

DRILLING FLUIDS  
ADDITIVES  
CHEMICALS

# PRODUCTS & EQUIPMENT





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# BIG-FOOT® Polymer Slurry

With enhanced sidewall stabilization and improved fluid loss control, BIG-FOOT is manufactured to improve quality control of the slurry and offers improved performance inside the excavation. Easy to mix and longer lasting, BIG-FOOT is the most advanced and highest performing polymer slurry product available.



## BENEFITS

- Enhanced sidewall stabilization
- Improved fluid loss control
- High performance, requires less slurry
- Increased productivity, consistent performance
- Easy-to-mix and use
- Mixes into solution quickly with MATRIX Hydro-Mixer
- Portable — less energy used and lower transportation costs
- Low disposal costs

**It's true. BIG-FOOT Polymer Slurry offers unparalleled performance in all types of soil conditions and environmental challenges.**

- Superior design and performance compared to existing bentonite and polymer drilling slurries.
- Greatly reduces soil destabilization due to slurry migration and radial seepage into non-excavated soils.
- The slurry's best performance properties are quickly recovered for re-use by adding small product dosages.

**BIG-FOOT® is so good you won't believe it!**



# EASY-TO-MIX & USE

## BIG-FOOT POLYMER SLURRY SYSTEM

Geology varies greatly coast to coast – from soil types to pH balance. MATRIX offers a line of additives and chemicals to enhance BIG-FOOT’s performance in any soil condition. Your MATRIX Representative will provide an easy mixing formula tailored to meet your location’s soil conditions, ensuring project success. The BIG-FOOT slurry system mixes into solution quickly with a MATRIX Hydro-Mixer, saving valuable site space, and equipment costs.

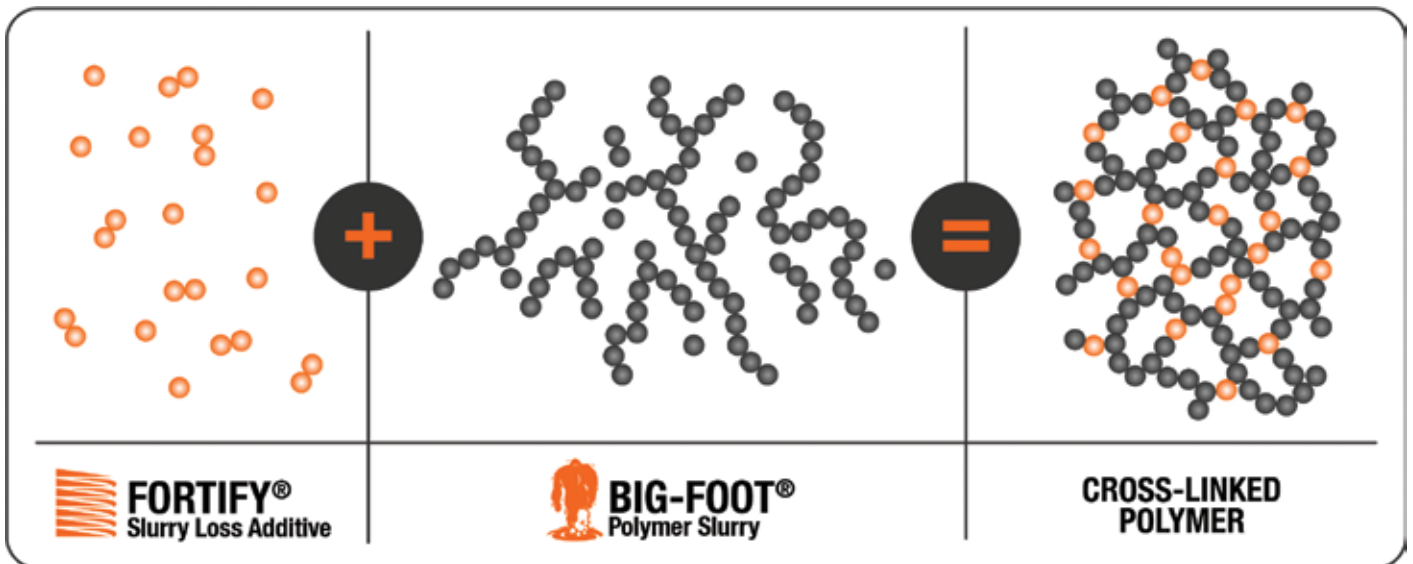
SLURRY VOLUME TABLE gal/ft				
DIAMETER FT (IN)	0 IN	3 IN	6 IN	9 IN
1 (12")	5.88	9.18	13.22	17.99
2 (24")	23.50	29.74	36.72	44.43
3 (36")	52.88	62.05	71.97	82.62
4 (48")	94.00	106.12	118.97	132.55
5 (60")	146.88	161.93	177.72	194.24
6 (72")	211.50	229.49	248.22	267.68
7 (84")	287.88	308.80	330.47	352.87
8 (96")	376.00	399.87	424.47	449.80
9 (108")	475.88	502.68	530.22	558.49
10 (120")	587.50	617.24	647.70	678.93
11 (132")	710.88	743.55	776.97	811.12
12 (144")	846.00	881.62	917.97	955.05

