

Monitoring Well Conversion

Gauge Deployment / Retrieval Procedures
Surface Packoff and Downhole Gauge Details

EOG Resources Inc (OGRID 7377)
Ross Gulch 8 No.3
30-015-39736
(SWD-1311)
Action ID 254154

May 20, 2024

From: [Jordan Kessler](#)
To: [Goetze, Phillip, EMNRD](#); [Harris, Anthony, EMNRD](#)
Cc: [Wrinkle, Justin, EMNRD](#); [Gebremichael, Million, EMNRD](#)
Subject: [EXTERNAL] FW: Ross Gulch 8 #3 SWD BHP Gauge Installation
Date: Thursday, May 16, 2024 3:12:22 PM
Attachments: [Fwd EXTERNAL Ross Gulch monitoring well conversion request.msg](#)
[Ross Gulch 8 #3 SWD RT Gauge Run Procedure TB 12424.docx](#)
[Ross Gulch 8 #3 SWD BHPG Illustrations.pptx](#)
[Triple J TC Double Packoff.pdf](#)
[RE EXTERNAL Ross Gulch monitoring well conversion request.msg](#)

CAUTION: This email originated outside of our organization. Exercise caution prior to clicking on links or opening attachments.

Good afternoon NMOCD,

Please see our attached additional information related to the Ross Gulch monitoring well. Please forgive the time elapsed since these questions were initially posed.

If there are additional questions regarding this information, could we have a meeting to resolve?

Thanks!

Jordan

From: Brice Letcher <Brice_Letcher@eogresources.com>
Sent: Wednesday, May 15, 2024 6:47 PM
To: Jordan Kessler <Jordan_Kessler@eogresources.com>; Tyler Burns <Tyler_Burns@eogresources.com>
Subject: Ross Gulch 8 #3 SWD BHP Gauge Installation

Hey Jordan,

Attached is an updated procedure for the Ross Gulch gauge installation and illustrations to help clarify the process for installing the gauge and I'll also try to specifically address NMOCD's questions below in red. Please let us know if you see anything we may have missed or if we may need more detail on any of this.

Summarized Questions from NMOCD

- Provide stack-up drawings to illustrate pressure control for deployment/retrieval of gauge. **See attached illustrations showing tree configuration before, during and after gauge installation.**
 - Location of pack-off relative to BOP? **I think this is a key clarification that addresses most of the questions/concerns – the dual pack-off being installed also acts as the “BOP” during installation. If necessary while running gauge/cable into the well, the pack-off fluid in the pack-off assembly will be pressurized in order to**

seal against the cable. The pack-off assembly acts similarly to an annular BOP – when hydraulic pressure is applied it seals off around the cable in order to maintain well control (see attached pack-off drawing). The injector-head feeds/forces the cable down through the pack-off assembly during installation and is capable of doing so with pressure on the well (same applies for pulling the gauge).

- Estimated weight of equipment above pack-off that will be transferred to the pack-off? The injector-head that feeds cable through the pack-off is hoisted by crane above the pack-off, so there is very little weight transferred to the pack-off assembly.
- Prior to installing the BOP (pack-off), will the gauge & cable already be deployed below the crown valve? Yes (see steps 2 & 3 in procedure) – the well will be killed by pumping kill fluid, the lower master valve will be closed (isolating the entire tree), then the top cap above the crown valve will be removed. Cable is fed through the pack-off assembly and then the gauge is made-up to the cable, then the gauge is lowered into the tree and the pack-off assembly is installed above the crown valve (lower master valve is still closed). Then the lower master valve is opened and gauge can be ran into the well.
 - Confirm which valves will be open/closed during rigup, pressure testing, and installation. Explained above.
- How is depth control achieved to ensure the gauge is placed at correct depth? Gauge depth is determined from feet of cable unspooled from reel (wireline unit equipment tracking feet deployed from reel), correlated to desired setting depth from KB and/or ground level.
- Is there more than one pack-off installed? No, it is one dual pack-off assembly being installed.
- How is the packer (assuming this is referring to the pack-off) installed when the BOP and lubricator are already rigged up on the well? Clarified this in updated procedure and above explanations.
- No mention of rigging down BOP, please confirm when BOP will be removed. The dual pack-off assembly installed (which also acts as BOP) remains on the well.
- How is pressure seal of pack-off confirmed? Pack-off assembly can be initially pressure tested after it is installed with the gauge hanging inside the tree (with lower master valve closed). However, after installation is complete with the gauge set at depth there is no way to pressure test the pack-off other than visual leak inspection with positive pressure on the tubing. Nonetheless, the pack-off fluid is left pressurized to maintain the pack-off seal around the cable and will be monitored.
 - How will pressure seal of pack-off be monitored? The pack-off fluid pressure will be monitored, significant leak-off of the pack-off fluid pressure could be an indication of losing pressure seal competency. Visual inspection would also identify loss of seal if fluids leak by. This is just a personal observation but I think it is worth noting that the pressure seal created by the pack-off around the cable in this scenario is somewhat similar to (but certainly greater than) the seal created by a stuffing box around a polished rod on rod-pump wells.

