

Offshore

• Rig Zone

FIVE Part Series

Producing wells declining in the shallow-water Gulf of Mexico

01/01/2019

New deepwater wells replacing shut-ins

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In the fourth part of this five-part series on Gulf of Mexico (GoM) well trends, producing and idle wells in the shallow water and deepwater are examined.

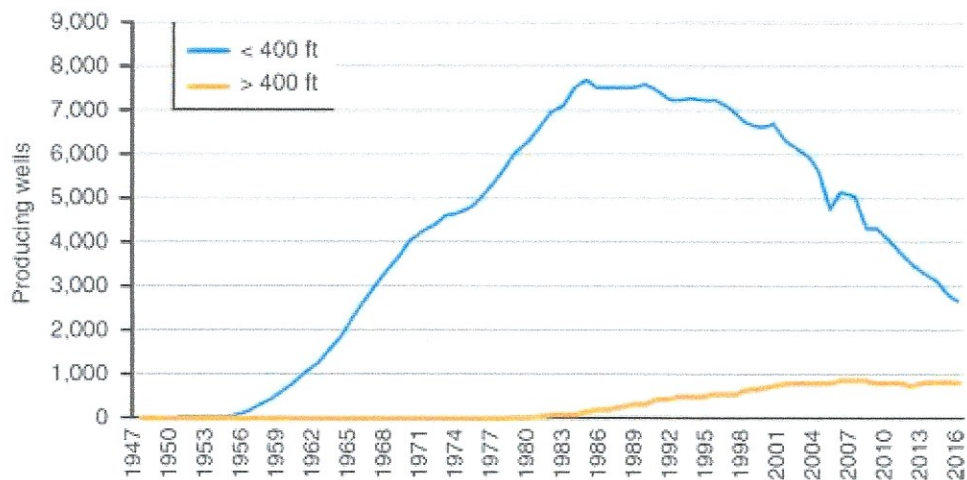
PRELIMINARIES

Wells start to decline almost immediately after they first produce. When wells stop producing they collect in inventory, sometimes returning to production via recompletion or a side track (although strictly speaking this is a new wellbore that is producing), and sometimes not returning to production.

Wells fail for any number of reasons and are shut-in for remedial work one or more times during their lifetime. Wells will produce more and for longer periods with regular maintenance, which is a primary reason subsea wells are abandoned at higher economic limits and tend to leave more reserves in the ground than dry tree wells. Some wells require more intervention than others and the level of intervention is one factor contributing to production volatility.

When wells remain inactive for a long period of time (i.e., several years) they have likely depleted their reservoirs or have mechanical problems that are not economically justified to remediate.

F1: PRODUCING WELL INVENTORIES IN THE SHALLOW AND DEEPWATER GULF OF MEXICO.



Source: BOEM, March 2018

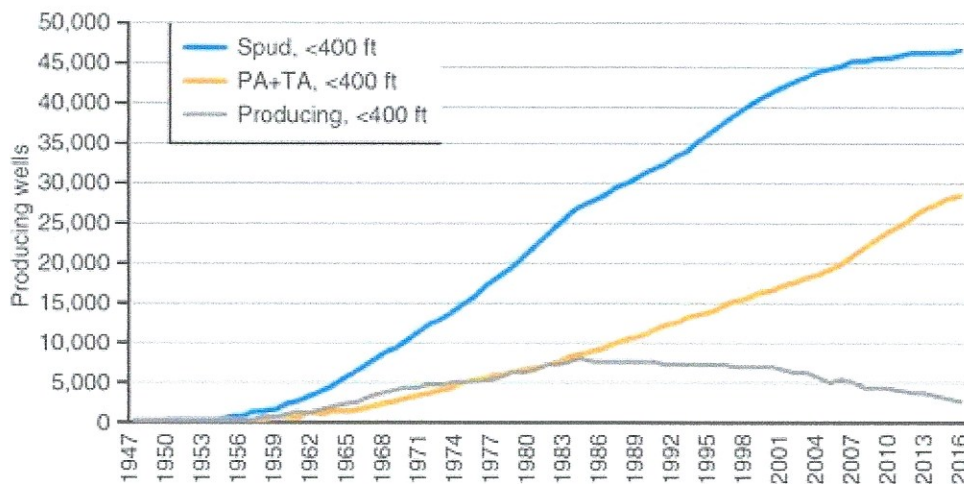
PRODUCING INVENTORY

In 2017, there were 3,463 wells in the GoM that produced hydrocarbons during the last 12 months, 2,644 wells in water depth <400 ft (122 m) and 819 wells in water depth >400 ft.

The number of producing wells varies with the size and age of the well inventory, the time (i.e., month) of assessment, the number of wells completed each year, and the development status of projects.

The number of producing wells is small relative to the total active well inventory, a mere 13% (2,644/20,989) in shallow water and 18% (819/4,582) in deepwater, but this is not uncommon in offshore field development.

F2: DRILLED, ABANDONED, AND PRODUCING WELLS IN THE SHALLOW-WATER GULF OF MEXICO



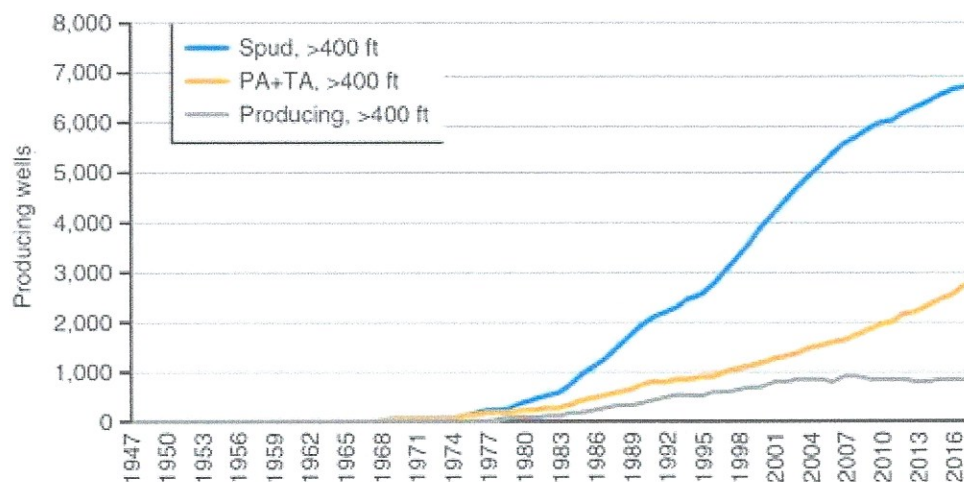
Source: BOEM, March 2018

PRODUCING INVENTORY TRENDS

The number of producing wells in shallow water has declined markedly over the past three decades. In 1985, there were 7,681 shallow-water producing wells, while circa 2017 there were 2,644 producing wells. Decline spikes in the years 2004-2005 and 2008 are attributed to hurricane activity and response.

