

APPENDIX A – DRILLING FLUIDS APPLICATION GUIDELINES

A.1 Applications of Bentonite-Based Drilling Fluids

BAROID DRILLING FLUIDS	
Bore-Gel	Specially blended system using high yielding Wyoming sodium bentonite. When mixed with fresh water, develops an easy to pump slurry with desirable properties for HDD drilling.
Quik-Gel	Viscosifier and gellant. Easy to mix in fresh water, premium grade, exceptional high yielding Wyoming sodium bentonite. Provides excellent rheological properties.
CETCO	
Hydraul-EZ	Can stabilize bore and return cuttings. It is easy on pumps and easy to mix.
CROSS TECH	
Cross-Gel	API 90 bbl yield sodium bentonite for freshwater drilling. Increases viscosity and controls filtration water base fluids.
Cross-Thick	Extra high yield 220 bbl sodium bentonite for freshwater drilling. Provides maximum borehole integrity in unstable geologic formations.
Hydraul-EZ	High yield 220-mesh sodium bentonite clay with a special dry polymer additive. It is designed to maintain borehole integrity in unstable geologic formations.
FEDERAL SUMMIT DRILLING FLUIDS	
MAX Gel	A 220+ barrel yield bentonite with extremely low sand content. Its finer grind allows it to mix easier and yield quicker than most other bentonites.
Smooth Bore	A multi-purpose, one sack HDD system. Five components are blended together to provide for a wide range of drilling conditions.
KEM-TRON	
Poly Kem EZT	Liquid polymer and drilling fluid additive for use in HDD applications along with bentonite or as a substitute. Excellent for clear water drilling, for water well drilling, and exploration bores. Has excellent borehole stabilization properties and prevents clay from swelling. Improves cutting transport in air foam injection.
Poly Kem D	Dry polymer drilling fluids additive. Excellent borehole properties and can be used to enhance or substitute bentonite properties.
Poly Seal	Water absorbing polymer sealant for preventing loss of drilling fluids to porous unconsolidated formations or through cracks/crevices. Polymer when pumped down to area of loss circulation quickly settles and seals formation due to its swelling properties. Swells 300 times its volume.

Kem X	Dry biopolymer drilling fluid additive to generate high viscosity. Excellent bentonite substitute. Super properties for hole cleaning and suspension, excellent for sand, cobble, and rock drilling.
Kem Det	Drilling detergent with inhibiting properties to reduce torque when drilling in swelling clays. Keeping the drill bit clean aids in preventing bit balling.
Ken Thin Super	Liquid thinner used to control viscosity of drilling fluids in high solids and viscosity fluids.
Kem Pak ULV	Modified polymer imparts viscosity and controls water loss properties of drilling fluid, increased borehole stability, and tighter filter cake.
PARCHEM	
Bore Flow	A one-sack system of premium Wyoming bentonite with additives for reducing fluid loss control. NSF approved.
Pargel 220	A high yield 220 bbl/ton NSF approved Wyoming bentonite used for HDD.
Salt Gel	An attapulgate clay used where chlorides exceed the limitations of sodium bentonite performance ranges.
POLYMER DRILLING SYSTEMS	
High Yield	Specially modified for water-well drilling or wherever a minimum 220 bbl yield is required. Mixes rapidly for quick hydration and carries cuttings in mud with lower soil content.
WYO-BEN, INC.	
Extra High Yield	High performance Wyoming bentonite for fresh water fluids. Offers fast mixing, low solids, consistent performance in all boring operations. NSF Certified and environmentally safe.
SW-101	Unique modified Wyoming bentonite that will not fall apart in brackish or seawater conditions. SW-101 is the only sodium bentonite drilling fluid, which can be mixed with seawater. Imparts excellent fluid loss control and hole cleaning ability.
Tru-Bore	High performance one-bag mix for building viscosity, controlling fluid loss, and increasing rig performance. Uniquely, yields in excess of 240 barrels. Environmentally safe and NSF Certified.

