	31.10
18113	305	12'0" – 14'0"	32.52	7.91	4.66	23.20		1440
18039	306	14'0" – 16'0"	38.77	6.00	3.00	18.23	LOI = 26.17	
18114	307	16'0" – 18'0"	39.01	5.76	2.08	20.11	Av. 51.7 25.6	
18115	308	18'0" – 20'0"	38.51	6.10	2.44	20.33		
			32.62	6.25	8.77	19.91		
34.96			*36.31		3.45			
6.85		6 – 20 = 14'	34.96	6.85	4.14	Fe_2O_3 30.75		
4.14								
30.75								
76.70								

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite

Project

Hole No. 26 Location Hill 650

Cent. NE¼ of sec. 21 T. 8 S. R. 3 W. County Marion

Coord. N. E.

Elev. collar 650 Map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 12/20/54

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
2'0"	4'0"	2'	300	Reddish-brown, slightly clayey,dar slightly earthy, gritty (gibb.),
4'0"	6'0"	2'	301	Same as above.Upper 1' contains much gibb. chunks.Lower 1' pisolit
6'0"	8'0"	2'	302	Reddish-brown to brownish-red, fairly hard,earthy,slightly clayey very gritty (gibb.),slightly damp.
8'0"	10'0"	2'	303	Brownish-yellow,very hard,very gritty,hit water at 9'.
10'0"	12'0"	2'	304	Same as above. Water in hole.
12'0"	14'0"	2'	305	Same as above.
14'0"	16'0"	2'	306	Same as above.
16'0"	18'0"	2'	307	Same as above.
18'0"	20'0"	2'	308	Same as above.

Remarks Note:- Water table (perched?) encountered at 9 feet. Had to bail constantly to keep water down. Only partially successful. Situation worsened last 2 feet and made further sampling invalid.

Hole # 24

P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO	Fe	L.O.I. ~~Fe_2O_3 / TiO_2~~	Al_2O_3 : TiO_2
V8494	Z34	2.5-5.0	3'-12' Comp. 40.6		Calc 18.6	Calc Fe_2O_3 28.72	17.43	
V8495	Z35	5.0-7.5					18.05	
18496	Z36	7.5-10.0					18.10	
18497	Z37	10.0-12.5	29.73	6.43	13.64	22.20	18.46	
18498	Z38	12.5-15.0	31.32	7.10	8.74	22.97	20.00	
18499	Z39	15.0-17.5	32.62	6.54	8.42	22.50	20.21	
18500	Z40	17.5-20.0	29.05	6.32	12.78	22.20	20.11	
18508	Z41	20.0-22.5	28.09	6.54	13.24	22.66	19.73	
18509	Z42	22.5-25.0	27.00	6.65	12.82	23.21	20.34	
Av.		~~1st 25-15'~~ 12.5 to 25=12.5'	29.63	6.60	11.60	~~22.62~~ Fe_2O_3 32.3	19.81	
		Aver. F.W.L	29.62 (by diff)	6.63	11.04	32.23	20.08	

Hole #25

P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO	Fe	L.O.I. ~~Fe_2O_3 / TiO_2~~	Al_2O_3 : TiO_2
18501	Z51	2.5-5.0	35.08	4.43	7.88	23.30	20.73	
18502	Z52	5.0-7.5	29.74	6.87	18.84	26.34	18.24	
18503	Z53	7.5-10.0	25.00	7.76	12.80	23.14	20.63	
18504	Z54	10.0-12.5	27.29	7.10	14.78	21.31	20.36	
18505	Z55	12.5-15.0	30.85	6.87	9.53	21.20	22.43	
18506	Z56	15.0-17.5	31.37	7.20	6.80	21.86	22.77	
18507	Z57	17.5-20.0	31.29	6.76	9.92	20.90	22.16	
18510	Z58	20.0-22.5	33.37	6.32	6.52	21.00	23.76	
18511	Z59	22.5-25.0	33.64	6.10	7.92	20.11	23.59	
18512	Z60	35.0 (bit)	29.76	6.00	16.90	19.33	18.83	
Av.			30.85	6.60	10.5	22.13	21.63	
		12.5-25=12.5	32.0 32.1 (by diff.)	6.65	8.14	Fe_2O_3 30.04	22.94	

Under "Remarks" use analyses at 35' depth

Hole #23 P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe Convert to Fe_2O_3	Fe_2O_3: TiO_2	Al_2O_3: TiO_2
							Comp. L.O.I. 20.52	
17330	190	2'0"-4'0"	50.68	3.92*	14.56	11.96		
17308	191	4'0"-6'0"	61.32	2.66	3.56	9.08	3.63	17.2
17301	192	6'0"-8'0"	35.40	6.14	7.64	23.40	5.44	5.7
17654	193	8'0"-10'0"	31.12	8.32*	14.72	25.47		
17302	194	10'0"-12'0"	38.28	6.44	6.24	21.37	4.76	5.95
17309	195	12'0"-14'0"	48.96	5.74	7.74	16.50	4.12	8.54
17303	196	14'0"-16'0"	34.96	7.90	6.34	21.37	3.88	4.44
17310	197	16'0"-18'0"	40.64	8.02*	6.40	24.58		
17304	198	18'0"-20'0"	39.52	7.42	6.12	23.92	4.61	5.33
17331	264	20'0"-22'0"	43.68	7.54	3.90	21.37	4.06	5.80
17543	265	22'0"-24'0"	39.68	7.32	3.02	21.60	4.22	5.43
17332	266	24'0"-26'0"	40.84	7.74	2.58	25.90	4.78	5.27
17333	267	26'0"-28'0"	36.20	10.19	2.62	31.34		
17334	268	28'0"-30'0"	39.24	6.45	4.28	27.10	6.00	6.07

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 23 Location On long, flat topped ridge in fir trees

SE¼ of sec. 22 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 635 (Map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9/28/54

Date hole finished 10/8/54

Shifts actually drilled 3

	From	To	Thickness of sample	Sample No.	Description
	0'	2'0"			Top soil, firm
	2'0"	4'0"	2'0"	190	Reddish, gritty, earthy, dry, much gibbsite (porcelanous).
	4'0"	6'0"	2'0"	191	Same as above. xtremly hd drilling
	6'0"	8'0"	2'0"	192	Same as above, not quite as gritty, less hard drilling.
	8'0"	10'0"	2'0"	193	Medium grayish brown, firm, earthy, slightly gritty, dry.
	10'0"	12'0"	2'0"	194	Dark reddish brown, somewhat more yellowish brown near bottom, fairly hard, firm, earthy, dry, gritty -al pisolitic.
	12'0"	14'0"	2'0"	195	Yellowish brown, hard, firm, earthy, dry, somewhat gritty.
	14'0"	16'0"	2'0"	196	Dark yellow brown, earthy, slightly gritty, damp, slightly clayey.
	16'0"	18'0"	2'0"	197	Same as above, damper, somewhat clayeyer.
	18'0"	20'0"	2'0" +	198	Same as above.
	20'0"	22'0"	2'0"	264	Same as above, still very gritty.
	22'0"	24'0"	2'0"	265	Same as above, still very gritty.
	24'0"	26'0"	2'0"	266	Same as above, black streaks, less gritty, somewhat redder near botto
	26'0"	28'0"	2'0"	267	Same as 266
	28'0"	30'0"	2'0"	268	Damper but still somewhat gritty.
T.D. =	30'0"	32'0"	2'0" +	269	Somewhat grayer, white streaks, bla streaks, clayey, damp, slightly grit

Remarks

Hole #22 P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe Convert to Fe_2O_3	Fe_2O_3 / TiO_2	Al_2O_3 / TiO_2
18031	178	2'0"-4'0"	36.24	3.38 *	13.39	17.43	30.69	
17299	179 ↑	4'0"-6'0"	52.32	3.06	8.32 ↑	9.13	23.30	17.4
17655	180	6'0"-8'0"	29.68	9.90	10.96	25.06	13.56	3.
17276	181	8'0"-10'0"	45.72	7.83	3.42	18.70 ✓	16.23	5.84
18032	182	10'0"-12'0"	36.80	7.40	2.18	21.66	22.62	
17277	183	12'0"-14'0"	35.80	6.80	5.38	25.44 ✓	15.72	5.26
17300	184	14'0"-16'0"	33.92	6.85	7.00	26.05 ✓	15.03	4.95
18042	185	16'0"-18'0"	28.94	7.70	4.70	25.08	Col=22.8	21.56
17278	186	18'0"-20'0"	35.60	5.95	4.96	25.72 ✓	16.79	6.02
17656	187	20'0"-22'0"	35.16	7.84 *	2.98	26.35	16.22	
17279	188	22'0"-24'0"	33.32	6.56	2.72 ↓	24.83 ✓	21.90	5.07
18033	189 ↓	24'0"-25'0"	32.16	7.20	2.40	28.85	16.84	
			36.30	6.17	5.70	22.36	4.81	

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite

Project

22 **Mendenhall Property**

Hole No. SW-SW Location 22 8 S 3 W Marion

of sec. T. R. County

Coord. N. E.

680 Map

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed 25'0"

Depth of hole

Elev. water table Yellow clay?

Bottomed in

~~3"~~ Iwan

Drill used 2

Number men Corcoran

Engr. in charge Corcoran

Mtrl. classfd. by Ewen

Sampler 9/22/54

Date hole began 9-28-54

Date hole finished 12½ hrs.

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
2'0"	4'0"	2'0"	178	Brownish red, hard, earthy, gritty, dry, numerous chunks gibbsite.
4'0"	6'0"	2'0"	179	Same as above only harder and mor chunks of gibbsite, gritty, dry.
6'0"	8'0"	2'0"	180	Grayish brown to reddish brown, so black clots, somewhat varicolored, fewer chunks gibbsite, earthy, grit dry.
8'0"	10'0"	2'0"	181	Same as above only harder and mor tan colored, more gibbsite chunks, granular variety instead of porce lanous, gritty, dry, not as varicolo
10'0"	12'0"	2'0"	182	Same as above, perhaps not qui so gritty, slightly damp.
12'0"	14'0"	2'0"	183	Reddish brown, gritty, earthy, sligh damp, slightly clayey.
14'0"	16'0"	2'0"	184	Same above. Somewhat more vari-colored.
16'0"	18'0"	2'0"	185	Same as above.
18'0"	20'0"	2'0"	186	Same as above.
20'0"	22'0"	2'0"	187	Same as above.
22'0"	24'0"	2'0"	188	Same as above.
24'0"	25'0"	1'0"	189	Somewhat more tan colored than above; less gritty, more clayey, quite damp.

Remarks: Note: Hole is due west of unused telephone pole on Russell property (pole and south side of house exactly line up). Bearing on fir tree at SW corner of county road zigzag = S 35 W. Distance from pole to hole = 98 feet 4 inches.

22

WL-24b

Hole No.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 21 Location Hendricks Property

NW-NW of sec. 35 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 8/31/54

Date hole finished 9/3/54

Shifts actually drilled 2

From	To	Thickness of sample	Sample No.	Description
2'0"	4'0"	2'0"	165	Red brown,earthy,gritty,hard,dry.
4'0"	6'0"	2'0"	166	Yellow brown,yellow spots,earthy, very gritty,very hard,gibbsite lumps,dry.
6'0"	8'0"	2'0"	167 X	Red brown,yellow spots,red spots, blue spots,varicolored,earthy, gritty,firm,dry.
8'0"	10'0"	2'0"	168	Red brown,lavenderish,varicolored spotted,earthy,slightly clayey, gritty,firm,dry.
10'0"	12'0"	2'0"	169 X	Red brown,slightly varicolored, slightly spotted,earthy,gritty, hard spots,slightly hard, lumps gibbsite,dry.
12'0"	14'0"	2'0"	+170 X	Yellowish brown,slightly red,somewh varicolored,earthy,slightly clayey, slightly gritty,firm,slightly damp.
14'0"	16'0"	2'0"	+171 X	Upper foot is yellowish-brown like previous 2 feet. Lower foot is reddish with white and black segre-gations,clayey,fairly soft,plastic damp.
16'0"	18'0"	2'0"	172 X	Brownish-red,white spots,black spot somewhat varicolored,clayey,firm, damp.
18'0"	20'0"	2'0"	+173 X	Reddish-brown to yellowish-brown, usual spots,somewhat vari.,clayey, soft,damp.

Remarks

WL-24b

Hole No. 21

Hole #21

P-#	Sample #	Interval	Al_2O_3	TiO_2 4.92	SiO_2	Fe (Convert to Fe_2O_3)	Fe_2O_3: TiO_2	Al_2O_3: TiO_2
							Comp. L.O.I. 22.74	
17883	165	2'0" – 4'0"	29.08	3.40 *	33.80	11.70		
17884	166	4'0" – 6'0"	51.08	2.41 *	9.32	8.28		
17657	167	6'0" – 8'0"	45.92	4.12	12.52	13.51	4.69	11.1
17885	168	8'0" – 10'0"	36.32	4.59 *	24.62	15.80		
17236	169	10'0" – 12'0"	50.32	8.43	13.42	10.73	1.82	5.96
17761	170	12'0" – 14'0"	42.64	5.19 *	3.52	17.80		
17229	171	14'0" – 16'0"	40.20	5.68	8.66	19.14	4.80	7.07
17554	172	16'0" – 18'0"	37.16 *	6.98 *	9.16 *	24.03	41.59 *	14.38
17230	173	18'0" – 20'0"	29.69	6.70	12.24	24.67	5.27	4.44
			40.27		14.14	16.18		

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 20 Location **Sherman Property**

C-NW¼ of sec. 27 T. 8 S R. 3 W County **Marion**

Coord. N. E.

Elev. collar 715 Map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used Iwan 3"

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 8/31/54

Date hole finished 8/31/54

Shifts actually drilled 1 + 1

From	To	Thickness of sample	Sample No.	Description
2'0"	4'0"	2'0"	160	Yellow brown,yellow spots,red spo earthy,black spots,gritty,firm,dr
4'0"	6'0"	2'0"	161 X	Yellow brown,white spots,yellow spots,red spots,black spots,earth gritty,firm,dry.
6'0"	8'0"	2'0"	162	Red brown,white spots,yellow spot red spots,black spots,earthy,grit firm,dry.
8'0"	10'0"	2'0"	163 X	Red brown,light yellow,white spot yellow spots,red spots,black spot varicolored,earthy,slightly cla slightly gritty,firm,slightly dam
10'0"	12'0"	2'0"	+ 164 X	Red brown,light yellow,white spot yellow spots,red spots,black spot varicolored,earthy,clayey,firm, damp.
12'0"	14'0"	2'0"	174A X	Reddish brown,clayey,earthy,soft, very damp,somewhat varicolored.
14'0"	16'0"	2'0"	175A X	Reddish brown,clayey,earthy,soft, varicolored,red-black-yellow-whit specks,very damp.
16'0"	18'0"	2'0"	176A X	Reddish brown,yellowish brown,var colored,mostly black streaks,red- orange-yellow-white specks (gibb. clayey,very damp.
18'0"	20'6"	2'0"	+ 177A X	Same as above except for yellowis brown,gritty,gibbsite lumps at 20 depth.

(Hole deepened 9/22/54)

Remarks 2 good sized chunks of pisolitic material were found in nut orchard at Sherman place. Last pod of material at 20' depth had to be coal augered because of hardness. Material was dark yellowish-brown, not varicolored, and contained numerous small gibbsite nodules. Went d approximately 6" farther. Last pod was taken separately to be checked on T.A.

WL-24b

Hole No. 20

Hole #20 P-#	Sample #	Interval	Al_2O_3	TiO_2 *Calc	SiO_2	Fe Convert to Fe_2O_3	Fe_2O_3: TiO_2 Comp. L.O.I	Al_2O_3: TiO_2
17881	160	2'0"-4'0"	32.80	5.64*	15.70	19.78	21.34	
17658	161	4'0"-6'0"	40.00	5.06	16.60	20.72	5.84	7.90
17882	162	6'0"-8'0"	34.32	5.90*	12.06	20.66		
17118	163 ↑	8'0"-10'0"	35.96 +	6.20	11.50 ↑	20.35	4.71	5.81
17760	164	10'0"-12'0"	34.32	6.47*	8.34	22.65		
17274	174A	12'0"-14'0"	34.04	7.65	6.38	25.27 ✓	4.73	4.45
17553	175A	14'0"-16'0"	40.86	5.96*	5.78	20.93	*36.29	*10.05
17659	176A	16'0"-18'0"	38.00*	7.16	4.06 *	25.70	5.14	5.30
17275	177A ↓	18'0"-20'6"	31.36	7.40	8.68 ↓	24.16 ✓	4.67	4.25
			35.74		9.90	22.21	5.02	

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 19 Location Hill 809 (Van Cleeve)

C-NW¼ of sec. 34 T. 8 S R. 3W County Marion

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used Iwan 3"

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 8/23/54

Date hole finished 8/30/54

Shifts actually drilled 2

From	To	Thickness of sample	Sample No.	Description
2'0"	4'0"	2'0"	151	Brown red, black spots, earthy, slightly clayey, gritty, slightly plastic, firm, pisolites, slightly damp.
4'0"	6'0"	2'0"	+ 152 X	Same as Sample No. 151.
6'0"	8'0"	2'0"	153	Yellow red, black spots, blue spots yellow spots, slightly varicolored spotted, earthy, slightly clayey, gritty, firm, few pisolites, slightly damp.
8'0"	10'0"	2'0"	+ 154 X	Red brown, black spots, brown spots earthy, slightly clayey, gritty, firm few pisolites, slightly damp.
10'0"	12'0"	2'0"	155	Same as Sample No. 154.
12'0"	14'0"	2'0"	+ 156 X	Red brown, black spots, brown spots earthy, slightly clayey, slightly gritty, slightly firm, few pisolites slightly damp.
14'0"	16'0"	2'0"	157	Yellow brown, yellow spots, black spots, green spots, earthy, slightly clayey, slightly gritty, soft, slightly damp.
16'0"	18'0"	2'0"	158 X	Yellow brown, light green, mottled, varicolored, earthy, clayey, soft, plastic, damp.
18'0"	20'0"	2'0"	159	Yellow brown, light grey, mottled, varicolored, earthy, clayey, soft, plastic, damp.

Remarks Note: T.A. on 4-6' int. indicates low gibbsite (less than 30%) & high Kaolin (greater than 20%) 8-10' & 12'-14' intervals, however, indicate a much higher gibbsite content

WL-24b

Hole No. 19

Hole #19 P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe (Convert to Fe_2O_3)	Fe_2O_3 / TiO_2	Al_2O_3 / TiO_2
17878	151	2'0"- 4'0"	29.76		34.84	13.26	Comp. L. O.F.	
17660	152	4'0"-6'0"	33.84		25.08	18.94	20.64	
17879	153	6'0"-8'0"	33.36		14.70	23.10		
17547	154 ↑	8'0"-10'0"	35.44		7.12	24.47		
17880	155	10'0"-12'0"	38.52		7.74	20.70		
17548	156 ↓	12'0"-14'0"	38.96 *	6.12	7.68 ↓ *	21.84	5.10	6.37
17766	157	14'0"-16'0"	33.28	5.80	13.74	20.44	5.04	5.74
17661	158	16'0"-18'0"	33.56		15.26	24.47	*35.00	*16.2
17767	159	18'0"-20'0"	23.60		21.06	23.32		
			33.33	33	16.35	21.80		

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 18 Location Hill 800 (Cunningham)

SE-SE of sec. 28 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used Iwan 3"

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 8/19/54

Date hole finished 8/23/54

Shifts actually drilled 2

From	To	Thickness of sample	Sample No.	Description
2'0"	4'0"	2'0"	142	Yellow brown,earthy,gritty,slight hard,dry, chunks gibbsite
4'0"	6'0"	2'0"	143 X	Yellow brown,earthy,gritty,slight hard,dry chunks gibbsite
6'0"	8'0"	2'0"	144	Yellow brown,earthy,gritty,slight hard,dry chunks gibbsite
8'0"	10'0"	2'0"	145 X	Yellow brown,earthy,gritty,slight hard,dry chunks gibbsite
10'0"	12'0"	2'0"	146 X	Yellow brown,slightly red,white spots,yellow spots,black spots, mottled,earthy,slightly clayey, slightly gritty,slightly plastic, firm,slightly damp.
12'0"	14'0"	2'0"	147 X	Yellow brown,slightly red,white spots,yellow spots,black spots, mottled,earthy,clayey,slightly gritty,slightly plastic,firm,damp
14'0"	16'0"	2'0"	148 X	Yellow brown,slightly red,white spots,yellow spots,black spots, mottled,earthy,clayey,slightly gritty,slightly plastic,firm, slightly damp.
16'0"	18'0"	2'0"	149 X	Yellow brown,red,white spots,yell spots,red spots,black spots,brown spots,green spots,blue spots,oran spots,pink spots,varicolored,mott earthy,clayey,silty,plastic,firm, slightly damp.
18'0"	20'0"	2'0"	150 X	Same as Sample No. 149.

Remarks Note: Material in bottom 4' very varicolored with a generally reddish purple hue.

Very definitely in weathered basalt.

WL-24b

Hole No. 18

Hole #18 P-#	Sample #	Interval	Al_2O_3	TiO_2 calc*	SiO_2	Fe Convert to Fe_2O_3	Fe_2O_3: TiO_2	Al_2O_3: TiO_2
17758	142	2'0"-4'0"	31.64	5.02	20.16	17.12	4.87	6.29
17662	143 ↑	4'0"-6'0"	46.80	6.00 *	4.32	21.15	Comp. L.O.I. 22.03	
17759	144	6'0"-8'0"	36.96	6.50	2.10	21.87	4.83	5.69
17092	145	8'0"-10'0"	38.36	6.34	3.12	22.45 ✓	5.07	6.06
17551	146	10'0"-12'0"	42.04	6.22	5.30	20.93	4.80	6.76
17228	147	12'0"-14'0"	35.97	6.94	7.20	21.24 ✓	4.36	5.19
17307	148	14'0"-16'0"	34.88	6.82	7.62	26.46 ✓	5.56	5.12
17552	149 ↓	16'0"-18'0"	33.92 *	7.25 *	11.28 *	25.60	* 37.57	* 7.64
17663	150	18'0"-20'0"	28.52	5.50	20.32	22.26	5.80	5.18
	151		36.56	c	9.05	22.12	5.05	

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 17 Location Hill 925 (north of McDougall)

C-NW¼ of sec. 19 T. 8 S. R. 3 W. County Marion

Coord. N. E.

Elev. collar 925 map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 8/6/54

Date hole finished 8/6/54

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
2' 0"	4' 0"	2' 0"	131	Yellow brown,earthy,gritty,firm,d (numerous chunks of gibbsite)
4' 0"	6' 0"	2' 0"	132 X	Yellow brown,earthy,gritty,firm,d (piselitic?)
6' 0"	8' 0"	2' 0"	133 X	Yellow brown,light red,earthy,gri firm,dry.
8' 0"	10' 0"	2' 0"	134 X	Yellow brown,light red,earthy, slightly clayey,gritty,firm,dry (last pod somewhat lighter colore
10' 0"	12' 0"	2' 0"	135 X	Tan,light red,earthy,slightly cla slightly gritty,slightly firm, slightly damp.
12' 0"	14' 0"	2' 0"	136 X	Tan,light red,white spots,yellow spots,red spots,black spots, slightly varicolored,earthy,claye slightly gritty,slightly firm, slightly damp.
14' 0"	16' 0"	2' 0"	137 X	Tan,blue,black,mottled,spotted, yellow spots,black spots,blue spo earthy,clayey,slightly gritty, slightly firm,slightly damp.
16' 0"	18' 0"	2' 0"	138 X	Brown,blue,black,mottled,spotted, yellow spots,black spots,blue spo earthy,clayey,slightly gritty, slightly firm,slightly damp.
18' 0"	20' 0"	2' 0"	139	Brown,blue,black,mottled,spotted, yellow spots,black spots,blue spo earthy,clayey,slightly gritty, slightly firm,slightly damp.

Remarks Note: 0' 0" - 2' 0" contained much gibbsite float.

Hole #17

P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe Convert to Fe_2O_3	Fe_2O_3 + TiO_2 L.O.I. (by diff)	Al_2O_3
18030	131	2'0"–4'0"	30.52	5.64 *	16.96	18.80	19.98	
17664	132	4'0"–6'0"	32.64	6.93 *	8.44	23.14	18.99	
17762	133	6'0"–8'0"	33.72	7.39 *	4.42	24.64	19.27	
17091	134	8'0"–10'0"	36.45	7.44	5.40	22.34 ✓	18.91	4.91
17549	135 ↓	10'0"–12'0"	34.64	6.80 *	13.44 ↓	22.64	17.72	
17227	136	12'0"–14'0"	29.11	6.39	15.02	23.00 ✓	16.58	4.56
17306	137	14'0"–16'0"	33.44	5.82	21.92	19.80 ✓	10.52	5.74
17550	138	16'0"–18'0"	34.60	5.00 *	27.96	16.66	8.64	
17877	139	18'0"–20'0"	28.16	5.33 *	28.04	17.80	13.07	
		33.59	32.59		15.73	20.98		

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite

Project

Hole No. 16 Location **Grabenhorst property**

NW-SE of sec. 30 T. 8 S. R. 3 W. County **Marion**

Coord. N. E.

Elev. collar 975 map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 7/30/54

Date hole finished 8/5/54

Shifts actually drilled 2

From	To	Thickness of sample	Sample No.	Description
2' 0"	4' 0"	2' 0"	120	Yellow brown,earthy,gritty,firm,dr
4' 0"	6' 0"	2' 0"	121 X	Yellow brown,earthy,gritty,firm, dry, hard going.
6' 0"	8' 0"	2' 0"	122 X	Yellow brown,earthy,gritty,firm, dry, hard going.
8' 0"	10' 0"	2' 0"	123 X	Yellow brown,slightly red, earthy, gritty,slightly clayey,firm,dry.
10' 0"	12' 0"	2' 0"	124	Yellow brown,earthy,gritty,slightl clayey,firm,dry.
12' 0"	14' 0"	2' 0"	125 X	Yellow brown red, varicolored,blac spots,red spots,brown spots,earthy slightly gritty,clayey,slightly slightly damp.
14' 0"	16' 0"	2' 0"	126 X	Yellow brown,slightly red,red spot black spots,earthy,gritty,slightly clayey,firm,slightly damp.
16' 0"	18' 0"	2' 0"	127 X	Yellow brown,slightly red,red spot black spots,earthy,gritty,slightly clayey,firm,slightly damp.
18' 0"	20' 0"	2' 0"	128 X	Yellow brown,slightly red,red spot black spots,earthy,gritty,slightly clayey,firm,slightly damp.
20' 0"	22' 0"	2' 0"	129 X	Yellow brown,slightly red,red spot black spots,white spots,banded, varicolored,earthy,clayey,slightly gritty,slightly firm,slightly damp
22' 0"	24' 0"	2' 0"	130 X	Yellow brown,red,red spots,black spots,white spots,yellow spots, banded,varicolored,earthy,very cl slightly gritty,slightly firm, ~~slightly damp.~~

Remarks

Note: Check sample 30 and 31 (taken in road cut by radio tower). Samples from 6' 0" - 12' 0" appeared somewhat pisolitic - many small chips and shots of gibbsite.

Hole #16 P-#	Sample #	Interval	Al_2O_3	TiO_2 *Calc	SiO_2	Fe Convert to Fe_2O_3	Fe_2O_3: TiO_2	Al_2O_3: TiO_2
17875	120	2'0"–4'0"	31.88	6.24*	9.92	19.78		
17545	121	4'0"–6'0"	37.82	7.10	3.56	21.60	4.35	5.33
17756	122	6'0"–8'0"	37.68	7.10 *	1.88	22.54		
17234	123	8'0"–10'0"	41.18	7.64	2.02	23.88 ✓	4.47	5.39
17876	124	10'0"–12'0"	36.72	7.31 *	3.04	23.20		
16914	125	12'0"–14'0"	37.63	7.40	2.08	23.14 ✓	4.46	5.08
17757	126	14'0"–16'0"	40.00	6.59 *	2.16	20.88		
17235	127	16'0"–18'0"	41.62	6.45	2.88	22.34 ✓	4.95	6.45
17665	128	18'0"–20'0"	36.40 *	7.34 *	3.44 *	23.32	*37.88	* 3.44
17546	129 ↓	20'0"–22'0"	32.80	8.26 *	10.40 ↓	26.24		
17090	130	22'0"–24'0"	30.25	7.16	13.74	22.23 ✓	4.43	4.23
			36.70	36.72	5.01	22.70	4.54	

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite

Project

Hole No. 15 Location Hill 1000 (Ted Schroeder property - R. E. Hanson rents)

NW-SW of sec. 30 T. 8 S. R. 3 W. County Marion

Coord. N. E.

Elev. collar 1000 map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 7/29/54

Date hole finished 8/19/54

Shifts actually drilled 3

From	To	Thickness of sample	Sample No.	Description
2' 0"	4' 0"	2' 0"	111 *	Yellow brown,earthy,gritty,soft, dry (chunks of gibbsite).
4' 0"	6' 0"	2' 0"	112 *	Yellow brown,earthy,gritty,soft, dry (hard ~~strikes~~ streaks)
6' 0"	8' 0"	2' 0"	113 *	Yellow brown,earthy,gritty,soft, dry (hard ~~strikes~~ streaks)
8' 0"	10' 0"	2' 0"	114 *	Yellow brown,light red,earthy,grit slightly clayey,slightly hard, slightly damp.
10' 0"	12' 0"	2' 0"	115 *	slight Yellow brown,light red,earthy,grit slightly clayey,slightly hard, slightly damp.
12' 0"	14' 0"	2' 0"	116 *	Yellow brown,light red,earthy, slightly gritty,slightly clayey, slightly hard,slightly damp.
14' 0"	16' 0"	2' 0"	+ 117 *	Yellow brown,light red,earthy, slightly gritty,slightly clayey, slightly hard,slightly damp.
16' 0"	18' 0"	2' 0"	118 *	Yellow brown,light red,earthy, gritty,clayey,firm,damp.
18' 0"	20' 0"	2' 0"	+ 119 *	Yellow brown,light red,earthy, gritty,clayey,firm,damp.
20' 0"	22' 0"	2' 0"	140 *	Yellow brown,light red,earthy, gritty,clayey,firm,very damp.
22' 0"	24' 0"	2' 0"	+ 141 *	Yellow brown,light red,earthy, gritty,clayey,firm,very damp.

Remarks Note: Hole approximately 200' horizontally and 4' vertically north of the top of the knoll. Very numerous chunks of gibbsite in uppermost 2' of soil.(Had more trouble getting auger past them than ever before.)

Hole #15 P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe Convert to Fe_2O_3	Fe_2O_3 / TiO_2	Al_2O_3 / TiO_2
17135 ✓	111	2'0" - 4'0"	36.17	5.00	13.24	18.55 ✓	5.32	7.24
17136 ✓	112	4'0" - 6'0"	38.56	7.48	2.22	21.69 ✓	4.15	5.16
17137 ✓	113	6'0" - 8'0"	38.94	7.04	2.08	21.12 ✓	4.29	5.54
17138 ✓	114	8'0" - 10'0"	41.95	5.65	1.34	18.80 ✓	4.76	7.44
16911 ✓	115	10'0" - 12'0"	40.09	6.90	2.36	22.15 ✓	4.60	5.82
17139 ✓	116	12'0" - 14'0"	37.45	7.24	3.76	21.90 ✓	4.33	5.19
16912 ✓	117	14'0" - 16'0"	39.81	*(6.65)	2.52	21.94 ✓		
17140 ✓	118	16'0" - 18'0"	37.49	7.44	3.52	20.90 ✓	4.03	5.05
16913 ✓	119	18'0" - 20'0"	39.81	*(6.52)	2.76	21.55		
17141 ✓	140	20'0" - 22'0"	35.46	7.44	4.26	24.11 ✓	4.63	4.77
17089 ✓	141	22'0" - 24'0"	30.68	7.34	9.02	24.66 ✓	4.81	4.18
Average			37.85	6.94	4.28	21.58 ✓		
18513	232	@ 85.0'	28.94	3.33	25.77	17.66		
				*calculated				

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 14 Location Hill 850 - Don Jones

NE-SW of sec. 29 T. 8 S. R. 3 W. County Marion

Coord. N. E.

Elev. collar 850 map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 7/28/54

Date hole finished 7/28/54

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0' 0"	2' 0"	2' 0"	0	Soil.
2' 0"	4' 0"	2' 0"	98	Yellow brown,earthy,gritty,soft,d
4' 0"	6' 0"	2' 0"	99 X	Yellow brown,light red,earthy, gritty,soft,dry.
6' 0"	8' 0"	2' 0"	100	Yellow brown,light grey,earthy, soft,slightly damp,clayey.
8' 0"	10' 0"	2' 0"	101 X	Yellow brown,light red,slightly varicolored,clayey,slightly plast soft,slightly damp.
10' 0"	12' 0"	2' 0"	+ 102 X	Yellow brown,varicolored,red,gre clayey,slightly plastic,soft, slightly damp.
12' 0"	14' 0"	2' 0"	103	Yellow brown,light grey,light red clayey,slightly plastic,soft, slightly damp.
14' 0"	16' 0"	2' 0"	104	Yellow brown,varicolored,light re grey,yellow spots,very clay, slightly plastic,soft,damp.
16' 0"	18' 0"	2' 0"	105	Yellow brown,mottled,grey,black spots,very clayey,plastic,soft, ~~slightly damp~~ very damp.
18' 0"	20' 0"	2' 0"	106	Yellow brown,mottled,grey,many black spots,very clayey,plastic, soft,very damp.

Remarks

WL-24b

Hole No. 14

Hole #14 P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe Convert to Fe_2O_3	Fe_2O_3 : TiO_2	Al_2O_3 : TiO_2
17874	98	2'0"-4'0"	35.08	6.64 *	5.44	23.97		
17544	99	4'0"-6'0"	33.96	6.20	3.50	27.80	6.43	5.49
17763	100	6'0"-8'0"	27.88	7.06 *	10.50	25.52		
17233	101	8'0"-10'0"	27.89	6.74	13.12	25.55	5.44	4.03
16910	102	10'0"-12'0"	34.46	5.66 *	22.28	20.35		
18034	103	12'0"-14'0"	23.92	6.20 *	22.00	22.40	4.90	3.69
18035	104	14'0"-16'0"	24.48	6.04 *	22.52	21.80	13.89	3.90
18036	105	16'0"-18'0"	22.46	6.10	25.18	20.88	LOI = 16.40	
18037	106	18'0"-20'0"	24.09	7.46	22.14	20.33	17.24	
			28.16	7.46	16.19	23.18	5.16	

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 13 Location Continued 3-2-54

_____ of sec. _____ T. _____ R. _____ County Marion

Coord. _____ N. _____ E.

Elev. collar _____

Depth to top of bed _____

Elev. of top of bed _____

Thickness of bed _____

Elev. bottom bed _____

Depth of hole _____

Elev. water table _____

Bottomed in _____

****

Drill used _____

Number men _____

Engr. in charge _____

Mtrl. classfd. by _____

Sampler _____

Date hole began _____

Date hole finished _____

Shifts actually drilled 2 hrs.

From	To	Thickness of sample	Sample No.	Description
10' 0"	12' 0"	2' 0"	80 *	Yellow brown, earthy, few pisolites, firm, damp.
12' 0"	14' 0"	2' 0"	81 *	Yellow brown, earthy, few pisolites, firm, damp.
14' 0"	16' 0"	2' 0"	82 *	Yellow brown, earthy, few pisolites, firm, damp.
16' 0"	18' 0"	2' 0"	83 *	Brown, earthy, pisolites, yellow spot red spots, black spots, damp.
18' 0"	20' 0"	2' 0"	+ 84 *	Brown, earthy, pisolites, yellow spot red spots, black spots, damp.

Remarks _____

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

ESTIMATE

SALEM BAUXITE
Project

Hole No. 13 Location Highest point on hill west of farm house.

SW SE of sec. 1 T. 9 S R. 3 W County Marion

Coord. N. E.

Elev. collar 625 (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 20'

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler "

Date hole began 11/5/53

Date hole finished

Shifts actually drilled 1½ hrs.

From	To	Thickness of sample	Sample No.	Description
0	2'	- - -	- - -	Light yellow soil.
2'-0"	4'-0"	2'	76*	Light yellow earthy-dry-firm.
4'-0"	6'-0"	2'	77*	Light yellow brown earthy-dry-firm.
6'-0"	8'-0"	2'	78*	Light yellow brown earthy-dry-firm.
8'-0"	10'-0"	2'	79*	Red-brown-earthy-dry-firm.

Remarks

WL-24b

Hole No. 13

Hole #13 P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe Convert to Fe_2O_3	$\frac{Fe_2O_3}{TiO_2}$	$\frac{Al_2O_3}{TiO_2}$
15800	76	2'0"-4'0"	27.72	5.25	27.96	16.85	4.61	5.27
15801	77	4'0"-6'0"	28.44	5.84	24.88	18.51	4.53	4.87
15802	78	6'0"-8'0"	29.36	*6.17	18.12	20.73	4.86	4.71
15803	79	8'0"-10'0"	33.11 *	7.04	5.80**	23.94	**35.87	**6.99
16334	80	10'0"-12'0"	36.41 *	*5.27	12.94**	17.22	*36.98	**7.24
16335	81	12'0"-14'0"	39.78	*5.91	3.90	19.23		
16336	82	14'0"-16'0"	36.03	*6.46	5.20	21.02		
16337	83	16'0"-18'0"	38.17	*6.00	8.18	19.56		
16338	84	18'0"-20'0"	34.52	*6.72	5.96	21.92		
Average			33.73	6.07	12.55	19.89		
				*calculated				

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE

Project

Hole No. 12 Location Near oak tree opposite oat field, house north side of road.

Center NW¼ of sec. 28 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 780 (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 20'

Elev. water table

Bottomed in Olive drab clay

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler "

Date hole began 11/5/53

Date hole finished

Shifts actually drilled 2½ hrs.

From	To	Thickness of sample	Sample No.	Description
0"	2'	- - -	- - -	Soil.
2'-0"	4'-0"	2'	67 *	Yellow-brown-earthy-firm-dry.
4'-0"	6'-0"	2'	68 *	Light yellow-brown-earthy-firm-dry-white spots-yellow spots.
6'-0"	8'-0"	2'	69 *	Light yellow-brown-earthy-slightly firm-dry-white spots-yellow-spots.
8'-0"	10'-0"	2'	70 *	Red-brown-earthy-slightly firm-dry white spots-yellow spots-black spo
10'-0"	12'-0"	2'	71 *	Red-brown-earthy-slightly firm-dry white spots-yellow spots-black spo
12'-0"	14'-0"	2'	72 *	Dark red-brown-slightly clayey-slightly damp-white spots-yellow spots-black spots.
14'-0"	16'-0"	2'	73 *	Dark brown-clayey-slightly firm-damp-(grey-white spots).
16'-0"	18'-0"	2'	74 *	Olive drab-grey-blue-banded-clayey damp.
18'-0"	20'-0"	2'	± 75 *	Olive drab-grey-blue-banded-clayey very damp.

Remarks Not very hard drilling.

Hole # 12 P-#	Sample #	Interval	Al_2O_3 +	TiO_2 (calc)	SiO_2	Fe Convert to Fe_2O_3	Fe_2O_3: TiO_2	Al_2O_3: TiO_2
16028	67	2'0" - 4'0"	26.04	5.66	25.28	18.48		
16029	68	4'0" - 6'0"	26.82	5.78	24.96	19.00		
15688	69	6'0" - 8'0"	28.60	4.89	27.10	16.14		
16030	70	8'0" - 10'0"	24.71	6.13	24.58	20.00		
15689	71	10'0" - 12'0"	27.64	5.17	26.52	16.96		
16031	72	12'0" - 14'0"	25.75	5.60	26.98	18.36		
15690	73	14'0" - 16'0"	28.87	5.45	26.30	17.85		
16032	74	16'0" - 18'0"	26.91	5.45	27.34	17.89		
15691	75	18'0" - 20'0"	26.46	5.92	25.10	19.40		
Average			26.87	5.56	26.02	18.23		

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 11 Location Tex Perry

¼ cor 20/29 of sec. 29 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler

Date hole began Deepened 5-25-54, 7-28-54, 9-3-54.

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
7'0"	9'0"	2'0"	94 X	Yellow brown,hard,dry,gritty.
9'0"	9'6"	0'6"	95	Same as Sample No. 94.
9'6"	11'0"	1'6"	96 X	Yellow brown,earthy,gritty,soft, damp,
11'0"	13'0"	2'0"	+ 97 X	Yellow,brown,yellow spots,red spots white spots,earthy,gritty,soft,damp
13'0"	15'0"	2'0"	174 X	Yellowish brown,earthy,gritty, slightly clayey,hard,slightly damp.
15'0"	17'0"	2'0"	175 X	Yellowish brown,slightly reddish, earthy,gritty,slightly clayey,ha slightly damp.
17'0"	19'0"	2'0"	176 X	Same as No. 175, somewhat clayeyer.
19'0"	21'0"	2'0"	+ 177 X	

Remarks Note: Hit water again at 13'0".

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE

Project

Hole No. 11 Location Near ¼ cor. secs. 20/29.

of sec. T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 780 (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 21

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler "

Date hole began 11/4/53

Date hole finished

Shifts actually drilled 2-3/4 hrs.

From	To	Thickness of sample	Sample No.	Description
0	2'	- - -	- - -	Yellow-brown-earthy.
2'-0"	4'-0"	2'	64*	Yellow-brown-earthy-very hard-dam
4'-0"	6'-0"	2'	65*	Red-brown-very hard-damp.
6'-0"	7'-0"	1'	66*	Red-brown-very hard-damp.

Remarks

WL-24b

Hole No. 11

Hole # 11 P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe Convert to Fe_2O_3	Fe_2O_3 / TiO_2	Al_2O_3 : TiO_2
15686	64	2'0" - 4'0"	*35.23	* 5.25	14.22	17.85		
15799	65	4'0" - 6'0"	38.32	6.05	4.04	20.85 ✓	4.95	6.33
15687	66	6'0" - 7'0"	*37.96	*6.76	4.30	23.39		
	94	7'0" - 9'0"	37.69	5.31 *	1.78 *	18.40 *		
	95	9'0 - 9'6"						
17232	96	9'6" - 11'0"	40.39	5.35	1.58	19.68 ✓	5.27	7.55
17088	97	11'0" - 13'0"	34.10	6.84	7.18	23.69 ✓	4.96	4.98
17764	174	13'0" - 15'0"	36.24	6.69 *	2.24	23.54		
17225	175	15'0" - 17'0"	39.28	6.55	2.92	22.56 ✓	4.93	6.00
17765	176	17'9" - 19'0"	32.48	6.00 *	3.54	25.63		
17226	177	19'0" - 21'0"	33.33	6.15	7.48	25.11 ✓	5.84	5.42
			36.50	6.13	4.93	22.07		
			*calculated					

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 10 Location Summit of hill 1029 just south of gate on E-W fence.

NE SW of sec. 18 T. 9 S R. 2 W County Marion

Coord. N. E.

Elev. collar 1029' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 12

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-24-53

Date hole finished 9-24-53

Shifts actually drilled 3½ hrs.

From	To	Thickness of sample	Sample No.	Description
0'	2'	- - - -	- - -	Brown soil.
2'	4'	2'	51 *	Red-brown-red spots-black spots-firm-gibbsite lumps-dry.
4'	6'	2'	52 *	Red-brown-yellow spots-red spots-black spots-earthy-firm-many gibbsite lumps-slightly damp.
6'	8'	2'	53 *	Yellow-brown-very many gibbsite lumps-solid-dry.
8'	10'	2'	54 *	Yellow-brown-varicolored-spotted-earthy-soft-slightly damp.
10'	12'	2'	† 55 *	Light yellow-brown-varicolored-spotted-earthy-soft-slightly damp.

Remarks Very hard drilling 6'-8' then easy going to bottom at 12'.

* have assays
T.A's
† partial

Hole #10 P-#	Sample #	Interval	Al_2O_3 + TiO_2 (calc)	SiO_2	Fe Convert to Fe_2O_3	Fe_2O_3: TiO_2	Al_2O_3: TiO_2
16025	51	2'0" - 4'0"	25.17	4.83 *	30.48	15.90	
16026	52	4'0" - 6'0"	28.66	5.36*	24.22	17.60	
16027	53	6'0" - 8'0"	32.52	5.16 *	18.74	17.00	
15429	54	8'0" - 10'0"	28.63	5.16 *	25.38	16.96	
15430	55	10'0" - 12'0"	23.08	6.94*	20.86	22.83	
Average			27.61	5.49	23.94	18.06	

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 8 Location Top of hill (Hayfield)

NENW of sec. 33 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 865' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 10

Elev. water table

Bottomed in Weathered basalt?

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-23-53

Date hole finished 9-23-53

Shifts actually drilled 2½ hrs.

From	To	Thickness of sample	Sample No.	Description
0'	2'	- - - -	- - -	Soil with gibbsite lumps.
2	4	2'	44 *	Red-brown-yellow spots-earthy-hard dry.
4	6	2	45 *	Yellow-brown-yellow spots-red spots-black spots-earthy-very firm-dry.
6	8	2	46 *	Yellow-brown-white spots-yellow spots-red spots-black spots-earthy-firm-dry.
8	10	2	† 47 *	Brown-black- white spots-yellow spots-red spots-black spots-blue spots-orange spots-pink spots-clayey-soft-damp.

Remarks Very hard drilling down to 7 feet - increasingly softer to bottom at 10'.

* have assays

T. A.'s † partial

WL-24b

Hole No. 8

Hole #8 P-#	Sample #	Interval	Al_2O_3 +	TiO_2 (calc)	SiO_2	Fe Convert to Fe_2O_3	Fe_2O_3: TiO_2	Al_2O_3: TiO_2
16023	44	2'0"–4'0"	34.15	5.87 * calc.	12.58	19.26		
16024	45	4'0"–6'0"	30.22	7.40 *	8.82	24.30		
15427	46	6'0"–8'0"	28.65	7.45 *	10.48	25.05	↓ 31.01	
15428	47	8'0"–10'0"	29.31	5.74 *	20.80	18.85		
Average			30.58	6.61	13.17	21.86		

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 7 Location (Continued)

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 20

Elev. water table - - -

Bottomed in Pink clay

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler "

Date hole began

Date hole finished 11/4/53

Shifts actually drilled 2½ hrs.

From	To	Thickness of sample	Sample No.	Description
		(continued)		
5'-6"	6'-0"	6"	56? *	Red-brown-very hard-dry-gibbsite lumps.
6'-0"	8'-0"	2'	57 *	Dark red-brown-firm-dry-gibbsite lumps?.
8'-0"	10'-0"	2'	+ 58 *	Red-Brown-slightly firm-slightly dry-gibbsite or basalt lumps.
10'-0"	12'-0"	2'	59 *	Slightly red-brown-slightly firm-damp-varicolored-clayey.
12'-0"	14'-0"	2'	60 *	Dark red-brown-slightly firm-damp very varicolored-clayey-banded.
14'-0"	16'-0"	2'	61 *	Dark red-brown-soft-damp-varic banded-clayey.
16'-0"	18'-0"	2'	+ 62 *	Red-brown-soft-damp-plastic-vari-colored-banded.
18'-0"	20'-0"	2'	+ 63 *	Light red-varicolored-banded-soft damp-clayey-plastic.
5'-6"-20'				

Remarks Occasional hard layers encountered about 1 foot apart from 8'-0" to 18'-0".

Light pink zone 18'-2" - 19'-8".

Hole abandoned at 20' due to difficulty in handling string of pipe.

WL-24b

Hole No. 7 cont.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE

Project

Hole No. 7 Location 50' north of chicken house on MacDougal(?) ranch.

NE SW of sec. 19 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 960' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 20

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-22-53

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - - -	- - -	Soil and gibbsite lumps.
2	4	2'	42 *	Red-brown gibbsite lumps-hard-dry.
4	5'-6"	1'-6"	+ 43 *	Red-brown-yellow spots-earthy-very hard-gibbsite lumps.
				SEE NEXT PAGE

Remarks Very hard drilling 2' to 5'-6". Hole abandoned at 5'-6" due to extreme hardness of ground.

WL-24b

* have assays
✓ being processed

T.A.'s
+ partial
+ complete

Hole No. 7

Hole # 7 P-#	Sample #	Interval	Al_2O_3	TiO_2 4.4	SiO_2	Fe Convert to Fe_2O_3	$\frac{Fe_2O_3}{TiO_2}$	$\frac{Al_2O_3}{TiO_2}$
15425	42	2'0"-4'0"	39.40	5.26 calc.*	5.78	17.30		
15426	43	4'0"-5'6"	41.01	4.85*	4.82	15.93		
16022	56	5'6"-6'0"						
15682	57	6'0"-8'0"	36.75	6.64*	6.84	21.83		
15796	58	8'0"-10'0"	30.64	9.32	4.40	26.38	4.05	
15683	59	10'0"-12'0"	31.76	7.32*	** 10.26	24.05	* 35.24	** 6.4
15797	60	12'0"-14'0"	30.16	6.92*	13.54	22.72		
15684	61	14'0"-16'0"	31.43	6.44*	13.56	21.17		
15798	62	16'0"-18'0"	31.55	7.34	5.80 8.13	25.16 ✓	4.91	4.30
15685	63	18'0"-20'0"	32.34	5.78*	17.04	19.04		
Average			33.89	(7.00)	9.11	21.50 ✓	4.40	4.76

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE

Project

Hole No. 6 Location Hudkins Hill 5' west of fence between prune orchard and wheat field.

Center of sec. 18 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 860' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 14

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-22-53

Date hole finished 9-22-53

Shifts actually drilled 2½ hrs.

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - - -	- - -	Soil.
2	4	2'	36 *	Yellow-brown-white spots-yellow-spots-red spots-black spots-earthy soft-dry.
4	6	2	37 *	Light yellow-brown-many white spot yellow spots-few red spots-vari-colored-earthy-slightly firm-dry.
6	8	2	38 *	Grey-yellow-brown-many white spots yellow spots-red spots-varicolored earthy-very firm-dry.
8	10	2	39 *	Yellow-brown-lumps-earthy-very fi slightly damp.
10	12	2	40 *	Grey-brown(10'-11') yellow-brown-white spots-yellow spots-red spots earthy-slightly soft-damp-lumps.
12	14	2	41 *	Dark yellow-brown-white spots-yellow spots-red spots-black spots earthy-firm-lumps-damp.
		Non gibb.		

Remarks

* have assays
✓ being processed

T. A.'s
+ partial
+ complete

WL-24b

Hole No. 6

Hole #6 P-#	Sample #	Interval	Al_2O_3	TiO_2 (calc)	SiO_2	Fe Convert to Fe_2O_3	Fe_2O_3 / TiO_2	Al_2O_3 : TiO_2
16017	36	2'0"-4'0"	33.83	5.38	18.16	17.65		
16018	37	4'0"-6'0"	30.78	5.32	22.10	17.47		
16019	38	6'0"-8'0"	37.10	4.02	22.66	13.22		
15424	39	8'0"-10'0"	28.00	4.96	27.24	16.30		
16020	40	10'0"-12'0"	27.82	4.60	30.92	15.12		
16021	41	12'0"-14'0"	28.87	4.36	31.40	14.26		
Average			31.07	4.77	25.41	15.67		

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 5 Location Top of plank hill 10' north of fence

NE NW of sec. 18 T. 8 S R. 3W County Marion

Coord. N. E.

Elev. collar 875'(map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole ~~13'-0"~~ 11'-8"

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-21-53

Date hole finished 9-21-53

Shifts actually drilled 3 hrs.

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - - -	- - -	Soil with gibbsite lumps.
2'	4'	2'	31 *	Yellow-brown-earthy-gibbsite lumps dry.
4'	6'	2'	32 *	Yellow-brown-white spots-yellow spots-earthy-very firm-dry.
6'	8'	2'	33 *	Yellow-brown-white spots-yellow spots-red spots-black spots-earthy firm-dry.
8'	10'	2'	34 *	Yellow-brown-white spots-red spots earthy-firm-slightly damp.
10'	11'-8"	1'-8"	35 *	Red-brown-white spots-yellow sp basalt lumps?-firm-slightly damp.

Remarks Hole drilled rather hard nearly all the way. Appearance of dark gray (basalt?) chips at 11'-0" seems to indicate base of section.

* have assays T. A.'s + partial

WL-24b

Hole No. 5

Hole # 5 P-#	Sample #	Interval	Al_2O_3 + TiO_2 (calc)		SiO_2	Fe (Convert to Fe_2O_3)	Fe_2O_3: TiO_2	Al_2O_3: TiO_2
16012	31	2'0" - 4'0"	38.19	6.24	6.00	20.51		
16013	32	4'0" - 6'0"	36.51	6.24	6.24	20.51		
16014	33	6'0" - 8'0"	33.17	6.66	11.02	21.93		
16015	34	8'0" - 10'0"	35.10 (31.74)	5.72 (6.24)	14.22 (9.37)	18.84		
15423	35	10'0" - 11'8"	31.08	5.46	20.08	18.07		
Average			34.81	6.07	11.51	19.97		

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 4 Location Hill 828, 30' west of N-S fence 150± north of brush lot.

SW¼ of sec. 36 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 828' (map)
Depth to top of bed
Elev. of top of bed
Thickness of bed
Elev. bottom bed
Depth of hole 20
Elev. water table
Bottomed in

****

Drill used 3" Iwan
Number men 2
Engr. in charge Mason
Mtrl. classfd. by Corcoran
Sampler Corcoran
Date hole began 9-18-53
Date hole finished 9-18-53
Shifts actually drilled 5 hrs.

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - -	- - -	Soil with gibbsite boulders.
2	4	2'	22 *	Red-brown-gibbsite lumps-dry-firm.
4	6	2	23 *	Light red-brown-earthy-firm-dry.
6	8	2	24 *	Light red-brown-white spots-earthy slightly firm-dry.
8	10	2	+ 25 *	Yellow-brown-few gibbsite-lumps-slightly damp-slightly firm.
10	12	2	26 *	Yellow-brown-white spots-red spots black spots-earthy-slightly firm-slightly damp.
12	14	2	27 *	Yellow-brown-white spots-yellow sp red spots-black spots-clayey-few gibbsite-lumps-slightly damp.
14	16	2	28 *	Yellow-brown-red spots-black spots white spots-earthy-few gibbsite-lumps-damp.
16	18	2	29 *	Dark yellow-brown-white spots-blac spots-earthy-firm-slightly damp.
18	20	2	+ 30 *	Red-brown-white spots-yellow spots black spots-clayey-soft-very damp.

Remarks

* have assays
√ being processed

T.A.'s
+ partial
+ complete

WL-24b

Hole No. 4

Hole #4 P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe Convert to Fe_2O_3	Fe_2O_3: TiO_2	Al_2O_3: TiO_2
16006	22	2'0"-4'0"	26.78	4.55	30.72	14.96	4.60	5.89
16007	23	4'0"-6'0"	30.14	4.66	25.20	17.85 ✓	5.49	6.45
16008	24	6'0"-8'0"	32.17	5.55	16.80	19.18 ✓	4.96	5.80
15421	25	8'0"-10'0"	36.31	4.44 AV	10.14	18.29		
16009	26	10'0"-12'0"	34.76	7.34	14.62	20.84 ✓	4.05	4.75
16010	27	12'0"-14'0"	30.44	7.45 *	10.94	24.50		
15422	28	14'0"-16'0"	35.11	4.44 AV	11.86	19.75		
16011	29	16'0"-18'0"	32.84	6.45 *	14.90	21.17		
15359	30	18'0"-20'0"	30.15	4.44 AV	19.08	19.62		
Average			32.08	5.48	17.14	19.57		

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 3 Location Top of Prospect Hill - 300' west of tower.

NE NE of sec. 25 T. 8 S R. 4 W County Marion

Coord. N. E.

Elev. collar 1125'(map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 10

Elev. water table

Bottomed in Weathered basalt

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-15-53

Date hole finished 9-16-53

Shifts actually drilled 2 hrs.

From	To	Thickness of sample	Sample No.	Description
0'	2'	- - -	- - -	Soil.
2	3	1	9 *	Brown-gritty-dry-small gibbsite nodules.
3	5	2	15 *	Red-brown-lumps-earthy-dry-gibbsite nodules.
5	7'-6"	2'-6"	+? 16 *	Brown-red spots-black spots-brown spots-blue spots-mottled-earthy-clayey-damp. Easy drilling.
7'-6"	10	2'-6"	+ 17 *	Brown-red spots-black spots- brown spots-blue spots-mottled-earthy-clayey-damp. Easy drilling.

Remarks

* have assays
✓ being processed
T. A.'s
+ partial

WL-24b

Hole No. 3

Hole #3 P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe convert to Fe_2O_3	Fe_2O_3 / TiO_2	Al_2O_3 : TiO_2
16004	9	2'0"-3'0"	33.29	(3.80)	22.26	16.96		
16005	15	3'0"-5'0"	33.71	"	18.84	20.51		
15358	16	5'0"-7'6"	33.72	"	20.90	16.24		
15420	17	7'6"-10'0"	31.78	"	23.24	17.30		
Average			33.10	(3.80)	21.31	17.75	6.68	8.70

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 2 Location (Cont.)

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled 3 hrs.

From	To	Thickness of sample	Sample No.	Description
21'6"	24'0"	2'6"	85	
24'0"	26'0"	2'0"	86	
26'0"	28'0"	2'0"	87	
28'0"	30'0"	2'0"	88	
30'0"	32'0"	2'0"	89	
32'0"	34'0"	2'0"	90	Olive drab,clayey,hard ribs.
34'0"	36'0"	2'0"	91	Same as above.
36'0"	38'0"	2'0"	92	Dark yellow,clayey,plastic,firm.
38'0"	40'0"	2'0"	93	Same as above.

Remarks Hole nearly filled with water, making sample recovery difficult.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 2 Location Top of knoll west of Tex Perry house 500' north of county road.

SW NW of sec. 29 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 860' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 40

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-15-53

Date hole finished 9-18-53

Shifts actually drilled 6½ hrs.

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - -	- - -	Soil.
2	4	2'	7 *	Brown-red spots-~~black spots~~ earthy-gritty dry.
4	4'-6"	0'-6"	+ 8 *	Ditto - very hard drilling.
4'-6"	6'-6"	2	10 *	Red-brown-earthy-gritty-damp. Very slightly Hard drilling.
6'-6"	8'-6"	2	11 *	Red-brown-earthy-clayey-gritty-dam hard drilling.
8'-6"	10'-6"	2	12 *	Red-brown-white spots-yellow-spots red spots-black spots-banded-clays gritty-damp. Easy drilling.
10'-6"	12'-6"	2	+ 13 *	Brown-black spots-brown spots-mot-tled-clayey-gritty-damp. Hard drlg
12'-6"	14'-6"	2	+ 14 *	Brown-red spots-black spots-brown spots-mottled-clayey-plastic-very damp.
14'-6"	16'-6"	2	+ 18 *	Brown-varicolored-red spots-black spots-brown spots-orange spots-clayey-damp.
16'-6"	18'-6"	2	19 *	Brown-varicolored-red spots- black spots-brown spots-orange spots-white spots-clayey-plastic-slightl damp.
18'-6"	20'-6"	2	+ 20 *	Grey-brown-few red spots-few black spots-fewbrown spots-few orange spots-silty-slightly plastic-slightly damp.
20'-6"	21'-0"	0'-6"	+ 21 *	Grey-brown-~~many~~ few red,black,brow orange spots-few varicolored lumps firm-slightly damp.

Remarks

Hole had to have coal auger and chopping bit from 0-8-6" and from 10'-6" - 13'-6". Easy drilling 13'-6" - 19'-6". Increasingly hard 19'-6" - 20'-6".

*have assays T. A.'s + partial

Hole #2 P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe convert to Fe_2O_3	Fe_2O_3 / TiO_2	Al_2O_3 : TiO_2
15347	7	2'0"-4'0"	38.04	(3.17)	6.06	21.67		
15348	8	4'0"-4'6"	37.68	7.2	8.12	20.11	4.00	5.24
15349	10	4'6"-6'6"	42.91	"	2.26	18.09		
15350	11	6'6"-8'6"	38.19	"	5.28	21.44		
15351	12	8'6"-10'6"	35.80	"	12.44	20.33		
15352	13	10'6"-12'6"	37.01	"	9.38	21.11		
15353	14	12'6"-14'6"	42.16	"	4.90	20.78		
15354	18	14'6"-16'6"	33.21	"	13.46	21.30		
15355	19	16'6"-18'6"	31.10	"	18.10	17.67		
15356	20	18'6"-20'6"	38.40	"	18.34	13.41		
15357	21	20'6"-21'0"	36.87	3.7	23.68	11.97	4.64	10.00
Average			36.59	(3.17)	11.10	18.89	"	11.50

38.83 6.47

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 1 Location Rosedale Friends Church

NE-SE of sec. 28 T. 8 S. R. 3 W. County Marion

Coord. N. E.

Elev. collar 750 map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Corcoran

Mtrl. classfd. by Corcoran

Sampler Ewen

Date hole began 7/28/54

Date hole finished 7/29/54

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
12' 0"	14' 0"	2' 0"	107	Yellow,brown,white spots,black spots,earthy,clayey,very damp.
14' 0"	16' 0"	2' 0"	108	Yellow,brown,white spots,red spots earthy,clayey,very damp,black spot
16' 0"	18' 0"	2' 0"	109	Yellow,brown,varicolored,red spots black spots,pink spots,earthy, clayey,soft,very damp.
18' 0"	20' 0"	2' 0"	110	Yellow,brown,varicolored,red spots black spots, pink spots,earthy, clayey,soft,very damp.

Remarks Note: Hole approximately 5' below top of knoll. Notch cut into east side of hill approximately 20' below surface of hole and 150' east of it. Notch about 3' deep on one side. Dug out material shows gibbsite chunks up to 1' plus bauxitic soil. No fresh or weathered basalt noted.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE *
Project

Hole No. 1 Location 40' south of Rosedale Friends Church

NE SE of sec. 28. T. 8 S. R. 3W. County Marion

Coord. N. E.

Elev. collar 750 (map)

Depth to top of bed 2' ?

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole ~~12~~ 20

Elev. water table -

Bottomed in weathered basalt

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-15-53

Date hole finished 9-15-53

Shifts actually drilled 1/2

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - -	- - -	Soil.
2	4	2'	1 *	Red-brown-dry-earthy-few lumps.
4	6	2	2 *	Red-brown-slightly damp-earthy few lumps.
6	8	2	3 *	Red-brown-black spots-white spots-gritty-damp-slightly plastic
8	10	2	+ 4 *	Red-brown-white spots-yellow spots red spots-black spots-banded-clay plastic-damp.
10	12	2	+ 6 *	Red-brown-white spots-yellow sp red spots-black spots-orange spot mottled-silty-clayey-plastic-damp.

Remarks Collar at edge of field about 40' from southwest corner of church. From 2-8' hole required coal auger to loosen soil.

* have assays X pending

WL-24b Have T.A.'s
+ partial
+ complete

Hole No. 1

Hole #1 P-#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe convert to Fe_2O_3	Fe_2O_3: TiO_2	Al_2O_3: TiO_2
15342	1	2'0"-4'0"	36.06	(5.34)	11.12	18.66		
15343	2	4'0"-6'0"	36.63	"	3.04	22.78		
15344	3	6'0"-8'0"	36.16	"	6.16	21.22		
15345	4	8'0"-10'0"	37.54	"	6.34	19.33		
15346	6	10'0"-12'0"	33.44	"	15.28	19.22		
17231	107	12'0"-14'0"	34.52	6.54	14.24	20.80 ✓	4.56	5.20
16909	108	14'0"-16'0"	34.21	6.25	9.68	22.03 ✓	5.05	5.47
17305	109	16'0"-18'0"	36.76	8.30	5.26	26.46 ✓	4.57	4.44
17087	110	18'0"-20'0"	34.28	8.04	7.66	24.11 ✓	4.27	4.27
Average			35.51	6.20	8.75	21.62		

ROCK ANALYSIS LABORATORY
Department of Geology
University of Minnesota

Analyses of rock samples submitted by R. E. Corcoran

Eileen H. Oslund, analyst

Lab. No.	R 2150 Basalt	R 2151 Clay	R2152 Bauxite
SiO_2	54.95	24.13	4.81
Al_2O_3	13.47	24.05	30.02
Fe_2O_3	2.26	26.18	33.14
FeO	10.00	2.73	2.79
MgO	3.47	.15	.23
CaO	7.13	.13	.13
Na_2O	3.00	.05	.03
K_2O	1.69	.04	.07
H_2O+	.82	12.43	17.15
H_2O-	.32	2.56	2.59
TiO_2	2.12	6.13	6.76
P_2O_5	.35	.79	1.51
MnO	.20	.31	.36
	99.78	99.68	99.59

Minneapolis, Minnesota
November 1, 1955

S. S. Goldich

Note: See anal. of Black & Gray Stayton Lavas in Barlow

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number Perrat Basalt Date Jan 18 1956

Spectrographic Laboratory Number 2150 Sample received from _____

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

Si Al

2. Elements present in concentrations 10% - 1%.

Fe Ca Na K Mg

3. Elements present in concentrations 1% - 0.1%.

Mn Ti

4. Elements present in concentrations 0.1% - .01%.

Ba Sr

5. Elements present in concentrations .01% - .001%.

Zr Cr V Ni

6. Elements present in concentrations below .001%.

Cu

Thomas C. Matthews, Spectroscopist

T C M

STATE DEPARTMENT OF GEOLOGY
AND MINERAL INDUSTRIES
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PORTLAND 1, OREGON

General Laboratory Number P-17879 Date Mar 7 1956

Spectrographic Laboratory Number H 19 2-4' Sample received from 2151

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

Al Fe

2. Elements present in concentrations 10% - 1%.

Si Ti

3. Elements present in concentrations 1% - 0.1%.

Mn

4. Elements present in concentrations 0.1% - .01%.

Mg Na K

5. Elements present in concentrations .01% - .001%.

Ca Zr Cr V

6. Elements present in concentrations below .001%.

Cu Ba Ni

Thomas C. Matthews, Spectroscopist

TCM

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-175-44 Date Mar 7 1956

Spectrographic Laboratory Number H19 9-6' Sample received from 215(

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

Al Fe

2. Elements present in concentrations 10% - 1%.

Si Ti

3. Elements present in concentrations 1% - 0.1%.

Mn

4. Elements present in concentrations 0.1% - .01%.

Mg Na K

5. Elements present in concentrations .01% - .001%.

Ca Zr Cr V

6. Elements present in concentrations below .001%.

Cu Ba Ni

Thomas C. Matthews, Spectroscopist

TCM

STATE DEPARTMENT OF GEOLOGY
AND MINERAL INDUSTRIES
1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18036 Date Mar 6 1956

Spectrographic Laboratory Number H14 16-18' Sample received from 2152

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

Si Al Fe

2. Elements present in concentrations 10% - 1%.

Ti

3. Elements present in concentrations 1% - 0.1%.

Mn

4. Elements present in concentrations 0.1% - .01%.

Mg Ca Na K

5. Elements present in concentrations .01% - .001%.

Zr V Ni Cu Ba

6. Elements present in concentrations below .001%.

Cr Sr

Thomas C. Matthews, Spectroscopist

TCM

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

General Laboratory Number P-18037 Date Mar 6, 1956

Spectrographic Laboratory Number A 14 18'20' Sample received from 2152

QUALITATIVE SPECTROGRAPHIC ANALYSIS
(Quantities estimated to nearest power of ten)

1. Elements present in concentrations over 10%.

Si Al Fe

2. Elements present in concentrations 10% - 1%.

Ti

3. Elements present in concentrations 1% - 0.1%.

Mn

4. Elements present in concentrations 0.1% - .01%.

Mg Ca Na K ~~P~~

5. Elements present in concentrations .01% - .001%.

Zr Cu Ba Ni

6. Elements present in concentrations below .001%.

Cr

Thomas C. Matthews, Spectroscopist

TCa

Baufit

July 27, 1965

Mr. Bert W. Allen
2632 N.W. 57
Seattle, Washington

Dear Mr. Allen:

Thank you for your letter inquiring about aluminum ore. This Department has been interested in the high-iron bauxites of Oregon for over 20 years. None of the several large deposits which have been discovered by this Department have ever been put into production, although we hope that sometime in the not too distant future they will be operated.

As a general guideline to assist you in determining whether your property may have any economic potential, we would like to suggest that the ore contain a minimum of 35 percent Al_2O_3 and a maximum of 10 percent SiO_2. To be of any interest to an aluminum company, the property should contain in the neighborhood of one hundred million tons of ore, with a stripping ratio of not more than 2:1.

If you can send us at your convenience a representive sample of your deposit we will be happy to analyze it for you. A sample information request blank is enclosed for this purpose. The rules and regulations governing this service appear on the back of the form.

Sincerely yours,

Ralph S. Mason
Mining Engineer

RSM:lk
Encl.

2632 - NW 57
Seattle 7 Wash.
July 8, 1965

Dear Sir,

I read recently in a trade publication that a new patented acid leach process was being used. And that your department were testing aluminum silicates found in Oregon.

I am interested in a brecciated andesite vein near the upper N. Santiam river.

If you think this type of rock might possibly be amenable to this leach process, please advise, and I will make a trip down to secure samples for test.

Yours Truly

Burt W. Allen

RECEIVED
JUL 9 1965
STATE DEPT. OF GEOLOGY
& MINERAL INDS.

July 9, 1974

Mr. E. B. Daggett, Manager
Corporation Unit
Department of Revenue
State Office Building
Salem, Oregon

Dear Mr. Daggett:

Thank you for your letter regarding the classification of laterite. As defined in A Dictionary of Mining, Mineral and Related Terms, published by the U.S. Bureau of Mines,1968, laterite is "Red residual soil developed in humid, tropical, and subtropical regions of good drainage. It is leached of silica and contains concentrations particularly of iron oxides and hydroxides and aluminum hydroxides. It may be an ore of iron, aluminum, manganese, or nickel." From this you will note that laterites are the source rocks for several different metals. When sufficiently rich in aluminum, laterites are called bauxite. Oregon has several lateritic deposits, including those in Washington and Columbia Counties (lrincipally) and Marion County which are rich in aluminum, and the Douglas County deposit now being mined for nickel.

At the present time none of the bauxitic laterites are being exploited for their aluminum content. A somewhat similar deposit, although lower in aluminum and higher in iron is mined from time to time in a small way for use as a paint pigment near Scappoose. This particular ore could also be used as a source for iron if the reserves were larger and mining costs could be brought down far enough to compete with the Peruvian ore now coming into the area.

Most of our bauxite currently comes from foreign sources. In the past this was a cheap source of supply but a wave of nationalism by the various emerging countries has resulted in meteoric price increases, demands for 51% local ownership, construction of primary and in some cases secondary plants, and export limitations. If this trend continues it is entirely possible that in the future the Oregon laterites may be mined for their aluminum content and that these resources will become metal mines. It is rather doubtful that these laterites will ever be used for anything else.

Sincerely yours,

Ralph S. Mason
Deputy State Geologist

RSM:lk

DEPARTMENT OF REVENUE

STATE OFFICE BUILDING • • SALEM, OREGON • • 97310

July 3, 1974

State of Oregon
Department of Geology and Mineral Industries
1069 State Office Building
Portland, OR 97201

I talked by telephone with Ralph S. Mason of your department, regarding a request which a taxpayer has made for a ruling as to whether the Oregon mineral, laterite, is a "metal".

The Oregon corporation excise tax law allows a deduction from gross income of a 15% depletion on "metal mines". There is no percentage depletion (only actual cost) allowed on nonmetallic minerals.

The taxpayer states that the laterite is being sold "---specifically for its metallic properties and not as an aggregate for concrete or as fill".

Could you assist us in this matter by giving your opinion as to whether or not the laterite properly can be classified as a "metal".

We will appreciate your help very much.

E. B. Daggett

E. B. Daggett, Manager
Corporation Unit

EBD:ld

RECEIVED
JUL 5 1974

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FIELD GEOLOGIST

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

702 WOODLARK BUILDING
PORTLAND 5, OREGON

16 February 1944

TO: E.K.N.

FROM: F.W.L.

SUBJECT: Washington County Iron Ore.

This ore presumably lies in flat beds and may possibly cover a considerable area. We have no information on thickness of the beds, other than that they may be comparable with limonite deposits at Scappoose. The Washington County deposits are, however, different from those at Scappoose in that the Washington County material contains a considerable proportion of small nodules or pisolites. The ore in general is high in alumina. Four samples taken range from 14 percent to 41 percent iron; from 23% to 46% alumina; from 3½% to 38% silica; and from .1% to .17% phosphorus. The material might be called bauxitic limonite.

Sometime ago Hewitt Wilson wrote to us inquiring what we knew concerning testing work on this type of ore, presumably in making high alumina slags in a shaft furnace, reportedly done in this area. Wilson also was interested in obtaining information on occurrences of the high alumina iron ore supposed to have been used in the testing work. I have been told that a company in the east is considering setting up a plant in this region to use the Pedersen process for treatment of such high alumina iron ore. Location of the plant would depend on quality and quantity of the ore deposits. The so-called Pedersen process might be used in two ways:

1. To produce alumina and ferro-silicon.
2. Alumina and pig iron.

I understand that electric furnaces are used and a considerable amount of electric energy would be consumed. We should try to verify reported interest in such deposits and possibilities of getting the plant.

In the occurrences so far seen on one trip, overburden would be relatively small and surface mining could be used. The deposits probably could produce material running better than 25 percent iron and 25 percent alumina with silica relatively low, maybe 10 or 12 percent. The nodules are magnetic.

