# MAR 19520001: GEORGE LAKE

Received date: Dec 31, 1952

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1952000

# <u>C O P Y</u>

|   | Edmonton, Alberta           |
|---|-----------------------------|
|   | Canada<br>ECONOMIC MINERALS |
|   | file report. No.            |
|   | BNJ-AF-01                   |
| 6 |                             |

December 26, 1952.

J. A. Kelso, M.Sc. Chemical Engineer Director Industrial Laboratories Provincial Analyst

> Mr. Wm. Pylypow, 11726 94th Str., EDMONTON, Alberta

Dear Sir:

I would advise that we have made preliminary tests on three small samples of clay submitted by you, numbered 1, 2 and 3 respectively.

#2 and #3 are the same and are ordinary clays with good plastic properties and burn to an ordinary grade of red brick. The shrinkage is satisfactory and the clay of good workalibity. The clay contains a small amount of sand.

#1 is quite similar to the other two but has a much higher shrinkage and does not burn to as satisfactory a color.

Signed: James A. Kelso,

James A. Kelso, Director Industrial Laboratories.

not relevent to bentonite evaluation

Pertonite

Certositie

J.A. KELSO, M.Sc. Chemical Engineer, Director Industrial Laboratories, Provincial Analyst

EDMONTON, Alberta CANADA

July 10, 1952.

Mr. Wm. Pylypow, 11726 94th Street, EDMONTON, Alberta.

Dear Sir:

I would advise that we have examined three samples received from you labelled #1, #2 and #3 respectively.

#2 and #3 are Bentonite clays and as advised, tests should be run by our Department of Petroleum Engineering re valuation for drilling mud.

#3 is a sandy clay and with a low Bentonite content. It would not have any commercial value.

Yours very truly,

(signed) James A. Kelso

JAMES A KELSO Director of Industrial Laboratories Telephones: ADVance 2604/6

Codes Bentley's 2nd Phrase

## WATFORD CHEMICAL COMPANY LTD.

Emulsifying Agents Pharmaceutical and Medical Specialties Heavy and Fine Chemicals, Industrial Raw Materials

G.M. Todd,C.A. Chairman H. Shilton,M.P.S. Managing Director K.S. Wallersteiner,M.A. Ph.D. F. Rogers, B.Sc. A.R.I.C. E.E. Byrne, Secretary Sales Office 30, Baker Street London, W.I., Telephone:WELBECK 0264/8 Registered Office 17,Half Moon St. W.I.

22/32, COPERFIELD ROAD, CANAL ROAD, LONDON, E. 3

Our Ref. FR/GT

29th July, 1952.

Mr. W.M. Pylypow, 11726 - 94th Street, EDMONTON, Alberta. Canada.

Dear Sir:

We have received your sample of bentonite, and although it is not so good as American material we are still interested.

We are contacting in this matter:-

Mr. H.A. Dyde, of Milner, Steer, Dyde, Poirier Martland & Layton Royal Bank of Canada Chambers, Edmonton

and

Mr. H. Shilton, 145 Yonge Street, Toronto.

One of whom will probably conduct further negotiation on our behalf.

Yours faithfully for WATFORD CHEMICAL CO. LTD. (signed) F. Rogers, Director

11726 - 94th Street, Edmonton, Alberta. December 18, 1952.

J. W. Patrick, Director of Mineral Rights, Department of Mines and Minerals, Administration Building, EDMONTON, Alberta.

Dear Sir:

35.00 . 10 Spert

With reference to your letter dated June 27, 1952, I am forwarding herewith a report as to the progress made on my hentonite reservation during the period since the reservation was granted. I have had three men including myself working at various periods throughout the summer months. Approximately 4090 feet of hole was drilled by hand tools and samples recovered from all horizons. Eleven holes were drilled to a total of 85 feet. It was found that the depth of the overburden varied from about 10 feet to 64 feet with the average depth of overburden being between 30 and 40 feet. In one area comprised in the reserved area two seams of bentonite of 25 feet and 27 feet respectively were located with approximately 7 feet between these seams.

Many samples of material were taken and submitted to various people for analysis. Enclosed are copies of letters received from people who have examined samples, including Dr. Kelso and the Department of Mines and Technical Surveys. Some of these reports have been quite encouraging and I am therefore requesting a further period in which to continue my exploratory operation so that I might further evaluate the commercial possibilities of the area.

 $\mu$ . Inasmuch as our investigations have proved that the south half of section 17, township 57, range 1, west of the 5th meridian does not warrant further work I would ask that it be deleted from the reserved area.

It is further requested that the north half of section 21, the south half of section 28, the north west quarter of section 29, the north east quarter of section 30 and the south west quarter of section 30, township 57, range 1, west of the 5th meridian be added to the reserved area.

Yours very truly,

exploration reservation

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Wasyl Pylypow

November 25th. 1951

Mr. W. Pylypow 11726 94th St., Edmonton, Alberta.

Dear Sir:

Your letter and samples of some few weeks back were rereceived in good order and while I finished a few preliminary tests early last week time did not permit of my writing you until the present concerning the results. As you will recall there were two samples, one being in a small box, the other in a paper bag, the one in the box I marked No. 1 and the other No. 2 so that they would have numbers.

While I only tested them on a dark mineral oil there yet remains to test them on other types like peanut oil etc. The No. 1 sample showed up quite well in its bleaching power for mineral oil and I would say is worthy of further work including that of activation, on the other hand No. 2 sample did not show up so well but it might develop a much higher bleaching power through activation, in this connection it could be treated at the same time as No. 1 in the event you should have the work done.

