

OIL FIELD RESEARCH LABORATORIES  
CHANUTE, KANSAS

January 9, 1952

Oko Oil & Gas Company  
Atlas Life Building  
Tulsa, Oklahoma

Attention: Mr. T. F. Lawry

Gentlemen:

Enclosed herewith is the report of the partial analysis of the 3" Rotary core taken from the Herman Lease, Well No. A-15, Anderson County, Kansas, and submitted to our laboratory on December 29, 1951.

In calculating the recovery for the area represented by this core, an allowance was made for oil lost during coring, and it was assumed that the true water saturation of the sand is 38 percent. This core shows a fairly good thickness of pay sand, but it is quite badly broken up by numerous layers of shale and shaley sandstone. Also the sand, for the most part, is rather tight, especially, in the upper and middle sections.

Very truly yours,

OIL FIELD RESEARCH LABORATORIES

Fred O. Stenger

FOH:bl

c.c. to Mr. D. E. Auld

OKO OIL & GAS COMPANY

CORE ANALYSIS REPORT

HERMAN LEASE      WELL NO. A-15

ANDERSON COUNTY, KANSAS

OIL FIELD RESEARCH LABORATORIES

CHANDLER, KANSAS

JANUARY 8, 1952

# Oil Field Research Laboratories

## GENERAL INFORMATION & SUMMARY

Company Oko Oil & Gas Company Lease Herman Well No. A-15

Location \_\_\_\_\_

Section 15 Twp. 21S Rge. 20E County Anderson State Kansas

|                              |                   |                 |
|------------------------------|-------------------|-----------------|
| Name of Sand                 |                   | <b>Squirrel</b> |
| Top of Core                  |                   | <b>778.00</b>   |
| Bottom of Core               |                   | <b>825.70</b>   |
| Top of Sand                  |                   | <b>786.70</b>   |
| Bottom of Sand               |                   | <b>824.15</b>   |
| Total Feet of Permeable Sand | <b>(Analyzed)</b> | <b>22.56</b>    |
| Total Feet of Floodable Sand | <b>(Analyzed)</b> | <b>21.31</b>    |

|                                 |      |          |
|---------------------------------|------|----------|
| Distribution of Permeable Sand: |      |          |
| Permeability Range              | Feet | Cum. Ft. |
| Millidarcys                     |      |          |

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| <b>Effective</b>                                                |                |
| Average Permeability Millidarcys                                | <b>1.09</b>    |
| Average Percent Porosity                                        | <b>17.82</b>   |
| Average Percent Oil Saturation                                  | <b>42.20</b>   |
| Average Percent Water Saturation                                | <b>-</b>       |
| Average Oil Content, Bbls./A. Ft.                               | <b>607.</b>    |
| Total Oil Content, Bbls./Acre                                   | <b>18,006.</b> |
| Average Percent Oil Recovery by Laboratory Flooding Tests       | <b>16.72</b>   |
| Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. | <b>247.</b>    |
| Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre     | <b>5,575.</b>  |
| Total Calculated Oil Recovery, Bbls./Acre                       | <b>3450.</b>   |
| Packer Setting, Feet                                            |                |
| Viscosity, Centipoises @                                        |                |
| A. P. I. Gravity, degrees @ 60 °F                               |                |
| Elevation, Feet                                                 |                |

OIL FIELD RESEARCH LABORATORIES  
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LOG

Company Oko Oil & Gas Company Lease Herman Well No. A-15

| <u>Depth Interval,<br/>Feet</u> | <u>Description</u>                                                |
|---------------------------------|-------------------------------------------------------------------|
| 778.00 - 778.55                 | - Laminated sandy shale.                                          |
| 778.55 - 780.10                 | - Gray shale.                                                     |
| 780.10 - 780.30                 | - Laminated sandy shale.                                          |
| 780.30 - 781.75                 | - Gray shale.                                                     |
| 781.75 - 783.75                 | - Laminated sandy shale.                                          |
| 783.75 - 784.95                 | - Laminated sandstone and shale.                                  |
| 784.95 - 785.85                 | - Gray shale.                                                     |
| 785.85 - 787.20                 | - Finely laminated shaley sandstone.                              |
| 787.20 - 787.75                 | - Laminated sandy shale.                                          |
| 787.75 - 788.60                 | - Gray shale.                                                     |
| 788.60 - 789.35                 | - Brown fine grained finely laminated micaceous shaley sandstone. |
| 789.35 - 789.75                 | - Finely laminated sandy shale.                                   |
| 789.75 - 789.90                 | - Gray shale.                                                     |
| 789.90 - 790.12                 | - Light brown fine grained micaceous shaley sandstone.            |
| 790.12 - 795.45                 | - Laminated sandy shale.                                          |
| 795.45 - 800.35                 | - Brown fine grained micaceous sandstone.                         |
| 800.35 - 801.75                 | - Finely laminated sandy shale.                                   |
| 801.75 - 803.10                 | - Brown fine grained micaceous sandstone.                         |
| 803.10 - 803.80                 | - Sandy shale.                                                    |
| 803.80 - 804.95                 | - Gray shale.                                                     |
| 804.95 - 805.45                 | - Laminated sandstone and shale.                                  |
| 805.45 - 806.05                 | - Brown fine grained laminated micaceous shaley sandstone.        |
| 806.05 - 807.15                 | - Brown fine grained micaceous sandstone.                         |
| 807.15 - 807.40                 | - Gray sandy shale.                                               |