Volume can be calculated with the formula  $(D/2)^2 \div 24.52$  where D is in inches.

# CROSS-LINKING

## KICK UP THE POWER

A Cross-Link is a bond that connects one polymer chain to another, enhancing the performance of the slurry.



The illustration above demonstrates how a web of polymer is created by cross-linking BIG-FOOT with FORTIFY Slurry Loss Additive.

Extreme Geologic conditions demand an extreme slurry to perform effectively. MATRIX ADDITIVES are the solution. When a MATRIX Additive is combined with BIG-FOOT it bonds (cross-links) to the polymer, creating a web. The result is a Polymer Slurry formulated to increase efficiency and productivity.

See page 11 for a list of all MATRIX Additives.

# Elevate the Power of BIG-FOOT®

# DRILLING FLUIDS ADDITIVES CHEMICALS



**MATRIX Drilling Fluids, Additives and Chemicals offer quality unmatched in the industry. The MATRIX Slurry System outperforms all other drilling fluids project after project.**

**The BIG-FOOT Polymer Slurry System is DOT approved!**

## MATRIX MISSION:

To provide the very best polymer slurry products & services, backed up with experienced onsite technical support.



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## A NEW DIMENSION IN CONSTRUCTION PRODUCTS

### DRILLING FLUIDS



BIG-FOOT®

Dry Stabilizing Powder



MATRIX-GEL®

API-90 BBL Bentonite



MEGA-GEL®

High Yield Bentonite



MO'S-MUD®

Instant Viscosity Booster



BLACK-BEAR®

Clay-free Biodegradable Drilling Fluid

### ADDITIVES



BLOCK-AID®

Sealing and Plugging Agent



CRISS-CROSS®

Thinning Agent



FAST-FLOC®

Liquid Flocculent



FORTIFY®

Filtration Control/Viscosifier



GEO-NET®

Acid Soluble Slurry Loss Material



GRID-LOCK®

Expandable Crystalline Dry Polymer



MESH-SET®

Granular Fracture Sealant



RAPID-DROP®

Fast Acting Dry Flocculent



SUPER-P® POWDER/LIQUID

Cement Plasticizer

### CHEMICALS



BASE-X®

Sodium Hydroxide/Mix Water Conditioner



BICARBONATE

Sodium Bicarbonate



CHLOR-AWAY®

Dry Chlorine Neutralizer



M-BOOSTER®

Dry pH Adjuster



NEUTRALIZER®

Big-Foot Slurry Breaker



ENZYME BREAKER®

Universal Breaker For Biopolymer Fluids

Visit our website for additional product and safety data for all MATRIX products, equipment and mixers.

[matrixcp.com](http://matrixcp.com)



BIG FOOT BEST



# DRILLING FLUIDS



## **BIG-FOOT® Polymer Slurry**

**BIG-FOOT** is a soil stabilizing 100% active dry polymer, formulated to make a viscous slurry fluid.

Due to its concentrated formula, small amounts of **BIG-FOOT** mixed with fresh water yield high viscosity. **BIG-FOOT** is ideal for drilled shafts, mini piles, slurry trenching, diaphragm walls, Horizontal Directional Drilling (HDD), Reverse Circulation (RC), Rotary Drilling and Tunneling.



## **MATRIX-GEL® Premium Grade Bentonite**

For use in drilling operations where premium grade Wyoming Bentonite is required. **MATRIX-GEL®**, is a 200 mesh finely ground, 90 bbl. yield sodium bentonite for fresh-water drilling. It is also used in slurry trenching, drilled shafts, and tunnel boring drilling.



