Submit 1 Copy To Appropriate District Office
District I – (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II – (575) 748-1283
811 S. First St., Artesia, NM 88210
District III – (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV – (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

NM OIL CONSERVATION
ARTESIA DISTRICT
MAR 30 2018
RECEIVED

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

NSL 5431

Form C-103
Revised July 18, 2013

WELL API NO. 30-015-34817	
5. Indicate Type of Lease STATE ☐ FEE ☑	
6. State Oil & Gas Lease No.	
SUNDRY NOTICES AND REPORTS ON WELLS (DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)	7. Lease Name or Unit Agreement Name: Vortec 22
1. Type of Well: Oil Well ☑ Gas Well ☐ Other	8. Well Number 1
2. Name of Operator: OXY USA Inc.	9. OGRID Number: 16696
3. Address of Operator: P.O. Box 50250 Midland, TX 79710	10. Pool name or Wildcat: Pierce Crossing, Bone Spring East
4. Well Location: Unit Letter P : 330 feet from the south line and 330 feet from the east line; Section 22 Township 24S Range 29E NMPM County Eddy	
11. Elevation (Show whether DR, RKB, RT, GR, etc.) 2917'	

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK ☐	PLUG AND ABANDON ☐	REMEDIAL WORK ☐	ALTERING CASING ☐
TEMPORARILY ABANDON ☐	CHANGE PLANS ☐	COMMENCE DRILLING OPNS. ☐	P AND A ☐
PULL OR ALTER CASING ☐	MULTIPLE COMPL ☐	CASING/CEMENT JOB ☐	
DOWNHOLE COMMINGLE ☐			
CLOSED-LOOP SYSTEM ☐			
OTHER: Liner, Perf, Frac ☑		OTHER: ☐	

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

1. MIRU pulling unit & reverse unit. POOH w/ pump & rods, ND WH, NU BOP. POOH w/ tbg and scan.
2. RIH w/ pkr & RBP, set RBP @ approximately 7250', load hole, test RBP to 500#. Rel pkr, load hole, test casing to 6150# for 30 min., if test is good, rel pkr & RBP & POOH.
3. PU BHA and clean out to approximately 10792'M. Pump WF PLA fluid loss product to seal existing perfs, circ hole clean, POOH.
4. RIH w/ 4-1/4" X 5-1/2" Frac Patch liner & set @ approximately 7821-10770'M, see attached for detail.
5. ND BOP, RDPU, NU frac tree, perf & frac via 5-1/2" X 4-1/4" liner, in 14 stages w/ zone isolation w/ 13 flow through composite plugs from approximately 8350-10570', see attached for detail.
6. After frac, MIRU CTU, RIH & drill out plugs & CO to PBTD @ 10790'. Circ hole w/ N2, then flow back and test.
7. After flow back, turn well over to operations, artificial lift procedure to be decided.

See attached for detail of proposed work and WBD.

Spud Date: | Rig Release Date:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE [signature] TITLE Sr. Regulatory Advisor DATE 3/27/18

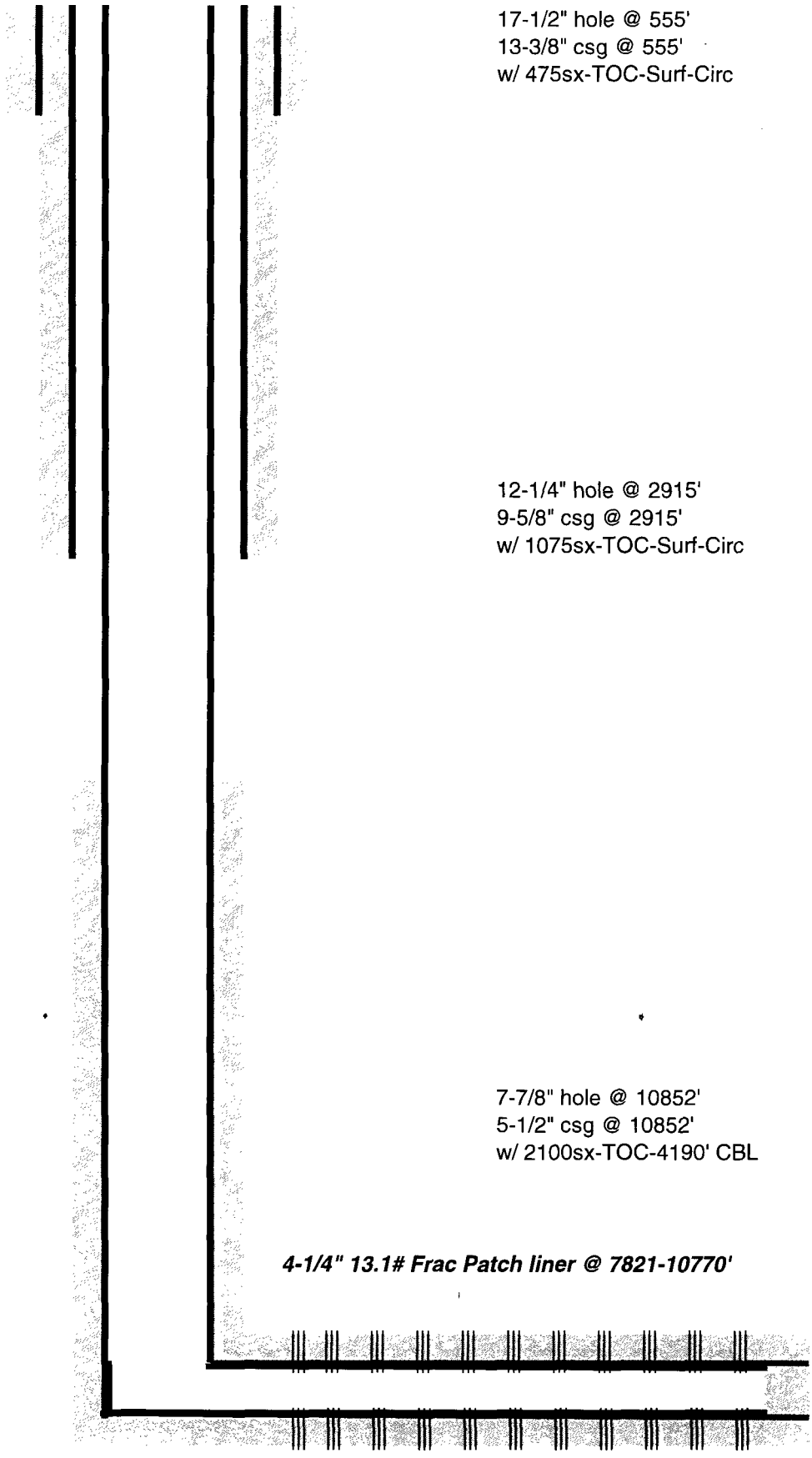
Type or print name David Stewart E-mail address: david_stewart@oxy.com PHONE: 432-685-5717