Ret. to FWL

SALEM STATESMAN

February 6, 1961

Strip-Mining of Bauxite

The presence of aluminum bearing bauxite in quality in the Salem Hills south of the city has long been known. A Canadian company did considerable exploratory work there and then Harvey Aluminum took leases on tracts. The recent issue of The Ore.-Bin, publication of the Department of Geology and Mineral Industries reporting for 1961 states:

> "Exploration for furriginous bauxite in the Salem Hills area of Marion county and in Washington and Columbia counties was continued by a major aluminum company."

The report also referred to an article in the August issue of Engineering & Mining Journal which described strip mining of bauxite in Hawaii.

> "It was discovered that if the first foot of topsoil was removed and saved and then replaced after the ore had been mined, up to ten times as much grass could be grown. It was also found that the bare topsoil when properly prepared and fertilized made an excellent soil and produced much heavier crops than the original soil."

This report is welcome, for we have feared removal of the bauxite might leave just a waste of the hilltops that were strip-mined.

Average analyses of Bauxite in Northwestern Oregon

County	Al_2O_3	Percent Fe	SiO_2	TiO_2
Washington	34.68	23.12	9.48	4.85
Columbia	38.63	20.70	9.36	5.83
Marion	35.00	22.02	6.70	6.50

Sept. 26, 1962

Hollis,

Marshall T. Ramstad, Mgr. Mkt. Research Div., Pennsalt Chemicals Corp., Tacoma, called today. He is interested in our local bauxites. He has and idea that just possibly this area is ripe for a custom Bayer plant to treat imported ores. Our ferruginous bauxite could then be possibly tributary to the plant.

I pointed out that there were very likely some important differences between foreign and local ores with respect to flowsheets required, etc. Ramstad usnderstands this but feels that perhaps slight modifications could be incorporated. Pennsalt makes caustic soda, hence it interest in a plant that would use lots of it. Sent him a copy of Bull 464 plus a letter summarizing the bauxite picture here.

This is confidential, for the time being at least.

r.

CHAS JACOBS
12-76

WILSON-SNEAD MINING CO.

BAUXITE K-72

Chemical Composition (Dry Basis)

SiO_2	16.50%	MgO	0.25%
Al_2O_3	56.50%	Na_2O	0.02%
Fe_2O_3	0.50%	K_2O	0.30%
TiO_2	1.00%	F_2	0.10%
P_2O_5	0.21%	SO_3	0.05%
CaO	0.15%	V_2O_5	0.032%

Loss on Ignition 25.0%
Free Moisture 17.0%

Mineral Content (X-ray Diffraction)

Kaolinite ($Al_2O_3 \cdot 2SiO_2 \cdot 2H_2O$)
Gibbsite ($Al_2O_3 \cdot 3H_2O$)
Calculated Free Silica Content - none
Montmorillonite ± 1%

BAUXITE K-60

Chemical Composition (Dry Basis)

SiO_2	29.37%	MgO	0.25%
Al_2O_3	46.53%	Na_2O	0.02%
Fe_2O_3	0.623%	K_2O	0.30%
TiO_2	1.56%	F_2	0.10%
P_2O_5	0.21%	SO_3	0.05%
CaO	0.15%	V_2O_5	0.032%

Loss on Ignition - 20.67%
Free Moisture - 16.29%

Mineral Content (X-ray Diffraction)

Kaolinite ($Al_2O_3 \cdot 2SiO_2 \cdot 2H_2O$)
Gibbsite ($Al_2O_3 \cdot 3H_2O$)
Calculated Free Silica Content - none
Montmorillonite - 1%

WILSON-SNEAD MINING CO.

BAUXITE - 45% Low Fe_2O_3

Chemical Composition (Dry Basis)

SiO_2	44.51%	MgO	0.26%
Al_2O_3	38.45%	Na_2O	0.01%
Fe_2O_3	1.12%	K_2O	< 0.01%
TiO_2	1.50%	F_2	< 0.01%
P_2O_5	0.03%	SO_3	0.04%
CaO	0.10%	V_2O_5	0.015%

Loss on Ignition - 13.92%
Free Moisture - 9.80%

Mineral Content (X-ray Diffraction)

Kaolinite ($Al_2O_3 \cdot 2SiO_2 \cdot 2H_2O$)

Calculated Free Silica Content - none

BAUXITE - 45% High Fe_2O_3

Chemical Composition (Dry Basis)

SiO_2	43.50%	MgO	0.38%
Al_2O_3	36.41%	Na_2O	0.02%
Fe_2O_3	4.49%	K_2O	0.52%
TiO_2	1.41%	F_2	< 0.01%
P_2O_5	0.04%	SO_3	< 0.01%
CaO	0.08%	V_2O_5	0.038%

Loss on Ignition - 13.06%
Free Moisture - 12.43%

Mineral Content (X-ray Diffraction)

Kaolinite ($Al_2O_3 \cdot 2SiO_2 \cdot 2H_2O$)

Calculated Free Silica Content - 0.2%

March 23, 1976

TO: Mr. Luis Ferrate

FROM: Raymond E. Corcoran, State Geologist

I recently received a letter from Mr. Norman S. Wagner (formerly with our Department), who returned from a trip to Guatemala a few weeks ago. According to Mr. Wagner, you are very interested in our aluminous laterites here in the Pacific Northwest.

Although the alumina content of these deposits is significantly below that of other foreign and domestic bauxites, we believe there is a good chance that mining operations could begin within the next five or ten years. Our traditional foreign sources of supply are becoming priced higher and higher, and the lower grade domestic ores have become more economically feasible as a result. The Oregon laterites also have a high iron content and it is possible that both pig iron and alumina would be produced from our deposits.

I am enclosing a copy of a report we prepared many years ago on the Salem Hills deposits. Large deposits of high-iron bauxites occur farther to the north at Portland but the report we published on the Portland area has long since gone out of print.

Latest available figures indicate that there are close to 60 million tons of material that we would call "ore" based primarily on low silica content - i.e., less than 10 percent.

If, after reading our report, you have some questions you would like to ask about our deposits, please feel free to write me.

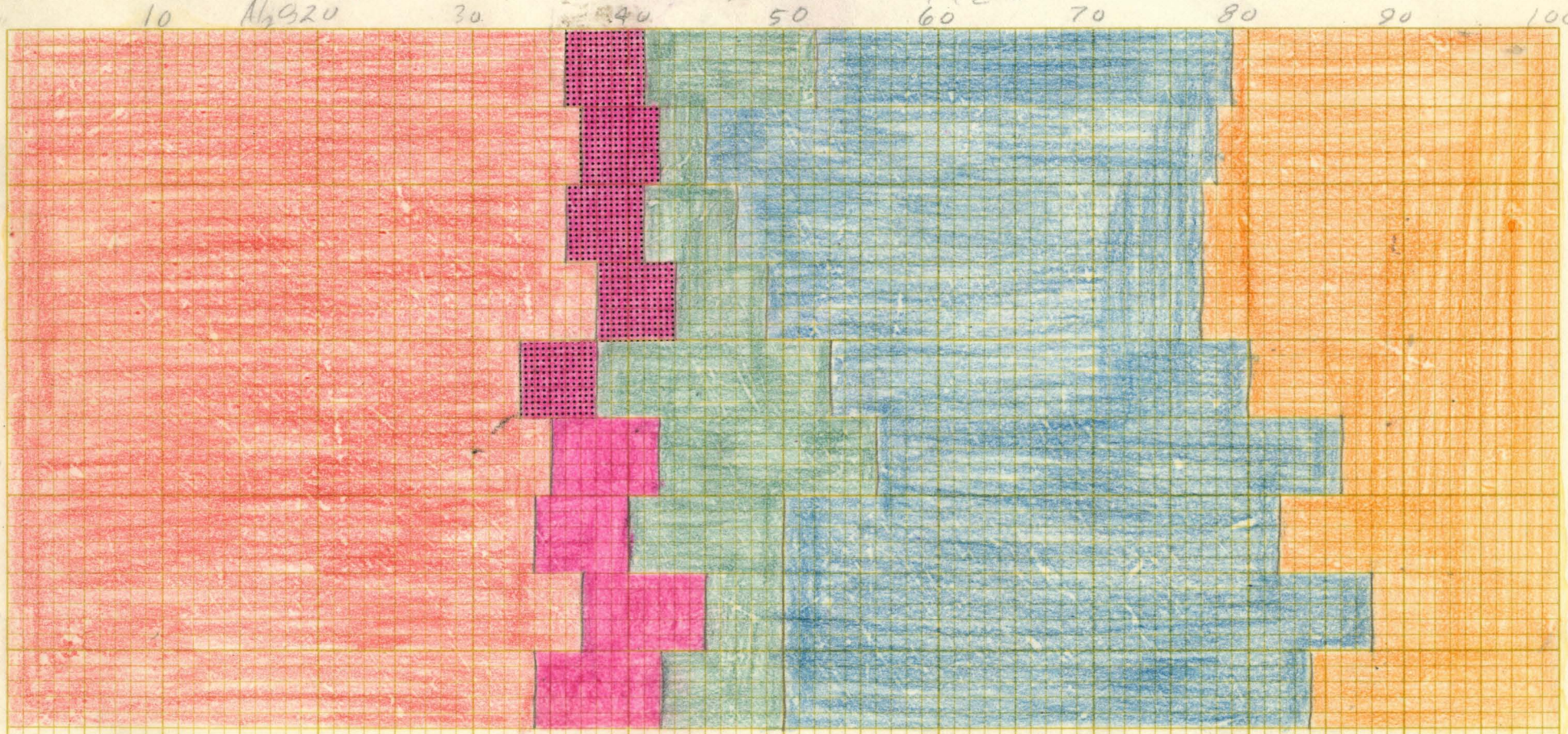
REC:jr
Encl.

Chemical analyses and carbon copies of drill logs for Holes #1 to #27 have been placed in red pressboard binder on library shelf with Washington and Columbia county bauxite drill logs.

R. S. Mason
10-1-58

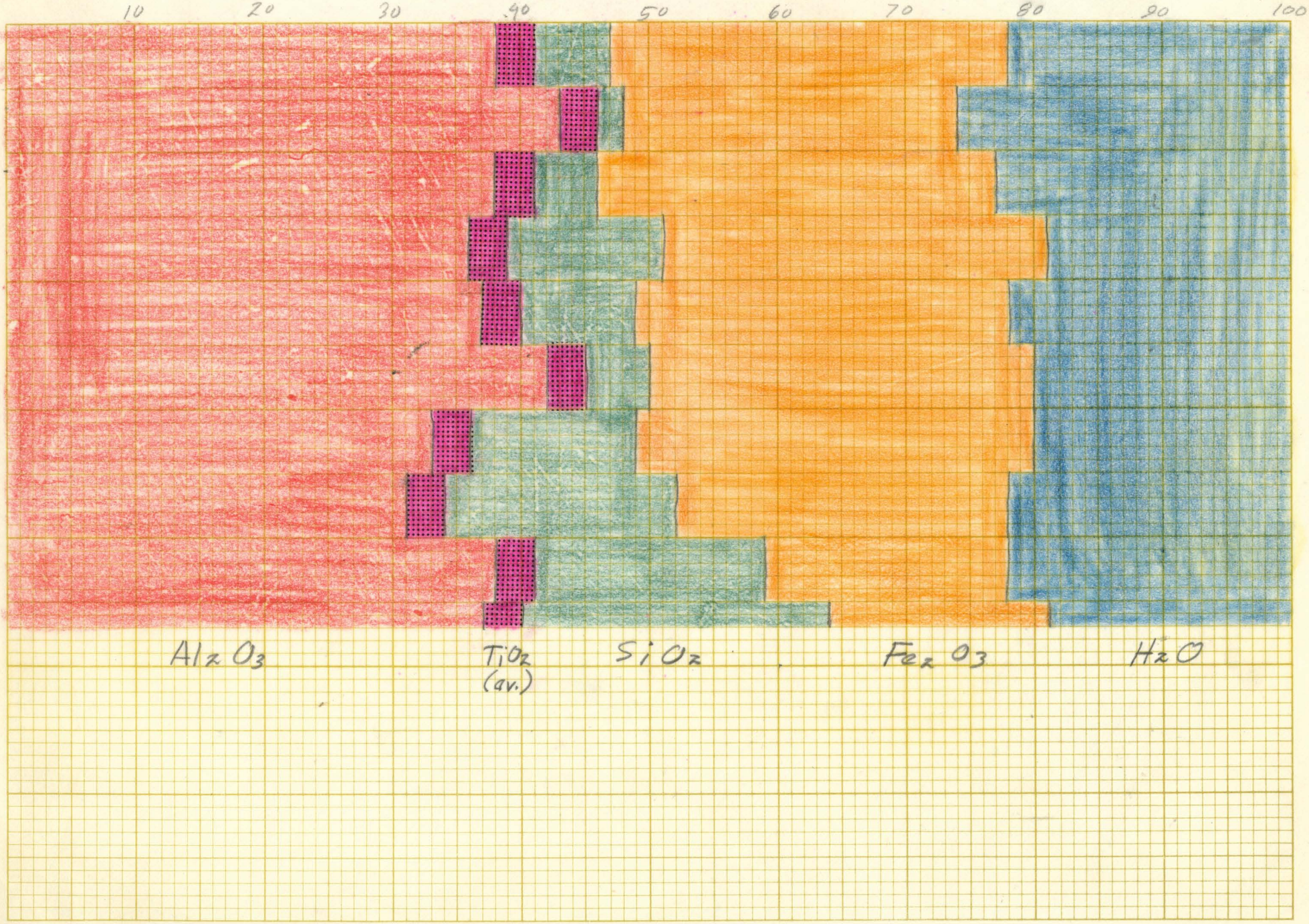
10 X 10 PER INCH
MADE IN U. S. A.

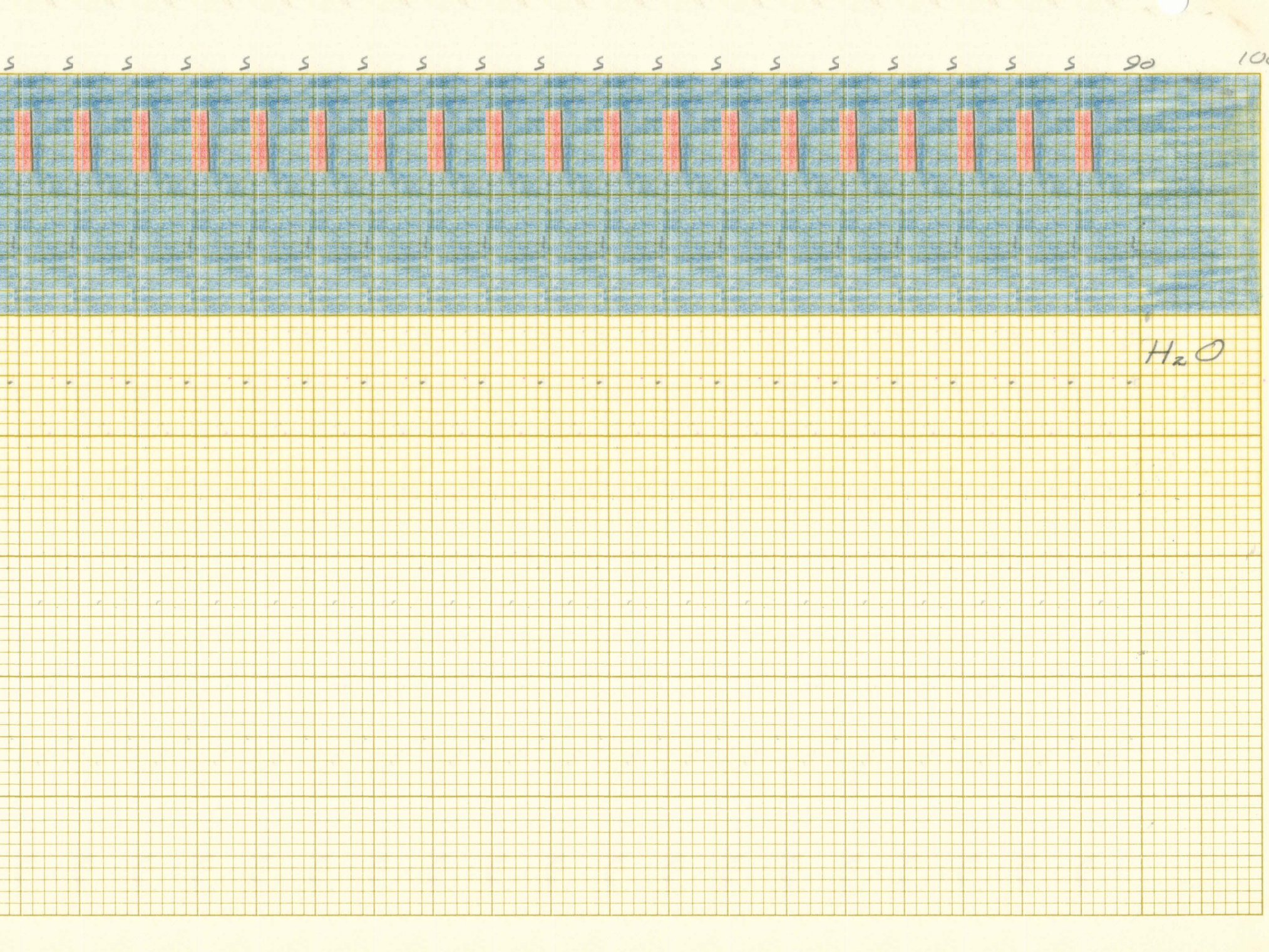
Hole #1



10 X 10 PER INCH
MADE IN U. S. A.

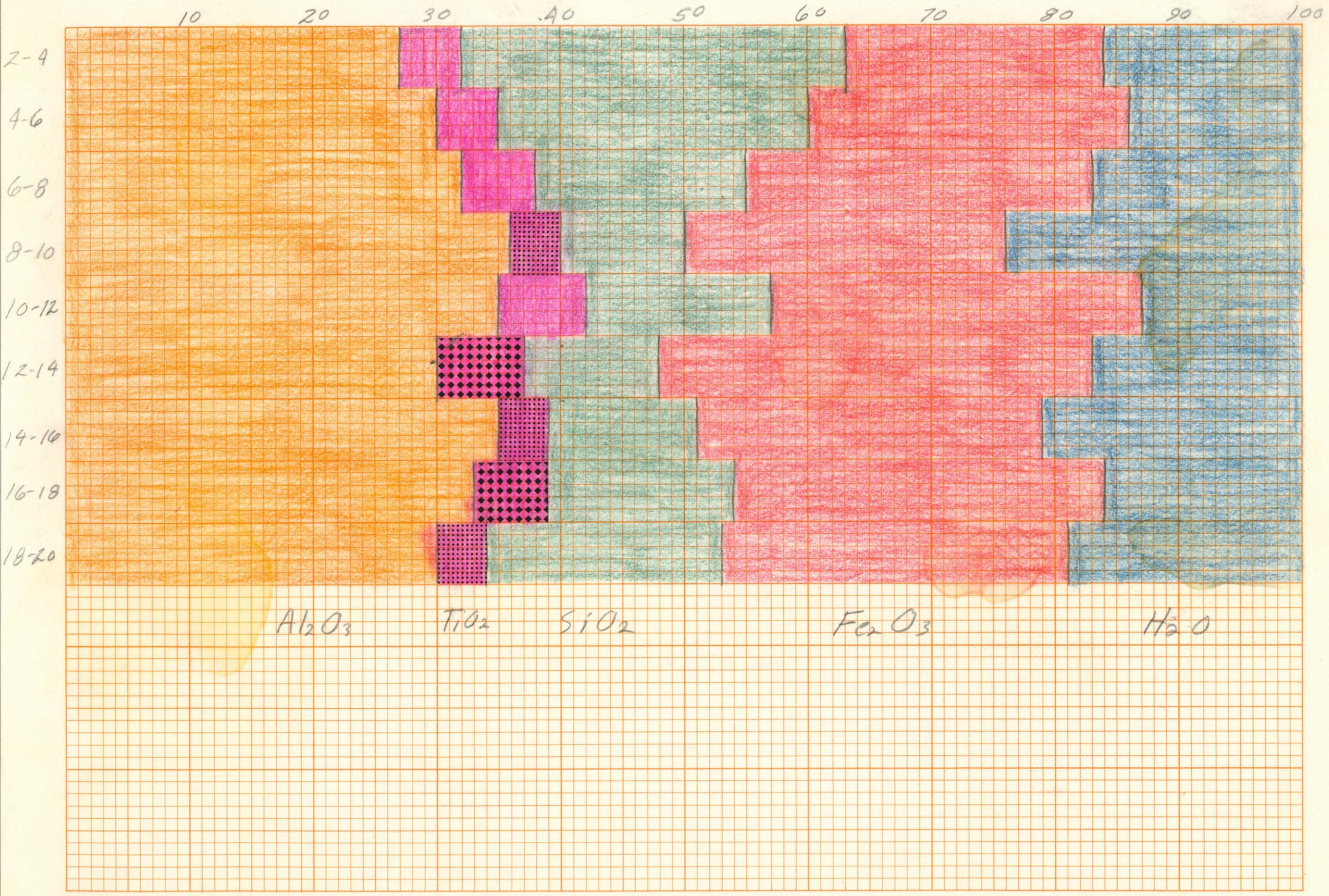
Hole #2




90
100
H_2O

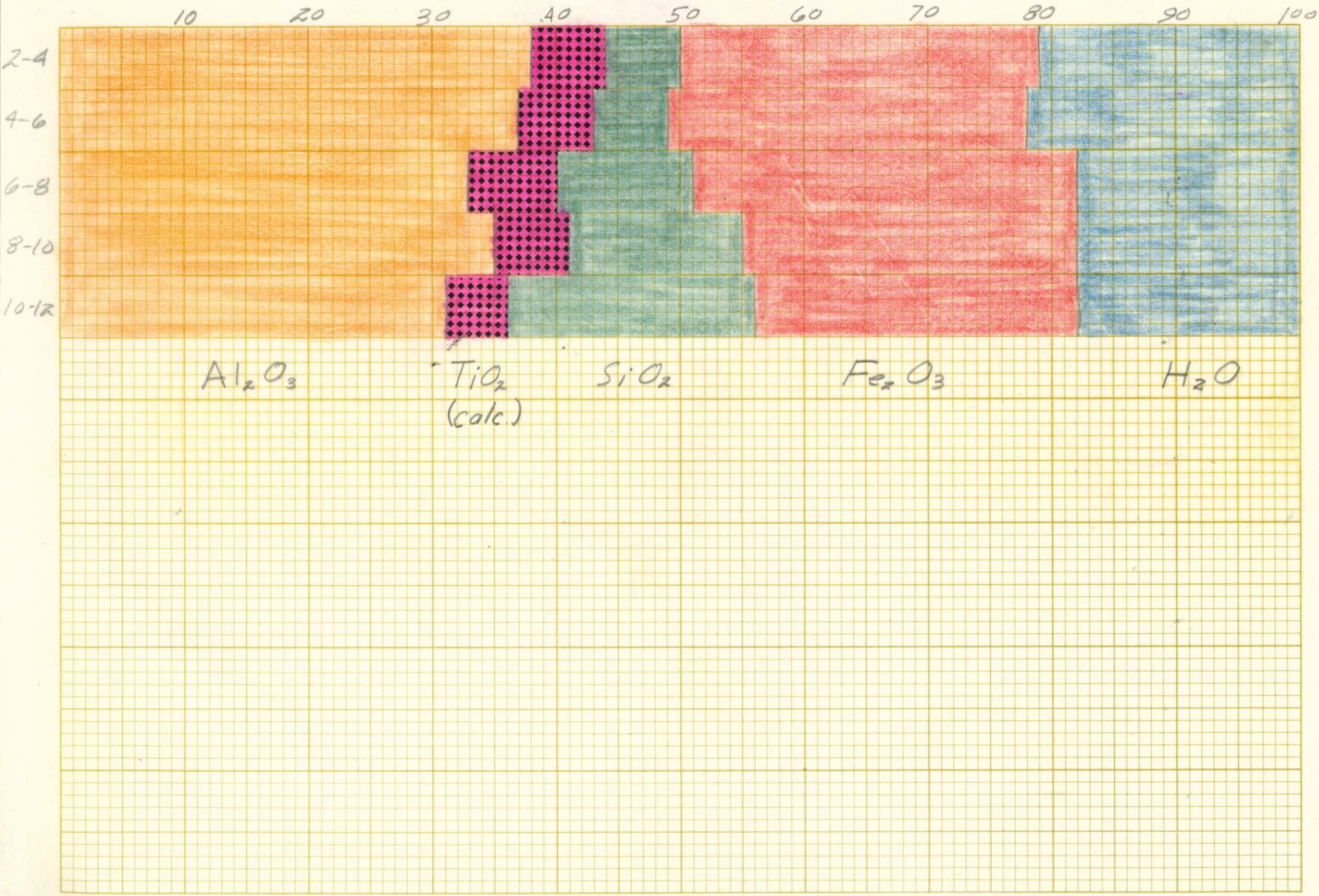
10 X 10 PER INCH

Hole #4



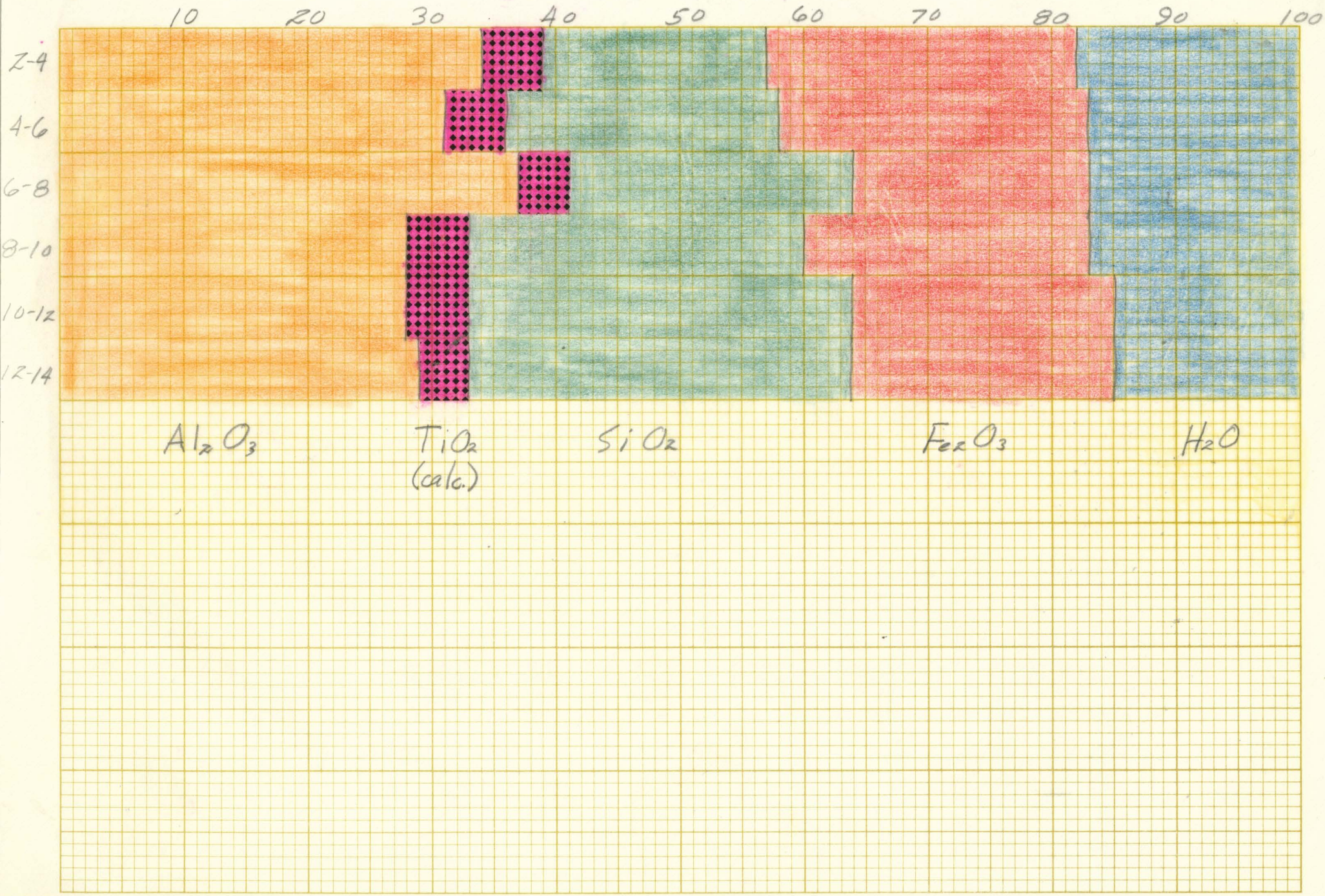
10 X 10 PER INCH
MADE IN U. S. A.

Hole #5



10 X 10 PER INCH
MADE IN U. S. A.

Hole #6



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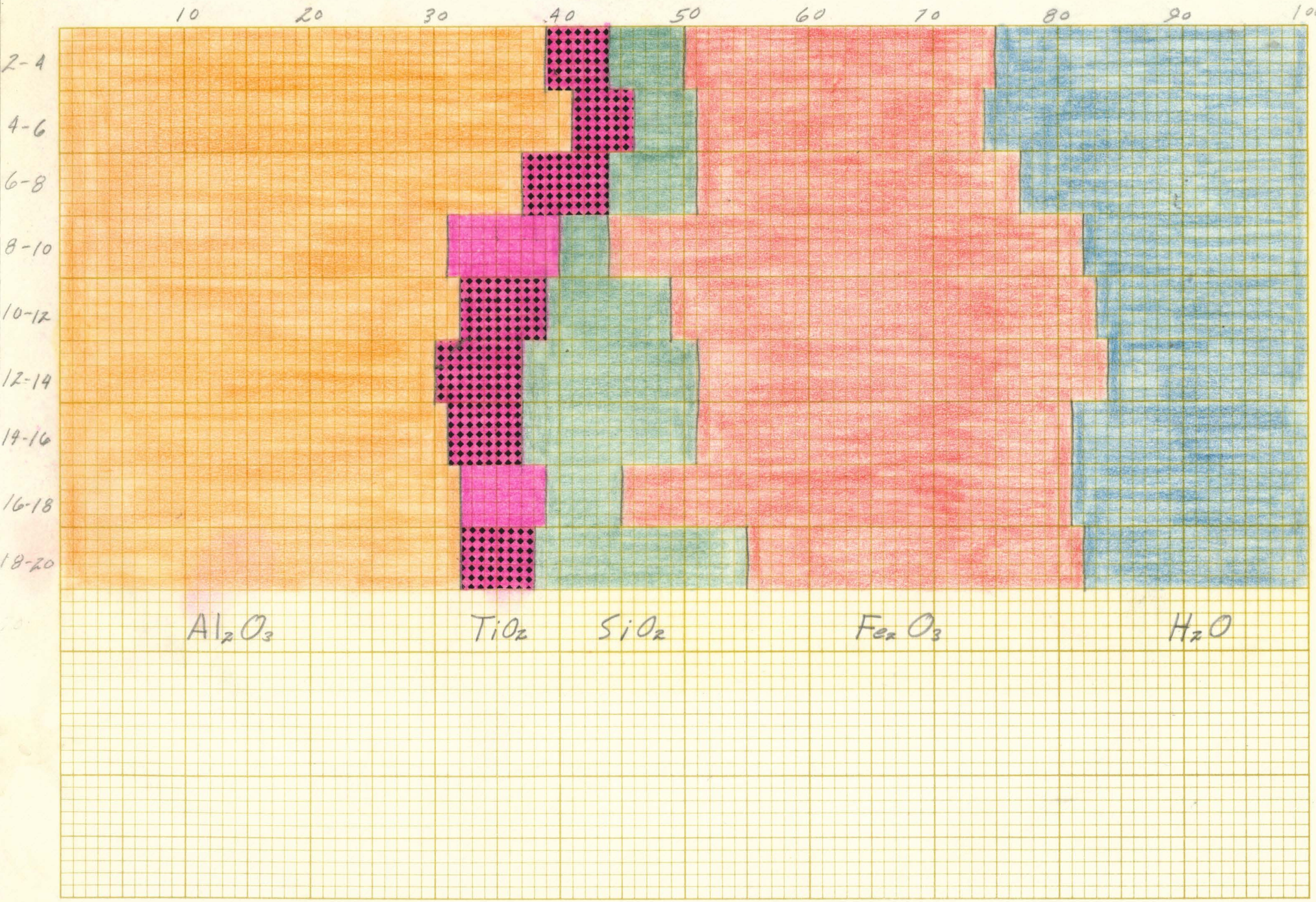
MADE IN U. S. A.

Hole #7



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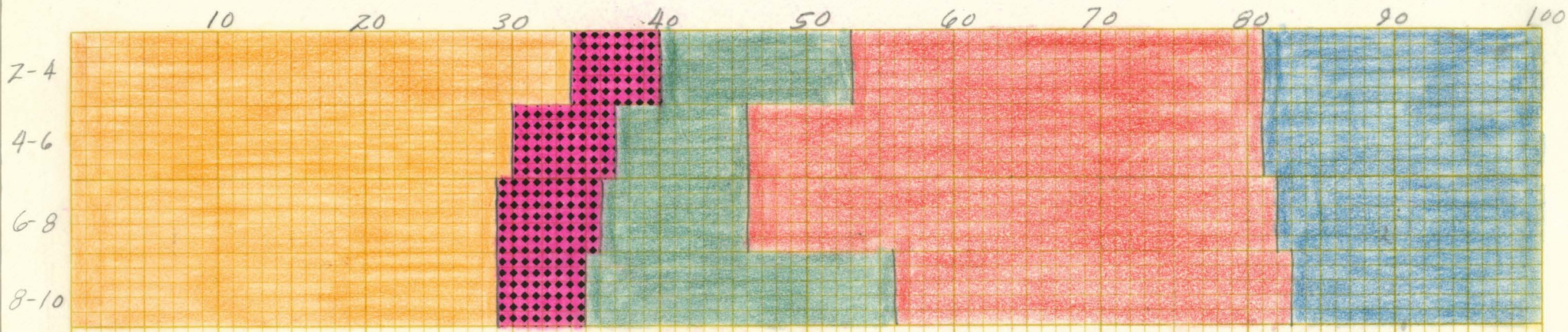
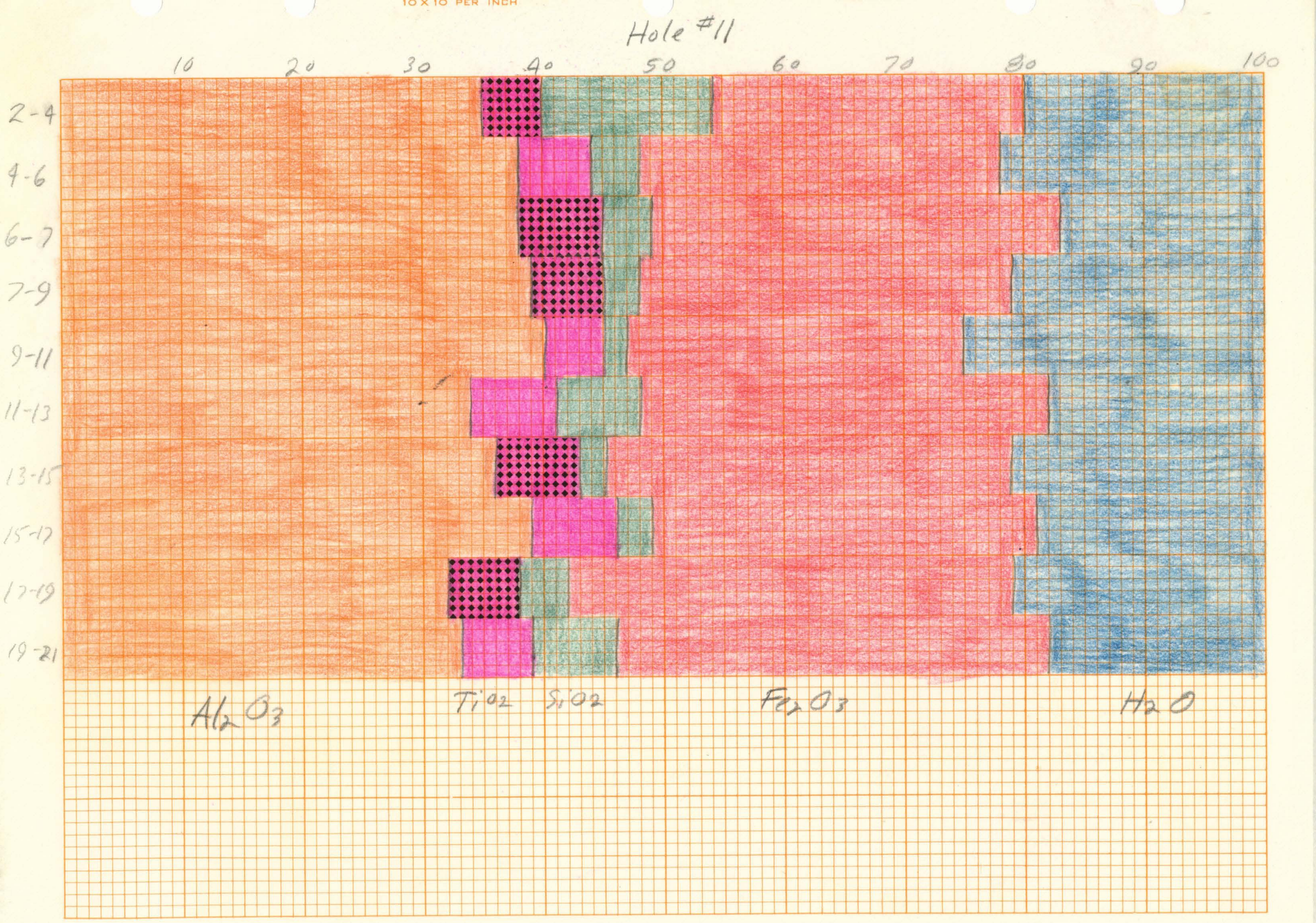
MADE IN U. S. A.

Hole #8

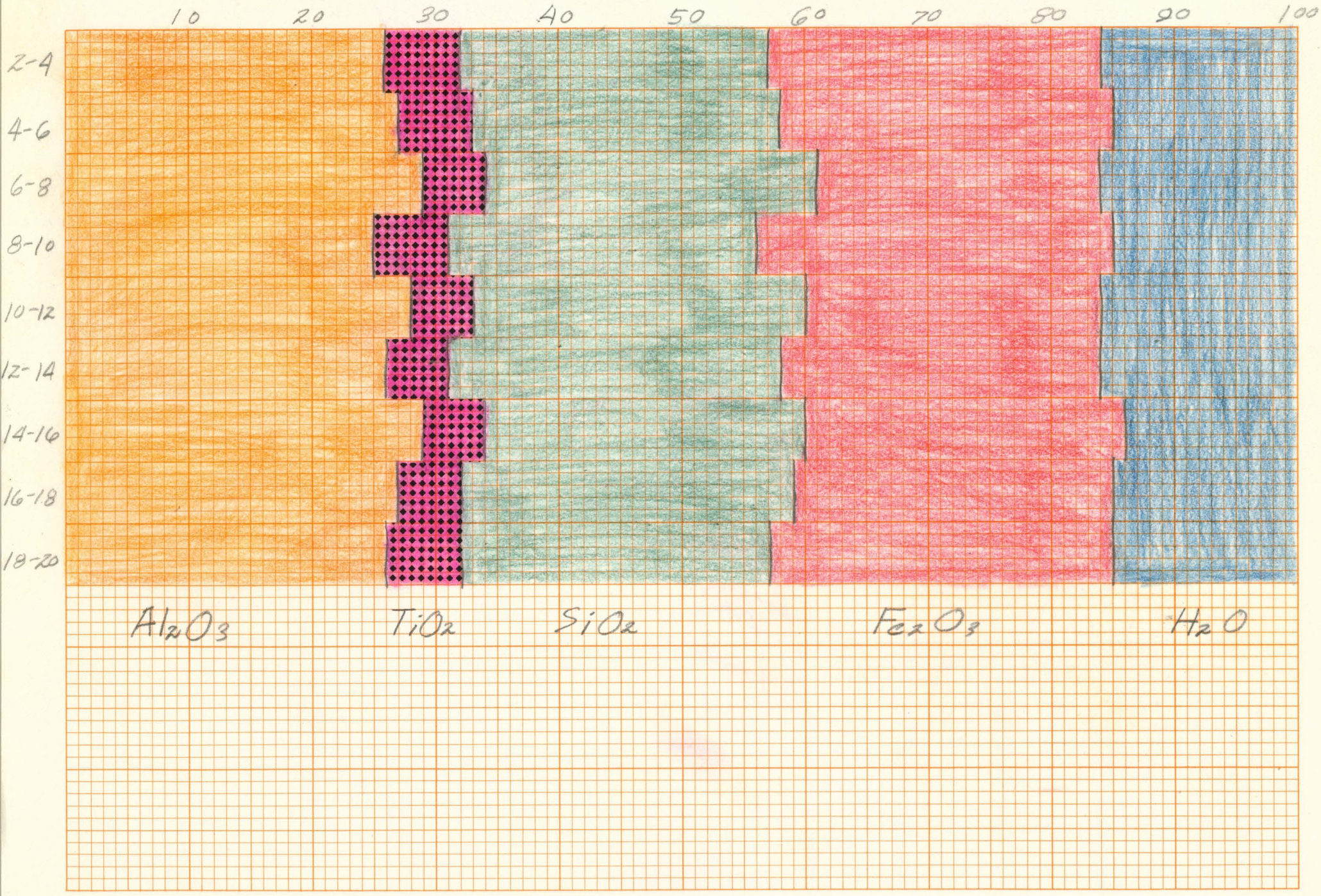


10 X 10 PER INCH



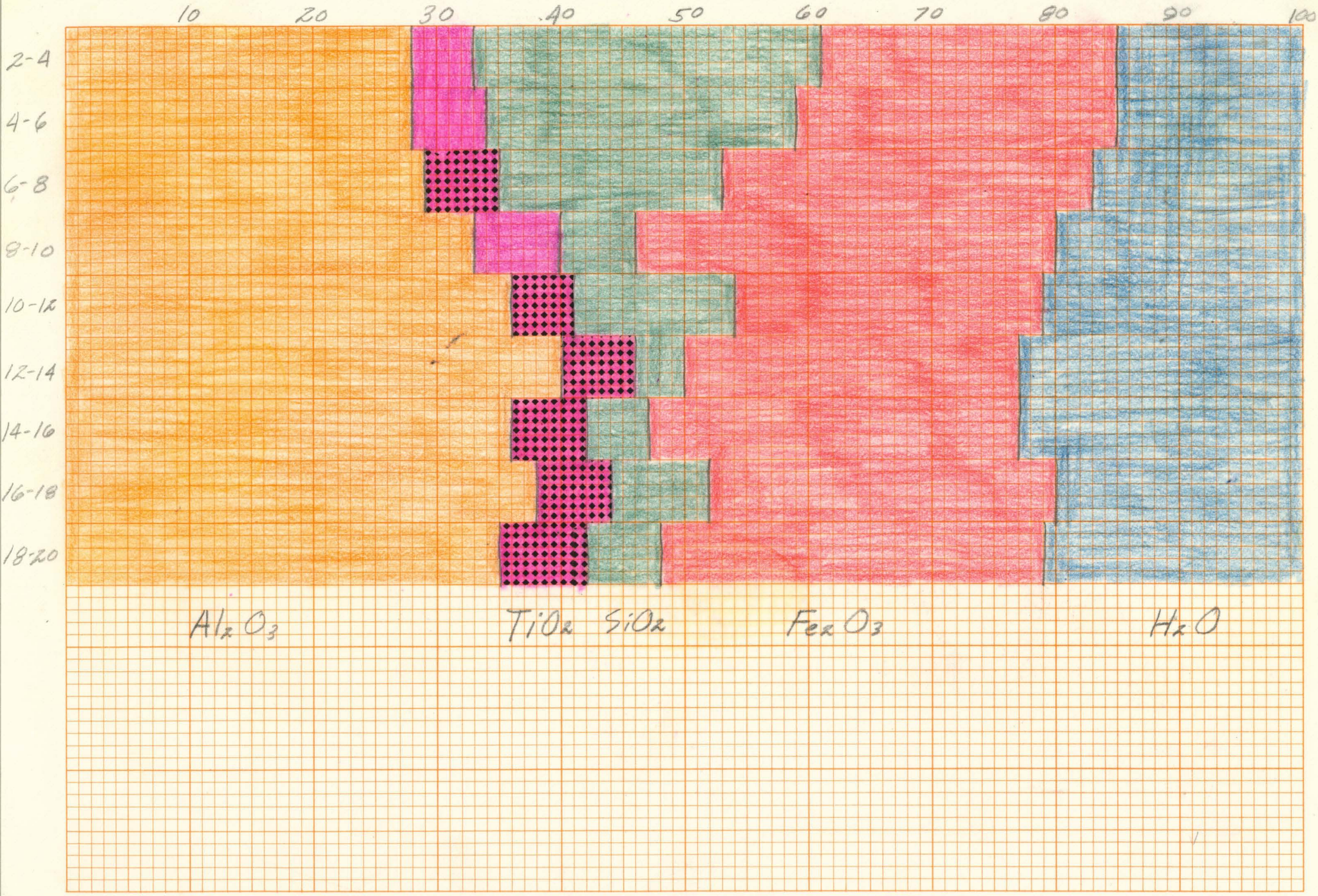
10 X 10 PER INCH

Hole #12



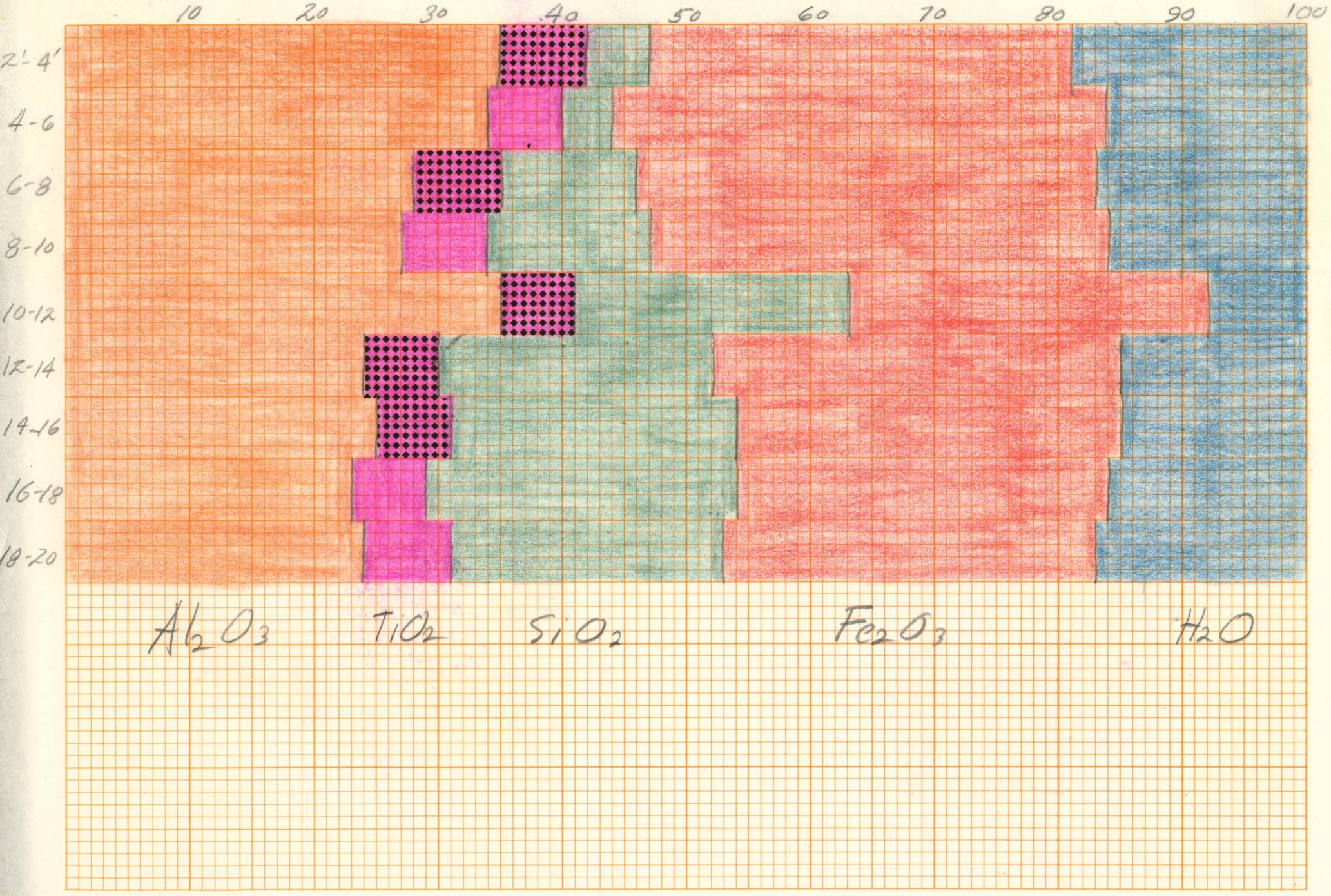
10 X 10 PER INCH

Hole #13



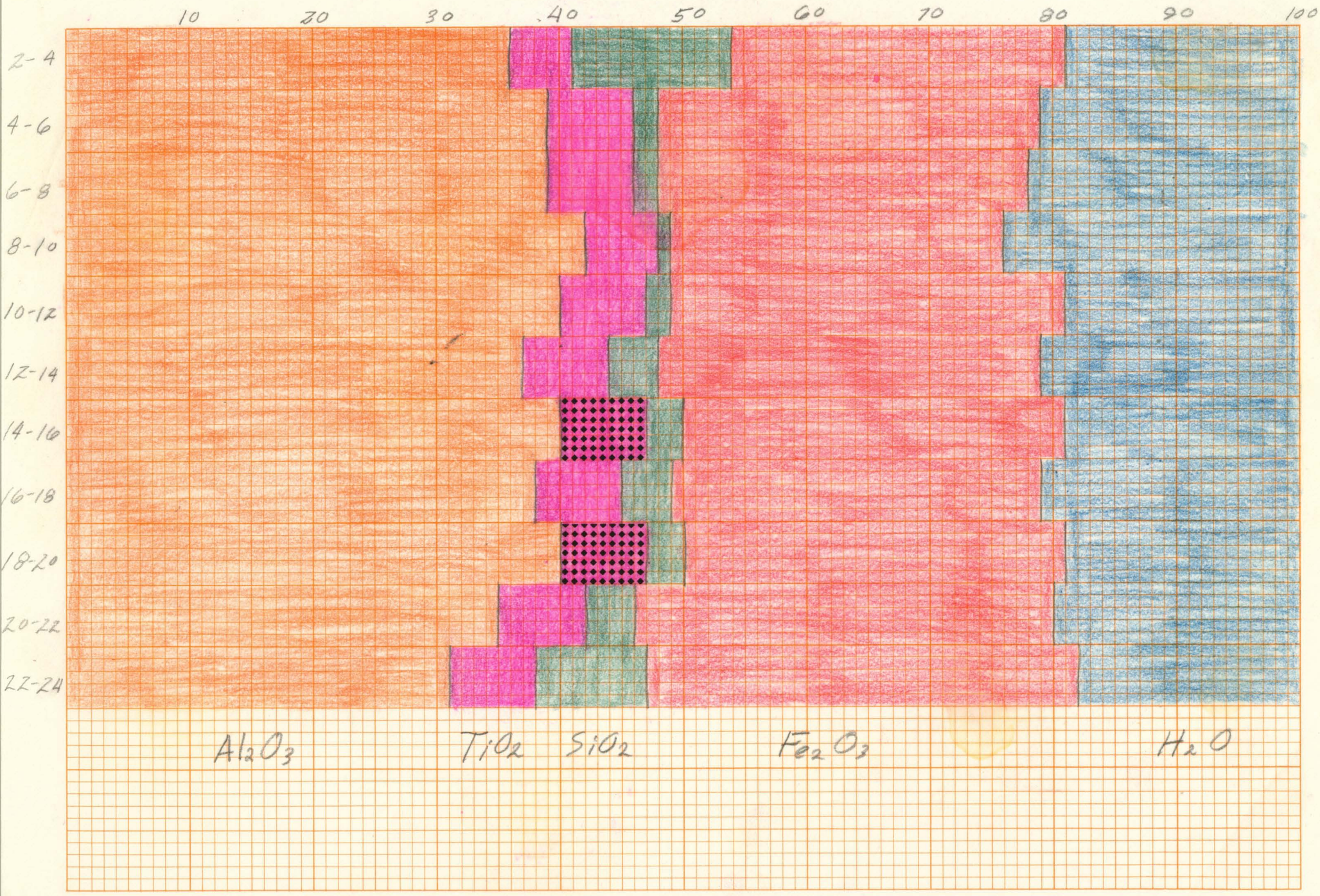
10 X 10 PER INCH

Hole #14



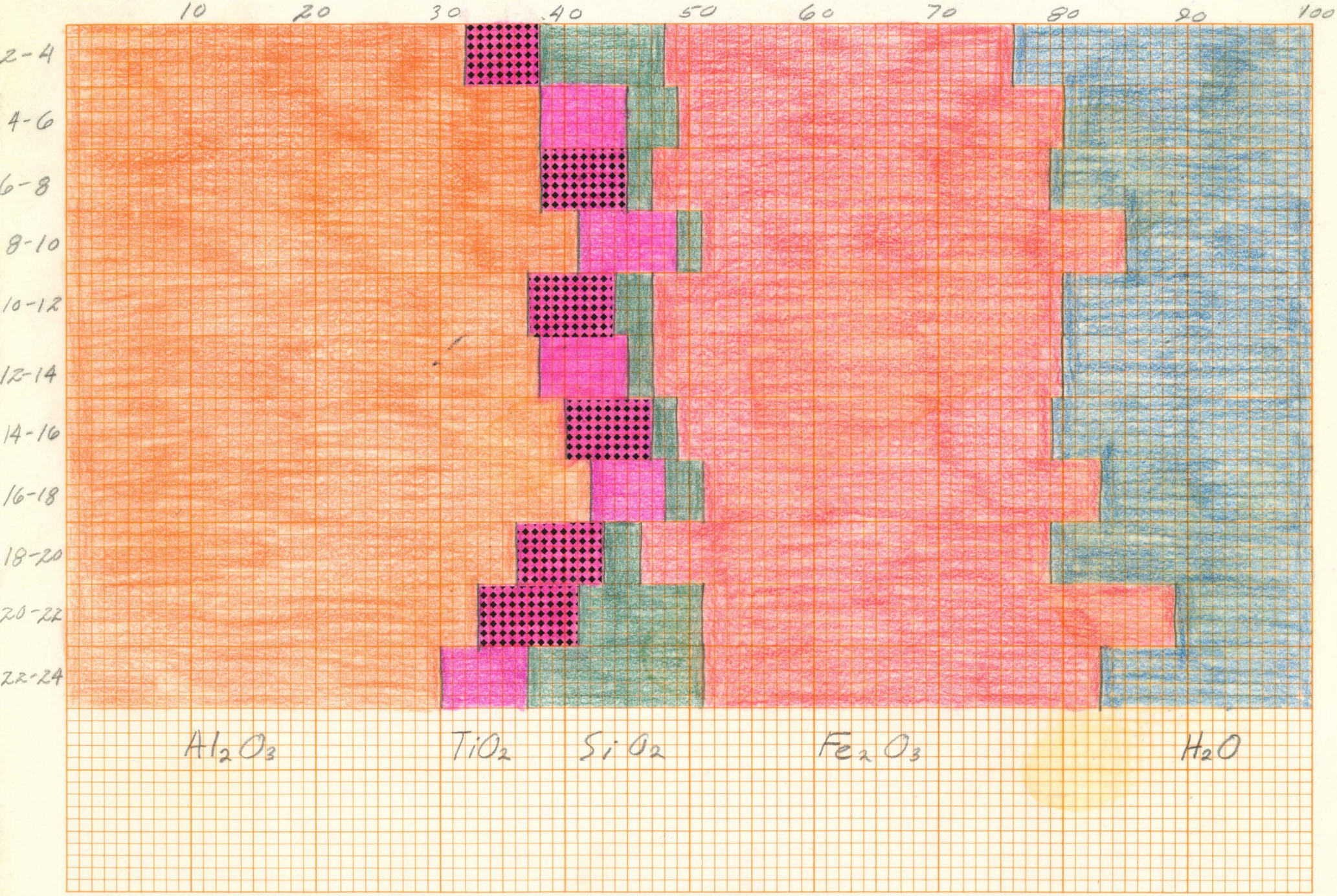
10 X 10 PER INCH

Hole #15



10 X 10 PER INCH

Hole #16



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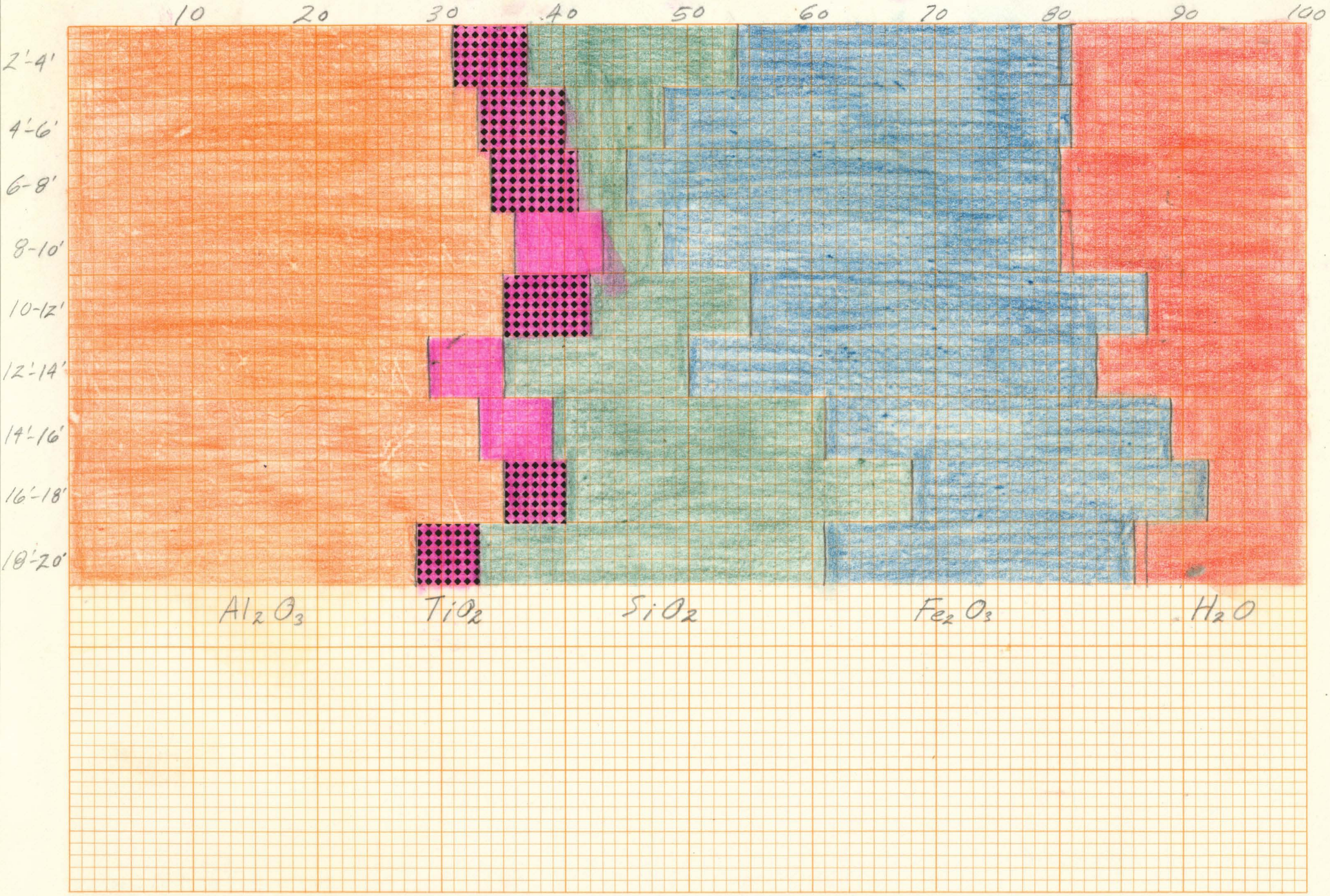
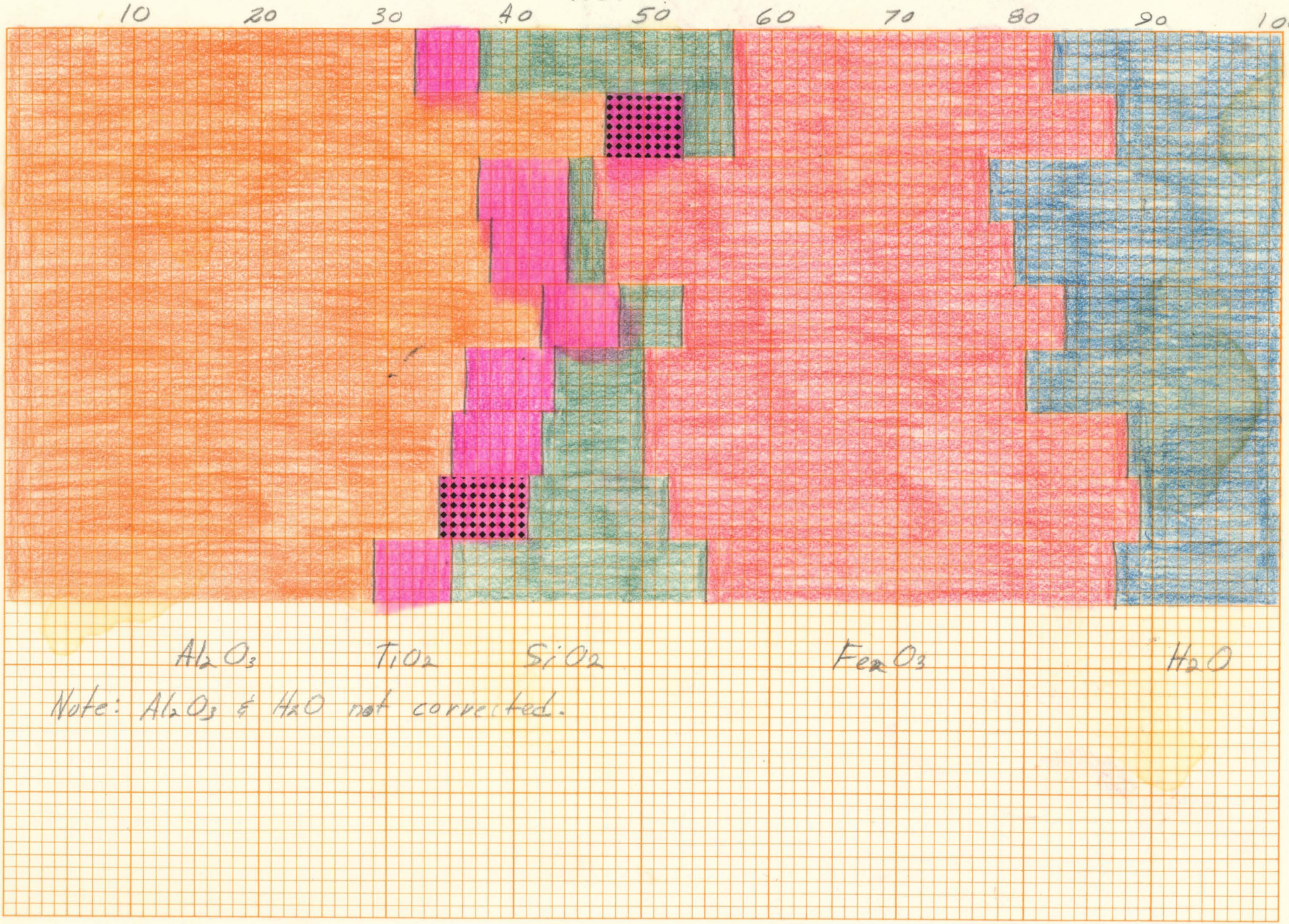
Hole #17



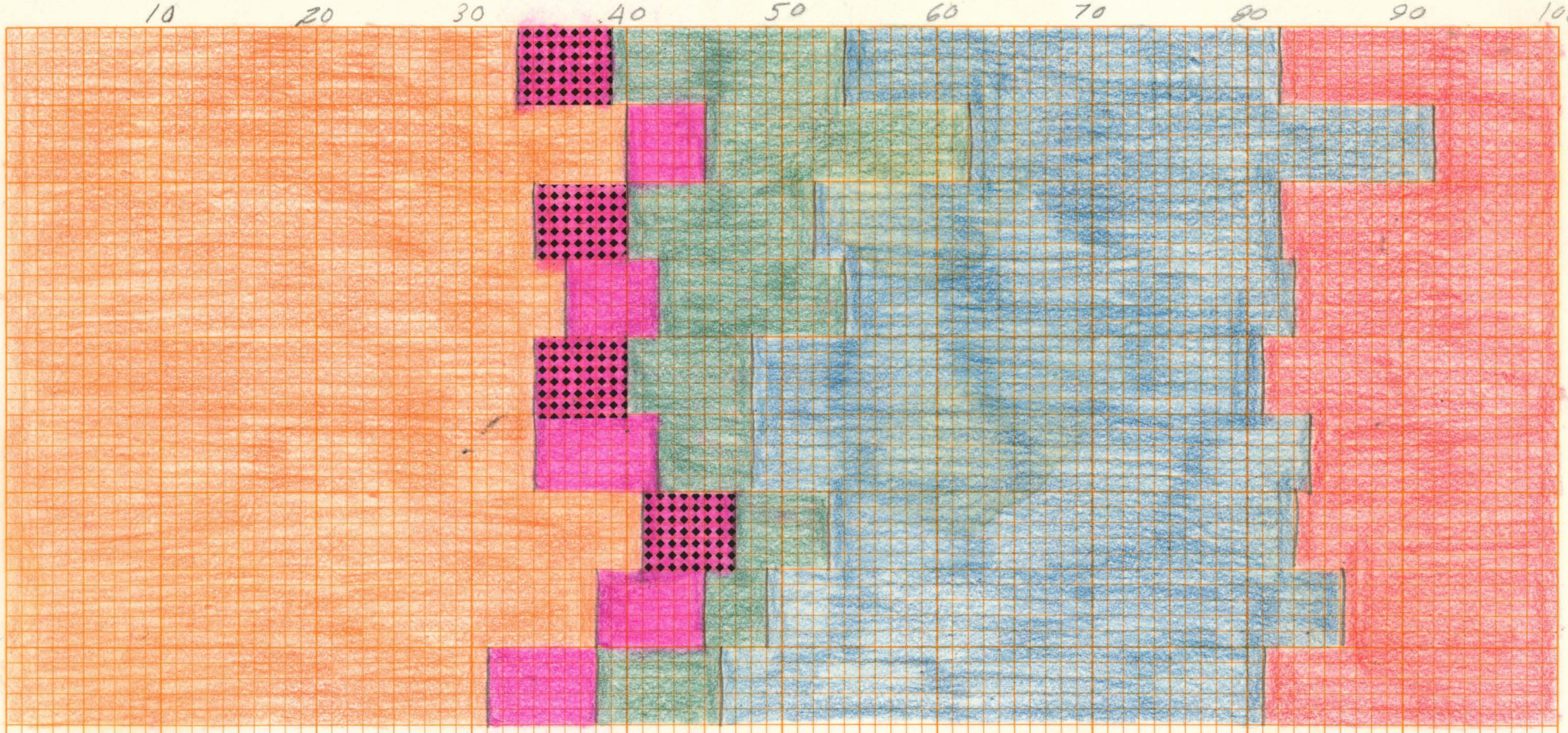
10 X 10 PER INCH
MADE IN U. S. A.

Hole #18



Note: Al_2O_3 & H_2O not corrected.

