



**LONGFELLOW ENERGY, LP.**  
**LOCO HILLS OPERATIONS**  
**RESTIMULATION PROCEDURE**

**Well Name: State 20 E #3**

**Loco Hills – Empire Yeso East Pool Field**  
**Re-Completion Program**  
 Version 1; 7/25/2018

<b>Well Name</b>	<b>State 20 E #3</b>	<b>Engineer In Charge</b>
Well Type	Proved Producing	Steven Buckler
Field	Empire; Yeso East Pool	<a href="mailto:steven.buckler@longfellowenergy.com">steven.buckler@longfellowenergy.com</a>
Operator	Longfellow Energy LP.	432-741-5355
County	Eddy	
State	New Mexico	

Casing & Equipment	OD	Conn. OD	ID	Drift	Wt	Grade	Conn	Burst-80%	Maximum Overpull	Top	Btm	Length	Notes
Surface	8 5/8				24	J-55				0	330	330	Cmt to surf
Production	5 1/2"		4.892	4.767	17	J-55	LTC	4200		0	4328	4328	Circ'd cmt.DV Tool @ 2602'
Tubing	2 7/8	3.668	2.441	2.347	6.5	J-55	8rd	5800	80,000	0	4140	4140	Used 122 Jts, TAC, 10 Jts, SN, PS, MA
Rods	1	2					SH T			22	1405	1383	57 rods
Rods	7/8	1.8					FS T			1405	2830	1425	57 rods
Rods	3/4	1.6					FS T			2830	3930	1100	44 rods
Rods	1.5	1.6					FS T			3930	4130	200	8 K-bars
Pump	1.5	2								4130	4146	16	2 1/2" x 1 1/2" x 16'

**Perfs:**

Top	Btm	# of Holes
3892	3893	1
3900	3901	1
3903	3904	1
3910	3911	1
3917	3918	1
3940	3941	1
3943	3944	1
3945	3946	1
3948	3949	1
3953	3954	1
3956	3957	1
3964	3965	1
3967	3968	1

Top	Btm	# of Holes
3970	3971	1
3973	3974	1
3976	3977	1
3982	3983	1
3985	3986	1
4004	4005	1
4007	4008	1
4014	4015	1
4017	4018	1
4033	4034	1
4037	4038	1
4044	4045	1
4049	4050	1

Top	Btm	# of Holes
4054	4055	1
4064	4065	1
4069	4070	1
4074	4075	1
4089	4090	1
4094	4095	1
4099	4100	1
4104	4105	1

**KB: 13.7'**

**Unit Size: American 456-305-120 SPM- 8.5**



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## Location Directions

State 20 E #3  
Section 20 – T17S – R29E  
+/-925' FNL & +/- 1700' FEL  
Ground Elevation – +/- 3626'  
Eddy, NM.

From Hobbs, NM. Go northwest on Hwy 18 to Lovington. Turn left (west) on Hwy 82. Go 39 miles to Loco Hills. Continue on Hwy 82 for 7 miles to CR 211, turn right (north). Continue on dirt road. Drive .9 miles and turn left (west) into State 20 E lease. A caliche pit will be on the right side of the road.

## Potential Hazards

1. Casinghead gas which could contain H<sub>2</sub>S.
2. Well will be on vacuum.
3. Used equipment, possibly corroded or damaged including the downhole casing.
4. Scale/iron sulfide/ paraffin deposits inside tubing string
5. High pressure iron.
6. Weather {cold, heat, windy, raining, etc}

## Pre-Spud Activity

1. Clean location if necessary
2. Contact all vendors and supply them with information on timing for their service
3. N/D Flowlines in accordance to NM policies

## Program Objective

1. To recomplete the Lower San Andres by hydraulically fracturing.

## Well History / Current Status

1. Well was drilled in 2/2004.
2. Hot acid stimulated the Yeso in 3/2004. Put on Rod Pump.
3. Last pull on 4/2013, hold-down on pump severely corroded.
4. Allocated cumulative production: 31M BO + 129 MMSCF
5. Currently producing 2 BOPD + 30 MSCFD + 7 BWPD.

## Attachments

1. Wellbore Diagrams (Actual and Proposed)
2. Stimulation Design
3. CCL/GR Logs



# LONGFELLOW ENERGY, LP.

## LONGFELLOW ENERGY LP.

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## CONTACTS

James S. Follis – LFE Drilling Engineer  
Steven Buckler – LFE Engineer  
Ryan Culpepper – LFE Land Representative  
Wayne Campbell – LFE Geologist  
David Mitchell – LFE VP of Engineering

## CELL

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## EMERGENCY RESPONSE INFO

### **Hospital**

Artesia General Hospital  
702 N 13<sup>th</sup> St  
Artesia, New Mexico 88210  
(575) 748- 3333

Take Hwy 82 from Field, turn right (north) on 10<sup>th</sup> street. Drive to W Hank Ave, turn left (west) and drive at hospital.

### **Police**

NM State Police  
Artesia, NM  
(575) 748-9718

### **Poison Control**

1-800-222-1222

### **Fire**

Artesia Fire Department  
(575) 746-5051

### **Oil Conservation Division- New Mexico**

1220 South St. Francis Dr.  
Santa Fe, NM 87505  
(505) 476-3440 Office  
(505) 476- 3462 Fax

**WORKOVER PROCEDURE**

**PRE-WORKOVER PREPARATION**

1. Turn off unit and monitor tubing and casing pressures.
2. Inspect location and discuss with LFE engineer if location needs remediating.
3. Inspect anchors.
4. Get water sample from source water (Frac Tanks on location) and run water analysis.
5. Get combability testing between Smart Chemical and Frac Service providers chemicals.
6. Get sample of San Andres oil from State 20 B #15 well and test 15% NEFE acid for oil sludging.
7. Contact service providers i.e. stimulation company, isolation tool, completion rig, etc

