Original: 2120

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Subject: Testimony on Proposed Rulemaking for Blasting **Date:** July 6, 2000

To: Environmental Quality Board **From:** Alvin (Mike) Best

Section 211.151 addresses the prevention of damage. In this section, it is proposed to change the scale distance to 90 as opposed to the current 55. This is a 61% increase over the current standard. On an average, here at RFI Energy, our parting shots average 1,100 pounds per delay. Under current regulations, we would seismograph this shot if the closest dwelling was within 1,824 feet. Under the new proposal, we would have to seismograph the closest dwelling within 2,985 feet. This is a very significant difference and will take a lot of time to prove nothing. You justify this change by saying that the department's experience shows that the federal standards for coal mining do not adequately protect structures from damage due to ground vibration. I would like to have a copy of the study that the department conducted to prove this to be true. Our experience, which is quite extensive, proves that the scale distance of 55 adequately protects structures. Most damage complaints are a result of a landowner feeling the blast to some degree. They then start looking around for cracks and upon finding them, a complaint is filed. Further investigation usually proves that the conditions were preexisting or due to inadequate construction. This change will result in significant additional cost because it will probably involve an additional man on our crew just to keep up with the seismographing that will be necessary to stay in compliance. There are very few places in Pennsylvania where you can mine and be farther than 2,900 feet from a structure.

It is also proposed that if we are blasting within the scale distance of 90, then our blast frequencies must fall below the B.O.M. maximum frequency level for no damage. To the best of our knowledge, there is no way to predict blast frequencies. We realize that generalizations can be made, but our experience has proven that this is not an exact science. Since this B.O.M. curve is being proposed into law, how does the department intend to handle a case where 9 out of 10 shots fall under the curve, but the 10th shot falls outside the range? What changes does the blaster make to ensure that the frequency isn't exceeded? How do you regulate frequency when it is not an exact science?

Section 211.182 addresses blasting activities near utility lines. Clarification is needed for electric transmission lines. Does the 200 foot limit apply to the structures only, or does it apply to the actual line that in some cases may be 150 feet in the air. Some of these structures are 2,000 feet apart or more. It does not make any sense to require special drilling when you are more than 200 feet from the structure, but within 200 feet of the cable.

Finally, the proposed rulemaking gives D.E.P. and its inspectors a free hand in changing blasting limits as it sees fit. There is no mention of sound scientific evidence coming into play or extensive investigation being necessary in order to change limits. This proposed rulemaking does not permit an operator to challenge the changes to the limits that D.E.P. has invoked. Whenever a free hand is given to any authority, almost always, abuses occur. In this case, it could cause the unnecessary loss of work or employment. Furthermore, the proposed rulemaking does not require inspectors to become actively involved in complaints. In most cases, complaints are unfounded and need a third, neutral party to intervene. This would normally help solve the problem. As is usually the case, D.E.P. is proposing rulemaking that, in their opinion, will eliminate complaints and therefore the need to investigate them. All this at the expense of doing any business or improvements in Pennsylvania. One thing that this rulemaking will do for Pennsylvania is stymie progress and cost jobs, and as always, does very little to actually solve the problem that it was intended to do.

Original: 2120

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JULY 6, 2000

Proposed rulemaking
Environmental quality board

CHANGES TO BE ADDRESSED IN 25 PA. CODE CHS. 210 AND 211

210.14

(b) , (2) The applicant has demonstrated an <u>inability or lack of intention</u> to comply with the Department's regulations concerning blasting activities.

Should this be? The applicant has demonstrated an ability or intention to comply with the Department's regulations concerning blasting activities.

210.17

(a), A blaster's license is issued for a specific classification of blasting activities. The classifications will be determined by the department and may include general blasting (Which includes all classifications EXCEPT DEMOLITION and underground noncoal mining), trenching and construction, seismic and pole line work, well perforation, surface mining, underground noncoal mining, industrial, limited and DEMOLITION.

Demolition activity. The act of demolishing a structure with explosives.

Any man made structure? Bridge abutments, Silos, bridges could all be considered construction.

Demolition has always been covered under a general license and still should be. . Blasters with a general license have been doing demolition blasting and should be at least Grand fathered into a demolition license.

What classifies as Demolition as opposed to construction blasting?

(d), A blaster's license is renewable if the blaster can demonstrate that he has had 8 hours of continuing education in Department-approved courses related to blasting and safety within the 3-year period.

This needs to be clarified,

Continued on Page 2

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July 6, 2000

PROPOSED RULEMAKING ENVIRONMENTAL QUALITY BOARD

CHANGES TO BE ADDRESSED IN 25 PA. CODE CHS. 210 AND 211

In house training?
Explosive Manufactures?
Third Party Training?
8 Hour MSHA Refresher Training?
Society of Explosive Engineers Chapters Meetings ?
Pa Drilling And Blasting Conference?

Subchapter E. TRANSPORTATION OF EXPLOSIVES

211.141 General requirements.

(6). **Only load explosives into a closed body vehicle if the load is 2,000 pounds (908 kilograms) or more of explosives.**

Should be: Any load of explosives that exceeds 2,000 pounds (908 kilograms) or more of explosives must be transported in a closed body vehicle.

211.151. Prevention of damage.

(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 adoption date) may continue as authorized unless the authorization is modified, suspended o revoked by the department.**

Continued on page 3

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July 6, 2000

PROPOSED RULEMAKING
ENVIRONMENTAL QUALITY BOARD

CHANGES TO BE ADDRESSED IN
25 PA. CODE CHS. 210 AND 211

The scaled distance has always been set at 50 for construction and industrial minerals and 60 for coal. To change to a scale distance of 90 and to use the Z curve as the only criteria for seismic reports and vibration control is unnecessary and puts a unnecessary burden on blasters and blasting companies with very little if any additional benefits to the public. To make the scale distance 60 for all operations and have the option to use the Z curve criteria would be more appropriate.

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 permitte or its customer, ground vibration and airblast monitoring shall be conducted. The department may require the permittee to conduct ground vibration and air blast monitoring at other buildings or structures even if the scaled distance is greater than 90.

The scaled distance for all locations should be set at 60. Any scale that is higher should not require monitoring. If complaints are received and the scale is higher than the Department requires for monitoring the Department should be responsible for monitoring at that location.

Breck Neeper.
Safety Director .

Original: 2120

COMMENTS TO ENVIRONMENTAL QUALITY BOARD ON PROPOSED 25 PA. CODE CHAPTER 211

Presented by
VIBRA-TECH ENGINEERS, INC.

July 5, 2000

§ 211.133 deletes the requirement for analysis or certification of seismograph records by a qualified independent consultant. We feel strongly that the elimination of this requirement substantially reduces the quality of the data required by blasters to show compliance and protect structures from damage. Furthermore, simply requiring better training of blasters or their helpers, as required in **§ 211.173**, will do little to solve this problem.

The main interest of blasters when they use a seismograph is to get low readings. Few blasters, despite their pride and competence in their chosen field, are particularly interested in becoming knowledgeable about seismology, or are willing to take the time and care required to record ***accurate*** seismic data over the wide range of field conditions they encounter. This knowledge and experience is extensive, as you will find after examining the document recently published by the **International Society of Explosives Engineers**, entitled 'Field Practice Guidelines for Blasting Seismographs', which we are including with these comments.

It is a leap of faith for the Department to expect blasters or their helpers to be able to properly analyze the seismograph data from their blasts. In addition to the obvious inherent conflict of interest, very few blasters have either the motivation or the background to understand the many nuances of a typical seismograph recording. To most blasters, a seismic record is simply a cluster of wiggly lines with numbers that tell them whether or not they are in compliance. And as long as the numbers are good, most blasters have no interest in determining whether the seismograms they attach to their blast reports are indeed valid and accurate representations of the effects of their blasts on adjacent structures.

These are major reasons why operators and explosives contractors use the services of independent professional seismologists who set up, interrogate, and maintain permanent seismograph stations at critical locations around their blasting operations. Each year, the practice of using permanent blast monitors controlled by third-party professionals is becoming more commonplace. We feel that this practice improves the quality of seismograph monitoring, and should be encouraged by the Department.

However, the Department's proposed requirement to make seismic records part of the blast report within 7 days of a blast will eliminate this option. While we agree that cases will certainly arise where the Department may need seismograph information quickly, we request that you preserve this option of independent blast monitoring by making the requirement more flexible. This could be accomplished by the following wording: **'Monitoring records shall be made part of the blast report within 7 days if specifically requested by the Department, but in no case more than 30 days.'**

In our opinion, it is in the interest of the Department and the citizens of the Commonwealth to involve the services of seismic professionals as much as possible without being an undue burden to the industry. These are the individuals whose careers are based on knowing how to use seismographs properly under a wide range of conditions, and to determine the accuracy and validity of the data they produce. No seismograph, no matter how advanced, can do these things by itself. A seismograph cannot tell you if it is programmed to record a particular blast properly; if it is located in the correct place; if it is coupled to the ground in a way that reads vibrations accurately; whether the recorded event was corrupted by radio frequency or other interference; or even if that event is from the blast in question. Furthermore, as a practical matter, there is only so much that we, as seismic professionals, can do to train a blaster, an explosives truck driver, or a driller about how to perform our work.

§ 211.171(d) requires that the ground vibration trigger level of seismographs with variable trigger settings be set at no more than 50% of the compliance limit unless otherwise directed by the Department. However, the compliance limit shown in figure 1 ranges from .01 to 2.0 inches per second depending on frequency, making this requirement ambiguous. Seldom, if ever, does blasting in Pennsylvania generate significant vibration energy below a frequency of 3 hertz. Therefore, in order to satisfy the intent of this requirement, we suggest that the maximum trigger level be set at 50% of .5 inch per second, or .25 inch per second.

INTERNATIONAL SOCIETY OF EXPLOSIVES ENGINEERS
BLAST VIBRATIONS AND SEISMOGRAPH SECTION

Proposed ISEE Field Practice Guidelines for Blasting Seismographs

Disclaimer: These field practice recommendations are intended to serve as general guidelines, and cannot describe all types of field conditions. It is incumbent on the operator to evaluate these conditions and to obtain good coupling between monitoring instrument and the surface to be monitored. In all cases, the operator should describe the field conditions and setup procedures in the permanent record of each blast.

Preface: Seismographs are used to establish compliance with regulations and evaluate explosive performance. Laws and regulations have been established to prevent damage to property and injury to people. The disposition of the rules is strongly dependant on the reliability and accuracy of ground vibration and airblast data. In terms of explosive performance the same holds true. One goal of the ISEE Blast Vibrations and Seismograph Section is to ensure reliable and consistent recording of ground vibrations and air blasts between all blasting seismographs.

Part I. General Guidelines
Seismographs are deployed in the field to record the levels of blast-induced ground vibration and airblast. Accuracy of the recordings is essential. These guidelines define the user's responsibilities when deploying seismographs in the field.

1. Read the instruction manual. Every seismograph comes with an instruction manual. Users are responsible for reading the appropriate sections before monitoring a blast.

2. Seismograph calibration. Annual calibration of the seismograph is recommended.

3. Keep proper records. A seismograph user's log should note: the user's name, date, time, place and other pertinent data.

4. Record the blast. When seismographs are deployed in the field, the time spent deploying the unit justifies recording an event. As practical, set the trigger levels low enough to record each blast.

5. Record the full waveform. It is not recommended that the continuous recording option available on many seismographs be used for monitoring blast generated vibrations.

6. Document the location of the seismograph. This includes the name of the structure and where the seismograph was placed on the property relative to the structure. Any person should be able to locate and identify the exact monitoring location at a future date.

7. Know and record the distance to the blast. The horizontal distance from the seismograph to the blast should be known to at least two significant digits. For example, a blast within 1000 feet would be measured to the nearest tens of feet and a blast within 10,000 feet would be measured to the nearest hundreds of feet. Where elevation changes exceed 2.5h:1v, slant distances or true distance should be used.

8. Know the data processing time of the seismograph. Some units take up to 5 minutes to process and print data. If another blast occurs within this time the second blast may be missed.

9. Know the memory or record capacity of the seismograph. Enough memory must be available to store the event. The full waveform should be saved for future reference in either digital or analog form.

10. Know the nature of the report that is required. For example, provide a hard copy in the field, keep digital data as a permanent record or both. If an event is to be printed in the field, a printer with paper is needed.

11. Allow ample time for proper setup of the seismograph. Many errors occur when seismographs are hurriedly set-up. Generally, more than 15 minutes for set-up should be allowed from the time the user arrives at the monitoring location until the blast.

12. Know the temperature. Seismograph have varying manufacturer specified operating temperatures.

13. Secure cables. Suspended or freely moving cables from the wind or other extraneous sources, can produce false triggers due to microphonics.

Part II. Ground Vibration Monitoring

Placement and coupling of the vibration sensor are the two most important factors to ensure accurate ground vibration recordings.

A. Sensor Placement

The sensor should be placed on or in the ground on the side of the structure towards the blast. A structure can be a house, pipeline, telephone pole, etc. Measurements on driveways, walkways, and slabs are to be avoided where possible.

1. Location relative to the structure. Sensor placement should ensure that the data obtained adequately represents the vibration levels received at the structure being protected. The sensor should be placed within 10 feet of the structure or less than 10% of the distance from the blast, whichever is less .

2. Soil density evaluation. The soil density should be greater than or equal to the sensor density. Fill material, sand, unconsolidated soils, flower-bed mulch or other unusual mediums may have an influence on the recording accuracy if not properly dealt with during geophone installation.

3. The sensor must be nearly level.

4. The longitudinal channel should be pointing directly at the blast and the bearing should be recorded.

5. Where access to the structure and/or property is not available, the sensor should be placed closer to the blast in undisturbed soil.

B. Sensor coupling

If the acceleration exceeds 0.2 g, slippage of the sensor may be a problem. Depending on the anticipated acceleration levels spiking, burial, or sandbagging of the geophone to the ground may be appropriate.

1. If the acceleration is expected to be:
   a. less than 0.2 g, no burial or attachment is necessary
   b. between 0.2 and 1.0 g, burial or attachment is preferred. Spiking may be acceptable.
   c. greater than 1.0 g, burial or firm attachment is required (USBM RI 8506).

The following table exemplifies the particle velocities and frequencies where accelerations are 0.2 g and 1.0 g.

Frequency, Hz	4	10	15	20	25	30	40	50	100	200
Particle Velocity - in/s at 0.2 g	3.07	1.23	0.82	0.61	0.49	0.41	0.31	0.25	0.12	0.06
Particle Velocity - in/s at 1.0 g	15.4	6.15	4.10	3.05	2.45	2.05	1.55	1.25	0.60	0.30

2. Burial or attachment methods.

a. The preferred burial method is excavating a hole that is no less than three times the height of the sensor (ANSI S2.47-1990, R1997), spiking the sensor to the bottom of the hole, and firmly compacting soil around and over the sensor.

b. Attachment to bedrock is achieved by bolting, clamping or glueing the sensor to the rock surface.

c. The sensor may be attached to the foundation of the structure if it is located within +/- 1-foot of ground level (USBM RI 8969). This should only be used if burial, spiking or sandbagging is not practical.

3. Other sensor placement methods.

a. Shallow burial is anything less than described at 2a above.

b. Spiking entails removing the sod, with minimal disturbance of the soil and firmly pressing the sensor with the attached spike(s) into the ground.

c. Sand bagging requires removing the sod with minimal disturbance to the soil and placing the sensor on the bare spot with a sand bag over top. Sand bags should be large and loosely filled with about 10 pounds of sand. When placed over the sensor the sandbag profile should be as low and wide as possible with a maximum amount of firm contact with the ground.

d. A combination of both spiking and sandbagging gives even greater assurance that good coupling is obtained.

C. Programing considerations

Site conditions dictate certain actions when programing the seismograph.

1. Ground vibration trigger level. The trigger level should be programmed low enough to trigger the unit from blast vibrations and high enough to minimize the occurrence of false events. The level should be slightly above the expected background vibrations for the area. A good starting level is 0.05 in/s.

2. Dynamic range and resolution. If the seismograph is not equipped with an auto-range function, the user should estimate the expected vibration level and set the appropriate range. The resolution of the printed waveform should allow verification of whether or not the event was a blast.

3. Recording duration - Set the record time for 2 seconds longer than the blast duration plus 1 second for each 1100 feet from the blast.

Part III Airblast Monitoring

Placement of the microphone relative to the structure is the most important factor.

A. Microphone placement

The microphone should be placed along the side of the structure nearest the blast.

1. The microphone should be mounted near the geophone with the manufacturer's wind screen attached.

2. The preferred microphone height is 3 feet above the ground or within 1.2 inches of the ground. Other heights may be acceptable for practical reasons. (ANSI S12.18-1994, ANSI S12.9-1992/Part2) (USBM RI 8508)

3. If practical, the microphone should not be shielded from the blast by nearby buildings, vehicles or other large barriers. If such shielding cannot be avoided, the horizontal distance between the microphone and shielding object should be greater than the height of the shielding object above the microphone.

4. If placed too close to a structure, the airblast may reflect from the house surface and record higher amplitudes. Structure response noise may also be recorded. Reflection can be minimized by placing the microphone near a corner of the structure. (RI 8508)

B. Programing considerations

Site conditions dictate certain actions when programing the seismograph to record airblast.

1. Trigger level. When only an airblast measurement is desired, the trigger level should be low enough to trigger the unit from the airblast and high enough to minimize the occurrence of false events. The level should be slightly above the expected background noise for the area. A good starting level is 120 dB.

2. Recording duration. When only recording airblast, set the recording time for at least 2 seconds more than the blast duration. When ground vibrations and airblast measurements are desired on the same record, follow the guidelines for ground vibration programing (Part II C.3).

Original: 2120

Summary of PCA Concerns with Proposed Blasting Regulations: Determination of Peak Particle Velocity in Certain Regions

- DEP has proposed adopting a Bureau of Mines standard to determine allowable peak particle velocity based on blast vibration frequencies. See Figure 1, 25 Pa. Code §211.151(c) (attached).
- In Northwest PA, glacial deposits of "till" – unconsolidated material comprised of sandy or clayish matter – may affect the proper calculation of "safe" peak particle velocity, which would not be expected to cause damage to structures in the vicinity of the blast.
- The glacial till may allow a greater peak particle velocity to hertz ratio (the relationship expressed in figure 1) without making damage to structures more likely, because unconsolidated material has a dampening effect on the frequencies.
- At the same time, the till may make it more difficult for the standard in Figure 1 to be achieved.
- Because the Proposed Rulemaking would dramatically increase the scaled distance requirement, an accurate and workable standard for determining allowable peak particle velocity is essential.
- The goal of the regulations is to protect structures. The regulations should be no more burdensome than is necessary to achieve this goal.
- The regulations should therefore allow for geologic variations and the presence of unconsolidated materials to be taken into account in determining the appropriate vibration limits under the regulations. The effect of blasting activities on unconsolidated materials may also be affected by weather conditions and other factors.
- We suggest that the EQB could address this concern by amending the preamble to the regulations, which the Department has acknowledged are more stringent than federal requirements. In the preamble to Section 211.151, the EQB proposed allowing DEP to use a more stringent standard based on site conditions. Changing this to allow the application of a "different" standard based on site-specific conditions would allow the presence of glacial till and other unconsolidated matter to be taken into account.
- We understand that DEP is currently studying this issue. We therefore suggest that the regulations should not be finalized until this issue is fully understood and these concerns resolved.
- We also would encourage DEP to study the application of Section 211.151 and Figure 1 in areas where abandoned mine spoil or other unconsolidated materials have been deposited by past mining to avoid unnecessary burdens to potential remining projects.

Post-it® Fax Note 7671	Date 8/30/00 pages 2
To John Jewett	From Mike Young
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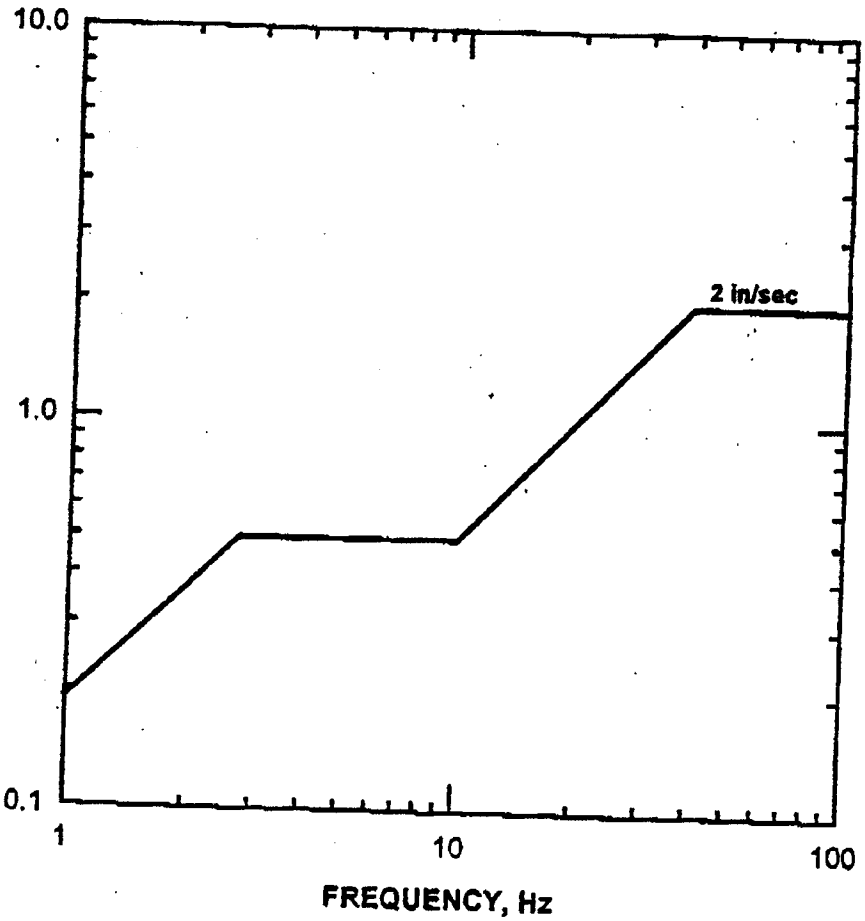
Figure 1.