In connection with your spending money to have further tests made there are certain conditions which are necessary to be met before I would say that you would be justified in sending money for tests, the main points to be given careful consideration by you are, is there a very large deposit sufficient to justify large operations? that is, are there thousands of tons? also how thick is the seam? that is, a few inches or say three or four ft.? Then again would it have to be mined or could the over burden be taken off economically Also how near is it to a railway or other means of transportaion? Is there fuel for drying near by? If these points are in the main favorable then I would say that you would be quite justified in spending money to prove up the property and have complete tests made. I am assuming of course that you either own the property or are quite certain that you can obtain possession or a lease. I mention all of these things in that I would not like to see you ar any one else loose or waste any money.

In the event that I can be of any further help to you it will be nice to hear from you.

Very truly yours, (signed) W.G. Worcester

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CANADA

Department of Mines and Technical Surveys

Industrial Minerals Division

Ottawa, October 18, 1951

Mines Branch

Mr. William Pylypow, 11726 - 94 Street, Edmonton, Alta.

Dear Sir:

#### Re: Bentonite Sample #3

The tests conducted on the use of bentonite Sample #3 for drilling clay showed it to be unsatisfactory. The yield value of the material was low i.e., 51 barrels per ton of 15 centipoise mud at 77°F. A Good drilling clay should give a yield value of around 100 barrels of 15 centipoise mud per ton of bentonite. The sand content of this sample measured 1.4%.

Unfavorable results were obtained in the tests conducted to determine the suitability of the bentonite for making lightweight concrete aggregate. It proved to be a very poor bloater.

The Ceramic section report that the bentonite fuses to a creamy colored glass at about 2500°F. It exhibits no properties which would indicate any commercial value to the Ceramic or papermaking industry.

We are not equipped here to evaluate the qualities of a bentonite to be suitable for bleaching mineral or vegetable oils. I would suggest that you contact some of the oil refineries and packing plants in Edmonton with regard to this. As an alternative, you might contact Professor W.G. Worcester, 720 Saskatchewan Crescent East, Saskatoon, Sask. I believe that he would be able to make bleaching tests for you.

A portion of the sample that you submitted has been turned over to the Foundry section to test its value as a foundry sand binder. They will be replying direct to you in due course.

> Yours very truly, (signed) J. Gordon Matthews

J. GORDON MATTHEWS Engineer

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| ECONOMIC MINERALS |
|-------------------|
| FILE REPORT NO.   |
| BNT-IR -02        |

CANADA Department of

Mines Branch

Mines & Technical Surveys

Physical Metallurgy Division

568 Booth Street, Ottawa, Ontario October 3, 1951

P.M. Test Report No: 9020

Re: Examination of two samples of Alberta Bentonites for foundry use.

To: Mr. Wm. Polypow 11726 94th Street, Edmonton, Alberta.

On August 28, 1951, two samples of bentonite were received from Mr. M.F. Goudge, Director, Industrial Minerals Division, for examination to determine their suitability for use londing strength tests as foundry sand binders. These samples had been submitted to the Industrial Minerals Division by Mr. Wm Polypow, 11726 - 94th Street, Edmonaotn, Alberta.

#### Method Of Testing

In conducting the tests, the methods and equipment. used were those recommended by the American Foundryman's Society (see Foundry Sand Testing Handbook, 1944 edition (A.F.S) The Alberta bentonites were compared with two commercial foundry bentonites by mixing test batches in an 18 inch laboratory mixer.

A commercial core sand was used in this investigation. This sand had a smooth sub-angular grain, and had the following screen distribution.

.....2

| U.S. Screen | Per Cent |
|-------------|----------|
| No.         | Retained |
| 16          | nil      |
| 20          | nil      |
| 30          | 0.6      |
| 40          | 2.6      |
| 50          | 14.8     |
| 70          | 41.2     |
| 100         | 36.2     |
| 140         | 4.3      |
| 200         | 0.2      |
| 270         | nil      |
| Pan         | Trace    |

The following mixture was used in testing the

sand

4000 gm sand 200 gm bentonite moisture to temper

The sand was mulled i minute to dry and 4 minutes wet in a laboratory sand muller.

# Physical Properties

The synthetic moulding sand mixtures prepared from the above bentonites had the following properties

....3

|  | Sample .<br>No. 1 | Sample<br>No. 2 | Wyoming<br>Bentonite | Missouri<br><u>Bentonite</u> |
|--|-------------------|-----------------|----------------------|------------------------------|
| Green<br>Compressive<br>Strength, psi          | 5.9               | 5.2             | 5.2                  | 5.5                          |
| Dry<br>Compressive<br>Strength, psi            | 65.5              | 45.5            | 48 <u>.</u> 5        | 30                           |
| Compressive<br>Strength<br>500 <sup>0</sup> F  | 69                | 74              | 58                   | 33                           |
| Compressive<br>Strength<br>1000 <sup>0</sup> F | 83                | 88              | 67                   | 40                           |
| Compressive<br>Strength<br>1500 <sup>0</sup> F | 97                | 130             | 120                  | 46                           |
| Compressive<br>Strength<br>2000 <sup>0</sup> F | 70                | 102             | 125                  | 49                           |
| Compressive<br>Strength<br>2200 F              | - 10              | 10              | 128                  | 19                           |

#### Durability

When clay is heated, water of crystallization is driven off and the bonding properties deteriorate. Measuring the loss of green and dry strength of the sand mixture after it has been heated is one means of testing the durability of a foundry clay.

