

Stream crossing methods

Different stream crossings may require different construction methods. The method selected depends on site-specific environmental, engineering and permitting requirements.

Conventional dry crossings

May be used at some streams where appropriate.

With conventional dry crossings:

- A trench is excavated across the watercourse
- The pipeline is installed within the trench
- The streambed and banks are restored following construction
- Additional mitigation measures may be used to reduce environmental impacts during construction

Conventional bore crossings

May be used where trenchless crossings are required and terrain allows.

With conventional boring:

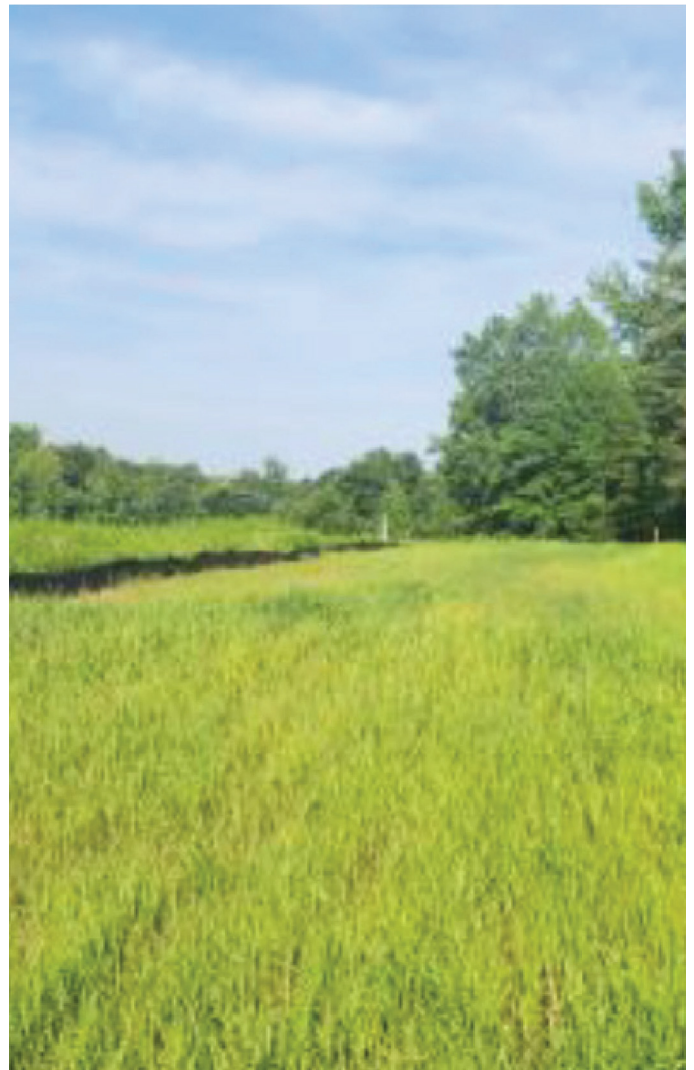
- A bore is installed beneath the feature being crossed
- The pipeline is installed underground within the bore
- Surface disturbance is reduced compared to open-cut construction
- The streambed and banks remain largely undisturbed

Clean Water Act

In accordance with Clean Water Act Sections 404 and 401, the project will undergo review by the US Army Corps of Engineers (USACE) and the NC Department of Environmental Quality (NCDEQ) - Division of Water Resources (DWR) to ensure compliance with federal and state environmental regulations. This review process is intended to confirm that the project has been designed to avoid and minimize impacts to waters of the US, wetlands and other natural resources where practicable such that water quality and the integrity of the surrounding environment are protected during construction and operation.

Erosion and sediment control plan

An erosion and sediment control plan will be prepared for the project. The plan will specify measures that minimize soil erosion, prevent sediment from leaving the site and protect off-site resources during construction and until the site is stabilized. The plan will be reviewed by the NCDEQ – Division of Energy, Mineral and Land Resources (DEMLR) and will require approval before construction.



Horizontal Directional Drilling

For larger rivers or environmentally sensitive areas, a trenchless construction method called Horizontal Directional Drilling (HDD) may be used.

With HDD:

- A bore is drilled beneath the feature
- The pipeline is installed deep underground
- The riverbed and banks remain largely undisturbed
- Construction activities are concentrated away from the waterbody

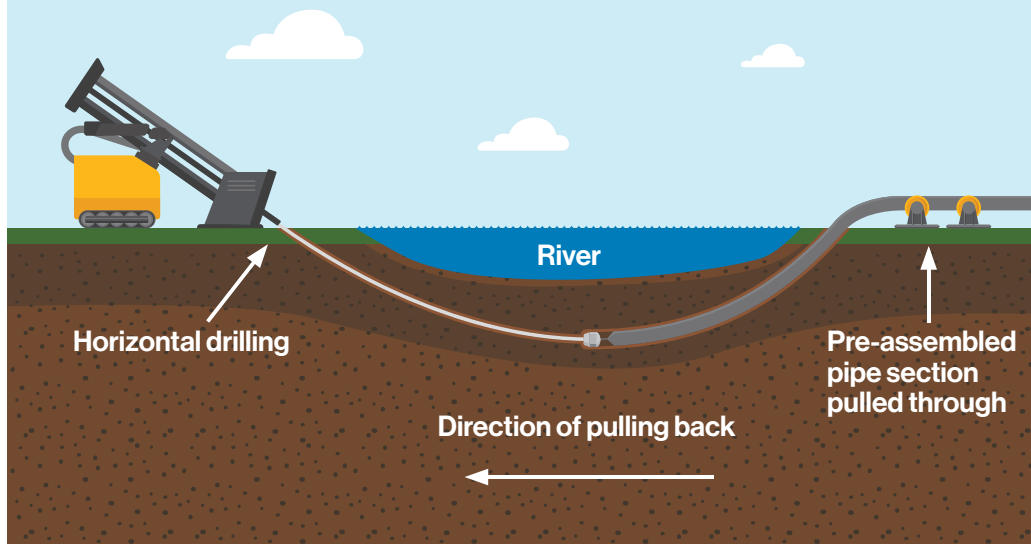
Why HDD is Used:

HDD can help:

- Reduce disturbance within the waterbody
- Minimize sediment entering the stream
- Reduce impacts to aquatic habitat
- Avoid direct excavation through sensitive waterways

Typical horizontal directional drilling method

This is an example of one of a number of watercourse crossing methods.



What we've heard

Enbridge Gas has heard important questions about:

- Water quality
- Aquatic species
- Stream and wetland impacts
- Groundwater protection
- Construction near sensitive waterways

These concerns are an important part of ongoing environmental studies and project planning.

The Haw River is expected to be crossed using HDD, a trenchless construction method designed to avoid direct disturbance of the riverbed and riverbanks.

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