(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 may not be thrown, slid along floors or over other packages of explosives, or handled roughly.

(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 may 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) A person may not 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 may 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 nonferrous, nonsparking tamping sticks may be used in loading a blast hole. Sectional poles connected

Jean Shuster

Original; 2120

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Brubacher Excavating would like to make it's position known to the Pennsylvania Department of Environmental Protection concerning the proposed changes to Chapter 210 & 211 of the Pennsylvania Code regulating the use of explosives in the Commonwealth. We would like to begin this statement by saying that Brubacher Excavating, Inc. is a well known and respected total site work developer in the central and eastern Pennsylvania area and prides itself on it's extraordinary safety record over the past 25 plus years. We strive to achieve total compliance with all Federal, State and Local laws, rules and regulations.

We feel that there are many much needed changes contained in Chapters 210 & 211. These changes help to bring the laws into the 21st century and more up to date with the state of the art in the explosives industry today. But there are certain proposed changes that we feel are detrimental to the industry. In particular we are referring to Chapter 211, subsection 211.124 and 211.125 requiring the procurement of site specific permits for blasting within the Commonwealth.

There is an old saying that goes, "If it ain't broke, don't fix it !". We feel that this old saying most certainly applies to the aforementioned subsections 211.124 & 211.125. At this time we are not required to procure site specific permits for blasting from the state and we see no reason to start now! We are already required to procure blasting permits from many of the municipalities we work in now. Would 211.124 & 211.125 supercede the right of local municipalities to require blasting permits? I see nothing in the code that would usurp the authority of political subdivisions to require blasting permits. Let's take a common scenario for example, let's say that we are blasting within a municipality that does require a blasting permit and we are working on a Penn DOT project, bear in mind that Penn DOT requires it's own separate blasting permit, under the new law we would be required to procure a third permit for the same function! This is silly and wasteful! We feel that things are working just fine the way they are, please leave them alone! One of our most important abilities is that of being able to quickly and efficiently respond to our customer's needs for blasting at their site when rock is encountered. Most of the local permits we need can be procured within 24 hours or less. We highly doubt that D.E.P. could or would be able to issue a permit in that amount of time. We would ask what infastructue D.E.P. plans to put into place to process the glut of permit applications that will certainly befall them if this law is put into action. How many more bureaucrats would we need to hire to staff the blasting permit department? And at what cost to the industry and the general taxpaying public? Add to this the fact that the 211.124 & 211.125 have several ambiguous requirements found in them and you have the recipe for disaster. These laws can only cost the end customer money in the end. If you enact these laws you will have contractors going to extraordinary means to get around it's requirements and the end results will be higher costs to the customer. In these days of a drastic labor shortage, contractors cannot afford to shut down men and equipment while

they wait for the state to process a blasting permit. So what they will inevitably do is try to find loopholes within the law to cut corners and this will inevitably cost the customer more money. If these laws are implemented, the stock of companies who sell demolition hammers and blasting caps will certainly go up drastically! Anyone who knows blasting and has thoroughly read chapter 211.124 & 211.125 will certainly understand what we mean by that statement. We see nothing in these proposed changes that benefits public safety by requiring these blasting permits. All we see is more "red tape" for those within the industry and more end cost for our valued customers. We urge you gentlemen to please reconsider and delete 211.124 & 211.125 from the proposed code changes.

Respectfully prepared and submitted by:

James S. Shuster
Drilling & Blasting Division Manager
Brubacher Excavating, Inc.

Original: 2120

EASTERN PENNSYLVANIA CHAPTER
SOCIETY OF EXPLOSIVES ENGINEERS

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August 1, 2000

TO: Environmental Quality Board
Rachel Carson State Office Building
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Harrisburg, PA 17101-2301

RE: Title 25 PA Chapter 210 & 211
Licensing of Blaster and Storage, Handling and Use of Explosives

The members of the Eastern PA Chapter of the I.S.E.E. applaud the EQB's efforts on the explosives regulations and strongly support the need for changes and modernization.

If the Environmental Quality Board would have any questions or need to clarify any point, we would be willing to meet with the Board Members.

§ 210.14 (b 1) Define "of good moral character", or be more specific.

§ 211.101 The "Blast Area" definition should coincide with MSHA 30 CFR

§ 211.124 (a 11) Suggest raising the liability insurance minimum per occurrence to $1,000,000 being an industry standard for insurance requirements.

§ 211.133 (a 1) Recommends inserting the word "specific" as follows: "The specific locations of the blast and monitoring readings."

§ 211.133 (a 3) Needs to be clearer, the permit number of what? Who? (i.e. Blasting activity permit number)

§ 211.133 (a 7) Requests a definition of "sketch". Does burden, spacing, pattern dimensions need to be on the sketch or listed on the report?

§ 211.133 (a 9) Needs to be more specific. For each hole, collectively, or average?

§ 211.133 (a 10) Needs to be more specific. For each hole, collectively, or average?

§ 211.133 (a 19) Suggest clearer wording, be more specific on how to be listed on shot report.

§ 211.133 (a 24) Change sentence to read: "If a known misfire occurred..."

§ 211.133 (b) Why may the Department require monthly summaries?

§ 211.141 (4) Disagree with 100 feet as the distance, suggest keeping at 50, which is consistent with MSHA, but still higher than DOT. Object to the posting of additional "no smoking" signs and feels that the signage currently used displayed at a site is more than adequate.

§ 211.141 (5) Suggest changing the first sentence to read "Load 2000 pounds (908 kilograms) or less of explosives..."

§ 211.141 (6) Should read - only a closed body vehicle should be used if the load is 2000 pounds...

§ 211.141 (11, i, ii) Feel that current DOT regulations are adequate.

§ 211.151 (b) This section needs to be modified. It was felt that the EQB is using the wrong word in the definition of "flyrock". The definition of "flyrock" states materials ejected from the "blast site". Since due to the nature of blasting, materials are always ejected beyond where the "charges are located", we feel "blast site" should be changed to "blast area" in the definition of "flyrock". This would make the regulation consistent with MSHA's 30 CFR 56.6000. If this definition is not modified under Section 211.151 (b), blasters will be notifying the Department within 4 hours of EVERY blast.

§ 211.151 (c) Suggest wording to read: "All blasts shall be designed and conducted in a manner that meets the allowable peak particle velocity." Under this criteria, this would eliminate the concern over determining scale distance.

§ 211.153 (b) Change the beginning of the sentence to read: "The use of matches and lighters, and smoking are prohibited..."

§ 211.154 (c) Clarify "present".

§ 211.154 (f 2) Recommend the following revised wording: "Sectional poles connected by brass fittings are permitted, provided that only the non-metallic, non-sparking end of the pole is used for tamping." If the wording is not revised, it will eliminate the use of plastic and rubber ends designed and intended for that use.

§ 211.154 (f 4) For consistency, recommend changing the phrase "wooden tamping pole" to "non-metallic, non-sparking tamping pole" for the reason stated above.

§ 211.154 (f 5) This instruction needs to be more concise, such as exactly what is to be measured, how frequently (i.e. every hole?) and to what degree should it be logged and reported on the blast report. Define "to be logged".

§ 211.154 (f 7) This section should be eliminated. The licensed blaster-in-charge knows best the circumstances of each blast and subsequent stemming. By allowing this phrase to remain, the Department could become unknowingly involved with safety and potential litigation issues.

§ 211.154 (k) Recommend: "Explosives may not be brought to a blast hole in greater quantities..., use hole instead of site. It is virtually impossible to bring the exact amount needed to the blast site depending on site and weather conditions. Thus all blasting companies could be cited on a daily basis for preparedness, based on site and weather conditions.

§ 211.154 (n) Change the last sentence to read: "Precautionary measures include but not be limited to stopping or slowing of traffic and posting signs.

§ 211.156 (b) We strongly recommend that the wording consist of "Only the blaster in charge or a designated licensed blaster may detonate the blast." Current regulations also regulates that the blaster in charge "is responsible for all effects of the blast" 211.154 (a), the blaster in charge cannot be in two places at the same time if needed to secure the blast area.

§ 211.159 Suggest adding a provision for "programmable electronic detonators".

§ 211.171 (d) Since this section as currently written would allow for a setting of .1, which could be triggered by traffic activity, we recommend "50% of the conservative compliance level of .5 inches per second (.25)".

§ 211.171 (e) It is impossible for older model and brick seismographs to obtain a printout of the date and time when the instrument was turned on and off. We would suggest adding the following wording to the end of 211.171 (f): "If a printout is not possible due to instrumentation, the operator will provide a signed statement indicating the aforementioned data." Also, please include a 3-year phase-in period, as was done in section 211.133 (a22) (monitoring records).

§ 211.172 Change the numbering system to be consistent with the rest of the regulations.

§ 211.173 (b 2) The committee would ask for clarification on (b1), (b2) and (b4). Isn't (b4) redundant with (b1)? We suggest wording such as "the calibration pulse, or equivalent calibration data".

§ 211.182 (c) Recommend revising this section to state: "When blasting within 200 feet (60.96) meters of a utility line not owned or leased by the permittee or their customer, blast holes may not exceed 3 inches (7.62×10^2 meters) in diameter, unless approved by the utility and the Department." Revising the definition of "utility line" to not include lines which are used in the operation of crushers, pumps, etc. could also modify this section.

Thank you for permitting us to submit concerns and comments on the proposed regulations.

Respectfully Submitted,

Dennis Kisthart
Regulatory Chairperson

Daniel Ray Leach
Program Chairperson

Randy May
President

EQB
Environmental Quality Board

Original: 2120
Testimony in File

p.o. box 8477 • harrisburg, pa. 17105-8477 • (717)787-4526

August 18, 2000

Mr. Robert E. Nyce, Executive Director
Independent Regulatory Review Commission
14th Floor, Harristown #2
333 Market Street
Harrisburg, PA 17120

RE: Licensing of Blasters and Storage, Handling, and Use of Explosives (#7-349)

Dear Mr. Nyce:

Enclosed are copies of the official verbatim transcripts for public hearings the Environmental Quality Board recently held on proposed amendments to licensing of blasters and storage, handling, and use of explosives.

If you have any questions, please call me.

Sincerely,

Catherine F. Coleman

for Sharon F. Trostle
Regulatory Coordinator

Enclosures

Original: 2120

Freeman, Sharon

From: DdHharris@aol.com
Sent: Sunday, July 30, 2000 4:37 PM
To: RegComments@dep.state.pa.us
Subject: written comments - follow up from verbal comments

To Whom it may Concern:

The following are written comments, per my verbal testimony given at the EQB public hearing, given at the Greensburg Four Points Sheraton, in Greensburg, PA, 7/5/2000.

In reviewing the draft of Chapter 221 of the Pennsylvania Code, I had the following comments:

Section 211.171 (c) should read: 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 0.50 inches per second compliance limit unless otherwise directed by the department.

As an engineer, and Vice President of a seismic consulting firm, I feel there could be some problems with how the section is currently written.

Thank you for you time and consideration. If you have any questions please do not hesitate to call me.

David Harrison
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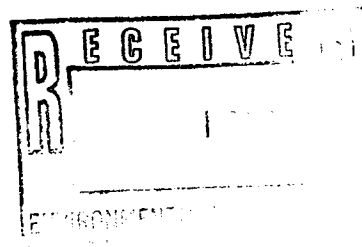

29 July 2000

Commonwealth of Pennsylvania
Department of Environmental Protection
Environmental Quality Board
P.O. Box 8477
Harrisburg, PA 17105-8477

Re: **Suggestions for Storage of Explosives in the Proposed Amendments for Chapter 211, in particular, Section 211.115, "Standards for Classifying and Storing Explosives and Constructing, Maintaining and Siting Magazines."**

Dear Sir or Madam:

The Commonwealth is currently in the process of rewriting completely its regulatory amendments for blaster licensing (Chapter 210) and storage, handling and use of explosives (Chapter 211). A 60-day comment period, running from 3 June 2000 to 2 August 2000 is in effect for providing public comment for these amendments. These amendments may be found on the Department web site at www.dep.state.pa.us.

In consideration of this effort by the Department, provided below are suggestions for the Amendments to Title 25 Pa. Code, Chapter 211, "Provisions for the Use, Storage and Handling of Explosives in Surface Applications". Enclosed are the proposed Chapter 211 and Title 27 CFR, Subparts A and K.

The following sections are provided:

- Long-term Depot Storage of Large Quantities of High Explosives
- Suggestions for Depot Storage to Section 211.115, with Existing and Suggested Text.
- Justification Statements for Suggestions.
- References.
- Considerations.

Long-term Depot Storage of Large Quantities of High Explosives:

The following suggestions are intended to fill a gap in Chapter 211 and in 27 CFR. This gap is the storage provisions for the long-term depot storage of large quantities of high explosives. This is necessary to provide guidance to a Company storing explosives in this fashion, and for the protection of the residents of the Commonwealth. The current storage provisions of Chapter 211 are more geared for storage in support of blasting operations. The Federal standard, 27 CFR, adopted by reference by Chapter 211, also does not sufficiently address provisions for depot storage.

In Chapter 211, it is suggested to define the two types of storage conditions, and provide provisions for each type of storage:

- Short duration storage for a particular blasting operation.
- Long-term depot storage of large quantities of high explosives.

There is sufficient contrast between these two types of storage. In blasting operations:

- The quantity of explosives stored on site will be consumed mostly on site.
- The explosives are for a particular blasting operation.
- The duration of storage is temporary.
- The explosives quantities are relatively small.

Therefore, storage provisions for blasting are for a temporary hazard, with limited possible effects from mishap because of the smaller quantities of explosives.

On the other hand, for depot storage:

- The explosives storage site is a long-term or permanent site.
- There are large quantities of explosives present at the site.

Therefore, depot storage of large quantities of high explosives deserves particular features and requirements because of the permanence of the hazard, and the large quantity of explosives involved, and thus, more damaging possible effects from mishap.

As indicated above, there are fundamental and significant differences between the two types of storage, temporary storage and depot storage. Organizations, such as the military, have developed experience with, and have developed provisions for, these two types of storage. However, as is evident in the suggestion below, the provisions for depot storage are mostly prudent concepts. There are several references that may provide guidance to the Commonwealth for depot storage. One of these is Reference 3.

It is strongly suggested that the Commonwealth consider these suggestions and incorporate them in total into Chapter 211. Alternately, incorporation may be made by reference, using some reference document that details the long-term depot storage of high explosives.

Suggestions for Depot Storage to Section 211.115, with Existing and Suggested Text:

The following is the full text of Section 211.115 with underlining, or a **solid bar at the right margin**, indicating the suggested new text to incorporate suggestions for the long-term depot storage of high explosives:

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

(a) The provisions of the Code of Federal Regulations (CFR) at 27 CFR Part 55, Subpart K (relating to commerce in explosives), and incorporated herein by reference, with the modifications and amplifications as indicated in subsections (b) through (j), below. 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) For purposes of incorporation by reference of 27 CFR Part 55 Subpart K, the term "Department" is substituted for the term "director", and the term "representatives of the Department" is substituted for the term "ATF Official".

(c) Type 2 magazines shall be treated in the same manner as Type 3 magazines.

(d) Type 2 and 3 magazines are for the attended, temporary storage of explosives used exclusively for a particular operation, at the site of the operation. These operations consist of blasting for mining, construction or demolition. When the blasting operation has ceased, the magazine shall be removed from the site in a timely fashion.

(e) Type 1 magazines are permanent magazine structures for the long-term, depot storage of high explosives, and other explosives. Long-term is defined as longer than 7 consecutive days, for one time only at a property or location. Depot storage is defined as storage on a property or location, and some or all of the explosives are not being consumed on the same property or location. However, Type 1 magazine storage is encouraged regardless of the duration of storage, or for the reason for the storage.

(f) The application for Site License for the depot storage of explosives shall include a report submitted to the Department. The report shall provide, as a minimum, a description and sketches showing magazine construction including grounding and lightning protection, quantity and type of explosives in each magazine, a scale drawing showing magazine layout and all exposed targets and utilities within and near the proposed site boundary with distance lines from the controlling magazine(s) to the site fence, public traffic routes and inhabited buildings. Separation distance from a magazine to the nearest existing inhabited building located outside the boundary fence shall be maintained at $D=100\ W^{1/3}$, the units of D is feet, and W is pounds of the TNT equivalent weight of explosives stored in the magazine.

(g) The site for Type 1 magazine(s) shall be completely surrounded by a continuous unclimbable fence, chain-link type with multiple barbed-wire stands, or razor wire, at the top, to be approved by the Department. Any gates shall remain locked at all times, with a lock with at least five tumblers and a casehardened shackle of at least 3/8" diameter. The minimum separation distance from the closest face of any magazine to the site fence shall be 1250 feet, or Inhabited Building Distance, whichever is greater. Signs attached to the fence at 200-foot intervals shall indicate the following: Private Property, No Trespassing, with no mention of the word "explosives" or any similar reference. Any additional fences within the site shall not be closer to a magazine than intermagazine distance, as determined by the quantity-distance relationship for that magazine.

(h) Type 1 magazines shall be under the surveillance of 24-hour video television cameras to be approved by the Department. The cameras shall observe the magazine door and the immediate environs of the magazine. There shall be a minimum of two cameras per explosives site. The video from the cameras shall be observed by 24-hour security personnel and recorded. The security personnel shall immediately alert the local police in the event of intruders or video failure. In lieu of video surveillance, 24-hour security by uniformed security personnel may be employed. These security personnel shall be issued radios to contact the local police, as required, and shall be armed with side arms, and qualified by Commonwealth statutes to carry side arms. Except in special cases, rifles shall not be used. The magazine entrance and immediate environs of the magazine shall be lighted during the hours of darkness for the visibility of the magazine by the cameras or by the security personnel.

(i) Any person who stores explosive materials shall notify the authority having jurisdiction for fire safety in the locality in which the explosive materials are being stored of the type of explosives, magazine capacity, and location of each site where such explosive materials are stored. Such notification shall be made by letter, to the authority indicated above, at least 20 days before commencing storage.

(j) Lightning protection and grounding of all types of magazines, and the features within the magazine site, such as fences, shall be as specified by the National Fire Protection Association, NFPA 780: "Standard for the Installation of Lightning Protection Systems", and as supplemented by the following: (1) Type 1 magazines constructed with reinforcing bars in the floors, walls or roof shall have these bars connected to each other and periodically connected to the ground girdle, (2) Type 1 magazines constructed with a steel arch shall have the steel arch periodically connected to the ground girdle. The reinforcing bars in the floor of the magazine shall also be periodically connected to the ground girdle, (3) "portable" steel box magazines (Type 3 magazines), and mobile (Type 2 magazines) shall be grounded by a minimum of two

independent grounds. Each independent ground shall consist of a minimum 1/0 cable mechanically connected to the magazine, and mechanically connected to a ground rod. The two grounds shall be at opposite corners of the magazine.

Justification Statements for Suggestions:

The following statements are offered as justification and explanation for the suggestions provided above:

Subsection (c):

This subsection suggests that Type 2 magazines shall be treated in the same manner as Type 3 magazines. That is, Type 2 magazines, as well as a Type 3 magazines, should be used for the attended, temporary storage of explosives. This more restrictive condition for Type 2 magazines than is specified in 27 CFR is in recognition that the Type 2 magazine is not sufficiently protective to be considered for the long-term storage of high explosives. As a consequence of the above, and because of its more durable and permanent construction features, it is suggested that Type 1 magazines should be the only type of magazine that can be used for the unattended, long-term storage of high-explosives.

The following table shows the wall construction specified in 27 CFR for these three types of magazines:

Magazine Type	Wall Construction
Type 1	Concrete end walls with corrugated steel or concrete shell, covered with earth
Type 2	¼ " steel lined with 2" of hardwood
Type 3	0.1046" steel lined with ½" plywood

The steel covering of a Type 3 magazine is 0.1046" thick, while the steel covering of the Type 2 magazine is ¼" thick, about an additional 1/8" of steel thicker than the steel covering of the Type 3 magazine. It is suggested that the Type 2 magazine is not significantly better constructed than a Type 3 magazine to warrant the unattended and long-term storage of high explosives. This is particularly apparent when the constructions of the Types 2 and 3 magazines are compared to the construction of a Type 1 magazine, which has reinforced concrete end walls with a steel or concrete shell, covered with earth. This construction of the Type 1 magazine is a permanent structure that is more protective for the long-term storage of high explosives.

