

as applying only to Option 3. This section has been retained in the final rule as § 816.67(e).

Section 816.68. Use of explosives: Records of blasting operations. As proposed, the new § 816.68 requires the operator to maintain blasting records for at least 3 years and to make them available for inspection by the regulatory authority or the public on request. This is required in Section 515(b)(15)(B) of the Act. Among the information which must be included is the name of the operator; the location, date, and time of the blast; the name, signature, and certification number of the blaster conducting the blast; identification, direction, and distance from the nearest blast hole to the nearest dwelling or other structure outside the permit area; weather conditions described in more detail below; the type of material blasted; sketches of blast pattern including number of holes and the burden, spacing, decks, and delay pattern; the diameter and depth of holes, the type of explosives used; the total weight of explosives used per hole; the maximum weight of explosives detonated within any 8-millisecond period; the initiation system; type and length of stemming; and mats or other protection used.

Section 816.68(o) includes the requirement that if seismographic and airblast records are required, they should include a record of the instrument type, its sensitivity and calibration signal or the certification of annual calibration; location, date, time, and distance the instrument is from the blast; the person's name and firm who obtained the readings, and the person's name and firm analyzing the seismographic record; and vibration and/or airblast levels recorded. In addition § 816.68(p) provides that information stating the reasons and conditions for each unscheduled blast shall be contained within the record.

Commenters objected to deletion of specific weather characteristics listed in the previous rules. These commenters reasoned that these conditions may assist in determining adverse effects due to blasting focused by weather such as: clouds, wind, and temperature inversions. OSM believes the commenter is correct, but a blaster in the field may not know if an inversion exists or what the specific wind velocity is. The requirement of this data could result in inaccurate entries leading to false interpretation of impacts of weather. OSM acknowledges the potential impacts on blasting of temperature inversions, wind direction, and velocity and has inserted a

provision for the blaster to estimate any adverse weather conditions which might exist.

A commenter objected to the deletion of previous § 816.68(1) establishing the number of holes to be detonated in any 8-millisecond-delay period because providing this information places no great burden on the operator. OSM believes this information summarizes data which are insignificant in the total blast record and are not necessary for assuring compliance with the rules. Another commenter believed that physical separation can provide the same effect as an 8-millisecond delay. OSM agrees. The 8-millisecond separation was determined by the Bureau of Mines as the minimum delay period to separate charges to reflect nonadditive ground-vibration levels when measured at some distance from the blast. However, this concept assumes that delay holes are at the same distance from the seismograph. In situations where holes are varying distances from the recorder, physical distance separation will delay arrival times of the ground vibration at a structure. This is variable, dependent on the velocity that the seismic wave travels in the specific geologic material.

A commenter objected to OSM's proposed deletion of the requirement that operators keep a record of the number of persons in the blasting crew. OSM believes that a specific number of persons should not be regulated on a national basis. The entry in OSM's old rules served the requirement governing crew size found in 30 CFR Part 850 which has been proposed for change. If a crew size is imposed by a State program, an appropriate entry could be required by the State. Accordingly, OSM has adopted no change to reinstate this entry.

A commenter suggested amending the entry under § 816.68(o)(3) to include the name of the person and firm conducting seismographic tests. OSM believes this to be an acceptable inclusion. Accordingly, OSM has adopted this requirement.

A commenter suggested including the frequency of recorded blast vibration in the seismic record. Not all records produced by seismographs in use in the industry today produce frequency spectra. Most recordings must be analyzed on complex systems to identify trace frequencies as expressed in the RI8507 report (Siskind and others, 1980). As discussed above, the use of a vibration criterion based on frequency monitoring is required in § 816.67(d)(4) in those situations where such sophistication is necessary. However,

imposing this condition on all monitored blasts would be overly stringent and unnecessary.