For State Use Only

APPROVED BY: [signature] TITLE Staff Mgr DATE 3-30-18

Conditions of Approval (if any):

OXY USA Inc. - Proposed
Vortex 22 #1
API No. 30-015-34817



17-1/2" hole @ 555'
13-3/8" csg @ 555'
w/ 475sx-TOC-Surf-Circ

12-1/4" hole @ 2915'
9-5/8" csg @ 2915'
w/ 1075sx-TOC-Surf-Circ

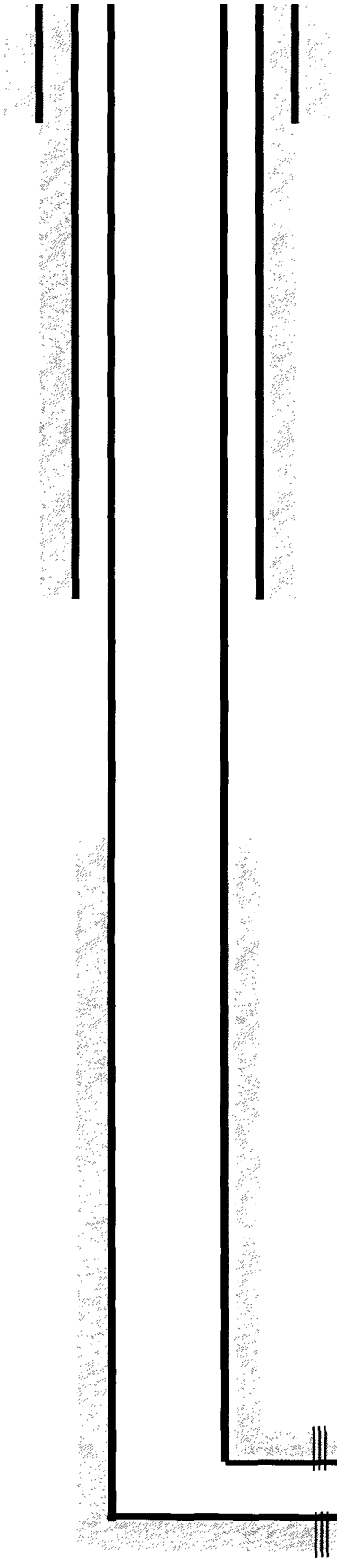
7-7/8" hole @ 10852'
5-1/2" csg @ 10852'
w/ 2100sx-TOC-4190' CBL

4-1/4" 13.1# Frac Patch liner @ 7821-10770'

Perfs @ 8189-10730'
Original Perfs @ 8121-10730'

TD-10852' M 7677' V

OXY USA Inc. - Current
Vortex 22 #1
API No. 30-015-34817



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7-7/8" hole @ 10852'
5-1/2" csg @ 10852'
w/ 2100sx-TOC-4190' CBL

Perfs @ 8121-10730'

TD-10852' M 7677' V
PBTD-10792' M 7677' V

OXY USA Inc. – Vortec 22 #1 – 30-015-34817

Equipment Pull
MIRU pulling unit and reverse unit. Record SITP. Ensure well is dead. If pressure exists on well, try to bleed off any psi and kill the well with fresh water or 10# brine if needed. Ensure well is dead. Remove pumping unit head. Refer to standing Level 5 MOC. Pressure test tubing to 500 psi for 5 min. Note in report whether successful or not. Prepare tools to pull rods. Unset pump. Pump tubing capacity of 10 ppg brine to ensure well is dead. POOH and lay down rods according to best practices. Pull and inspect rods and pump. Add pressure gauge to production casing to monitor buildup pressure. Function test and NU 5K BOP with 2 7/8" tubing rams. Low pressure test to 250 psi. High pressure test to 4500 psi. Prepare rig floor to pull tubing. Unset TAC and POOH with 2-7/8" tubing. TOOH and send pipe in for inspection.

