

NELSON #RW-8

Location: 775' WEL & 1850' SNL, SW $\frac{1}{4}$
Sec. 21, T26S, R21E
Allen County, KS

Elevation: 1052.4'
Perfs.: 641'-650'
672'-688'

T.D.: 750'
PBSD: 725'
2 7/8" Casing @ 739'

Profile Modification Treatment

(Channelblock)

Dates of Treatment: 9-1 - 9-4-94

The polymer mixing tank was filled with approximately 20 barrels of fresh water. Added to the fresh water was the appropriate amounts of calcium chloride, potassium chloride and thiosulfate.

Next, J-279 dry polymer was added through the eductor. The mixing tank was filled to approximately 100 barrels with the polymer slurry. Hydrochloric acid was then added to lower the pH.

Injection began at 1:00 p.m. on 9-1-94 and terminated at 3:45 p.m. on 9-4-94. The treatment was displaced with four barrels of injection water and the well shut-in at 640 PSI.

It should be noted that an appropriate amount of sodium dichromate was added to the stream of polymer solution over the three days of treatment.

The average rate of polymer slurry injection was 50 gallons per hour, while the average pressure was 570 PSI.

Chemicals Injected

J-279 Polymer	250 lbs.
Calcium Chloride	160 lbs.
Potassium Chloride	100 lbs.
Thiosulfate	25 lbs.
Sodium Dichromate	15.4 lbs.
HCl (28%)	1.3 gal.

September 8, 1994: Clean Out Well After Channelblock

Set up Company pulling unit and Faith Well Service air compressor. Ran 1" with drag bit to 450' and blew water with some polymer and scale. Ran to 667', hit hard bottom. Blew polymer and scale. Started spudding and went down to T.D. of 725'. Blew hole clean with soap and water.

Pulled 1" up to bottom of perforations at 688'. Spotted 50 gallons of 10% acid with one pint of ESA #96, one-half pint of ESA #50, and one quart of Goldtreat over perforations. Let soak for two hours. Blew hole clean with soap and water, recovering black iron sulfide and acid remains which were spent.

Spotted another batch of acid with chemicals as described above. Let soak and staged into perforations over an hour. Blew hole to T.D. with gray-colored returns. Acid was spent.

September 9, 1994:

Pulled 1" and hooked well up to injection.

September 10, 1994:

Well took 20 barrels at 610 PSI.

September 11, 1994:

Well took 10 barrels at 560 PSI. Will require additional stimulation.

September 12, 1994:

Well took 7 barrels at 580 lbs.

September 13, 1994: To Jet & Acidize Lower Perforations 672'-688'

Using Company pulling unit, ran to 689' with jet bit. Jetted perforations with 12 bbls. salt water and two gallons Goldtreat mixed in water. Spotted 25 gallons 10% modified acid through 1" and jetted perforations. Washed clean. Spotted 30 gallons 10% modified acid and staged into perforations with annulus shut-in. Pressure started at 600 PSI, ended at 430 PSI. Washed well to PBTD, 727'. Pulled 1" and jet. Put well on injection at 5:00 p.m. *To Abilene, Weaver, TORP, JEFF 10-2-94*

April 6, 1995:

Ran steel line. Tagged bottom at 670'. Bottom perforations, B-3 Zone, covered.

April 11, 1995:

OBJECTIVE: To Clean Lower Perforations By Washing, Jetting & Acidizing

Set up Company pulling rig and wash equipment. Tallied a string of 1" 10RD with jet bit. Ran in and washed to T.D., 725'.

NOTE: Hit bridge at 670'; returns-brown to black with some channelblock material and scale.

Took samples of returns. Pulled up to 688' and dropped ball to jet. Mixed two and one-half gallons Goldtreat in ten barrels of lease water. Jetted with mixture from 672'-688' until clean.

Mixed one gallon ESA 96, one quart ESA 91 and one pint ESA 50 in 50 gallons of acid. Spotted @ 688'. Shut annulus in and staged into perforations. Pressure started at 500 PSI; repeated with another drum of acid mixed as above, pressure was 400-450 PSI. Repeated with another drum mixed as above, pressure was 350-400 PSI. Mixed two and one-half gallons Goldtreat and one gallon of ESA 50 in eight barrels of lease water. Displaced 1" with two barrels of the mixture. Shut 1" in and tied on to annulus. Pumped six barrels of above mixture @ 300-350 PSI at two-barrel-per-minute rate. Shut in.

