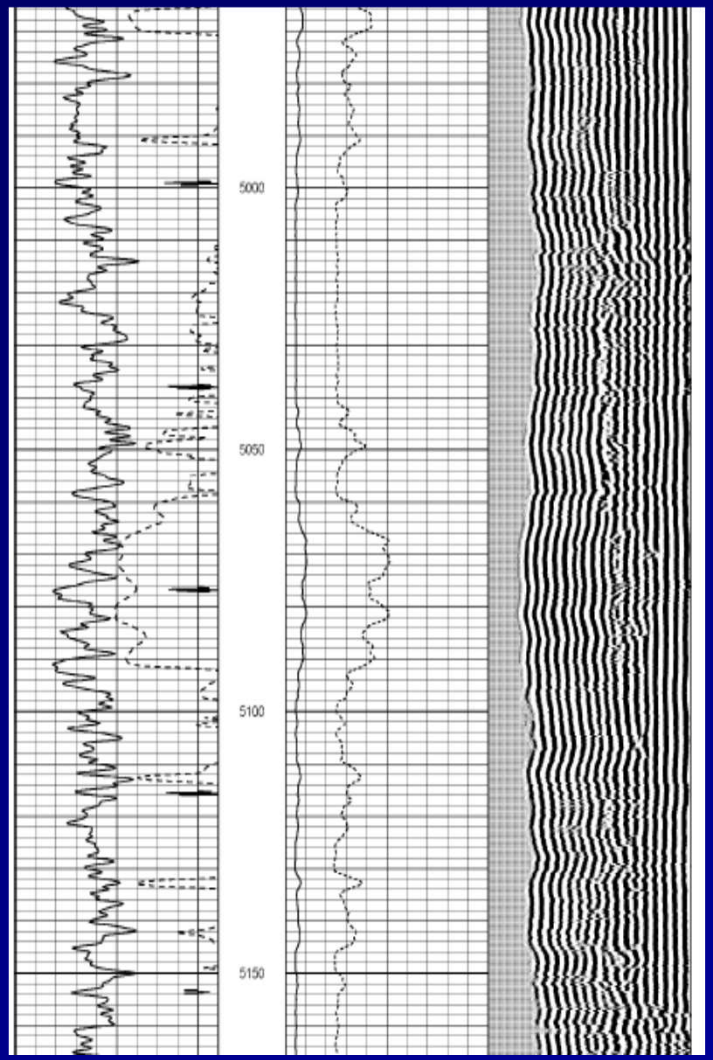
Seven Steps to An Excellent Bond Log



“Best Bond Log I’ve Ever Seen”



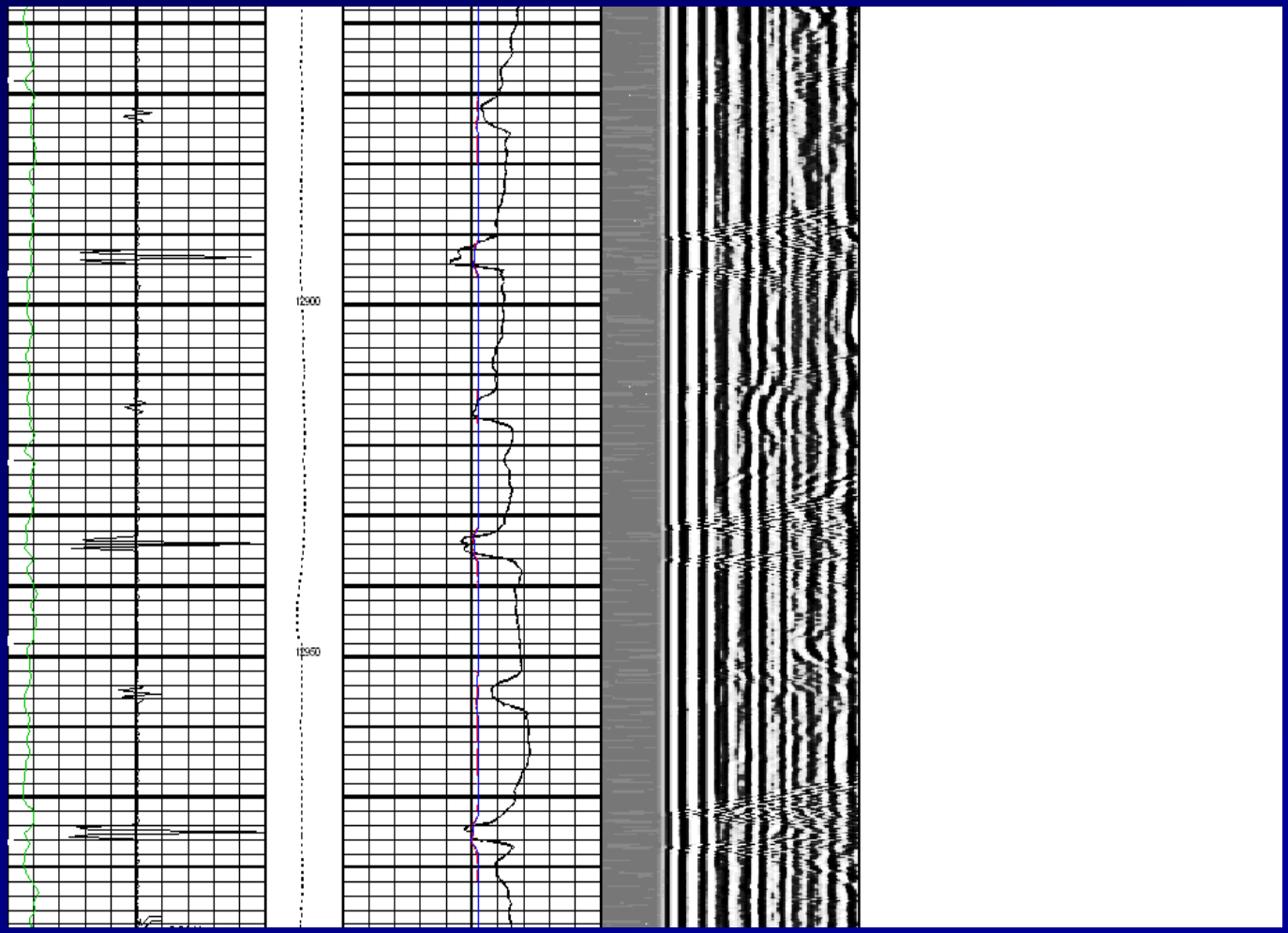
Seven Steps To An Excellent Bond Log

1. Sandblast the Casing
2. Centralize the Pipe
3. Expansive Cement Additive
4. High Compressive Strength Cement
5. Displace with a Low Density Fluid
6. Do Not Pressure Test Casing
7. Log with a Pressure Pass

Step # 1

Sandblast the Casing

Sample well



SPE 22063 Carpenter, et al

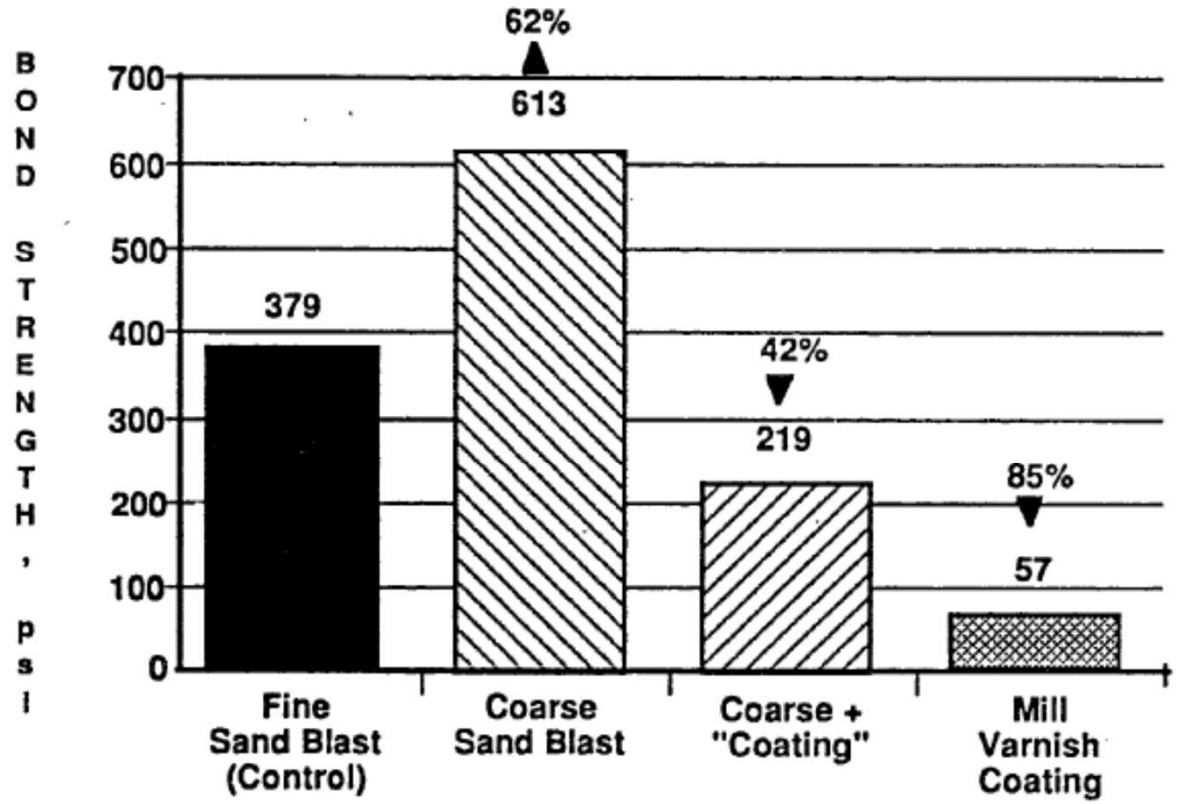
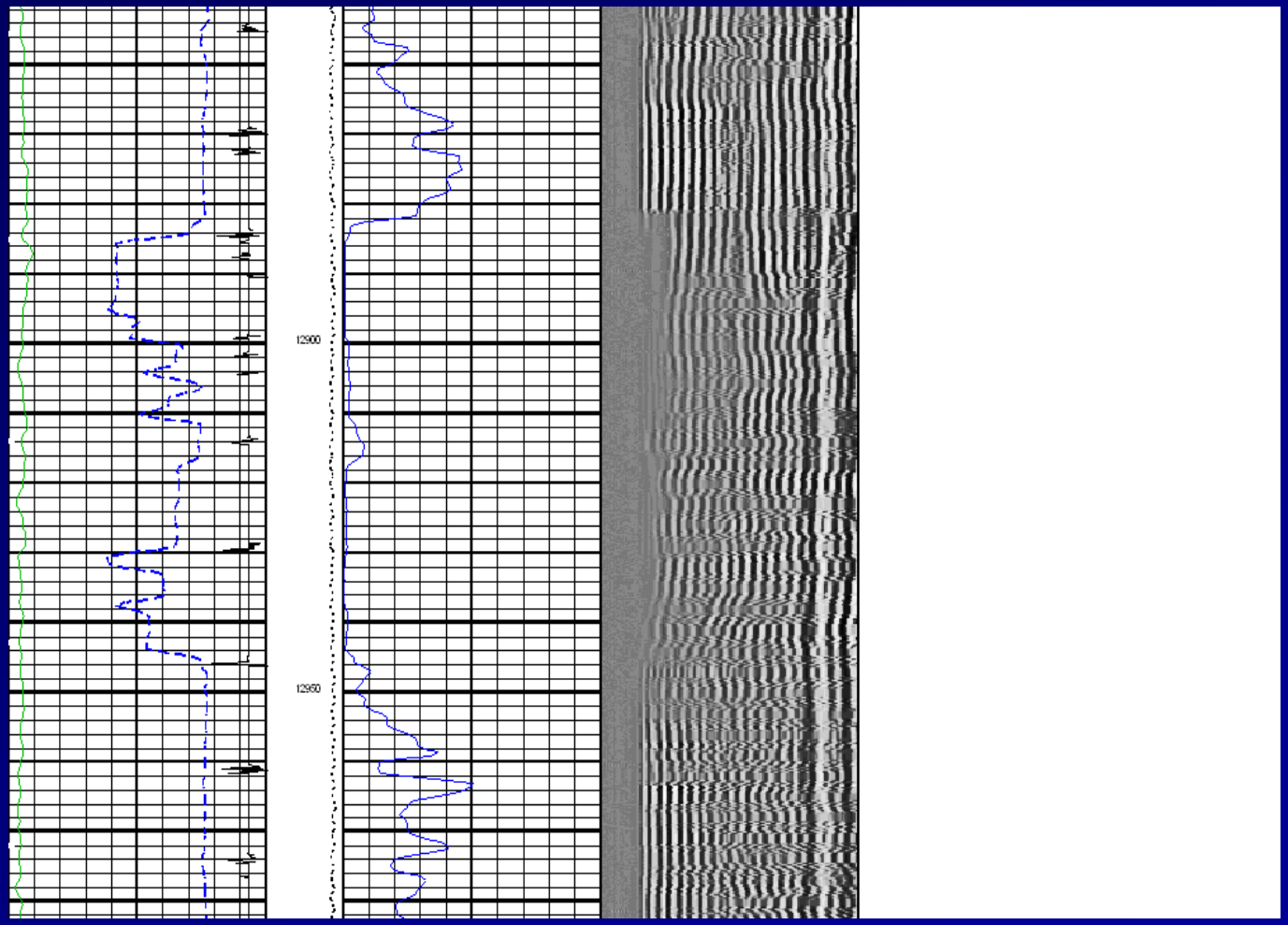


FIGURE 5. TWO DAY SHEAR BOND STRENGTH; CONVENTIONAL LFL CEMENT WITH VARIOUS CASING PREPARATIONS.