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- 807.40 - 807.68 - Brown fine grained micaceous sandstone.  
807.68 - 808.40 - Laminated sandy shale.  
808.40 - 809.65 - Brown fine grained micaceous sandstone.  
809.65 - 810.00 - Gray sandy shale.  
810.00 - 810.68 - Brown fine grained micaceous sandstone containing a shale break.  
810.68 - 810.90 - Gray shale.  
810.90 - 811.55 - Brown fine grained micaceous sandstone.  
811.55 - 811.80 - Gray shale.  
811.80 - 814.35 - Brown fine grained micaceous sandstone.  
814.35 - 815.90 - Laminated sandstone and shale.  
815.90 - 816.75 - Brown fine grained laminated micaceous slightly shaley sandstone.  
816.75 - 818.40 - Brown fine grained micaceous sandstone.  
818.40 - 818.70 - Gray shale.  
818.70 - 818.90 - Laminated sandstone and shale.  
818.90 - 821.20 - Brown fine grained micaceous sandstone.  
821.20 - 824.15 - Dark brown fine grained micaceous sandstone.  
824.15 - 824.35 - Brown fine grained micaceous shaley sandstone.  
824.35 - 824.70 - Dark brown fine grained micaceous sandstone.  
824.70 - 825.05 - Sandy limestone.  
825.05 - 825.70 - Dark gray shale.

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## RESULTS OF SATURATION TESTS

TABLE III

Oke Oil & Gas Company

Herman

A-15

Lease

Well No.

Company

| Sat. No. | Depth, Feet | Effective Porosity Percent | Percent Saturation |       |       | Oil Content, Bbls./A. Ft. | Feet of Core |          | Total Oil Content Bbls./Acre |
|----------|-------------|----------------------------|--------------------|-------|-------|---------------------------|--------------|----------|------------------------------|
|          |             |                            | Oil                | Water | Total |                           | Ft.          | Cum. Ft. |                              |
| 2        | 780.20      | 13.7                       | 36.1               | -     | -     | 384                       | 0.20         | 0.20     | 77                           |
| 3        | 786.30      | 15.9                       | 42.1               | -     | -     | 520                       | 0.85         | 1.05     | 442                          |
| 6        | 787.05      | 18.1                       | 42.0               | -     | -     | 592                       | 0.50         | 1.55     | 296                          |
| 7        | 789.20      | 17.5                       | 56.2               | -     | -     | 764                       | 0.75         | 2.30     | 573                          |
| 8A       | 790.08      | 20.4                       | 35.1               | -     | -     | 557                       | 0.22         | 2.52     | 123                          |
| 9        | 791.05      | 13.5                       | 24.1               | -     | -     | 252                       | 1.18         | 3.70     | 298                          |
| 10       | 791.70      | 14.1                       | 32.7               | -     | -     | 358                       | 1.00         | 4.70     | 358                          |
| 11       | 792.87      | 13.0                       | 22.3               | -     | -     | 225                       | 1.00         | 5.70     | 225                          |
| 13       | 794.25      | 13.1                       | 12.5               | -     | -     | 127                       | 1.30         | 7.00     | 165                          |
| 14       | 794.95      | 13.8                       | 19.5               | -     | -     | 209                       | 0.85         | 7.85     | 178                          |
| 15       | 795.60      | 19.6                       | 37.6               | -     | -     | 572                       | 0.95         | 8.80     | 544                          |
| 17       | 797.35      | 19.3                       | 36.4               | -     | -     | 545                       | 1.30         | 10.10    | 708                          |
| 18       | 798.10      | 20.2                       | 33.9               | -     | -     | 688                       | 0.80         | 10.90    | 550                          |
| 19       | 798.95      | 20.2                       | 43.6               | -     | -     | 841                       | 0.90         | 11.80    | 757                          |
| 20       | 799.80      | 20.6                       | 40.2               | -     | -     | 642                       | 0.95         | 12.75    | 610                          |
| 23       | 801.90      | 19.2                       | 48.5               | -     | -     | 723                       | 0.65         | 13.40    | 470                          |
| 24       | 802.88      | 18.9                       | 53.0               | -     | -     | 777                       | 0.70         | 14.10    | 545                          |