## **MEGA-GEL® (High Yield Premium Bentonite)**

Easy-to-mix extra high yield premium Bentonite designed for fresh water drilling and boring applications. **MEGA-GEL** is a (200-mesh) Wyoming sodium Bentonite that is blended with special extenders.



## **MO'S-MUD® Strong Viscosity Booster**

Highly concentrated liquid polymer specially designed as a multi-purpose copolymer cross link additive. **MO'S-MUD** rapidly mixes into the **BIG-FOOT®** slurry system where it quickly bonds to the polymer molecules. This cross-linking function of **MO'S-MUD** provides the first key in the binding polymer system.



## **BLACK-BEAR® Biodegradable Drilling Fluid**

**Black Bear®** is an HDD fluid. Packaged as a clay-free powder, it is designed for environmentally sensitive conditions. Naturally biodegradable, **Black Bear** can be used in a variety of directional drilling and tunnelling operations.



KICK UP  
THE POWER

# ADDITIVES



## **FORTIFY® Slurry Loss Additive**

An important additive in the MATRIX Polymer Slurry System, **FORTIFY** works in combination with **BIG-FOOT**. **FORTIFY** reduces slurry loss in porous ground. It stabilizes the side walls of the drilling shaft excavation.



## **BLOCK-AID® Plugging Mineral Chips**

Designed to seal and plug voids and porous zones encountered when drilling. Ideal for use as a sealant on any vertical bore hole. Sealing prevents and stops slurry loss into the surrounding formation.



## **GRID-LOCK® Expandable Crystalline Dry Polymer**

A specialty polymer that quickly stops slurry loss in very porous ground conditions (gravels, cobbles, and boulders).



## **CRISS-CROSS® Thinning Agent for Mineral Slurry**

Highly concentrated additive that works quickly to thin and disperse Bentonite Fluids.



## **MESH-SET® Granular Sealing Material**

Contains #8-20 mesh size high swelling natural minerals. Absorbs over five times the weight of water making it a perfect plugging sealant.



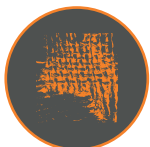
## **FAST-FLOC® Rapid Acting Liquid Flocculant**

Reduces the time needed to remove suspended solids (silt, micron sized particles) within the slurry. The solids then settle down to the bottom of the excavation for easy clean out.



## **RAPID-DROP® Fast Acting Dry Flocculant**

A MATRIX SPECIAL BLEND added directly into the drilling excavation. **RAPID DROP** captures all of the suspended solids and drops them to the bottom of the fluid for easier removal.



## **GEO-NET® Slurry Loss Circulation Material**

Attaches to the soil making a “net” that catches the **BIG-FOOT**, creating a seal along the sidewall of the excavation.



## **SUPER-P® Plasticizer Dispersant**

Used to reduce the filtration rate and delay the set of Portland Grout Cement. Used in water well, mineral exploration and construction applications.



**MATRIX  
ONSITE SUPPORT**

**TRUE MEASURE  
OF VALUE IS THE  
PERFORMANCE  
YOU GET**

**MORE  
PAGE 21**

# CHEMICALS



## M-BOOSTER® Dry pH Adjuster

M-BOOSTER is used to pretreat the mix water before adding BIG-FOOT. M-BOOSTER increases the effectiveness of BIG-FOOT by conditioning and softening the mix water and raising the pH.



## BASE-X® Sodium Hydroxide/ Mix Water Conditioner

Controls hardness and functions to revitalize BIG-FOOT in situations where it has been weakened by severe carbonate alkalinity, seawater, organic peat soil, brackish salt impacted soil or cation contaminations



## BICARBONATE® Sodium Bicarbonate

Lowers the pH of drilling slurry. Bicarbonate maintains a pH of 8.1-9.0.



## CHLOR-AWAY® Dry Chlorine Neutralizer

Deactivates the chlorine in municipal water supplies. CHLOR-AWAY should be used when the mix water comes from a city fire hydrant. This white granular powder prevents the early decrease in viscosity of drilling slurry and extends the reuse time of BIG-FOOT Slurry.



## NEUTRALIZER® Big-Foot Slurry Breaker

Oxidizing product used to breakdown BIG-FOOT Polymer Slurry. This effective dry product tears down the long polymer backbone when it's time to dispose of the slurry.