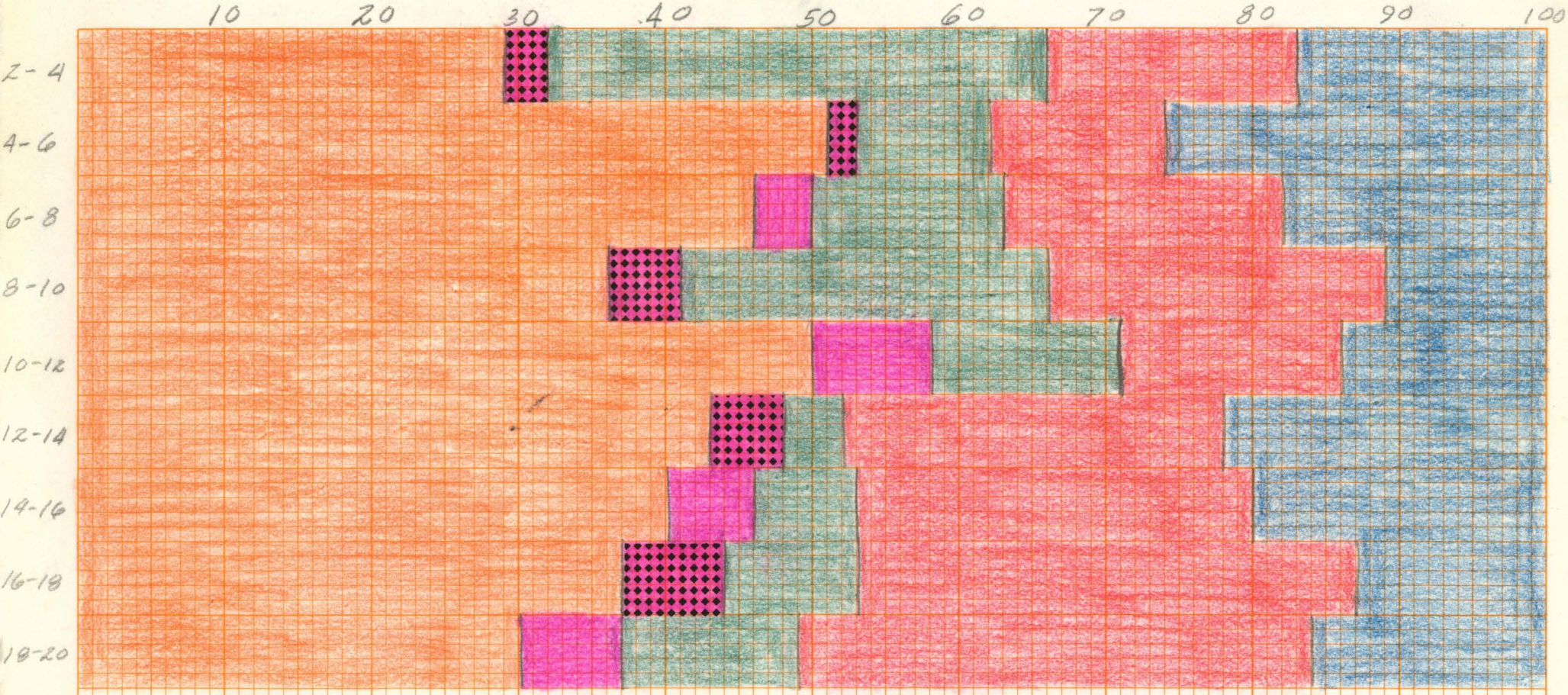
Hole #20



Al_2O_3 TiO_2 SiO_2 Fe_2O_3 H_2O

Note: Al_2O_3 & H_2O not corrected

Hole #21



Note: Al_2O_3 & H_2O not corrected

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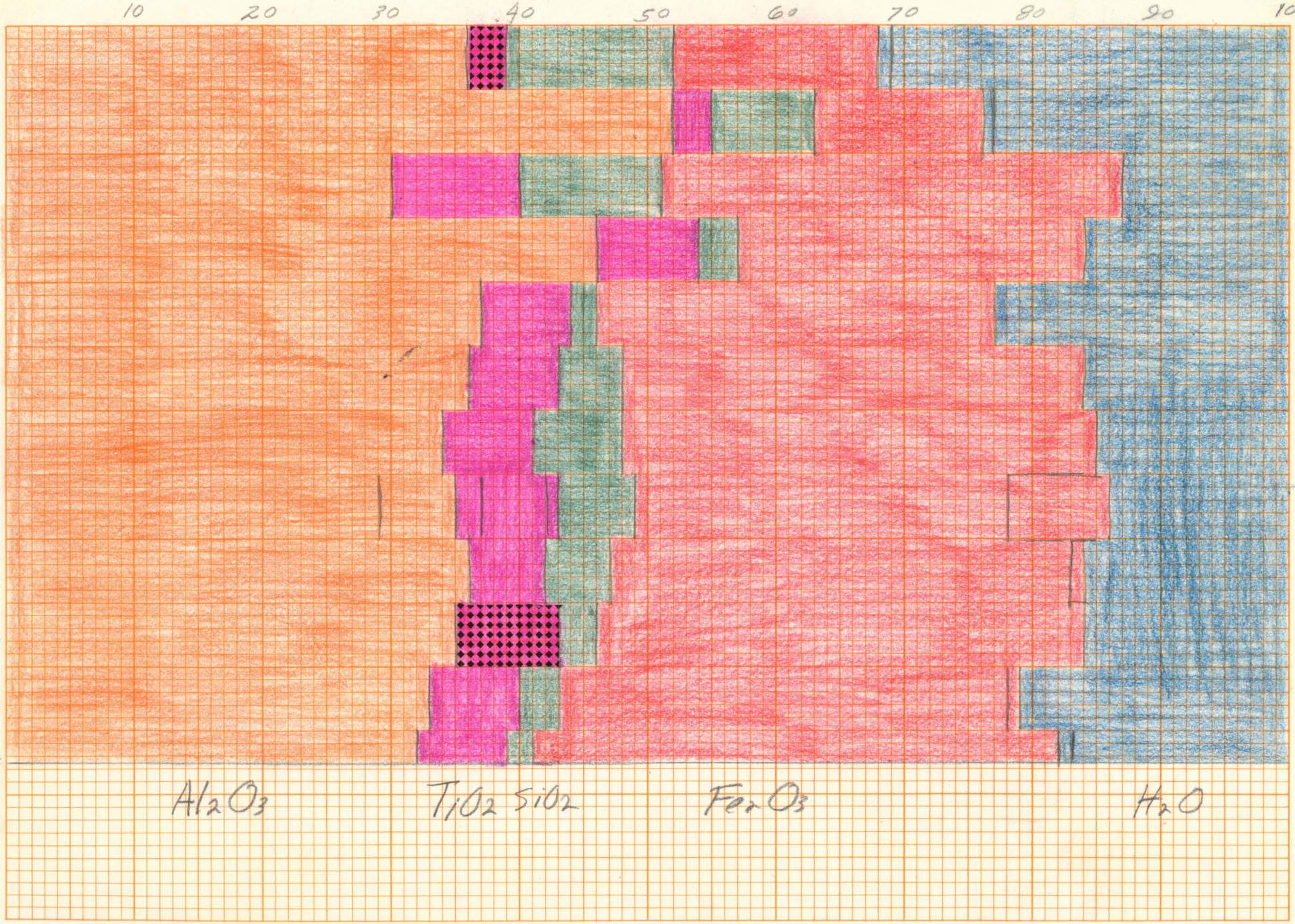
Hole #22



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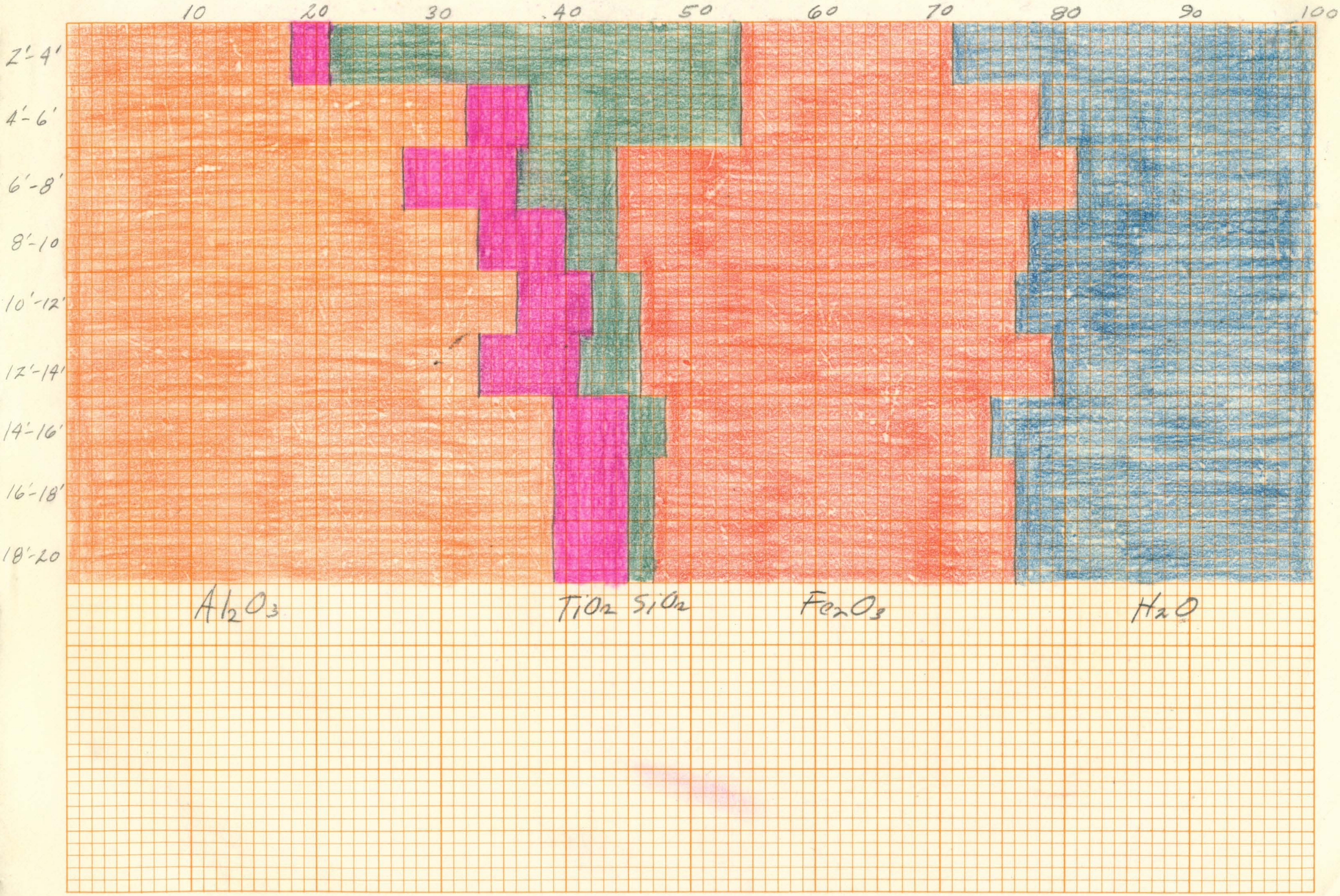

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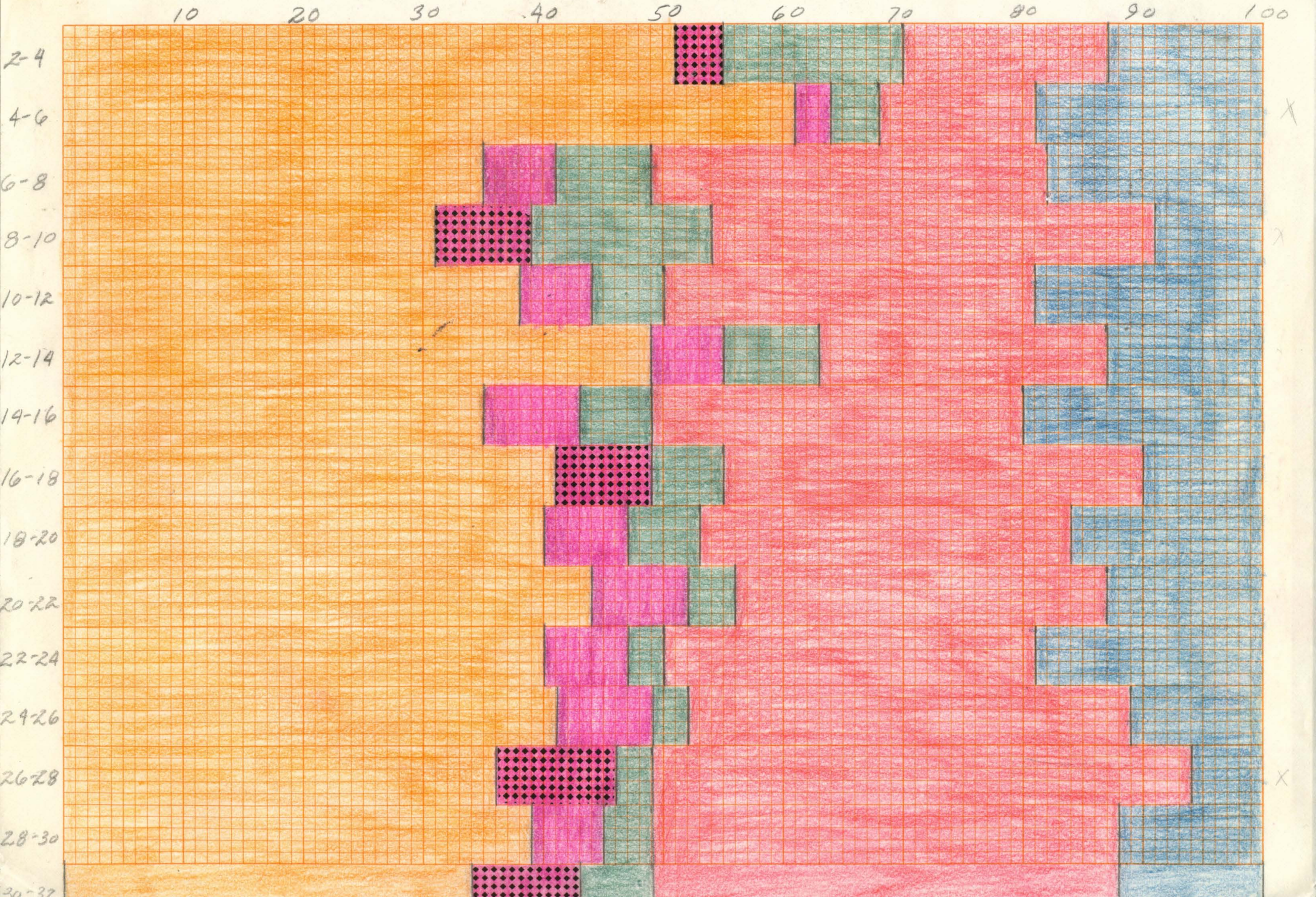
Hole #23

Note; Al_2O_3 & H_2O not corrected



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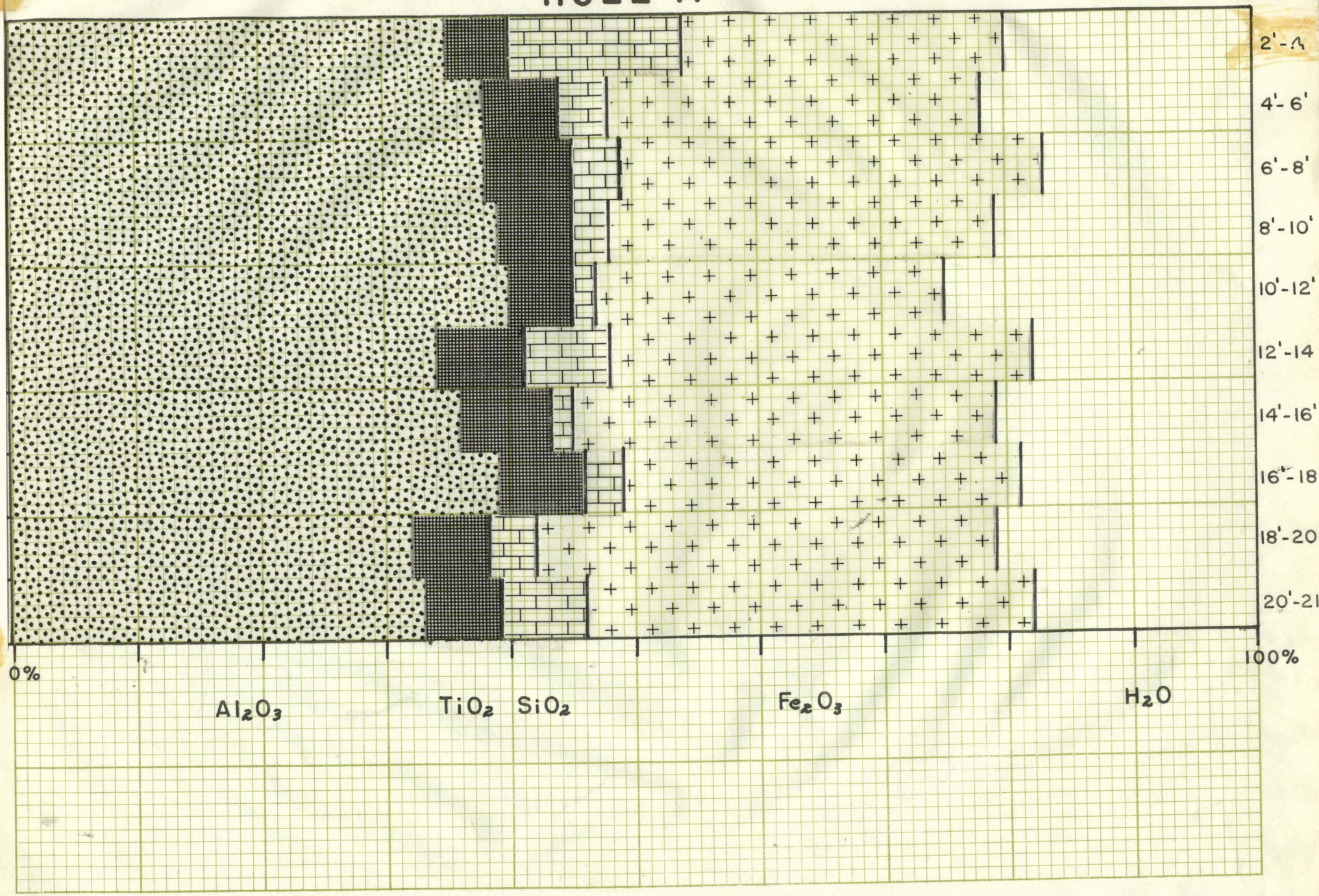
HOLE II



NO. 340 10 DIETZGEN GRAPH PAPER
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EUGENE DIETZGEN CO
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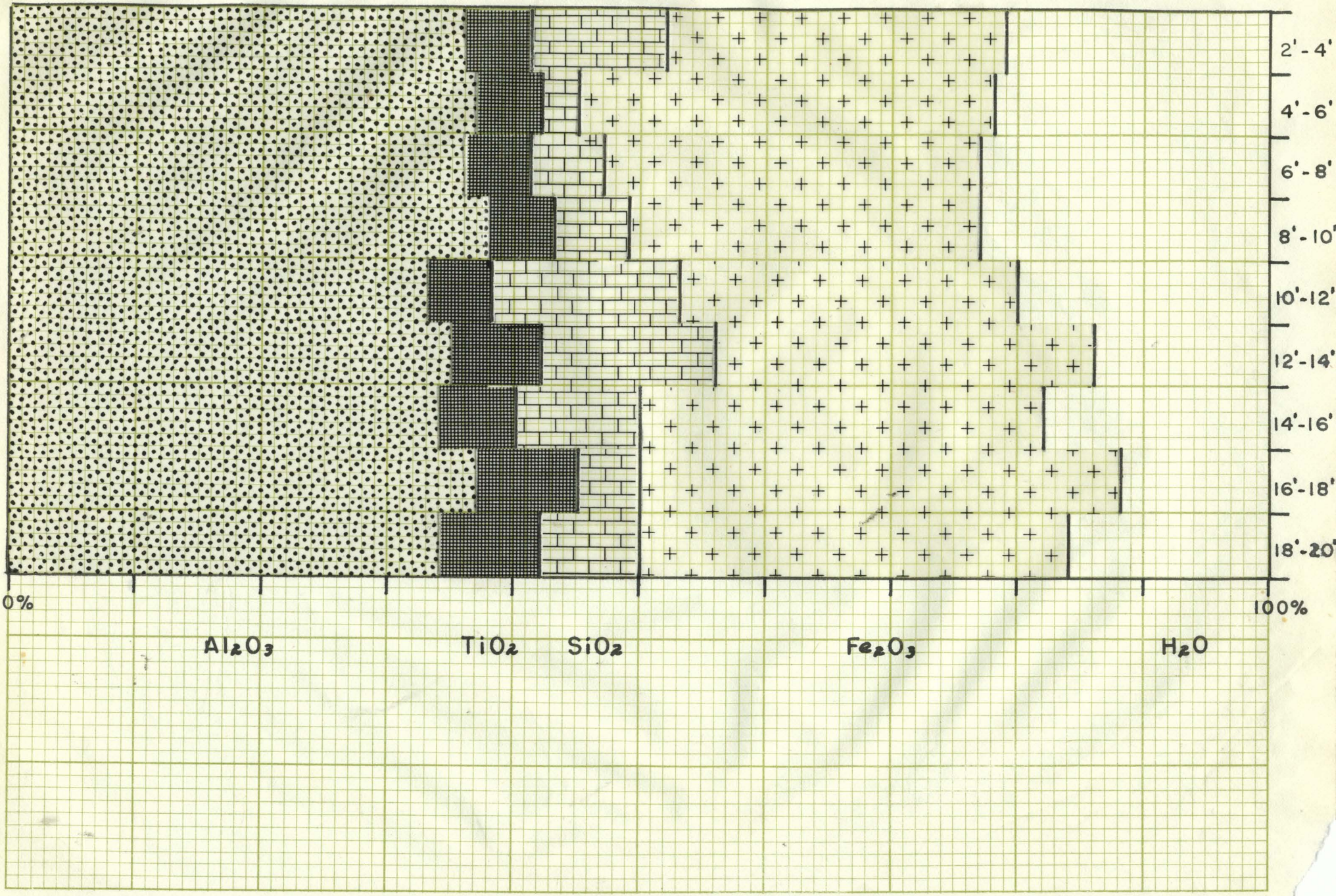
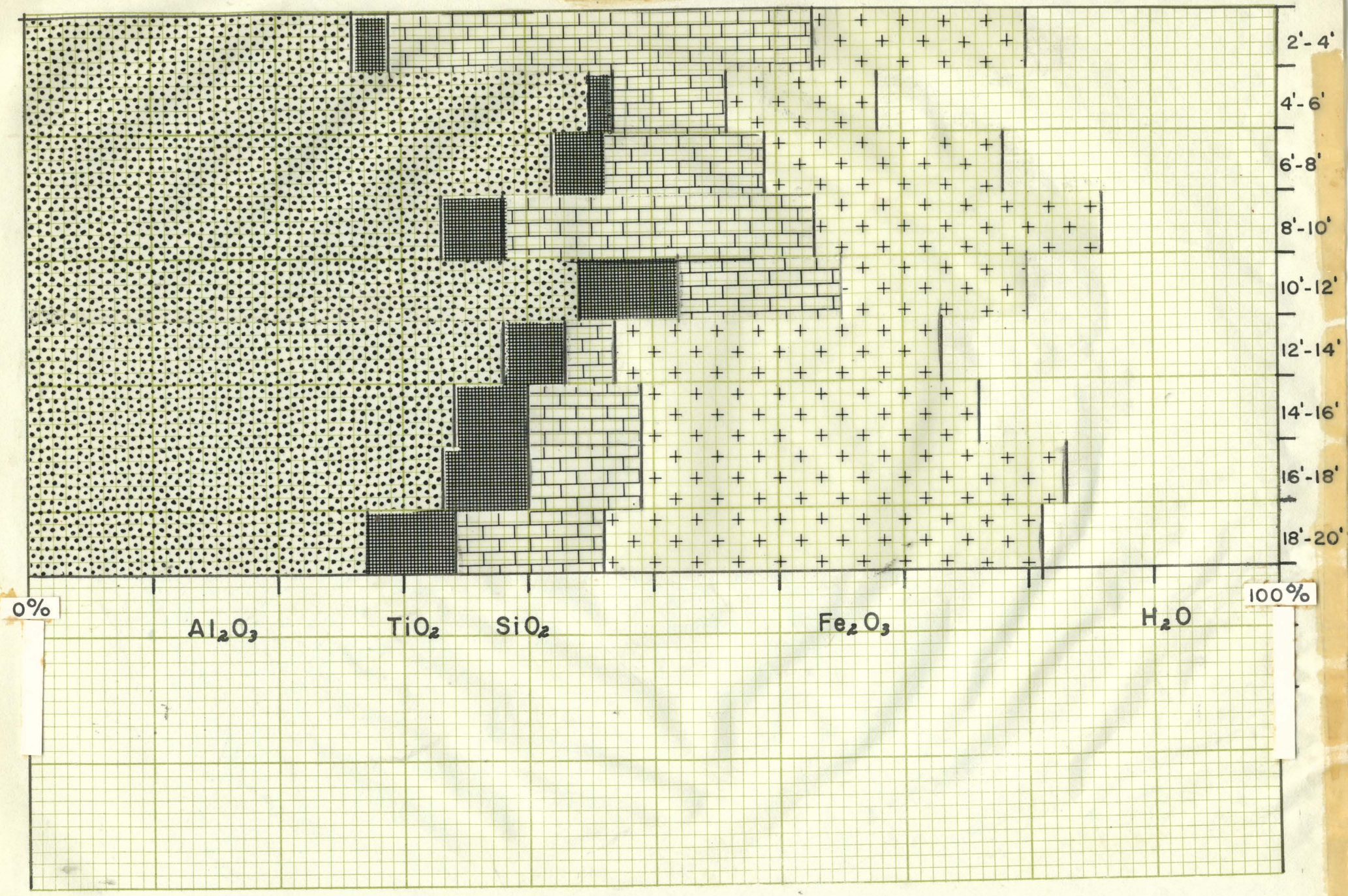
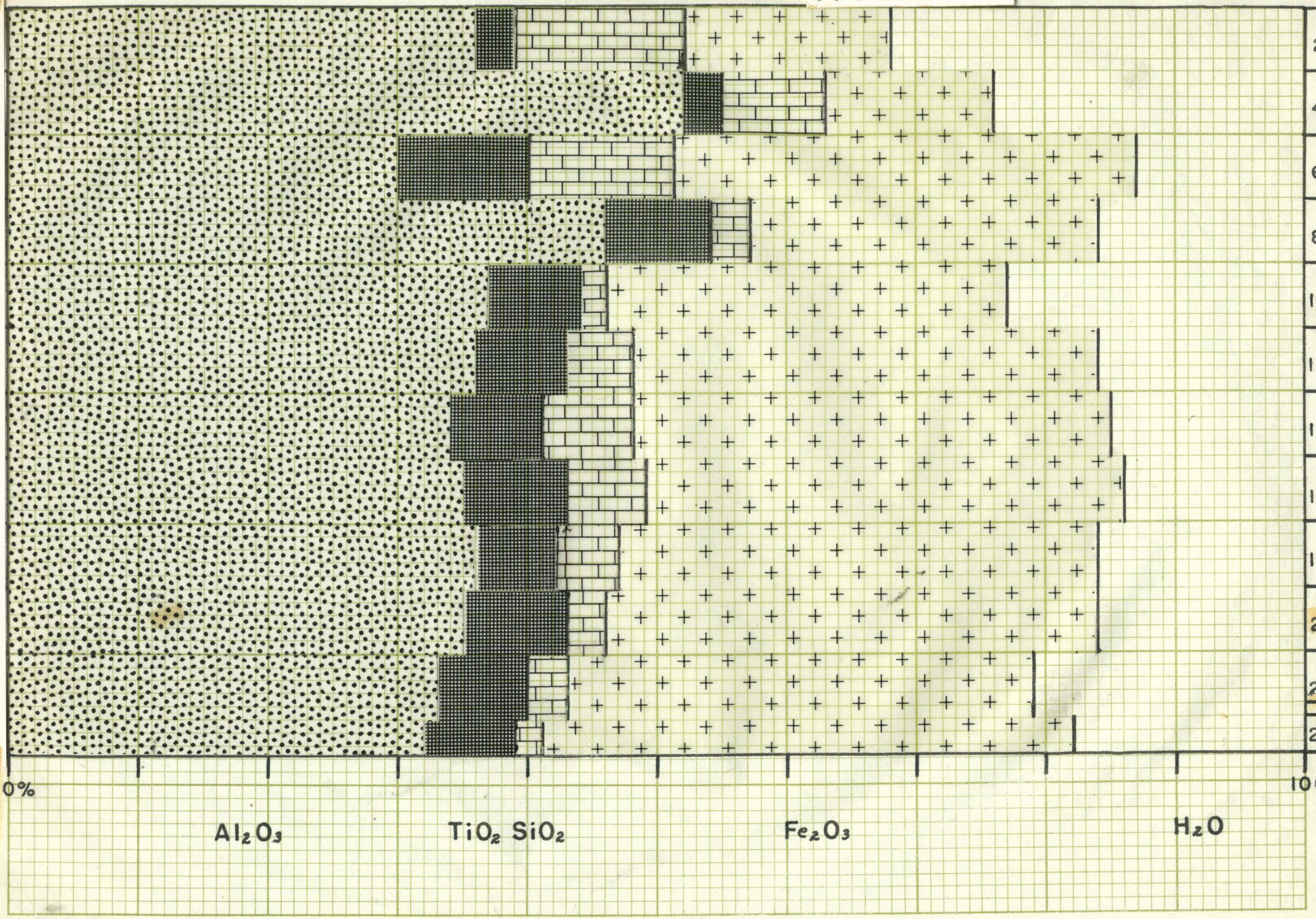
HOLE 1



HOLE 21


2'-4'
4'-6'
6'-8'
8'-10'
10'-12'
12'-14'
14'-16'
16'-18'
18'-20'
0%
100%
Al_2O_3
TiO_2
SiO_2
Fe_2O_3
H_2O

HOLE 22 HOLE 21



SAMPLES FROM THE SALEM AREA

Sample No.	Location	Description	Al_2O_3	Fe	SiO_2	TiO_2	Ign.Loss
P-3532	US 99 E. roadcut SE¼ sec. 35, T 8 S, R 3 W.	1-ft. nodule	56.50	1.21	4.87	1.3	32.86
P-3537	Do	Below P-3532 5½-ft. channel	35.27	20.60	10.65	4.62	19.84
P-3573	Do	Below P-3537 3-ft. channel	30.75	21.89	17.77	5.25	16.91
P-3533	Roadcut near center sec. 30, T 8 S, R 3 W.	Loose nodules	50.64	13.57	2.23	2.11	27.07
P-3536	Roadcut, Sunnyside School area, sec. 26, T 8 S, R 3 W.	(prob. incl. silt in soil) 3½-ft. channel	28.35	14.71	28.7	4.32	16.97
P-3546	Do	Loose nodule	59.55	2.59	3.24	1.00	32.85
P-3540	US 99 E. roadcut SE¼ sec. 35, T 8 S, R 3 W.	Grab sample of weathered basalt	30.04	15.98	28.47	3.41	16.33
P-3541	US 99 E. roadcut NW¼ sec. 2, T 9 S, R 3 W.	Hard nodule in weathered basalt	15.34	37.84	16.58	0.301	16.79
P-3545	Roadcut, Sunnyside School area. SW¼ sec. 26, T. 8 S., R 3 W.	Weathered basalt	28.29	18.08	30.10	3.41	12.85
P-3549	Roadcut near center sec. 28, T 8 S, R 3 W. NE-SW	Gibbsitic nodules					
P-3571	Do	Spheroidally weathered basalt, below P-3549. 5-ft. channel	37.46	21.20	10.55	2.78	19.80
P-3570	Do	Below P-3571 4 ft.-channel	29.22	24.66	17.33	3.27	16.88
P-3551	Roadcut Prospect Hill area, SW¼, sec. 19, T 8 S, R 3 W.	Gibbsitic nodules					
3552	Do	Assoc. limonite					

Sample No.	Location	Description	Al_2O_3	Fe	SiO_2	TiO_2	Ign.Loss
P-3553	Roadcut, SW¼, sec. 17 T 8 S, R 3 W.	Gibbsitic nodules					
P-3565	Wallace Hill, SE¼ sec. 8, T 7 S, R 3 W	Float gibbsite	43.65*	9.77*	10.19*	1.88*	28.87
P-3566	Jefferson Highway. SE¼ sec. 15, T 8 S, R 3 W.	3-ft. channel	23.07	22.24	27.97	2.98	16.40
P-3569	Rosedale School area, roadcut. NW¼ sec. 28, T 8 S, R 3 W.	Upper horizon 3-ft. channel	35.08	18.57	17.71	3.57	20.43
P-3568	Do	Middle horizon 3-ft. channel	29.69	15.1	31.49	3.77	15.73
P-3567	Do	Lower horizon 1½-ft. channel	29.60	12.75	35.03	4.07	15.23
P-3572	Roadcut, about center W½ sec. 27, T 8 S, R 3 W.	Specimen sample from 12 ft. long exposure about 1 ft. thick	52.80	9.98	2.55	2.98	28.77
P-3574	Chaplin Hill, SW¼ sec. 16, T 7 S, R 3 W	2-ft. channel from cesspool excavation	34.01	16.62	19.10	3.18	19.28

Part of sample lost during analysis. Al_2O_3 will probably be higher and SiO_2 lower, according to Hoagland.

The Factors of Rock Weathering

3. Mineralogical Constitution.-In the make up of single minerals chemical and geometrical factors are closely interwoven and both play their part in weathering processes. Rocks, however, are seldom composed of single minerals, and there is no reason why the constituent minerals of rocks should weather independently of each other. The weathering of one mineral naturally alters the chemical environment of another. This aspect of the matter has, however, received practically no study from the physico-chemical point of view, although it is undoubtedly of great importance. Geologists have long recognized that certain secondary minerals arise from the simultaneous weathering of several primary minerals. The present study, for instance, illustrates the formation of secondary epidote from calcium feldspar and ferromagnesian minerals.

For the most part the weathering of igneous rocks consists in the decomposition of silicates. It is now possible to follow some of the chemical and structural factors involved.

The silicates in general are silicon-oxygen structures in which the part which the chemist would regard as the silicate radicle may take the following forms: discrete groups, linear chains, planar networks and three dimensional frameworks. In all cases the silicate or aluminosilicate radicle carries a negative charge which is balanced by the positive charges of cations. In accordance with this salt-like character the action of water can be regarded in the first instance as an interposition of H_2O dipoles between the cations and the silicate anions. The extent of this reaction is primarily conditioned by the degree of accessibility of the silicate or aluminosilicate radicle to water molecules. The geometry of the structure thus assumes great importance. Other things being equal, the more open the structure the easier the weathering.

Channels smaller than the minimum diameter of water molecules will, however, be of secondary importance.

The degree of disruption caused by this tendency towards the interposition of water molecules will depend on the nature of the cation and on the way in which it is built into the structure. Both the valency and the coordination number of the cation are important factors, and the distribution of charge in the silicate radicle itself probably also plays a part. In the case of the zeolites and probably also that of the feldspars this first stage in weathering occurs with no disruption of the aluminosilicate structure.

That portion of the silicate into which water molecules have penetrated now has an opportunity to come to equilibrium with its environment. Thus under intense leaching by rainwater that ionic reaction most favored will be an exchange of the mobilized cations of the silicate for the small hydrogen ions from dissolved carbonic acid. Under less drastic conditions, however, metallic cations derived from the weathering of one mineral might interchange with those of another, provided the ionic sizes permitted. In more advanced stages of weathering the hydrogen ions may come from previously formed acid clays as demonstrated by Graham or from organic acids derived from plant residues. In many cases this exchange of a metallic cation for the hydrogen ion causes the complete destruction of the original silicate lattice. At this stage, therefore, secondary minerals make their appearance. Numerous physicochemical studies of the weathering of the feldspars are in agreement with this general interpretation.

In extreme cases differences in stability towards weathering agents are readily understood. For instance, we may compare orthoclase with kaolinite, whose structures are portrayed in a general way in Figures 48 and 49. In

orthoclase the three dimensional silicate structure contains well defined channels containing the potassium atoms. These channels are just large enough to admit water molecules. Weathering will start at the outer surface and will proceed inwards by the successive replacement of potassium atoms by hydrogen. Kaolinite is constructed on a layer lattice plan, the charge on the silica sheet (Si_2O_3) being balanced by a hydrated double alumina sheet. As pointed out by Bragg the high polarizability of the Al atom causes OH ions associated with it to become closely associated together. Thus instead of discrete groups neutralizing the negative charge of the silica layer we have a continuous double sheet of composition $(OH)_3$ Al O_2OH. Such a structure will present no points for attack by hydrogen ions except at the edges of the continuous sheets. Thus in spite of the ready basal cleavage which offers good accessibility to water molecules, kaolinite is an extremely resistent mineral to the agents of weathering.

The present investigation brings out clearly the great difference in rate of weathering between the potash feldspars and the calcium feldspars. This has frequently been the subject of quantitative investigation and has shown itself as a difference in rate rather than a difference in mechanism. As regards structural accessibility, the x-ray investigations summarized by Bragg indicate only minor differences. The major difference is chemical rather than geometrical - the calcium feldspars carry a higher charge per unit of the aluminosilicate skeleton than the sodium or potassium feldspars. The exact way in which this affects the rate of weathering is not known.

Alongside the water molecules, dissolved oxygen also enters into the accessible structures. In many minerals ferrous ions form part of the cationic establishment. In the presence of oxygen and water these are rapidly

transformed to ferric ions. Such a change in valency completely upsets the normal balance of the silicate which is forced to take up one OH^- ion for each Fe^{++} oxidized to Fe^{+++}. In most cases this is geometrically impossible; hence the silicate decomposes completely and the OH^- ion is accommodated in the decomposition products. The presence of ferrous ions in a silicate structure thus causes very rapid breakdown once accessibility to the agents of weathering is established. Since this is a single stage process characterized by a very high electro-chemical potential it is not surprising that its consequences are the first to be recognized under the microscope. In the case of the pyroxenes and amphiboles the structural accessibility appears small, but the initial penetration by water molecules is facilitated by the numerous cracks along cleavage planes. Hence the oxidation proceeds rapidly and is easily recognized under the microscope in these cracks.

From - Mineralogical and Chemical Studies of Soil Formation from Acid and Basic Igneous Rocks in Missouri: University of Missouri College of Agriculture, Agricultural Experiment Station Research Bulletin 359, p. 55-57, January 1943.

TITANIUM REFERENCES

Sherman, G. Donald, Factors influencing the development of lateritic and laterite soils in the Hawaiian Islands: Pacific Science, 1949, vol. 3, pp. 307-314.

Shows that TiO_2 and Fe_2O_3 increase constantly with weathering. "These oxides are present as two secondary minerals, hematite and anatase."

Fredrickson, A. F., Mode of occurrence of titanium and zirconium in laterites: Amer. Min., vol. 33, nos. 5 and 6, pp. 374-377, 1948.

Shows that in Arkansas bauxites the predominant titanium minerals are ilmenite and brookite (altered product of the ilmenite).

Eyles, V. A., The composition and origin of the Antrim laterites and bauxites: Govt. of Northern Ireland, Mem. of the Geol. Survey, 1952.

Found only one sample that contained ilmenite. "Ilmenite may alter to anatase under lateritic conditions, and anatase appears to be the normal form in which titanium occurs in the laterites." Note in same publication: Dr. Ing. H. S. Simons found anatase in some Arkansas bauxite. Anatase was the only titaniferous mineral recorded by him (Simons) from a number of Indian laterites (developed on basalt) which he examined. This mineral has also been recorded in the Ayrshire bauxitic clays and in the French bauxites.

Allen, V. T., Formation of bauxite from basaltic rocks in Oregon: Econ. Geol., vol. 43, no. 8, pp. 619-626, 1948.

States that the chief titanium mineral in the Washington County bauxites is titaniferous magnetite with perhaps some ilmenite. Anatase is also present.

Edwards, A. B., Textures of the ore minerals and their significance: Australasian Inst. of Mining and Metallurgy, 1947.

States, "Titanium can enter into solid solution in magnetite at high temperatures." On page 67 he shows that in a magnetite-ilmenite solid solution either mineral may be host. Further on he states "natural occurrences of the homogenous solid solution appear to be restricted to basaltic lavas.

Results of my work so far

I have taken a few samples and panned them down to get out as much heavy material as was possible. The heavy material was then acid treated and afterward run through a heavy liquid (bromoform with a specific gravity of approximately 2.95). The heavies were then separated magnetically and analyzed for TiO_2 and Fe. There was approximately twice as much of the nonmagnetic fraction as the magnetic. The following table shows the results of the analyses.

	Original sample		Magnetic separates		Nonmagnetic separates		Slimes
					Acid treated	Nonacid	
	Fe	TiO_2	Fe	TiO_2	TiO_2		TiO_2
P-16009	20.8	7.3	45.5	27.8			
P-16024	24.3		41.4	31.8			
P-16008	19.2	5.6	(42.5?)	28.7	47.9	31.2	4.2
Titanium		3.4		17.2	28.8	18.7	2.5

The results of the analyses show that as far as the panned concentrates are concerned, the titanium minerals are mostly ilmenite with some titaniferous magnetite. However, you will note that the amount of TiO_2 in Sample P-16008 was only reduced from 5.6 percent to 4.2 percent (Note: Further panning of the slimes using Bartell's Chico pan reduced the TiO_2 content of the slimes to 3.5 percent). My conclusions therefore are that (1) most of the titanium in the samples occurs as one of the secondary type such as anatase or brookite or (2) the material was too fine grained to be panned efficiently. Since the Bureau of Mines found that most of the material was of minus 400 mesh size it is entirely possible that I was unable to do a complete job of separating the smaller sized heavy fractions from the lighter material. However, the presence of anatase-brookite in laterites and bauxites developed on basalts has been established by numerous workers, and I feel that there is a definite possibility that the Salem bauxites may contain a significant percentage of these secondary titanium minerals.

April 26, 1955

Mr. H. B. Owen
Commonwealth of Australia
Department of National Development
Bureau of Mineral Resources, Geology and Geophysics
Canberra, Australia

Dear Mr. Owen:

I have just finished reading with interest your bulletin on "Bauxite in Australia," since I am working on similar type deposits here in Oregon. Although there are several questions that I would like to ask you concerning your bulletin, I will only take the time in this letter to ask you one. You mentioned that there is no "lithomarge" beneath your bauxite horizon in your deposits, the apparent implication being that the clay beneath the bauxite is due to resilication of an entire bauxite horizon. Do I understand you correctly in this regard? From the work of Eyles[1] on the Antrim laterites in Ireland, he feels that there are two stages in the formation of bauxite. First, the process of alteration of the parent material to lithomarge, "a rock consisting essentially of hydrated silicate of alumina," which he calls"kaolinization"; and secondly, the formation of laterite, which may be either aluminous (bauxitic) or ferruginous. This two-stage development of bauxitic material from basaltic lavas appears to be what has happened here in Oregon. My main reason for believing this is that there is at least 85 to 100 feet of varicolored kaolinitic clay above weathered basalt, which in turn grades upward into the bauxite horizon averaging 20 to 25 feet in thickness. I find it hard to visualize an original bauxite section approximately 100 feet thick being largely resilicated to clay, especially when the change from weathered basalt to bauxite is very gradational in aspect. Allen[2], in his report on similar type deposits here in Oregon, also believes that the two-stage process operated to produce the bauxites.

I would also like to secure a copy of the bulletin put out by Prescott and Pendleton entitled "Laterite and Lateritic Soils," which, according to your bibliography, was published as Commonwealth Bur. Soil Sci. Tech. Commn. 47. Could I obtain such a copy from your Department, or would I have to make my request through another Department. Any help you can give me in obtaining that article would be very much appreciated.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk

REFERENCES

[1]Eyles, V. A.
1952 The composition and origin of the Antrim laterites and bauxites: Gov't of Northern Ireland, Mem. of the Geol. Survey, 1952.

[2]Allen, V. T.
1948 Formation of bauxite from basaltic rocks in Oregon: Econ. Geology, vol. 43, no. 8, Dec. 1948.

8405 Rayburn Road
Bethesda 14, Md.
February 25, 1956

Mr. R. E. Corcoran, Geologist
Department of Geology and Mineral Industries
1069 State Office Building
Portland 1, Oregon.

Dear Mr. Corcoran:

In reply to your letter of February 15 concerning further interpretation of my previous work on the Salem Hills bauxites, I am afraid that I can only make guesses. Bardossy Gyorgy does not specify the nature of the parent material from which his Hungarian bauxites have formed; this I think may be one of the keys to the problem. The parent material for the Salem bauxites apparently has a very appreciable portion of its total titanium content as the relatively resistant oxide mineral, ilmenite, whereas many of the parent materials on which bauxite has formed elsewhere, perhaps including the Hungarian, contain appreciable amounts of their titanium as more readily decomposed silicate minerals. This difference in itself might be adequate to explain the differences between bauxites. In addition to this, however, there are other parameters to consider, in particular the weathering conditions themselves. If there are differences in climate, or in the pH or chemical composition of the soil water in the two cases, one could easily imagine a situation in which ilmenite might be resistant to solution under the one set of conditions, and completely decompose to yield secondary anatase, rutile, and brookite under the other set. It is quite expectable that the soil solutions in a weathering basalt would be considerably different from that in a weathering syenite, for example.

It should also be pointed out that there might be a good correlation, of the type Gyorgy found, between Al_2O_3 and the <u>non</u>-clastic portion of the titanium in the Salem bauxite. Obviously this would be the only part of the titanium that <u>could</u> show any significant correlation. Your statement "that there are none of the usual secondary titanium minerals in the Salem Hills bauxites" is not really justified. I show in my report that perhaps 25%, or even up to 50%, of the titanium in these bauxites can possibly be present as such secondary minerals, but that time did not permit identification of them. The only aspect of this occurrence of titanium in bauxite that is perhaps unique is the high ilmenite content of the source material before lateritization.

I hope that this answers your questions satisfactorily; if not, please write again.

Yours sincerely,

Edwin Roedder

Edwin Roedder

February 15, 1956

Dr. E. A. Roedder
8405 Rayburn Road
Bethesda 14, Maryland

Dear Dr. Roedder:

I am finally getting around to writing the section on titanium in the Salem Hills bauxites, and there is one more thing that I want to ask you about the research project you did for us.

You will note I am including a copy of a letter I got from Bardossy in Hungary, who did geochemical work on titanium in some Hungarian bauxites. If you remember, I wrote to you about that paper he published showing the close relationship between the Al_2O_3 and the TiO_2 in his bauxites. Last December I wrote him, requesting what titanium minerals were present in the Hungarian bauxites and this is his answering letter. All this seems to point up the fact that there are none of the usual secondary titanium minerals in the Salem Hills bauxites, which is a further corroboration of your work on these deposits. However, what I am wondering now is just why the laterite deposits on the Miocene basalts here in Oregon contain what are apparently residual titanium minerals from the parent basalts. So far as I can determine from the literature, this is certainly a somewhat unique circumstance, as in almost all of the cases the titanium minerals in laterites are of the anatase-brookite-rutile type.

In the course of your titanium investigation for us did you have any possible theories as to why our laterites don't contain any of these secondary titanium oxides? I would appreciate it very much if you could give me any ideas concerning this and its possible geochemical significance.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk

8405 Rayburn Road,
Bethesda 14, Md.
November 21, 1955

Mr. Hollis M. Dole,
Director, Dept. of Geology and Mineral Industries
1069 State Office Building
Portland 1, Oregon

Dear Hollis:

Attached you will find my report on the Salem bauxite, at long last. I hope that the information is in time to still be of some value to you. I relied heavily on not hearing any deadline from you.

One item which was not explored in the report, for lack of time, was the cause for the rather wide variation from one sample to another. Perhaps your field studies will show some correlation that would not be apparent in the lab. In any case, if you have any questions, please feel free to ask.

May I say once agin that we had an entirely wonderful time on our visit there with you and your lovely family, and hope that we may be able to reciprocate sometime. I am very sorry that I have not had time to write before this, but I have been terribly busy with many trips to the field and other labs, getting to know the people and the job, moving twice, househunting (we have bought here), learning the projects here, promotions, program review, and budget, not to mention that nasty work manuscripts!

In any case I sincer ly hope that my delay has not caused you trouble. Best regards to the family.

Sincerely

RECEIVED
STATE DEPT. OF GEOLOGY & MINERAL INDS.

UNIVERSITY OF UTAH
SALT LAKE CITY

DEPARTMENT OF MINERALOGY

May 19, 1955

RECEIVED
MAY 23 1955
STATE DEPT. OF GEOLOGY
& MINERAL INDS.

Mr. Hollis M. Dole, Acting Director
Dept. of Geology & Mineral Industries
1069 State Office Bldg.
Portland 1, Oregon

Dear Hollis:

I shall be sending you a series of titanium concentrates for chemical analysis in the very near future. Unfortunately, they will be small samples, so ask him to do the best he can. He may use the entire sample. Most should run at least 10% if not 20 or 30% TiO_2. It would appear that more of the titanium is as residual grains than I previously thought. In any case I would like to get the results back as soon as your analyst can do it as the mad rush will be gathering momentum soon. Some general idea as to the format, number of copies, etc. of the report would be appreciated, ~~etc.~~

Presumably we shall be leaving here July 1 and stopping for a one day visit in S.F., then on up to Oregon. Will you be in Grants Pass, Portland, the Legislature, or the field along about July 5? We are not sure yet that we <u>can</u> leave then (due to house-selling problems), or that we <u>want</u> to leave then (due to the problems of finding camping sites in northern California on a long fourth-of-July weekend. If you have any information on the p^P (like pH, the population pressure) in California parks during that time I would appreciate it. Incidentally, is there any geology worth seeing in Oregon?

Best regards,

Ed

Edwin Roedder
Associate Prof. of Mineralogy

ER:jb

P.S. My brother-in-law, a civil engin. with Beth. Steel in S.F., is very interested in geology (wishes he had taken it up instead) and <u>may</u> be travelling with us up to Oregon for the camping etc. Don't worry - we won't descend upon your hospitality with 4 adults + 4 children, but we would like to know about camping facilities in that area.

P.P.S. Kathleen knows nothing about the consulting fee on the laterite work. She knows only that I have been writing to you concerning your problems. I want to surprise her next wedding anniversary.

DEPARTMENT OF MINERALOGY

UNIVERSITY OF UTAH
SALT LAKE CITY 1

May 5, 1955

REC

Mr. R.E. Corcoran
Dept. of Geology & Mineral Industries
1069 State Office Bldg.
Portland 1, Oregon

Dear Mr. Corcoran:

I have your letter of the 29th before me, ~~but~~ and have ~~not~~ received the copy of your latest progress report you mentioned. I have made some heavy liquid concentrates and am in the process of X-raying them now, after which I shall send them to Hollis for chemical analyses.

Sincerely yours,

Edwin Roedder

Edwin Roedder
Associate Prof. of Mineralogy

ER:jb

April 29, 1955

Professor Edwin Roedder
Department of Mineralogy
University of Utah
Salt Lake City, Utah

Dear Professor Roedder:

Hollis has asked me to send you a copy of our latest progress report on the Salem Hills bauxite, since he thought that you might be interested in the chemical analyses so far obtained.

The weather out here has been too rainy to permit much field work to be done as yet, which is fortunate in my case as I am just now able to get around fairly well. I am hoping to have all the field work down there completed sometime before the end of May because all of the chemical analyses on the bauxites should be finished by then.

Hollis is in Spokane attending the regional conference of the AIME, and he asked me to be sure to send you his regards.

If you have any questions concerning the article I will be glad to answer them as best as I am able from the information that we now have.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk

March 17, 1955

Prof. Edwin Roedder
Department of Mineralogy
University of Utah
Salt Lake City, Utah

Dear Professor Roedder:

Please excuse my lateness in answering your letter of February 21 but I was involved in a little automobile accident recently in the course of some field work.

I am sorry I wasn't clear in my last letter concerning the pulps and rejects that I sent to you but these are merely used by our assayer to indicate the samples which are finely ground in the pulping machine and those that are merely run through the rough grinder. In other words, every sample is divided into two parts - the pulps which are subsequently analyzed and the rejects which are set aside in case anything happens to the pulps during analysis. Nothing aside from grinding has therefore been done to either one of these cuts before being sent to you and if you have run chemical analyses on both, you should find very close agreement between the two.

I perhaps gave you the wrong impression concerning my Fe_2O_3 TiO_2 and Al_2O_3 TiO_2 ratios as to their validity. I realize, of course, that the graphs show little, if any, correlation using either of the sets of ratios but it would appear that there was a somewhat closer relationship between the Fe_2O_3 and the TiO_2 than the Al_2O_3 and the TiO_2. Since Bardossy and Bardossy seem to think that there is a very definite relationship between the Al_2O_3 and the TiO_2 in laterites, I was just curious to see if I could find the same thing in the Salem material. I especially wanted to see if I could find some method of "calculating" the amount of TiO_2 in any of my samples since our chemist is not going to make complete analyses. We have had some companies show a certain amount of interest in the TiO_2 in the laterite down there and I therefore thought it might be practical to spend some time on the problem to see if there was some indirect method of determining, even semiquantitatively, just how much some of those samples would run in TiO_2.

In regard to the gibbsitic nodules or layers that you asked about, all I can say at the present time is that the nodules, so far as we have been able to determine, only occur in the first 2 to 3 feet of the soil horizon and we did not sample them at all in our drilling since no samples were taken above the upper 2 feet. In at least two holes, however, we did seem to run into

a solid layer of gibbsite at least 2 feet thick and maybe thicker. This layer, if it is such, was encountered in holes 22 and 23 and I sent you a sample of this material from hole 23 (P-17308, sample no. 191, 4-6 feet showing 61.32 percent Al_2O_3). However since we have never done any trenching work and it has never been exposed in any of the nearby roadcuts, we can only assume that the gibbsite actually does occur in place as a definite layer rather than as the more typical nodules found in that area.

In answer to your last question, you are correct in assuming that all of the analyses are on an air dry basis.

I hope that the above information has not arrived too late to be of use to you in your research on this work.

Sincerely yours,

R. E. Corcoran
Geologist

REC:jr

DEPARTMENT OF MINERALOGY

UNIVERSITY OF UTAH
SALT LAKE CITY 1

February 21, 1955

RECEIVED
FEB 24 1955
STATE DEPT. OF GEOLOGY
& MINERAL INDS.

Mr. Hollis Dole, Acting Director,
Dept. of Geology and Mineral Industries,
1069 State Capitol Bldg.,
Portland, Oregon.

Dear Hollis:

I have received the samples which Corcoran sent, but am a little confused concerning a few points. The terms "Pulps" and"Rejects" are used on the samples. May I infer that "pulp" refers to the original crushed portion of the drill hole for that interval, untreated in any way except for crushing and mixing? If so, the term "reject" would imply that some separation process was applied to the pulp sample and these rejects were the material remaining after separation of a concentrate. If this has been done, I would like to have whatever information is available on the quantities and analyses of the concentrates. This is particularly important in that the data given by Corcoran in his letter of Feb 10 and his earlier blue memorandum that you sent me would indicate that a minimum of 34% (or 41%) of the head sample titanium content was extracted as a heavy concentrate. This is based on the assumption that the weights given in Corcoran's letter of Feb. 10 refer to sample P-16008. The two values given above refer to the calculations made with the two mentioned slime values of 4.2 and 3.1% TiO_2. If some portion of the finer grain sizes of heavies was lost during the panning, the percentage of heads TiO_2 in the heavies would be that much greater than the 34 or 41% values given.

Your comments on "calculated" TiO_2 contents bothers me for several reasons. First, the data which Corcoran sent on Hole 15 shows two calculated TiO_2 values. These yield values of Fe_2O_3/TiO_2 of 4.71 and 4.74, whereas the average for this hole is 4.55. This hole, if one uses 4.55 to calculate TiO_2 values, shows that the calculated TiO_2 values may be nearly 1% TiO_2 off from the analyzed, yet there is comparatively little variation in the Fe_2O_3/TiO_2 ratio in this hole compared with the others. Corcoran's plot of Fe_2O_3 vs. TiO_2 shows 39 points falling in true random fashion in the block enclosed by 20-26.5% Fe_2O_3 and 6.0-8.1% TiO_2. Within this block there is absolutely no trend discernable, the correlation of TiO_2 with Fe_2O_3 being zero. If one includes the ten points in the range of 16-20% Fe_2O_3 and 4.6-5.9% TiO_2, there is a definite trend toward lower

DEPARTMENT OF MINERALOGY

UNIVERSITY OF UTAH
SALT LAKE CITY 1

TiO_2 with lower Fe_2O_3, but the correlation is poor, so that calculated TiO_2 contents could easily be wrong by plus or minus 1% TiO_2. Incidentally, much of the data on the sheet that Corcoran sent me is not on the graphs sent - were these graphs made from some specially selected data?

As shown by Corcoran's graph of Al_2O_3 vs. TiO_2, there is comparatively little correlation between these two values. In this connection, I would like to ask whether gibbsite nodules and layers were eliminated, in part, by the sampling procedure (auger), resulting in some biased samples. If part of the titania is as detrital minerals and part as dissolved and reprecipitated titania along with the alumina, the correlation of alumina with titania would be more or less random, depending on the amount of movement of the two. I also presume that the analyses are all on an air-dry basis. If this is not the case, please let me know, as the amounts of water involved are large.

Best regards from the land of snow, ice and cold!

Sincerely,

Edwin Roedder

P.S. Scuse my typing.

Hollis:
please read + return
WB

February 10, 1955

Professor Edwin Roedder
Department of Mineralogy
University of Utah
Salt Lake City, Utah

Dear Professor Roedder:

I am sending to you in a separate box 21 samples from some of the holes that I hand augered in the ferruginous bauxite areas near Salem, Oregon. You will note that I have included in some cases both a cut of the pulps and the rejects for your examination. I unfortunately was not able to find a complete suite of rejects, but the pulps of every sample were found with the exception of one (No. P-16911). I did, however, include a reject of that particular sample interval so you should be able to make your analyses from that. I am sending you the complete samples from one hole (No. 15) that was drilled to 24 feet. The other samples that I am sending you were picked more or less at random from some of the other holes. Sample No. P-15796 contained the greatest percentage of TiO_2 encountered thus far, and Sample No. P-17308 not only showed the least amount of TiO_2 and Fe_2O_3 but also the greatest percentage of Al_2O_3 so far encountered.

You will find included with this letter, in addition to the tabulations on the samples being sent, a quadrangle map of the Salem area showing the locations of the holes from which the samples were taken, a frequency diagram showing the TiO_2 analyses that have been completed, and two graphs showing the variation of Al_2O_3 and Fe_2O_3 content as a function of the TiO_2 content.

I have been doing some research on the occurrence of titanium in laterites and bauxites and the graphs show that there is a somewhat closer correlation between the Fe_2O_3 and the TiO_2 than between the Al_2O_3 and the TiO_2. This is of interest since Bardossy and Bardossy* have found just the opposite to be true with respect to Hungarian bauxites. Their reasoning is based on the fact that the ionic potential of the Ti^{+4} (6.25) is much closer to Al^{+3} (5.25) than Fe^{+3} (4.48), however it must be noted that Ti^{+3} (4.35) is closer to the Fe^{+3} than the Al^{+3}, so the problem apparently would boil down to whether the Ti present in my Salem bauxites is trivalent or quadrivalent. If the titanium was present as anatase or brookite then of course it would have to be quadrivalent, but if it is present as ilmenite it could apparently (according to Dana) be either quadrivalent or trivalent.

- - - - - - - - - - -

* Bardossy, G. Y., and Bardossy, S. L., Contributions to the geochemistry of titanium: Acta Geologica. Academiae Scientiarum Hungaricae Redigit Szadeczky - Kardoss E. Tomus 11, Fasc. 3-4, Budapest 1954.

Work done by the U. S. Bureau of Mines and the Aluminum Company of Canada on the Salem bauxites indicates that the predominant titanium mineral so far as they have been able to determine from x-ray diffraction work is ilmenite with very little, if any, anatase or brookite being present. I would appreciate it if you could give this matter some thought during your research work on these samples.

In your last letter to Hollis you asked him if I could give you the percentage of heads in the sample that I had our chemist assay. The original sample weighed 114.3 grams. The heavies that remained after panning were divided into magnetic and nonmagnetic portions. The magnetic fraction weighed 2.9 grams and the nonmagnetic weighed 4.8 grams. Approximately half of the nonmagnetic separates were acid treated as you will note on the table that Hollis included in his letter to you. The total weight of the panned concentrates therefore came to 7.7 grams. This should have left approximately 107 grams of slimes but unfortunately because of the fine-grained nature of the sample (most of which passes minus 400 mesh) I only had approximately 49 grams of slimes remaining after panning. Since I was only able to reduce the TiO_2 content from 5.6 percent to 3.1 percent even after repanning the slimes, I did not consider my experiment too successful so I did not follow through on it. I hope that the figures that I gave you will be of some use to you, however. If you have any further questions regarding these samples either Hollis or I will be glad to answer them as best as we can.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk
Encl.

Hole #15 (NW-SW sec. 30, T. 8 S., R. 3 W.)

P#	Sample #	Interval	Al_2O_3	TiO_2	SiO_2	Fe_2O_3	Fe_2O_3 : TiO_2	Al_2O_3 : TiO_2
17135	111	2'0"- 4'0"	36.17	5.00	13.24	26.6	5.32	7.24
17136	112	4'0"- 6'0"	38.56	7.48	2.22	31.0	4.15	5.16
17137	113	6'0"- 8'0"	38.94	7.04	2.08	30.2	4.29	5.54
17138	114	8'0"-10'0"	41.95	5.65	1.34	26.9	4.76	7.44
16911	115	10'0"-12'0"	40.09	6.90	2.36	31.7	4.60	5.82
17139	116	12'0"-14'0"	37.45	7.24	3.76	31.3	4.33	5.19
16912	117	14'0"-16'0"	39.81	6.65*	2.52	31.3		
17140	118	16'0"-18'0"	37.49	7.44	3.52	29.9	4.03	5.05
16913	119	18'0"-20'0"	39.81	6.52*	2.76	30.9		
17141	140	20'0"-22'0"	35.46	7.44	4.26	34.4	4.63	4.77
17089	141	22'0"-24'0"	30.68	7.34	9.02	35.3	4.81	4.18
Average			37.85	6.94	4.28	30.8	4.55	5.59

*Calc.

Hole #1 (NE-SE sec. 28, T. 8 S., R. 3 W.)

17231	107	12'0"-14'0"	34.52	6.54	14.24	29.8	4.56	5.20
17305	109	16'0"-18'0"	36.76	8.30	5.26	37.9	4.57	4.44

Hole #11 (Near ¼ cor. secs. 20/29, T. 8 S., R. 3 W.)

17225	175	15'0"-17'0"	39.28	6.55	2.92	32.3	4.93	6.00
17226	177	19'0"-21'0"	33.33	6.15	7.48	35.9	5.84	5.42

Hole #7 (NE-SW sec. 19, T. 8 S., R. 3 W.)

15796	58	8'0"-10'0"	30.64	9.32	4.40	37.7	4.05	6.96

Hole #21 (NW-NW sec. 35, T. 8 S., R. 3 W.)

17657	167	6'0"- 8'0"	45.92	4.12	12.52	19.3	4.69	11.15
17236	169	10'0"-12'0"	50.32	8.43	13.44	15.3	1.82	5.96

Hole #23 (SE¼ sec. 22, T. 8 S., R. 3 W.)

17308	191	4'0"- 6'0"	61.32	2.66	3.56	12.9	3.63	17.2
17309	195	12'0"-14'0"	48.96	5.74	7.74	23.6	4.12	8.54
17304	198	18'0"-20'0"	39.52	7.42	6.12	34.2	4.61	5.33

February 18, 1955

Prof. Edwin Roedder
Department of Mineralogy
University of Utah
Salt Lake City 1, Utah

Dear Professor Roedder:

This is in reply to your letter of February 10 inquiring about analyses on TiO_2 concentrates.

I would prefer to have the samples sent to our laboratory rather than farming them out to the U. S. Bureau of Mines in Salt Lake. Our chemist tells me that if you would send in four or five samples at a time, he could have returns back to you in a minimum time of a week - in other words, about 7 to 10 days. Size of the sample would be 3-4 grams if possible. The degree of accuracy of the analyses sent to you is at least 0.1 percent. If you would send samples that would contain below 2 percent titania, the samples would be checked by two methods - gravimetric and volumetric. On the gravimetric they would be controlled also by a colorimetric method. Therefore it appears that on the low (less than 2 percent) titania, a fairly accurate determination could be made.

The titania value that was "calculated" on the sample sent to you from hole 23 was arrived at in this manner. Five complete analyses were run on samples from this hole. The sample sent you did not have a complete analysis. From the five complete analyses an Fe_2O_3 - TiO_2 ratio was determined. The sample sent you was calculated using this ratio and the amount of Fe_2O_3 found to be present.

I think your approach to this problem in running down the location of the titania as much as possible is very good. I am confident that you will be able to give us some good information.

Very best regards.

Sincerely yours,

H. M. Dole
Acting Director

HMD:jr

COPY

STATE DEPARTMENT OF GEOLOGY AND
MINERAL INDUSTRIES
1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

February 2, 1955

Prof. Edwin Roedder
Department of Mineralogy
University of Utah
Salt Lake City, Utah

Dear Professor Roedder:

Arrangements have been authorized for an expenditure of $500 for research on the mineralogy, especially the occurrence of titanium, of the Salem Hills bauxite.

Andy

I have instructed Corcoran to send you a group of samples with descriptions of where they were taken, positions within the bauxite horizon, and other pertinent information.

The second paragraph in your letter of January 29 has me a little perplexed. The authorization by the Governing Board for the expenditure of the funds has been specifically designated for you. Would it be possible for you to rent the equipment from Hugh Hamilton and submit that along with your bill (the total of which should not exceed $500), or would you rather have me write Mr. Hamilton and explain the whole thing to him? Inasmuch as all of our negotiations have been with you, I would rather not engage someone else and in turn have him employ you. However I will await your advice on how to proceed on this. The fact that the money has been authorized and you will do the work is sufficient for the time being to get started.

Best regards,

Sincerely yours,

H. M. Dole
Acting Director

HMD:jr

COPY

UNIVERSITY OF UTAH
Department of Mineralogy
Salt Lake City 1, Utah

January 29, 1955

Mr. Hollis Dole, Acting Director
Dept. of Geology and Mineral Industries
1069 State Office Building
Portland 1, Oregon

Dear Hollis:

Thanks for your recent letter -- I'm sorry I couldn't answer sooner, but I've been culturing a batch of bugs again. As to the $500 expenditure, I'm sure that we can get a good deal of information on the titanium mineralogy with that. Of course, as with any scientific work, the amount and validity of the data obtained is directly related to the amount of time spent. Some portion of the funds used will have to go toward the use of the Xray, etc. Most of this equipment is officially the property of the Engineering Experiment Station, and they have set up a price schedule for each instrument per hour of use. This was done just recently as a result of the necessity of replacing a $500 transformer on one of the Xray machines. Everyone had been using it, but no one admitted using it as much as they really had.

As a consequence of the above charges for Xray time, it would be best if the request for the work go through Hugh Hamilton's hands officially; he would then "employ" me to do the job.

The weight balance that I requested on the Corcoran samples was percent of heads in each case. Even if a portion of the sample was lost, the analysis can still be used quantitatively, within the limitations of the slime loss. As to the suggestion of chemical techniques, I would like to withhold judgement until I work a little with the samples and see what kind of fractions I can separate physically.

Best regards,

/s/ Edwin Roedder

COPY

STATE DEPARTMENT OF GEOLOGY AND
MINERAL INDUSTRIES
1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

January 14, 1955

Prof. Edwin Roedder
Department of Mineralogy
300 Mines Building
University of Utah
Salt Lake City 1, Utah

Dear Professor Roedder:

Thanks for your letter of January 9 in reply to my inquiry concerning consulting work.

I was hoping that you could give me some idea on the amount of work that might be involved in the identification of these minerals but I see that we are in the same boat. I am going to request an authorization from our Governing Board of an expenditure of at least $500 for this work. That would involve approximately ten days' work by you. Do you think that this would be sufficient? If not, let me know at your earliest convenience.

From the present speed of receipt of the chemical analysis on the bauxite samples, it is now doubtful that the material for publication will be ready by this spring. Therefore the April deadline mentioned in my original letter would be extended.

On the analyses given by Corcoran weights were attempted. However he panned his sample in an open vessel, resulting in loss of the slimes. Consequently the analyses can be considered as nothing more than a very rough estimate. If you should wish chemical analysis or could suggest certain techniques to be used in our chemical laboratory that would be of help to you, we would try our best to comply. I might mention that we have little in the way of special equipment other than a spectrograph and a homemade DTA setup. We do not have a magnetic separator such as you mentioned.

Very best regards,

Sincerely,

H. M. Dole
Acting Director

HMD:jr

COPY

STATE DEPARTMENT OF GEOLOGY AND
MINERAL INDUSTRIES
1069 STATE OFFICE BUILDING
PORTLAND 1, OREGON

January 7, 1955

Prof. Edwin Roedder
Mineralogy Department
Mines Building
University of Utah
Salt Lake City, Utah

Dear Professor Roedder:

This Department is conducting an exploration and mapping program of an area of high-iron bauxite developed on Miocene lavas in the Willamette Valley of Oregon. Analyses show that a very large tonnage of material averaging better than 35 percent Al_2O_3 and less than 10 percent SiO_2 is to be found. This material will also average around 20 percent Fe_2O_3 and somewhere around 6 percent TiO_2. Occurring within the laterite zone is a discontinuous gibbsite layer that will "sweeten" the bauxite considerably. I believe I gave you a sample of the banded gibbsite from this area.

Our exploration is drawing to a close on this project but there are still quite a few chemical analyses and differential thermal analyses to be completed on the sampling. We have had trouble trying to determine how the titanium occurs in this material. Samples run by the U.S. Bureau of Mines Electrodevelopment Laboratory at Albany have indicated that the titanium occurs mostly as ilmenite with minor titaniferous magnetite and "leucoxene". Our work indicates that the titanium is largely secondary. References to bauxite occurrences in other parts of the world seemingly bear this out but agreement is not too good. Also, we wish to be more specific and not use the term "leucoxene". Therefore we are in doubt and before publishing would like to have more information. This leads up to the purpose of this letter.

Would you consider doing petrographic work, X-ray analyses, or any other procedure necessary for the identification of the titanium minerals on a consulting basis for us? If so, what would be your fee? We may also like to consult with you on the geochemistry of the laterization of this material. Results which we would obtain from you may be incorporated in our bulletin on this investigation with due credit, of course. R. E. Corcoran, geologist with our Department, has been doing the bulk of the exploration in this area. F. W. Libbey, our former Director who did the pioneer work in an area north of here, will collaborate with Corcoran on the preparation of the bulletin. I am enclosing a memorandum from Corcoran on titanium references and some of the research he has done on the identification of the titanium. Also enclosed is a copy of a preliminary report which he got out late last year.

Under separate cover I am sending you some of the bauxitic material, a sample of the weathered basalt (noncommercial), and a sample of the parent basalt on which the bauxite has developed. This is sent only for the purpose of acquainting you with the type material it will be necessary to deal with so that you may better quote a price for your consulting work. The plans are for the material for this bulletin to be prepared by late spring. Field work will be completed this winter. Therefore if you did take on the job, we would want results sometime before the latter part of April.

I hope that you will consider this as I am sure you can be of great help to us.

Very best regards,

Sincerely,

H. M. Dole
Acting Director

HMD:jr

UNIVERSITY OF HAWAII
COLLEGE OF AGRICULTURE
HONOLULU 14, HAWAII

HAWAII AGRICULTURAL EXTENSION SERVICE

HAWAII AGRICULTURAL EXPERIMENT STATION

December 21, 1955

Mr. R. E. Corcoran
Dept. of Geology and Mineral Industries
State of Oregon
1069 State Office Building
Portland, Oregon

Dear Mr. Corcoran:

I have your letter of December 15 regarding the type of titanium minerals in laterite. I am sure it is possible to have ilmenite in the normal laterite. Our studies indicate that under certain conditions ilmenite is altered and in other conditions it is not. Laterite developed under tropical rain forest or conditions approximating the tropical rain forest will have most of its titanium as the secondary mineral, anatase. The laterites formed under relative dry conditions show very little evidence of alteration of ilmenite. The latter will have 80 per cent of its titanium as anatase and the latter 80-90 per cent as ilmenite or titaniferous magnetite. We do think that titanium moves from the weathering materials under the very wet tropical rain forest to less wet condition where it is concentrated.

I hope this will help you.

Very truly yours,

G. Donald Sherman

G. Donald Sherman, Chairman
Department of Soils and
Agricultural Chemistry

GDS:km

December 15, 1955

Mr. G. Donald Sherman
Hawaii Agricultural Experiment Station
University of Hawaii
Honolulu, T. H.

Dear Mr. Sherman:

I have read with interest your numerous papers on the laterites of the Hawaiian Islands. These are of particular interest to me since I am at present doing some work on laterites in northwestern Oregon which also developed on basaltic parent material.

One of the problems on which I am working is the titanium mineralogy of these laterites. Some of the material contains as much as 10 percent TiO_2 and as such may possibly constitute a future ore of titanium. I have had numerous x-ray diffraction studies made on the Oregon laterites and find that almost without exception the titanium minerals are ilmenite and titaniferous magnetite.

According to your studies in the Hawaiian Islands the titanium minerals more typically occur as one of the secondary types such as anatase or brookite. The secondary titanium minerals apparently are more normally expected in laterites, as pointed out in the recent papers by Eyles in Ireland and Owen in Australia. Therefore, I am somewhat puzzled by this complete lack of any such secondary titanium minerals in the Oregon laterites and wonder whether this unique situation here is of any particular significance.

If you have any ideas on why the original titanium minerals sometimes do and sometimes do not alter to the secondary types during the process of laterization, I would appreciate hearing from you.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk

FORM 471 4-43

STANOLIND OIL AND GAS COMPANY

STANOLIND BUILDING

TULSA, OKLAHOMA

December 29, 1955

Mr. R. E. Corcoran
Dept. of Geology and Mineral Industries
1069 State Office Building
Portland 1, Oregon

Dear Mr. Corcoran:

I regret to say that I have not done any extensive research on the occurrence of titanium in laterites during the last few years.

The amount of leucoxene found in the Arkansas bauxites and several other laterites that I have investigated varies within wide limits. Much of the secondarily reworked bauxite deposits in Arkansas have bands of almost pure ilmenite or titaniferous magnetite. In material of this kind, leucoxene is rarely found.

Most of the leucoxene observed occurs in the residual deposits that have secondarily been leached and have not been subsequently reworked. Some care should be taken to get a quantitative titanium balance in the samples studied. The titanium occurring in the form of ilmenite or titaniferous magnetite, although these materials are very conspicuous, often does not account for the total titanium in rock. Some of the titanium occurs as one of the three polymorphs of TiO_2 as discrete, very tiny particles in the gibbsite or clay minerals. In this form, the titanium is very hard to see by microscope observation.

Hoping these comments will be of some assistance to you, I am

Sincerely yours,

A. F. Frederickson

A. F. Frederickson
Research Section Supervisor

AFF:jpc

cc: Dr. Daniel Silverman

December 15, 1955

Dr. A. F. Fredrickson
Washington University
St. Louis, Missouri

Dear Dr. Fredrickson:

I have read with interest your notes on the occurrence of titanium in laterites (in the American Mineralogist, May-June 1948).

I am at present making a study of bauxitic laterites here in northwestern Oregon and in the course of the study I have also been working on the titanium mineralogy. Some of the laterites here contain as much as 10 percent TiO_2, and x-ray diffraction studies have shown the titanium minerals to be, almost without exception, titaniferous magnetite and ilmenite. A very small amount of "leucoxene" (less than 2 percent) has been noted coating a few grains of ilmenite. This almost complete lack of any of the secondary titanium minerals in the laterite appears to be almost unique in the world so far as I can determine from the available literature.

I thought I would write to you to see if you had done any further research on titanium in laterites and could give me some ideas as to the possible significance of my findings.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk

February 23, 1956

Mr. Gyorgy Bardossy
Tudomanyegyetemi Foldtani Intezet
Budapest, VIII
Muzeum-Korut 4/A
Hungary

Dear Mr. Bardossy:

Thank you for your letter of January 24.

The information you have given me has cleared up the matter to my satisfaction and further corroborates my findings on the titanium mineralogy in these Oregon bauxites.

I will be happy to send you a copy of my bulletin as soon as it is published.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk

TUDOMÁNYEGYETEMI FÖLDTANI INTÉZET
INSTITUT DE GÉOLOGIE DE L'UNIVERSITÉ
BUDAPEST, VIII, MÚZEUM-KÖRÚT 4/A.
TELEFON: 130—287

January 24, 1956

Mr.R.E. CORCORAN,
State Dept.of Geology
and Mineral Industries,
Portland, Oregon.

Dear Mr. Corcoran,

I have read your letter with great interest.

Here, in Hungary, TiO_2 is present in bauxites in the mineralogical form of secondary rutile and anathase. They were formed, in our opinion, of an Al, Fe, Ti containing gel. So the strong correlation between Al_2O_3 and TiO_2 is based on their common geochemical origin and mode of sedimentation. Here I must call your attention to the importance of the ionic potential in the formation of bauxites.

Reading your interesting statements about Oregon bauxites I have the following impressions: If TiO_2 is present in the form of ilmenite and titaniferous magnetite, there can not be any proportional connection between Al_2O_3 and TiO_2. In this case, from the geochemical point of view their origin is different: Ilmenite and titaniferous magnetite are clastic minerals, not influenced by the rules of the ionic potential, while Al_2O_3 minerals are governed by them.

It would be very interesting for me to know which Al and Fe minerals are present in Oregon bauxites. Knowing them would make it much easier to explain the mode of correlation between them and TiO_2.

I would be very grateful if you could send me your papers published on this interesting subject of Oregon bauxites.

Sincerely Yours

Bárdossy György

December 15, 1955

Mr. Gy. Bardossy
Hungarian-Soviet Bauxite-Aluminum Corp.
Budapest, Hungary

Dear Mr. Bardossy:

I have read with interest your paper concerning the geochemistry of titanium.

In your paper you mentioned the apparent close correlation between the TiO_2 and Al_2O_3 content of Hungarian laterites. I have been doing a certain amount of research on laterites here in northwestern Oregon, and following your method have attempted to find some sort of correlation between the TiO_2 in these Oregon laterites and the Al_2O_3 and Fe_2O_3. However, I have found that there is little, if any, correlation between the TiO_2 and the Fe_2O_3 or the TiO_2 and the Al_2O_3. If there is any correlation at all, it is between the TiO_2 and the Fe_2O_3.

You do not state in your paper what titanium minerals are present in the Hungarian laterites and this I feel should have some bearing on the geochemistry of these types of deposits. The laterites of northwestern Oregon, contrary to laterites in many other areas of the world, do not contain any of the secondary titanium oxides such as anatase, brookite, or rutile, but the titanium present occurs entirely as ilmenite and titaniferous magnetite.

I would appreciate it if you could find out for me just what titanium minerals are present in your Hungarian bauxites as this may give me a clue as to the geologic significance of the correlations that you have shown in your paper and why I get so little agreement with them.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk

April 29, 1955

Mr. H. R. Hose
1800 Sun Life Building
Montreal, Canada

Dear Mr. Hose:

I am sending you under separate cover a copy of our April Ore.-Bin which includes another progress report on the Salem bauxites.

