

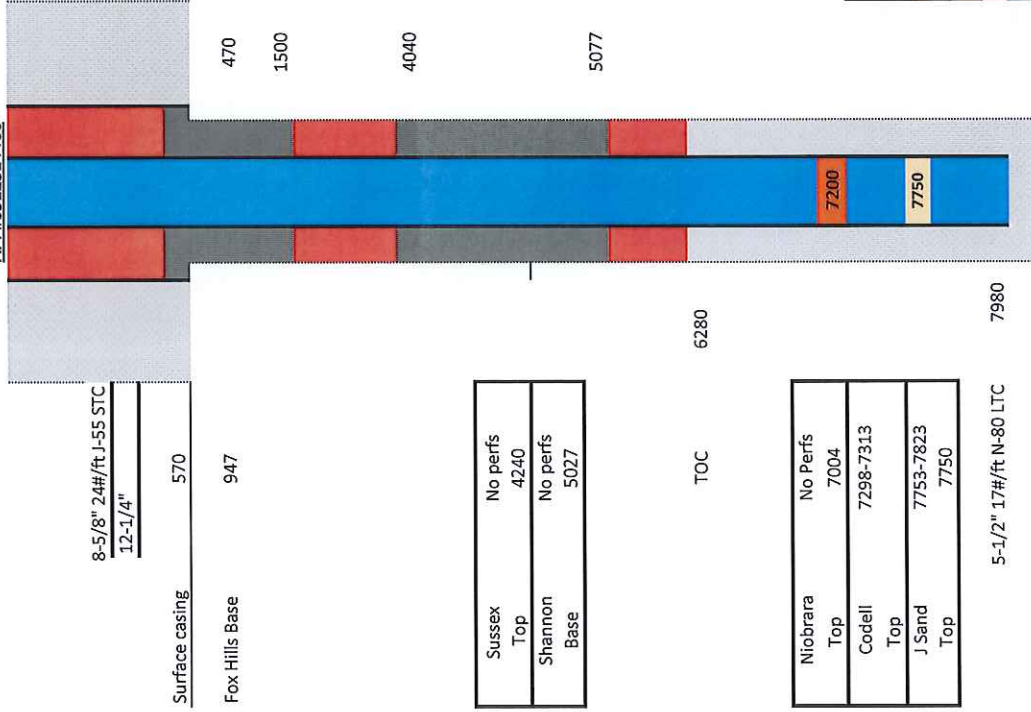
## UPRR 21 Pan Am "L" #1 – Bradenhead Procedure

- 1 Call Foreman or Lead Operator at least 24 hr prior to rig move. If not already completed, request that they catch and remove plunger, isolate production equipment and remove any automation equipment prior to the rig showing up. Install perimeter fence as needed.
- 2 MIRU Slick line. Fish plunger if necessary and tag for PBTD (should be at 7833').
- 3 Prepare location for base beam rig.
- 4 Spot 12 jts of 2-3/8" 4.7# J-55 8RD EUE tbg.
- 5 Spot 6 2 7/8" 16# drill collars.
- 6 MIRU WO rig. Kill well with fresh water with biocide. ND wellhead, NU BOPs.
- 7 Run two 2" or one 3" line(s) from starting head to return tanks. (Need to be able to circulate at 10 bbl/min).
- 8 PU 8-10' landing joint with TIW safety valve on top and screw into the tbg hanger. Back out the lock down pins and pull up on the tbg string to break any possible sand bridges. Do not exceed 80% of tubing tensile strength, or 57,384-lb.
- 9 Unseat tbg hanger and LD tbg hanger and landing joint. Install rubber wiper in stripping head.
- 10 MIRU EMI equipment. TOO H with 2-3/8" tbg. EMI tbg while TOO H. Lay down joints with wall loss or penetrations >35%. Replace joints as necessary. Keep yellow and blue band tubing. Note joint number and depth of tubing leak(s) on production equipment failure report in OpenWells. Clearly mark all junk (red band) tubing sent to yard.
- 11 MIRU Wire Line.
- 12 RIH with CCL/gage ring to 7200'. POOH.
- 13 PU and RIH with 5.5" RBP (5.5" 17# N80). Set RBP at +/- 7200' (Collars at 7166' and 7210'). Dump bail 2 sx sand on top of RBP and POOH.
- 14 Pressure test RBP to 1,000 psi for 15 minutes. (Pressure test to make sure plug is set correctly)
- 15 PU and RIH with CCL and 3-1/8" perforating gun, 0.60" EHD charge, 3 spf. Perforate 5 1/2" csg @ +/- 5077' (or lower) avoiding any collars identified by CCL (No CBL exists for this depth). POOH, RMDO wire line.
- 16 Establish circulation through perfs with rig pump prior to MIRU cement company. If circulation cannot be established, contact engineering for further support.
- 17 MIRU Cement company. Establish circulation with 9.0 ppg drilling mud at 10 bbl/min or maximum rate achievable.
- 18 Commence pumping cement job consisting 5 bbl fresh water, 5 bbl sodium meta silicate and 5 bbl fresh water; 73 bbl (355 sx) of G" w/ 0.25 pps cello-flake, 0.4% CD-32, 0.4% ASA-301 mixed at 15.8 ppg and 1.15 cuft/sk blended for a 6 hr pump time (Cement from +/- 5077' to 4040'). Drop wiper plug and under displace by 1.5 bbl (115.7 bbl total, leave 100' of cement in csg. Do not over displace).
- 19 Break lines and clean up with fresh water. RMDO cement company.
- 20 NU tbg head and BOP.
- 21 Leave well shut in overnight with 100 psi on it.
- 22 Circulate gas out of hole with fresh water with biocide.
- 23 PU 6 2 7/8" 16# drill collars with 4-5/8" bit/mill and TIH with 2-3/8" tbg and crossover. Rig up power swivel and mill to +/- 5100. TOO H and SB tbg, LD collars.