The durability was tested by baking batches at temperatures of 220°, 400°, 600°, 800°, 1000°, and 1200°F. The properties of the bentonite bonded sands were measured after baking for 2 hours at each of these temperatures. The results of these tests are tabulated below.

# Durability of Green Bond

# Green Compressive Strength, psi

## Alberta Bentonite

| Baking<br>oTemperature<br>F | Sample<br>No. 1 | S <sub>ample</sub><br>No. 2 | Wyoming<br>Bentonite | Missouri<br>Bentonite |
|-----------------------------|-----------------|-----------------------------|----------------------|-----------------------|
| Room                        | 5.0             | 4.6                         | 4.9                  | 5.3                   |
| 7100                        | 4.9             | 5.2                         | 4.7                  | 4.8                   |
| 600                         | . 4.8           | 5.0                         | 4.5                  | 3.5                   |
| 800                         | 4.7             | L.8                         | 5.2                  | 3.0                   |
| 1000                        | 3.7             | 4.7                         | 4.8                  | 1.1                   |
| 1200                        | 1.5             | 1.7                         | 1.5                  | -                     |
|                             |                 |                             |                      |                       |

Durability of Dry Bond

Green Compressive Strenght, psi

|   | <u> </u>                | aroon comproperto screency per |                      |                       |  |
|---|-------------------------|--------------------------------|----------------------|-----------------------|--|
| BAKING<br>Temperature<br><sup>O</sup> F | Sample<br>No <b>. l</b> | Sample<br>No. 2                | Wyoming<br>Bentonite | Missouri<br>Bentonite |  |
| 220                                     | 56.5                    | 58.5                           | 78.                  | 30                    |  |
| 400                                     | 39                      | 38                             | 69                   | 38                    |  |
| 600                                     | 43                      | <b>3</b> 8                     | 60                   | 31                    |  |
| 800                                     | 54                      | 140                            | 40                   | 22                    |  |
| 1000                                    | .33                     | 25                             | 23                   | 6                     |  |
| 1200                                    | 1                       | 0.8                            | 7.5                  | 1.6                   |  |

#### Conclusion

Delcine

1. The foundry properties of the two Alberta bentonites submitted for test are somewhat similar to thos of the Wyoming bentonites, although some of the hot strength properties have a slight resemblance to the Missouri bentonites 6

2. These bentonites could be substituted fro Wyoming bentonites in foundry practice without changing the properties of the sand mixtures appreciably.

-5-

3. The durability of the Alberta bentonites is equal to that of the Wyoming bentonites, that is, the durability is good

(signed) A.E. Murton

A.E. MURTON Metallurgist

AEM/KW

Department of Chemical Engineering

Edmonton, Alberta. Canada

University of Alberta

### June 25, 1951

Mr. William Pylypow 11726 94th Street, Edmonton, Alberta.

Dear Mr. Pylypow:

Enclosed please find reports on the two samples of clay which were delivered to our laboratory on June 19th, 1951

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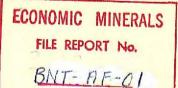
The tests conducted on these clays indicate them to be unsatisfactory as drilling clays. The viscosity developed by the clay obtained at 50 feet was 14.6 cp. in a 10.3% suspension and for the sample obtained at 30 feet it was 12.2 cp. in the same Bentonites is 20 cp. in a 7% suspension. The minimum viscosity developed by fresh water drilling clays is 15 cp. in a 6% suspension, unless the price on poorer clays is extremely Sand content attractive.

The sand content of both samples was relatively high.

Yours very truly,

(signed) D.B. Robinson Assistant Professor

DBR:AB Encl. 2



UNIVERSITY OF ALBERTA.

Edmonton, Alberta. Canada

Indexing Pocument No. 700727

Department of Chemical Engineering

Chemical and Engineering Laboratories

Test No. 547

DATE: June 25, 1951

Report of Tests of Clay sample obtained at 30 ft.

Date of Tests June 20-22,1951

For: Mr. William Pylypow . 11726 94th Street, Edmonton, Alberta.

The lump clay sample was dried, pulverized and sieved to pass 200 mesh screen. Samples of mud corresponding to yields of 50 and 70 bbl./ton of clay were prepared. After a 24 hour period the acidity was properly adjusted and the sample allowed to stand for 20 hours. Tests were then made for viscosity and sand content.

Viscosity

The Stormer viscosity of the 50 bbl/ton sample at 70°F was 12.2 cp. The viscosity of the 70 bbl./ton sample was not obtained.

Sand Content

The sand content obtained by centrifuge for the 50 bbl./ton sample was 1.2% (approx)

Tested by: D.B. Robinson

Approved:

#### Test No. 548

Report of Tests of Clay sample obtained at 50 ft.

Date June 25, 1951 Date of Tests June 19-22,1951

For: Mr. William Pylypow 11726 94th Street, Edmonton, Alberta

The lump clay sample was dried, pulverized and sieved to pass 200 mesh screen. Samples of mud corresponding to yields of 50 and 70 bbl./ton of clay were prepared. After a 24 hr. period the acidity was properly adjusted and the sample allowed to stand for 20 hr. Tests were then made for viscosity and sand content.

#### Viscosity

The Stormer viscosity of the 50 bbl./ton sample at 70°F was 14.6 cp. The viscosity of the 70 bbl./ton sample was not obtained.