# Oil Field Research Laboratories

## RESULTS OF SATURATION TESTS

TABLE III

Company Oke Oil & Gas Company Lease Herman Well No. A-13

| Sat. No. | Depth, Feet | Effective Porosity Percent | Percent Saturation |       |       | Oil Content, Bbls./A. Ft. | Feet of Core |          | Total Oil Content Bbls./Acre |
|----------|-------------|----------------------------|--------------------|-------|-------|---------------------------|--------------|----------|------------------------------|
|          |             |                            | Oil                | Water | Total |                           | Ft.          | Cum. Ft. |                              |
| 27       | 805.35      | 15.8                       | 39.5               | -     | -     | 485                       | 0.50         | 14.60    | 242                          |
| 28       | 806.20      | 18.2                       | 52.4               | -     | -     | 742                       | 1.10         | 15.70    | 615                          |
| 30       | 807.55      | 21.6                       | 49.7               | -     | -     | 666                       | 0.28         | 15.98    | 187                          |
| 31       | 808.30      | 14.3                       | 38.3               | -     | -     | 426                       | 0.72         | 16.70    | 307                          |
| 32       | 809.30      | 18.6                       | 46.4               | -     | -     | 671                       | 1.25         | 17.95    | 839                          |
| 33       | 810.10      | 19.0                       | 40.5               | -     | -     | 597                       | 0.56         | 18.51    | 334                          |
| 34       | 811.05      | 20.3                       | 51.3               | -     | -     | 809                       | 0.65         | 19.16    | 526                          |
| 35       | 812.02      | 19.0                       | 43.2               | -     | -     | 666                       | 1.00         | 20.16    | 666                          |
| 37       | 813.70      | 19.1                       | 42.5               | -     | -     | 631                       | 1.55         | 21.71    | 977                          |
| 38       | 814.55      | 17.9                       | 48.0               | -     | -     | 666                       | 0.20         | 21.91    | 133                          |
| 40       | 815.95      | 16.4                       | 50.3               | -     | -     | 640                       | 0.85         | 22.76    | 544                          |
| 41       | 817.05      | 18.9                       | 56.2               | -     | -     | 824                       | 0.75         | 23.51    | 617                          |
| 42       | 818.05      | 19.2                       | 54.7               | -     | -     | 816                       | 0.90         | 24.41    | 735                          |
| 43       | 819.30      | 19.9                       | 43.8               | -     | -     | 678                       | 0.80         | 25.21    | 542                          |
| 44       | 820.05      | 19.1                       | 47.1               | -     | -     | 698                       | 0.90         | 26.11    | 629                          |
| 45       | 821.05      | 19.1                       | 46.5               | -     | -     | 690                       | 0.60         | 26.71    | 414                          |
| 46       | 822.05      | 19.6                       | 54.5               | -     | -     | 829                       | 1.40         | 28.11    | 1,160                        |
| 48       | 823.55      | 19.2                       | 61.5               | -     | -     | 916                       | 1.55         | 29.66    | 1,420                        |
| Total -  |             |                            |                    |       |       |                           | -            | -        | 18,006                       |

Note: "A" - Sample was taken from core after it was received in the laboratory.

# Oil Field Research Laboratories

## SUMMARY OF SATURATION TESTS

TABLE IV

| Company                 | Okro Oil & Gas Company   | Lease                          | Herman                               | Well No.                               | A-15                                  |                                    |
|-------------------------|--------------------------|--------------------------------|--------------------------------------|----------------------------------------|---------------------------------------|------------------------------------|
| Depth Interval,<br>Feet | Feet of Core<br>Analyzed | Average<br>Percent<br>Porosity | Average<br>Percent Oil<br>Saturation | Average<br>Percent Water<br>Saturation | Average<br>Oil Content<br>Bbl./A. Ft. | Total Oil<br>Content<br>Bbls./Acre |
| 780.10-795.45           | 7.85                     | 14.60                          | 29.31                                | -                                      | 348                                   | 2,735                              |
| 795.45-816.40           | 16.56                    | 18.86                          | 44.96                                | -                                      | 671                                   | 11,106                             |
| 816.90-824.15           | 5.25                     | 19.39                          | 52.76                                | -                                      | 793                                   | 4,166                              |
| 780.10-824.15           | 29.66                    | 17.82                          | 42.20                                | -                                      | 607                                   | 15,006                             |



## RESULTS OF LABORATORY FLOODING TESTS

Company Dico Oil & Gas Company Lease Holman Well No. 4-18

Notes: cc - cubic centimeter  
\* - Volume of water recovered at the time of maximum oil recovery.  
\*\* - Determined by passing water through sample which still contains residual oil.  
"A" - Sample was taken from core after it was received in the laboratory.