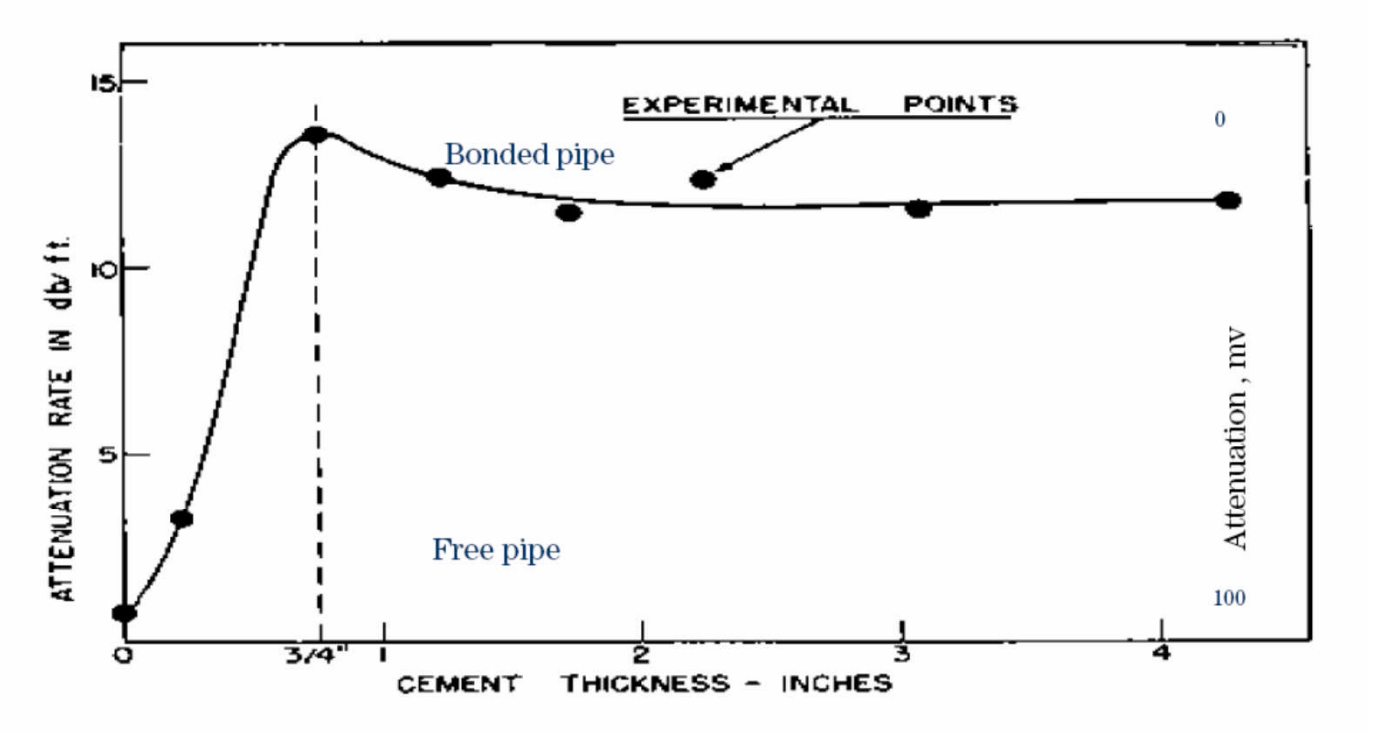
Sample Well



Step # 2

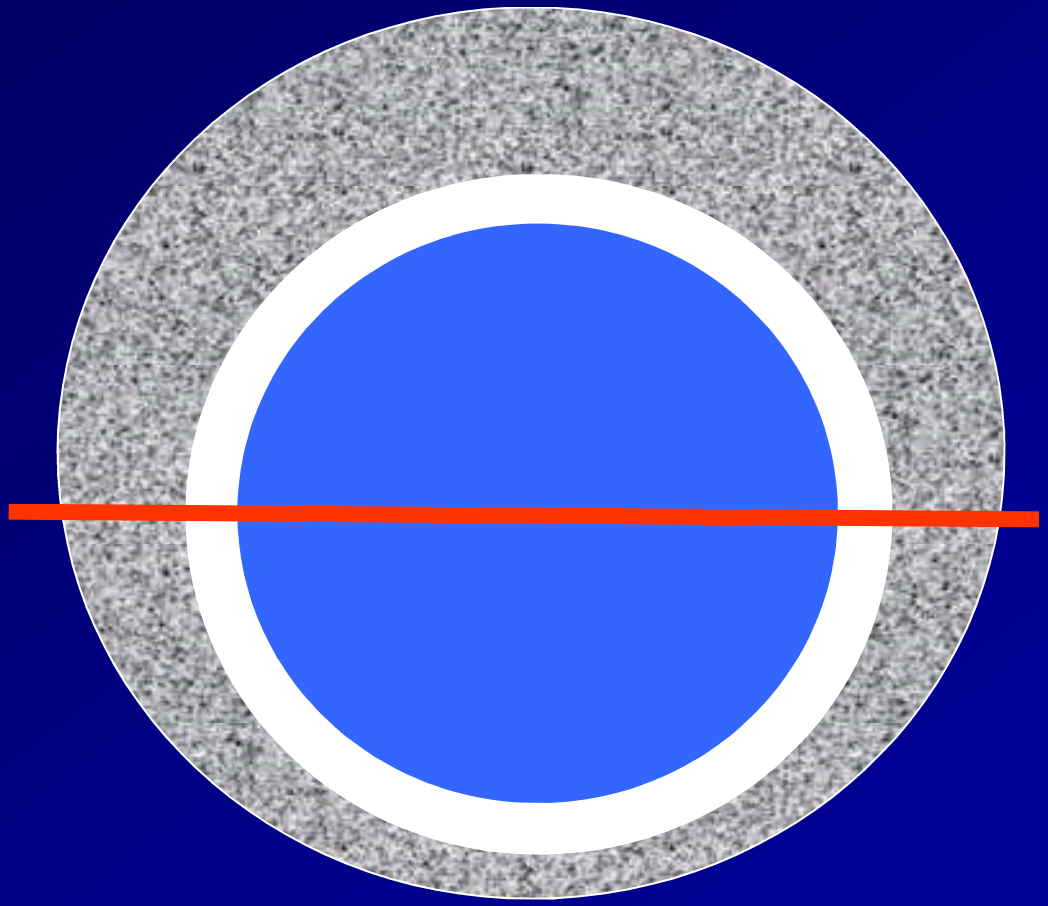
Centralize the Pipe

Effect of Cement Thickness on Cement Bond Curve



Schlumberger

Centralizers



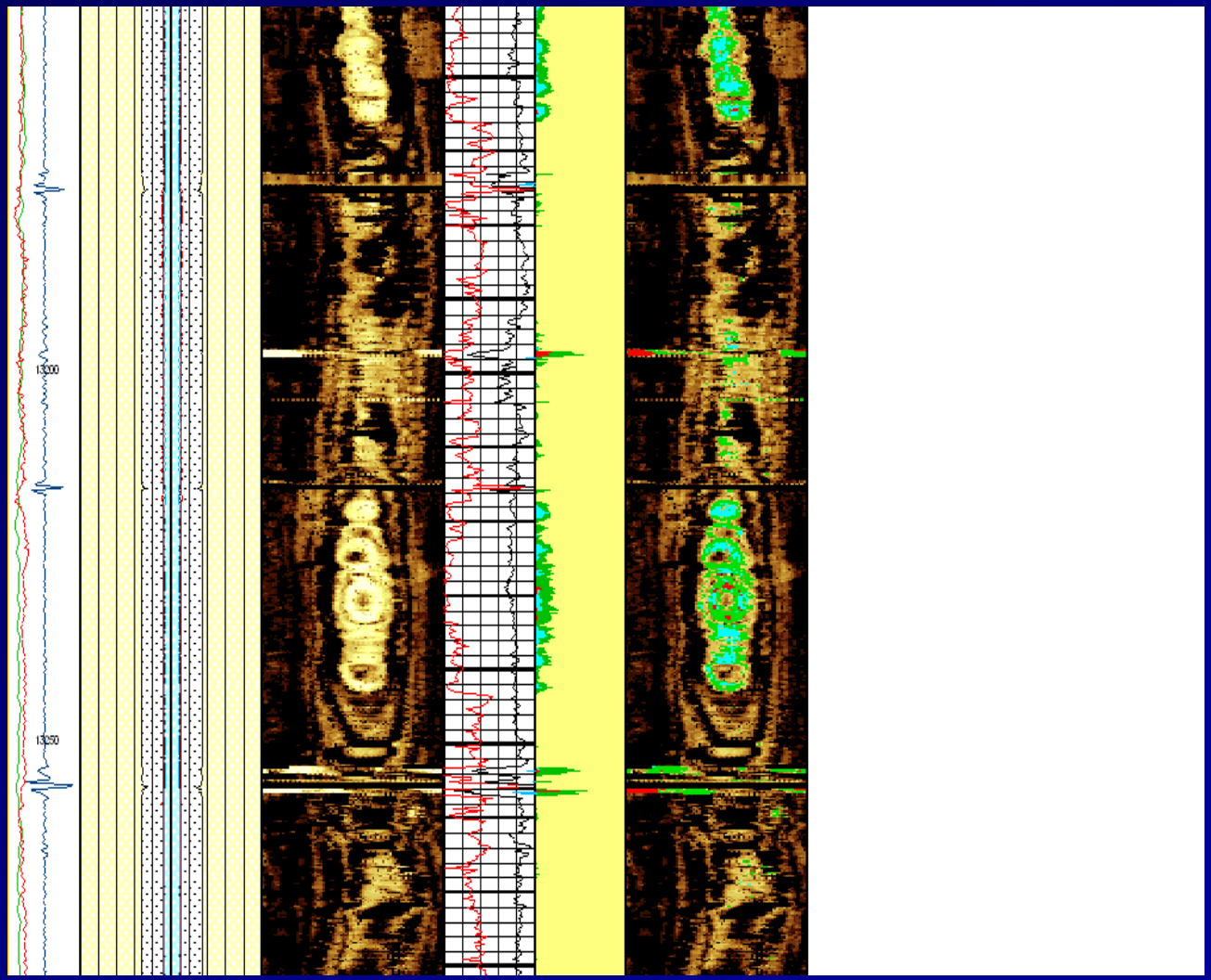
Centralize the Pipe

- Rigid in Open Hole
- Spacing Program

- 1 per jt- vertical
- 2 per jt - deviated



Sample well



Step # 3

Expansive Cement Additive

Expansion

SPE 22063 – Carpenter, et al

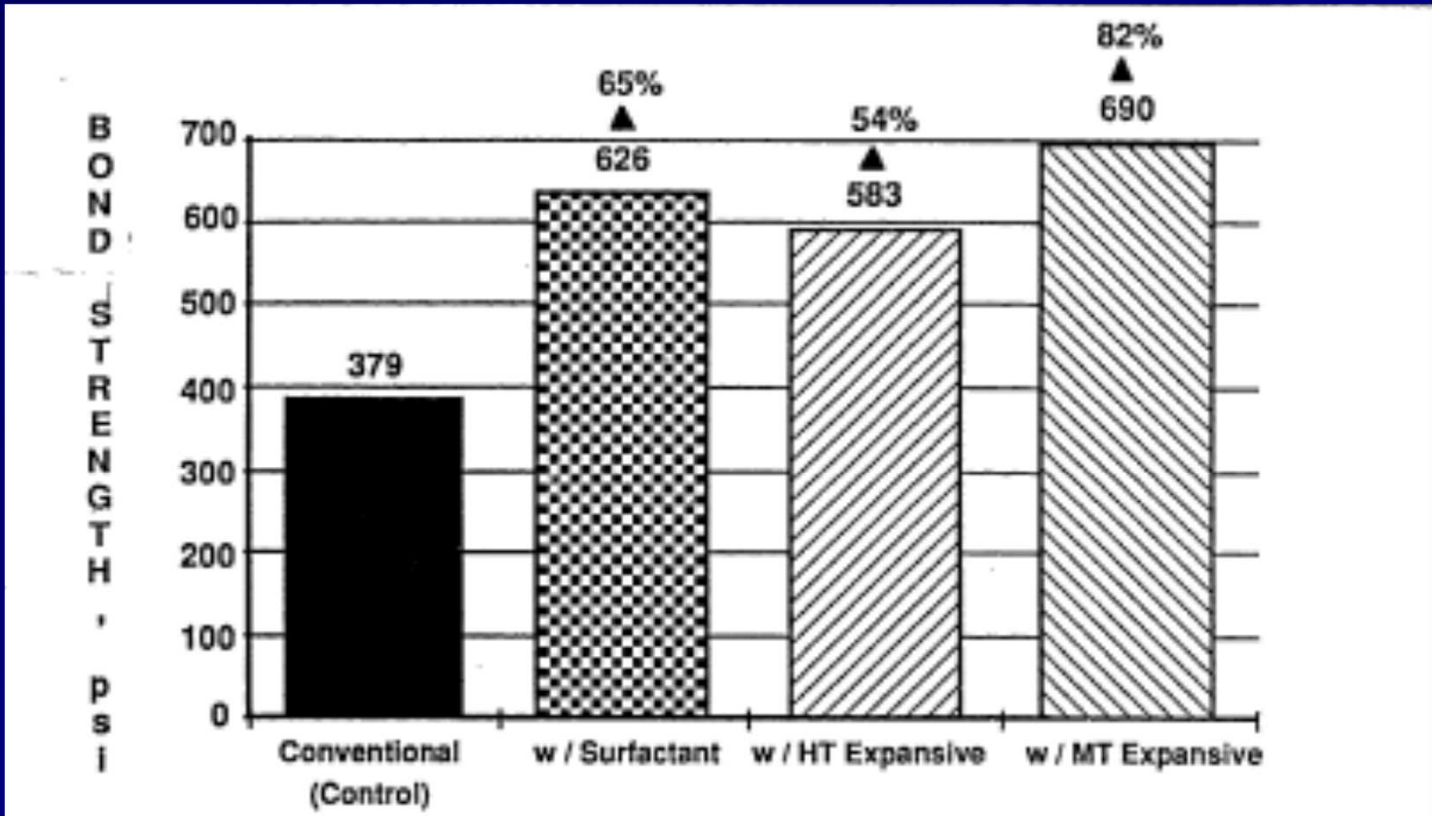
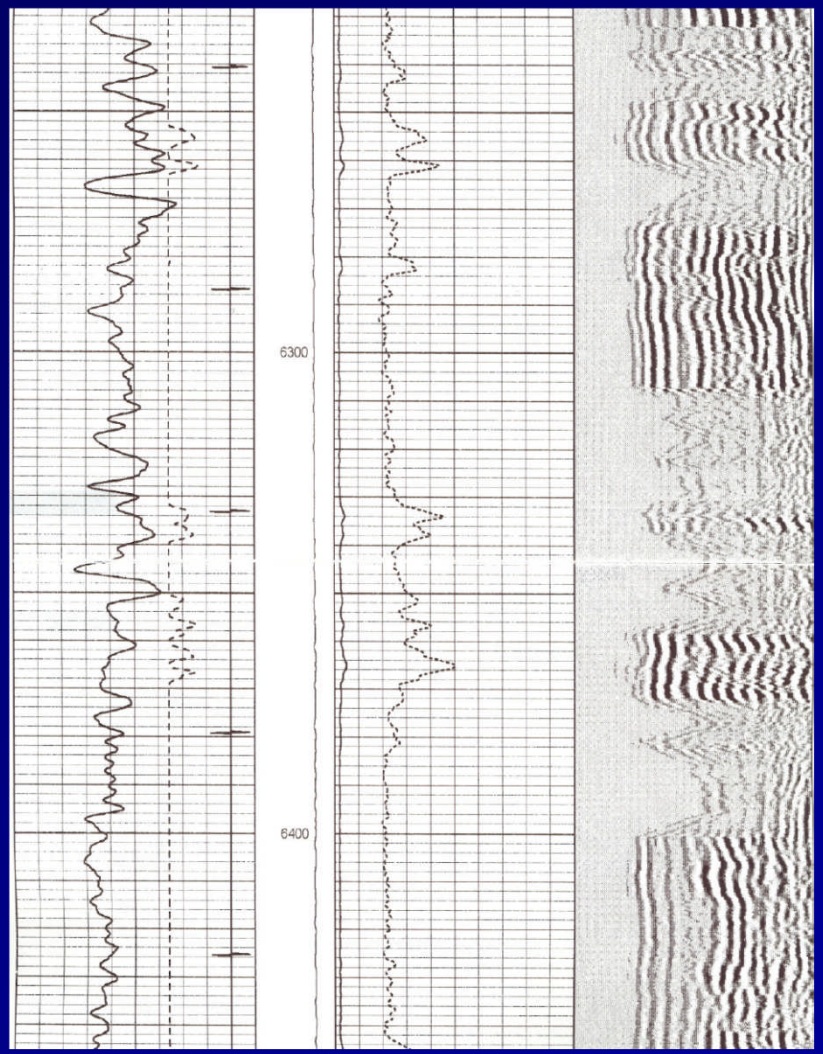


FIGURE 6. TWO DAY SHEAR BOND STRENGTH; CONVENTIONAL LFL CEMENTS WITH VARIOUS ADMIXES.

