



# OILFIELD RESEARCH LABORATORIES

536 NORTH HIGHLAND - CHANUTE, KANSAS 66720 - PHONE (316) 431-2650

July 23, 1979

Rantoul Industries  
Route #1, Box 99  
Rantoul, Kansas 66079

Gentlemen:

Enclosed herewith is the report of the analysis of the rotary core taken from the Judson B Lease, Well No. 1, Franklin County, Kansas, and submitted to our laboratory on July 12, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

*Benjamin R. Pearman*  
Benjamin R. Pearman

BRP:dlb

5 c to Rantoul, Kansas

# Oilfield Research Laboratories

## GENERAL INFORMATION & SUMMARY

|          |                    |        |          |          |              |
|----------|--------------------|--------|----------|----------|--------------|
| Company  | Rantoul Industries | Lease  | Judson B | Well No. | 1            |
| Location | 300' NSL & 90' EWL |        |          |          |              |
| Section  | 23                 | Twp    | 17S      | Rge.     | 21E          |
|          |                    | County | Franklin |          | State Kansas |

  

|                              |       |
|------------------------------|-------|
| Name of Sand                 | Peru  |
| Top of Core                  | 343.0 |
| Bottom of Core               | 361.3 |
| Top of Sand                  | 343.0 |
| Bottom of Sand               | 361.3 |
| Total Feet of Permeable Sand | 18.3  |
| Total Feet of Floodable Sand | 14.8  |

  

| Distribution of Permeable Sand:<br>Permeability Range<br>Millidarcys | Feet | Cum. Ft. |
|----------------------------------------------------------------------|------|----------|
| 0 - 10                                                               | 2.5  | 2.5      |
| 10 - 50                                                              | 8.4  | 10.9     |
| 50 - 100                                                             | 5.6  | 16.5     |
| 100 & Above                                                          | 1.8  | 18.3     |

  

|                                                                     |        |
|---------------------------------------------------------------------|--------|
| Average Permeability Millidarcys                                    | 51.1   |
| Average Percent Porosity                                            | 20.8   |
| Average Percent Oil Saturation                                      | 29.6   |
| Average Percent Water Saturation                                    | 50.0   |
| Average Oil Content, Bbls./A. Ft.                                   | 475.   |
| Total Oil Content, Bbls./Acre                                       | 8,697. |
| Average Percent Oil Recovery by Laboratory Flooding Tests           | 3.8    |
| Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft.     | 62.    |
| Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre         | 768.   |
| Total Calculated Oil Recovery, Bbls./Acre (Primary & waterflooding) | 3,900. |
| Packer Setting, Feet                                                |        |
| Viscosity, Centipoises @                                            |        |
| A. P. I. Gravity, degrees @ 60 °F                                   |        |
| Elevation, Feet                                                     |        |

# Oilfield Research Laboratories

## GENERAL INFORMATION & SUMMARY

Company Rantoul Industries Lease Judson B Well No. 1

Location 300' NSL & 90' EWL

Section 23 Twp. 17S Rge. 21E County Franklin State Kansas

Name of Sand - - - - - Upper Squirrel

Top of Core - - - - - 498.0

Bottom of Core - - - - - 518.0

Top of Sand - - - - - 498.0

Bottom of Sand - - - - - 518.0

Total Feet of Permeable Sand - - - - - 19.1

Total Feet of Floodable Sand - - - - - 8.1

Distribution of Permeable Sand:  
Permeability Range  
Millidarcys

Feet

Cum. Ft.

|         |      |      |
|---------|------|------|
| 0 - 5   | 12.1 | 12.1 |
| 5 - 10  | 3.9  | 16.0 |
| 10 - 13 | 3.1  | 19.1 |

Average Permeability Millidarcys - - - - - 5.2

Average Percent Porosity - - - - - 17.9

Average Percent Oil Saturation - - - - - 37.9

Average Percent Water Saturation - - - - - 50.6

Average Oil Content, Bbls./A. Ft. - - - - - 529.

Total Oil Content, Bbls./Acre - - - - - 10,109.

Average Percent Oil Recovery by Laboratory Flooding Tests - - - - - 11.6

Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - - 172.

Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - - 1,222.

Total Calculated Oil Recovery, Bbls./Acre (Primary & waterflooding) 2,060.

