

Preliminary Procedure



Pintail SWD 0780 1-16D Initial

SHL: SEC 16, TWP 7N, RNG 80W (325' FNL & 1890' FWL)

Jackson County, CO

AFE #:

SWD Procedure

API #: --
Corp ID: 0
Field: Northpark

Elevations: 8155' KB; 8139' GL
Depths: 10,803' MD; 10,743' PBTD
Spud Date: Future

Completions Supervisor: Carl Enright 405-635-5287 cenright@sandridgeenergy.com
Engineering Manager: Adam Cole 405-429-5528 acole@sandridgeenergy.com
Production Superintendent: Kellen McLoughlin 432-813-2077 kmcloughlin@sandridgeenergy.com

CSG	Bit Size	OD	ID	Drift	Grade	Thd	Wt/Ft	Cap (bpf)	Burst	Collapse	Top	Set @
Surface	17.5	13.375	12.615	12.459	J-55	BT&C	54.5#	0.1545932	2730	1130	0'	'
Int	12.25	9.625	8.835	8.679	L-80	LT&C	40#	0.0758279	5750	4230	0'	2,309'
Prod	8.75	7	6.184	6.125" SD	P-110	LT&C	29#	0.0371497	11220	8510	0'	10,803'
Inj Tbg		3.5	2.992	2.867	J-55	8rd	9.3#	0.0086964	6980	7400	0'	10,545'

Maximum allowable pressure is limited by 5K tree

4800 psi

Cement Details

13 3/8" Cmt'd w/ sxs @ ppg.

9 5/8" Cmt'd w/ sxs mixed at ppg, followed by sxs @ ,

7 " Cmt'd w/ sxs mixed at ppg, followed by sxs @ ,

Directions to Location

GPS Coordinates: 40.57403, -106.382214

From Walden, CO, head south 12.3 miles on CO-14W (signs towards Steamboat Springs). Lease road entrance will be on the east side. Head 1/4 mile east on lease road and well is on the left.

Completion Summary

Entrada SWD w/ 3-1/2" Injection Tubing

WHAT'S NEW WITH THE PINTAIL SWD 0780 1-16D INITIAL COMPLETION?

- 1) Run GR/JB for 7" casing before running RCBL to determine TOC in 7".
- 2) Pressure test casing to 4500 psi.
- 3) Perforate Entrada formation. Run 3-1/2"x7" packer. Perform acid job. Step rate test.
- 4) MIT well.

Jackson County Emergency Contacts

Sheriff: (970)-723-4242

	Walden					
Fire	970-723-4747					
Ambulance	911					

Hospital: North Park Medical Clinic
350 McKinley St
Walden, CO 80480
(970) 723-4255

Yampa Valley Medical Center
1024 Central park Dr.
Steamboat Springs, CO 80487
(970) 879-1322

THE SAFETY OF PERSONNEL AND PROTECTION OF THE ENVIRONMENT IS OF PRIMARY CONCERN DURING ANY OPERATION. UNDER NO CIRCUMSTANCE SHOULD SAFETY OR ENVIRONMENTAL PROTECTION BE COMPROMISED.

ALL PERSONNEL ARE REQUIRED TO REPORT ALL INCIDENTS TO SANDRIDGE COMPLETIONS FOREMAN WITHIN 2 HOURS. FAILURE TO REPORT AN INCIDENT COULD RESULT IN REMOVAL FROM LOCATION.

SANDRIDGE ENERGY REQUIRES THAT HARD HATS, STEEL TOED BOOTS, SAFETY GLASSES AND FRCs BE WORN ON LOCATION AT ALL TIMES.

HOLD SAFETY MEETING & COMPLETE JSAs PRIOR TO COMMENCING ALL OPERATIONS.

NO IGNITION SOURCE WITHIN 50 FT OF THE WELLHEAD, FLOWBACK TANKS OR PRODUCTION EQUIPMENT.

ALL PERSONNEL ON LOCATION HAVE THE AUTHORITY AND OBLIGATION TO STOP WORK IF ANY UNSAFE CONDITIONS ARE OBSERVED.

