MARKET INSIGHT (SAMPLE SLIDES)

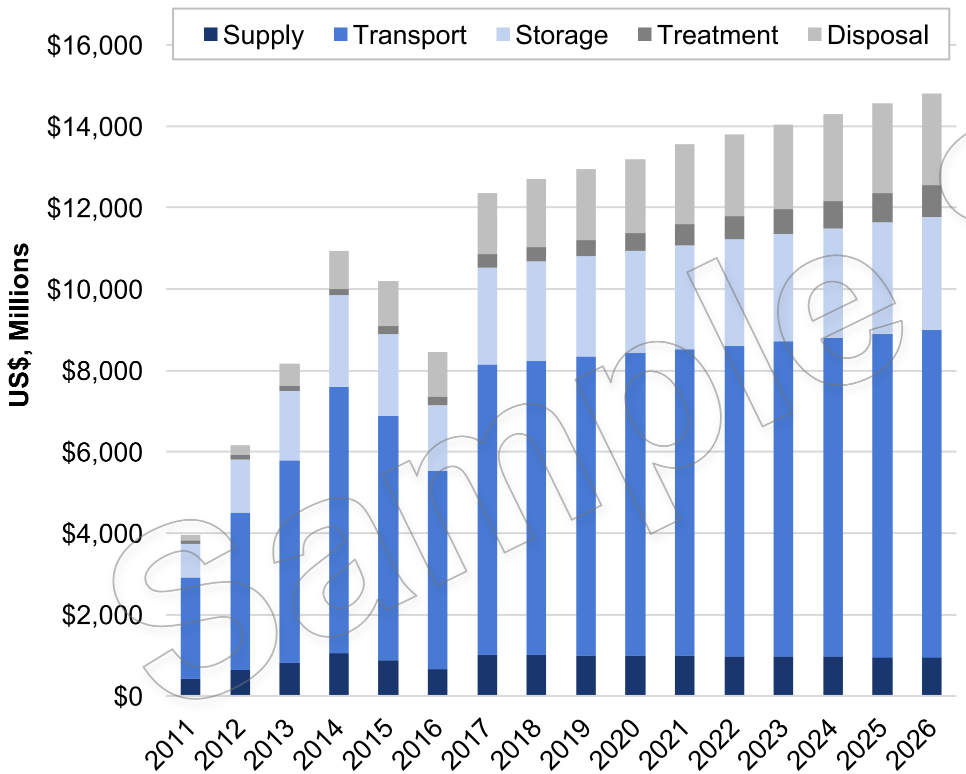
Water for U.S. Hydraulic Fracturing:
Competitive Strategies, Solutions, & Outlook, 2017-2026

June 2017

Hydraulic Fracturing Water Services Forecast

Bluefield Research forecasts annual spending for water management, including supply, storage, transport, treatment, and disposal to total US$136 billion from 2017 to 2026.