Packer Setting, Feet - - - - -

Viscosity, Centipoises @ - - - - -

A. P. I. Gravity, degrees @ 60 °F - - - - -

Elevation, Feet - - - - -

# Oilfield Research Laboratories

## GENERAL INFORMATION & SUMMARY

|                                                                           |                    |        |          |          |                |
|---------------------------------------------------------------------------|--------------------|--------|----------|----------|----------------|
| Company                                                                   | Rantoul Industries | Lease  | Judson B | Well No. | 1              |
| Location                                                                  | 300' NSL & 90' EWL |        |          |          |                |
| Section                                                                   | 23                 | Twp.   | 17S      | Rge.     | 21E            |
|                                                                           |                    | County | Franklin |          | State Kansas   |
| Name of Sand                                                              | - - - - -          |        |          |          | Lower Squirrel |
| Top of Core                                                               | - - - - -          |        |          |          | 575.0          |
| Bottom of Core                                                            | - - - - -          |        |          |          | 581.0          |
| Top of Sand                                                               | - - - - -          |        |          |          | 575.0          |
| Bottom of Sand                                                            | - - - - -          |        |          |          | 581.0          |
| Total Feet of Permeable Sand                                              | - - - - -          |        |          |          | 3.0            |
| Total Feet of Floodable Sand                                              | - - - - -          |        |          |          | 0.0            |
| Distribution of Permeable Sand:                                           |                    |        |          |          |                |
| Permeability Range<br>Millidarcys                                         | Feet               |        | Cum. Ft. |          |                |
| 0 - 1.0                                                                   | 2.0                |        | 2.0      |          |                |
| 1.0 & Above                                                               | 1.0                |        | 3.0      |          |                |
| Average Permeability Millidarcys - - - - -                                |                    |        |          |          |                |
|                                                                           |                    |        |          |          | 5.5            |
| Average Percent Porosity - - - - -                                        |                    |        |          |          |                |
|                                                                           |                    |        |          |          | 15.9           |
| Average Percent Oil Saturation - - - - -                                  |                    |        |          |          |                |
|                                                                           |                    |        |          |          | 27.8           |
| Average Percent Water Saturation - - - - -                                |                    |        |          |          |                |
|                                                                           |                    |        |          |          | 60.0           |
| Average Oil Content, Bbls./A. Ft. - - - - -                               |                    |        |          |          |                |
|                                                                           |                    |        |          |          | 345.           |
| Total Oil Content, Bbls./Acre - - - - -                                   |                    |        |          |          |                |
|                                                                           |                    |        |          |          | 2,070.         |
| Average Percent Oil Recovery by Laboratory Flooding Tests - - - - -       |                    |        |          |          |                |
|                                                                           |                    |        |          |          | 0.             |
| Average Oil Recovery by Laboratory Flooding Tests, Bbls./A. Ft. - - - - - |                    |        |          |          |                |
|                                                                           |                    |        |          |          | 0.             |
| Total Oil Recovery by Laboratory Flooding Tests, Bbls./Acre - - - - -     |                    |        |          |          |                |
|                                                                           |                    |        |          |          | 0.             |
| Total Calculated Oil Recovery, Bbls./Acre - - - - -                       |                    |        |          |          |                |
|                                                                           |                    |        |          |          | 0.             |
| Packer Setting, Feet - - - - -                                            |                    |        |          |          |                |
| Viscosity, Centipoises @ - - - - -                                        |                    |        |          |          |                |
| A. P. I. Gravity, degrees @ 60 °F - - - - -                               |                    |        |          |          |                |
| Elevation, Feet - - - - -                                                 |                    |        |          |          |                |

These cores were sampled by a representative of Oilfield Research Laboratories. Fresh water mud was used as the coring fluid.

### FORMATION CORED

The detailed log of the formation cored is as follows:

| <u>Depth Interval,<br/>Feet</u> | <u>Description</u>                                           | <u>Peru Sand</u> |
|---------------------------------|--------------------------------------------------------------|------------------|
| 343.0 - 347.2                   | Brown and gray slightly laminated sandstone and shale.       |                  |
| 347.2 - 348.6                   | Brown and gray laminated calcareous sandstone and limestone. |                  |
| 348.6 - 350.0                   | Brown slightly calcareous sandstone.                         |                  |
| 350.0 - 351.1                   | Brownish gray very calcareous sandstone.                     |                  |
| 351.1 - 352.3                   | Brown slightly calcareous sandstone.                         |                  |
| 352.3 - 353.1                   | Brown very calcareous sandstone.                             |                  |
| 353.1 - 353.7                   | Brown slightly calcareous sandstone.                         |                  |
| 353.7 - 359.2                   | Brown calcareous sandstone.                                  |                  |
| 359.2 - 360.3                   | Brown and gray laminated sandstone and shale.                |                  |
| 360.3 - 361.3                   | Brown slightly calcareous sandstone.                         |                  |

