Soil Sampling Drill Systems

Advantages & Disadvantages



Environmental Drilling Methods

- Solid Stem Auger
- Hollow Stem Auger/Split Spoon
- Direct Push
- ODEX
- Coring
- Sonic



Solid Stem Auger Advantages

- Relatively Efficient
- Minimal Support Required
- Advancement into Weathered Bedrock



Solid Stem Auger Disadvantages

- Sample Quality
- Depth Accuracy
- Well Installation Quality
- Zone Cross Contamination
- Sloughing
- Sample Spin-Up
- Sample Cross Contamination

Hollow Stem Auger Advantages

- Ability to Split Spoon Sample
- Continually Cased Borehole
- Select Sample Depths



Hollow Stem Auger Disadvantages

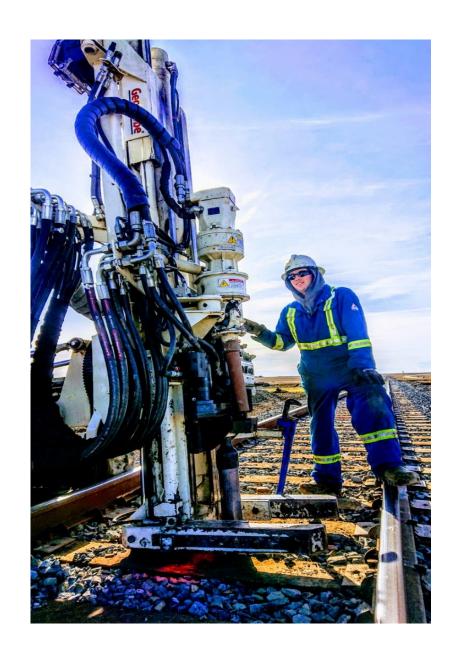


- ► Time Intensive
- Excessive Soil Cuttings
- Excessive Material Required For Backfill & Well Installation
- Labour Intensive
- Difficulty Drilling in Flowing Sands

Direct Push Advantages

- Speed of Drilling/Well Installation
- Sample Quality
- Depth Accuracy
- Continuously Cased Borehole
- Sample Doubles as Shelby Tube
- Minimal Soil Cuttings
- Clean
- Ability to Drill Telescopically





Direct Push
Disadvantages

- Loud
- Bedrock Refusal
- Difficult Drilling in Flowing Sands

Sonic Drilling Advantages

- Powerful
- Sample Quality
- Depth Accuracy
- Continuously Cased Borehole
- Ability to Drill Telescopically
- Can Switch to Wireline System for Increased Efficiency
- Ease of Drilling in Flowing Sands
- Able to Drill Into Bedrock



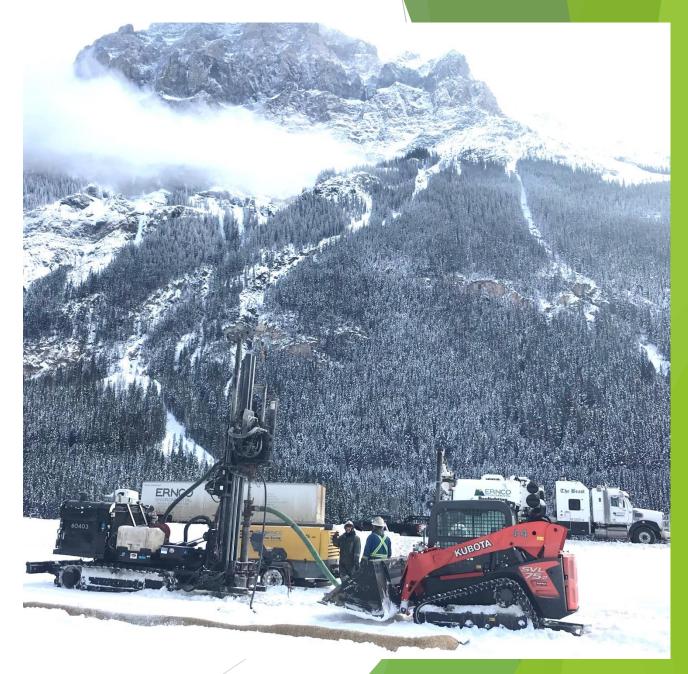
Sonic Drilling Disadvantages

- Additional Support Equipment Required
- Water Required For Casing Advancement



ODEX Advantages

- Continuously Cased Borehole
- Ability to Drill Hard Bedrock
- Can Drill Telescopically
- ► Sample Collection Using Diverter & Cyclone
- Great in Large Cobble
- Great For Cased Well Installations
- Depth Accuracy



ODEX Disadvantages

- Sample Quality
- Some Additional Support Equipment Required
- Dust & Water Containment Required on Most Downstream Sites



Coring Advantages

- Sample Quality
- Depth Accuracy
- Ability to Drill Very Hard Rock
- Wireline Sample Retrieval



Coring Disadvantages

- Water Required
- Additional Support Equipment
- Fluid Containment
- Fluid Disposal
- Core Recovery Can Vary Depending on The Formation
- Speed of Drilling



Conclusion

- There are many different drilling methods for many different sampling requirements. Finding the right match is key.
- Less expensive drilling equipment doesn't always equal cost savings.
- Knowing ground conditions ahead of time (when possible) will help drilling contractors come up with a better game plan.