Every day in New York, explosives are safely detonated in quarries and underground mines. DEC’s Division of Mineral Resources regulates the environmental impacts of blasting in mines through its Mined Land Reclamation Program. Blast vibration limits protect structures from damage. Windows and dishes may rattle, but blasting conducted within New York’s regulatory limits should not damage homes or other structures.

**Why is blasting necessary?**
Blasting is the most cost-effective way to fracture rock so that it can be excavated. Blasting lowers costs for building materials, such as sand, gravel, concrete and other products derived from rocks.

**Who may conduct blasting?**
Only a certified blaster licensed by the State of New York may conduct blasting in New York’s quarries and mines. Licenses are issued by the New York State Department of Labor.

**Do they still use dynamite?**
Dynamite is rarely used in New York. The most common blasting agent today is called ANFO, which is much less hazardous and breaks rock more efficiently.

**How far do fractures extend from the blasthole?**
Blastholes are usually drilled vertically in a grid-like pattern. Blastholes in quarries are typically two to seven inches wide and 10 to 70 feet deep. Rock fracturing normally occurs within 20 to 30 feet from a blasthole.

**What causes ground vibration and how is it measured?**
When a blast detonates, energy radiates in all directions as wave motion, like a ripple created in a lake when a stone hits the water. This wave, or ground vibration, travels mainly along the surface at 5,000 to 20,000 feet per second. Its energy level falls off rapidly with distance and is normally undetectable by most people beyond several thousand feet. Because explosives are expensive and vibration represents wasted energy, it is to the blaster’s advantage to minimize ground vibration. Seismographs measure ground vibration in terms of particle velocity, which is the speed, in inches per second, at which ground particles oscillate as the wave passes. Beyond several thousand feet, ground movement is only a small fraction of an inch.
How is ground vibration controlled?
Blasters control ground vibration by limiting the weight of explosives detonated within any 8-millisecond period of time. They use millisecond-delay detonators (blasting caps) to separate the firing time of each hole. A typical 50-hole blast, therefore, is actually 50 smaller, separate explosions.

What is airblast and how is it measured?
When a blast is detonated, some energy is lost to the atmosphere as noise or concussion. This is caused by gases venting through cracks and the motion of rock on top and in front of blastholes. The resulting sudden increase in air pressure is called airblast. Like ground vibrations, airblast levels decrease rapidly with distance. However, airblast travels only at the speed of sound, about 1,100 feet per second, depending on air temperature, and can be greatly influenced by wind direction and speed. Atmospheric temperature inversions can also influence airblast by bending it back towards the earth and focusing its energy several miles away. Airblast is measured with a special microphone connected to a seismograph. The most common units of airblast measurement are pounds per square inch (PSI) and decibels (dB).

How is airblast controlled?
Airblast is controlled by placing stemming material (drill cuttings or crushed stone) above the explosives in the blasthole and by not loading explosives into parts of holes with cracks, voids or mud seams.

What are the ground vibration and airblast limits?
The United States Bureau of Mines conducted extensive research over a 35-year period and has published recommendations that limit blast-induced ground vibration and airblast to protect homes and other structures from damage. The Division of Mineral Resources has incorporated these recommendations into mining permits as special permit conditions for mines across the state.

Who do I call with blasting questions?
Contact the New York State Department of Environmental Conservation’s Mined Land Reclamation Program in Albany at (518) 402-8072 or your Regional DEC Office. For further information, check out our website at www.dec.ny.gov.

(This brochure was adapted with permission from information prepared by the Ohio Department of Natural Resources.)