A commenter objected to inclusion of the amount of information required by proposed § 816.68(g) stating that sketches should only be required if blasts are conducted within 1,000 feet from a dwelling or other structure. OSM believes the record is important for reference purposes to ensure the mitigation of damage. Moreover, OSM's regulation of aspects of the blast such as burden, spacing, decking, and delays is mandated by the Act. Other information proves valuable if a complaint arises. Also, an operator who maintains this type of record may revise future blast design if problems occur. OSM believes this degree of information is within that envisioned by the Act, and the final rule adopts the requirement. Commenters also felt that too much information was required for a single sketch. OSM accepts the comment that a single sketch may be cluttered and allows multiple sketches to reflect this information if a single sketch cannot be made.

A commenter believed that all blasts should be certified as designed by a certified blaster in the record. OSM does not require every blast to be designed by a certified blaster. Rather, they must be carried out by certified blasters. Since blast patterns and delays may be designed by someone other than the blaster carrying out the blast, the name of the designer may not be available. Furthermore, OSM requires certifications of blast designs when blasting is conducted within 1,000 feet of structures. OSM therefore has not added such a provision to its recordkeeping rules.

A commenter suggested limiting the data kept in records required by § 816.68(j) on explosives to total explosives used per blast rather than explosives per hole. OSM believes this information is necessary to evaluate the amount of explosives per delay. Furthermore, the per-hole information requirement is taken from the Section 515(b)(15)(B) of the Act. OSM agrees that total charge weight information is important, but recognizes that it is available by totalling all holes. Therefore, it is not considered to be necessary as additional data to be entered. Accordingly, OSM has not adopted such a provision.

A commenter requested that a provision be made in § 816.68(o) to allow "annual calibration" to relieve operators from showing calibration signals on each record. The commenter argued that some seismographs do not

have calibration signals integral with the records. OSM has adopted this provision in the final rule.

A commenter suggested deletion of the requirement in proposed § 816.68(o)(2) for location of the instrument and the date and time of the blast. OSM believes that this information is necessary to ensure that the operator is utilizing the monitoring system agreed to in the permit, and that the data recorded can be traced to a specific blast.

A commenter requested deletion of the requirement in proposed § 816.68(p) of the names of persons notified when unscheduled blasts are conducted. As discussed above in conjunction with § 816.64(a)(2), OSM is deleting the requirement of verbal notification of area residents of unscheduled blasts. Instead, audible signals will be used. Weather and other site-specific conditions which necessitate unscheduled blasts may not allow notification to individual residences. Accordingly, OSM does not require records of individuals notified.

A commenter requested confirmation of the availability of blasting records to the public. Both § 816.68 and the Act require the operator to provide access to the blasting records for public inspection upon request. A commenter objected to the degree of detail made available to the public in the records required by § 816.68, stating that it exceeds the requirements of the Act. OSM recognizes that the information required in § 816.68 exceeds that specifically listed in Section 515(b)(15)(B) of the act. OSM requires additional information to evaluate the performance levels of rules implemented pursuant to Sections 515(b)(15)(C), (D), and (E) and 719 of the Act. The additional information relates to performance standard found in §§ 816.61 through 816.67. Such information is necessary to determine whether performance levels were attained. Segregating in the record the items listed in the Act to be available for public inspection is impractical and unnecessary. The commenter failed to demonstrate any harm that would occur through the public disclosure of the additional information. OSM therefore, has chosen to require the entire blasting record to be made available for public inspection.

Rules governing use of explosives associated with underground mining. The performance standards adopted in this rule governing the use of explosives associated with underground mining are identical to those governing surface mining except as noted below. Most offsite impacts, such as airblast and

ground vibration, for surface blasting incident to underground mines are not substantially different from those for blasting at surface mines. OSM only regulates the surface impacts of blasting from underground mines, which are derived almost exclusively from surface blasting associated with such mines. This is not a change from the previous rules which also only regulated surface blasting activities incident to underground mining.