The construction of a Type 2 magazine is not resistant to bullet attack, as required by 27 CFR. According to 27 CFR, the walls of the Type 2 magazine shall be "bullet-resistant". Also, 27 CFR describes that the magazine may be constructed with "... ¼ inch steel and lined with at least two inches of hardwood." However, ¼ inch steel can be defeated by most rifle calibers, such as 30-06, as provided by Reference 1, Table 6-6 (Ballistic properties of mild steels, Sandia National Laboratories 1982, see enclosed copy of this Table). Given that the magazine is not "bullet

resistant" as required by 27 CFR, it is suggested that Type 2 magazines are unsuitable for the long-term storage of high explosives.

Because the Type 2 magazine is not "bullet resistant", it is particularly unsuitable in the Commonwealth. In many areas of the Commonwealth, there is extensive hunting and target practicing. Thus, there is more opportunity for the magazine to be struck by a bullet, through accident or intention, regardless of barricading.

The Type 2 magazine is described by 27 CFR as a "box, trailer, semi-trailer or other mobile facility". The Type 2 magazine is vulnerable because of its mobility. The Type 2 magazine may be removed, in total, by theft because it is designed to be mobile, or to become mobile.

The physical vulnerabilities of the Type 2 magazine include:

- Light construction of the Type 2 magazine that is ostensibly similar to the Type 3 magazine.
- The Type 2 magazine is not "bullet resistant" as required by 27 CFR.
- Unsuitability of the Type 2 magazine, which is not "bullet resistant", in the Commonwealth, where there is extensive hunting and shooting.
- Increased potential for loss of the entire Type 2 magazine to theft, because it is mobile.

Therefore, it is suggested that Type 2 magazines be treated in the same manner as Type 3 magazines. That is, the Type 2 and Type 3 magazines shall be used for the attended, temporary storage of high explosives. It is suggested that the long-term storage of high explosives should be relegated to Type 1 magazines.

Subsection (d):

This suggestion regarding Type 3 magazines is made to provide necessary restrictive conditions on this magazine type that are absent in the 27 CFR. This suggestion regarding Type 3 magazines is made to insure that this type of magazine does not ostensibly become a Type 1 magazine. To prevent this action from occurring, it is necessary to define the reason for the use of a Type 3 magazine, and the condition for its removal.

Subsection (e):

This suggestion regarding Type 1 magazines is made to provide the necessary definitions that are absent in the 27 CFR. Otherwise, it is possible that methods of storage other than Type 1 may be used for the long-term depot storage of high explosives. Therefore, it is necessary to define the permanent storage condition. This permanent storage condition may be defined by the duration of storage, and purpose of storage. However, because this type of storage is encouraged, it is also suggested that Type 1 storage may be used for any condition.

Subsection (f):

Reference 3 recommends Inhabited Building Distance or 1250 feet as the minimum separation distance from the magazine to the site fence. However, Reference 3 recommends greater distances should be employed if possible.

To provide for the safety of innocent individuals and their property, it is suggested to use $D=100\ W^{1/3}$, rather than the Inhabited Building Distance, as the minimum separation distance from a magazine to an existing building located outside the site fence of a depot storage site for high explosives. Note that Inhabited Building Distance is approximately $D=40\ W^{1/3}$. These equations are obtained from explosives references, such as References 1, 2 and 3. In these equations, D is the separation distance in feet from the magazine to the inhabited building, and W is the net explosive equivalent weight of TNT explosives. The $D=100\ W^{1/3}$ separation distance will limit blast overpressure to about 0.3 psi at the target building. This separation distance is intended to preclude injuries to persons, and to minimize damage to private property.

The following description provides the level of protection provided to persons and buildings located at the Inhabited Building Distance from a magazine containing the amount of explosives commensurate for that distance. The Inhabited Building Distance is obtained from Tables in references such as Chapter 211 of 25 Pa. Code and 27 CFR (Code of Federal Regulations).

The Inhabited Building Distance limits blast overpressure to about 0.9 to 1.2 psi. This is equivalent to a pressure of 130 to 173 psf (pounds per square foot) that will be imposed upon any structure, or persons caught in the open. Note that typical structures are designed to resist snow loads of about 30 psf, and lateral wind pressures of about 30 psf. Given that ordinary buildings are generally designed for 30 psf, and the loads from a blast overpressure are 130 to 173 psf, damage is expected to buildings at the Inhabited Building Distance.

According to Reference 3, at Inhabited Building Distance, the damage to buildings is expected to amount to 5 percent of the replacement cost of the building. Damage to buildings may include serious weakening or displacement of foundations, broken windows, and breaks in wall members, roof joists and some floor joists.

According to Reference 3, injuries to persons will mostly be minimal, although some serious injuries and death may result from broken windows and flying glass. Injuries and death can be expected also from building debris torn loose such as window frames, doors and other hazardous objects.

About 10 percent of persons may experience temporary hearing loss for a period of time after exposure to the blast wave at the Inhabited Building Distance, according to Reference 2. The threshold pressure level for the temporary hearing loss is well below 1 psi, which is well within the incident pressures of 0.9 to 1.2 psi. What should be considered is that children are most highly susceptible to hearing damage.

Reference 3 recommends Inhabited Building Distance or 1250 feet as the distance from the magazine to the site fence. However, Reference 3 recommends greater distances should be employed if possible, as would follow given the possibility of injuries, death and damages described above.

It is suggested that a distance of 2 to 3 times the Inhabited Building Distance be employed, such as $D=100\ W^{1/3}$. In this equation, D is the distance in feet from the magazine to the inhabited building, and W is the net explosive equivalent weight of TNT explosives.

It is suggested that the building damages, listed above, and the possibility of serious injuries and death are unacceptable for existing buildings, and the persons inside and near those existing buildings. Therefore, it is suggested to use $D=100\ W^{1/3}$ as the distance from the magazine to an existing inhabited building outside the site fence of a proposed depot storage site for high explosives.

Subsection (g):

This suggestion provides for a fence surrounding the explosives site, that is absent in the 27 CFR. This suggestion provides for the physical security of the magazines, provides a buffer zone between the magazines and the fence to promote physical security, and for the protection of persons and any buildings, or future buildings, outside the fence of the explosives site.

A minimum distance from the magazine to the fence surrounding the site is recommended by Reference 3 to be the larger of:

- 1250-feet, based on fragment hazard.
- Inhabited Building Distance, based on blast overpressure hazard.

Reference 3 specifies the 1250-foot distance based on the fragment hazard. The Inhabited Building distance provides for some safety from blast overpressure for buildings that may encroach up to the site fence at some time in the future.

At the 1250-foot distance, it is expected that the maximum fragment density would be one hazardous fragment per 600 square feet (one hazardous fragment about every 25 feet on average). A hazardous fragment is defined as a fragment with an energy of 58 foot-pounds.

In summary, a fence surrounding the magazine site is suggested. The fence should be located at a separation distance from the magazine to provide some measure of safety for buildings and persons outside the fence, and promote the physical security of the site. The fence surrounding the site also is indicative of the increased degree of care that is deserved by the presence of large quantities of high explosives contained within the magazines.

Subsection (h):

A security system is suggested for Type 1 magazines, as suggested by References 1 and 3. Note that 27 CFR, Section 55.209 specifies that a Type 3 magazine shall be attended. This stipulation that the Type 3 magazine shall be attended is in recognition that any lock or door can be defeated in minutes. So, it is consistent that a Type 1 magazine, containing high explosives, also should be attended, or observed, at all times, because the door on a Type 1 magazine can be defeated in minutes as well.

The door construction specified in 27 CFR for a Type 1 magazine is "...not less than ¼" steel plate and lined with at least two inches of hardwood." Using the forced-entry data from Reference 1, it is estimated that this magazine door can be breached in 12 minutes with standard tools. This would allow entry and unloading of the contents of the magazine.

Consideration should be given for the consequences of the theft of the contents of a high-explosives magazine. Within our current political environment, it is necessary to consider the physical security of assets, such as buildings, bridges, tunnels, airports, aircraft, etc. Likewise, it is necessary to consider the physical security of the tools that will assist the loss of those assets, in this case, high explosives, and the desirability of these tools by those wishing to destroy those assets, that is terrorists. Therefore, a security system should be a necessary and prudent feature for any site where there are stored large quantities of high explosives.

Thus, given the short time in which any magazine can be breached, and the desirability of the contents of the magazine by terrorists, it is suggested that a security system be installed at each Type 1 high-explosives storage site.

Subsection (i):

This suggestion regarding notification of the Fire Chief recognizes that 27 CFR does not provide for timely notice of the Fire Chief of the jurisdiction. It is suggested that a minimum of a 20-day notice be provided to the Fire Chief before explosives storage can commence. This section is a rewrite of Section 55.201 (f) in 27 CFR. The Federal guideline specifies notification of the Fire Chief, "orally before the end of the day on which storage of the explosive materials commenced and in writing within 48 hours from the time such storage commenced." It is suggested that this is not timely notice to the Fire Chief.

The advantages of timely notice are the following:

- There is no additional burden on the Company storing the explosives to provide timely notice to the Fire Chief, particularly because other parties, such as the Commonwealth, have been informed far in advance of the existence of the explosives site, through the request for a magazine license to the Commonwealth.
- It is suggested that the Official tasked with a public safety function be given more time for notice than the same day that the explosives are being stored. This will allow the Chief some time to disseminate the information to his fire fighting force, and conduct training as required.
- It is in the best interests of the Company storing the explosives as well, as the explosives assets are more likely to be considered in the event of a situation in the area. This would be particularly true if the situation arises near to the time to when explosives storage commenced.
- Sufficient prior notice to the Fire Chief would allow for some prior planning by actual physical acts such as planning meetings with his lieutenants, and sufficient time for the Chief and his lieutenants to cogitate the situation.

Lack of sufficient prior notice to the Fire Chief has particular liabilities and unnecessary risks:

- Allowing notice on the same day that explosives storage has commenced places an extraordinary and unnecessary burden on the explosives Company representative tasked with making this oral notice. And this burden could become a liability for the Company and the individual, should the representative fail to provide notice on the particular day that explosives are being stored.
- Allowing same day notice potentially places the lives of firefighters and other rescue personnel at unnecessary risk. Consider the situation that explosives storage has commenced at 9:00 A.M. That morning, a call is made to the fire department to respond to the area for some reason, such as a plane crash, rescue or brush fire. If the explosives Company representative had planned to inform the chief sometime after 9:00 A.M., by now, the Fire Chief is unavailable and the Fire Chief and his fire fighters have already been deployed to the area, unaware of the explosives hazard. Prior notice by several days could prevent this, and could change the strategy of fire fighting efforts, such that a primary goal would be to protect the explosives area.

Thus, it is suggested that some sufficient prior notice, such as 20-day notice, be provided to the Fire Chief of the jurisdiction prior to commencing storage of explosives.

Subsection (j):

This suggestion regarding grounding and lightning protection are necessary requirements for magazines that are absent in 27 CFR, and thus should be specified. Grounding and lightning protection are necessary features for any structure, but in particular, for Type 3 magazine boxes or magazine structures containing explosives. The NFPA recommendations are adopted by reference. Thus, this requirement is provided, as suggested above.

References:

The following references are used in the discussions for the suggestions:

1. American Society of Civil Engineers (ASCE), *Structural Design for Physical Security, State of the Practice*, 1999.
2. Departments of the Army, the Navy and the Air Force, "Structures to Resist the Effects of Accidental Explosions", (Department of the Army Technical Manual TM 5-1300, Department of the Navy Publication NAVFAC P-397, Department of the Air Force Manual AFM 88-22), November 1990.
3. Department of the Navy, Naval Sea Systems Command, "NAVSEA OP-5, Ammunition and Explosives Ashore, Safety Regulations for Handling, Storing, Production, Renovation and Shipping", Volume 1, 6th Revision.

Considerations:

These suggestions and recommendations are offered to the Commonwealth, and any other interested party, for the public good and at no cost to these parties. In consideration for this, Michael F. Salley and his heirs shall be held harmless for any costs or damages in this matter.

If you have any questions, please call me at 570-287-3212.

Sincerely,

Michael F. Salley

Michael F. Salley, P.E.

Enclosures:
1. Table 6-6 (Ballistic properties of mild steels, Sandia National Laboratories 1982), from Reference 1.
2. Title 25 Pa. Code, Chapter 211 (Proposal Document).
3. Title 27 CFR (Code of Federal Regulations), Part 55, Subpart B, "Definitions" and Subpart K, "Storage".

Copy to:

Mr. Richard Lamkie
Chief – Explosives and Safety Section
Commonwealth of Pennsylvania
Bureau of Mining and Reclamation
Rachel Carson State Office Building
Harrisburg, PA 17105-8464

Mr. Walter A. Dieterle, Jr.
Monitoring and Compliance Manager
Commonwealth of Pennsylvania
Department of Environmental Protection
5 West Laurel Boulevard
Pottsville, PA 17901-2454

Mr. Richard Parsons
Blasting Inspector
Commonwealth of Pennsylvania
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5 West Laurel Boulevard
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Table 6-6. Ballistic Properties for Mild Steels (Sandia National Laboratories 1982)

Weapon Caliber Projectile Weight PMV	M1 .30 M2 AP 166 gr 2,765 ft/s	M14 7.62 mm M80 Ball 149 gr 2,750 ft/s	30-06 .30 SP 220 gr 2,410 ft/s	30-06 .30 SP 125 gr 3,140 ft/s	M16 5.56 mm M193-Ball 56 gr 3,185 ft/s	30-60 .222 SP 55 gr 4,050 ft/s
3/16 in.	No test	1,634	1,435	1,604	1,860	1,776
1/1 in.	<1,400	1,887	1,758	1,833	2,206	2,181
3/8 in.	1,699	2,429	2,172	2,593	3,282*	3,210
1/2 in.	1,862	2,726	2 537*	2,838	3,659	3,680
5/8 in.	2,118	3,217*	2,849	3,550*	No test	No Test
3/4 in.	2,207	>3,535	3,200	3,635	4,189	4,116*
1 in.	2,765	--	--	--	--	--
1-1/4 in.	3,158*	--	--	--	--	--

NOTES: PMV = published muzzle velocity; AP = armor piercing; SP = soft point; asterisk in each column denotes the recommended thickness

6.6 REFERENCES

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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

SUBCHAPTER B
STORAGE AND CLASSIFICATION OF EXPLOSIVES

SUBCHAPTER C
PERMITS

SUBCHAPTER D
RECORDS OF DISPOSITION OF EXPLOSIVES

SUBCHAPTER E
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SUBCHAPTER F
BLASTING ACTIVITIES

SUBCHAPTER G
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SUBCHAPTER H
BLASTING ACTIVITIES NEAR UTILITY LINES

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.

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.

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.

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.

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.

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.

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.

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.

(a) The department may issue such orders as are necessary to implement the regulations in this Chapter including an order to suspend, modify or revoke a license or permit authorized by this Chapter.

(b) Before issuing an order modifying peak particle velocity or airblast limits in a blasting activity permit, the Department will first provide the permittee with an opportunity to meet and discuss 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 and Constructing, Maintaining and Siting Magazines.

(a) The provisions of the Code of Federal Regulations (CFR) at 27 CFR Part 55, Subpart K (relating to commerce in explosives), 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) For purposes of incorporation by reference of 27 CFR Part 55 Subpart K, the term "Department" is substituted for the term "director", and the term "representatives of the Department" is 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 residents within 200 feet (65.61 meters) of the blast site were informed of the proposed blasting operation. This notification could be a personal notification, written material left at each residence or first class mail. The notification will provide general information about the blasting operation including the duration of the operation.

(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 report to provide the Department with sufficient information to reconstruct the conditions and events surrounding a 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

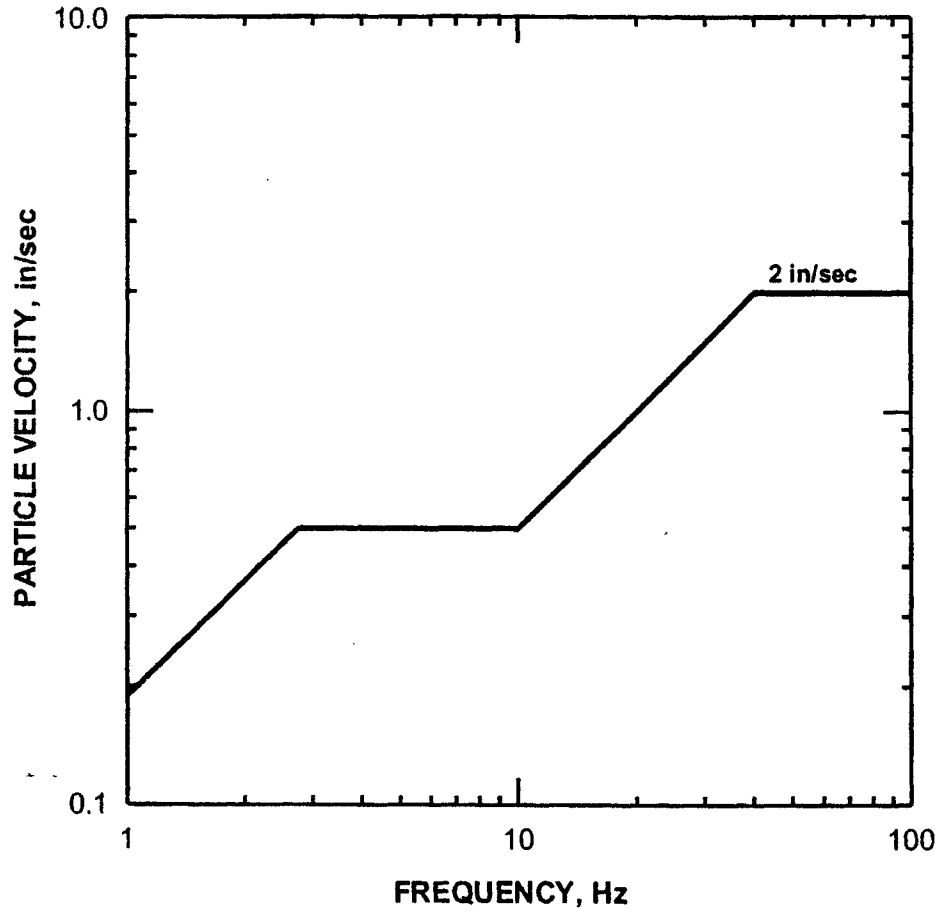
§211.151. Prevention of Damage.

(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, 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.

§ 53.186 Accounting procedures for like articles.

(a) *Identification of manufacturer.* In applying section 6416 of the Code and the regulations thereunder, a person who has purchased like articles from various manufacturers may determine the particular manufacturer from whom that person purchased any one of those articles by a first-in, first-out (FIFO) method, by a last-in, first-out (LIFO) method, or by any other consistent method approved by the regional director. For the first year for which a person makes a determination under this section, the person may adopt any one of the following methods without securing prior approval by the regional director.

(1) FIFO method.

(2) LIFO method.

(3) Any method by which the actual manufacturer of the article is in fact identified.

(4) Any other method of determining the manufacturer of a particular article must be approved by the regional director before its adoption. After any method for identifying the manufacturer has been properly adopted, it may not be changed without first securing the consent of the regional director.

(b) *Determining amount of tax paid.* In applying section 6416 and §§ 53.171–53.186, if the identity of the manufacturer of any article has been determined by a person pursuant to a method prescribed in paragraph (a) of this section, that manufacturer of the article must determine the tax paid under Chapter 32 of the Code with respect to that article consistently with the method used in identifying the manufacturer.

§ 53.187 OMB control numbers.

(a) *Purpose.* This section collects and displays the control numbers assigned to collections of information in this part by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1980. ATF intends that this section comply with the requirements of §§ 1320.12, 1320.13, and 1320.14 of 5 CFR part 1320 (OMB regulations implementing the Paperwork Reduction Act), for the display of control numbers assigned by OMB to collections of information in the regulations in this part.

(b) *Display.*

27 CFR part 53 section number	OMB control number(s)
§ 53.1	1545–0723
§ 53.3	1545–0685
§ 53.11	1545–0723
§ 53.92	1545–0023
§ 53.93	1545–0023
§ 53.99	1545–0023
§ 53.131	1545–0023
§ 53.132	1545–0023
§ 53.133	1545–0023
§ 53.134	1545–0023
§ 53.136	1545–0023
§ 53.140	1545–0023
§ 53.141	1545–0023
§ 53.142	1545–0023
§ 53.143	1545–0023
§ 53.151	1545–0023, 1545–0723
§ 53.152	1545–0723
§ 53.153	1545–0257, 1545–0723
§ 53.155	1545–0723
§ 53.157	1545–0257
§ 53.171	1545–0023, 1545–0723
§ 53.172	1545–0723
§ 53.173	1545–0723
§ 53.174	1545–0723
§ 53.175	1545–0723
§ 53.176	1545–0723
§ 53.177	1545–0723
§ 53.178	1545–0723
§ 53.179	1545–0723
§ 53.180	1545–0723
§ 53.181	1545–0723
§ 53.182	1545–0723
§ 53.183	1545–0723
§ 53.184	1545–0023, 1545–0723
§ 53.185	1545–0023, 1545–0723
§ 53.186	1545–0723

PART 55—COMMERCE IN EXPLOSIVES

Subpart A—Introduction

Subpart B—Definitions

Subpart C—Administrative and Miscellaneous Provisions

Subpart D—Licenses and Permits

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Subpart H—Exemptions

Subpart I—Unlawful Acts, Penalties, Seizures, and Forfeitures

Subpart J—Marking of Plastic Explosives

Subpart K—Storage

AUTHORITY: 18 U.S.C. 847.

