

Editor's Note: As part of this proposal, the EQB is proposing to delete the existing text of Chapter 211 which appears at *Pennsylvania Code* pages 211-1 through 211-38, serial numbers (243465-243502).

**TITLE 25. ENVIRONMENTAL PROTECTION
PART I. DEPARTMENT OF ENVIRONMENTAL PROTECTION
SUBPART D. ENVIRONMENTAL HEALTH AND SAFETY
ARTICLE IV. OCCUPATIONAL HEALTH AND SAFETY
CHAPTER 211. PROVISIONS FOR THE USE, STORAGE, AND
HANDLING OF EXPLOSIVES IN SURFACE APPLICATIONS**

**SUBCHAPTER A
GENERAL PROVISIONS**

- 211.101. Definitions.
- 211.102. Scope.
- 211.103. Enforcement.

**SUBCHAPTER B
STORAGE OF EXPLOSIVES**

- 211.111. Scope.
- 211.112. Magazine License and Fees.
- 211.113. Application Contents.
- 211.114. Displaying the License.
- 211.115. Standards for Classifying and Storing Explosives, Constructing, Maintaining and Siting Magazines.

**SUBCHAPTER C
PERMITS**

- 211.121. Scope.
- 211.122. Permits to Sell Explosives.
- 211.123. Permits to Purchase Explosives.
- 211.124. Blasting Activity Permits.
- 211.125. Blasting Activity Permit-By-Rule.

**SUBCHAPTER D
RECORDS OF DISPOSITION OF EXPLOSIVES**

- 211.131. Sales Records.
- 211.132. Purchase Records.
- 211.133. Blast Report.

**SUBCHAPTER E
TRANSPORTING EXPLOSIVES**

- 211.141. General Requirements.

**SUBCHAPTER F
BLASTING ACTIVITIES**

- 211.151. Prevention of Damage.
- 211.152. Control of Noxious Gases.
- 211.153. General Requirements for Handling Explosives.
- 211.154. Preparing the Blast.
- 211.155. Preblast Measures.
- 211.156. Detonating the Blast.
- 211.157. Postblast Measures.
- 211.158. Mudcapping.
- 211.159. Electric Detonation.
- 211.160. Non-electric Detonation.
- 211.161. Detonating Cords.
- 211.162. Safety Fuse.

**SUBCHAPTER G
REQUIREMENTS FOR MONITORING**

- 211.171. General Provisions for Monitoring.
- 211.172. Monitoring Instruments.
- 211.173. Monitoring Records.

**SUBCHAPTER H
BLASTING ACTIVITIES NEAR UTILITY LINES**

- 211.181. General Provisions.

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**SUBCHAPTER A
GENERAL PROVISIONS**

§211.101. Definitions.

The following words and terms when used in this chapter have the following meanings, unless the context clearly indicates otherwise:

Airblast – An airborne shock wave resulting from an explosion, also known as air overpressure, which may or may not be audible.

Blaster – An individual who is licensed by the Department under Chapter 210 (relating to licensing blasters) to detonate explosives and supervise blasting activities.

Blaster-in-Charge – The blaster designated to have supervision and control over all blasting activities related to a blast.

Blast Area – The area around the blast site that should be cleared to prevent injury to persons and damage to property.

Blast Site – The area where the explosive charges are located.

Blasting Activity – All actions associated with the use of explosives from the time of delivery of explosives to a worksite until all post-blast measures are taken, including priming, loading, stemming, wiring or connecting, detonating, and all necessary safety, notification and monitoring measures.

Building – A structure that is regularly occupied where people live, work or assemble.

Charge weight – The weight in pounds of an explosive charge.

Delay interval – The designed time interval, usually in milliseconds, between successive detonations.

Department – The Department of Environmental Protection.

Demolition Activity – The act of wrecking or demolishing a structure with explosives.

Detonator – A device containing an initiating or primary explosive that is used for initiating detonation of explosives. The term includes electric blasting caps of instantaneous and delay types, blasting caps for use with safety fuses, detonating cord, delay connectors and non-electric instantaneous and delay blasting caps.

Explosive – A chemical compound, mixture or device that contains oxidizing and combustible materials or other ingredients in such proportions or quantities that an ignition by fire, friction, concussion, percussion, or detonation may result in an explosion. The term includes safety fuse, squibs, detonating cord, and igniters. The term does not include the following:

(1) Commercially manufactured black powder, percussion caps, safety and pyrotechnic fuses, matches and friction primers, intended to be used solely for sporting, recreational or cultural purposes in antique firearms or antique devices, as defined in Section 921(a)(16) of Title 18 of the United States Code.

(2) Smokeless powder, primers used for reloading rifle or pistol cartridges, shot shells, percussion caps and smokeless propellants intended for personal use.

Flyrock – Overburden, stone, clay or other material ejected from the blast site by the force of a blast.

Magazine – A building or structure used for the storage of explosives.

Misfire – Incomplete detonation of explosives.

Person – A natural person, partnership, association, or corporation or an agency, instrumentality or entity of state government. Whenever used in any clause prescribing and imposing a penalty, or imposing a fine or imprisonment, or both, the term “person” shall not exclude the members of an association and the directors, officers or agents of a corporation.

Particle Velocity – A measure of the intensity of ground vibration, specifically the time rate of change of the amplitude of ground vibration.

Peak Particle Velocity – The maximum intensity of particle velocity.

Primer – A cartridge or package of high explosives into which a detonator has been inserted or attached.

Purchase – To obtain ownership of explosives from another person.

