xylem
Industrial Solutions

Oil & Gas Case Study
Hydraulic Engineering, Water Transfer

Engineering a more efficient way to source and transfer water

A RELIABLE WATER TRANSFER SOLUTION SAVES $30,000 IN ANNUAL MAINTENANCE

Challenge

One of the largest global energy exploration companies faced the challenge of drawing source water among the steep slopes of Northern Pennsylvania. The water had to be drawn from a 30-feet deep wet well beside a creek and then pumped 300-feet vertically out of a ravine into the impoundment pond. As the amount of water needed to complete a well often exceeds the quantity of oil or gas produced, efficient water management is vital to productivity and profitability. The conventional self-priming pumps on site did not provide the necessary lift or flow rate to overcome the challenging elevation and transfer water from the source to the well pad.

Xylem was tasked with designing and installing a system capable of handling the extreme vertical lift while also achieving the permitted maximum source water withdrawal rate.

"This has significantly reduced operating costs, and the energy savings will help achieve payback in under a year."



Given a 300' vertical distance from the source to the impoundment pond, conventional self-priming pumps didn't provide the necessary lift or flow rate.



Xylem's field team installed high-lift Goulds Water Technology vertical in-line turbine pump down into the well shaft with a connected Godwin variable frequency drive and MJK flowmeters provided greater visibility.

Project Highlights

- Overcame an extreme lift to transfer source water to the frack site
- Significantly reduced operating and maintenance costs for faster payback
- Achieved the site's maximum withdrawal rate
- Provided greater visibility and peace of mind with connected solutions

Products Used

- Goulds Water Technology Vertical Turbine
- Godwin Variable Frequency Drive
- MJK Flowmeters

Solution

Xylem's expansive product portfolio and deep expertise ensured that the team could develop the ideal solution for this demanding and specific application. The field team engineered a system that placed a Goulds Water Technology lineshaft vertical turbine pump powered by 150 horsepower motor down into the well shaft, which replaced two diesel 200 horsepower pumps that were used in the old system.

This powerful pump is configured such that the hydraulic components are submerged while the motor is located above ground. This makes it easy to access electrical components for maintenance, if necessary. Mounted vertically without the need for a special pad or foundation, the heavy-duty pump is ideal for applications like this where space is limited.

To ensure year round efficiency, a Godwin variable frequency drive (VFD) was connected to the vertical turbine so that the flow rate adjusts automatically during summer when the permitted withdrawal rate is decreased. This was previously managed manually. Xylem's MJK flowmeters were connected to the operation's existing SCADA system to allow the global energy exploration company to easily report water consumption data to the state agency as required.

"Because Xylem offers such wide range of different pumps, we were able to match the right solution to this very demanding application."

Result

Thanks to the powerful hydraulic design of the Goulds Water Technology vertical turbine pump, our customer now has the lift and flow rate needed to achieve this site's maximum withdrawal rate of 1 million gallons per day (MGD). The enhanced performance and energy efficiency of the new pumping solution has significantly reduced operating costs, and the energy savings will help achieve payback in less than one year.

This solution also aligns with the company's plans to reduce its carbon footprint, aiming to be carbon neutral by 2030. Permanent line power will be available on site which means there will be no need to use generators.

The Goulds Water Technology vertical turbine pump also delivers long-term reliability, operating all year with no maintenance required – no need for oil or filter changes as is required when operating diesel-driven pumps. This has significantly reduced maintenance and associated labor costs by an estimated $30,000 annually.



The powerful hydraulic design of the Goulds Water Technology vertical turbine pump provides the lift and flow-rate needed to achieve this site's maximum withdrawal rate.

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