#### Sand Content

The sand content obtained by centrifuge for the 50 bbl./ton sample was 1.2% (approx)

Tested by D.B. Robinson

#### UNIVERSITY OF ALBERTA.

## June 13, 1951

Date of Tests June 11, 1951

#### Evaluation of clay

For Mr. W. Pylypow 11726 94th Street, Edmonton,

#### Preparation of Clay

The sample of clay as delivered was dried  $2l_1$  hours at 110 - 120°C, pulverized in a ball mill, and screened. Owing to the size and nature of the sample, everything passing 150 mesh was used in preparation of mud samples.

#### Preparation of Mud Samples

Samples of mud representing yields of 40 and 60 bbl./ton were prepared from the screened clay. Indications were that the clay was unsuitable as a drilling mud component. The samples were allowed to stand 20 hours. The acidity was adjusted to the required value.

#### Viscosity

It was apparent from visual observation that the mud samples prepared from the clay specimen would not meet viscosity requirements. Tests were therefore discontinued at this point

Test by: D.B. Robinson

Frospecting done by Melinder & For label taughers by Gerlogist feb-11-15 3- Gordon Kidd Luscae Coal Comp - N. E. 21-57-1-51 That to Bealmice Thet of Bealmile 15- feet Och - 26 - 1953 - C. J. Horfou Mages Bar teras -N.E.21-57-1-5 Tfeet to Bealouite Tfeet If Bealmile 14-feet april -16-1954 - Mr. Wolke for Richardsong Ins J-E-30-37-1-5 le feet la Beulmite 10 feet of Beulmite 16- feet may -1-1934 - Sharsfor Duecace Sufley J. E-30-57-1-5 le feet la Becelonile, 10 feet of Becelonile 16-feet May -1-1954 - Than In Duncan Luply N-E-21-57-1-5 I feet to Bentonile Tfeet of Berelonite 14- feet may-13-1954 - Mr. Foole for Barrid Jetes, N-E-21-57-1 - 5 Hore Nº 1- 8 feet & Bealmile & feet & Bealmile 14. fut Hole N: 2. 3 feet to Bealmite to feet of Bealmite 11/2 Shall and Get of Bentomile Clay on Buttone 13-feet May-11.1934-m. Teole for Bassice Jeres - J.E. 30-57- 1-5 le feet lo Beulmile 13 feet & Beulruite 19-feet May -18-1954 - Im Force for Barriel Jeras, N.E-21-57-1-5-Hree Nº 3.9 feet la Beulonde 1/2 7/Beulonile falance Clay, 19- feet Hole Nº 4. 3 feet to Berelonile 3 feet of Beetonia falma Clay, 11- feet May - 24-1954 - M. Fhaller for Richardson Son - J. E-30-37-1-3 4 foet to Beulonite & feet of Beulmite 14-feet Islace 167 feets

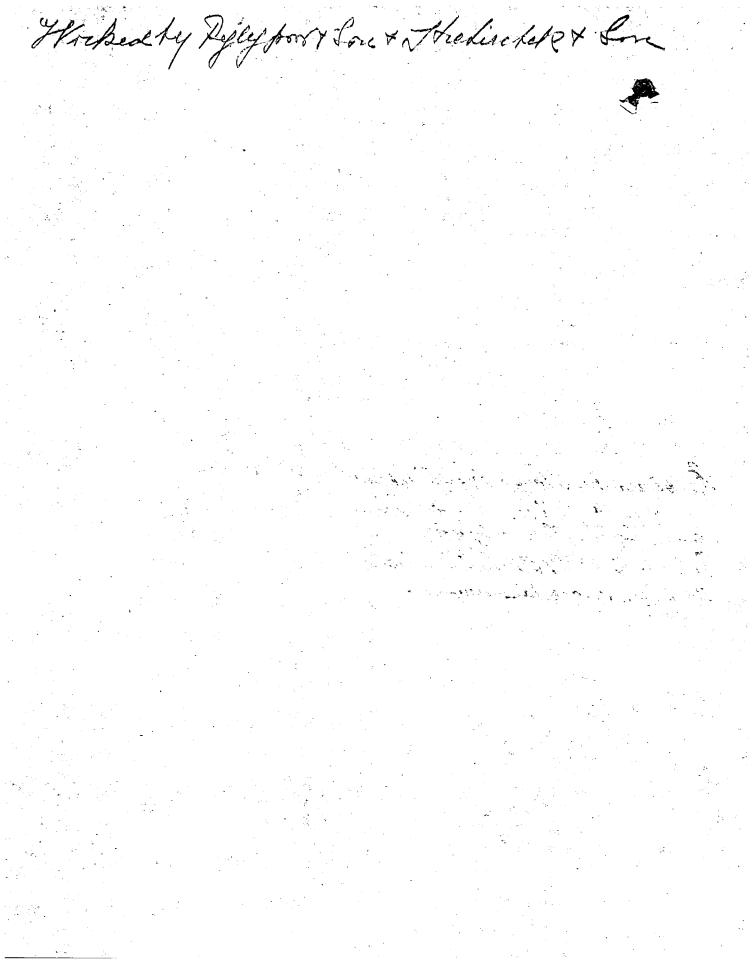
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Conflicatione by The hischer & fre