Sale or Sell – To transfer ownership of explosives to another person.

Scaled distance (Ds) – A value calculated by using the actual distance (D) in feet, measured in a horizontal line from the blast site to the nearest building, neither owned nor leased by the blasting activity permittee or their customer, divided by the square root of the maximum weight of explosives (W) in pounds, that is detonated per delay period of less than eight (8) milliseconds.

$$Ds = D \div \sqrt{W}$$

Stemming – Inert material placed in a blast hole after an explosive charge for the purpose of confining the explosion gases to the blast hole, and inert material used to separate explosive charges in decked holes.

Structure – A combination of materials or piece of work built or composed of parts joined together in some definite manner for occupancy, use, or ornamentation. The term includes everything that is built or constructed, including bridges, offices, water towers, silos and dwellings.

Utility Lines – An electric cable, fiber optic line, pipeline or other type of conduit used to transport or transmit electricity, gases, liquids and other media including information.

§211.102. Scope.

(a) The provisions in this chapter apply to persons using, storing, purchasing, and selling explosives and engaging in blasting activities within this Commonwealth. Persons using and storing explosives at underground mines are exempt from the provisions of this chapter; provided however that the storage of explosives in magazines on the surface at an underground noncoal mine is subject to the applicable requirements of this chapter. The provisions of this chapter that are more stringent than the blasting provisions in Chapters 77, 87 and 88 apply to blasting activities at coal or noncoal surface mines.

(b) Compliance with the requirements of this chapter does not relieve a person who is engaged in the purchase or sale of explosives, or blasting activities, from compliance with other applicable laws or regulations of the Commonwealth.

§211.103. Enforcement.

Before issuing an order modifying peak particle velocity or airblast limits in a blasting activity permit, the Department will first give the permittee an opportunity to meet and discuss the modifications.

SUBCHAPTER B
STORAGE AND CLASSIFICATION OF EXPLOSIVES

§211.111. Scope.

This subchapter applies to the classification and storage of explosives. It establishes the requirements, procedures and standards for licensing, constructing, siting and maintaining magazines.

§211.112. Magazine License and Fees.

(a) A person storing explosives shall do so in a magazine licensed by the Department. No person shall construct, install or modify a magazine until the Department has issued or amended the license in writing. The licensee shall store explosives in accordance with the approved application, the license and this chapter.

(b) The license specifies the types and quantities of explosives to be stored in the magazine and any other condition necessary to ensure that the proposed activity complies with applicable statutes and the requirements of this chapter.

(c) Licenses expire annually on December 31 of each year. If the Department receives a complete renewal application by December 31, the licensee may continue to operate under the current license until the Department acts on the renewal application.

(d) License Fees:

(1) License

(a) Application - \$50.00

(b) Site Inspection - \$50.00

(2) License Modifications - \$50.00

(3) License Renewals - \$50.00

(4) License Transfers - no fee

§211.113. Application Contents.

(a) An application to obtain, renew, modify or transfer a magazine license shall be on forms approved by the Department. Before the Department issues, renews, transfers or modifies a license, the application must demonstrate that the applicant has complied with all applicable requirements of this chapter.

- (b) A license application shall include:
- (1) The applicant's identity, including name, address and telephone number.
 - (2) A contact person, including name, title, and telephone number.
 - (3) The types and quantities of explosives to be stored at the magazine.
 - (4) A map, plan, or a sketch of the site location showing the nearest buildings, nearest railways, nearest highways, and existing barricades, if any, and proposed barricades.
 - (5) A plan showing the design and specifications of the magazine to be licensed.
- (c) A license renewal application shall include:
- (1) The applicant's identity, including name, address and telephone number.
 - (2) A contact person, including name, title, and telephone number.
 - (3) The maximum amount and type of explosives for which the magazine is currently licensed.

§211.114. Displaying the License.

The magazine license, or a legible copy of the license, shall be conspicuously displayed. Where possible, the license shall be displayed inside the magazine. In all other cases, the license shall be displayed at the site and adjacent to the magazine to which it applies.

§211.115. Standards for Classifying and Storing Explosives, Constructing, Maintaining and Siting Magazines.

- (a) The provisions of the Code of Federal Regulations (CFR) at 27 CFR Part 55, Subpart K, relating to storage, are incorporated herein by reference. These provisions shall be used to:
- (1) Classify explosives.
 - (2) Determine which class of explosives may be stored in each type of magazine.
 - (3) Determine the quantity of explosives that may be stored.

(4) Determine the applicable construction standards for each type of magazine.

(5) Site the magazine.

(6) Specify maintenance and housekeeping standards for a magazine.

(7) Grant variances.

(b) When reading 27 CFR Part 55 Subpart K, the term “Department” shall be substituted for the term “director”, and the term “representatives of the Department” shall be substituted for the term “ATF Official”.

SUBCHAPTER C PERMITS

§211.121. General Requirements.

(a) Except as otherwise provided in this subchapter, no person may engage in blasting activities, or sell or purchase explosives in the Commonwealth of Pennsylvania without first obtaining the appropriate permit from the Department issued under this chapter.

(b) Permits under this chapter are not required for the sale, purchase or use of fireworks governed by the Act of May 15, 1939, P.L. 134, *as amended* (35 P.S. §§1271, et. seq.).

(c) A permit issued under the Surface Mining Conservation and Reclamation Act, Act of May 31, 1945, P.L. 1198, *as amended* (52 P.S. §§1396.1 – 1396.18); or the Noncoal Surface Mining and Conservation and Reclamation Act, Act of December 19, 1984, P.L. 1093, No. 219, *as amended* (52 P.S. §§3301-3326), and the regulations promulgated thereunder, authorizing blasting activity shall act as a blasting activity permit issued under this chapter.