## ENZYME BREAKER® Universal Breaker For Biopolymer Fluids

Suited for biopolymer solutions with a pH from 5.0-11.0. ENZYME BREAKER is a freeze proof suspension of active enzymes in a carrier liquid. It breaks long chain polymers without causing damage to the formation. Non-Toxic formula compared to oxidant breakers.



MATRIX CERTIFIED  
TESTING EQUIPMENT & MIXERS

# TESTING EQUIPMENT

## MATRIX SLURRY TEST KIT

The MATRIX Slurry Test Kit provides the required instruments to get laboratory quality measurements for viscosity, specific gravity/density, pH, water hardness and sand content. A metal mud balance and Marsh Funnel with Cup are included in a convenient carrying case constructed of hard sturdy plastic — with room for extra equipment.

### SLURRY TEST KIT INCLUDES:

1-metal mud balance; 1-marsh funnel viscometer; 1-plastic measuring cup (1,000 ml); 1-sand content screen; tube and funnel; 1-digital stopwatch; 1-pack of pH test strips (100 strips); 1-pack of hardness test strips (50 strips) 1-250 ml plastic squirt bottle; 1-plastic carrying case



## MATRIX SLURRY SAMPLER

The custom designed MATRIX Slurry-Sampler® captures samples of drilling fluid from any specific depth within an excavation or borehole. The unique one-piece laser cut steel design is important to confirm exact depth viscosity, specific gravity, pH, and sand content data collected from the drilling fluid.

### SPECIFICATIONS:

Constructed of durable laser cut steel tubing, neoprene and aluminum

### SAMPLER TUBE

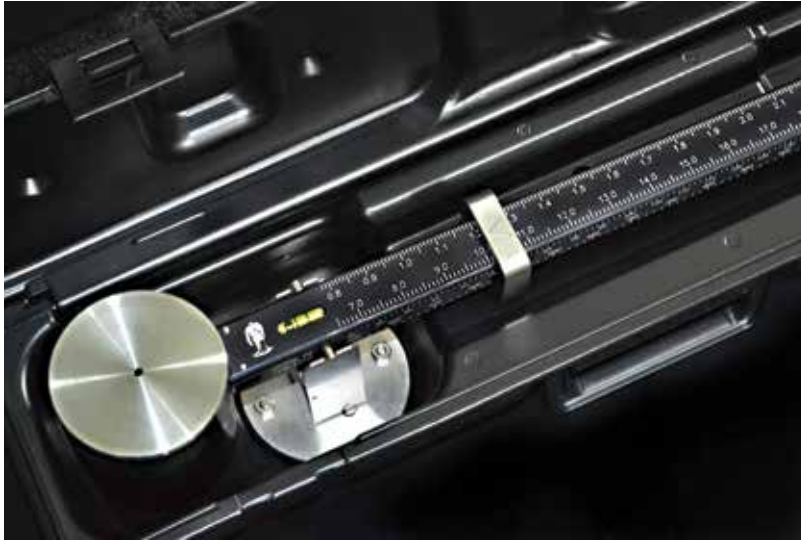
LENGTH: 33.75 in (85.7 cm)  
 TUBE DIAMETER: 4.5 in (11.4 cm)  
 WEIGHT: 10.5 lb (4.8 kg)

### POLYPROPYLENE TWIST ROPE

LENGTH: 150 ft (45.7 m)



# TESTING EQUIPMENT



## MUD BALANCE

This four scale sleek new metal Mud Balance is built in the USA using an all machine manufactured process instead of the old die-cast molded method. This uniform method of construction results in a more rugged instrument that is an accurate, self-contained measuring device used to determine the slurry density. It is one of the most sensitive and accurate field instruments available for determining the density or weight-per-unit-volume (specific gravity) of drilling fluids. It has a range of 7-24 pounds per gallon (lbs/gal) or a specific gravity of 0.84 to 2.88 (SG g/cm<sup>3</sup>).

The Mud Balance consists of a constant-volume sample cup and lid connected to a balance arm that has four graduated scales.

On one side are scales for measuring density in pounds per gallon (lb/gal) and specific gravity (SG g/cm<sup>3</sup>). On the other side are scales for measuring pounds per cubic feet (lbs/ft<sup>3</sup>) and pounds per square inch per 1,000 feet of depth (lbs/in<sup>2</sup>/1000 ft).



