

Pipeline and Midstream Facilities

Getting Natural Gas to Market Safely



Why do we need pipelines?

Pipelines are regarded as the safest and one of the most efficient ways of transporting natural gas and natural gas liquids (NGLs) from the point of production to the ultimate point of consumption. Midstream pipelines are generally constructed out of steel and are buried underground, typically at depths of at least three feet. Special coatings and cathodic protections, which employ small electrical currents applied to the steel tube, are utilized to guard against corrosion.

What is meant by 'Midstream'?

Midstream generally refers to the processing, transportation and storage of natural gas and NGLs, covering activities occurring after natural gas comes out of the wellhead and before it is sold to an end-user. Midstream facilities can include gathering and transmission pipelines, compressor stations, dehydration, processing, fractionation, treatment, storage and other related facilities necessary to safely prepare and transport natural gas and NGLs to market.

What are the different types of pipelines?

Gathering pipeline

A gathering pipeline transports natural gas or NGLs from a production operation to a transmission line. The location for gathering pipelines is determined by negotiating right-of-way agreements with landowners along the route necessary to transport natural gas. Gathering pipelines also do not carry the provision of eminent domain. Gathering pipelines typically range between 4 to 30 inches in diameter. Operators must obtain a variety of necessary permits and adhere to strict environmental protection standards to guard against erosion, subsequent sedimentation, increased rates or volumes of storm water runoff, ensure wetlands and waterways are protected, and avoid impacts to rare, threatened and endangered species and their habitat.

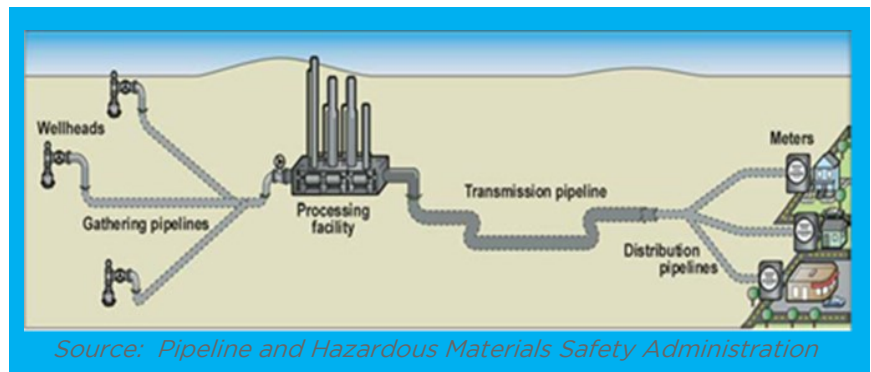
Transmission pipeline

A transmission pipeline transports natural gas from a gathering pipeline or storage facility, often over great distance at greater volume and pressure, to another storage facility or a distribution system. Major interstate transmission pipelines typically range between 24 to 36 inches in diameter.

Distribution pipeline

A distribution pipeline is used to supply natural gas directly to the consumer, including homes, businesses, or a large customer such as a power plant or manufacturer. When the natural gas exits the transmission pipeline and enters the distribution pipeline, the pressure is reduced and the gas flows through smaller diameter pipelines. The pipelines usually range between one-half to six inches in diameter and are able to safely deliver natural gas to the end user. Odorant is also injected at this point as a safety precaution for leak detection. Most distribution lines are owned and operated by public utility companies.

Gathering, Transmission and Distribution Diagram



Source: Pipeline and Hazardous Materials Safety Administration

What is a compressor station?

Compressor stations are critical to moving natural gas safely and efficiently within pipeline systems. Gathering pipeline systems require compressor stations to maintain flow from the well field before it moves on to a larger diameter transmission line. In transmission pipeline systems, gas may be transported hundreds, or even thousands, of miles from its point of production to an end use customer. It must be re-pressurized along the route to ensure flow volumes until it reaches its intended customer. Generally, compressor stations are located every 40 to 70 miles along a transmission pipeline, though the exact interval is determined by a variety of factors, including the volume and pressure of the natural gas being transported.

Do pipeline operators have eminent domain authority?

In Pennsylvania, owners or operators of gathering pipelines and intrastate transmission lines do not have eminent domain authority. Rather, owners or operators must negotiate with each landowner where a pipeline is proposed, and provide fair compensation as agreed to by the two parties.

Distribution pipelines, which are owned and operated by utility companies and overseen by the Pennsylvania Public Utility Commission (PA PUC), as well as interstate transmission lines, which are overseen by the Federal Energy Regulatory Commission (FERC), do have eminent domain authority. To utilize such authority, the owner or operator of the proposed pipeline or related facility must demonstrate to the court's satisfaction that utilization of eminent domain authority will further the public's interest. Eminent domain is utilized as a last resort, and is preceded by a public input process and efforts to reach a satisfactory resolution between the pipeline owner or operator and the landowner.

How are pipelines sited?

The proposed route for gathering pipelines is determined by the location of natural gas wells and the willingness of property owners to allow a pipeline through their property. Eminent domain may not be used to site a gathering pipeline.

The proposed route for interstate transmission pipelines is reviewed by FERC prior to the issuance of a certificate of public convenience. The FERC process takes into consideration various concerns raised by the public, local community officials and other stakeholders regarding these large-scale projects. Re-routing of a proposed route may occur based on feedback gathered throughout the process. FERC allows for use of eminent domain as a last resort, if the proposed project is determined to be in the public's interest.

Additionally, state and federal regulations require all pipelines (gathering, transmission and distribution) to obtain all necessary permits or authorizations designed to avoid or minimize environmental impacts before they are constructed.

What is a Right-of-Way?

A right-of-way is a strip of land overtop of and adjacent to a pipeline's corridor, whereby the owner or operator of the pipeline is granted certain legal rights to access and maintain the pipeline in exchange for compensation to the landowner. Typical right-of-way widths average about 50-75 feet depending on factors such as the number of pipelines within the space, with additional, temporary width during construction. Right-of-ways are typically kept clear of trees and deep-rooted shrubs, and are often planted with grasses, seasonal crops or other vegetation approved by the property owner. Farming activities generally can continue to take place on a right-of-way. The width of a pipeline right-of-way can vary depending on the size of the pipeline and consideration of the landowner's requirements.

To learn more about what agencies are responsible for pipeline oversight, reference the Pipeline Oversight Fact Sheet.