Pre-job Checklist

- 1) Ensure all ratholes, ditches and sumps used in the drilling operation have been filled and that location is free of slip/trip/fall hazards. Ensure portable toilets and trash trailers are made available. Keep location and surrounding area free of debris. **Report and document any environmental issues existing prior to commencing completion operations.**
- 2) Evaluate wellhead height and provide work platforms, man lifts and fall protection as needed to provide safe access.
- 3) Check and monitor surface csg and production csg pressures. Report pressures daily.
- 4) Ensure ALL frac/acid tank valves are capped prior to filling.
- 5) Fill cellar as required to minimize confined space risk.

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Detailed Procedure

Wireline Operations

- 1) Inspect location and wellhead. Wellhead is 11" 5K x 7-1/16" 10K B-section with dual outlets. Notify Spence Laird 48 hours prior to start of work in step 2.
- 2) MIRU WH heater to ensure WH stays thawed, if needed. Check well for pressure. Slowly bleed off any pressure through needle valve.
- 3) NU 7-1/16" 10K x 7-1/16" 5K DSA. NU 7-1/16" 5K frac valve. Function test FV. MIRU e-line unit with mast, 5,000 psig lubricator, pack-off and pump-in sub. NU wireline flange to FV. Hook up lubricator to flange and pressure test to 4,500 psig. Bleed off Pressure. Pick up and RIH w/ gauge ring/junk basket (7" Casing Drift = 6.125" , Pkr OD =6.00") to PBTD. POOH. **Note tight spots or junk in WellView.**
- 4) RIH w/ RCBL to PBTD. Pressure up on 7" casing to 1000 psi and hold for log. Log up to surface and record TOC in WellView. Send results to engineer, cenright@sandridgeenergy.com, before continuing with casing test and perforations.
- 5) Hook up pump truck to 7-1/16" 5M B-section. Pressure test lines to 4800 psi. Pressure test FV and casing to 4500 psi for 30 minutes. Have chart recorder record pressure. Bleed off pressure.
Chart and record pressure test for Sandridge records. Can be circular chart or pressure logger.
- 6) Make up 3-1/8" perf guns with Owens SDP-4500-311 Charges (4 SPF, 60 deg phasing, 39 gm, 0.58" EHD, 40" Pen) and GR/CCL. Pick up lubricator and tools. Equalize WH to lubricator. RIH with GR/CCL and perf guns to shooting depth. Correlate to **SLB OH Log on 8/1/17 w/ GR**. Perforate the Entrada formation as follows, using GR to correlate, (making as many runs as necessary to shoot entire interval):

Perforate off GR on OH Log. Engineer will send log to correlate off of.

STAGE 1							
Top	Btm						
10,595'	-	10,700'	4	spf	105'	420	holes
TOTAL					105'	420'	holes

POOH. Lay down guns and ensure all shots fired. Repeat step 6 until all perfs are fired.

Well could flow after perforations, make plans to flow test well if it decides to flow. Will need to take fluid samples.

- 7) SWI at FV and RDMO e-line and associated equipment. **If we are shut in for an extended amount of time, displace WH with methanol or glycol and/or use WH heaters to keep WH and frac valve thawed.**

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WOR Operations EH&S Focus

WOR operations have accounted for a high percentage of recent SD EH&S incidents. Please focus on the following prior to and during WOR ops: 1) Conducting rig inspections and correcting any deficiencies identified, 2) Ensuring everyone is familiar with and understands their responsibility regarding Stop Work Authority, 3) Ensuring everyone understands that they are responsible for their own safety plus that of those working around them and 4) Adjusting work pace or shut down ops as weather conditions dictate (heat, cold, storms).