Every four years or so 1,000 wells have dropped out of production. In 1997, more than 7,000 wells were producing; in 2003, there were ~6,000 producing wells; in 2007, ~5,000 producing wells; in 2011, ~4,000 producing wells; and in 2015, ~3,000 producing wells.

F3: DRILLED, ABANDONED, AND PRODUCING WELLS IN THE DEEPWATER GULF OF MEXICO



Source: BOEM, March 2018

If these dropout trends continue, which seems likely considering the age of producing

wells and the lack of replacements, by 2019 one might expect ~2,000 producing wells, and by 2023 or so ~1,000 producing wells.

GULF OF MEXICO WELL INVENTORY CIRCA 2017

	<400 ft	>400 ft	Total
Drilled	46,243	6,733	52,964
Permanently abandoned	25,254	2,151	27,405
Remaining	20,989	4,582	25,559
Producing	2,644	819	3,463

Source: BOEM, March 2018

Deepwater producing wells are on a different trajectory than shallow water with new wells replacing those that are shut-in. From 2002, there have been 800 or more producing deepwater wells most years, hitting a high in 2007 at 867 and numbering 819 in 2017.

Running totals of wells drilled, abandoned, and producing for the shallow water and deepwater are depicted in the accompanying figures. •

Offshore

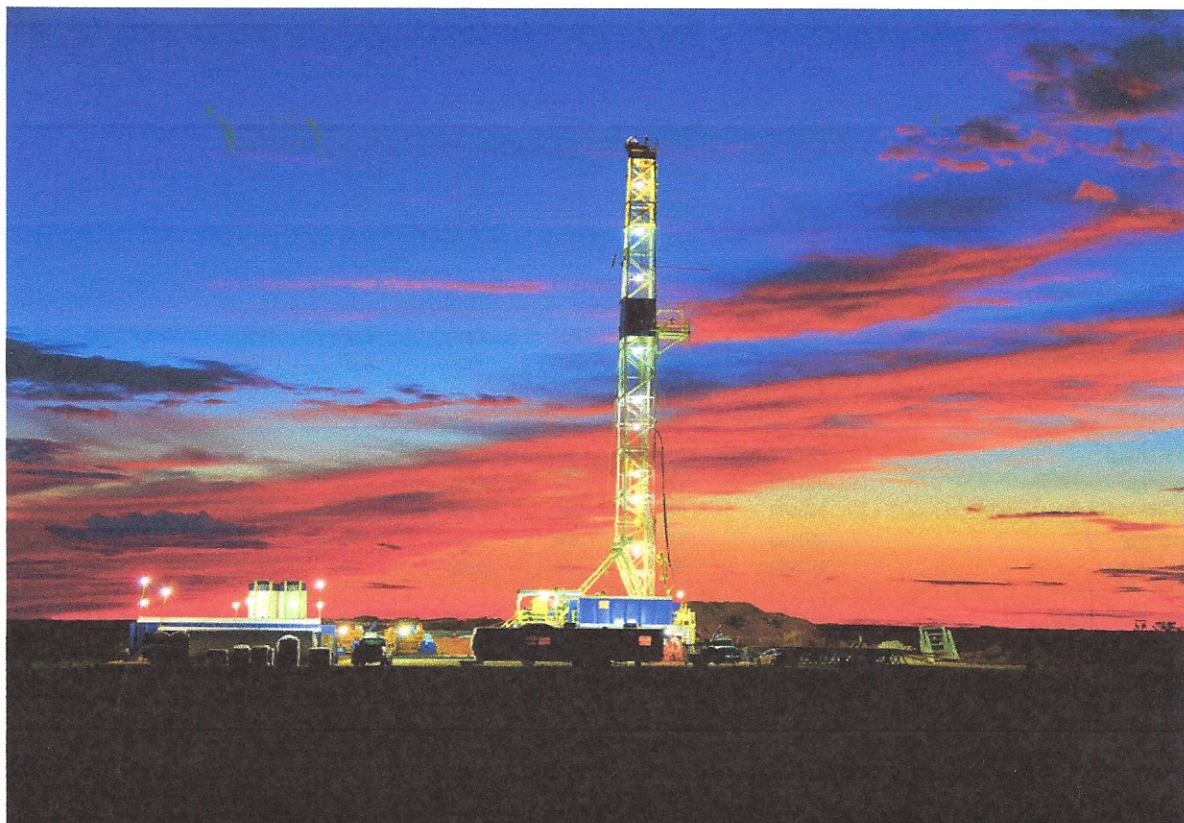


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BI-WEEKLY ENERGY SERVICE REPORT

ENERGY INVESTMENT BANKING GROUP



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Energy Service Report

Week Ended: Friday, February 15, 2019

Financial Market Statistics^{1,2}

	Date	This Period	Week Prior	% Change	Year Prior	% Change
Oil Service Index (OSX)	02/15/19	98.58	92.82	6.2%	136.55	(27.8%)
Oil Index (XOI)	02/15/19	1,305.60	1,256.53	3.9%	1,303.35	0.2%
S&P 500 Index (SP500)	02/15/19	2,775.60	2,707.88	2.5%	2,731.20	1.6%
NASDAQ Comp. Index (IXIC)	02/15/19	7,472.41	7,298.20	2.4%	7,256.43	3.0%
Dow Industrials (DJI)	02/15/19	25,883.25	25,106.33	3.1%	25,200.37	2.7%
3-Month T-Bill, Coupon Yield (%)	02/15/19	2.38	2.38	0.0%	1.56	52.6%
Prime Rate (%)	02/15/19	5.50	5.50	0.0%	4.50	22.2%

