

# PERMIAN BASIN

REGIONAL OVERVIEW



AES DRILLING FLUIDS

# PERMIAN BASIN

## OPERATIONS



Throughout its rich history, the Permian Basin remains a critical energy resource that continues to reinvent itself through advances in technology and drilling practices.

Drilling challenges in the Permian Basin are not easily characterized by generic descriptions. Regions of the Delaware Basin, Central Basin Platform, and Midland Basin demand different strategies to prevent and mitigate costly problems. Losses,  $H_2S$ , saltwater flows, abnormal pressure regimes, and wellbore instability are just a few of the challenges that vary in severity and likelihood depending on the specific location.

AES Drilling Fluids' extensive experience, operational capabilities, and technical solutions provide our customers the capacity to drill flawless wells - one after another. From multi-pad drilling campaigns to deep saltwater disposal wells, our team has the knowledge to minimize risk and optimize fluid solutions. As our largest operating area, many of our products were inspired and designed specifically to meet the demands of the Permian Basin.

Since 2015, AES Drilling Fluids has serviced more than 11,200 wells in the region. With our world-class facilities and support services, we are ready to drill thousands more with ever-increasing efficiency.



Our loss prevention portfolio features proven products like ECM 1<sup>†</sup>, ECM 2<sup>†</sup>, and ENERLOC<sup>†</sup> to prevent and treat losses in the Cherry and Brushy Canyon and into the lateral. The EnerLITE direct emulsion system eliminates an extra casing string through salt inhibition and density control in the Delaware Basin. Throughout the Permian Basin, our AES VERT<sup>†</sup> invert emulsion system provides the performance to drill record-breaking laterals.

Technical support for the region is provided by our Midland Support Services and Training Center, which provides rapid turnaround for key testing including mud checks and particle size analysis. Our Houston Support Services Center provides supplemental support with advanced analytical tools such as x-ray diffraction, GC-MS, and TGA.

The Midland Support Services and Training Center also features dedicated training space for custom and standard classes on new products and best practices.

Our RIG FILE system tracks drilling fluid properties, volumes, product usage, and drilling activity for daily reporting and overall well performance data. This system integrates with our dedicated sales portal to minimize paperwork without compromising accuracy of critical records.

Our experience goes beyond our proven personnel to our ability to utilize offset data for the best possible outcome of a given well. Our data analytics platform, AES ANALYTICS<sup>†</sup>, tracks key benchmarks and success factors to plan, execute, and review drilling fluid practices. Rapid access to data allows for informed decisions at critical moments to save time and money.

# 11,200+

## WELLS SERVICED SINCE 2015

More than 11,200 wells in the Permian Basin since 2015



### FULL-SERVICE FACILITIES

Kermit and Midland operate on 24-hour regional dispatch with a lab engineer on duty at all times to perform required mud checks in the on-site mud testing lab. Our Midland facility features a product handling facility and full service drilling fluids lab.



### AMPLE CAPACITY

Kermit Warehouse can service 120 rigs at a time and the Midland Mud Plant can service 50 rigs at a time.



# FACILITIES

KERMIT, TEXAS

The Kermit facility in Winkler County sits on 33 acres featuring a 12,000 square foot warehouse, mixing facility, and bulk storage. Kermit operates on 24-hour regional dispatch with a lab engineer on duty at all times to perform required mud checks in the on-site mud testing lab.

The Kermit facility services the Permian Basin with a full mixing facility and chemical warehouse. The liquid mud plant supports water-based, oil-based, or synthetic-based drilling fluids.

Chemical inventory includes key drilling fluid additives, including bulk barite and lost circulation material. Chemical storage is available in the 12,000 square foot warehouse or outdoors in dedicated areas on the 33 acre site.

AES Drilling Fluids is constantly upgrading facilities to meet the needs of its customers. Confirm the latest capabilities and locations with an AES account manager.



Our Kermit Facility boasts the largest liquid mud plant in the Permian Basin, providing a quick turnaround for liquid mud mixes, product delivery, and barite distribution. Contact your AES Account Manager for more information today.

Our four 300 ton barite silos (pictured right) provide rapid loading of barite trucks, minimizing the time trucks must remain at the site and preventing delays delivering material to the rigsite.

Automated process continues to enhance our operations, reducing time on location and improving report accuracy. Our barite silos feature a kiosk system where the truck driver never leaves the vehicle.

