OILFIELD RESEARCH LABORATORIES

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

July 9, 1979

James E. Russell Petroleum, Inc. P.O. Box 2618

Abilene, Texas 79604

Gentlemen:

Attached hereto is a log of the rotary core taken from the Sprague Lease, Well No. 4, located 1320° EWL & 1100° SNL, NE¹/₄, in Sec. 9-T23S-R19E, Anderson County, Kansas, and submitted to our laboratory on June 25, 1979.

Your business is greatly appreciated.

Very truly yours,

OILFIELD RESEARCH LABORATORIES

Berjamin R. Pearman

BRP:km 3 c to Abilene, Texas 2 c to Chanute, Kansas

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LOG

| - | C. Russell eum, Inc. Lease Sprague Well No. 4 |
|----------------------|---|
| Depth Interval, Feet | Description |
| 735.0 - 742.5 | Silty shale - More shale than silt. |
| 742.5 - 751.0 | Pure gray shale. |
| 751.0 - 754.5 | Silty shale. |
| 754.5 - 760.7 | Gray shale. |
| 760.7 - 762.6 | Coal. |
| 762.6 - 764.0 | Gray shale. |
| 764.0 - 766.2 | Conglomeratic shale. |
| 766.2 - 770.7 | Gray shale. |
| 770.7 - 772.1 | Limestone. |
| 772.1 - 774.1 | Very black, fine shale with lime concretions mixed in shaly conglomerate. |
| 774.1 - 776.0 | Coal. |

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JAMES E. RUSSELL PETROLEUM, INC.

Sprague Lease Well No. 4 Peru Sand

Relative* Mg/l Chlorides and Acid Solubilities

| Sample # | Depth | Relative* Mg/l Cl | Soluble_ |
|----------|------------------|----------------------|----------|
| 1 | 530 - 535 | 1200 | 28. |
| 2 | 535 - 540 | 1600 | 19. |
| 3 | 540 - 545 | 2000 | 24. |
| _ | 545 - 550 | 1400 | 21. |
| 4 | 550 - 555 | 2400 | 26. |
| 5 | 555 - 560 | 1600 | 25. |
| 6 | 560 - 565 | 1400 | 24. |
| 7 | 565 - 570 | 1200 | 27. |
| 8 | 570 - 575 | 1000 | 31. |
| 9 | 575 - 580 | 1400 | 23. |
| 10 | 580 - 585 | 1200 | 23. |
| 11 | | 1200 | 28. |
| 12 | 585 - 590 | | 29. |
| 13 | 590 – 595 | 1200 | 62. |
| 14 | 595 – 600 | 1000 | O |

^{*} These values are not absolute but are only relative to each other.

| | 0 | | | | |
|---|-------------|---------|-------------|---------|-------------|
| RELATIVE MG/L CHLORIDES | _100500 |) | 1000 | 1500 | 2000 |
| % SOLUBLE | 10- | 20. | 0. 1 149. 1 | 150, | /eg/////jb/ |
| % OF FLORESCENCE | 10. 20. | 30. 40. | 50. 60. | 70. 80. | 90. 100. |
| LITHOLOGY DESCRIPTION INTERVA | | | | | |
| 530 | 1,,,,,,,,,, | 111111 | | | |
| The largest percent is slightly sandy shale, bluish gray color. The rest of sample is buff to brown crystalline limestone. | | | | | |
| Mostly greenish blue and gray sandy shale, some buff colored limestone. | | | | | |
| 540 | 11111111 | 17/11 | | | |
| First show of sandstone, (no oil show) trace of limestone and some slightly sandy shale. | | | | | |
| Largest part of sample is sand- stone, trace of sandy shale, and some dark limestone(not much lime). Under ultraviolet light, | | | | | |
| sand showed few scattered green specs. Small amount of sand, mostly its' gone back to sandy shale and some limestone, sand that is present has slight oil show as | | | | | |
| indicated by ultraviolet light. 555 Shale is multi-colored. 555 Sample is almost all sand, did not detect any oil, clean sand | | | | | |
| trace of buff colored limestone. 560 All sandstone with slight show of oil, slight trace of shale, | | | | | |
| but not much. | | | | | JAMES E. |
| Still mostly sandstone with trace of gray and green shale, no oil show apparent in sand-stone. | | | | | Sprague |
| Mostly sandstone with trace of | | 11/// | | | Pe |
| limestone and shale. The ultraviolet light detected some florescence. | | | | | |
| Mostly sandstone with slight indication of oil. Rest is a black and green shale with trace of limestone. | | | | | |
| Mostly sandstone. Sand has florescence. There is trace of white to buff limestone and some black and green shale. | | | | | |
| The florescence is dull. Mostly all sand with a trace of gray and green shale, plus some | | | | | |
| brown limestone. Sand has florescence. 59 Mostly sandstone with a trace | | | | | |
| of oil stained sand. Also slight amount of buff colored limestone (noticed part of a crinoid stem fossil) and a trace of black shale. | 5 | | | | |
| 45% sandstone, no oil show noticed, the sample mainly contains buff to brown colored limestone with trace of green | | | | | |
| and black shale. Lime in all samples apparently matrix of 60 the sandstone. | 0 1 1 1 1 1 | NINA | | | |