Vertical Casing Pressure Test
Pick up 2-7/8" PH6 workstring and 4.75" bit and 5.5" 17# Casing Scraper. RIH to 7,270' (20' below plug set depth). POOH with bit and scraper, making note of any paraffin or scale seen during cleanout run. PU RBP and RIH to 7,250' and set RBP. Test to 500 psi to ensure proper set. POOH with tubing. Nipple up Guardian Casing Test Isolation tool and test casing to 6150 psi for 30 min.

Initial Cleanout Run
Pick up 2-7/8" PH6 workstring (~10,800' 2 7/8" PH6 needed) and BHA as follows: RIH, set slips and apply safety clamp. Remove Lift sub. Pick up 2 joints of 2 7/8" PH6 and make up 2 7/8" PH6 check valve above and below tubing. Make up 2 7/8" PH6 check valve to the box looking up in the rotary. Torque all necessary connections. RIH and set in rotary. Pick up and run 30 joints of 2 7/8" PH6 tubing (capacity 4.87bbl). Make up 2 7/8" PH6 safety joint to 2 7/8" PH6 tubing in the rotary. Pick up 1 joint of 2 7/8" PH6 tubing and make up to safety joint. RIH and set in slips. Makeup VACS tool with screen made up to 2 7/8" PH 6 tubing looking up in the rotary and make up 2-7/8" PH-6 tubing on top of VACS and continue picking up workstring and continue running in hole to KOP @ 7,252' MD. Rig up power swivel and break circulation, circulate at a rate of 1 ½ to 2 BPM. Record weight up, weight down, free rotating torque, and pump pressure at a given rate. With pumps on, start rotating at 20 RPM and slowly lower BHa into curve watching weight on bit and torque. Wash thru curve and out into horizontal stopping every 5 joints to work the BHA up the hole one joint and then back down watching for significant drag. If significant drag is seen, begin POOH 1 joint then washing back down and then lay down a single or stand back that double and repeat as needed. Once cleanup is completed continue RIH. Should progress stop and we no longer make hole; mark pipe at the rotary, pick up 10 feet and mark the pipe again. Raise the work string as high as possible in the derrick and stop circulation. Lower pipe until we reach the 10 foot above bottom mark, and continue to reciprocate pipe washing off the filter three to four times. Once again lower pipe to 10 foot off bottom mark. Break circulation and begin rotation at the same parameters as before and continue in the hole. If the same spot is reached and progress is once again stopped, increase rotating speed to 45 RPM and increase circulation to 3-4 PM. If no progress can be made - lay down swivel and POOH and check for Debris in 2 7/8" PH6 cavity and in 4-1/2" Debris catcher at the Bottom of the BHA. Inspect the bottom of the Rotary Shoe for any evidence of milling a metal restriction. String will pull wet past the VACS tool. Need to have necessary equipment setup to handle the wellbore fluid and debris. Repeat process until VACS tool comes up empty.

Cleanout w/ Mill BHA
Make up BHA as follows with 500' of cavity below VACS: Stop above KOP and check all of the parameters; up weight, down weight, rotating weight, static weight, free rotating torque, RPM, Circ Pressure etc. With pumps on, slowly lower BHA into curve watching weight on bit and torque. RIH to 50' above top of expandable liner set depth and start rotating at 40-45 RPM and pumping 3-4 bpm. Slowly RIH to 50' below bottom of expandable liner set depth While rotating slowly ream through any restrictions encountered. Make 6-8 reaming trips back and forth while rotating at 45 RPM to make sure the ID is clean and polished. Pick up and POOH to 8000' and then Trip back to 10,752' without rotation several times to ensure ID has no restriction and future 4.75" OD equipment can pass through with no restrictions. After confirmation of cleanwell bore from Liner rep on location, POOH. Move all 2-7/8" PH6 8RD tubing to the side of location. For the Mohawk clean out/drift run, we will need to pick up 162 joints (~5000') of 2-7/8" 7.9# P110 PH6 tubing and 210 joints (~6500') of 2-7/8" 10.4# S-135 AOH tubing. We will also need to order out 2 crossovers -- 2-7/8" 7.9# P110 PH6 Pin Down x 2-7/8" 10.4# S-135 AOH Box Up

Proposed Expandable Liner Depths

Top of problem	8,121
Bottom of problem	10,730
Planned top of liner (TOL)	7,821
Bottom of liner (BOL)	10,770
Post expanded liner length	2,949