SOURCE: T.D. ATF-87, 46 FR 40384, Aug. 7, 1981, unless otherwise noted.

Subpart A—Introduction

§ 55.1 Scope of regulations.

(a) *In general.* The regulations contained in this part relate to commerce in explosives and implement Title XI, Regulation of Explosives (18 U.S.C. Chapter 40; 84 Stat. 952), of the Organized Crime Control Act of 1970 (84 Stat. 922), Public Law 103-322 (108 Stat. 1796), and Public Law 104-132 (110 Stat. 1214).

(b) *Procedural and substantive requirements.* This part contains the procedural and substantive requirements relative to:

(1) The interstate or foreign commerce in explosive materials;

(2) The licensing of manufacturers and importers of, and dealers in, explosive materials;

(3) The issuance of user permits;

(4) The conduct of business by licensees and operations by permittees;

(5) The storage of explosive materials;

(6) The records and reports required of licensees and permittees;

(7) Relief from disabilities under this part;

(8) Exemptions, unlawful acts, penalties, seizures, and forfeitures; and

(9) The marking of plastic explosives.

[T.D. ATF-87, 46 FR 40384, Aug. 7, 1981, as amended by T.D. ATF-363, 60 FR 17449, Apr. 6, 1995; T.D. ATF-387, 62 FR 8376, Feb. 25, 1997]

§ 55.2 Relation to other provisions of law.

The provisions in this part are in addition to, and are not in lieu of, any other provision of law, or regulations, respecting commerce in explosive materials. For regulations applicable to commerce in firearms and ammunition, see Part 178 of this chapter. For regulations applicable to traffic in machine guns, destructive devices, and certain other firearms, see Part 179 of this chapter. For statutes applicable to the registration and licensing of persons engaged in the business of manufacturing, importing or exporting arms, ammunition, or implements of war, see section 38 of the Arms Export Control Act (22 U.S.C. 2778), and regulations of Part 47 of this chapter and in Parts 121 through 128 of Title 22, Code of Federal Regulations. For statutes applicable to nonmailable materials, see 18 U.S.C. 1716 and implementing regulations. For statutes applicable to water quality standards, see 33 U.S.C. 1341.

Subpart B—Definitions

§ 55.11 Meaning of terms.

When used in this part, terms are defined as follows in this section. Words in the plural form include the singular, and vice versa, and words indicating the masculine gender include the feminine. The terms "includes" and "including" do not exclude other things not named which are in the same general class or are otherwise within the scope of the term defined.

Act. 18 U.S.C. Chapter 40.

Ammunition. Small arms ammunition or cartridge cases, primers, bullets, or smokeless propellants designed for use in small arms, including percussion caps, and 3/32 inch and other external burning pyrotechnic hobby fuses. The term does not include black powder.

Approved storage facility. A place where explosive materials are stored,

consisting of one or more approved magazines, conforming to the requirements of this part and covered by a license or permit issued under this part.

Articles pyrotechnic. Pyrotechnic devices for professional use similar to consumer fireworks in chemical composition and construction but not intended for consumer use. Such articles meeting the weight limits for consumer fireworks but not labeled as such and classified by U.S. Department of Transportation regulations in 49 CFR 172.101 as UN0431 or UN0432.

Artificial barricade. An artificial mound or revetted wall of earth of a minimum thickness of three feet, or any other approved barricade that offers equivalent protection.

ATF officer. An officer or employee of the Bureau of Alcohol, Tobacco and Firearms (ATF) authorized to perform any function relating to the administration or enforcement of this part.

Authority having jurisdiction for fire safety. The fire department having jurisdiction over sites where explosives are manufactured or stored.

Barricaded. The effective screening of a magazine containing explosive materials from another magazine, a building, a railway, or a highway, either by a natural barricade or by a artificial barricade. To be properly barricaded, a straight line from the top of any sidewall of the magazine containing explosive materials to the eave line of any other magazine or building, or to a point 12 feet above the center of a railway or highway, will pass through the natural or artificial barricade.

Blasting agent. Any material or mixture, consisting of fuel and oxidizer, that is intended for blasting and not otherwise defined as an explosive; if the finished product, as mixed for use or shipment, cannot be detonated by means of a number 8 test blasting cap when unconfined. A number 8 test blasting cap is one containing 2 grams of a mixture of 80 percent mercury fulminate and 20 percent potassium chlorate, or a blasting cap of equivalent strength. An equivalent strength cap comprises 0.40–0.45 grams of PETN base charge pressed in an aluminum shell with bottom thickness not to exceed to 0.03 of an inch, to a specific gravity of not less than 1.4 g/cc., and primed with standard weights of primer depending on the manufacturer.

Bulk salutes. Salute components prior to final assembly into aerial shells, and finished salute shells held separately prior to being packed with other types of display fireworks.

Bullet-sensitive explosive materials. Explosive materials that can be exploded by 150-grain M2 ball ammunition having a nominal muzzle velocity of 2700 fps (824 mps) when fired from a .30 caliber rifle at a distance of 100 ft (30.5 m), measured perpendicular. The test material is at a temperature of 70 to 75 degrees F (21 to 24 degrees C) and is placed against a ½ inch (12.4 mm) steel backing plate.

Bureau. The Bureau of Alcohol, Tobacco and Firearms, Department of the Treasury, Washington, DC.

Business premises. When used with respect to a manufacturer, importer, or dealer, the property on which explosive materials are manufactured, imported, stored or distributed. The premises include the property where the records of a manufacturer, importer, or dealer are kept if different than the premises where explosive materials are manufactured, imported, stored or distributed. When used with respect to a user of explosive materials, the property on which the explosive materials are received or stored. The premises includes the property where the records of the users are kept if different than the premises where explosive materials are received or stored.

Chief, Firearms and Explosives Licensing Center. The AFT official responsible for the issuance and renewal of licenses and permits under this part.

Consumer fireworks. Any small firework device designed to produce visible effects by combustion and which must comply with the construction, chemical composition, and labeling regulations of the U.S. Consumer Product Safety Commission, as set forth in title 16, Code of Federal Regulations, parts 1500 and 1507. Some small devices designed to produce audible effects are included, such as whistling devices, ground devices containing 50 mg or less of explosive materials, and aerial devices containing 130 mg or less of explosive materials. Consumer fireworks are classified as fireworks UN0336, and

UN0337 by the U.S. Department of Transportation at 49 CFR 172.101. This term does not include fused setpieces containing components which together exceed 50 mg of salute powder.

Crime punishable by imprisonment for a term exceeding one year. Any offense for which the maximum penalty, whether or not imposed, is capital punishment or imprisonment in excess of one year. The term does not include (a) any Federal or State offenses pertaining to antitrust violations, unfair trade practices, restraints of trade, or (b) any State offense (other than one involving a firearm or explosive) classified by the laws of the State as a misdemeanor and punishable by a term of imprisonment of two years or less.

Customs officer. Any officer of the Customs Service or any commissioned, warrant, or petty officer of the Coast Guard, or any agent or other person authorized to perform the duties of an officer of the Customs Service.

Dealer. Any person engaged in the business of distributing explosive materials at wholesale or retail.

Detonator. Any device containing a detonating charge that is used for initiating detonation in an explosive. The term includes, but is not limited to, electric blasting caps of instantaneous and delay types, blasting caps for use with safety fuses, detonating-cord delay connectors, and nonelectric instantaneous and delay blasting caps.

Director. The Director, Bureau of Alcohol, Tobacco and Firearms, Department of the Treasury, Washington, DC.

Display fireworks. Large fireworks designed primarily to produce visible or audible effects by combustion, deflagration, or detonation. This term includes, but is not limited to, salutes containing more than 2 grains (130 mg) of explosive materials, aerial shells containing more than 40 grams of pyrotechnic compositions, and other display pieces which exceed the limits of explosive materials for classification as "consumer fireworks." Display fireworks are classified as fireworks UN0333, UN0334 or UN0335 by the U.S. Department of Transportation at 49 CFR 172.101. This term also includes fused setpieces containing components which together exceed 50 mg of salute powder.

Distribute. To sell, issue, give, transfer, or otherwise dispose of. The term does not include a mere change of possession from a person to his agent or employee in connection with the agency or employment.

Executed under penalties of perjury. Signed with the required declaration under the penalties of perjury as provided on or with respect to the return, form, or other document or, where no form of declaration is required, with the declaration:

> "I declare under the penalties of perjury that this—(insert type of document, such as, statement, application, request, certificate), including the documents submitted in support thereof, has been examined by me and, to the best of my knowledge and belief, is true, correct, and complete".

Explosive actuated device. Any tool or special mechanized device which is actuated by explosives, but not a propellent actuated device.

Explosive materials. Explosives, blasting agents, water gels and detonators. Explosive materials include, but are not limited to, all items "in the List of Explosive Materials" provided for in §55.23.

Explosives. Any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite and other high explosives, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, and igniters.

Fireworks. Any composition or device designed to produce a visible or an audible effect by combustion, deflagration, or detonation, and which meets the definition of "consumer fireworks" or "display fireworks" as defined by this section.

Fireworks mixing building. Any building or area used for mixing and blending pyrotechnic compositions except wet sparkler mix.

Fireworks nonprocess building. Any office building or other building or area in a fireworks plant where no fireworks, pyrotechnic compositions or explosive materials are processed or stored.

Fireworks plant. All land and buildings thereon used for or in connection

with the assembly or processing of fireworks, including warehouses used with or in connection with fireworks plant operations.

Fireworks plant warehouse. Any building or structure used exclusively for the storage of materials which are neither explosive materials nor pyrotechnic compositions used to manufacture or assemble fireworks.

Fireworks process building. Any mixing building; any building in which pyrotechnic compositions or explosive materials is pressed or otherwise prepared for finished and assembly; or any finishing or assembly building.

Fireworks shipping building. A building used for the packing of assorted display fireworks into shipping cartons for individual public displays and for the loading of packaged displays for shipment to purchasers.

Flash powder. An explosive material intended to produce an audible report and a flash of light when ignited which includes but is not limited to oxidizers such as potassium chlorate or potassium perchlorate, and fuels such as sulfur or aluminum powder.

Fugitive from justice. Any person who has fled from the jurisdiction of any court of record to avoid prosecution for any crime or to avoid giving testimony in any criminal proceeding. The term also includes any person who has been convicted of any crime and has fled to avoid imprisonment.

Hardwood. Oak, maple, ash, hickory, or other hard wood, free from loose knots, spaces, or similar defects.

Highway. Any public street, public alley, or public road, including a privately financed, constructed, or maintained road that is regularly and openly traveled by the general public.

Importer. Any person engaged in the business of importing or bringing explosive materials into the United States for purposes of sale or distribution.

Indictment. Includes an indictment or information in any court under which a crime punishable by imprisonment for a term exceeding one year may be prosecuted.

Inhabited building. Any building regularly occupied in whole or in part as a habitation for human beings, or any church, schoolhouse, railroad station, store, or other structure where people are accustomed to assemble, except any building occupied in connection with the manufacture, transportation, storage, or use of explosive materials.

Interstate or foreign commerce. Commerce between any place in a State and any place outside of that State, or within any possession of the United States or the District of Columbia, and commerce between places within the same State but through any place outside of that State.

Licensed dealer. A dealer licensed under this part.

Licensed importer. An importer licensed under this part.

Licensed manufacturer. A manufacturer licensed under this part to engage in the business of manufacturing explosive materials for purposes of sale or distribution or for his own use.

Licensee. Any importer, manufacturer, or dealer licensed under this part.

Magazine. Any building or structure, other than an explosives manufacturing building, used for storage of explosive materials.

Manufacturer. Any person engaged in the business of manufacturing explosive materials for purposes of sale or distribution or for his own use.

Mass detonation (mass explosion). Explosive materials mass detonate (mass explode) when a unit or any part of a larger quantity of explosive material explodes and causes all or a substantial part of the remaining material to detonate or explode.

Natural barricade. Natural features of the ground, such as hills, or timber of sufficient density that the surrounding exposures which require protection cannot be seen from the magazine when the trees are bare of leaves.

Number 8 test blasting cap. (See definition of "blasting agent.")

Permittee. Any user of explosives for lawful purpose, who has obtained a user permit under this part.

Person. Any individual, corporation, company, association, firm, partnership, society, or joint stock company.

Plywood. Exterior, construction grade (laminated wood) plywood.

Propellant actuated device. Any tool or special mechanized device or gas generator system which is actuated by a propellant or which releases and directs work through a propellant charge.

Pyrotechnic compositions. A chemical mixture which, upon burning and without explosion, produces visible, brilliant displays, bright lights, or sounds.

Railway. Any steam, electric, or other railroad or railway which carries passengers for hire.

Region. A geographical region of the Bureau of Alcohol, Tobacco and Firearms.

Regional director (compliance). The principal regional official responsible for administering regulations in this part.

Salute. An aerial shell, classified as a display firework, that contains a charge of flash powder and is designed to produce a flash of light and a loud report as the pyrotechnic effect.

Screen barricade. Any barrier that will contain the embers and debris from a fire or deflagration in a process building, thus preventing propagation of fire to other buildings or areas. Such barriers shall be constructed of metal roofing, ¼ to ½ inch (6 to 13 mm) mesh screen, or equivalent material. The barrier extends from floor level to a height such that a straight line from the top of any side wall of the donor building to the eave line of any exposed building intercepts the screen at a point not less than 5 feet (1.5 m) from the top of the screen. The top 5 feet (1.5 m) of the screen is inclined towards the donor building at an angle of 30 to 45 degrees.

Softwood. Fir, pine, or other soft wood, free from loose knots, spaces, or similar defects.

State. A State of the United States. The term includes the District of Columbia, the Commonwealth of Puerto Rico, and the possessions of the United States.

State of residence. The State in which an individual regularly resides or maintains his home. Temporary stay in a State does not make the State of temporary stay the State of residence.

Theatrical flash powder. Flash powder commercially manufactured in premeasured kits not exceeding 1 ounce and mixed immediately prior to use and intended for use in theatrical shows, stage plays, band concerts, magic acts, thrill shows, and clown acts in circuses.

U.S.C. The United States Code.

User-limited permit. A user permit valid only for a single purchase transaction, a new permit being required for a subsequent purchase transaction.

User permit. A permit issued to a person authorizing him (a) to acquire for his own use explosive materials from a licensee in a State other than the State in which he resides or from a foreign country, and (b) to transport explosive materials in interstate or foreign commerce.

Water gels. Explosives or blasting agents that contain a substantial proportion of water.

(18 U.S.C. 847 (84 Stat. 959); 18 U.S.C. 926 (82 Stat. 1226)

[T.D. ATF-87, 46 FR 40384, Aug. 7, 1981, as amended by T.D. ATF-92, 46 FR 46916, Sept. 23, 1981; T.D. ATF-200, 50 FR 10497, Mar. 15, 1985; T.D. ATF-290, 54 FR 53053, Dec. 27, 1989; T.D. ATF-293, 55 FR 3720, Feb. 5, 1990; T.D. ATF-314, 56 FR 49140, Sept. 27, 1991; T.D. ATF-382, 61 FR 38084, July 23, 1996; T.D. ATF-400, 63 FR 45001, Aug. 24, 1998]

Subpart C—Administrative and Miscellaneous Provisions

§ 55.21 Forms prescribed.

(a) The Director is authorized to prescribe all forms required by this part. All of the information called for in each form shall be furnished as indicated by the headings on the form and the instructions on or pertaining to the form. In addition, information called for in each form shall be furnished as required by this part.

(b) Requests for forms should be mailed to the ATF Distribution Center, 7943 Angus Court, Springfield, Virginia 22153.

[T.D. ATF-92, 46 FR 46916, Sept. 23, 1981, as amended by T.D. ATF-249, 52 FR 5961, Feb. 27, 1987; T.D. 372, 61 FR 20724, May 8, 1996]

§ 55.22 Alternate methods or procedures; emergency variations from requirements.

(a) *Alternate methods or procedures.* The permittee or licensee, on specific approval by the Director as provided by this paragraph, may use an alternate

method or procedure in lieu of a method or procedure specifically prescribed in this part. The Director may approve an alternate method or procedure, subject to stated conditions, when he finds that:

(1) Good cause is shown for the use of the alternate method or procedure;

(2) The alternate method or procedure is within the purpose of, and consistent with the effect intended by, the specifically prescribed method or procedure and that the alternate method or procedure is substantially equivalent to that specifically prescribed method or procedure; and

(3) The alternate method or procedure will not be contrary to any provision of law and will not result in an increase in cost to the Government or hinder the effective administration of this part.

Where the permittee or licensee desires to employ an alternate method or procedure, he shall submit a written application to the regional director (compliance), for transmittal to the Director. The application shall specifically describe the proposed alternate method or procedure and shall set forth the reasons for it. Alternate methods or procedures may not be employed until the application is approved by the Director. The permittee or licensee shall, during the period of authorization of an alternate method or procedure, comply with the terms of the approved application. Authorization of any alternate method or procedure may be withdrawn whenever, in the judgment of the Director, the effective administration of this part is hindered by the continuation of the authorization. As used in this paragraph, alternate methods or procedures include alternate construction or equipment.

(b) *Emergency variations from requirements.* The Director may approve construction, equipment, and methods of operation other than as specified in this part, where he finds that an emergency exists and the proposed variations from the specified requirements are necessary and the proposed variations:

(1) Will afford security and protection that are substantially equivalent to those prescribed in this part;

(2) Will not hinder the effective administration of this part; and

(3) Will not be contrary to any provisions of law.

Variations from requirements granted under this paragraph are conditioned on compliance with the procedures, conditions, and limitations set forth in the approval of the application. Failure to comply in good faith with the procedures, conditions, and limitations shall automatically terminate the authority for the variations and the licensee or permittee shall fully comply with the prescribed requirements of regulations from which the variations were authorized. Authority for any variation may be withdrawn whenever, in the judgment of the Director, the effective administration of this part is hindered by the continuation of the variation. Where the licensee or permittee desires to employ an emergency variation, he shall submit a written application to the regional director (compliance) for transmittal to the Director. The application shall describe the proposed variation and set forth the reasons for it. Variations may not be employed until the application is approved, except when the emergency requires immediate action to correct a situation that is threatening to life or property. Corrective action may then be taken concurrent with the filing of the application and notification of the Director via telephone.

(c) *Retention of approved variations.* The licensee or permittee shall retain, as part of his records available for examination by ATF officers, any application approved by the Director under this section.

§ 55.23 List of explosive materials.

The Director shall compile a list of explosive materials, which shall be published and revised at least annually in the FEDERAL REGISTER. The "List of Explosive Materials" (AFT Publication 5400.8) is available at no cost upon request from the ATF Distribution Center, 7943 Angus Court, Springfield, Virginia 22153.

[T.D. ATF-290, 54 FR 53054, Dec. 27, 1989]

lawfully manufactured exclusively for military or police purposes.

[T.D. ATF-387, 62 FR 8377, Feb. 25, 1997]

§55.183 Importation of plastic explosives on or after April 24, 1997.

Persons filing Form 6 applications for the importation of plastic explosives on or after April 24, 1997, shall attach to the application the following written statement, prepared in triplicate, executed under the penalties of perjury:

(a) "I declare under the penalties of perjury that the plastic explosive to be imported contains a detection agent as required by 27 CFR 55.180(b)"; or

(b) "I declare under the penalties of perjury that the plastic explosive to be imported is a "small amount" to be used for research, training, or testing purposes and is exempt from the detection agent requirement pursuant to 27 CFR 55.182."

[T.D. ATF-387, 62 FR 8377, Feb. 25, 1997]

§55.184 Statements of process and samples.

(a) A complete and accurate statement of process with regard to any plastic explosive or to any detection agent that is to be introduced into a plastic explosive or formulated in such plastic explosive shall be submitted by a licensed manufacturer or licensed importer, upon request, to the Director.

(b) Samples of any plastic explosive or detection agent shall be submitted by a licensed manufacturer or licensed importer, upon request, to the Director.

(Paragraph (a) approved by the Office of Management and Budget under control number 1512-0539)

[T.D. ATF-387, 62 FR 8378, Feb. 25, 1997]

§55.185 Criminal sanctions.

Any person who violates the provisions of 18 U.S.C. 842(l)-(o) shall be fined under title 18, U.S.C., imprisoned for not more than 10 years, or both.

[T.D. ATF-387, 62 FR 8378, Feb. 25, 1997]

§55.186 Seizure or forfeiture.