Only one difference exists between the two sets of rules in Parts 816 and 817. This relates to the use of blasting schedules. Rather than requiring a blasting schedule, § 817.64 will require weekly notice prior to any surface blasting in support of underground coal mining. Because of the occasional, sporadic nature of surface blasting in support of underground coal mining, the public will be sufficiently served by receiving notification weekly, but not less than 24 hours before any blasting occurs. The mine operator also will be relieved of the task of publishing and republishing a blasting schedule.

Blast design. OSM had proposed to place blast designs among the permitting requirements of § 780.13 for surface mines. No similar planning requirement was included for underground mines because blasting plans are not required for underground mines.

As described above, in adopting the final rules governing surface mines, OSM has shifted the requirement for blast design from the blasting plan section to the general performance standards requirement. This has been done for several reasons: (1) To emphasize the fact that the requirement for special information when blasting within sensitive areas is not a prohibition of mining within these areas, but a protection of structures more likely to suffer damage; (2) To ensure that blast designs are prepared in advance for blasting in areas where the possibility of damage is greatest; (3) To provide the regulatory authority with the greatest information when blasting will be conducted in sensitive areas to allow for monitoring or review of blast designs.

A number of commenters urged that blast designs also be required for underground mines. Because surface blasts may be equally damaging when associated with underground mines, OSM has adopted a requirement in § 817.61(d) identical to the blast design requirement of § 816.61(d).

Blasting schedules. Several commenters objected to the proposed retention of the previous 24-hour notice requirement for notification of local residents within one-half mile of the

blasting site in proposed § 817.64(a). Since underground mines have a reasonably constant area of surface disturbance and the time period in which surface blasting would be performed is limited, OSM has rewritten the notification provisions for underground mines to require notification of residents within the ½ mile of the blasting site and local governments. The rule also allows weekly schedules to be distributed. This concept is envisioned to provide the advanced written notice required by statute, while recognizing the infrequent and limited blasting operations used in surface operations of underground mine development. The rule allows daily notification as in the previous rule, but also allows an operator to publish a schedule of weekly blasting events to avoid daily notification. This final rule is envisioned to allow flexibility in use of notification procedures.

Signs and markers. It was mentioned by several commenters that the introductory language to proposed § 817.66(a) used the wrong wording for the underground section. This has been corrected by removing the introductory language and restructuring the provision to parallel § 816.66. New § 817.61(a) limits the applicability of § 817.66 to surface blasting activities incidental to underground coal mining.

Addition of Figure 1. The addition of Figure 1 to §§ 715.19(e)(2)(ix), 816.67(d), and 817.69(d) is discussed in the preamble under the "Ground Vibration" section.

III. Procedural Matters

Federal Paperwork Reduction Act

The information collection requirements in existing 30 CFR Parts 715, 780, 816, and 817 were approved by the Office of Management and Budget (OMB) under 44 U.S.C. 3507 and assigned new clearance numbers 1029-0007, 1029-0036, 1029-0047, and 1029-0048 on April 1, 1981. This approval was identified in "Notes" at the introduction to 30 CFR Parts 715, 780, 816, and 817 under the old numbers R0494, R0606, R0618, and R0619 (all under No. B-190462). OSM has codified the OMB approvals under the new §§ 715.10, 780.10, 816.10, and 817.10 (47 FR 33683, August 4, 1982) and has received new OMB approval of these information collection requirements.

The information required by 30 CFR Part 715, will be used by the regulatory authority in monitoring blasting operations. This information required by 30 CFR Part 715 is mandatory.

The information required by 30 CFR Part 780 will be used by the regulatory authority to determine whether the applicant can meet the environmental protection performance standards of the regulatory program. This information required by 30 CFR Part 780 is mandatory.

The information required by 30 CFR Parts 816 and 817 will be used by the regulatory authority to monitor surface and underground mining activities to ensure that they are conducted in a manner which preserves and enhances environmental and other values of the Act. This information required by 30 CFR Parts 816 and 817 is mandatory.

Executive Order 12291

The DOI has determined that this document is not a major rule and does not require a regulatory impact analysis under Executive Order 12291.