(d) An application for a permit for the sale or purchase of explosives or to conduct blasting activities shall be on a form provided by the Department. No permit will be issued unless the application is complete and demonstrates that the proposed activities comply with the applicable requirements of this chapter. The permittee shall comply with the approved application, the permit and this chapter.

(e) The Department shall not issue a permit to any person who either:

(1) Has failed and continues to fail to comply with any provisions of this chapter or any condition of a permit issued under this chapter or any order issued to enforce the requirements of this chapter.

(2) Has demonstrated an inability or lack of intention to comply with the requirements of this chapter as indicated by past or continuing violations.

§211.122. Permits to Sell Explosives.

- (a) An application for a permit to sell explosives shall:
 - (1) Identify the applicant's name, address, telephone number, and type of business.
 - (2) Identify a contact person, including name, title, and telephone.
 - (3) Specify the type of explosives to be sold.
 - (4) State whether the applicant will purchase or manufacture the explosives to be sold.
 - (5) For in-state sellers, include the applicant's magazine license number, if applicable.
- (b) Permits to sell explosives are not transferable.
- (c) Permits to sell explosives expire on April 30 of each year. If the Department receives a complete renewal application by April 30, the permittee may continue to operate under the current permit until the Department acts on the renewal application.
- (d) A permit to sell explosives shall:
 - (1) Identify the permittee.
 - (2) Specify the type of explosives that the permittee may sell.
 - (3) Contain conditions, as necessary, to ensure that the proposed activity complies with the requirements of applicable statutes and this chapter.

§211.123. Permits to Purchase Explosives.

- (a) An application for a permit to purchase explosives shall:
 - (1) Identify the applicant's name, address, telephone number and type of business.
 - (2) Identify a contact person, including name, title, and telephone.
 - (3) Identify the location and license number of the magazine to be used for storing the explosives, if applicable.

- (4) Specify the type of explosives that will be purchased.
- (5) Specify whether the explosives are being purchased for sale or use by the permittee.

(b) Permits to purchase explosives are not transferable.

(c) Permits to purchase explosives expire on April 30 of each year. If the Department receives a complete renewal application by April 30, the permittee may continue to operate under the current permit until the Department acts on the renewal.

§211.124. Blasting Activity Permits.

(a) An application for a blasting activity permit shall be prepared by a blaster and shall include:

- (1) The applicant's name, address, telephone number, and type of business.
- (2) A contact person's name, title and telephone number.
- (3) The identity of independent subcontractors who will be performing the blasting activities.
- (4) The type of explosives to be used.
- (5) The maximum amount of explosives that will be detonated per delay interval of less than 8 milliseconds.
- (6) The maximum amount of explosives that will be detonated in any one blast.
- (7) A map indicating the location where the explosives will be used.
- (8) The purpose for which the explosives will be used.
- (9) The location and license number of the magazine that will be used to store the explosives, if applicable.
- (10) A description of how the monitoring requirements of Subchapter G (relating to Requirements for Monitoring) will be satisfied.
- (11) Proof of third party general liability insurance in the amount of \$300,000 or greater per occurrence. This requirement is not applicable if the permittee is a noncoal surface mine operator who produces no more than 2,000 tons (1,814 metric tons) of marketable minerals per year from all its noncoal surface mining operations.

(12) The anticipated duration of the blasting activity for which the permit is needed.

(13) The anticipated days of the week and times when blasting may occur.

(14) The distance and direction to the closest building not owned by the permittee or their customer.

(15) Other information needed by the Department to determine compliance with applicable laws and regulations.

(16) The printed name, signature and license number of the blaster who prepared the application.

(17) Proof that notice of the blasting activity was published in a newspaper of general circulation, or that documentable notification of residents occurred within 200 feet (65.61 meters) of the blast site informing them that blasting would occur.

(b) Blasting activity permits are not transferable.

(c) The blasting activity permit shall specify:

(1) The blasting activity permittee.

(2) Any independent subcontractors performing work under this permit.

(3) Limits on particle velocity and airblast.

(4) The types of explosives that may be used.

(5) The duration of the permit.

(6) Other conditions necessary to ensure that the proposed blasting activity complies with the requirements of applicable statutes and this chapter.

(d) The permittee may request extensions and modifications by submitting an amended application.

§211.125. Blasting Activity Permit-by-Rule.

(a) A person shall be deemed to have a permit for a blasting activity if:

(1) All blasts are designed and performed for a scaled distance of 90 or greater.

(2) No more than 15 pounds (6.81 kilograms) of explosives are detonated per delay interval of less than 8 milliseconds.

(3) The total charge weight per blast does not exceed 150 pounds (68.18 kilograms).

(4) The person notifies the Department either verbally, in writing, or by other means approved by the Department prior to the initial blast. If the person gives verbal notification, a written notice shall be received by the Department within 5 working days. The notification shall indicate the following information for all blasts that will occur under this permit:

- (i) The identity of the person.
- (ii) The location where the blasting will occur.
- (iii) The purpose of the blasting.
- (iv) The distance to the nearest building not owned or leased by the person or their customer.
- (v) The days of the week and times when blasting may occur.
- (vi) The duration of blasting activities under this permit-by-rule.
- (vii) The minimum scaled distance.
- (viii) The maximum weight of explosives detonated per delay period of less than 8 milliseconds.
- (ix) The maximum total weight of explosives per blast.
- (x) A contact person and phone number.

