

TLS Report PNR1z

Author		Senior Geoscientist	File Name:	TLS_report_ event_261018_PNR1z	
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Version	Section	Revision Information		Date	Reviser
0.1	All	Draft Publication		26/10/18	Senior Geoscientist
1.0	All	Final Publication		29/10/18	Senior Geoscientist

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.

Event Summary

During injection operations of stage 30 for the hydraulic stimulation of PNR1z, a seismicity related traffic light system red light threshold was exceeded. The seismic event had a local magnitude of 0.76 ML. The seismic event hypocenter shown in the map and x-section by the blue dot, was roughly 304.48 m from the injection point.

Event Classification

Green Event	Amber Light	Red Light	Trailing Event (<=0.5ML)	Trailing Event (>0.5ML)
		X		

Event Details

Magnitude (ML)	Date	Time (24hr) BST	Last Stage Injection
0.76	26/10/2018	12:36:59	30

Hypocenter Information

X [mEast] BNG	Y [mNorth] BNG	Z [mTVDGL]	Distance to Nearest Injection Point (m)
336439	432898	-2300	304

Error / Uncertainties

P Trace Quality	S Trace Quality	Trace Quality	Min Ellipsoid size (m)	Mid Ellipsoid size (m)	Max Ellipsoid size (m)
0.87	0.72	0.69	174	191	597

Ground Motion & Well Integrity

Max PPV (mm/sec)	Average PPV (mm/sec)	Fit to GMPE (mm/sec)	Annular Pressure Change (psi)
0.6	0.11	0.3	0

Injection Information

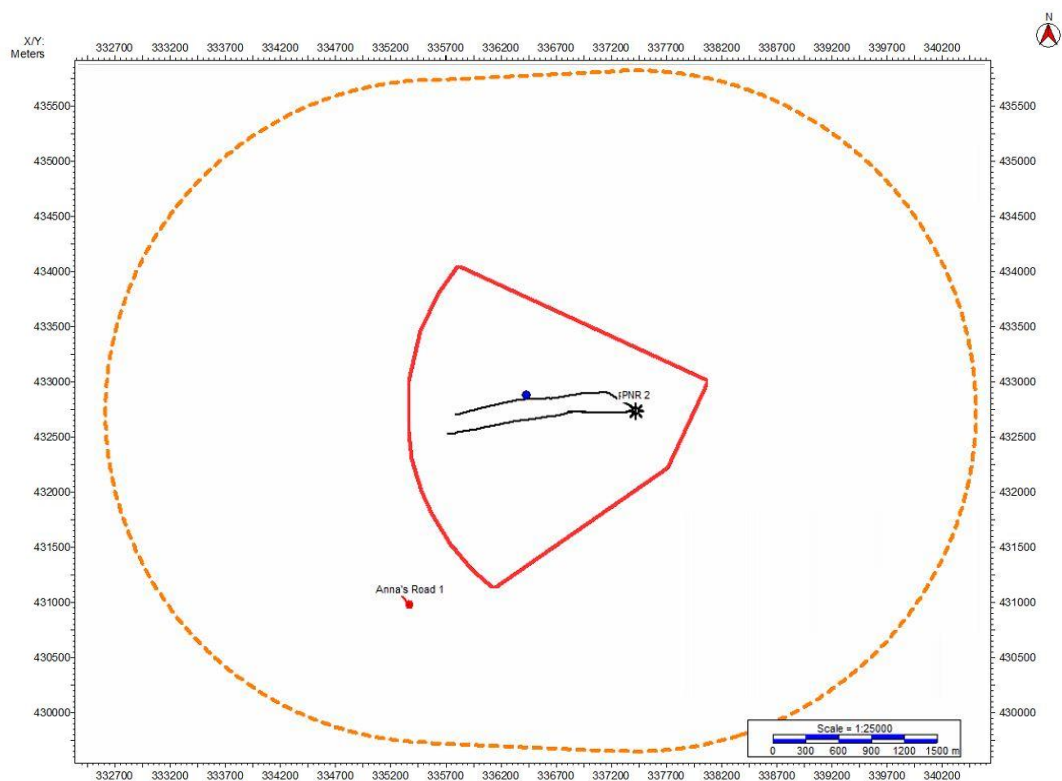
Sleeve	Fluid Volume Injected (m³)	Proppant Volume Injected (tonnes)	Average Rate (m³/min)	Max Treatment Pressure (surface) (bar)	Average Treatment Pressure (surface) (bar)
30	144.2	3.6	3.6	375	340

Stage (cumulative)	Fluid Volume Injected (m³) (cumulative)	Proppant Volume Injected (tonnes) (cumulative)	Flow Back (m³) (cumulative)
9	2313	139	229

