GASSY!

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"***Gassy***" refers to mines that have levels of gases that must be diluted with pure air to prevent an explosion. **Methane** is normally the culprit. Methane – or "natural gas" – is a valuable resource, and provides energy for industry as well as for heating and cooking in homes around the world. However, its readiness to ignite when mixed with air also makes it dangerous at certain levels – specifically when air contains above 5.3 percent methane. This number is called the "Lower Explosive Limit" (LEL).

When the amount of methane, pentane, butane, propane, gasoline vapor, or any other explosive gas reaches its LEL, just a spark can cause an explosion.

This is why smoking is prohibited near the pumps at gas stations – and is prohibited by MSHA regulations "within 50 feet of explosive material" (30 CFR 56/57.6904) or in gassy underground mines (57.22101-22105).

Not all underground mines are "gassy." MSHA assigns categories and sub-categories to all mines, according to their "gassiness" (57.22003). Categories I and III apply to mines that either "liberate methane or have the potential" to do so at explosive levels.

Category II applies to salt dome mines with potential for a sudden, violent release of solids, methane and other gases. There are three such mines in the south central district, all in southern Louisiana.

Category IV mines liberate methane, but not at explosive levels. Category V mines are petroleum mines (yes, *"crude"* can be mined!). Category VI applies to those mines "in which the presence of methane has not been established" (the majority of the mines in this district).

Special requirements for ventilation apply to gassy mines. All mines except category IV and VI require weekly methane tests, and immediate ventilation changes if the methane is found to be at certain levels.

Most of the time when MSHA inspectors go underground, they carry hand-held electronic multi-gas detectors. Their typical instrument can detect methane as well as oxygen, carbon monoxide (CO), and nitrogen dioxide (NO_2).

The latter two gases are not explosive, but they are *toxic*; CO is particularly dangerous because it's odorless and colorless, while NO_2 is deadly at very low levels. These two gases are associated with blasting as well as the exhaust gases of underground diesel equipment.

There are 37 underground mines in the 6-state area covered by the south central district. That represents about 3000 miners. The safety of these men and women depends on both MSHA inspectors and the miners themselves maintaining instruments in proper calibration, using them regularly -- and responding rapidly to any indications that toxic or explosive gases are approaching dangerous levels.