I am still not sure of the accuracy of some of our analyses because when I was plotting up the results I found that the L.O.I. (by difference) was abnormally low for the chemically determined Al_2O_3 content. For instance, in Hole 23 the overall average Al_2O_3 for the entire 32 feet was 41 percent, and the average L.O.I. by difference amounted to only 14 percent. When Hoagland ran a composite L.O.I. on this hole he found it to be (as you will note in the chart) 20.52 percent. We, therefore, had no coice but to use this latter figure and subtract the difference (approximately 6 percent) from our overall Al_2O_3 average, which cut it down as you can see to 33.8 percent. When we found this large discrepancy between determined L.O.I. by difference in Hole 23, we decided to have composite L.O.I. determinations made on some of the other holes that indicated abnormally low L.O.I's. These were Holes 18, 19, 20, and 21. We found that the determined L.O.I.'s were in every case at least 3 to 5 percent above the L.O.I. found by difference, and this discrepancy was subtracted again from our Al_2O_3 for each hole. What I am wondering is if you think it might be possible that some of this water could be chemically combined with the Fe_2O_3. I noticed in your chemical analyses of the bauxites down here that you determined your L.O.I. and found your amount of alumina by difference. Apparently that is why the Al_2O_3 content made by your company was in all cases less than that which we determined for the same samples. I was noticing in Eyles' publication, that after he used as much water as was necessary to form gibbsite and kaolinite from the total alumina and silica content there was almost invariably a small surplus of water. He was unable to determine empirically what the water surplus was due to, but thought that the small amount of surplus water may be held in the laterites by some undetermined physical bond. The main point of this discussion is that I do not feel that the alumina content is as low as indicated when one determines L.O.I. and arrives at the alumina content by difference; but if you are planning to return to this area perhaps we can discuss it in greater detail then, as I would certainly like to know your conclusions concerning this matter.

If you have any questions concerning the article I will be very glad to answer them as best as I am able.

Sincerely,

R. E. Corcoran
Geologist

REC:lk

1800 SUN LIFE BUILDING MONTREAL CANADA

1 February 1955

Mr. R. E. Corcoran,
State Department of Geology and Mineral Industries,
1069 State Office Building,
Portland 1, Oregon.

Dear Mr. Corcoran:

Attached to this letter are the X-Ray Diffraction and Spectrographic Analyses of samples 1, 2 and 3 from your drill holes No. 23, Sample 1, No. 19 Sample 2, and No. 18, sample 3, which I promised to send you on my return to Montreal. Thank you for everything you did for me and especially for taking me around the Salem Hills on week days and holidays and for your assistance in collecting the 100-pound sample.

Yours very truly,

H. R. Hose

HRH:EG

Encl.

X-Ray Diffraction:

Pattern K-1821, 1822 and 1823, Sample 1, 2 and 3.

X-ray diffraction shows all the samples to be similar, containing chiefly gibbsite ($Al_2O_3.3H_2O$) and goethite ($Fe_2O_3.H_2O$). There would appear to be some magnetite (Fe_3O_4) and/or gamma - Fe_2O_3* in all the samples with sample 3 containing the largest quantity. A small amount of hematite is possibly present in the samples. A few weak lines in samples 2 and 3 agree moderately well with data for dickite ($Al_2O_3.2SiO_2 2H_3O$). A small amount of quartz is possibly present in the samples.

* The X-ray diffraction data for magnetite and gamma - Fe_2O_3 are similar.

Spectrographic:

	%Al	%Si	%Fe	%Ti	%Mn	% Mg	% V	% Zr	% Ca	% Cu
Supposed Bauxite No. 1	24.	4.	8.	3.	.01	.01	.01	.05	.003	.001
Supposed Bauxite No. 2	22.	4.	8.	2.	.01	.009	.02	.04	.001	.002
Supposed Bauxite No. 3	24.	4.	9.	3.	.01	.01	.02	.04	.001	< .001

% of Al, Si, Fe and Ti were corelated with accuracy programme sample No. 3 and correct the other elements were not corrected to standards.

Semi quantitative estimates.

		L.O.I.	SiO_2	Fe_2O_3	TiO_2	Al_2O_3 (by diff.)
		19.00	3.02	30.90	7.32	39.68
K - 1821	23 (22-24)	21.66	3.29	29.62	7.32	38.11
			7.68	31.2		38.96
K - 1822	19 (12-14)	20.45	7.57	28.99	6.12	36.87
		17.00	5.30			42.04 = 59
K - 1823	18	21.11	5.80	29.46	6.22	37.41

(26-28) 36.20 7.00 2.62 31.34 L.O.I. 20.25 97.41

(4-6) 61.32 2.66 3.56 9.08 26.51 103.13

21.66 3.29 29.62 7.32 61.89

100.00 61.89 38.11

36.87 20.95 7.57 28.99 6.12 100.00

	Loss.	SiO_2	Fe_2O_3	TiO_2	Al_2O_3 (Diff)
Sample 1	21.7	3.29	29.6	7.32	38.09
Sample 2	20.5	7.57	29.0	6.12	36.81
Sample 3	21.1	5.80	29.5	6.22	37.38

All samples consist principally of (XRD) gibbsite and goethite also probably some magnetite and maybe quartz and dickite (weak lines). Rutile and anatase not noted (these usually show up). It seems that the Ti is probably all as ilmenite. The XRD is preliminary only full results XRD and spectrographic on 21/1/55.

March 13, 1956

Mr. M. J. Mundorff, District Geologist
U. S. Geological Survey
Water Resources Division, Ground Water Branch
2128 South 38th Street
Tacoma 9, Washington

Dear Mr. Mundorff:

Just a short note to thank you for sending me your photomicrograph negatives. They appear to be in excellent condition, and if I am able to use them in the bulletin I will certainly acknowledge the source.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Water Resources Division - Ground Water Branch
2128 South 38th Street
Tacoma 9, Washington

March 7, 1956

Mr. R. E. Corcoran, Geologist
Department of Geology and Mineral Inudustries
1069 State Office Building
Portland, 1 Oregon

Dear Mr. Corcoran,

I was very much interested to learn of your investigation and report on the ferruginous bauxite deposits in the Salem Hills.

I used the name "Illahee formation" after Thayer. I presume the chief reason he used a new name was because he felt that exact correlation at that time was not possible. However, now that these beds have been more precisely correlated and have been traced more or less continuously into the Eugene formation, I see no reason for not calling them the Eugene formation.

I did a bit of rummaging around in the attic and finally located the photomicrograph negatives and some positives. These are enclosed. I also have the thin sections which appear to be usable, although the Canada balsam has yellowed around the edges. If these would be useful to you I would be glad to lend them.

I will be very interested in seeing your report when it is completed.

Sincerely yours,

M. J. Mundorff

M. J. Mundorff
District Geologist

Enc.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Albany, Oregon

March 7, 1956

RECEIVED
MAR 8 1956
STATE DEPT. OF GEOLOGY
& MINERAL INDS.

Hollis M. Dole, Director
Oregon State Department of
Geology and Mineral Industries
1069 State Office Building
Portland 1, Oregon

Dear Mr. Dole:

At the last AIME meeting on February 17th Mr. Libbey asked me to send you the chemical analyses of the ferruginous bauxite samples the Bureau obtained from the Hendricks property and the Perry property southwest of Salem. About a 5-ton sample was obtained from a field approximately 1/2 mile north of Perry's buildings. I am not sure of the exact location from which the Hendrick's sample was obtained; however, I believe Mr. Hendricks has referred to the location as the Bridge's place. The analyses of these samples are tabulated below:

	Fe	SiO_2	Al_2O_3	TiO_2	LOI	P	Tons
	22.6						
Perry's	22.8	4.4	38.6	5.16	20.6	0.47	5
Hendrick's	18.6	17.2	33.4	2.67	18.03	0.25	30
	26.6						

I believe Mr. Libbey and Mr. Corcoran wish to use these analyses in the bulletin they are preparing on ferruginous bauxite.

If I can be of any further assistance please do not fail to call on me.

Sincerely yours,

Lloyd H. Banning

Lloyd H. Banning
Chief, Branch of Pyrometallurgy
Region I

Thought you might be interested. Pls. return REC

KAISER ALUMINUM & CHEMICAL CORPORATION

KAISER BUILDING, 1924 BROADWAY, OAKLAND 12, CALIFORNIA

December 27, 1955

R. E. Corcoran
Department of Geology & Mineral Industries
State of Oregon
1069 State Office Building
Portland 1, Oregon

Dear Mr. Corcoran:

This is in reply to your letter of December 16 to Mr. H. S. Fowler, requesting the analyses of the six bauxite samples you sent to Baton Rouge last May. I am pleased to send you the following results of those analyses:

Hole No.	18	20	21	22	22	23
Interval Feet	4-18	8-20	4-18	4-25	4-6	4-32
Sample No.	X-14	X-16	X-17	X-18	X-20	X-19
Total Al_2O_3	33.2 32.8			36.6 36.8		35.9 33.8
SiO_2	6.44	7.75	11.95	5.03	8.5	6.03
L.O.I.	18.55			17.37		16.80
Fe_2O_3	33.0			34.6		33.8
TiO_2	6.8			7.3		7.2
P_2O_5	1.29			0.98		0.87
CaO						.23

You may feel free to use our data in your bulletin provided you do not cite the source of your information. We would very much like to obtain a copy of the bulletin and would appreciate being notified as soon as it is available.

Let me take this opportunity to thank you again for your cooperation with our exploration efforts. Please let me know if I can be of any further service to you.

Very truly yours,

KAISER ALUMINUM & CHEMICAL CORP.

H F Kurtz

H. F. Kurtz
Exploration Department

HFK:bn

cc: H. S. Fowler

KACC - EXPLORATION DEPT.

Country USA Town Salem **Nº x 20**

Property Salem Hills

Location Hole 22

Sample Interval 4-6 True Width 2.

Remarks Dept Analysis total Al_2O_3 52.3% SiO_2 8.3

Sample Sent to N. Bell Baton Rouge

Analyze for: (Dry basis)							
	T. Al_2O_3 ☐		T-SiO_2 ☒		Zn ☐		☐
	T.A.A. ☒		A-SiO_2 ☐		CaF_2 ☐		☐
	T.H.A. ☐		Fe_2O_3 ☐		R_2O_3 ☐		☐
	L.O.I. ☐		TiO_2 ☐		$CaCO_3$ ☐		☐
	Insol. ☐		T-P_2O_5 ☐		$BaSO_4$ ☐		☐
			A-P_2O_5 ☐		S= ☐		☐

Send Analyses to H S Fowler Oakland

Nº x 20 | Date May 12, 19 55 By HSF

KACC - EXPLORATION DEPT.

Country Town **Nº x 19**

Property As No. 3.

Location Hole 23

Sample Interval 4-32 True Width 28'

Remarks Oregon State Lab finds TiO_2 & Fe_2O_3 tend to interfere so total including Al_2O_3 is >100%

Sample Sent to N. Bell. Baton Rouge

Analyze for: (Dry basis)							
	T. Al_2O_3 ☒		T-SiO_2 ☒		Zn ☒	CaO	☒
	T.A.A. ☒		A-SiO_2 ☒		CaF_2 ☐		☐
	T.H.A. ☒		Fe_2O_3 ☒		R_2O_3 ☐		☐
	L.O.I. ☒		TiO_2 ☒		$CaCO_3$ ☐		☐
	Insol. ☐		T-P_2O_5 ☒		$BaSO_4$ ☐		☐
			A-P_2O_5 ☒		S= ☐		☐

Send Analyses to H S Fowler Oakland

Nº x 19 | Date May 10, 19 55 By HSF

KACC - EXPLORATION DEPT.

Country Town **Nº x 18**

Property As No 3

Location Hole 22

Sample Interval 4-25 True Width 21

Remarks Samples 3-19 are compos of 2' intervals prepared by Andy Corcoran.

Sample Sent to N. Bell. Baton Rouge

Analyze for: (Dry basis)							
	T. Al_2O_3 ☒		T-SiO_2 ☒		Zn ☒		☐
	T.A.A. ☒		A-SiO_2 ☒		CaF_2 ☐		☐
	T.H.A. ☒		Fe_2O_3 ☒		R_2O_3 ☐		☐
	L.O.I. ☒		TiO_2 ☒		$CaCO_3$ ☐		☐
	Insol. ☐		T-P_2O_5 ☒		$BaSO_4$ ☐		☐
			A-P_2O_5 ☒		S= ☐		☐

Send Analyses to

Nº x 18 | Date May 10, 19 55 By HSF

KACC - EXPLORATION DEPT.

Country ..... Town .....

Property As No 3 Hole 21

Location .....

Sample Interval 4-18 True Width 14'

Remarks .....

Sample Sent to .....

Analyze for:							
(Dry basis)	T. Al_2O_3	☐	T-SiO_2	☒	Zn	☐	☐
	T.A.A.	☒	A-SiO_2	☐	CaF_2	☐	☐
	T.H.A.	☐	Fe_2O_3	☐	R_2O_3	☐	☐
	L.O.I.	☐	TiO_2	☐	$CaCO_3$	☐	☐
	Insol.	☐	T-P_2O_5	☐	$BaSO_4$	☐	☐
			A-P_2O_5	☐	S=	☐	☐

Send Analyses to

№ x 17 | Date ....., 19..... By HSF

KACC - EXPLORATION DEPT.

Country ..... Town .....

Property As No 3. Hole 20

Location .....

Sample Interval 8 - 20.5 True Width ~~10~~ 12.5

Remarks .....

Sample Sent to .....

Analyze for:							
(Dry basis)	T. Al_2O_3	☐	T-SiO_2	☒	Zn	☐	☐
	T.A.A.	☒	A-SiO_2	☐	CaF_2	☐	☐
	T.H.A.	☐	Fe_2O_3	☐	R_2O_3	☐	☐
	L.O.I.	☐	TiO_2	☐	$CaCO_3$	☐	☐
	Insol.	☐	T-P_2O_5	☐	$BaSO_4$	☐	☐
			A-P_2O_5	☐	S=	☐	☐

Send Analyses to

№ x 16 | Date ....., 19..... By HSF

KACC - EXPLORATION DEPT.

Country ..... Town .....

Property As No 3.

Location Hole 18

Sample Interval 4-18 True Width .....

Remarks .....

Sample Sent to N. Bell Baton Rouge

Analyze for:							
(Dry basis)	T. Al_2O_3	☒	T-SiO_2	☒	Zn	☒	☐
	T.A.A.	☒	A-SiO_2	☒	CaF_2	☐	☐
	T.H.A.	☒	Fe_2O_3	☒	R_2O_3	☐	☐
	L.O.I.	☒	TiO_2	☒	$CaCO_3$	☐	☐
	Insol.	☐	T-P_2O_5	☒	$BaSO_4$	☐	☐
			A-P_2O_5	☒	S=	☐	☐

Send Analyses to H S Fowler Oakland

№ x 14 | Date May 10 ....., 19 55 By HSF

May 17, 1955

Mr. H. S. Fowler
Kaiser Aluminum & Chemical Corporation
1924 Broadway
Oakland 12, California

Dear Mr. Fowler:

I have sent the composite samples from Holes 18, 20, 21, 22, and 23 and the separate from the 4 to 6 foot interval in Hole 22 down to your Baton Rouge plant as you requested. You will note that we are enclosing a bill for the postage in the amount of $1.60.

Also enclosed is a reprint from one of our ORE.-BIN articles concerning the "Limestone Deposits of Oregon." Although this was originally published in 1943, there is little to add in the way of any further developments. As you can see, the deposits in the Gold Hill area of Josephine County in southwestern Oregon and the Baker County deposits in eastern Oregon have the highest purity and therefore are of greatest interest. I think the article is as complete as we can make it at the present time. You will note also some analyses of limestone deposits in the Willamette Valley, but I am sure these will have too high a silica percentage.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk
Encl.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

RECEIVED
DEC 17 1954
STATE DEPT. OF GEOLOGY
& MINERAL INDS.

Region II

Albany, Oregon
December 16, 1954

REC

Mr. H. M. Dole, Acting Director
State Department of Geology and Mineral Industries
1069 State Office Building
Portland 1, Oregon

Dear Mr. Dole:

This is in reply to your letter of December 10, 1954, regarding the study which was conducted at this laboratory on a suite of ferruginous bauxitic clay samples furnished by your department.

As was requested by Mr. Corcoran when he submitted the samples, a detailed mineralogical study was conducted, with special attention being directed to the identification of all titanium, aluminum, and iron minerals in order to supplement routine chemical analyses made by your department.

Although the results of the x-ray diffraction study were not included in the original report, such a study was made. As was explained at the time of your discussion with Mr. Hess on December 10, 1954, ilmenite was the only titanium mineral that could be identified by x-ray analysis. It was not possible to confirm the microscopic identification of the leucoxene partially because of the very nature of the material and also because of the relatively small amounts present in each of the samples. I believe that a more detailed explanation of this, in relation to the limitations of x-ray analysis, also was explained at the time of your recent discussion with Mr. Hess.

The term "leucoxene" was used in our report for lack of a better applicable classification. According to the more recent works, it has been established that leucoxene consists of fine-grained titanium dioxide minerals, such as rutile and anatase, and in some instances sphene. In the cases noted, it was found to occur as an alteration product of ilmenite, titaniferous magnetite, perovskite, and other titanium minerals. The leucoxene, in the samples furnished by your department, was found to be a direct alteration product of the other titanium minerals in the samples, occurring in part as extremely fine-grained coatings on these minerals.

The liberation data which you refer to in the last paragraph of the report were furnished for the benefit of Mr. Banning as an aid in determining the practicability of recovering the ilmenite by conventional ore dressing

methods. This information was furnished solely for this purpose and has no bearing upon the identification of the ilmenite.

As you requested, a portion of the rejects from Sample DOGMI No. 3 is being returned to you under separate cover.

Sincerely yours,

Mark L. Wright

Mark L. Wright
for Stephen M. Shelton
Regional Director
Region II

December 10, 1954

Dr. Stephen M. Shelton, Regional Director
U. S. Bureau of Mines, Region II
Albany, Oregon

Dear Dr. Shelton:

Thank you very much for the analyses on the ferruginous bauxite samples from Salem Hills, Oregon.

I understood that your organization was to run X-ray diffraction studies on these samples. If this could be done, I am sure it would be of great help as you will note on the petrographic report leucoxene was reported. Leucoxene, according to the later workers, is not a mineral but one of the indefinite mineraloids. Also there appears to be some discrepency between the first paragraph and the last paragraph of page 1 of the report. You will note that the ilmenite is still "locked" through the minus 400 mesh and therefore raises the question of the identification of the ilmenite.

Further, on the chemical analysis of DOGAMI No. 3, 23.4 percent Al_2O_3 is reported. Although we did not analyze this certain section, we analyzed the section just above and just below. Our results were considerably higher than your laboratory reports. Therefore I am wondering if we could obtain a portion of the rejects to check in our laboratory.

Thank you very much for the cooperation you have shown us on this project.

Sincerely yours,

H. M. Dole
Acting Director

HMD:jr

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Albany, Oregon
December 9, 1954

RLC

Hollis M. Dole, Acting Director
Oregon State Department of
Geology and Mineral Industries
1069 State Office Building
Portland 1, Oregon

Dear Mr. Dole:

Attached you will find a report on petrographic and chemical analyses of a suite of ferruginous bauxitic clay samples from Salem Hills, Oregon that your Mr. R. E. Corcoran left with us.

We are happy to be able to cooperate with you in making these studies. If we can be of any further service, please do not hesitate to call on us.

Yours sincerely,

Stephen M. Shelton
Regional Director
Region II

Attachment

RECEIVED
DEC 10 1954
STATE DEPT. OF GEOLOGY
& MINERAL INDS.

The following table summarizes the results of a chemical analyses of the elected samples:

ample Designation	Percentages			
	SiO_2	Al_2O_2	TiO_2	Fe
OGAMI No. 3	8.32 12.1	52.32 23.4	3.06 9.9	9.13 26.1
" No. 11	3.42 2.72 2.6	45.72 33.32 27.2	7.83 6.56 6.7	18.70 24.83 29.8
" No. 13	8.12 7.5	37.68 33.0	(Au 3.17) 7.2	20.11 20.5
" No. 21	23.68 25.7	36.87 33.4	(Au 3.17) 3.7	11.97 11.6
" No. 25	27.28 25.6	27.5? 22.6	7.0? 5.3	20.35 20.9
" No. 28	27.2	22.8	4.7	20.3

H. D. Hess

DH:iw
: Hergert
Hess
Mf
Rf

UNIVERSITY OF MINNESOTA
COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS
MINNEAPOLIS 14

ARTMENT OF GEOLOGY AND MINERALOGY

MD
REC

June 20, 1955

Mr. H. M. Dole, Acting Director
Department of Geology and Mineral Industries
1069 State Office Building
Portland 1, Oregon

Dear Mr. Dole:

Your letter of June 3rd and order No. F84027 for three rock analyses arrived some time ago, and the samples to be analysed have just arrived. We hope to complete the chemical analyses this summer.

Sincerely yours,

S. S. Goldich

S. S. Goldich
Professor of Geology

SSG/ls

RECEIVED
JUN 22 1955
STATE DEPT. OF GEOLOGY
& MINERAL INDS.

UNIVERSITY OF MINNESOTA
COLLEGE OF SCIENCE, LITERATURE, AND THE ARTS
MINNEAPOLIS 14

DEPARTMENT OF GEOLOGY AND MINERALOGY

R E C

1109

June 22, 1955

Mr. R. E. Corcoran
Dept. of Geology & Mineral Industries
1069 State Office Bldg.
Portland 1, Oregon

Dear Mr Corcoran:

Your samples arrived and were acknowledged in reply to a letter by Mr. Dole. I hope we will able to make the analyses this summer. It is hard to estimate how long the work will take. We common encounter unforseen analytical problems, but we will do our best to get the results for you as early as possible.

Sincerely yours,

S S Goldich

June 19, 1956

Dr. Victor T. Allen, Director
Department of Geology and Geological Engineering
Saint Louis University
15 North Grand Boulevard
Saint Louis 3, Missouri

Dear Dr. Allen:

I am returning to you the photographs that you loaned me to be used in our bulletin on the bauxite deposits in the Salem Hills, Oregon.

Thank you again.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk
Encl.

March 13, 1956

Dr. Victor T. Allen, Director
Department of Geology and Geological Engineering
Saint Louis University
15 North Grand Boulevard
Saint Louis 3, Missouri

Dear Dr. Allen:

Just a short note to acknowledge receipt of the photomicrographs you sent me. They appear to be in excellent condition, and if I am able to use them in the bulletin I will acknowledge the source as you requested.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk

March 5, 1956

Dr. Victor T. Allen, Director
Department of Geology and Geological Engineering
Saint Louis University
15 North Grand Boulevard
Saint Louis 3, Missouri

Dear Dr. Allen:

Thank you for your letter on the titanium mineral occurrences of the Oregon bauxites.

The consensus does appear to be that the Oregon laterites are not as unique as I had originally thought from reading the literature. The titanium minerals are apparently extremely fine grained, as the Bureau of Mines analyses indicated that the majority of the ilmenite passed 400 mesh screen. If this is true then probably much of the secondary titanium was lost during concentration, since the x-ray patterns on the concentrates failed to show any of these secondary minerals. Dr. Erwin Roedder of the U. S. Geological Survey did some research on the titanium mineralogy of the Salem laterites for this Department while he was a professor at the University of Utah last spring. If you are interested in learning more details of this problem and the results of his work, I am sure he will be glad to write to you concerning them.

I would appreciate it if you could send me the original photographs mentioned in your letter. We would, of course, acknowledge the source of such photographs if we use them in our bulletin.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk

SAINT LOUIS
UNIVERSITY
"FIRST WEST OF THE MISSISSIPPI"

NSTITUTE OF TECHNOLOGY
PARTMENT OF GEOLOGY AND
EOLOGICAL ENGINEERING

15 NORTH GRAND BOULEVARD
SAINT LOUIS 3, MISSOURI

February 29, 1956

Mr. R. E. Corcoran
Dept. of Geology and Mineral Industries
1069 State Office Building
Portland 1, Oregon

Dear Mr. Corcoran:

Thank you for your letter of February 20, and for writing me about your work on the titanium minerals in the ferruginous bauxite of Oregon. X-ray patterns on leucoxene are hard to get and at the best are poor. It is not possible to estimate the percentage of leucoxene from its x-ray pattern. Leucoxene occurs mainly as a thin coating on some grains. Have you concentrated the titanium minerals by gravity using heavy solutions and the electro-magnet, and run x-ray patterns on the concentrates?

Ilmenite and magnetite are present in many bauxites and laterites. At the plants processing bauxite, the black sands composed of these minerals are removed from the ore and tons of the material is present in the red mud dumps. In my GSA paper (1952 p. 666) appears the statement, "a few grains of rutile, titaniferous magnetite, or ilmenite can be seen in thin sections, but the amounts do not appear sufficient to account for all the titania in the bauxite." On this basis the Oregon laterites are not unique. The lack of abundant leucoxene suggests that the Oregon materials have not been subjected to the same degree of weathering as that at some of the other localities. This is in keeping with the limited distrubution and size of the known deposits in Oregon.

I could send you an original photograph from which Plate 1, Figure 3 and Plate 6, Figure 4 of my GSA paper were made. If it is to be reproduced in any publication, the usual acknowledgement of the source is expected. If this will not do, I will see if I can locate the negatives.

Sincerely yours,

Victor T. Allen

Victor T. Allen
Director, Department of Geology
and Geological Engineering

VTA:bld

February 20, 1956

Dr. Victor T. Allen
St. Louis University
St. Louis, Missouri

Dear Dr. Allen:

I am at present working on a project which concerns the ferruginous bauxite deposits in the Salem Hills, Oregon. One phase of this study on which I have been doing some work is the titanium mineralogy of these deposits. I have had numerous x-ray diffraction studies as well as petrographic work done on some of the bauxitic material and so far as can be determined the only titanium minerals present in these laterites are ilmenite and titaniferous magnetite, although there may perhaps be 1 to 2 percent "leucoxene." From what I have been able to read in the literature, including your paper in the July 1952 Bulletin of the G.S.A., the titanium minerals typically associated with laterites are the various secondary varieties such as anatase, sphene, or brookite. In your paper on the bauxite deposits of Washington and Columbia counties, in the December 1948 Economic Geology magazine, you also mention: "The chief titanium mineral is titaniferous magnetite but the long narrow plates of the black opaque mineral in some thin sections suggest ilmenite. . . . Small amounts of leucoxene giving an x-ray pattern of anatase are also present in some bauxite samples." Do you believe this somewhat unique situation with respect to the Oregon laterites is of any geological or geochemical significance? If you have any particular comments or suggestions bearing on this problem I would very much appreciate hearing from you.

I am also wondering if it would be possible for me to borrow the negatives of the photomicrographs you made on the basalts and gibbsite in the Salem Hills for possible inclusion in our bulletin. I am particularly interested in Plate 1, Fig. 3, and Plate 6, Fig. 4 from your paper in the G.S.A. Bulletin of July 1952.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk

June 19, 1956

Mr. Maurice Mundorff
U. S. Geological Survey
2128 S. 37th Street
Tacoma, Washington

Dear Mr. Mundorff:

I am returning to you the photographs that you loaned me to be used in our bulletin on the bauxite deposits in the Salem Hills, Oregon.

Thank you again.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk
Encl.

February 20, 1956

Mr. Maurice Mundorff
U. S. Geological Survey
2128 S. 37th Street
Tacoma, Washington

Dear Mr. Mundorff:

As you may perhaps have heard, I am writing a bulletin on the ferruginous bauxite deposits in the Salem Hills. I have relied heavily on your thesis in my description of the geology of that area, and have gone one step further in calling the Illahe formation the Eugene formation because of the very close lithologic similarity, age of the fossils, and stratigraphic position. Allison and Felts are calling the Oligocene beds in the Lebanon quadrangle Eugene formation, and the Illahe here beneath the Salem Hills can be traced almost directly into their area. I hope this won't be too much out of line with your thinking on this problem.

One other thing I am interested in obtaining from you would be either the original snapshots or preferably the negatives of some of the photomicrographs you took of the Salem Hills basalt. If I could obtain such photomicrographs I would like to include them in the bulletin.

If you have any comments concerning the geology of the area I would appreciate hearing from you.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk

December 22, 1955

Mr. Donald Trimble
Geology Division
U. S. Geological Survey
Denver Federal Center
Denver, Colorado

Dear Don:

I am presently in the throes of writing up the bulletin on bauxite in the Salem Hills.

One of the things I wanted to discuss in the bulletin is the age of the laterization of the basalts. During one of our conversations last year you brought out the idea that the laterization may have been restricted to only one period and was probably later than many people had heretofore realized. If I understood you correctly at that time, you summarized the situation by stating that the laterization must have been post-Rhododendron, which would place it in middle or upper Pliocene. You restricted the laterization to one period by saying that where the older lavas were exposed during post-Rhododendron time they were laterized, but in other areas of the valley where the Miocene lavas had been covered by younger material (i.e., the Rhododendron) these younger deposits became laterized.

However, since I may not have understood your thinking in this matter completely, I was wondering if you could send me a short letter briefly outlining your ideas on this problem of the age of the laterization and whether you feel there was more than period.

Sincerely yours,

R. E. Corcoran
Geologist

REC:lk

IN REPLY REFER TO:
G-Eng-Den:DET

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
Geologic Division
Denver Federal Center
Denver, Colorado

January 5, 1956

Mr. R. E. Corcoran, Geologist
Department of Geology and Mineral Industries
State of Oregon
1069 State Office Building
Portland 1, Oregon

Dear Andy:

Your memory is pretty good on all details, except time of laterization, of the hypothesis that I proposed to you last summer--and the thought is still hypothetical. I suggested that we should consider the possibility that there was only one period of laterization and that the period of laterization was post-Rhododendron but pre-Troutdale in age. The Rhododendron is post-Molalla, which according to Dr. R. W. Brown is middle Miocene, and the laterite developed on the Rhododendron is overlain by basal Troutdale siltstone as you have seen. The only age commitment we have on the Troutdale is from flora from the top of the basal siltstone section that Ralph Chaney says are lower Pliocene, a dating with which Brownie is inclined to agree. The period of laterization then is lower Pliocene or upper Miocene or both. The restricted age of the Rhododendron and its laterite are proposed in an abstract entitled "New Concept of the Rhododendron formation of Hodge," by D. E. Trimble that will appear in the December issue of Bulletin of GSA.

Where the Rhododendron rests on the Columbia River basalt with no intervening Molalla sediments--as in the Bull Run River, Sandy River, Eagle Creek, and the Clackamas River--the contact has not been observed directly, but I have seen no evidence to suggest laterization of the Columbia River basalt in these areas. The basalt has been laterized, however, only a few miles north of the Bull Run River near Crown Point. This, plus the unlikely age proximity of two rather extensive horizons of laterite if they were the products of two separate periods of laterization, lead me to suggest that both the laterite developed on the Columbia River basalt and the laterite developed on the Rhododendron formation might have resulted from one period of laterization.

At the present time then, I believe the weight of evidence is strongest for only one period of laterization, but I don't think we can discard the possibility that the two laterites are the result of separate periods of laterization. Does this confuse you sufficiently?

Since my return in September, I have been acting as the geologist-in-charge of our Manuscript Processing Unit and have accomplished practically nothing on the Portland reports. I have now been relieved of the staff chore and hope to get down to my own work. I see by the paper that the rains have raised havoc in Portland.

Best regards to all.

Sincerely,

Don

Donald E. Trimble
Geologist
Engineering Geology Branch

Sample locations for DOGAMI museum's collection of laterites and bauxites

Sample No.	Material*	County	Location & other information
CC-1	fine-grain Fer. Bauxite	Columbia	no record
CC-2	nodular Fer. Bauxite	Columbia	no record
CC-3	fine-grain Fer. Bauxite	Cowlitz (WA)	no record
CC-4	fine-grain Fer. Bauxite	Cowlitz (WA)	no record
CC-5	fine-grain Fer. Bauxite	Washington	no record
NY-17	fine-grain Laterite	Columbia	Sec31, T5N, R1W Vrvilo Pit
NY-23	pisolitic Laterite nodule	Columbia	Sec23, T5N, R2W Fay Olsen Pit
NY-100	pisolitic Laterite	?	Sec1, T4N, R2W St Helens area, Soderberg drill hole #2, 33-36'
NY-104	pisolitic Clay	?	Sec1, T4N, R2W St Helens area, Soderberg drill hole #2, 30-33'
NY-106	pisolitic Laterite	?	Sec1, T4N, R2W St Helens area, Madsen drill hole #10
NY-111	nodular Laterite	?	Sec1, T4N, R2W St Helens area, Soderberg drill hole #3, 47-50'
NY-113	nodular Laterite	?	Sec1, T4N, R2W St Helens area, Soderberg drill hole #3, 44-47'
NY-120	weathered Basalt	?	Sec1, ? ? St Helens area, Soderberg drill hole #9, 115'
NY-149	Laterite nodule (float)	?	Sec 34, T5N, R2W Columbia City area
PO-467	Laterite	?	S1/2 Sec1, T9S, R2E Mehama ?Kiel Creek area
PO-471	Fer. Bauxite	Washington	Sec6, T2N, R2W **(5)** Hillsboro quad, Hendrickson cut, elev 1280'
PO-472	pisolitic Fer Bauxite	Washington	NW1/4 Sec3, T1N, R2W **(12)** Hillsboro quad, Leitzel , elev 350'
PO-473	Fer. Bauxite	Washington	NW1/4 Sec27, T2N, R2W **(14)** Hillsboro q., Anderson, elev 800'
PO-474	Fer. Bauxite	Multnomah	SW1/4SE1/4 Sec25, T1N, R4E Camas quad, R'ster Rk Rd, el 600'
PO-476	Gibbsitic nodule	Washington	NW1/4Sec27, T2N, R2W **(14)** Hillsboro q., Anderson, elev 800'
PO-477	porous Bauxite nodule	Marion	NEcornSW1/4Sec28, T8S, R3W Salem quad
PO-478	pisolitic Fer. Bauxite	Washington	Sec3, T1N, R2W Hillsboro quad, Leitzel locality, elev 350-400'
PO-479	porous Fer. Bauxite	Columbia	Sec34, T7N, R2W **(30)** Kalama quad, elev 1150'
PO-480	pisolitic Fer. Bauxite	Columbia	Sec1, T4N, R2W St Helens quad
PO-481	pisolitic Fer. Bauxite	Columbia	Sec18, T7N, R2W **(32)** Kalama quad, elev 665'
PO-482	Bauxite	Marion	SE1/4Sec1, T9S, R2E McMahon claims near Mehama
PO-484	banded Gibbsite float	Marion	Sec19, T9S, R2W Stayton quad, elev 650'
PO-485	porous Bauxite nodule	Marion	Sec30, T8S, R3W **(81)** Salem quad, elev 825'
PO-486	pisolitic Fer. Bauxite	Marion	SW1/4Sec15, T8S, R3W **(93)** Salem quad, elev 500'
PO-487	Gibbsite nodule	Marion	SE1/4Sec26, T8S, R3W **(86)** Salem quad, elev 750'
PO-488	Gibbsite nodule	Marion	SE1/4Sec35, T8S, R3W Salem quad
PO-489	pisolitic Bauxite	Marion	SW1/4Sec15, T8S, R3W **(93)** Salem quad, elev 500'
PO-491	Gibbsite nodule	Marion	NW1/4Sec21, T8S, R1W Stayton quad, in Fern ridge tuff, elev 500'
PO-492	Bauxite	Marion	SE1/4Sec1, T9S, R2E McMahon claims near Mehama
PO-495	Gibbsite nodule	Marion	Sec30, T8S, R3W, **(81)** Salem quad, elev 825'
PO-496	porous Gibbsite nodule	Marion	NE1/4SW1/4Sec28, T8S, R3W **(83)** Salem quad, elev 775'

*Some terms were used as synoynms: Laterite = Ferruginous Bauxite

(xx) indicates samples collected and analyzed for *Ferruginous Bauxite Deposits in Northwest Oregon*, by F. Libbey, W. Lowry, R. Mason, 1945 (out of print, available through the State Library), DOGAMI Bulletin 29.

Compiled by G.L. Baxter from existing documents. ~~Not~~ proof read.

FINE-GRAINED FERRUGINOUS BAUXIT

Cowlitz County, Washingt

Al_2O_3 . . . 42.42 percent

SiO_2 . . . 1.26 "

Fe_2O_3 . . . 27.52 "

TiO_2 . . . 4.24 "

FINE-GRAINED FERRUGINOUS BAUXITE

Washington County, Oregon

Al_2O_3 . . . 33.01 percent

SiO_2 . . . 1.82 "

Fe_2O_3 . . . 38.40 "

TiO_2 . . . 7.99 "

NODULAR FERRUGINOUS BAUXITE

Columbia County, Oregon

Al_2O_3 . . . 39.82 percent

SiO_2 . . . 4.22 "

Fe_2O_3 . . . 28.10 "

TiO_2 . . . 4.55 "

FINE-GRAINED FERRUGINOUS BAUXITE

Cowlitz County, Washington

Al_2O_3 . . . 34.53 percent

SiO_2 . . . 12.14 "

Fe_2O_3 . . . 28.02 "

TiO_2 . . . 6.61 "

FINE-GRAINED FERRUGINOUS BAUXIT

Columbia County, Orego

Al_2O_3 . . . 37.75 percen

SiO_2 . . . 2.24 "

Fe_2O_3 . . . 32.20 "

TiO_2 . . . 7.32 "

No. NY 106

THE ALCOA MINING COMPANY
Specimen Collection

Specimen of Pisolitic Laterite
Locality St. Helens Area
Date Collected 1946
Collected by Sample crew
Described in
Description Madsen drill hole #10

FOR ANALYSIS SEE OTHER SIDE

No. NY-17

THE ALCOA MINING COMPANY
Specimen Collection

Specimen of Fine-grained Laterite
Locality Vrvilo Pit-Columbia County
Date Collected 3-1-50
Collected by Lewis & Robbins
Described in
Description

FOR ANALYSIS SEE OTHER SIDE

NY111

THE ALCOA MINING COMPANY
Specimen Collection

Specimen of Nodular Laterite
Locality St. Helens Area
Date Collected 1945
Collected by Sample crew
Described in
Description Soderberg drill hole #3
47' to 50'

FOR ANALYSIS SEE OTHER SIDE

No. NY-23

THE ALCOA MINING COMPANY
Specimen Collection

Specimen of Pisolitic Laterite Nodu
Locality Fay Olsen Pit-Columbia Co.
Date Collected 3-1-50
Collected by Lewis & Robbins
Described in
Description

FOR ANALYSIS SEE OTHER SIDE

No. NY 113

THE ALCOA MINING COMPANY
Specimen Collection

Specimen of Nodular Laterite
Locality St. Helens Area
Date Collected 1945
Collected by Sample crew
Described in
Description Soderberg drill hole #3
44' to 47'

FOR ANALYSIS SEE OTHER SIDE

No. NY 100

THE ALCOA MINING COMPANY
Specimen Collection

Specimen of Pisolitic Laterite
Locality St. Helens Area
Date Collected 1945
Collected by Sample Crew
Described in
Description Soderberg Drill Hole #
33' - 36'

FOR ANALYSIS SEE OTHER SIDE

No. NY 120

THE ALCOA MINING COMPANY
Specimen Collectio

Specimen of Weathered Basalt
Locality St. Helens Area
Date Collected 1945
Collected by Sample Crew
Described in
Description Soderberg Drill Hole #9
115'

FOR ANALYSIS SEE OTHER SIDE

No. NY 104

THE ALCOA MINING COMPANY
Specimen Collection

Specimen of Pisolitic Clay
Locality St. Helens Area
Date Collected 1945
Collected by Sample crew
Described in
Description Soderberg drill hole #2
30' - 33'

FOR ANALYSIS SEE OTHER SIDE

No. NY 113

Analysis made by Hillsboro

Date made 5/31/50

Al_2O_3	29	50
SiO_2	14	02
Fe_2O_3	34	68
TiO_2	5	61
Loss	16	19
Moisture		
FeO		
MgO		
CaO		
Na_2O		
K_2O		
N.R. SiO_2		32
Al_2O_3 Det.	28	21
Total		

Remarks Sec. 1, T4N, R2W

No. NY 104

Analysis made by Hillsboro

Date made 5/31/50

Al_2O_3	31	50
SiO_2	13	30
Fe_2O_3	34	30
TiO_2	5	57
Loss	15	33
Moisture		
FeO		
MgO		
CaO		
Na_2O		
K_2O		
N.R. SiO_2	3	38
Al_2O_3 Det.	30	83
Total		

Remarks Sec. 1, T4N, R2W

No. N.Y. 17

Analysis made by Hillsboro Lab

Date made March 13, 1950

Al_2O_3	32	82
SiO_2	2	34
Fe_2O_3	36	90
TiO_2	8	94
Loss	19	00
Moisture		
FeO		
MgO		
CaO		
Na_2O		
K_2O		
N.R. SiO_2		00
Total		

Remarks Sec. 31, T5N, R4W

No. NY 120

Analysis made by Hillsboro

Date made 5/31/50

Al_2O_3	28	93
SiO_2	25	66
Fe_2O_3	26	76
TiO_2	5	37
Loss	13	28
Moisture		
FeO		
MgO		
CaO		
Na_2O		
K_2O		
N.R. SiO_2		64
Al_2O_3 Det.	28	67
Total		

Remarks Sec. 1, T

No. NY 106

Analysis made by Hillsboro

Date made 5/31/50

Al_2O_3	35	91
SiO_2	5	78
Fe_2O_3	31	54
TiO_2	6	85
Loss	19	92
Moisture		
FeO		
MgO		
CaO		
Na_2O		
K_2O		
N.R. SiO_2	3	42
Al_2O_3 Det.	35	11
Total		

Remarks Sec. 1, T4N, R2W

No. N.Y. 23

Analysis made by Hillsboro Lab.

Date made March 1, 1950

Al_2O_3	27	67
SiO_2	5	14
Fe_2O_3	44	20
TiO_2	9	34
Loss	13	65
Moisture		
FeO		
MgO		
CaO		
Na_2O		
K_2O		
N.R. SiO_2	1	96
Total		

Remarks Sec. 23, T5N, R3W

No. NY 111

Analysis made by Hillsboro

Date made 5/31/50

Al_2O_3	24	98
SiO_2	13	16
Fe_2O_3	42	22
TiO_2	4	34
Loss	15	30
Moisture		
FeO		
MgO		
CaO		
Na_2O		
K_2O		
N.R. SiO_2		08
Al_2O_3 Det.	25	04
Total		

Remarks Sec. 1, T4N, R2W

No. NY 100

Analysis made by Hillsboro

Date made 5/31/50

Al_2O_3	33	27
SiO_2	6	82
Fe_2O_3	35	93
TiO_2	5	10
Loss	18	88
Moisture		
FeO		
MgO		
CaO		
Na_2O		
K_2O		
N.R. SiO_2		40
Al_2O_3 Det.	32	77
Total	100	00

Remarks Sec. 1, T4N, R2W

No. NY 149

THE ALCOA MINING COMPANY
Specimen Collection

Specimen of Laterite Nodule (float)

Locality Columbia City Area

Date Collected April, 1950

Collected by A. A. Lewis

Described in

Description S. L. Miller

FOR ANALYSIS SEE OTHER SIDE

No. NY 149

Analysis made by Hillsboro

Date made 5/31/50

Al_2O_3	50	23	
SiO_2	21	86	
Fe_2O_3	25	13	
TiO_2	5	73	
Loss	17	05	
Moisture			
FeO			
MgO			
CaO			
Na_2O			
K_2O			
N.R. SiO_2		32	
Al_2O_3 Det.	50	14	
Total			

Remarks Sec. 34, T5N, R2W

Laterites PO 467

MUSEUM LABEL

Drawer No. 35 Catalog No.

Date rec'd. Collector

Location: County Quad.
Sec. T. R. Elev.

Description: 2 lateritic samples from Meham Kiel Creek Area -- 5½, sec 1, T9S, R2E - Samp. 7a is good quality material, (+40% Al) Samp 7b is more clayey (+10% SiO_2)

Ident:

See DTA curves

Ferruginous Bauxite PO 471

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 1944 Collector McQueen & Lowry

Location: County Washington Quad. Hillsboro
Sec. 6 T. 2N R. 2W Elev. 1280

Description: Hendrickson cut, (Loc 4) of Bull 29
Piece of FERRUGINOUS BAUXITE
w/ GIBBSITE (white)

Ident: both ores of Aluminum.

p29 Bull 29 3/B Loc 5 g Baxter 1-29-92

Pisolitic Ferruginous Bauxite PO 472

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 1945 Collector Lowry

Location: County Washington Quad. Hillsboro
NW¼ Sec. 3 T. 1N R. 2W Elev. 350'

Description: Leitzel Locality, #12 of Bull. 2
PISOLITIC FERRUGINOUS
BAUXITE (Al. ORE)

Ident:

Ferruginous Bauxite PO. 473

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 2/21/45 Collector Lowry

Location: County Washington Quad. Hillsboro
NW¼ Sec. 27 T. 2N R. NW Elev. 800

Description: Anderson Locality, Loc 14
of Bull 29

Ident: Ferruginous BAUXITE (Al ore)

Ferruginous Bauxite PO 474

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 6/14/46 Collector Lowry

Location: County Multnomah Quad. Camas
SW¼ SE¼ Sec. 25 T. 1N R. 4E Elev. 600±

Description: Rooster Rock Road Laterite =

FERRUGINOUS BAUXITE

Ident:

GIBBSITIC NODULE PO 476

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 2/21/45 Collector

Location: County WASHINGTON Quad. HILLSBORO
NW¼ Sec. 27 T. 2N R. 2W Elev. 800

Description: Loc 14 of Bull. 29

GIBBSITIC NODULE

Ident:

BAUXITE NODULE PO 477

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 4/28/45 Collector Lowry

Location: County Marion Quad. Salem
NE CORN. SW¼ Sec. 28 T. 8S R. 3W Elev.

Description: Porous granular BAUXITE
Nodule (Thin sectioned)

Ident:

PISOLITIC FERRUGINOUS BAUXITE PO 478

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 7/44 Collector Lowry

Location: County Washington Quad. Hillsboro
Sec. 3 T. 1N R. 2W Elev. 350-40

Description: Leitzel Locality

PISOLITIC FERRUGINOUS BAUXITE

Ident:

FERRUGINOUS BAUXITE PO 479

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 3/13/45 Collector W.O. COWRY

Location: County Columbia Quad. Kalama
Sec. 34 T. 7N R. 2W Elev. 1150

Description: Locality 30 of Bull. 29

POROUS GRANULAR FERRUGINOUS

Ident: BAUXITE

PISOLITIC FERRUGINOUS BAUXITE PO 480

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 1/3/45 Collector W.O. Lowry

Location: County Columbia Quad. St. Helens
Sec. 1 T. 4N R. 2W Elev.

Description: Yankton R.R. cut -- Concretion
in PISOLITIC FERRUGINOUS
BAUXITE

Ident:

Pisolitic Ferruginous Bauxite PO-481

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 1945 Collector W. O. Lowry

Location: County Columbia Quad. Kalama
Sec. 18 T. 7N R. 2W Elev. 665

Description: Locality 32 of Bull. 29

Ident: PISOLITIC FERRUGINOUS
BAUXITE

BAUXITE PO 482

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 7/15/50 Collector F.W. Libbey

Location: County Marion Quad.
SE 1/4 Sec. 1 T. 9S R. 2E Elev.

Description: From McMahon claims near
Mehama: BAUXITE

Ident:

Banded Gibbsite PO 484

MUSEUM LABEL

Drawer No. 1945 Catalog No.

Date rec'd. 52 Collector W. D. Lowry

Location: County Marion Quad. Stayton
Sec. 19 T. 9S R. 2W Elev. 650

Description: Banded Gibbsite (float)

Ident:

BAUXITE PO 485

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 4/27/45 Collector Lowry

Location: County Marion Quad. Salem
Sec. 30 T. 8S R. 3W Elev. 825

Description: Locality 81 of Bull. 29
Nodule of porous granular

Ident: BAUXITE

Pisolitic Ferruginous Bauxite PO 486

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 1945 Collector Lowry

Location: County Marion Quad. Salem
SW 1/4 Sec. 15 T. 8S R. 3W Elev. 500

Description: Locality 93 of Bull 29

Ident: PISOLITIC FERRUGINOUS
BAUXITE

GIBBSITE PO 487

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 4/28/45 Collector Lowry

Location: County Marion Quad. Salem
SE 1/4 Sec. 26 T. 8S R. 3W Elev. 750'

Description: Loc 86 of Bull 29

Ident: GIBBSITE NODULE (Thn Sectioned)

P-3546

GIBBSITE PO 488

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 4/28/45 Collector Lowry

Location: County Marion Quad. Salem
SE 1/4 Sec. 35 T. 8S R. 3W Elev.

Description: Gibbsite Nodule
P-3542

Ident:

PISOLITIC BAUXITE PO 489

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 9/1/45 Collector Lowry

Location: County Marion Quad. Salem
SW 1/4 Sec. 15 T. 8S R. 3W Elev. 500

Description: Loc 93 of Bull 29

Ident: PISOLITIC BAUXITE

GIBBSITE PO 491

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 1945 Collector Lowry ~~Stayton~~

Location: County Marion Quad. Stayton
NW 1/4 Sec. 21 T. 8S R. 1W Elev. 500

Description: Gibbsite Nodules found
in fern ridge tuff.

Ident:

Bauxite PO 492

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 7/15/50 Collector F. W. Libbey

Location: County Marion Quad.
SE 1/4 Sec. 1 T. 9S R. 2E Elev.

Description: From Mc Mahon claims
near Mehama: Bauxite

Ident:

Gibbsite PO 495

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 4/27/45 Collector Lowry

Location: County Marion Quad. Salem
Sec. 30 T. 8S R. 3W Elev. 825

Description: Locality 81 of Bull. 29

Ident: GIBBSITE Nodule
P-3533

Gibbsite PO 496

MUSEUM LABEL

Drawer No. 52 Catalog No.

Date rec'd. 4/28/45 Collector Lowry

Location: County Marion Quad. Salem
Sec. 28 T. 8S R. 3W Elev. 775

Description: Locality 83 of Bull. 29

Ident: Porous granular nodule of
Gibbsite

NEIL GOLDSCHMIDT
GOVERNOR

Department of Geology and Mineral Industries
ADMINISTRATIVE OFFICE
910 STATE OFFICE BLDG., 1400 SW 5th AVE., PORTLAND, OR 97201-5528 PHONE (503) 229-5580

January 10, 1989

Dr. Douglas Jinks
Chief Geologist
Reynolds Metals
6601 W. Broad Street
P.O. Box 27003
Richmond, VA 23261

Dear Dr. Jinks,

Our Department and the Geology Department of Portland State University would like to have access to the laterite drill core stored at Troutdale, Oregon.

Thank you.

Sincerely,

Jerry J. Gray
Economic Geologist
Dept. of Geology & Mineral Industries

Michael L. Cummings
Dr. Michael L. Cummings
Associate Professor
Department of Geology
Portland State University

C O P Y

ALCOA MINING COMPANY

Drill Hole Record

Property: Dudley No. 20 - NW¼ NW¼ Sec. 5, T. 2 N., R. 2 W.
Special Deep Test Hole Washington County

Location: 140' N. of W. Line
40' N. of S. Line

Elevation: 1371'

From	To	Description
0	7	Gray and tan silt.
7	13	Tan silt with scattered oolites.
13	43	Reddish tan and red silty clay with scattered oolites.
43	47	Red clay with oolites increasing in quantity from 45' to 47'.
47	51	Red oolitic and pisolitic laterite with greenish tan streaks.
51	59	Dark reddish brown fine-grained laterite with scattered nodules.
59	61	Dark greenish brown fine-grained laterite with scattered nodules.
61	67	Reddish and greenish gray plastic clay with tan and black streaks.
67	71	Tan, very fine-grained laterite clay with scattered pisolites and with black and gray streaks.
71	91	Tan crumbly clay (weathered basalt) with black, brown, red, and gray streaks and with scattered streaks of fine-grained lateritic material and weathered basalt nodules.
91	131	Tan crumbly clay (weathered basalt) with black, grayish green, brown, and red streaks and with scattered red brittle streaks.
131	155	Hard, dark green basalt.

Total depth 155'

C O P Y

ALCOA MINING COMPANY

Oregon Department

Laboratory Report: Hillsboro Laboratory

Analysis of: Special

This Report for: File: H.M., W.Y., R.J.A.

Date: January 14, 1946

DUDLEY NO. 20 - DEEP TEST

From To	Al_2O_3	Fe_2O_3	SiO_2	TiO_2	Ignition loss	Residue %	Al_2O_3 Det.
3' - 5'	26.60	6.10	62.30	.93	4.07	14	
5' - 7'	25.36	6.80	61.66	1.10	5.08	10	
7' - 9'	26.15	7.40	58.96	1.15	6.34	8	
9' - 11'	25.11	7.90	59.10	1.26	6.63	6	
11' - 13'	24.24	8.50	59.00	1.33	6.93	4	
13' - 15'	24.13	9.20	57.82	1.49	7.36	2	
15' - 17'	24.63	9.40	56.82	1.46	7.69	2	
17' - 19'	25.00	9.60	56.00	1.43	7.97	2	
19' - 21'	23.58	9.30	58.06	1.46	7.60	2	
21' - 23'	24.37	9.10	57.82	1.38	7.33	1	
23' - 25'	24.17	9.40	57.22	1.49	7.72	2	
25' - 27'	22.02	8.60	60.86	1.49	7.03	2	
27' - 29'	21.50	8.60	61.58	1.49	6.83		
29' - 31'	22.84	9.40	58.56	1.54	7.66		
31' - 33'	24.17	9.70	56.20	1.51	8.42		
33' - 35'	22.99	9.20	58.44	1.51	7.86		
35' - 37'	22.32	8.80	60.28	1.49	7.11		
37' - 39'	21.45	8.50	61.68	1.38	6.99		
39' - 41'	21.81	9.10	60.42	1.38	7.29		
41' - 43'	23.68	9.80	57.00	1.46	8.06		
43' - 45'	32.68	22.80	27.60	3.03	13.89		
45' - 47'	37.41	27.90	10.98	4.41	19.30		36.89
47' - 49'	34.08	39.50	3.30	6.08	17.04		
49' - 51'	36.35	34.80	2.10	6.61	20.14		
51' - 53'	33.91	37.30	2.44	5.89	20.46		
53' - 55'	36.64	33.50	2.12	6.85	20.89		
55' - 57'	37.12	33.00	1.76	7.21	20.91		
57' - 59'	35.58	35.70	.92	7.47	20.33		
59' - 61'	32.38	37.80	3.96	7.42	18.44		
61' - 63'	28.76	36.10	12.92	7.42	14.80		
63' - 65'	31.57	31.20	15.62	6.23	15.38		
65' - 67'	38.98	24.30	11.44	5.57	19.71		
67' - 69'	39.77	29.60	3.38	5.49	21.76		

From	To	Al_2O_3	Fe_2O_3	SiO_2	TiO_2	Ignition loss	Residue %	Al_2O_3 Det.
69'	- 71'	36.62	27.60	11.36	5.45	18.97		
71'	- 73'	34.04	32.00	8.78	6.90	18.28		
73'	- 75'	31.07	23.60	26.08	5.25	14.00		
75'	- 77'	27.98	30.10	22.76	6.23	13.02		
77'	- 79'	29.51	27.90	24.18	5.41	13.00		
79'	- 81'	27.19	30.40	23.56	6.65	12.20		
81'	- 83'	27.72	30.60	23.18	5.89	12.61		
83'	- 85'	26.04	31.60	24.24	6.08	12.04		
85'	- 87'	27.72	29.50	23.72	5.94	13.12		
87'	- 89'	28.39	31.20	20.34	6.46	13.61		
89'	- 91'	29.89	29.20	21.16	5.85	13.90		
91'	- 93'	31.21	26.50	22.80	4.90	14.59		
93'	- 95'	34.07	27.30	16.42	5.06	17.15		
95'	- 97'	30.23	23.80	27.66	5.13	13.18		
97'	- 99'	27.91	28.20	26.34	5.57	11.98		
99'	-101'	27.49	29.30	24.26	6.32	12.63		
101'	-103'	27.09	26.80	28.70	5.57	11.84		
103'	-105'	28.59	23.00	31.38	4.55	12.48		
105'	-107'	26.05	31.40	23.72	6.80	12.03		
107'	-109'	26.05	28.30	28.40	5.61	11.64		
109'	-111'	25.99	27.80	28.86	5.73	11.62		
111'	-113'	25.20	29.20	28.40	5.65	11.55		
113'	-115'	25.81	26.70	29.88	5.85	11.76		
115'	-117'	24.64	28.50	30.14	5.17	11.55		
117'	-119'	25.91	27.50	30.32	4.75	11.52		
119'	-121'	25.11	26.90	31.74	5.06	11.19		
121'	-123'	26.36	26.70	30.40	5.41	11.13		
123'	-125'	24.95	26.00	32.34	5.13	10.98		
125'	-127'	24.67	26.40	32.96	5.10	10.87		
127'	-129'	25.03	24.20	35.24	4.86	10.67		
129'	-131'	24.63	22.60	38.22	4.59	9.96		
*131'	-143'	33.67	19.70	35.58	3.89	7.16		
**143'	-155'	37.66	16.60	37.70	3.48	4.56		

*This sample contains 16% residue
**This sample contains 25% residue

Chemist: Joe D. Bryant

November 2, 1976

Mr. Joe B. Rosenbaum
1149 Mercedes Way
Salt Lake City, Utah 84108

Dear Joe:

In accordance with my telephone call with you yesterday, I am forwarding John Hook's proposal to develop additional reserves to Reynolds' holdings of ferruginous bauxite in the Pacific Northwest.

It appears to me to be a well thought-out plan and I hope it will be approved by the Reynolds management.

John refers to our Open File Report 0-76-3 which he prepared for us last year. I understand that you already have a copy of this report, but if you would like another, please let me know.

I am also including John's request for his fee in preparing this proposal and as agreed by you.

If you have any further questions, please feel free to call or write me.

Sincerely yours,

Raymond E. Corcoran
State Geologist

REC:jr
Encl.

1149 Mercedes Way
Salt Lake City, Utah 84108
September 23, 1976

Mr. Ralph S. Mason
Deputy State Geologist
Dept. of Geology and Minerals Industries
1069 State Office Building
Portland, Oregon - 97201

Dear Mr. Mason:

Thanks for your letter of September 20th. I understand that Andy Corcoran may be at the Mining Congress meeting at Denver this weekend. I will try to see him there. Otherwise, I will get in touch with him after my return to Salt Lake City on October 1st.

Sincerely,

Joe B. Rosenbaum
Consulting Metallurgist

JBR:g

September 20, 1976

Mr. Joe B. Rosenbaum
Metallurgical Consultant
1149 Mercedes Way
Salt Lake City, Utah 84108

Dear Mr. Rosenbaum:

Andy Corcoran is on annual leave until October 1. Before he left he asked me to get in touch with you re the bauxite samples from northwest Oregon. We believe we can obtain the necessary samples for you but will need a bit more information on the number of samples, size of the individual samples, and any precautions or restrictions to be observed in taking them. Also, how and where should the samples be shipped.

We are hoping that in the event you will require more than a few pounds of sample from any one spot that we can find an exposure in some roadcut where a bulk sample can be cut. Since the ore horizon lies buried under approximately 20 feet of overburden and the zone to be sampled lies below the ore body which may be over 20 feet in thickness, the recovery of large samples will have to be restricted to those outcrops fortuitously exposed by the combined vagaries of topography, geologic structure, and the county road department.

Sincerely yours,

Ralph S. Mason
Deputy State Geologist

RSM:lk

September 16, 1976

Mr. Joe B. Rosenbaum
1149 Mercedes Way
Salt Lake City, Utah 84108

Dear Mr. Rosenbaum:

I am enclosing copy of a memorandum I just received from John W. Hook, concerning the possibility of developing significant additional tonnages of bauxitic material in northwest Oregon and southwest Washington.

As John notes, Reynolds' present reserves could probably be doubled, especially if northern Columbia County was given a hard look.

I am enclosing a copy of a figure that is part of the report which John prepared for us on "Ferruginous Bauxites of the Pacific Northwest". If you don't already have a copy of this report, I will be glad to send it to you.

As you will note in the generalized section of the ferruginous bauxite zones, there is a mixed gibbsite kaolin clay horizon that lies between the so-called ore zone and the clays in the lower relic basalt zone. John feels that there is a good chance that this transition zone may contain considerable gibbsitic material that could be ore grade laterite.

If Reynolds is interested in pursuing this possibility, John would be happy to assist me in preparing a detailed budget report. As he would probably be spending approximately a week or 10 days preparing this proposal, he is asking for a fee of $1,000 to pay for his time.

If you have any further questions, please feel free to write me.

Sincerely yours,

Raymond E. Corcoran
State Geologist

REC:jr
Encl.

1149 Mercedes Way
Salt Lake City, Utah 84108
2 August 1976

9-0-(801) 582-3597

Mr. R. E. Corcoran, Director
Oregon Dept. of Geology and Mineral Industries
1069 State Office Building
Portland, Oregon 97201

Dear Andy:

Your helpfulness in reconnoitering the Clackamas and Wahama potential bauxite sites with Walt Lewis is certainly appreciated.

I agree with both of you that the relict basalt zone offers an excellent possibility of bauxite resources that may be amenable to the beneficiation process under development by Reynolds. I'll let you know of any plans that may be forthcoming to obtain samples in Oregon for analyses and laboratory studies.

Sincerely,

Joe B. Rosenbaum
Metallurgical Consultant

JBR:g

RECEIVED-PTLD
AUG 5 - 1976
DEPT OF GEOLOGY
& MINERAL INDUS.

COPY

ALCOA MINING COMPANY

DRILL HOLE RECORD

Date

Property DUDLEY NO. 20 Hole No.....

Area Special Deep Test Hole Total Depth.....

Location 140' E. of W. Line
40' N. of S. Line

Section..... Township and Range.....

County..... State.....

Elevation 1371'

From	To	DESCRIPTION
0	7	Gray and tan silt
7	13	Tan silt with scattered oolites
13	43	Reddish tan and red silty clay with scattered oolites
43	47	Red clay with oolites increasing in quantity from 45' to 47'
47	51	Red oolitic and pisolitic laterite with greenish tan streaks
51	59	Dark reddish brown fine-grained laterit with scattered nodules
59	61	Dark greenish brown fine-grained laterite with scattered nodules
61	67	Reddish and greenish gray plastic clay with tan and black streaks
67	71	Tan, very fine-grained laterite clay wi scattered pisolites and with black and gray streaks
71	91	Tan crumbly clay (weathered basalt) wit black, brown, red, and gray streaks and with scattered streaks of fine-grained lateritic material and weathered basalt nodules

ALCOA MINING COMPANY

DRILL HOLE RECORD

Date

Property DUDLEY NO. 20 Hole No.....

Area Total Depth.....

Location

Section..... Township and Range.....

County..... State.....

Elevation.....

From	To	DESCRIPTION
9 1	131	Tan crumbly clay (weathered basalt) with black, grayish green, brown, and red streaks and with scattered red brittle streaks
131	155	Hard, dark green basalt
Total depth 155'		

COPY

LABORATORY REPORT

ALCOA MINING COMPANY

OREGON DEPARTMENT

Hillsboro Laboratory

Date January 14, 1946

Analysis of Special

This Report for File: E.M., N.Y., R.J.A.

DESCRIPTION		Labor No.	Date Rec'd	ANALYSIS Al_2O_3	Fe_2O_3	SiO_2	TiO_2	Loss on Ignition	N.R. SiO_2	Residue %	Al_2O_3 Det.
DUDLEY NO. 20	3' - 5'	15251	1/10	26.60	6.10	62.30	.93	4.07		14	
Deep Test	5' - 7'	15252		25.36	6.80	61.66	1.10	5.08		10	
	7' - 9'	15293		26.15	7.40	58.96	1.15	6.34		8	
	9' - 11'	15254		25.11	7.90	59.10	1.26	6.63		6	
	11' - 13'	15255		24.24	8.50	59.00	1.33	6.93		4	
	13' - 15'	15256		24.13	9.20	57.82	1.49	7.36		2	
	15' - 17'	15257		24.63	9.40	56.82	1.46	7.69		2	
	17' - 19'	15258		25.00	9.60	56.00	1.43	7.97		2	
	19' - 21'	15259		23.58	9.30	58.06	1.46	7.60		2	
	21' - 23'	15260		24.37	9.10	57.82	1.38	7.33		1	
	23' - 25'	15261		24.17	9.40	57.22	1.49	7.72		2	
	25' - 27'	15262		22.02	8.60	60.86	1.49	7.03		2	
	27' - 29'	15263		21.50	8.60	61.58	1.49	6.83			
	29' - 31'	15264		22.84	9.40	58.56	1.54	7.66			
	31' - 33'	15265		24.17	9.70	56.20	1.51	8.42			
	33' - 35'	15266		22.99	9.20	58.44	1.51	7.86			
	35' - 37'	15267		22.32	8.80	60.28	1.49	7.11			
	37' - 39'	15268		21.45	8.50	61.68	1.38	6.99			
	39' - 41'	15269		21.81	9.10	60.42	1.38	7.29			
	41' - 43'	15270		23.68	9.80	57.00	1.46	8.06			
	43' - 45'	15271		32.68	22.80	27.60	3.03	13.89			
	45' - 47'	15272		37.41	27.90	10.98	4.41	19.30			36.89
	47' - 49'	15273		34.08	39.50	3.30	6.08	17.04			
	49' - 51'	15274		36.35	34.80	2.10	6.61	20.14			

1980 20M 5-47
PRINTED IN U.S.A.

Joe D. Bryant
Chemist

LABORATORY REPORT

ALCOA MINING COMPANY
OREGON DEPARTMENT

Date

Analysis of

This Report for DUDLEY NO. 20 Cont'd.

DESCRIPTION	Labor No.	Date Rec'd	ANALYSIS							
			Al_2O_3	Fe_2O_3	SiO_2	TiO_2	Loss on Ignition	N.R. SiO_2	Residue	Al_2O_3 Det.
51' - 53'	15275	1/10	33.91	37.30	2.44	5.89	20.46			
53' - 55'	15276		36.64	33.50	2.12	6.85	20.89			
55' - 57'	15277		37.12	33.00	1.76	7.21	20.91			
57' - 59'	15278		35.58	35.70	.92	7.47	20.33			
59' - 61'	15279		32.38	37.80	3.96	7.42	18.44			
61' - 63'	15280		28.76	36.10	12.92	7.42	14.80			
63' - 65'	15281		31.57	31.20	15.62	6.23	15.38			
65' - 67'	15282		38.98	24.30	11.44	5.57	19.71			
67' - 69'	15283		39.77	29.60	3.38	5.49	21.76			
69' - 71'	15284		36.62	27.60	11.36	5.45	18.97			
71' - 73'	15285		34.04	32.00	8.78	6.90	18.28			
73' - 75'	15286		31.07	23.60	26.08	5.25	14.00			
75' - 77'	15287		27.98	30.10	22.76	6.23	13.02			
77' - 79'	15288		29.51	27.90	24.18	5.41	13.00			
79' - 81'	15289		27.19	30.40	23.56	6.65	12.20			
81' - 83'	15290		27.72	30.60	23.18	5.89	12.61			
83' - 85'	15291		26.04	31.60	24.24	6.08	12.04			
85' - 87'	15292		27.72	29.50	23.72	5.94	13.12			
87' - 89'	15293		28.39	31.20	20.34	6.46	13.61			
89' - 91'	15294		29.89	29.20	21.16	5.85	13.90			
91' - 93'	15295		31.21	26.50	22.80	4.90	14.59			
93' - 95'	15296		34.07	27.30	16.42	5.06	17.15			
95' - 97'	15297		30.23	23.80	27.66	5.13	13.18			
97' - 99'	15298		27.91	28.20	26.34	5.57	11.98			

1980 20M 5-47
PRINTED IN U.S.A.

Chemist

LABORATORY REPORT

ALCOA MINING COMPANY
OREGON DEPARTMENT

Date

Analysis of

This Report for DUDLEY NO. 20 Cont'd.

DESCRIPTION	Labor No.	Date Rec'd	ANALYSIS Al_2O_3	Fe_2O_3	SiO_2	TiO_2	Loss on Ignition	N.R. SiO_2	Residue	Al_2O_3 Det.
99' - 101'	15299	1/10	27.49	29.30	24.26	6.32	12.63			
101' - 103'	15300		27.09	26.80	28.70	5.57	11.84			
103' - 105'	15301		28.59	23.00	31.38	4.55	12.48			
105' - 107'	15302		26.05	31.40	23.72	6.80	12.03			
107' - 109'	15303		26.05	28.30	28.40	5.61	11.64			
109' - 111'	15304		25.99	27.80	28.86	5.73	11.62			
111' - 113'	15305		25.20	29.20	28.40	5.65	11.55			
113' - 115'	15306		25.81	26.70	29.88	5.85	11.76			
115' - 117'	15307		24.64	28.50	30.14	5.17	11.55			
117' - 119'	15308		25.91	27.50	30.32	4.75	11.52			
119' - 121'	15309		25.11	26.90	31.74	5.06	11.19			
121' - 123'	15310		26.36	26.70	30.40	5.41	11.13			
123' - 125'	15311		24.95	26.00	32.94	5.13	10.98			
125' - 127'	15312		24.67	26.40	32.96	5.10	10.87			
127' - 129'	15313		25.03	24.20	35.24	4.86	10.67			
129' - 131'	15314		24.63	22.60	38.22	4.59	9.96			
131' - 143'	15315	*	33.67	19.70	35.58	3.89	7.16			
143' - 155'	15316	**	37.66	16.60	37.70	3.48	4.56			

1980 20M 5-47
PRINTED IN U.S.A.

*This sample contains 16% Residue
**This sample contains 25% Residue

.....
Chemist

C O P Y

ALCOA MINING COMPANY

Drill Hole Record

Property: Dudley No. 20
Special Deep Test Hole

Location: 140' E. of W. Line
40' N. of S. Line

Elevation: 1371'

From	To	Description
0	7	Gray and tan silt.
7	13	Tan silt with scattered oolites.
13	43	Reddish tan and red silty clay with scattered oolites.
43	47	Red clay with oolites increasing in quantity from 45' to 47'.
47	51	Red oolitic and pisolitic laterite with greenish tan streaks.
51	59	Dark reddish brown fine-grained laterite with scattered nodules.
59	61	Dark greenish brown fine-grained laterite with scattered nodules.
61	67	Reddish and greenish gray plastic clay with tan and black streaks.
67	71	Tan, very fine-grained laterite clay with scattered pisolites and with black and gray streaks.
71	91	Tan crumbly clay (weathered basalt) with black, brown, red, and gray streaks and with scattered streaks of fine-grained lateritic material and weathered basalt nodules.
31	131	Tan crumbly clay (weathered basalt) with black, grayish green, brown, and red streaks and with scattered red brittle streaks.
131	155	Hard, dark green basalt.

Total depth 155'

C O P Y

ALCOA MINING COMPANY

Oregon Department

Laboratory Report: Hillsboro Laboratory

Analysis of: Special

This Report for: File: E.M., N.Y., R.J.A.

