

**PILOT SCALE TEST OF A PRODUCED WATER
TREATMENT SYSTEM FOR ORGANIC COMPOUNDS**

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A pilot scale test utilizing surfactant modified zeolite (SMZ) adsorbent beds and a vapor phase bioreactor (VPB) was conducted at a produced-water disposal facility in Farmington NM. Most water disposed at the facility is from coal-bed gas production, with some oil production waters. Gravity-driven flow rates up to 25 gal/hr of produced water were cycled sequentially through three adsorbent units. Input water was routed to the other two units while each spent unit was drained and regenerated using a small air compressor. Regeneration air was routed to an activated carbon buffer unit to flatten BTEX input to the VPB. Removal of BTEX was found in the VPB up to 90% with an EBCT of 1 minute. Complete removal of semivolatile organics and removal of inorganic (Mn and Fe oxide) particulates also was found. Organic acids were not removed by the system. Future work will improve organic acid removal, long-term VOC and SVOC removal, and implement automation. An engineering cost evaluation shows that the cost to implement the SMZ/VPB system along with a Reverse Osmosis system would be between \$3.16 to \$4.75 per 1000 gallons of produced water at up to 40 gpm. Current estimated disposal costs for produced water is between \$1.75 to \$4.91 per bbl, including transportation.