**PULL PRODUCTION EQUIPMENT**

8. Conduct safety meeting. Discuss scope of work for the day and associated hazards i.e. weather, H2S, trip hazards, etc.
9. MIRU 300 Series 4-line Workover Rig (capable of pulling 100K) and ensure all personnel is wearing proper PPE which includes H2S monitors. Install guy wires and scope up derrick. Do not blow down well until all personnel on location is safely out harm's way (upwind) and rig is turned off. Blow down casing slowly, then blow down tbg. You can take check valve flapper out of casing side to blow down tbg. **Must re-install if this is done.**
10. Notify pump shop (Garner Pumps) of pump repair.
11. L/D Horseshed & PR. Unseat pump and POOH w/ rods & pump. Inspect rods while coming out of the hole. Tally rods and note any issues (rod box wear, pitting, paraffin, etc). If heavy paraffin is present on rods, then hot water rods with 50 bbls treated (biocide) produced water + smart chemical dispersant down tubing. Contact Craig Williams [505-444-3255] for recommended volume.
12. Blow down csg head gas. If well cannot be blown down then pump 10- 20 bbls of 2% KCL + biocide water to kill well. Notify EIC if more volume is necessary to kill well.
13. Unset TAC and N/D 7 1/16" 5M Wellhead. N/U 3K Manual BOP for 2 7/8" tubing.
14. POOH w/ 2 7/8" J-55 6.5# 8rd tbg. **Tally out of the hole.** Record any notables (scale, paraffin, sand, wear, pitting, etc). Confirm tally + Jt # from above table. L/D 2 7/8" Perf sub, MA, BP.
15. Inspect TAC and SN. Replace SN with new one (order SN from pump shop, must match cups on pump). If TAC is seen to have damage, send in to pump shop for R&R.

**CLEAN OUT WELL + PLUG BACK YESO**

16. M/U 4 3/4" tri-cone bit and 5 1/2" casing scrapper. RIH w/ bit & scrapper to 4,000'. **Hydro test tbg while RIH. Test tbg to 7000#.** Note any tags and rotate using tbg tongs to work pass any bridges inside csg.
  - a. M/U Torque on 2 7/8" J-55 8rd EUE is 1650– 2000 ft/lbs. Must check that operator is properly torqueing connections.
17. If cannot work get bit/scrapper deeper than 4000' then immediately contact LFE engineer. A bailer run might be necessary.
18. POOH w/ bit & scrapper. Inspect bit & scrapper for damage or debris. L/D bit & scrapper.
19. SI Blind rams and secure well.
20. MIRU Wireline Unit and Crew
  - a. Wireline Unit
  - b. 3K BOP with Pack-off
  - c. Use WO rig in place of crane.
21. RIH with Wireline CIBP and Setting Assembly
  - a. Rope Socket
  - b. CCL
  - c. Setting Tool
  - d. 5.5" 10K CIBP



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- 22. Set CIBP @ 3880' between collars at 3872' and 3911'. Tag back with setting tool to ensure released from setting tool. Record tension drop. POOH with setting tool. Laydown and inspect equipment.
- 23. RU Kill Truck and fill the well with treated (2% KCL & Biocide) fresh water.
- 24. Pressure test CIBP and casing to 3000 psi.
- 25. RIH with 3" dump bailer w/ 35' of cement and break glass on CIBP set at 3890'. POOH w/ bailer.

## PERFORATE SAN ANDRES

26. Assemble Perforation gun as follows:

Perf Configuration(s)	Gun 1	Gun 2	Gun 3	Gun 4
Top Perf	3657	3683	3719	3770
Btm Perf	3658	3685	3720	3772
Length	1	1.5	1	1.5
Carrier Size	3 1/8"	3 1/8"	3 1/8"	3 1/8"
Density	6 spf	6 spf	6 spf	6 spf
Phasing	60 deg	60 deg	60 deg	60 deg
Shots	6	9	6	9

- 27. Conduct Safety Meeting. Discuss RF safety protocols, mitigation of current sources, site access, and any other perforation specific safety concerns. Document safety meeting.
- 28. PU and RIH with Perf Gun 1, correlating depths to GR & CCL from HES CNL/GR.
- 29. Perforate San Andres between 3657' to 3772'. Dual confirm gun detonation through e-line, and physically on cable. Report any suspected misfires immediately to EIC.
- 30. POOH to surface, laydown and inspect guns, report any misfires.
- 31. SI Blind Rams on BOP and secure well.

## PAD SITE PREP

- 32. All services should discuss rig up requirements in detail with completions foreman.
- 33. Inspect Frac Pit to ensure 30,000 bbls of total fluid is available for completion.
- 34. Set 6 x 500 bbl frac tanks, 2 x acid tanks and a manifold system.
  - a. Treat FW by adding biocide, surfactant, iron sulfide chemical & scale inhibitor. Contact Craig Williams to get chemicals and recommended volumes to treat tanks. Let Smart Chemical do the mixing and fluid compatibility analysis.
  - b. Lay containment for tanks on location.
    - i. When laying containment plan accordingly for weather conditions. Avoid laying containment on days with high winds or inclement weather. Wind more than 30mph is not ideal for laying containment and a decision must be reached between the Containment Company and foreman on whether to proceed safely.
- 35. Rig up water transfer. Water must be capable of 80 bpm delivery to location. Consult well specific water transfer plan for impoundment uses and line routing. Once tanks are on location and line is rigged up, start filling tanks with treated water.
- 36. Discuss with stimulation service provider on frac spread placement. Determine appropriate location for sand bins and pre-set bins. Load bins with designed sand volumes.
- 37. Ensure proper rental services are on location. I.E. Man lift, forklift, Port O Johns, safety and trash trailer.

## WELL PREP

- 38. MIRU 15K Isolation Tool Service Provider.
  - a. Contact service provider and provide them with B Section dimensions for proper sizing of equipment.
  - b. Ensure supplied goat head has at least 5 x 1502 Iron Connections.

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- c. Pressure test isolation tool to design rating: 500 psi low/ 6,000 psi high. Document and report test. Foreman must witness pressure test.
  - d. Please note, isolation tool is the single most important piece of safety equipment on location. Its maintenance and integrity should not be compromised. Report any issues observed immediately to Foreman.
  - e. The operation of the valving system on the isolation tool can only occur under the direct supervision of the Completions Foreman and service provider. No exceptions.
39. MIRU Well Test Service Company for Frac
- a. Equipment Required:
    - i. 1502 Flowback Iron
    - ii. Dual 1502 Choke Manifold
    - iii. 500 BBL Flowback Tank w/ Gas Buster
  - b. RU 2" 1502 flowback lines, 15K manifold, and open-top tank equipped with gas buster separation. Choke manifold should be located ~20' from wellhead.
  - c. Rig up flowback iron onto B section casing valve.
  - d. Lines should be rigged up in as straight a line as possible. Where changes in direction are required, all flowback and bleed-off iron must use hard T-connections, straight connections, and 90-degree connections (no swivel joints), and must be secured to ground using cement blocking and cable systems.
  - e. Pressure test all flowback lines. Document and report test. Foreman must witness pressure test.
  - f. A visual inspection of the rig-up must be conducted with the Foreman prior to release of rig-up crew.