April 12, 1995:

Well was on vacuum. Ran to T.D. of 725'. Washed clean; bottom showed remains of some chemical. Hooked up to injection line.

April 13, 1995:

42 barrels @ 300 PSI.

October 6, 1995:

Ran steel line measure to T.D. of 703'; standing full.

April 17, 1996:

Ran down with coil tubing unit. Spotted 50 gallons 28% acid, two gallons of ESA-96, two gallons of ESA-91, and two quarts of ESA-50. Pulled out and hooked up to injection system.

September 4, 1996:

Shut well in at noon for Differential Temperature Survey.

September 5, 1996:

Rigged up Cornish and ran temperature tool to a total depth of 676.3'. Most of lower perforations, 672'-688', are covered. There is probably no water entering the B Zone. Only a temperature gradient curve was recorded because of the malfunctioning tool. A solids sample was retained from the bottom of the temperature tool; it is black and has an iron sulfide appearance.

This well will need to be washed and jetted over the B Zone.

September 25, 1996:

Rigged up Company pulling unit and wash equipment. Tallied 725' of 1"10RD with jet bit. Washed well to T.D. of 725'. Hit slight bridge at 672'. Spudded through easily. Caught samples from 672' to T.D., 725'. Returns were mostly black fines, with exception of samples caught while jetting perforations, which were chunks of scale and formation solids. X

Pulled bit up to 688' and dropped ball to jet perforations. Mixed two gallons Goldtreat and one gallon ESA-50 in 40 barrels of least salt water. Jetted with mixture from 672'-688' until clean.

Mixed two gallons ESA-96, two gallons ESA-91 and two quarts ESA-50 in 50 gallons of acid. Spotted acid at 688'. Displaced acid out of 1" wash string with one barrel of water. Shut-in 1". Hooked wash head up to annulus and staged acid into perforations. Initial pressure - 600 PSI. Dropped to 400 PSI at one-half barrel per minute rate. Increased to 600 PSI at one barrel per minute rate. Finished staging acid with six barrels of field salt water. Shut down for lunch.

Repeated treatment with another drum of acid mixed as above. Pressure and rates were identical to above. Shut well in overnight.

September 26, 1996:

Pulled 1" wash string and bit. Made wellhead connections. Started well back on injection at approximately 50 barrels per day rate.

40 barrels @ 380 PSI

September 27, 1996:

51 barrels @ 380 PSI

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September 28, 1996:

80 barrels @ 420 PSI

September 29, 1996:

80 barrels @ 420 PSI

10 1/2 the world 10-10-96

December 25, 1986:

Continued injection at 400 psi. At 7:00 p.m. meter and injection pump plugging, shut down Profile Modification treatment after injecting a total of 182 bbls. Cleared casing with 8 bbls. of injection water at the rate of 2.7 bbls./hr. No polymer has been detected at any of the surrounding producers.

April 29, 1987:

Reason for Job: To lower pressure on polymer block.
Current: 45 B/D @ 570 psi
Rec.: 115 B/D

Broke down wellhead. Well did not back flow. Rigged up and ran string 1". Set down on soft bottom at 720'. Washed & reamed to 725'. Washed up well, getting back polymer. Pulled 1" to 675'. Spotted 3 carb. acid and displaced out of 1". Shut well in and let set 1 hour. Well was on vacuum when opened. Set 1" back on bottom and washed up, getting back broken down polymer (fish eyes & slimy). Pulled 1" back up to 675'. Spotted 2 carb. acid and displaced out of 1". Pulled out of hole. Filled well with water and hooked up. Started back onto inj. at a very slow rate for several hours before turning up.

April 30, 1987: 55 B/D @ 280 psi
May 1, 1987: 36 B/D @ 380 psi
May 2, 1987: 44 B/D @ 380 psi
May 3, 1987: 48 B/D @ 400 psi.