Additional Items Requested from NMOCD

- How will cable and gauge be recovered assuming positive pressure on the well?
 - To pull the gauge:
 - Cable would be disconnected from monitoring equipment and fed up through injection-head, then spliced back onto cable from the reel.
 - Kill fluid would then be pumped down tbg/csg to control/kill the well.
 - Injector-head would then be hoisted by wireline/cable unit and set down above pack-off.
 - Pack-off fluid pressure would then be bled off (but not completely so that some degree of positive seal is still maintained), the slips in the top of the pack-off assembly would then be unset in order to begin pulling cable and gauge out of the well. My understanding is that, if necessary, the cable could actually be pulled up through the pack-off with the pack-off fluid fully pressurized.
 - Once the gauge is pulled to surface and tags up inside the tree (double verified by feet of cable spooled back onto reel), the lower master valve can then be closed in order to fully isolate the tree.
 - ND pack-off and remove injector-head, pack-off and gauge, then the top cap above the crown valve would be re-installed to secure the well.
- Details of the wellhead configuration with gauge installed. See attached illustrations/diagrams.
- Details on what the OCD Inspector need to check during site-visits.
 - Visual inspection of the pack-off to look for fluid leaking up around the cable.
 - Digital gauge on the pack-off assembly showing the pack-off fluid pressure (we'll need to update NMOCD as to what the pressure is left set at). Leak-off of greater than 10% may require the pack-off to be re-pressurized and/or further inspection.
 - The surface monitoring equipment of the BHP gauge may or may not have a surface readout, more than likely it will be a digital gauge that sends data back to our SCADA system.

I think that covers everything NMOCD was asking but please let me know if we need to address anything else for this or if we need to jump on a call with NMOCD to talk through it.

Thanks,

Brice Letcher
Production Eng. Specialist
EOG Resources - Midland
Cell: (575) 748-5021

Ross Gulch 8 #3 SWD



Olivia Desser 11/28/2023

Ross Gulch 8 #3 SWD**Real Time Gauge Run****API #: 30-015-39736****Location: Eddy County, NM****Lat/Long: 32.0568161, -103.8011627****H2S: ND****Perforations: 4,062 – 5,517' (3 stages)****Injection Formation: Bell Canyon****Injection Zone: 4000 – 6400, packer must be set no higher than 100' above injection zone.****Maximum Wellhead Injection Pressure: 800 psi**

Executive Summary: Running real-time pressure & temperature gauge to sit above the wireline reentry guide for continuous monitoring.

Procedure*(Top Perf: 4,062' Bottom Perf: 5,517' – Casing: 7" 26# HC L80 8RD)*

Contact Jose Sandoval to get gauge and running unit on location

Tally Production Systems – 432-888-0075

1. MIRU Modified Wireline Unit. Prep to run real-time bottom hole pressure gauge (RT BHPG) and cable.
2. Hoist/pick up injector-head and 5k dual pack off assembly, run cable through injector-head and dual pack off then make up gauge assembly below the pack-off to prep for install.
3. Kill the well then close bottom master valve. Function test all WH valves and pressure test tree. Remove top cap above crown valve, lower gauge through crown valve then NU dual pack off and injector-head.
4. Open bottom master valve and TIH with 0.75" OD BHPG and 0.25" OD cabling, set gauge at 4,020'.
5. Engage slips over cable in top of pack off and secure cable. Pressure up pack off to 5,000 psi and ensure no leak off to indicate good seal around cable. ND injector-head and cut cable, leaving 50'+ for connecting to monitoring equipment.
6. Remove wheels from lower and upper master valves and place near wellhead. Wheels are removed to avoid accidental cutting of the wire hanging in the well.
7. RDMO wireline unit.
8. RU monitoring equipment for BHPG and install PT gauge to monitor dual pack off fluid pressure. Ensure BHPG psi, tbg psi, csg psi, and dual pack off fluid psi gauges are reading and coming into SCADA system correctly.
9. Turn over well to SWD Foreman – Adrian Flores. All injection capabilities are to be removed from the well site.
 - a. Disconnect injection line from wellhead - LOTO
 - b. Remove power to pumps - LOTO
 - c. Remove inlet valve to facility - LOTO



Ross Gulch 8 #3 SWD

Olivia Desser 11/28/2023

Kerry Fortner, Compliance Officer A**Office: 575-393-6161 ext. 120****Cell: 575-263-6633***Kerry.fortner@state.nm.us***Gary Robinson, Compliance Officer A****Office: 575-393-6161 ext.106****Cell: 575-263-4507***Gary.robinson@state.nm.us***Production Engineer: Olivia Desser 11/30/2023****Emergency Contact**