Proposed Expandable Liner Specs

4.25 inch, 0.31 wall x 5.5 inch, 17 lb/ft FracPatch Specifications					
Expandable Pipe Body					
Pre-Expansion			**Post Expansion**		
OD	4.250	*inches*	OD	4.805	*inches*
ID	3.630	*inches*	ID	4.218	*inches*
Wall Thickness	0.310	*inches*	Wall Thickness	0.293	*inches*
Weight	13.100	*lb/ft*	Drift	4.158	*inches*
Drift	3.505	*inches*	Internal Yield	9,895	*psi*
Seal Joint OD	4.490	*inches*	Collapse	5,600	*psi*
Seal Thickness	0.120	*inches*	Expansion Ratio	16.207	*%*

Expandable Connection					
Pre-Expansion			**Post Expansion**		
Connection OD	4.310	*inches*	Connection OD	4.865	*inches*
Connection ID	3.600	*inches*	Connection ID	4.218	*inches*
Drift	3.505	*inches*	Drift	4.158	*inches*
Tensile Rating	142,286	*lbs*	Internal Yield	9,895	*psi*
Compressive Rating	142,286	*lbs*	Collapse	5,600	*psi*
Max DLS	36.01	*°/100ft*	Tensile Rating	154,125	*lbs*
Optimum Torque	1,360	*ft-lbs*	Compressive Rating	138,713	*lbs*
Max Torque	1,496	*ft-lbs*	Yield Torque	1,700	*ft-lbs*

Proposed BHA's

Table 1: Recommended Clean Out/Drift BHA – (Exact BHA can change depending on connections)

Qty	*Description*	*Mohawk Part Number*	*Connection Up*	*Connection Down*	*Supplier*
210	2-7/8" 10.4# AOH		2-7/8" 10.4# AOH Box	2-7/8" 10.4# AOH Pin	Operator
1	Crossover		2-7/8" 10.4# AOH Box	2-7/8" 10.4# AOH Pin	Operator
162	2-7/8" 7.9# PH6		2-7/8" 7.9# PH6 Box	2-7/8" 7.9# PH6 Pin	Operator
1	Ball drop drain sub 625 psi/pin		2-7/8" 7.9# PH6 Box	2-7/8" 7.9# PH6 Pin	Mohawk
1	Crossover		2-7/8" 7.9# PH6 Box	2-7/8" API Reg Pin	Mohawk
1	4.798" String mill		2-7/8" API Reg Box	2-7/8" API Reg Pin	Mohawk
1	Magnets		2-7/8" API Reg Box	2-7/8" API Reg Pin	Mohawk
1	4.798" String mill		2-7/8" API Reg Box	2-7/8" API Reg Pin	Mohawk
1	Venturi Basket		2-7/8" API Reg Box	N/A	Mohawk

Table 2: Proposed Liner

Qty	*Description*	*Mohawk Part Number*	*Connections*	*Length (ft)*	*Elastomer OD (in)*
1	Exit Joint	A-00843	r2m Box (down) x Stub Acme Box (up)	7'	N/A
1	Upper Seal Joint	A-00887 ?	r2m Box (down) x Pin (up)	1'	4.490
1	Standard Joint	A-00842	r2m Box (down) x Pin (up)	~22'	N/A
1	Spacer Joint	A-00741	r2m Box (down) x Pin (up)	7'	N/A
1	Anchor/Seal Joint	A-00883	r2m Pin (up)	~3'	4.490

Table 3: Proposed Inner String BHA

Qty	Description	Mohawk Part Number	Connection Up	Connection Down	Supplier
210	2-7/8" 10.4# AOH		2-7/8" 10.4# AOH Box	2-7/8" 10.4# AOH Pin	Operator
1	Crossover		2-7/8" 10.4# AOH Box	2-7/8" 10.4# AOH Pin	Operator
162	2-7/8" 7.9# PH6		2-7/8" 7.9# PH6 Box	2-7/8" 7.9# PH6 Pin	Operator
1	Drain sub 625 psi/pin	O-00347	2-7/8", 7.9# PH6 Box	2-7/8", 7.9# PH6 Pin	Mohawk
1	Hydraulic disconnect 630 psi/pin	O-00346	2-7/8", 7.9# PH6 Box	2-7/8", 7.9# PH6 Pin	Mohawk
1	Mohawk latch in sub	A-00643	2-7/8", 7.9# PH6 Box	Latch	Mohawk

Drift Run Procedure

The liner will be received on location and unloaded using the specified Mohawk handling procedure to prevent damage to the equipment. Conduct a safety meeting. Go over parameters such as important depths, expected weights, drain sub pressure, and safe running speeds. Make up recommended Mohawk clean out / drift BHA (see Section 3.8, Table 1). Set drain sub activation pressure according to equipment available on site. Trip in hole picking up 2-7/8" tubing in singles. If in a horizontal, circulate joints through the curve. Rotate mills through setting depths with power swivel. Work any tight spots (if significant milling is needed POOH and change to an operator supplied BHA. Mohawk mills are for gauging the hole and are not dressed for significant work). If pickling, pickle the tubing and reverse the fluids out, if well allows. Drop the drain sub ball. Once the ball lands pressure up to 500 psi less than activation pressure, 10 cycles, to flex the tubing. On the last cycle pressure up to activation pressure to open the drain sub. Reverse circulate bottoms up, if well allows. POOH racking back 2-7/8" tubing. Lay down clean out/drift BHA. Gauge mills to check for significant wear. May have to repeat the cleanout/drift run based on assessment from Mohawk.

