

Morning Report PNR1z				
Management System:		HSE	File Name:	018-PNR1z-25.10.18-RMR
Approver:		Senior Geoscientist	Version No:	1
Reviewer:		Frac Manager	Date of Issue:	26 th October 2018
Author:		Senior Geoscientist	Proposed date of Review:	n/a
Version	Section	Revision Information	Date	Reviser
0.1	All	Draft Publication	26/10/2018	Senior Geoscientist
<i>Documents are reviewed as per proposed review date, or sooner if a significant change to the operation has taken place, to ensure relevance to the systems and process that they define.</i>				

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Summary

Overview of day's operations:

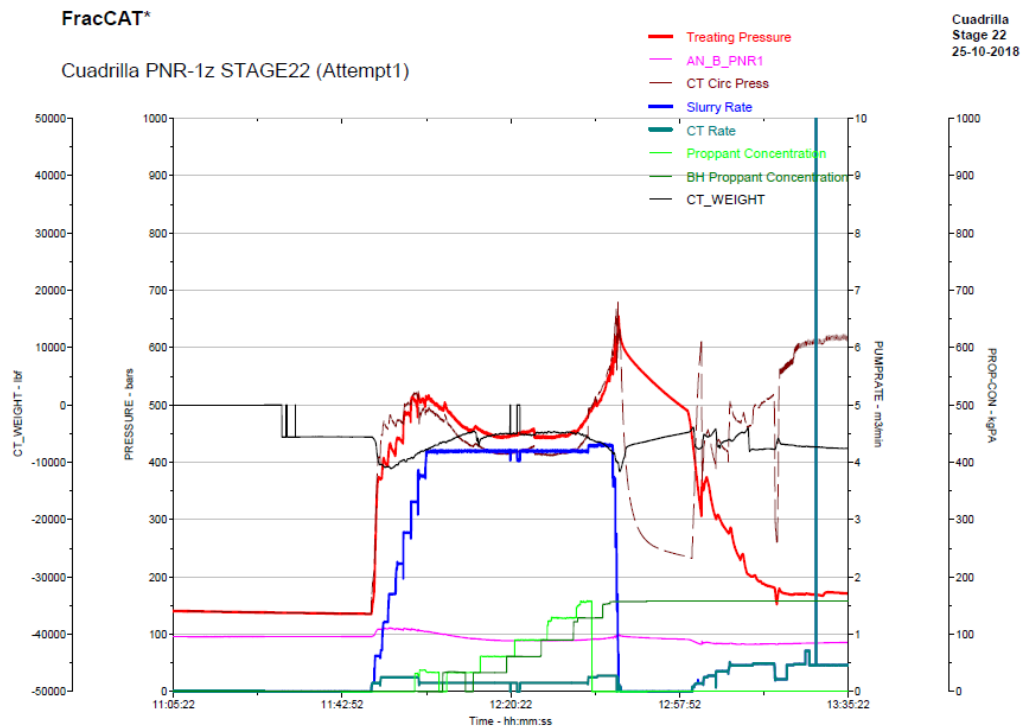
- Split Injection into Stage 22, 2:30 delay between injections
- 220 m3 initial, 130 m3 secondary
- Flow back performed – 20.62 m³
- Amber traffic light Induced seismicity at 15:59:27 – M_L = 0.37
- No red line boundary breached

Injection Summary

Stage 22

Injection Depth m (RT)	Volume (fluid m3, proppant tonne)	Fluid System	Additives (type, mass kg, %)
-2998.51 M MDRT	Slickwater Frac (350.9 m3 & 17 T)	Slickwater	B528 Friction Reducer, Slickwater Frac – 84 kg – 0.02 %
-2322.31 M TVDRT			