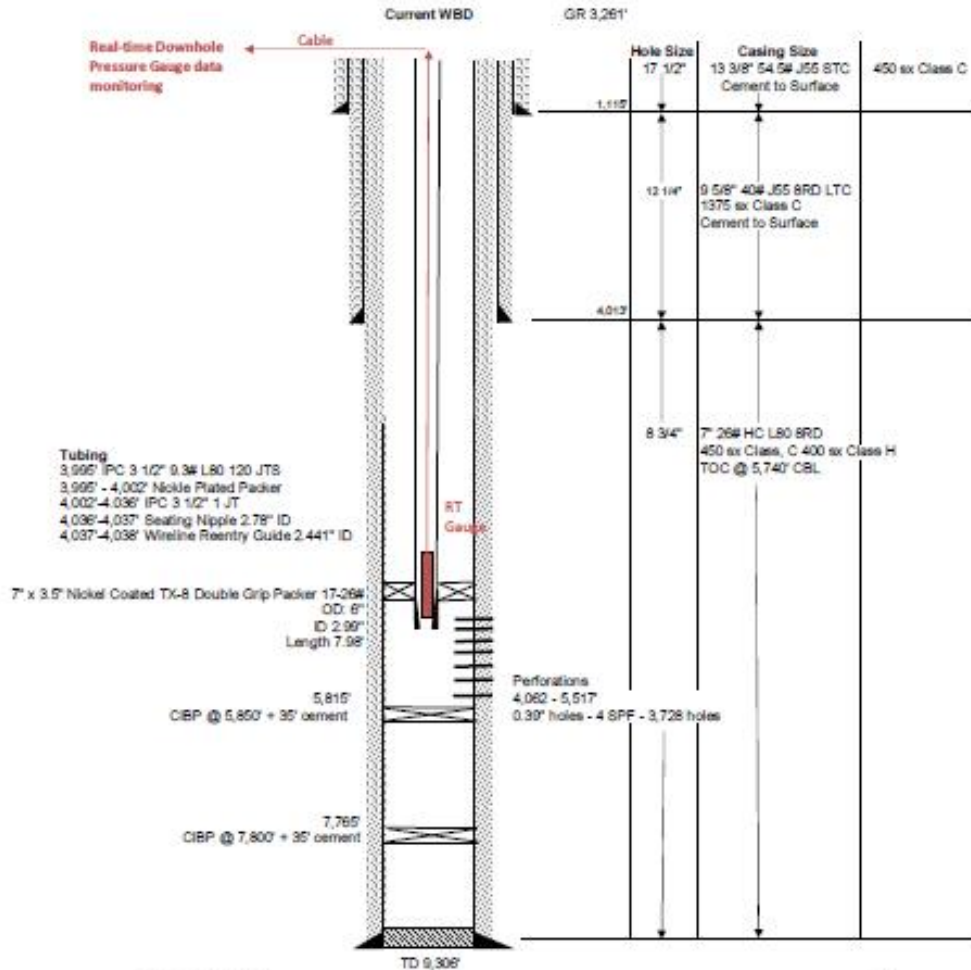
Emergency Contact Information			
In the event of an accident/safety incident involving EOG employees or contract personnel contact:			
Name	Title	Cell	Office
Brian Chandler	Safety Manager	817-239-0251	817-806-0486
Ashley Mayfield	Sr. Safety Rep	432-258-7998	432-686-3662
In the event of a spill or environmental release contact:			
Name	Title	Cell	Office
Paige Jordan	Environmental Rep	281-624-7374	432-686-3745
Andrea Guerrero	Environmental Rep	432-385-6568	432-848-9154
Doug Lowrie	Environmental Manager	432-425-6923	432-686-3755
Production Department Contacts:			
Name	Title	Cell	Office
Joe Justus	Water Resources Superintendent	817-733-3645	
Adrian Flores	SWD Foreman	432-250-9848	
Ron Willett	Production Advisor	432-230-2135	432-686-3775
Tim Singley	Sr. Production Superintendent	601-731-4718	432-686-6900
Olivia Desser	Production Engineer	443-797-9314	432-238-8639
Kent Caudle	Chemical Advisor EOG	432-210-9260	
Police/Fire/Hospital Contacts			
Fire			911
Sheriff (Eddy County)			575-887-7551
Sheriff (Lea County)			575-396-3611
Hospital – Carlsbad Medical Center (Carlsbad, NM)			575-887-4100
Hospital – Lea Regional Medical Center (Hobbs, NM)			575-492-5000
Hospital – Nor-Lea General Hospital (Lovington, NM)			575-396-6611
Hospital – Winkler County Memorial Hospital (Kermit, TX)			432-586-5864

Ross Gulch 8 #3 SWD



Olivia Desser 11/28/2023

	Monitor Well Reclassification Proposal	Ross Gulch 8 #3 SWD
	August 2023	32-0568161-103.8011627
		API 30-015-30736
		Eddy County, New Mexico
		Max Permitted Injection Pressure: 800 psi
		Permitted Injection Zone 4000-6400'
		OCDesser Edit 8/31/2021



Casing (3 items)

Detail	Size	Weight	Grade	TOC	Depth
SURFACE	13.375	54.5	J-55	0	1115
INTERMEDIATE #1	9.625	40	J-55	0	4015
PRODUCTION	7	26	HCL80	0	9300

Perforations (No items found)

Stage	Top	Bottom	Num Perfs
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Tubing (6 items)

Component	Name	# Items	Length	Top MD	Bot MD	Description
KB	KB	1	25.0	00.0	25.0	0 0 KB
Tubing	Tubing	120	2,970.0	25.0	2,995.0	2.5 9.3 L-80 2.992 Tubing
Packer	Arrowset Packer	1	08.0	3,995.0	4,003.0	7 0 0 Packer
Tubing	Tubing	1	33.2	4,003.0	4,036.2	3.5 9.3 L-80 2.992 Tubing
Sealing Nipple	chemical Top Lock	1	01.1	4,036.2	4,037.3	3.5 0 2.78 Sealing Nipple
Wireline Entry Guide	Wireline Entry Guide	1	00.6	4,037.3	4,037.9	3.5 0 2.441 Wireline Entry Guide