(5) Blast reports are completed in accordance with §211.133 (relating to blast report).

(6) All other monitoring and performance standards of this chapter are met.

(b) The Department may revoke a blasting activity permit-by-rule if:

(1) The permittee has demonstrated an unwillingness or inability to comply with the applicable regulations; or

(2) The blasting activity possesses a sufficient risk of harm to the public or the environment to warrant an individual blasting activity permit.

SUBCHAPTER D
RECORDS OF DISPOSITION OF EXPLOSIVES

§211.131. Sales Records.

The seller shall keep an accurate record of every sale of explosives for a period of three years. The record shall identify the purchaser's name and address, the Department purchase permit number, the date of the sale, and the amount and types of explosives.

§211.132. Purchase Records.

The purchaser shall keep a record of all purchases of explosives for a period of three years. The record shall identify the date, types and amounts of explosives purchased, and the name and address of the seller.

§211.133. Blast Report.

(a) The blaster-in-charge shall prepare a report of each blast. The purpose of this report is to provide the Department with enough information to enable it to recreate the blast. The Department may develop and require a blast report form to be used. The blasting activity permittee shall retain the blast report for at least three years and shall make the blast report available to the Department upon request. Blast reports shall contain, at a minimum, the following:

- (1) The locations of the blast and monitoring readings.
- (2) The name of the blasting activity permittee.
- (3) The permit number.
- (4) The date and time of the blast.
- (5) The printed name, signature, and license number of the blaster-in-charge.
- (6) The type of material blasted.
- (7) A sketch showing the number of blast holes, burden, spacing, pattern dimensions, and point of initiation.
- (8) The diameter and depth of blast holes.
- (9) The height or length of stemming and deck separation.

- (10) The types of explosives used and arrangement in blast holes.
- (11) The total weight in pounds of explosives and primer cartridges used.
- (12) The maximum weight in pounds of explosives detonated per delay period of less than eight (8) milliseconds.
- (13) The type of circuit, if electric detonation was used.
- (14) The direction and distance in feet from the blast site to the nearest building not owned by the blasting activity permittee or their customer.
- (15) A description of the nearest building location based upon local landmarks.
- (16) The scaled distance.
- (17) The weather conditions.
- (18) The direction from which the wind was coming.
- (19) The measures taken to control flyrock, including whether or not mats were used.
- (20) The total quantity and type of detonators used and delays used.
- (21) The number of individuals in the blasting crew.
- (22) The maximum number of blast holes or portions of blast holes detonated per delay period less than eight (8) milliseconds.
- (23) The monitoring records required by §211.173 (relating to monitoring records). Monitoring records shall be made part of the blast report within 30 days of the blast. Beginning _____ (3 years from the effective date of the regulation), monitoring records shall be made part of the blast report within 7 days of the blast.
- (24) If a misfire occurred, the actions taken to make the site safe.

(b) The Department may require monthly summaries of these reports. The summaries shall include the date and time of the blasts, scaled distance, peak particle velocity, airblast, monitoring location, amount and types of explosives used and any other information the Department deems necessary to ensure compliance with this chapter.

SUBCHAPTER E TRANSPORTATION OF EXPLOSIVES

§211.141. General Requirements.

The blasting activity, purchase or sale permittee shall:

- (1) Immediately unload a vehicle carrying explosives upon reaching a magazine location. The unloaded vehicle shall be removed from the site. The only exception to this requirement is if the vehicle is a licensed magazine pursuant to Subchapter B (relating to the storage of explosives).
- (2) Load or unload explosives from a vehicle only after the engine is turned off, unless power is needed for the loading or unloading operation. The permittee shall take all precautions necessary, such as blocking the wheels, to prevent the movement of the vehicle while it is being loaded or unloaded.
- (3) Load explosives only into a vehicle that is marked in accordance with the Pennsylvania Department of Transportation standards for placarding vehicles transporting explosives.
- (4) Prohibit smoking within 100 feet of a vehicle used for transporting explosives. "NO SMOKING" signs shall be posted when a vehicle containing explosives is parked at a blast site or magazine.
- (5) Load no more than 2,000 pounds (908 kilograms) of explosives into an open body vehicle for transporting. The ends and sides shall be high enough to prevent explosives from falling off, and the load shall be covered with a fire-resistant tarpaulin, unless the explosives are transported in a magazine securely attached to the vehicle.
- (6) Only load explosives into a closed body vehicle if the load is 2,000 pounds (908 kilograms) or more of explosives.
- (7) Only load explosives into a vehicle with a bed made of wood or other non-sparking material.
- (8) Load explosives into a vehicle which is also transporting metal, metal tools, blasting machines, or other articles or materials likely to damage the explosives, only if such items are separated from the explosives by substantial non-sparking bulkheads so constructed as to prevent damage to the explosives.
- (9) Load detonators and other explosives into the same vehicle only if the detonators are in containers that conform to the current version of the Institute of Makers of Explosives Safety Library Publication #22 available from the Institute of Makers of Explosives, 1120 Nineteenth Street, N.W., Suite 310, Washington, DC 20036-3605.

(10) Not load explosives into the same vehicle with materials such as matches, firearms, electric storage batteries, corrosive compounds, flammable substances, acids, oxidizing agents, and ammonium nitrate not in the original containers.