Injection Chart

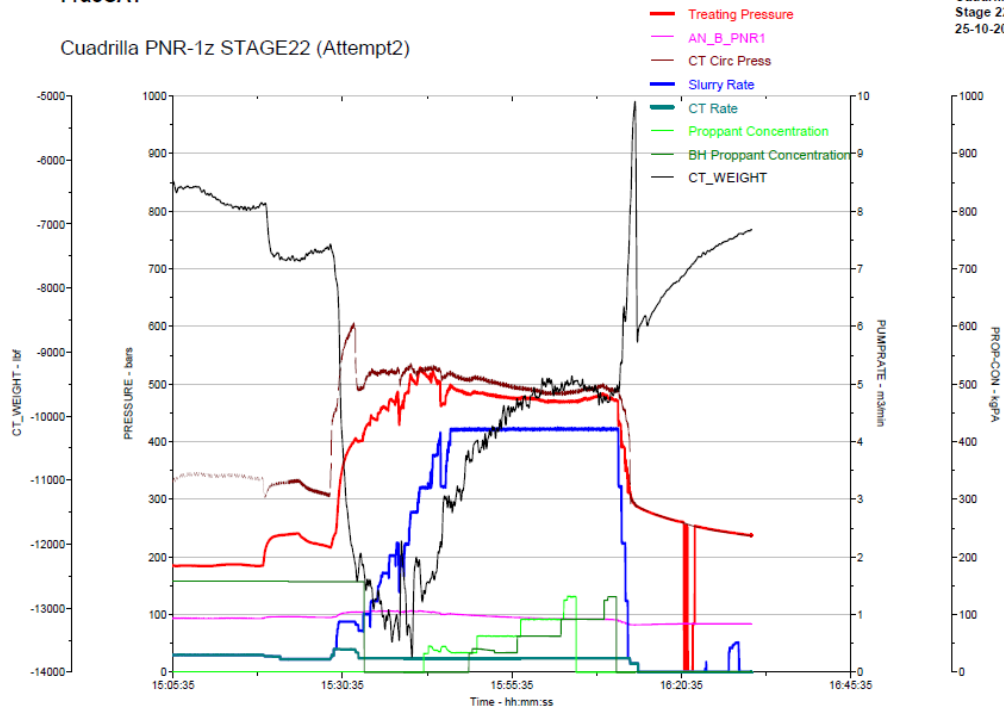


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FracCAT*

Cuadrilla PNR-1z STAGE22 (Attempt2)

Cuadrilla
Stage 22
25-10-2018



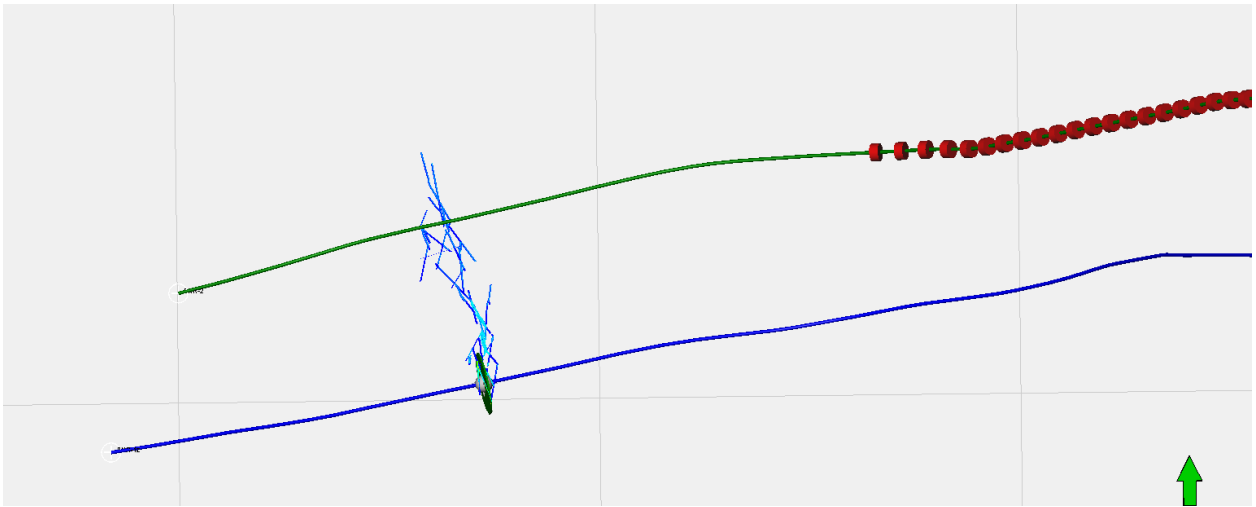
Pumping Time:

- 1) 25/10/2018 11:49:22 – 25/10/2018 12:44:50
- 2) 25/10/2018 15:18:56 – 25/10/2018 16:14:16

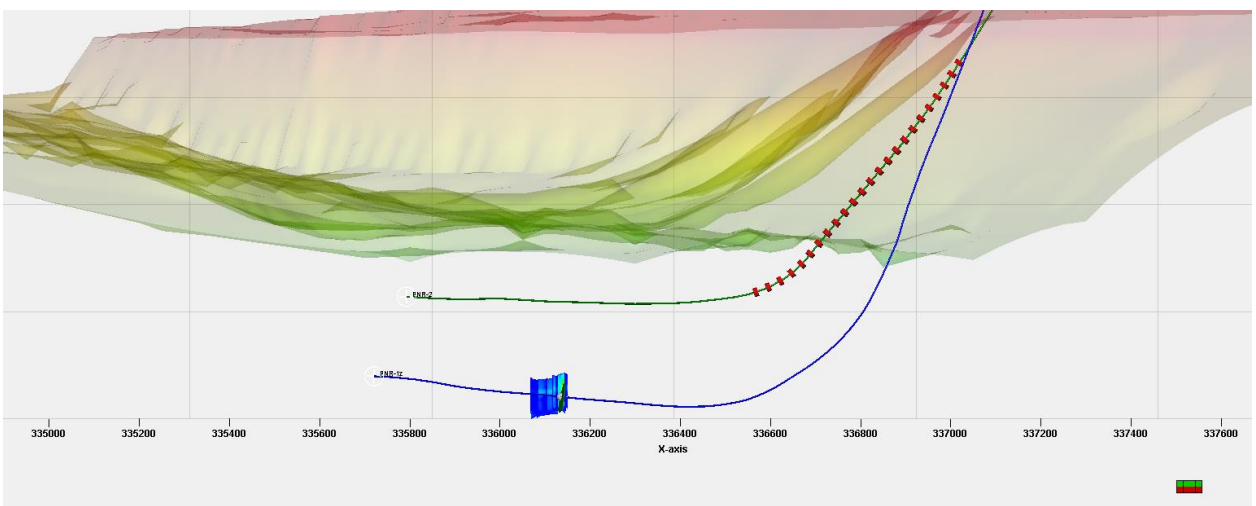
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Fracture Growth

Frac #1

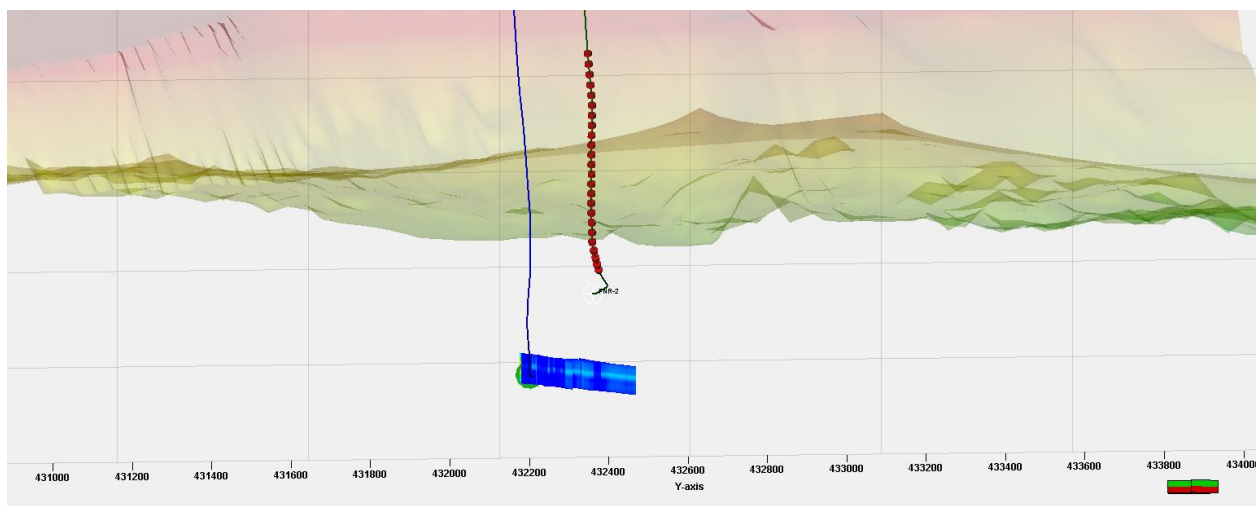


- Map View, scale north bar [Frac #1]