Regulatory Flexibility Act

The DOI certifies that this document will not have a significant economic effect on a substantial number of small entities and therefore does not require a regulatory flexibility analysis under Pub. L. 96-354.

National Environmental Policy Act

Revision of § 715.19 of the initial program regulations is deemed not to be a major Federal action within the meaning of the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4332, as stated in Section 501(a) of the Surface Mining Control and Reclamation Act of 1977 (the Act), 30 U.S.C. 1251, and a detailed statement on the analysis of the environmental impacts of its revision is not required.

Amendments relating to use of explosives in 30 CFR Parts 780, 816 and 817, have been considered in relation to revisions of certain other rules in OSM's Final Environmental Statement OSM-EIS-1: Supplement. The final supplement is available in OSM's Administrative Record in Room 5315, 1100 L Street, NW., Washington, D.C., or may be obtained by mail from Mark Boster, Chief, Branch of Environmental Analysis, Room 134, Interior South Building, U.S. Department of the Interior, Washington, D.C. 20240. This preamble serves as the record of decision under NEPA. These final rules are the same as the preferred alternatives published in Volume III of the final EIS and analyzed in the EIS.

List of Subjects

30 CFR Part 715

Coal mining, Environmental protection, Surface mining, Underground mining.

30 CFR Part 780

Coal mining, Reporting requirement, Surface mining.

30 CFR Part 816

Coal mining, Environmental protection, Reporting requirements, Surface mining.

30 CFR Part 817

Coal mining, Environmental protection, Reporting requirements, Underground mining.

Agency Approval. Section 516(a) requires that, with regard to rules directed toward the surface effects of underground mining, OSM must obtain written concurrence from the head of the department which administers the Federal Coal Mine Health and Safety Act of 1969. OSM has obtained the written concurrence of the Assistant Secretary for Mine Safety and Health, U.S. Department of Labor.

Accordingly, 30 CFR Parts 715, 780, 816, and 817 are amended as set forth herein.

Dated: February 28, 1983.

William P. Pendley,

Acting Assistant Secretary, Energy and Minerals.

PART 715—GENERAL PERFORMANCE STANDARDS

1. Section 715.19 is amended by revising Paragraphs (e)(2)(ii) and (e)(2)(iii) and removing Paragraphs (e)(2)(iv)–(e)(2)(vi) to read as follows: § 715.19 Use of explosives.

- (e) * * *
- (2) **Blasting standards.** (i) * * *
- (ii) **Ground vibration.**—(A) **General.** In all blasting operations, except as otherwise authorized in Paragraph (e)(2)(iii) of this section, the maximum ground vibration shall not exceed a value approved by the regulatory authority. It shall be established in accordance with the maximum peak-particle-velocity limit of Paragraph (e)(2)(ii)(B), the scaled-distance equation of Paragraph (e)(2)(ii)(C), or the blasting-level chart of Paragraph (e)(2)(ii)(D), or such other standard established under Paragraph (e)(2)(ii)(E), of this section. All structures in the vicinity of the blasting area, not listed in Paragraph (e)(2)(ii)(B), of this section, such as water towers, pipelines and other

utilities, tunnels, dams, impoundments, and underground mines, shall be protected from damage by establishment of a maximum allowable limit on the ground vibration, submitted by the operator and approved by the regulatory authority before the initiation of blasting.

(b) **Maximum peak-particle velocity.**

(1) The maximum ground vibration shall not exceed the following limits at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area.

Distance (D) from blasting site, in feet	Maximum allowable peak particle velocity (V _{max}) for ground vibration, in inches/second ¹	Scaled-distance factor to be applied without seismic monitoring ²
0 to 300.....	1.25	50
301 to 5,000.....	1.00	55
5,001 and beyond.....	0.75	65

¹Ground vibration shall be measured as particle velocity. Particle velocity shall be recorded in three mutually perpendicular directions. The maximum allowable peak particle velocity shall apply to each of the three measurements.
²Applicable to the scaled-distance equation of Paragraph (e)(2)(i)(C)(7) of this section.