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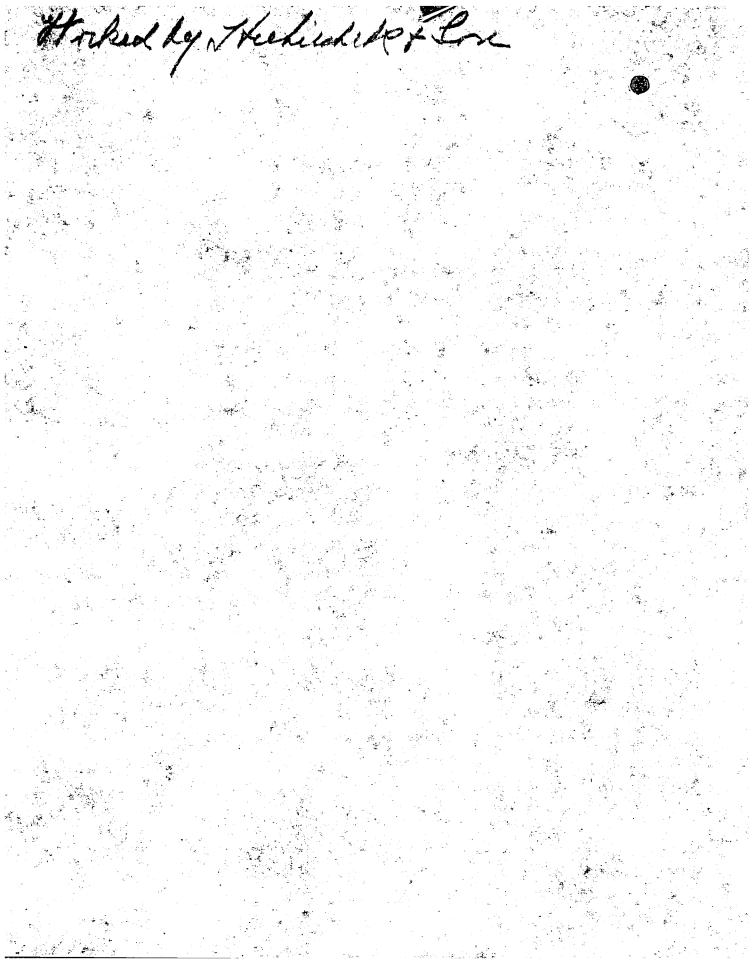
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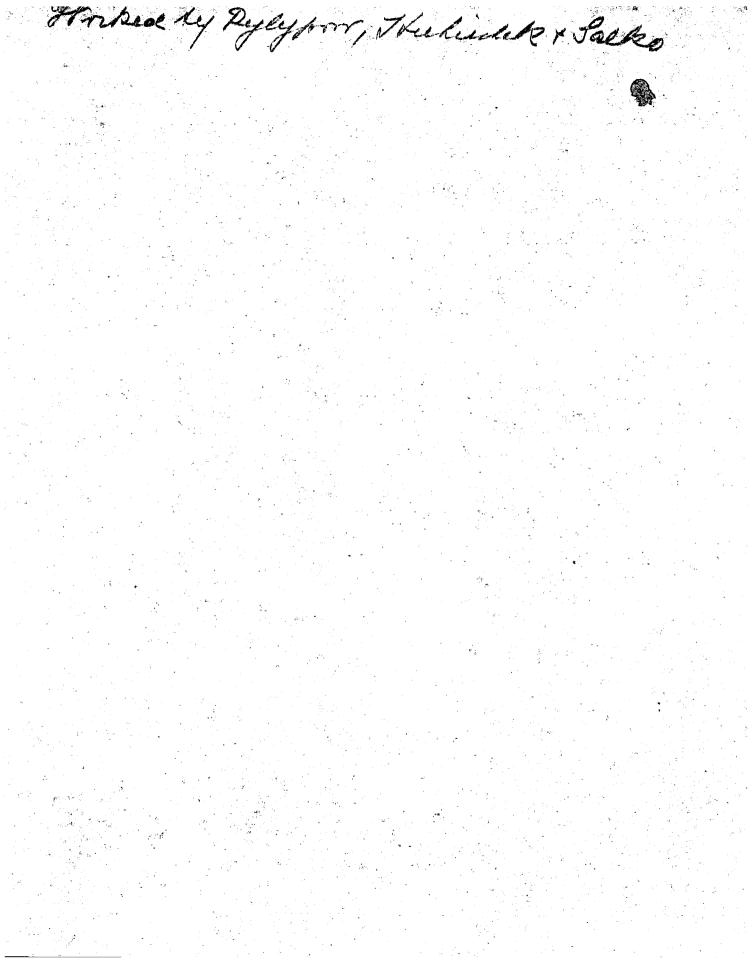
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Nº23. 32 feet Nº 19-22 feet meridian . fruthe No 20 - 24 feet pet No 16 - 16 - 8. 16 Reviewe 9-26 Reviewe day 21/2 feet Reviewe Nº 222 feet No 20 accelery 10 2A) 17 feet 10 To Reuloule 4 Beulowile balance clay Nº 22 - 24 feet Clay Total 202 feet noth.

