

Natural Gas Compressors - Controlling Sound

Five Things You Should Know

- A natural gas compressor increases the pressure of the gas so it can be transported through a pipeline and ultimately used by consumers. Depending on the volume and flow of wells within a natural gas producing area, a compressor station may have one or more compressor units.
- Southwestern Energy (SWN) locates our compressor units away from residential populations as much as possible. The location of a compressor station depends on the quantity and location of wells in relation to the pipeline system.
- Compressor station facility maintenance activity or other variables may cause a short-term increase in sound level.
- SWN reduces the sound generated from compressor facilities through station design, equipment and sound absorbing systems that lower sound levels.
- At minimum, SWN achieves sound levels below 55 decibels (dB) at the nearest residence, which is slightly quieter than the sound level of an average conversation.

Facts About Compressors and Sound

SWN currently operates more than 800 compressor units located on well pads or at large stations away from well pads. We use a variety of methods to control sound levels. In 2011, the Arkansas Oil and Gas Commission (AOGC) passed a new rule, requiring a sound level of 55 dB at all "Noise Sensitive Areas" (NSA) in proximity to natural gas compressors. However, SWN already achieved that level of sound control at many of our existing stations.

Finding the Right Location

One of the best ways to reduce sound is distance. SWN works to select sites for compressor stations that are located away from residences and other occupied areas. Certain terrains and cultural features such as parks, historic sites and wetlands are not considered for locations.

Conducting the Right Testing

SWN conducts sound surveys before and after installation of a compressor station. We also take readings at nearby residences to determine sound levels. In situations where sound levels exceed the 55 dB design goal, SWN has taken corrective action to reduce sound exposure.

Continued on back

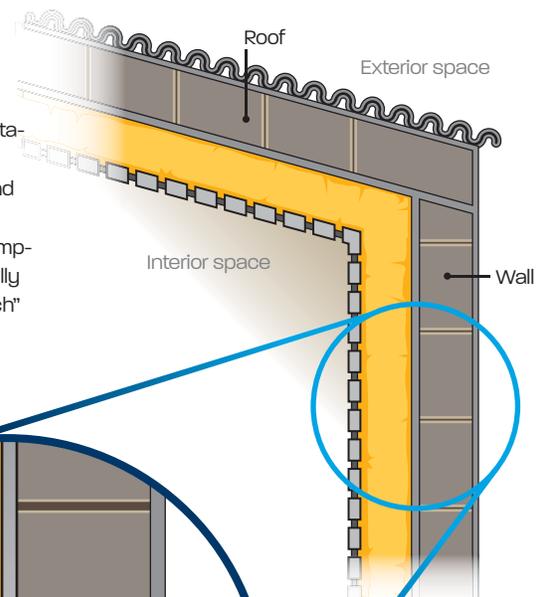
Well-insulated

The insulation layers used in compressor-station buildings provide a solid surface to contain noise and materials to reduce sound energy or "dampen" sound before it can escape. By varying the types of sound-dampening material, sound levels are exponentially decreased because one material can "catch" sound the other material allows to escape.

Perforated aluminum panel – holes provide space for sound to travel through and be "caught" in sound-dampening material.

Fiberglass Insulation – same insulation used in homes, dampens sound.

Mineral Wool – insulation material, dampens sound.



Controlling Sound (continued)

Using the Right Equipment

SWN purchases special or non-standard compressor units with extra silencers and the highest level of sound reduction available related to exhaust systems. We have worked to reduce the four main sources of constant sound from our compressor stations.

1 Engine exhaust and air intake systems are equipped with silencers to reduce sound by 50 and 60 dB.

2 Natural gas and water-cooling equipment have high efficiency fans to prevent turbulence and reduce sound by 2 to 3 dB. These high efficiency fans have a greater number of blades, which also contributes to producing less noise.

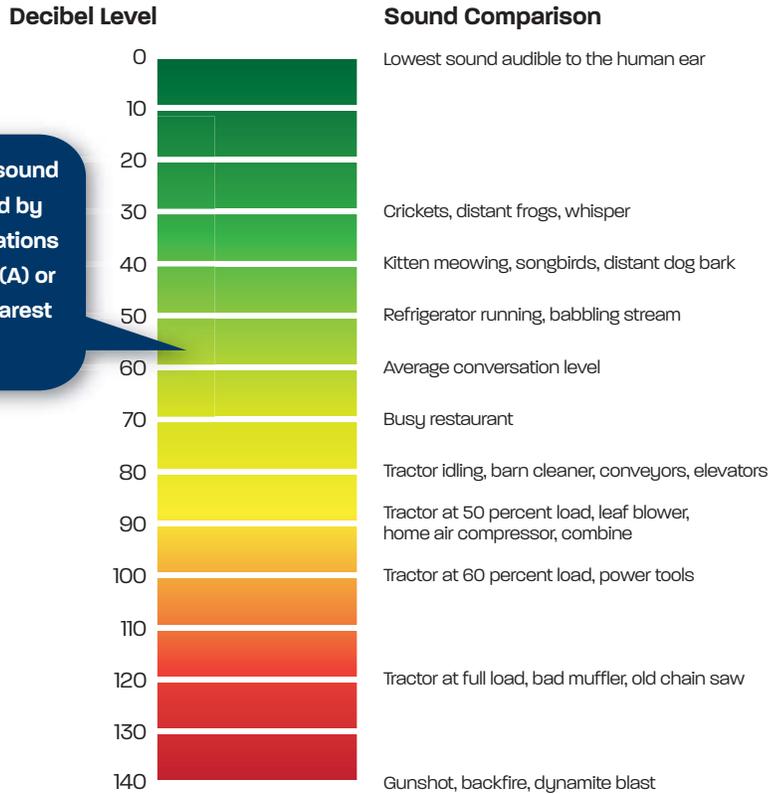
3 Larger piping than typically used in compressor stations is installed to keep the gas velocity low. This reduces continuous high-frequency (high-pitched) sounds.

4 If sound levels are above 55 dB at a Noise Sensitive Area, SWN constructs buildings over mechanical equipment to reduce sound levels. SWN spends between \$145,000 and \$200,000 per compressor to enclose them and currently has 42 stations with buildings. Each station contains one or more compressor.

SWN ensures sound levels produced by compressor stations measure 55 dB(A) or lower at the nearest residence.

How Loud is it Really?

Sound pressure is measured in decibels (dB). When SWN takes a reading, we test and report sound in levels of the A scale, which is the scale associated with human hearing and most regulations.



Data courtesy of the Texas Cooperative Extension, Texas A&M University

The Environmental Protection Agency (EPA) recommends a maximum 24-hour continuous sound-level exposure of 70 dB. The Occupational Health and Safety Administration (OSHA) has mandated a maximum limit of 90 dB for eight hours of continuous sound exposure without hearing protection.



SWN CONSTRUCTS BUILDINGS around compressor equipment to lower sound levels. Many of our large compressor stations currently have buildings around them.

Doing the Right Thing

If a resident has a concern related to sound level or other issues concerning SWN, residents may contact (866) 322-0801.