Oil Statistics³

West Texas Intermediate Spot (\$/Barrel)	02/15/19	55.60	52.75	5.4%	61.48	(9.6%)
North Sea Brent Spot (\$/Barrel)	02/15/19	66.25	61.37	8.0%	62.86	5.4%
EIA U.S. Crude Oil Stocks (MMBbls)	02/08/19	450.84	447.21	0.8%	422.10	6.8%
- EIA Cushing, OK Crude Oil Stocks (MMBbls)	02/08/19	41.61	42.63	(2.4%)	32.67	27.4%
EIA U.S. Crude Oil Production (MMBbls/Day)	02/08/19	11.90	11.90	0.0%	10.27	15.9%
EIA U.S. Crude Oil Imports (MMBbls/Day)	02/08/19	6.21	7.15	(13.1%)	7.89	(21.3%)

Natural Gas Statistics³

Henry Hub Spot (\$/MMBtu)	02/15/19	2.62	2.66	(1.5%)	2.49	5.3%
U.S. Working Gas In Storage (bcf)	02/08/19	1,882	1,960	(4.0%)	2,197	(14.3%)

Rig Counts

Total U.S. Drilling ⁴	02/15/19	1,051	1,049	0.2%	975	7.8%
Canada Drilling ⁴	02/15/19	224	240	(6.7%)	318	(29.6%)
Rest Of World Drilling (International) ^{4,5}	12/30/18	1,025	991	3.4%	954	7.4%
U.S. Oil Drilling ⁴	02/15/19	857	854	0.4%	798	7.4%
U.S. Gas Drilling ⁴	02/15/19	194	195	(0.5%)	177	9.6%
U.S. Miscellaneous Drilling ⁴	02/15/19	0	0	NA	0	0.0%
U.S. Directional/Horizontal Drilling ⁴	02/15/19	70	58	20.7%	71	(1.4%)
U.S. Vertical Drilling ⁴	02/15/19	66	68	(2.9%)	65	1.5%
Total U.S. Well Service ^{5,6}	12/31/18	1294	1319	(1.9%)	1187	9.0%

Offshore Activity⁷

U.S. Gulf Of Mexico (GOM) Rig Count	02/15/19	71	71	0.0%	92	(22.8%)
World Rig Count (Incl. U.S.)	02/15/19	757	758	(0.1%)	799	(5.3%)

¹ For all index and stock prices, prior periods are adjusted for stock dividends and splits.

² Sources: FactSet and Wall Street Journal (BigCharts).

³ Sources: Bloomberg, Intercontinental Exchange and Energy Information Administration.

⁴ Source: Baker Hughes.

⁵ Week Prior is actually Month Prior.

⁶ Source: Cameron-AESC.

⁷ Source: ODS-Petrodata (rig counts).