(11) Only load explosives into vehicles equipped with at least two fire extinguishers approved and coded by the National Board of Underwriters. All fire extinguishers shall be easily accessible and ready for immediate use. If the vehicle has:

(A) A gross weight of 14,000 pounds (6356 kilograms) or less, the extinguishers shall have a combined capacity of 4-A:20-B,C, or equivalent.

(B) A gross weight of greater than 14,000 pounds (6356 kilograms) and for tractor/semi-trailers, the extinguishers shall have a combined capacity of 4-A:70-B,C, or equivalent.

(12) Load explosives into a vehicle so that explosives containers are not exposed to sparks or hot gases from the exhaust tailpipe. Exhaust systems that discharge upwards are recommended to avoid possible exposure of sparks or hot gases to explosives.

(13) Only load explosives into vehicles that have passed the state safety inspection or certification.

SUBCHAPTER F BLASTING ACTIVITIES

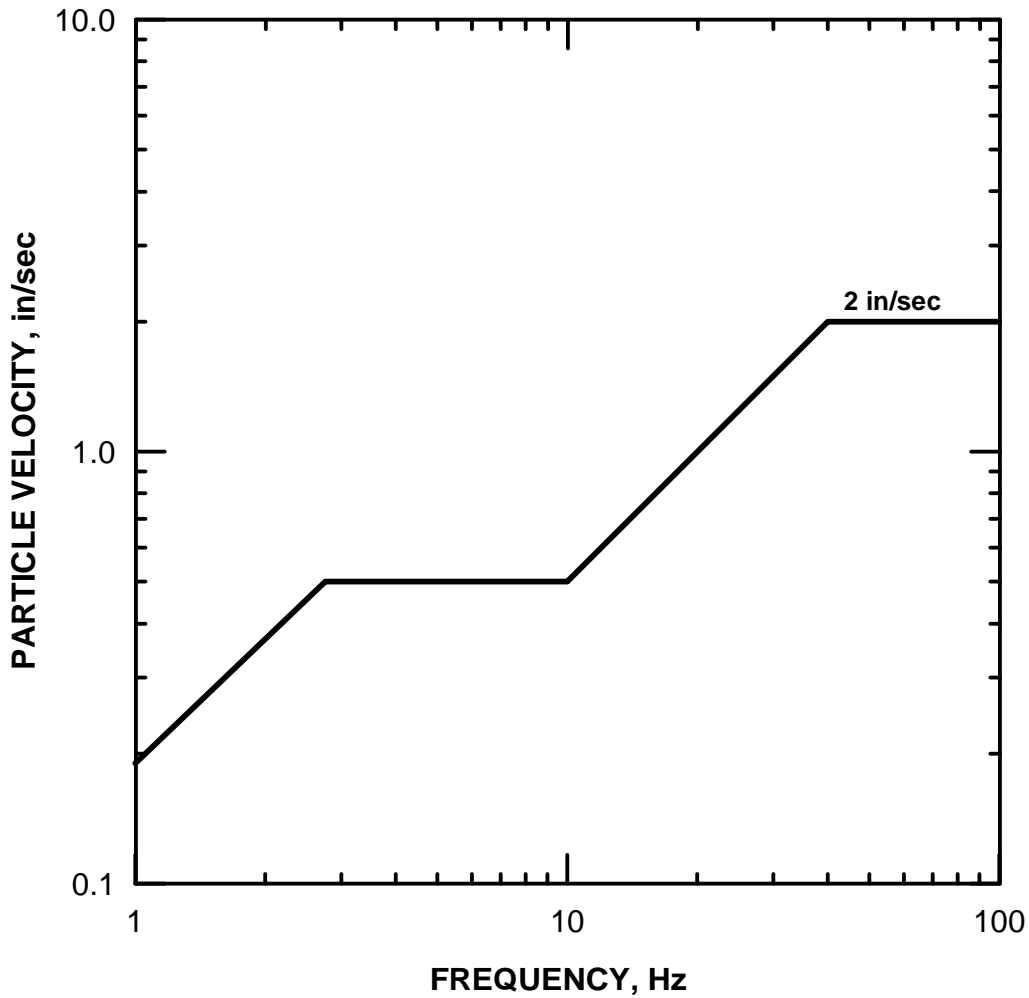
§211.151. Prevention of Damage.

(a) Blasting shall not damage real property except for real property under the control of the permittee. If damage occurs, the blaster-in-charge shall notify the Department within four hours of learning of the damage.

(b) Blasting shall not cause flyrock. If flyrock occurs, the blaster-in-charge shall notify the Department within four hours of learning of the flyrock.

(c) Blasts shall be designed and conducted in a manner that achieves either a scaled distance of 90 or meets the maximum allowable peak particle velocity as indicated by Figure 1. However, blasting activities authorized prior to _____ (effective date of the regulation) may continue as authorized unless the authorization is modified, suspended or revoked by the Department. The scaled distance and maximum allowable peak particle velocity does not apply at a building or other structure owned or leased by the permittee or their customer.

Figure 1.



(d) Blasts shall be designed and conducted to control airblast so that it does not exceed the noise levels specified in Table 1 at a building or other structure designated by the Department unless the building is owned or based by the permittee or their customer.

Table 1	
Lower frequency limits of measuring System in Hz(+3dB)	Maximum allowable levels in dBL
0.1 Hz or lower – flat response*	134 peak
2.0 Hz or lower – flat response	133 peak
6.0 Hz or lower – flat response	129 peak
C – weighted – slow response*	105 peak
*only when approved by the Department	

(e) The Department may reduce the maximum peak particle velocity or airblast level if it determines that a lower standard is appropriate because of density of population, land use, age or type of structure, geology or hydrology of the area, frequency of blasts or other factors.