Date: January 14, 1946

DUDLEY NO. 20 - DEEP TEST

From	To	Al_2O_3	Fe_2O_3	SiO_2	TiO_2	Ignition loss	Residue %	Al_2O_3 Det.
3'	5'	26.60	6.10	62.30	.93	4.07	14	
5'	7'	25.36	6.80	61.66	1.10	5.08	10	
7'	9'	26.15	7.40	58.96	1.15	6.34	8	
9'	11'	25.11	7.90	59.10	1.26	6.63	6	
11'	13'	24.24	8.50	59.00	1.33	6.93	4	
13'	15'	24.13	9.20	57.82	1.49	7.36	2	
15'	17'	24.63	9.40	56.82	1.46	7.69	2	
17'	19'	25.00	9.60	56.00	1.43	7.97	2	
19'	21'	23.58	9.30	58.06	1.46	7.60	2	
21'	23'	24.37	9.10	57.82	1.38	7.33	1	
23'	25'	24.17	9.40	57.22	1.49	7.72	2	
25'	27'	22.02	8.60	60.86	1.49	7.03	2	
27'	29'	21.50	8.60	61.58	1.49	6.83		
29'	31'	22.84	9.40	58.56	1.54	7.66		
31'	33'	24.17	9.70	56.20	1.51	8.42		
33'	35'	22.99	9.20	58.44	1.51	7.86		
35'	37'	22.32	8.80	60.28	1.49	7.11		
37'	39'	21.45	8.50	61.68	1.38	6.99		
39'	41'	21.81	9.10	60.42	1.38	7.29		
41'	43'	23.68	9.80	57.00	1.46	8.06		
43'	45'	32.68	22.80	27.60	3.03	13.89		
45'	47'	37.41	27.90	10.98	4.41	19.30		36.89
47'	49'	34.08	39.50	3.30	6.08	17.04		
49'	51'	36.35	34.80	2.10	6.61	20.14		
51'	53'	33.91	37.30	2.44	5.89	20.46		
53'	55'	36.64	33.50	2.12	6.85	20.89		
55'	57'	37.12	33.00	1.76	7.21	20.91		
57'	59'	35.58	35.70	.92	7.47	20.33		
59'	61'	32.38	37.80	3.96	7.42	18.44		
61'	63'	28.76	36.10	12.92	7.42	14.80		
63'	65'	31.57	31.20	15.62	6.23	15.38		
65'	67'	38.98	24.30	11.44	5.57	19.71		
67'	69'	39.77	29.60	3.38	5.49	21.76		

From	To	Al_2O_3	Fe_2O_3	SiO_2	TiO_2	Ignition loss	Residue %	Al_2O_3 Det.
69'	- 71'	36.62	27.60	11.36	5.45	18.97		
71'	- 73'	34.04	32.00	8.78	6.90	18.28		
73'	- 75'	31.07	23.60	26.08	5.25	14.00		
75'	- 77'	27.98	30.10	22.76	6.23	13.02		
77'	- 79'	29.51	27.90	24.18	5.41	13.00		
79'	- 81'	27.19	30.40	23.56	6.65	12.20		
81'	- 83'	27.72	30.60	23.18	5.89	12.61		
83'	- 85'	26.04	31.60	24.24	6.08	12.04		
85'	- 87'	27.72	29.50	23.72	5.94	13.12		
87'	- 89'	28.39	31.20	20.34	6.46	13.61		
89'	- 91'	29.89	29.20	21.16	5.85	13.90		
91'	- 93'	31.21	26.50	22.80	4.90	14.59		
93'	- 95'	34.07	27.30	16.42	5.06	17.15		
95'	- 97'	30.23	23.80	27.66	5.13	13.18		
97'	- 99'	27.91	28.20	26.34	5.57	11.98		
99'	-101'	27.49	29.30	24.26	6.32	12.63		
101'	-103'	27.09	26.80	28.70	5.57	11.84		
103'	-105'	28.59	23.00	31.38	4.55	12.48		
105'	-107'	26.05	31.40	23.72	6.80	12.03		
107'	-109'	26.05	28.30	28.40	5.61	11.64		
109'	-111'	25.99	27.80	28.86	5.73	11.62		
111'	-113'	25.20	29.20	28.40	5.65	11.55		
113'	-115'	25.81	26.70	29.88	5.85	11.76		
115'	-117'	24.64	28.50	30.14	5.17	11.55		
117'	-119'	25.91	27.50	30.32	4.75	11.52		
119'	-121'	25.11	26.90	31.74	5.06	11.19		
121'	-123'	26.36	26.70	30.40	5.41	11.13		
123'	-125'	24.95	26.00	32.94	5.13	10.98		
125'	-127'	24.67	26.40	32.96	5.10	10.87		
127'	-129'	25.03	24.20	35.24	4.86	10.67		
129'	-131'	24.63	22.60	38.22	4.59	9.96		
*131'	-143'	33.67	19.70	35.58	3.89	7.16		
**143'	-155'	37.66	16.60	37.70	3.48	4.56		

*This sample contains 16% residue
**This sample contains 25% residue

Chemist: Joe D. Bryant

REYNOLDS ALUMINUM
REYNOLDS METALS COMPANY • RICHMOND, VIRGINIA 23261

January 24, 1989

Messrs. Jerry L. Gray and Michael L. Cummings
Dept. of Geology and Mineral Industries
Administrative Office
910 State Office Building
1400 SW 5th Avenue
Portland, Oregon 97201-5528

Gentlemen:

Reynolds is pleased to give the core from its Pacific Northwest laterite properties to the Department of Geology and Mineral Resources. The core is stored at Troutdale, Oregon, and by copy of this letter, I am authorizing Mr. Dan Ten Eyck of our Troutdale Plant to release the core.

If any research is done on the core, Reynolds would greatly appreciate a copy of the results, published or unpublished. We would also like to be accorded access to the core if a future need arises.

Sincerely,

REYNOLDS METALS COMPANY

Douglas D. Jinks
Operations Manager
Precious Metals and Geology

DDJ:pj

cc: D. Ten Eyck, Reynolds 503 666-0780
F. Witzel, North American Exploration

REYNOLDS METALS COMPANY

N. W. BAUXITES

CORE INVENTORY SUMMARY 9/1/88

DRILL HOLE #	TOTAL BOXES OF CORE	DEPTH
2/2 5E 27 1A	7	21'
2/2 5E 27 1B	1	25'
2/2 5E 27 2A	4	17'
2/2 5E 27 2B	7	19'
3/3 35N 3 1C	7	26'
3/3 35N 3 1D	7	26'
3/3 35N 3 2A	6	22'
3/3 35N 3 2B	6	24'
3/3 35N 3 2C	6	22'
3/3 35N 3 2D	6	20'
3/3 35N 3 3A	6	20'
3/3 35N 3 3B	3	12'
3/3 35N 3 3C	5	17'
3/3 35N 3 3D	3	18'
5/1 30 19 1A	9	33'
5/1 30 19 1C	8	40'
5/1 30 19 2B	8	40'
5/1 30 19 3A	13	42'

DRILL HOLE #	TOTAL BOXES OF CORE	DEPTH
5/1 30 19 3C	11	51'
5/1 30R 19 1A	4	47'
5/1 30R 19 1B	5	41'
5/1 30R 19 2A	11	46'
5/1 19 58 1B	6	23'
5/1 19 58 2B	7	28'
5/1 19 58 3A	8	27'
5/1 19 58 3B	6	25'
5/1 19 58 3C	11	39'
5/1 19 58 3D	6	21'
5/2 23B 1A	9	28'(?)
5/2 23B 1C	4	10'
5/2 23B 2A	3	35'
5/2 23B 2B	7	22'
5/2 23B 2C	5	16'
5/2 23B 3B	8	26'
5/2 23B 3C	4	19'
8/3 19L 1A	6	18'
8/3 19L 1B	4	12'
8/3 19L 1C	3	12'
8/3 19L 2C	6	19'
8/3 19L 3A	6	21'
8/3 19L 3B	7	22'
8/3 19L 4B (2B)	3	67'
8/3 30K 1A	5	15'
8/3 30K 1C	3	11'

DRILL HOLE #	TOTAL BOXES OF CORE	DEPTH
8/3 30K 2A	2	9'
8/3 30K 2B	1	15'
8/3 30K 2C	1	5'
8/3 30K 3A	2	9'
8/3 30K 3B	2	11'
8/3 30K 3C	2	12'
8/3 20A 1A	1	5'
8/3 20A 1B	1	6'
8/3 20A 1C	3	17'
8/3 20A 2A	3	10'
8/3 20A 2B	3	14'
8/3 20A 2C	1	20'
8/3 20A 3A	1	12'
8/3 20A 3B	2	14'
8/3 20A 3C	1	12'
8/5 1N 1A	9	30'
8/5 1N 1B	5	20'
8/5 1N 1C	8	30'
8/5 1N 2A	9	30'
8/5 1N 2B	9	30'
8/5 1N 2C	5	18'
8/5 1N 3A	7	25'
8/5 1N 3B	9	30'
8/5 1N 3C	8	29'
9/3 31R 1A	4	30'

DRILL HOLE #	TOTAL BOXES OF CORE	DEPTH
9/3 31R 1B	8	30'
9/3 31R 1C	7	29'
9/3 31R 2A	8	30'
9/3 31R 2B	8	28'
9/3 31R 2C	8	30'
9/3 31R 3A	8	28'
9/3 31R 3B	8	28'
9/3 31R 3C	8	28'
9/4 21F 1A	6	22'
9/4 21F 1B	6	25'
9/4 21F 1C	8	28'
IRON KING #1 48	11	28'
IRON KING #2 46A	18	42'
IRON KING #2	11	27'
BAUXITE #3 119	23	53'
DELSMAN 3A	7	17'
HATLETT - 91	11	32'
H. G. SMITH 77A	9	28'
H. G. SMITH 89A	6	20'
De VAUL 37A	11	35'
H. R. PLACE 25A	11	23'
J. W. CHEEVERS 6A	77	19'
J. W. CHEEVERS 13A	9	21'
FAY OLSEN	17	36'
272/220	4	24'

DRILL HOLE #	TOTAL BOXES OF CORE	DEPTH
246/216	6	33'
224/226	13	49.5'
230/174	6	33'
121A	5	18'
146A	10	26'
309A	7	27'
348A	7	27'
361A	9	33'
GRAND TOTALS	675	2554.5'
	Ave. depth	24.56'

REYNOLDS METALS COMPANY

N. W. BAUXITES

CORE INVENTORY 9/1/88

2/2 5E 27 ← Drill Hole No.

— Offsets

BOXED INTERVAL	1A	1B	2A	2B
	0-3	0-2.5	2-6	0-2
	3-6		6-9	2-5
	6-9		9-12	5-8
	9-12		12-17	8-11
	12-15			11-14
	15-18			14-17
	18-21			17-19

3/3 35N 3

1C	1D	2A	3B	2C
6-9	5-8	4-7	6-9	4-7
9-12	8-11	7-10	9-12	7-9
12-15	11-14	10-13	12-15	9-13
15-18	14-17	13-16	15-18	13-16
18-21	17-20	16-19	18-21	16-19
21-24	20-23	19-22	21-24	19-22
24-26	23-26			

2D	3A	3B	3C	3D
4-7	3-6	3-6	4-7	10-13
7-10	6-9	6-9	7-10	13-16
10-13	9-12	9-12	10-13	16-18
13-16	12-15		13-16	
16-18	15-18		16-17	
18-20	18-20			

5/1 30 19

1A	1C	2B	3A	3C
6-9	18-21	17-20	5-8	19-22
9-12	21-24	20-23	8-11	22-25
12-15	24-27	23-26	11-14	25-28
15-18	27-30	26-29	14-17	28-31
18-21	30-33	29-31	17-20	31-34
21-24	33-36	31-35	20-23	34-37
24-27	36-39	35-38	23-26	37-40
27-30	39-40	38-40	26-29	40-43
30-33			29-32	43-46
			32-35	46-49
			35-38	49-51

5/1 30R 19

1A	1B	2A
33-36	20-23	12-16
36-39	23-26	16-19
39-42	26-29	19-22
45-57	35-38	22-25
	38-41	25-28
		28-31
		31-34
		34-37
		37-40
		40-43

5/1 19 58

1B	2B	3A	3B	3C
6-9	6-9	5.5-8	20-23	5-9
9-12	9-12	8-11	23-25	9-13
12-15	14-15	11-14		13-16
15-18	12-14 & 15-16	14-17		16-19
18-21	16-19	17-20		19-22
21-23	19-22	20-23		22-25
	22-25	23-25		25-28
		26-27		31-34
				34-37
				37-39

3D
5-8
8-11
11-14
14-17
17-20
20-21

5/2 23B

1A	1C	2A	2B	2C
1-4	0-3	25-28	0.7-4	3-6
4-7	3-6	28-31	4-7	6-9
7-10	6-9	31-35	7-10	9-12
10-13	9-10		10-13	12-15
13-16			13-16	15-16
16-19			16-19	
19-22			19-22	
22-25				
25-28				

3B	3C
2-5	.5-4
5-8	4-7
8-11	10-13
11-14	16-19
14-17	
17-20	
20-23	
23-26	

8/3 19L

1A	1B	1C	2C	3A
2-5	2-5	3-6	1-4	1.5-5
5-8	5-8	6-9	4-7	5-8
8-11	8-11	9-12	7-10	8-11
11-13	11-12		10-13	11-14
14-17			13-16	17-20
17-18			16-19	20-21

3B	4B (2B)
2-5	13-16
5-8	16-19
8-11	43-67
11-14	
14-17	
17-20	
20-22	

8/3 30K

1A	1C	2A	2B	2C
1.5-5	2-5	3.5-6	12-15	2-5
5-8	5-8	6-9		
8-11	8-11			
11-14				
14-15				

3A	3B	3C
3-6	5-8	8-11
6-9	8-11	11-12

8/3 20A

1A	1B	1C	2A	2B
2.5-5	3-6	2-5	2-5	5-8
		5-8	5-8	8-11
		14-17	8-10	11-14

2C	3A	3B	3C
17-20	9-12	9-12	9-12
		12-14	

8/5 IN

1A	1B	1C	2A	2B
5-8	5-8	7-10	4-7	4-7
8-11	8-11	10-13	7-10	7-10
11-14	11-14	13-16	10-13	10-13
14-17	14-17	16-19	13-16	13-16
17-20	17-20	19-22	16-19	16-19
20-23		22-25	19-22	19-22
23-26		25-28	22-25	22-25
26-29		28-30	25-28	25-28
29-30			28-30	28-30

2C	3A	3B	3C
5-8	5-8	5-8	5-8
8-11	8-11	8-11	8-11
11-14	11-14	11-14	11-14
14-17	14-17	14-17	14-17
17-18	17-20	17-20	17-20
	20-23	20-23	20-23
	23-35	23-26	23-26
		26-29	26-29
		29-30	

9/3 31R

1A	1B	1C	2A	2B
8-11	7.5-11	7.8-11	7-10	6-9
20-23	11-14	11-14	10-13	9-12
26-29	14-17	14-17	13-16	12-15
29-30	17-20	17-20	16-19	15-18
	20-23	20-23	19-22	18-21
	23-26	23-26	22-25	21-24
	26-29	26-29	25-28	24-27
	29-30		28-30	27-28

2C	3A	3B	3C
6-9	6-9	6-9	6-9
9-12	9-12	9-12	9-12
12-15	12-15	12-15	12-15
15-18	15-18	15-18	15-18
18-21	18-21	18-21	18-21
21-24	21-24	21-24	21-24
24-27	24-27	24-27	24-27
27-30	27-28	27-28	27-28

9/4 21F

1A	1B	1C
3.5-7	6.8-10	5.5-9
7-10	10-13	9-12
10-13	13-16	12-15
13-16	16-19	15-18
16-19	19-22	18-21
19-22	22-25	21-24
		24-27
		27-28

9/4 31R

1C
23-26

IRON KING #1

48
6-8
8-10
10-12
12-14
14-16
16-18
18-20
20-22
22-24

IRON KING #2

46A	Continued
6-8	24-26
8-10	26-28
10-12	28-30
12-14	30-32
14-16	32-34
16-18	34-36
18-20	36-38
20-22	38-40
22-24	40-42

IRON KING

#2
6-8
8-10
10-12
12-13.5
13.5-15
15-17
17-19
19-21
21-23
23-25
25-27

BAUXITE #3

119	Continued	Continued	Continued	Continued
7-9	17-19	27-29	37-39	47-49
9-11	19-21	29-31	39-41	49-51
11-13	21-23	31-33	41-43	51-53
13-15	23-25	33-35	43-45	
15-17	25-27	35-37	45-47	

DELSMAN

3A
3-5
5-7
7-9
9-11
11-13
13-15
15-17

HATLETT

91	Continued
10-12	22-24
12-14	24-26
14-16	26-28
16-18	28-30
18-20	30-32
20-22	

H. G. SMITH

77A	89A
11-13	8-10
13-15	10-12
15-17	12-14
17-19	14-16
19-21	16-18
21-23	18-20
23-25	
25-26	
26-28	

De VAUL

37A	Continued	Continued
13-15	23-25	33-35
15-17	25-27	
17-19	27-29	
19-21	29-31	
21-23	31-33	

H R PLACE

25A	Continued	Continued
2-3	10-12	20-23
3-5	12-14	
5-7	14-16	
7-8	16-18	
8-10	18-20	

J W CHEEVERS

6A	13A
5-7	3-5
7-9	5-7
9-11	7-9
11-13	9-11
13-15	11-13
15-17	13-15
17-19	15-17
	17-19
	19-21

FAY OLSEN	Continued	Continued
2-4	14-16	26-28
4-6	16-18	28-30
6-8	18-20	30-32
8-10	20-22	32-34
10-12	22-24	34-36
12-14	24-26	

272/220

13.5-15
15-18
18-21
21-24

224/226

12-15
15-18
18-21
21-24
24-27
27-30
30-33
33-36
36-39
39-42
42-45
45-48
48-49.5

230/174

16-18
18-21
21-24
24-27
27-30
30-33

266/216

16.5-18
18-21
21-24
24-27
27-30
30-33
33-36
36-37.5

121 A

3-6
6-9
9-12
12-15
15-18

146 A

1-3
3-6
6-9
9-12
12-15
15-18
18-20
20-22
22-24
24-26

309 A

6.8-9
9-12
12-15
15-18
18-21
21-24
24027

348 A

12-15
15-18
18-21
21-24

361 A

5-9
9-12
12-15
15-18
18-21
21-24
24-27
27-30
30-33

A/S ÅRDAL OG SUNNDAL VERK

ÅSV ALUMINIUM

Sørkedalsveien 6
P. O. Box 5177 Oslo 3
Telephone 60 58 90
Cables: Årdalverk Oslo
Telex 11 093

Mr. John W. Hook
7315 Battle Creek Rd. S.E.
SALEM
Oregon 97302
USA

Your ref. Your letter dated 8/25-75 Our ref. Mi/ra OSLO 4 Nov. 1975

Dear Mr. Hook,

Thank you for your letter of August 25th 1975, requesting some detailed information about our Pedersen-process. We recognize the fact that you presently consider this process as a possible feasible alumina-process.

ÅSV is at the moment themselves heavily involved in checking out the possibility to use this process on alternative raw materials. In order not to jeopardize our own activity, we are at present reluctant to give away figures related to capital and operating costs, especially since we are the only Company in the world to be able to produce some data with reasonable confidence.

We will, however, give you some ideas of a suitable raw material and its limitations.

Compared to the Bayer-process, the Pedersen-process has the possibility to use a wide range of raw materials effectively. The optimum raw material composition for a Pedersen-process would be as follows:

Al_2O_3:	25 - 30%	SiO_2:	1 - 4%
Fe_2O_3:	50 - 60%	TiO_2:	0 - 3%

As you will realize this means more or less a pig iron plant with alumina as a by product. If there is available iron ore in the neighbourhood, there is a possibility to make up an economical blend.

One of the main obstacle is the silica content. Excess silica must be compensated with lime, hence rather big volumes. Considering the analysis given in your letter for

ASV Group: A/S ÅRDAL OG SUNNDAL VERK, Oslo — ÅRDAL VERK, Årdalstangen — HØYANGER VERK, Høyanger — SUNNDAL VERK, Sunndalsøra — VIK VERK, Vik i Sogn — GLÆRUM KALKSTEINGRUVE, Surnadal — LASSEDAL FLUSSPATGRUVE, Lassedal pr. Kongsberg.

A/S NORDISK ALUMINIUMINDUSTRI, Holmestrand — METALLEMBALLASJE A/S, Stange — AB NORDISKA TUBFABRIKEN, Hjo, Sweden — TUBEFABRIKKEN A/S, Sem. — IL-O-VAN ALUMINIUMVAREFABRIK A/S, Rygge — KLØVERBLAD ALUMINIUM A/S, Copenhagen — ALUMINORD A/S, Copenhagen — NORDISK ALUMINIUM A/S, Glyngøre and Skive, Denmark.

the 10% cut off, i.e. 5% SiO_2, 30% Fe_2O_3, and 35% Al_2O_3 will result in about 3 tons of bauxite raw material per 1000 kg Al_2O_3. The total energy requirement to produce one metric ton of alumina would be in the region of 4500 kWh. In addtition this also will give you about 650 kg of pig iron. The power consumption is based on calcined raw materials.

The analysis given for 25% cut off is due to its high SiO_2 content not likely to be of any economical interest.

In order to get a sound basis for an evaluation of alternative materials the following must be carried out:

(i) A smelting test

This is to ensure that the pig iron and slag produced will have an acceptable quality. Further to establish consumption figures. This test is likely to be preceded by some agglomerating tests to ensure a suitable feed to the electrical smelting test.

(ii) Leaching and precipitation test

This again is to ensure that the quality of the produced al. hydrate is within the acceptable range. Particular reference is made to the necessity of depressing silica content.

This test must be carried out in a pilot plant of suitable size, big enough to envisage possible operational difficulties in a full scale plant.

We are sorry that we at present are not in a position to give further information about the cost, but for the fact that based on certain conditions the process is competitive with the present Bayer-process.

We will draw your attention to a paper presented at AIME/74 (paper No. A74-72) about the Pedersen-process, history and future.

./. Enclosed you will also find a copy of our letter to Mr. Corcoran, dated May 3rd 1971, describing our Høyanger plant.

Yours faithfully,
for A/S ÅRDAL OG SUNNDAL VERK

Kjell Nielsen

J. Miller

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Dr. Nixon

Project

Hole No. 30 Location 425 feet N. 45° W. of logging road at point .26 mi. from P.R. Rd.
1850 feet N. 65° W. of Hole 61.
of sec. 34 T. 3 N., R. 3 W., County Washington

Coord. N. E.

Elev. collar 1312.98
Depth to top of bed 2
Elev. of top of bed 1311.0
Thickness of bed 10+ ?
Elev. bottom bed ?
Depth of hole 13
Elev. water table ——
Bottomed in Red clay

****

Drill used Hand auger
Number men 3
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler Mason
Date hole began 6-8-44
Date hole finished 6-8-44
Shifts actually drilled 1½

From	To	Thickness of sample	Sample No.	Description
0	2			Top soil
2	6			Iron mixed with red clay
6	13			Hard red clay

Remarks Hole bottomed in ore.

Sample # 22-A 2' - 6'
22-B 6' -- 8'
22-C 8' -13'

WL-24b

Hole No. 30

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchison
Project

Hole No. 32 Location 75 feet north of Hutchison's house.

of sec. 1 T. 2N., R. 3 W., County Washington

Coord. N. E.

Elev. collar 1100

Depth to top of bed 8

Elev. of top of bed 1092

Thickness of bed 14

Elev. bottom bed 1078

Depth of hole 28

Elev. water table

Bottomed in Mottled clay

****

Drill used 2-in.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler Both

Date hole began 6/8/44

Date hole finished 7/24/44

Shifts actually drilled 3/4

From	To	Thickness of sample	Sample No.	Description
0'	4'			Top soil
4'	8'			Red clay
8'	12'			Oölitic iron (hard)
12'	13'			Yellow clay with specks of decomposed feldspar
13'	14'6"	1'6"	200	Dark red-brown clay-like material. Few oölites.
14'6"	16'6"	2'	201	Yellow, brown, clay-like material with white fragments & oggas. oölites.
16'6"	17'6"	1'	202	Very few, if any, oölites.
17'6"	19'6"	2'	203	Brown and yellow brown pebbly clay-like material.
19'6"	20'0"	6"	204	No change.
20'0"	22'0"	2'	205	Mottled, varicolored, clay-like, white streaks.
22'	24'	2'	206	Same
24'	25'	1'	207	Same
25'	26'	1'	208	Clay apparently increasing.
26'	27'10"	1'10"	209	Streaked with red, white, black.
27'10"	28'	2"	210	Wetter, more clay, whiter.

Remarks Hole stopped at 28 feet when sufficient depth (without further assays) believed reached. No apparent change noted at bottom.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson

Project

Hole No. 34 Location On rd. 1325 feet west of Hutchinson's house.

of sec. 1, T. 2 N., R. 3 W., County Washington

Coord. N. E.

Elev. collar ± 1125

Depth to top of bed 5

Elev. of top of bed ± 1120

Thickness of bed 9+

Elev. bottom bed

Depth of hole 14

Elev. water table

Bottomed in Red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole began 6-9-44

Date hole finished 6-9-44

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0	5			Top soil
5	14			Red clay

Remarks No iron - no sample

WL-24b

Hole No. 34

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 44 Location 300 feet N. 80° W. of Hole 32; 10 feet west of road

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1113.35

Depth to top of bed 22.0

Elev. of top of bed 1091.35

Thickness of bed 12 (?)

Elev. bottom bed 1079.35

Depth of hole 37

Elev. water table none

Bottomed in Weathered basalt

****
3" auger
Drill used 2" at 22 feet

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Mason

Sampler Swanson

Date hole began 9-19-44

Date hole finished 9-23-44

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0	6'			Light brown loam.
6'	12'			Reddish brown.
12'	14'	2'	A	Dark red - some gritty.
14'	16'	2'	B	Dark red, thin yellow streaks.
16'	18'	2'	C	Dark red, slightly gritty - light spots.
18'	20'	2'	D	Dark red, grittier - more white spots.
20'	22'	2'	E	Brick red - gritty - no white spots, oölites?
22'	23'	1'	S-85	Very hard, brick red, oölites.
23'	24'	1'	S-86	Similar to above.
24'	25'	1'	S-87	Similar to above.
25'	26'	1'	S-88	Hard, brick red, many oölites.
26'	27'	1'	S-89	Softer, gritty, red-brown; many oölites.
27'	28'	1'	S-90	Softer, gritty, brown with some red; oölites, yellow brown at bottom
28'	29'	1'	S-91	Gritty, yellow brown; Big oölites.
29'	30'	1'	S-92	Brick red, gritty, oölites Blue specks.
30'	31'	1'	S-93	Very hard for 2 inches; brick red; oölites.

Remarks

See next page for Hole 44 continued.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson

Project

(cont.)

Hole No. 44 Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
31'	32'	1'	S-94	Softer, brick red, oölitic.
32'	33'	1'	S-121	Soft, some oölites, red, with whit spot
33'	34'	1'	S-122	Gritty, brick red, yellow spots.
34'	35'	1'	S-123	Soft, red-yellow, no oölites, white streaks.
35'	36'	1'	S-124	Soft, red, black spots, varicolored, streaked.
36'	37'	1'	S-125	Soft, varicolored, red spots.

Remarks Hole abandoned after passing through supposed ore zone.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 45 Location 250 feet S. 75° W. of Hole 44.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1099.64
Depth to top of bed
Elev. of top of bed
Thickness of bed
Elev. bottom bed
Depth of hole 28'
Elev. water table none
Bottomed in red clay

****

Drill used 3" auger
Number men 2
Engr. in charge Mason
Mtrl. classfd. by Mason
Sampler Swanson
Date hole began 9-20-44
Date hole finished 9-23-44
Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0'	10'			Yellow-brown silty clay; very firm.
10'	12'	2'	A	Brick red, no oölites; very firm.
12'	14'	2'	B	Brick red, some yellow-white streaks.
14'	16'	2'	C	Brick red with yellow and white streaks.
16'	18'	2'	D	Same.
18'	20'	2'	E	Brick red with fewer white and yellow spots.
20'	21'	1'	S-126	Soft, brick red, black spots.
21'	22'	1'	S-127	" " " " "
22'	23'	1'	S-128	Soft, brick red, clayey.
23'	24'	1'	S-129	" " " "
24'	25'	1'	S-130	" " " "
25'	26'	1'	S-131	" " " "
26'	27'	1'	S-132	" " " "
27'	28'	1'	S-133	" " " "

Remarks Hole abandoned when ore horizon believed passed.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson - Nixon
Project

Hole No. 46 Location (Redrilled)

of sec. T. R. County

Coord. N. E.

Elev. collar 1100.56

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 30

Elev. water table

Bottomed in Alt. basalt

****

Drill used 3 inch

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Jordan

Date hole began 2/25/45

Date hole finished 2/25/45

Shifts actually drilled 2½ hrs. (2 men)

From	To	Thickness of sample	Sample No.	Description
0'	9'			Yellow, brown, silty clay
9'	11'	2'	408	Red-brown clay. Few shots.
11'	13'	2'	409	Red-brown clay. Quite firm.
13'	15'	2'	410	"
15'	18'	3'	411	"
18'	21'	3'	412	Soft brown clay.
21'	24'	3'	413	Soft red-brown clay
24'	27'	3'	414	"
27'	30'	3'	415	Gritty, red-brown. White, red, and pink spots.

Remarks Hole abandoned when altered basalt (?) hit. Hole redrilled and sampled.

No ore found upon analysis.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 47 Location 60 feet S. 60° W. of Hole 46, on old trail.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1111.03

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 13'

Elev. water table none

Bottomed in red clay

****

Drill used 3" auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Mason

Sampler Swanson

Date hole began 9-25-44

Date hole finished

Shifts actually drilled 1/4

From	To	Thickness of sample	Sample No.	Description
0'	6'			Tan, silty, clayey, firm.
6'	10'			Brown, clayey, sandy, soft.
10'	12'			Red brown, clayey, firm.
12'	13'			Dark red, clayey, firm.

Remarks

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 48 Location 350 feet N. 45° W. of Hole 44.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1122.17
Depth to top of bed 29.00
Elev. of top of bed 1093.17
Thickness of bed 16.00
Elev. bottom bed 1077.17
Depth of hole 45
Elev. water table none
Bottomed in Altered basalt?

****
3" auger.
Drill used 2" at 32 feet
Number men 2
Engr. in charge Mason
Mtrl. classfd. by Mason
Sampler Swanson
Date hole began 9-25-44
Date hole finished 9-26-44
Shifts actually drilled 2

From	To	Thickness of sample	Sample No.	Description
0'	4'			Tan, silty, firm.
4'	6'			Pink and white; silty, sandy, soft.
At	6'			Hematite cobble.
6'	8'			Brown, clayey, sandy, soft.
8'	9'			Red brown, clayey, firm; some oölites.
9'	18'			Brick red, clayey, firm; some oölites.
18'	19'			Brick red with yellow spots, clayey, firm, some oölites.
19'	20'	1'	S-135	Brick red with white & yellow spots, clayey, firm, some oölites.
20'	21'	1'	S-136	Brick red, clayey, gritty, soft magnetic oölites.
21'	22'	1'	S-137	Brick red, clayey, gritty, oölitic.
22'	23'	1'	S-138	Brick red, clayey, oölitic.
23'	24'	1'	S-139	Brick red, clayey, gritty, oölitic.
24'	25'	1'	S-140	Brick red, clayey, gritty, oölitic, pisolitic.
25'	26'	1'	S-141	Brick red, clayey, gritty, oölitic.
26'	27'	1'	S-142	Brick red, clayey, gritty, oölitic.
27'	28'	1'	S-143	Brick red, sandy, gritty, oölitic.

Remarks See next page for continuation of Hole 48.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 48 (cont.) Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 45

Elev. water table

Bottomed in Altered basalt

****

Drill used 2" auger at 32'

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began Additional 12/1/44

Date hole finished 12/1/44

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
28'	29'	1'	S-144	Brick red, sandy, gritty, oölitic.
29'	30'	1'	S-145	Brick red, sandy, gritty, pisolitic; oölites very magnetic.
30'	31'	1'	S-146	Brick red, sandy, gritty, oölitic, pisolitic.
31'	32'	1'	S-147	Brick red, clayey, sandy, gritty, pisolitic; oölites not magnetic.
32'	33'	1'	S-148	Brick red, clayey, gritty, oölitic.
33'	34'	1'	S-149	Brick red, clayey, gritty, limonite lumps.
34'	35'	1'	S-150	Olive drab, clayey, oölitic.
35'	36'	1'	S-275	Red, clayey, gritty; oölites.
36'	37'	1'	S-276	Brown, sandy, gritty, non-magnetic oölites.
37'	38'	1'	S-277	Varicolored, sandy, gritty, non-magnetic oölites.
38'	39'	1'	S-278	Varicolored, sandy, non-magnetic oölites.
39'	40'	1'	S-279	Varicolored, sandy, gritty, non-magnetic oölites.
40'	41'	1'	S-280	Red, sandy, gritty, non-magnetic oölites.
41'	42'	1'	S-281	Brown, gritty, non-magnetic oölites.
42'	43'	1'	S-282	Brown, gritty, siliceous lumps.
43'	44'	1'	S-283	Brown, gritty; basalt lumps?
44'	45'	1'	S-284	Varicolored, plastic, soft.

Remarks

Hole abandoned when altered basalt believed struck.

WL-24b

Hole No. 48 cont.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 49 Location 12 feet north of Hole 48.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1122.00

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 7

Elev. water table none

Bottomed in dark clay

****

Drill used 3" auger

Number men 1

Engr. in charge Mason

Mtrl. classfd. by Mason

Sampler Swanson

Date hole began 9-26-44

Date hole finished 9-26-44

Shifts actually drilled 1/2 hr.

From	To	Thickness of sample	Sample No.	Description
0	6'			Tan, silty, clayey, firm.
6'	7'			Dark brown, clayey, firm.

Remarks This hole put down to check occurrence of hematite boulder at 6 feet in Hole 48. No hematite found.

WL-24b

Hole No. 49

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 50 Location 5 west of road 350 feet N. 55 W. of hole 48.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1131.53

Depth to top of bed 30.00

Elev. of top of bed 1101.53

Thickness of bed 20.0

Elev. bottom bed 1081.53

Depth of hole 50

Elev. water table None

Bottomed in Ore

****

Drill used 3-in. auger
2-in. at 30 feet

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 9/27/44

Date hole finished 1/18/45

Shifts actually drilled 14

From	To	Thickness of sample	Sample No.	Description
0'	7'			Soft tan silty clay.
7'	8'			Firm brown silty clay
8'	10'	2'	S-151	Firm red-brown clay
10'	12'	2'	S-152	Firm brick-red clay. Few mag. oölites.
12'	14'	2'	S-153	" Some yellow spots
14'	16'	2'	S-154	"
16'	18'	2'	S-155	"
18'	19'6"	1'6"	S-156	"
19'6"	20'	0'6"	S-157	Firm varicolored clay
20'	22'	2'	S-158	Soft brick-red clay. White-yellow spots.
22'	24'	2'	S-159	Soft brick-red clay. Few oölites.
24'	26'	2'	S-160	Firm brick-red clay. Slightly oölitic.
26'	27'	1'	S-161	" Mag. oölites.
27'	28'	1'	S-162	"
28'	30'	2'	S-163	Very hard. Brick-red clay. Oölites-pisolites.
30'	32'	2'	S-164	Very hard brick-red clay. Oölites - spots.

Remarks (See next sheet)

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 50 (con't) Location _____ of sec. _____ T. _____ R. _____ County Washington

Coord. _____ N. _____ E.

Elev. collar _____

Depth to top of bed _____

Elev. of top of bed _____

Thickness of bed _____

Elev. bottom bed _____

Depth of hole 50

Elev. water table _____

Bottomed in Alt. basalt ?

****
3-in. to 30
Drill used 2-in. at 30

Number men _____

Engr. in charge _____

Mtrl. classfd. by _____

Sampler _____

Additional
Date hole ~~began~~ 12/1/44
1/18/45
Date hole finished _____

Man hours
~~Shifts~~ actually drilled 14

Remarks _____

From	To	Thickness of sample	Sample No.	Description
32'	34'	2'	S-165	Hard brick-red gritty clay. Oölit
34'	36'	2'	S-166	Hard varicolored gritty clay. Oölites and limonite.
36'	36'3"	3"	S-167	Firm red-brown gritty clay. Few oölites.
36'3"	36'6"	3"	"	Hard olive drab gritty clay. Oölites.
36'6"	38'	1'6"	S-285	Hard, brown, gritty clay. Few mag. oölites.
38'	39'	1'	286	Hard red-brown gritty. Few mag. oölites.
39'	40'	1'	287	Firm; brick-red sandy.
40'	41'	1'	288	Firm. Light brick-red, sandy. Mag. oölites.
41'	42'	1'	289	" Very few mag. oölites.
42'	43'	1'	302	Firm, light brick-red, sandy
43'	44'	1'	303	Hard, brick-red, gritty
44'	45'	1'	304	" White spots.
45'	46'	1'	305	Firm, brick-red, gritty. Shots.
46'	47'	1'	306	Hard, red-brown, yellow, gritty.
47'	48'	1'	307	" Some lumps.
48'	49'	1'	308	Firm, red-brown-yellow. Spotted.
49'	50'	1'	309	Firm, varicolored. Spotted. Olive drab.

Hole abandoned at 50 feet for lack of pipe.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 51 Location 200 feet due south of hole 50.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1120.50
Depth to top of bed 29.0
Elev. of top of bed 1091.50
Thickness of bed 12.0
Elev. bottom bed 1079.50
Depth of hole 42.5
Elev. water table None
Bottomed in Alt. basalt ?

****
Drill used 3-in. auger 2-in. at 29 feet.

Number men 2
Engr. in charge Mason
Mtrl. classfd. by "
Sampler Swanson
Date hole began 9/28/44
Date hole finished 10/2/44
Shifts actually drilled 2½

From	To	Thickness of sample	Sample No.	Description
0'	7'			Soft tan silty clay
7'	10'			Soft red-brown clay
10'	15'			Soft brick-red clay
15'	18'	3'	S-168	Firm brick-red clay
18'	19'	1'	S-169	Firm brick-red clay;yellow spots.
19'	20'	1'	S-170	"
20'	21'	1'	S-171	"
21'	23'	2'	S-172	" Few mag. oölites.
23'	24'	1'	S-173	Mag. oölites."
24'	25'	1'	S-174	"
25'	26'	1'	S-175	Hard "
26'	27'	1'	S-176	" Firm. Many mag. oölites.
27'	28'	1'	S-177	Firm "
28'	29'	1'	S-178	"
29'	30'	1'	S-179	Hard "
30'	31'	1'	S-180	"

Remarks Hole abandoned when ore zone believed passed. (con't)

WL-24b

Hole No. 51

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 52 Location 300/ feet due S. of hole 51.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1091.07

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 42.5

Elev. water table None

Bottomed in Alt. basalt

****
3-in. auger
Drill used 2-in. at 34 feet.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/2/44

Date hole finished 10/4/44

Shifts actually drilled 2½

Remarks Hole abandoned for lack of pipe.

From	To	Thickness of sample	Sample No.	Description
0'	6'			Soft tan silty clay
6'	10'			Firm brown silty clay
10'	16'			Firm red-brown clay
16'	19'	6'	(S-192)	Firm dark-red clay
19'	22'		(")	Firm dark-red gritty clay
22'	25'	3'	S-193	"
25'	28'	3'	S-194	"
28'	30'	2'	S-195	" Few mag. oölites
30'	32'	2'	S-196	"
32'	33'	1'	S-197	"
33'	34'	1'	S-198	Firm dark-brown, gritty. Mag. oölites.
34'	35'	1'	S-199	Firm dark-brown spotted clay.
35'	35'9"	9"	S-200	"
35'9"	36'3"	6"	S-201	Firm brick-red clay.
36'3"	36'6"	3"	S-202	Firm dark-brown clay. Mag. oölites
36'6"	37'	6"	S-203	Firm varicolored, spotted
37'	38'	1'	S-204	Firm olive-drab. Mag. oölites.
38'	40'	2'	S-210	"
40'	42'	2'	S-211	"
42'	42'6"	6"	S-212	"

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 53 Location On road 460 ± N. 75 W. of hole 50.

_____ of sec. _____ T. _____ R. _____ County Washington

Coord. _____ N. _____ E.

Elev. collar 1120.97

Depth to top of bed 24.0

Elev. of top of bed 1096.97

Thickness of bed 12.0

Elev. bottom bed 1084.97

Depth of hole 42.5

Elev. water table _____

Bottomed in Alt. basalt

Drill used ********** 3-in. auger 2-in. at 25 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/4/44

Date hole finished 10/5/44

Shifts actually drilled 7 hrs.

From	To	Thickness of sample	Sample No.	Description
0	10'			
10'	13'	3'	S-205	Tan silty clay
13'	16'	3'	S-206	Light brick-red clay. Few shots.
16'	19'	3'	S-207	Brick-red clay. Few shots.
19'	21'	2'	S-208	Brick-red clay with white & yellow spots. Oölites.
21'	22'	1'	S-209	"
22'	23'	1'	S-213	"
23'	24'	1'	S-214	Brick-red gritty clay oölites.
24'	25'	1'	S-215	"
25'	26'	1'	S-216	" Some pisolites.
26'	27'	1'	S-217	Yellow, brick-red gritty oölites-pisolites.
27'	27'6"	6"	(S-218)	"
27'6"	28'	6"	(")	Red-brown very gritty. Oölites - pisolites.
28'	29'	1'	S-219	Brick-red, gritty oölites - pisolites.
29'	30'	1'	S-220	Dark-red, gritty oölites - pisolites.
30'	31'	1'	S-221	Brick-red, white spots, gritty oölites. Varicolored lumps.

Remarks Hole abandoned when ore zone believed passed.

(Con't)

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 53 (Con't) Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
31'	32'	1'	S-222	Red-brown, sandy, gritty; oölites - varicolored lumps.
32'	33'	1'	S-223	"
33'	34'	1'	S-224	Red-brown sandy, gritty oölites.
34'	35'	1'	S-225	"
35'	36'	1'	S-226	Dark-brown sandy oölites.
36'	37'	1'	S-227	Red-brown yellow spots. Gritty oölites.
37'	38'	1'	S-228	Varicolored gritty oölites.
38'	39'	1'	S-229	Varicolored gritty
39'	40'6"	1'6"	S-230	Dark-brown, white, yellow, red, gray spots.
40'6"	42'	1'6"	S-231	Varicolored clay.
42'	42'6"	6"	S-232	"

Remarks

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 54 Location 980 feet N. 10° W. of hole 53.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1144.89

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 15

Elev. water table

Bottomed in Red clay

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began 10/7/44

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0'	4'			Yellow-brown silt.
4'	7'			Brown, white spotted silt.
7'	8'			Dark brown silty clay. White red spots.
8'	9'			Red brown silty clay.
9'	11'	2'	S-233	Brick-red clay. Yellow spots.
11'	13'	2'	S-234	Brick-red gritty clay. Oölites.
13'	14'	1'	S-235	"
14'	15'	1'	S-236	Brick red, gritty oölites, lumps, and limonite.

Remarks Hole abandoned at 15 feet due to crooked hole. New hole (55) started 10 feet lower and 35 feet from hole 54. No ore found in 54 upon analysis.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 55 Location 35 feet N. 65° W. of hole 54.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1135.09

Depth to top of bed 8.00

Elev. of top of bed 1127.09

Thickness of bed 12.00

Elev. bottom bed 1115.09

Depth of hole 25

Elev. water table None

Bottomed in Alt. basalt

****

Drill used 3-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/9/44

Date hole finished 10/9/44

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0	2'			Yellow, tan, silty clay
2'	4'			Yellow brown clay. Few Mag. oölites
4'	6'	2'	S-237	Brick red gritty clay. Mag. oölit
6'	8'	2'	S-238	Brick red gritty clay. Oölites and limonites.
8'	10'	2'	S-239	"
10'	12'	2'	S-240	"
12'	14'	2'	S-241	Red brown gritty clay. Oölites and limonite lumps.
14'	16'	2'	S-242	Dark brown clay. Few oölites and lumps.
16'	18'	2'	S-243	"
18'	20'	2'	S-244	Reddish-yellow clay. Few Mag oölites.
20'	22'	2'	S-245	"
22'	23'	1'	S-246	"
23'	25'	2'	S-247	Varicolored clay. Gray lumps.

Remarks Hole bottomed when altered basalt believed hit.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 56 Location On logging road 745 feet N. 15° E. of hole 50.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1132.40

Depth to top of bed 15.00

Elev. of top of bed 1117.40

Thickness of bed 14.00

Elev. bottom bed 1103.40

Depth of hole 31

Elev. water table

Bottomed in Alt. basalt

****

Drill used 3-in. auger
~~2-in. at 24'~~

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/9/44

Date hole finished 10/10/44

Shifts actually drilled 7 hrs.

From	To	Thickness of sample	Sample No.	Description
0	7'			Tan silty clay
7'	10'			Dark brown silty clay; few shots.
10'	13'	3'	S-253	Red brown clay; few shots.
13'	15'	2'	S-254	Brick red gritty clay. Few Mag oölites.
15'	17'	2'	S-255	"
17'	19'	2'	S-256	Red brown gritty clay; oölites and limonite lumps.
19'	21'	2'	S-257	"
21'	23'	2'	S-258	Brick red, gritty, oölitic lumps.
23'	25'	2'	S-259	"
25'	27'	2'	S-260	Dark red gritty, oölitic.
27'	29'	2'	S-261	Reddish brown spotted clay.
29'	31'	2'	S-262	Varicolored soft basalt ?

Remarks Hole abandoned at 31 feet when altered basalt struck.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 57 Location On road 1100 feet N. 5° E. of hole 55.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1185.84

Depth to top of bed 28.00

Elev. of top of bed 1157.84

Thickness of bed 10.00

Elev. bottom bed 1147.84

Depth of hole 42

Elev. water table None

Bottomed in Altered basalt

Drill used ********** 3-in. auger 2½-in. at 25 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/11/44

Date hole finished 10/13/44

Shifts actually drilled 8 hrs.

Remarks

From	To	Thickness of sample	Sample No.	Description
0	5'			Yellowish-tan silty clay
5'	6'			Dark-red brown clay. Few Mag oölites.
6'	10'	4'	S-248	Brick red clay. Few Mag oölites.
10'	13'	3'	S-249	"
13'	16'	3'	S-250	"
16'	18'	2'	S-251	Brick red, spotted, gritty, hard Mag. oölites.
18'	20'	2'	S-252	Brick red, gritty, hard Mag. oölites.
20'	22'	2'	S-263	"
22'	25'	3'	S-264	"
25'	28'	3'	(Sack) S-265	Dark red, gritty. Many Mag. oölites.
28'	31'	3'	S-266	Dark brown, spotted, gritty, Mag. oölites.
31'	33'	2'	S-267	"
33'	35'	2'	)	Yellowish-brown, gritty; few Mag oölites.
35	36'9"	1'9"	)S-268)	"
36'9"	38'	1'3"	S-271	Varicolored, gritty; few mag. oölites.
38'	39'	1'	S-272	"
39'	40'	1'	S-273	"
40'	41'	1'	S-274	Varicolored, spotted, gray basalt
41'	42'	1'	S-275	

Hole abandoned at 42 feet when altered basalt believed struck.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 58 Location On road at Wm. Hoard's road junction; 1400 ft. N. 40° W. of hole 57.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1229.63

Depth to top of bed 13.00

Elev. of top of bed 1216.63

Thickness of bed 13.00

Elev. bottom bed 1203.63

Depth of hole 27

Elev. water table 23'

Bottomed in Alt. basalt

****

Drill used 3-in. auger
2-in. at 15 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/12/44

Date hole finished 10/16/44

Shifts actually drilled 5 hrs.

From	To	Thickness of sample	Sample No.	Description
0	5'			Yellowish-brown silty clay
5'	7'			Dark brown clay
7'	13'	6'	S-269	Red brown, few Mag oölites
13'	15'	2'	S-270	Brick red, gritty, few Mag. oölites and pisolites
15'	16'	1'	S-276	Brick red, very gritty. Many oölites. Few pisolites.
16'	17'	1'	S-277	Brick red, very gritty. Few oolites & pisolites.
17'	17'10"	10"	S-278	"
17'10"	19'	1' 2"	S-279	Yellowish, brick red. Very gritty. Few oölites.
19'	20'	1'	S-280	Yellowish red brown Gritty. Many oölites.
20'	21'	1'	S-281	Spotted red brown. Very gritty oölites.
21'	22'	1'	S-282	Brick red. Gritty. Few oölites.
22'	23'	1'	S-283	"
23'	24'	1'	S-284	Brick red; spotty; gritty; oölites & pisolites.
24'	25'	1'	S-285	Brick red; spotted. Gritty. Few oölites.
25'	26'	1'	S-286	"
26'	27'	1'	S-287	Varicolored. Slightly gritty basalt. ?

Remarks * Material from 20-27 ft. not tested with magnet. Hole abandoned at 27 feet when altered basalt (?) struck at 26 feet.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 59 Location On Nixon-Hutchinson road 4500 ft. from Nixon cut; 1700 ft. N. 65° W. of hole 58.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1237.24

Depth to top of bed 10.50

Elev. of top of bed 1226.74

Thickness of bed 9.50

Elev. bottom bed 1217.24

Depth of hole 25

Elev. water table None

Bottomed in Alt. basalt

****

Drill used 3-in. auger
2-in. at 10 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/16/44

Date hole finished 10/17/44

Shifts actually drilled 5 hrs.

From	To	Thickness of sample	Sample No.	Description
0	6'6"			Tan silty clay
6'6"	9'6"	3'	Jar S-265	Brick red. Limonite lumps, oölites
9'6"	10'6"	1'	S-266	"
10'6"	12'	1'6"	S-267	Reddish brown, gritty oölites Limonite lumps
12'	14'	2'	S-268	Reddish brown, gritty oölites
14'	15'	1'	S-269	Spotted reddish brown, very gritty oölites
15'	16'	1'	S-270	Spotted brown oölites
16'	18'	2'	S-271	Brick red. Few Mag. oölites
18'	20'	2'	S-272	"
20'	22'	2'	S-273	Red brown, spotted Mag oölites
22'	25'	3'	S-274	Varicolored, few Mag oölites

Remarks Material from 0 to 14 ft. not tested with magnet. Hole abandoned at 25 feet when ore zone believed passed.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 60 Location 3000 ft. SE. Nixon cut on road; 1350 ft. N. 65° W. of hole 59.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1271.13

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 42.5

Elev. water table None

Bottomed in Limonite clay

****

Drill used 3-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10-17-44

Date hole finished 10-18-44

Shifts actually drilled 5 hrs.

Remarks

From	To	Thickness of sample	Sample No.	Description
0	4		Sacks	Yellowish-tan silty clay
4	7	3'	S-275	Red brown clay Few Mag oölites
7	10	3'	S-276	"
10	13	3'	S-277	"
13	16	3'	S-278	Brick red clay Few Mag oölites
16	19	3'	S-279	"
19	21	2'	S-282	"
21	23	2'	S-283	"
23	25	2'	S-284	"
25	27	2'	S-285	"
27	29	2'	S-286	Brick red gritty clay Many Mag oölites
29	31	2'	S-287	"
31	33	2'	S-288	"
33	35	2'	S-289	"
35	37	2'	S-290	Brick red clay Few Mag oölites
37	39	2'	S-291	"
39	41	2'	S-292	"
41	42'6"	1'6"	S-293	Yellow clay. Non-mag. oölites & limonite lumps.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 61 Location 1500 ft. SE. Nixon cut on road; 1600 ft. N. 65° W. of hole 60.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1288.18

Depth to top of bed 11.00

Elev. of top of bed 1277.18

Thickness of bed 18.00

Elev. bottom bed 1259.18

Depth of hole 30.0

Elev. water table None

Bottomed in Basalt ?

****

Drill used 3-in. auger
2-in. at 11 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/17/44

Date hole finished 10/19/44
1/18/45

Shifts actually drilled 4½ hrs.

From	To	Thickness of sample	Sample No.	Description
0	4			Yellowish-tan silty clay
4	8			Red-brown clay Few Mag oölites
8	10	2'	S-280	Brick red gritty clay Mag oölites
10	11	1'	S-281	"
11	14	3'	S-294	Dark brown, spotted, gritty. Mag oölites
14	16	2'	S-295	Dark brown, gritty Few basalt (?) lumps
16	18	2'	S-296	"
18	19	1'	S-297	Red brown, varicolored, Spotted
19	20	1'	310	Red brown spotted clay
20	21	1'	311	"
21	22	1'	312	"
22	23	1'	313	"
23	24	1'	401	Varicolored, spotted clay
24	25	1'	402	"
25	26	1'	403	"
26	27	1'	404	"

(Cont.)

Remarks

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson - Nixon
Project

Hole No. 61 Location (Cont.)

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 2"

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled 4½

From	To	Thickness of sample	Sample No.	Description
27	28	1'	405	Varicolored spotted clay
28	29	1'	406	"
29	30	1'	407	" Altered basalt ?

Remarks Hole abandoned at 30 feet when altered basalt believed struck.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchison
Project

Hole No. 62 Location 250 feet N. 45° W. from hole 60.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1280.0

Depth to top of bed 16.0

Elev. of top of bed 1264.0

Thickness of bed 10.0

Elev. bottom bed 1254.0

Depth of hole 27.0

Elev. water table 1269.0

Bottomed in Basalt?

****

Drill used 3-in. auger; coal auger at 16 ft.; 2-in. at 21 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Baldwin

Sampler Both

Date hole began 3/27/45

Date hole finished 3/27/45

Shifts actually drilled 12 man hrs.

Remarks

From	To	Thickness of sample	Sample No.	Description
0'	6'			Red-brown silty clay
6'	8'	2'	420	"
8'	10'	2'	421	Brick-red gritty clay
10'	12'	2'	422	" Few oölites.
12'	14'	2'	423	"
14'	15'	1'	424	Brick-red, very gritty; limonite lumps, oölites.
15'	16'	1'	425	Yellowish-brick-red, spotted, very gritty; oölites - limonites
16'	17'	1'	426	"
17'	18'	1'	427	"
18'	19'	1'	428	"
19'	20'	1'	429	"
20'	21'	1'	430	Brick-red, varicolored, gritty; oölites.
21'	22'	1'	431	"
22'	23'	1'	432	"
23'	24'	1'	433	Brick-red varicolored clay
24'	25'	1'	434	"
25'	26'	1'	435	Varicolored clay; olive drab streaks
26'	27'	1'	436	"

Hole bottomed at 27 feet for want oftime.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Dr. Nixon
Project

Hole No. 30 Location 425 feet N. 45° W. of logging road at point .26 mi. from P.R. Rd.
1850 feet N. 65° W. of Hole 61.
of sec. 34 T. 3 N., R. 3 W., County Washington

Coord. N. E.

Elev. collar 1312.98
Depth to top of bed 2
Elev. of top of bed 1311.0
Thickness of bed 10+ ?
Elev. bottom bed ?
Depth of hole 13
Elev. water table
Bottomed in Red clay

****

Drill used Hand auger
Number men 3
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler Mason
Date hole began 6-8-44
Date hole finished 6-8-44
Shifts actually drilled 1/2

From	To	Thickness of sample	Sample No.	Description
0	2			Top soil
2	6			Iron mixed with red clay
6	13			Hard red clay

Remarks Hole bottomed in ore. Sample # 22-A 2' - 6'
22-B 6' -- 8'
22-C 8' -13'

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 31 Location 50 feet west of limonite outcrop in Hutchinson canyon.

of sec. 1 T. 2 N., R. 3 W., County Washington

Coord. N. E.

Elev. collar 1053

Depth to top of bed 9'6"

Elev. of top of bed 1043

Thickness of bed

Elev. bottom bed

Depth of hole 10'

Elev. water table

Bottomed in Limonite

****

Drill used Hand auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole began 6-8-44

Date hole finished 6-8-44

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0	3			Top soil
3	9'6"			Variegated clay (red, brown, yellow, black)
9'6"	10'			Limonite

Remarks Did not drill through limonite.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchison
Project

Hole No. 32 Location 75 feet north of Hutchison's house.

of sec. 1 T. 2N., R. 3 W., County Washington

Coord. N. E.

Elev. collar 1100

Depth to top of bed 8

Elev. of top of bed 1092

Thickness of bed 14

Elev. bottom bed 1078

Depth of hole 28

Elev. water table

Bottomed in Mottled clay

****

Drill used 2-in.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler Both

Date hole began 6/8/44

Date hole finished 7/24/44

Shifts actually drilled 3/4

From	To	Thickness of sample	Sample No.	Description
0'	4'			Top soil
4'	8'			Red clay
8'	12'			Oölitic iron (hard)
12'	13'			Yellow clay with specks of decomposed feldspar
13'	14'6"	1'6"	200	Dark red-brown clay-like material. Few oölites.
14'6"	16'6"	2'	201	Yellow, brown, clay-like material with white fragments & oolites.
16'6"	17'6"	1'	202	Very few, if any, oölites.
17'6"	19'6"	2'	203	Brown and yellow brown pebbly clay-like material.
19'6"	20'0"	6"	204	No change.
20'0"	22'0"	2'	205	Mottled, varicolored, clay-like, white streaks.
22'	24'	2'	206	Same
24'	25'	1'	207	Same
25'	26'	1'	208	Clay apparently increasing.
26'	27'10"	1'10"	209	Streaked with red, white, black.
27'10"	28'	2"	210	Wetter, more clay, whiter.

Remarks Hole stopped at 28 feet when sufficient depth (without further assays) believed reached. No apparent change noted at bottom.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson

Project

Hole No. 34 Location On rd. 1325 feet west of Hutchinson's house.

of sec. 1, T. 2 N., R. 3 W., County Washington

Coord. N. E.

Elev. collar ± 1125

Depth to top of bed 5

Elev. of top of bed ± 1120

Thickness of bed 9 ±

Elev. bottom bed

Depth of hole 14

Elev. water table

Bottomed in Red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole began 6-9-44

Date hole finished 6-9-44

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0	5			Top soil
5	14			Red clay

Remarks No iron - no sample

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 44 Location 300 feet N. 80° W. of Hole 32; 10 feet west of road

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1113.35

Depth to top of bed 22.0

Elev. of top of bed 1091.35

Thickness of bed 12 (?)

Elev. bottom bed 1079.35

Depth of hole 37

Elev. water table none

Bottomed in Weathered basalt

****
3" auger
Drill used 2" at 22 feet

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Mason

Sampler Swanson

Date hole began 9-19-44

Date hole finished 9-23-44

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0	6'			Light brown loam.
6'	12'			Reddish brown.
12'	14'	2'	A	Dark red - some gritty.
14'	16'	2'	B	Dark red, thin yellow streaks.
16'	18'	2'	C	Dark red, slightly gritty - light spots.
18'	20'	2'	D	Dark red, grittier - more white spots.
20'	22'	2'	E	Brick red - gritty - no white spots, oölites?
22'	23'	1'	S-85	Very hard, brick red, oölites.
23'	24'	1'	S-86	Similar to above.
24'	25'	1'	S-87	Similar to above.
25'	26'	1'	S-88	Hard, brick red, many oölites.
26'	27'	1'	S-89	Softer, gritty, red-brown; many oölites.
27'	28'	1'	S-90	Softer, gritty, brown with some red; oölites, yellow brown at bottom
28'	29'	1'	S-91	Gritty, yellow brown; Big oölites.
29'	30'	1'	S-92	Brick red, gritty, oölites Blue specks.
30'	31'	1'	S-93	Very hard for 2 inches; brick red; oölites.

Remarks

See next page for Hole 44 continued.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

(cont.)

Hole No. 44 Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
31'	32'	1'	S-94	Softer, brick red, oölitic.
32'	33'	1'	S-121	Soft, some oölites, red, with whit spot
33'	34'	1'	S-122	Gritty, brick red, yellow spots.
34'	35'	1'	S-123	Soft, red-yellow, no oölites, white streaks.
35'	36'	1'	S-124	Soft, red, black spots, varicolored, streaked.
36'	37'	1'	S-125	Soft, varicolored, red spots.

Remarks Hole abandoned after passing through supposed ore zone.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 45 Location 250 feet S. 75° W. of Hole 44.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1099.64
Depth to top of bed
Elev. of top of bed
Thickness of bed
Elev. bottom bed
Depth of hole 28'
Elev. water table none
Bottomed in red clay

****

Drill used 3" auger
Number men 2
Engr. in charge Mason
Mtrl. classfd. by Mason
Sampler Swanson
Date hole began 9-20-44
Date hole finished 9-23-44
Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0'	10'			Yellow-brown silty clay; very firm.
10'	12'	2'	A	Brick red, no oölites; very firm.
12'	14'	2'	B	Brick red, some yellow-white streaks.
14'	16'	2'	C	Brick red with yellow and white streaks.
16'	18'	2'	D	Same.
18'	20'	2'	E	Brick red with fewer white and yellow spots.
20'	21'	1'	S-126	Soft, brick red, black spots.
21'	22'	1'	S-127	" " " " "
22'	23'	1'	S-128	Soft, brick red, clayey.
23'	24'	1'	S-129	" " " "
24'	25'	1'	S-130	" " " "
25'	26'	1'	S-131	" " " "
26'	27'	1'	S-132	" " " "
27'	28'	1'	S-133	" " " "

Remarks Hole abandoned when ore horizon believed passed.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson - Nixon
Project

Hole No. 46 Location (Redrilled)

of sec. T. R. County

Coord. N. E.

Elev. collar 1100.56

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 30

Elev. water table

Bottomed in Alt. basalt

****

Drill used 3 inch

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Jordan

Date hole began 2/25/45

Date hole finished 2/25/45

Shifts actually drilled 2½ hrs. (2 men)

From	To	Thickness of sample	Sample No.	Description
0'	9'			Yellow, brown, silty clay
9'	11'	2'	408	Red-brown clay. Few shots.
11'	13'	2'	409	Red-brown clay. Quite firm.
13'	15'	2'	410	"
15'	18'	3'	411	"
18'	21'	3'	412	Soft brown clay.
21'	24'	3'	413	Soft red-brown clay
24'	27'	3'	414	"
27'	30'	3'	415	Gritty, red-brown. White, red, and pink spots.

Remarks Hole abandoned when altered basalt (?) hit. Hole redrilled and sampled.
No ore found upon analysis.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 47 Location 60 feet S. 60° W. of Hole 46, on old trail.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1111.03

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 13'

Elev. water table none

Bottomed in red clay

****

Drill used 3" auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Mason

Sampler Swanson

Date hole began 9-25-44

Date hole finished

Shifts actually drilled 1/4

From	To	Thickness of sample	Sample No.	Description
0'	6'			Tan, silty, clayey, firm.
6'	10'			Brown, clayey, sandy, soft.
10'	12'			Red brown, clayey, firm.
12'	13'			Dark red, clayey, firm.

Remarks

WL-24b

Hole No. 47

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 48 Location 350 feet N. 45° W. of Hole 44.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1122.17
Depth to top of bed 29.00
Elev. of top of bed 1093.17
Thickness of bed 16.00
Elev. bottom bed 1077.17
Depth of hole 45
Elev. water table none
Bottomed in Altered basalt?

****
3" auger.
Drill used 2" at 32 feet

Number men 2
Engr. in charge Mason
Mtrl. classfd. by Mason
Sampler Swanson
Date hole began 9-25-44
Date hole finished 9-26-44
Shifts actually drilled 2

From	To	Thickness of sample	Sample No.	Description
0'	4'			Tan, silty, firm.
4'	6'			Pink and white; silty, sandy, soft.
At	6'			Hematite cobble.
6'	8'			Brown, clayey, sandy, soft.
8'	9'			Red brown, clayey, firm; some oölites.
9'	18'			Brick red, clayey, firm; some oölites.
18'	19'			Brick red with yellow spots, clayey, firm, some oölites.
19'	20'	1'	S-135	Brick red with white & yellow spots, clayey, firm, some oölites.
20'	21'	1'	S-136	Brick red, clayey, gritty, soft magnetic oölites.
21'	22'	1'	S-137	Brick red, clayey, gritty, oölitic.
22'	23'	1'	S-138	Brick red, clayey, oölitic.
23'	24'	1'	S-139	Brick red, clayey, gritty, oölitic.
24'	25'	1'	S-140	Brick red, clayey, gritty, oölitic, pisolitic.
25'	26'	1'	S-141	Brick red, clayey, gritty, oölitic.
26'	27'	1'	S-142	Brick red, clayey, gritty, oölitic.
27'	28'	1'	S-143	Brick red, sandy, gritty, oölitic.

See next page for continuation of Hole 48.

Remarks

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 48 (cont.) Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 45

Elev. water table

Bottomed in Altered basalt

****

Drill used 2" auger at 32'

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began Additional 12/1/44

Date hole finished 12/1/44

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
28'	29'	1'	S-144	Brick red, sandy, gritty, oölitic.
29'	30'	1'	S-145	Brick red, sandy, gritty, pisolitic; oölites very magnetic.
30'	31'	1'	S-146	Brick red, sandy, gritty, oölitic, pisolitic.
31'	32'	1'	S-147	Brick red, clayey, sandy, gritty, pisolitic; oölites not magnetic.
32'	33'	1'	S-148	Brick red, clayey, gritty, oölitic.
33'	34'	1'	S-149	Brick red, clayey, gritty, limonite lumps.
34'	35'	1'	S-150	Olive drab, clayey, oölitic.
35'	36'	1'	S-275	Red, clayey, gritty; oölites.
36'	37'	1'	S-276	Brown, sandy, gritty, non-magnetic oölites.
37'	38'	1'	S-277	Varicolored, sandy, gritty, non-magnetic oölites.
38'	39'	1'	S-278	Varicolored, sandy, non-magnetic oölites.
39'	40'	1'	S-279	Varicolored, sandy, gritty, non-magnetic oölites.
40'	41'	1'	S-280	Red, sandy, gritty, non-magnetic oölites.
41'	42'	1'	S-281	Brown, gritty, non-magnetic oölites.
42'	43'	1'	S-282	Brown, gritty, siliceous lumps.
43'	44'	1'	S-283	Brown, gritty; basalt lumps?
44'	45'	1'	S-284	Varicolored, plastic, soft.

Remarks

Hole abandoned when altered basalt believed struck.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 49 Location 12 feet north of Hole 48.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1122.00

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 7

Elev. water table none

Bottomed in dark clay

****

Drill used 3" auger

Number men 1

Engr. in charge Mason

Mtrl. classfd. by Mason

Sampler Swanson

Date hole began 9-26-44

Date hole finished 9-26-44

Shifts actually drilled 1/2 hr.

From	To	Thickness of sample	Sample No.	Description
0	6'			Tan, silty, clayey, firm.
6'	7'			Dark brown, clayey, firm.

Remarks This hole put down to check occurrence of hematite boulder at 6 feet in Hole 48. No hematite found.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson.
Project

Hole No. 50 Location 5' west of road 350 feet N. 55 W. of hole 48.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1131.53

Depth to top of bed 30.00

Elev. of top of bed 1101.53

Thickness of bed 20.0

Elev. bottom bed 1081.53

Depth of hole 50

Elev. water table None

Bottomed in Ore

****
Drill used 3-in. auger 2-in. at 30 feet

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 9/27/44

Date hole finished 1/18/45

Shifts actually drilled 14

From	To	Thickness of sample	Sample No.	Description
0'	7'			Soft tan silty clay.
7'	8'			Firm brown silty clay
8'	10'	2'	S-151	Firm red-brown clay
10'	12'	2'	S-152	Firm brick-red clay. Few mag. oölites.
12'	14'	2'	S-153	" Some yellow spots
14'	16'	2'	S-154	"
16'	18'	2'	S-155	"
18'	19'6"	1'6"	S-156	"
19'6"	20'	0'6"	S-157	Firm varicolored clay
20'	22'	2'	S-158	Soft brick-red clay. White-yellow spots.
22'	24'	2'	S-159	Soft brick-red clay. Few oölites.
24'	26'	2'	S-160	Firm brick-red clay. Slightly oölitic.
26'	27'	1'	S-161	" Mag. oölites.
27'	28'	1'	S-162	"
28'	30'	2'	S-163	Very hard. Brick-red clay. Oölites-pisolites.
30'	32'	2'	S-164	Very hard brick-red clay. Oölites - spots.

Remarks (See next sheet)

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 50 (con't) Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 50

Elev. water table

Bottomed in Alt. basalt ?

****

Drill used 3-in. to 30
~~2-in. at 30~~

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Additional

Date hole ~~began~~ 12/1/44

Date hole finished 1/18/45

Man hours

~~Shifts~~ actually drilled 14

From	To	Thickness of sample	Sample No.	Description
32'	34'	2'	S-165	Hard brick-red gritty clay. Oölit
34'	36'	2'	S-166	Hard varicolored gritty clay. Oölites and limonite.
36'	36'3"	3"	S-167	Firm red-brown gritty clay. Few oölites.
36'3"	36'6"	3"	"	Hard olive drab gritty clay. Oölites.
36'6"	38'	1'6"	S-285	Hard, brown, gritty clay. Few mag. oölites.
38'	39'	1'	286	Hard red-brown gritty. Few mag. oölites.
39'	40'	1'	287	Firm; brick-red sandy.
40'	41'	1'	288	Firm. Light brick-red, sandy. Mag. oölites.
41'	42'	1'	289	" Very few mag. oölites.
42'	43'	1'	302	Firm, light brick-red, sandy
43'	44'	1'	303	Hard, brick-red, gritty
44'	45'	1'	304	" White spots.
45'	46'	1'	305	Firm, brick-red, gritty. Shots.
46'	47'	1'	306	Hard, red-brown, yellow, gritty.
47'	48'	1'	307	" Some lumps.
48'	49'	1'	308	Firm, red-brown-yellow. Spotted.
49'	50'	1'	309	Firm, varicolored. Spotted. Olive drab.

Remarks

Hole abandoned at 50 feet for lack of pipe.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 51 Location 200 feet due south of hole 50.

_____ of sec. _____ T. _____ R. _____ County Washington

Coord. _____ N. _____ E.

Elev. collar 1120.50

Depth to top of bed 29.0

Elev. of top of bed 1091.50

Thickness of bed 12.0

Elev. bottom bed 1079.50

Depth of hole 42.5

Elev. water table None

Bottomed in Alt. basalt ?

Drill used ********** 3-in. auger 2-in. at 29 feet.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 9/28/44

Date hole finished 10/2/44

Shifts actually drilled 2½

From	To	Thickness of sample	Sample No.	Description
0'	7'			Soft tan silty clay
7'	10'			Soft red-brown clay
10'	15'			Soft brick-red clay
15'	18'	3'	S-168	Firm brick-red clay
18'	19'	1'	S-169	Firm brick-red clay;yellow spots.
19'	20'	1'	S-170	"
20'	21'	1'	S-171	"
21'	23'	2'	S-172	" Few mag. oölites.
23'	24'	1'	S-173	Mag. oölites."
24'	25'	1'	S-174	"
25'	26'	1'	S-175	Hard "
26'	27'	1'	S-176	" Firm. Many mag. oölites.
27'	28'	1'	S-177	Firm "
28'	29'	1'	S-178	"
29'	30'	1'	S-179	Hard "
30'	31'	1'	S-180	"

Remarks Hole abandoned when ore zone believed passed. (con't)

WL-24b

Hole No. _____

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 51 con't. Location _____

_____ of sec. _____ T. _____ R. _____ County Washington

Coord. _____ N. _____ E.

Elev. collar _____

Depth to top of bed _____

Elev. of top of bed _____

Thickness of bed _____

Elev. bottom bed _____

Depth of hole _____

Elev. water table _____

Bottomed in Alt. basalt ?

****

Drill used _____

Number men _____

Engr. in charge _____

Mtrl. classfd. by _____

Sampler _____

Date hole began _____

Date hole finished _____

Shifts actually drilled _____

From	To	Thickness of sample	Sample No.	Description
31'	32'	1'	S-181	Hard brick-red. Few mag. oölites.
32'	33'	1'	S-182	Firm red-brown; non-mag. oölites. lumps.
33'	34'	1'	S-134	Hard. "
34'	35'	1'	S-183	Firm red-brown, gritty; non-mag. oölites.
35'	36'	1'	S-184	Firm brick-red clay. Spotted-shot
36'	37'	1'	S-185	"
37'	38'	1'	S-186	" Few mag. oölites.
38'	39'	1'	S-187	Firm dark-red gritty clay. Shots.
39'	40'	1'	S-188	Firm dark-brown, spotted, gritty. Oölites.
40'	41'	1'	S-189	Firm varicolored clay, gritty; shots.
41'	42'	1'	S-190	"
42'	42'6"	6"	S-191	Olive drab at " bottom.

Remarks _____

WL-24b

Hole No. 51 cont.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 52 Location 300± feet due S. of hole 51.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1091.07

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 42.5

Elev. water table None

Bottomed in Alt. basalt

****
Drill used 3-in. auger 2-in. at 34 feet.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/2/44

Date hole finished 10/4/44

Shifts actually drilled 2½

Remarks Hole abandoned for lack of pipe.

From	To	Thickness of sample	Sample No.	Description
0'	6'			Soft tan silty clay
6'	10'			Firm brown silty clay
10'	16'			Firm red-brown clay
16'	19'	6'	(S-192)	Firm dark-red clay
19'	22'		(")	Firm dark-red gritty clay
22'	25'	3'	S-193	"
25'	28'	3'	S-194	"
28'	30'	2'	S-195	" Few mag. oölites
30'	32'	2'	S-196	"
32'	33'	1'	S-197	"
33'	34'	1'	S-198	Firm dark-brown, gritty. Mag. oölites.
34'	35'	1'	S-199	Firm dark-brown spotted clay.
35'	35'9"	9"	S-200	"
35'9"	36'3"	6"	S-201	Firm brick-red clay.
36'3"	36'6"	3"	S-202	Firm dark-brown clay. Mag. oölites.
36'6"	37'	6"	S-203	Firm varicolored, spotted
37'	38'	1'	S-204	Firm olive-drab. Mag. oölites.
38'	40'	2'	S-210	"
40'	42'	2'	S-211	"
42'	42'6"	6"	S-212	"

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 53 Location On road 460 ± N. 75 W. of hole 50.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1120.97
Depth to top of bed 24.0
Elev. of top of bed 1096.97
Thickness of bed 12.0
Elev. bottom bed 1084.97
Depth of hole 42.5
Elev. water table
Bottomed in Alt. basalt
Drill used ~~3-in. auger~~ 2-in. at 25 ft.
Number men 2
Engr. in charge Mason
Mtrl. classfd. by "
Sampler Swanson
Date hole began 10/4/44
Date hole finished 10/5/44
Shifts actually drilled 7 hrs.

From	To	Thickness of sample	Sample No.	Description
0	10'			
10'	13'	3'	S-205	Tan silty clay
13'	16'	3'	S-206	Light brick-red clay. Few shots.
16'	19'	3'	S-207	Brick-red clay. Few shots.
19'	21'	2'	S-208	Brick-red clay with white & yellow spots. Oölites.
21'	22'	1'	S-209	"
22'	23'	1'	S-213	"
23'	24'	1'	S-214	Brick-red gritty clay oölites.
24'	25'	1'	S-215	"
25'	26'	1'	S-216	" Some pisolites.
26'	27'	1'	S-217	Yellow, brick-red gritty oölites-pisolites.
27'	27'6"	6"	(S-218)	"
27'6"	28'	6"	(")	Red-brown very gritty. Oölites - pisolites.
28'	29'	1'	S-219	Brick-red, gritty oölites - pisolites.
29'	30'	1'	S-220	Dark-red, gritty oölites - pisolites.
30'	31'	1'	S-221	Brick-red, white spots, gritty oölites. Varicolored lumps.

Remarks Hole abandoned when ore zone believed passed.