Select Energy Service Stocks^{1,2}

	Date	This Period	Week Prior	% Change	Year Prior	% Change
Diversified Oilfield Service Stocks						
Baker Hughes, a GE Company (BHGE) (\$/Share)	02/15/19	25.83	24.61	5.0%	25.48	1.4%
Halliburton (HAL) (\$/Share)	02/15/19	31.85	29.70	7.2%	46.06	(30.8%)
Schlumberger (SLB) (\$/Share)	02/15/19	44.95	42.78	5.1%	63.77	(29.5%)
Weatherford Intl (WFT) (\$/Share)	02/15/19	0.86	0.89	(3.6%)	2.75	(68.8%)
Median - Diversified Oilfield Service				5.0%		(30.2%)
Pressure Pumping Stocks						
Basic Energy (BAS) (\$/Share)	02/15/19	5.07	4.51	12.4%	18.43	(72.5%)
C&J Energy Services (CJ) (\$/Share)	02/15/19	16.98	15.82	7.3%	25.76	(34.1%)
Eco-Stim Energy Solutions (ESES) (\$/Share)	02/15/19	0.02	0.02	(7.0%)	1.29	(98.4%)
FTS International (FTSI) (\$/Share)	02/15/19	9.90	7.95	24.5%	18.92	(47.7%)
Keane Group (FRAC) (\$/Share)	02/15/19	11.13	9.90	12.4%	14.98	(25.7%)
Liberty Oilfield Services (LBRT) (\$/Share)	02/15/19	17.00	15.32	11.0%	19.74	(13.9%)
Mammoth Energy Services (TUSK) (\$/Share)	02/15/19	23.10	21.15	9.2%	20.24	14.2%
ProPetro (PUMP) (\$/Share)	02/15/19	18.16	16.91	7.4%	16.80	8.1%
Quintana Energy Services (QES) (\$/Share)	02/15/19	4.87	4.95	(1.6%)	9.40	(48.2%)
RPC (RES) (\$/Share)	02/15/19	10.58	10.39	1.8%	17.84	(40.7%)
Superior Energy (SPN) (\$/Share)	02/15/19	4.43	3.80	16.6%	8.94	(50.4%)
Median - Pressure Pumping				9.2%		(40.7%)
Manufacturing and Equipment Stocks						
Cactus (WHD) (\$/Share)	02/15/19	36.60	32.06	14.2%	23.41	56.3%
CIRCOR Int'l (CIR) (\$/Share)	02/15/19	31.44	27.65	13.7%	47.51	(33.8%)
Forum Energy Technologies (FET) (\$/Share)	02/15/19	6.59	5.84	12.8%	11.95	(44.9%)
MRC Global (MRC) (\$/Share)	02/15/19	17.87	15.46	15.6%	17.39	2.8%
National Oilwell Varco (NOV) (\$/Share)	02/15/19	29.81	28.35	5.1%	34.95	(14.7%)
Dril-Quip (DRQ) (\$/Share)	02/15/19	39.10	35.79	9.2%	46.50	(15.9%)
Flowserv (FLS) (\$/Share)	02/15/19	47.78	43.78	9.1%	42.12	13.4%
NCS Multistage Holdings (NCSM) (\$/Share)	02/15/19	5.72	5.44	5.1%	14.62	(60.9%)
NOW (DNOW) (\$/Share)	02/15/19	15.10	13.25	14.0%	10.24	47.5%
Oceanenergy Int'l (Oil) (\$/Share)	02/15/19	16.65	14.83	12.3%	17.87	(6.8%)
Oil States Int'l (OIS) (\$/Share)	02/15/19	18.30	16.60	10.2%	26.95	(32.1%)
Powell Industries (POWL) (\$/Share)	02/15/19	32.97	30.62	7.7%	27.21	21.2%
Profire Energy (PFIE) (\$/Share)	02/15/19	1.77	1.64	7.9%	2.17	(18.4%)
Roper Technologies (ROP) (\$/Share)	02/15/19	311.96	300.16	3.9%	274.07	13.8%
Solaris Oilfield Infrastructure (SOI) (\$/Share)	02/15/19	15.77	13.68	15.3%	18.66	(15.5%)
Superior Drilling Products (SDPI) (\$/Share)	02/15/19	1.64	1.51	8.6%	1.55	5.6%
TechnipFMC (FTI) (\$/Share)	02/15/19	24.40	25.18	(3.1%)	29.13	(16.3%)
Tenaris (TS) (\$/Share)	02/15/19	26.81	24.57	9.1%	31.84	(15.8%)
Median - Manufacturing & Equipment				9.2%		(15.1%)
Proppants Stocks						
Carbo Ceramics (CRR) (\$/Share)	02/15/19	4.41	3.67	20.2%	7.59	(41.9%)
Emerge Energy Services (EMES) (\$/Share)	02/15/19	2.38	2.81	(15.3%)	7.65	(68.9%)
Covia (CVIA) (\$/Share)	02/15/19	4.80	4.98	(3.6%)	22.15	(78.3%)
Hi-Crush Partners (HCLP) (\$/Share)	02/15/19	4.02	4.00	0.5%	11.01	(63.5%)
Smart Sand (SND) (\$/Share)	02/15/19	2.95	2.65	11.3%	8.20	(64.0%)
U.S. Silica (SLCA) (\$/Share)	02/15/19	14.44	13.07	10.5%	29.88	(51.7%)
Median - Proppants				5.5%		(63.8%)
Other Oilfield Services Stocks						
Apergy (APY) (\$/Share)	02/15/19	36.79	33.89	8.6%	N/A	N/A
Civeo (CVEO) (\$/Share)	02/15/19	2.52	2.36	6.8%	3.26	(22.7%)
Core Laboratories (CLB) (\$/Share)	02/15/19	67.96	63.87	6.4%	103.83	(34.5%)
Cypress Energy Partners (CELP) (\$/Share)	02/15/19	7.65	6.99	9.4%	5.53	38.3%
Dynamic Materials Corporation (BOOM) (\$/Share)	02/15/19	35.13	34.63	1.4%	21.05	66.9%
Flotek Industries (FTK) (\$/Share)	02/15/19	2.98	2.62	13.7%	5.58	(46.6%)
Frank's International (FI) (\$/Share)	02/15/19	6.59	5.80	13.6%	6.08	8.4%
Key Energy (KEG) (\$/Share)	02/15/19	1.94	1.86	4.3%	12.82	(84.9%)
KLX Energy Services (KLXE)	02/15/19	28.42	26.90	5.7%	N/A	N/A
Newpark Resources (NR) (\$/Share)	02/15/19	9.37	9.29	0.9%	8.40	11.5%
Nine Energy Services (NINE) (\$/Share)	02/15/19	25.46	23.77	7.1%	25.95	(1.9%)
Ranger Energy Services (RNGR) (\$/Share)	02/15/19	7.95	7.70	3.2%	9.49	(16.2%)
Select Energy Services (WTTR) (\$/Share)	02/15/19	9.35	8.17	14.4%	16.21	(42.3%)
Tetra Technologies (TTI) (\$/Share)	02/15/19	2.59	2.21	17.2%	3.59	(27.9%)
RigNet (RNET) (\$/Share)	02/15/19	14.94	13.81	8.2%	14.30	4.5%
Median - Other Oilfield Services				7.1%		(16.2%)

¹ For all index and stock prices, prior periods are adjusted for stock dividends and splits.

² Source: FactSet.