- X-section due north [Frac #1]

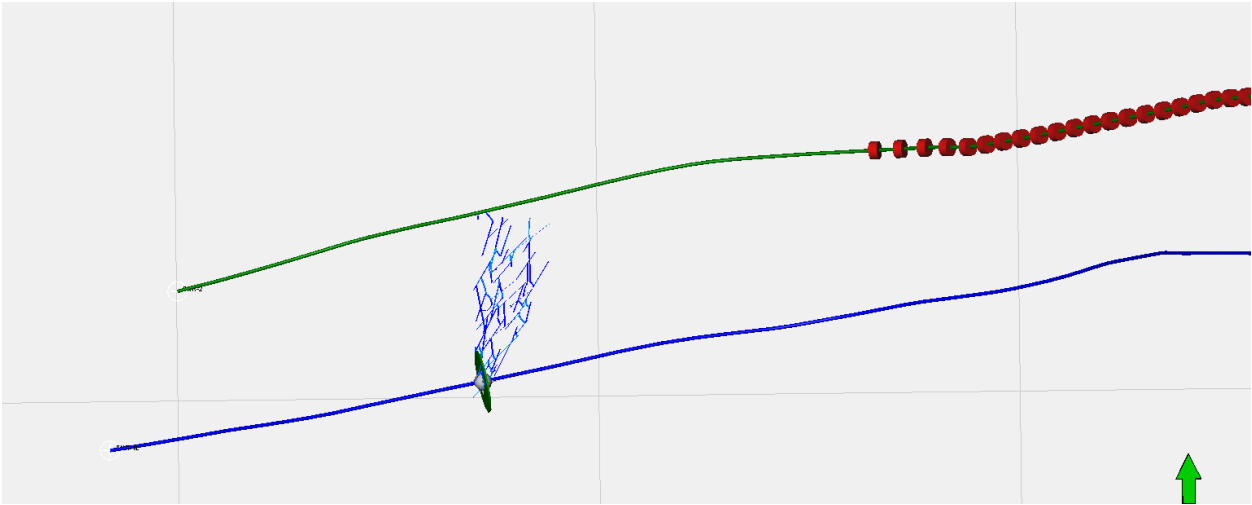
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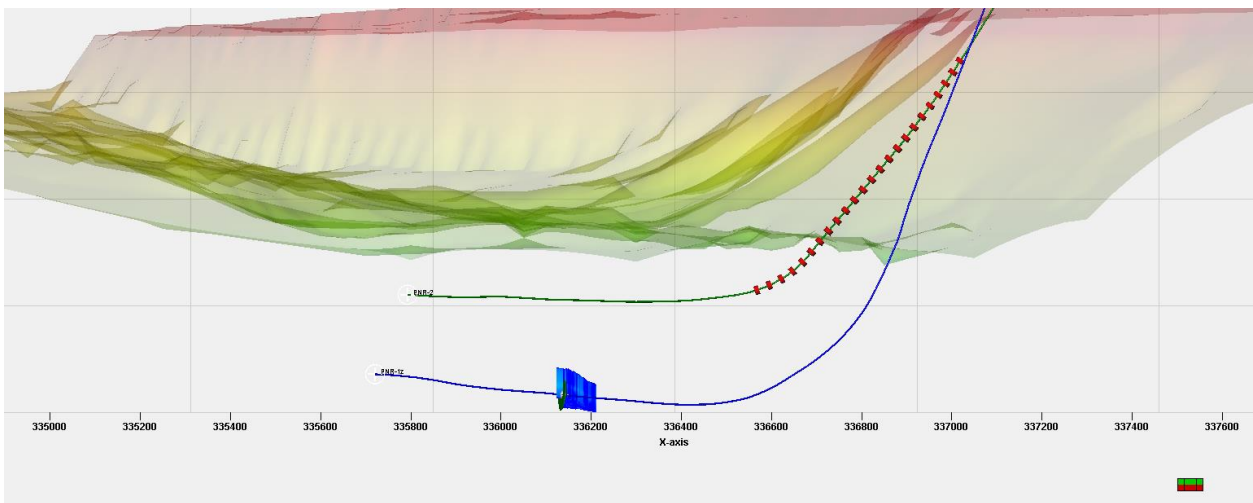
- X-section due east [Frac #1]
- Max hydraulic frac half length: 284.51 m
- Hydraulic frac height at well: 86.79 m