December 19, 1986:

Mixed with 98 bbls. of pond water 200 lbs. synthetic polymer (5,500 ppm), 350 lbs. salt (10,000 ppm), 35 lbs. of calcium chloride (1000 ppm), 3 gal. of formaldehyde and 2 qt. acid. As polymer solution was hydrating the required reagents of Sodium Dicromate (6 lbs. 8 oz.) and Sodium Thiosulfate (6 lbs. 8 oz.) were prepared.

Began injection at 35 B/D at wellhead pressure 0 psi. Samples were taken and pressure monitored.

December 20, 1986:

Sodium Thiosulfate chemical pump not working, cleaned pump and screens. Mixed 6 lbs. 8 oz. Dicromate in 30 gal. water and continued injecting polymer solution at 160 psi. .

December 21, 1986:

Approximately 56 bbls. injected without proper blend of reagents. Worked over chemical pump. Chemical pump working. Continued injection at 150 psi.

December 22, 1986:

Chemical pump now operating correctly. Mixed with 95 bbls. pond water, 200 lbs. synthetic polymer (5,500 ppm), 350 lbs. salt (10,000 ppm), 35 lbs. calcium chloride (1000 ppm), 1 gal. formaldehyde and 1 gal. acid. Mixed reagents: Sodium Dicromate (6 lbs. 8 oz.) and Sodium Thiosulfate (6 lbs. 8 oz.). Continued injecting polymer solution. Pressure 190 psi.

December 23, 1986:

Due to the inconsistency of sodium thiosulfate injected, it was recommended that a higher concentrate be used for the remainder of the treatment. Mixed reagents (6 lbs. 8 oz.) sodium dicromate and (9 lbs. 8 oz.) sodium thiosulfate. Meter plugged with polymer overnight, cleaned meter and resumed injecting polymer at 80 psi.

December 24, 1986:

Continued injection at 230 psi. Following a recommendation to drop the pH of the polymer solution, 1/2 gal. of acid was added.

September 28, 1996:

80 bbls. @ 420 PSI

September 29, 1996:

80 bbls. @ 420 PSI

September 3, 1997:

Turned well off for temperature log.

September 4, 1997:

Cornish Wireline Services ran a temperature log to a total depth of 712.5'.

Water influencing formations from 620' down to 678', with principal entry from 654'-674' (between perforations). It was decided to do a polymer crosslink job. The plan was to shut off water going into the B-2 sand and to chem-wash jet the B-3 sand to start water into that zone.

September 30, 1997:

Ran SLM to T.D. of 712'. Poured frac sand down 2 7/8" casing to cover B-3 perforations. Ran SLM and found bridge at 642'. Spudded down to 643'. Well pressured up to 690 PSI and would not take water.

October 1, 1997:

Ran 1" pipe and hit bridge that held up 1" at 642'. Reverse-circulated sand out to 675'. Pulled 1". Started injection and well pressure was 520 PSI. Ran short pressure fall-off test.

October 2, 1997:

Started injection of 40 barrels per day to confirm injection rate. First test pressure was 600 PSI. Changed 1" valve and header filter. Second test pressure was 610 PSI, at an injection rate of 85 barrels per day.

October 3, 1997:

TO CHANNELBLOCK WELL

Using Chanute city water delivered by Consolidated, mixed a 62-barrel channelblock batch. Added salts and thiosulfate to the batch while agitating and hydrating polymer. The sodium bichromate was added continuously during the treatment at a concentration from 650-750 ppm.

Starting injecting polymer at 11:58 a.m., but shut down to repair leaks. Continuous injection started at 12:38 p.m. Finished injection at 5:30 a.m., October 4, 1997.

Initial Pressure	420 PSI
Final Pressure	500 PSI
Average Pressure	500 PSI
Polymer Injection Rate	3.68 BPH
Volume of Treatment	62 Bbls.
pH Solution	5.4-6.2
Viscosity	49.5-52 cp
Temperature	27.5° c
# Polymer Alcoflood 935	137.5 lbs.

Don / Paul

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October 3, 1997 Channelblock (continued):

# Sodium Bichromate	14.2 lbs.
# Sodium Thiosulfate	10.5 lbs.
# Sodium Chloride	100.0 lbs.
# Calcium Chloride	65.0 lbs.

NOTE: A field report with detailed readings is maintained in the files.