## MARSH FUNNEL VISCOMETER

The Marsh Funnel Viscometer is an easy to operate instrument used for quick on the spot measurements of slurry viscosity. The readings are general measurements, but the frequent observations will alert the user to swift changes in the viscosity that could require corrective action.



# TESTING EQUIPMENT

## MATRIX SAND CONTENT KIT

### DELUXE 5-PIECE SET

The MATRIX Sand Content Kit is used for measuring the percentage of sand by volume of slurry. Sand content is defined as anything retained on a 200-mesh screen and the percentage volume of particles larger than 74 microns. The value read is reported as percentage by volume.

#### MATRIX SAND CONTENT KIT INCLUDES:

- (1) 200 mesh sieve 2-1/2 inches in diameter, fastened inside
- (1) collar upon which a small funnel is fitted on either end
- (1) 10 ml glass measuring tube
- (1) 500 ml wash bottle
- (1) carrying case



## MATRIX SAND CONTENT REPLACEMENT SET

### 3-PIECE SET

The MATRIX Sand Content Replacement Set is a Sieve Analysis Apparatus for determining Sand Content of drilling fluid.

#### MATRIX SAND CONTENT REPLACEMENT SET INCLUDES:

- (1) 200 mesh sieve 2-1/2 inches in diameter, fastened inside
- (1) collar upon which (1) small funnel is fitted on either end
- (1) 10 ml glass measuring tube



# TESTING EQUIPMENT



## pH TEST STRIPS

Used to measure pH using a dipstick method. The ideal pH of a drilling slurry in the excavation is 9.0-10.0.

100 strips/box



## HARDNESS TEST STRIPS

Measure Total Hardness using a dipstick method.