<b>WIRELINE AND FRAC PREP</b>
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40. MIRU Crane
- a. Ensure a minimum room needed for the crane to set up. Ensure this will be enough room for the crane to operator with its outriggers full extended.
  - b. Identify a no-go zone around the crane and under the loads that will be lifted during its operations. This zone should be chained off with red chains and cones.
  - c. Crane must be able to support load of 20' 5k lubricator.
41. MIRU Wireline Service Company
- a. MIRU Crane
  - b. Ensure a minimum room needed for the crane to set up. Ensure this will be enough room for the crane to operator with its outriggers full extended.
  - c. MIRU Wireline Truck & Gun Trailer
  - d. Spot and rig up wireline in conjunction with the crane vendor so wireline can access all wells on pad without having to rig down and move.
  - e. Identify a no-go zone around the crane and under the loads that will be lifted during its operations. This zone should be chained off with red chains and cones.
42. Frac Plug Company
- a. Call out 10K Frac Plugs for total job plus an additional 2 contingency plugs.
  - b. Store plugs with Wireline Services so as they do not interfere with vehicle traffic or operations.
43. MIRU Stimulation Service Provider
- a. Ensure appropriate number of pump trucks are on location to provide 80 bpm. Pump trucks must be set-up so that access between adjacent vehicles is open for foot traffic and safety; if possible the ability for them to be removed if complete failure occurs.
  - b. Blender and missile are capable of 80 bpm and blender can handle sand concentrations of 2.5 lb/gal.
  - c. All 3" or 4" frac iron must be regularly inspected and rated to at least 10,000 psi.
  - d. **Rig up a ball launcher in-line with the frac iron.**
  - e. All pumps must be rigged up with check valves on the discharge side of the pump.
  - f. All high-pressure iron must be elevated on blocking and rubber matting to reduce axial loads, bending and torsional loads. Component design rating only applicable in the absence of external loading.
  - g. All pumps on location must have independent pressure transducer upstream of the check valve on the discharge side of the pump.
  - h. **Rig up a pressure transducer on the A section wellhead to monitor the backside pressure.**



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- i. A minimum of two 3" mechanical pop-offs (pressure relief valves) downstream of the H-manifolds and upstream of the ground valves and checks. Pop-offs must be on separate ground lines, oriented so the discharge is vertically upwards.

### 44. Shutdown Set-Points

- a. High pressure shut down system should be set at cascading pressures to ensure there is no over pressure of the well head or iron. For a 4,000 psi rated operation the sequence should be as follows:
- b. 1/3 of the pumps set at 3,800 psi
- c. 1/3 of the pumps set at 3,900 psi
- d. 1/3 of the pumps set at 4,000 psi
- e. All high-pressure iron must be pressure-tested to 4,000 psi prior to every stage.

### 45. Pump Testing

- a. A loop test to ensure computer flow rates are correct must be performed on location and witnessed by the completions foreman.
- b. Bucket testing must be performed on location to ensure chemical pump flow rates are correct. This process is witnessed by completions foreman. This includes third party chemical pumps.

## LOWER SAN ANDRES MULTI-STAGE FRACTURE STIMULATION

46. Conduct safety meeting. Discuss acid safety protocols, pressure on lines, relief valves, hazards, etc.
  - a. Confirm pop-off valves are set @ 4200 psi.
  - b. Ensure all surface equipment is tested to 5000 psi.
47. Pump Lower San Andres Frac Design as per attached design stimulation. Max pressure is 4000 psi and max rate is 75 bpm.
  - a. Before each fracture treatment. Pump 5000 gals of 15% HCL w/ 40 ball sealers. Drop 10 ball sealers every 1250 gals of acid. Flush well with treated fluid to top perf.
  - b. After all ball sealers are pumped. Surge back 10 bbls to remove diverter. Confirm difference in pressure to ensure balls were removed.
  - c. Pump sand stimulation in accordance to design. Flush well to top perf. Drop rate to < 10 bpm to pick up 500 gals of acid. Spot acid across next perforation interval.
  - d. Record 5/10/15 min ISIP, ball action/ball out, average rates/pressures, etc
48. Post-Job Reporting Requirements
  - a. Job plots should be provided to the EIC immediately following the 15min ISIP.
  - b. A detailed post-job report must be provided to the stimulation service company in a timely fashion.
  - c. The Completions foreman will complete a frac summary every stage. The frac summary will be provided by the EIC and is in excel format.
  - d. Pre and Post job material volumes (proppant, water, chemicals) must be reported to ensure QCQA of materials.

## RIG DOWN EQUIPMENT AND FRAC FLEET

49. After completing the last stage. Shut-in master valve on isolation tool, bleed off pressure on pump side and put a pressure gauge on the wellhead to monitor pressure.
50. Sting out of wellhead with isolation tool. SI Blind Rams on 3K BOPE unless pressure at the wellhead exceeds it.
51. N/D Isolation Tool if pressure is not an issue.
52. Before Water Transfer rigs down, ensure 1 x frac tank is full of treated water for drill out operations.
53. Begin to R/D Frac Fleet, W/L, W/T and release surplus rentals {# of Port O' Johns, man basket, acid tanks, # of light towers, etc}
54. Once Frac Fleet has exited location, make a housecleaning pass around location. Immediately notify service providers if any trash or pieces of equipment were left behind.