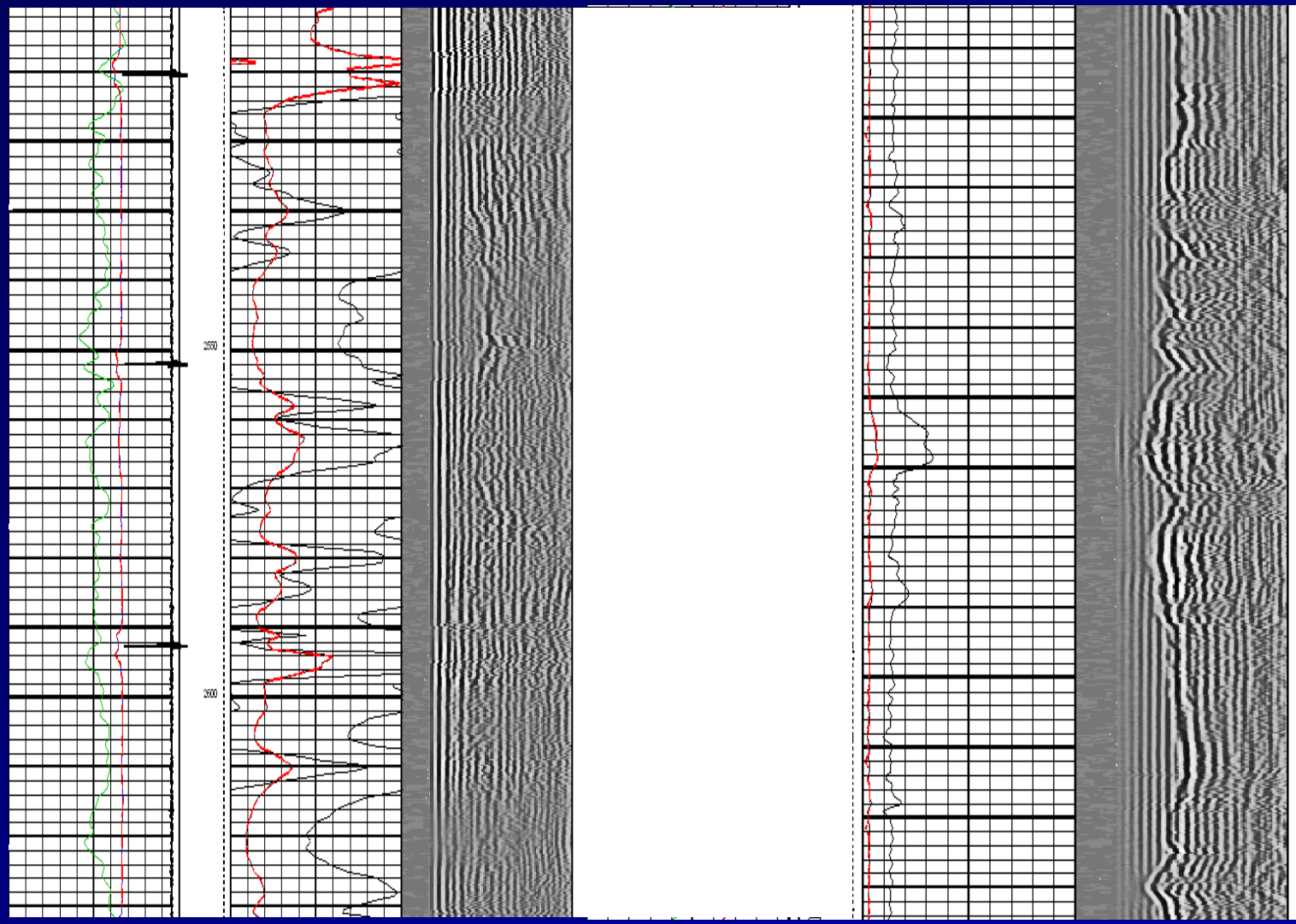
Gas Well



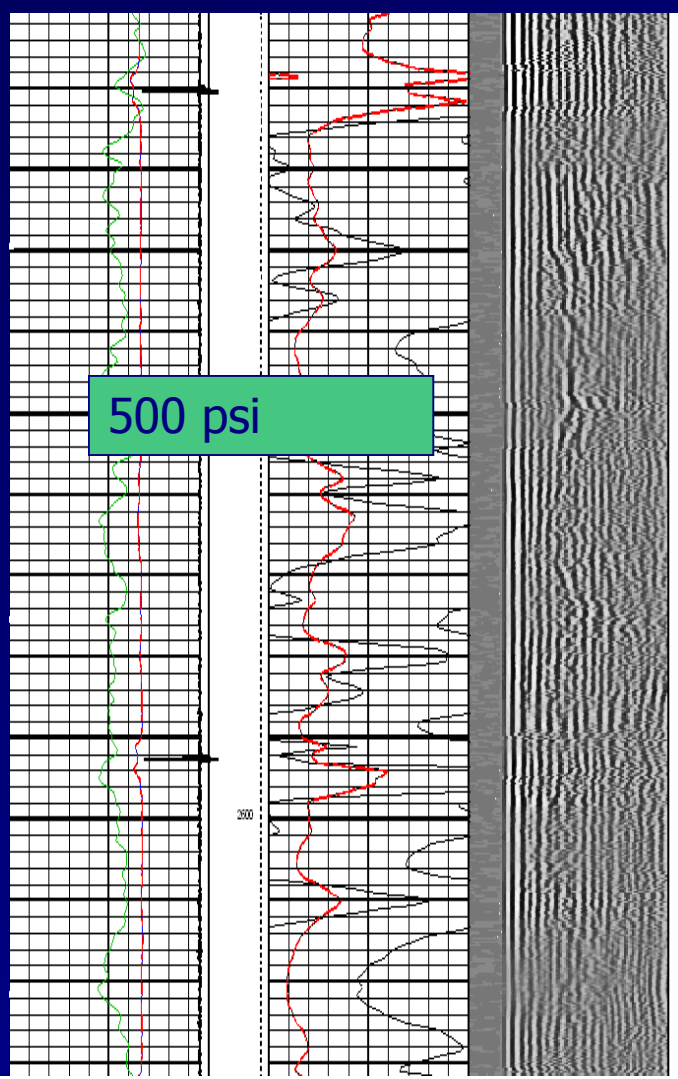
Step # 4

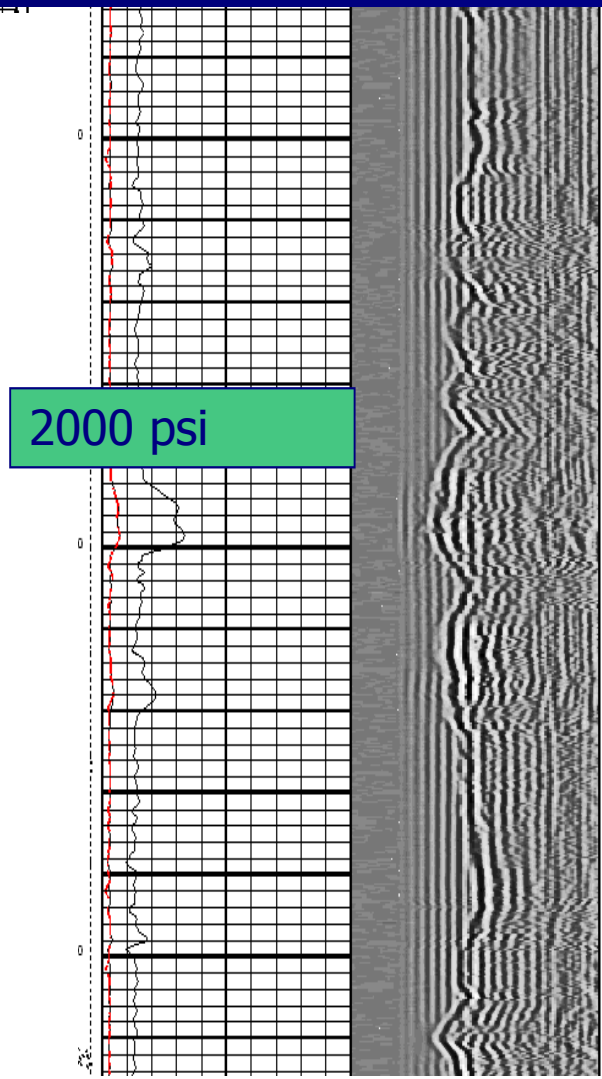
High Compressive Strength Cement

Compressive Strength vs Log

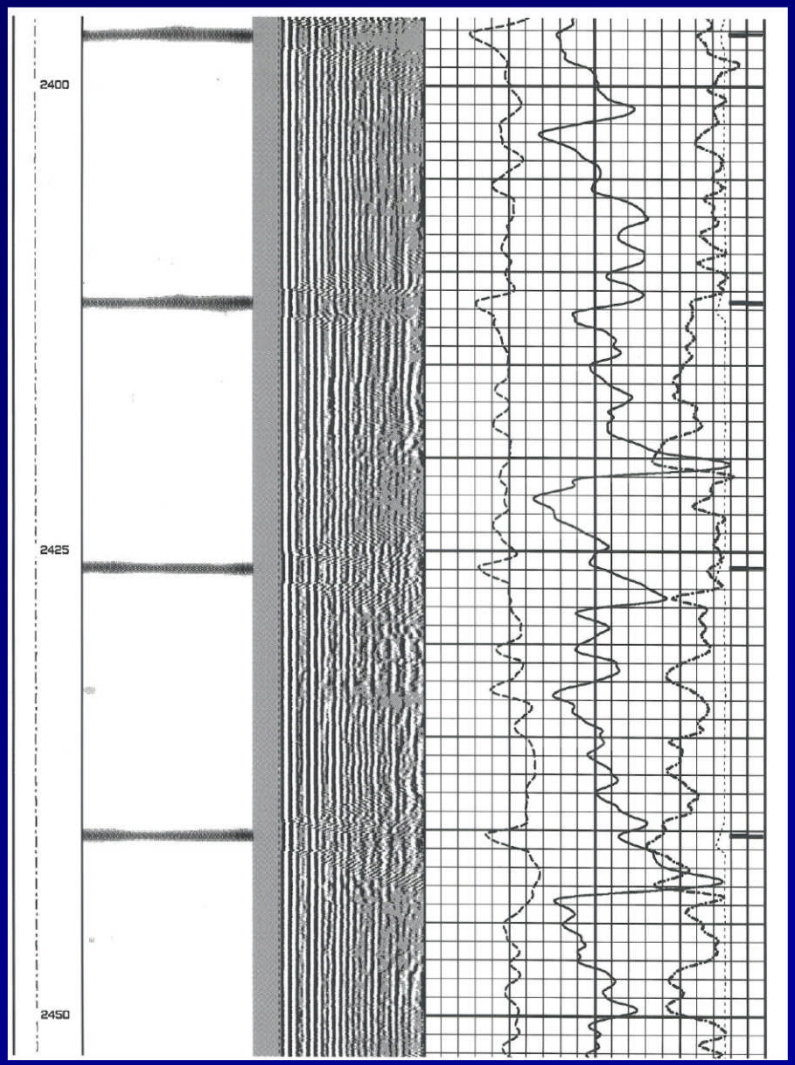


Compressive Strength vs Log





Oil Well – Silica Flour



High Compressive Strength – Curing Time

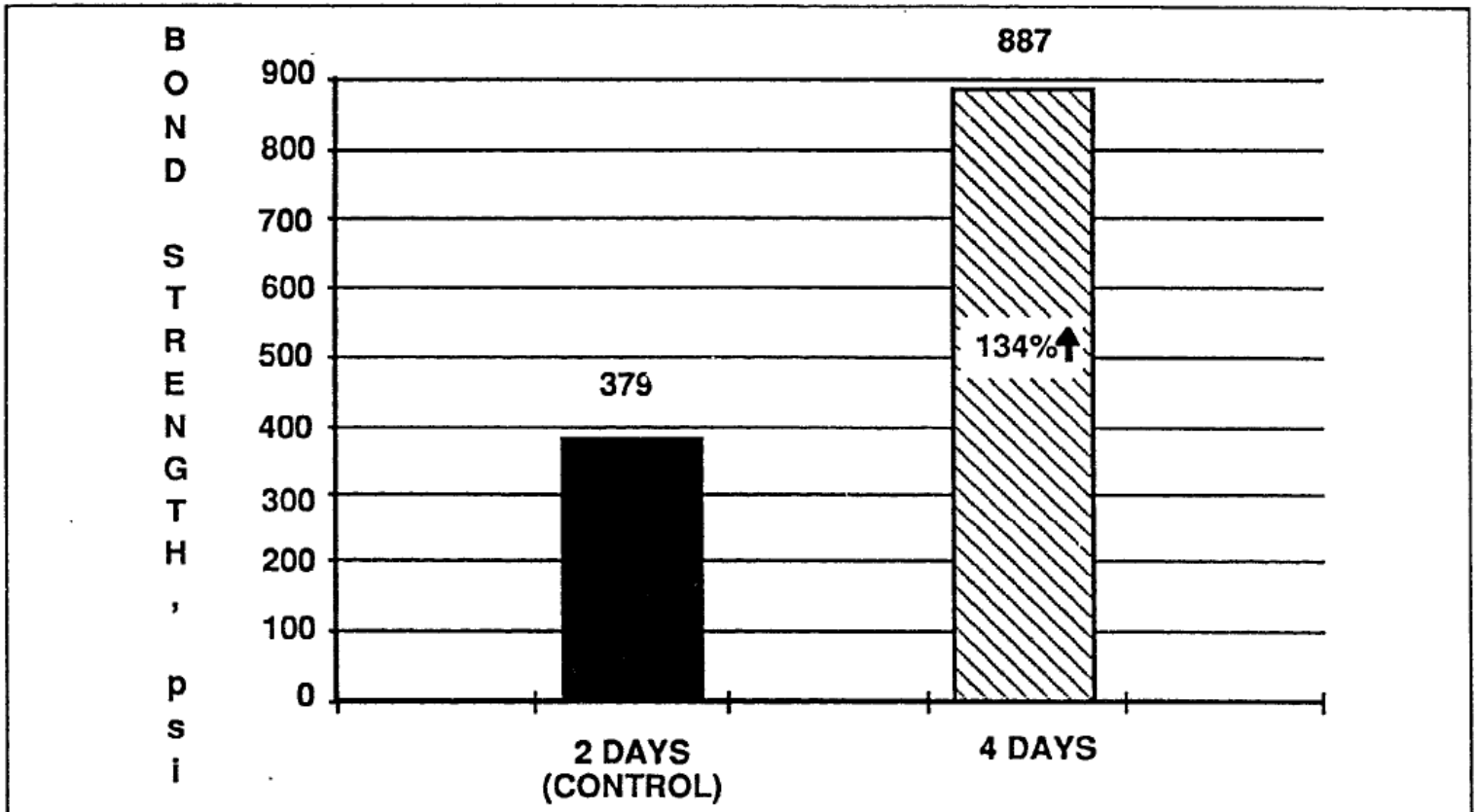
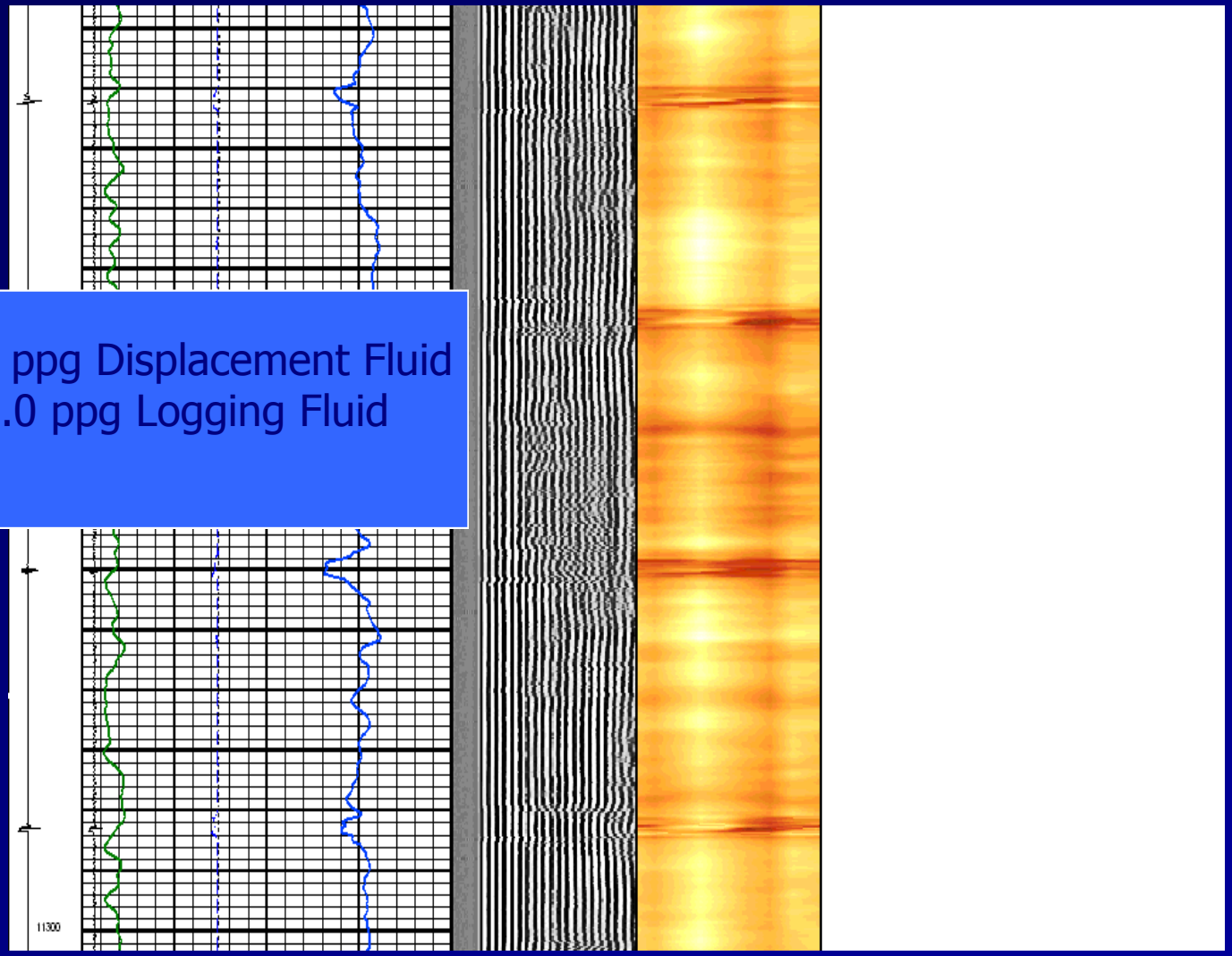