Liner Installation Procedure

Maximum allowable pressures must be confirmed for all surface equipment. Maximum allowable pressure for the setting tool is 5,000 psi. Minimum flow rate must be confirmed for pumping equipment. Maximum allowable slack off / pull for the liner is 15,000 lbs down and 25,000 lbs up during RIH operations. If maximum slack off / pull for the liner is exceeded, consult Mohawk representative. Do no circulate through the setting tool without a Mohawk representative present. Clean fluid must be used during the expansion procedure. Mohawk recommends counting all joints on locations to confirm tally.

Liner Make Up and Deployment

Conduct a safety meeting. Go over parameters such as number of joints to pick up, safe running speeds, safe running weights, and important depths. Mohawk rep will discuss circulation tool function. Discuss well control options before running the liner (see Section 3.10.4 for Liner Circulating Operations). Rig up Mohawk liner lifting subs, TIW valve, and circulating crossover subs. Rig up casing handling equipment including slips and bowls, flush joint elevators, and tongs (if used). Pick up setting tool with elevators using Mohawk's lift nubbin as a shoulder. Run in hole and set in slips (some applications require the slips to be set on the seal joint). Install a safety clamp. Make up liner in final proposed order per *ReFracPatch* liner tally sheet. Install lift nubbin on each joint. Mohawk's proprietary r2m thread is made up dopeless. Do not put dope on r2m threads. Make up each r2m connection with Mohawk provided wrenches or to 1,300 ft-lbs with casing crew tongs. Install safety clamp on every joint. Designate one man to watch the lift nubbin while making up joints to ensure it spins freely and does not back off while making a connection. After running all liner joints, pick up the exit joint with the exit joint lift nubbin. Land the exit joint as low as possible in the slips. Rig up the Mohawk false rotary table on top of the exit joint. Swap over to the Mohawk inner string circulating crossover assembly. Rig up the work string slips on top of the Mohawk table. Cover the hole. Swap all handling equipment to run work string inside of the Mohawk liner joints. Pick up the inner string BHA (see Section 3.8, Table 3). Use minimum dope only on the pins. Check tally and have a meeting to discuss latch-in depth (the inner string BHA will latch into the setting tool and pick up the liner). Begin tripping in hole with work string: Confirm latch-in depth. 10ft above the setting tool, slow the trip in speed to 10 ft/min. Continue to run in hole and latch into the setting tool by slacking off. After latching in, pick up slowly and check to see the tool is latched and the liner lifts out of the slips. Set down and pick up again to check latch-in (resetting the slip and bowl may be required). Pick up out of the slips. Rig down the work string slips, rig down Mohawk table, and rig down the liner slips. Rig up the work string slips and begin running the liner in the hole. RIH 1 min/stand. If anything is tagged while RIH, notify a Mohawk representative. Use caution on and off slips to avoid jarring the liner. Circulate through tool at 0.5 BPM every 50 stands for 3 BBL. If in a horizontal, take pick up and slack off weights before entering the lateral. Monitor pick up and slack off weights. After entering the lateral, pump down tubing 0.5 BPM every 10 stands. Trip in hole to setting depth. If using a plug or no-go for depth correlation, tag the plug and pull up accordingly. If only using the tally for depth, run in past the target by at least 1 joint, pull back up to setting depth and measure depth while on up weight.