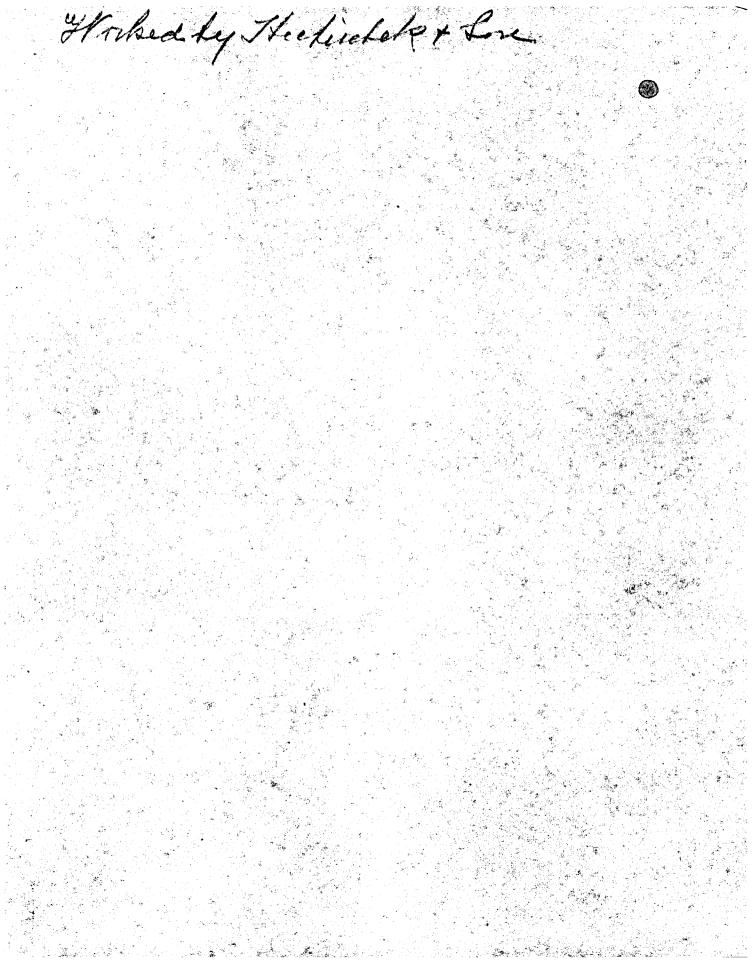
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NO Clay withit S-W-21-57-X-58 Unilly N2 20- 14 feet Clay + feme Total 35 feet

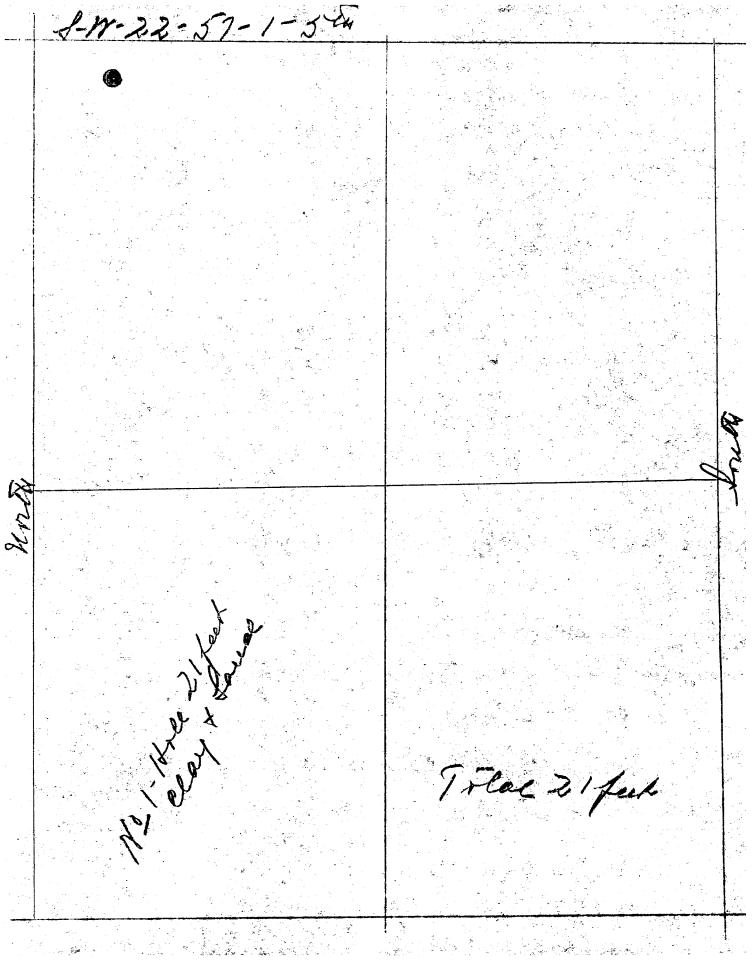




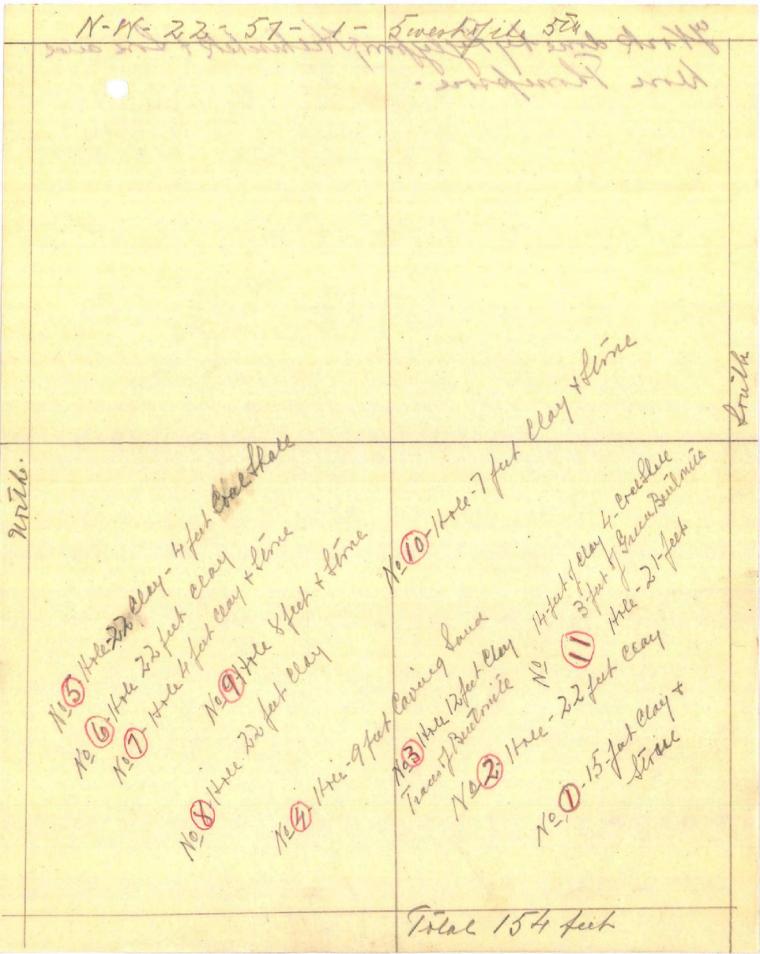
N-W-20-57-1-504 No 6 Sfeet 2 Beretmill 3 feet Bentmile and eley 12 feet No Beulneilie clay Land ree Butterne Nº 3 20 fret Clary + No 37 feet clay + fine No & Steeh clacy + Trace 68 feet NOO Hall 15 feet clay & flore