Select Energy Service Stocks^{1,2}

	Date	This Period	Week Prior	% Change	Year Prior	% Change
Geophysical Stocks						
CGG (CGG) (\$/Share)	02/15/19	1.86	1.63	14.2%	4.74	(60.7%)
Dawson Geophysical (DWSN) (\$/Share)	02/15/19	3.85	3.66	5.2%	5.41	(28.8%)
Geospace Technologies (GEOS) (\$/Share)	02/15/19	15.51	14.49	7.0%	11.74	32.1%
ION Geophysical (IO) (\$/Share)	02/15/19	12.54	11.29	11.1%	30.55	(59.0%)
Mitcham Industries (MIND) (\$/Share)	02/15/19	4.03	4.06	(0.7%)	3.51	14.8%
SAExploration (SAEX) (\$/Share)	02/15/19	4.42	3.66	20.8%	33.80	(86.9%)
Median - Geophysical				9.1%		(43.9%)
Gas Compression Stocks						
Archrock Inc (AROC) (\$/Share)	02/15/19	9.69	9.04	7.2%	8.87	9.3%
CSI Compressco (CCLP) (\$/Share)	02/15/19	2.68	2.54	5.5%	5.89	(54.5%)
Exterran Corporation (EXTN) (\$/Share)	02/15/19	18.16	16.49	10.1%	27.10	(33.0%)
Natural Gas Services (NGS) (\$/Share)	02/15/19	18.28	17.74	3.0%	26.70	(31.5%)
USA Compression Partners (USAC) (\$/Share)	02/15/19	14.99	14.32	4.7%	15.71	(4.6%)
Median - Gas Compression				5.5%		(31.5%)
Onshore Drilling Stocks						
Helmerich & Payne (HP) (\$/Share)	02/15/19	57.40	55.44	3.5%	62.86	(8.7%)
Independence Contract Drilling (ICD) (\$/Share)	02/15/19	3.55	3.37	5.3%	4.35	(18.4%)
Nabors Industries (NBR) (\$/Share)	02/15/19	3.20	2.76	15.9%	6.31	(49.3%)
Parker Drilling (PKD) (\$/Share)	02/15/19	0.33	0.32	1.6%	15.45	(97.9%)
Patterson-UTI Energy (PTEN) (\$/Share)	02/15/19	14.41	12.68	13.6%	18.26	(21.1%)
Pioneer Energy Services (PES) (\$/Share)	02/15/19	1.69	1.50	12.7%	2.90	(41.7%)
Precision Drilling (PDS) (\$/Share)	02/15/19	2.45	1.95	25.6%	3.37	(27.3%)
Unit Corporation (UNT) (\$/Share)	02/15/19	16.47	15.22	8.2%	20.29	(18.8%)
Median - Onshore Drilling				10.4%		(24.2%)
Offshore Drilling Stocks						
Diamond Offshore (DO) (\$/Share)	02/15/19	10.35	9.97	3.8%	13.83	(25.2%)
ENSCO (ESV) (\$/Share)	02/15/19	4.78	4.39	8.9%	4.94	(3.2%)
Noble Corp. (NE) (\$/Share)	02/15/19	3.13	3.12	0.3%	4.00	(21.8%)
Rowan Cos. (RDC) (\$/Share)	02/15/19	13.11	12.04	8.9%	12.55	4.5%
Sadrill Partners (SDLP) (\$/Share)	02/15/19	1.02	1.01	1.0%	2.89	(64.7%)
Transocean (RIG) (\$/Share)	02/15/19	8.93	8.28	7.9%	9.23	(3.3%)
Median - Offshore Drilling				5.8%		(12.5%)
Transportation Stocks						
Bristow Group (BRS) (\$/Share)	02/15/19	1.32	2.90	(54.5%)	16.04	(91.8%)
Era Group (ERA) (\$/Share)	02/15/19	10.28	9.62	6.9%	9.97	3.1%
Hornbeck Offshore (HOS) (\$/Share)	02/15/19	1.59	1.39	14.4%	3.89	(59.1%)
Kirby (KEX) (\$/Share)	02/15/19	77.68	73.92	5.1%	75.15	3.4%
PHI (PHI) (\$/Share)	02/15/19	4.10	5.35	(23.4%)	11.28	(63.7%)
SEACOR Holdings (CKH) (\$/Share)	02/15/19	46.06	42.16	9.3%	44.60	3.3%
Tidewater (TDW) (\$/Share)	02/15/19	23.05	20.90	10.3%	25.10	(8.2%)
Median - Transportation				6.9%		(8.2%)
Construction Stocks						
Gulf Island Fabrication (GIFI) (\$/Share)	02/15/19	9.72	9.46	2.7%	12.15	(20.0%)
Helix Energy Solutions (HLX) (\$/Share)	02/15/19	7.36	6.89	10.0%	6.96	5.7%
McDermott Int'l (MDR) (\$/Share)	02/15/19	7.23	8.92	(18.9%)	23.46	(69.2%)
NA Energy Partners (NOA) (\$/Share)	02/15/19	10.63	9.90	7.4%	4.90	116.7%
Primoris Energy Services (PRIM) (\$/Share)	02/15/19	21.32	19.74	8.0%	24.17	(11.8%)
Median - Construction				7.4%		(11.8%)
E&C, Midstream Services And Other Stocks						
Babcock & Wilcox (BWC) (\$/Share)	02/15/19	51.45	48.42	6.3%	63.61	(19.1%)
Chart Industries (GTLS) (\$/Share)	02/15/19	88.16	76.20	15.7%	49.29	78.9%
Fluor (FLR) (\$/Share)	02/15/19	36.31	34.48	5.3%	56.89	(36.2%)
Jacobs Engineering (JEC) (\$/Share)	02/15/19	68.72	65.73	4.5%	63.14	8.8%
KBR (KBR) (\$/Share)	02/15/19	18.14	17.42	4.1%	17.79	2.0%
Matrix Service (MTRX) (\$/Share)	02/15/19	20.95	19.99	4.8%	15.50	35.2%
Team (TISI) (\$/Share)	02/15/19	14.92	14.28	4.5%	17.55	(15.0%)
Median - E&C, Midstream Svcs And Other				4.8%		2.0%

¹ For all index and stock prices, prior periods are adjusted for stock dividends and splits.

² Source: FactSet.

