



## Proposed P&A Procedure

Well Name: DARYL L ARNOLD 1

API	Original KB Elevation (ft)	Ground Elevation (ft)	Total Depth (ftKB)	Current PBTD (mKB)
Section	Township	Range	County/Parish	State/Province

### Casing Strings

Csg Des	MD (ftKB)	Run Date	Prop Run?	Cut/Pull Date	Proposed Cut/Pull?	Depth Cut/Pull (ftKB)	OD (in)	ID (in)	Grade	Len (ft)
Surface	218.0	4/19/1971	No		No		8 5/8	8.10		206.00
Production	7,576.0	4/28/1971	No	2/16/2018	Yes	1,000.0	4 1/2	4.00		7,564.00

### Tubing Strings

Des	Set Depth (ftKB)	Run Date	Prop Run?	String Location	Pull Date	Prop Pull?	Cut/Pull Date	Proposed Cut/Pull?	Depth Cut/Pull (ftKB)

### Perforations

Zone	Type	Date	Prop?	Top (ftKB)	Btm (ftKB)
	Perforated	2/16/2018	Yes	2,500.00	2,500.00
J SAND, Original Hole	Perforated	5/1/1971	No	7,463.00	7,497.00

### Other In Hole

Des	Run Date	Prop Run?	Prop Pull?	Top (ftKB)	Btm (ftKB)
Cast Iron Bridge Plug w/ 2 SX Cement		Yes	No	6,645.0	6,650.0
Cement Retainer	2/16/2018	Yes	No	2,395.0	2,400.0

### Cement Stages

Des	Type	Prop?	End Date	Top (ftKB)	Btm (ftKB)
Surface Casing Cement	Casing	No	4/19/1971	12.0	218.0
Production Casing Cement	Casing	No	4/28/1971	6,100.0	7,576.0
Cement Plug	Plug	No		12.0	132.0
Cement Plug	Plug	No		7,325.0	7,425.0
*COPY* Cement Plug	Plug	Yes		7,325.0	7,425.0
Cement Plug	Plug	Yes		2,400.0	2,500.0
Cement Plug	Plug	Yes		12.0	1,000.0
Cement Plug	Plug	Yes		1,000.0	1,050.0
Cement Plug	Casing	Yes		2,000.0	2,500.0
Cement Plug	Plug	Yes		2,300.0	2,395.0

### P&A PROCESS

Type Abandon	Sub Type WBI	Start Date 2/28/2018	Engineer Brandi Willson	Cell Phone 2813870969
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### PROCESS STEPS