- 8) Set 5 frac tanks. Fill 2 tanks with fresh water treated with 2% KCl substitute and biocide. Fill other 3 tanks with produced water treated with biocide. Set 1 open top flowback tank with steel flowback line from B-section to tank with choke manifold. Spot pipe racks. Unload and tally 3-1/2" 9.3# J-55 EUE tbq.
- 9) MIRU WSU and pump truck. NU 7-1/16" 5K dual ram BOP with blind rams on bottom and 3-1/2" pipe rams on top of 5K frac valve. Spot accumulator lines. Function test BOP. Close FV. Close blind rams. Hook up pump to valve below blind rams. Pressure test BOP and FV to 4500 psig for 15 minutes. Check and record well pressure. If necessary, bleed off pressure to flowback tank.
- (Have BOP vendor stump test all BOPs to 4500 psi prior to BOP delivery. Chart test and have chart delivered with BOPs.)**

- 10) Make up 3-1/2" x 7" 29# packer assembly (6" running OD, min ID = 2.66") and RIH on tbq as follows:
- a. 3-1/2" WLEG w/ pump out plug in place (pinned to +/- 3500 psi)
 - b. 3-1/2" x 4' 9.3# J-55 EUE pup joint
 - c. 3-1/2" x 2.81" XN nipple (2.66" no-go)
 - d. 3-1/2" x 4' 9.3# J-55 EUE pup joint
 - e. 3-1/2" x 7" 10K PLT retrievable pkr
 - f. 3-1/2" TL On/Off tool w/ 2.81" X profile on top
 - f. 3-1/2" 9.3# J-55 EUE tbq to surface
- Packer to be set at 10545. Use 3-1/2" pups as needed.**

RIH and to **packer set depth** (looking at RCBL ensure packer is not between collars). Max RIH speed is 90 ft/min. Pick up and slack off to record slack off and pick-up weights. Pick up on tubing and rotate 1/4 turn to the right. Lower tubing to engage slips, releasing right hand torque while moving down. Continue to set weight on packer to pack off elements. Min force required to set at packer is 14,000 lbs. After setting weight on packer, pick up on tubing. Pull tension into packer to engage upper slips and complete pack off. Repeat setting weight and pulling tension 2-3 more times. Set down **20,000 lbs in compression on packer** and mark tubing for space out.

- 11) Release off O/O tool. Space out tubing to land hanger. Use pup jts as necessary. Hook up pump truck and circulate backside capacity full of packer fluid w/ 2% KCl, biocide, and packer fluid (1%) (290 bbls).
- 12) Make up EN hanger with BPV in place, landing sub and TIW valve. Land tubing hanger through BOP and FV with 20K compression at packer. Top off annulus with packer fluid. Pressure test annulus to 2500 psi for 15 mins, bleed off pressure.
- 13) Back out landing sub. ND BOP and frac valve. NU 7-1/16" 5M x 3-1/16" 5M adapter and 3-1/16" 5M injection tree. Test seal area to 4500 psig. Retrieve BPV.
- 13) MIRU pump truck and hook up to production tree, test lines to 5000 psi. Test tubing and packer to 2500 psi for 5 min, before pumping out pump out plug treated 2% KCl FW w/ biocide. Monitor backside for communication while pumping out plug. Do not exceed 4500 psi. Establish injection rate w/ 10-15 bbls. Monitor pressure and rate for initial injection test. SD and record ISIP, 5 min, 10 min, and 15 min.
- 14) RDMO pump truck. Pick up WOR swabbing equipment with swab cups for 3-1/2". RIH and swab down tubing to recover fluid samples from the **Entrada** formation. Record fluid amount, pressure, chlorides, oil cut, smell, and fluid weight for each run in WellView. Have Nalco on location to gather samples for testing and conduct tailgate tests. Will need to swab at least 100 bbls to recover formation fluid. Plan on swabbing 200-300 bbls, but will know more as we collect samples. If well kicks off, allow well to flow to flowback tank, taking samples every 10-15 bbls.