Any plastic explosive that does not contain a detection agent in violation of 18 U.S.C. 842(l)-(n) is subject to seizure and forfeiture, and all provisions of 19 U.S.C. 1595a, relating to seizure, forfeiture, and disposition of merchandise introduced or attempted to be introduced into the U.S. contrary to law, shall extend to seizures and forfeitures under this subpart. See §72.27 of this chapter for regulations on summary destruction of plastic explosives that do not contain a detection agent.

[T.D. ATF-387, 62 FR 8378, Feb. 25, 1997]

Subpart K—Storage

§55.201 General.

(a) Section 842(j) of the Act and §55.29 of this part require that the storage of explosive materials by any person must be in accordance with the regulations in this part. Further, section 846 of this Act authorizes regulations to prevent the recurrence of accidental explosions in which explosive materials were involved. The storage standards prescribed by this subpart confer no right or privileges to store explosive materials in a manner contrary to State or local law.

(b) The Director may authorize alternate construction for explosives storage magazines when it is shown that the alternate magazine construction is substantially equivalent to the standards of safety and security contained in this subpart. Any alternate explosive magazine construction approved by the Director prior to August 9, 1982, will continue as approved unless notified in writing by the Director. Any person intending to use alternate magazine construction shall submit a letter application to the regional director (compliance) for transmittal to the Director, specifically describing the proposed magazine. Explosive materials may not be stored in alternate magazines before the applicant has been notified that the application has been approved.

(c) A licensee or permittee who intends to make changes in his magazines, or who intends to construct or acquire additional magazines, shall comply with §55.63.

(d) The regulations set forth in §§55.221 through 55.224 pertain to the storage of display fireworks, pyrotechnic compositions, and explosive

materials used in assembling fireworks and articles pyrotechnic.

(e) The provisions of §55.202(a) classifying flash powder and bulk salutes as high explosives are mandatory after March 7, 1990: *Provided,* that those persons who hold licenses or permits under this part on that date shall, with respect to the premises covered by such licenses or permits, comply with the high explosives storage requirements for flash powder and bulk salutes by March 7, 1991.

(f) Any person who stores explosive materials shall notify the authority having jurisdiction for fire safety in the locality in which the explosive materials are being stored of the type, magazine capacity, and location of each site where such explosive materials are stored. Such notification shall be made orally before the end of the day on which storage of the explosive materials commenced and in writing within 48 hours from the time such storage commenced.

(Paragraph (f) approved by the Office of Management and Budget under control number 1512-0536)

[T.D. ATF-87, 46 FR 40384, Aug. 7, 1981, as amended by T.D. ATF-293, 55 FR 3722, Feb. 5, 1990; T.D. ATF-400, 63 FR 45003, Aug. 24, 1998]

§55.202 Classes of explosive materials.

For purposes of this part, there are three classes of explosive materials. These classes, together with the description of explosive materials comprising each class, are as follows:

(a) *High explosives.* Explosive materials which can be caused to detonate by means of a blasting cap when unconfined, (for example, dynamite, flash powders, and bulk salutes). See also §55.201(e).

(b) *Low explosives.* Explosive materials which can be caused to deflagrate when confined (for example, black powder, safety fuses, igniters, igniter cords, fuse lighters, and "display fireworks" classified as UN0333, UN0334, or UN0335 by the U.S. Department of Transportation regulations at 49 CFR 172.101, except for bulk salutes).

(c) *Blasting agents.* (For example, ammonium nitrate-fuel oil and certain water-gels (see also §55.11).

[T.D. ATF-87, 46 FR 40384, Aug. 7, 1981, as amended by T.D. ATF-293, 55 FR 3722, Feb. 5, 1990; T.D. ATF-400, 63 FR 45003, Aug. 24, 1998]

§55.203 Types of magazines.

For purposes of this part, there are five types of magazines. These types, together with the classes of explosive materials, as defined in §55.202, which will be stored in them, are as follows:

(a) *Type 1 magazines.* Permanent magazines for the storage of high explosives, subject to the limitations prescribed by §§55.206 and 55.213. Other classes of explosive materials may also be stored in type 1 magazines.

(b) *Type 2 magazines.* Mobile and portable indoor and outdoor magazines for the storage of high explosives, subject to the limitations prescribed by §§55.206, 55.208(b), and 55.213. Other classes of explosive materials may also be stored in type 2 magazines.

(c) *Type 3 magazines.* Portable outdoor magazines for the temporary storage of high explosives while attended (for example, a "day-box"), subject to the limitations prescribed by §§55.206 and 55.213. Other classes of explosives materials may also be stored in type 3 magazines.

(d) *Type 4 magazines.* Magazines for the storage of low explosives, subject to the limitations prescribed by §§55.206(b), 55.210(b), and 55.213. Blasting agents may be stored in type 4 magazines, subject to the limitations prescribed by §§55.206(c), 55.211(b), and 55.213. Detonators that will not mass detonate may also be stored in type 4 magazines, subject to the limitations prescribed by §§55.206(a), 55.210(b), and 55.213.

(e) *Type 5 magazines.* Magazines for the storage of blasting agents, subject to the limitations prescribed by §§55.206(c), 55.211(b), and 55.213.

§55.204 Inspection of magazines.

Any person storing explosive materials shall inspect his magazines at least every seven days. This inspection need not be an inventory, but must be sufficient to determine whether there

has been unauthorized entry or attempted entry into the magazines, or unauthorized removal of the contents of the magazines.

§ 55.205 Movement of explosive materials.

All explosive materials must be kept in locked magazines meeting the standards in this subpart unless they are:

(a) In the process of manufacture;

(b) Being physically handled in the operating process of a licensee or user;

(c) Being used; or

(d) Being transported to a place of storage or use by a licensee or permittee or by a person who has lawfully acquired explosive materials under § 55.106.

§ 55.206 Location of magazines.

(a) Outdoor magazines in which high explosives are stored must be located no closer to inhabited buildings, passenger railways, public highways, or other magazines in which high explosives are stored, than the minimum distances specified in the table of distances for storage of explosive materials in § 55.218.

(b) Outdoor magazines in which low explosives are stored must be located no closer to inhibited buildings, passenger railways, public highways, or other magazines in which explosive materials are stored, than the minimum distances specified in the table of distances for storage of low explosives in § 55.219, except that the table of distances in § 55.224 shall apply to the storage of display fireworks. The distances shown in § 55.219 may not be reduced by the presence of barricades.

(c)(1) Outdoor magazines in which blasting agents in quantities of more than 50 pounds are stored must be located no closer to inhabited buildings, passenger railways, or public highways than the minimum distances specified in the table of distances for storage of explosive materials in § 55.218.

(2) Ammonium nitrate and magazines in which blasting agents are stored must be located no closer to magazines in which high explosives or other blasting agents are stored than the minimum distances specified in the table of distances for the separation of ammonium nitrate and blasting agents in § 55.220. However, the minimum distances for magazines in which explosives and blasting agents are stored from inhabited buildings, etc., may not be less than the distances specified in the table of distances for storage of explosives materials in § 55.218.

[T.D. ATF-87, 46 FR 40384, Aug. 7, 1981, as amended by T.D. ATF-293, 55 FR 3722, Feb. 5, 1990; T.D. ATF-400, 63 FR 45003, Aug. 24, 1998]

§ 55.207 Construction of type 1 magazines.

A type 1 magazine is a permanent structure: a building, an igloo or "Army-type structure", a tunnel, or a dugout. It is to be bullet-resistant, fire-resistant, weather-resistant, theft-resistant, and ventilated.

(a) *Buildings.* All building type magazines are to be constructed of masonry, wood, metal, or a combination of these materials, and have no openings except for entrances and ventilation. The ground around building magazines must slope away for drainage or other adequate drainage provided.

(1) *Masonry wall construction.* Masonry wall construction is to consist of brick, concrete, tile, cement block, or cinder block and be not less than 6 inches in thickness. Hollow masonry units used in construction must have all hollow spaces filled with well-tamped, coarse, dry sand or weak concrete (at least a mixture of one part cement and eight parts of sand with enough water to dampen the mixture while tamping in place). Interior walls are to be constructed of, or covered with, a nonsparking material.

(2) *Fabricated metal wall construction.* Metal wall construction is to consist of sectional sheets of steel or aluminum not less than number 14-gauge, securely fastened to a metal framework. Metal wall construction is either lined inside with brick, solid cement blocks, hardwood not less than four inches thick, or will have at least a six inch sand fill between interior and exterior walls. Interior walls are to be constructed of, or covered with, a nonsparking material.

(3) *Wood frame wall construction.* The exterior of outer wood walls is to be covered with iron or aluminum not less than number 26-gauge. An inner wall

of, or covered with nonsparking material will be constructed so as to provide a space of not less than six inches between the outer and inner walls. The space is to be filled with coarse, dry sand or weak concrete.

(4) *Floors.* Floors are to be constructed of, or covered with, a nonsparking material and shall be strong enough to bear the weight of the maximum quantity to be stored. Use of pallets covered with a nonsparking material is considered equivalent to a floor constructed of or covered with a nonsparking material.

(5) *Foundations.* Foundations are to be constructed of brick, concrete, cement block, stone, or wood posts. If piers or posts are used, in lieu of a continuous foundation, the space under the buildings is to be enclosed with metal.

(6) *Roof.* Except for buildings with fabricated metal roofs, the outer roof is to be covered with no less than number 26-guage iron or aluminum, fastened to at least ⅞ inch sheathing.

(7) *Bullet-resistant ceilings or roofs.* Where it is possible for a bullet to be fired directly through the roof and into the magazine at such an angle that the bullet would strike the explosives within, the magazine is to be protected by one of the following methods:

(i) A sand tray lined with a layer of building paper, plastic, or other nonporous material, and filled with not less than four inches of coarse, dry sand, and located at the tops of inner walls covering the entire ceiling area, except that portion necessary for ventilation.

(ii) A fabricated metal roof constructed of 3/16-inch plate steel lined with four inches of hardwood. (For each additional 1/16 inch of plate steel, the hardwood lining may be decreased one inch.)

(8) *Doors.* All doors are to be constructed of not less than ¼ inch plate steel and lined with at least two inches of hardwood. Hinges and hasps are to be attached to the doors by welding, riveting or bolting (nuts on inside of door). They are to be installed in such a manner that the hinges and hasps cannot be removed when the doors are closed and locked.

(9) *Locks.* Each door is to be equipped with (i) two mortise locks; (ii) two padlock fastened in separate hasps and staples; (iii) a combination of a mortise lock and a padlock; (iv) a mortise lock that requires two keys to open; or (v) a three-point lock. Padlocks must have at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter. Padlocks must be protected with not less than ¼ inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

(10) *Ventilation.* Ventilation is to be provided to prevent dampness and heating of stored explosive materials. Ventilation openings must be screened to prevent the entrance of sparks. Ventilation openings in side walls and foundations must be offset or shielded for bullet-resistant purposes. Magazines having foundation and roof ventilators with the air circulating between the side walls and the floors and between the side walls and the ceiling must have a wooden lattice lining or equivalent to prevent the packages of explosive materials from being stacked against the side walls and blocking the air circulation.

(11) *Exposed metal.* No sparking material is to be exposed to contact with the stored explosive materials. All ferrous metal nails in the floor and side walls, which might be exposed to contact with explosive materials, must be blind nailed, countersunk, or covered with a nonsparking lattice work or other nonsparking material.

(b) *Igloos, "Army-type structures", tunnels, and dugouts.* Igloo, "Army-type structure", tunnel, and dugout magazines are to be constructed of reinforced concrete, masonry, metal, or a combination of these materials. They must have an earthmound covering of not less than 24 inches on the top, sides and rear unless the magazine meets the requirements of paragraph (a)(7) of this section. Interior walls and floors must be constructed of, or covered with, a nonsparking material. Magazines of this type are also to be constructed in conformity with the requirements of

paragraph (a)(4) and paragraphs (a)(8) through (11) of this section.

§ 55.208 Construction of type 2 magazines.

A type 2 magazine is a box, trailer, semitrailer, or other mobile facility.

(a) *Outdoor magazines*—(1) *General.* Outdoor magazines are to be bullet-resistant, fire-resistant, weather-resistant, theft-resistant, and ventilated. They are to be supported to prevent direct contact with the ground and, if less than one cubic yard in size, must be securely fastened to a fixed object. The ground around outdoor magazines must slope away for drainage or other adequate drainage provided. When unattended, vehicular magazines must have wheels removed or otherwise effectively immobiliized by kingpin locking devices or other methods approved by the Director.

(2) *Exterior construction.* The exterior and doors are to be constructed of not less than ¼-inch steel and lined with at least two inches of hardwood. Magazines with top openings will have lids with water-resistant seals or which overlap the sides by at least one inch when in a closed position.

(3) *Hinges and hasps.* Hinges and hasps are to be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps must be installed so that they cannot be removed when the doors are closed and locked.

(4) *Locks.* Each door is to be equipped with (i) two mortise locks; (ii) two padlocks fastened in separate hasps and staples; (iii) a combination of a mortise lock and a padlock; (iv) a mortise lock that requires two keys to open; or (v) a three-point lock. Padlocks must have at least five tumblers and a case-hardened shackle of at least ⅜-inch diameter. Padlocks must be protected with not less than ¼-inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

(b) *Indoor magazines*—(1) *General.* Indoor magazines are to be fire-resistant and theft-resistant. They need not be bullet-resistant and weather-resistant if the buildings in which they are stored provide protection from the weather and from bullet penetration. No indoor magazine is to be located in a residence or dwelling. The indoor storage of high explosives must not exceed a quantity of 50 pounds. More than one indoor magazine may be located in the same building if the total quantity of explosive materials stored does not exceed 50 pounds. Detonators must be stored in a separate magazine (except as provided in § 55.213) and the total quantity of detonators must not exceed 5,000.

(2) *Exterior construction.* Indoor magazines are to be constructed of wood or metal according to one of the following specifications:

(i) Wood indoor magazines are to have sides, bottoms and doors constructed of at least two inches of hardwood and are to be well braced at the corners. They are to be covered with sheet metal of not less than number 26-gauge (.0179 inches). Nails exposed to the interior of magazines must be countersunk.

(ii) Metal indoor magazines are to have sides, bottoms and doors constructed of not less than number 12-gauge (.1046 inches) metal and be lined inside with a nonsparking material. Edges of metal covers must overlap sides at least one inch.

(3) *Hinges and hasps.* Hinges and hasps are to be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps must be installed so that they cannot be removed when the doors are closed and locked.

(4) *Locks.* Each door is to be equipped with (i) two mortise locks; (ii) two padlocks fastened in separate hasps and staples; (iii) a combination of a mortise lock and a padlock; (iv) a mortise lock that requires two keys to open; or (v) a three-point lock. Padlocks must have at least five tumblers and a case-hardened shackle of at least ⅜-inch diameter. Padlocks must be protected with not less than ¼-inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. Indoor magazines located in secure rooms that are locked as provided in this subparagraph may have each door locked with one steel padlock (which need not be protected by a steel

hood) having at least five tumblers and a case-hardened shackle of at least ⅜-inch diameter, if the door hinges and lock hasp are securely fastened to the magazine. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

(c) *Detonator boxes.* Magazines for detonators in quantities of 100 or less are to have sides, bottoms and doors constructed of not less than number 12-gauge (.1046 inches) metal and lined with a nonsparking material. Hinges and hasps must be attached so they cannot be removed from the outside. One steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least ⅜-inch diameter is sufficient for locking purposes.

§55.209 Construction of type 3 magazines.

A type 3 magazine is a "day-box" or other portable magazine. It must be fire-resistant, weather-resistant, and theft-resistant. A type 3 magazine is to be constructed of not less than number 12-gauge (.1046 inches) steel, lined with at least either ½-inch plywood or ½-inch Masonite-type hardboard. Doors must overlap sides by at least one inch. Hinges and hasps are to be attached by welding, riveting or bolting (nuts on inside). One steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least ⅜-inch diameter is sufficient for locking purposes. Explosive materials are not to be left unattended in type 3 magazines and must be removed to type 1 or 2 magazines for unattended storage.

§55.210 Construction of type 4 magazines.

A type 4 magazine is a building, igloo or "Army-type structure", tunnel, dugout, box, trailer, or a semitrailer or other mobile magazine.

(a) *Outdoor magazines*—(1) *General.* Outdoor magazines are to be fire-resistant, weather-resistant, and theft-resistant. The ground around outdoor magazines must slope away for drainage or other adequate drainage be provided. When unattended, vehicular magazines must have wheels removed or otherwise be effectively immobilized by kingpin locking devices or other methods approved by the Director.

(2) *Construction.* Outdoor magazines are to be constructed of masonry, metal-covered wood, fabricated metal, or a combination of these materials. Foundations are to be constructed of brick, concrete, cement block, stone, or metal or wood posts. If piers or posts are used, in lieu of a continuous foundation, the space under the building is to be enclosed with fire-resistant material. The walls and floors are to be constructed of, or covered with, a nonsparking material or lattice work. The doors must be metal or solid wood covered with metal.

(3) *Hinges and hasps.* Hinges and hasps are to be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps must be installed so that they cannot be removed when the doors are closed and locked.

(4) *Locks.* Each door is to be equipped with (i) two mortise locks; (ii) two padlocks fastened in separate hasps and staples; (iii) a combination of a mortise lock and a padlock; (iv) a mortise lock that requires two keys to open; or (v) a three-point lock. Padlocks must have at least five tumblers and case-hardened shackle of at least ⅜ inch diameter. Padlocks must be protected with not less than ¼ inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

(b) *Indoor magazine*—(1) *General.* Indoor magazines are to be fire-resistant and theft-resistant. They need not be weather-resistant if the buildings in which they are stored provide protection from the weather. No indoor magazine is to be located in a residence or dwelling. The indoor storage of low explosives must not exceed a quantity of 50 pounds. More than one indoor magazine may be located in the same building if the total quantity of explosive materials stored does not exceed 50 pounds. Detonators that will not mass detonate must be stored in a separate

magazine and the total number of electric detonators must not exceed 5,000.

(2) *Construction.* Indoor magazines are to be constructed of masonry, metal-covered wood, fabricated metal, or a combination of these materials. The walls and floors are to be constructed of, or covered with, a nonsparking material. The doors must be metal or solid wood covered with metal.

(3) *Hinges and hasps.* Hinges and hasps are to be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps must be installed so that they cannot be removed when the doors are closed and locked.

(4) *Locks.* Each door is to be equipped with (i) two mortise locks; (ii) two padlocks fastened in separate hasps and staples; (iii) a combination of a mortise lock and padlock; (iv) a mortise lock that requires two keys to open; or (v) a three-point lock. Padlocks must have at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter. Padlocks must be protected with not less than ¼ inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. Indoor magazines located in secure rooms that are locked as provided in this subparagraph may have each door locked with one steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter, if the door hinges and lock hasp are securely fastened to the magazine. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

§ 55.211 Construction of type 5 magazines.

A type 5 magazine is a building, igloo or "Army-type structure", tunnel, dugout, bin, box, trailer, or a semitrailer or other mobile facility.

(a) *Outdoor magazines*—(1) *General.* Outdoor magazines are to be weather-resistant and theft-resistant. The ground around magazines must slope away for drainage or other adequate drainage be provided. When unattended, vehicular magazines must have wheels removed or otherwise be effectively immobilized by kingpin locking devices or other methods approved by the Director.

(2) *Construction.* The doors are to be constructed of solid wood or metal.

(3) *Hinges and hasps.* Hinges and hasps are to be attached to doors by welding, riveting, or bolting (nuts on inside of door). Hinges and hasps must be installed so that they cannot be removed when the doors are closed and locked.

(4) *Locks.* Each door is to be equipped with (i) two mortise locks; (ii) two padlocks fastened in separate hasps and staples; (iii) a combination of a mortise lock and a padlock; (iv) a mortise lock that requires two keys to open; or (v) a three-point lock. Padlocks must have at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter. Padlocks must be protected with not less than ¼ inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. Trailers, semitrailers, and similar vehicular magazines may, for each door, be locked with one steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter, if the door hinges and lock hasp are securely fastened to the magazine and to the door frame. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

(5) *Placards.* The placards required by Department of Transportation regulations at 49 CFR part 172, subpart F, for the transportation of blasting agents shall be displayed on all magazines.

(b) *Indoor magazines*—(1) *General.* Indoor magazines are to be theft-resistant. They need not be weather-resistant if the buildings in which they are stored provide protection from the weather. No indoor magazine is to be located in a residence or dwelling. Indoor magazines containing quantities of blasting agents in excess of 50 pounds are subject to the requirements of § 55.206 of this subpart.

(2) *Construction.* The doors are to be constructed of wood or metal.

(3) *Hinges and hasps.* Hinges and hasps are to be attached to doors by welding, riveting, or bolting (nuts on inside). Hinges and hasps must be installed so

that they cannot be removed when the doors are closed and locked.