The appropriate purchase order is entered into the entry kiosk, barite is loaded from a silo, and a final weight is recorded at the exit kiosk. From there, field tickets are automatically distributed and the mud engineer receives a text that barite is on the way.

## STORAGE

12,000 square foot warehouse

### OBM Plant:

29,500 bbls of oil-based mud storage in the berm  
18,000 bbl additional storage in frac tanks  
500 bbls freshwater, 2,000 bbls of CaCl<sub>2</sub> brine  
6,300 bbls of diesel storage in the berm  
4,800 bbls of diesel/chemical storage available in Bulk Liquid Terminal

### WBM Plant:

2,000 of water-based mud base fluid storage in the berm  
500 bbls Freshwater, 2,500 bbls of NaCl brine in the berm  
1 x 335 bbls Premix pit

### Kermite Blending Facility:

16 x 800 bbl tanks and 3 x 260 bbl blend tanks

### Bulk Barite Facility:

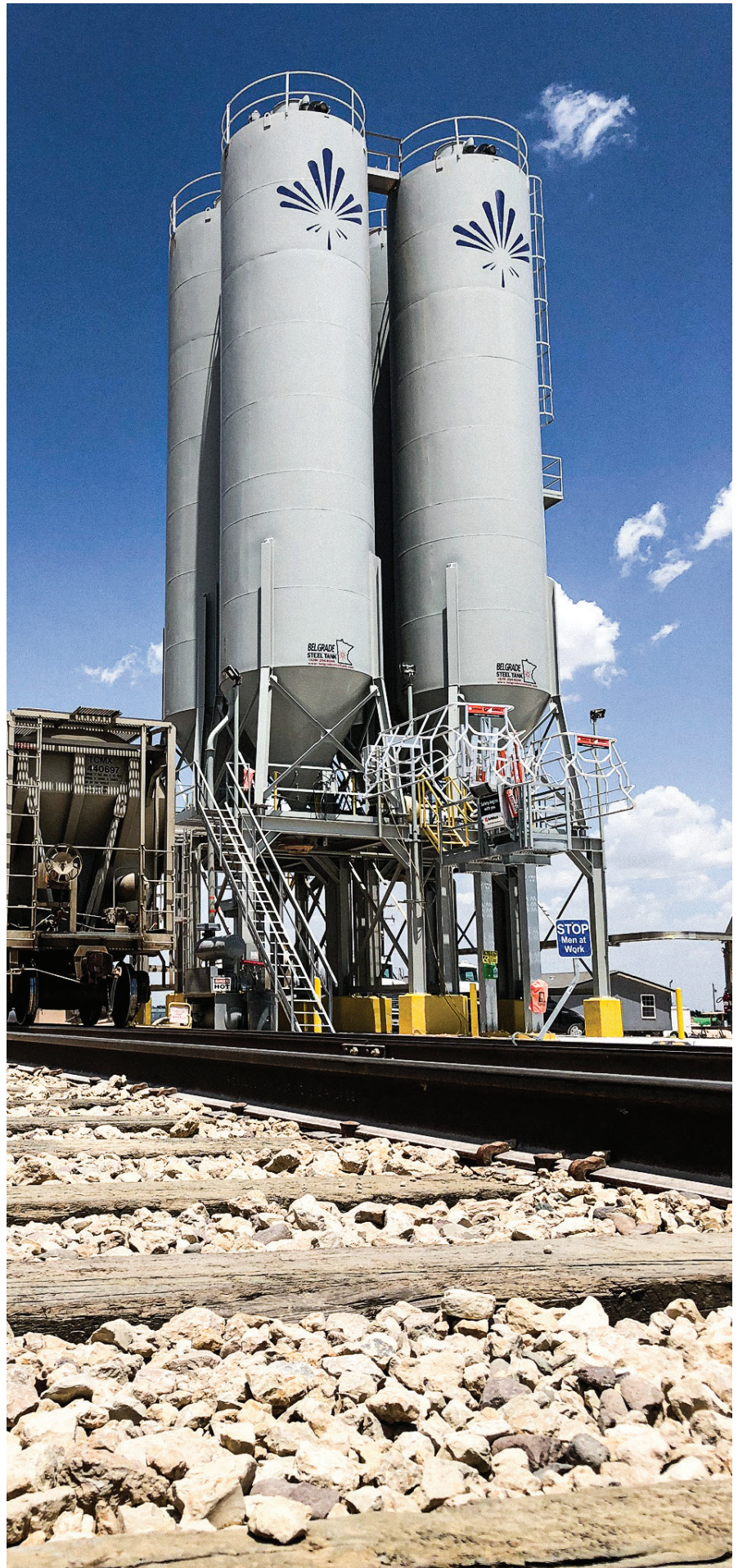
3,900 tons of bulk barite storage,  
including 4 x 350-ton top loading silos and  
7 x 200 ton high pressure silos w/Dust Collector