<b>DRILL OUT OPERATIONS</b>
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55. Monitor pressure on wellhead gauge. If pressure exists, then rig up flowback equipment to casing valves and flowback well under guidance of flowback company.
  - a. MIRU Well Test Service Company
    - i. Equipment Required:
      1. 1502 Flowback Iron
      2. Dual 1502 Choke Manifold
      3. 500BBL Flowback Tank w/ Gas Buster
      4. Transfer C-Pump (Capable of ~5 bpm)
    - ii. Flowback well until well is dead.
    - iii. If pressure persists, rig up 10K pump truck and pump down 10 ppg brine water to kill well.
56. When confirmed that well is dead then open blind rams on BOPE.
57. MIRU 300 Series W/O Rig and ancillary equipment. Ensure all personnel is wearing proper PPE which includes H2S monitors.
  - a. Extra Equipment
    - iv. Reverse Unit [2 x 5k Pumps]
    - v. Bowen Power Swivel
    - vi. Drill Bit & 6 x 3 1/2" DCs
    - vii. Subs
    - viii. Pipe racks
58. TIH with Drill Out Work-String BHA
  - b. 4 3/4" Sealed Bearing Tri-Cone Drill Bit i.e. 524 or 634. Nozzle size: 12/32nds.
  - c. Bit Sub
  - d. 8 x 3 1/2" Slick DCs {Torque connections 3400 – 4100 ft-lbs}
59. TIH w/ 2 7/8" tubing out of derrick. {Torque connections 1650 – 2000 ft-lbs}.
  - e. Conduct periodic weight check. Take neutral weight before tagging fill on top of plug.
  - f. R/U both pumps to the tubing.
  - g. Break circulation above first plug to ensure tubing string is clear.
60. Continue TIH and tag first frac plug. Record depth of tag and compare to recorded depth from wireline. Immediately inform EIC if depth is significantly different.
  - h. Conduct weight check.
  - i. R/U power swivel
61. Plug Drill Out Parameters
  - j. Fluid = Treated Water
  - k. Pump Flowrate: 2 – 6 bpm
  - l. Rotary RPM = 40 – 60 RPM
  - m. WOB = 1500-2200 lbs
  - n. ROP (est.) = 0.09-0.2 inch/min
  - o. Duration (est.) = 5-45 min
  - p. Time Drill (est.) = 1" / 4 min
  - q. Circulation Pressure (est.) = 1000 - 1500 psi
62. Once plug is drilled, ream and circulate by pumping high viscosity sweeps to remove debris.
63. Continue to TIH to next plug, if excessive weight is noticed then P/U above frac'd interval and wash & ream to clean up. Pump 5 – 20 bbl gel sweeps down tubing as necessary.
64. Repeat process until all plugs are drilled out.
65. RIH and tag PBSD. Notify EIC in charge of depth. It may necessary to clean out to desired PBSD.
66. Once desired PBSD has been reached and returns are clean of debris then POOH w/ tubing, DCs and bit. L/D DCs and bit.

<b>RUN PRODUCTION EQUIPMENT</b>
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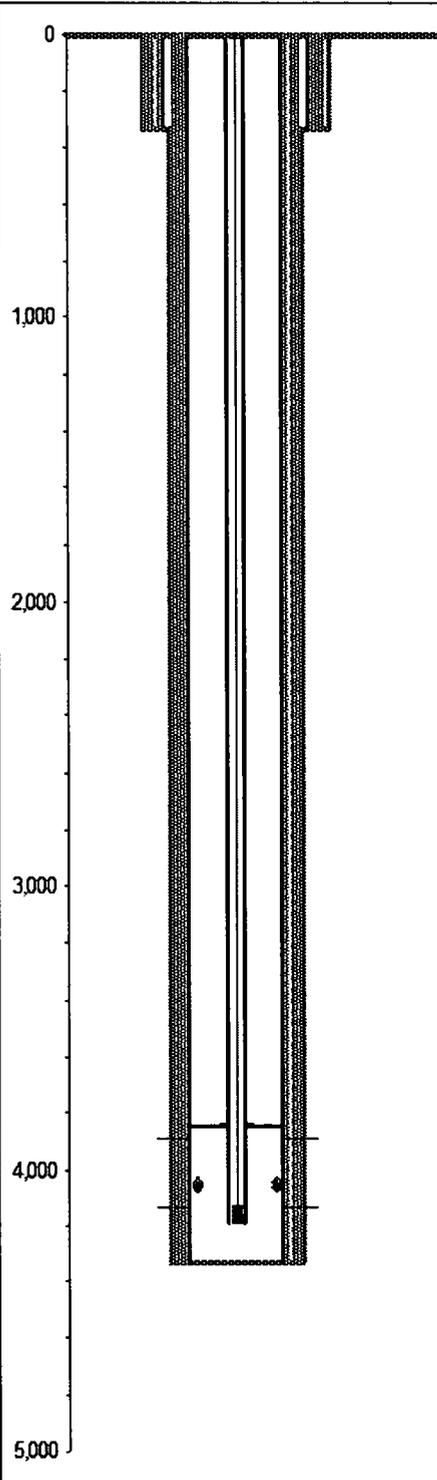
67. M/U Tbg BHA and RIH w/ tbg as follows: (From bottom to top). Depths could vary depending on PBTD.  
**Depths include KB.**
- i. 2 7/8" 8rd Bull Plug (~3830')
  - ii. 2 7/8" 8rd J-55 EUE Jt
  - iii. Box- Pin XO to 2 7/8"
  - iv. 3 1/2" 8rd Slotted Mud Anchor
  - v. 3 1/2" 8rd Pin-Pin XO to 2 7/8" 8rd
  - vi. New Cup Type SN (~3764')
  - vii. 8 Jts of 2 7/8" J-55 8rd EUE
  - viii. 5 1/2" x 2 7/8" TAC w/ 35K Shear {~3508'}
  - ix. ~110 Jts of 2 7/8" J-55 8rd EUE (~3504')
- b. Make sure to properly torque 2 7/8" connections between 1650 – 2000 ft/lbs.
68. Set TAC w/ 15 points. N/D 3k BOPE and N/U 7 1/16" Tubing Wellhead.
69. Run R&R'd 1 1/2" pump & rods out of derrick (1" x 7/8" x K-bars). Will have to L/D approximately 15 3/4" rods.
- a. Use rod cards for makeup torque on rods.
  - b. Replace used rod boxes if necessary.
  - c. Space well out where pump is 24" off bottom.
70. Confirm pump action and load and test well to 500#.
71. R/D P/U and release Rig.

