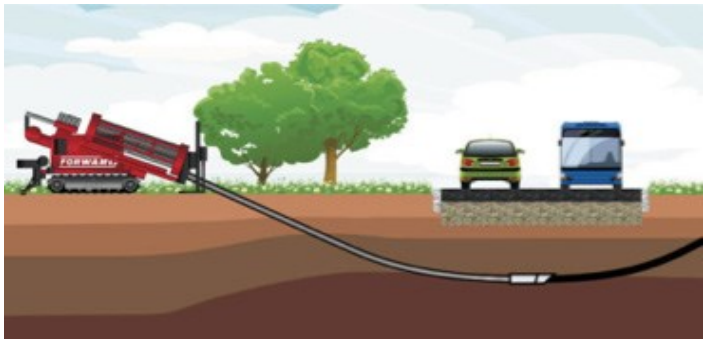
MARCELLUS SHALE COALITION™

Horizontal Directional Drilling 101

Horizontal Directional Drilling, or HDD, is an infrastructure construction process that is often deployed when installing underground utility lines (such as pipelines, electric transmission lines, cable). HDD may be used when an underground utility crosses under a roadway, river or stream, or other environmentally sensitive area. The construction technique is an alternative to "open trenching, "which is not always feasible when crossing under a roadway, river, stream or other sensitive area. HDD often involves drilling well below (30 – 300') the protected area and can result in less surface disturbance than other construction methods.

What are the steps involved in HDD?

First, operators examine the utility line's proposed route and work with community stakeholders and environmental regulators to identify locations to minimize surface disturbance. Prior to securing necessary permitting from environmental regulators, operators perform studies of the subsurface to plan the most appropriate path and depth based on the information collected.



Source: Oklahoma State University, March 2017

Once the appropriate permits have been issued, the operator establishes an entry and exit point and then, often with the use of bentonite, drills the borehole following a designed path under the surface. The bore is then reamed to the necessary diameter, before new pipe is pulled through the hole and connected with the line.

What is Bentonite?

Bentonite is a type of naturally occurring clay that is used when boring beneath a river or streambed, roadway, or other environmentally sensitive area. This drilling fluid – used to lubricate and cool the drill head – is non-toxic and generally does not cause long-term impacts to water supplies or sensitive environmental areas.

Other Uses of Bentonite

- PA Department of Environmental Protection (PA DEP) requires installing a bentonite seal when constructing groundwater monitoring wells.
- PA Department of Conservation and Natural Resources recommends a bentonite/cement plug when completing drinking water wells.
- Among other potential solutions, Penn State University recommends lining ponds with bentonite to seal leaks.

What is an Inadvertent Return?

An inadvertent return occurs when the bentonite fluid flows to the surface in a location other than the entry hole. While extensive environmental and geological precautions are taken to carefully understand the subsurface prior to HDD, in some cases small, undetectable fissures provide a pathway for the bentonite to inadvertently return to the surface. Each operator that obtains a permit from the PA DEP to utilize HDD must also adopt a contingency plan to respond to potential inadvertent returns. This plan must be reviewed and approved by PA DEP.

What measures are in place to protect communities and the environment?

PA DEP has adopted very specific regulations regarding HDD. Permitting requires operators to have a plan in place to capture, contain and clean any non-toxic drilling mud that may inadvertently return to the surface .