FIGURE 4. SHEAR BOND STRENGTH - TWO VS. FOUR DAY CONVENTIONAL LOW FLUID LOSS (LFL) CEMENT.

Step # 5

Displacement Fluid

West Texas well



Step # 6

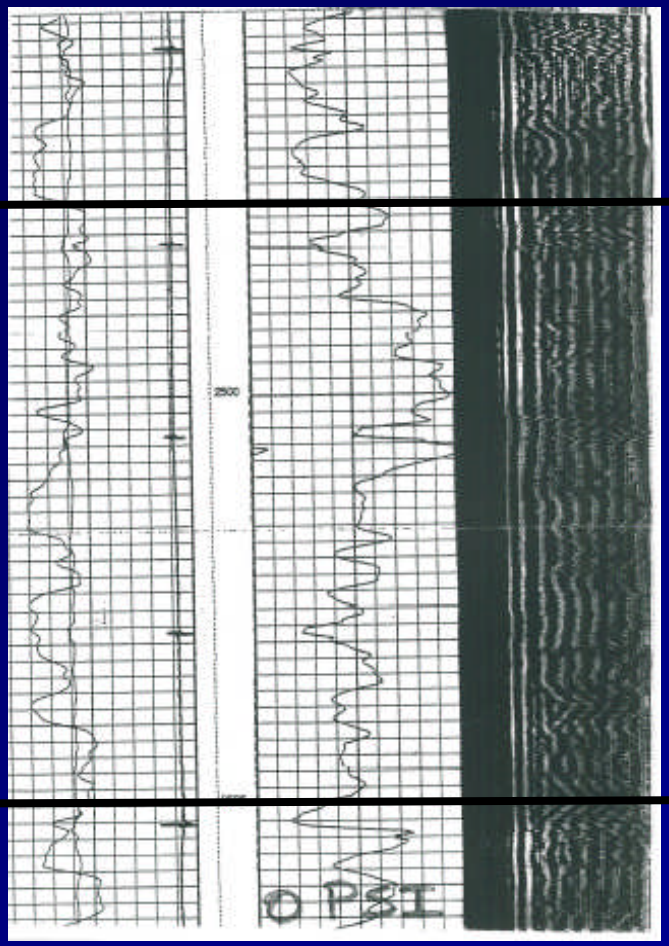
Do Not Pressure Test Casing Before Running Bond Log

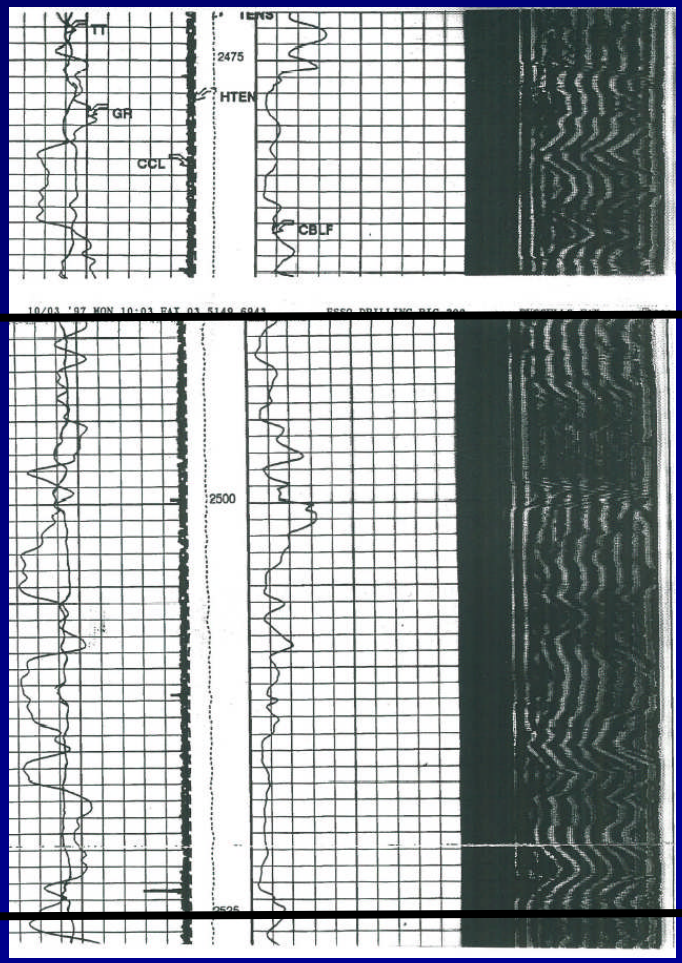
Pressure Testing Casing

- Do Not Pressure Test Casing Before Running a Bond Log
- Pressure Testing Casing After Bumping Plug – while Cement is still liquid – is a Best Practice
  - Hold Pressure for 10 minutes

