

# BENEFITS OF TERRA-SLICE AFTER A HYDRO FRACTURE INJECTION WELL RESULTS

A Comparative Review of Terra- in Injection Wells		Perforation then Hydrofracturing vs. Terra-Slicing then Hydrofracturing					
Well Name & Interval Depth, m (ft)	Operation	Frac Treatment Pressure (P)		Injectivity (Q)		Injection Working Pressure (P)	
		atm	psi (approx)	m <sup>3</sup> /d	bopd (approx)	atm	psi (approx)
Unvin Well No. 317 Interval 2082-2097 (6831'-7136')	Perforation	650	9500	0	0	650	9500
	Fracture						
	Terra-Slicing	420	6172	40	252	175	2572
	Fracture						
% Improvement	-	-	<i>infinite</i>	<i>infinite</i>	-72%	-72%	
Unvin Well No. 300 Interval 2169-2175 (7116'-7136')	Perforation	600	8800	36	226	183	2689
	Fracture						
	Terra-Slicing	400	5878	20	126	185	2719
	Fracture						
% Improvement	-	-	1761%	1765%	9%	9%	
Unvin Well No. 273 Interval 2138-2153 (7014'-7063')	Perforation	600	8800	30	189	165	2425
	Fracture						
	Perforation	550	8083	2	13	90	1323
	Fracture						
	Terra-Slicing	400	5878	60	377	200	2939
	Fracture						
% Improvement	-	-	5150%	4977%	78%	78%	
Unvin Well No. 326 Interval 2220-2232 (7283'-7323')	Perforation	600	8800	0	0	600	8800
	Fracture						
	Perforation	550	8083	10	63	155	2278
	Fracture						
	Terra-Slicing	350	5144	70	440	200	2939
	Fracture						
% Improvement	-	-	1020%	1017%	23%	23%	
Unvin Well No. 106 Interval 2259-2268 (7411'-7441')	Perforation	600	8800	0	0	600	8800
	Fracture						
	Perforation	500	8083	0	0	500	7348
	Fracture						
	Terra-Slicing	400	5878	305	1918	420	6172
	Fracture						
% Improvement	-	-	<i>infinite</i>	<i>infinite</i>	-60%	-60%	
Yurchouk Well No. 215 Interval 2152-2162 (7060'-7093')	Perforation	600	8800	0	0	600	8800
	Fracture						
	Terra-Slicing	300	4409	39	245	164	2410
	Fracture						
% Improvement	-	-	569%	570%	25%	25%	
Yurchouk Well No. 211 Interval 2106-2098 (6909'-6883')	Perforation	600	8800	17	107	650	9500
	Fracture						
	Terra-Slicing	400	5878	21	132	198	2910
	Fracture						
% Improvement	-	-	467%	467%	-2%	-2%	