Rods (No items found)

Component	Name	# Items	Length	Top MD	Bot MD	Description
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Other Equipment (No items found)

Component	Name	Length	Top MD	Bot MD
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Item	Name	Casing	Is Cased	Length	# of Items	Joint #	Top Depth (F)	Bottom Depth (F)	Inches	OD (inch)	ID (inch)	Grade	WT (lb)	Connection Type	Max OD (inch)	Flow Condition	Run Date	Full Date	Material	Mfg	Model
KB	KB	W		25.00	1		0	25		0	0		0	0	0	0	8/13/2021		Please Select		
Tubing	Tubing	W		2,970.00	120	120	25	2995	1.05	3.5	2.992	L-80	9.3	0	0	0	8/13/2021		Please Select		
Packer	Arrowset P	W		7.56	1		3999	4003.96	1.40	7	0		0	0	0	0	8/13/2021		Please Select		905-TD
Tubing	Tubing	W		33.20	1	121	4032.98	4036.08	1.40	3.5	2.992	L-80	9.3	0	0	0	8/13/2021		Please Select		
Sealing Nipple	Mechanics	W		1.67	1		4036.18	4037.26	1.64	3.5	2.78		0	0	0	0	8/13/2021		Please Select		W14-102
Wireline Entry Guide	Wireline G	W		0.60	1		4037.25	4037.85	1.05	3.5	2.441		0	0	0	0	8/13/2021		Please Select		

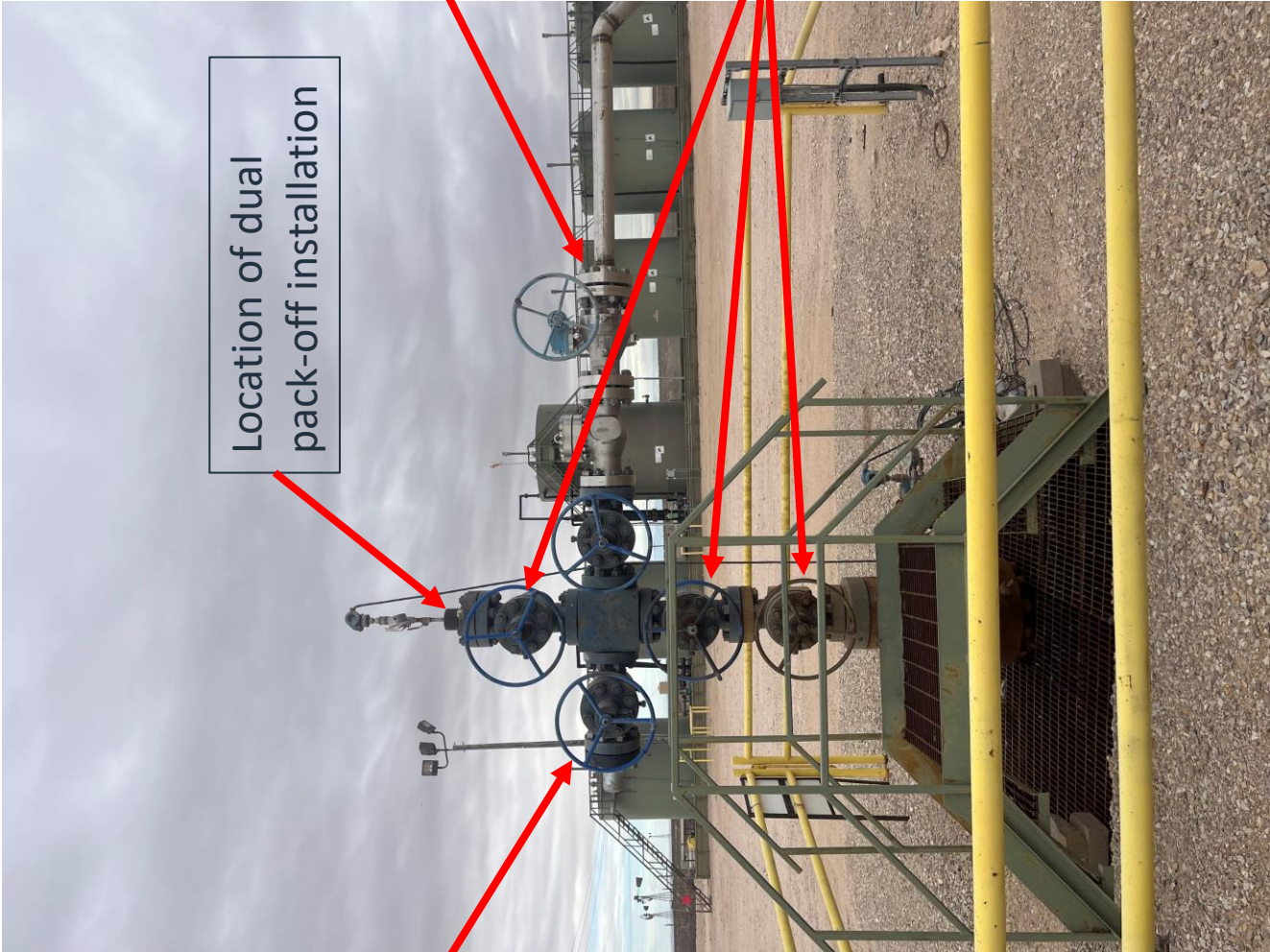
Tree Example

Location of wing valve to pump kill fluid

Location of dual pack-off installation

Injection line to be blinded off.