### Upper Squirrel Sand

|               |                                 |
|---------------|---------------------------------|
| 498.0 - 499.1 | Brown sandstone.                |
| 499.1 - 500.0 | Brown slightly shaly sandstone. |
| 500.0 - 504.0 | Brown sandstone.                |
| 504.0 - 508.9 | Brown shaly sandstone.          |
| 508.9 - 509.8 | Brown slightly shaly sandstone. |
| 509.8 - 516.1 | Brown shaly sandstone.          |
| 516.1 - 517.0 | Gray sandy shale.               |
| 517.0 - 518.0 | Brown shaly sandstone.          |

Lower Squirrel

|               |                                                    |
|---------------|----------------------------------------------------|
| 575.0 - 576.0 | Brown slightly laminated slightly shaly sandstone. |
| 576.0 - 581.0 | Brown and gray laminated sandstone and shale.      |

LABORATORY FLOODING TESTS

The sand in the Peru and Upper Squirrel cores responded to laboratory flooding tests, as a total recovery of 768 and 1,222 barrels of oil per acre was obtained from 12.4 and 7.1 feet of sand respectively. The weighted average effective permeabilities of the Peru and Upper Squirrel are 1.61 and 0.17 millidarcys, while the average initial fluid production pressure is 21.6 and 35.7 pounds per square inch respectively (See Table V).

CALCULATED RECOVERY

A study of the laboratory data indicates that efficient primary and waterflooding operations in the vicinity of this well should recover approximately 3,900 and 2,060 barrels of oil per acre from the Peru and Upper Squirrel reservoirs. The above values represent average recoveries of 263 and 254 barrels per acre foot from the 14.8 and 8.1 feet of floodable sand analyzed in the Peru and Upper Squirrel cores respectively.

These recovery values were calculated using the following data and assumptions:

|                                        | <u>Peru</u> | <u>Upper Squirrel</u> |
|----------------------------------------|-------------|-----------------------|
| Original formation volume factor       | 1.03        | 1.04                  |
| Reservoir water saturation, percent    | 35.0        | 30.0                  |
| Average porosity, percent              | 21.0        | 19.5                  |
| Oil saturation after flooding, percent | 27.2        | 30.0                  |
| Performance factor, percent            | 45.0        | 45.0                  |
| Net floodable pay sand, feet           | 14.8        | 8.1                   |