# Oil Field Research Laboratories

## RESULTS OF LABORATORY FLOODING TESTS

TABLE V

Company One Oil & Gas Company

Lease Herman

Well No. A-15

| Sample No. | Depth, Feet | Effective Porosity Percent | Original Oil Saturation |              | Oil Recovery |              | Residual Saturation |         |              | Volume of Water Recovered cc* | Effective Permeability, Millidarcys ** | Initial Fluid Production Pressure Lbs./Sq. In. |
|------------|-------------|----------------------------|-------------------------|--------------|--------------|--------------|---------------------|---------|--------------|-------------------------------|----------------------------------------|------------------------------------------------|
|            |             |                            | Percent                 | Bbls./A. Ft. | Percent      | Bbls./A. Ft. | % Oil               | % Water | Bbls./A. Ft. |                               |                                        |                                                |
| 2          | 780.20      | 13.7                       | 36.1                    | 364          | 0.0          | 0            | 36.1                | 57.6    | 364          | 0                             | Imp.                                   | 50+                                            |
| 5          | 786.30      | 15.9                       | 42.1                    | 320          | 0.0          | 0            | 42.1                | 53.7    | 320          | 0                             | Imp.                                   | 50+                                            |
| 6          | 787.05      | 18.1                       | 42.0                    | 532          | 5.6          | 52           | 56.2                | 52.7    | 510          | 29                            | 0.700                                  | 25                                             |
| 7          | 789.20      | 17.5                       | 56.2                    | 784          | 12.1         | 164          | 44.1                | 55.4    | 600          | 0                             | 0.014                                  | 50                                             |
| 8A         | 790.08      | 20.4                       | 55.1                    | 537          | 3.3          | 32           | 31.5                | 55.0    | 505          | 103                           | 2.97                                   | 15                                             |
| 9          | 791.05      | 13.5                       | 24.1                    | 552          | 0.0          | 0            | 24.1                | 55.7    | 252          | 0                             | Imp.                                   | 50+                                            |
| 10         | 791.70      | 14.1                       | 32.7                    | 358          | 0.0          | 0            | 32.7                | 63.4    | 358          | 0                             | Imp.                                   | 50+                                            |
| 11         | 792.87      | 15.0                       | 22.5                    | 225          | 0.0          | 0            | 22.3                | 75.7    | 225          | 0                             | Imp.                                   | 50+                                            |
| 13         | 794.25      | 13.1                       | 12.5                    | 127          | 0.0          | 0            | 12.5                | 79.2    | 127          | 0                             | Imp.                                   | 50+                                            |
| 14         | 794.95      | 13.8                       | 19.5                    | 209          | 0.0          | 0            | 19.5                | 76.2    | 209          | 0                             | Imp.                                   | 50+                                            |
| 15         | 795.60      | 19.6                       | 37.6                    | 572          | 4.1          | 62           | 35.5                | 64.0    | 510          | 27                            | 0.510                                  | 25                                             |
| 17         | 797.56      | 19.3                       | 36.4                    | 545          | 9.1          | 136          | 27.3                | 67.3    | 409          | 33                            | 0.620                                  | 20                                             |
| 18         | 798.10      | 20.2                       | 35.9                    | 666          | 7.8          | 123          | 28.1                | 61.1    | 553          | 60                            | 1.12                                   | 20                                             |
| 19         | 798.95      | 20.2                       | 43.6                    | 541          | 19.5         | 306          | 24.1                | 65.9    | 555          | 40                            | 0.633                                  | 20                                             |
| 20         | 799.00      | 20.6                       | 60.2                    | 643          | 12.3         | 196          | 27.9                | 67.2    | 444          | 66                            | 1.64                                   | 20                                             |
| 23         | 801.90      | 19.2                       | 48.5                    | 723          | 18.9         | 282          | 29.6                | 67.0    | 441          | 50                            | 1.47                                   | 20                                             |
| 24         | 802.68      | 18.9                       | 53.0                    | 777          | 27.8         | 407          | 25.2                | 71.5    | 370          | 55                            | 1.68                                   | 15                                             |
| 27         | 805.35      | 15.6                       | 39.5                    | 485          | 9.5          | 117          | 30.0                | 68.1    | 369          | 0                             | 0.018                                  | 40                                             |
| 28         | 806.20      | 16.2                       | 32.4                    | 742          | 25.0         | 328          | 29.4                | 62.6    | 418          | 14                            | 0.401                                  | 15                                             |
| 30         | 807.55      | 21.6                       | 49.7                    | 686          | 16.6         | 278          | 25.1                | 71.3    | 388          | 105                           | 2.97                                   | 15                                             |
| 31         | 808.50      | 14.3                       | 36.3                    | 426          | 0.0          | 0            | 38.2                | 58.5    | 426          | 0                             | Imp.                                   | 50+                                            |
| 32         | 809.50      | 18.6                       | 46.4                    | 671          | 18.0         | 260          | 28.4                | 62.8    | 411          | 12                            | 0.435                                  | 20                                             |
| 33         | 810.10      | 19.0                       | 40.5                    | 597          | 10.8         | 159          | 29.7                | 67.9    | 438          | 19                            | 0.500                                  | 25                                             |
| 34         | 811.05      | 20.3                       | 51.3                    | 609          | 17.6         | 278          | 33.7                | 61.0    | 531          | 25                            | 0.650                                  | 20                                             |
| 35         | 812.02      | 19.0                       | 45.2                    | 666          | 12.5         | 204          | 25.9                | 65.7    | 382          | 23                            | 0.787                                  | 20                                             |
| 37         | 813.70      | 19.1                       | 42.5                    | 631          | 13.5         | 227          | 27.2                | 68.4    | 404          | 38                            | 1.02                                   | 20                                             |
| 38         | 814.55      | 17.9                       | 48.0                    | 666          | 24.5         | 344          | 25.2                | 72.0    | 322          | 19                            | 0.532                                  | 15                                             |
| 40         | 815.95      | 16.4                       | 50.3                    | 640          | 18.5         | 207          | 34.0                | 60.4    | 433          | 1                             | 0.100                                  | 30                                             |
| 41         | 817.05      | 18.9                       | 56.2                    | 824          | 25.2         | 378          | 30.4                | 61.9    | 446          | 14                            | 0.454                                  | 20                                             |
| 42         | 818.05      | 19.2                       | 54.7                    | 616          | 25.6         | 351          | 31.1                | 60.4    | 465          | 22                            | 0.569                                  | 15                                             |