Valve handles to be removed to prevent unintentional cutting of cable.



Wireline/Cable Unit Example



Modified Wireline Unit

Cable reel

Crane for hoisting injector-head

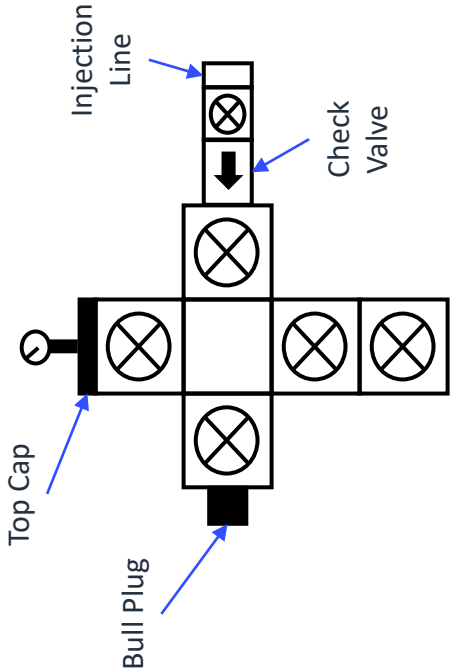
Injector-head

Location of dual pack-off installation

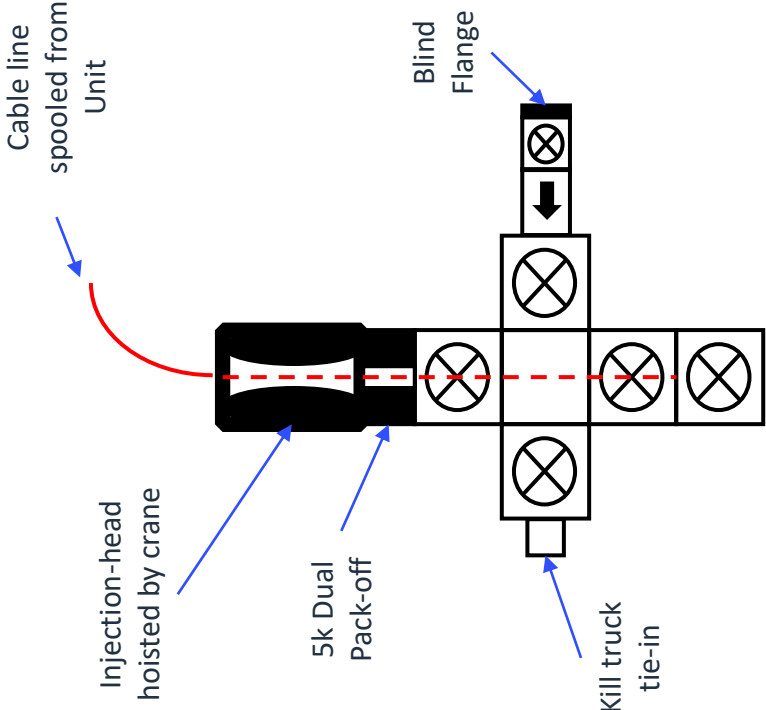


Stack-up diagrams

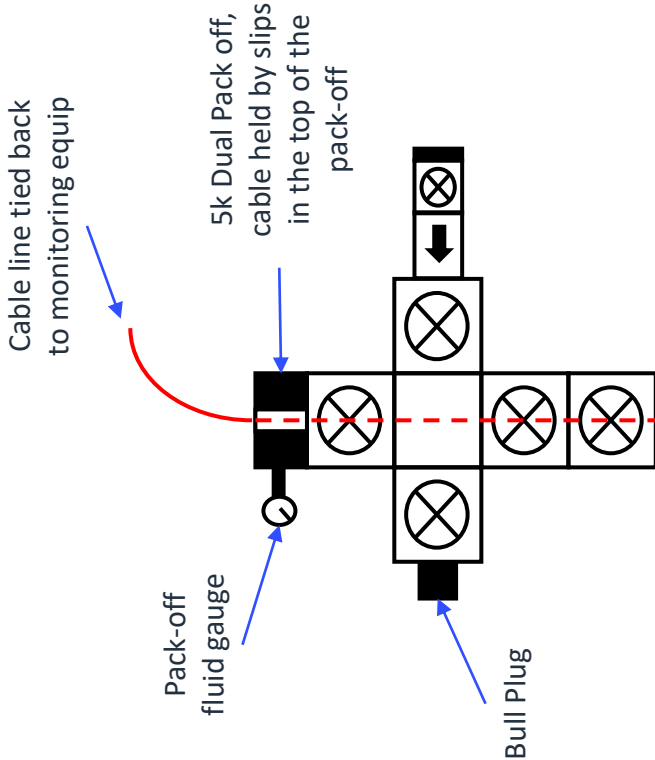
Current Tree



Gauge Installation



Final Setup

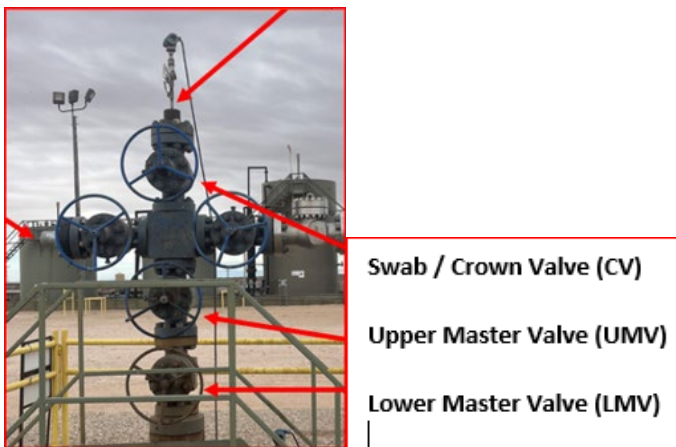


From: [Harris, Anthony, EMNRD](#)
To: [Jordan Kessler](#); [Goetze, Phillip, EMNRD](#)
Cc: [Wrinkle, Justin, EMNRD](#); [Gebremichael, Million, EMNRD](#); [Patrick Padilla](#); [Tyler Burns](#)
Subject: RE: [EXTERNAL] Ross Gulch monitoring well conversion request
Date: Monday, February 19, 2024 2:34:00 PM
Attachments: [image001.png](#)
[image002.png](#)
[image005.png](#)
[image003.png](#)

Good Day Jordan

We have some questions regarding the proposed running procedure for the gauge and the dual packoff assembly. To avoid any confusion, I wish to clarify the following terminology

- **Swab/Crown Valve: (CV)** Uppermost valve in the image below
- **Flow Cross:** 4-way Block below the crown valve with side outlets for wing & kill valves
- **Upper Master Valve: (UMV)** Manual valve below the flow cross
- **Lower Master Valve: (LMV)** Manual Valve below the Upper valve (ie. lowermost valve in below image)



I have pasted a copy of your procedure below, and inserted questions / items to clarify in **red text**.

Procedure

(Top Perf: 4,062' Bottom Perf: 5,517' – Casing: 7" 26# HC L80 8RD)

Contact Jose Sandoval to get gauge and running unit on location

Tally Production Systems – 432-888-0075

1. MIRU Modified Wireline Unit. Prep to run real-time bottom hole pressure gauge (RT BHPG) and cable.
2. NU 5K BOP and new swap valve packer. Function test all valves and pressure test connections before proceeding.
 - Please provide a stack-up drawing to illustrate the pressure control equipment utilized for deployment and retrieval of the gauge.