(2) A seismographic record shall be provided for each blast.

(C) **Scaled-distance equation.** (1) The operator may use the scaled-distance equation, $W = (D/D_s)^2$, to determine the allowable charge weight of explosives to be detonated in any 8-millisecond period without seismic monitoring; where W = the maximum weight of explosives, in pounds; D = the distance, in feet, from the blasting site to the nearest protected structure; and D_s = the scaled-distance factor, which may initially be approved by the regulatory authority using the values for scaled-distance factor listed in Paragraph (e)(2)(ii)(B)(1), of this section.

(2) The development of a modified scaled-distance factor may be authorized by the regulatory authority on receipt of a written request by the operator, supported by seismographic records of blasting at the minesite. The modified scaled-distance factor shall be determined such that the particle velocity of the predicted ground vibration will not exceed the prescribed maximum allowable peak particle velocity of Paragraph (e)(2)(B)(1) of this section at a 95-percent confidence level.

(D) **Blasting-level chart.** (1) An operator may use the ground-vibration limits in Figure 1 to determine the maximum allowable ground vibration.

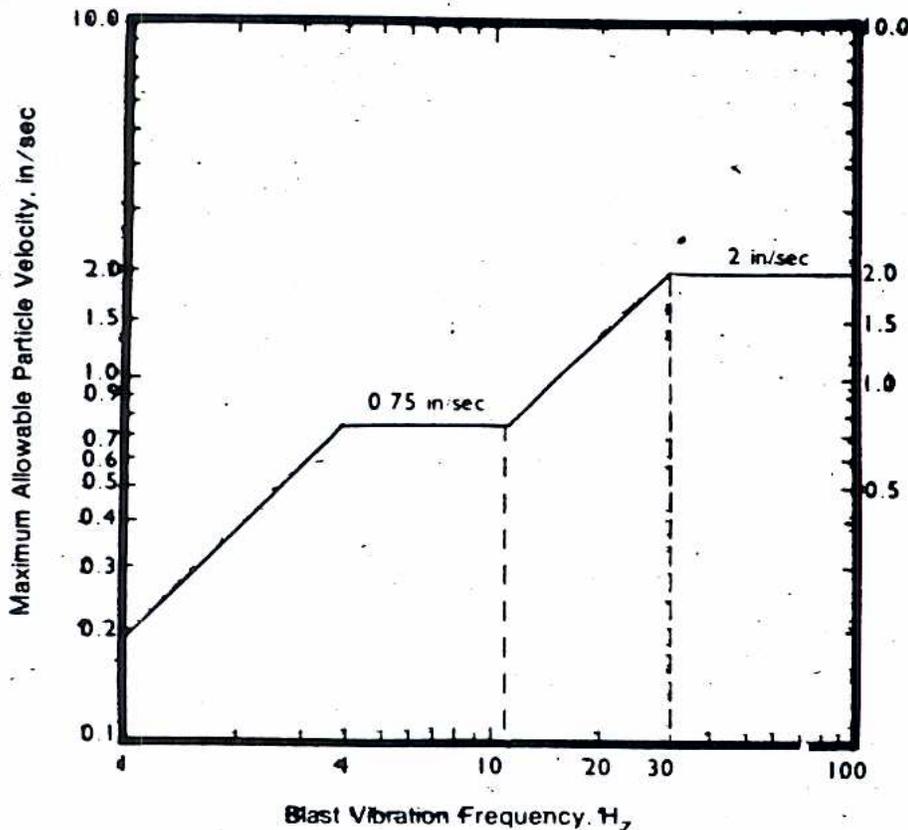


Figure 1. Alternative blasting level criteria

(Source: Modified from figure B-1, Bureau of Mines R18507)

(2) If the Figure 1 limits are used, a seismographic record including both particle-velocity and vibration-frequency levels shall be provided for each blast. The method for the analysis of the predominant frequency contained in the blasting records shall be approved by the regulatory authority before application of this alternative blasting criterion.

