

Apache

REDUCING FRESHWATER USE

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APACHE IN THE PERMIAN



- Most active driller in the Permian Basin
- 36 rigs running
- Region will drill approximately 768 wells in 2014

REDUCING USE OF FRESHWATER

- Apache has set a corporate goal of reducing freshwater use
- Completing each well with multi-stage HF requires approximately 200,000 barrels of water
- Apache has worked to find ways to treat and recycle the water
- Not possible everywhere
- In the TX part of the Permian, less than half of the water used for HF is fresh
- In Irion County, Apache hasn't used freshwater for fracturing since 2012

IRION COUNTY – BARNHART AREA



- ▶ Apache has drilled 119 wells in Irion County
- ▶ In 2013, Apache used 10 million barrels of brackish water and 3.1 million barrels of produced water
- ▶ On average, Apache treats 30,000 barrels of produced water each day
- ▶ Cost effective -- driven by high costs of transporting water and disposing of water

HOW IT WORKS

- Brackish water is pumped from the Santa Rosa aquifer into a large, lined pond capable of holding about 500,000 barrels
- A system of pipes carries flowback and produced water from well sites to a row of storage tanks – modified grain bins – where it is treated to remove iron and other organics
- Water from both sources is piped back to a well site for the next frac job. The water is treated with chemical agents to kill bacteria when it is pumped downhole
- The process is repeated

RRC RECYCLING RULES

- Updates to Rule 3.8 last year made it much easier to move forward with recycling projects
- Allowed Apache to more safely store produced water – in grain bins
- Made it possible to swap water with other operators
- New Mexico lags behind Texas in recycling projects because permitting is much more onerous
- Recycling efforts growing in Texas where possible – Wheeler County and Andrews County

REPEATABLE -- LOTS MORE ON THE WAY



- ▶ Favorable permitting climate in TX
- ▶ Expansion to Panhandle and Gulf Coast
- ▶ Competitors w/ flattering imitations
- ▶ Cost effective and economic