U.S. Water Management & Services Spending by Activity, 2017-2026



Source: Bluefield Research

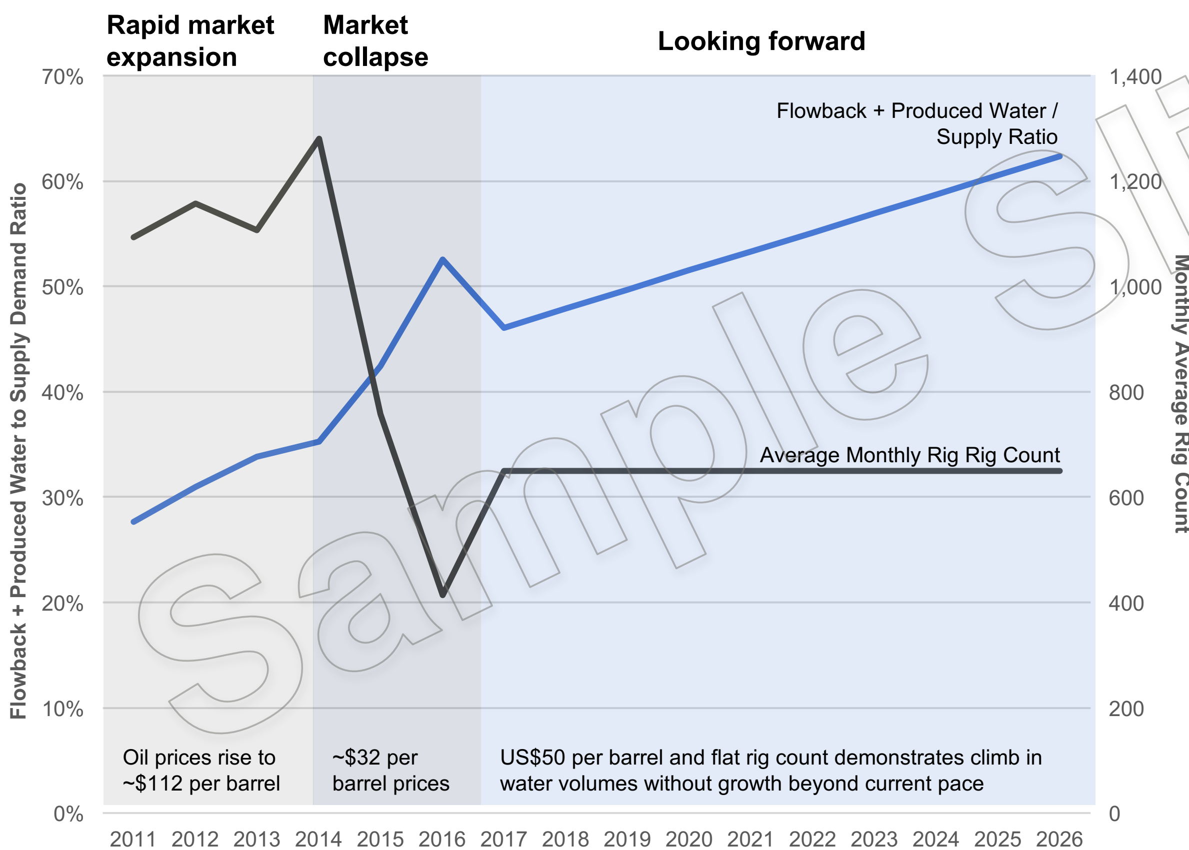
Analysis

The outlook for water management & services is posed for a rebound in 2017

- Spending between 2017-2027 will inch upward at a compound annual growth rate of 2% without any rig count additions during the period.
- Treatment of flowback and produced water represents only 4% of the total, totaling 5 billion over the forecast period, while disposal represents 14% of the total.
- Across the seven major U.S. shale plays, spending on water related activities for hydraulic fracturing will total US$6.38 billion in 2014, climbing to US$6.9 billion in 2020.
- Transport represents the largest water related expense at 56% of the total water-related spend through 2026 across all U.S. plays.

Total Water Supply Demand vs. Flowback & Produced Water Volumes

Scaling volumes of flowback and produced water are steadily rising– even during declines in well installations– as a percentage of water demand, thereby bolstering the ongoing needs for disposal wells for water unable to be reused.



Analysis

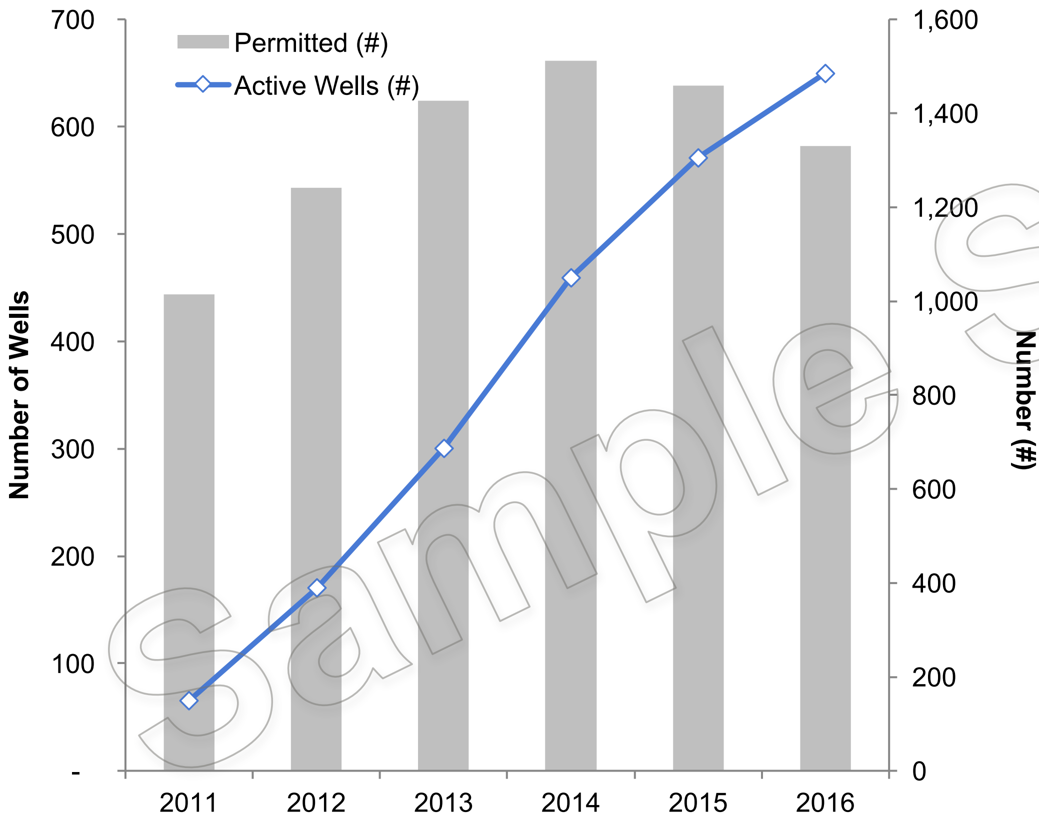
Forecast shows steady uptick in water treatment rates.