## RESULTS OF SATURATION &amp; PERMEABILITY TESTS

TABLE 1-B

| Sample No. | Depth, Feet | Effective Porosity Percent | Percent Saturation |       |       | Oil Content Bbls. / A Ft. | Perm., Mill. | Feet of Sand |          | Total Oil Content | Perm. Capacity Ft. X md. |
|------------|-------------|----------------------------|--------------------|-------|-------|---------------------------|--------------|--------------|----------|-------------------|--------------------------|
|            |             |                            | Oil                | Water | Total |                           |              | Ft.          | Cum. Ft. |                   |                          |
| 1          | 343.5       | 23.7                       | 20                 | 56    | 76    | PERU SAND                 | 31.          | 1.0          | 1.0      | 388               | 31.00                    |
| 2          | 344.7       | 25.3                       | 27                 | 52    | 79    |                           | 67.          | 1.0          | 2.0      | 530               | 67.00                    |
| 3          | 345.5       | 25.0                       | 31                 | 52    | 83    |                           | 22.          | 1.0          | 3.0      | 601               | 22.00                    |
| 4          | 346.6       | 23.9                       | 33                 | 49    | 82    |                           | 39.          | 1.2          | 4.2      | 735               | 46.80                    |
| 5          | 347.5       | 18.0                       | 40                 | 57    | 97    |                           | 0.70         | 0.8          | 5.0      | 447               | 0.56                     |
| 6          | 348.4       | 17.6                       | 31                 | 45    | 76    |                           | 2.6          | 0.6          | 5.6      | 254               | 1.56                     |
| 7          | 349.5       | 17.1                       | 27                 | 48    | 75    |                           | 97.          | 1.4          | 7.0      | 501               | 135.80                   |
| 8          | 350.3       | 18.2                       | 34                 | 41    | 75    |                           | 3.4          | 1.1          | 8.1      | 470               | 3.74                     |
| 9          | 351.5       | 19.9                       | 31                 | 51    | 82    |                           | 84.          | 1.2          | 9.3      | 575               | 100.80                   |
| 10         | 352.5       | 19.0                       | 30                 | 52    | 82    |                           | 13.          | 0.8          | 10.1     | 354               | 10.40                    |
| 11         | 353.5       | 22.8                       | 31                 | 45    | 76    |                           | 103.         | 0.6          | 10.7     | 328               | 61.80                    |
| 12         | 354.5       | 20.7                       | 28                 | 49    | 77    |                           | 31.          | 1.3          | 12.0     | 585               | 40.30                    |
| 13         | 355.5       | 18.5                       | 28                 | 54    | 82    |                           | 45.          | 1.0          | 13.0     | 402               | 45.00                    |
| 14         | 356.8       | 22.6                       | 27                 | 50    | 77    |                           | 33.          | 1.0          | 14.0     | 473               | 33.00                    |
| 15         | 357.5       | 20.3                       | 40                 | 37    | 77    |                           | 99.          | 1.0          | 15.0     | 630               | 99.00                    |
| 16         | 358.5       | 20.7                       | 31                 | 53    | 84    |                           | 133.         | 1.2          | 16.2     | 597               | 159.60                   |
| 17         | 359.8       | 21.3                       | 21                 | 63    | 84    |                           | 13.          | 1.1          | 17.3     | 382               | 14.30                    |
| 18         | 360.8       | 20.5                       | 28                 | 44    | 72    |                           | 62.          | 1.0          | 18.3     | 445               | 62.00                    |
| 19         | 498.9       | 20.3                       | 27                 | 59    | 86    | UPPER SQUIRREL SAND       | 11.          | 1.1          | 1.1      | 468               | 12.10                    |
| 20         | 499.5       | 16.1                       | 25                 | 50    | 75    |                           | 3.0          | 0.9          | 2.0      | 281               | 2.70                     |
| 21         | 500.8       | 18.5                       | 33                 | 55    | 88    |                           | 11.          | 1.0          | 3.0      | 474               | 11.00                    |
| 22         | 501.5       | 19.8                       | 26                 | 53    | 79    |                           | 7.9          | 1.0          | 4.0      | 399               | 7.90                     |
| 23         | 502.5       | 18.7                       | 44                 | 44    | 88    |                           | 3.3          | 1.0          | 5.0      | 638               | 3.30                     |
| 24         | 503.8       | 21.3                       | 33                 | 52    | 85    |                           | 13.          | 1.0          | 6.0      | 545               | 13.00                    |
| 25         | 504.3       | 19.4                       | 52                 | 44    | 96    |                           | 3.7          | 1.0          | 7.0      | 783               | 3.70                     |