Liner Expansion

Once on depth, conduct a safety meeting. Review all tallies and confirm depths. Rig up the pump-in sub, tubing swivel (chicksan), high pressure hose, and expansion pump on to the tubing. Pressure test surface lines to 6000 psi: Ensure the liner is in exact position prior to starting the test. Ensure pump kick-outs (or pop offs) are working. Ensure there is a way to bleed pressure from tubing. Open tubing and pump through the Mohawk setting tool, break circulation if well allows. Ensure the liner is in exact position prior to circulating. Set kick-outs to 500psi. Do not exceed 0.5 BPM flow rate to circulate. If pressure increases while circulating, do not bleed off. After circulation, set kick-outs to 4000 psi. Increase rate to 1 BPM, pressure will begin to build. Bring pressure to 3,500 psi and hold for 1 minute (hold first stroke only). Bleed tubing down to zero pressure. Mark the work string at the slips for reference. With the rig, pull the tubing to reset the tool with 3,000-5,000 lbs over string weight or 3' (whichever occurs first). Mark the new position and measure. Repeat Steps 6 through 9 until all lower seals are expanded. After lower seals are expanded, begin pulling out with the rig: Mohawk will recommend max hook loads to ensure safe operations. Pull force will be string weight plus expansion force. Expansion force can vary as the expansion tool moves through connections and wellbore restrictions. If max hook load is seen, stop, slack down to neutral hook load, rig up the hose, and repeat Steps 6-9. Pup joints can be on location to help with slacking down. Stop expansion before reaching the upper seals. Check progress using pipe tally. Keep stretch in mind when calculating position. Rig up the high pressure hose on to the tubing. Increase rate to 1 BPM, pressure will begin to build. If liner compression is required, follow Mohawk direction. Otherwise, increase pressure to 3,700 psi. Bring pressure to 1,000 psi and hold. Slack down with pressure on tubing to compress the liner. Increase pressure to 3,700 psi. While holding pressure, pick back up to neutral. Bleed tubing down to zero pressure. Mark the work string at the slips for reference. With the rig, pull the tubing to reset the tool with 3,000-5,000 lbs over string weight. Mark the new position and measure. Repeat steps 14-16 until upper seals are expanded: Use pipe tally and pressure response to gauge when the upper seals have been expanded. Upper seals should be expanded with hydraulic expansion and not mechanical over pull. Clear the rig of all unnecessary personnel. Begin expanding the liner by pulling with the rig. Pull slowly. Hook load will decrease once the setting tool exits the liner. When exiting the top of the patch insure all pressure has been bled off the tubing. Tag the top of the liner and confirm depth. Drop 1.25" ball, load tubing and pressure up to open drain sub. Once the drain sub is open, load the hole. Close BOP's and pressure up to 4500 psi for 10 mins. This will test the pressure integrity of the expanded liner. Release pressure. POOH and lay down all Mohawk tools.

Setting Tool

Table 4: 4.25 Setting Tool Specifications

Tool connection up	2-7/8", 7.9# PH-6 Box
Tool weight	900 lbs
Tool length	40.0 ft
Expansion stroke	2.80 ft
Max. dog-leg severity	25 °/100ft
Axial load rating	200,000 lbs
Max. pressure	4,500 psi
Max. temperature	400 °F
Circulation flow rate	30 gpm
Valve shut off flow rate	46 gpm
Pressure/force conversion	44 lbs/psi

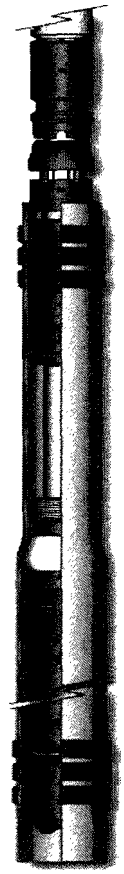

Table 5: 3.50 Tool Running Parameters

Event	Pressure or Force
Stabbing sub latching load	500 lbs
Max. slack off during deployment	15,000 lbs
Max. overpull during deployment	25,000 lbs
Drive unit shear disk	1,750 psi
Tool reset	3,000-5,000 lbs
Safety burst disk relief	5,000 psi

Liner Circulating Options

The Liner Lifting Sub and the Exit Joint Lifting Sub are to have a ball-type safety valve and lift cap (operator supplied) made up to the top connection and set aside for easy access on, or near the rig floor. Inspect that O-rings are installed in the liner connection box, or the stub acme pin. While picking up the unexpanded joints, if circulation is required, pick-up the Mohawk Liner lifting sub assembly and make up to the liner pin connection on the slips. Remove safety clamp and lower string below the BOPs to close pipe rams and TIW valve on circulating crossover assembly. While picking up the innerstring into the unexpanded liner sitting on the slips, (and circulation is required), pick up the Mohawk Exit Joint circulation crossover assembly, makeup onto work string, then remove slips/bowls, safety clamp and false table. Make up the circulating crossover assembly's pin connection onto the exposed box of the exit joint on the slips. (Four holes on the OD of the Lifting Cap are to assist with the makeup. Insert a bar or use chain tongs to rotate this sub to achieve full make up.) Pick up string, remove slips, and trip below the BOPs and close rams and TIW valve. During makeup be careful not to damage the sealing surface on the OD of the mandrel. Torque drill pipe connections to their required ratings.

Stimulation Procedure

MIRU stimulation equipment. Ensure high pressure lines are properly secured. Ensure area is restricted to, essential personnel only. Pessure test lines, hydraulic pop-off valve(s) and global pump kick-outs to pressures in Table 1. Stagger electronic kick-outs at 50 – 100 psi increments below the global kick-out. Verify the lowest kick-out is greater than the estimated treating pressure. Do not exceed max pressure (6150 psi) during active pumping. Prior to frac, ensure that computer van is monitoring all rates and pressures accurately. Review the frac treatment schedules. Execute the appropriate frac schedule for the current stage. Be prepared to modify pump schedule as needed. Report the following pressures for each stage: Break down pressure, ISIP, and estimated F.G. Shut-in pressure and shut-in time when the well is opened for the pump down perforating run. Break down the perforations. Use rate diversion for acid stages, increasing rate in ~5 bpm increments as pressure break-back dictates until the design treatment rate is achieved. Monitor pressures to avoid high-rate screen out events.Screen-out Guideline: If screen out leaves excessive proppant in the wellbore, flowback the well. Do not exceed 4320 bpd (~5-8 bpm). Once proppant has been unloaded, flowback one additional casing volume to verify the casing is clean. Establish injection rate and displace 100 vis sweep to the perforations to clean the wellbore for the following stage. Flush Procedure: When the in-line densitometer proppant concentration falls to 0.2 ppg, pump a 20 bbl slick water spacer and then mark flush. Flush with slick water to the top perforation depth. This should over-flush the 20 bbls spacer into the perforations. Shut down and record ISIP and F.G. Shut in the well and prepare for pump down perforating. Tree Saver: After each stage ND Guardian 10k Tree saver and NU Lubricator