# LONGFELLOW ENERGY, LP.

State 20 E # 3

ID: 81178-003

API # 3001533207



925' FNL & 1,700' FWL	GL Elev: 3,626.00	KOP:
Section 20, Township 17S, Range 29E		E OC:
County, State: Eddy, NM		Fill Depth: 4,285
Aux ID:		PBTD: 4,285.00
*KB' correction: 13.7; All Depths Corr To: KB		TD: 4,328.00
		BOP: 7 1/16" 5M

Hole Size			
Diameter	Top At	Btm At	Date Drilled
11.0000	0.00	330.00	2/18/2004
7.8750	330.00	4,328.00	2/25/2004

Surface Casing								Date Ran: 2/18/2004
Description	#	Diameter	Weight	Grade	Length	Top At	Btm At	
Casing	10	8.6250	24.00	J55	270.67	13.70	284.37	
Casing	1	8.6250	24.00	J55	45.13	284.37	329.50	
Guide Shoe	1	8.6250	24.00	J55	0.50	329.50	330.00	

Production Casing String 1								Date Ran: 2/25/2004
Description	#	Diameter	Weight	Grade	Length	Top At	Btm At	
Casing	117	5.5000	17.00	J55	2,588.00	13.70	2,601.70	
D.V. Tool	1	5.5000	17.00	J55	2.50	2,601.70	2,604.20	
Casing	42	5.5000	17.00	J55	1,681.00	2,604.20	4,285.20	
Float Collar	1	5.5000	17.00	J55	1:30	4,285.20	4,286.50	
Casing	1	5.5000	17.00	J55	40.70	4,286.50	4,327.20	
Float Shoe	1	5.5000	17.00	J55	1.00	4,327.20	4,328.20	

Cement								
Top At	Btm At	I D	O D	TOC Per	# - Type	# Sx	Class	Wt.
0.00	330.00	8.625	11.000		Circ1 - Lead	100		14.40
					2 - Tail	250		14.80
2,600.00	4,328.00	5.500	7.875		Circ1 - Lead	400	50:50 Poz	14.20
					2 - Tail	130	PP	14.80

Formation Tops / Bottoms		
Top At	Bottom At	Formation
1,900	2,350	Greyburg
2,400	3,130	Upper San Andres
3,300	3,810	Lower San Andres
3,890	4,150	Yeso

**Zone and Perfs**

Glorieta-Yeso, East

**Comments / Completion Summary**

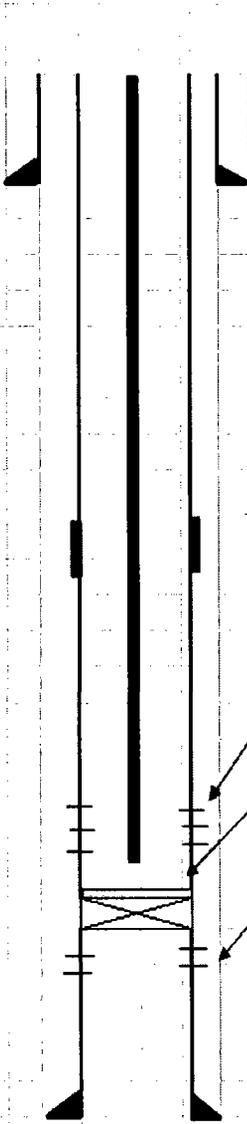
Acidized w/ 44,000 gals of heated 20% & 15% acid w/ 1293 bbls of 40# Ge1. AIR - 25 bpm. MIR - 28 bpm. MIP - 1800#. AIP - 1762 psi. ISIP - 1020#

Perforations						
Top	Bottom	Formation	Status	Opened	Closed	# / Ft Ttl #
3,892.00	4,130.00	YESO	A	3/6/2004		1 39

Tubing String 1								Date Ran: 3/6/2004
Description	#	Diameter	Weight	Grade	Length	Top At	Btm At	
Tubing	122	2.8750	6.50	J55	3,830.00	13.70	3,843.70	
Tubing Anchor	1	5.5000	6.50	J55	4.00	3,843.70	3,847.70	
Tubing	10	2.8750	6.50	J55	310.00	3,847.70	4,157.70	
Seat Nipple	1	2.8750	6.50	J55	1.10	4,157.70	4,158.80	
Perf Nipple	1	2.8750	6.50	J55	4.00	4,158.80	4,162.80	
Mud Anchor	1	2.8750	6.50	J55	31.00	4,162.80	4,193.80	
Bull Plug	1	2.8750	6.50	J55	0.00	4,193.80	4,193.80	

Rod String 1								Date Ran: 4/9/2013
Description	#	Diameter	Rod Box	Grade	Length	Top At	Btm At	
Polish Rod Liner	1	1.5000			16.00	0.00	16.00	
Polish Rod	1	1.2500			22.00	16.00	38.00	
Pony Rods	2	1.0000			8.00	38.00	46.00	
Rods	55	1.0000			1,375.00	46.00	1,421.00	
Rods	57	0.8750			1,425.00	1,421.00	2,846.00	
Rods	44	0.7500			1,100.00	2,846.00	3,946.00	
Sinker Bars	8	1.5000			200.00	3,946.00	4,146.00	
Pump	1	1.5000			16.00	4,146.00	4,162.00	
Gas Anchor	1	1.0000			6.00	4,162.00	4,168.00	

**Proposed State 20 E #3 WBD**



**Tubulars:**

**Surface Casing:**

8 5/8" 24# @ 330'. TOC = Surface

**Well History:**

Well was drilled in 2/2004.

Hot acid stimulated in Yeso in 3/2004. Put on rod pump.

Last pull on 4/2013, hold-down on pump was severely corroded.

Allocated cumulative production: 31 MBO + 129 MMSCF

Currently producing 2 BOPD+ 30 MSCFD + 7 BWPD

**Tubing String:**

2 7/8" J-55 6.5# 8rd EUE to 3850'

**New Perfs:**

3590' - 3810'

CIBP @ 3880' w/ 35' cmt.

