Inspecting the Grouting Process
Random 1 ¼” High Density Polyethene Pipe (HDPE) in a 6” diameter borehole.
And ungrouted boreholes can endanger aquifers. Shoveling drill cuttings back into the borehole risks possible bridging without solid heat conducting material throughout.
A properly grouted borehole
Trailer mounted grout rig
Tremie Pipe on reel to pump grout down
Typical New England water truck mounted grout rig
Roller guides tremie pipe down borehole after loops have been placed.
Workers manually push tremie pipe down as reel unwinds.
When tremie pipe reaches the bottom, grout gets mixed and pumped down to fill the borehole.
If sand is used, the ratio of number of bags of sand per bentonite clay batch is printed on a table on each bag. More sand = higher thermal conductivity.
Graphite mix with bentonite clay achieves higher thermal conductivities than sand.
Paddle mixing hopper mixes bentonite clay and water and graphite or sand.
Water is automatically pumped into the mixing hopper.
Progressive cavity pump forces mixed grout slurry down tremie tube to the bottom.
Number of bags in mixture is controlled and counted. 14 batches would fill a 450 ft borehole.
The motor on the tremie pipe reel pulls the tremie line out as grout fills the borehole.
As the grout rises, the ground water or drill water appears first.
Then the water turns tan grout color as the grout is almost to the top.
Once grout is hydrated, it has a peanut butter consistency as shown here overtopping a cut steel casing.
A Sample of grout can be tested for in place thermal conductivity, preferred to be over 1.0 BTU/hr. degree F.
Mail Sample to South Dakota for free testing.
Top off grout if it settles, otherwise no further work is necessary.