- An inventory of more than 83,000 completed, horizontal wells have already required supply, transport, treatment, and disposal services for more than 350 billion gallons of water since 2011.
- The energy sector has developed techniques to drill faster and deeper wells that now require as much as 12 million gallons per frack, or triple the volumes needed five years ago.
- As a result, produced water volumes will outpace demand for supplies, even if the rig count stays flat year-over-year. The simple takeaway is that this wastewater will need to be managed.

West Virginia Fracking Activity

West Virginia has produced an estimated 25 million barrels of produced water since 2010, of which 95% has been injected into Class II wells in one of the 77 in-state disposal wells.

West Virginia Well Count, Permitted & Estimated Active



Source: WVDEP, Bluefield Research

Analysis

Out-of-state brine continues to take on majority of injected water.

- An estimated 3,500 horizontal wells have been permitted in state at last report
- Bluefield has estimated West Virginia's well count to be an estimated1,600 from 2011 through 2016.
- West Virginia does not record water volumes. Approximately 50% of produced water volume is transported out-of-state – estimated to Pennsylvania for reuse and to Ohio for disposal.
- Antero's recycling facility signals continued market expansion in the state.

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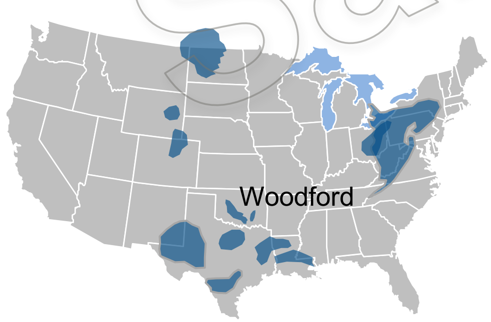
Cana Woodford Shale

Background

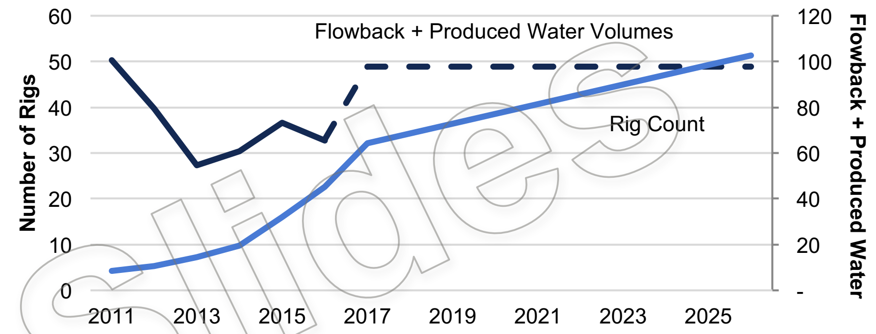
The Cana Woodford play is emerging as an increasingly active region, particularly in context to other basins that have decline more significantly in recent years. An oil play, the Cana Woodford's water services market has not declined, but has rather risen steadily since 2011. Only the Permian has shown a similar trajectory. Regulators in Oklahoma are tightening controls on the market because of seismic activity that will result in more recycling of produced water.

State(s)	Oklahoma
2017 Gas / Oil Production Mix (%)	0.02% / 99%
Cumulative Well Count (Year End 2016)	2,737
Produced Water Reuse Estimate Percentage (2016)	5%

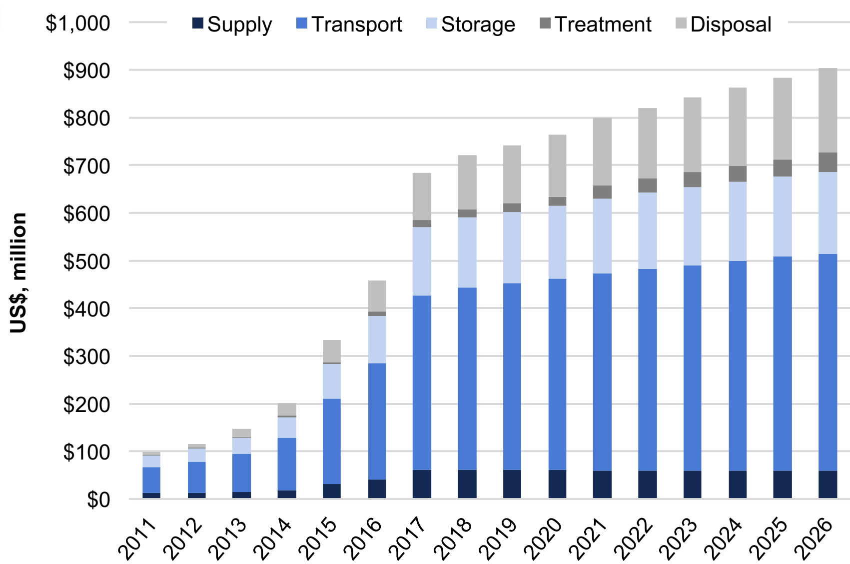
Basin Geography



Rig Count and Produced Water (barrels)