(4) *Locks.* Each door is to be equipped with (i) two mortise locks; (ii) two padlocks fastened in separate hasps and staples; (iii) a combination of a mortise lock and a padlock; (iv) a mortise lock that requires two keys to open; or (v) a three-point lock. Padlocks must have at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter. Padlocks must be protected with not less than ¼ inch steel hoods constructed so as to prevent sawing or lever action on the locks, hasps, and staples. Indoor magazines located in secure rooms that are locked as provided in this subparagraph may have each door locked with one steel padlock (which need not be protected by a steel hood) having at least five tumblers and a case-hardened shackle of at least ⅜ inch diameter, if the door hinges and lock hasps are securely fastened to the magazine and to the door frame. These requirements do not apply to magazine doors that are adequately secured on the inside by means of a bolt, lock, or bar that cannot be actuated from the outside.

[T.D. ATF-87, 46 FR 40384, Aug. 7, 1981, as amended by T.D. ATF-298, 55 FR 21863, May 30, 1990]

§55.212 Smoking and open flames.

Smoking, matches, open flames, and spark producing devices are not permitted:

(a) In any magazine;

(b) Within 50 feet of any outdoor magazine; or

(c) Within any room containing an indoor magazine.

§55.213 Quantity and storage restrictions.

(a) Explosive materials in excess of 300,000 pounds or detonators in excess of 20 million are not to be stored in one magazine unless approved by the Director.

(b) Detonators are not to be stored in the same magazine with other explosive materials, except under the following circumstances:

(1) In a type 4 magazine, detonators that will not mass detonate may be stored with electric squibs, safety fuse, igniters, and igniter cord.

(2) In a type 1 or type 2 magazine, detonators may be stored with delay devices and any of the items listed in paragraph (b)(1) of this section.

§55.214 Storage within types 1, 2, 3, and 4 magazines.

(a) Explosive materials within a magazine are not to be placed directly against interior walls and must be stored so as not to interfere with ventilation. To prevent contact of stored explosive materials with walls, a nonsparking lattice work or other nonsparking material may be used.

(b) Containers of explosive materials are to be stored so that marks are visible. Stocks of explosive materials are to be stored so they can be easily counted and checked upon inspection.

(c) Except with respect to fiberboard or other nonmetal containers, containers of explosive materials are not to be unpacked or repacked inside a magazine or within 50 feet of a magazine, and must not be unpacked or repacked close to other explosive materials. Containers of explosive materials must be closed while being stored.

(d) Tools used for opening or closing containers of explosive materials are to be of nonsparking materials, except that metal slitters may be used for opening fiberboard containers. A wood wedge and a fiber, rubber, or wooden mallet are to be used for opening or closing wood containers of explosive materials. Metal tools other than nonsparking transfer conveyors are not to be stored in any magazine containing high explosives.

§55.215 Housekeeping.

Magazines are to be kept clean, dry, and free of grit, paper, empty packages and containers, and rubbish. Floors are to be regularly swept. Brooms and other utensils used in the cleaning and maintenance of magazines must have no spark-producing metal parts, and may be kept in magazines. Floors stained by leakage from explosive materials are to be cleaned according to instructions of the explosives manufacturer. When any explosive material has deteriorated it is to be destroyed in accordance with the advice or instructions of the manufacturer. The area surrounding magazines is to be kept

clear of rubbish, brush, dry grass, or trees (except live trees more than 10 feet tall), for not less than 25 feet in all directions. Volatile materials are to be kept a distance of not less than 50 feet from outdoor magazines. Living foliage which is used to stabilize the earthen covering of a magazine need not be removed.

§ 55.216 Repair of magazines.

Before repairing the interior of magazines, all explosive materials are to be removed and the interior cleaned. Before repairing the exterior of magazines, all explosive materials must be removed if there exists any possibility that repairs may produce sparks or flame. Explosive materials removed from magazines under repair must be (a) placed in other magazines appropriate for the storage of those explosive materials under this subpart, or (b) placed a safe distance from the magazines under repair where they are to be properly guarded and protected until the repairs have been completed.

§ 55.217 Lighting.

(a) Battery-activated safety lights or battery-activated safety lanterns may be used in explosives storage magazines.

(b) Electric lighting used in any explosives storage magazine must meet the standards prescribed by the "National Electrical Code," (National Fire Protection Association, NFPA 70–81), for the conditions present in the magazine at any time. All electrical switches are to be located outside of the magazine and also meet the standards prescribed by the National Electrical Code.

(c) Copies of invoices, work orders or similar documents which indicate the lighting complies with the National Electrical Code must be available for inspection by ATF officers.

§ 55.218 Table of distances for storage of explosive materials.

Quantity of explosives		Distances in feet							
Pounds over	Pounds not over	Inhabited buildings		Public highways with traffic volume 3000 or less vehicles/day		Passenger railways—public highways with traffic volume of more than 3,000 vehicles bay		Separation of magazines	
		Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded
0	5	70	140	30	60	51	102	6	12
5	10	90	180	35	70	64	128	8	16
10	20	110	220	45	90	81	162	10	20
20	30	125	250	50	100	93	186	11	22
30	40	140	280	55	110	103	206	12	24
40	50	150	300	60	120	110	220	14	28
50	75	170	340	70	140	127	254	15	30
75	100	190	380	75	150	139	278	16	32
100	125	200	400	80	160	150	300	18	36
125	150	215	430	85	170	159	318	19	38
150	200	235	470	95	190	175	350	21	42
200	250	255	510	105	210	189	378	23	46
250	300	270	540	110	220	201	402	24	48
300	400	295	590	120	240	221	442	27	54
400	500	320	640	130	260	238	476	29	58
500	600	340	680	135	270	253	506	31	62
600	700	355	710	145	290	266	532	32	64
700	800	375	750	150	300	278	556	33	66
800	900	390	780	155	310	289	578	35	70
900	1,000	400	800	160	320	300	600	36	72
1,000	1,200	425	850	165	330	318	636	39	78
1,200	1,400	450	900	170	340	336	672	41	82
1,400	1,600	470	940	175	350	351	702	43	86
1,600	1,800	490	980	180	360	366	732	44	88
1,800	2,000	505	1,010	185	370	378	756	45	90
2,000	2,500	545	1,090	190	380	408	816	49	98
2,500	3,000	580	1,160	195	390	432	864	52	104
3,000	4,000	635	1,270	210	420	474	948	58	116
4,000	5,000	685	1,370	225	450	513	1,026	61	122
5,000	6,000	730	1,460	235	470	546	1,092	65	130
6,000	7,000	770	1,540	245	490	573	1,146	68	136
7,000	8,000	800	1,600	250	500	600	1,200	72	144

Quantity of explosives		Distances in feet							
Pounds over	Pounds not over	Inhabited buildings		Public highways with traffic volume 3000 or less vehicles/day		Passenger railways—public highways with traffic volume of more than 3,000 vehicles bay		Separation of magazines	
		Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded	Barricaded	Unbarricaded
8,000	9,000	835	1,670	255	510	624	1,248	75	150
9,000	10,000	865	1,730	260	520	645	1,290	78	156
10,000	12,000	875	1,750	270	540	687	1,374	82	164
12,000	14,000	885	1,770	275	550	723	1,446	87	174
14,000	16,000	900	1,800	280	560	756	1,512	90	180
16,000	18,000	940	1,880	285	570	786	1,572	94	188
18,000	20,000	975	1,950	290	580	813	1,626	98	196
20,000	25,000	1,055	2,000	315	630	876	1,752	105	210
25,000	30,000	1,130	2,000	340	680	933	1,866	112	224
30,000	35,000	1,205	2,000	360	720	981	1,962	119	238
35,000	40,000	1,275	2,000	380	760	1,026	2,000	124	248
40,000	45,000	1,340	2,000	400	800	1,068	2,000	129	258
45,000	50,000	1,400	2,000	420	840	1,104	2,000	135	270
50,000	55,000	1,460	2,000	440	880	1,140	2,000	140	280
55,000	60,000	1,515	2,000	455	910	1,173	2,000	145	290
60,000	65,000	1,565	2,000	470	940	1,206	2,000	150	300
65,000	70,000	1,610	2,000	485	970	1,236	2,000	155	310
70,000	75,000	1,655	2,000	500	1,000	1,263	2,000	160	320
75,000	80,000	1,695	2,000	510	1,020	1,293	2,000	165	330
80,000	85,000	1,730	2,000	520	1,040	1,317	2,000	170	340
85,000	90,000	1,760	2,000	530	1,060	1,344	2,000	175	350
90,000	95,000	1,790	2,000	540	1,080	1,368	2,000	180	360
95,000	100,000	1,815	2,000	545	1,090	1,392	2,000	185	370
100,000	110,000	1,835	2,000	550	1,100	1,437	2,000	195	390
110,000	120,000	1,855	2,000	555	1,110	1,479	2,000	205	410
120,000	130,000	1,875	2,000	560	1,120	1,521	2,000	215	430
130,000	140,000	1,890	2,000	565	1,130	1,557	2,000	225	450
140,000	150,000	1,900	2,000	570	1,140	1,593	2,000	235	470
150,000	160,000	1,935	2,000	580	1,160	1,629	2,000	245	490
160,000	170,000	1,965	2,000	590	1,180	1,662	2,000	255	510
170,000	180,000	1,990	2,000	600	1,200	1,695	2,000	265	530
180,000	190,000	2,010	2,010	605	1,210	1,725	2,000	275	550
190,000	200,000	2,030	2,030	610	1,220	1,755	2,000	285	570
200,000	210,000	2,055	2,055	620	1,240	1,782	2,000	295	590
210,000	230,000	2,100	2,100	635	1,270	1,836	2,000	315	630
230,000	250,000	2,155	2,155	650	1,300	1,890	2,000	335	670
250,000	275,000	2,215	2,215	670	1,340	1,950	2,000	360	720
275,000	300,000	2,275	2,275	690	1,380	2,000	2,000	385	770

TABLE: AMERICAN TABLE OF DISTANCES FOR STORAGE OF EXPLOSIVES (DECEMBER 1910), AS REVISED AND APPROVED BY THE INSTITUTE OF MAKERS OF EXPLOSIVES—JULY, 1991.

Notes to the Table of Distances for Storage of Explosives

(1) Terms found in the table of distances for storage of explosive materials are defined in §55.11.

(2) When two or more storage magazines are located on the same property, each magazine must comply with the minimum distances specified from inhabited buildings, railways, and highways, and, in addition, they should be separated from each other by not less than the distances shown for "Separation of Magazines," except that the quantity of explosives contained in cap magazines shall govern in regard to the spacing of said cap magazines from magazines containing other explosives. If any two or more magazines are separated from each other by less than the specified "Separation of Magazines" distances, then such two or more magazines, as a group, must be considered as one magazine, and the total quantity of explosives stored in such group must be treated as if stored in a single magazine located on the site of any magazine of the group, and must comply with the minimum of distances specified from other magazines, inhabited buildings, railways, and highways.

(3) All types of blasting caps in strengths through No. 8 cap should be rated at 1½ lbs. of explosives per 1,000 caps. For strengths higher than No. 8 cap, consult the manufacturer.

(4) For quantity and distance purposes, detonating cord of 50 or 60 grains per foot should be calculated as equivalent to 9 lbs. of high explosives per 1,000 feet. Heavier or

lighter core loads should be rated proportionately.

[T.D. ATF-87, 46 FR 40384, Aug. 7, 1981, as amended by T.D. ATF-400, 63 FR 45003, Aug. 24, 1998]

§ 55.219 Table of distances for storage of low explosives.

Pounds		From inhabited building distance (feet)	From public railroad and highway distance (feet)	From above ground magazine (feet)
Over	Not over			
0	1,000	75	75	50
1,000	5,000	115	115	75
5,000	10,000	150	150	100
10,000	20,000	190	190	125
20,000	30,000	215	215	145
30,000	40,000	235	235	155
40,000	50,000	250	250	165
50,000	60,000	260	260	175
60,000	70,000	270	270	185
70,000	80,000	280	280	190
80,000	90,000	295	295	195
90,000	100,000	300	300	200
100,000	200,000	375	375	250
200,000	300,000	450	450	300

§ 55.220 Table of separation distances of ammonium nitrate and blasting agents from explosives or blasting agents.

TABLE: DEPARTMENT OF DEFENSE AMMUNITION AND EXPLOSIVES STANDARDS, TABLE 5-4.1 EXTRACT; 4145.27 M, MARCH 1969

Donor weight (pounds)		Minimum separation distance of acceptor from donor when barricaded (ft.)		Minimum thickness of artificial barricades (in.)
Over	Not over	Ammonium nitrate	Blasting agent	
.....	100	3	11	12
100	300	4	14	12
300	600	5	18	12
600	1,000	6	22	12
1,000	1,600	7	25	12
1,600	2,000	8	29	12
2,000	3,000	9	32	15
3,000	4,000	10	36	15
4,000	6,000	11	40	15
6,000	8,000	12	43	20
8,000	10,000	13	47	20
10,000	12,000	14	50	20
12,000	16,000	15	54	25
16,000	20,000	16	58	25
20,000	25,000	18	65	25
25,000	30,000	19	68	30
30,000	35,000	20	72	30
35,000	40,000	21	76	30
40,000	45,000	22	79	35
45,000	50,000	23	83	35
50,000	55,000	24	86	35
55,000	60,000	25	90	35
60,000	70,000	26	94	40
70,000	80,000	28	101	40
80,000	90,000	30	108	40
90,000	100,000	32	115	40
100,000	120,000	34	122	50
120,000	140,000	37	133	50
140,000	160,000	40	144	50
160,000	180,000	44	158	50
180,000	200,000	48	173	50
200,000	220,000	52	187	60
220,000	250,000	56	202	60
250,000	275,000	60	216	60
275,000	300,000	64	230	60

TABLE: NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) OFFICIAL STANDARD NO. 492, 1968

Notes of Table of Separation Distances of Ammonium Nitrate and Blasting Agents From Explosives or Blasting Agents

(1) This table specifies separation distances to prevent explosion of ammonium nitrate and ammonium nitrate-based blasting agents by propagation from nearby stores of high explosives or blasting agents referred to in the table as the "donor." Ammonium nitrate, by itself, is not considered to be a donor when applying this table. Ammonium nitrate, ammonium nitrate-fuel oil or combinations thereof are acceptors. If stores of ammonium nitrate are located within the sympathetic detonation distance of explosives or blasting agents, one-half the mass of the ammonium nitrate is to be included in the mass of the donor.

(2) When the ammonium nitrate and/or blasting agent is not barricaded, the distances shown in the table must be multiplied by six. These distances allow for the possibility of high velocity metal fragments from mixers, hoppers, truck bodies, sheet metal structures, metal containers, and the like which may enclose the "donor." Where explosives storage is in bullet-resistant magazines or where the storage is protected by a bullet-resistant wall, distances and barricade thicknesses in excess of those prescribed in the table in § 55.218 are not required.

(3) These distances apply to ammonium nitrate that passes the insensitivity test prescribed in the definition of ammonium nitrate fertilizer issued by the Fertilizer Institute.[1] Ammonium nitrate failing to pass the test must be stored at separation distances in accordance with the table in § 55.218.

(4) These distances apply to blasting agents which pass the insensitivity test prescribed in regulations of the U.S. Department of Transportation (49 CFR part 173).

[1] Definition and Test Procedures for Ammonium Nitrate Fertilizer, Fertilizer Institute 1015–18th St. N.W. Washington, DC 20036.

(5) Earth or sand dikes, or enclosures filled with the prescribed minimum thickness of earth or sand are acceptable artificial barricades. Natural barricades, such as hills or timber of sufficient density that the surrounding exposures which require protection cannot be seen from the "donor" when the trees are bare of leaves, are also acceptable.

(6) For determining the distances to be maintained from inhabited buildings, passenger railways, and public highways, use the table in § 55.218.

§ 55.221 Requirements for display fireworks, pyrotechnic compositions, and explosive materials used in assembling fireworks or articles pyrotechnic.

(a) Display fireworks, pyrotechnic compositions, and explosive materials used to assemble fireworks and articles pyrotechnic shall be stored at all times as required by this Subpart unless they are in the process of manufacture, assembly, packaging, or are being transported.

(b) No more than 500 pounds (227 kg) of pyrotechnic compositions or explosive materials are permitted at one time in any fireworks mixing building, any building or area in which the pyrotechnic compositions or explosive materials are pressed or otherwise prepared for finishing or assembly, or any finishing or assembly building. All pyrotechnic compositions or explosive materials not in immediate use will be stored in covered, non-ferrous containers.

(c) The maximum quantity of flash powder permitted in any fireworks process building is 10 pounds (4.5 kg).

(d) All dry explosive powders and mixtures, partially assembled display fireworks, and finished display fireworks shall be removed from fireworks process buildings at the conclusion of a day's operations and placed in approved magazines.

[T.D. ATF-293, 55 FR 3722, Feb. 5, 1990, as amended by T.D. ATF-400, 63 FR 45004, Aug. 24, 1998]

§ 55.222 Table of distances between fireworks process buildings and between fireworks process and fireworks nonprocess buildings.

Net weight of fireworks [1] (pounds)	Display fireworks [2] (feet)	Consumer fireworks [3] (feet)
0–100	57	37
101–200	69	37
201–300	77	37
301–400	85	37
401–500	91	37
Above 500	Not permitted [4 5]	Not permitted [4 5]

[1] Net weight is the weight of all pyrotechnic compositions, and explosive materials and fuse only.

[2] The distances in this column apply only with natural or artificial barricades. If such barricades are not used, the distances must be doubled.

[3] While consumer fireworks or articles pyrotechnic in a finished state are not subject to regulation, explosive materials used to manufacture or assemble such fireworks or articles are subject to regulation. Thus, fireworks process buildings where consumer fireworks or articles pyrotechnic are being processed shall meet these requirements.

[4] A maximum of 500 pounds of in-process pyrotechnic compositions, either loose or in partially-assembled fireworks, is permitted in any fireworks process building. Finished display fireworks may not be stored in a fireworks process building.

[5] A maximum of 10 pounds of flash powder, either in loose form or in assembled units, is permitted in any fireworks process building. Quantities in excess of 10 pounds must be kept in an approved magazine.

[T.D. ATF-293, 55 FR 3723, Feb. 5, 1990, as amended by T.D. ATF-400, 63 FR 45004, Aug. 24, 1998]

§ 55.223 Table of distances between fireworks process buildings and other specified areas.

DISTANCE FROM PASSENGER RAILWAYS, PUBLIC HIGHWAYS, FIREWORKS PLANT BUILDINGS USED TO STORE CONSUMER FIREWORKS AND ARTICLES PYROTECHNIC, MAGAZINES AND FIREWORKS SHIPPING BUILDINGS, AND INHABITED BUILDINGS. [3 4 5]

Net weight of fireworks [1] (pounds)	Display fireworks [1] (feet)	Consumer fireworks [2] (feet)
0–100	200	25
101–200	200	50
201–300	200	50
301–400	200	50
401–500	200	50
Above 500	Not permitted	Not permitted.

[1] Net weight is the weight of all pyrotechnic compositions, and exposive materials and fuse only.

[2] While consumer fireworks or articles pyrotechnic in a finished state are not subject to regulation, explosive materials used to manufacture or assemble such fireworks or articles are subject to regulation. Thus, fireworks process buildings where consumer fireworks or articles pyrotechnic are being processed shall meet these requirements.

[3] This table does not apply to the separation distances between fireworks process buildings (see § 55.222) and between magazines (see §§ 55.218 and 55.224).

[4] The distances in this table apply with or without artificial or natural barricades or screen barricades. However, the use of barricades is highly recommended.

[5] No work of any kind, except to place or move items other than explosive materials from storage, shall be conducted in any building designated as a warehouse. A fireworks plant warehouse is not subject to § 55.222 or this section, tables of distances.

[T.D. ATF-293, 55 FR 3723, Feb. 5, 1990, as amended by T.D. ATF-400, 63 FR 45004, Aug. 24, 1998]

§ 55.224 Table of distances for the storage of display fireworks (except bulk salutes).

Net weight of firework[1] (pounds)	Distance between magazine and inhabited building, passenger railway, or public highway[3,4] (feet)	Distance between magazines[2,3] (feet)
0–1000	150	100
1001–5000	230	150
5001–10000	300	200
Above 10000	Use table § 55.218	

[1] Net weight is the weight of all pyrotechnic compositions, and exposive materials and fuse only.

[2] For the purposes of applying this table, the term "magazine" also includes fireworks shipping buildings for display fireworks.

[3] For fireworks storage magazines in use prior to (30 days from the date of publication of the final rule in the Federal Register), the distances in this table may be halved if properly barricaded between the magazine and potential receptor sites.

[4] This table does not apply to the storage of bulk salutes. Use table at § 55.218.

[T.D. ATF-293, 55 FR 3723, Feb. 5, 1990, as amended by T.D. ATF-400, 63 FR 45004, Aug. 24, 1998]

Original: 2120

Pennsylvania
Aggregates and Concrete
Association

3509 North Front Street • Harrisburg, PA 17110-1438

(received in Rick Lamkie's office on 7/31)

July 28, 2000

Mr. Rick Lamkie
Division of Monitoring and Compliance
Bureau of Mining and Reclamation
Pennsylvania Department of Environmental Protection
P.O. Box 8461
Harrisburg, PA 17105-8461

Dear Mr. Lamkie:

The Pennsylvania Aggregates and Concrete Association's (PACA) Blasting Committee has extensively reviewed the proposed Chapter 210 and 211 draft regulations as published in the June 3 *Pennsylvania Bulletin*. On behalf of the membership of PACA, we would like to offer the following input regarding the regulations.