Displaced treatment with 1 1/2 bbls. uncrosslinked polymer and two bbls. injection water. Shut-in offset producers number H-21 & K-44 at end of treatment. Both producers have been checked for polymer by clay test during treatment. All results were negative.

October 6, 1997:

Placed offset producers back on production.

October 10, 1997:

Placed well back on injection.

October 11, 1997:

Injection rate: 39 BPD @ 540 PSI.

October 12, 1997:

Injection rate: 43 BPD @ 540 PSI.

October 15, 1997:

After completing repairs to channelblock unit, made injection test. Pumped injection water through unit for two hours at a rate of 3.68 barrels per hour - stabilized wellhead pressure, 590 PSI.

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October 3, 1997 Channelblock (continued):

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# Sodium Chloride	100.0 lbs.
# Calcium Chloride	65.0 lbs.

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After completing repairs to channelblock unit, made injection test. Pumped injection water through unit for two hours at a rate of 3.68 barrels per hour - stabilized wellhead pressure, 590 PSI.

November 18, 1997:

2nd Channelblock - 1st Batch

Using Chanute city water delivered by Fresh Water Haulers, mixed 32.6 barrels of fresh water with polymer. Tank was stirred for two hours, twenty minutes and allowed to set overnight. Salts and thiosulfate will be added in the morning.

November 19, 1997:

Added salts and thiosulfate while agitating tank for one additional hour. The sodium bichromate was added continuously during the treatment at a concentration of 600 ppm for the first 16 barrels of treatment and 800 ppm for the last 16.6 barrels. The chrome pump partially plugged (from 1.6 gal/hour to 0.34 gal/hour) for about two hours during the last half of treatment.

Started injecting polymer at 12:20 p.m. Finished injection at 8:55 p.m.

Initial Pressure	335 PSI
Final Pressure	490 PSI
Average Pressure	480 PSI
Polymer Injection Rate	3.6 BPH
Volume of Treatment	32.6 Bbls.
pH Solution	5.7

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Viscosity	Not Taken
Temperature	51 - 43 dcgrces F.
# Polymer Alcoflood 935	70 Lbs.
# Sodium Bichromate	6.8 Lbs.
# Sodium Thiosulfate	5.25 Lbs.
# Sodium Chloride	50.0 Lbs.
# Calcium Chloride	32.5 Lbs.
28% HCl Acid	None

Displaced treatment with four barrels injection water. The chrome pump was left on during the four-barrel displacement. Final pressure, 500 PSI. Finished at 10:00 p.m. Offset producers H-21 and K-44 were checked for polymer by bleach and acetic acid during treatment. All results were negative.

NOTE: It appears that hydrating the polymer one day ahead of injection should cause no problems, and may even streamline operations. The affect, however, of adding the salts and thiosulfate after hydration, is not totally understood.

November 20, 1997:

2nd Channelblock - 2nd Batch

Using Chanute city water delivered by Fresh Water Haulers, mixed a 31.8-barrel channclblock batch. Added salts and thiosulfate to the batch while agitating and hydrating polymer. The sodium bichromate was added continuously during the treatment at a concentration of 750 ppm.

Starting injecting polymer at 12:45 p.m. Finished injection at 8:25 p.m., November 20, 1997.

Initial Pressure	755 PSI
Final Pressure	590 PSI
Average Pressure	585 PSI
Polymer Injection Rate	3.7 BPH
Volume of Treatment	31.8 Bbls. Mixed, 28.1 Bbls. Used
pH Solution	5.8-4.4
Viscosity	Not Taken
Temperature	11.8-9.3°C
# Polymer Alcoflood 935	84 lbs.
# Sodium Bichromate	7.4 lbs.
# Sodium Thiosulfate	5.25 lbs.
# Sodium Chloride	50 lbs.
# Calcium Chloride	32.5 lbs.
28% HCl Acid	2 quarts

Displaced treatment with three bbls. injection water. Displaced at approximate same rate as channelblock. Final pressure, 600 PSI. Finished at 9:15 p.m. Offset producers number H-21 & K-44 were checked for polymer by bleach and acetic acid during treatment. All results were negative.

NOTE: Pump stopped with 3.5 inches (3.7 bbls.) of gel still in tank. There was a large concentration of unmixed material on bottom. A field report with detailed readings is maintained in the files.