(E) The maximum allowable ground vibration shall be reduced by the regulatory authority beyond the limits otherwise provided by this section, if determined necessary to provide damage protection.

(F) The regulatory authority may require an operator to conduct seismic monitoring of any or all blasts and may specify the location at which the measurements are taken and the degree of detail necessary in the measurement.

(iii) If blasting is conducted in accordance with Paragraph (e)(2)(i) of this section, the maximum ground-vibration and airblast standards shall not apply at the following locations:

(A) At structures owned by the permittee and not leased to another person.

(B) At structures owned by the permittee and leased to another person, if a written waiver by the lessee is submitted to the regulatory authority before blasting.

§ 715.19 [Amended]

2. Section 715.19 is amended by removing Paragraph (e)(3) and redesignating Paragraph (e)(4) as Paragraph (e)(3).

PART 780—SURFACE MINING PERMIT APPLICATIONS—MINIMUM REQUIREMENTS FOR RECLAMATION AND OPERATION PLAN

3. Part 780 is amended by revising § 780.13 to read as follows:

§ 780.13 Operation plan: Blasting.

(a) *Blasting plan.* Each application shall contain a blasting plan for the proposed permit area, explaining how the applicant will comply with the requirements of §§ 816.61-816.68 of this chapter. This plan shall include, at a minimum, information setting forth the limitations the operator will meet with regard to ground vibration and airblast, the bases for those limitations, and the

methods to be applied in controlling the adverse effects of blasting operations.

(b) *Monitoring system.* Each application shall contain a description of any system to be used to monitor compliance with the standards of § 816.67 including the type, capability, and sensitivity of any blast-monitoring equipment and proposed procedures and locations of monitoring.

(c) *Blasting near underground mines.* Blasting operations within 500 feet of active underground mines require approval of the State and Federal regulatory authorities concerned with the health and safety of underground miners.

PART 816—PERMANENT PROGRAM PERFORMANCE STANDARDS—SURFACE MINING ACTIVITIES

§ 816.11 [Amended]

4. Section 816.11 is amended by removing paragraph (f) and redesignating paragraph (g) as paragraph (f).

5. Section 816.61 is amended by revising paragraphs (a) and (b) and adding paragraph (d) to read as follows:

§ 816.61 Use of explosives: General requirements.

(a) Each operator shall comply with all applicable State and Federal laws and regulations in the use of explosives.

(b) Blasts that use more than 5 pounds of explosive or blasting agent shall be conducted according to the schedule required under § 816.64.

(d) *Blast design.* (1) An anticipated blast design shall be submitted if blasting operations will be conducted within—

(i) 1,000 feet of any building used as a dwelling, public building, school, church, or community or institutional building outside the permit area; or

(ii) 500 feet of an active or abandoned underground mine.

(2) The blast design may be presented as part of a permit application or at a time, before the blast, approved by the regulatory authority.

(3) The blast design shall contain sketches of the drill patterns, delay periods, and decking and shall indicate the type and amount of explosives to be used, critical dimensions, and the location and general description of structures to be protected, as well as a discussion of design factors to be used, which protect the public and meet the applicable airblast, flyrock, and ground-vibration standards in § 816.67.

(4) The blast design shall be prepared and signed by a certified blaster.

(5) The regulatory authority may require changes to the design submitted.
6. Section 816.62 is revised to read as follows:

§ 816.62 Use of explosives: Preblasting survey.

(a) At least 30 days before initiation of blasting, the operator shall notify, in writing, all residents or owners of dwellings or other structures located within $\frac{1}{2}$ mile of the permit area how to request a preblasting survey.

(b) A resident or owner of a dwelling or structure within $\frac{1}{2}$ mile of any part of the permit area may request a preblasting survey. This request shall be made, in writing, directly to the operator or to the regulatory authority, who shall promptly notify the operator. The operator shall promptly conduct a preblasting survey of the dwelling or structure and promptly prepare a written report of the survey. An updated survey of any additions, modifications, or renovations shall be performed by the operator if requested by the resident or owner.