- PACA's Blasting Committee approves of all language proposed in the Chapter 210 Draft.

Regarding the Chapter 211 draft, the following is offered:

- 211.133 (a 1) PACA would highly recommend inserting the word "specific" as follows: "The specific locations of the blast and monitoring readings."

- 211.141 (4) PACA objects to the posting of additional "no smoking" signs and feels that the signage currently used displayed at a site is more than adequate.

- 211.151 (b) The definition of "flyrock" states materials ejected from the "blast site". Since due to the nature of blasting, materials are always ejected beyond where the "charges are located", PACA strongly feels that the correct wording of the definition of "flyrock" should be "blast area". This would make the regulation consistent with MSHA's 30 CFR 56.6000. If this definition is not modified, under Section 211.151 (b), blasters will be notifying the Department within 4 hours of EVERY blast.

- 211.154 (f 2) PACA would highly recommend the following revised wording: "Sectional poles connected by brass fittings are permitted, provided that only the ~~wooden~~ non-ferrous, non-sparking end of the pole is used for tamping." If the wording is not revised, it will eliminate the use of plastic and rubber ends designed and intended for that use. The change is also recommended to keep the wording consistent.

- 211.154 (f 4) For consistency, PACA would also recommend changing the phrase "wooden tamping pole" to "non-ferrous, non-sparking tamping pole" for the reason stated above.

- 211.154 (f 5) The regulation states that "the blast hole shall be logged to measure the amount and location of explosives placed in the blast hole." The committee was unsure of the intentions of this section, such as what exactly is to be measured, how frequently (i.e. every hole?) and to what degree should it be logged.

- 211.154 (f 7) PACA is strongly urging that this section, which states the "the Department may specify the type and amount of stemming" be eliminated. We feel that the licensed blaster-in-charge knows best the circumstances of each blast and subsequent stemming. By allowing this phrase to remain, the committee feels that the Department could become unknowingly involved with safety and potential litigation issues.

- 211.154 (g) PACA would like to see this section be consistent with MSHA 30 CFR Section 56.6306 (e) or at least, as recommended previously, change "blast area" to "blast site".

- 211.154 (k) Due to the fact that the quantity of explosives taken to the blast site varies according to the ground conditions, it is recommended that this section be modified slightly to say "Explosives may not be brought to the blast site in greater quantities than that needed for the blast <u>under varying conditions</u>."

- 211.156 (b) PACA would recommended this section state that "Only the blaster-in charge, <u>or a licensed blaster designated by the blaster-in-charge</u>, may detonate a blast". This would enable the blaster-in-charge to secure the area as per the regulations.

- 211.159 Once again, PACA would strongly advise that a provision be included in this section for "<u>programmable</u> electric detonators".

- 211.171 (d) Since this section as currently written would allow for a setting of .1, which could be triggered by traffic activity, PACA would recommend "50% of the conservative compliance level of .5 inches per second (.25)".

- 211.171 (e) It is impossible for older model and brick seismographs to obtain a printout of the date and time when the instrument was turned on and off. PACA would suggest adding the following wording to the end of 211.171 (f): "If a printout is not possible due to instrumentation, the operator will provide a signed statement indicating the aforementioned data." Also, please include a 3-year phase-in period, as was done in section 211.133 (a22) (monitoring records).

- 211.173 (b 2) The committee would ask for clarification on (b1), (b2) and (b4). Isn't (b4) redundant with (b1)? PACA would suggest wording such as "the calibration pulse, or equivalent calibration data".

- 211.182 (c) PACA would highly recommend revising this section to state: "When blasting within 200 feet (60.96 meters) of a utility line not owned or leased by the permittee or their customer, blast holes may not exceed 3 inches (7.62×10^{-2} meters) in diameter, unless approved by the utility and the Department." Revising the definition of "utility line" to not include lines which are used in the operation of crushers, pumps, etc. could also modify this section.

PACA would also like to recommend that the written numbered and lettered sections of the regulation be indented to aid in readability and legibility.

Members of PACA's Blasting Committee would be willing to meet with the Department or the EQB to discuss any of the above suggestions, if necessary. Thank you for this opportunity to provide our input, and if you have any questions or comments, please contact me.

Sincerely,

James D. Sells
President

Randall S. May
Maurer & Scott, Inc.
Blasting Committee Chairman

cc: Randall May

Original: 2120

Hall Explosives Inc.
2981 Elizabethtown Road
Hershey, PA 17033
Phone (717) 533-6565
Fax (717) 533-6716

July 28, 2000

TO: Environmental Quality Board
Rachel Carson State Office Building
15th Floor
400 Market Street
Harrisburg, PA 17101-2301

RE: Title 25 PA Chapter 210 & 211
Licensing of Blaster and Storage, Handling and Use of Explosives

The employees of Hall Explosives Inc. have reviewed the proposed regulations and would like to offer the following input on the draft. We recognize the need for changes and modernization of the regulations for our industry.

If the Environmental Quality Board would have any questions or need to clarify any point, we would be willing to meet with the Board Members.

§ 210.14 (b 1) Define "of good moral character", or be more specific.

§ 211.101 The "Blast Area" definition should coincide with MSHA 30 CFR

§ 211.124 (a 11) Suggest raising the liability insurance minimum per occurrence to $1,000,000 being an industry standard for insurance requirements.

§ 211.133 (a 1) Recommends inserting the word "specific" as follows: "The specific locations of the blast and monitoring readings."

§ 211.133 (a 3) Needs to be clearer, the permit number of what? Who? (i.e. Blasting activity permit number)

§ 211.133 (a 7) Requests a definition of "sketch". Does burden, spacing, pattern dimensions need to be on the sketch or listed on the report?

§ 211.133 (a 9) Needs to be more specific. For each hole, collectively, or average?

§ 211.133 (a 10) Needs to be more specific. For each hole, collectively, or average?

§ 211.133 (a 19) Suggest clearer wording, be more specific on how to be listed on shot report.

§ 211.133 (a 24) Change sentence to read: "If a known misfire occurred..."

§ 211.133 (b) Why may the Department require monthly summaries?

§ 211.141 (4) Disagree with 100 feet as the distance, suggest keeping at 50, which is consistent with MSHA, but still higher than DOT. Object to the posting of additional "no smoking" signs and feels that the signage currently used displayed at a site is more than adequate.

§ 211.141 (5) Suggest changing the first sentence to read "Load 2000 pounds (908 kilograms) or less of explosives..."

§ 211.141 (11, i, ii) Feel that current DOT regulations are adequate.

§ 211.151 (b) This section needs to be modified. It was felt that the EQB is using the wrong word in the definition of "flyrock". The definition of "flyrock" states materials ejected from the "blast site". Since due to the nature of blasting, materials are always ejected beyond where the "charges are located", we feel "blast site" should be changed to "blast area" in the definition of "flyrock". This would make the regulation consistent with MSHA's 30 CFR 56.6000. If this definition is not modified under Section 211.151 (b), blasters will be notifying the Department within 4 hours of EVERY blast.

§ 211.153 (b) Change the beginning of the sentence to read: "The use of matches and lighters, and smoking are prohibited..."

§ 211.154 (c) Clarify "present".

§ 211.154 (f 2) Recommend the following revised wording: "Sectional poles connected by brass fittings are permitted, provided that only the non-metallic, non-sparking end of the pole is used for tamping." If the wording is not revised, it will eliminate the use of plastic and rubber ends designed and intended for that use.

§ 211.154 (f 4) For consistency, recommend changing the phrase "wooden tamping pole" to "non-metallic, non-sparking tamping pole" for the reason stated above.

§ 211.154 (f 5) This instruction needs to be more concise, such as exactly what is to be measured, how frequently (i.e. every hole?) and to what degree should it be logged and reported on the blast report. Define "to be logged".

§ 211.154 (f 7) This section should be eliminated. The licensed blaster-in-charge knows best the circumstances of each blast and subsequent stemming. By allowing this phrase to remain, the Department could become unknowingly involved with safety and potential litigation issues.

§ 211.154 (n) Change the last sentence to read: "Precautionary measures include but not be limited to stopping or slowing of traffic and posting signs.

§ 211.159 Suggest adding a provision for "programmable electronic detonators".

§ 211.17 Change the numbering system to be consistent with the rest of the regulations.

§ 211.182 (c) Recommend revising this section to state: "When blasting within 200 feet (60.96) meters of a utility line <u>not owned or leased by the permittee or their customer</u>, blast holes may not exceed 3 inches (7.62×10^2 meters) in diameter, <u>unless approved by the utility and the Department</u>." Revising the definition of "utility line" to not include lines which are used in the operation of crushers, pumps, etc. could also modify this section.

Thank you for permitting us to submit concerns and comments on the proposed regulations.

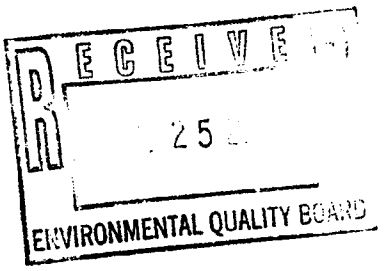
Respectfully Submitted,

Daniel Ray Leach
President

Original: 2120

Freeman, Sharon

From: RickBLASTER@webtv.net
Sent: Sunday, July 23, 2000 10:54 AM
To: RegComments@dep.state.pa.us
Subject: Proposed rulemaking regarding 25 PA. Code Chs. 210 and 211



Dear Board

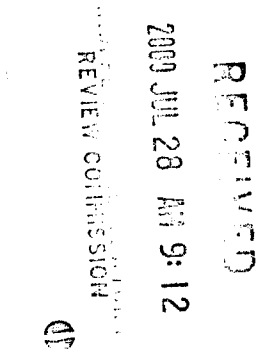
The following comments are directed at gaining relief for the oil and gas industry regarding the use of explosives for reservoir stimulation(shooting).

211.124 Blasting activity permits

It is my belief that oil and gas operators and contractors that service their wells should be exempt from this section for two reasons. (1) The wells are already supervised by D.E.P.'s oil and gas division (2) Because of the depths of the wells and the horizontal laminations of the earth very little if any vibrational energy ever reaches the surface.

211.125 Blasting activity by rule

It is my belief that all blasting done for oil and gas wells should be included under this section and therefore exempt from permit. Because of the depths of the wells from 800 to many thousands of feet deep it becomes very difficult for any vibrational energy to reach the surface. I myself have never measured more than a .07 peak particle velocity on any shot that I have been on and these measurements were taken for general data rather than any need to monitor at anyone's house since 99 % of the wells are 1000's of feet from the nearest home. Scaled distance calculations for oil and gas wells is useless unless you use the distance from the house to the explosive underground. If this distance is used even worse case scenarios where homes are within 300 ft of the wells produce scaled distances exceeding 90. How many complaints has the dept received for oil and gas well shooting work which has been done in the commonwealth since 1865?



211.141 Transportation of Explosives

No provision has been made here for the oil and gas industry which carries explosives and detonators on the same vehicles but not in IME 22 containers. Remember the IME 22 container was an exemption under D.O.T regulations for many years whereas the oil and gas industry has specific container descriptions in the regulations. For example the MC 200 container and the MC 201 container allow transportation of desensitized liquid explosives with detonators. My suggestion here is to allow the Oil and Gas industry and their contractors to transport detonators and explosives according to D.O.T.

This final comment has to do with the insurance requirements under 211.124 that affect surface blasting. Is the Board going to contact the Pa Insurance commission to make sure that this new mandated insurance will be available to all that need it. This was done when Pa adoptec the D.O.T regulations some years ago and thus mandated the $5,000,000 over the road coverage needed to transport explosives. The Pa Insurance dept. made sure through a pool that this insurance would be available to all and at reasonable cost. If the Board is not prepared to do this I don't believe they should mandate coverage as smaller operators will find themselves at a loss for reasonably priced coverage when the insurance market inevitably tightens again.

Richard F. Tallini
3343 Brantford Rd.
Toledo, Oh 43606

McGuireWoods LLP
CNG Tower
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Original: 2120

William P. Boswell
Direct: 412.667.7901

McGUIREWOODS

wboswell@mcguirewoods.com
Direct Fax: 412.667.7952

July 26, 2000

VIA OVERNIGHT MAIL

Ms. Joan Martin
Environmental Quality Board
Rachael Carson Building
15th Floor, 400 Market Street
Harrisburg, PA 17101-2301

Re: Proposal 25 PA. Code 210 & 211 (30 Pa.B.2768) Licensing of Blasters and Storage, Handling and Use of Explosives

Gentlemen:

Below are the comments of the Pennsylvania One Call System, Inc. (POCS) with respect to the above-captioned proposal. POCS asks that you consider them as you complete your work in this matter. POCS membership includes in excess of 2100 utilities, contractors, municipalities, locators and others operating in Pennsylvania. As indicated below, POCS handles all of the statutorily required communication between excavators and facility owners within the Commonwealth. POCS thus has a direct and substantial interest in this proposal.

COMMENTS OF PENNSYLVANIA ONE CALL SYSTEM, INC. (POCS)

A. POCS is the statewide entity established pursuant to PA Act 287 of 1974, as amended, 73 P.S. § 176 et seq., inter alia, to receive and communicate notification of demolition and excavation work within the Commonwealth.

B. Blasting is a covered activity under the statute, and anyone wishing to blast is obliged to provide notice to POCS not less than three nor more than ten working days prior to so doing. This duty applies to each contractor ("contractor" means any person who or which performs excavation or demolition work for himself or for another person), and is not merely the responsibility of the project director or general contractor of a construction project.

C. POCS requests that the department include in its regulations a specific provision making reference to the statute and its provisions as they apply to blasting, in as much as state law is clear on the subject. If this is done, there will be no confusion in the minds of those engaged in blasting and related operations as to their responsibilities under either the statute or the proposed regulations.

Respectfully submitted,

WP Boswell

Counsel for Pennsylvania One Call System, Inc.

cc: William G. Kiger, Executive Director, POCS

Pennsylvania Coal Association
212 North Third Street • Suite 102 • Harrisburg, PA 17101

(717) 233-7900
(800) COAL NOW (PA Only)
(717) 231-7610 Fax

GEORGE ELLIS
President

Original: 2120

July 21, 2000

Environmental Quality Board
P.O. Box 8477
Rachel Carson State Office Building
Harrisburg, PA 17105-8477

Re: Notice of Proposed Rulemaking: Licensing of Blasters and Storage, Handling and Use of Explosives, 25 Pa. Code Chapters 210 and 211, *Pennsylvania Bulletin June 3, 2000*

Members of the Board:

The Pennsylvania Coal Association (PCA) submits these written comments in response to the above-referenced Notice of Proposed Rulemaking (the "Proposed Rulemaking"). PCA represents 28 bituminous coal producers and 88 associate members, including blasting companies, engineers, consultants and other entities which may be subject to the Department of Environmental Protection's regulations governing explosives.

General Comments

PCA supports the effort to update regulations governing explosives, in order to improve currency, safety, efficiency and consistency. At the same time, we have concerns, questions and suggested improvements to the regulations, as set forth in our specific comments.

Specific Comments

Preamble

D. Background and purpose: PCA objects to the following language in the preamble:

> To the extent that [specific regulations governing the handling and use of explosives in anthracite and bituminous coal mines and non-coal mines] contain requirements that are comparable to, but less stringent than provisions in Chapter 211, they will be superseded by the more stringent provisions in Chapter 211.

PCA is concerned that this broad, general statement will lead to confusion and may result in inconsistent application of explosives regulation. There appear to be very limited circumstances in which the Proposed Rulemaking would be "more stringent than" the regulations contained in Chapters 87. Therefore, the Proposed Rulemaking should be

revised to delete the above language and to specifically identify the regulatory provisions which are being superseded to clarify the limited scope of the changes to Chapter 211 as they relate to the applicable provisions of the mining regulations.

PCA also notes that the bituminous surface coal mine permitting and performance standards in Chapter 87 were revised in 1998, after a full and thorough review, and that the blasting regulations contained in Chapter 87 conform to federal mining regulations. The Department represented to the MRAB Regulation, Legislation and Technical Committee in August of 1999 that there had been only one order issued for blasting damage in the previous three years. We therefore question why regulations that appear to be effective in preventing damage from the use of explosives in connection with surface mining should be superseded by more stringent regulations.

Chapter 210

§210.14. Eligibility Requirements.

PCA understands and agrees with the Department's intention to preclude issuance of a blaster's license to persons who may be unfit to handle explosives. However, the term "good moral character" is vague, and it is not clear from the language of the preamble whether other character defects, aside from "proven violent tendencies" will be excluded; what degree or type of "proof" will be required; and how the determination will be made. These issues should be clarified.

§210.17. Issuance and Renewal of Licenses.

PCA supports the proposed change to a three-year licensing period.

§210.18. Recognition of Out-of-State Blaster's License.

As applications from blasters licensed from out of state are reviewed, DEP will acquire an understanding of the requirements in other states. The Department should identify the states which are found to have equivalent programs and should notify blasting companies and other employers of blasters as states are added to or deleted from this list. This will help ensure that those who wish to employ blasters from out of state are able to determine whether the blaster is qualified to obtain a license without going through the full licensing procedure.

Chapter 211

§211.101. Definitions.

Definition of "person": The definition as applied to fines and penalties may imply liability which exceeds the boundaries of the law. *See Kaites v. Department of Environmental Resources,* 529 A.2d 1148, 1151 (Pa. Commw. 1986) (corporate officer

must actually participate in wrongful acts for liability to attach). The definition should clarified to conform to the law.

Definition of Structure: The definition should be revised to exclude "utility lines," since utility lines are defined separately and separate procedures are proposed for their protection.

§211.102. Scope.

Again, PCA disagrees with the blanket preemption of the mining regulations by "more stringent" provisions in Chapter 211. The Department should revise the proposed rulemaking to clearly delineate those provisions that will be superseded or pre-empted in order to avoid confusion and to ensure the Proposed Rulemaking is properly reviewed and that any final rulemaking is properly interpreted and enforced.

§211.133. Blast Report .

PCA supports the provision at §211.133(a)(23) providing three years for adopting the seven-day reporting requirement. However, this is not merely an equipment problem. It is logistically difficult for some blasters to collect and submit data from a number of widely-scattered monitoring points within seven days. This may place a particular burden on small business entities. PCA therefore suggest that the seven-day requirement be extended to 14 days.

§211.151. Prevention of Damage.

The Department should provide clear guidance on notification, especially after-hours notification and how this may be accomplished.

PCA is also concerned with the difference between this section and 25 Pa. Code §87.127. Those regulations have been very effective in preventing damage. The reduction in the scaled distance will require a seismographic record for the vast majority of blasting events. PCA understands the benefits of such records, both for the Department and for blasters. However, we note that the seven-day reporting requirement is proposed to be deferred for three years to allow equipment to be modernized. Because this provision will supersede §87.127, DEP should defer the application of §211.151(c) and other "more stringent" provisions until the mining regulations are amended to be consistent with the requirements of this section. This would allow time to adapt to the requirements, while ensuring that this regulation and the proposed changes to the mining regulations (which have been duly promulgated by the EQB and approved by the Federal Office of Surface Mining) are properly reviewed.

§211.171. General Provisions for Monitoring.

The Proposed Rulemaking should be revised to specify the circumstances under which the Department "may require" ground vibration and airblast monitoring. There should be a reasonable basis for requiring monitoring, and the basis should be articulated.

§211.173. Monitoring Records.

Subsection (c) should be revised to clarify the situations which will allow the Department to require third party analysis and/or certification. The Department consistently maintained, throughout the development of this regulation, that third-party certification would be unnecessary with the modern instruments now available. PCA agrees with that position. DEP should therefore limit this requirement for third party verification to circumstances that indicate a specified deficiency in the monitoring record.

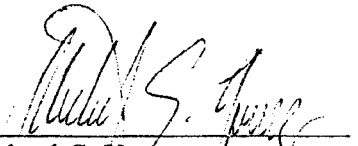
§211.182. (Blasting Near Utility Lines) General Provisions

PCA objects to the specific requirements contained in Subsection (c) and (d). The Mining and Reclamation Advisory Board, PCA and utility interests worked diligently in 1998 to provide a procedure for ensuring that surface mining activities and blasting near utility lines would minimize damage, destruction and disruption of utility services. The procedures provide an opportunity for the Department to approve proposed procedures for accomplishing this or to require more stringent procedures.

The policy has been effective. The Proposed Rulemaking should therefore be revised to allow "other measures, as approved by the Department, or agreed to by the utility, after the utility has been notified and has had an opportunity to object to the procedures proposed for protection of the line." This change is reasonable, given that the Proposed Rulemaking includes a provision allowing for a waiver of the specific requirements.

Thank you for considering these comments. We do wish to receive the final-form regulations when they are available.