Australia well

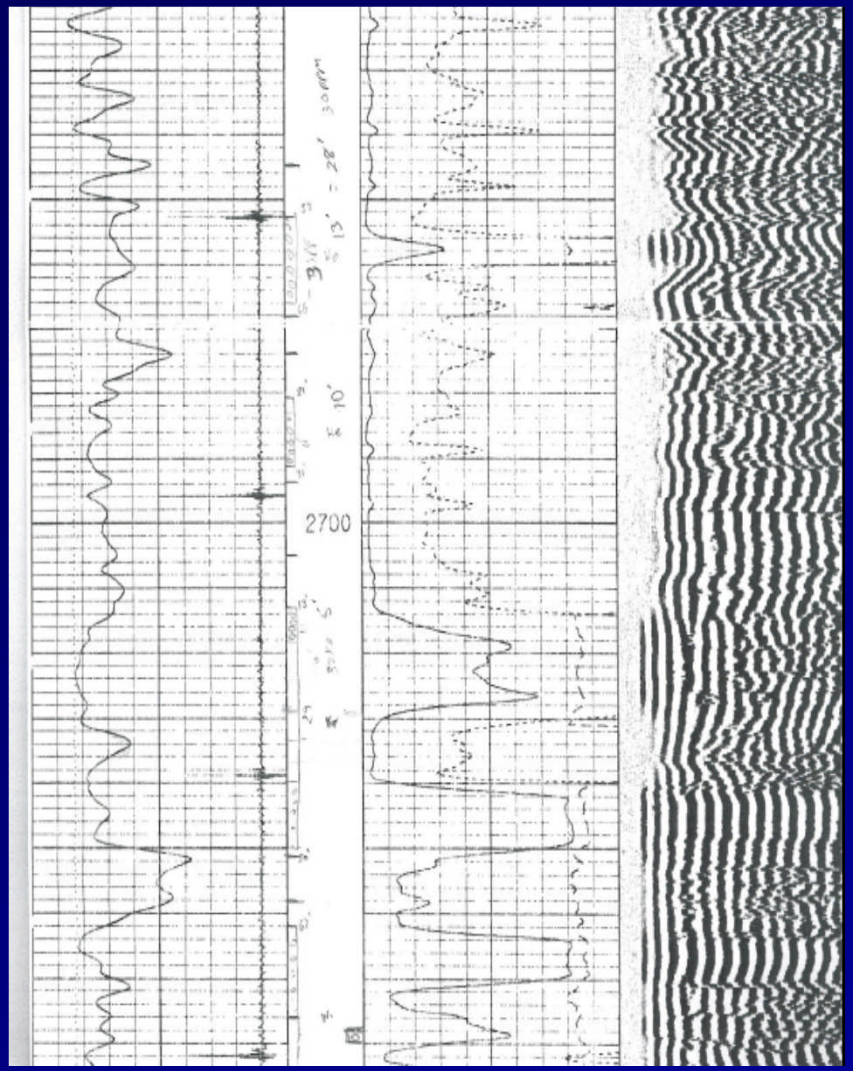
Casing was tested to 3000 psi before bond logging