(c) The operator shall determine the condition of the dwelling or structure and shall document any preblasting damage and other physical factors that could reasonably be affected by the blasting. Structures such as pipelines, cables, transmission lines, and cisterns, wells, and other water systems warrant special attention; however, the assessment of these structures may be limited to surface conditions and other readily available data.

(d) The written report of the survey shall be signed by the person who conducted the survey. Copies of the report shall be promptly provided to the regulatory authority and to the person requesting the survey. If the person requesting the survey disagrees with the contents and/or recommendations contained therein, he or she may submit to both the operator and the regulatory authority a detailed description of the specific areas of disagreement.

(e) Any surveys requested more than 10 days before the planned initiation of blasting shall be completed by the operator before the initiation of blasting.

7. Section 816.64 is revised to read as follows:

§ 816.64 Use of explosives: Blasting schedule.

(a) *General requirements.* (1) The operator shall conduct blasting operations at times approved by the regulatory authority and announced in the blasting schedule. The regulatory authority may limit the area covered, timing, and sequence of blasting as listed in the schedule, if such limitations

are necessary and reasonable in order to protect the public health and safety or welfare.

(2) All blasting shall be conducted between sunrise and sunset, unless nighttime blasting is approved by the regulatory authority based upon a showing by the operator that the public will be protected from adverse noise and other impacts. The regulatory authority may specify more restrictive time periods for blasting.

(3) *Unscheduled blasts* may be conducted only where public or operator health and safety so require and for emergency blasting actions. When an operator conducts an unscheduled blast, the operator, using audible signals, shall notify residents within $\frac{1}{2}$ mile of the blasting site and document the reason for the unscheduled blast in accordance with § 816.68(p).

(b) *Blasting schedule publication and distribution.* (1) The operator shall publish the blasting schedule in a newspaper of general circulation in the locality of the blasting site at least 10 days, but not more than 30 days, before beginning a blasting program.

(2) The operator shall distribute copies of the schedule to local governments and public utilities and to each local residence within $\frac{1}{2}$ mile of the proposed blasting site described in the schedule.

(3) The operator shall republish and redistribute the schedule at least every 12 months and revise and republish the schedule at least 10 days, but not more than 30 days, before blasting whenever the area covered by the schedule changes or actual time periods for blasting significantly differ from the prior announcement.

(c) *Blasting schedule contents.* The blasting schedule shall contain, at a minimum—

(1) Name, address, and telephone number of operator;

(2) Identification of the specific areas in which blasting will take place;

(3) Dates and time periods when explosives are to be detonated;

(4) Methods to be used to control access to the blasting area; and

(5) Type and patterns of audible warning and all-clear signals to be used before and after blasting.

§ 816.65 [Removed]

8. Section 816.65 is removed.

9. Section 816.66 is added to read as follows:

§ 816.66 Use of explosives: Blasting signs, warnings, and access control.

(a) *Blasting signs.* Blasting signs shall meet the specifications of § 816.11. The operator shall—

(1) Conspicuously place signs reading "Blasting Area" along the edge of any blasting area that comes within 100 feet of any public road right-of-way, and at the point where any other road provides access to the blasting area; and

(2) At all entrances to the permit area from public roads or highways, place conspicuous signs which state "Warning! Explosives in Use," which clearly list and describe the meaning of the audible blast warning and all-clear signals that are in use, and which explain the marking of blasting areas and charged holes awaiting firing within the permit area.

(b) *Warnings.* Warning and all-clear signals of different character or pattern that are audible within a range of $\frac{1}{2}$ mile from the point of the blast shall be given. Each person within the permit area and each person who resides or regularly works within $\frac{1}{2}$ mile of the permit area shall be notified of the meaning of the signals in the blasting schedule.

(c) *Access control.* Access within the blasting area shall be controlled to prevent presence of livestock or unauthorized persons during blasting and until an authorized representative of the operator has reasonably determined that—

(1) No unusual hazards, such as imminent slides or undetonated charges, exist; and

(2) Access to and travel within the blasting area can be safely resumed.