- 24 MIRU wire line and run CCL-GR-CBL-VDL from 5100' to 4000'. If cement is not above 4040', contact engineering for further instructions. Stand by wire line.
- 25 Pressure test csg to 1,000 psig. If pressure does not hold contact engineering for further support.
- 26 MIRU wire line. PU and RIH with CCL and 3-1/8" perforating gun, 0.60" EHD charge, 3 spf. Perforate 5 1/2" csg @ +/- 1500' (or lower) avoiding any collars identified by CCL (No CBL exists for this depth). POOH, RMDO wire line.
- 27 Establish circulation with rig pump prior to MIRU cement company. If circulation cannot be established, contact engineering.
- 28 MIRU cement company. Establish circulation with 9.0 ppg drilling mud at 10 bbl/min or maximum rate achievable.
- 29 Commence pumping cement job at pump rate of consisting 5 bbl fresh water, 20 bbl sodium meta silicate and 5 bbl fresh water; 75 bbl (275 sx) of Type III + with CaCl<sub>2</sub> and 2 lb/sk PS Flake mixed at 14.0 ppg and 1.53 cuft/sk blended for a 3 hr pump time (Cement from 1500' to 470'). Drop wiper plug and under displace by 1.5 bbl (31.9 bbl total, leave 100' of cement in csg. Do not over displace).
- 30 Break lines and clean up with fresh water. RMDO cement company.
- 31 NU 2-3/8" tbg head and BOP.
- 32 Leave well shut overnight with 100 psi on it.
- 33 Circulate gas out of hole with fresh water with biocide.
- 34 PU 6 2 7/8" 16# drill collars with 4-5/8" bit/mill and TIH with 2-3/8" tbg and crossover. Rig up power swivel and mill to +/- 1500.
- 35 TOOH with bit and SB tbg, LD collars.
- 36 MIRU wire line and run CCL-GR-CBL-VDL from 1600' to 100'. If cement is not above 470', contact engineering for further instructions. RDMO wire line.
- 37 Pressure test csg to 1,000 psig. If pressure does not hold, contact engineering for further support.
- 38 TIH with 2-3/8" tbg and retrieving head and tag sand above RBP @ +/- 7200'. Circulate sand off RBP. Latch onto RBP and release RBP. TOOH standing back all 2 3/8" tbg and LD RBP.
- 39 TIH with 2-3/8" XN, Arrowset AS-1X packer and 2-3/8" 4.7# J55 EUE tbg. Hydro test tbg while TIH.
- 40 Set Packer @ +/- 5100 avoiding any collars identified by CCL in previous wire line run.
- 41 Pressure test packer to 1,000 psig.
- 42 Land tbg @ +/- 7268' (1 jt above top Codell perf). Broach tbg to XN nipple.
- 43 ND BOP, NU master valve and hydrotest tubing head to 5,000 psi for 15 minutes.
- 44 RMDO WO rig.
- 45 Clean location and swab well back to production. Notify field foreman/field coordinator of finished work and turn well back over to production team.

Existing

KB=10'  
UPRR 21 Pan Am "L" #1  
API #0512314466



8-5/8" 24#/ft J-55 STC  
12-1/4"

Surface casing

570

Fox Hills Base

947

Sussex Top	No perfs 4240
Shannon Base	No perfs 5027

TOC

Niobrara Top	No Perfs 7004
Codell Top	7298-7313
J Sand Top	7753-7823 7750

5-1/2" 17#/ft N-80 LTC

Csg OD (in)  
Csg ID (in)

Type III

Fox Hill Plug

Wellbore Diameter (in)  
Hole/Csg Capacity (ft3/ft)  
Cement Coverage Height (ft)  
Cement Volume (ft3)  
20% Excess (ft3)  
Cement Vol (bbl)  
Sx  
TFV (bbl)  
AFV (bbl)  
CIC (ft)  
Under Disp Vol (bbl)

5.5  
4.892  
9.50  
0.33  
1030  
337  
404  
75  
275  
34.87  
31.93  
100  
2.94

G"

Shannon/Sussex Plug  
Wellbore Diameter (in)  
Hole/Csg Capacity (ft3/ft)  
Cement Coverage (ft)  
Cement Volume (ft3)  
20% Excess (ft3)  
Cement Vol (bbl)  
Sx  
TFV (bbl)  
AFV (bbl)  
CIC (ft)  
Under Disp Vol (bbl)

9.50  
0.33  
1037.00  
339.36  
407.23  
72.53  
354.11  
118.03  
115.70  
100.00  
2.32

Existing cement
New Cement
DCBP
Sand Plug
RSP
Mud
Fresh Water w/ Bio