Select Energy Service Stocks^{1,2}

	Date	This Period	Week Prior	% Change	Year Prior	% Change
Canadian Stocks						
Black Diamond Group (BDI.TO) (C\$/Share)	02/15/19	2.05	1.90	7.9%	2.99	(31.4%)
Calfrac Well (CFW.TO) (C\$/Share)	02/15/19	3.20	2.64	21.2%	6.71	(52.3%)
Canadian Energy (CEU.TO) (C\$/Share)	02/15/19	3.34	3.08	8.4%	5.36	(37.7%)
Enerflex (EFX.TO) (C\$/Share)	02/15/19	17.01	16.75	1.6%	14.79	15.0%
Ensign (ESI.TO) (C\$/Share)	02/15/19	5.24	4.43	18.3%	6.21	(15.6%)
Horizon North Logistics (HNL.TO) (C\$/Share)	02/15/19	1.96	1.86	5.4%	1.77	10.4%
Major Drilling (MDI.TO) (C\$/Share)	02/15/19	4.55	4.64	(1.9%)	6.77	(32.8%)
McCoy Global (MCB.TO) (C\$/Share)	02/15/19	1.08	1.02	5.9%	1.32	(18.2%)
Mullen Group (MTL.TO) (C\$/Share)	02/15/19	11.91	11.51	3.5%	14.02	(15.1%)
Pason Systems (PSI.TO) (C\$/Share)	02/15/19	20.42	19.60	4.2%	16.74	22.0%
Secure Energy Services (SES.TO) (C\$/Share)	02/15/19	8.59	7.71	11.4%	7.65	12.3%
Select Sands (SNS.TO) (C\$/Share)	02/15/19	0.08	0.08	0.0%	0.46	(83.7%)
ShawCor (SCL-A.TO) (C\$/Share)	02/15/19	20.60	19.63	4.9%	25.68	(19.8%)
Source Energy Services (SHLE.TO) (C\$/Share)	02/15/19	1.30	1.25	4.0%	N/A	N/A
Total Energy (TOT.TO) (C\$/Share)	02/15/19	10.18	10.12	0.6%	13.50	(24.6%)
Trican Well (TCW.TO) (C\$/Share)	02/15/19	1.47	1.28	14.8%	3.75	(60.8%)
Trinidad Drilling (TDG.TO) (C\$/Share)	02/15/19	1.68	1.68	(0.3%)	1.76	(4.8%)
Western Energy Services (WRG.TO) (C\$/Share)	02/15/19	0.38	0.35	7.1%	1.12	(66.5%)
Median - Canadian				5.2%		(19.8%)
International (Excluding Canada) Stocks						
Aban Offshore (ABANOFFSH.BO) (INR/Share)	02/15/19	50.20	51.10	(1.8%)	177.15	(71.7%)
Akastor (AKA.OL) (NOK/Share)	02/15/19	13.76	13.64	0.9%	15.36	(10.4%)
Aker Solutions (AKSO.OL) (NOK/Share)	02/15/19	42.95	43.65	(1.6%)	44.20	(2.8%)
Archer (ARCHER.OL) (NOK/Share)	02/15/19	5.58	4.67	19.6%	9.02	(38.1%)
BOURBON (GBB.PA) (€/Share)	02/15/19	3.28	3.53	(7.0%)	7.07	(53.6%)
BW Offshore (BWO.OL) (NOK/Share)	02/15/19	46.60	41.20	13.1%	36.25	28.6%
China Oilfield Svcs. Ltd. (2883.HK) (HKD/Share)	02/15/19	7.79	7.64	2.0%	8.63	(9.7%)
DOF (DOF.OL) (NOK/Share)	02/15/19	5.10	3.50	45.7%	6.33	(19.4%)
EMGS (EMGS.OL) (NOK/Share)	02/15/19	1.32	1.39	(5.4%)	3.97	(66.9%)
Fugro (FUR.AS) (€/Share)	02/15/19	9.62	8.93	7.6%	12.03	(20.0%)
Gulf Marine Services (GMS.L) (GBp/Share)	02/15/19	19.23	22.00	(12.6%)	44.50	(56.8%)
Hunting (HTG.L) (GBp/Share)	02/15/19	579.00	531.00	9.0%	569.33	1.7%
Keppel Corp. (BN4.SI) (S\$/Share)	02/15/19	6.08	6.04	0.7%	7.64	(20.4%)
Kvaerner (KVAER.OL) (NOK/Share)	02/15/19	13.20	11.90	10.9%	14.90	(11.4%)
MODEC (JP-6269) (¥/Share)	02/15/19	2,968.00	2,992.00	(0.8%)	2,477.64	19.8%
Petrofac (PFC.L) (GBp/Share)	02/15/19	400.30	394.00	1.6%	388.79	3.0%
Petroleum Geo-Services (PGS.OL) (NOK/Share)	02/15/19	20.24	18.87	7.3%	21.36	(5.2%)
Prosafe SE (PRS.OL) (NOK/Share)	02/15/19	15.30	15.02	1.9%	11.34	34.9%
SBM Offshore (SBMO.AS) (€/Share)	02/15/19	16.45	14.27	15.3%	13.10	25.5%
Schoeller-Bleckmann (SBO.VI) (€/Share)	02/15/19	68.65	63.95	7.3%	79.11	(13.2%)
SembCorp Marine (S51.SI) (S\$/Share)	02/15/19	1.60	1.58	1.3%	2.51	(36.2%)
Sevan Marine (SEVAN.OL) (NOK/Share)	02/15/19	6.50	6.50	0.0%	7.01	(7.3%)
Sinopec Engineering (HKG-2386) (HK\$/Share)	02/15/19	7.46	7.90	(5.6%)	7.42	0.5%
Solstad Offshore (SOFF.OL) (NOK/Share)	02/15/19	1.73	1.50	15.3%	5.70	(69.6%)
Subsea 7 (SUBC.OL) (NOK/Share)	02/15/19	101.15	92.80	9.0%	108.54	(6.8%)
TGS-NOPEC (TGS.OL) (NOK/Share)	02/15/19	255.60	241.80	5.7%	181.05	41.2%
Vallourec (VK.PA) (€/Share)	02/15/19	1.61	1.49	8.4%	4.75	(66.1%)
Wood Group (WG.L) (GBp/Share)	02/15/19	5.23	5.00	4.7%	5.79	(9.6%)
WorleyParsons (WOR.AX) (A\$/Share)	02/15/19	15.28	14.13	8.1%	12.89	18.6%
Median - International				4.7%		(9.7%)

¹ For all index and stock prices, prior periods are adjusted for stock dividends and splits.