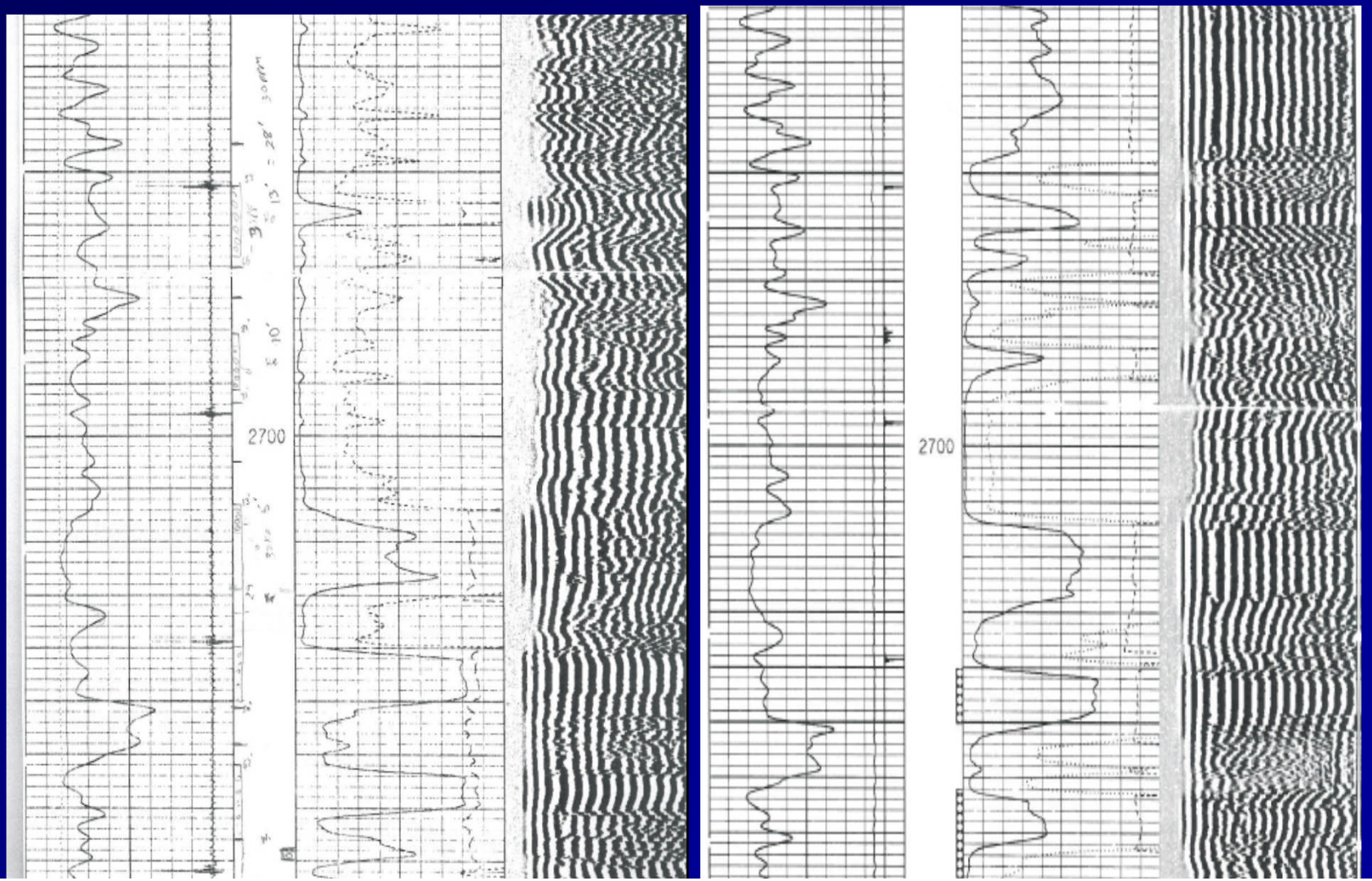


1000 psi

MidContinent Well



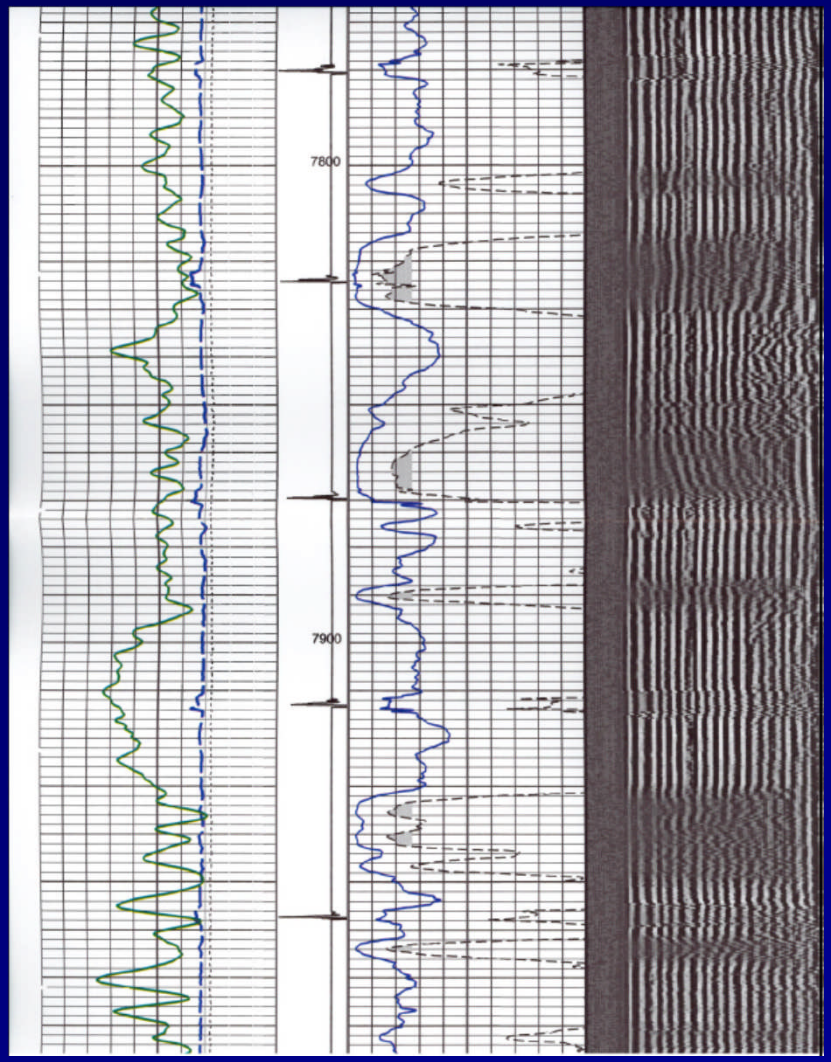
MidContinent Well



Best Practice # 7

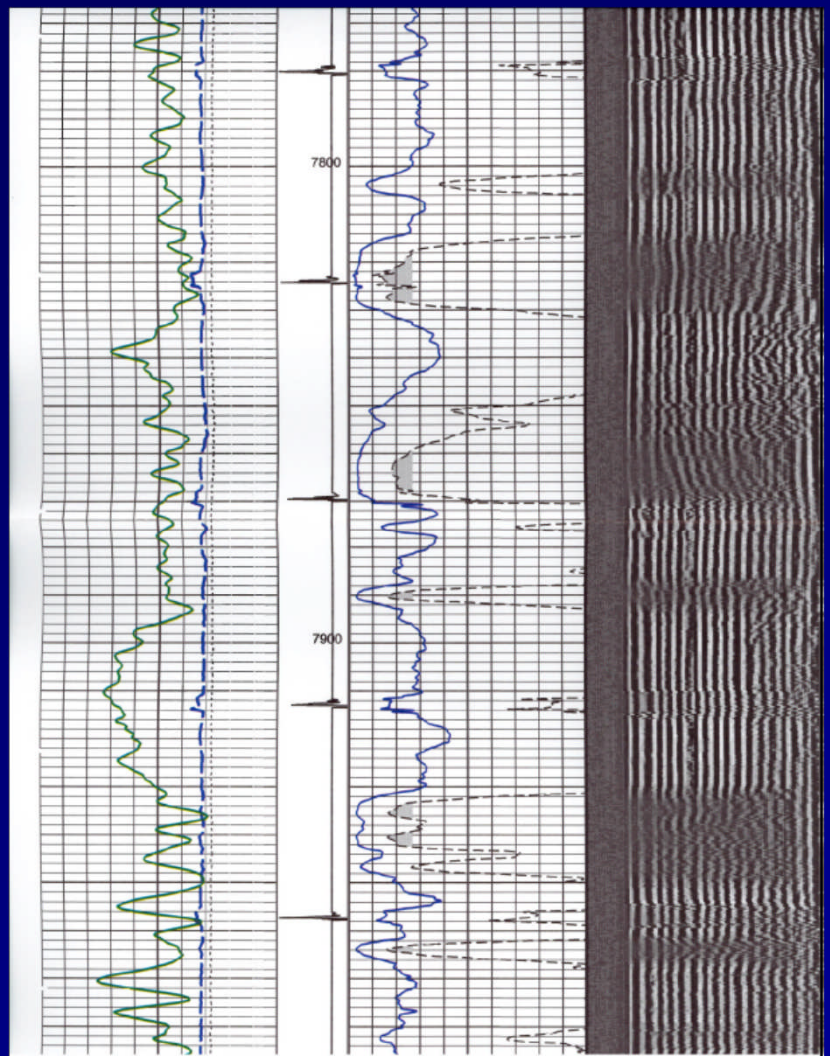
Log with a
Pressure Pass

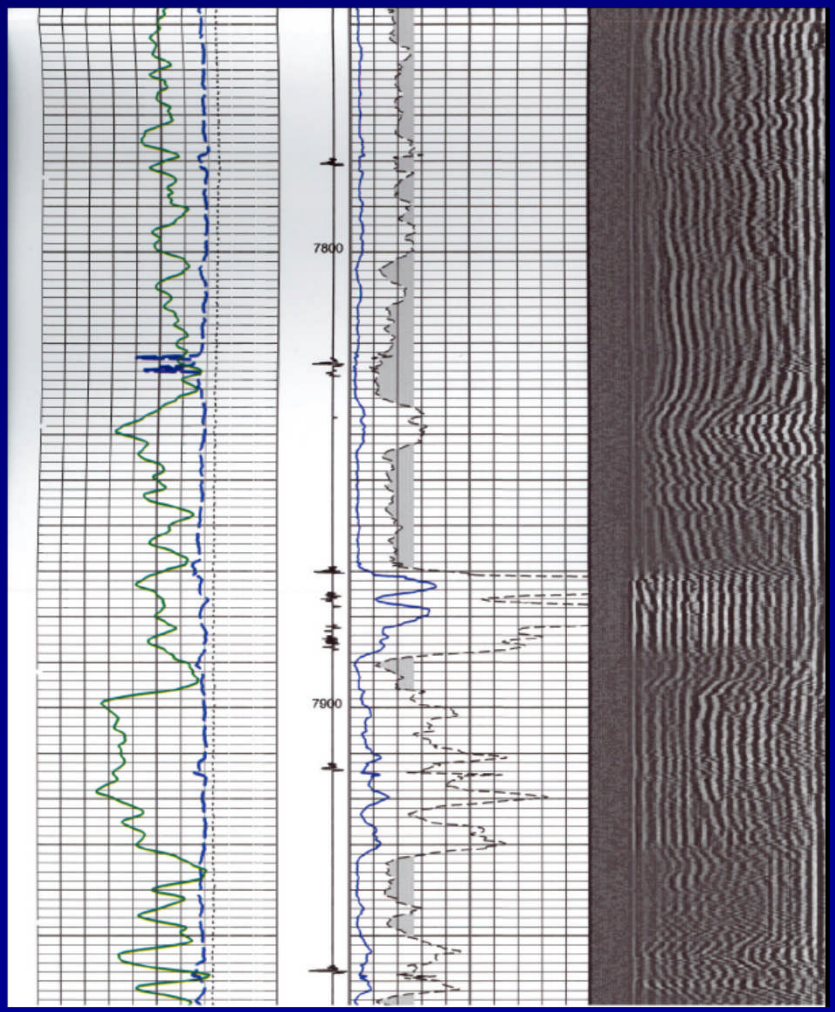
West Texas Well



Log run with 0 psi

West Texas Well





Pressure Pass @ 1000 psi

Seven Steps To An Excellent Bond Log

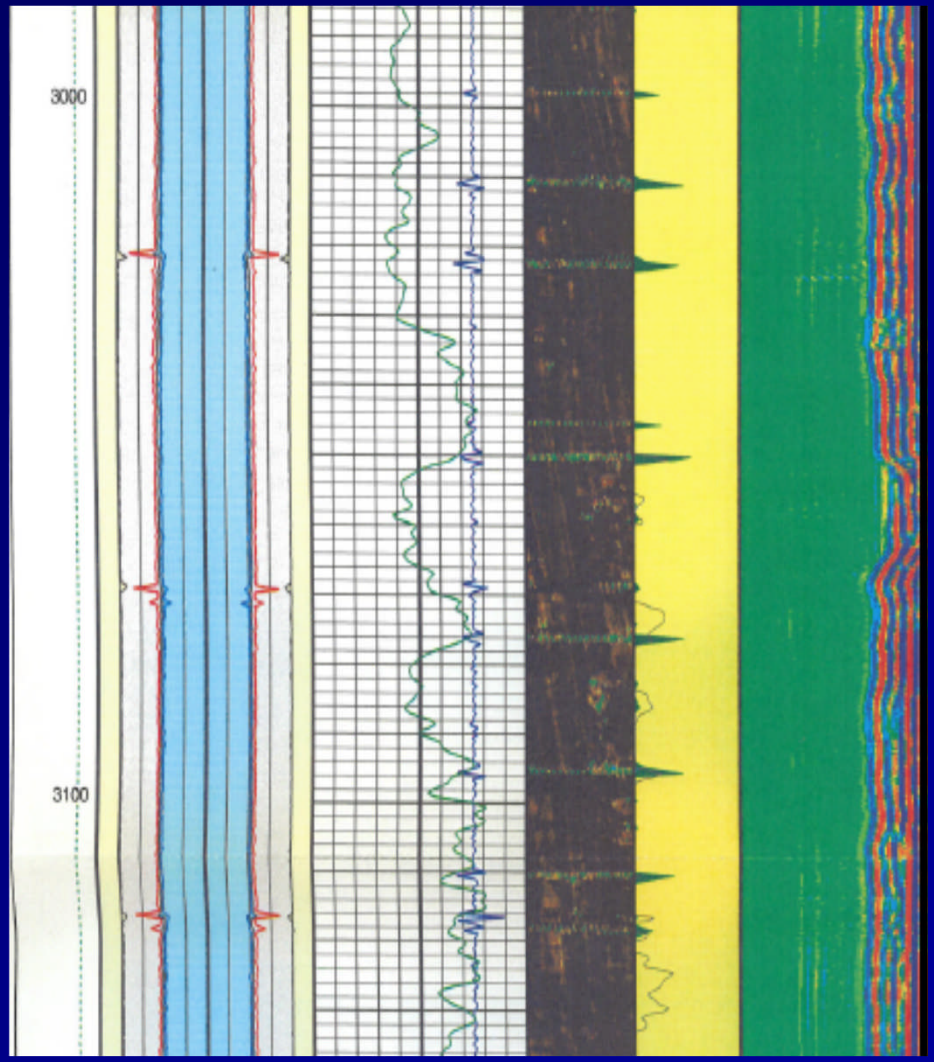
1. Sandblast the Casing
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Additional Tips