**Yeso Perfs:**

Perfs: 3892' - 4130'

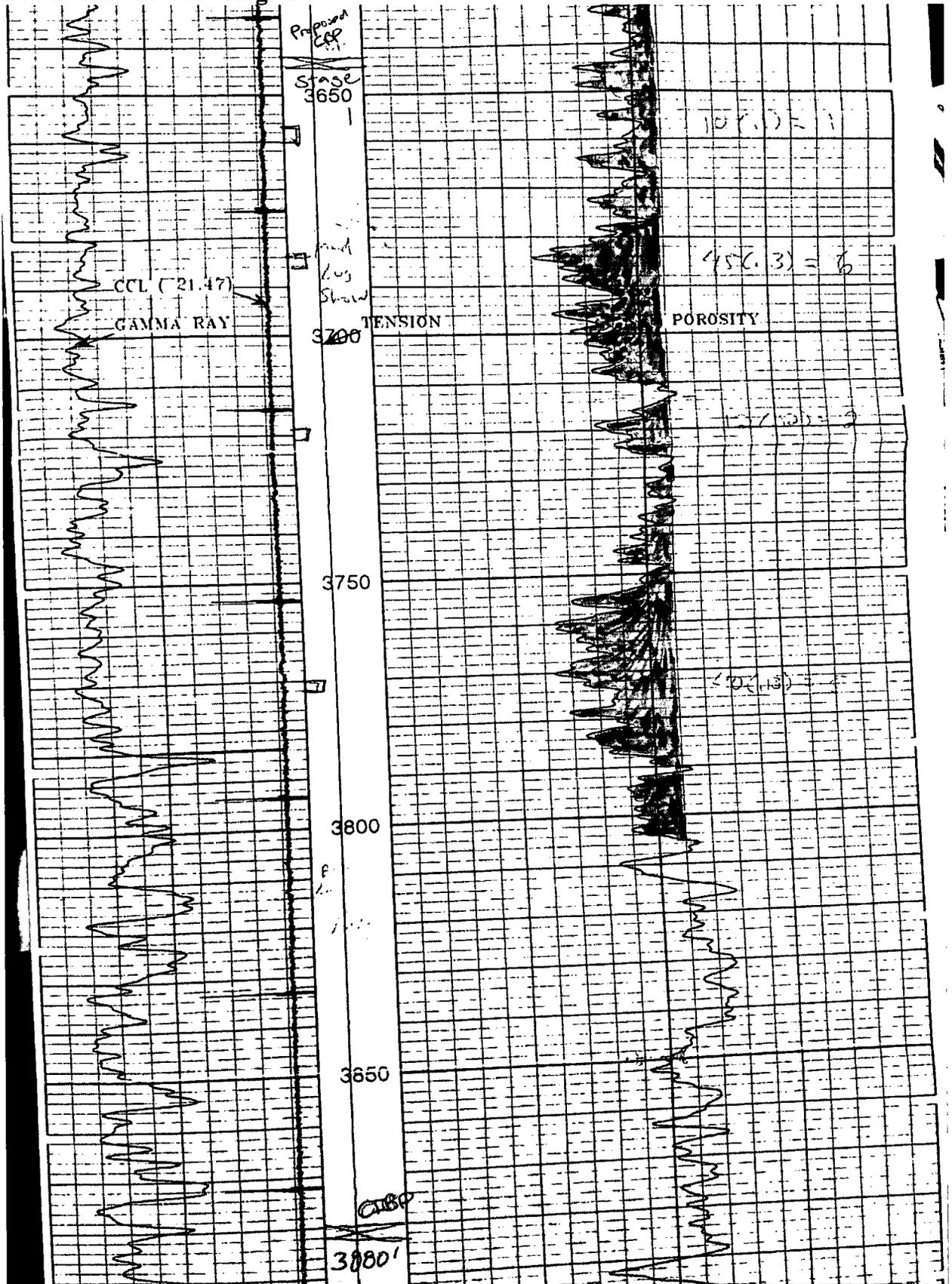
**Production Casing:**

5 1/2" 17# J-55 @ 4328'. ID=4.892". Drift Diameter=4.767". Burst=5320#. Max Pressure = 4200#.

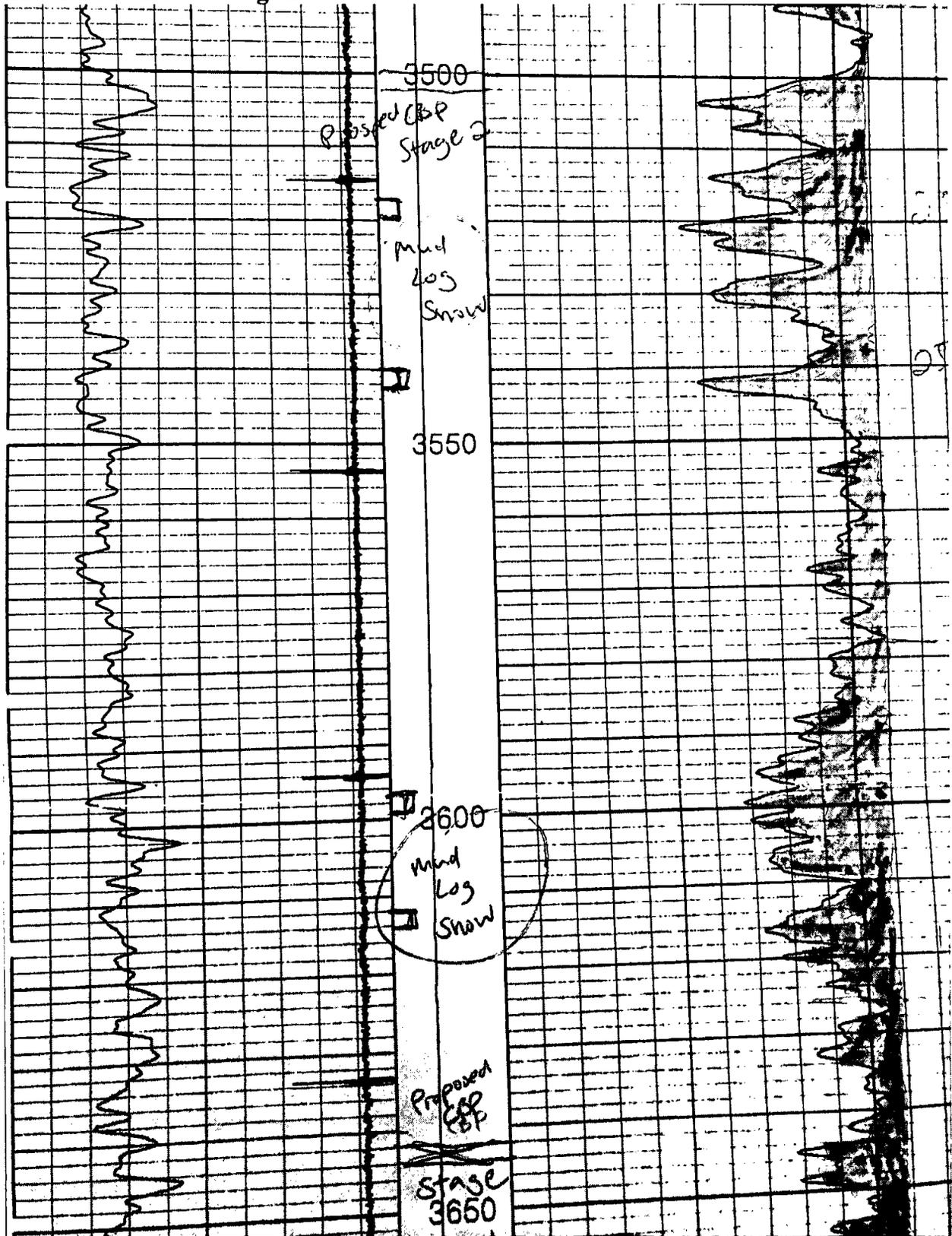
DV Tool @ 2602'