Type	Comment																																								
1)	Survey and locate abandoned well, mark with stake and take location photos																																								
2)	Excavate to expose top of surface casing																																								
3)	Weld 2" collar to top of 8 5/8" surface casing cap. Make up to collar, pneumatic drill with non-sparking bit. Drill out cap venting possible trapped gas.																																								
4)	Once verified that no gas exists beneath top of surface casing plate, cut off surface casing below plate with torch, dress up smooth.																																								
5)	Cut off production casing inside surface casing with torch, dress up smooth																																								
6)	Butt weld 4 1/2" casing to dressed cut, bringing threaded end of casing to ground level.																																								
7)	Butt weld 8 5/8" casing to dressed cut, bringing threaded end of casing to ground level.																																								
8)	Make up to 4 1/2" production casing, 8 5/8" surface casing, 8 5/8" collar and 8 5/8" starter well head																																								
9)	NU flange adaptor and 5K BOP, test BOP.																																								
10)	NU and RIH with 3 7/8" cone bit, PU 2 7/8" drill collars, 2 3/8" 6.5# tubing, and TIW valve																																								
11)	Drill out first cement plug inside surface casing (TOC @ surface).																																								
12)	Continue RIH, cleaning out with drilling mud or water to 7325'. Tag top of balanced plug at 7325'. If TOC is deeper than 7325', contact office.																																								
13)	TOOH with cone bit, drill collars, and 2 3/8" tubing.																																								
14)	RU wireline and run CBL from 7325' - surface. ***If CBL shows inadequate cement up to 6500' (Nio top @ 6700'), contact office.																																								
15)	RIH w/ CIBP and set @ 6650' (50' above Nio Top). POOH																																								
16)	Load hole with fluid and pressure test CIBP to 1000 psi with rig pumps. Hold for 15 minutes.																																								
17)	Dump bail 2 sx of Class G Neat cement on top of CIBP.																																								
18)	RIH w/ 1' perforating gun and shoot 4-6 spf @ 2500'.																																								
19)	RIH w/ CICR on workstring and set @ 2400' (100' above perforations).																																								
20)	Load annulus between production casing and workstring. Pressure test CICR at 500 psi for 15min																																								
21)	Establish injection rate.																																								
22)	RU cement crew and pump 10 bbls mud flush (or similar spacer) followed by 165 sxs of 15.8ppg Class G "neat" cement. Assumes 10 SX above and below CICR.																																								
	<table><tr><th>Interval</th><th>Start</th><th>Interval End</th><th>Length (ft)</th><th>Vol. Factor (ft^3/ft)</th><th>Volume (ft^3)</th><th>Yield (ft^3/sk)</th><th>Cement (sxs)</th></tr><tr><td>2500</td><td></td><td>2000</td><td>500</td><td>0.3313</td><td>166</td><td>1.15</td><td>144</td></tr><tr><td>2500</td><td></td><td>2400</td><td>100</td><td>0.0872</td><td>9</td><td>1.15</td><td>8</td></tr><tr><td>2300</td><td></td><td>2400</td><td>100</td><td>0.0872</td><td>9</td><td>1.15</td><td>8</td></tr><tr><td colspan="6">TOTAL</td><td></td><td>165</td></tr></table>	Interval	Start	Interval End	Length (ft)	Vol. Factor (ft^3/ft)	Volume (ft^3)	Yield (ft^3/sk)	Cement (sxs)	2500		2000	500	0.3313	166	1.15	144	2500		2400	100	0.0872	9	1.15	8	2300		2400	100	0.0872	9	1.15	8	TOTAL							165
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23)	Displace cement with 7 bbls fresh water (2 bbls short of workstring volume).																																								

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## PROCESS STEPS

Type	Comment						
	Tubing ID 1.995	Length (ft) 2400	Disp. (bbl/ft) 0.00387	Disp. (bbl) 9	Disp - 2 bbl 7		
24)	Unsting from CICR.						
25)	Place remaning 10 SX of cement on top of CICR. Allow to fall on CICR as pulling out. TOC: 2300'.						
26)	POOH w/ workstring.						
27)	RIH with wireline and cut production casing @ 1000'.						
28)	Circulate a MINIMUM of 2 bottoms up volume (120 bbls) or until well is free of oil, gas, or any large cuttings. Maintain circulation.						
29)	Perform flow check for 5 minutes to ensure well is static and record current fluid weight in Wellview.						
30)	Unland production casing.						
31)	POOH and LD production casing filling pipe every 6 joints.						
32)	RIH w/ workstring to 1,050' (inside production casing)						
33)	Establish Circulation.						
34)	Pump 10 bbls Mud Flush (or similar spacer) followed by 375 SX of cement as balanced plug. TOC should be at surface. Fox Hills covered.						
	Interval Start	Interval End	Length (ft)	Vol. Factor (ft^3/ft)	Volume (ft^3)	Yield (ft^3/sk)	Cement (sxs)
	218	surface	218	0.3576	78	1.15	68
	1000	218	782	0.4418	345	1.15	300
	1050	1000	50	0.0872	4	1.15	4
	TOTAL						375
35)	POOH w/ workstring. Top off cement if needed. Cement needs to be ~ 10' from surface.						
36)	ND BOP. Top off cement as needed.						
37)	Let cement set over night, verify cement has not settled and is still at surface. RDMO.						
38)	Excavate around wellhead to 8' below grade, cut off 8 5/8" casing, weld on cap.						
39)	Backfill hole and reclaim surface to original conditions.						