## MIXING

6 x 500 bbl invert emulsion mixing tanks  
3 x 500 bbl water-base mixing tank  
1 x 300 water-based mud mixing pits  
6 x 500 bbl oil-based mud mixing pits  
Super-sack handling capability

## EQUIPMENT

Mud lab (quality control)  
Vacuum tankers  
Drop deck trailers  
Barite bulk trailers  
Railroad spur (3717 feet)



# FACILITIES

## MIDLAND, TEXAS

The Midland Facility located in Midland County features a 20,000 square foot warehouse, 7,500 square foot 3-sided pole barn and operates on 24-hour regional dispatch with a mud engineer on duty at all times to perform required mud checks in the on-site mud testing lab.

The Midland facility services the Permian Basin with a full mixing facility and chemical warehouse. The liquid mud plant supports water-based, oil-based, or synthetic-based drilling fluids.

As drilling activity continues to grow in the Permian Basin, AES is actively supporting that growth with expanded infrastructure. Consistent with our approach at other locations, our ongoing expansions and facility additions alleviate local bottlenecks and enhance operational flow across all facilities in the region.

AES Drilling Fluids is constantly upgrading facilities to meet the needs of its customers. Confirm the latest capabilities and locations with an AES account manager.





## STORAGE

9-acre property in Midland County  
20,000 square foot warehouse  
7,500 sq. ft. 3-sided pole barn  
3,400 sq. ft. office space  
13,200 OBM storage capacity  
1,900 bbl OBM building capacity  
6,000 sacks of bulk barite mud plant storage  
1,920 bbl diesel oil storage capacity  
800 bbl calcium chloride brine storage capacity  
500 bbl fresh water storage  
Dedicated 24-hour mud lab

# MIDLAND

## SUPPORT SERVICE CENTER

The 3,000 square foot Midland Support Service and Training Center provides an extensive set of tools to solve problems and create new solutions. Unlike a field support lab, this facility has the equipment and personnel to both solve basic problems and support development of new products.

The Midland Support Service and Training Center features a broad suite of laboratory equipment to perform full fluid testing functions and complex analysis of samples. A dedicated training space features 7 lab stations with full field kits to accommodate up to 14 students at a time.

AES Drilling Fluids is constantly upgrading facilities to meet the needs of its customers. Confirm the latest capabilities and locations with an AES account manager.

## SELECT EQUIPMENT

Full suite of equipment for API 13B-1 and 13B-2 water-, oil-, and synthetic-based drilling fluid checks

Extensive mixing and dynamic ageing equipment for pilot testing and troubleshooting

Bruker Alpha II Fourier transform infrared spectrometer (FTIR)

Horiba LA-350 Partica Mini laser particle analyzer

Micromeritics AccuPyc II 1340 gas displacement pycnometer



Fourier Transform  
Infrared Spectrometer



Laser particle  
analyzer

The Midland Support Service Center specializes in services for customer projects, operations support, and new product development. AES Drilling Fluids has multiple Labs, Warehouses and Mud Plant Facilities Supporting the Southern United States.



# SYSTEMS & PRODUCTS

By working with our customers to address specific needs, our products and systems perfectly complement our incomparable support and services.

AES Drilling Fluids manufactures many of its own products to insure they perform to the highest standards for the operations we serve. Our drilling fluid systems offer the flexibility to perform across a range of environments. From the conventional water-based systems to chloride-free synthetic invert emulsions, we continue to delivery application-based solutions.

The EnerLITE<sup>†</sup> direct emulsion system provides a simple solution for density control in freshwater or saturated brine environments. Even with superior solutions, we continue to advance our portfolio with new and improved offerings to meet the needs of evolving drilling technology.