TERRA SLICE INTERNATIONAL WELLS								
District Well	Rock	Formation Depth (m)	Interval Height	Porosity (%)	Permeability (Darcy)	Spud Date	Performance Before TS	Performance After TS
Volga 12	Sandstone	4894-4900	6.0	11.0	0.002	11.1978	2000 m3 (gas)	6000 m3 (gas)
Volga 15	Sandstone	4613-4524	5.0	11.0	0.002	7.1978	1500 m3 (gas)	7000 m3 (gas)
Volga 3917	Sandstone	1420.5-1432.5	8.1	21.0	0.44	7.1984	injection 10.0 m3	injection 180.0 m3
Volga 3919	Sandstone	1396-1408	6.0	21.0	0.44	6.1984	injection 30.0 m3	injection 60.0 m3
Volga 3922	Sandstone	1470-1486	7.6	21.0	0.44	9.1984	injection 60.0 m3	injection 120.0 m3
Volga 3923	Sandstone	1462-1479	4.2	21.0	0.44	1.1985	injection 30.0 m3	injection 70.0 m3
Volga 3925	Sandstone	1376.139	13.0	21.0	0.44	9.1984	injection 80.0 m3	injection 180.0 m3
Volga 4007	Sandstone	1396-1410	9.0	21.0	0.44	11.1983	2m3/day oil	5.3m3/day oil
Siberia 1452	Sandstone	2362-2391	19.0	23.0	0.31	7.1987	0.1m3/day oil	20m3/day oil
Siberia 2532	Sandstone	2322-2343	18.0	23.0	0.31	7.1986	5.9m3/day oil	21m3/day oil
Siberia 2887	Sandstone	2535-2560	14.5	20.0	0.4	5.1987	6.8m3/day oil	21m3/day oil
Siberia 2894	Sandstone	2612-2642	19.6	20.0	0.4	6.1987	12m3/day oil	60m3/day oil
China 9-508	Sandstone	2796.2	6.0			10.1993	0m3/day oil	38.2m3/day oil
China 8-5-8	Sandstone	3019.7-3026.3	6.8			10.1993	4.5m3/day oil	30m3/day oil
Yemen 5	Carbonate	1457-1468	4.1			9.1998	0m3/day oil	5.6m3/day oil
Yemen 11	Carbonate	1289-1303	7.9			5.1989	0m3/day oil	22.1m3/day oil
TERRA-SLICE INTERNATIONAL WELLS								
Well Number		Well Type	Number Sq. Reservoir	Interval (m)	Effective Power (m)	Performance Before TS	Performance After TS	Increase (times)
682		Exploratory	Sushinskaya	1240.5-1247	1.0	2.00	3.22	1.61
424		Exploratory	Centrainaya	1206.6-1209	1.6	0.00	1.43	1.43
443		Exploratory	Naryadovskaya	1378.4-1380.2	3.2	0.00	11.00	11.00
589		Exploratory	Sushinskaya	1890-1915	3.2	0.40	7.80	19.50
411		Exploratory	Sushinskaya	1224.8-1230.2	1.6	0.00	13.80	13.80
1080		Exploratory	Centrainaya	1196.2-1199	2.2	0.00	2.20	2.20
1089		Exploratory	Centrainaya	1273.2-1274.4	1.0	0.00	1.83	1.83
222		Exploratory	Listvenskaya	1195-1197.5	2.5	12.40	43.40	3.50
615		Exploratory	Debesskaya	1676-1697	10.0	0.60	2.77	4.62
598		Exploratory	Elnikovskaya	950-966	10.0	0.70	2.70	3.86
605		Exploratory	Debesskaya	1728-1738	10.0	4.70	5.70	1.21
1741		Production	Mishkinskaya	1142-1156	9.2	1.40	3.50	2.50
2027		Production	Mishkinskaya	1174-1190	11.4	2.00	3.50	1.75
2042		Production	Mishkinskaya	1150.4-1156.4	6.0	0.50	6.30	12.60
3822		Production	Elnikovskaya	1468.2-1475.2	5.6	9.60	12.00	1.25
593		Production	Kiengolskaya	1226.2-1245.4	9.8	9.30	28.60	3.08
588		Production	Kiengolskaya	1298.8-1314	8.6	7.40	20.30	2.74
943		Production	Churturskaya	1318.4-1324.4	4.8	4.00	6.30	1.58
261		Production	Churturskaya	1275-1288.5	5.5	1.40	4.50	3.21
495		Production	Kiengolskaya	1238-1265.6	13.2	0.90	4.60	5.11
958		Production	Churturskaya	1256.8-1262	5.2	8.00	13.00	1.63
985		Exploratory	Karakuliskaya	952-957	2.0	7.10	11.80	1.66
988		Exploratory	Karakuliskaya	996.5-1003	6.0	0.24	1.10	4.58
980		Exploratory	Karakuliskaya	1035.5-1038.5	1.4	0.64	1.35	2.11
878		Exploratory	Karakuliskaya	1054-1056.5	1.4	0.00	2.80	2.80
790		Exploratory	Eniseiskaya	1302.5-1305.5	2.6	0.70	40.00	57.14
23		Exploratory	Overitskaya	1540-1614	45.0	3.50	35.40	10.11
265		Exploratory	Urengoiskaya	3704-3711	6.0	0.00	fountain & gas	
7		Exploratory	Andriashev	5249-5266	12.0	100.00	1000.00	10.00
2942		Production	Dudashirskaya	1494.8-1503.6	4.8	1.80	10.80	6.00
2943		Production	Dudashirskaya	1525.6-1542	8.0	1.90	3.10	1.63
362		Production	Begeevshovskaya	1187.6-1204	9.0	7.90	13.50	1.71
117		Production	Kyanhobchoe	2823-2824.5	1.5	0.50	3.00	6.00
3		Production	Opehsyprokan	872-1998	6.0	50000.00	90000.00	1.80
TERRA-SLICE INTERNATIONAL WELLS								
Field		Well	Rock	Depth (ft)	Porosity (%)	Permeability (Darcy)	Before (Mcf) TS	After (Mcf) TS
D. Volga		3907	Clay Stone	4659-4698	21.00	0.440	10.00	180.00
W. Siberia		1463	Sandstone	4580-4619	23.00	0.310	11.00 bbl	95.00 bbl
W. Siberia		2539	Sandstone	7749-7845	23.00	0.310	8.0 bbl	80.00 bbl
W. Siberia		2801	Sandstone	7618-7687	15.00	0.005	50.00	350.00
W. Siberia		2810	Clay Stone	4514-4560	25.00	0.450	35.00	200.00
W. Siberia		2915	Sandstone	4526-4580	13.00	0.004	55.00	275.00