TOC = Surf. Circ'd cmt on both stages.

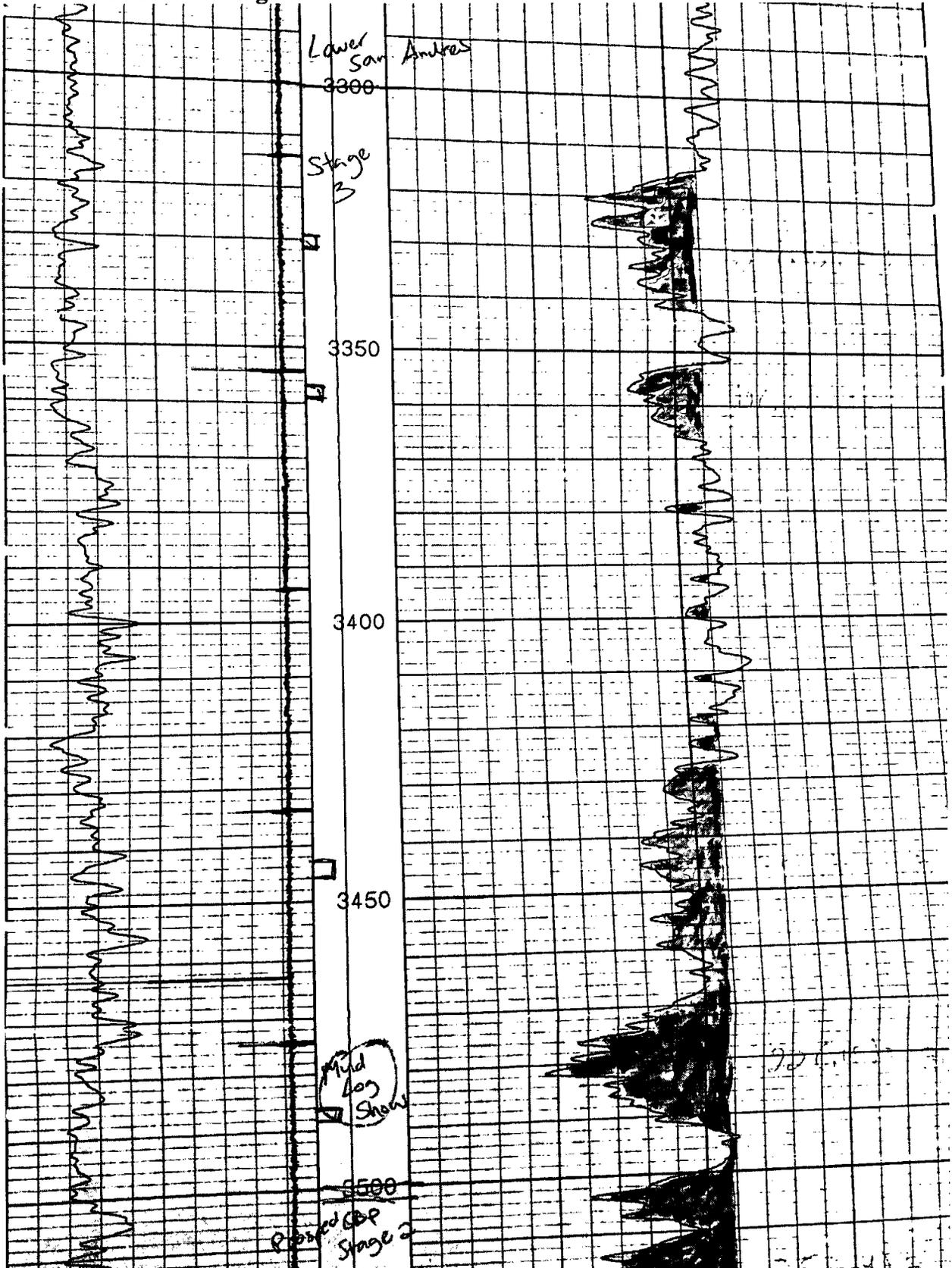
Lower San Andres- Stage 1



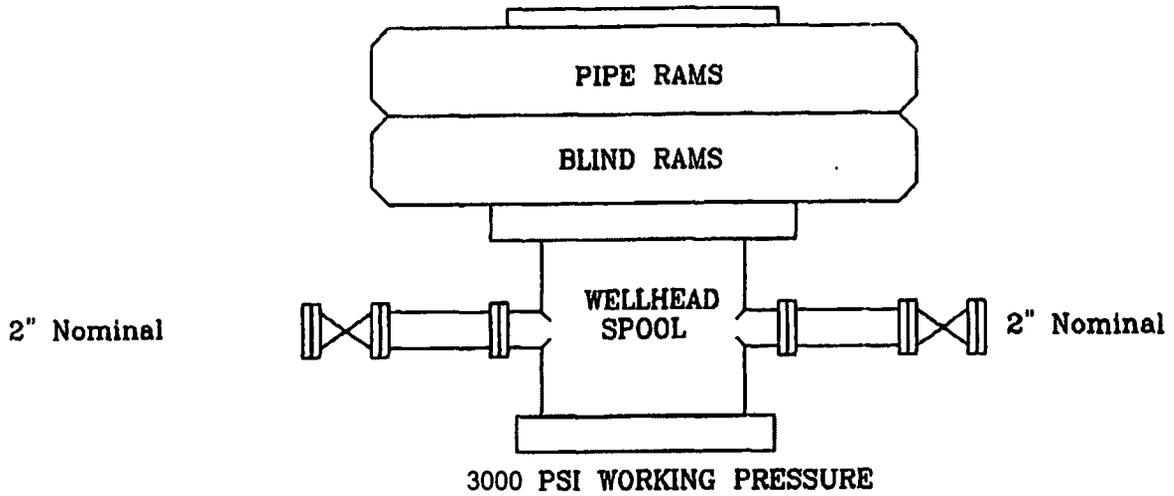
Lower San Andres- Stage 2



Lower San Andres- Stage 3



# PRODUCTION WORKOVER



Location: NE/4 NW/4  
Sec. 20, T 17S, R 29E  
Eddy County, NM

State 20 E #3

RECOMPLETION BLOWOUT PREVENTER

7-25-2018

Scale: None

## **HAZARDOUS ATMOSPHERES**

A hazardous atmosphere is an atmospheric condition that may expose workers to a risk of death, incapacitation, and impair their ability to escape unaided, cause injury or acute illness. Testing of hazardous areas is required prior to entry into an area of concern. Employees are not to enter ANY area containing hazardous concentrations of toxic gases unless they are properly trained, protected and utilize calibrated air monitoring equipment.

### **HYDROGEN SULFIDE**

Hydrogen sulfide (H<sub>2</sub>S), also referred to as sour gas, is a highly toxic, flammable, colorless gas that is heavier than air. When inhaled in moderate concentrations, H<sub>2</sub>S can cause immediate death. Even at low concentrations H<sub>2</sub>S can affect the eyes as well as the respiratory tract. H<sub>2</sub>S has an offensive odor, similar to rotten eggs, which rapidly deadens the sense of smell; therefore, odor is an unreliable means of detecting this poisonous gas. H<sub>2</sub>S burns with a blue flame and produces sulfur dioxide that is another toxic gas.

Signs will be posted in areas where known detectable limits of H<sub>2</sub>S may be present. This includes production sites, tank batteries, gas processing plants, and oil and gas exploration leases. Personnel working in an H<sub>2</sub>S environment must have H<sub>2</sub>S hazard training and are required to carry a current H<sub>2</sub>S training certification card on their person at all times.

LFRP will notify employees if they will be working in areas or at facilities with known hydrogen sulfide hazards. Personnel working in an H<sub>2</sub>S environment must have a personal gas detection monitor with the alarm set point at 10 PPM for H<sub>2</sub>S. The supervisor may agree upon the use of one monitor for a crew if the workers are working in the same confined area and an initial hazard assessment has been performed. Employees are expected to notify LFRP if they detect H<sub>2</sub>S gas in areas that were not previously known for sour gas potential.

Well servicing operations in areas of known H<sub>2</sub>S hazards require an H<sub>2</sub>S Contingency Plan. Key elements of the plan include:

- Gas detection monitors installed in fixed locations. These atmospheric monitoring systems used in oil and gas well drilling and servicing and workover operations must include visual and audible alarm(s), located where the alarm can be seen or heard throughout the work area;
- Monitoring equipment must be serviced, calibrated, and tested as recommended by the equipment manufacturer. Inspections, calibrations, and tests must be documented;
- Appropriate respiratory protection equipment, including emergency escape and emergency response SCBA's must be provided, and all potential users identified in the contingency plan must receive the applicable respirator training;