3 N20014400 10 feed Ceny King No ONANCe Speed Land red the dead Blue Cher " and the . I Kent are haven Hall have 2 of ach clary & Long No. Gead Word to marc 2/2 march Lalace cler R red N2 20 Hore & Heart Clay and N. O. HARCE 14 Wheat Clary & Cone 1 & fee bla Beulmile Sewaher of Beulmine tolance deals Clal Na Hale 37 feek rea J

Hickord by Rylypon, Heelindele & fore -



Hocked by Pylefpor, Stichicket for and love Florepore -

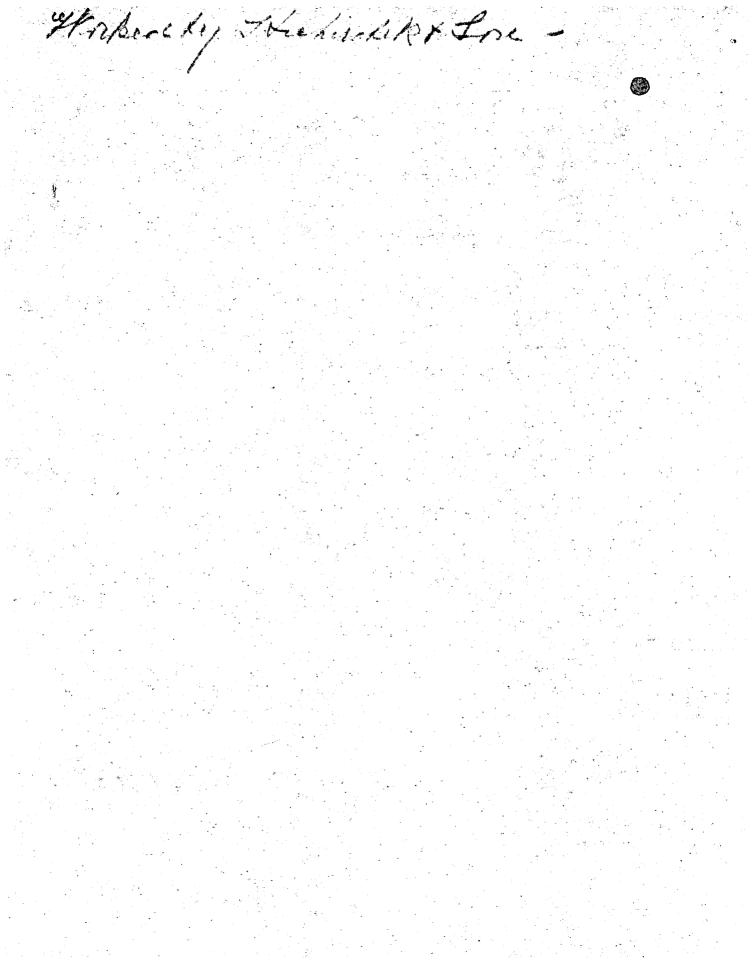


Work done by Pylyprix He hischele & Low and . here Fline porce. 

northy -No. 6. 6 feet Grand 1. Thee - 127- Just No - B-B- Interdence by Hubert Fun - 36-fut. Ne Dikie Sole NoO Hier Ister Elder N.G. 12 fret 5 feed 2 No Q three to the Care Beutmile & Jeet Beutmile balance Beutnuile clay touth .



J.E-29-57-1-54 the Nº2 Hole 17 feet & feek Cley - 6 feet murlauce Decelonice 3 feet Skale Hard Coal on Buttom -Nº (7) Hale - 10 feet Clay Lime ou Builone No 3)- 18 feet 5 1/2 G Beutonile 31/2 Beutmile lefect Shale Blue Land re Buttone



-W-29-57-1-58 nord S. Ditree 2 EX 0 Total - Ziz feet

Haked by Thedische to Inc

Unty-Now three 23 feet yellow clacy + faced 1 fla NOD Hree - 23 feet. Julen Clay & Shall

Wriked by Stechischer & Ine

Not 14feet -7 feet yeers hard clay Nº 6- 14 feet 7 feet A 7.9 feet 14 - Clay - 4 NO 10 feet 4 feet. Crae Share balence Jelem No 3- 21 feed fand & Clay hardfullow clay Nº 8-12 feet NO 10 feet laving Lance faud & Quels faud N 20 Hole & feet Land and Stone



all. Jottall, Drilling Holes. for. Bentonite

92 E. 22-57-1-5 5.6. 25-57-2-5 91.W. 22- 57-1-5 NE 21 11 11 u , 11  $SW_{121}$  w . 14 JW. 27, 11 a i ίİ 11 9.6. 27 įL. ł.  $\mathcal{U}_{\mathcal{L}}$ 58,30 tt 14 11 M.E. 20. " it . 11 Ą a. C. 21. 11 11 U. - (1

Jan Mark

314 fat 219 "" 678 11 11 82 11 11 3,6 63. 227 10 25 103 785 3562 put

2010 2 th 195-1 11726-94 at admande Non solting gruelo.

