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drilling method

The Sonic drill head is a technologically advanced, hydraulically activated unit that imparts high frequency sinusoidal wave vibrations into a drill string to effectuate a cutting action at the bit face. The resultant cutting action forces a circular continuous core of the formation up into the drilling string. Due to the high forces developed by the Sonic head and the external flush nature of the drill string, excess formation material generated by the cutting face of the bit is forced into the borehole wall thus resulting in the generation of no cuttings during the drilling process other than the generated core sample.

Through the development of various sizes and types of tooling, boreholes of different depths and dimensions can be drilled using the Sonic drilling method in most types of subsurface formations.

WASTE MINIMIZATION

The Sonic drilling method yields no excess cuttings – only core. A typical 8" hollow stem auger boring drilled to 100' in depth will yield the core plus about 4000lbs. of cuttings (seven-55 gallon drums). Reduced cuttings generation by the sonic drilling method means there are reduced costs for:

- Drums
- Drum transportation
- Waste disposal or treatment
- Fencing or storage of drums onsite

VERSATILITY

The sonic drilling technology allows for quick coring of formations, and the ability to collect in-situ water samples in discrete zones with a Simulprobe®, HYDROPUNCH®, BAT Probe, bailers or pumps.

Large diameter boreholes can be drilled to construct monitor wells or extraction/injection wells. Vadose zone soil vapor tests and wells, neutron probes, pipe installations (with no annulus around the pipe), and injection pipes for bioremediation procedures are easily installed with the sonic drilling method.

CONTINUOUS CORE

The Sonic drilling method yields excellent soil core recovery rates in formations that may be difficult or impossible with other methods. This allows for a complete, highly accurate description and screening of the soil column to be made. With proper packaging and handling, core samples are ready for laboratory analysis of mechanical and chemical characteristics.

SPEED OF DRILLING

The rate of penetration varies as a function of the type of formation being cut. Speeds from one foot per second to one foot per minute are encountered when drilling loose to compact formations. Field results demonstrate that the daily continuous core output of one Sonic rig can approximate the daily continuous core output of multiple four hollow stem auger rigs.

DRILLING MOST FORMATIONS

The Sonic drill easily drills alluvium, sand, clays, permafrost, caliche, or almost any subsurface formation. Because the borehole is literally "flush cased" as drilling progresses, the sonic drilling technology is useful when:

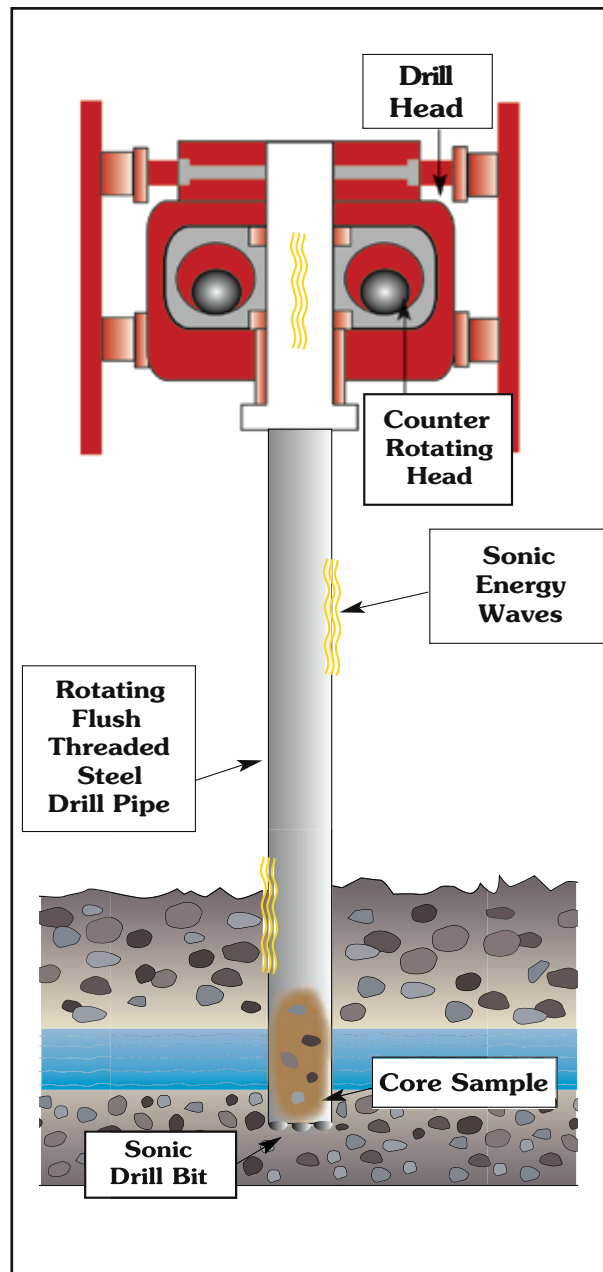
- There are loose and unstable overburden conditions.
- Working in areas of nuclear contamination of soil/groundwater.
- Drilling on landfills through metals, garbage, tires, wood, or concrete.
- There is a need to sample under trenches, ponds, waste lagoons, or active/ inactive buildings.
- Working in areas with a high groundwater table.
- Drilling at sites requiring continuous core with no fluid or air circulation mediums.
- Attempting to collect core samples in formations traditionally difficult for Hollow Stem Auger or Wireline Coring methods.

LOWER COST

Since the Sonic method drills more core footage per day, overall project cost are reduced. Less field time for geologists, technicians, inspectors, laboratories and other support functions is required. Borehole abandonment costs are reduced due to reduced boring diameters. The Sonic borehole rarely requires more cement than its calculated amount. Waste minimization from no cuttings greatly reduces the overall project cost.

AVOIDING CROSS CONTAMINATION WHEN DRILLING THROUGH MULTIPLE AQUIFERS

Using telescopic Sonic casing advancement, wells or borings can be installed through multiple or confined water bearing units without risking cross contamination. Depth discreet water sampling combined with the high quality geologic data generated from continuous core samples can result in excellent subsurface site characterizations.



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