 - It is assumed both packoffs will be pre-installed below the BOP during deployment and/or retrieval? Please confirm
 - What is the estimated weight of the BOP's and Pressure control

- equipment that will be transferred to the packoff assemblies?
 - Please confirm the packoffs are designed to handle the compressive and shear loads transmitted via the BOP and Pressure control equipment during rigup, pressure testing, deployment and retrieval.
 - Prior to installing the BOP, will the gauge and cable already be deployed below the crown valve?
 - Note: The gauge is ~ 14" long and OD=0.75". Since the Packoff ID= 0.25", the only option appears to deploy the gauge below the crown valve (ie. hung across the flow cross and UMV) while rigging up the BOP? Please confirm
 - Barrier protocol - Please confirm which valves will be open / closed during rigup and pressure testing of the BOP and lubricator
- 3. TIH 0.75" OD BHPG and 0.25" OD cabling. Stop at 4,020'.
- How is depth control achieved to ensure the gauge is placed at 4020 ft?
- 4. Secure cabling. NU double swap packer. ND Lubricator, RD Wireline Unit.
 - Is this different from the swab valve packer that was installed in Step 2?
 - How is the packer installed when the BOP and lubricator are already rigged up on the well?
 - No mention of rigging down BOP. Please confirm when BOP will be removed. Presumably after pressure seal is confirmed in Step 5?
- 5. Check for leaks and increase packing fluid as needed to confirm pressure seal.
 - How is pressure seal confirmed? Via inflow test? How do you confirm if there is no pressure on the wellhead at the time?
 - Are there any other pressure tests planned to confirm the packoff seal integrity?
- 6. Remove wheels from lower and upper master valves and place near wellhead. Wheels are removed to avoid accidental cutting of the wire hanging in the well.
- 7. RDMO
- 8. Turn over well to SWD Foreman – Adrian Flores. All injection capabilities are to be removed from the well site.
 - a. Disconnect injection line from wellhead - LOTO
 - b. Remove power to pumps - LOTO
 - c. Remove inlet valve to facility - LOTO