The pH of the polymer solution and fresh water of this batch was 7.5 at 53.4 degrees F. When Consolidated delivered the "fresh" water, the pH was 6.2 at 82.0 degrees F. (October 3, 1997 batch). This may explain why acid was needed to lower pH. The Consolidated trucks may not be as clean as desired.

For future reference, a treatment that will totally cover the agitator in the polymer tank and allow better "mixing", should be considered.

December 18, 1997:

Using Company equipment, ran 1" pipe and washed well to plug back TD of 675' with injection water. Pulled wash pipe and tested channelblock job. Pumped in with channelblock equipment at 3.68 bbls. per hour at 550 PSI. The job did not appear to hold. Left well shut in.

January 21, 1998:

Unable to channelblock due to surface conditions. Placed well back on injection through B-2 perforations, with plug back TD still at 675'. Well started taking water at a low rate at 650 PSI. Left on injection until January 28, 1998. The well had pressured up to 700 PSI and stopped taking fluid. Well took 204 bbls. during that week with pressure gradually increasing from 650 to 700 PSI.

January 28, 1998:

Ran SLM to check TD. Found bottom ok at 676'. Well was on weak vacuum.

February 4, 1998:

Rigged up Company wash equipment and pulling unit. Tallied 750' of 1" 10RD wash string. Ran 1" and jet bit to 675' and hit sand plug. Attached wash head. Washed and spudded to T.D. of 725'. Retained wash samples. Recovered sand, soft crosslink polymer, black in color, and fine black iron sulfide.

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February 4, 1998 (continued):

Circulated well clean. Pulled jet bit up to 688' and jetted perforations up to 672'. Retained samples of jet water; had more polymer and small black iron sulfide. Jetted perforations with 15 bbls. lease salt water with one gallon ESA-96, one gallon ESA-91, and one-half gallon ESA-50.

Lowered bottom of pipe back to 688', spotted 50 gallons of 28% acid with two gallons ESA-96, two gallons ESA-91, and one-half gallon of ESA-50 at bottom of perforations. Displaced acid out of 1" with one barrel of water. Put stuffing box on wellhead. Shut 1" in with valve. Hooked wash truck up to annulus and pushed acid into formation at very slow rate.

Well pressured up to 600 lbs. and started taking acid. Pumped one barrel of water in at extremely slow rate. Pressure dropped to 550 lbs. Stepped up treatment rate to one bbl. per three minutes and well was taking at 500 lbs. Finished displacement with six bbls. of water. Shut-in pressure on well was 300 lbs. Shut-in overnight.

February 5, 1998:

Placed well back on injection.

February 6, 1998:

Well took 36 bbls. @ 450 PSI

February 7, 1998:

Well took 26 bbls. @ 480 PSI

February 12, 1998:

Using Company pulling unit, pulled 1" pipe. Connected well to injection line and restarted injection at normal rate.

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February 4, 1998 (continued):

Circulated well clean. Pulled jet bit up to 688' and jetted perforations up to 672'. Retained samples of jet water; had more polymer and small black iron sulfide. Jetted perforations with 15 bbls. lease salt water with one gallon ESA-96, one gallon ESA-91, and one-half gallon ESA-50.

Lowered bottom of pipe back to 688', spotted 50 gallons of 28% acid with two gallons ESA-96, two gallons ESA-91, and one-half gallon of ESA-50 at bottom of perforations. Displaced acid out of 1" with one barrel of water. Put stuffing box on wellhead. Shut 1" in with valve. Hooked wash truck up to annulus and pushed acid into formation at very slow rate.

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Placed well back on injection.

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February 7, 1998:

Well took 26 bbls. @ 480 PSI

February 12, 1998:

Using Company pulling unit, pulled 1" pipe. Connected well to injection line and restarted injection at normal rate.

March 25, 1998:

Using Joe Goley, ran MIT.

Using Cornish Wireline, ran Delta Temperature Log. Tagged bottom at 727.2'.

May 26, 1998:

Using Cornish Wireline, ran Delta Temperature Log. Tagged bottom at 726.2'.