Pennsylvania Coal Association

BY: 

Michael G. Young
Director of Regulatory Affairs

Proposed Rulemaking: Revision of 25 Pa. Code Chapters 210-211, Licensing of Blasters and Storage, Handling and Use of Explosives
June 3, 2000 *Pa. Bulletin*

One-Page Summary of Comments of Pennsylvania Coal Association (PCA)

- PCA opposes the Proposed Rulemaking's preemption of blasting regulations promulgated specifically for the mining program and approved by the federal Office of Surface Mining. The mining regulations have effectively prevented damage from blasting activities carried out in conjunction with surface coal mining.
- PCA supports the proposed three-year license period.
- Additional clarity is needed for some terms. "Good moral character" is not very well defined or explained in the pre-amble, while the definitions of "person" and "structure" are overly broad.
- PCA supports extending the effective date of the reduction in time (from 30 to seven days) for submitting blast reports under §211.133. However, seven days is a hardship for some operators, who have widely-scattered monitoring points. The report time should be extended to 14 days.
- The proposed requirements for increased scaled distance will require seismographic records for the majority of blasting events. The requirement should be deferred to allow the mining regulations to be amended for consistency with Chapter 211, rather than superseding the mining regulations through this proposal. This would be consistent with the three-year deferral of the reduction in time from 30 to seven days for submission of blasting reports, would allow blasting concerns to modernize their equipment and would ensure clarity, consistency and proper review of the regulations.
- The Proposed Rulemaking should be revised to specify the circumstances in which the Department may require ground vibration and airblast monitoring and third-party certification of monitoring records. The proposal provides no standards for the exercise of the Department's discretion.
- The proposed provisions for blasting near utility lines should be revised to provide greater flexibility and to conform to the procedure negotiated by the Mining and Reclamation Advisory Board and coal, oil and gas industry representatives, which effectively ensures protection of utility lines.

Original: 2120

D. C. GUELICH EXPLOSIVE CO.
R. D. # 3 BOX 125
CLEARFIELD PA. 16830

Phone 814-765-1558
Fax 814-765-1558

JULY 17, 2000

Proposed rulemaking
Environmental quality board

CHANGES TO BE ADDRESSED IN 25 PA. CODE CHS. 210 AND 211

Additional comments requested after presentation before
The Environmental Quality Board on July 6, 2000

210.17

(a), A blaster's license is issued for a specific classification of blasting activities. The classifications will be determined by the department and may include general blasting (Which includes all classifications EXCEPT DEMOLITION and underground noncoal mining), trenching and construction, seismic and pole line work, well perforation, surface mining, underground noncoal mining, industrial, limited and DEMOLITION.

Demolition activity. The act of demolishing a structure with explosives.

Any man made structure? Bridge abutments, Silos, bridges could all be considered construction.

What classifies as Demolition as opposed to construction blasting?

Comments I have heard on the need for a demolition license are that there needs to be more training on the use and application of specialized explosives.

The questions that I have in regards to this training are:

(1) Would the Department of Environmental Protection change their Blasters Training and Testing program to cover demolition blasting?

(2) Would this training be separate from all other testing and training?

(3) If so how many times a year would this take place?

(4) Who in the department of Environmental Protection would be qualified to teach this "specialized application"?

Continued Page 2

D. C. GUELICH EXPLOSIVE CO.
R. D. # 3 BOX 125 A
CLEARFIELD PA 16830

Phone 814-765-1558
FAX 814-765-2962

July 17, 2000

The training requirements for a Blasters license is one year's experience in the handling and use of explosives prior to taking a Blasters test. No matter which Blasters license test the applicant is taking. The Departments Training and Testing does not constitute technical application for any blasting specialty.

Many Blasters with a general license have already done demolition Blasting and does The Department of Environmental Protection want to take this ability away with out due process?

Demolition has always been covered under a general license and still should be.

The Department of Environmental Protection possess neither the duty or the responsibility and it is virtually impossible to teach the many technical applications of explosives.

The technical applications of Explosives needs to be learned through experience and working with experienced blasters. Not through the Department of Environmental Protection.

The Blasting Activity Permit is The Department of Environmental Protections only opportunity to control or deny a particular Blaster or Blasting Company the ability to do the blast.

The prime responsibility of The Departmental Environmental Protection is to give a general knowledge of the regulations and rules to govern the use of explosives in Pennsylvania.

Sincerely,

Breck Neeper.
Safety Director .

D. C. GUELICH EXPLOSIVE CO.
R. D. # 3 BOX 125
CLEARFIELD PA. 16830

Phone 814-765-1558
Fax 814-765-1558

JULY 6, 2000

Proposed rulemaking
Environmental quality board

CHANGES TO BE ADDRESSED IN 25 PA. CODE CHS. 210 AND 211

210.14

(b) , (2) The applicant has demonstrated an <u>inability or lack of intention</u> to comply with the Department's regulations concerning blasting activities.

Should this be? The applicant has demonstrated an ability or intention to comply with the Department's regulations concerning blasting activities.

210.17

(a), A blaster's license is issued for a specific classification of blasting activities. The classifications will be determined by the department and may include general blasting (Which includes all classifications EXCEPT DEMOLITION and underground noncoal mining), trenching and construction, seismic and pole line work, well perforation, surface mining, underground noncoal mining, industrial, limited and DEMOLITION.

Demolition activity. The act of demolishing a structure with explosives.

Any man made structure? Bridge abutments, Silos, bridges could all be considered construction.

Demolition has always been covered under a general license and still should be. . Blasters with a general license have been doing demolition blasting and should be at least Grand fathered into a demolition license.

What classifies as Demolition as opposed to construction blasting?

(d), A blaster's license is renewable if the blaster can demonstrate that he has had 8 hours of continuing education in Department-approved courses related to blasting and safety within the 3-year period.

This needs to be clarified,

Continued on Page 2

D. C. GUELICH EXPLOSIVE CO.
R. D. # 3 BOX 125 A
CLEARFIELD PA. 16830

Phone 814-765-1558
FAX 814-765-2962

July 6, 2000

PROPOSED RULEMAKING
ENVIRONMENTAL QUALITY BOARD

CHANGES TO BE ADDRESSED IN 25 PA. CODE CHS. 210 AND 211

In house training?
Explosive Manufactures?
Third Party Training?
8 Hour MSHA Refresher Training?
Society of Explosive Engineers Chapters Meetings ?
Pa Drilling And Blasting Conference?

Subchapter E. TRANSPORTATION OF EXPLOSIVES

211.141 General requirements.

(6). **Only load explosives into a closed body vehicle if the load is 2,000 pounds (908 kilograms) or more of explosives.**

Should be: Any load of explosives that exceeds 2,000 pounds (908 kilograms) or more of explosives must be transported in a closed body vehicle.

211.151. Prevention of damage.

(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 adoption date) may continue as authorized unless the authorization is modified, suspended o revoked by the department.**

Continued on page 3

D. C. GUELICH EXPLOSIVE CO.
R. D. # 3 BOX 125 A
CLEARFIELD PA. 16830

Phone 814-765-1558
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July 6, 2000

PROPOSED RULEMAKING
ENVIRONMENTAL QUALITY BOARD

CHANGES TO BE ADDRESSED IN
25 PA. CODE CHS. 210 AND 211

The scaled distance has always been set at 50 for construction and industrial minerals and 60 for coal. To change to a scale distance of 90 and to use the Z curve as the only criteria for seismic reports and vibration control is unnecessary and puts a unnecessary burden on blasters and blasting companies with very little if any additional benefits to the public. To make the scale distance 60 for all operations and have the option to use the Z curve criteria would be more appropriate.

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 permitte or its customer, ground vibration and airblast monitoring shall be conducted. The department may require the permittee to conduct ground vibration and air blast monitoring at other buildings or structures even if the scaled distance is greater than 90.

The scaled distance for all locations should be set at 60. Any scale that is higher should not require monitoring. If complaints are received and the scale is higher than the Department requires for monitoring the Department should be responsible for monitoring at that location.

Breck Neeper.
Safety Director .

Original: 2130

WAMPUM HARDWARE CO. Distributors of Explosives

636 PADEN ROAD
New Galilee, PA 16141
Business Phone:
(412) 336-4501
(412) 336-5153
FAX (412) 336-3818

July 11, 2000

Environmental Quality Board
P.O. Box 8477
Harrisburg, PA 17105-8477

Subject: Amendments to PA Blasting Regulations

From: James A. Elkin
BL 4088,
Wampum Hardware Co.
636 Paden Rd.
New Galilee, PA. 16141.
724-336-4501

To Whom It May Concern:

I am requesting that you look at regulation 211.162 Safety Fuse. Currently there are no manufactures of Safety Fuse, which sell their product in North America. I believe the intent of the amendments to the PA Blasting Regulations is to get current with technology. Safety fuse is not current technology. Safety fuse that is being sold in the USA at this time is being produced in South America, or Europe. Quailty is very poor. The foreign manufactures do no require the percision we are accustom to in the USA.

The reason US manufactures do not sell their product in the US is because of accidents with the use of the product. Customers have an accident with the product and then sue the manufactures. There have been to many problems using this product in surface applications.

It is my recommendation that you band the use of safety fuse in all surface applications. This means coalmines, quarries, and any type of construction application (pipeline, trenching, etc.) The blaster does not have control over the exact firing of the blast with this type of initiation system. There are many other systems to fire the blast (Nonel lead-in-line, remote firing, etc.). I do believe there to be application of this product in the underground applications (tunneling, stone mining, etc.).

I'm a firm believer that the blaster should have full control over the exact firing time of the blast. With safety fuse the blaster could have as much as 1 minute where if he has a breakdown in jobsite security, the workers or the general public could get hurt or killed. Please look at this situation and correct it. The proposed rulemakings should delete this type of action from being a hazard within the Commonwealth of Penna.

Thank you for your time in this matter. If someone needs additional information I can be reached at 412-289-0174.

Sincerely,

James A Elkin
Wampum Hardware Co.

Original: 2120

Freeman, Sharon

From: Gil Freedman [gil@ezonline.com]
Sent: Friday, July 14, 2000 7:00 PM
To: RegComments@dep.state.pa.us
Subject: Proposed Blasting Regulations

Comments On Proposed Blasting Regulations Pennsylvania Department of Environmental Protection

By Gilbert M. Freedman

July 14, 2000

Please make these comments a part of the record on the issue of proposed changes in the blasting regulations of the Commonwealth. I would also appreciate it if staff gave their attention to the issues I raise below.

Our comments deal primarily with blasting at stone quarries where large amounts of explosive are used and blasting may continue for many years. I am concerned for life safety and the protection of, primarily, residential property.

I hold a bachelor's and master's degree in mechanical engineering from Penn State and Stanford, respectively, and am a professional engineer registered in the Commonwealths of Pennsylvania and Virginia. I own and live in a residence that is sometimes within only 200 feet of quarry blasting, a residence that was here before the site became a quarry. I served on the Blasters' Technical Advisory Committee of the predecessor to DEP. I have had special training at the University of Southern California's School of Public Administration in air pollution control and am retired from the position of Energy Efficiency Engineer with your department.

While I recognize the importance to the community of stone production, I don't want it done at the expense of public safety and the environment as now practiced. In effect quarry neighbors are asked to subsidize the cost of stone production by permissive blasting regulation.

Scope

Your comments were very helpful in understanding the changes - or lack of them - of the proposed regulations. As stated, the regulations are designed to protect property. Blasting threatens life and DEP should assume authority to protect it, certainly the lives of the public off the quarry premises. Each blast involves detonation of tons of explosive, probably more than that used to destroy the Oklahoma City Federal building. Flyrock kills or maims about a person each year or so in the state. Isn't this a high price? Even after flyrock "events" DEP has advised

there are no additional steps that can be taken. There are:

Mats should be required on blasts within 1,000 feet of members of the public. A flyrock event should be grounds, with no qualifications, to close the mining operation for thirty days and revoke the blaster's license, at least for thirty days. Fines for flyrock events, as well as violations of the regulations should be significant. They're currently set very low at something less than $10,000. A quarry makes $10,000 in an hour or two of production. Fines should be raised an order of magnitude.

Nowhere do the existing or proposed regulations deal with air pollution control. These blasts certainly contribute a great deal of airborne particulate matter and should be controlled. They may be a significant source of NOx and organics emissions.

Comments on the Regulations

The regulations do not recognize structural vibration fatigue: The US Bureau of Mine's testing showed only that significant damage was not done to two specific homes of specific construction, below a specific particle velocity. The geologic setting was profoundly different than those around a limestone quarry. No one knows what subjecting a single-family wood frame, concrete block foundation residence to blasting for twenty years or more will do. I assure you it does damage. My homes and those of my neighbors have been damaged. The defense of the industry has been that there are 50 other reasons why cracks or other damage occur to a residence, and therefore they disavow responsibility. This just isn't fair. We must recognize the vulnerability of older structures subject to incessant vibration.

Peak particle velocity should be limited to 0.1 inch per second in the 10 - 18 Hz range.

Scale distance should be a minimum of 90 for all blasts, with no loopholes.

Air blast pressure limits proposed are like proposing a highway speed of 200 miles per hour - they do nothing to protect the public. Even if not physiologically injurious they can be very upsetting.

Administration

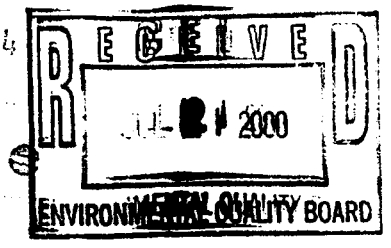
Blasting reports should be conveniently available to the public.

It is a good idea that operators are required to share Blasting Activity Plans with persons within 200 feet of such proposed activity. Included in the plans, and therefore informing such persons, should be how they may report damage and make claims, and a reasonable time-limit on the operator's response, such as 30 days.

Original: 2120

HRH Risk Management

Insuring the Way



July 11, 2000

Mr. Joseph E. Sieber, Executive Policy Specialist
Pennsylvania Department of Environmental Protection
Rachel Carson State office Building
P.O. Box 2063
Harrisburg, PA 17105-2063

Dear Mr. Sieber:

I am forwarding the Standard Blast Report required on the Pennsylvania Turnpike Commission's Mon/Fayette Expressway Project. This form was developed to address the need for standard information utilized in evaluating blasting claims that we were not getting on the various blast report formats being submitted by blasting contractors.

As I commented on at the July 5th Public Meeting at Greensburg, I encourage the PADEP to develop and mandate a Standard Blast Report form as part of 25PA.Code, Chapter 211, Subchapter D, Section 211.133 Blast Report.

Sincerely,

Bill Boots/es

William B. Boots, ARM, CSHM
Senior Loss Control Consultant

WBB/es

enclosures

cc: Dennis Genevie - PA Turnpike Commission

Hilb, Rogal and
Hamilton Company
of Pittsburgh, Inc.

Risk Management

USX Tower, Suite 5500
600 Grant Street
Pittsburgh, PA 15219

Tel 412-281-3353
Fax 412-281-1536
www.hrh.com

DICK CORPORATION
Contract No. 94-002-FU41, Section 52G

BLAST NO. _____

BLAST LOCATION:* _____ STA.: _____ DATE: _____ TIME: _____ A.M. _____ P.M.

*Reference point is to the center of pattern unless noted otherwise.

DETAILS OF SHOT

TYPE OF SHOT _____ HOLE DEPTH(S) _____ FT.
NO. BLAST HOLES _____ SUB DRILLING _____ FT.
TYPE MATERIAL _____ DIAMETER _____ IN.
NO. DECKS PER HOLE _____ DECK _____ FT.
BURDEN _____ FT. SPACING _____ FT.
STEM MATERIAL _____ STEMMING _____ FT.
TYPE OF DETONATION (CIRCLE ONE)
EBC NONELECTRIC PRIMACORD
WEATHER (CIRCLE TWO)
CLEAR CLOUDY RAIN
HOT WARM COLD
WIND DIRECTION WIND SPEED (EST. MPH)
BLAST MACHINE _____ TIME INTERVAL _____
TYPE OF CIRCUIT _____

DETONATORS

LENGTH/TYPE	USED

EXPLOSIVES USED	AMOUNT - LBS
NON-BULK 50 LB. BAGS	
PRIMERS EACH	LBS
TOTAL LBS.	

LEAD-IN-LINE USED FT.
TOTAL NO. DETS USED EACH
CYS BLASTED
POWDER FACTOR LBS/CYS
LBS. PER DELAY PERIOD @ 8MS OR GREATER

SCALE DISTANCE

SD = _____

$SD = \frac{D}{\sqrt{W}}$ $W = \left(\frac{D}{SD} \right)^2$

Are mats used? Y N

NO. OF HOLES AVERAGE DEPTHS FEET DRILLED
x =

COMPLETE NAME OF NEAREST DWELLING, STRUCTURE, ETC.: _____
STRUCTURE/PREBLAST INSPECTION I.D. NO. _____
DIRECTION AND DISTANCE TO NEAREST DWELLING, STRUCTURE, ETC. _____
SEISMOGRAPH SERIAL NO. _____
HIGHEST READING PPV _____ d B _____
Attach Seismic Record

BLAST SITE SAFETY INSPECTION ☐
Is methane being monitored? Y N If yes, level measured _____

REMARKS:

Blaster (Print) _____ Signed _____
Blaster License No.

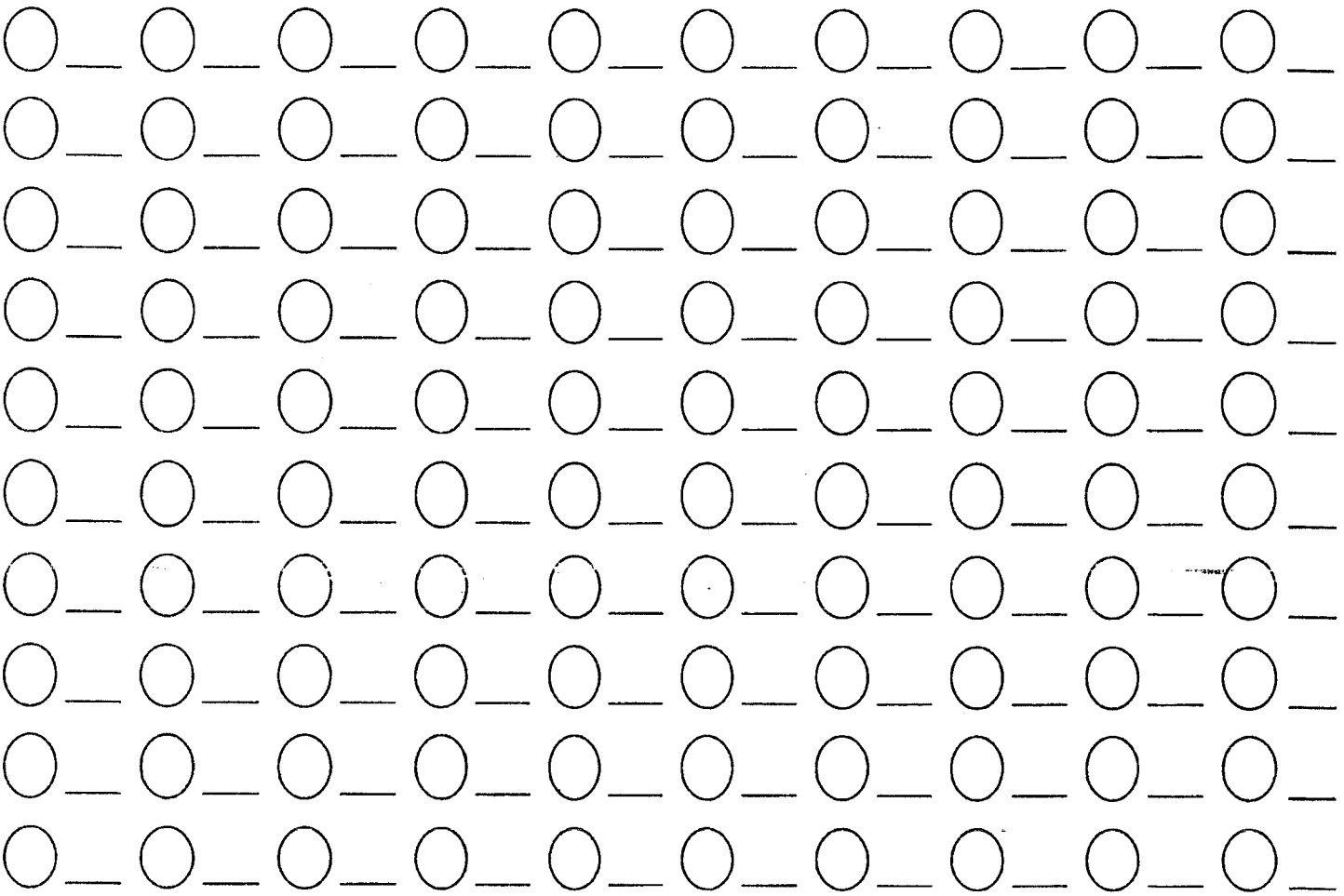
LIST ALL MEMBERS OF SHOT CREW:

Person taking seismograph readings? _____

Who is verifying seismograph readings? _____

DICK CORPORATION
Contract No. 94-002-FU41, Section 52G

Blast # ____ Time: _____ a.m. _____ p.m. Location: _____ Sta.: _____ Date: _____



Complete name of nearest house, building or structure: _____

Direction and distance to nearest house, building or structure: _____

Scaled Distance, D_s _____ $D_s = \frac{D}{\sqrt{W}}$ $W = \left[\frac{D}{SD}\right]^2$

Attach Seismograph Report

*Please mark initiation hole with a star (*).