Company Rantoul Industries

Lease

Judson B

Well No. 1

# Oilfield Research Laboratories

## RESULTS OF SATURATION & PERMEABILITY TESTS

TABLE 1-B

| Company             |             | Rantoul Industries         |                    |       | Lease |                           | Judson B     |              | Well No. |                   | 1                        |  |
|---------------------|-------------|----------------------------|--------------------|-------|-------|---------------------------|--------------|--------------|----------|-------------------|--------------------------|--|
| Sample No.          | Depth, Feet | Effective Porosity Percent | Percent Saturation |       |       | Oil Content Bbls. / A Ft. | Perm., Mill. | Feet of Sand |          | Total Oil Content | Perm. Capacity Ft. X md. |  |
|                     |             |                            | Oil                | Water | Total |                           |              | Ft.          | Cum. Ft. |                   |                          |  |
| 26                  | 505.8       | 18.6                       | 63                 | 30    | 93    | 909                       | 3.0          | 1.0          | 8.0      | 909               | 3.00                     |  |
| 27                  | 506.9       | 19.0                       | 41                 | 43    | 84    | 604                       | 4.3          | 1.0          | 9.0      | 604               | 4.30                     |  |
| 28                  | 507.9       | 17.3                       | 40                 | 53    | 93    | 537                       | 1.3          | 1.0          | 10.0     | 537               | 1.30                     |  |
| 29                  | 508.8       | 18.1                       | 36                 | 56    | 92    | 506                       | 3.7          | 0.9          | 10.9     | 455               | 3.33                     |  |
| 30                  | 509.5       | 17.1                       | 33                 | 62    | 95    | 438                       | 7.2          | 0.9          | 11.8     | 394               | 6.48                     |  |
| 31                  | 510.2       | 17.1                       | 39                 | 54    | 93    | 517                       | 2.9          | 1.2          | 13.0     | 621               | 3.48                     |  |
| 32                  | 511.7       | 15.0                       | 10                 | 85    | 95    | 116                       | 3.6          | 1.0          | 14.0     | 116               | 3.60                     |  |
| 33                  | 512.8       | 17.5                       | 37                 | 53    | 90    | 502                       | 6.0          | 1.0          | 15.0     | 502               | 6.00                     |  |
| 34                  | 513.5       | 17.8                       | 35                 | 50    | 85    | 483                       | 2.3          | 1.0          | 16.0     | 483               | 2.30                     |  |
| 35                  | 514.9       | 17.7                       | 48                 | 40    | 88    | 659                       | 6.0          | 1.0          | 17.0     | 659               | 6.00                     |  |
| 36                  | 515.4       | 14.7                       | 50                 | 40    | 90    | 570                       | 3.4          | 1.1          | 18.1     | 627               | 3.74                     |  |
| 37                  | 517.5       | 17.2                       | 46                 | 39    | 85    | 614                       | 1.8          | 1.0          | 19.1     | 614               | 1.80                     |  |
| LOWER SQUIRREL SAND |             |                            |                    |       |       |                           |              |              |          |                   |                          |  |
| 38                  | 575.9       | 14.7                       | 24                 | 73    | 97    | 274                       | 0.80         | 1.0          | 1.0      | 274               | 0.80                     |  |
| 39                  | 576.7       | 18.4                       | 29                 | 43    | 72    | 414                       | 15.          | 1.0          | 2.0      | 414               | 15.00                    |  |
| 40                  | 577.5       | 16.7                       | 29                 | 54    | 83    | 376                       | 0.60         | 1.0          | 3.0      | 376               | 0.60                     |  |
| 41                  | 578.8       | 15.3                       | 23                 | 71    | 94    | 273                       | Imp.         | 1.0          | 4.0      | 273               | 0.00                     |  |
| 42                  | 579.8       | 13.8                       | 28                 | 69    | 97    | 300                       | Imp.         | 1.0          | 5.0      | 300               | 0.00                     |  |
| 43                  | 580.9       | 16.4                       | 34                 | 50    | 84    | 433                       | Imp.         | 1.0          | 6.0      | 433               | 0.00                     |  |

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## SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

### PERU SAND

| Company                 |                          | Lease                                   |                                        | Well No.                              |                                    |
|-------------------------|--------------------------|-----------------------------------------|----------------------------------------|---------------------------------------|------------------------------------|
| Rantoul Industries      |                          | Judson B                                |                                        | 1                                     |                                    |
| Depth Interval,<br>Feet | Feet of Core<br>Analyzed | Average<br>Permeability,<br>Millidarcys | Permeability<br>Capacity<br>Ft. x Md.  |                                       |                                    |
| 343.0 - 361.3           | 18.3                     | 51.1                                    | 934.66                                 |                                       |                                    |
| Depth Interval,<br>Feet | Feet of Core<br>Analyzed | 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 |
| 343.0 - 361.3           | 18.3                     | 29.6                                    | 50.0                                   | 475                                   | 8,697                              |

# Oilfield Research Laboratories

## SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

### UPPER SQUIRREL

| Rantoul Industries |                         | Lease                    |                                         | Judson B                              |  | Well No. |  | 1 |
|--------------------|-------------------------|--------------------------|-----------------------------------------|---------------------------------------|--|----------|--|---|
| Company            | Depth Interval,<br>Feet | Feet of Core<br>Analyzed | Average<br>Permeability,<br>Millidarcys | Permeability<br>Capacity<br>Ft. x Md. |  |          |  |   |
|                    | 498.0 - 507.0           | 9.0                      | 6.8                                     | 61.00                                 |  |          |  |   |
|                    | 507.0 - 518.0           | 10.1                     | 3.8                                     | 38.03                                 |  |          |  |   |
|                    | 498.0 - 518.0           | 19.1                     | 5.2                                     | 99.03                                 |  |          |  |   |

  

| 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 |
|-------------------------|--------------------------|--------------------------------|--------------------------------------|----------------------------------------|---------------------------------------|------------------------------------|
| 498.0 - 507.0           | 9.0                      | 19.1                           | 38.2                                 | 47.9                                   | 567                                   | 5,101                              |
| 507.0 - 518.0           | 10.1                     | 16.9                           | 37.6                                 | 53.0                                   | 406                                   | 5,008                              |
| 498.0 - 518.0           | 19.1                     | 18.0                           | 37.9                                 | 50.6                                   | 534                                   | 10,109                             |