June 10, 1998:

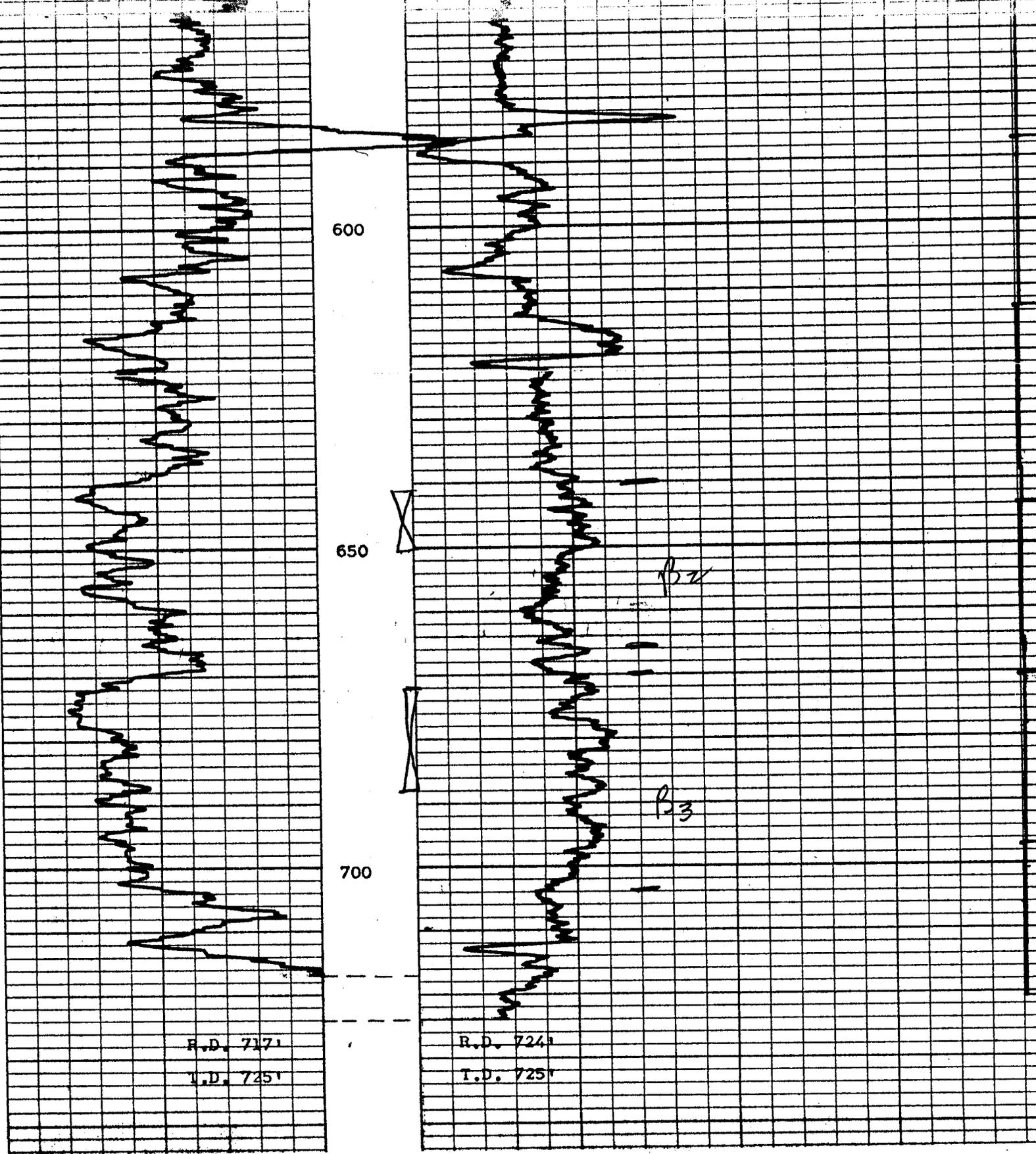
Ran SLM to depth of 729.5'.

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June 15, 1998:

Set up Company pulling unit and ran 2 7/8" Bolt packer with 25' anchor on bottom. Used 26 joints Sawhill 1" pipe and pup joint of 13.5'. Set packer at 660' in tension and clamped off. Hooked tubing to injection system. Injecting into lower perforations only.