Table 1 – Pressures and Rates

CATEGORY	PRESSURES (PSI)
Max Allowable Pressure	6,150
Max Pressure	6,000
Global Kick Outs (Computer Control)	6,050
Pop Offs (Mechanical)	6,100
Test lines	6,150
Expected Treating Pressure	5,000

Pump Down Plug & Perforating Procedure

On the initial plug-and-perf run, tie-in the CCL with the markers listed in the casing summary. Make a CCL correlation log in the lateral section while POOH. Mark the perforation depths and plug setting depths for each stage on the correlation log. Adjust perforation intervals to avoid shooting casing collars. Ensure the pump operator and WL operator have working radio communication. Confirm the maximum pump rate and running speed with the plug vendor. Follow service company best practices for pump down. MU the plug-and-perf assembly as per service company standard procedures. Implement radio silence procedure to deploy and recover the plug-and-perf assembly. NU the 10M lubricator and test to 1000 psi over previous stage ISIP. Equalize lubricator to wellbore pressure. Turn on two-way radios and data acquisition system when the guns are 200' below the surface. Begin RIH to the plugs setting depth. Tie in depth in the vertical section. Idle the pump-down pumps at 1-2 bpm in the vertical section. At the kick-off-point depth, note the line tension and increase pump rate to ~3 bpm. In the horizontal section, increase the pump rate in 2-3 bpm increments until the optimum running speed is achieved. Monitor CCL to verify the tools are moving past collars at the expected speed. Be prepared to POH if the next stage cannot be reached, and attempt to clean the wellbore with viscous sweeps. Shut off the pumps when 20' below the plug setting depth. Log up to the setting depth and set the solid composite bridge plug. Setting depths to be verified by the WSM. All stages will be 5" 18# Boss Hog composite plugs (refer to plug and perforation info). Log up to the perforation depth and perforate each cluster. Perforation depths to be verified by WSM. POOH no faster than 300'/min in horizontal section and 600'/min in vertical section. Verify that the tool string passes through the tool trap and the tool trap closes. Close the upper master valve and document with valve sign-off sheet. Bleed off pressure & close the crown valve. LD the tool string using service company standard procedures. Report the number of shots fired. Implement radio silence

procedures to deploy and recover the perforating gun. Drop the ball. Verify ball was dropped. Open the crown valve. Close the crown valve. Open the upper master (hydraulic) valve and listen for the ball to drop. Once next well has been perforated, displace the ball at 10 bpm. Just prior to seating the ball, reduce rate to 3-5b pm seating rate when 80% of casing volume from heel to plug has been reached. Once the ball has seated, break down the perforations and establish injection rate slowly at 5 bpm increments.

WELL CLEAN OUT AND FLOWBACK PROCEDURE

Check well head pressure- bleed off pressure if any to grounded flowback tank. MIRU 2" CT unit, PU 3-1/2" JZ bit, (Mohawk liner, 4.25"0D, RIH and DO plugs and CO to PBTD. Circulate hole clean w/ N2 if needed. RDMO CT unit. MIRU PU and casing crew. RDMO PU. Turn well to production. An artificial lift procedure will be provided once flowback operations completed.

Slickwater 2 (5,000 ft)			1500 #/ft_50 ft x 4 Clusters_Slickwater_Reduced Fluid								
			Fluid Information					Proppant Information			
#	Time [min]	Type	Rate [bpm]	Clean [gals]	Dirty [gals]	Cum. Dirty [gals]	Description	Prop. Conc. [PPA]	Description	Stage Sand [lbs]	Cum. Sand [lbs]
1	0.79	Acid	30	1000	1,000	1,000	7.5% HCl			-	-
2	6.08	Pad	90	15000	20,000	21,000	Slick Water			-	-
3	9.61	Sand-Laden	90	10000	13,635	34,634	Slick Water	0.50	100 Mesh	5,000	5,000
4	13.84	Sand-Laden	90	12000	16,543	51,177	Slick Water	0.75	100 Mesh	9,000	14,000
5	19.14	Sand-Laden	90	15000	20,904	72,081	Slick Water	1.00	100 Mesh	15,000	29,000
6	26.19	Sand-Laden	90	20000	28,174	100,255	Slick Water	1.25	100 Mesh	25,000	54,000
7	36.42	Sand-Laden	90	29000	41,290	141,545	Slick Water	1.50	100 Mesh	43,500	97,500
8	47.00	Sand-Laden	90	30000	43,166	184,711	Slick Water	1.75	100 Mesh	52,500	150,000
9	52.29	Sweep	90	15000	20,904	205,616	Slick Water	1.00	40/70 White	15,000	165,000
10	57.58	Sand-Laden	90	15000	21,131	226,746	Slick Water	1.25	40/70 White	18,750	183,750
11	64.64	Sand-Laden	90	20000	28,476	255,222	Slick Water	1.50	40/70 White	30,000	213,750
12	72.75	Sand-Laden	90	23000	33,094	288,316	Slick Water	1.75	40/70 White	40,250	254,000
13	80.86	Sand-Laden	90	23000	33,441	321,757	Slick Water	2.00	40/70 White	46,000	300,000
14	0.00	Flush	90				Slick Water		(Flush to Top Perf)		300,000