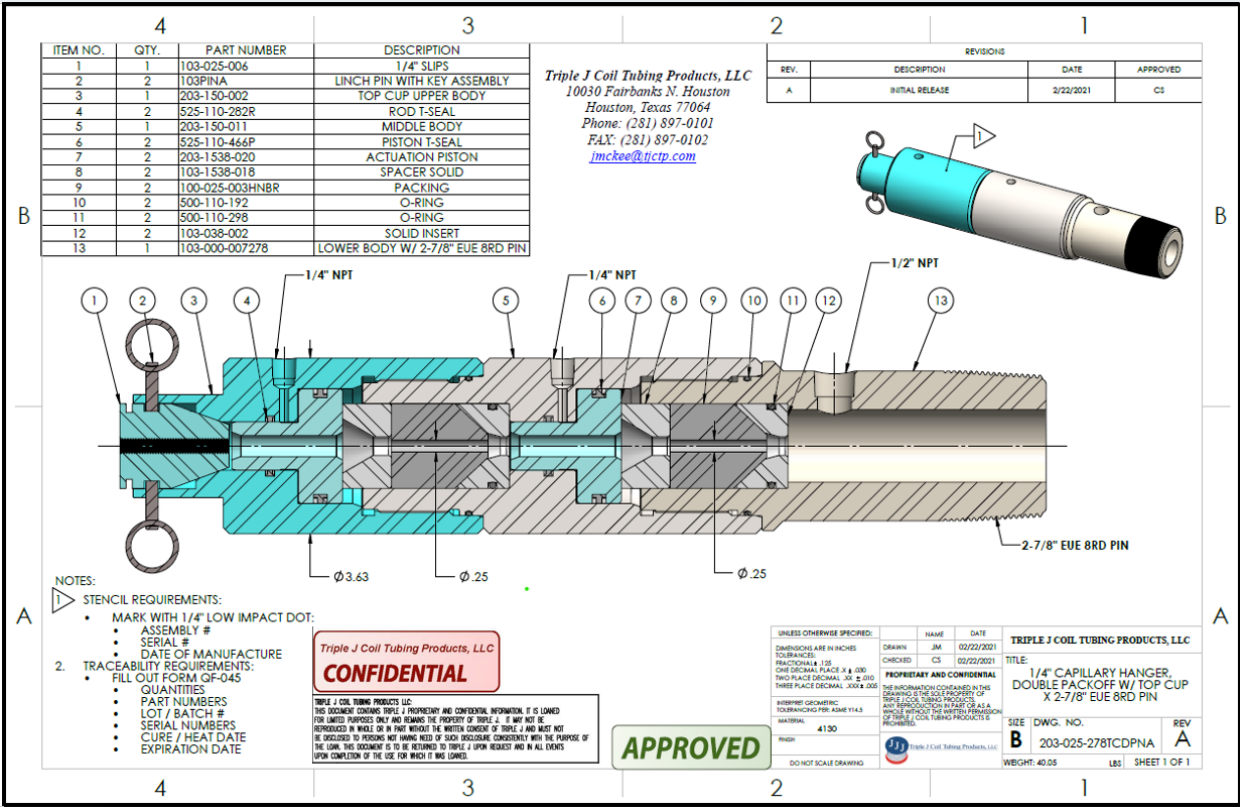
Additional items:

1. Please provide a procedure detailing how the cable and gauge will be recovered assuming positive pressure on the well
2. For the benefit of OCD inspectors who will visit the site, please provide the following:
 - a. Details of what the entire stack-up assembly will look like once the gauge has been deployed.
 - b. Details on what the OCD Inspectors need to check during visits to the well
 - i. Packoff pressure ?
 - ii. Level / quantity of Packing fluid in the reservoir?
 - iii. Packing fluid pump ?
 - iv. Surface readout panel?
 - v. Other items?

Thanks and Regards

Regards
Tony Harris
Petroleum Specialist





0.75" Piezo Perm

Application

DataCan's Multi-Gauge Piezo Bottom Pressure Tool can be used on its own or at the bottom of a multi-gauge pressure system. This tool comes in a standard version as well as a pressure testable version for quality assurance.

Benefits

The Multi-Gauge Piezo Bottom Pressure Tool is easy to install and produces high quality reservoir data in real time. It's fully welded construction, dual protection metal to metal seal design, and hermetically sealed electronics make it a very reliable product. This is the final gauge in a multi-gauge system. Alternatively, this gauge can be used on it's own as a single gauge in a single gauge system.

The Crimp-y-doo, at the heart of DataCan's new gauge design, ensures correct wire prep and prevents the TEC conductor from pulling up into the armor. If you find yourself assembling a gauge without a crimpy-doo, you just better crimp-y-don't!