§211.152. Control of Noxious Gases.

A blast shall be conducted in such a manner that the gases generated by the blast do not affect the health and safety of individuals. Effects from gases may be prevented by taking measures, and such as venting the gases to the atmosphere, interrupting the path along which gases may flow, evacuating people from areas that may contain gases.

§211.153. General Requirements for Handling Explosives.

(a) Only a non-ferrous, non-sparking tool shall be used to open containers of explosives.

(b) Matches, lighters and smoking are prohibited within 100 feet (30.84 meters) of the blast site and areas where explosives are used or stored.

(c) If it becomes necessary to destroy damaged or deteriorated explosives, the permittee shall immediately contact the manufacturer for technical advice and assistance.

(d) Detonators shall not be forced into cartridges of explosive or cast boosters. Detonators shall be completely inserted into a hole in an explosive cartridge made with an approved powder punch or into the detonator well of a cast booster.

(e) Explosives shall not be left unattended. They are to be stored in a licensed magazine or kept under the permittee's supervision and control.

(f) A loaded blast shall always be under the continuous observation of the blaster-in-charge or his designee.

(g) Shooting or carrying ammunition or firearms on a blast site and in areas where explosives are used or stored is prohibited, except for material needed to initiate the blast.

(h) If blasting activities are conducted in the vicinity of electric lines such as transmission lines or electrified railways, a test shall be made for presence of stray electric currents. Electric blasting caps may not be used if stray electric currents in excess of 50 milliamperes are present.

(i) A package of explosives shall not be thrown, slid along floors or over other packages of explosives, or handled roughly in any manner.

(j) If an electrical storm approaches an area where there is an activity involving explosives, the area shall be cleared by the permittee or licensee, who shall post guards at all approaches to prevent trespass of unauthorized persons.

(k) Explosives and equipment that are obviously damaged or deteriorated shall not be used.

(l) Explosives may not be abandoned.

§211.154. Preparing the Blast.

(a) The blasting activity permittee shall designate a blaster-in-charge for each blast. The blaster-in-charge shall control and supervise the blasting activity. The blaster-in-charge is responsible for all effects of the blast.

(b) Only equipment necessary for loading blast holes may be allowed to operate within 50 feet (15.24 meters) of the blast site. The Department may establish in writing a different distance limitation.

(c) No person shall prepare or detonate a blast unless another person is present, able and ready to render assistance in the event of accident or injury.

(d) The blaster-in-charge shall make every effort to determine the condition of the material to be blasted from the individual who drilled the blast holes or from the drill log.

(e) Only the blaster-in-charge, other blasters, and up to six assistants per blaster may be at a blast site once loading of blast holes begins.

(f) While loading a blast hole, the following measures shall be followed:

(1) Ferrous material shall not be used in the blast hole unless the use is approved by the Department in writing. This includes the use of steel casings, ferrous tools and retrieving equipment.

(2) Only non-ferrous, non-sparking tamping sticks may be used in loading a blast hole. Sectional poles connected by brass fittings are permitted, provided that only the wooden end of the pole is used for tamping. Retrieving hooks shall be made from non-sparking metal such as brass or bronze.

(3) When using a pneumatic loading device, every precaution shall be taken to prevent an accumulation of static electricity. A loading operation shall be stopped immediately if static electricity or stray electrical currents are detected. The condition shall be remedied before loading may be resumed.

(4) The blast hole shall be carefully checked for obstructions with a wooden tamping pole, a tape, a light, or a mirror before it is loaded. The use of magnifying mirrors is prohibited. Explosives shall not be forced past an obstruction in a blast hole.

(5) The blast hole shall be logged to measure the amount and location of explosives placed in the blast hole. The information is to be recorded on the blast report required by §211.133 (relating to blast report).

(6) A blast hole containing loose dynamite shall be stemmed but not tamped.

(7) The Department may specify the type and amount of stemming.

(g) Before connecting one loaded blast hole to another, all activity within the blast area must cease, and all non-essential persons shall retreat to a safe place. The blaster-in-charge shall determine the blast area.

(h) Primers shall be prepared only at the hole to be loaded, immediately prior to loading. The components of the primer are to be kept separated at the collar of the blast hole. The primer may not be slit, dropped, deformed, or carelessly handled and may not be tamped or forced into the blast hole.

(i) Immediately upon completing the loading of a blast hole, any wood, paper or other materials used to pack explosives shall be inspected for the presence of explosives and removed to an isolated area. These materials may be burned after the blast has been fired. No person shall be within 100 feet (30.48 meters) of these burning materials.

(j) Measures shall be taken to reduce the chance of fly rock including:

(1) The use of blasting mats or other protective devices, if, in the opinion of the blaster-in-charge, such measures are necessary to prevent injuries to persons or damage to property.

(2) When blasting to an open, vertical face, checking the face for loose, hanging material or other faults prior to loading the blast holes.

(k) Explosives shall not be brought to a blast site in greater quantities than that needed for that blast. Surplus explosives may not be stored at the blast site.

(l) Before a blast hole is loaded, it shall be checked to ensure that it is cool and does not contain any hot metal or smoldering material remaining from drilling the hole.

(m) The use of abrasive or sharp-edged constituents in stemming material shall be avoided if tamping is necessary and the tamping may sever blasting cap leg wires, shock tubes, or detonating cords.

(n) Blasting activities may not be conducted within 800 feet (243.84 meters) of a public roadway unless precautionary measures are taken to safeguard the public. Precautionary measures include stopping or slowing of traffic and posting signs.