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## SUMMARY OF PERMEABILITY & SATURATION TESTS

TABLE III

### LOWER SQUIRREL

| Company | Rantoul Industries      |                          | Lease | Judson B                                |                                       | Well No. | 1 |
|---------|-------------------------|--------------------------|-------|-----------------------------------------|---------------------------------------|----------|---|
|         | Depth Interval,<br>Feet | Feet of Core<br>Analyzed |       | Average<br>Permeability,<br>Millidarcys | Permeability<br>Capacity<br>Ft. x Md. |          |   |
|         | 575.0 - 581.0           | 3.0                      |       | 5.5                                     | 16.40                                 |          |   |

|  | 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>Bbbl./Acre |
|--|-------------------------|--------------------------|--------------------------------|--------------------------------------|----------------------------------------|---------------------------------------|------------------------------------|
|  | 575.0 - 581.0           | 6.0                      | 15.9                           | 27.8                                 | 60.0                                   | 345                                   | 2,070                              |

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## RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

| Rantonl Industries  |             |                            | Lease                   |              | Judson B     |              | Well No.            |         | 1                             |                                      |                                                |
|---------------------|-------------|----------------------------|-------------------------|--------------|--------------|--------------|---------------------|---------|-------------------------------|--------------------------------------|------------------------------------------------|
| 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. |
|                     |             |                            | %                       | Bbbs./A. Ft. | %            | Bbbs./A. Ft. | % Oil               | % Water |                               |                                      |                                                |
| 1                   | 343.5       | 23.4                       | 20                      | 363          | 0            | PERU SAND    | 20                  | 63      | 110                           | 1.50                                 | 20                                             |
| 2                   | 344.7       | 25.0                       | 27                      | 524          | 2            | 39           | 25                  | 62      | 81                            | 1.05                                 | 20                                             |
| 3                   | 345.5       | 24.9                       | 31                      | 599          | 4            | 77           | 27                  | 71      | 44                            | 0.60                                 | 20                                             |
| 4                   | 346.6       | 24.3                       | 33                      | 622          | 4            | 75           | 29                  | 69      | 108                           | 1.43                                 | 20                                             |
| 5                   | 347.5       | 17.7                       | 40                      | 549          | 0            | 0            | 40                  | 59      | 0                             | Imp.                                 | -                                              |
| 6                   | 348.4       | 17.3                       | 32                      | 429          | 0            | 0            | 32                  | 48      | 0                             | Imp.                                 | -                                              |
| 7                   | 349.5       | 16.9                       | 27                      | 354          | 0            | 0            | 27                  | 61      | 84                            | 1.13                                 | 20                                             |
| 8                   | 350.3       | 18.2                       | 34                      | 480          | 6            | 85           | 28                  | 62      | 63                            | 0.83                                 | 20                                             |
| 9                   | 351.5       | 19.5                       | 31                      | 469          | 4            | 61           | 27                  | 67      | 97                            | 1.20                                 | 20                                             |
| 10                  | 352.5       | 18.5                       | 30                      | 431          | 3            | 43           | 27                  | 66      | 65                            | 0.90                                 | 25                                             |
| 11                  | 353.5       | 22.7                       | 31                      | 546          | 2            | 35           | 29                  | 62      | 63                            | 1.13                                 | 20                                             |
| 12                  | 354.5       | 20.9                       | 28                      | 454          | 2            | 32           | 26                  | 65      | 129                           | 2.10                                 | 20                                             |
| 13                  | 355.5       | 18.8                       | 28                      | 408          | 2            | 29           | 26                  | 69      | 152                           | 2.62                                 | 20                                             |
| 14                  | 356.8       | 22.4                       | 27                      | 469          | 0            | 0            | 27                  | 66      | 55                            | 0.75                                 | 20                                             |
| 15                  | 357.5       | 20.7                       | 40                      | 642          | 10           | 161          | 30                  | 60      | 103                           | 1.80                                 | 20                                             |
| 16                  | 358.5       | 20.4                       | 31                      | 491          | 4            | 63           | 27                  | 68      | 119                           | 2.30                                 | 35                                             |
| 17                  | 359.8       | 21.0                       | 22                      | 358          | 0            | 0            | 22                  | 71      | 44                            | 0.67                                 | 25                                             |
| 18                  | 360.8       | 20.4                       | 28                      | 443          | 2            | 32           | 26                  | 67      | 175                           | 2.92                                 | 20                                             |
| UPPER SQUIRREL SAND |             |                            |                         |              |              |              |                     |         |                               |                                      |                                                |
| 19                  | 498.9       | 20.6                       | 27                      | 431          | 3            | 48           | 24                  | 75      | 10                            | 0.33                                 | 30                                             |
| 20                  | 499.5       | 16.3                       | 24                      | 304          | 0            | 0            | 24                  | 52      | 0                             | Imp.                                 | -                                              |
| 21                  | 500.8       | 18.9                       | 33                      | 484          | 6            | 88           | 27                  | 64      | 8                             | 0.15                                 | 35                                             |
| 22                  | 501.5       | 20.0                       | 26                      | 403          | 0            | 0            | 26                  | 73      | 17                            | 0.33                                 | 40                                             |
| 23                  | 502.5       | 19.0                       | 44                      | 649          | 13           | 192          | 31                  | 63      | 7                             | 0.15                                 | 30                                             |
| 24                  | 503.8       | 21.2                       | 33                      | 543          | 5            | 82           | 28                  | 71      | 4                             | 0.08                                 | 35                                             |