NELSON NO. RW-8

7-8-83 GN SBL

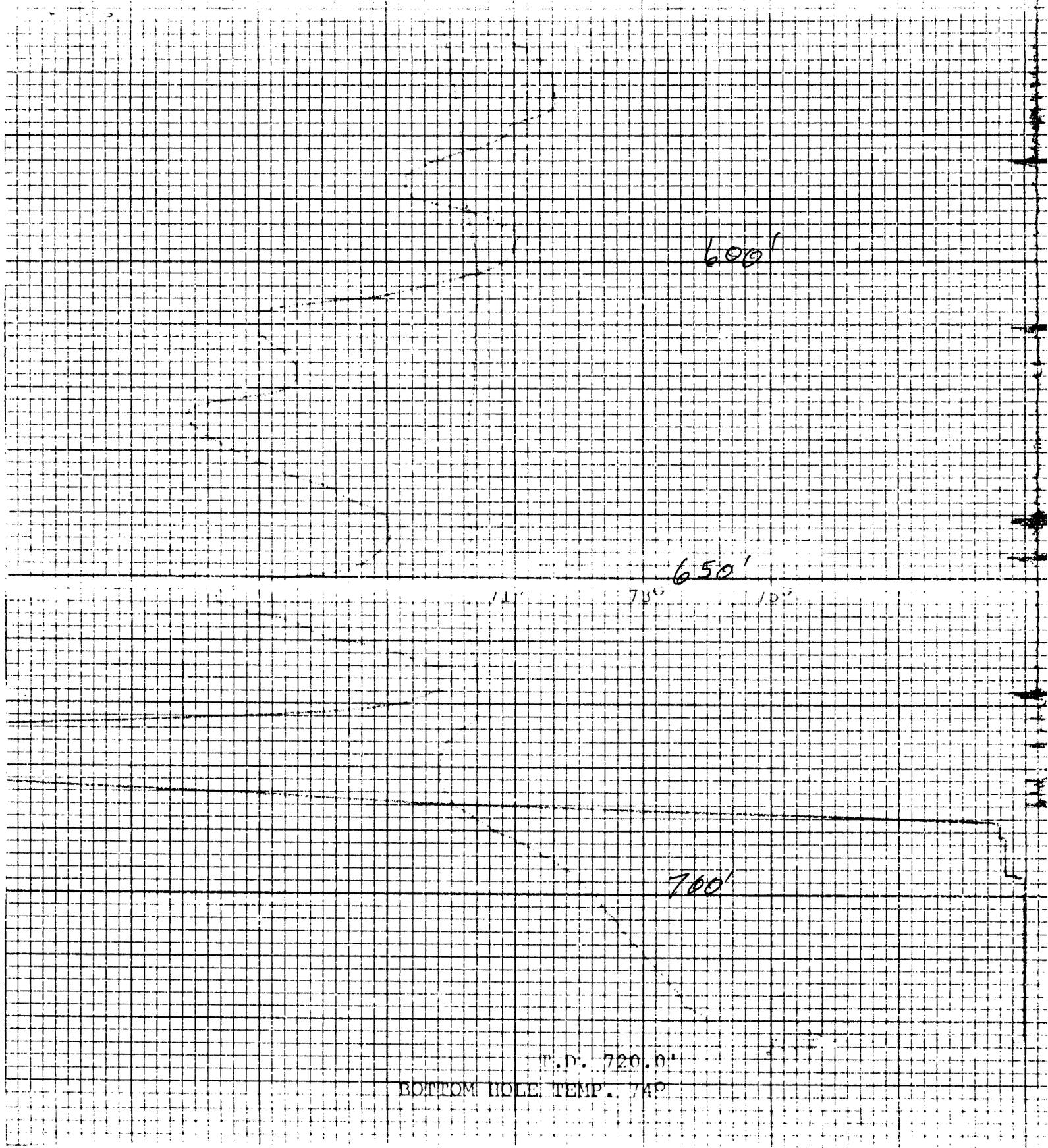
JAMES E. RUSSELL PETROLEUM, INC.