S. E. 14. sac, 30. Im. 57 - renge, 1- 5, maridion D. averhordon. Lowgrede. Bentonde Bentonili Dry. Hole YS Hole 4F.BI How 4.4.30 17 D F. Hale 124845 NOW 74 Note V.S. Hale D. Hall Nole XE 55 F X. 40.F.D Male XEUSF 0 Auch 1. one Hale 13 X. 75 G. X. 30, F. D. Hole Jottall. fat 1025; 58-30-57-1-5 Auter V. Pall and

M. E. 21-57-1-5 H. til 18. fut, elvy H.X. 16. pet. clay H.X. 22 fut. C HX.15 put C. H.X. 18. fut clay Sub - 15 Sule .--16. Holes. 14. but prom. le. inches to 7. fuit. Bentonite 7. fuit. 10. Holes. 14 fut prom. 18. inches to J. but Bentonite 18 pulis, Bentomile 4 Holes, Bentomile 10.18 but. 11. 14 fut. elay 6. Holes. cloy Tottall, 785 but 91821-57-1-5 Sul. - 9 Sub-

S.W. 21-57-1-5 Hole. 20 feet, 6. mehrs. Benbouile overborden. 18 but 16. fut. day x H Suli-5 S.W-21-57-1-5 Jottall put. 36 put Juli - 3 Juli-1

5.8.21-57-1-5 HX: 22, fut. cloy HX. 18. Jut, clay H.X. 20, fut. clay H.X.22 fut. clay sule S. Jule. 7 Jottoll 82 but 96.21-57-1-5 Juli - One. (1)

n e 20- 57 1-5 Hole: 36 fut clay E Hole, 7. 30, but E 20 fut, to Bentonite E 4. inches. Bentonite Hole X Kellens, clay 27. fuel elay Sule .-16 15 Juli Fattall, 103 but ME.20-57-- 5 le, 9 sule-10

n & 22-57-1-5 H.X.14 but clay HX14 f. clay HX.14 but  clay H. X. 14. but clay H.X.14, but, chuy HX. 14 fut. cloy H. 14. fut, elvy, H. XI Hipitelog Sub -- 16 Jule - 15 HX 14 but. clay H.X. 14 but. cloy HX.14. feet, chay H.X. 14 but choy HX 20. but clay HX14. fut clay H.X. 14, beet, cluy H.X. 14. feet clay HX. 14. but, clay 128.22-57-1-5 Jollall. - 314 put Suli - 9 Juli -- 10

(N.W. 22, -57 - 1 - 5 Hix. 14 put elvy H x. fut. clay H. X. fut. clay. 16. Holes. 14. fut. all Hix, 14, but clay Clay H. X. 14. fut. Chy. Hole V14, fee, C Jottall. 224. put. Tattall, 90, but day Sub. - 1H Sub. ---- 13' 7. Holes. 14 fut. Joltall. but \$98 clay 19. Holes. 14. but Tottell, feet, 266 elay Jottall 678 fet. chay MW22-57-1-5 Jul - 12

Senge, nobidion Joelion Jonship 92.8.14.27- 57-5 ſ H.X. Hole eloy. <u>H X</u> B. X. Bentonite HX. 16.F 6 HX16 F C HX-18, F C H.X. 18. F C H.X. 14. F C HX. 22. F. Hinch. B. owerborden, 20, F Sule, no. 16 Jule, No. 15 HX. 20, F G H.X. 22. F. C HX: 15- F. C H, X, 14, F. C HX. 12, F. C M.B. 27-57-1-5 H.X. 18, F. C Jottoll 227 fat HX, 22. F 6 Sale. no 10 Sule no. 9

soction. marichian 5 Tonship Unge. <u>3: W.14 27 - 57 -</u> H.X. Hole feet F. Clay H.X 12. F Ċ H.X. 21. F C Dule, no. 5 Jul no 6 H. X. 16 F C H.X. 14, F Ċ S. VA-257-1-55 Jollall, but 63 Jule. no. 4 Sule, no. 3.

Sollion Jonship nge maridiun 5. 8.14. 27 - 57-Hole  $H_{\cdot} X$ the elvy L. H.X.15 F B HX, 10, F C HX. 14 F. C H X. 16. F. C Jule, Jule. no. 7 7 NO. H.X. 12. F. 6  $\mathcal{C}$ HX. 16. F. 5.8.27-57-1-5 P HX14,F tall - 97 beet 2 NU.

5 E. 14. Dac. 95. Jon. 57 renge, 9. w-5 erhorden Bentonite ale. Fry. m. montmirillenite Ho 4. DH 14. F. XIIF D.H X D. X, H 1 P. H H +4 4 metus. 16 Fi. H Y, Jule, Guy 2 orie. X. O. 10 F. Mr. 10. F. 22 F. H 5 X 10. , ,) 5 8:25-57-1-5 Tattall fre 219 Duli, 7