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- 15) Set 2 lined acid tanks on containment. Load with 10,000 gals 15% NE-Fe HCl containing NE-Fe package, corrosion inhibitor designed for 24 hours and 220 deg F. Make up water that is used to mix concentrated acid should contain bioicide. Roll acid tank every 12 hours to keep acid dispersed. Roll again before pumping acid job. **Can use transport if needed.**
- 16) MIRU Acid stimulation company. Lay additional pressure transducer to B-section and monitor 3-1/2" x 7" annulus throughout job. Have adequate soda ash on location to neutralize any acid spills and any live acid during flowback. Hold JSA. Pressure test lines to 6000 psig. Set kick outs at 4800 psig. Pressure up on annulus to hold 1500 psig during job. Acidize Entrada perms with 10,000 gals 15% NE-Fe HCl at 5 - 8 bpm as follows (MTP = 5000 psig):

15% NEFE HCL Acid	
Corrosion inhibitor @ 24 hrs and 220 deg F	2 gal/1000
Iron Control	3 gal/1000
Emulsifer-Nonionic	1 gal/1000
Surfactant-Nonionic	1 gal/1000

2% KCl w/ Freshwater and Biocide for Make Up

Acid Pump Schedule					
Stage	Interval	Rate-bpm	Vol, gal	Vol, bbl	Fluid
1	Bkdwn	1-3	420	10.0	Treated Water
2	Pad	5-8	3930	93.6	Treated Water
3	Acid	5-8	1000	23.8	15% NEFe HCl
4	Diversion	5-8	2000	47.6	15% NEFe HCl w/ 100 7/8" bioballs
5	Acid	5-8	1000	23.8	15% NEFe HCl
6	Diversion	5-8	2000	47.6	15% NEFe HCl w/ 100 7/8" bio-balls
7	Acid	5-8	1000	23.8	15% NE-Fe HCl
8	Diversion	5-8	2000	47.6	15% NEFe HCl w/ 100 7/8" bio-balls
8	Acid	5-8	1000	23.8	15% NE-Fe HCl
9	Flush	5-8	4303	102.5	Treated Water (btm perf + 5 bbls)
Total Treated Water		8653	gal	206	bbls
Total 15% NEFE HCl		10000	gal	238	bbls
Total Bioballs		600		Total Perfs	420

If ball off early, surge balls off formation and continue job. Note any ball action. Record volume to load, break down pressure and rate, ATR, ATP, MTR, MTP, ISIP, and 5 min-, 10min-, and 15min-SIPs. Do not exceed a surface treating pressure of 5,000 psig or a surface treating rate of 8 bpm. RD acid stimulation service company.

- 17) Open well to flowback to flow balls off formation. Have soda ash on location to neutralize any unspent acid. Utilize pH strips to test for unspent acid. Flow well back until load is recovered or well dies. **If load is recovered, begin taking fluid samples to check for formation fluid.**

Notify Spence Laird and COGCC 48 hours prior to step rate test.

- 18) MIRU pump trucks capable of achieving 15 bpm at 5000 psi. Have back up pump truck in-line in case we lose a pump during the test. Ensure tanks are loaded with produced water treated with biocide. Forward sample of produced water to chemical company to verify weight of water. **Need to know bhp for step rate test.** Ensure rate and pressure are being recorded every second.

Pump trucks need to have digital recorder for pressure and rate. Ensure all data is recorded in excel format, along with a chart readout.

- 19) Hold JSA. Pressure test lines to 5800 psi, **Max Pressure = 4500 psi.** Pump step rate injectivity test as follows:
Hold 1500 psi on backside (3-1/2"x7" annulus) during step rate test. Monitor for communication.

Step	Rate (bpm)	Time (min)	Volume (bbls)
1	0.5	30	15
2	1	30	30
3	2	30	60
4	3	30	90
5	5	30	150
6	8	30	240
7	10	30	300
8	15	30	450

Sum: 240 1335 Treated Produced Water w/ Biocide

After final step, bring pumps offline. SD and record ISIP, 5 min-, 10 min-, 15 min-, and 30 min-SIPS and TLTR. SWI. RDMO pump trucks. Forward rate and pressure data to OKC. Leave well SI.

NOTE: It is important to hold rate constant. Find a rate that pumps can maintain near the design rate and hold for the step.

NOTE: It is important to hold the time step constant.

Notify Spence Laird and COGCC 48 hours prior to MIT

- 20) Schedule MIT with COGCC witness. MIRU pump truck. Perform MIT by pressuring up annulus to 300 psig over expected injection pressure (3500 psig for MIT on Vaneta) and holding for 30 minutes. Bleed off pressure.