- The contingency plan should include information regarding the immediate action plan and response details with concise instructions to be followed by designated personnel any time they receive notice of a potentially hazardous hydrogen sulfide discharge. This includes designating specific muster areas where evacuated personnel will report.
- Locations should be evaluated on the basis of the confinement presented by the area of the site and the specific environmental conditions
- All means of access to the location should be designed so that they can be barricaded at a predetermined location if hydrogen sulfide emergency conditions arise.
- A determination of the level of hazard shall be established and applicable warning signs and/or colored flags will be used as follows.

- 
- **CONDITION I: Potential Danger To Life and Health: Well Operations Under Control.**
    - **Warning Device:** Green (H<sub>2</sub>S concentration < 10 ppm).
    - **Characterized By:** Routine well operations in zones containing hydrogen sulfide.
    - H<sub>2</sub>S may be present at concentrations below action levels.
    - **General Action:**
      - A. Check safety equipment for proper functioning. Keep it available.
      - B. Be alert for a condition change.
      - C. Follow instructions of onsite operator representative.
  - **CONDITION II: Moderate Danger To Life and Health: Critical Well Control Operations.**
    - **Warning Device:** Yellow (H<sub>2</sub>S concentration > 10 ppm and < 30 ppm).
    - **Characterized By:** H<sub>2</sub>S is or potentially may be present up to 30 ppm on the well location.
    - **General Action:**
      - A. Stay in the SAFE BRIEFING AREA if not working to correct the situation.
      - B. Follow instructions of the onsite operator representative.
      - C. The onsite operator representative will follow community warning and protection plan procedures.
  - **CONDITION III: Extreme Danger To Life and Health: Loss Of Well Control**
    - **Warning Device:** Red (H<sub>2</sub>S concentration > 30 ppm).
    - **Characterized By:** H<sub>2</sub>S concentration is above or potentially may be above 30 ppm.
    - **General Action:**
      - A. Stay in the SAFE BRIEFING AREA if not working to correct the situation.
      - B. Follow instructions of the onsite operator representative.
      - C. The onsite operator representative will make appropriate notifications, activate the audible alarm and initiate the community warning and protection plan.
      - D. If the well is ignited, the burning H<sub>2</sub>S will be converted to sulfur dioxide, which is also dangerous to life and health. Continue to observe applicable emergency and safety procedures and follow the instructions of the onsite operator representative.
    - Prevailing wind data will be considered in locating briefing areas (muster areas) on either side of the location at a safe distance considering prevailing winds, or at a 90-degree angle for wind direction shifts in this area. Windsocks, wind streamers, flags, or other suitable device(s) will be placed at points around the well site location.