§211.155. Preblast Measures.

Prior to detonating a blast, the blaster-in-charge shall:

- (1) Ensure that all excess explosives have been removed from the blast area and are located in a safe area.
- (2) Inspect the blast site to ensure that connections are proper and adequate.
- (3) Ensure that the blast area is cleared and safeguarded.
- (4) In addition to the warning signal, see that all persons who may be in danger are notified.
- (5) Ensure that the necessary precautions are in place to protect the public on public roads.
- (6) At least 1 minute but no more than 2 minutes prior to detonation, sound a warning signal of 3 blasts, each lasting approximately 5 seconds. The warning signal shall be of sufficient power to be heard 1,000 feet (304.80 meters) from the blast site.

§211.156. Detonating the Blast.

- (a) A blast may be detonated only between sunrise and sunset unless the Department authorizes a blast at another time of day.
- (b) Only the blaster-in-charge may detonate a blast.

§211.157. Postblast Measures.

- (a) After a blast has been detonated, no one may return to the blast area until all smoke and fumes have dissipated.
- (b) After the smoke and fumes have cleared, the blaster-in-charge shall return to the blast site and closely inspect the blast site to ensure that it is safe with respect to the blasting activity.
- (c) After the blaster-in-charge has determined the blast area is safe, the blaster-in-charge shall sound an all-clear signal, consisting of 1 long blast, lasting approximately

10 seconds. This all-clear signal shall be of sufficient power to be heard 1,000 feet (304.80 meters) from the blast site.

(d) The blaster-in-charge shall determine if a misfire occurred and shall take all actions necessary to render the blast site safe. The blast site shall be made safe before drilling or muck removal begins.

(e) If the blaster-in-charge suspects that undetonated ammonium nitrate/fuel mixture remains in the muck pile, the muck pile must be thoroughly wetted down with water before any digging is attempted. Special attention must be given to determine if primers, other explosives or detonators are present in the muck pile.

(f) The blaster-in-charge shall immediately complete the blast report as required by §211.133 (relating to blast report).

(g) The blaster-in-charge shall notify the Department within 24 hours of the occurrence of a misfire. A copy of the blast report shall be forwarded to the Department.

§211.158. Mudcapping.

Mudcapping in blasting activities is allowed only if the blaster-in-charge determines that drilling the material to be blasted would endanger the safety of the workmen. If mudcapping is necessary, no more than 10 pounds (4.53 kilograms) of explosives shall be used for a blast.

§211.159. Electric Detonation.

(a) Electric blasting caps shall be tested for continuity with a blaster's galvanometer or blaster's multimeter specifically designed for testing blasting circuits. Testing shall be done:

- (1) Before the primers are made up.
- (2) After the blast hole has been loaded but prior to stemming.
- (3) As the final connecting of the circuit progresses.

(b) When a shunt is removed from electric blasting cap leg wires, the exposed wires shall be re-shunted.

(c) Electric blasting caps shall not be employed in a blast if there is any possibility of wires from the circuit being thrown against overhead or nearby electric lines.

(d) No effort shall be made to reclaim or re-use electric blasting caps if the leg wires have been broken off near the top of the cap.

(e) Leg wires on electric blasting caps shall extend above the top of the blast hole. Wire connections and splices are not allowed in the blast hole.

(f) Only solid wire shall be used in a blasting circuit. The use of stranded wire is prohibited.

(g) When electric detonation is used near public roads, signs shall be erected at least 500 feet (152.40 meters) from the blast areas reading: "BLAST AREA – SHUT OFF ALL TWO-WAY RADIOS".

(h) A blasting machine is the only permissible source of electrical power for a detonation.

(i) The blasting circuit shall remain shunted until the time for detonation unless the circuit is being tested or connections are being made.

(j) Blasting machines must display a sticker that shows they have been tested within the last 30 days by procedures recommended by the manufacturer or supplier to ensure performance at rated capacity. If blasting caps are used in the test, they shall be covered with earth or sand.

(k) When electronic detonation is used, the blaster-in-charge shall determine that adequate current, as specified by the manufacturer of the detonators, is available to properly energize the detonators in the circuit.

§211.160. Non-Electric Detonation.

Non-electric initiation systems shall be checked and tested for secure connections in accordance with recommendations of the manufacturer of the system in use.

§211.161. Detonating Cords.

(a) Detonating cord shall be cut from the supply roll immediately after placement in the blast hole. A sufficient length of downlines shall be left at the top of the blast hole for connections to trunklines. The supply roll shall be immediately removed from the site. All scrap pieces of detonating cord shall be destroyed after connections are made.

(b) A trunk line shall be covered with at least 12 inches (0.30 meters) of earth or sand, unless otherwise authorized by the Department.

(c) Detonating cord shall not be spliced if the resulting splice will fall within a blast hole.

§211.162. Safety Fuse.

(a) When safety fuse is used in blasting, it shall be long enough to provide a burn time of 120 seconds or longer.

(b) Prior to using safety fuse, the blaster-in-charge shall conduct a test burn. The test burn will utilize at least a 12-inch (0.30-meter) section of fuse which is lit, then timed to determine actual burn time.

(c) A blasting cap shall only be crimped to a safety fuse with a proper crimping tool. No blasting cap shall be attached to safety fuse in or within 10 feet (3.05 meters) of a magazine.

**SUBCHAPTER G
REQUIREMENTS FOR MONITORING**

§211.171. General Provisions for Monitoring.