Chart and record pressure test for COGCC and Sandridge records. Can be circular chart or pressure logger.



Proposed

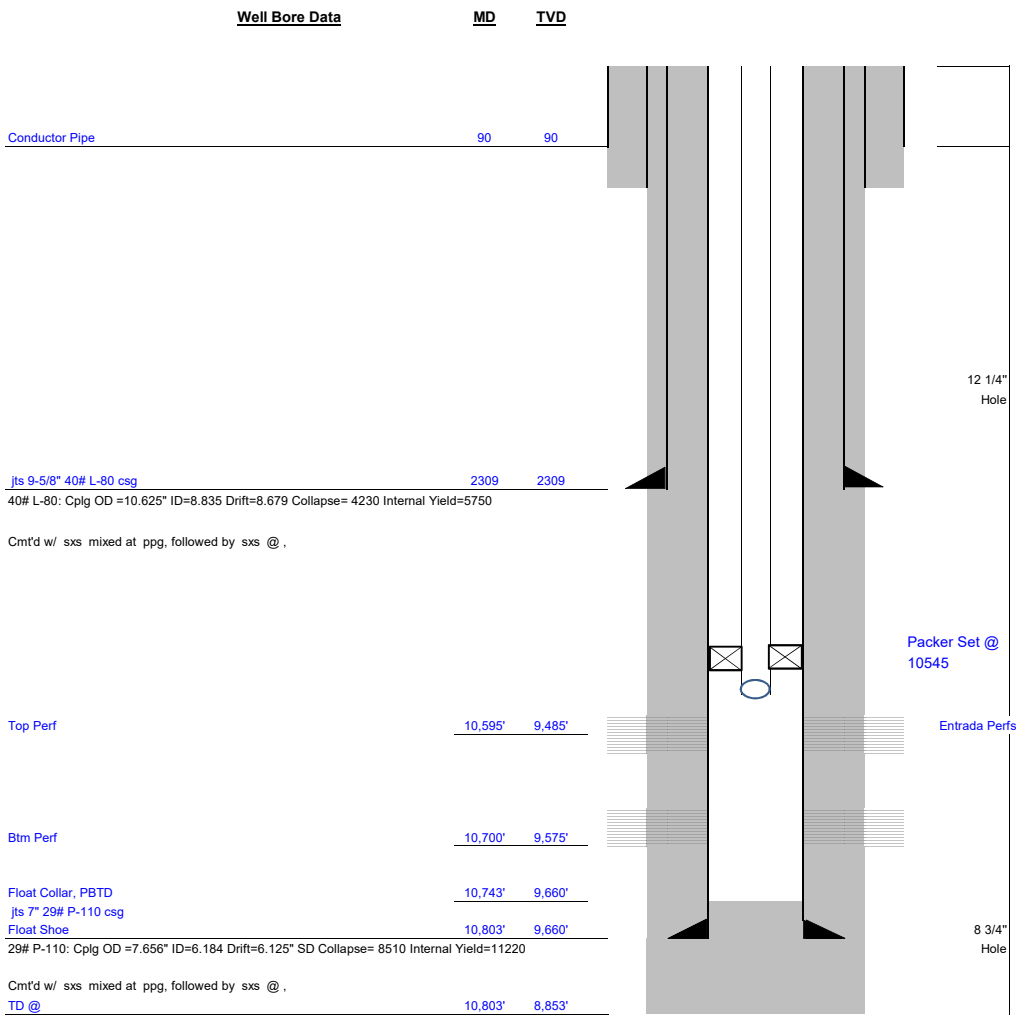
Spud Date Future

Field Northpark
County Jackson
State CO
Well **Pintail SWD 0780 1-16D Initial**
SH Location SEC 16, TWP 7N, RNG 80W
Elevations 8155' KB; 8139' GL

Wellbore Schematic

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API No.

Original Completion ()	
Current	
Workover	
Proposed	<input checked="" type="checkbox"/>



Formations	TVD
Niobrara	7275'
Carlile	8085'
Dakota	8860'
Entrada	9485'