(Con't)

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 53 (Con't) Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
31'	32'	1'	S-222	Red-brown, sandy, gritty; oölites - varicolored lumps.
32'	33'	1'	S-223	"
33'	34'	1'	S-224	Red-brown sandy, gritty oölites.
34'	35'	1'	S-225	"
35'	36'	1'	S-226	Dark-brown sandy oölites.
36'	37'	1'	S-227	Red-brown yellow spots. Gritty oölites.
37'	38'	1'	S-228	Varicolored gritty oölites.
38'	39'	1'	S-229	Varicolored gritty
39'	40'6"	1'6"	S-230	Dark-brown, white, yellow, red, gray spots.
40'6"	42'	1'6"	S-231	Varicolored clay.
42'	42'6"	6"	S-232	"

Remarks

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 54 Location 980 feet N. 10° W. of hole 53.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1144.89

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 15

Elev. water table

Bottomed in Red clay

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began 10/7/44

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0'	4'			Yellow-brown silt.
4'	7'			Brown, white spotted silt.
7'	8'			Dark brown silty clay. White red spots.
8'	9'			Red brown silty clay.
9'	11'	2'	S-233	Brick-red clay. Yellow spots.
11'	13'	2'	S-234	Brick-red gritty clay. Oölites.
13'	14'	1'	S-235	"
14'	15'	1'	S-236	Brick red, gritty oölites, lumps, and limonite.

Remarks Hole abandoned at 15 feet due to crooked hole. New hole (55) started 10 feet lower and 35 feet from hole 54. No ore found in 54 upon analysis.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 55 Location 35 feet N. 65° W. of hole 54.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1135.09

Depth to top of bed 8.00

Elev. of top of bed 1127.09

Thickness of bed 12.00

Elev. bottom bed 1115.09

Depth of hole 25

Elev. water table None

Bottomed in Alt. basalt

****

Drill used 3-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/9/44

Date hole finished 10/9/44

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0	2'			Yellow, tan, silty clay
2'	4'			Yellow brown clay. Few Mag. oölite
4'	6'	2'	S-237	Brick red gritty clay. Mag. oölit
6'	8'	2'	S-238	Brick red gritty clay. Oölites and limonites.
8'	10'	2'	S-239	"
10'	12'	2'	S-240	"
12'	14'	2'	S-241	Red brown gritty clay. Oölites and limonite lumps.
14'	16'	2'	S-242	Dark brown clay. Few oölites and lumps.
16'	18'	2'	S-243	"
18'	20'	2'	S-244	Reddish-yellow clay. Few Mag oölites.
20'	22'	2'	S-245	"
22'	23'	1'	S-246	"
23'	25'	2'	S-247	Varicolored clay. Gray lumps.

Remarks Hole bottomed when altered basalt believed hit.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 56 Location On logging road 745 feet N. 15° E. of hole 50.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1132.40

Depth to top of bed 15.00

Elev. of top of bed 1117.40

Thickness of bed 14.00

Elev. bottom bed 1103.40

Depth of hole 31

Elev. water table

Bottomed in Alt. basalt

****

Drill used 3-in. auger
~~2-in. at 24'~~

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/9/44

Date hole finished 10/10/44

Shifts actually drilled 7 hrs.

From	To	Thickness of sample	Sample No.	Description
0	7'			Tan silty clay
7'	10'			Dark brown silty clay; few shots.
10'	13'	3'	S-253	Red brown clay; few shots.
13'	15'	2'	S-254	Brick red gritty clay. Few Mag oölites.
15'	17'	2'	S-255	"
17'	19'	2'	S-256	Red brown gritty clay; oölites and limonite lumps.
19'	21'	2'	S-257	"
21'	23'	2'	S-258	Brick red, gritty, oölitic lumps.
23'	25'	2'	S-259	"
25'	27'	2'	S-260	Dark red gritty, oölitic.
27'	29'	2'	S-261	Reddish brown spotted clay.
29'	31'	2'	S-262	Varicolored soft basalt ?

Remarks Hole abandoned at 31 feet when altered basalt struck.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 57 Location On road 1100 feet N. 5° E. of hole 55.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1185.84

Depth to top of bed 28.00

Elev. of top of bed 1157.84

Thickness of bed 10.00

Elev. bottom bed 1147.84

Depth of hole 42

Elev. water table None

Bottomed in Altered basalt

****
Drill used 3-in. auger
2½-in. at 25 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/11/44

Date hole finished 10/13/44

Shifts actually drilled 8 hrs.

Remarks

From	To	Thickness of sample	Sample No.	Description
0	5'			Yellowish-tan silty clay
5'	6'			Dark-red brown clay. Few Mag oölites.
6'	10'	4'	S-248	Brick red clay. Few Mag oölites.
10'	13'	3'	S-249	"
13'	16'	3'	S-250	"
16'	18'	2'	S-251	Brick red, spotted, gritty, hard Mag. oölites.
18'	20'	2'	S-252	Brick red, gritty, hard Mag. oölites.
20'	22'	2'	S-263	"
22'	25'	3'	S-264	"
25'	28'	3'	(Sack) S-265	Dark red, gritty. Many Mag. oölites.
28'	31'	3'	S-266	Dark brown, spotted, gritty, Mag. oölites.
31'	33'	2'	S-267	"
33'	35'	2'	)	Yellowish-brown, gritty; few Mag oölites.
35	36'9"	1'9"	)S-268)	"
36'9"	38'	1'3"	S-271	Varicolored, gritty; few mag. oölites.
38'	39'	1'	S-272	"
39'	40'	1'	S-273	"
40'	41'	1'	S-274	Varicolored, spotted, gray basalt
41'	42'	1'	S-275	

Hole abandoned at 42 feet when altered basalt believed struck.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 58 Location On road at Wm. Hoard's road junction; 1400 ft. N. 40° W. of hole 57.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1229.63

Depth to top of bed 13.00

Elev. of top of bed 1216.63

Thickness of bed 13.00

Elev. bottom bed 1203.63

Depth of hole 27

Elev. water table 23'

Bottomed in Alt. basalt

****

Drill used 3-in. auger
2-in. at 15 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/12/44

Date hole finished 10/16/44

Shifts actually drilled 5 hrs.

From	To	Thickness of sample	Sample No.	Description
0	5'			Yellowish-brown silty clay
5'	7'			Dark brown clay
7'	13'	6'	S-269	Red brown, few Mag oölites
13'	15'	2'	S-270	Brick red, gritty, few Mag. oölites and pisolites
15'	16'	1'	S-276	Brick red, very gritty. Many oölites. Few pisolites.
16'	17'	1'	S-277	Brick red, very gritty. Few oolites & pisolites.
17'	17'10"	10"	S-278	"
17'10"	19'	1' 2"	S-279	Yellowish, brick red. Very gritty. Few oölites.
19'	20'	1'	S-280	Yellowish red brown Gritty. Many oölites.
20'	21'	1'	S-281	Spotted red brown. Very gritty oölites.
21'	22'	1'	S-282	Brick red. Gritty. Few oölites.
22'	23'	1'	S-283	"
23'	24'	1'	S-284	Brick red; spotty; gritty; oölites & pisolites.
24'	25'	1'	S-285	Brick red; spotted. Gritty. Few oölites.
25'	26'	1'	S-286	"
26'	27'	1'	S-287	Varicolored. Slightly gritty basalt. ?

Remarks * Material from 20-27 ft. not tested with magnet. Hole abandoned at 27 feet when altered basalt (?) struck at 26 feet.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 59 Location On Nixon-Hutchinson road 4500 ft. from Nixon cut; 1700 ft. N. 65° W. of hole 58.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1237.24

Depth to top of bed 10.50

Elev. of top of bed 1226.74

Thickness of bed 9.50

Elev. bottom bed 1217.24

Depth of hole 25

Elev. water table None

Bottomed in Alt. basalt

****

Drill used 3-in. auger
2-in. at 10 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/16/44

Date hole finished 10/17/44

Shifts actually drilled 5 hrs.

From	To	Thickness of sample	Sample No.	Description
0	6'6"			Tan silty clay
6'6"	9'6"	3'	Jar S-265	Brick red. Limonite lumps, oölites
9'6"	10'6"	1'	S-266	"
10'6"	12'	1'6"	S-267	Reddish brown, gritty oölites Limonite lumps
12'	14'	2'	S-268	Reddish brown, gritty oölites
14'	15'	1'	S-269	Spotted reddish brown, very gritty oölites
15'	16'	1'	S-270	Spotted brown oölites
16'	18'	2'	S-271	Brick red. Few Mag. oölites
18'	20'	2'	S-272	"
20'	22'	2'	S-273	Red brown, spotted Mag oölites
22'	25'	3'	S-274	Varicolored, few Mag oölites

Remarks Material from 0 to 14 ft. not tested with magnet. Hole abandoned at 25 feet when ore zone believed passed.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 60 Location 3000 ft. SE. Nixon cut on road; 1350 ft. N. 65° W. of hole 59.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1271.13

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 42.5

Elev. water table None

Bottomed in Limonite clay

****

Drill used 3-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10-17-44

Date hole finished 10-18-44

Shifts actually drilled 5 hrs.

Remarks

From	To	Thickness of sample	Sample No.	Description
0	4		Sacks	Yellowish-tan silty clay
4	7	3'	S-275	Red brown clay Few Mag oölites
7	10	3'	S-276	"
10	13	3'	S-277	"
13	16	3'	S-278	Brick red clay Few Mag oölites
16	19	3'	S-279	"
19	21	2'	S-282	"
21	23	2'	S-283	"
23	25	2'	S-284	"
25	27	2'	S-285	"
27	29	2'	S-286	Brick red gritty clay Many Mag oölites
29	31	2'	S-287	"
31	33	2'	S-288	"
33	35	2'	S-289	"
35	37	2'	S-290	Brick red clay Few Mag oölites
37	39	2'	S-291	"
39	41	2'	S-292	"
41	42'6"	1'6"	S-293	Yellow clay. Non-mag. oölites & limonite lumps.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 61 Location 1500 ft. SE. Nixon cut on road; 1600 ft. N. 65° W. of hole 60.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1288.18

Depth to top of bed 11.00

Elev. of top of bed 1277.18

Thickness of bed 18.00

Elev. bottom bed 1259.18

Depth of hole 30.0

Elev. water table None

Bottomed in Basalt ?

****

Drill used 3-in. auger
2-in. at 11 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/17/44

Date hole finished 10/19/44
1/18/45

Shifts actually drilled 4½ hrs.

From	To	Thickness of sample	Sample No.	Description
0	4			Yellowish-tan silty clay
4	8			Red-brown clay Few Mag oölites
8	10	2'	S-280	Brick red gritty clay Mag oölites
10	11	1'	S-281	"
11	14	3'	S-294	Dark brown, spotted, gritty. Mag oölites
14	16	2'	S-295	Dark brown, gritty Few basalt (?) lumps
16	18	2'	S-296	"
18	19	1'	S-297	Red brown, varicolored, Spotted
19	20	1'	310	Red brown spotted clay
20	21	1'	311	"
21	22	1'	312	"
22	23	1'	313	"
23	24	1'	401	Varicolored, spotted clay
24	25	1'	402	"
25	26	1'	403	"
26	27	1'	404	"

(Cont.)

Remarks

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Project ~~Hutchinson - Nixon~~

Hole No. 61 Location (Cont.)

_____ of sec. _____ T. _____ R. _____ County _____

Coord. _____ N. _____ E.

Elev. collar _____

Depth to top of bed _____

Elev. of top of bed _____

Thickness of bed _____

Elev. bottom bed _____

Depth of hole _____

Elev. water table _____

Bottomed in _____

****

Drill used 2"

Number men _____

Engr. in charge _____

Mtrl. classfd. by _____

Sampler _____

Date hole began _____

Date hole finished _____

Shifts actually drilled 4½

From	To	Thickness of sample	Sample No.	Description
27	28	1'	405	Varicolored spotted clay
28	29	1'	406	"
29	30	1'	407	" Altered basalt ?

Remarks Hole abandoned at 30 feet when altered basalt believed struck.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchison
Project

Hole No. 62 Location 250 feet N. 45° W. from hole 60.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1280.0

Depth to top of bed 16.0

Elev. of top of bed 1264.0

Thickness of bed 10.0

Elev. bottom bed 1254.0

Depth of hole 27.0

Elev. water table 1269.0

Bottomed in Basalt

****

Drill used 3-in. auger; coal auger at 16 ft.; 2-in. at 21 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Baldwin

Sampler Both

Date hole began 3/27/45

Date hole finished 3/27/45

Shifts actually drilled 12 man hrs.

Remarks

From	To	Thickness of sample	Sample No.	Description
0'	6'			Red-brown silty clay
6'	8'	2'	420	"
8'	10'	2'	421	Brick-red gritty clay
10'	12'	2'	422	" Few oölites.
12'	14'	2'	423	"
14'	15'	1'	424	Brick-red, very gritty; limonite lumps, oölites.
15'	16'	1'	425	Yellowish-brick-red, spotted, very gritty; oölites - limonites
16'	17'	1'	426	"
17'	18'	1'	427	"
18'	19'	1'	428	"
19'	20'	1'	429	"
20'	21'	1'	430	Brick-red, varicolored, gritty; oölites.
21'	22'	1'	431	"
22'	23'	1'	432	"
23'	24'	1'	433	Brick-red varicolored clay
24'	25'	1'	434	"
25'	26'	1'	435	Varicolored clay; olive drab streaks
26'	27'	1'	436	"

Hole bottomed at 27 feet for want of time.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Dr. Nixon
Project

Hole No. 30 Location 425 feet N. 45° W. of logging road at point .26 mi. from P.R. Rd.
1850 feet N. 65° W. of Hole 61.
of sec. 34 T. 3 N., R. 3 W., County Washington

Coord. N. E.

Elev. collar 1312.98
Depth to top of bed 2
Elev. of top of bed 1311.0
Thickness of bed 10+ ?
Elev. bottom bed ?
Depth of hole 13
Elev. water table
Bottomed in Red clay

****

Drill used Hand auger
Number men 3
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler Mason
Date hole began 6-8-44
Date hole finished 6-8-44
Shifts actually drilled ½

From	To	Thickness of sample	Sample No.	Description
0	2			Top soil
2	6			Iron mixed with red clay
6	13			Hard red clay

Remarks Hole bottomed in ore. Sample # 22-A 2' - 6'
22-B 6' -- 8'
22-C 8' -13'

WL-24b

Hole No. 30

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 31 Location 50 feet west of limonite outcrop in Hutchinson canyon.

of sec. 1 T. 2 N., R. 3 W., County Washington

Coord. N. E.

Elev. collar 1053

Depth to top of bed 9'6"

Elev. of top of bed 1043

Thickness of bed

Elev. bottom bed

Depth of hole 10'

Elev. water table

Bottomed in Limonite

****

Drill used Hand auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole began 6-8-44

Date hole finished 6-8-44

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0	3			Top soil
3	9'6"			Variegated clay (red, brown, ~~yellow, black~~)
9'6"	10'			Limonite

Remarks Did not drill through limonite.

WL-24b

Hole No. 31

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchison
Project

Hole No. 32 Location 75 feet north of Hutchison's house.

of sec. 1 T. 2N., R. 3 W., County Washington

Coord. N. E.

Elev. collar 1100

Depth to top of bed 8

Elev. of top of bed 1092

Thickness of bed 14

Elev. bottom bed 1078

Depth of hole 28

Elev. water table

Bottomed in Mottled clay

****

Drill used 2-in.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler Both

Date hole began 6/8/44

Date hole finished 7/24/44

Shifts actually drilled 3/4

From	To	Thickness of sample	Sample No.	Description
0'	4'			Top soil
4'	8'			Red clay
8'	12'			Oölitic iron (hard)
12'	13'			Yellow clay with specks of decomposed feldspar
13'	14'6"	1'6"	200	Dark red-brown clay-like material. Few oölites.
14'6"	16'6"	2'	201	Yellow, brown, clay-like material with white fragments & oolites.
16'6"	17'6"	1'	202	Very few, if any, oölites.
17'6"	19'6"	2'	203	Brown and yellow brown pebbly clay-like material.
19'6"	20'0"	6"	204	No change.
20'0"	22'0"	2'	205	Mottled, varicolored, clay-like, white streaks.
22'	24'	2'	206	Same
24'	25'	1'	207	Same
25'	26'	1'	208	Clay apparently increasing.
26'	27'10"	1'10"	209	Streaked with red, white, black.
27'10"	28'	2"	210	Wetter, more clay, whiter.

Remarks Hole stopped at 28 feet when sufficient depth (without further assays) believed reached. No apparent change noted at bottom.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson

Project

Hole No. 34 Location On rd. 1325 feet west of Hutchinson's house.

of sec. 1, T. 2 N., R. 3 W., County Washington

Coord. N. E.

Elev. collar ± 1125

Depth to top of bed 5

Elev. of top of bed ± 1120

Thickness of bed 9 ±

Elev. bottom bed

Depth of hole 14

Elev. water table

Bottomed in Red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole began 6-9-44

Date hole finished 6-9-44

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0	5			Top soil
5	14			Red clay

Remarks No iron - no sample

WL-24b

Hole No. 34

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 44 Location 300 feet N. 80° W. of Hole 32; 10 feet west of road

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1113.35
Depth to top of bed 22.0
Elev. of top of bed 1091.35
Thickness of bed 12 (?)
Elev. bottom bed 1079.35
Depth of hole 37
Elev. water table none
Bottomed in Weathered basalt

****
Drill used 3" auger 2" at 22 feet
Number men 2
Engr. in charge Mason
Mtrl. classfd. by Mason
Sampler Swanson
Date hole began 9-19-44
Date hole finished 9-23-44
Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0	6'			Light brown loam.
6'	12'			Reddish brown.
12'	14'	2'	A	Dark red - some gritty.
14'	16'	2'	B	Dark red, thin yellow streaks.
16'	18'	2'	C	Dark red, slightly gritty - light spots.
18'	20'	2'	D	Dark red, grittier - more white spots.
20'	22'	2'	E	Brick red - gritty - no white spots, oölites?
22'	23'	1'	S-85	Very hard, brick red, oölites.
23'	24'	1'	S-86	Similar to above.
24'	25'	1'	S-87	Similar to above.
25'	26'	1'	S-88	Hard, brick red, many oölites.
26'	27'	1'	S-89	Softer, gritty, red-brown; many oölites.
27'	28'	1'	S-90	Softer, gritty, brown with some red; oölites, yellow brown at bottom.
28'	29'	1'	S-91	Gritty, yellow brown; Big oölites.
29'	30'	1'	S-92	Brick red, gritty, oölites Blue specks.
30'	31'	1'	S-93	Very hard for 2 inches; brick red; oölites.

Remarks

See next page for Hole 44 continued.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

(cont.)
Hole No. 44 Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
31'	32'	1'	S-94	Softer, brick red, oölitic.
32'	33'	1'	S-121	Soft, some oölites, red, with whit spot
33'	34'	1'	S-122	Gritty, brick red, yellow spots.
34'	35'	1'	S-123	Soft, red-yellow, no oölites, white streaks.
35'	36'	1'	S-124	Soft, red, black spots, varicolored, streaked.
36'	37'	1'	S-125	Soft, varicolored, red spots.

Remarks Hole abandoned after passing through supposed ore zone.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 45 Location 250 feet S. 75° W. of Hole 44.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1099.64

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 28'

Elev. water table none

Bottomed in red clay

****

Drill used 3" auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Mason

Sampler Swanson

Date hole began 9-20-44

Date hole finished 9-23-44

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0'	10'			Yellow-brown silty clay; very firm.
10'	12'	2'	A	Brick red, no oölites; very firm.
12'	14'	2'	B	Brick red, some yellow-white streaks.
14'	16'	2'	C	Brick red with yellow and white streaks.
16'	18'	2'	D	Same.
18'	20'	2'	E	Brick red with fewer white and yellow spots.
20'	21'	1'	S-126	Soft, brick red, black spots.
21'	22'	1'	S-127	" " " " "
22'	23'	1'	S-128	Soft, brick red, clayey.
23'	24'	1'	S-129	" " " "
24'	25'	1'	S-130	" " " "
25'	26'	1'	S-131	" " " "
26'	27'	1'	S-132	" " " "
27'	28'	1'	S-133	" " " "

Remarks Hole abandoned when ore horizon believed passed.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson - Nixon
Project

Hole No. 46 Location (Redrilled)

of sec. T. R. County

Coord. N. E.

Elev. collar 1100.56

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 30

Elev. water table

Bottomed in Alt. basalt

****

Drill used 3 inch

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Jordan

Date hole began 2/25/45

Date hole finished 2/25/45

Shifts actually drilled 2½ hrs. (2 men)

From	To	Thickness of sample	Sample No.	Description
0'	9'			Yellow, brown, silty clay
9'	11'	2'	408	Red-brown clay. Few shots.
11'	13'	2'	409	Red-brown clay. Quite firm.
13'	15'	2'	410	"
15'	18'	3'	411	"
18'	21'	3'	412	Soft brown clay.
21'	24'	3'	413	Soft red-brown clay
24'	27'	3'	414	"
27'	30'	3'	415	Gritty, red-brown. White, red, and pink spots.

Remarks Hole abandoned when altered basalt (?) hit. Hole redrilled and sampled.

No ore found upon analysis.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 47 Location 60 feet S. 60° W. of Hole 46, on old trail.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1111.03

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 13'

Elev. water table none

Bottomed in red clay

****

Drill used 3" auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Mason

Sampler Swanson

Date hole began 9-25-44

Date hole finished

Shifts actually drilled 1/4

From	To	Thickness of sample	Sample No.	Description
0'	6'			Tan, silty, clayey, firm.
6'	10'			Brown, clayey, sandy, soft.
10'	12'			Red brown, clayey, firm.
12'	13'			Dark red, clayey, firm.

Remarks

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 48 Location 350 feet N. 45° W. of Hole 44.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1122.17
Depth to top of bed 29.00
Elev. of top of bed 1093.17
Thickness of bed 16.00
Elev. bottom bed 1077.17
Depth of hole 45
Elev. water table none
Bottomed in Altered basalt?

****
3" auger.
Drill used 2" at 32 feet

Number men 2
Engr. in charge Mason
Mtrl. classfd. by Mason
Sampler Swanson
Date hole began 9-25-44
Date hole finished 9-26-44
Shifts actually drilled 2

From	To	Thickness of sample	Sample No.	Description
0'	4'			Tan, silty, firm.
4'	6'			Pink and white; silty, sandy, soft.
At	6'			Hematite cobble.
6'	8'			Brown, clayey, sandy, soft.
8'	9'			Red brown, clayey, firm; some oölites.
9'	18'			Brick red, clayey, firm; some oölites.
18'	19'			Brick red with yellow spots, clayey, firm, some oölites.
19'	20'	1'	S-135	Brick red with white & yellow spots, clayey, firm, some oölites.
20'	21'	1'	S-136	Brick red, clayey, gritty, soft magnetic oölites.
21'	22'	1'	S-137	Brick red, clayey, gritty, oölitic.
22'	23'	1'	S-138	Brick red, clayey, oölitic.
23'	24'	1'	S-139	Brick red, clayey, gritty, oölitic.
24'	25'	1'	S-140	Brick red, clayey, gritty, oölitic, pisolitic.
25'	26'	1'	S-141	Brick red, clayey, gritty, oölitic.
26'	27'	1'	S-142	Brick red, clayey, gritty, oölitic.
27'	28'	1'	S-143	Brick red, sandy, gritty, oölitic.

Remarks See next page for continuation of Hole 48.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 48 (cont.) Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 45

Elev. water table

Bottomed in Altered basalt

****

Drill used 2" auger at 32'

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began Additional 12/1/44

Date hole finished 12/1/44

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
28'	29'	1'	S-144	Brick red, sandy, gritty, oölitic.
29'	30'	1'	S-145	Brick red, sandy, gritty, pisolitic; oölites very magnetic.
30'	31'	1'	S-146	Brick red, sandy, gritty, oölitic, pisolitic.
31'	32'	1'	S-147	Brick red, clayey, sandy, gritty, pisolitic; oölites not magnetic.
32'	33'	1'	S-148	Brick red, clayey, gritty, oölitic.
33'	34'	1'	S-149	Brick red, clayey, gritty, limonite lumps.
34'	35'	1'	S-150	Olive drab, clayey, oölitic.
35'	36'	1'	S-275	Red, clayey, gritty; oölites.
36'	37'	1'	S-276	Brown, sandy, gritty, non-magnetic oölites.
37'	38'	1'	S-277	Varicolored, sandy, gritty, non-magnetic oölites.
38'	39'	1'	S-278	Varicolored, sandy, non-magnetic oölites.
39'	40'	1'	S-279	Varicolored, sandy, gritty, non-magnetic oölites.
40'	41'	1'	S-280	Red, sandy, gritty, non-magnetic oölites.
41'	42'	1'	S-281	Brown, gritty, non-magnetic oölites.
42'	43'	1'	S-282	Brown, gritty, siliceous lumps.
43'	44'	1'	S-283	Brown, gritty; basalt lumps?
44'	45'	1'	S-284	Varicolored, plastic, soft.

Remarks

Hole abandoned when altered basalt believed struck.

WL-24b

Hole No. 48 cont

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 49 Location 12 feet north of Hole 48.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1122.00

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 7

Elev. water table none

Bottomed in dark clay

****

Drill used 3" auger

Number men 1

Engr. in charge Mason

Mtrl. classfd. by Mason

Sampler Swanson

Date hole began 9-26-44

Date hole finished 9-26-44

Shifts actually drilled 1/2 hr.

From	To	Thickness of sample	Sample No.	Description
0	6'			Tan, silty, clayey, firm.
6'	7'			Dark brown, clayey, firm.

Remarks This hole put down to check occurrence of hematite boulder at 6 feet in Hole 48. No hematite found.

WL-24b

Hole No. 49

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 50 Location 5' west of road 350 feet N. 55 W. of hole 48.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1131.53

Depth to top of bed 30.00

Elev. of top of bed 1101.53

Thickness of bed 20.0

Elev. bottom bed 1081.53

Depth of hole 50

Elev. water table None

Bottomed in Ore

****

Drill used 3-in. auger
2-in. at 30 feet

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 9/27/44

Date hole finished 1/18/45

Shifts actually drilled 14

From	To	Thickness of sample	Sample No.	Description
0'	7'			Soft tan silty clay.
7'	8'			Firm brown silty clay
8'	10'	2'	S-151	Firm red-brown clay
10'	12'	2'	S-152	Firm brick-red clay. Few mag. oölites.
12'	14'	2'	S-153	" Some yellow spots
14'	16'	2'	S-154	"
16'	18'	2'	S-155	"
18'	19'6"	1'6"	S-156	"
19'6"	20'	0'6"	S-157	Firm varicolored clay
20'	22'	2'	S-158	Soft brick-red clay. White-yellow spots.
22'	24'	2'	S-159	Soft brick-red clay. Few oölites.
24'	26'	2'	S-160	Firm brick-red clay. Slightly oölitic.
26'	27'	1'	S-161	" Mag. oölites.
27'	28'	1'	S-162	"
28'	30'	2'	S-163	Very hard. Brick-red clay. Oölites-pisolites.
30'	32'	2'	S-164	Very hard brick-red clay. Oölites - spots.

Remarks (See next sheet)

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 50 (con't) Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 50

Elev. water table

Bottomed in Alt. basalt?

****

Drill used 3-in. to 30
2-in. at 30

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole ~~began~~ Additional 12/1/44
1/18/45

Date hole finished

~~Shifts~~ Man hours actually drilled 14

Remarks

From	To	Thickness of sample	Sample No.	Description
32'	34'	2'	S-165	Hard brick-red gritty clay. Oölit
34'	36'	2'	S-166	Hard varicolored gritty clay. Oölites and limonite.
36'	36'3"	3"	S-167	Firm red-brown gritty clay. Few oölites.
36'3"	36'6"	3"	"	Hard olive drab gritty clay. Oölites.
36'6"	38'	1'6"	S-285	Hard, brown, gritty clay. Few mag. oölites.
38'	39'	1'	286	Hard red-brown gritty. Few mag. oölites.
39'	40'	1'	287	Firm; brick-red sandy.
40'	41'	1'	288	Firm. Light brick-red, sandy. Mag. oölites.
41'	42'	1'	289	" Very few mag. oölites.
42'	43'	1'	302	Firm, light brick-red, sandy
43'	44'	1'	303	Hard, brick-red, gritty
44'	45'	1'	304	" White spots.
45'	46'	1'	305	Firm, brick-red, gritty. Shots.
46'	47'	1'	306	Hard, red-brown, yellow, gritty.
47'	48'	1'	307	" Some lumps.
48'	49'	1'	308	Firm, red-brown-yellow. Spotted.
49'	50'	1'	309	Firm, varicolored. Spotted. Olive drab.

Hole abandoned at 50 feet for lack of pipe.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 51 Location 200 feet due south of hole 50.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1120.50
Depth to top of bed 29.0
Elev. of top of bed 1091.50
Thickness of bed 12.0
Elev. bottom bed 1079.50
Depth of hole 42.5
Elev. water table None
Bottomed in Alt. basalt ?

****
Drill used 3-in. auger 2-in. at 29 feet.

Number men 2
Engr. in charge Mason
Mtrl. classfd. by "
Sampler Swanson
Date hole began 9/28/44
Date hole finished 10/2/44
Shifts actually drilled 2½

From	To	Thickness of sample	Sample No.	Description
0'	7'			Soft tan silty clay
7'	10'			Soft red-brown clay
10'	15'			Soft brick-red clay
15'	18'	3'	S-168	Firm brick-red clay
18'	19'	1'	S-169	Firm brick-red clay; yellow spots.
19'	20'	1'	S-170	"
20'	21'	1'	S-171	"
21'	23'	2'	S-172	Few mag. oölites.
23'	24'	1'	S-173	Mag. oölites."
24'	25'	1'	S-174	"
25'	26'	1'	S-175	Hard "
26'	27'	1'	S-176	Firm. Many mag. oölites.
27'	28'	1'	S-177	Firm "
28'	29'	1'	S-178	"
29'	30'	1'	S-179	Hard "
30'	31'	1'	S-180	"

Remarks Hole abandoned when ore zone believed passed. (con't)

WL-24b

Hole No. 51

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 51 con't. Location _____

_____ of sec. _____ T. _____ R. _____ County Washington

Coord. _____ N. _____ E.

Elev. collar _____

Depth to top of bed _____

Elev. of top of bed _____

Thickness of bed _____

Elev. bottom bed _____

Depth of hole _____

Elev. water table _____

Bottomed in Alt. basalt ?

****

Drill used _____

Number men _____

Engr. in charge _____

Mtrl. classfd. by _____

Sampler _____

Date hole began _____

Date hole finished _____

Shifts actually drilled _____

From	To	Thickness of sample	Sample No.	Description
31'	32'	1'	S-181	Hard brick-red. Few mag. oölites.
32'	33'	1'	S-182	Firm red-brown; non-mag. oölites. lumps.
33'	34'	1'	S-134	Hard. "
34'	35'	1'	S-183	Firm red-brown, gritty; non-mag. oölites.
35'	36'	1'	S-184	Firm brick-red clay. Spotted-shot
36'	37'	1'	S-185	"
37'	38'	1'	S-186	" Few mag. oölites.
38'	39'	1'	S-187	Firm dark-red gritty clay. Shots.
39'	40'	1'	S-188	Firm dark-brown, spotted, gritty. Oölites.
40'	41'	1'	S-189	Firm varicolored clay, gritty; shots.
41'	42'	1'	S-190	"
42'	42'6"	6"	S-191	" Olive drab at bottom.

Remarks _____

51 cont.

WL-24b

Hole No. _____

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 52 Location 300± feet due S. of hole 51.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1091.07

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 42.5

Elev. water table None

Bottomed in Alt. basalt

Drill used ********** 3-in. auger 2-in. at 34 feet.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/2/44

Date hole finished 10/4/44

Shifts actually drilled 2½

Remarks Hole abandoned for lack of pipe.

From	To	Thickness of sample	Sample No.	Description
0'	6'			Soft tan silty clay
6'	10'			Firm brown silty clay
10'	16'			Firm red-brown clay
16'	19'	6'	(S-192)	Firm dark-red clay
19'	22'		(")	Firm dark-red gritty clay
22'	25'	3'	S-193	"
25'	28'	3'	S-194	"
28'	30'	2'	S-195	" Few mag. oölites
30'	32'	2'	S-196	"
32'	33'	1'	S-197	"
33'	34'	1'	S-198	Firm dark-brown, gritty. Mag. oölites.
34'	35'	1'	S-199	Firm dark-brown spotted clay.
35'	35'9"	9"	S-200	"
35'9"	36'3"	6"	S-201	Firm brick-red clay.
36'3"	36'6"	3"	S-202	Firm dark-brown clay. Mag. oölites.
36'6"	37'	6"	S-203	Firm varicolored, spotted
37'	38'	1'	S-204	Firm olive-drab. Mag. oölites.
38'	40'	2'	S-210	"
40'	42'	2'	S-211	"
42'	42'6"	6"	S-212	"

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 53 Location On road 460 ± N. 75 W. of hole 50.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1120.97

Depth to top of bed 24.0

Elev. of top of bed 1096.97

Thickness of bed 12.0

Elev. bottom bed 1084.97

Depth of hole 42.5

Elev. water table

Bottomed in Alt. basalt

Drill used ********** 3-in. auger 2-in. at 25 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/4/44

Date hole finished 10/5/44

Shifts actually drilled 7 hrs.

From	To	Thickness of sample	Sample No.	Description
0	10'			
10'	13'	3'	S-205	Tan silty clay
13'	16'	3'	S-206	Light brick-red clay. Few shots.
16'	19'	3'	S-207	Brick-red clay. Few shots.
19'	21'	2'	S-208	Brick-red clay with white yellow spots. Oölites.
21'	22'	1'	S-209	"
22'	23'	1'	S-213	"
23'	24'	1'	S-214	Brick-red gritty clay oölites.
24'	25'	1'	S-215	"
25'	26'	1'	S-216	" Some pisolites.
26'	27'	1'	S-217	Yellow, brick-red gritty oölites-pisolites.
27'	27'6"	6"	(S-218)	"
27'6"	28'	6"	(")	Red-brown very gritty. Oölites - pisolites.
28'	29'	1'	S-219	Brick-red, gritty oölites - pisolites.
29'	30'	1'	S-220	Dark-red, gritty oölites - pisolites.
30'	31'	1'	S-221	Brick-red, white spots, gritty oölites. Varicolored lumps.

Remarks Hole abandoned when ore zone believed passed.

(Con't)

WL-24b

Hole No. 53

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 53 (Con't) Location

of sec. T. R. County Washington

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
31'	32'	1'	S-222	Red-brown, sandy, gritty; oölites - varicolored lumps.
32'	33'	1'	S-223	"
33'	34'	1'	S-224	Red-brown sandy, gritty oölites.
34'	35'	1'	S-225	"
35'	36'	1'	S-226	Dark-brown sandy oölites.
36'	37'	1'	S-227	Red-brown yellow spots. Gritty oölites.
37'	38'	1'	S-228	Varicolored gritty oölites.
38'	39'	1'	S-229	Varicolored gritty
39'	40'6"	1'6"	S-230	Dark-brown, white, yellow, red, gray spots.
40'6"	42'	1'6"	S-231	Varicolored clay.
42'	42'6"	6"	S-232	"

Remarks

WL-24b

Hole No. 53 (con't)

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 54 Location 980 feet N. 10° W. of hole 53.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1144.89

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 15

Elev. water table

Bottomed in Red clay

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began 10/7/44

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0'	4'			Yellow-brown silt.
4'	7'			Brown, white spotted silt.
7'	8'			Dark brown silty clay. White red spots.
8'	9'			Red brown silty clay.
9'	11'	2'	S-233	Brick-red clay. Yellow spots.
11'	13'	2'	S-234	Brick-red gritty clay. Oölites.
13'	14'	1'	S-235	"
14'	15'	1'	S-236	Brick red, gritty oölites, lumps, and limonite.

Remarks Hole abandoned at 15 feet due to crooked hole. New hole (55) started 10 feet lower and 35 feet from hole 54. No ore found in 54 upon analysis.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 55 Location 35 feet N. 65° W. of hole 54.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1135.09

Depth to top of bed 8.00

Elev. of top of bed 1127.09

Thickness of bed 12.00

Elev. bottom bed 1115.09

Depth of hole 25

Elev. water table None

Bottomed in Alt. basalt

****

Drill used 3-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/9/44

Date hole finished 10/9/44

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0	2'			Yellow, tan, silty clay
2'	4'			Yellow brown clay. Few Mag. oölite
4'	6'	2'	S-237	Brick red gritty clay. Mag. oölit
6'	8'	2'	S-238	Brick red gritty clay. Oölites and limonites.
8'	10'	2'	S-239	"
10'	12'	2'	S-240	"
12'	14'	2'	S-241	Red brown gritty clay. Oölites and limonite lumps.
14'	16'	2'	S-242	Dark brown clay. Few oölites and lumps.
16'	18'	2'	S-243	"
18'	20'	2'	S-244	Reddish-yellow clay. Few Mag oölites.
20'	22'	2'	S-245	"
22'	23'	1'	S-246	"
23'	25'	2'	S-247	Varicolored clay. Gray lumps.

Remarks Hole bottomed when altered basalt believed hit.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 56 Location On logging road 745 feet N. 15° E. of hole 50.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1132.40

Depth to top of bed 15.00

Elev. of top of bed 1117.40

Thickness of bed 14.00

Elev. bottom bed 1103.40

Depth of hole 31

Elev. water table

Bottomed in Alt. basalt

****

Drill used 3-in. auger
~~2-in. at 24'~~

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began ~~10/9/44~~

Date hole finished ~~10/10/44~~

Shifts actually drilled ~~7 hrs.~~

From	To	Thickness of sample	Sample No.	Description
0	7'			Tan silty clay
7'	10'			Dark brown silty clay; few shots.
10'	13'	3'	S-253	Red brown clay; few shots.
13'	15'	2'	S-254	Brick red gritty clay. Few Mag oölites.
15'	17'	2'	S-255	"
17'	19'	2'	S-256	Red brown gritty clay; oölites and limonite lumps.
19'	21'	2'	S-257	"
21'	23'	2'	S-258	Brick red, gritty, oölitic lumps.
23'	25'	2'	S-259	"
25'	27'	2'	S-260	Dark red gritty, oölitic.
27'	29'	2'	S-261	Reddish brown spotted clay.
29'	31'	2'	S-262	Varicolored soft basalt ?

Remarks Hole abandoned at 31 feet when altered basalt struck.

WL-24b

Hole No. 56

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 57 Location On road 1100 feet N. 5° E. of hole 55.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1185.84

Depth to top of bed 28.00

Elev. of top of bed 1157.84

Thickness of bed 10.00

Elev. bottom bed 1147.84

Depth of hole 42

Elev. water table None

Bottomed in Altered basalt

Drill used ********** 3-in. auger 2-in. at 25 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/11/44

Date hole finished 10/13/44

Shifts actually drilled 8 hrs.

Remarks

From	To	Thickness of sample	Sample No.	Description
0	5'			Yellowish-tan silty clay
5'	6'			Dark-red brown clay. Few Mag oölites.
6'	10'	4'	S-248	Brick red clay. Few Mag oölites.
10'	13'	3'	S-249	"
13'	16'	3'	S-250	"
16'	18'	2'	S-251	Brick red, spotted, gritty, hard Mag. oölites.
18'	20'	2'	S-252	Brick red, gritty, hard Mag. oölites.
20'	22'	2'	S-263	"
22'	25'	3'	S-264	"
25'	28'	3'	(Sack) S-265	Dark red, gritty. Many Mag. oölites.
28'	31'	3'	S-266	Dark brown, spotted, gritty, Mag. oölites.
31'	33'	2'	S-267	"
33'	35'	2'	)	Yellowish-brown, gritty; few Mag oölites.
35	36'9"	1'9"	)S-268)	"
36'9"	38'	1'3"	S-271	Varicolored, gritty; few mag. oölites.
38'	39'	1'	S-272	"
39'	40'	1'	S-273	"
40'	41'	1'	S-274	Varicolored, spotted, gray basalt
41'	42'	1'	S-275	

Hole abandoned at 42 feet when altered basalt believed struck.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 58 Location On road at Wm. Hoard's road junction; 1400 ft. N. 40° W. of hole 57.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1229.63
Depth to top of bed 13.00
Elev. of top of bed 1216.63
Thickness of bed 13.00
Elev. bottom bed 1203.63
Depth of hole 27
Elev. water table 23'
Bottomed in Alt. basalt

****
Drill used 3-in. auger
2-in. at 15 ft.

Number men 2
Engr. in charge Mason
Mtrl. classfd. by "
Sampler Swanson
Date hole began 10/12/44
Date hole finished 10/16/44
Shifts actually drilled 5 hrs.

From	To	Thickness of sample	Sample No.	Description
0	5'			Yellowish-brown silty clay
5'	7'			Dark brown clay
7'	13'	6'	S-269	Red brown, few Mag oölites
13'	15'	2'	S-270	Brick red, gritty, few Mag. oölites and pisolites
15'	16'	1'	S-276	Brick red, very gritty. Many oölites. Few pisolites.
16'	17'	1'	S-277	Brick red, very gritty. Few oolites & pisolites.
17'	17'10"	10"	S-278	"
17'10"	19'	1' 2"	S-279	Yellowish brick red. Very gritty. Few oölites.
19'	20'	1'	S-280	Yellowish red brown Gritty. Many oölites.
20'	21'	1'	S-281	Spotted red brown. Very gritty oölites.
21'	22'	1'	S-282	Brick red. Gritty. Few oölites.
22'	23'	1'	S-283	"
23'	24'	1'	S-284	Brick red; spotty; gritty; oölites & pisolites.
24'	25'	1'	S-285	Brick red; spotted. Gritty. Few oölites.
25'	26'	1'	S-286	"
26'	27'	1'	S-287	Varicolored. Slightly gritty basalt. ?

Remarks * Material from 20-27 ft. not tested with magnet. Hole abandoned at 27 feet when altered basalt (?) struck at 26 feet.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 59 Location On Nixon-Hutchinson road 4500 ft. from Nixon cut; 1700 ft. N. 65° W. of hole 58.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1237.24

Depth to top of bed 10.50

Elev. of top of bed 1226.74

Thickness of bed 9.50

Elev. bottom bed 1217.24

Depth of hole 25

Elev. water table None

Bottomed in Alt. basalt

****

Drill used 3-in. auger
2-in. at 10 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/16/44

Date hole finished 10/17/44

Shifts actually drilled 5 hrs.

From	To	Thickness of sample	Sample No.	Description
0	6'6"			Tan silty clay
6'6"	9'6"	3'	Jar S-265	Brick red. Limonite lumps, oölites
9'6"	10'6"	1'	S-266	"
10'6"	12'	1'6"	S-267	Reddish brown, gritty oölites Limonite lumps
12'	14'	2'	S-268	Reddish brown, gritty oölites
14'	15'	1'	S-269	Spotted reddish brown, very gritty oölites
15'	16'	1'	S-270	Spotted brown oölites
16'	18'	2'	S-271	Brick red. Few Mag. oölites
18'	20'	2'	S-272	"
20'	22'	2'	S-273	Red brown, spotted Mag oölites
22'	25'	3'	S-274	Varicolored, few Mag oölites

Remarks Material from 0 to 14 ft. not tested with magnet. Hole abandoned at 25 feet when ore zone believed passed.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 60 Location 3000 ft. SE. Nixon cut on road; 1350 ft. N. 65° W. of hole 59.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1271.13

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 42.5

Elev. water table None

Bottomed in Limonite clay

****

Drill used 3-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10-17-44

Date hole finished 10-18-44

Shifts actually drilled 5 hrs.

Remarks

From	To	Thickness of sample	Sample No.	Description
0	4		Sacks	Yellowish-tan silty clay
4	7	3'	S-275	Red brown clay Few Mag oölites
7	10	3'	S-276	"
10	13	3'	S-277	"
13	16	3'	S-278	Brick red clay Few Mag oölites
16	19	3'	S-279	"
19	21	2'	S-282	"
21	23	2'	S-283	"
23	25	2'	S-284	"
25	27	2'	S-285	"
27	29	2'	S-286	Brick red gritty clay Many Mag oölites
29	31	2'	S-287	"
31	33	2'	S-288	"
33	35	2'	S-289	"
35	37	2'	S-290	Brick red clay Few Mag oölites
37	39	2'	S-291	"
39	41	2'	S-292	"
41	42'6"	1'6"	S-293	Yellow clay. Non-mag. oölites & limonite lumps.

WL-24b

Hole No. 60

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson
Project

Hole No. 61 Location 1500 ft. SE. Nixon cut on road; 1600 ft. N. 65° W. of hole 60.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1288.18

Depth to top of bed 11.00

Elev. of top of bed 1277.18

Thickness of bed 18.00

Elev. bottom bed 1259.18

Depth of hole 30.0

Elev. water table None

Bottomed in Basalt ?

****

Drill used 3-in. auger
2-in. at 11 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Swanson

Date hole began 10/17/44

Date hole finished 10/19/44
1/18/45

Shifts actually drilled 4½ hrs.

From	To	Thickness of sample	Sample No.	Description
0	4			Yellowish-tan silty clay
4	8			Red-brown clay Few Mag oölites
8	10	2'	S-280	Brick red gritty clay Mag oölites
10	11	1'	S-281	"
11	14	3'	S-294	Dark brown, spotted, gritty. Mag oölites
14	16	2'	S-295	Dark brown, gritty Few basalt (?) lumps
16	18	2'	S-296	"
18	19	1'	S-297	Red brown, varicolored, Spotted
19	20	1'	310	Red brown spotted clay
20	21	1'	311	"
21	22	1'	312	"
22	23	1'	313	"
23	24	1'	401	Varicolored, spotted clay
24	25	1'	402	"
25	26	1'	403	"
26	27	1'	404	"

(Cont.)

Remarks

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchinson - Nixon
Project

Hole No. 61 Location (Cont.)

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 2"

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled 4½

From	To	Thickness of sample	Sample No.	Description
27	28	1'	405	Varicolored spotted clay
28	29	1'	406	"
29	30	1'	407	" Altered ~~basalt~~ ?

Remarks Hole abandoned at 30 feet when altered basalt believed struck.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hutchison
Project

Hole No. 62 Location 250 feet N. 45° W. from hole 60.

of sec. T. R. County Washington

Coord. N. E.

Elev. collar 1280.0

Depth to top of bed 16.0

Elev. of top of bed 1264.0

Thickness of bed 10.0

Elev. bottom bed 1254.0

Depth of hole 27.0

Elev. water table 1269.0

Bottomed in Basalt

****

Drill used 3-in. auger; coal auger at 16 ft.; 2-in. at 21 ft.

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Baldwin

Sampler Both

Date hole began 3/27/45

Date hole finished 3/27/45

Shifts actually drilled 12 man hrs.

Remarks

From	To	Thickness of sample	Sample No.	Description
0'	6'			Red-brown silty clay
6'	8'	2'	420	"
8'	10'	2'	421	Brick-red gritty clay
10'	12'	2'	422	" Few oölites.
12'	14'	2'	423	"
14'	15'	1'	424	Brick-red, very gritty; limonite lumps, oölites.
15'	16'	1'	425	Yellowish-brick-red, spotted, very gritty; oölites = limonites
16'	17'	1'	426	"
17'	18'	1'	427	"
18'	19'	1'	428	"
19'	20'	1'	429	"
20'	21'	1'	430	Brick-red, varicolored, gritty; oölites.
21'	22'	1'	431	"
22'	23'	1'	432	"
23'	24'	1'	433	Brick-red varicolored clay
24'	25'	1'	434	"
25'	26'	1'	435	Varicolored clay; olive drab streaks
26'	27'	1'	436	"

Hole bottomed at 27 feet for want of time.

Barnett

McMahan laterite locality trip, August 17, 1950 David J. White

5.8 miles - From Mehama on Little North Santiam Highway.

5.7 miles (obtained on August 17).

Turn left - .7 mile to P. G. Ferris mill in center of sec. 12, T. 9 S., R. 2 E.

Uphill on logging road 1/2 - 3/4 mile and 500 feet higher in elevation to first pits on southeast side of a ridge in SE¼ sec. 1, T. 9 S., R. 2 E.

Altimeter readings

1210' - At car at mill.

1700' - Tan and grey weathered material (clay) with some minor gibbsite. Sample #1 (P-10031).

1770' - Tan and grey granular laterite from pit on southeast side of ridge near top. Sample #2 (P-10032).

1770' - Sample #3 (P-10033). Float from vicinity of Sample #2.

1780' - Sample #4 (P-10034). Tan and grey laterite float with brown bands from top of ridge southwest of first ridge (elevation 1780).

1780'? - Sample #5. Basalt from top of ridge northwest of Sample #2. Ridge runs NE-SW.

1660' - In draw on north side of logging road and about west of ridge on which Sample #4 was taken.

A sample of basalt (slightly altered) was taken. Sample #6.

1720' - Sample #7 (P-10035). Tan laterite nodule from pit about 20 feet above lower pits (Sample #1) approximately N.W. of Sample #1 locality.

McMahan laterite locality trip, August 17, 1950

1820' - Elevation in road which crosses small saddle in the NE-SW trending ridge. Sample #8 taken from pit in road which crosses saddle at highest point of road; sample consists of red clay with red iron bands and some laterite nodules.

1820' - Sample #9 taken as grab sample from dump and consisting of material dug from a 2' hole in bottom of a bulldozer cut on ridge southwest of Sample #8. Open cut runs S. 60° W. for a distance of 75 feet and is about 8' wide by 5' deep. Upper 2' is brown soil and lower 3' consists of clay (red to tan color) containing broken red iron bands and tan laterite nodules. Hole in bottom of open cut exposes 2' of tan clay with red and grey streaks and some light grey material showing fine limonite streaks which give the appearance of bedding, but probably represent channels through which surface water circulated and deposited the limonite. Walked from bulldozer cut across saddle in NE direction to top of NE knob of ridge (1820') to observe porphyritic basalt float.

1800' - Elev. Sample #10 on SE side of ridge below porphyritic basalt locality. A 3' channel sample of red clay with soft white spots from a hole dug in side of hill.

1810' - Sample #11 - grab sample of grey weathered lava? (Clay) with white spots - small amount of tan clay from hole dug in road leading NW across saddle.

1810' - Sample #12. Tan and grey weathered clay surrounded by grey and white clay (Sample #11) and underlain by a purple clay from same hole that Sample #11 was taken from.

Took trip with McMahon, McBride to bulldozer cuts in northern part of Sec. 1, T. 9 S., R. 2 E. Observed a lot of weathered ash.

McMahan laterite locality trip, August 17, 1950

#1 (bulldozer cut)

0- 5 - Yellow clay (irony).

5- 6 - Brownish yellow clay with grey clay streak.

6-10 - Grey clay with brown streaks and yellow.

10-11 - Purple and brown clay. (Has large purple porphyritic nodules or pebbles in brown clay matrix.)

11-14 - Purple and white grainy clay.

	Al_2O_3	Fe_2O_3	SiO_2	TiO_2	Loss on ignition
0- 2	33.09	14.30	37.30	1.91	13.40
2- 4	33.42	15.20	35.60	1.91	13.87
4- 6	39.24	10.80	30.90	2.09	16.97
6- 8	43.10	11.50	22.34	2.24	20.82
8-10	43.50	11.10	22.62	2.21	20.57
10-12	35.11	15.20	32.54	1.73	15.42
12-14	34.13	14.50	35.60	1.75	14.02

#3 (about 50'-100' W. of N. of pits with laterite nodules.)

0- 1 - Top soil.

1- 7 - Brown sandy clay with yellow and grey and red seams and few scattered grey nodules.

7-15 - Brown-yellow and red clay with black streaks.

15-19 - Red weathered flow rock (friable).

McMahan laterite locality trip, August 17, 1950

	Al_2O_3	Fe_2O_3	SiO_2	TiO_2	Loss on ignition
1- 3	27.23	18.00	39.12	2.89	12.76
3- 5	30.16	18.10	35.26	2.55	13.93
5- 7	38.54	13.50	28.40	2.03	17.53
7- 9	34.08	15.10	34.84	1.91	14.07
9-11	34.13	13.60	36.78	1.89	13.60
11-13	31.99	16.40	36.36	2.09	13.16
13-15	31.84	16.40	36.82	2.12	12.82
15-17	30.58	18.10	36.74	1.97	12.61
17-19	30.07	18.10	37.26	2.09	12.48

Trip to Mark's clay locality (1950) David J. White

595.5 - Mabel

597.5 - Turned off to McCauley.

597.9 - Mabel road again

599.45 - Howard Road junction.

600.1 - Old Carl Mark house.

600.3 - Carl Mark house.

600.8 - 100 yards west drilled 12'.

601.7 - Mark house

605.4 - Howard Road

607.4 - Creek. Took samples in road cut north and south of creek.

607.6 - Elevation 1150. Sample of grey clay.

612.6 - At Y-road intersection.

614.8 - Crawfordsville - Holley road intersection with Mabel road. E½ sec. 24, T. 14 S., R. 3 W.

626.2 - Brownsville sandstone quarry on Union Pt. road - south of town.

629.8 - To Brownsville at intersection of Brownsville-Crawfordsville road.

Sample #1: Massive grey clay in road cut south of creek 5.6 miles north of Mabel on road to Holley.

Sample #2: Thin seam of grey clay (quite platy) in road cut north of creek 5.6 miles north of Mabel on road to Holley.

Sample #3: Tannish-grey (weathered lava?) from road cut 5.9 miles north of Mabel on road to Holley.

RSM DESK FIL

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

KIGGINS LATERITE
Project

Hole No. 1 Location On hillside above road about ¼ mile below house.

W½ of sec. 3 T. 4S R. 4E County Clackamas

Coord. N. E.

Elev. collar Aneroid 1075

Depth to top of bed 6"

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 15'

Elev. water table 8'-6"

Bottomed in Weathered basalt

****

Drill used 2" auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Jones

Date hole began 8/4/48

Date hole finished 8/5/48

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0'	1'	1'	P-7630 1	Mostly soil - rocks
1'	2'	1'	P-7631 2	few rocks Dk. brown, earthy, firm,
2'	3'	1'	P-7632 3	damp, oolites or pisolites Brick red, earthy, very firm,
3	4	1'	P-7633 4	few non-magnetic oolites Brick red, earthy, hard, damp,
4	5	1'	P-7634 5	few non-magnetic oolites Brick red, earthy, hard, damp,
5	6	1'	P-7635 6	few non-magnetic oolites Brick red, earthy, hard, damp,
6	7	1'	P-7636 7	few non-magnetic oolites Brick red, earthy, hard, damp,
7	8	1'	P-7637 8	Brick red, earthy, hard, damp
8	9	1'	P-7638 9	plastic, damp Brick red, earthy, clayey,
9	10	1'	P-7639 10	very damp Dk. brick red, clayey, plastic,
10	11	1'	P-7640 11	very damp Dk. brick red, clayey, plastic
11	12	1'	P-7641 12	plastic, damp Dk. brick red, clayey, slightly
12	13	1'	P-7642 13	plastic, damp, firm Dk. brick red, clayey, slightly
13	14	1'	P-7643 14	clayey, slightly plast, damp, fi Dark brown, red, blue spots,
14	15	1'	P-7644 15	slightly plastic, damp, firm Dark brown, red, blue spots,

Remarks Hole drilled thru tough ground all the way. Coal auger required. No gritty material save pebbles of basalt near top.

RSM DESK FIL

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

KIGGINS LATERITE
Project

Hole No. 2 Location

W½ of sec. 3 T. 4S R. 4E County Clackamas

Coord. N. E.

Elev. collar Aneroid 1086

Depth to top of bed 6"

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 11'

Elev. water table

Bottomed in Red clay?

****

Drill used 2" auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Jones

Date hole began 8/5/48

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0	1	1'	P-7645 16	Brown, earthy, dry
1	2	1'	P-7646 17	earthy,clay.,fm,sl.dmp,no shots Red br., wh.-bl.-black spots,
2	3	1'	P-7647 18	earthy,vy.fm,sl.dmp, no shots Red br., wh.-bl.-black spots, cl
3	4	1'	P-7648 19	earthy,vy.fm,sl.damp, no shots Red br., wh.-bl.-black spots, cl
4	5	1'	P-7649 20	earthy, very firm, sl. damp,cla Red br,many wh.-bl.-black spots
5	6	1'	P-7650 21	or.-pnk,shots,clay,vy fm,sl.dmp Red br,many wh.-spots, black-bl
6	7	1'	P-7651 22	or.-pnk shs,clay,vy.fm., sl.dmp Red br,many wh.-spots, black-bl
7	8	1'	P-7652 23	shs,dk.or.-pnk shs,cl.vy.fm.sl Br. rd.,dk.yel.-wh sps.,black-bl
8	9	1'	P-7653 24	pnk shs.,clay,plastic,sft,damp Br. rd.,vy few wh.-yel.-bl.-blue
9	10	1'	P-7654 25	plastic, soft, damp Br. rd., big wh. shots, clayey,
10	11	1'	P-7655 26	damp. Brick red, clayey, plastic, soft

Remarks Collar is 11' vertically above hole 1, and directly up the slope from it. Small cut made to level off for collar, about 6" overburden removed.

RSM DESK FIL

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

KIGGINS LATERITE
Project

Hole No. 3 Location Directly up slope from hole 4 and about 15' west of it.

W½ of sec. 3 T. 4S R. 4E County Clackamas

Coord. N. E.

Elev. collar Aneroid 1097

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 3

Elev. water table

Bottomed in Rock

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0	1	Not taken	-	Soil
1	2	1'	P-7656 27	dry rocks Brown, earthy, gritty, soft,
2	3	1'	P-7657 28	dry rocks Brown, earthy, gritty, soft,

Remarks Collar is about 11' higher than hole 2. Hole abandoned when solid (?) rock encountered. Hole assumed (in field) to be in unweathered portion of a flow.

RSM DESK FILE

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

KIGGINS LATERITE
Project

Hole No. 5 Location 500' S20°E from hole 1, same elevation approximately

W½ of sec. 3 T. 4S R. 4E County Clackamas

Coord. N. E.

Elev. collar Aneroid 1075

Depth to top of bed 4-6"(?)

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 15

Elev. water table 12-6"

Bottomed in Laterite

****

Drill used 2" auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Jones

Date hole began 8/6/48

Date hole finished 8/9/48

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0	1	1'	P-7664 35	Brown, earthy, dry pebbles
1	2	1'	P-7665 36	slightly damp, pebbles Dk. yellow brown, earthy, firm,
2	3	1'	P-7666 37	slightly damp, pebbles Yellow brown, earthy, firm,
3	4	1'	P-7667 38	slightly damp, pebbles Yellow brown, earthy, firm,
4	4'-6"	6"	P-7668 39	firm, damp, pebbles Red brown to brick red, sl.claye
4'-6"	5'	6"	P-7669 40	damp, pebbles Dk. brick red, clayey, firm,
5	6	1'	P-7670 41	Brick red, clayey, hard, damp
6	7	1'	P-7671 42	spots, clayey, hard, damp Brick red, banded white-yellow
7	8	1'	P-7672 43	clayey, hard, damp Brick red, yel. & gray banded,
8	9	1'	P-7673 44	orange spots, clayey, damp, har Br. red, yel.&gray banded, black
9	10	1'	P-7674 45	sps,or-pnk-rd sps,clay,hard,dam Br. red, yel.&gray banded, big w
10	11	1'	P-7675 46	wh.-br-red sps,clay,firm, damp Br.red, banded br.-lt.gray,or-pn
11	12	1'	P-7676 47	br-pnk-sps,clay,vy.plas,sft,v d Br.red,band.br.-lt.gray,wh-red-o
12	13	1'	P-7677 48	very damp Brick red, earthy, very firm,
13	14	1'	P-7678 49	very damp Brick red, earthy, very firm,
14	15	1'	P-7679 50	very damp Brick red, earthy, very firm,

Remarks Hole apparently passes thru two flows, with top of lower flow at 12-13'. Hole abandoned when drill jammed by rocks in upper part of hole.

RSM DESK FIL

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

KIGGINS LATERITE
Project

Hole No. 6 Location 550 north of hole 1 and about 7' lower.

W½ of sec. 3 T. 4S R. 4E County Clackamas

Coord. N. E.

Elev. collar Aneroid 1068

Depth to top of bed 2' (?)

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 22'

Elev. water table 10'6"

Bottomed in Weathered basalt (?)

****

Drill used 3" auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by "

Sampler Jones

Date hole began 8/9/48

Date hole finished 8/10/48

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0'	1'	1'	P-7680 51	slightly damp Dk. red brown, earthy, firm,
1'	2'	1'	P-7681 52	slightly damp Light red brown, earthy, firm,
2	3	1'	P-7682 53	firm, damp, crumbly Dk. brick red, earthy-clayey,
3	4	1'	P-7683 54	very firm, damp, crumbly Dk. brick red, earthy-clayey,
4	5	1'	P-7684 55	Brick red, clayey, slightly
				banded yel.-sl. pink spots, yel. spots, crumbly, firm, damp
5	6	1'	P-7685 56	grey, crumbly, firm, damp Brick red, spotted, white spots
6	7	1'	P-7686 57	gritty, slightly damp Brick red, white spots, slightl
7	8	1'	P-7687 58	Brick red, spotted white, grey,
				very few non-magnetic shots, crumbly, firm, damp
8	9	1'	P-7688 59	gritty, earthy, firm, sl. damp Brick red, orange-white spots,
9	10	1'	P-7689 60	pisolite-sl. magn., sl. damp Brick red, firm, gritty, earthy
10	11	1'	P-7690 61	oolites, damp, few limonite piso Brick red, sandy, firm, few mag
11	12	1'	P-7691 62	magnetic pisolite Brick red, gritty, slightly dam
12	13	1'	P-7692 63	magnetic pisolite, slightly da Brick red, slightly gritty, har
13	14	1'	P-7693 64	magnetic pisolite, slightly da Brick red, slightly gritty, har

Continued on next page - - -

Remarks Top 1 foot of soil removed to make hitch in hill for collar. Hole abandoned at 22' when laterite section believed to be bottomed.

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STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

KIGGINS LATERITE
Project

Hole No. 6 Cont. Location

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
14	15	1'	P-7693 65	Brick red, slightly gritty, hard, magnetic pisolite, damp, few non-magnetic pisolite
15	16	1'	P-7694 66	Red brown, slightly gritty, sl. clayey, firm, few magnetic pisolite, few non-magn. pisoli
16	17	1'	P-7695 67	Red brown, clayey, slightly gri very firm, very few magnetic shots, very damp
17	18	1'	P-7696 68	Red brown, clayey, slightly gri very firm, very few magnetic shots, very damp
18	19	1'	P-7697 69	very damp Dark red brown, clayey, firm,
19	20	1'	P-7698 70	clayey, firm, very damp Dark red brown, slightly gritty
20	21	1'	P-7699 71	orange-pink spots, clay,fm,v.d Dark red brown, red-green-blue-
21	22	1'	P-7701 72	Dark red brown, white, yellow, red,brown,green,blue, orange, pink spots, clayey, firm, damp

Remarks

WL-24b

Hole No. 6

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

KIGGINS LATERITE

Project

Hole No. 1 Location ON HILLSIDE ABOVE ROAD ABOUT ¼ MI. BELOW HOUSE.

W ½ of sec. 3 T. 4S R. 4E County CLACKAMAS

Coord. N. E.

Elev. collar NWR2010 1075

Depth to top of bed 6"

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 15'

Elev. water table 8'-6"

Bottomed in WEATHERED BASALT

****

Drill used 2" AUGER

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler JONES

Date hole began 8/4/48

Date hole finished 8/5/48

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description KEY 3
0'	1'	1' P	7630 1	MOSTLY SOIL - ROCKS
1'	2'	1'	7631 2	CD, 1, 8; FEW ROCKS
2'	3'	1'	7632 3	E, 1, 8, 16 NO. 11's OR 12's
3	4	1	7633 4	E, 1, 9, 16 ÷ 26-11
4	5	1'	7634 5	" " " " ÷ 26-11
5	6	1'	7635 6	" " " " ÷ 26-11
6	7	1'	7636 7	" " " " ÷ 26-11
7	8	1'	7637 8	" " " "
8	9	1'	7638 9	" " 4, 6, 16
9	10	1'	7639 10	E, 4, 6, 16
10	11	1'	7640 11	" " " "
11	12	1'	7641 12	" " Ē, 16
12	13	1'	7642 13	" " Ē, 16, 8
13	14	1'	7643 14	CD, K̄, 4, Ē, 8, 16
14	15	1'	7644 15	CD, K, Ē, 8, 16

Remarks HOLE DRILLED THRU TOUGH GROUND ALL THE WAY. COAL AUGER REQUIRED. NO GRITTY MATERIAL SAVE PEBBLES OF BASALT NEAR TOP.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

KIGGINS
Project

Hole No. 2 Location

of sec. T. R. County

Coord. N. E.

Elev. collar ANEROID 1086

Depth to top of bed 6"

Elev. of top of bed -

Thickness of bed -

Elev. bottom bed -

Depth of hole 11'

Elev. water table -

Bottomed in RED CLAY?

****

Drill used 2" AUGER

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler JONES

Date hole began 8/5/48

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0	1	1'	D-7645 16	C, I, 15
1	2	1'	7646 17	DC, F, K, I, 4, 8, $\bar{16}$ NO SHOTS
2	3	1'	7647 18	" " " " " " 8, $\bar{16}$ "
3	4	1'	7648 19	DC F K I, 4, 8, $\bar{16}$ "
4	5	1'	7649 20	DC, E K, I, 4 8 $\bar{16}$
5	6	1'	7650 21	DC, E, G, I, K, L, M, 4, 8 $\bar{16}$
6	7	1'	7651 22	DC, E, G, I, K, L, M, 4, 8, $\bar{16}$
7	8	1'	7652 23	E - E G I K L M, 4 8, $\bar{16}$
8	9	1'	7653 24	E, F, G, I K L M 4, 6, 7, 16
9	10	1'	(SPCES) 7654 25	E, BIG F, 4, 6, 7, 16
10	11	1'	7655 26	E, 4, 6, 7, 16

Remarks COLLAR IS 11' VERTICALLY ABOVE HOLE 1, AND DIRECTLY UP THE SLOPE FROM IT. SMALL CUT MADE TO LEVEL OFF FOR COLLAR, ABOUT 6" OVERBURDEN REMOVED.

WL-24b

Hole No. 2

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

KIGGINS
Project

Hole No. 3 Location DIRECTLY UP SLOPE FROM HOLE 4 AND AZIMUTH 15° WEST OF IT.

of sec. T. R. County

Coord. N. E.

Elev. collar ANEROID 1097

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 3

Elev. water table

Bottomed in ROCK

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0	1	NOT TAKEN	—	SOIL
1	2	1'	D-7656 27	C, 1, 5, 7, 15 ROCKS
2	3	1'	7657 28	C, 1, 5, 7, 15 "

Remarks COLLAR IS ABOUT 11' HIGHER THAN HOLE 2. HOLE ABANDONED WHEN SOLID(?) ROCK ENCOUNTERED. HOLE ASSUMED (IN FIELD) TO BE IN UNWEATHERED PORTION OF A FLOW.

WL-24b

Hole No. 3

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

RUGGED
Project

Hole No. 4 Location DIRECTLY UP THE SLOPE FROM HOLE 2, AND ABOUT 15' WEST FROM IT.

of sec. T. R. County

Coord. N. E.

Elev. collar ANEROID 1090

Depth to top of bed

Elev. of top of bed 2'-6"(?)

Thickness of bed

Elev. bottom bed

Depth of hole 5'-6"

Elev. water table

Bottomed in LATERITE

****

Drill used 2" AUGER

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler JONES

Date hole began 8/6/48

Date hole finished "

Shifts actually drilled 2 HRS.

From	To	Thickness of sample	Sample No.	Description
0'	1'	1' P	~~7658~~ 29	C, 1, 7, $\dot{\bar{2}}$6-10, 15, COBBLES
1'	2'	1'	7659 30	C, 1, 7, $\bar{2}$6-10, $\bar{1}$6, "
2'	2'-6"	6"	7660 31	DC, $\bar{4}$, $\dot{\bar{2}}$6-10, 16
2'-6"	3'-6"	1'	7661 32	E, 4, 8, $\dot{\bar{2}}$6-10, 16
3'-6"	4'-6"	1'	7662 33	E, 4, 8, 16
4'-6"	5'-6"	1'	7663 34	E. 4, 8, 16

Remarks COLLAR IS ABOUT 4'-6" VERTICALLY ABOVE HOLE 2. TOP 1' OF OVERBURDEN REMOVED TO MAKE PLACE FOR COLLAR. HOLE ABANDONED WHEN AS DEEP AS ELEV OF SECTION IN HOLE 2 BELOW. ~~[illegible]~~ Es T.

WL-24b

Hole No. 4

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

KIGGINS
Project

Hole No. 5 Location 500' S20°E FROM HOLE 1, SAME ELEVATION APPROX.

of sec. T. R. County

Coord. N. E.

Elev. collar ANEROID 1075

Depth to top of bed 4'-6"(?)

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 15

Elev. water table 12-6"

Bottomed in LATERITE

****

Drill used 2" AUGER

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler JONES

Date hole began 8/6/48

Date hole finished 8/9/48

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0	1	1'	P-7664 35	C, 1, 15 PEBBLES
1	2	1'	7665 36	BC, 1, 8, $\bar{16}$ "
2	3	1'	7666 37	BC, 1, 8, $\bar{16}$ "
3	4	1'	7667 38	BC, 1, 8, $\bar{16}$ "
4	4'-6"	6"	7668 39	DC To E, $\bar{8}$, 16 "
4-6"	5'	6"	7669 40	E, 4, 8, 16 "
5	6	1'	7670 41	E, 4, 9, 16
6	7	1'	7671 42	E, S(F,G.) 4, 9, 16
7	8	1'	7672 43	E(B $\bar{8}$ S) 4, 9, 16
8	9	1'	7673 44	E(B $\bar{8}$ S) I, L, 4, 9, 16
9	10	1'	7674 45	E(B $\bar{8}$ S) B I G F, L, M, H, 4, 9, 16
10	11	1'	7675 46	E, (S, C, $\bar{O}$) L, M, F, J, H, 4, 8, 16
11	12	1'	7676 47	E(S, C, $\bar{O}$) F, H, L, I, M, 4, 5, 7, 16
12	13	1'	7677 48	E, 1, 8, 16
13	14	1'	7678 49	E, 1, 8, 16
14	15	1'	7679 50	E, 1, 8, 16

Remarks HOLE APPARENTLY PASSES THRU TWO FLOWS, WITH TOP OF LOWER FLOW AT 12-13'. HOLE ABANDONED WHEN DRILL JAMMED BY ROCKS IN UPPER PART OF HOLE.

WL-24b

Hole No. 5

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

KIGGINS
Project

Hole No. 6 Location 550 N OF HOLE 1 AND ABOUT 7' LOWER

of sec. T. R. County

Coord. N. E.

Elev. collar ANEROID 1068

Depth to top of bed 2' (?)

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 22'

Elev. water table 10'6"

Bottomed in WEATHERED BASALT (?)

****

Drill used 3" AUGER

Number men 2

Engr. in charge MASON

Mtrl. classfd. by "

Sampler JONES

Date hole began 8/9/43

Date hole finished 8/10/43

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0'	1'	1'	D-7680 51	DC, 1, 8, $\bar{1}6$
1'	2'	1'	7681 52	$\bar{D}C$, 1, 8, $\bar{1}6$
2	3	1'	7682 53	E, 1-4, 8, 16 CRUMBLY
3	4	1'	7683 54	E, 1-4, 8, 16 "
4	5	1'	7684 55	E, 4, $\bar{S}$-B, MG, " 8, 16
5	6	1'	7684 56	E, U-F-O, "
6	7	1'	7685 57	E, F, $\bar{5}$, $\bar{1}6$
7	8	1'	7687 58	E, U F, O $\dot{2}\dot{5}$-10 "
8	9	1'	7688 59	E L, F 5, 1, 8 $\bar{1}6$
9	10	1'	7689 60	E 8, 5, 1, 12-$\bar{2}5$, $\bar{1}6$
10	11	1'	7690 61	E, 2, 8, $\dot{2}5$-11, 16, $\dot{2}1$-12
11	12	1'	7691 62	E 5, 16 25-12
12	13	1'	7692 63	E 5, 9 25-12 16
13	14	1'	7693 64	E, 5, 9 25-12, 16
14	15	1'	7694 65	E, 5, 9, 25-12, 16, $\dot{2}6$-12
15	16	1'	7695 66	DC, $\bar{5}$, 4, 8, $\dot{2}5$-12, $\dot{2}6$-12

(CON'T ON ANOTHER SHEET)

Remarks TOP 1 FOOT OF SOIL REMOVED TO MAKE HITCH IN HILL FOR COLLAR. HOLE ABANDONED AT 22' WHEN LATERITE SECTION BELIEVED TO BE BOTTOMED

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

KIGGINS

Project

Hole No. 6-CON'T Location

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
16	17	1'	P-7696 67	DC, 4-5, 8. Z5-10, 16
17	18	1'	7697 68	DC, 4-5, 8, Z5-10. 16
18	19	1'	7698 69	DC, 4, 8, 16
19	20	1'	7699 70	DC, 5, 4, 8. 16
20	21	1'	7700 71	DC, H, I, J, K, L, M, 4, 8. 16
21	22	1'	7701 72	DC-N, F, G, H, J, JJ, K, L, M, 4, 8,

Remarks

WL-24b

Hole No. 6-CON'T

Typed Drill Logs

HENDRICKSON FERRUGINOUS BAUXITE PROJECT

1944

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 1 Location ± 1000 ft. W. of house; 7 ft. below outcrop in road.

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 600 N. - 4290 E.

Elev. collar 1253.6

Depth to top of bed

Elev. of top of bed 1250.6

Thickness of bed 8

Elev. water table

Depth of hole 13

Cumulative depth 13

Bottomed in reddish brown clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/12/44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	11				Iron (sample No. 1)
11	13				Reddish brown clay

Remarks:

P-2320 (Sample No. 1)

SiO_2	6.92
Fe	31.22
Al_2O_3	32.52

Hole No. 1

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson

Project

Hole No. 2 Location ± 1000 ft. W. of house; 25 ft. below outcrop in road.

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 630 N. - 4250 E.

Elev. collar 1242

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 19 ft.