A.2 Applications of Polymer-Based Drilling Fluids

BAROID DRILLING FLUIDS	
Bio-Bore	A polymer-based system that provides a clay-free biodegradable drilling fluid in situations where the use of clay-based fluids are restricted
Diamond Seal	A water-swallowable, not water-soluble, 100 percent crystalline synthetic polymer. Absorbs hundreds of times its weight in water. It is used primarily as a loss circulation material in HDD
EZ-Mud Plus	A liquid polymer emulsion used as a borehole-stabilizing agent to prevent active shale and clay from swelling and sloughing. May be added to bentonite slurries to improve cuttings carrying capacity and to air foam injection mixtures to upgrade all properties, including foam stability and cuttings carrying capacity.
No-Sag	A free flowing biopolymer when added to a bentonite-based drilling fluid provides increased gel strength, resulting in superior suspension of coarse drill cuttings, sand, and gravel. Can be used with fresh or brackish water slurries.
Poly-Bore	Soluble fresh water, easy mixing, 100 percent dry granular polymer. Provides a clear, solids-free, viscous, clay-free, borehole-stabilizing fluid.
Quik-Trol	A modified natural cellulose polymer. Provides filtration controlled clay stability in bentonite-based fresh water drilling and boring fluids.
CETCO	
PureGold Clean Drill	For drilling operations where clay-based drilling fluids are restricted and a biodegradable drilling fluid is recommended.
CROSS TECH	
Cross-Lube	Used to reduce bit-balling, clay sticking to drill pipe and downhole tools. Reduced torque and drag to improve temperature stability.
Cross-Vis	Multi-functional, non-fermenting polymer for improved viscosity, fluid loss control, bit lubrication, and shale stabilization/inhibition.
Rel-Pac Dry Polymer	Designed for building low solids drilling fluid with increased borehole stability and assisting in forming a thinner, less permeable filter cake.
Super Pac Liquid Polymer	Designed to be added to drilling fluids for increasing viscosity for better cuttings transport and suspension, minimizing fluid loss to the formation.
FEDERAL SUMMIT DRILLING FLUIDS	
Enviro-Bore	A starch-based product that provides excellent viscosity and hole cleaning, but breaks down quickly to allow for permeable formations.

FSF 1500 & 1800	Polymers that boost viscosity, lubricity, and improve general rheology of the drilling slurry. Formulated to resist settling out in a pail.
FSF Liquid PAC Plus	An additive that provides water-loss control, clay swelling inhibition, and boosts overall fluid viscosity and performance.
FSF Super VIS	An additive that dramatically improves the suspension and hole cleaning performance of your drilling slurry. Especially effective in sand, cobble, gravel, rock.
Super PAC	An additive that provides water loss control, clay swelling inhibitions and boosts overall fluid viscosity and performance.
PARCHEM	
Enviromud	A clay-free polymer-based biodegradable system primarily used in environmental remediation installations or where bentonite-based fluids are restricted.
Mud Up	A phpa polymer viscosifier for addition to a bentonite system offering improved viscosity and lubrication qualities. Mud Up can be used as a viscosifier in a clear water system, is biodegradable or can be rapidly broken back.
Mud Up (granular)	An easy mixing dry granular polymer. Provides a clear solid free, viscous, clay free, borehole stabilizing fluid for use in HDD applications. Can also be used in bentonite slurry like the regular liquid Mud Up.
Xanvis	A biopolymer when added to a bentonite-based drilling fluid provides high gel strength, resulting in vastly improved suspension of large drill cuttings, sand, and gravel. Xanvis is effective with or brackish make-up water.
Envis	When added to bentonite slurry, produces high fragile gels for superior suspension and carrying capacity of sand, gravel, and rock cuttings from the borehole. Easy to pump, improves hole stability, and reduces the chances of loss circulation.
Staflo	A polyanionic cellulose polymer or pac material used for reducing fluid loss and improving the filter cake and overall quality of a bentonite system.
POLYMER DRILLING SYSTEMS	
Super Mud	Liquid polymer emulsion primarily used as viscosifying agent and as a soil stabilizer to prevent sloughing and/or collapse of a borehole.
WYO-BEN, INC.	
Borzan	True biopolymer developed for environmental or other specialized applications where bentonite-based drilling fluids may be undesirable. Its highly concentrated formula allows for significantly lower application rates and lower cost per gallon of fluids.
Kwik-Vis "D"	A highly concentrated dry polymer viscosifier for use in all types of boring and trenching applications. It disperses quickly and builds viscosity rapidly. Kwik-Vis "D" promotes excellent gel-strengths and provides superior lubricity.

Uni-Drill	Advanced polymer for conducting drilling fluids to control fluid loss, shield troublesome clays, and maintains hole control. It mixes rapidly and promotes a thin tough filter cake, which reduces rotational torque and pullback pressures. Non-toxic and environmentally compatible. Extended shelf life and pourable in sub-zero temperatures.
Wyo-Vis	A PHPA polymer for building viscosity fast, Wyo-Vis also shields clays and promotes lubricity. Can be mixed with bentonite-based drilling fluids or used as a standalone polymer drilling fluid.