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.

# Oilfield Research Laboratories

## RESULTS OF LABORATORY FLOODING TESTS

TABLE IV

| Company                    |             |                            | Rantoul Industries      |               |              | Lease         |                     |         | Judson B                      |                                      |                                                | Well No.      |  |  | 1 |  |  |
|----------------------------|-------------|----------------------------|-------------------------|---------------|--------------|---------------|---------------------|---------|-------------------------------|--------------------------------------|------------------------------------------------|---------------|--|--|---|--|--|
| 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. |               |  |  |   |  |  |
|                            |             |                            | %                       | Bbbls./A. Ft. | %            | Bbbls./A. Ft. | % Oil               | % Water |                               |                                      |                                                | Bbbls./A. Ft. |  |  |   |  |  |
| 25                         | 504.3       | 19.0                       | 52                      | 766           | 17           | 251           | 35                  | 64      | 12                            | 0.33                                 | 30                                             |               |  |  |   |  |  |
| 26                         | 505.8       | 18.9                       | 63                      | 924           | 32           | 469           | 31                  | 68      | 1                             | 0.07                                 | 45                                             |               |  |  |   |  |  |
| 27                         | 506.9       | 18.7                       | 41                      | 595           | 6            | 87            | 35                  | 62      | 4                             | 0.08                                 | 45                                             |               |  |  |   |  |  |
| 28                         | 507.9       | 17.1                       | 40                      | 531           | 0            | 0             | 40                  | 54      | 0                             | Imp.                                 | -                                              |               |  |  |   |  |  |
| 29                         | 508.8       | 18.3                       | 35                      | 497           | 0            | 0             | 35                  | 58      | 0                             | Imp.                                 | -                                              |               |  |  |   |  |  |
| 30                         | 509.5       | 17.3                       | 35                      | 470           | 0            | 0             | 35                  | 62      | 3                             | 0.08                                 | 45                                             |               |  |  |   |  |  |
| 31                         | 510.2       | 16.7                       | 37                      | 479           | 0            | 0             | 37                  | 57      | 0                             | Imp.                                 | -                                              |               |  |  |   |  |  |
| 32                         | 511.7       | 15.2                       | 12                      | 142           | 0            | 0             | 12                  | 82      | 1                             | 0.07                                 | 50                                             |               |  |  |   |  |  |
| 33                         | 512.8       | 17.9                       | 37                      | 514           | 0            | 0             | 37                  | 55      | 2                             | 0.15                                 | 35                                             |               |  |  |   |  |  |
| 34                         | 513.5       | 17.8                       | 35                      | 483           | 0            | 0             | 35                  | 52      | 0                             | Imp.                                 | -                                              |               |  |  |   |  |  |
| 35                         | 514.9       | 17.2                       | 47                      | 627           | 0            | 0             | 47                  | 44      | 0                             | 0.05                                 | 45                                             |               |  |  |   |  |  |
| 36                         | 515.4       | 14.7                       | 51                      | 582           | 0            | 0             | 51                  | 42      | 0                             | Imp.                                 | -                                              |               |  |  |   |  |  |
| 37                         | 517.5       | 17.3                       | 48                      | 644           | 0            | 0             | 48                  | 41      | 0                             | Imp.                                 | -                                              |               |  |  |   |  |  |
| <u>LOWER SQUIRREL SAND</u> |             |                            |                         |               |              |               |                     |         |                               |                                      |                                                |               |  |  |   |  |  |
| 38                         | 575.9       | 14.9                       | 26                      | 301           | 0            | 0             | 26                  | 73      | 0                             | Imp.                                 | -                                              |               |  |  |   |  |  |
| 39                         | 576.7       | 18.9                       | 29                      | 425           | 0            | 0             | 29                  | 68      | 65                            | 1.50                                 | 20                                             |               |  |  |   |  |  |
| 40                         | 577.5       | 16.7                       | 31                      | 402           | 0            | 0             | 31                  | 53      | 0                             | Imp.                                 | -                                              |               |  |  |   |  |  |
| 41                         | 578.8       | 15.4                       | 23                      | 275           | 0            | 0             | 23                  | 74      | 0                             | Imp.                                 | -                                              |               |  |  |   |  |  |
| 42                         | 579.8       | 13.8                       | 26                      | 278           | 0            | 0             | 26                  | 72      | 0                             | Imp.                                 | -                                              |               |  |  |   |  |  |
| 43                         | 580.9       | 16.3                       | 34                      | 430           | 0            | 0             | 34                  | 52      | 0                             | Imp.                                 | -                                              |               |  |  |   |  |  |