Cumulative depth 32 "

Bottomed in dark gray clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/12/44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	4				Top soil
4	12				Reddish brown clay
12	19				Dark gray clay streaked with red

Remarks:

Hole 2 below iron bed.

Hole No. 2

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson

Project

Hole No. 3 Location ± 1000 ft W. of house; 8 ft. above outcrop in road.

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 630 N. - 4350 E.

Elev. collar 1268.1

Depth to top of bed 8

Elev. of top of bed 1260.1

Thickness of bed

Elev. water table

Depth of hole 9 ft.

Cumulative depth 41

Bottomed in iron

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/12/44

" " "

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	4				Top soil
4	8				Light brown clay
8	9				Iron (sample no. 1)

Remarks:

(Sample no.1)

SiO_2 6.92

Fe 31.22

Al_2O_3 32.52

Thickness of iron 17.5 ft.

Elevation 1260.1 - Elev. 1242.6

(bottom of hole No.

Apparently sample no.1 includes ore from holes 1 and 3.

Hole No. 3

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 4 Location ± 300 ft. E. of H. house

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 940 N. - 5410 E.

Elev. collar 1288.7

Depth to top of bed 13 ft.

Elev. of top of bed 1274 ft.

Thickness of bed 7

Elev. water table 18 in.

Depth of hole 21

Cumulative depth 62

Bottomed in reddish brown clay

****
Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/13/44

Date hole finished 4/14/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	5				Top soil
5	13				Light brown clay
13	16				Iron (hard)
16	20				Iron (mixed with clay) } Samp No.
20	21				Dark grey clay in red stre

Remarks:

P-2321 (Sample no. 2)

SiO_2	28.45
Fe	16.16
Al_2O_3	29.44

Hole No. 4

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson

Project

Hole No. 5 Location ± 400 ft. W. of Grange Hall

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2220 N. - 6110 E.

Elev. collar 1349.4

Depth to top of bed 5 ft.

Elev. of top of bed 1337 ?

Thickness of bed 8 ft.

Elev. water table 18 ft.

Depth of hole 16 ft.

Cumulative depth 78

Bottomed in reddish brown clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/14/44

Date hole finished 4/14/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	5				Light brown clay
5	13				Iron (sample No. ____)
13	16				Reddish brown clay with dark streaks.

Remarks: Cleaver says that they moved up to Hole 6 as they did not get entire thickness of iron bed at Hole 5. Iron from Holes 5 and 6 mixed to give composite sample with following analysis: (W.D.L.)

P-2322 (Sample No. 3)

SiO_2	13.38
Fe	24.24
Al_2O_3	29.28

Hole No. 5

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 6 Location ± 400 ft. W. of Grange Hall

Sec. ____ T. ____ R. ____ County Washington

Coord. 2210 N. - 6155 E.

Elev. collar 1353.4

Depth to top of bed 11

Elev. of top of bed 1345 ?

Thickness of bed 6' ± 8' in hole no. 5 - 14'

Elev. water table ____

Depth of hole 17

Cumulative depth 95

Bottomed in iron

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler ____

Date hole begun 4/15/44

Date hole finished " " "

Shifts actually drilled ____

Diam. casing ____ Diam. shoe ____

Type of bit:

____ from ____ to ____

____ from ____ to ____

____ from ____ to ____

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	4				Top soil
4	11				Light brown clay
11	17				Iron

Remarks: Cleaver says they moved to Hole 6 from Hole 5 to get full section as represented at Hole 6. Iron from Holes 5 and 6 mixed to form composite sample which gave the following analysis: (W.D.L.)

P-2320 (Sample No. 3)

SiO_2	13.38
Fe	24.24
Al_2O_3	29.28

Hole No. 6

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson

Project

Hole No. 6A - REDRILLED Location W. of Grange Hall

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2190 N. - 6120 E.

Elev. collar 1352

Depth to top of bed 10

Elev. of top of bed 1342

Thickness of bed 15

Elev. water table

Depth of hole 25

Cumulative depth 439

Bottomed in red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5-22-44

Date hole finished 5-22-44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	5				Top soil
5	10				Light brown clay
10	12				Iron mixed with red clay
12	20				Oölitic iron
20	21				Magnetic and granular mtrl
21	25				Red clay

Remarks:

Average analysis:

SiO_2	8.41
Fe	25.22
Al_2O_3	31.83

Sample Nos.

6-A-1	10' - 12'	6-A-5	17' - 19'
6-A-2	12' - 14'	6-A-6	19' - 20'
6-A-3	14' - 15'	6-A-7	20' - 21'
6-A-4	15' - 17'	6-A-8	21' - 25'

Hole No. 6A

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson

Project

Hole No. 7 Location ± 660ft. N. of road & 400ft. W. of turn.

Sec. 6 T. 2N. R. 2W. County Washington

Coord. 1710 N. - 3780 E.

Elev. collar 1300.5

Depth to top of bed 7

Elev. of top of bed 1293

Thickness of bed 14 ft.

Elev. water table

Depth of hole 22

Cumulative depth 117

Bottomed in hard grey clay.

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/15/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	7				Light brown clay
7	12				Iron mixed with red clay
12	17				Hard oölitic iron
17	21				Hard iron (not oölitic)
21	22				Hard dark grey clay

Remarks:

P-2323 (Sample No. 4)

SiO_2 8.30

Fe 23.80

Al_2O_3 33.12

Hole No. 7

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson

Project

Hole No. 8 Location ± 1000 ft. W. of Hole No. 7

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1990 N. - 2915 E.

Elev. collar 1286.2

Depth to top of bed 4

Elev. of top of bed 1282.2

Thickness of bed 13

Elev. water table

Depth of hole 18

Cumulative depth 135

Bottomed in dark grey clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/19/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	4				Light brown clay
4	7				Oölitic iron
7	17				Iron (not oölitic)
17	18				Dark grey clay with streaks of red

Remarks:

P-2324 (Sample No. 5)

SiO_2	7.26
Fe	23.08
Al_2O_3	35.34

Hole No. 8

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 9 Location 300 ft. W. of hole no. 8

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2130 N. - 2670 E.

Elev. collar 1278.2

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 16

Cumulative depth 151

Bottomed in light brown clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/24/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	7				Light brown clay
7	10				Red clay
10	16				Light brown clay

Remarks:

No sample. No iron.

Hole No. 9

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 10 Location

Sec. T. R. County Washington

Coord. 980 N. - 6120 E.

Elev. collar 1290 ft.

Depth to top of bed 9 ft.

Elev. of top of bed 1281

Thickness of bed 3 ft.

Elev. water table

Depth of hole 13 ft.

Cumulative depth 164

Bottomed in dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/24/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	9				Light grey clay
9	9'8"				Oolitic iron
9'8"	12'				Iron mixed with red clay
12'	13'				Dark grey clay

Remarks:

P-2325 (Sample No. 6)

SiO_2	40.42
Fe	12.45
Al_2O_3	29.54

Hole No. 10

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 11 Location N. of H. house

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1500 N. - 5200 E.

Elev. collar 1290

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 10 ft

Cumulative depth 174

Bottomed in brown clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/2/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	5				Top soil
5	10				Light brown clay

Remarks:

Iron apparently eroded out.

Hole No. 11

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 12 Location N. of H. house.

Sec. ____ T. ____ R. ____ County ____

Coord. 1400 N. - 5200 E.

Elev. collar 1300 ft.

Depth to top of bed 9 ft.

Elev. of top of bed 1291 ft.

Thickness of bed 12 ft.

Elev. water table ____

Depth of hole 22 ft.

Cumulative depth 196

Bottomed in dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler ____

Date hole begun 5/2/44

Date hole finished " " "

Shifts actually drilled ____

Diam. casing ____ Diam. shoe ____

Type of bit:

____ from ____ to ____

____ from ____ to ____

____ from ____ to ____

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	9				Light brown clay
9	16				Hard oölitic iron
16	21				Iron mixed with clay & feldsp
21	22				Dark grey clay with streaks o red.

Remarks:

P-2326 (Sample No. 7)

SiO_2	12.52
Fe	27.67
Al_2O_3	27.80

Hole No. 12

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson

Project

Hole No. 13 Location On railroad grade at end of trestle

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2600 N. - 5200 E.

Elev. collar 1298

Depth to top of bed 5

Elev. of top of bed

Thickness of bed trace

Elev. water table

Depth of hole 16

Cumulative depth 212

Bottomed in dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/2/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	5				Light brown clay (red streak
5	16				Light brown clay grading down to dark grey clay with red streaks and spots of dec. feldspar.

Remarks:

P-2327 (Sample No. 8)

SiO_2	27.66
Fe	17.87
Al_2O_3	28.12

Hole No. 13

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 14 Location N. of H. house

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2200 N. - 5200 E.

Elev. collar 1317

Depth to top of bed 14

Elev. of top of bed 1303

Thickness of bed 9

Elev. water table

Depth of hole 24

Cumulative depth 236

Bottomed in dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/2/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Yellow clay
3	14				Red clay
14	18				Hard oölitic iron
18	23				Iron (not oölitic)
23	24				Dark clay with red streaks.

Remarks:

P-2328 (Sample No. 9)

SiO_2	8.90
Fe	35.42
Al_2O_3	21.56

Hole No. 14

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 15 Location Near corner of highway and Hend. road.

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1000 N. - 6200 E.

Elev. collar 1301

Depth to top of bed 10 ft.

Elev. of top of bed 1291

Thickness of bed 11 ft.

Elev. water table

Depth of hole 22

Cumulative depth 258

Bottomed in dark grey clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/3/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	10				Light brown clay
10	11				Iron mixed with clay
11	18				" Oolitic iron
18	21				Iron (not oolitic)
21	22				Dark grey clay with spots dec. feldspar.

Remarks:

P-2329 (Sample No. 10) from 10' to 16

SiO_2 19.94

Fe 17.60

Al_2O_3 35.96

P-2330 (Sample No. 10A) from 16' to 20

SiO_2 8.78

Fe 21.19

Al_2O_3 37.80

Hole No. 15

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 16 Location

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1925 N. - 3780 E.

Elev. collar 1303

Depth to top of bed 8

Elev. of top of bed 1295

Thickness of bed 13

Elev. water table

Depth of hole 22

Cumulative depth 280

Bottomed in dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/3/44

Date hole finished 5/4/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	8				Light brown clay
8	12				Hard oölitic iron
12	21				Very hard red iron
21	22				Dark grey clay with spots dec. feldspar.

Remarks:

P-2335 (Sample No. 11) 8' - 15'

SiO_2 6.50
Fe 26.65
Al_2O_3 33.28

P-2336 (Sample No. 11A) 15' - 21'

SiO_2 32.88
Fe 12.16
Al_2O_3 32.16

Hole No. 16

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 17 Location

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1000 N. - 6400 E.

Elev. collar 1296

Depth to top of bed 16

Elev. of top of bed 1280

Thickness of bed 6 in.

Elev. water table

Depth of hole 22

Cumulative depth 302

Bottomed in red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/5/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	16				Light brown clay
16	16'6"				Hard iron
16'6"	22				Red clay

Remarks:

No sample taken.

Iron apparently removed by erosion.

Water level 6 ft.

Hole No. 17

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson

Project

Hole No. 18 Location N. of Grange Hall

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2600 N. - 6400 E.

Elev. collar 1340

Depth to top of bed 9

Elev. of top of bed 1331

Thickness of bed 6 ft.

Elev. water table

Depth of hole 17

Cumulative depth 319

Bottomed in dark rock

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/5/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	9				Light brown clay
9	15				Oolitic iron
15	16				Fractured hard dark rock w/ metallic luster
16	17				Dark granular basic rock resembling basalt

Remarks:

P-2337 (Sample No. 12)

SiO_2 13.38

Fe 24.99

Al_2O_3 24.64

Hole No. 18

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 19 Location South end of project

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 200 N. - 5400 E.

Elev. collar 1278

Depth to top of bed 7

Elev. of top of bed 1271

Thickness of bed 13

Elev. water table

Depth of hole 21

Cumulative depth 340

Bottomed in dark grey clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/8/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	7				Light brown clay
7	12				Iron mixed with red clay
12	20				Hard oolitic iron
20	21				Dark grey clay with red streaks

Remarks:

P-2346 (Sample No. 13)

SiO_2	10.78
Fe	23.13
Al_2O_3	35.52

Hole No. 19

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 20 Location On hill between Grange Hall & Hendrickson house.

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1650 N. - 6100 E.

Elev. collar 1348

Depth to top of bed 29

Elev. of top of bed 1319

Thickness of bed 11 +

Elev. water table

Depth of hole 41

Cumulative depth 381

Bottomed in red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/8/44

Date hole finished 5/9/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	26				Light brown clay
26	29				Red sticky clay
29	41				Soft oolitic iron mixed with red clay

Remarks:

Hole drilled near head of water course. Iron seems to be softened and altered by water. No sample taken.

Hole No. 20

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson

Project

Hole No. 21 Location On E. side of highway S. of Grange Hall.

Sec. 5 T. 2 N. R. 2 W. County Washington

Coord. 1200 N. - 6525 E.

Elev. collar 1314

Depth to top of bed 14

Elev. of top of bed 1300

Thickness of bed 18

Elev. water table

Depth of hole 33

Cumulative depth 414

Bottomed in Dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/10/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	14				Light brown clay
14	32				Red clay with decomposed oolites of iron
32	33				Dark reddish clay

Remarks: Iron fairly soft. Hole had much water.

P-2347 (Sample No. 14)

SiO_2	56.16
Fe	6.64
Al_2O_3	22.08

Hole No. 21

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson Extension
Project

Hole No. 26 Location West extension

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2200 N. - 1900 E.

Elev. collar ± 1300

Depth to top of bed 5

Elev. of top of bed 1287 ±

Thickness of bed 13

Elev. water table

Depth of hole 27

Cumulative depth 562

Bottomed in brown clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Lowry

Sampler

Date hole begun 5/29/44

Date hole finished 6/6/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	5				Light brown clay
5	13				Reddish clay with scattered oölit
13	22				Hard oölitic iron
22	26				Reddish brown clay with scattered oölites
26	27				Mottled brown and red clay

Remarks: This hole may be bottomed in ore.

Sample No.		SiO_2	Fe	Al_2O_3
18-A	13-19	6.70	24.18	34.80
18-B	19-22	8.16	25.07	34.60
18-C	22-26	6.40	21.27	40.80

Hole No. 26

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson Extension
Project

Hole No. 27 Location 400 ft. N. 40° W. from Hole No. 26.

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2500 N. - 1630 E.

Elev. collar ± 1290

Depth to top of bed 16

Elev. of top of bed 1274

Thickness of bed 9

Elev. water table

Depth of hole 25

Cumulative depth 587

Bottomed in red clay

****

Drill used Hand auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole begun 6/6/44

Date hole finished 6/7/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	16				Light brown clay
16	25				Red clay with scattered oölites

Remarks: Silica too high

Sample No. 19 16' - 19'

SiO_2 55.96

Fe 6.38

Al_2O_3 26.00

Hole No. 27

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson Extension
Project

Hole No. 28 Location 150 ft. W. of Hole No. 27

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2500 N. - 1490 E.

Elev. collar ± 1263

Depth to top of bed 9

Elev. of top of bed 1254

Thickness of bed 2

Elev. water table

Depth of hole 13

Cumulative depth 600

Bottomed in light brown clay

****

Drill used Hand auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole begun 6/7/44

Date hole finished " " "

Shifts actually drilled

Diam.casing Diam.shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	9				Red clay
9	11				Oölitic iron
11	13				Light brown clay with spots of decomposed feldspar

Remarks:

Sample No. 20' 9'-11'

SiO_2	18.36
Fe	28.88
Al_2O_3	24.96

Hole No. 28

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Parmele (Hendrickson - South)
Project

Hole No. 29 Location On County road 27 miles E. of highway junction on Parmele property

Sec. 8 T. 2 N. R. R. 2 W. County Washington

Coord.

Elev. collar ± 1240 ft. (RSM-WBL)

Depth to top of bed 4

Elev. of top of bed ± 1240 ft.

Thickness of bed 10

Elev. water table

Depth of hole 14

Cumulative depth 614

Bottomed in red clay

****

Drill used Hand auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole begun 6/7/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	4				Light brown clay
4	8				Hard oolitic iron
8	14				Hard red clay with a few white specks

Remarks:

			SiO_2	Fe	Al_2O_3
Sample No. 21-A	4 ft.	- 6 ft.	14.74	18.92	36.40
21-B	6	8	7.74	26.64	34.08
21-C	8	14	8.52	25.18	30.88

Hole No. 29

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 37 Location On fence line at N. end clover field N. of house

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2000 ± N. - 5500 ± E.

Elev. collar 1335 ±

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 14

Cumulative depth

Bottomed in loam

****

Drill used 2-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler

Date hole begun 7/6/44

Date hole finished " " "

Shifts actually drilled ¼

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	7				Variegated brown grey silty loam, clay
7	14				Brown silty loam

Remarks:

Hole abandoned at 14 ft. when indications of ore failed to appear.

Hole No. 37

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 38 Location

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1900 N. ± - 5500 E. ±

Elev. collar 1325 ±

Depth to top of bed 18ft.-6in.

Elev. of top of bed 1306'-6

Thickness of bed 3'7" +

Elev. water table

Depth of hole 22 ft.

Cumulative depth

Bottomed in ore

****

Drill used 2-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler "

Date hole begun 7/6/44

Date hole finished 7/7/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Organically stained
3	4				Yellow-brown loam silty clay
4	8				Brown grey silty loam
8'	11'				Occasional black shots. Silt redder
11	13				More shots in silt
13	14				Red clay start moisture sample
14	15				Red clay
15'0"	15'1"				Hard oolites(?)
15'1"	17'0"				Red clay
17'0"	18'6"				Hard oolites
18'6"	19'0"				Hard ore
19'0"	19'6"				" "
19'6"	20'6"				" "
20'6"	21'0"				Dark red brown ore
21'0"	21'6"				" " " "

Remarks:

LOG CONTINUED ON NEXT SHEET

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 38(Cont.) Location Continuation of Hole 38.

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1900 N. ± - 5500E. ±

Elev. collar 1325 ±

Depth to top of bed 18'6"

Elev. of top of bed 1308

Thickness of bed 3'7" +

Elev. water table

Depth of hole 22 ft.

Cumulative depth

Bottomed in ore

****

Drill used 2-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler "

Date hole begun 7/6/44

Date hole finished 7/7/44

Shifts actually drilled 1

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
21'6"	22'0"				Very dark red brown ore
22'0"	22'1"				Ore darker than sec. above

Remarks:

No analysis other than moisture made. See summary sheet.

Hole abandoned without bottoming ore due to extreme hardness of ground.

Hole No. 38 (Cont.)

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 39 Location On slope dipping to northwest 10 ft. below top

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2330 N. ± - 3350 E. ±

Elev. collar 1300 ±

Depth to top of bed ?

Elev. of top of bed ?

Thickness of bed ?

Elev. water table

Depth of hole 19

Cumulative depth

Bottomed in yellow brown clay

****

Drill used 2-in auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler

Date hole begun 7/10/44

Date hole finished " " "

Shifts actually drilled ½

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	9				Brown silty top soil
9	17'6"				Reddish clay silt
17'6"	18'0"				Reddish clay with numerous shot.
18	19				Dark mottled yellow-brown black clay

Remarks: Hole abandoned when sample resembled material underlying iron in other holes.

P-2509 (17'6" - 18'0")

SiO_2	28.35 %
Fe	18.45
Al_2O_3	27.72
H_2O	29.5

Hole No. 39

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 40 Location On top of flat knoll

Sec. ____ T. ____ R. ____ County Washington

Coord. 2175 ± N. - 3450 ± E.

Elev. collar 1311 ±

Depth to top of bed 13

Elev. of top of bed 1298 ±

Thickness of bed ____

Elev. water table ____

Depth of hole 15'1"

Cumulative depth ____

Bottomed in ore

****

Drill used 2-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler ____

Date hole begun 7/10/44

Date hole finished " " "

Shifts actually drilled ¼

Diam. casing ____ Diam. shoe ____

Type of bit:

____ from ____ to ____

____ from ____ to ____

____ from ____ to ____

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	5'6"				Light brown silt Occasional shot
5'6"	9'0"				Material gradually getting redder
9'0"	11'0"				Reddish material with occasional shots.
11'0"	13'0"				Reddish material with occasional shots.
13'0"	14'0"				Hard reddish brown ore
14'0"	15'0"				14½ ft. very hard ore
15'0"	15'1"				Darker brown color; very hard ore

Remarks:
Abandoned due to hour and losing sample out of pod when bringing out due to dryness of ore. Still hard at bottom. Only analysis for H_2O made. See summary sheets.

Hole No. 40

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 43 (cut) Location

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1700 N. - 3800 E.

Elev. collar ~~1269~~ 1269

Depth to top of bed 0'

Elev. of top of bed ~~1271~~ 1271

Thickness of bed

Elev. water table

Depth of hole 21'6"

Cumulative depth

Bottomed in brown earth

****

Drill used 2-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler Both

Date hole begun 8/23/44

Date hole finished " " "

Shifts actually drilled 3/4

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2		x 2'	P-2623 A	Varicolored earthy 2' channel sample
Hole begun at 2	3		1'	P-2624 B	Very dark, somewhat oolitic & hard; softer at bottom
3	4		1'	P-2625 C	Dark, soft, streaked with re brown & black; more clay-lik
4	5		x 1'	P-2626 D	Soft, darker, same clay. Apparent residual texture.
5	6		1'	P-2627 E	More earthy; firmer, drier
6	7		1'	P-2628 F	Dark brown; earthy
7	8		x 1'	P-2629 G	No apparent change
8	9		1'	P-2630 H	Light-colored specks decomp. feldspar, mottled hard pel
9	10		1'	P-2631 I	buff strea No apparent change
10	11		1'	P-2632 J	Somewhat lighter colored
11	12		x 1'	P-2633 K	Choc. brown with nearly white specks
12	13		x 1'	P-2634 L	Varicolored; brown with blu clay(?) Wetter
13	14		1'	P-2635 M	Lt.brown-somewhat varicolor few light specks; clayey; b
14	15		x 1'	P-2636 N	gre Getting wetter
15	16		x 1'	P-2637 O	Very wet; lt.brown, changin abruptly to blue with yello streaks. Basaltic(?) fragments.

Remarks:

SEE NEXT PAGE

Collar of hole in floor of cut. Channel samples of ____ ft. of overlying ore. Collar 12 ft. in from portal of cut.

Hole No. 43

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 43 (cut) (cont.) Location

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1700 N. - 3800 E.

Elev. collar 1369

Depth to top of bed 0'

Elev. of top of bed 1371

Thickness of bed

Elev. water table

Depth of hole 21'6"

Cumulative depth

Bottomed in brown earth (tan earthy material)

****

Drill used 2-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler Both

Date hole begun 8/23/44

Date hole finished " " "

Shifts actually drilled 3/4

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
16	17		1'	P-2638 P	Mottled; mostly blue; green, brown, white specks.
17	18		1'	P-2639 Q	Mostly bluish gray; darker, wet.
18	19		1'	P-2640 R	Mottled; blue green; dark brown "plastic"
19	20		1'	P-2641 S	Mottled; purple-brown with white specks. (Basalt texture
20	21		1'	P-2642 T	Darker gritty; variegated yellow specks.
21	22		1'	P-2643 U	Dark purple with some red specks
22	23		1'	P-2644 V	Dark purplish-black. More uniform comp. Dryer
23	23'6"		6"	P-2645 W	Tan, Dry, fine-grained earthy material.

Remarks:

Hole bottomed when firm material at bottom slowed rate of advance. Section to be sampled believed to be complete with this depth. See summary sheets for results.

Hole No. 43 (Cont.)

Original Drill Logs

NELSON FERRUGINOUS BAUXITE PROJECT

1944

State of Oregon
Department of Geology
and Mineral Industries

Washington Co. Iron
Coal Exploration
Nelson
Project

Hole No. 22
Sheet

Sec. 32 T 3 N R 2 W
County Washington

Hole No. 22 (Nelson)
Location 165' N of Nelsons wind charger.
Coordinates 4130N - 8220E ~~4130N - 8060E~~
Elev. ground (collar) 1368
Depth to top of coal 7
Elev. of top of coal 1361
Thickness of coal 15
Elev. water table
Depth of hole 26
Cumulative depth 465
Bottomed in Dk. clay

Drill used Hand auger
Number men 2
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun 5-23-44
Date hole finished
Shifts actually drilled
Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	7				Lt. brn. clay
7	10				Iron mixed w. red clay
10	20				Oölitic iron
20	22				Iron mixed w. red clay
22	24				Red clay
24	26				Dk. clay w. basalt pebbles

15A
15B
15C

Sample # 15 A to O every foot samples from 7' to 22'

See other side for analysis

See summary sheet for analyses

P-2391 to P-2405 inc.

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.

Lab. #	Sample #	Hole #	SiO_2	Fe	Al_2O_3	Depth
P- 2391	15-A	22	19.88	1[illegible]8	36.28	7
2392	15-B	"	28.70	12.50	33.88	8
2393	15-C	"	25.74	13.30	34.32	9
2394	15-D	"	36.32	14.97	31.28	10
2395	15-E	"	17.36	15.76	40.44	11
2396	15-F	"	19.50	16.55	35.80	12
2397	15-G	"	11.06	20.26	38.10	13
2398	15-H	"	11.72	23.76	35.60	14
2399	15-I	"	8.20	27.13	32.64	15
2400	15-J	"	8.68	27.44	33.52	16
2401	15-K	"	7.68	27.81	33.92	17
2402	15-L	"	8.40	23.76	32.64	18

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Washington Co. Iron

~~Hendrickson~~ Nelson
Project

Hole No. 24 Location 500' S. of Nelsons windcharger 22' below barn level

Sec. 32 T. 3N R. 2W County Washington

Coord. 3625N - 8120E
3650N - 8060E

Elev. collar 1366

Depth to top of bed 17'

Elev. of top of bed 1349

Thickness of bed 12'

Elev. water table

Depth of hole 30'

Cumulative depth 510

Bottomed in DK. red clay

****

Drill used Hand Auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5-24-44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	12				Lt. brn. clay
12	17				Red clay
17	29				Red clay w oolites (fairly hard)
29	30				Dark red clay w scattered oolites.

Remarks:

Sampled — AS FOLLOWS -

P-2416 (#17-A) — 12'-17'
P-2417 (#17-B) — 17'-23'
P-2418 (#17-C) — 23'-26'
P-2419 (#17-D) — 26'-28'
P-2420 (#17-E) — 28'-29'

Hole No. 24

See summary sheet for results of analyses

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Washington Co. Iron

~~Henderson~~ Welson
Project

Hole No. 25 Location 500' S. & 400' W. of Windcharger 20' below barn level

Sec. 32 T. 3N R. 2W County Washington

Coord. 3620N - 7740E
3650N - 7665E

Elev. collar 1368

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 25

Cumulative depth 535

Bottomed in Red clay

****

Drill used Hand Auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5-24-44

Date hole finished 5-25-44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	10				Lt. brn clay
10	25				Red clay w. scattered oolites

Remarks: No iron - No sample

Hole No. 25

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 35 Location 400' E. & 150' N. of Nelsons Windcharger

Sec. 32 T. 3N R. 2W County Washington Co.

Coord. ~~4125N - 8495E~~ 4150N 8460E

Elev. collar 1368

Depth to top of bed —

Elev. of top of bed —

Thickness of bed —

Elev. water table

Depth of hole 9'

Cumulative depth 686

Bottomed in DK. clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 6-14-44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	8				Lt. brn. clay w. grey streaks
8	9				Dark clay & basalt pebbles

Remarks: No iron - No sample

Hole No. 35

9 10 250,000

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 36 Location 400' E. of Nelsons Windcharger

Sec. 33 T. 3N R. 2W County Washington

Coord. 4030N - 8460E (3975N - 8490E)

Elev. collar 1378

Depth to top of bed —

Elev. of top of bed —

Thickness of bed —

Elev. water table

Depth of hole 14

Cumulative depth 700'

Bottomed in Varicolored clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 6-14-44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	5				Top soil
5	8				Lt. brn. clay
8	12				Red clay w. scattered soft lalitas
12	14				Mottled red, yellow & gray clay

Remarks: Trace of iron - No sample

Hole No. 36

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HENDRICKSON – NELSON
Project

Hole No. 41 Location NEAR Ⓐ STA 'A' E OF ROAD 40 FT

Sec. 5 T. 2 N R. 2W County WASHINGTON

Coord. 2850 N approx. 6800 E approx.

Elev. collar 1344

Depth to top of bed —

Elev. of top of bed —

Thickness of bed —

Elev. water table NONE

Depth of hole 19'-0"

Cumulative depth

Bottomed in RED CLAY

****

Drill used 3" & 2"

Number men 2

Engr. in charge MASON

Mtrl. classfd. by LOWRY

Sampler BOTH

Date hole begun 7-25-44

Date hole finished 7-25-44

Shifts actually drilled 1/4

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0'	9'				LIGHT GRAY MOTTLED SILT
9'	14'-0				BECOMING REDDER Reddish brown clay
14'-0	16'-0"	JAR	211		Reddish brown clay in part mottled
16'-0"	16'-3"	JAR	212		START OF ORE! SOFT CLAY LIKE
16'-3"	18'-0"	JAR	213		DEEP RED CLAY LIKE MTRL.
18'-0"	19'-0"	JAR	214		SOME WHITE STREAKS

Remarks:

ORE HORIZON APPARENTLY ERODED BY DRAINAGE TO W. OF ROAD. HOLE ABANDONED WHEN BOTTOM OF HOLE LOWER THAN BOTTOM OF ORE SHOULD BE.

See summary sheet for analyses

(ANALYSES OVER)

Hole No. 41

			FE	Al_2O_3	SiO_2	MOISTURE
P-2549	14'-16'		6.65		58.36	22.0%
P-2550	16'-16'-3"		8.55		56.76	22.9%
P-2551	16'-3"-18'		5.70		58.08	28.2
P-2552	18'-19'		6.26		57.86	26.1

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

NELSON
Project

Hole No. 42 Location 100± S OF ROAD BETWEEN HOLES 24 & 25

Sec. _____ T. _____ R. _____ County WASHINGTON

Coord. _____

Elev. collar 1350±

Depth to top of bed —

Elev. of top of bed —

Thickness of bed —

Elev. water table —

Depth of hole 22

Cumulative depth —

Bottomed in REDDISH CLAY-SILT

****

Drill used 3" -

Number men 2

Engr. in charge MASON

Mtrl. classfd. by LOWRY

Sampler BOTH

Date hole begun 7-25-44

Date hole finished 7-25-44

Shifts actually drilled _____

Diam. casing _____ Diam. shoe _____

Type of bit:

_____ from _____ to _____

_____ from _____ to _____

_____ from _____ to _____

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	22				BROWN-GREY SILT
					TURNING REDDER WITH DEPTH

Remarks:

HOLE LIES 240' WEST OF HOLE 24 AND 120' DUE S OF ℄ OF COUNTY ROAD. HOLE ABANDONED AT 22, WHEN POSSIBLE ORE HORIZON PASSED.

Hole No. 42

Original Drill Logs

HENDRICKSON FERRUGINOUS BAUXITE PROJECT

1944

State of Oregon
Department of Geology
and Mineral Industries

Iron
Coal Exploration
Hendrickson
Project

Hole No. 1
Sheet

Sec. 6 T 2N. R 2W.
County Washington

Hole No. 1
Location ±1000' West of house
7' below outcrop in road
Coordinates 600 N- 4290 E
Elev. ground (collar) 1253.6
Depth to top of ~~coal~~ iron
Elev. of top of ~~coal~~ iron 1250.6
Thickness of ~~coal~~ iron 8
Elev. water table
Depth of hole 13
Cumulative depth 13
Bottomed in reddish brn. clay

Drill used Hand auger
Number men 2
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun 4-12-44
Date hole finished " " "
Shifts actually drilled
Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	11				iron (sample no. 1)
11	13				reddish brn. clay

P-2320
1250.1
1250.6
(sample no. 1)

SiO_2 6.9%
Fe 31.2%
Al_2O_3 32.5%

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.
1								P-2320

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Iron
~~Coal~~ Exploration
Washington Co. – Hendrickson
Project

Hole No. 2
Sheet

Sec. 6 T 2 N. R 2 W.
County Wash.

Hole No. 2
Location 1000' N of house, 25' below outcrop in road
Coordinates 630N – 4250 E
Elev. ground (collar) 1242
Depth to top of coal —
Elev. of top of coal —
Thickness of coal —
Elev. water table
Depth of hole 19'
Cumulative depth 32'
Bottomed in dark grey clay

Drill used Hand auger
Number men 2
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun 4-12-44
Date hole finished " " "
Shifts actually drilled
Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	4				Top soil
4	12				reddish brn. clay
12	19				dark grey clay
					streaked w. red

Hole 2 below iron bed

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Recy.	Sent for Analysis To	Date Sent	Refer to Lab. No.

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Iron ~~Coal~~ Exploration

Washington Co. – Hendrickson
Project

Hole No. 3

Sheet

Sec. 6 T 2N. R 2W.

County Wash.

Hole No. 3
Location 1/1000' W. of house 8' above outcrop in rd.
Coordinates 630N – 4350 E
Elev. ground (collar) 1268.1'
Depth to top of ~~coal~~ iron 8
Elev. of top of ~~coal~~ iron 1260.1
Thickness of ~~coal~~ —
Elev. water table
Depth of hole 9'
Cumulative depth 41
Bottomed in iron

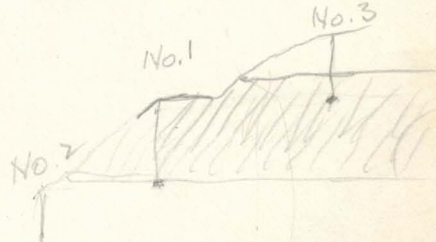
Drill used Hand auger
Number men 2
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun 4-12-44
Date hole finished " " "
Shifts actually drilled
Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	4				Top soil
4	8				lt. brn. clay
8	9				iron. (sample #1)

SiO_2 6.9%
Fe 31.2%
Al_2O_3 32.5%

Thickness of iron 17.5 ft.
Elev 1260.1 – Elev 1242.6 (bottom of Hole #1)

Apparently sample no. 1 includes ore from holes 1 + 3



Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.

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~~Coal~~ Exploration

Washington Co. - Hendrickson
Project

Hole No. 4

Sheet

Sec. 6 T 2 N. R 2 W.

County Wash.

Hole No. 4

Location ± 300' E. of H house

Coordinates 940 N — 5410 E

Elev. ground (collar) 1288.7

Depth to top of ~~coal~~ iron 13'

Elev. of top of ~~coal~~ iron 1274'

Thickness of ~~coal~~ iron 7

Elev. water table 18"

Depth of hole 21

Cumulative depth 68

Bottomed in reddish brn clay

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4-13-44

Date hole finished 4-14-44

Shifts actually drilled

Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	5				Top soil
5	13				Lt. brn. clay
13	16				iron (hard) — sample no. 2
16	20				iron (mixed w. clay) — sample no. 2
20	21				dk. grey clay w red stks

P-2321 (Sample #2)

SiO_2 28.45

Fe 16.16

Al_2O_3 29.44

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.
2								P-2321

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Iron ~~Coal~~ Exploration

Washington Co. - Hendrickson
Project

Hole No. 5

Sheet

Sec. 6 T 2N. R 2W.

County Washington

Hole No. 5

Location ± 400' W. of Grange Hall

Coordinates 2220 N - 6110 E

Elev. ground (collar) 1349.4

Depth to top of ~~coal~~ iron 5'

Elev. of top of ~~coal~~ 1337 ?

Thickness of coal 8'

Elev. water table 18'

Depth of hole 16'

Cumulative depth 78

Bottomed in reddish brn. clay

Drill used Hand Auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4-14-44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	5				Lt. brn. clay
5	13				Iron (sample #
13	16				reddish brn. clay w. dark etc

P-2322 (Sample #3)

Cleaver says that they moved up to Hole 6 as they did not get entire thickness of iron bed at Hole 5. Iron from Holes 5 + 6 mixed to give composite sample with following analysis. (W.D.L.)

SiO_2 13.38
Fe 24.24
Al_2O_3 29.28

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Recy.	Sent for Analysis To	Date Sent	Refer to Lab. No.
3								P-2322

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Iron ~~Coal~~ Exploration

Washington Co. - Hendrickson
Project

Hole No. 6

Sheet

Sec. T R

County

Hole No. 6

Location ±400' W. of Grange hall

Coordinates 2210N -- 6155E

Elev. ground (collar) 1353.4

Depth to top of ~~coal~~ iron 11

Elev. of top of ~~coal~~ iron 1346 ?

Thickness of ~~coal~~ iron 6'+8' in hole #5 14'

Elev. water table

Depth of hole 17

Cumulative depth 95

Bottomed in iron

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4-15-44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	4				Top soil
4	11				Lt. brn. clay
11	17				iron

P-2320 (Sample #3)

SiO_2 13.38
Fe 24.24
Al_2O_3 29.28

Cleaver says they moved to Hole 6 from Hole 5 to get full sections as represented at Hole 6. Iron from Holes 5 & 6 mixed to form composite sample which gave the following analysis: wet.

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.
3								P-2320

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Coal Exploration

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Project

Hole No. 6A

Sheet

Redrilled

Sec. 6 T 2N R 2W

County Washington

Hole No. 6A
Location W. of Grangehall

Coordinates 2190N-6120E
Elev. ground (collar) 1352
Depth to top of coal 10
Elev. of top of coal 1342
Thickness of coal 15
Elev. water table
Depth of hole 25
Cumulative depth 439
Bottomed in Red clay

Drill used Hand auger
Number men 2
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun 5-22-44
Date hole finished
Shifts actually drilled
Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	5				Top Soil
5	10				Lt. brn. clay
10	12				Iron mixed w. red clay
12	20				Oolitic iron
20	21				Magnetite & granular material
21	25				Red clay

omit

See other side for analysis

Average Analysis
SiO2 8.41
Fe 25.22
Al2O3 31.83

Sample #
6-A-1 10'-12'
6-A-2 12'-14'
6-A-3 14'-15'
6-A-4 15'-17'
6-A-5 17'-19'
6-A-6 19'-
6-A-7 20'-
6-A-8 21-25

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.

Lab. #	Sampk #	Hole #	Horizon		Fe	Al_2O_3
# P-2383	6A-1	6A	10-12	7.64	24.55	29.36
2384	6A-2	"	12-14	13.96	29.16	28.48
2385	6A-3	"	14-15	5.24	31.86	25.80
2386	6A-4	"	15-17	6.26	23.02	34.40
2387	6A-5	"	17-19	5.82	23.42	37.52
2388	6A-6	"	19-20	15.32	22.01	33.28
2389	6A-7	"	20-21	6.10	24.60	32.92
2390	6A-8	"	21-25	6.98	23.19	32.88
						34.64
						31.83

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and Mineral Industries

Iron ~~Coal~~ Exploration

Washington Co.-Hendrickson
Project

Hole No. 7

Sheet

Sec. 6 T 2N. R 2W.

County Wash

Hole No. 7
Location ± 660' N of rd. & 400' W. of turn
Coordinates 1710N - 3780 E
Elev. ground (collar) 1300.5
Depth to top of ~~coal~~ iron 7
Elev. of top of ~~coal~~ iron 1293
Thickness of ~~coal~~ iron 14'
Elev. water table
Depth of hole 22
Cumulative depth 117
Bottomed in hard grey clay

Drill used Hand Auger
Number men 2
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun 4-15-44
Date hole finished
Shifts actually drilled
Diam. casing ____ Diam. shoe ____

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	7				Lt. brn. clay
7	12				Iron mixed w. red clay
12	17				Hard oölitic iron
17	21				Hard iron (not oölitic)
21	22				Hard dark grey clay

P-2323 (Sample # 4)
SiO_2 8.30
Fe 23.80
Al_2O_3 33.1

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.
4								P-2323

State of Oregon
Department of Geology
and Mineral Industries

Iron ~~Coal~~ Exploration

Washington Co.-Hendrickson
Project

Hole No. 8

Sheet

Sec. 6 T 2N. R 2W.

County Washington

Hole No. 8

Location ±1000' W of hole #7

Coordinates 1990N-2915E

Elev. ground (collar) 1286.2

Depth to top of ~~coal~~ iron 4

Elev. of top of ~~coal~~ iron 1282.2

Thickness of ~~coal~~ iron 13

Elev. water table

Depth of hole 18

Cumulative depth 135

Bottomed in darkgreyclay

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4-19-44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	4				Lt. brn. clay
4	7				Oölitic iron
7	17				Iron (not oölitic)
17	18				dk. grey clay w. stks. red.

P-2324 (Sample #5)
SiO_2 7.26
Fe 23.08
Al_2O_3 35.34

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Recy.	Sent for Analysis To	Date Sent	Refer to Lab. No.
5								P-2324

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Iron
~~Coal~~ Exploration

Washington Co. – Hendrickson
Project

Hole No. 9

Sheet

Sec. 6 T 2N R 2W.

County Wash

Hole No. 9
Location 300' W of hole #8

Coordinates 2130 N – 2670 E
Elev. ground (collar) 1278.2
Depth to top of ~~coal~~ —
Elev. of top of ~~coal~~ —
Thickness of ~~coal~~ —
Elev. water table
Depth of hole 16
Cumulative depth 151
Bottomed in Lt. brn. clay

Drill used Hand auger
Number men 2
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun 4-24-44
Date hole finished
Shifts actually drilled
Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	7				Lt. brn. clay
7	10				Red clay
10	16				Lt. brn. clay

No sample. No iron.

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Recy.	Sent for Analysis To	Date Sent	Refer to Lab. No.

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Iron ~~Coal~~ Exploration

Washington Co. - Hendrickson
Project

Hole No. 10

Sheet

Sec. T R

County

Hole No. 10

Location

Coordinates 980N--6120E

Elev. ground (collar) 1290'

Depth to top of ~~coal~~ iron 9'

Elev. of top of ~~coal~~ iron 1281

Thickness of ~~coal~~ iron 3'

Elev. water table

Depth of hole 13'

Cumulative depth 164

Bottomed in dk. clay

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 1-24-44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	9				Lt. grey clay
9	9'8"				Oölitic iron
9'8"	12'				Iron mixed w. red clay
12	13'				Dark. grey clay

P-2325 (Sample #6)

SiO_2 40.4 ✓

Fe 12.45 ✓

Al_2O_3 29.54 ✓

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.
6								P-2325

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Hole No. 11

Sheet

Sec. 6 T 2N. R 2W.

County Wash.

Hole No. 11

Location N. of H. House

Coordinates 1500N - 5200E

Elev. ground (collar) 1290

Depth to top of ~~coal~~ -

Elev. of top of ~~coal~~ -

Thickness of ~~coal~~ -

Elev. water table

Depth of hole 10'

Cumulative depth 174

Bottomed in Brn. Clay

Drill used Hand Auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5-2-44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	5'				Top soil
5'	10				Lt. brn. clay

Iron Apparently eroded out

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Recy.	Sent for Analysis To	Date Sent	Refer to Lab. No.

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Iron
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Washington Co. - Hendrickson
Project

Hole No. 12

Sheet

Sec. T R

County

Hole No. 12
Location N. of H. house

Coordinates 1400N - 5200E
Elev. ground (collar) 1300'
Depth to top of ~~coal~~ iron 9'
Elev. of top of ~~coal~~ iron 1291'
Thickness of ~~coal~~ iron 12
Elev. water table
Depth of hole 22
Cumulative depth 196
Bottomed in dk. clay

Drill used Hand Auger
Number men 2
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun 5-2-44
Date hole finished
Shifts actually drilled
Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	9				Lt. brn. clay
9	16				Hard oolitic iron
16	21				Iron mixed w. clay + feldsp.
21	22				DK. grey clay w. stks. of

P-2326 (Sample #7.)
SiO_2 12.52
Fe 27.67
Al_2O_3 27.80

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Recy.	Sent for Analysis To	Date Sent	Refer to Lab. No.
7								P-2326

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Project

Hole No. 13

Sheet

Sec. 6 T 2N. R 2W.

County

Hole No. 13
Location On R.R. Grade at end of trestle
Coordinates 2600N-5200E
Elev. ground (collar) 1298.
Depth to top of ~~coal~~ 5'
Elev. of top of ~~coal~~
Thickness of ~~coal~~ trace (circle)
Elev. water table
Depth of hole 16
Cumulative depth 212
Bottomed in DK. clay

Drill used Hand Auger
Number men 2.
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun 5-2-44
Date hole finished " " "
Shifts actually drilled
Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	5'				Lt. brn. clay (red stks)
5'	16				Lt. brn clay grading down to dk. grey clay w. red stks. + spots of dec. feldspar.

(Sample #8)

P-2327

SiO_2 27.66
Fe 17.87
Al_2O_3 28.12

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.
8								P-2327

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IRON
~~Coal~~ Exploration

Washington Co. - Hendrickson
Project

Hole No. 14

Sheet

Sec. 6 T 2N R 2W

County Wash.

Hole No. 14
Location N. of H. house

Coordinates 2200N - 5200E
Elev. ground (collar) 1317
Depth to top of ~~coal~~ iron 14
Elev. of top of ~~coal~~ iron 1303
Thickness of ~~coal~~ iron 9
Elev. water table
Depth of hole 24
Cumulative depth 236
Bottomed in DK. clay

Drill used Hand Auger
Number men 2
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun 5-2-44
Date hole finished
Shifts actually drilled
Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Yellow clay
3	14				Red clay
14	18				Hard oolitic iron
18	23				Iron (not oolitic)
23	24				DK. clay w. red oolites

(Sample #9)
P-2328
SiO_2 8.90
Fe 35.42
Al_2O_3 21.56

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.
9								P-2328

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~~Coal~~ Exploration

Washington Co. - Hendrickson
Project

Hole No. 15

Sheet

Sec. 6 T 2N. R 2W.

County Washington

Hole No. 15

Location Near corner of hgwy. & Hend. rd.

Coordinates 1000N - 6200 E

Elev. ground (collar) 1301

Depth to top of ~~coal~~ iron 10'

Elev. of top of ~~coal~~ iron 1291

Thickness of ~~coal~~ iron 11'

Elev. water table

Depth of hole 22

Cumulative depth 258

Bottomed in dk. grey clay

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5-3-44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	10				Lt. brn. clay
10	11				Iron mixed w. clay
11	18				Oölitic iron
18	21				Iron (not oölitic)
21	22				Dk. grey clay w spots dec. feldspar

P-2329 (#10) SiO_2 19.94
Fe 17.60
Al_2O_3 35.96

P-2330 (#10A) SiO_2 8.78
Fe 21.19
Al_2O_3 37.80

P-2329 (Sample #10) from 10' to 16'
P-2330 (" #10A) from 16 to 20.

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Recy.	Sent for Analysis To	Date Sent	Refer to Lab. No.
10								P-2329
10A								P-2330

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Washington Co. - Hendrickson
Project

Hole No. 16

Sheet

Sec. 6 T 2N R 2W

County Wash.

Hole No. 16

Location

Coordinates 1925 N - 3780 E

Elev. ground (collar) 1303

Depth to top of coal 8

Elev. of top of coal 1295

Thickness of coal 13

Elev. water table

Depth of hole 22

Cumulative depth 280

Bottomed in Dk. clay

Drill used Hand Auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5-3-44

Date hole finished 5-4-44

Shifts actually drilled

Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	8				Lt. brn. clay
8	12				Hard oolitic iron
12	21				Very hard red iron
21	22				Dk. grey clay w. specks dec. feldspar

P-2335 SiO_2 6.50 ✓
Fe 26.65 ✓
Al_2O_3 33.28 ✓

P-2335 (Sample # 11) 8'-15'
P-2336 (" # 11A) 15'-21'

P-2336
SiO_2 32.88 ✓
Fe 12.16 ✓
Al_2O_3 32.16 ✓

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Recy.	Sent for Analysis To	Date Sent	Refer to Lab. No.
11								P-2335
11A								P-2336

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Iron ~~Coal~~ Exploration

Washington Co. - Hendrickson
Project

Hole No. 17

Sheet

Sec. 6 T 2N. R 2W.

County Wash.

Hole No. 17

Location

Coordinates 1000N-6400E

Elev. ground (collar) 1296

Depth to top of ~~coal~~ iron 16

Elev. of top of ~~coal~~ iron 1280

Thickness of ~~coal~~ iron 6"

Elev. water table

Depth of hole 22

Cumulative depth 302

Bottomed in Red clay

Drill used Hand Auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5-5-44

Date hole finished "

Shifts actually drilled

Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Top Soil
3	16				Lt. brn. clay
16	16'6"				Hard iron
16'6"	22				Red clay

Iron apparently removed by erosion
Water level 6'

No Sample taken -

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.

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IRON ~~Coal~~ Exploration

Washington Co.-Hendrickson Project

Hole No. 18

Sheet

Sec. 6 T 2 N. R 2 W.

County Wash.

Hole No. 18

Location N. of Grange Hall

Coordinates 2600 N - 6400 E

Elev. ground (collar) 1340

Depth to top of ~~coal~~ iron 9

Elev. of top of ~~coal~~ iron 1331

Thickness of ~~coal~~ iron 6'

Elev. water table

Depth of hole 17

Cumulative depth 319

Bottomed in Dk. rock

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5-5-44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	9				Lt. brn. clay
9	15				Oölitic iron
15	16				Fractured hard dark rock w. metallic luster
16	17				Dark granular basic rock resembling basalt

(Sample #12)

P-2337 SiO_2 13.38 ✓
Fe 24.99 ✓
Al_2O_3 24.64 ✓

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Rec'y.	Sent for Analysis To	Date Sent	Refer to Lab. No.
12								P-2337

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Coal Exploration

Washington Co - Hendrickson
Project

Hole No. 19

Sheet

Sec. 6 T 2N R 2W

County Wash.

Hole No. 19
Location South end of project

Coordinates 200N - 5400 E
Elev. ground (collar) 1278
Depth to top of ~~coal~~ iron 7
Elev. of top of ~~coal~~ iron 1271
Thickness of ~~coal~~ iron .13
Elev. water table
Depth of hole 21
Cumulative depth 340
Bottomed in Dark grey clay

Drill used Hand Auger
Number men 2
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun 5-8-44
Date hole finished
Shifts actually drilled
Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	1				Tob soil
1	7				Lt. bry. clay
7	12				Iron mixed w. red clay
12	20				Hard oölitic iron
20	21				Dark grey clay w. red st

P-2346 (Sample #13)

SiO_2 10.78
Fe 23.13
Al_2O_3 35.52

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Recy.	Sent for Analysis To	Date Sent	Refer to Lab. No.
13								P-2346

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~~Coal~~ Exploration

Washington Co. - Hendrickson
Project

Hole No. 20

Sheet

Sec. 6 T 2N. R 2W.

County Wash.

Hole No. 20
Location On hill between Grange Hall & Hendricksons house
Coordinates 1650N — 6100E
Elev. ground (collar) 1348
Depth to top of ~~coal~~ 29
Elev. of top of ~~coal~~ 1319
Thickness of ~~coal~~ 11+
Elev. water table
Depth of hole 41
Cumulative depth 381
Bottomed in Red clay

Drill used Hand Auger
Number men 2
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun 5-8-44
Date hole finished 5-9-44
Shifts actually drilled
Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	26				Lt. brn. clay
26	29				Red stickey clay
29	41				Soft oölitic iron mixed w. red clay

Hole drilled near head of water course. Iron seems to be softened and altered by water. No sample taken

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Recy.	Sent for Analysis To	Date Sent	Refer to Lab. No.

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Hendrickson
Project

Hole No. 21
Sheet

Sec. 5 T 2 N. R 2 W.
County Wash.

Hole No. 21
Location On E. side of Hwy. S. of Grange Hall
Coordinates 1200N-6525E
Elev. ground (collar) 1314
Depth to top of coal 14
Elev. of top of coal 1300
Thickness of coal 18
Elev. water table
Depth of hole 33
Cumulative depth 414
Bottomed in Dark clay

Drill used Hand Auger
Number men 2
Engr. in charge Cleaver
Mtrl. classfd. by Swanson
Sampler
Date hole begun 5-10-44
Date hole finished " " "
Shifts actually drilled
Diam. casing Diam. shoe

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	14				Lt. brn. clay
14	32				Red clay w. decomposed oölites of iron
32	33				Dark reddish clay

P-2347 (Sample #14)
Iron fairly soft. Hole had much water

SiO_2 56.16
Fe 6.64
Al_2O_3 22.08

Samples taken:

Sample No.	Total Wet Weight	Weight of Sample Sent	Total Thickness Repres'd.	Core Rec'y. Inches	% Core Recy.	Sent for Analysis To	Date Sent	Refer to Lab. No.
14								P-2347

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson Extension
Project

Hole No. 26 Location West extension

Sec. 6 T. 2N R. 2W County Washington

Coord. 2200N — 1900 E

Elev. collar ± 1300

Depth to top of bed 5

Elev. of top of bed 1287±

Thickness of bed 13

Elev. water table —

Depth of hole 27

Cumulative depth 562

Bottomed in Grn. clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Lowrey

Sampler

Date hole begun 5-29-44

Date hole finished 6-6-44

Shifts actually drilled

Diam.casing Diam.shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	5				Lt. brn. clay
5	13				Reddish clay w. scattered oö
13	22				Hard oölitic iron
22	26				Reddish brn. clay w. scattered oöl
26	27				Mottled brn. & red clay

Remarks:

Sample # 18-A 13-19
18-B 19-22
18-C 22-26

SiO_2	Fe	Al_2
6.70	24.18	34
8.16	25.07	3
6.40	21.27	4

13 Ft. Good Ore

Hole No. 26

This hole may be bottomed in ore.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson Extension
Project

Hole No. 27 Location 400' N-40°W from Hole #26

Sec. 6 T. 2N R. 2W County Washington

Coord. 2500N - 1630E

Elev. collar ± 1290

Depth to top of bed 16

Elev. of top of bed 1274

Thickness of bed 9

Elev. water table

Depth of hole 25'

Cumulative depth 587

Bottomed in Red clay

****

Drill used Hand auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole begun 6-6-44

Date hole finished 6-7-44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	16				Lt. brn. clay
16	25				Red clay w. scattered oölite

Remarks: Sample #19 16'-25'

Silica too high

SiO_2 55.96
Fe 6.38
Al_2O_3 26.00

Hole No. 27

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson Extension
Project

Hole No. 28 Location 150' W. of Hole #27

Sec. 6 T. 2N R. 2W County Washington

Coord. 2500N - 1490E

Elev. collar ±1263

Depth to top of bed 9

Elev. of top of bed 1254

Thickness of bed 2

Elev. water table

Depth of hole 13

Cumulative depth 600

Bottomed in Lt. brn. clay

****

Drill used Hand Auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole begun 6-7-44

Date hole finished " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	1				Talo soil
1	9				Red clay
9	11				Oölitic iron
11	13				Lt. brn. clay w. spots
					decomposed feldspar

Remarks: Sample #20
9'-11'

SiO_2 18.36
Fe 28.88
Al_2O_3 27.96

High Silica

Hole No. 28

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Parmele (Hendrickson-South)
Project

Hole No. 29 Location On Co. rd. .2 mi E. of hgwy. jct. on Parmele property

Sec. 8 T. 2N R. 2W County Washington

Coord.

Elev. collar 1240' ±1125

Depth to top of bed 4

Elev. of top of bed 1240' ±1125

Thickness of bed 10

Elev. water table

Depth of hole 14

Cumulative depth 614

Bottomed in Red clay

****

Drill used Hand Auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole begun 6-7-44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	4				Lt. brn. clay
4	8				Hard oölitic iron
8	14				(Hard red clay WITH A FEW WHITE SPECKS.

Remarks:

Sample #			SiO_2	Fe	Al_2
	21-A	4'-6'	14.74	18.92	36
	21-B	6'-8'	7.74	26.64	34
	21-C	8'-14'	8.52	25.18	30

Hole No. 29

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HENDRICKSON
Project

Hole No. 37 Location ON FENCE LINE AT N. END CLOVER FIELD, N. OF HOUSE

Sec. 6 T. 2N. R. 2W. County WASH

Coord. 2000± N 5500± E

Elev. collar 1335±

Depth to top of bed —

Elev. of top of bed —

Thickness of bed —

Elev. water table —

Depth of hole 14

Cumulative depth —

Bottomed in LOAM

****

Drill used 2" AUGER

Number men 2

Engr. in charge MASON

Mtrl. classfd. by LOWRY

Sampler "

Date hole begun 7-6-44

Date hole finished "

Shifts actually drilled ½

Diam. casing ____ Diam. shoe ____

Type of bit:

____ from ____ to ____

____ from ____ to ____

____ from ____ to ____

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	7				VARIEGATED BROWN GREY SILTY LOAM, CLAY
7	14				BROWN SILTY LOAM

Remarks:

HOLE ABANDONED AT 14' WHEN INDICATIONS OF ORE FAILED TO APPEAR.

Hole No. 37

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HENDRICKSON
Project

Hole No. 38 Location

Sec. 6 T. 2 N. R. 2 W. County WASH

Coord. 1900 N ± 5500 E ±

Elev. collar 1325 ±

Depth to top of bed 18'-6"

Elev. of top of bed 1306.6

Thickness of bed 3'7"+

Elev. water table —

Depth of hole 22'

Cumulative depth

Bottomed in ORE

****

Drill used 2" AUGER

Number men 2

Engr. in charge MASON

Mtrl. classfd. by LONG

Sampler "

Date hole begun 7-6-44

Date hole finished 7-7-44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				ORGANICALLY STAINED
3	4				YELLOW-BROWN LOAM SILTY-CLAY
4	8				BROWN-GREY SILTY LOAM
8'	11'				OCCASIONAL BLACK SHOTS SILT REDDER
11	13				MORE SHOTS IN SILT
13	14	(BOTTLE	103 (I)		RED-CLAY START MOISTURE SAMPLE
14	15	("	100 (II)		RED CLAY
15'-0"	15'-1"	("	(III)		HARD O'OLITES (?)
15'-1"	17'-0"	(" (SAME)	(III)		RED CLAY
17'-0"	18'-6"	("	(IIII)		HARD OOLITES
18'-6"	19'-0"	(" 107	(IIII)		HARD ORE
19'-0"	19'-6"	(" 104	(V)		" "
19'-6"	20'-6"	("	(VI)		" "
20'-6"	21'-0"	(" 105	(VII)		DARK RED BROWN OOLITIC
21'-0"	21'-6	" 73	—		VERY DARK " " "

Remarks:

LOG CON'T ON NEXT SHEET

Hole No. 38

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 38 Cont'd Location continuation of Hole 38

Sec. 6 T. 2N. R. 2W. County Washington

Coord. 1900 N I 5500 E I

Elev. collar 1325 I

Depth to top of bed 18'-6"

Elev. of top of bed 1308

Thickness of bed 3'7"+

Elev. water table —

Depth of hole 22'

Cumulative depth —

Bottomed in ORE

****

Drill used 2" AUGER

Number men 2

Engr. in charge MASON

Mtrl. classfd. by LOWRY

Sampler "

Date hole begun 7-6-44

Date hole finished 7-7-44

Shifts actually drilled 1

Diam. casing ____ Diam. shoe ____

Type of bit:

____ from ____ to ____

____ from ____ to ____

____ from ____ to ____

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
21'-6"	22'-0"	(BOTTLE 73)			VERY DARK RED BROWN ORE
22'-0	~~22'-1"~~	"	(VIII)		ORE - DARKER THAN SECTION ABOVE
HOLE	ABANDONED	WITHOUT	BOTTOMING		
ORE.	DUE TO	EXTREME	HARDNESS OF GROUND		

Remarks:

No analysis other than moisture made.
See summary sheet

Hole No. 38 (cont.)

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HENDRICKSON
Project

Hole No. 39 Location ON SLOPE DIPPING TO NORTH WEST 10' BELOW TO

Sec. 6 T. 2N. R. 2W. County WASH

Coord. 2330N ± 3350E ±

Elev. collar 1300 ±

Depth to top of bed ?

Elev. of top of bed ?

Thickness of bed ?

Elev. water table —

Depth of hole 19

Cumulative depth

Bottomed in YEL-BR-RE CLAY

****

Drill used 2" AUGER

Number men 2

Engr. in charge MASON

Mtrl. classfd. by LOWRY

Sampler

Date hole begun 7-10-44

Date hole finished 7-10-44

Shifts actually drilled 1/2

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	9				BROWN SILTY TOPSOIL
9	17'-6"				REDDISH CLAY SILT
17'-6"	18'-0"	(BOTTLE 1X)			REDDISH CLAY WITH NUMEROUS SHOT
18	19				DARK MOTTLED YELL-BROWN-RED CLAY

Remarks: HOLE ABANDONED. WHEN SAMPLE RESEMBLED MTRL. UNDERLYING IRON IN OTHER HOLES.

P - 2509 (17'6" - 18'0")

SiO_2	28.35 %
Fe	18.45
Al_2O_3	27.72
H_2O	29.5

Hole No. 39

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendricksan
Project

Hole No. 40 Location ON TOP OF FLAT KNOLL

Sec. ____ T. ____ R. ____ County Washington

Coord. 2175± N 3450± E

Elev. collar 1311±

Depth to top of bed 13

Elev. of top of bed 1298±

Thickness of bed —

Elev. water table —

Depth of hole 15'-1"

Cumulative depth —

Bottomed in ORE

****

Drill used 2" AUGER

Number men 2

Engr. in charge WILSON

Mtrl. classfd. by LOWRY

Sampler —

Date hole begun 7-10-44

Date hole finished 7-10 44

Shifts actually drilled 1/2

Diam. casing ____ Diam. shoe ____

Type of bit:

____ from ____ to ____

____ from ____ to ____

____ from ____ to ____

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	5'-6"				LIGHT BROWN SILT OCCASIONAL SHOT
5'-6"	9'-0"				MTRL. GRADUALLY GETTING REDDER
9'-0"	11'-0"	(JAR	X)		REDDISH MTRL WITH OCCASIONAL SHOTS
11'-0"	13'-0"	(JAR	XI)		" "
13'-0"	14'-0"	(Jar	XII)		Hard reddish brown o
14'-0"	15'-0"	(Jar	XIII - ½	102)	14½' very hard o
15'-0"	15'-1"	(Jar	XIV)		darker brown color very hard ore

Remarks:

abandoned due to loss & losing sample out of pod when bringing out due to lowness of ore. Still hard at bottom

Only analysis for H_2O made - See summary sheets

Hole No. 40

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 43 (Cut) Location

of sec. 6 T. 2N R. 2W County Washington

Coord. 1700 N. 3800 E.

Elev. collar 1269 RSM ~~1269~~

Depth to top of bed 0'

Elev. of top of bed 1271 RSM ~~1271~~

Thickness of bed

Elev. bottom bed

Depth of hole 21'6"

Elev. water table —

Bottomed in brown earth

****

Drill used 2" AUGER

Number men 2

Engr. in charge MASON

Mtrl. classfd. by LOWRY

Sampler BOTH

Date hole began 8-23-44

Date hole finished 8-23-44

Shifts actually drilled 3/4

From	To	Thickness of sample	Sample No.	Description
0	2	2'	P-2623 A	varicolored earthy 2' channel sample
Hole begun at 2	3	1'	P-2624 B	very dark, somewhat oölitic+ hard, soft at bottom
3	4	1'	P-2625 C	dark, soft, streaked with red, brown + black, more clay
4	5	1'	P-2626 D	Soft, darker, same clay apparent residual texture
5	6	1'	P-2627 E	More earthy, firmer, drier
6	7	1'	P-2628 F	DK. BROWN - EARTHY
7	8	1'	P-2629 G	No APPARENT CHANGE
8	9	1'	P-2630 H	LIGHT COLORED SPECKS DECOM FELDSPAR. MOTTLED-HARD PELLET BUFF STREAKS
9	10	1'	P-2631 I	NO APPARENT CHANGE
10	11	1'	P-2632 J	SOMEWHAT LIGHTER COLORED
11	12	1' P-2633	P-2633 K	CHOC. BR. WITH NEARLY WHITE SPECKS
12	13	1' P-2634	P-2634 L	VARI-COLORED - BROWN WITH BLUE CLAY(?) WETTER SOMEWHAT
13	14	1'	P-2635 M	LIGHT BROWN - VARI-COLORED FEW LIGHT SPECKS - CLAYEY
14	15	1'	P-2636 N	GETTING WETTER
15	16	1'	P-2637 O	VERY WET - LIGHT BROWN CHUNK ABRUPTLY TO BLUE W/YEL. STG. (BENTONITE(?) FRAGMENTS)
16	17	1	P-2638 P	MOTTLED, MOSTLY BLUE, GREEN BROWN, WHITE SPECKS

(SEE NEXT PAGE)

Remarks COLLAR OF HOLE IN FLOOR OF CUT. CHANNEL SAMPLES OF ___ FT OF OVERLYING OPEN. COLLAR 12 FT IN FROM PORTAL OF CUT

WL-24b

Hole No. 43

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

HENDRICKSON
Project

Hole No. 43 CONT Location

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

...o water table

Bottomed in TAN EARTHY MTL

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
17	18	1'	P-2639 Q	MOSTLY BLUISH GRAY. DARKER. WET
18	19	1'	P-2640 R	MOTTLED - BLUE-GREEN & DARK BROWN & PLASTIC
19	20	1'	P-2641 S	MOTTLED - PURPLE-BROWN W/WHITE SPECS (BASALT TEXTURE)
20	21	1' X	P-2642 T	DARKER GRITTY - VARIEGATED YELLOW SPECKS
21	22	1'	P-2643 U	DARK PURPLE WITH SOME RED SPECKS
22	23	1'	P-2644 V	DARK-PURPLISH-BLACK MORE UNIFORM COMP. DRY
23	23'-6"	6" X	P-2645 W	TAN, DRY, FINE GRAINED, EARTHY MTL.

Remarks HOLE BOTTOMED WHEN DRILLING FIRM MTL at bottom SLOWED RATE OF ADVANCE. SECTION TO BE SAMPLED BELIEVED TO BE COMPLETE WITH THIS DEPTH

See summary sheets for results

WL-24b

Hole No. 43(Co

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 22 Nelson Location 165 ft. N. of Nelson's wind-charger

Sec. 32 T. 3 N. R. 2 W. County Washington

Coord. 4130 N. - 8120 E.

Elev. collar 1368

Depth to top of bed 7

Elev. of top of bed 1361

Thickness of bed 15

Elev. water table

Depth of hole 26

Cumulative depth 465

Bottomed in dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/23/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	7				Light brown clay
7	10				Iron mixed with red clay
10	20				Oolitic iron
20	22				Iron mixed with red clay
22	24				Red clay
24	26				Dark clay with basalt pebble

Remarks:

P-2391 to P-2405 (inclusive) Sample No. 15, A to O. See summary sheet for analysis. Every foot sampled from 7' to 22'.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 23 Location 300 ft. N. and 400 ft. W. of Nelson's wind-charger.

Sec. 32 T. 3 N. R. 2 W. County Washington

Coord. 4130 N. - 7745 E.

Elev. collar 1367

Depth to top of bed 6

Elev. of top of bed 1361

Thickness of bed 9

Elev. water table

Depth of hole 15

Cumulative depth 480

Bottomed in dark clay

****

Drill used hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/23/44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	6				Light brown clay
6	8				Iron mixed with red clay
8	12				Oölitic iron
12	15				Dark clay with magnetite and basalt pebbles

Remarks: Sample No. 16 (A to I). Every 1 ft. sampled from 6 ft. to 15 ft. P-2406 to P-2414 inclusive. See summary sheet for analysis.

16A = 6'-7'
16B = 7'-8'

Hole No. 23

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 24 Location 500 ft. S. of Nelson's wind-charger; 22 ft. below barn level.

Sec. 32 T. 3 N. R. 2 W. County Washington

Coord. 3625 N. - 8120 E.

Elev. collar 1366

Depth to top of bed 17'

Elev. of top of bed 1349

Thickness of bed 12'

Elev. water table

Depth of hole 30'

Cumulative depth 510

Bottomed in dark red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/24/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	12				Light brown clay
12	17				Red clay
17	29				Red clay with oölites; (fairly hard)
29	30				Dark red clay with scattered oölites.

Remarks: See summary sheet for results of analysis.

SAMPLED AS FOLLOWS:

P-2416 (No. 17-A) 12' - 17'
P-2417 (No. 17-B) 17' - 23'
P-2418 (No. 17-C) 23' - 26'
P-2419 (No. 17-D) 26' - 28'
P-2420 (No. 17-E) 28' - 29'

Hole No. 24

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 25 Location 500 ft. S. and 400 ft. W. of wind-charger; 20 ft. below barn level.

Sec. 32 T. 3 N. R. 2 W. County Washington

Coord. 3620 N. - 7740 E.

Elev. collar 1368

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 25

Cumulative depth 535

Bottomed in red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/24/44

Date hole finished 5/25/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	10				Light brown clay
10	25				Red clay with scattered oölites.

Remarks:
No iron. No sample.

Hole No. 25

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 35 Location 400 ft. E. and 150 ft. N. of Nelson's wind-charger.

Sec. 32 T. 3 N. R. 2 W. County Washington

Coord. 4125 N. - 8495 E.

Elev. collar 1368

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 9 ft.

Cumulative depth 686

Bottomed in dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 6/14/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	8				Light brown clay with gray streaks
8	9				Dark clay and basalt pebbles

Remarks:

No iron. No sample.

Hole No. 35

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 36 Location 400 ft. E. of Nelson's wind-charger.

Sec. 32 T. 3 N. R. 2 W. County Washington

Coord. 3975 N. - 8490 E.

Elev. collar 1378

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 14

Cumulative depth 700 ft.

Bottomed in varicolored clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 6/14/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	5				Top soil
5	8				Light brown clay
8	12				Red clay with scattered soft oölites.
12	14				Mottled red, yellow, and gray clay.

Remarks:

Trace of iron. No sample.

Hole No. 36

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson - Nelson
Project

Hole No. 41 Location Near △ Sta. 'A' E. of road 40 ft.

Sec. 5 T. 2 N. R. 2 W. County Washington

Coord. 2850 N. approximately. 6800 E. approximately

Elev. collar 1344

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table None

Depth of hole 19'0"

Cumulative depth

Bottomed in red clay ?

****

Drill used 3"/2"

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler Both

Date hole begun 7/25/44

Date hole finished " " "

Shifts actually drilled ¼

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0'	9'				Light gray mottled silt
9'	14'0"				Becoming redder Reddish brown clay
14'0"	16'0"				In part mottled gray; Reddish brown clay.
16'0"	16'3"				Start of ore? Soft clay-like
16'3"	18'0"				Deep red clay-like materia
18'0"	19'0"				Some white streaks.

Remarks:

Ore horizon apparently eroded by drainage to W. of road. Hole abandoned when bottom of hole lower than bottom of ore should be.

See summary sheet for analysis.

Hole No. 41

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 42 Location 100 ± S. of road between Holes 24 and 25.

Sec. ____ T. ____ R. ____ County Washington

Coord. ____

Elev. collar 1350 ±

Depth to top of bed ____

Elev. of top of bed ____

Thickness of bed ____

Elev. water table ____

Depth of hole 22

Cumulative depth ____

Bottomed in reddish clay-silt

****

Drill used 3"-

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler Both

Date hole begun 7/25/44

Date hole finished " " "

Shifts actually drilled ____

Diam. casing ____ Diam. shoe ____

Type of bit:

____ from ____ to ____

____ from ____ to ____

____ from ____ to ____

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	22				Brown gray silt turning redder with depth

Remarks: Hole lies 240 ft. W. of Hole 24 and 120 ft. due S. of ℄ of County road. Hole abandoned at 22 when possible ore horizon passed.

Hole No. 42

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 22 Location 165 ft. N. of Nelson's wind-charger
Nelson
Sec. 32 T. 3 N. R. 2 W. County Washington

Coord. 4130 N. - 8120 E.

Elev. collar 1368

Depth to top of bed 7

Elev. of top of bed 1361

Thickness of bed 15

Elev. water table

Depth of hole 26

Cumulative depth 465

Bottomed in dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/23/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	7				Light brown clay
7	10				Iron mixed with red clay
10	20				" Oolitic iron
20	22				Iron mixed with red clay
22	24				Red clay
24	26				Dark clay with basalt pebble

Remarks:
P-2391 to P-2405 (inclusive) Sample No. 15, A to O. See summary sheet for analysis. Every foot sampled from 7' to 22'.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 23 Location 300 ft. N. and 400 ft. W. of Nelson's wind-charger.

Sec. 32 T. 3 N. R. 2 W. County Washington

Coord. 4130 N. - 7745 E.

Elev. collar 1367

Depth to top of bed 6

Elev. of top of bed 1361

Thickness of bed 9

Elev. water table

Depth of hole 15

Cumulative depth 480

Bottomed in dark clay

****

Drill used hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/23/44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	6				Light brown clay
6	8				Iron mixed with red clay
8	12				Oölitic iron
12	15				Dark clay with magnetite and basalt pebbles

Remarks: Sample No. 16 (A to I). Every 1 ft. sampled from 6 ft. to 15 ft. P-2406 to P-2414 inclusive. See summary sheet for analysis.

16A = 6'-7'
16B = 7'-8'

Hole No. 23

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 24 Location 500 ft. S. of Nelson's wind-charger; 22 ft. below barn level.

Sec. 32 T. 3 N. R. 2 W. County Washington

Coord. 3625 N. - 8120 E.

Elev. collar 1366

Depth to top of bed 17'

Elev. of top of bed 1349

Thickness of bed 12'

Elev. water table

Depth of hole 30'

Cumulative depth 510

Bottomed in dark red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/24/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	12				Light brown clay
12	17				Red clay
17	29				Red clay with oölites; (fairly hard)
29	30				Dark red clay with scattered oölites.

Remarks: See summary sheet for results of analysis.