50 strips/bottle

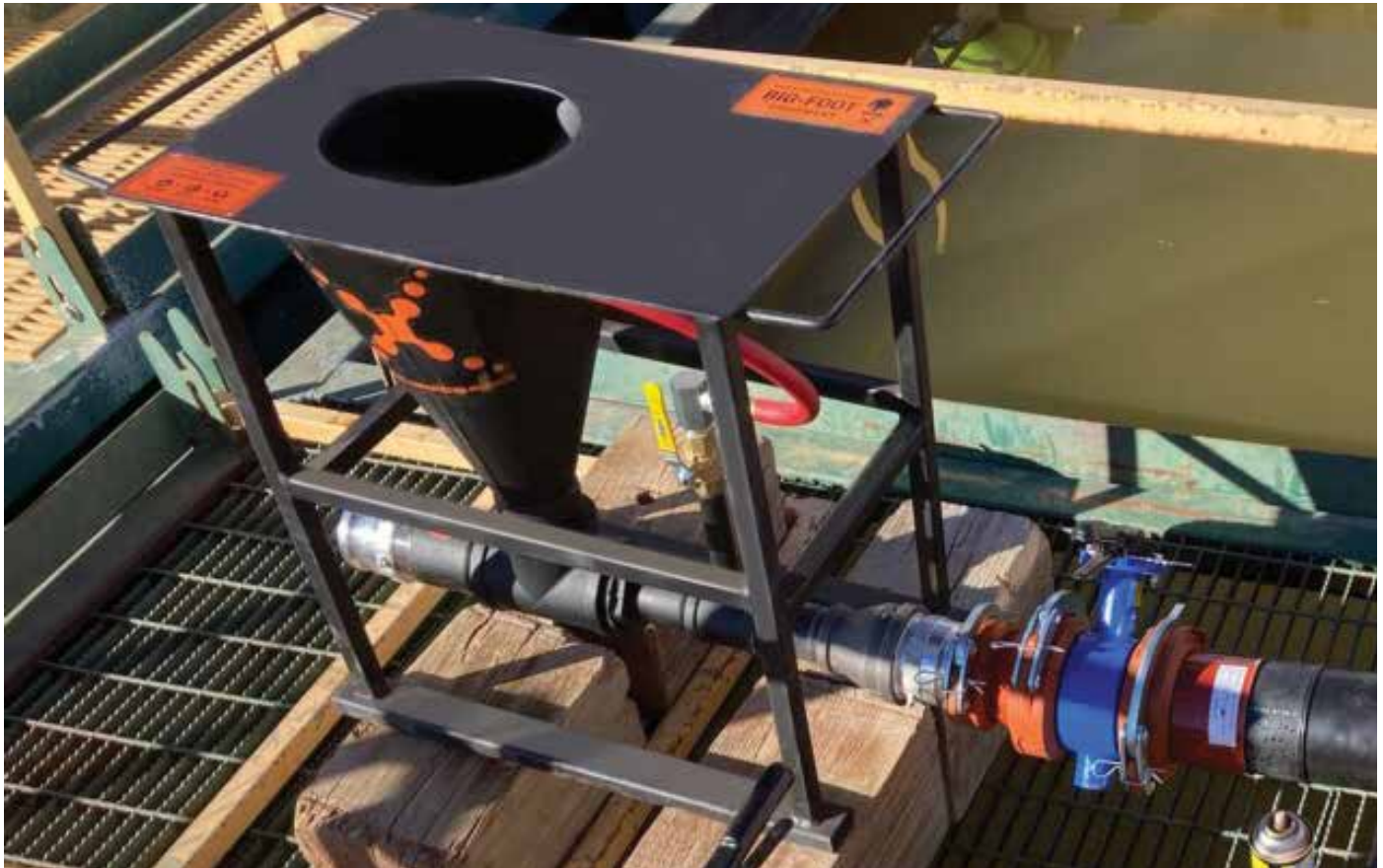


## CHLORINE TEST STRIPS

This test strip method uses an indicator chemical that develops a color when added to chlorinated water. The color turns darker with high chlorine residuals. Users compare this color to a color scale to read the chlorine residual in milligrams per liter mg/L. If there is no color change, there is no chlorine in the water.

50 strips/bottle

# MATRIX HYDRO-MIXER



## MATRIX HYDRO-MIXER

### 3" MIXING HOPPER

The MATRIX Hydro-Mixer directs fluids into the hopper generating a swirling vortex. This cyclonic flow is drawn into the jet mixer suction and out the discharge effluent. This allows faster, clog free-mixing. The top opening is custom engineered for mixing in high winds and reducing dust.

MATRIX Hydro-Mixer is made from durable steel and painted black. This sturdy Hydro-Mixer is designed specifically to mix BIG-FOOT Polymer Slurry and MATRIX Additives.

## BENEFITS

- Engineered Specifically for BIG-FOOT® Dry Polymer & Additives
- Faster, Clog-free Mixing
- Reduces Dust



## IMPORTANT MIXING DIRECTIONS

**ALWAYS ADD PRODUCTS IN THIS ORDER**



**M-BOOSTER®**  
Dry pH Adjuster

+



**FORTIFY®**  
Slurry Loss Additive

+



**BIG-FOOT®**  
Polymer Slurry

# SLURRY ENGINEERING SERVICES

## SLURRY RECIPE & MIXING INSTRUCTIONS

It is always recommended to pre-mix the BIG-FOOT® polymer in surface mixing systems to improve the yield and performance of the slurry. Developing slurry by directly mixing in the hole is not recommended. This increases the potential for shaft instability due to water exposure prior to slurry properties reaching target values. The practice of mixing within the excavation also increases the amount of material necessary to reach target values and the amount of un-yielded, or wasted, product. Regardless of the mixing method and location, the prepared slurry fluid should be pre-treated with M-BOOSTER® as specified by MATRIX Construction Products.



**M-BOOSTER®**  
Dry pH Adjuster



**FORTIFY®**  
Slurry Loss Additive



**BIG-FOOT®**  
Polymer Slurry

### DOSAGE TO MIX A FULL NEW TANK OF SLURRY

**IMPORTANT! ALWAYS ADD PRODUCTS IN THIS ORDER**



PER 19,000 GALLON SLURRY MIX TANK		
PRODUCT	VALUE	DESCRIPTION
M-BOOSTER®	100 lb	M-BOOSTER (lb) per 19,000 gal water (2 pails)
FORTIFY®	100 lb	FORTIFY (lb) per 19,000 gal water (4 pails)
BIG-FOOT®	140 lb	BIG-FOOT (lb) per 19,000 gal water (4 pails)

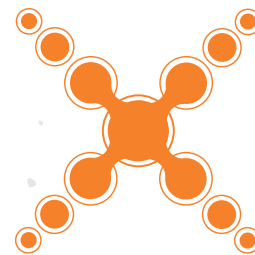
BIG-FOOT polymer dosage and slurry viscosity should be selected and controlled within ranges which match the soil and mix water conditions of the individual project. The ranges need to be in accordance with the table below.