# Oil Field Research Laboratories

## SUMMARY OF LABORATORY FLOODING TESTS

TABLE VI

| Company                                           | Oko Oil & Gas Company | Lease   | Herman | Well No. |
|---------------------------------------------------|-----------------------|---------|--------|----------|
|                                                   |                       |         |        | A-15     |
| Depth Interval Feet                               | 786.70                | 795.45  | 818.90 | 786.70   |
| Feet of Core Analyzed                             | 790.12                | 818.40  | 824.15 | 824.15   |
| Average Percent Porosity                          | 1.47                  | 15.84   | 5.25   | 22.56    |
| Average Percent Original Oil Saturation           | 15.16                 | 19.07   | 19.39  | 19.08    |
| Average Percent Oil Recovery                      | 48.16                 | 45.05   | 52.78  | 47.05    |
| Average Percent Residual Oil Saturation           | 8.64                  | 16.44   | 19.85  | 16.72    |
| Average Percent Residual Water Saturation         | 39.32                 | 28.61   | 32.93  | 30.33    |
| Average Percent Total Residual Fluid Saturation   | 59.31                 | 65.05   | 62.13  | 64.00    |
| Average Original Oil Content, Bbls./A. Ft.        | 98.83                 | 93.66   | 95.06  | 94.33    |
| Average Oil Recovery, Bbls./A. Ft.                | 674.                  | 682.    | 793.   | 707.     |
| Average Residual Oil Content, Bbls./A. Ft.        | 119.                  | 242.    | 298.   | 247.     |
| Total Original Oil Content, Bbls./Acre            | 555.                  | 440.    | 495.   | 460.     |
| Total Oil Recovery, Bbls./Acre                    | 991.                  | 10,803. | 4,164. | 15,958.  |
| Total Residual Oil Content, Bbls./Acre            | 175.                  | 5,836.  | 1,564. | 5,579.   |
| Average Effective Permeability, Millidarcys       | 816.                  | 6,967.  | 2,800. | 10,383.  |
| Average Initial Fluid Production Pressure, p.s.i. | 0.690                 | 0.811   | 2.03   | 1.09     |
|                                                   | 23.3                  | 20.8    | 16.0   | 20.2     |

NOTE: Only those samples which recovered oil were used in calculating the above averages.