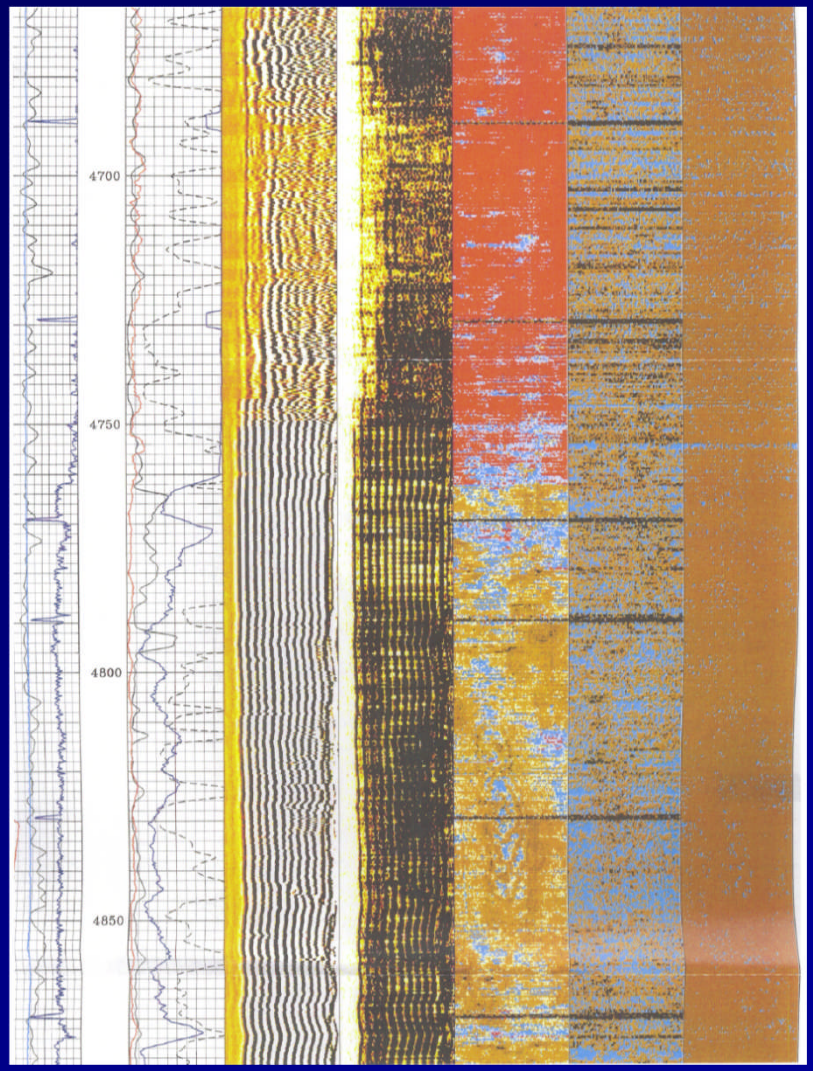
Tip # 1

Run Combination CBL/Ultrasonic Log

Horizontal Well



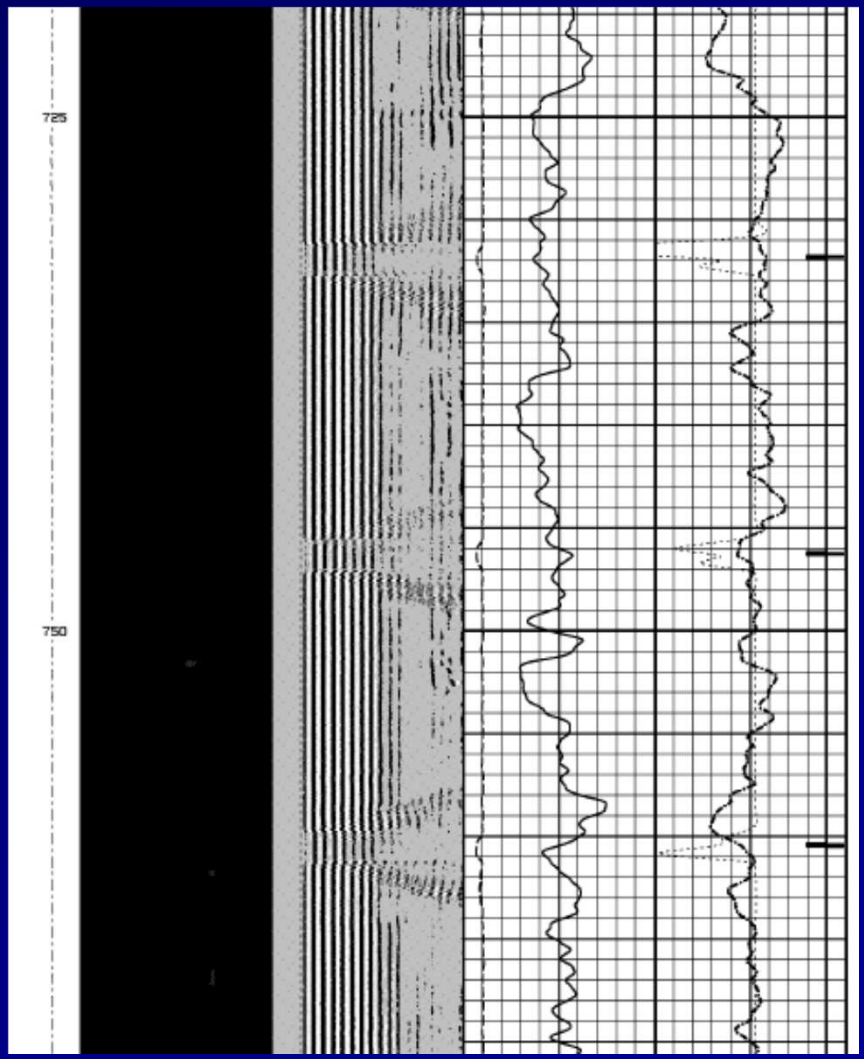
Foam Cement



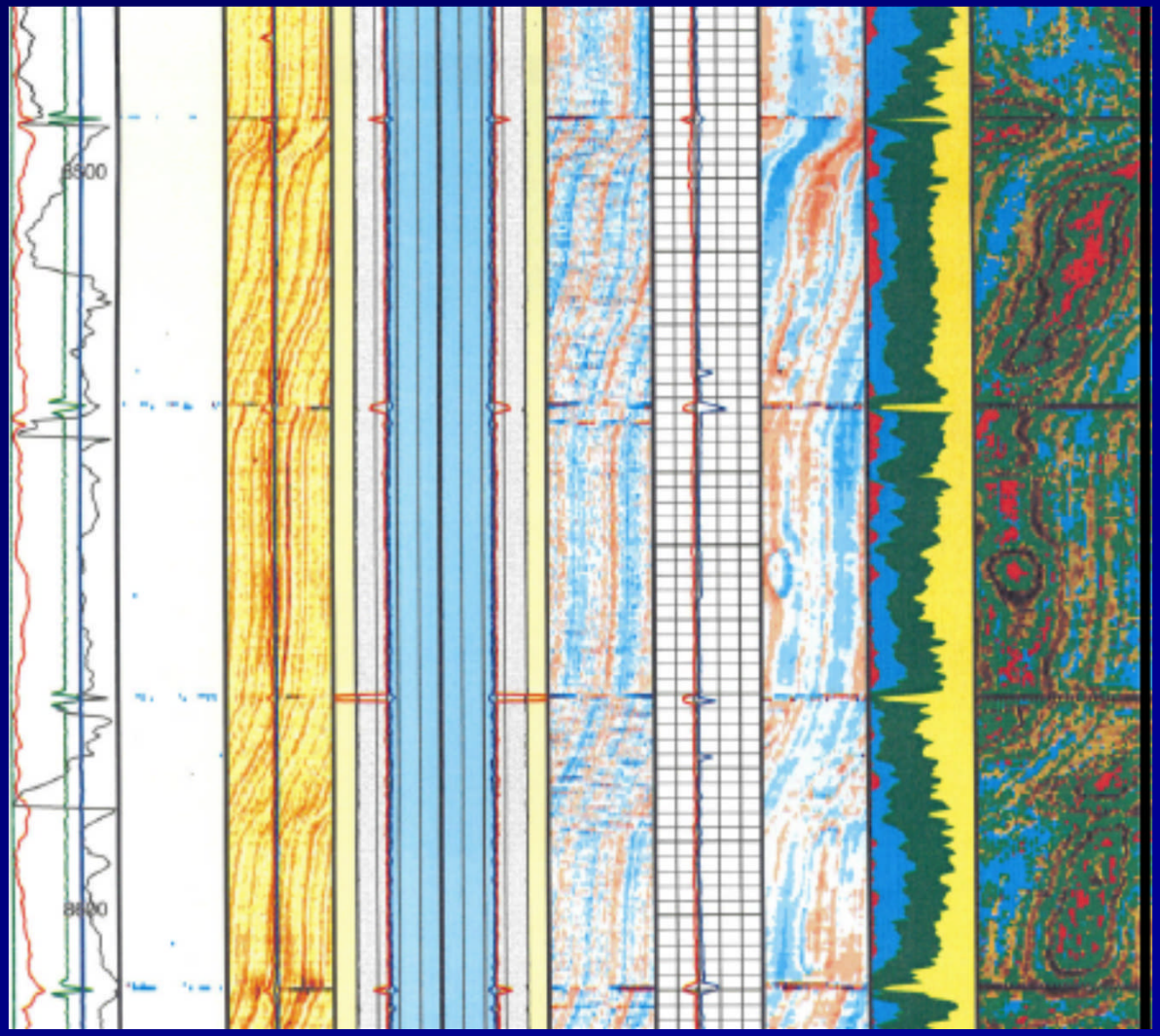
Tip # 2

Observe
Free Pipe Readings

South America Well

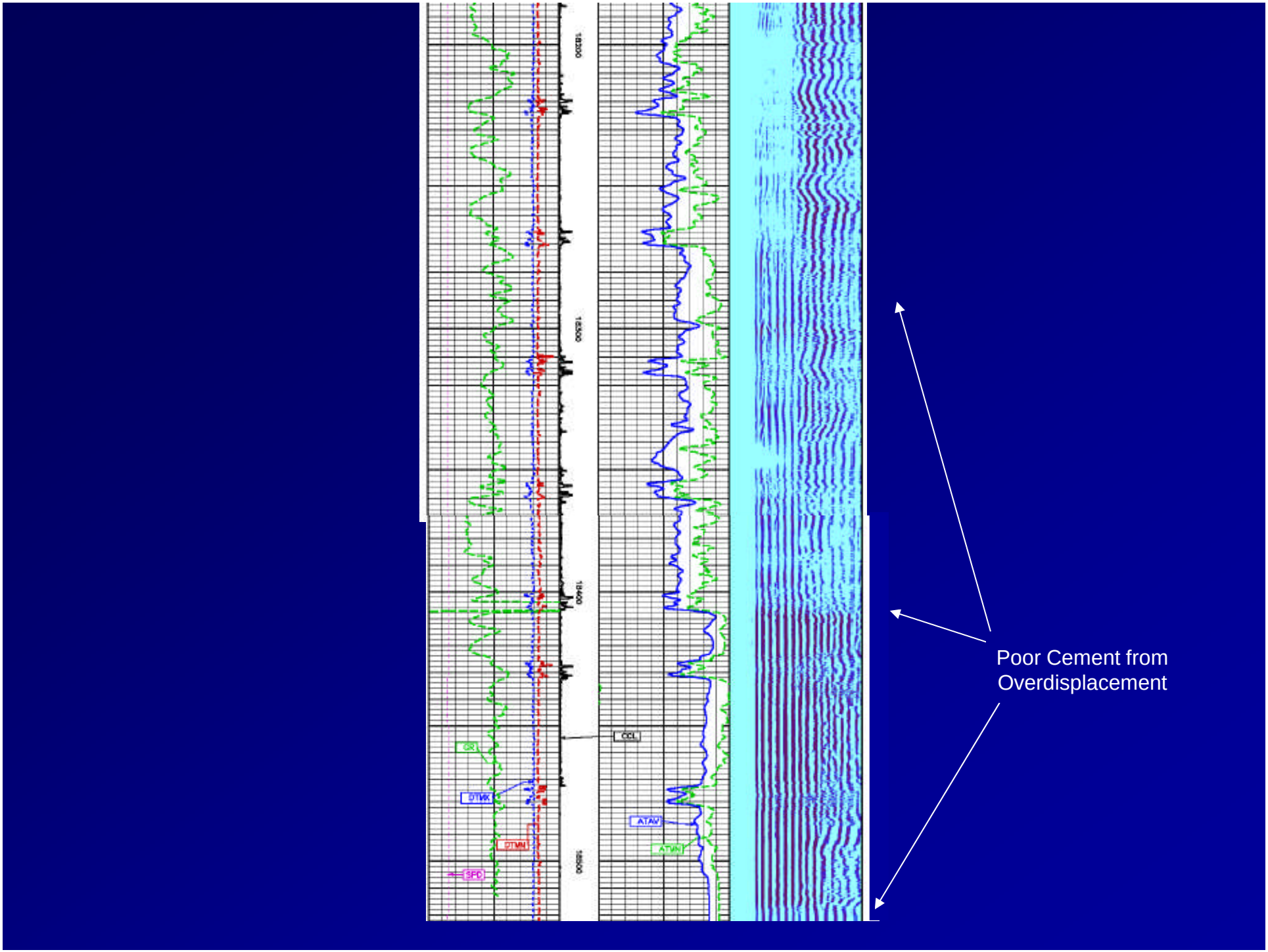


California Well



Tip # 3

Displace Theoretical
+ ½ Shoe Track Volume


18300
18500
18400
18500
GR
DTWK
DTWN
SPD
CCL
ATAR
ATVN
Poor Cement from
Overdisplacement

Tip # 4

Coatings for Casing

Bond Coat

Tip # 5

Do Not Squeeze

Do Not Squeeze

"Do not squeeze solely because of a bad bond log !"

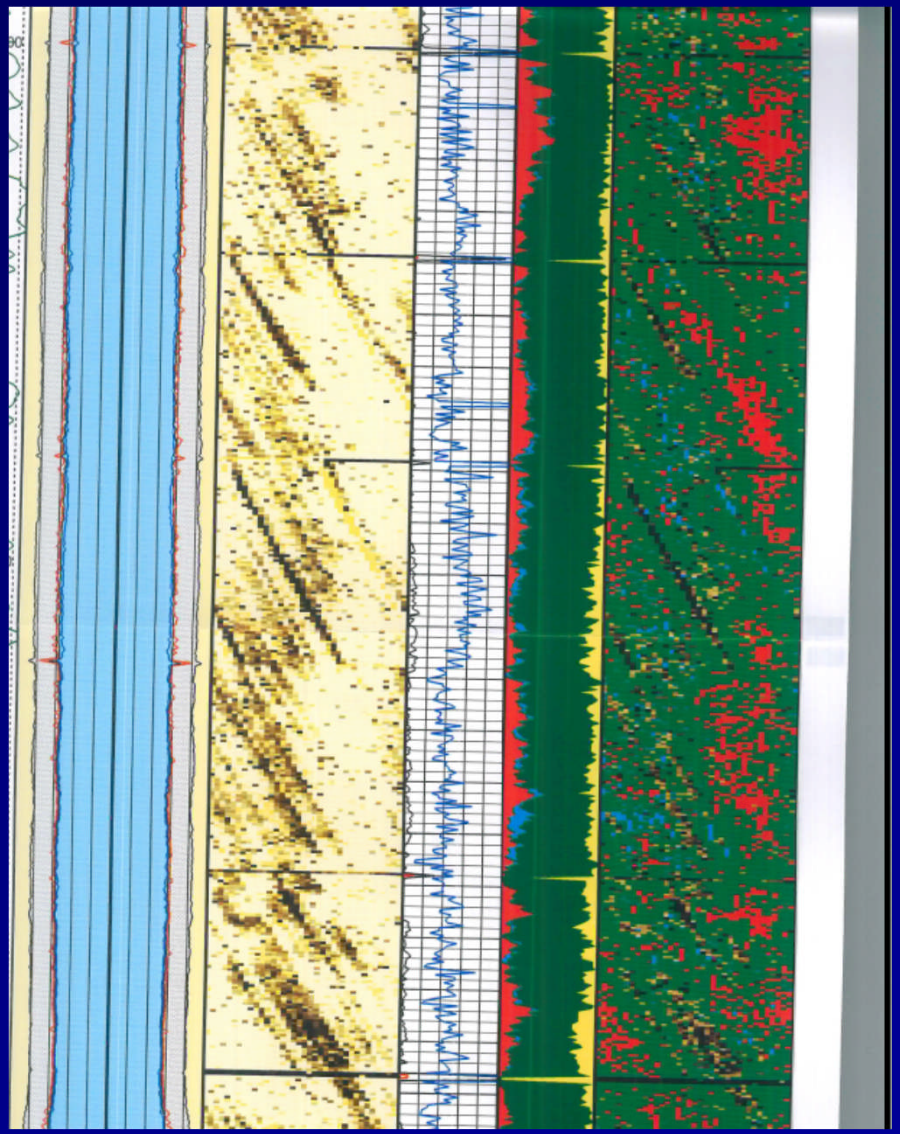
instead ….

"Use the bond log when you have to squeeze"

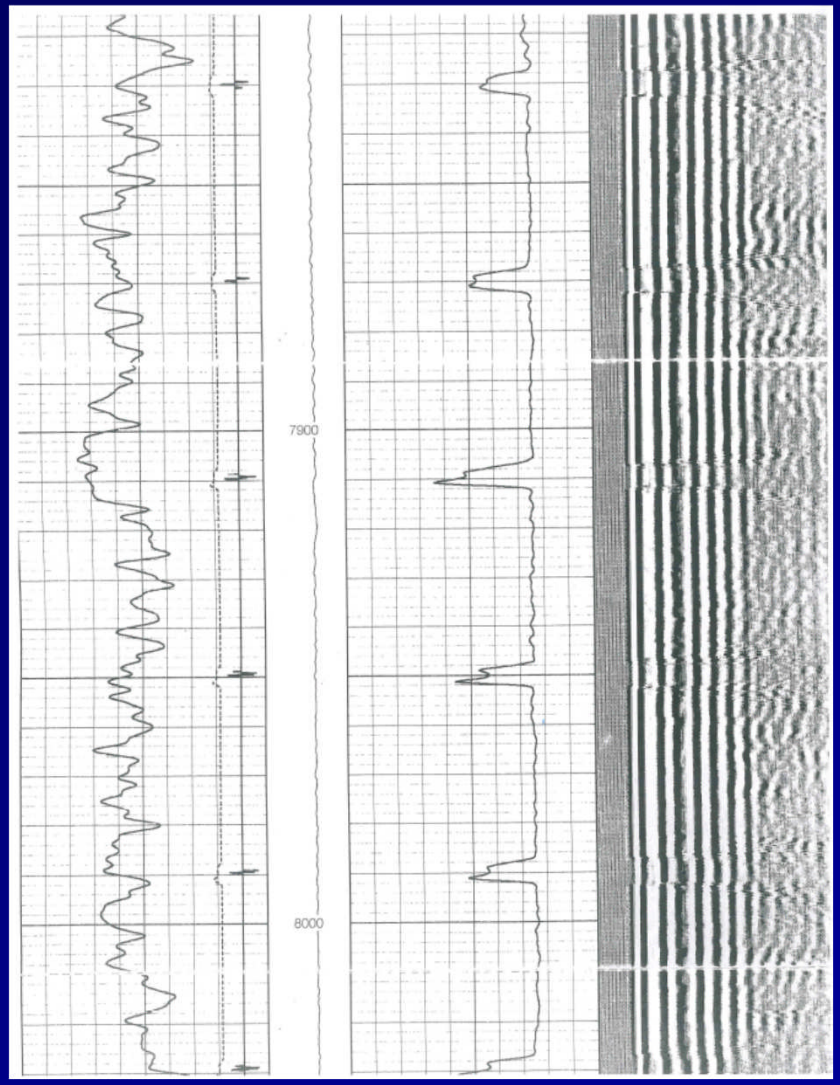
You Should Squeeze When You Have a Bad Bond Log PLUS

- Cementing Knowledge
  - Major losses occurred during cementing
  - The plug did not bump
  - Casing was stuck
  - Mud properties were not optimum
  - The well flowed after cementing
  - Cement slurry did not mix and pump as expected
  - Cement lift pressures while displacing were not observed
  - High Differential Pressures Between Zones of Interest