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.

# Oilfield Research Laboratories

## SUMMARY OF LABORATORY FLOODING TESTS

TABLE V

| Company                                           | Rantoul Industries | Lease | Judson B | Well No. |
|---------------------------------------------------|--------------------|-------|----------|----------|
|                                                   |                    | PERU  |          | 1        |
| Depth Interval, Feet                              | 343.0 - 361.3      |       |          |          |
| Feet of Core Analyzed                             | 12.4               |       |          |          |
| Average Percent Porosity                          | 21.0               |       |          |          |
| Average Percent Original Oil Saturation           | 31.0               |       |          |          |
| Average Percent Oil Recovery                      | 3.8                |       |          |          |
| Average Percent Residual Oil Saturation           | 27.2               |       |          |          |
| Average Percent Residual Water Saturation         | 65.9               |       |          |          |
| Average Percent Total Residual Fluid Saturation   | 93.1               |       |          |          |
| Average Original Oil Content, Bbls./A. Ft.        | 508.               |       |          |          |
| Average Oil Recovery, Bbls./A. Ft.                | 62.                |       |          |          |
| Average Residual Oil Content, Bbls./A. Ft.        | 446.               |       |          |          |
| Total Original Oil Content, Bbls./Acre            | 6,305.             |       |          |          |
| Total Oil Recovery, Bbls./Acre                    | 768.               |       |          |          |
| Total Residual Oil Content, Bbls./Acre            | 5,537.             |       |          |          |
| Average Effective Permeability, Millidarcys       | 1.61               |       |          |          |
| Average Initial Fluid Production Pressure, p.s.i. | 21.6               |       |          |          |

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

**Oilfield Research Laboratories**  
**SUMMARY OF LABORATORY FLOODING TESTS**

**TABLE V**

| Company                                           | Lease                           | Well No. |
|---------------------------------------------------|---------------------------------|----------|
| Rantoul Industries                                | Judson B                        | 1        |
| Depth Interval, Feet                              | UPPER SQUIRREL<br>498.0 - 507.0 |          |
| Feet of Core Analyzed                             | 7.1                             |          |
| Average Percent Porosity                          | 19.5                            |          |
| Average Percent Original Oil Saturation           | 41.6                            |          |
| Average Percent Oil Recovery                      | 11.6                            |          |
| Average Percent Residual Oil Saturation           | 30.0                            |          |
| Average Percent Residual Water Saturation         | 66.9                            |          |
| Average Percent Total Residual Fluid Saturation   | 96.9                            |          |
| Average Original Oil Content, Bbls./A. Ft.        | 625.                            |          |
| Average Oil Recovery, Bbls./A. Ft.                | 172.                            |          |
| Average Residual Oil Content, Bbls./A. Ft.        | 453.                            |          |
| Total Original Oil Content, Bbls./Acre            | 4,435.                          |          |
| Total Oil Recovery, Bbls./Acre                    | 1,222.                          |          |
| Total Residual Oil Content, Bbls./Acre            | 3,213.                          |          |
| Average Effective Permeability, Millidarcys       | 0.17                            |          |
| Average Initial Fluid Production Pressure, p.s.i. | 35.7                            |          |

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