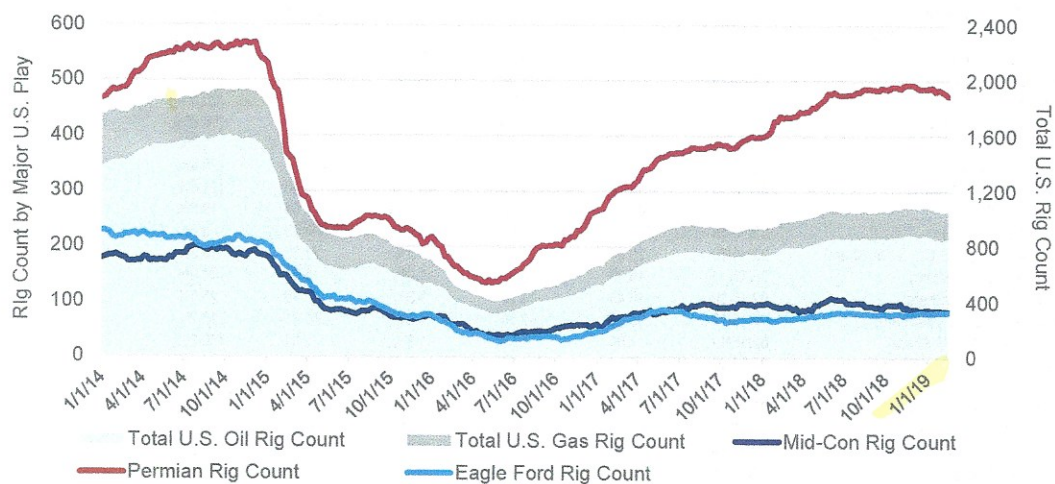
² Source: FactSet.

As of 2/15/2019

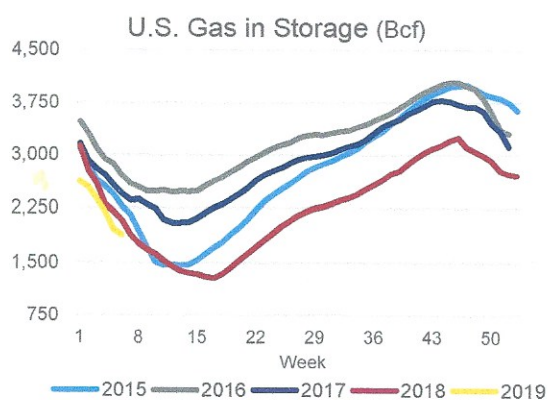
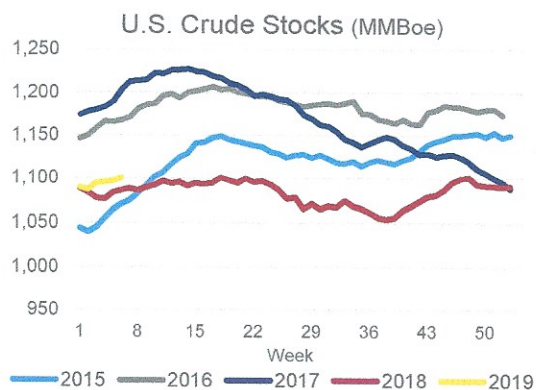
As of 2/15/2019

Industry Sector	Forward Looking FY EBITDA Multiples ^{1,2}					Net Debt / EBITDA ^{1,3}
	Current Consensus			1 Year Prior		
	2019	2020	2021	2019	2020	
Diversified Oilfield Services	9.7x	7.9x	6.6x	8.9x	7.4x	3.0x
Pressure Pumping	5.1x	4.0x	4.5x	4.0x	3.9x	1.2x
Manufacturing and Equipment	11.2x	8.9x	8.3x	9.7x	8.8x	1.3x
Proppants	7.3x	5.9x	5.4x	5.1x	6.1x	1.1x
Other Oilfield Services	8.8x	6.8x	9.5x	7.9x	8.5x	1.2x
Geophysical	4.5x	2.9x	3.0x	3.8x	4.7x	2.2x
Gas Compression	6.5x	5.9x	7.1x	7.5x	6.5x	2.5x
Onshore Drillers	5.7x	4.7x	4.3x	5.9x	6.3x	2.2x
Offshore Drillers	14.6x	12.5x	8.3x	14.0x	13.2x	3.7x
Transportation	11.4x	7.3x	5.8x	9.3x	6.2x	3.9x
Construction	6.3x	4.3x	5.1x	6.1x	5.6x	0.6x
E&C, Midstream Services	10.1x	8.6x	10.4x	9.0x	9.9x	0.8x
Canadian	7.4x	5.6x	6.5x	6.4x	5.8x	2.2x
International	9.9x	7.3x	6.1x	8.0x	7.4x	2.7x
Industry Wide Average	8.7x	6.9x	6.9x	7.6x	7.3x	1.9x

