Strategies for Effective Fluid and Waste Management

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Water used for drilling fluids and hydro-excavation is key for effective utility installation, but proper disposal can add significant operational costs and logistical challenges for contractors. The right equipment and a good plan are key. This presentation will discuss what to consider when planning the next job's disposal. It will highlight one industry solution that helps contractors control the cost, time and complexity of drilling fluid and hydro-excavation waste management, and illustrates why it's a good option for a variety of utility installation situations.

Agenda

- Why are fluids important to utility installation?
- So what's the problem with fluids management?
- How are contractors dealing with it today?
- How does solidification compare to separation?
- How does solidification work?
- How is Super Absorbent Powder (SAP) mixed?
- How is the solidification mixer loaded?
- How much SAP does the process require?
- How do solidification costs compare to "pump-and-dump" costs?
- Where is this solution needed?
- Once the mud is solidified, what are some options for it?
- Close

Why are fluids important to utility installation?

- Drilling
  - Cool drill head
  - Carry cuttings
  - Support the bore hole

Why are fluids important to utility installation?

- Hydro excavation
  - Non-destructive digging
  - Efficient excavation

So what's the problem with fluids management?

- "Pump-and-dump" has been the go-to strategy for fluid management in the utility installation market for years
  - Eroding margins
    - Drills waiting on vacs
    - Disposal costs
    - Transport costs
  - Drilling fluid practices
    - Operators use less bentonite and water volume than recommended

How are contractors dealing with it today?

- Large truck vacs
  - Expensive
  - Overweight
  - Traffic congestion
- Reclaimers
  - Setup
  - Mud weight

How does solidification compare to separation?

Solidification

- To make solid; change from a liquid or gas to a solid form

Separation

- An act or instance of separating; something that separates or divides

Criteria for technology selection

- Particle size range: <1 micron to 4” (10.2 cm)
- Solids content range: 0% to 100%
- Solids pass paint filter test

How does solidification compare to separation?

Separation limitations

- Paint filter test
- Water reuse application
- Solids concentration
- Particle size range
- Unloading vacs
- Material larger than 0.75” (1.9 cm)

Separation particle size range

- Shale shaker
  - 60 micron to 0.75” (1.9 cm)
- Hydrocyclone
  - 30 micron to 200 micron
- Centrifuge
  - 7 micron to 74 micron
- Centrifuge with dosing
  - 1 micron to 7 micron

How does solidification work?

Super Absorbent Powder (SAP)

- **Absorption –** happens as the SAP draws the liquids into it
- **Adsorption –** happens as the water molecules adhere to the SAP and sodium bentonite
- **Ion exchange –** happens as the sodium bentonite ions exchange with liquids and solids to bind them together

Piled 15 minutes after solidification

Thin layer after two weeks outside

**Photos provided by Surface to Surface*

How is SAP mixed?

How is the solidification mixer loaded?

How much SAP does the process require?

- Dose determined by mud weight but fluctuates by soil type

	A	B	C	D	E	F	G	H	I	J
1		Surface To Surface Dosing Estimate for Flailbond 100								
2	DOSING PERCENTAGE	MUD WEIGHT								
3		Potholing Material			Drill Mud			Water		
4	LB OF FLAILBOND/LB OF MUD	16	15	14	13	12	11	10	9	8.3
5		COST OF SOLIDIFICATION PER GALLON OF MUD								
6	0.50%									
7	0.60%									
8	0.70%									
9	0.80%									
10	0.90%									
11	1.00%									
12	1.10%									
13	1.20%									
14	1.30%									
15	1.40%									
16	1.50%									
17	1.60%									
18	1.70%									
19	1.80%									
20	1.90%									
21	2.00%									
22	2.10%									
23	2.20%									
24	2.30%									
25	2.40%									
26	3.00%									
27	*Estimated dosing rates are based on initial limited testing and sampling of soil conditions and mud weights. Dosing									
28	percentages are recommendations only. Actual dosing percentages required may vary based on conditions, polymer use,									
29	and other external factors. This is a tool for estimating only and is not a guarantee of actual results.									

How do solidification costs compare to "pump-and-dump" costs?

- If five 800 gal (3028 L) vacs two-thirds full of heavy hydro-excavation material costs $400 to dump and you will spend two hours in traffic
  - Total cost - $3,500 *((5 x $400/vac)-(5 vacs x 2 hrs x $150/hr))*
- If material from the same vacs costs $91 to solidify, $747 to dispose of at an approved landfill and $200 transport
  - Total cost - $1,402 *((5 x $91)+$747 + $200)*
- $2,098 saved per day x 200 working days per year
  - $419,600 total annual savings

Once the mud is solidified, what are some options for it?

- Land application
- Landfill
- Compost facility

Criteria for disposal as a solid

- Paint filter test compliance
- Stackable

Where is this solution needed?

- Where utility installations are performed
- Where disposal costs are high
- Where disposal locations are few and far between
- Where traffic can get congested

Close

Solidification is a practical way to help contractors control the cost, time and complexity of drilling fluid and hydro-excavation waste management.

Vermeer
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