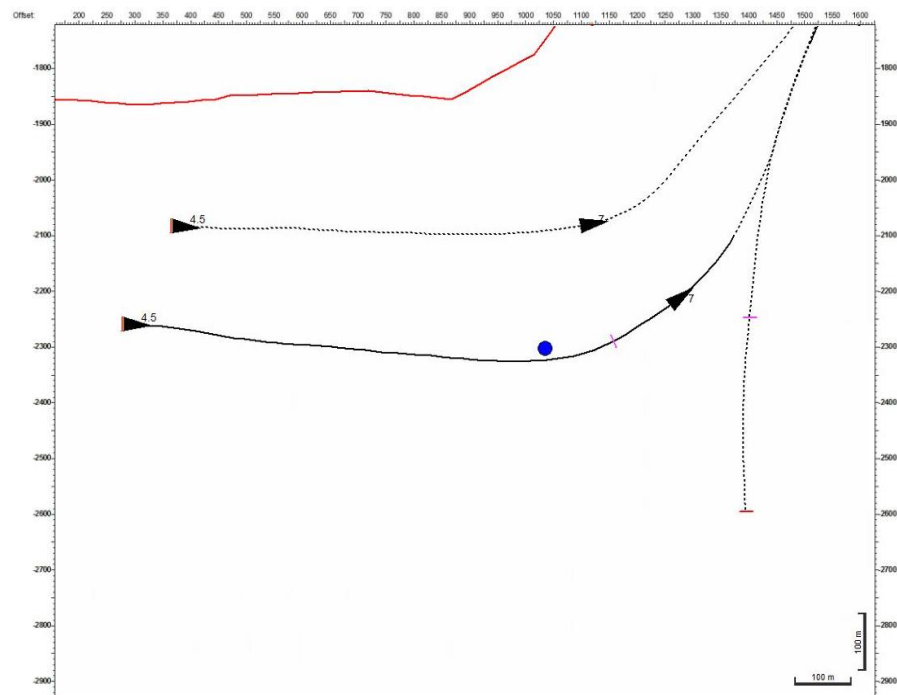
Forward Injection Schedule / Additional Mitigation

Waiting Time (hr) (<0.0ML)	Next Stage	Proposed Volume (m³)	Mini Frac	Additional Mitigation
18	-	-	Yes/no	

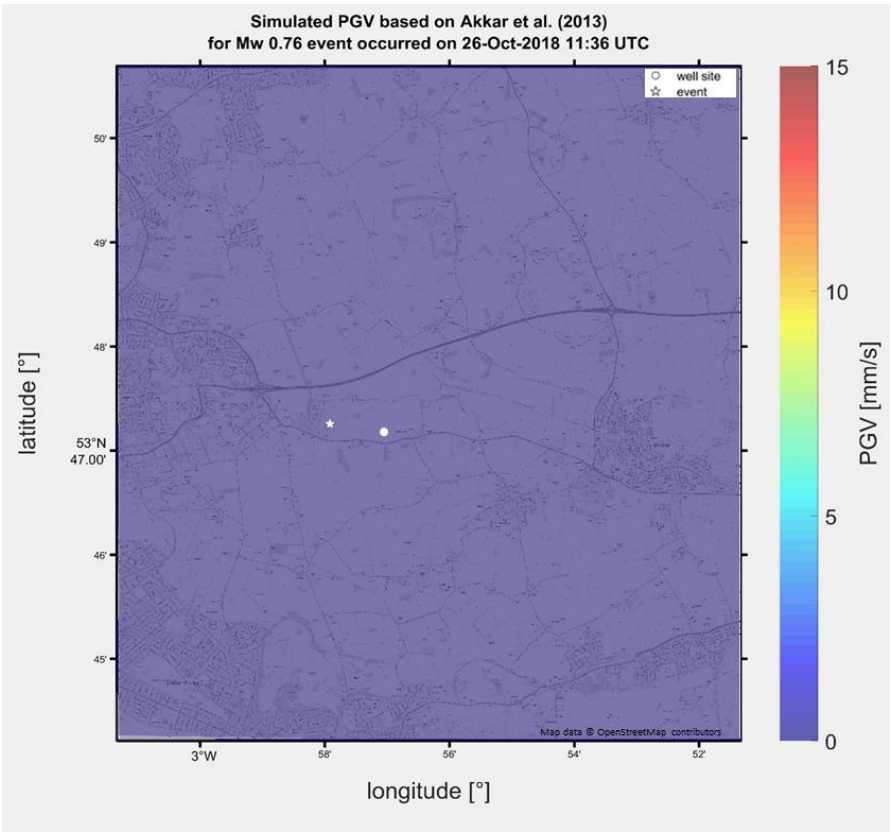
Base Map



Cross Section



Shake Map



The location of the sensor sites has been redacted on the basis of commercial confidentiality and public safety

Attenuation Curve