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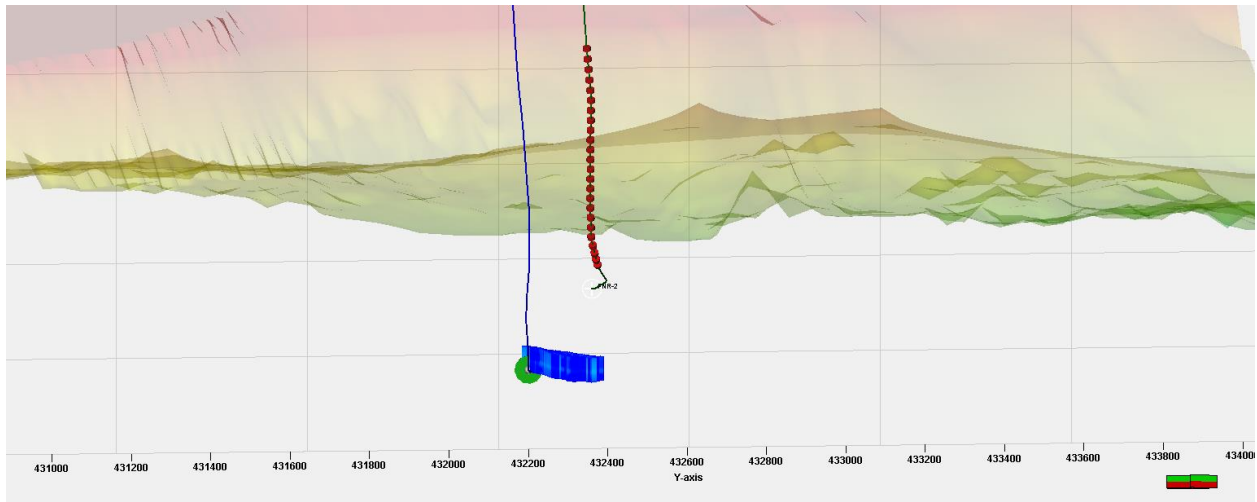
Frac #2



- Map View, scale north bar [Frac #2]



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- X-section due east [Frac #2]
- Max hydraulic frac half length: 201.43 m
- Hydraulic frac height at well: 66.34 m

Well Integrity Status

- No change

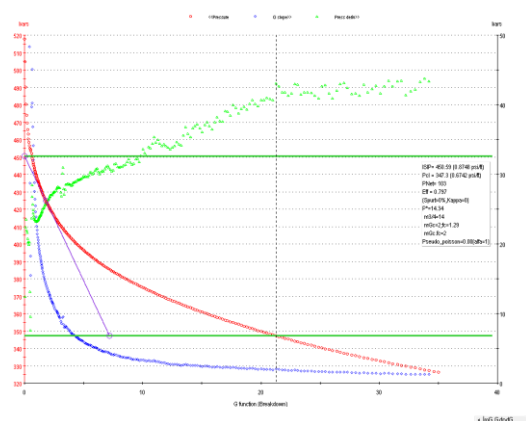
Induced Seismicity of Note

- 25/10//2018 15:59:27 = $M_w = 0.561$ & $M_L = 0.37$, BNG: 336423 432842, -2500 TVDSS

Update to Stress Magnitude

No update to stress magnitude as closure was not observed

- $S_{Hmin} = 0.0152$ MPa/m



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