(a) If the scaled distance of a blast is 90 or numerically less at the closest building not owned or leased by the blasting activity permittee or their customer, ground vibration and airblast monitoring shall be conducted. The Department may require the permittee to conduct ground vibration and airblast monitoring at other buildings or structures even if the scaled distance is greater than 90.

(b) Blasting activities without monitoring may be considered in compliance with this chapter if at a specified location, on at least 5 blasts, monitoring has demonstrated that the maximum peak particle velocity at the specified location represents more than a fifty percent (50%) reduction from the limit in the permit and this chapter. All future blasts shall maintain a scaled distance equal to or greater than the scaled distance for the monitored blasts.

(c) If monitoring is required, a ground vibration and airblast record of each blast shall be made part of the blast report.

(d) If monitoring is performed with instruments that have variable “trigger levels”, the trigger for ground vibration shall be set at a particle velocity of no more than 50% of the compliance limit unless otherwise directed by the Department.

(e) If the peak particle velocity and airblast from a blast are below the set trigger level of the instrument, a printout from the instrument shall be attached to the blast report. This printout shall provide the date and time when the instrument was turned on and off, the set trigger levels and information concerning the status of the instrument during the activation period.

§211.172. Monitoring Instruments.

If monitoring is required, the monitoring instrument shall provide a permanent record of each blast.

- (1) A monitoring instrument for recording ground vibration, at a minimum, shall have:
 - (A) A frequency range of 2 Hz to 100 Hz.
 - (B) Particle velocity range of .02 to 4.0 inches (5.08×10^{-4} to 0.10 meters) per second or greater.
 - (C) An internal dynamic calibration system.
- (2) A monitoring instrument used to record airblast shall have:
 - (A) A lower frequency limit of 0.1, 2.0 or 6.0 Hz.
 - (B) An upper end flat-frequency response of at least 200 Hz.
 - (C) A dynamic range that, at a minimum, extends from 106 to 142 dBL
- (3) A monitoring instrument shall be calibrated annually and when an instrument is repaired and the repair may effect the response of the instrument. Calibration shall be done by the manufacturer of the equipment, or by an organization approved by the manufacturer, or by an organization having verifiable knowledge of the calibration procedures developed by the manufacturer. The calibration procedure must include testing the response of the entire system to externally-generated dynamic inputs. These inputs must test the entire monitoring system at a sufficient number of discrete frequency intervals to assure flat response throughout the frequency ranges specified by the regulations. Dynamic reference standards used for calibration must be traceable to the National Institute of Standards and Technology (NIST). Calibration procedures and documentation of calibration shall be made available for review by the Department.
- (4) A non-alterable sticker that is clearly visible shall be firmly affixed to the instrument. The sticker shall indicate the name of the calibration facility, the calibration technician, the date of calibration, and frequency range of the airblast monitor.

211.173. Monitoring Records.

- (a) Anyone using a monitoring instrument shall be trained on the proper use of that instrument by a representative of the manufacturer or distributor, or other competent individual. A record of that training is to be maintained and available for review by the Department.

- (b) Monitoring records, at a minimum, shall contain:
- (1) Calibration pulse.
 - (2) Calibration signal of the gain setting, for instruments with variable gain settings.
 - (3) Time history of particle velocities for 3 mutually perpendicular ground vibration traces and 1 air-overpressure trace, including time base, amplitude scales and peak values for all traces.
 - (4) Results of a field calibration test for each channel.
 - (5) Frequency content of all vibration signals using either single degree of freedom (SDF) response spectrum or half-cycle zero-crossing analysis methods.
 - (6) Frequency versus particle velocity plots as indicated in Figure 1 of §211.151(c) (relating to prevention of damage).
 - (7) Name and signature of the individual taking the recording.
 - (8) The location of the monitoring instrument, date and time of the recording.
 - (9) The last calibration date of the monitoring instrument.
- (c) The Department may require a ground vibration or airblast recording to be analyzed or certified by an independent, qualified consultant who is not related to the blasting activity permittee or its customer. When the Department requires that a recording be analyzed or certified, it must be performed and included with the blast report within 30 days.

SUBCHAPTER H BLASTING ACTIVITIES NEAR UTILITY LINES

§211.181. Scope.

The provisions of this subchapter apply to buried or underground utility lines and utility lines making contact with the surface of the ground.

§211.182. General Provisions.

(a) Blasts shall be designed and conducted in a manner that provides the greatest relief possible in a direction away from the utility line, so as to keep the resulting vibration and actual ground movement to the lowest possible level.

(b) Blasting shall use a type of explosive specifically designed to minimize the likelihood of propagation between explosive charges.

(c) When blasting within 200 feet (60.96 meters) of a utility line, blast holes may not exceed 3 inches (7.62×10^{-2} meters) in diameter.

(d) Blasting in the vicinity of a utility line shall be conducted as follows:

(1) Excavation from the ground surface to a depth corresponding to the elevation of the top of the buried utility line may proceed at the discretion of the blaster-in-charge, using safe, accepted techniques.

(2) Once the excavation has attained a depth equal to the elevation of the top of the buried utility line or if the line is exposed, or makes solid contact with the surface, the vertical depth of subsequent blast holes shall be restricted to 1/2 the horizontal distance from the closest portion of the utility line.

(e) If one or more of these provisions is not feasible or creates a potential safety problem, the permittee may apply to the Department for a waiver of the provision or provisions in question. This waiver will be granted if, in the judgment of the Department, the alternate procedure does not endanger the utility line.