Features

- Fully Welded Construction
- Hermetically Sealed
- Corrosion Resistant - NACE MR0175
- Slim 0.75" Diameter
- Pressure Testable Option

Multi-Gauge Piezo Bottom Pressure Tool - Standard

Pressure	Temperature	Part No.					
		1/8" Wire		1/4" Wire		4mm Wire	
		SS	Inconel	SS	Inconel	SS	Inconel
750 psi	150°C	111542	111548	111530	111536	111554	111560
1,500 psi		111543	111549	111531	111537	111555	111561
3,000 psi		111544	111550	111532	111538	111556	111562
6,000 psi		111545	111551	111533	111539	111557	111563
10,000 psi		111546	111552	111534	111540	111558	111564
15,000 psi		111547	111553	111535	111541	111559	111565



Multi-Gauge Piezo Bottom Pressure Tool - Pressure Testable

Pressure	Temperature	Part No.					
		1/8" Wire		1/4" Wire		4mm Wire	
		SS	Inconel	SS	Inconel	SS	Inconel
750 psi	150°C	112166	112172	112154	112160	112178	112184
1,500 psi		112167	112173	112155	112161	112179	112185
3,000 psi		112168	112174	112156	112162	112180	112186
6,000 psi		112169	112175	112157	112163	112181	112187
10,000 psi		112170	112176	112158	112164	112182	112188
15,000 psi		112171	112177	112159	112165	112183	112189

Accessories

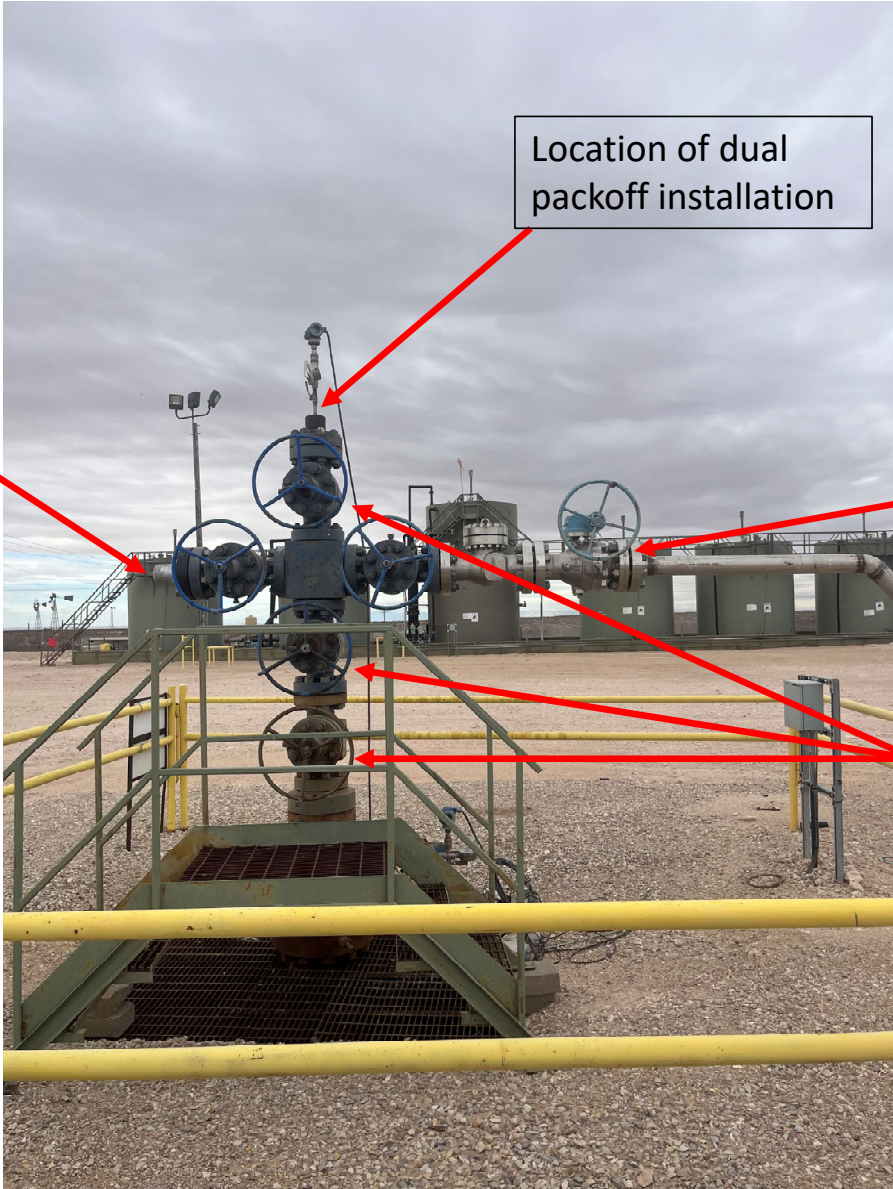
Accessory Type	Part No.		
	1/8" Wire	1/4" Wire	4mm Wire
Redress Kit Sweet	112758	112756	112760
Redress Kit Sour	112759	112757	112761

Specifications

	Pressure	Temperature
Accuracy Up To	0.03% F.S.	0.5°C
Resolution	0.0003% F.S.	0.005°C
Drift	< 3 psi / year	< 0.1°C / year

Manuals

[Permanent Downhole Gauge - User Manual](#)



Location of wing valve to pump kill fluid

Location of dual packoff installation

Injection line to be blinded off.

Valve handles to be removed to prevent unintentional cutting of cable.

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 345625

CONDITIONS

Operator: EOG RESOURCES INC 5509 Champions Drive Midland, TX 79706	OGRID: 7377
	Action Number: 345625
	Action Type: [IM-SD] Well File Support Doc (ENG) (IM-AWF)

CONDITIONS

Created By	Condition	Condition Date
anthony.harris	None	5/20/2024