AES Drilling Fluids utilizes both unique and patented technologies and specialized personnel to help our customers to lower their overall drilling costs and enhance efficiency of the wells they drill.

As drilling has become more complex, the applied down-hole technologies are becoming increasingly important in driving success for operators. AES drilling fluids continues to invest in research and development to lead the drilling fluids market in technology.



## EnerLITE<sup>†</sup>

Direct Emulsion System

The EnerLITE direct emulsion system provides a simple solution for density control in freshwater or saturated brine environments. Density is controlled through additions of diesel or mineral oil to achieve mud weights well below typical water-continuous systems. EnerLITE RECOVER Direct Emulsion Recovery Service is used to further enhance solids recovery, dramatically reducing oil consumption.

**PRECISE DENSITY  
CONTROL**

**ELIMINATES EXTRA  
CASING**

**INHIBITS SALT  
WASHOUT**

**SAVES RIG  
TIME**



## AES VERT<sup>†</sup>

Invert Emulsion System

AES VERT is the standard for invert emulsion systems in the Permian Basin. Its powerful emulsifier and wetting agent packages provide superior stability while maintaining the key benefits of an invert emulsion - elevated rate of penetration, lubricity, and inhibition.

**MAXIMIZE RATE OF  
PENETRATION**

**HIGHLY  
INHIBITIVE**

**MINIMIZES  
TORQUE**

**FLEXIBLE SYSTEM  
DESIGN**



## BRINEX EP<sup>†</sup>

Extreme Pressure Lubricant

BRINEX EP is an extreme pressure lubricant formulated to improve lubricity and minimize metal-to-metal and metal-to-formation friction wear in water-based and brine-based drilling fluids.



## AQUA-FLEX<sup>†</sup>

Optimized Water-Based Drilling Fluid

AQUA-FLEX typical components include a base brine, AES FLOC 4003, BRINEX lubricant, and WALLPLEX for contingency sweeps.

AQUA-FLEX component selection and concentrations are easily modified based on drilling challenges relevant to the drilling location. Performance and cost savings are realized by matching products to specific risks.



## ECM 1<sup>†</sup> & ECM 2<sup>†</sup>

Loss Circulation Material

ECM 1 is part of an optimized blend of fine and medium-sized natural materials, fibers, and cellulose to prevent and treat lost circulation.

ECM 2 is part of an optimized blend of medium and coarse-sized natural materials, fibers, and cellulose to prevent and treat lost circulation.

When used in combination with one another, the blend provides a broad distribution for bridging and sealing while minimizing products required at the rigsite.



## ENERLOC<sup>†</sup>

Loss Circulation Material

ENERLOC is a coarse blend of granular and fibrous lost circulation materials to seal large pores and fractures.

ENERLOC complements ECM 1 and ECM 2 in highly fractured areas where the risk of losses is elevated. This combination is proven highly effective in the Cherry Canyon and Brushy Canyon formations along with lateral sections that encounter faulted zones.



# AES ANALYTICS

AES ANALYTICS allows operators to compare wells and identify outlying cost and performance data quickly and easily. Points of interest can be investigated in more detail by clicking on a data set of interest for a well, pad, rig, or region for quick comparison. This helps to determine the best options for mud weight selection, drilling fluid properties, treatment solutions, and much more.

## DESCRIPTION

A data analytics platform to optimize drilling fluid performance and minimize cost  
Easily observable data sets are presented on dashboards customized to customer needs

## BENEFITS

Rapid access to large data sets minimize time to make informed decisions  
Visualizations allow for quick trend analysis  
Customization and continuous improvement regularly enhance available insight

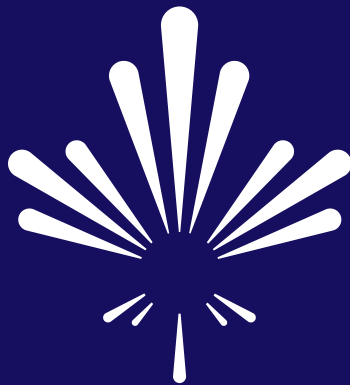
## APPLICATIONS

Well planning to identify risks and maximize insight from offset wells  
Tracking activity to key performance indicators  
Evaluating cost, product consumption, and overall performance by area, pad, rig, or other criteria



## QUESTIONS?

Reach out to your AES Account Manager or visit [www.aesfluids.com](http://www.aesfluids.com) for more information



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