ALLEN COUNTY, KANSAS

21-26S-21E

JULY 8, 1983

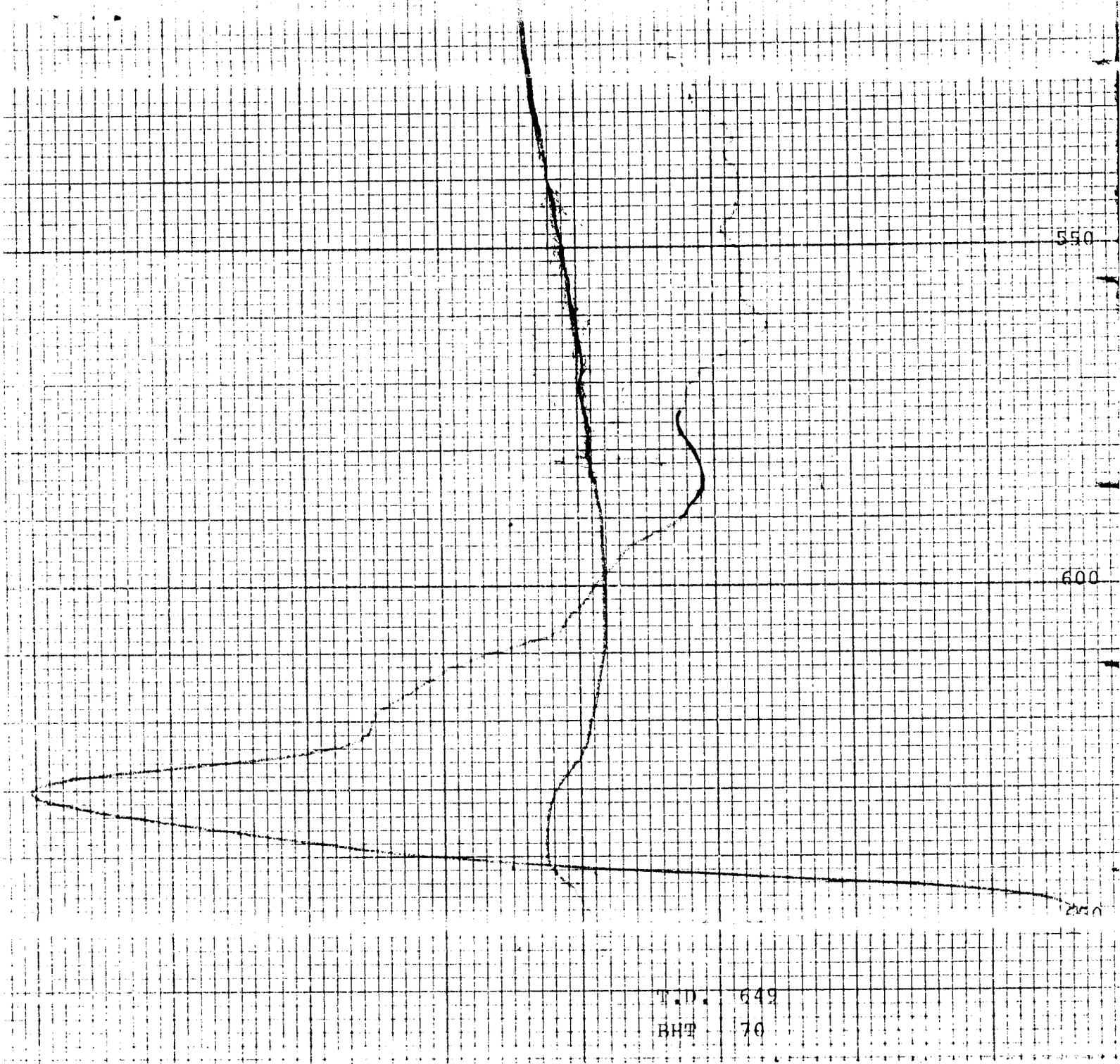
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NELSON # RW-8
JAMES E. RUSSELL PETROLEUM, INC.
ALLEN COUNTY, KANSAS
SEPTEMBER 29, 1994

9-29-94 TEMP. SURVEY

21-26S-21E



T.D.	649
BHT	70

NELSON #RW-8
JAMES E. RUSSELL PETROLEUM, INC.
ALLEN COUNTY, KANSAS
JUNE 22, 1994

6-22-94 TEMP SURVEY
21-26S-21E