Forecasted Water Services Spending



Noble Midstream Partners

Supply | Transport | Treatment | Disposal

Company Background & Positioning

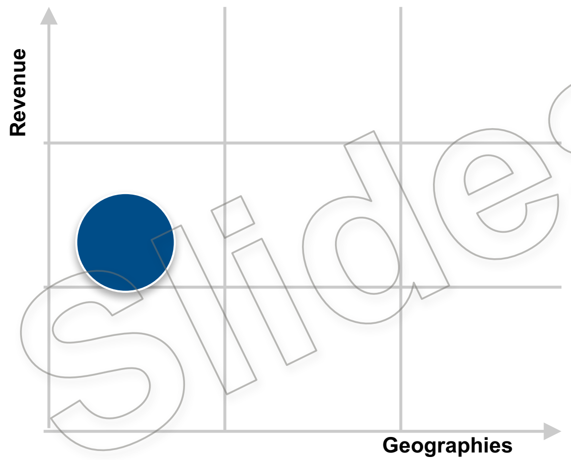
Nobel Midstream operates and owns crude oil gathering pipelines, crude oil treating facilities, natural gas gathering pipelines and a central facility. It also provides Noble with water-related services, including the storage and distribution of fresh water for drilling, completion operations, and treatment and disposal of flowback and produced waters. Noble's assets are in the DJ Basin and the Delaware Basin in Texas.

Headquarters:	Houston, Texas
Annual Revenues	US$161 million
Business Model	Midstream Energy Service Provider

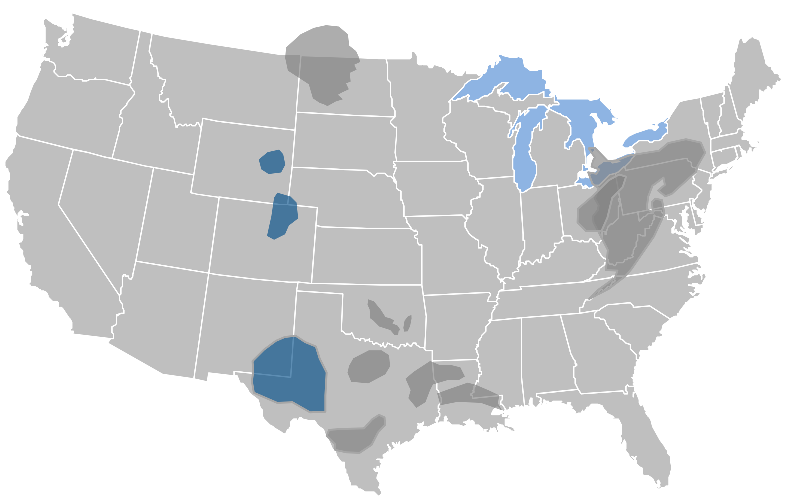
Hydraulic Fracturing Activity

- Storage capacity for up to 32,000 barrels of saltwater at the Wells Ranch central facility; approximately 20 miles of fresh water pipelines that delivered an average of approximately 3,100 barrels per day of fresh water. A fresh water storage system with a storage capacity of approximately 500,000 Bbls of fresh water for Wells Ranch.
- The San Juan River DevCo LP's assets in the East Pony IDP consist of rights-of-way and surface rights for produced water facilities and fresh water systems consisting of approximately 10 miles of pipelines and a storage capacity of approximately 550,000 Barrels.

Revenue Footprint



US Hydraulic Fracturing Footprint



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Global companies across the value chain are developing strategies to capitalize on greenfield opportunities in water – new build, new business models, and private investment. Bluefield Research supports a growing roster of companies across key technology segments and industry verticals addressing risks and opportunities in the new water landscape.

Companies are turning to Bluefield for in-depth, actionable intelligence into the water sector and the sector's impacts on key industries. The insights draw on primary research from the water, energy, power, mining, agriculture, financial sectors and their respective supply chains.

Bluefield works with key decision-makers at utilities, project development companies, independent water and power providers, EPC companies, technology suppliers, manufacturers, and investment firms, giving them tools to define and execute strategies.

Complete 80-slide report (+ Data Appendix) available for online purchase and immediate download. Contact us at the information below.

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