Perforating Guns and Plugs

Stage or Cluster No.	Total Shots	EHD (in)	Gun Length (ft) & Charge Loaded Length (ft)	Description (carrier type, charge name, spf, phasing, and API EHD and TTP)
All Stages	32	0.42	1.33'	3.125" Carrier , 6 spf gun 60 deg, 8shots per cluster SGH-3119-330 Charges .5" EHD with 40" of penetration

Composite Plug Set for Stage No.	Plug Size (in) (casing size)	Running Tool	Description (make, model, WP)	Ball OD (in)	Ball Material or Description
Stage #1	5" / 18#	Baker	Solid Plug – Boss Hog Composite Bridge Plug	n/a	n/a
Remaining Stages	5" / 18#	Baker	Composite Plugs – Boss Hog 5" 18#	1.063"	Composite Ball

- All wireline depths will be correlated using the first open log ran below the surface casing.
- In the event an open-hole log was not run in the well, depth correlation will be made using pipe measurements and casing pup joints.

Plug and Perforation Depth

Stage	Depth	Perforation Cluster				Plug top
(#)	(ft)	Cluster 1	Cluster 2	Cluster 3	Cluster 4	
1	Top	10,730	10,685	10,640	10,595	10,570
	Bottom	10,729	10,684	10,639	10,594	
	Hole	6	6	6	6	
	Phasing	60 Deg	60 Deg	60 Deg	60 Deg	
2	Top	10,545	10,500	10,455	10,410	10,385
	Bottom	10,544	10,499	10,454	10,409	
	Hole	6	6	6	6	
	Phasing	60 Deg	60 Deg	60 Deg	60 Deg	
3	Top	10,360	10,315	10,270	10,225	10,200
	Bottom	10,359	10,314	10,269	10,224	
	Hole	6	6	6	6	
	Phasing	60 Deg	60 Deg	60 Deg	60 Deg	
4	Top	10,175	10,130	10,085	10,040	10,015
	Bottom	10,174	10,129	10,084	10,039	
	Hole	6	6	6	6	
	Phasing	60 Deg	60 Deg	60 Deg	60 Deg	
5	Top	9,990	9,945	9,900	9,855	9,830
	Bottom	9,989	9,944	9,899	9,854	
	Hole	6	6	6	6	
	Phasing	60 Deg	60 Deg	60 Deg	60 Deg	
6	Top	9,805	9,760	9,715	9,670	9,645
	Bottom	9,804	9,759	9,714	9,669	
	Hole	6	6	6	6	
	Phasing	60 Deg	60 Deg	60 Deg	60 Deg	
7	Top	9,620	9,575	9,530	9,485	9,460
	Bottom	9,619	9,574	9,529	9,484	
	Hole	6	6	6	6	
	Phasing	60 Deg	60 Deg	60 Deg	60 Deg	
8	Top	9,435	9,390	9,345	9,300	9,275
	Bottom	9,434	9,389	9,344	9,299	
	Hole	6	6	6	6	
	Phasing	60 Deg	60 Deg	60 Deg	60 Deg	
9	Top	9,250	9,205	9,160	9,115	9,090
	Bottom	9,249	9,204	9,159	9,114	
	Hole	6	6	6	6	
	Phasing	60 Deg	60 Deg	60 Deg	60 Deg	
10	Top	9,065	9,020	8,975	8,930	8,905
	Bottom	9,064	9,019	8,974	8,929	
	Hole	6	6	6	6	
	Phasing	60 Deg	60 Deg	60 Deg	60 Deg	
11	Top	8,880	8,835	8,790	8,745	8,720
	Bottom	8,879	8,834	8,789	8,744	
	Hole	6	6	6	6	
	Phasing	60 Deg	60 Deg	60 Deg	60 Deg	
12	Top	8,695	8,650	8,605	8,560	8,535
	Bottom	8,694	8,649	8,604	8,559	
	Hole	6	6	6	6	
	Phasing	60 Deg	60 Deg	60 Deg	60 Deg	
13	Top	8,510	8,465	8,420	8,375	8,350
	Bottom	8,509	8,464	8,419	8,374	
	Hole	6	6	6	6	
	Phasing	60 Deg	60 Deg	60 Deg	60 Deg	
14	Top	8,325	8,280	8,235	8,190	
	Bottom	8,324	8,279	8,234	8,189	
	Hole	6	6	6	6	
	Phasing	60 Deg	60 Deg	60 Deg	60 Deg	