SAMPLED AS FOLLOWS:

P-2416 (No. 17-A) 12' - 17'
P-2417 (No. 17-B) 17' - 23'
P-2418 (No. 17-C) 23' - 26'
P-2419 (No. 17-D) 26' - 28'
P-2420 (No. 17-E) 28' - 29'

Hole No. 24

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelsen
Project

Hole No. 25 Location 500 ft. S. and 400 ft. W. of wind-charger; 20 ft. below barn level.

Sec. 32 T. 3 N. R. 2 W. County Washington

Coord. 3620 N. - 7740 E.

Elev. collar 1368

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 25

Cumulative depth 535

Bottomed in red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/24/44

Date hole finished 5/25/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	10				Light brown clay
10	25				Red clay with scattered oölites.

Remarks:

No iron. No sample.

Hole No. 25

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 35 Location 400 ft. E. and 150 ft. N. of Nelson's wind-charger.

Sec. 32 T. 3 N. R. 2 W. County Washington

Coord. 4125 N. - 8495 E.

Elev. collar 1368

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 9 ft.

Cumulative depth 686

Bottomed in dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 6/14/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	8				Light brown clay with gray streaks
8	9				Dark clay and basalt pebble

Remarks:

No iron. No sample.

Hole No. 35

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 36 Location 400 ft. E. of Nelson's wind-charger.

Sec. 32 T. 3 N. R. 2 W. County Washington

Coord. 3975 N. - 8490 E.

Elev. collar 1378

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 14

Cumulative depth 700 ft.

Bottomed in variecolored clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 6/14/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	5				Top soil
5	8				Light brown clay
8	12				Red clay with scattered soft oölites.
12	14				Mottled red, yellow, and gray clay.

Remarks:

Trace of iron. No sample.

Hole No. 36

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson - Nelson
Project

Hole No. 41 Location Near △ Sta. 'A' E. of road 40 ft.

Sec. 5 T. 2 N. R. 2 W. County Washington

Coord. 2850 N. approximately. 6800 E. Approximately

Elev. collar 1944

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table None

Depth of hole 19'0"

Cumulative depth

Bottomed in red clay ?

****

Drill used 3"/2"

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler Both

Date hole begun 7/25/44

Date hole finished " " "

Shifts actually drilled ½

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0'	9'				Light gray mottled silt
9'	14'0"				Becoming redder Reddish brown clay
14'0"	16'0"				In part mottled gray; Reddish brown clay.
16'0"	16'3"				Start of ore? Soft clay-like
16'3"	18'0"				Deep red clay-like materia
18'0"	19'0"				Some white streaks.

Remarks:

Ore horizon apparently eroded by drainage to W. of road. Hole abandoned when bottom of hole lower than bottom of ore should be.

See summary sheet for analysis.

Hole No. 41

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Nelson
Project

Hole No. 42 Location 100 ± S. of road between Holes 24 and 25.

Sec. ____ T. ____ R. ____ County Washington

Coord. ____

Elev. collar 1350 ±

Depth to top of bed ____

Elev. of top of bed ____

Thickness of bed ____

Elev. water table ____

Depth of hole 22

Cumulative depth ____

Bottomed in reddish clay-silt

****

Drill used 3"-

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler Beth

Date hole begun 7/25/44

Date hole finished " " "

Shifts actually drilled ____

Diam. casing ____ Diam. shoe ____

Type of bit:

____ from ____ to ____

____ from ____ to ____

____ from ____ to ____

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	22				Brown gray silt turning redder with depth

Remarks:

Hole lies 240 ft. W. of Hole 24 and 120 ft. due S. of ℄ of County road. Hole abandoned at 22 when possible ore horizon passed.

Hole No. 42

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

~~Hendrickson~~
Project

Hole No. 1 Location ~~2 1000 ft. S. of house; 7 ft. below outcrop in road.~~

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 600 N. - 4290 E.

Elev. collar 1253.6

Depth to top of bed

Elev. of top of bed 1250.6

Thickness of bed 8

Elev. water table

Depth of hole 13

Cumulative depth 13

Bottomed in ~~reddish brown clay~~

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/12/44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	9				~~Top soil~~
9	11				~~Iron (sample No. 1)~~
11	13				~~Reddish brown clay~~

Remarks:

P-2320 (Sample No. 1)

SiO_2	6.92
Fe	31.22
Al_2O_3	32.52

Hole No. 1

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 2 Location ± 1000 ft. W. of house; 25 ft. below outcrop in road.

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 630 N. - 4250 E.

Elev. collar 1242

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 19 ft.

Cumulative depth 32 "

Bottomed in dark gray clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/12/44

Date hole finished

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	4				Top soil
4	12				Reddish brown clay
12	19				Dark gray clay streaked with red

Remarks:

Hole 2 below iron bed.

Hole No. 2

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 3 Location ± 1000 ft W. of house; 8 ft. above outcrop in road.

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 630 N. - 4350 E.

Elev. collar 1268.1

Depth to top of bed 8

Elev. of top of bed 1260.1

Thickness of bed

Elev. water table

Depth of hole 9 ft.

Cumulative depth 41

Bottomed in iron

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/12/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	4				Top soil
4	8				Light brown clay
8	9				Iron (sample no. 1)

Remarks:

(Sample no.1)

SiO_2 6.92

Fe 31.22

Al_2O_3 32.52

Thickness of iron 17.5 ft.
Elevation 1260.1 - Elev. 1242.6
(bottom of hole No.
Apparently sample no.1 includes ore
from holes 1 and 3.

Hole No. 3

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 4 Location ± 300 ft. E. of H. house

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 940 N. - 5410 E.

Elev. collar 1288.7

Depth to top of bed 13 ft.

Elev. of top of bed 1274 ft.

Thickness of bed 7

Elev. water table 18 in.

Depth of hole 21

Cumulative depth 62

Bottomed in Reddish brown clay

Drill used ********** Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/13/44

Date hole finished 4/14/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	5				Top soil
5	13				Light brown clay
13	16				Iron (hard)
16	20				Iron (mixed with clay)
20	21				Dark grey clay in red str

Remarks:

P-2321 (Sample no. 2)

SiO_2	28.45
Fe	16.16
Al_2O_3	29.44

Hole No. 4

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 5 Location ± 400 ft. N. of Grange Hall

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2220 N. - 6110 E.

Elev. collar 1349.4

Depth to top of bed 5 ft.

Elev. of top of bed 1337 ?

Thickness of bed 8 ft.

Elev. water table 18 ft.

Depth of hole 16 ft.

Cumulative depth 78

Bottomed in reddish brown clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/14/44

Date hole finished 4/14/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	5				Light brown clay
5	13				Iron (sample No. ____)
13	16				Reddish brown clay with dark streaks.

Remarks: Cleaver says that they moved up to Hole 6 as they did not get entire thickness of iron bed at Hole 5. Iron from Holes 5 and 6 mixed to give composite sample with following analysis: (W.D.L.)

P-2322 (Sample No. 3)

SiO_2	13.38
Fe	24.24
Al_2O_3	29.28

Hole No. 5

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 6 Location ± 400 ft. W. of Grange Hall

Sec. ____ T. ____ R. ____ County Washington

Coord. 2210 N. - 6155 E.

Elev. collar 1953.4

Depth to top of bed 11

Elev. of top of bed 1945 ?

Thickness of bed 6' ± 8' in hole no. 5 - 14'

Elev. water table ____

Depth of hole 17

Cumulative depth 95

Bottomed in Iron

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler ____

Date hole begun 4/15/44

Date hole finished " " "

Shifts actually drilled ____

Diam. casing ____ Diam. shoe ____

Type of bit:

____ from ____ to ____

____ from ____ to ____

____ from ____ to ____

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	4				Top soil
4	11				Light brown clay
11	17				Iron

Remarks: Cleaver says they moved to Hole 6 from Hole 5 to get full section as represented at Hole 6. Iron from Holes 5 and 6 mixed to form composite sample which gave the following analysis: (W.D.L.)

P-2320 (Sample No. 3)

SiO_2	13.38
Fe	24.24
Al_2O_3	29.28

Hole No. 6

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 6A - REDRILLED Location W. of Grange Hall

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2190 N. - 6120 E.

Elev. collar 1352

Depth to top of bed 10

Elev. of top of bed 1342

Thickness of bed 15

Elev. water table

Depth of hole 25

Cumulative depth 439

Bottomed in red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5-22-44

Date hole finished 5-22-44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	5				Top soil
5	10				Light brown clay
10	12				Iron mixed with red clay
12	20				Oölitic iron
20	21				Magnetic and granular mtrl.
21	25				Red clay

Remarks:

Average analysis:

SiO_2	8.41
Fe	25.22
Al_2O_3	31.83

Sample Nos.

6-A-1	10' - 12'	6-A-5	17' - 19'
6-A-2	12' - 14'	6-A-6	19' - 20'
6-A-3	14' - 15'	6-A-7	20' - 21'
6-A-4	15' - 17'	6-A-8	21' - 25'

Hole No. 6A

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson

Project

Hole No. 7 Location ± 660ft. N. of road & 400ft. W. of turn.

Sec. 6 T. 2N. R. 2W. County Washington

Coord. 1710 N. - 3780 E.

Elev. collar 1300.5

Depth to top of bed 7

Elev. of top of bed 1293

Thickness of bed 14 ft.

Elev. water table

Depth of hole 22

Cumulative depth 117

Bottomed in hard grey clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/15/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	7				Light brown clay
7	12				Iron mixed with red clay
12	17				Hard oölitic iron
17	21				Hard iron (not oölitic)
21	22				Hard dark grey clay

Remarks:

P-2323 (Sample No. 4)

SiO_2 8.30

Fe 23.80

Al_2O_3 33.12

Hole No. 7

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson

Project

Hole No. 8 Location ± 1000 ft. W. of Hole No. 7

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1990 N. - 2915 E.

Elev. collar 1286.2

Depth to top of bed 4

Elev. of top of bed 1282.2

Thickness of bed 13

Elev. water table

Depth of hole 18

Cumulative depth 135

Bottomed in dark grey clay.

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/19/44

Date hole finished " " "

Shifts actually drilled

Diam. casing ____ Diam. shoe ____

Type of bit:

____ from ____ to ____

____ from ____ to ____

____ from ____ to ____

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	4				Light brown clay
4	7				Oölitic iron
7	17				Iron (not oölitic)
17	18				Dark grey clay with streak of red

Remarks:

P-2324 (Sample No. 5)

SiO_2	7.26
Fe	23.08
Al_2O_3	35.34

Hole No. 8

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 9 Location 300 ft. W. of hole no. 8

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2130 N. - 2670 E.

Elev. collar 1278.2

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 16

Cumulative depth 151

Bottomed in light brown clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/24/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	7				Light brown clay
7	10				Red clay
10	16				Light brown clay

Remarks:

No sample. No iron.

Hole No. 9

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 10 Location

Sec. T. R. County Washington

Coord. 980 N. - 6120 E.

Elev. collar 1290 ft.

Depth to top of bed 9 ft.

Elev. of top of bed 1281

Thickness of bed 3 ft.

Elev. water table

Depth of hole 13 ft.

Cumulative depth 164

Bottomed in dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 4/24/44

Date hole finished " " "

Shifts actually drilled

Diam.casing Diam.shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	9				Light grey clay
9	9'8"				" Oolitic iron
9'8"	12'				Iron mixed with red clay
12'	13'				Dark grey clay

Remarks:

P-2325 (Sample No. 6)

SiO_2	40.42
Fe	12.45
Al_2O_3	29.54

Hole No. 10

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 11 Location N. of H. house

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1500 N. - 5200 E.

Elev. collar 1290

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 10 ft

Cumulative depth 174

Bottomed in brown clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/2/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	5				Top soil
5	10				Light brown clay

Remarks:

Iron apparently eroded out.

Hole No. 11

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 12 Location N. of H. house.

Sec. _____ T. _____ R. _____ County _____

Coord. 1400 N. - 5200 E.

Elev. collar 1300 ft.

Depth to top of bed 9 ft.

Elev. of top of bed 1291 ft.

Thickness of bed 12 ft.

Elev. water table _____

Depth of hole 22 ft.

Cumulative depth 196

Bottomed in dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler _____

Date hole begun 5/2/44

Date hole finished " " "

Shifts actually drilled _____

Diam. casing _____ Diam. shoe _____

Type of bit:

_____ from _____ to _____

_____ from _____ to _____

_____ from _____ to _____

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	9				Light brown clay
9	16				Hard oölitic iron
16	21				Iron mixed with clay & feld
21	22				Dark grey clay with streaks red

Remarks:

P-2326 (Sample No. 7)

SiO_2 12.52

Fe 27.67

Al_2O_3 27.80

Hole No. 12

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson

Project

Hole No. 13 Location On railroad grade at end of trestle

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2600 N. - 5200 E.

Elev. collar 1298

Depth to top of bed 5

Elev. of top of bed

Thickness of bed trace

Elev. water table

Depth of hole 16

Cumulative depth 212

Bottomed in dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/2/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	5				Light brown clay (red stre
5	16				Light brown clay grading down to dark grey clay with red streaks and spot of dec. feldspar.

Remarks:

P-2327 (Sample No. 8)

SiO_2 27.66

Fe 17.87

Al_2O_3 28.12

Hole No. 13

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 14 Location N. of H. house

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2200 N. - 5200 E.

Elev. collar 1317

Depth to top of bed 14

Elev. of top of bed 1303

Thickness of bed 9

Elev. water table

Depth of hole 24

Cumulative depth 236

Bottomed in dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/2/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	3				Yellow clay
3	14				Red clay
14	18				Hard oölitic iron
18	23				Iron (not oölitic)
23	24				Dark clay with red streaks

Remarks:

P-2328 (Sample No. 9)

SiO_2	8.90
Fe	35.42
Al_2O_3	21.56

Hole No. 14

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 16 Location

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1925 N. - 3780 E.

Elev. collar 1303

Depth to top of bed 8

Elev. of top of bed 1295

Thickness of bed 13

Elev. water table

Depth of hole 22

Cumulative depth 280

Bottomed in dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/3/44

Date hole finished 5/4/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	8				Light brown clay
8	12				Hard oölitic iron
12	21				Very hard red iron
21	22				Dark grey clay with spots dec. feldspar.

Remarks:

P-2335 (Sample No. 11) 8' - 15'

SiO_2 6.50
Fe 26.65
Al_2O_3 33.28

P-2336 (Sample No. 11A) 15' - 21'

SiO_2 32.88
Fe 12.16
Al_2O_3 32.16

Hole No. 16

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 17 Location

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1000 N. - 6400 E.

Elev. collar 1296

Depth to top of bed 16

Elev. of top of bed 1280

Thickness of bed 6 in.

Elev. water table

Depth of hole 22

Cumulative depth 302

Bottomed in red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/5/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	16				Light brown clay
16	16'6"				Hard iron
16'6"	22				Red clay

Remarks:

No sample taken.

Iron apparently removed by erosion.

Water level 6 ft.

Hole No. 17

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 18 Location N. of Grange Hall

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2600 N. - 6400 E.

Elev. collar 1340

Depth to top of bed 9

Elev. of top of bed 1331

Thickness of bed 6 ft.

Elev. water table

Depth of hole 17

Cumulative depth 319

Bottomed in dark rock

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/5/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	9				Light brown clay
9	15				Oölitic iron
15	16				Fractured hard dark rock w metallic luster
16	17				Dark granular basic rock resembling basalt

Remarks:

P-2337 (Sample No. 12)

SiO_2 13.38

Fe 24.99

Al_2O_3 24.64

Hole No. 18

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 19 Location South end of project

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 200 N. - 5400 E.

Elev. collar 1278

Depth to top of bed 7

Elev. of top of bed 1271

Thickness of bed 13

Elev. water table

Depth of hole 21

Cumulative depth 340

Bottomed in dark grey clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/8/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	7				Light brown clay
7	12				Iron mixed with red clay
12	20				Hard oölitic iron
20	21				Dark grey clay with red streaks

Remarks:

P-2346 (Sample No. 13)

SiO_2	10.78
Fe	23.13
Al_2O_3	35.52

Hole No. 19

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 20 Location On hill between Grange Hall & Hendrickson house.

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1650 N. - 6100 E.

Elev. collar 1348

Depth to top of bed 29

Elev. of top of bed 1319

Thickness of bed 11 +

Elev. water table

Depth of hole 41

Cumulative depth 381

Bottomed in red clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/8/44

Date hole finished 5/9/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	26				Light brown clay
26	29				Red sticky clay
29	41				Soft oölitic iron mixed with red clay

Remarks:

Hole drilled near head of water course. Iron seems to be softened and altered by water. No sample taken.

Hole No. 20

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 21 Location On E. side of highway S. of Grange Hall.

Sec. 5 T. 2 N. R. 2 W. County Washington

Coord. 1200 N. - 6525 E.

Elev. collar 1314

Depth to top of bed 14

Elev. of top of bed 1300

Thickness of bed 18

Elev. water table

Depth of hole 33

Cumulative depth 414

Bottomed in Dark clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler

Date hole begun 5/10/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	14				Light brown clay
14	32				Red clay with decomposed oolites of iron
32	33				Dark reddish clay

Remarks: Iron fairly soft. Hole had much water.

P-2347 (Sample No. 14)

SiO_2	56.16
Fe	6.64
Al_2O_3	22.08

Hole No. 21

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson Extension
Project

Hole No. 26 Location West extension

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2200 N. - 1900 E.

Elev. collar ± 1300

Depth to top of bed 5

Elev. of top of bed 1287 ±

Thickness of bed 13

Elev. water table

Depth of hole 27

Cumulative depth 562

Bottomed in brown clay

****

Drill used Hand auger

Number men 2

Engr. in charge Cleaver

Mtrl. classfd. by Lowry

Sampler

Date hole begun 5/29/44

Date hole finished 6/6/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Tan soil
2	5				Light brown clay
5	13				Reddish clay with scattered oölites
13	22				Hard oölitic iron
22	26				Reddish brown clay with scattered oölites
26	27				Mottled brown and red clay

Remarks:

This hole may be bottomed in ore.

			SiO_2	Fe	Al_2O_3
Sample No.	18-A	13-19	6.70	24.18	34.80
	18-B	19-22	8.16	25.07	34.60
	18-C	22-26	6.40	21.27	40.80

Hole No. 26

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson Extension
Project

Hole No. 27 Location 400 ft. N. 40° W. from Hole No. 26.

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2500 N. - 1630 E.

Elev. collar + 1290

Depth to top of bed 16

Elev. of top of bed 1274

Thickness of bed 9

Elev. water table

Depth of hole 25

Cumulative depth 587

Bottomed in red clay

****

Drill used Hand auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole begun 6/6/44

Date hole finished 6/7/44

Shifts actually drilled

Diam.casing Diam.shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Top soil
3	16				Light brown clay
16	25				Red clay with scattered oölites

Remarks:

Silica too high

Sample No. 19 16' - 19'

SiO_2 55.96

Fe 6.38

Al_2O_3 26.00

Hole No. 27

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson Extension

Project

Hole No. 28 Location 150 ft. W. of Hole No. 27

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2500 N. - 1490 E.

Elev. collar ± 1263

Depth to top of bed 9

Elev. of top of bed 1254

Thickness of bed 2

Elev. water table

Depth of hole 13

Cumulative depth 600

Bottomed in light brown clay

****

Drill used Hand auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole begun 6/7/44

Date hole finished " " "

Shifts actually drilled

Diam. casing ____ Diam. shoe ____

Type of bit:

____ from ____ to ____

____ from ____ to ____

____ from ____ to ____

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	1				Top soil
1	9				Red clay
9	11				Oolitic iron
11	13				Light brown clay with spots of decomposed feldspar

Remarks:

Sample No. 20 9'-11'

SiO_2	18.36
Fe	28.88
Al_2O_3	24.96

Hole No. 28

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Parmele (Hendrickson - South)
Project

Hole No. 29 Location On County road 27 miles E. of highway junction on Parmele property

Sec. 8 T. 2 N. R. R. 2 W. County Washington

Coord.

Elev. collar ± 1240 ft. (RSM-WSL)

Depth to top of bed 4

Elev. of top of bed ± 1240 ft.

Thickness of bed 10

Elev. water table

Depth of hole 14

Cumulative depth 614

Bottomed in red clay

****

Drill used Hand auger

Number men 3

Engr. in charge Cleaver

Mtrl. classfd. by Swanson

Sampler Mason

Date hole begun 6/7/44

Date hole finished " " "

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2				Top soil
2	4				Light brown clay
4	8				Hard oölitic iron
8	14				Hard red clay with a few white specks

Remarks:

			SiO_2	Fe	Al_2O_3
Sample No. 21-A	4 ft.	- 6 ft.	14.74	18.92	36.40
21-B	6	8	7.74	26.64	34.08
21-C	8	14	8.52	25.18	30.88

Hole No. 29

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 37 Location On fence line at N. end clover field N. of house

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2000 ± N. - 5500 ± E.

Elev. collar 1335 ±

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. water table

Depth of hole 14

Cumulative depth

Bottomed in loam

****

Drill used 2-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler

Date hole begun 7/6/44

Date hole finished " " "

Shifts actually drilled ½

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	7				Variegated brown grey silty loam, clay
7	14				Brown silty loam

Remarks:

Hole abandoned at 14 ft. when indications of ore failed to appear

Hole No. 37

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 38 Location .

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1900 N. ± - 5500 E. ±

Elev. collar 1325 ±

Depth to top of bed 18ft.-6in.

Elev. of top of bed 1306'-6

Thickness of bed 3'7" +

Elev. water table

Depth of hole 22 ft.

Cumulative depth

Bottomed in ore

****

Drill used 2-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler "

Date hole begun 7/6/44

Date hole finished 7/7/44

Shifts actually drilled

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	3				Organically stained
3	4				Yellow-brown loam silty clay
4	8				Brown grey silty loam
8'	11'				Occasional black shots. Silt redder
11	13				More shots in silt
13	14				Red clay start moisture sample
14	15				Red clay
15'0"	15'1"				Hard oölites(?)
15'1"	17'0"				Red clay
17'0"	18'6"				Hard oölites
18'6"	19'0"				Hard ore
19'0"	19'6"				" "
19'6"	20'6"				" "
20'6"	21'0"				Dark red brown ore
21'0"	21'6"				" " " "

Remarks:

LOG CONTINUED ON NEXT SHEET

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 38(Cont.) Location Continuation of Hole 38.

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1900 N. ± - 5500E. ±

Elev. collar 1325 ±

Depth to top of bed 18'6"

Elev. of top of bed 1308

Thickness of bed 3'7" +

Elev. water table

Depth of hole 22 ft.

Cumulative depth

Bottomed in ore

****

Drill used 2-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler "

Date hole begun 7/6/44

Date hole finished 7/7/44

Shifts actually drilled 1

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
21'6"	22'0"				Very dark red brown ore
22'0"	22'1"				Ore darker than sec. above

Remarks:

No analysis other than moisture made. See summary sheet.

Hole abandoned without bottoming ore due to extreme hardness of ground.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 39 Location On slope dipping to northwest 10 ft. below top

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 2330 N. ± - 3350 E. ±

Elev. collar 1300 ±

Depth to top of bed ?

Elev. of top of bed ?

Thickness of bed ?

Elev. water table

Depth of hole 19

Cumulative depth

Bottomed in yellow brown clay

****

Drill used 2-in auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler

Date hole begun 7/10/44

Date hole finished " " "

Shifts actually drilled ½

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Depth Cased to	Length of Core	Sample No.	Description
0	9				Brown silty top soil
9	17'6"				Reddish clay silt
17'6"	18'0"				Reddish clay with numerous shot.
18	19				Dark mottled yellow-brown black clay

Remarks: Hole abandoned when sample resembled material underlying iron in other holes.

P-2509 (17'6" - 18'0")

SiO_2	28.35 %
Fe	18.45
Al_2O_3	27.72
H_2O	29.5

Hole No. 39

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 40 Location On top of flat knoll

Sec. ____ T. ____ R. ____ County Washington

Coord. 2175 ± N. - 3450 ± E.

Elev. collar 1311 ±

Depth to top of bed 13

Elev. of top of bed 1298 ±

Thickness of bed ____

Elev. water table ____

Depth of hole 15'1"

Cumulative depth ____

Bottomed in ore

****

Drill used 2-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler ____

Date hole begun 7/10/44

Date hole finished " " "

Shifts actually drilled ½

Diam. casing ____ Diam. shoe ____

Type of bit:

____ from ____ to ____

____ from ____ to ____

____ from ____ to ____

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	5'6"				Light brown silt Occasional shot
5'6"	9'0"				Material gradually getting redder
9'0"	11'0"				Reddish material with occasional shots.
11'0"	13'0"				Reddish material with occasional shots.
13'0"	14'0"				Hard reddish brown ore
14'0"	15'0"				14½ ft. very hard ore
15'0"	15'1"				Darker brown color; very hard ore

Remarks: Abandoned due to hour and losing sample out of pod when bringing out due to dryness of ore. Still hard at bottom. Only analysis for H_2O made. See summary sheets.

Hole No. 40

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 43 (cut) Location

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1700 N. - 3800 E.

Elev. collar 1269 ~~1269~~

Depth to top of bed 0'

Elev. of top of bed 1271 ~~1271~~

Thickness of bed

Elev. water table

Depth of hole 21'6"

Cumulative depth

Bottomed in brown earth

****

Drill used 2-in. auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler Both

Date hole begun 8/23/44

Date hole finished " " "

Shifts actually drilled 3/4

Diam. casing Diam. shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
0	2		x 2'	P-2623 A	Varicolored earthy 2' channel sample
Hole begun at 2	3		1'	P-2624 B	Very dark, somewhat oölitic & hard; softer at bottom
3	4		1'	P-2625 C	Dark, soft, streaked with brown & black; more clay-li
4	5		x 1'	P-2626 D	Soft, darker, same clay. Apparent residual texture.
5	6		1'	P-2627 E	More earthy; firmer, drier
6	7		1'	P-2628 F	Dark brown; earthy
7	8		x 1'	P-2629 G	No apparent change
8	9		1'	P-2630 H	Light-colored specks decom feldspar, mottled hard pel
9	10		1'	P-2631 I	buff str No apparent change
10	11		1'	P-2632 J	Somewhat lighter colored
11	12		x 1'	P-2633 K	Choc. brown with nearly white specks
12	13		x 1'	P-2634 L	Varicolored; brown with bl clay(?) Wetter
13	14		1'	P-2635 M	Lt.brown-somewhat varicolo few light specks; clayey;
14	15		x 1'	P-2636 N	g Getting wetter
15	16		x 1'	P-2637 O	Very wet; lt.brown, changi abruptly to blue with yell streaks. Basaltic(?) fragments.

Remarks:

SEE NEXT PAGE

Collar of hole in floor of cut. Channel samples of ____ft. of overlying ore. Collar 12 ft. in from portal of cut.

Hole No. 43

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Hendrickson
Project

Hole No. 43 (cut) (cont.) Location

Sec. 6 T. 2 N. R. 2 W. County Washington

Coord. 1700 N. - 3800 E.

Elev. collar ~~1269~~ 1271

Depth to top of bed 0'

Elev. of top of bed ~~1269~~ 1271

Thickness of bed

Elev. water table

Depth of hole 21'6"

Cumulative depth

Bottomed in brown earth (tan earthy material)

****

Drill used 2-in.auger

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Lowry

Sampler Both

Date hole begun 8/23/44

Date hole finished " " "

Shifts actually drilled 3/4

Diam.casing Diam.shoe

Type of bit:

from to

from to

from to

Depth From	Depth To	Cased to	Length of Core	Sample No.	Description
16	17		1'	P-2638 P	Mottled; mostly blue; green, brown, white specks.
17	18		1'	P-2639 Q	Mostly bluish gray; darker, wet.
18	19		1'	P-2640 R	Mottled; blue green; dark brown "plastic"
19	20		1'	P-2641 S	Mottled; purple-brown with white specks. (Basalt textur
20	21		1'	P-2642 T	Darker gritty; variegated yellow specks.
21	22		1'	P-2643 U	Dark purple with some red specks
22	23		1'	P-2644 V	Dark purplish-black. More uniform comp. Dryer
23	23'6"		6"	P-2645 W	Tan, Dry, fine-grained earthy material.

Remarks:

Hole bottomed when firm material at bottom slowed rate of advance. Section to be sampled believed to be complete with this depth. See summary sheets for results.

Hole No. 43 (Cont.)

SENT 4-29-58

DR. HIRSCH LOEVENSTEIN
HARVEY ALUMINUM CO OF UNITED STATES
NORTH CHERRY AVE
SALEM, OREGON

—

CHIEF GEOLOGIST
KAISER ALUMINUM CO
KAISER BUILDING
1924 BROADWAY
OAKLAND 12 CALIF.

—

JOHN H. MOSES, CHIEF GEOLOGIST
REYNOLDS METALS CO.
P.O. BOX 416
BAUXITE, ARK

—

MR LAURENCE LICHTFIELD JR
ALUMINUM CO. OF AMERICA
PRES. MINING CO
1501 ALCOA BLDG
PITTSG 19 PENN

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 1 Location 40' south of Rosedale Friends Church

NE SE of sec. 28 T. 8 S R. 3W County Marion

Coord. N. E.

Elev. collar 750 (map)

Depth to top of bed 2' ?

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 12

Elev. water table -

Bottomed in weathered basalt

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-15-53

Date hole finished 9-15-53

Shifts actually drilled 1/2

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - -	- - -	Soil.
2	4	2'	1	Red-brown-dry-earthy-few lumps.
4	6	2	2	Red-brown-slightly damp-earthy few lumps.
6	8	2	3	Red-brown-black spots-white spots gritty-damp-slightly plastic
8	10	2	4	Red-brown-white spots-yellow spot red spots-black spots-banded-clay plastic-damp.
10	12	2	6	Red-brown-white spots-yellow spot red spots-black spots-orange spot mottled-silty-clayey-plastic-damp

Remarks Collar at edge of field about 40' from southwest corner of church. From 2-8' hole required coal auger to loosen soil.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 2 Location Top of knoll west of Tex Perry house 500' north of county road.

SW NW of sec. 29 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 860' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-15-53

Date hole finished 9-18-53

Shifts actually drilled 6½ hrs.

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - -	- - -	Soil.
2	4	2'	7	Brown-red spots-~~black spots~~ earthy-gritt dry.
4	4'-6"	0'-6"	8	Ditto - very hard drilling.
4'-6"	6'-6"	2	10	Red-brown-earthy-gritty-damp. ~~Ver~~ slightly hard drilling.
6'-6"	8'-6"	2	11	Red-brown-earthy-clayey-gritty-da Hard drilling.
8'-6"	10'-6"	2	12	Red-brown-white spots-yellow-spot red spots-black spots-banded-clay gritty-damp. Easy drilling.
10'-6"	12'-6"	2	13	Brown-black spots-brown spots-mot tled-clayey-gritty-damp. Hard dri
12'-6"	14'-6"	2	14	Brown-red spots-black spots-brown spots-mottled-clayey-plastic-very damp.
14'-6"	16'-6"	2	18	Brown-varicolored-red spots-black spots-brown spots-orange spots- clayey-damp.
16'-6"	18'-6"	2	19	Brown-varicolored-red spots- blac spots-brown spots-orange spots- white spots-clayey-plastic-slight damp.
18'-6"	20'-6"	2	20	Grey-brown-few red spots-few blac spots-fewbrown spots-few orange spots-silty-slightly plastic- slightly damp.
20'-6"	21'-0"	0'-6"	21	Grey-brown-~~xxxy~~ few red,black,bro orange spots-few varicolored lump firm-slightly damp.

Remarks

Hole had to have coal auger and chopping bit from 0-8-6" and from 10'-6" - 13'-6". Easy drillin 13'-6" - 19'-6". Increasingly hard 19'-6" - 20'-6".

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 3 Location Top of Prospect Hill - 300' west of tower.

NE NE of sec. 25 T. 8 S R. 4 W County Marion

Coord. N. E.

Elev. collar 1125'(map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in Weathered basalt

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-15-53

Date hole finished 9-16-53

Shifts actually drilled 2 hrs.

From	To	Thickness of sample	Sample No.	Description
0'	2'	- - -	- - -	Soil.
2	3	1	9	Brown-gritty-dry-small gibbsite nodules.
3	5	2	15	Red-brown-lumps-earthy-dry-gibbsi nodules.
5	7'-6"	2'-6"	16	Brown-red spots-black spots-brown spots-blue spots-mottled-earthy-clayey-damp. Easy drilling.
7'-6"	10	2'-6"	17	Brown-red spots-black spots- brow spots-blue spots-mottled-earthy-clayey-damp. Easy drilling.

Remarks

WL-24b

Hole No. 3

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 4 Location Hill 828, 30' west of N-S fence 150± north of brush lot.

SW¼ of sec. 36 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 828' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-18-53

Date hole finished 9-18-53

Shifts actually drilled 5 hrs.

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - -	- - -	Soil with gibbsite boulders.
2	4	2'	22	Red-brown-gibbsite lumps-dry-firm
4	6	2	23	Light red-brown-earthy-firm-dry.
6	8	2	24	Light red-brown-white spots-earth slightly firm-dry.
8	10	2	25	Yellow-brown-few gibbsite-lumps- slightly damp-slightly firm.
10	12	2	26	Yellow-brown-white spots-red spot black spots-earthy-slightly firm- slightly damp.
12	14	2	27	Yellow-brown-white spots-yellow s red spots-black spots-clayey-few gibbsite-lumps-slightly damp.
14	16	2	28	Yellow-brown-red spots-black spot white spots-earthy-few gibbsite- lumps-damp.
16	18	2	29	Dark yellow-brown-white spots-bla spots-earthy-firm-slightly damp.
18	20	2	30	Red-brown-white spots-yellow spot black spots-clayey-soft-very damp

Remarks

WL-24b

Hole No. 4

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 5 Location Top of plank hill 10' north of fence

NE NW of sec. 18 T. 8 S R. 3W County Marion

Coord. N. E.

Elev. collar 875'(map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-21-53

Date hole finished 9-21-53

Shifts actually drilled 3 hrs.

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - - -	- - -	Soil with gibbsite lumps.
2'	4'	2'	31	Yellow-brown-earthy-gibbsite lump dry.
4'	6'	2'	32	Yellow-brown-white spots-yellow spots-earthy-very firm-dry.
6'	8'	2'	33	Yellow-brown-white spots-yellow spots-red spots-black spots-earth firm-dry.
8'	10'	2'	34	Yellow-brown-white spots-red spot earthy-firm-slightly damp.
10'	11'-8"	1'-8"	35	Red-brown-white spots-yellow spot basalt lumps?-firm-slightly damp.

Remarks Hole drilled rather hard nearly all the way. Appearance of dark gray (basalt?) chips at 11'-0" seems to indicate base of section.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE

Project

Hole No. 6 Location Hudkins Hill 5' west of fence between prune orchard and wheat field.

Center of sec. 18 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 860' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-22-53

Date hole finished 9-22-53

Shifts actually drilled 2½ hrs.

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - - -	- - -	Soil.
2	4	2'	36	Yellow-brown-white spots-yellow-spots-red spots-black spots-earth soft-dry.
4	6	2	37	Light yellow-brown-many white spo yellow spots-few red spots-vari-colored-earthy-slightly firm-dry.
6	8	2	38	Grey-yellow-brown-many white spot yellow spots-red spots-varicolore earthy-very firm-dry.
8	10	2	39	Yellow-brown-lumps-earthy-very fi slightly damp.
10	12	2	40	Grey-brown(10'-11') yellow-brown-white spots-yellow spots-red spot earthy-slightly soft-damp-lumps.
12	14	2	41	Dark yellow-brown-white spots-yellow spots-red spots-black spot earthy-firm-lumps-damp.

Remarks

WL-24b

Hole No. 6

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE

Project

Hole No. 7 Location 50' north of chicken house on MacDougal(?) ranch.

NE SW of sec. 19 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 960' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-22-53

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - - -	- - -	Soil and gibbsite lumps.
2	4	2'	42	Red-brown gibbsite lumps-hard-dry.
4	5'-6"	1'-6"	43	Red-brown-yellow spots-earthy-ver hard-gibbsite lumps.

Remarks Very hard drilling 2' to 5'-6". Hole abandoned at 5'-6" due to extreme hardness of ground.

WL-24b

Hole No. 7

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 7 Location (Continued)

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 20

Elev. water table - - -

Bottomed in Pink clay

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler "

Date hole began

Date hole finished 11/4/53

Shifts actually drilled 2½ hrs.

From	To	Thickness of sample	Sample No.	Description
		(continued)		
5'-6"	6'-0"	6"	56?	Red-brown-very hard-dry-gibbsite lumps.
6'-0"	8'-0"	2'	57	Dark red-brown-firm-dry-gibbsite lumps?.
8'-0"	10'-0"	2'	58	Red-Brown-slightly firm-slightly dry-gibbsite or basalt lumps.
10'-0"	12'-0"	2'	59	Slightly red-brown-slightly firm damp-varicolored-clayey.
12'-0"	14'-0"	2'	60	Dark red-brown-slightly firm-dam very varicolored-clayey-banded.
14'-0"	16'-0"	2'	61	Dark red-brown-soft-damp-varicol banded-clayey.
16'-0"	18'-0"	2'	62	Red-brown-soft-damp-plastic-vari colored-banded.
18'-0"	20'-0"	2'	63	Light red-varicolored-banded-sof damp-clayey-plastic.
5'-6"-20'				

Remarks Occasional hard layers encountered about 1 foot apart from 8'-0" to 18'-0".

Light pink zone 18'-2" - 19'-8".

Hole abandoned at 20' due to difficulty in handling string of pipe.

WL-24b

Hole No. 7 cont.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 8 Location Top of hill (Hayfield)

NENW of sec. 33 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 865' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 10

Elev. water table

Bottomed in Weathered basalt?

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-23-53

Date hole finished 9-23-53

Shifts actually drilled 2½ hrs.

From	To	Thickness of sample	Sample No.	Description
0'	2'	- - - -	- - -	Soil with gibbsite lumps.
2	4	2'	44	Red-brown-yellow spots-earthy-har dry.
4	6	2	45	Yellow-brown-yellow spots-red spo black spots-earthy-very firm-dry.
6	8	2	46	Yellow-brown-white spots-yellow s red spots-black spots-earthy-firm-dry
8	10	2	47	Brown-black- white spots-yellow spots-red spots-black spots-blue spots-orange spots-pink spots- clayey-soft-damp.

Remarks Very hard drilling down to 7 feet - increasingly softer to bottom at 10'.

WL-24b

Hole No. 8

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. Cut Location Highway cut S. Commercial and Vista Ave.

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began 9-23-53

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
3'	6'	3	48	Brick red-clayey-hard.
6	9	3	49	Red-brown-yellow spots-red spots-clayey-hard-dry.
9	13	4	50	Olive drab-red-brown-white spots-yellow spots-red spots-black spot orange spots-pink spots-clayey-ha vesicular.

Remarks Top section of dark brown vesicular basalt about 2' thick not sampled. Channel cut.

WL-24b

Hole No. Cut

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 9 Location

of sec. T. R. County Marion

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in Weathered basalt

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-24-53

Date hole finished 9-24-53

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0'	2'	- - - -	- - -	Olive drab soil.
2	4	- - - -	- - -	Olive drab-earthy-hard-dry.

Remarks Hole abandoned at 4' when basalt float discovered in vicinity.

WL-24b

Hole No. 9

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE

Project

Hole No. 10 Location Summit of hill 1029 just south of gate on E-W fence.

NE SW of sec. 18 T. 9 S R. 2 W County Marion

Coord. N. E.

Elev. collar 1029' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-24-53

Date hole finished 9-24-53

Shifts actually drilled 3½ hrs.

From	To	Thickness of sample	Sample No.	Description
0'	2'	- - - -	- - -	Brown soil.
2'	4'	2'	51	Red-brown-red spots-black spots-firm-gibbsite lumps-dry.
4'	6'	2'	52	Red-brown-yellow spots-red spots-black spots-earthy-firm-many gibbsite lumps-slightly damp.
6'	8'	2'	53	Yellow-brown-very many gibbsite lumps-solid-dry.
8'	10'	2'	54	Yellow-brown-varicolored-spotted-earthy-soft-slightly damp.
10'	12'	2'	55	Light yellow-brown-varicolored-spotted-earthy-soft-slightly damp

Remarks Very hard drilling 6'-8' then easy going to bottom at 12'.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE

Project

Hole No. 11 Location Near ¼ cor. secs. 20/29.

of sec. T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 780 (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler "

Date hole began 11/4/53

Date hole finished

Shifts actually drilled 2-3/4 hrs.

From	To	Thickness of sample	Sample No.	Description
0	2'	- - -	- - -	Yellow-brown-earthy.
2'-0"	4'-0"	2'	64	Yellow-brown-earthy-very hard-da
4'-0"	6'-0"	2'	65	Red-brown-very hard-damp.
6'-0"	7'-0"	1'	66	Red-brown-very hard-damp.

Remarks

WL-24b

Hole No. 11

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE

Project

Hole No. 12 Location Near oak tree opposite oat field, house north side of road.

Center NW¼ of sec. 28 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 780 (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 20'

Elev. water table

Bottomed in Olive drab clay

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler "

Date hole began 11/5/53

Date hole finished

Shifts actually drilled 2½ hrs.

From	To	Thickness of sample	Sample No.	Description
0"	2'	- - -	- - -	Soil.
2'-0"	4'-0"	2'	67	Yellow-brown-earthy-firm-dry.
4'-0"	6'-0"	2'	68	Light yellow-brown-earthy-firm-dry-white spots-yellow spots.
6'-0"	8'-0"	2'	69	Light yellow-brown-earthy-slightl firm-dry-white spots-yellow-spots
8'-0"	10'-0"	2'	70	Red-brown-earthy-slightly firm-dr white spots-yellow spots-black sp
10'-0"	12'-0"	2'	71	Red-brown-earthy-slightly firm-dr white spots-yellow spots-black sp
12'-0"	14'-0"	2'	72	Dark red-brown-slightly clayey-fi slightly damp-white spots-yellow spots-black spots.
14'-0"	16'-0"	2'	73	Dark brown-clayey-slightly firm-damp-(grey-white spots).
16'-0"	18'-0"	2'	74	Olive drab-grey-blue-banded-claye damp.
18'-0"	20'-0"	2'		Olive drab-grey-blue-banded-claye very damp.

Remarks Not very hard drilling.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 13 Location Highest point on hill west of farm house.

SW SE of sec. 1 T. 9 S R. 3 W County Marion

Coord. N. E.

Elev. collar 625 (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler "

Date hole began 11/5/53

Date hole finished

Shifts actually drilled 1½ hrs.

From	To	Thickness of sample	Sample No.	Description
0	2'	- - -	- - -	Light yellow soil.
2'-0"	4'-0"	2'	76	Light yellow-earthy-dry-firm.
4'-0"	6'-0"	2'	77	Light yellow-brown-earthy-dry-firm.
6'-0"	8'-0"	2'	78	Light yellow-brown-earthy-dry-firm.
8'-0"	10'-0"	2'	79	Red-brown-earthy-dry-firm.

Remarks

WL-24b

Hole No. 13

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 1 Location 40' south of Rosedale Friends Church

NE SE of sec. 28 T. 8 S R. 3W County Marion

Coord. N. E.

Elev. collar 750 (map)

Depth to top of bed 2' ?

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 12

Elev. water table -

Bottomed in weathered basalt

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-15-53

Date hole finished 9-15-53

Shifts actually drilled 1/2

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - -	- - -	Soil.
2	4	2'	1 X	Red-brown-dry-earthy-few lumps.
4	6	2	2 X	Red-brown-slightly damp-earthy few lumps.
6	8	2	3 X	Red-brown-black spots-white spots gritty-damp-slightly plastic
8	10	2	4 X	Red-brown-white spots-yellow spot red spots-black spots-banded-clay plastic-damp.
10	12	2	6 X	Red-brown-white spots-yellow spot red spots-black spots-orange spot mottled-silty-clayey-plastic-damp

Remarks Collar at edge of field about 40' from southwest corner of church. From 2-8' hole required coal auger to loosen soil.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 2 Location Top of knoll west of Tex Perry house 500' north of county road.

SW NW of sec. 29 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 860' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-15-53

Date hole finished 9-18-53

Shifts actually drilled 6½ hrs.

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - -	- - -	Soil.
2	4	2'	7 X	Brown-red spots-earthy-gritty-dry.
4	4'-6"	0'-6"	8 X	Ditto - very hard drilling.
4'-6"	6'-6"	2	10 X	Red-brown-earthy-gritty-slightly damp. Very hard drilling.
6'-6"	8'-6"	2	11 X	Red-brown-earthy-clayey-gritty-damp. Hard drilling.
8'-6"	10'-6"	2	12 X	Red-brown-white spots-yellow-spots-red spots-black spots-banded-clayey-gritty-damp. Easy drilling.
10'-6"	12'-6"	2	13 X	Brown-black spots-brown spots-mottled-clayey-gritty-damp. Hard drilling.
12'-6"	14'-6"	2	14 X	Brown-red spots-black spots-brown spots-mottled-clayey-plastic-very damp.
14'-6"	16'-6"	2	18 X	Brown-varicolored-red spots-black spots-brown spots-orange spots-clayey-damp.
16'-6"	18'-6"	2	19 X	Brown-varicolored-red spots-black spots-brown spots-orange spots-white spots-clayey-plastic-slightly damp.
18'-6"	20'-6"	2	20 X	Grey-brown-few red spots-few black spots-few brown spots-few orange spots-silty-slightly plastic-slightly damp.
20'-6"	21'-0"	0'-6"	21 X	Grey-brown-few red,black,brown orange spots-few varicolored lumps-firm-slightly damp.

Remarks

Hole had to have coal auger and chopping bit from 0-8-6" and from 10'-6" - 13'-6". Easy drilling 13'-6" - 19'-6". Increasingly hard 19'-6" - 20'-6".

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 3 Location Top of Prospect Hill - 300' west of tower.

NE NE of sec. 25 T. 8 S R. 4 W County Marion

Coord. N. E.

Elev. collar 1125' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in Weathered basalt

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-15-53

Date hole finished 9-16-53

Shifts actually drilled 2 hrs.

From	To	Thickness of sample	Sample No.	Description
0'	2'	- - -	- - -	Soil.
2	3	1	9	Brown-gritty-dry-small gibbsite nodules.
3	5	2	15	Red-brown-lumps-earthy-dry-gibbsi nodules.
5	7'-6"	2'-6"	16 X	Brown-red spots-black spots-brown spots-blue spots-mottled-earthy-clayey-damp. Easy drilling.
7'-6"	10	2'-6"	17	Brown-red spots-black spots- brow spots-blue spots-mottled-earthy-clayey-damp. Easy drilling.

Remarks

WL-24b

Hole No. 3

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 4 Location Hill 828, 30' west of N-S fence 150± north of brush lot.

SW¼ of sec. 36 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 828' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-18-53

Date hole finished 9-18-53

Shifts actually drilled 5 hrs.

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - -	- - -	Soil with gibbsite boulders.
2	4	2'	22	Red-brown-gibbsite lumps-dry-firm
4	6	2	23	Light red-brown-earthy-firm-dry.
6	8	2	24	Light red-brown-white spots-earth slightly firm-dry.
8	10	2	25	Yellow-brown-few gibbsite-lumps-slightly damp-slightly firm.
10	12	2	26	Yellow-brown-white spots-red spot black spots-earthy-slightly firm-slightly damp.
12	14	2	27	Yellow-brown-white spots-yellow s red spots-black spots-clayey-few gibbsite-lumps-slightly damp.
14	16	2	28	Yellow-brown-red spots-black spot white spots-earthy-few gibbsite-lumps-damp.
16	18	2	29	Dark yellow-brown-white spots-bla spots-earthy-firm-slightly damp.
18	20	2	30	Red-brown-white spots-yellow spot black spots-clayey-soft-very damp

Remarks

WL-24b

Hole No. 4

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 5 Location Top of plank hill 10' north of fence

NE NW of sec. 18 T. 8 S R. 3W County Marion

Coord. N. E.

Elev. collar 875'(map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-21-53

Date hole finished 9-21-53

Shifts actually drilled 3 hrs.

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - - -	- - -	Soil with gibbsite lumps.
2'	4'	2'	31	Yellow-brown-earthy-gibbsite lump dry.
4'	6'	2'	32	Yellow-brown-white spots-yellow spots-earthy-very firm-dry.
6'	8'	2'	33	Yellow-brown-white spots-yellow spots-red spots-black spots-earth
				firm-dry.
8'	10'	2'	34	Yellow-brown-white spots-red spot earthy-firm-slightly damp.
10'	11'-8"	1'-8"	35	Red-brown-white spots-yellow spot basalt lumps?-firm-slightly damp.

Remarks Hole drilled rather hard nearly all the way. Appearance of dark gray (basalt?) chips at 11'-0" seems to indicate base of section.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 6 Location Hudkins Hill 5' west of fence between prune orchard and wheat field.

Center of sec. 18 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 860' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-22-53

Date hole finished 9-22-53

Shifts actually drilled 2½ hrs.

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - - -	- - -	Soil.
2	4	2'	36	Yellow-brown-white spots-yellow-spots-red spots-black spots-earth soft-dry.
4	6	2	37	Light yellow-brown-many white spo yellow spots-few red spots-vari-colored-earthy-slightly firm-dry.
6	8	2	38	Grey-yellow-brown-many white spot yellow spots-red spots-varicolore earthy-very firm-dry.
8	10	2	39	Yellow-brown-lumps-earthy-very fi slightly damp.
10	12	2	40	Grey-brown(10'-11') yellow-brown-white spots-yellow spots-red spot earthy-slightly soft-damp-lumps.
12	14	2	41	Dark yellow-brown-white spots-yellow spots-red spots-black spot earthy-firm-lumps-damp.

Remarks

WL-24b

Hole No. 6

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE

Project

Hole No. 7 Location 50' north of chicken house on MacDougal(?) ranch.

NE SW of sec. 19 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 960' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-22-53

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description Key No. 3
0'	2'	- - - -	- - -	Soil and gibbsite lumps.
2	4	2'	42 ✓	Red-brown gibbsite lumps-hard-dry.
4	5'-6"	1'-6"	43 ✓	Red-brown-yellow spots-earthy-ver hard-gibbsite lumps.

Remarks Very hard drilling 2' to 5'-6". Hole abandoned at 5'-6" due to extreme hardness of ground.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 7 Location (Continued)

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 20

Elev. water table - - -

Bottomed in Pink clay

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler "

Date hole began

Date hole finished 11/4/53

Shifts actually drilled 2½ hrs.

From	To	Thickness of sample	Sample No.	Description
		(continued)		
5'-6"	6'-0"	6"	56?	Red-brown-very hard-dry-gibbsite lumps.
6'-0"	8'-0"	2'	57	Dark red-brown-firm-dry-gibbsite lumps?.
8'-0"	10'-0"	2'	58	Red-Brown-slightly firm-slightly dry-gibbsite or basalt lumps.
10'-0"	12'-0"	2'	59	Slightly red-brown-slightly firm damp-varicolored-clayey.
12'-0"	14'-0"	2'	60	Dark red-brown-slightly firm-dam very varicolored-clayey-banded.
14'-0"	16'-0"	2'	61	Dark red-brown-soft-damp-varicol banded-clayey.
16'-0"	18'-0"	2'	62	Red-brown-soft-damp-plastic-vari colored-banded.
18'-0"	20'-0"	2'	63	Light red-varicolored-banded-sof damp-clayey-plastic.
5'-6"-20'				

Remarks Occasional hard layers encountered about 1 foot apart from 8'-0" to 18'-0".

Light pink zone 18'-2" - 19'-8".

Hole abandoned at 20' due to difficulty in handling string of pipe.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 8 Location Top of hill (Hayfield)

NENW of sec. 33 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 865' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 10

Elev. water table

Bottomed in Weathered basalt?

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-23-53

Date hole finished 9-23-53

Shifts actually drilled 2½ hrs.

From	To	Thickness of sample	Sample No.	Description
0'	2'	- - - -	- - -	Soil with gibbsite lumps.
2	4	2'	44	Red-brown-yellow spots-earthy-har dry.
4	6	2	45	Yellow-brown-yellow spots-red spo black spots-earthy-very firm-dry.
6	8	2	46	Yellow-brown-white spots-yellow s red spots-black spots-earthy-firm-dry
8	10	2	47	Brown-black- white spots-yellow spots-red spots-black spots-blue spots-orange spots-pink spots- clayey-soft-damp.

Remarks Very hard drilling down to 7 feet - increasingly softer to bottom at 10'.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. Cut Location Highway cut S. Commercial and Vista Ave.

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began 9-23-53

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
3'	6'	3	48	Brick red-clayey-hard.
6	9	3	49	Red-brown-yellow spots-red spots-clayey-hard-dry.
9	13	4	50	Olive drab-red-brown-white spots-yellow spots-red spots-black spot orange spots-pink spots-clayey-ha vesicular.

Remarks Top section of dark brown vesicular basalt about 2' thick not sampled. Channel cut.

WL-24b

Hole No. Cut

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 9 Location

of sec. T. R. County Marion

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in Weathered basalt

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-24-53

Date hole finished 9-24-53

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0'	2'	- - - -	- - -	Olive drab soil.
2	4	- - - -	- - -	Olive drab-earthy-hard-dry.

Remarks Hole abandoned at 4' when basalt float discovered in vicinity.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 10 Location Summit of hill 1029 just south of gate on E-W fence.

NE SW of sec. 18 T. 9 S R. 2 W County Marion

Coord. N. E.

Elev. collar 1029' (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-24-53

Date hole finished 9-24-53

Shifts actually drilled 3½ hrs.

From	To	Thickness of sample	Sample No.	Description
0'	2'	- - - -	- - -	Brown soil.
2'	4'	2'	51	Red-brown-red spots-black spots-firm-gibbsite lumps-dry.
4'	6'	2'	52	Red-brown-yellow spots-red spots-black spots-earthy-firm-many gibbsite lumps-slightly damp.
6'	8'	2'	53	Yellow-brown-very many gibbsite lumps-solid-dry.
8'	10'	2'	54	Yellow-brown-varicolored-spotted-earthy-soft-slightly damp.
10'	12'	2'	55	Light yellow-brown-varicolored-spotted-earthy-soft-slightly damp

Remarks Very hard drilling 6'-8' then easy going to bottom at 12'.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 11 Location Near ¼ cor. secs. 20/29.

of sec. T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 780 (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler "

Date hole began 11/4/53

Date hole finished

Shifts actually drilled 2-3/4 hrs.

From	To	Thickness of sample	Sample No.	Description
0	2'	- - -	- - -	Yellow-brown-earthy.
2'-0"	4'-0"	2'	64	Yellow-brown-earthy-very hard-da
4'-0"	6'-0"	2'	65	Red-brown-very hard-damp.
6'-0"	7'-0"	1'	66	Red-brown-very hard-damp.

Remarks

WL-24b

Hole No. 11

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 12 Location Near oak tree opposite oat field, house north side of road.

Center NW¼ of sec. 28 T. 8 S R. 3 W County Marion

Coord. N. E.

Elev. collar 780 (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 20'

Elev. water table

Bottomed in Olive drab clay

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler "

Date hole began 11/5/53

Date hole finished

Shifts actually drilled 2½ hrs.

From	To	Thickness of sample	Sample No.	Description
0"	2'	- - -	- - -	Soil.
2'-0"	4'-0"	2'	67	Yellow-brown-earthy-firm-dry.
4'-0"	6'-0"	2'	68	Light yellow-brown-earthy-firm-dry-white spots-yellow spots.
6'-0"	8'-0"	2'	69	Light yellow-brown-earthy-slightly firm-dry-white spots-yellow-spots
8'-0"	10'-0"	2'	70	Red-brown-earthy-slightly firm-dry white spots-yellow spots-black sp
10'-0"	12'-0"	2'	71	Red-brown-earthy-slightly firm-dry white spots-yellow spots-black sp
12'-0"	14'-0"	2'	72	Dark red-brown-slightly clayey-fi slightly damp-white spots-yellow spots-black spots.
14'-0"	16'-0"	2'	73	Dark brown-clayey-slightly firm-damp-(grey-white spots).
16'-0"	18'-0"	2'	74	Olive drab-grey-blue-banded-claye damp.
18'-0"	20'-0"	2'		Olive drab-grey-blue-banded-claye very damp.

Remarks Not very hard drilling.

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 13 Location Highest point on hill west of farm house.

SW SE of sec. 1 T. 9 S R. 3 W County Marion

Coord. N. E.

Elev. collar 625 (map)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler "

Date hole began 11/5/53

Date hole finished

Shifts actually drilled 1½ hrs.

From	To	Thickness of sample	Sample No.	Description
0	2'	- - -	- - -	Light yellow soil.
2'-0"	4'-0"	2'	76	Light yellow-earthy-dry-firm.
4'-0"	6'-0"	2'	77	Light yellow/brown-earthy-dry-firm.
6'-0"	8'-0"	2'	78	Light yellow/brown-earthy-dry-firm.
8'-0"	10'-0"	2'	79	Red-brown-earthy-dry-firm.

Remarks

WL-24b

Hole No. 13

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 1 Location 40' S OF ROSEDALE FRIENDS CHURCH

NESE of sec. 28 T. 8S R. 3W County MARION

Coord. N. E.

Elev. collar 750 (MAP)

Depth to top of bed 2'?

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 12

Elev. water table —

Bottomed in WEATHERED BASALT

****

Drill used 3" IWAN

Number men 2

Engr. in charge MASON

Mtrl. classfd. by CORCORAN

Sampler "

Date hole began 9-15-53

Date hole finished 9-15-53

Shifts actually drilled 1/2

From	To	Thickness of sample	Sample No.	Description KEY NO 3
0	2'	—	—	SOIL
2	4	2'	1	D-C-15-1-$\bar{13}$
4	6	2'	2	D-C-$\bar{16}$-1-$\bar{13}$
6	8	2'	3	D-C-I-F-5-16-$\bar{6}$
8	10	2'	4	D-C-F-G-H-I-S-4-6-16
10	12	2'	6	D-C-F-G-H-I-L-T-3-4-6-16

Remarks COLLAR AT EDGE OF FIELD ABOUT 40 FROM SW COR OF CHURCH. FROM 2-8' HOLE REQUIRED COAL AUGER TO LOOSEN SOIL

WL-24b

Hole No. 1

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 2 Location TOP OF KNOLL W. OF TEX PERRY HOUSE 500' N OF COUNTY ROAD

SW NW of sec. 29 T. 8 S R. 3 W County MARION

Coord. N. E.

Elev. collar 860' (MAP)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" IWAN

Number men 2

Engr. in charge MASON

Mtrl. classfd. by CORCORAN

Sampler CORCORAN

Date hole began 9-15-53

Date hole finished 9-18-53

Shifts actually drilled 6½ HRS

From	To	Thickness of sample	Sample No.	Description KEY NO 3
0	2'	—	—	SOIL
2	4	2'	7	C-H-I-5-15
4	4-6"	0'-6"	8	DITTO-VERY HARD DRILL
4'6"	6'6"	2'	10	D-C-I-5-$\overline{16}$ - HARD DRILL
6'-6"	8'-6"	2'	11	D-C-I-4-5-16 - HARD DRILLIN
8'-6"	10'-6"	2	12	D-C-FGHI-5-4-5-16 EASY DRILLIN
10'-6"	12'-6"	2	13	C-I-J-T-4-5-16 HARD DRILLING
12'-6"	14-6"	2	14	C-H-I-J-T-4-6-16
14-6"	16-6"	2	18	C-R-H-I-J-L-4-16
16-6"	18-6"	2	19	C-R-H-I-J-L-F-4-6-$\overline{16}$
18-6	20-6"	2	20	O-C-$\dot{H}$-$\dot{I}$-$\dot{J}$-$\dot{L}$-3-$\overline{6}$-$\overline{16}$
20-6"	21'0	0'-6"	21	O-C-$\dot{H}$$\dot{I}$-$\dot{J}$$\dot{L}$ $\dot{R}$-13-8 $\overline{16}$

Remarks HOLE HAD TO HAVE COAL AUGER & CHOPPING BIT FROM 0-8-6" AND FROM 10'-6" TO 13'-6" EASY DRILLING 13-6"-19-6" - INCREASINGLY HARD 19-6"-20'-6"

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

Salem Bauxite
Project

Hole No. 3 Location Top of Prospect Hill - 300' W. of tower

NE-NE of sec. 25 T. 8S R. 4W County Marion

Coord. N. E.

Elev. collar 1125' map

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in WEATHERED BASALT

****

Drill used 3" Iwan

Number men 2

Engr. in charge Mason

Mtrl. classfd. by Corcoran

Sampler Corcoran

Date hole began 9-15-53

Date hole finished 9-16-53

Shifts actually drilled 2 Hrs

From	To	Thickness of sample	Sample No.	Description KEY NO3
0	2	-	-	SOIL
2	3	1	9	C-5-15 SMALL GIBBSITE NODULES
3	5	2	15	D-C-13-1-15 GIBBSITE NODULES
5	7-6"	2-6"	16	C-H-I-J-K-T-1-4-16 EASY DRILL
7-6"	10'	2-6"	17	C-H-I-J-K-T-1-4-16 "

Remarks

WL-24b

Hole No. 3

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 4 Location HILL 828 30' WEST OF N-S FENCE 150±. N OF BEOSH LOT

SW 1/4 of sec. 36 T. 8S R. 3W County MARION

Coord. N. E.

Elev. collar 828-MAP

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" IWAN

Number men 2

Engr. in charge MASON

Mtrl. classfd. by CORCORAN

Sampler CORCORAN

Date hole began 9-18-53

Date hole finished 9-18-53

Shifts actually drilled 5 HRS

From	To	Thickness of sample	Sample No.	Description KEY NO 3
0	2	-	-	SOIL W/GIBBSITE BOU
2	4	2'	22	D-C-GIBBSITE LUMPS 15-8
4	6	2'	23	$\bar{D}$-C-1-8-15
6	8	2'	24	$\bar{D}$-C-F-1-$\bar{8}$-15
8	10	2'	25	B-C-$\dot{3}\bar{1}$-13-$\bar{1}\bar{6}$-$\bar{8}$
10	12	2'	26	B-C F-H-I-1-$\bar{8}$-$\bar{1}\bar{6}$
12	14	2'	27	B-C-F-G-H-I-4-$\dot{3}\bar{1}$-13-$\bar{1}\bar{6}$
14	16	2'	28	B-C-H-I-F-1-$\dot{3}\bar{1}$-13-16
16	18	2'	29	$\underline{B}$-C-F-I-1-8-$\bar{1}\bar{6}$
18	20	2'	30	D-C-F-G-I-4-7-$\underline{16}$

Remarks

WL-24b

Hole No. 4

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 5 Location ~~NE NW~~ 18 TOP OF PLANK HILL 10' N OF FE

NE NW of sec. 18 T. 8S R. 3W County MARION

Coord. N. E.

Elev. collar 875 MAP
Depth to top of bed
Elev. of top of bed
Thickness of bed
Elev. bottom bed
Depth of hole
Elev. water table
Bottomed in

****

Drill used 3" IWAN
Number men 2
Engr. in charge MASON
Mtrl. classfd. by CORCORAN
Sampler CORCORAN
Date hole began 9/21/53
Date hole finished 9/21/53
Shifts actually drilled 3 HS

From	To	Thickness of sample	Sample No.	Description KEY No 3
0	2	—	—	SOIL WITH GIBBSITE LUMPS
2'	4'	2'	31	B-C-1-GIBBSITE LUMPS-15
4'	6'	2'	32	B-C-F-G-1-8-15
6'	8'	2'	33	B-C-F-G-H-I-1-8-15
8	10'	2'	34	B-C-F-H-1-8-16
10	11-8"	1-8"	35	D-C-F-G-23-13(?) 8 16

Remarks HOLE DRILLED RATHER HARD NEARLY ALL THE WAY. APPEARANCE OF DARK GRAY (BASALT?) CHIPS AT 11'-0" SEEMS TO INDICATE BASE OF SECTION

WL-24b

Hole No. 5

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 6 Location HUDKINS HILL 5' W/OF FENCE BETWEEN PRUNE ORCHARD & WHEAT FIELD

CENTER of sec. 18 T. 8S R. 3W County MARION

Coord. N. E.

Elev. collar 860 MAP

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" IVAN

Number men 2

Engr. in charge MASON

Mtrl. classfd. by CONCORAN

Sampler CONCORAN

Date hole began 9/22/53

Date hole finished 9/22/53

Shifts actually drilled 2½

From	To	Thickness of sample	Sample No.	Description
0	2	—	—	SOIL
2	4	2'	36	B-C-F-G-H-I-1-7-15
4	6	2'	37	B-C E G-H-R-1-8-15
6	8	2'	38	O-B-C-E-G-H-R-1-8-15
8	10	2'	39	B-C-13-1-8-16
10	12	2'	40	O-C [10 11] B-C-13-F-G-H-1-7-16
12	14	2'	41	B-C-F-G-H-I-1-8-13-16

Remarks

WL-24b

Hole No. 6

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 7 Location 50' N OF CHICKEN HOUSE ON MACDOUGAL(?) RANCH

NE SW of sec. 19 T. 8S R. 3W County MARION

Coord. N. E.

Elev. collar 960 MAP

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" IWAN

Number men 2

Engr. in charge MASON

Mtrl. classfd. by CORCORAN

Sampler CORCORAN

Date hole began 9/22/53

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
0	2'	—	—	SOIL & GIBBSITE LOAMS
2	4	2'	42	D-C 31-13-9-15
4	5'-6"	1'-6"	43	D-C-G-1-9-31-13
				CON'T ON NEXT SHEET

Remarks VERY HARD DRILLING 2' TO 5'-6". HOLE ABANDONED AT 5'-6" DUE TO EXTREME HARDNESS OF GROUND

WL-24b

Hole No. 7

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 7 Location (CONT)

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 20

Elev. water table —

Bottomed in PINK CLAY

****

Drill used 3" IMPAIN

Number men 2

Engr. in charge MASON

Mtrl. classfd. by CONCONAN

Sampler "

Date hole began

Date hole finished 11/4/53

Shifts actually drilled 2½ HRS

From	To	Thickness of sample	Sample No.	Description KEY No. 3
	CONT			
5-6"	6'-0"	6"	56?	D-C-9-15-(31-13)
6'-0"	8'-0"	2'	57	D-C-8-15 (31-13?)
8'-0"	10'-0"	2'	58	D-C-8-15 (31 or 23-13's)
10'-0"	12'-0"	2'	59	D-C-8-16-R-4
12'-0"	14'-0"	2'	60	D-C 8-16-R-4-S
14'-0"	16'-0"	2'	61	D-C 7-16-R-S-4
16'-0"	18'-0"	2	62	D-C-7-16-6-R-S
18'-0"	20'-0"	2	63	D-R-S-7-16-4-6
5'-6"-20'				

Remarks OCCASIONAL HARD LAYERS ENCOUNTERED ABOUT 1 FOOT APART FROM 8-0" TO 18'-0"

LIGHT PINK ZONE 18-2" - 19'-8"

HOLE ABANDONED AT 20' DUE TO DIFFICULTY IN HANDLING STRING OF PIPE

WL-24b

Hole No. 7 CONT

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 8 Location TOP OF HILL (HATFIELD)

NE NW of sec. 33 T. 8S R. 3W County MARION

Coord. N. E.

Elev. collar 865 (MAP)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 10

Elev. water table —

Bottomed in WEATHERED BASALT(?)

****

Drill used 3" IWAN

Number men 2

Engr. in charge MASON

Mtrl. classfd. by CORCORAN

Sampler CORCORAN

Date hole began 9-23-53

Date hole finished 9-23-53

Shifts actually drilled 2½ H.

From	To	Thickness of sample	Sample No.	Description KEY NO 3
0	2'	—	—	SOIL WITH 31-13's
2'	4'	2'	44	D-C-G-1-9-15
4	6	2	45	B-C-G-H-I-1-8-15
6	8	2'	46	B-C-F-G-H-I-1-8-15
8	10	2'	47	C-Q-F-G-H-I-K-L-M-4-7-16

Remarks VERY HARD DRILLING DOWN TO 7 FEET - INCREASINGLY SOFTER TO BOTTOM AT 10'

WL-24b

Hole No. 8

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BASALTE
Project

Hole No. CUT Location HIWAY CUT S COMMERCIAL & VISTA AVE

of sec. T. R. County

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used

Number men

Engr. in charge

Mtrl. classfd. by

Sampler

Date hole began 9-23-53

Date hole finished

Shifts actually drilled

From	To	Thickness of sample	Sample No.	Description
3	6	3	48	E-4-9
6	9	3	49	D-C-G-H-4-9-15
9	13	4	50	N-D-c-E-G-H-I-L-M 4-9 (VESICULAR)

Remarks TOP SECTION OF DARK BROWN VESICULAR BASALT ABOUT 2' THICK HAS SAMPLED. CHANNEL CUT

WL-24b

Hole No. CUT

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 9 Location

of sec. T. R. County MARION

Coord. N. E.

Elev. collar

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in WEATHERED BASALT

****

Drill used 3" IWAN

Number men 2

Engr. in charge MASON

Mtrl. classfd. by CORCORAN

Sampler CORCORAN

Date hole began 9-24-53

Date hole finished 9-24-53

Shifts actually drilled 1

From	To	Thickness of sample	Sample No.	Description
0	2	—	—	OLIVE DRAB SOIL
2	4	—	—	N-1-9-15

Remarks HOLE ABANDONED AT 4' WHEN BASALT FLOAT DISCOVERED IN VICINITY

WL-24b

Hole No. 9

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 10 Location SUMMIT OF HILL 1029 JUST S. OF GATE ON E-W FENCE

NE SW of sec. 18 T. 9S R. 2W County MARION

Coord. N. E.

Elev. collar 1029 (MAP)

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" / WAN

Number men 2

Engr. in charge MASON

Mtrl. classfd. by CONCOYNH

Sampler CONCOYNH

Date hole began 9-24-53

Date hole finished 9-24-53

Shifts actually drilled 3½ HRS

From	To	Thickness of sample	Sample No.	Description KEY NO 3
0'	2'	—	—	BROWN SOIL
2'	4'	2'	51	D-C-H-I-1-8-3̄1-13-15
4'	6'	2'	52	D-C-G-H-I-1-8-3̄1-13-16̄
6'	8'	2'	53	B-C-3̄1-13-14-15
8	10	2'	54	BC-R-U-1-7-16̄
10	12	2'	55	BC-R-U-1-7-16̄

Remarks VERY HARD DRILLING 6'-8' THEN EASY GOING TO BOTTOM AT 12'

WL-24b

Hole No. 10

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 11 Location NEAR ¼ COR. SECS 20/29

of sec. T. 8S R. 3W County MARION

Coord. N. E.

Elev. collar 780 MAP
Depth to top of bed
Elev. of top of bed
Thickness of bed
Elev. bottom bed
Depth of hole
Elev. water table
Bottomed in

****

Drill used 3" IWDN
Number men 2
Engr. in charge MASON
Mtrl. classfd. by CORCORAN
Sampler "
Date hole began 11/4/53
Date hole finished
Shifts actually drilled 1:30-4:15

From	To	Thickness of sample	Sample No.	Description KEY No 3
0	2	—	—	B-C-1
2-0"	4-0"	2'	64	B-C-1-2-16
4-0"	6-0"	2	65	D-C-2-16
6-0"	7-0"	1	66	D-C 2-16

Remarks

WL-24b

Hole No. 11

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 12 Location NEAR OAK TREE OPPOSITE OATFIELD HOUSE N SIDE CENTER NW¼ OF ROAD
of sec. 28 T. 8S R. 3W County MARION

Coord. N. E.

Elev. collar 780 MAP

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole 20'

Elev. water table

Bottomed in OLIVE DRAB CLAY

****

Drill used 3" IWAN

Number men 2

Engr. in charge MASON

Mtrl. classfd. by CONCONAN

Sampler

Date hole began 11/5/53

Date hole finished 11/20-12

Shifts actually drilled 2½ HRS

From	To	Thickness of sample	Sample No.	Description
0	2	-	-	SOIL
2'-0"	4'-0"	2'	67	B-C-1-8-15
4'-0"	6'-0"	2'	68	B-C-1-8-15-F-G
6'-0"	8'-0"	2'	69	B-C-1-8-15-F-G
8'-0"	10'-0"	2'	70	D-C-1-8-15-F-G-I
10'-0"	12'-0"	2'	71	D-C-1-8-15-F-G-I
12'-0"	14'-0"	2'	72	D-C-4-8-16-F-G-I
14'-0"	16'-0"	2'	73	C-4-8-16-(O-F)
16'-0"	18'-0"	2'	74	N-O-P-S-4-16
18'-0"	20'-0"	2'	75	N-O-P-S-4-16

Remarks NOT VERY HARD DRILLING

WL-24b

Hole No. 12

STATE DEPARTMENT OF GEOLOGY & MINERAL INDUSTRIES

SALEM BAUXITE
Project

Hole No. 13 Location HIGHEST POINT ON HILL W OF FARMHOUSE

SWSE of sec. 1 T. 9S R. 3W County MARION

Coord. N. E.

Elev. collar 625 MAP

Depth to top of bed

Elev. of top of bed

Thickness of bed

Elev. bottom bed

Depth of hole

Elev. water table

Bottomed in

****

Drill used 3" IVAN

Number men 2

Engr. in charge MASON

Mtrl. classfd. by CONCORAN

Sampler "

Date hole began 11/5/53

Date hole finished

Shifts actually drilled 1½ HRS

From	To	Thickness of sample	Sample No.	Description KEY No. 3
0	2	—	—	LIGHT YELLOW SOIL
2'0"	4'0"	2'	76	B-1-15-8
4'0"	6'0"	2'	77	B-C-1-15-8
6'0"	8'0"	2'	78	B-C-1-15-8
8'0"	10'0"	2'	79	D-C-1-15-8

Remarks

WL-24b

Hole No. 13