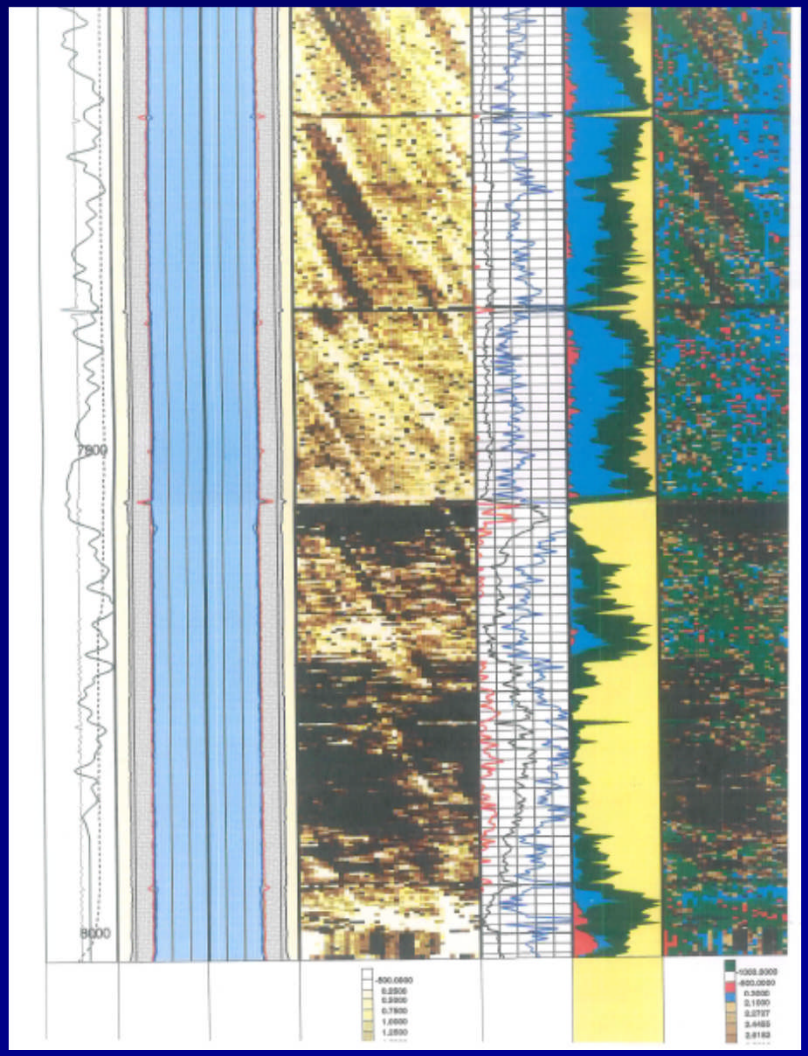
Colorado Well



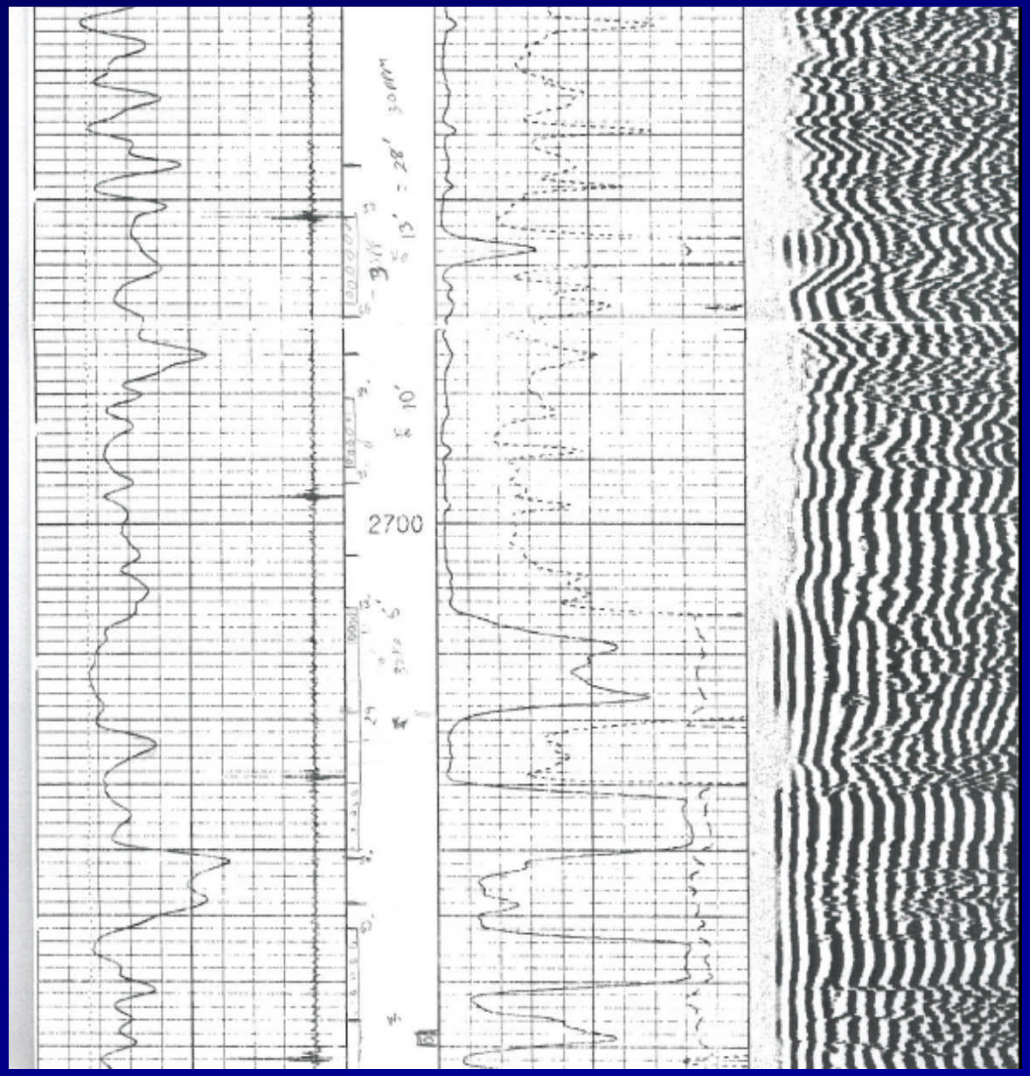
Colorado Well



Colorado Well



Kansas Well

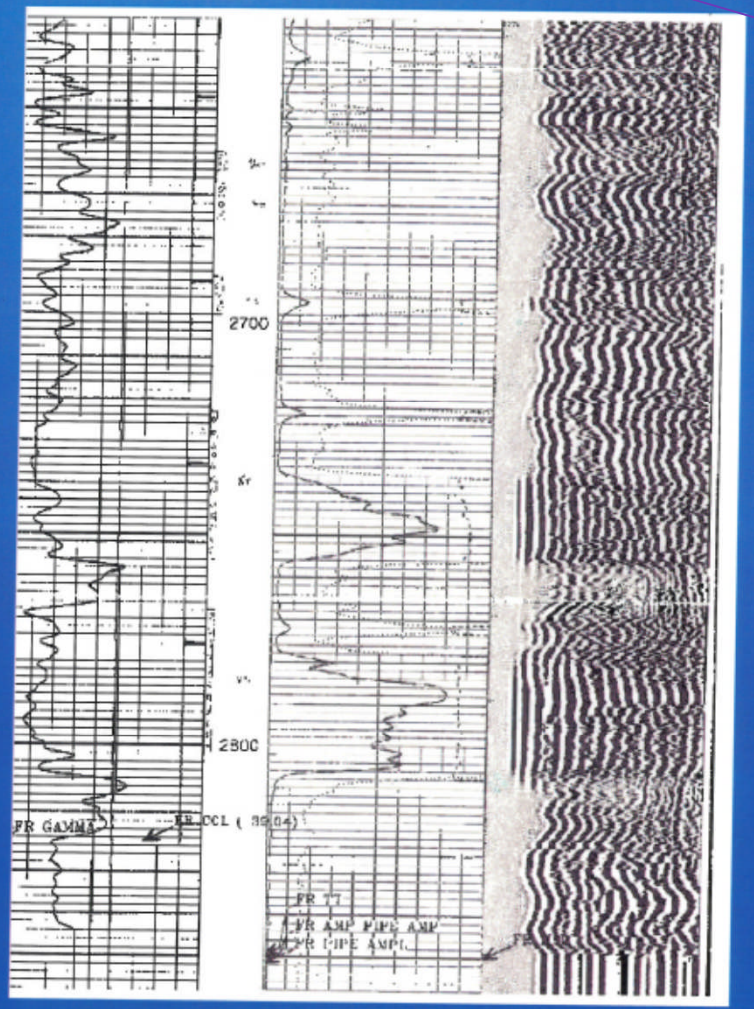


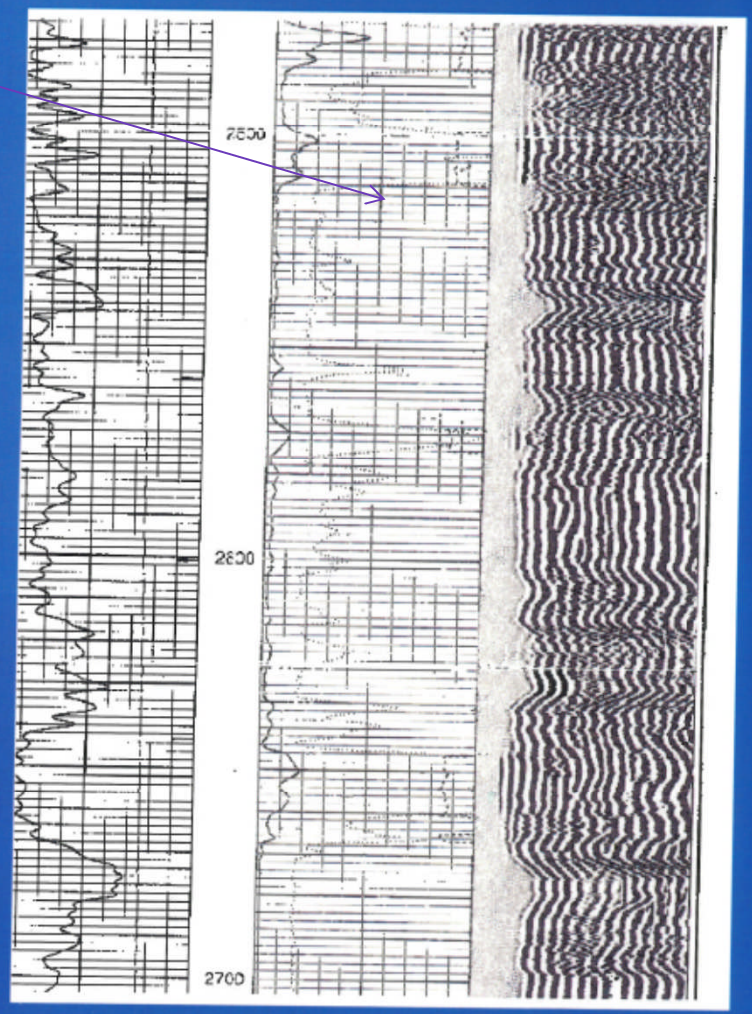
Expansion Additive

Cement Bond Logs

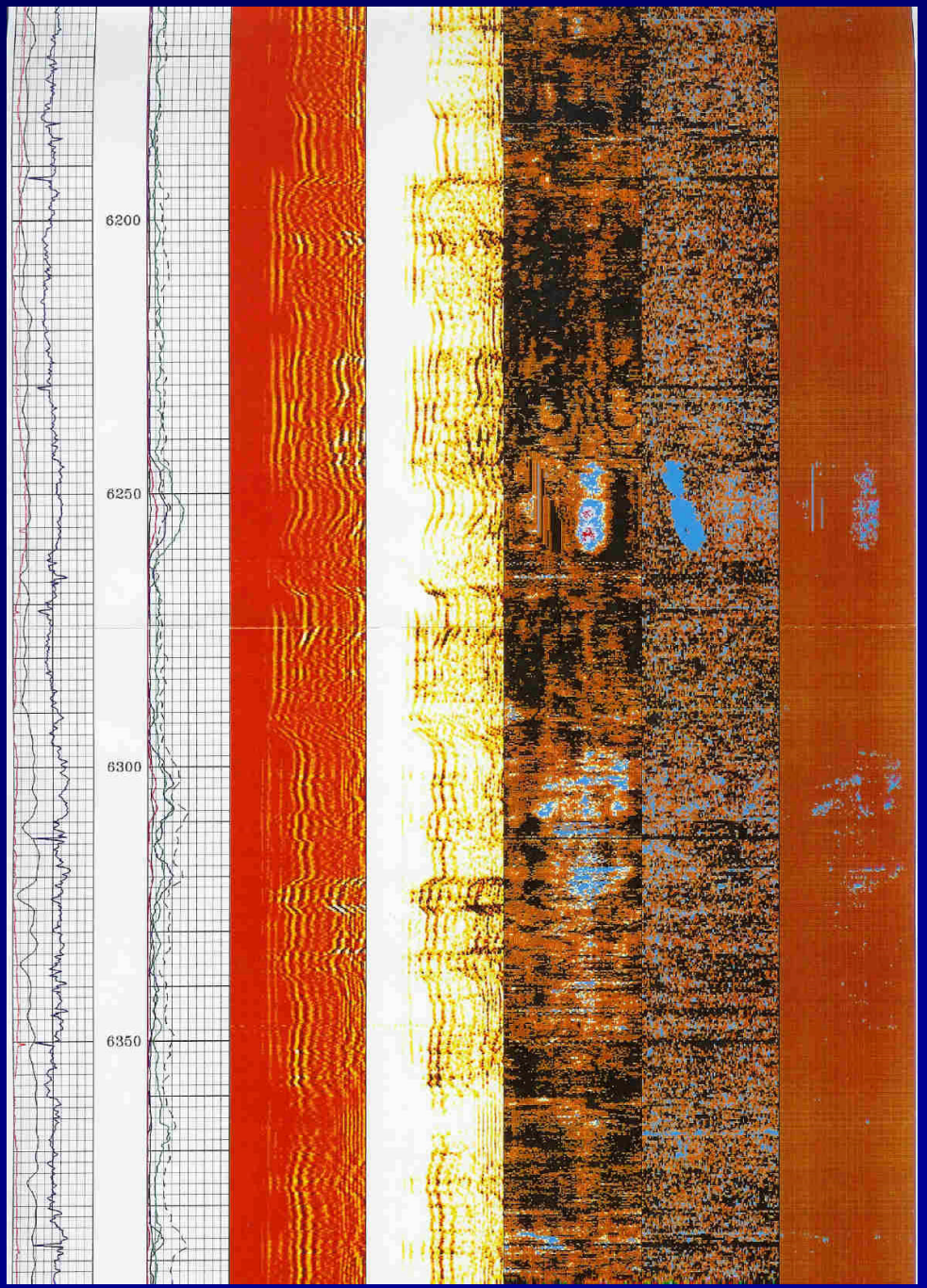
Kansas Well

Old cement blend





Improved cement blend


6200
6250
6300
6350