U.S. Rig Counts⁴



Inventories⁴



¹ Factset Consensus

² Excludes multiples outside the range 0x-30x

³ Excludes multiples outside the range -2x-8x

⁴ Sourced from Baker Hughes and U.S. EIA

Energy Service M&A And Other Strategic Activities⁸

Date	Target	Description
02/14/19	Noble Joe Knight jackup rig from PaxOcean Group	Noble Corp (NE) acquired a second newbuild Gusto MSC CJ46 design jackup rig from the PaxOcean Group (Singapore, Singapore) for total consideration of US\$83.75 million (US\$30.1 million cash; US\$53.6 million debt at a 4.25% interest rate paid in cash and 1.25% PIK over the term of the financing). Noble Joe Knight is a Gusto MSC CJ46 design jack up rig built in Indonesia for moderate drilling environments and will be relocated to a shipyard in Singapore for commissioning and final outfitting. Operations are expected to commence during 3Q 2019 under a three-year primary contract with Saudi Aramco. Transaction expected to close in February 2019.
02/14/19	Undisclosed Seller	Wolverine Energy and Infrastructure (Edmonton, AB, CA) agreed to acquire a leading environmental services division from an undisclosed midstream provider for C\$50 million (US\$37.8 million; C\$15 million cash and C\$35 million debt). Assets are focused on providing waste management, waste disposal and crude oil handling services across Western Canada and include 12 environmental service facilities (Alberta, Saskatchewan). Acquired business is expected to generate US\$13.5 million in TTM EBITDA, implying a 2.8x acquisition multiple. Transaction, which is subject to necessary approvals, is expected to close on or before 2/28/19.
02/13/19	Amperage Energy (Cochrane, AB, CA)	Aureus Energy Services (Calgary, AB, CA) acquired all of the outstanding shares of Amperage Energy for an undisclosed amount. Amperage provides water treatment solutions & services (e.g., eco-centers, zero atmosphere packages, removal of contaminants and acid water neutralization) to the oil & gas industry (Canada).
02/13/19	Shamrock Energy Solutions (Houma, LA)	Danos (Gray, LA) agreed to acquire Shamrock Energy Solutions for an undisclosed amount. With ~1,000 employees, Shamrock provides contract production personnel, mechanical services and electrical services to the oil & gas industry. Transaction, which is subject to certain remaining contingencies, is expected to close in March 2019.
02/12/19	Aaron Oil (Mobile, AL)	Tradebe Environmental Services (Merrillville, IN; portfolio company of Advent International) acquired Aaron Oil for an undisclosed amount. Aaron Oil provides petroleum reclamation and used oil recycling services to the oil & gas industry (Alabama, Gulf Coast).
02/11/19	Kodiak Gas Services of Stephens Group	EQT Infrastructure III (Stockholm, Sweden) acquired Kodiak Gas Services (Houston, TX) from the Stephens Group (Little Rock, AR) for an undisclosed amount. With 285+ employees, Kodiak provides contract compression and related services to the oil & gas industry (Permian, Eagle Ford, Scoop/Stack).
02/07/19	Independent Oilfield Services (Peterhead, Scotland)	WellConnection Group (Tananger, Norway; portfolio company of EV Private Equity) acquired Independent Oilfield Services for an undisclosed amount. Independent Oilfield Services provides storage, handling, inspection, refurbishment and management of oilfield equipment and tubulars to the oil & gas industry. Post transaction, Independent Oilfield Services will change its name to "WellConnection IOS".
02/07/19	Aucerna (Calgary, AB, CA; portfolio company of Rubicon Technology Partners)	Thoma Bravo (Chicago, IL) agreed to acquire Aucerna for an undisclosed amount. With 12 global offices serving 500+ customers, Aucerna provides technology solutions for integrated planning, execution and reserves to the oil & gas industry. Transaction, which is subject to necessary approvals, is expected to close during 1Q 2019.
02/07/19	offshore support vessels of Sea Trucks Group and West African Ventures	Telford Offshore (Dubai, UAE) acquired seven offshore support vessels from Sea Trucks Group (Lagos, Nigeria) and West African Ventures (Durban, South Africa). Assets include one DP3 pipelay & accommodation vessel and six AHTS vessels.
02/06/19	precision machining business of Proserv	GIL Investments (Stratford-upon-Avon, U.K.) acquired the precision machining business of Proserv (Westhill, U.K.; portfolio company of Oaktree Capital Management and KKR) for an undisclosed amount. Acquired business is based in Coatbridge, Scotland and provides precision machining services to companies operating in the aerospace & defense, rail, food and oil & gas sectors. Post transaction, combined entity will trade under the new name "KRG Specialist Engineering Services".
02/05/19	industrial & frac sand mine	Select Materials (Fort Lupton, CO) agreed to acquire an industrial & frac sand mine from an undisclosed seller. Assets are located in Mount Vernon (Columbus, OH). Transaction is Select Materials second sand mine and first endeavor into the frac sand market. Transaction is subject to necessary approvals.
02/04/19	CTAP (Lafayette, CO)	Sooner Pipe (Tulsa, OK) agreed to acquire 100% equity interest in CTAP for an undisclosed amount. With 11 service centers, CTAP distributes oil country tubular goods (e.g., line pipe, couplings, culvert and conductor) to the oil & gas industry (Rockies & Bakken).

⁸ Sources: Various; including company press releases, SEC filings and newswires.

Energy Service M&A And Other Strategic Activities⁸

Date	Target	Description
02/04/19	Eurasia Drilling Company (Moscow, Russia)	Schlumberger (SLB) cancelled the acquisition of a majority equity interest of 51% in Eurasia Drilling. (See 7/28/17, 10/2/15, 9/25/15, 7/3/15, 6/5/15, 5/22/15, 2/20/15 and 1/23/15 bi-weekly reports for additional details).
02/04/19	SGC Metering of Petrofrac	Proserv Group (Westhill, U.K.; portfolio company of Oaktree Capital Management and KKR) acquired SGC Metering from Petrofac (U.K.) for an undisclosed amount. SGC Metering designs and manufactures flow computer metering systems for the oil & gas industry (U.K.).

⁸ Sources: Various; including company press releases, SEC filings and newswires.

Energy Service Offerings And Recent Registrations (IPOs, Follow-ons)⁸

Filing Date	Company	Est. Gross Proceeds (MM)	Description
06/01/18	AFG Holdings (AFGL)	US\$300	On 7/18/18, AFGH postponed its planned IPO due to market conditions. On 7/9/18, AFGH had filed its latest amendment for an IPO on NYSE for an offering size of US\$300 million. AFGH provides pressure pumping and managed pressure systems to the oil & gas industry.
01/12/18	Vista Proppants & Logistics (VPRL)	US\$100	On 1/12/18, VPRL filed an S-1 for IPO on NASDAQ with maximum proceeds of US\$100 million. VPRL provides proppant and related solutions to the oil & gas industry (TX & OK). VPRL plans to use net proceeds to repay outstanding indebtedness and for general corporate purposes, which may include working capital and future capital expenditures.
08/10/17	Preferred Sands (PSND)	US\$100	On 8/10/17, PSND filed an S-1 for IPO on NYSE with maximum proceeds of US\$100 million. PSND provides proppant and related solutions to the oil & gas industry (Eagle Ford & Permian). PSND plans to use net proceeds to repay outstanding indebtedness and for general corporate purposes, which may include working capital and future capital expenditures.

⁸ Sources: Various; including company press releases, SEC filings and newswires. Offering registrations are latest 9 months.

Other Energy Service Financing & Reorganization Activities⁸

Date	News
02/14/19	Forbes Energy Services (OTCPK: FLSS) announced an offering of 5.00% Subordinated PIK Notes Due 2020 for principal amount of US\$54.3924 million.

⁸ Sources: Various; including company press releases, SEC filings and newswires. Offering registrations are latest 9 months.

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