SOIL FORMATION	BIG-FOOT® POLYMER MIX DOSAGE		MARSH FUNNEL VISCOSITY
	lb/1,000 gal	kg/m <sup>3</sup>	sec/qt
CLAY & SHALE	4.0-5.0	0.5-0.6	40-45
SILT & FINE-MEDIUM SAND	6.0-6.5	0.7-0.75	75-115
COARSE SAND-PEA GRAVEL	7.0-8.0	0.8-1.0	120-135
GRAVEL-COBBLE	9.0-10.0	1.1-1.2	145-175

# SLURRY ENGINEERING SERVICES



## ON-SITE SUPPORT SLURRY ENGINEERING



In addition to slurry system programs, MATRIX offers on-site Slurry Engineering. This service includes oversight of the drilling slurry testing and record keeping as per site specific requirements. Our professionally trained Slurry Engineer will adjust the drilling slurry if there is a change in the soil borings or drilling conditions. We will be there to train your employees in the construction, mixing and testing of slurry on site.

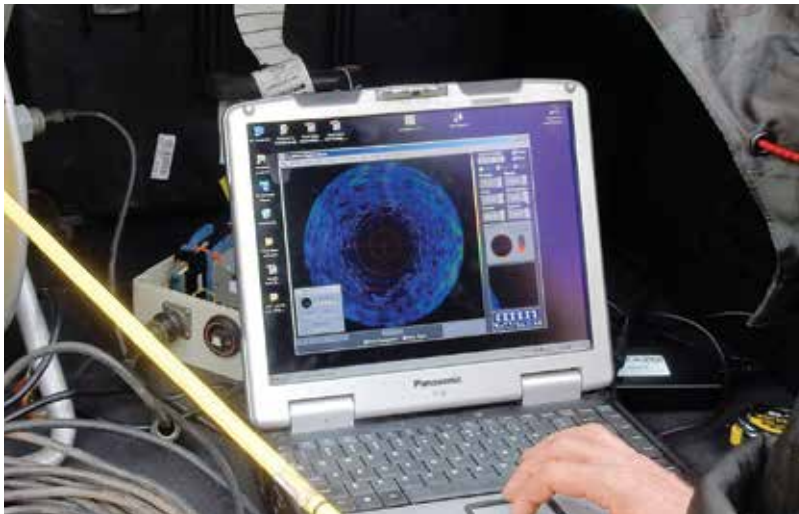
**MATRIX SLURRY ENGINEERING = PROJECT SUCCESS**

# SLURRY ENGINEERING SERVICES



## ON-SITE SUPPORT & QA/QC TRAINING

MATRIX offers on-site employee training in the use and mixing of the BIG-FOOT polymer slurry system. A MATRIX Professional will teach your employees proper testing, sampling and record keeping. On-site slurry training has been proven to increase productivity and project success.



## SLURRY ESTIMATES

A professional Geologist/Hydrogeologist will review the soil borings and unique on-site conditions to create an estimate with slurry recipe, dosage, and mixing instructions. This service is available to all MATRIX customers and maximizes product performance and increases drilling production.



## SLURRY SCHOOLS

Classroom instruction provided by a MATRIX Professional offers certification in the application of the BIG-FOOT Slurry, Additives, Chemicals and Equipment. Training ensures employees learn the proper way to use the BIG-FOOT Polymer Slurry system. The Slurry School includes both a Lecture style class with hands on demonstrations as well as a field day. The interactive Field Day allows your employees to use the MATRIX System as they would on a job site. Quality control testing and lessons are also included. MATRIX will provide lunch for all attendees.

# SLURRY ENGINEERING SERVICES



## MATRIX LUNCH & LEARN

This one-hour presentation will include:

- Introduction to MATRIX — who we are and why we are the best choice in Polymer Slurry!
- Review of BIG-FOOT SLURRY products and how they work.
- Review our process on estimating and providing a quote specific to the project.
- Questions and answers.

We will provide lunch delivered to your office for attendees to enjoy during the program.

A meeting room with A/V equipment needed for our power point presentation.



CALL MATRIX 877 591 3137  
Or visit our website for additional product and safety  
data for all MATRIX products, equipment and mixers.  
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