10. Section 816.67 is revised to read as follows:

§ 816.67 Use of explosives: Control of adverse effects.

(a) *General requirements.* Blasting shall be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availability of surface or ground water outside the permit area.

(b) *Airblast.*—(1) *Limits.* (i) Airblast shall not exceed the maximum limits listed below at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area, except as provided in Paragraph (e) of this section.

Lower frequency limit of measuring system, in Hz (± 3 dB)	Maximum level, in dB
0.1 Hz or lower—flat response ¹	134 peak.
2 Hz or lower—flat response	133 peak.
8 Hz or lower—flat response	129 peak.
C-weighted—slow response ¹	105 peak dBC.

¹ Only when approved by the regulatory authority.

(ii) If necessary to prevent damage, the regulatory authority shall specify

lower maximum allowable airblast levels than those of Paragraph (b)(1)(i) of this section for use in the vicinity of a specific blasting operation.

(2) *Monitoring.* (i) The operator shall conduct periodic monitoring to ensure compliance with the airblast standards. The regulatory authority may require airblast measurement of any or all blasts and may specify the locations at which such measurements are taken.

(ii) The measuring systems shall have an upper-end flat-frequency response of at least 200 Hz.

(c) *Flyrock.* Flyrock travelling in the air or along the ground shall not be cast from the blasting site—

(1) More than one-half the distance to the nearest dwelling or other occupied structure;

(2) Beyond the area of control required under § 818.66(c); or

(3) Beyond the permit boundary.

(d) *Ground vibration—(1) General.* In all blasting operations, except as otherwise authorized in Paragraph (e) of this section, the maximum ground vibration shall not exceed the values approved in the blasting plan required under § 780.13 of this chapter. The maximum ground vibration for protected structures listed in Paragraph (d)(2)(i) of this section shall be established in accordance with either the maximum peak-particle-velocity limits of Paragraph (d)(2), the scaled-distance equation of Paragraph (d)(3), the blasting-level chart of Paragraph (d)(4) of this section, or by the regulatory authority under Paragraph (d)(5) of this section. All structures in the vicinity of the blasting area, not listed in Paragraph (d)(2)(i) of this section, such as water towers, pipelines and other utilities, tunnels, dams, impoundments, and underground mines, shall be protected from damage by establishment of a maximum allowable limit on the ground vibration, submitted by the operator in the blasting plan and approved by the regulatory authority.

(2) *Maximum peak particle velocity.*

(i) The maximum ground vibration shall not exceed the following limits at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area:

Distance (D), from the blasting site, in feet	Maximum allowable peak particle velocity (V _{max}) for ground vibration, in inches/second ¹	Scaled-distance factor to be applied without seismic monitoring ²
0 to 300.....	1.25	50
301 to 5,000.....	1.00	55
5,001 and beyond.....	0.75	65

¹ Ground vibration shall be measured as the particle velocity. Particle velocity shall be recorded in three mutually perpendicular directions. The maximum allowable peak particle velocity shall apply to each of the three measurements.

² Applicable to the scaled-distance equation of Paragraph (d)(3)(i) of this section.

(ii) A seismographic record shall be provided for each blast.

(3) *Scale-distance equation.* (i) An operator may use the scaled-distance equation, $W = (D/D)^2$, to determine the allowable charge weight of explosives to be detonated in any 8-millisecond period, without seismic monitoring; where W = the maximum weight of explosives, in pounds; D = the distance,

in feet, from the blasting site to the nearest protected structure; and D_s = the scaled-distance factor, which may initially be approved by the regulatory authority using the values for scaled-distance factor listed in Paragraph (d)(2)(i) of this section.

(ii) The development of a modified scaled-distance factor may be authorized by the regulatory authority on receipt of a written request by the operator, supported by seismographic records of blasting at the minesite. The modified scale-distance factor shall be determined such that the particle velocity of the predicted ground vibration will not exceed the prescribed maximum allowable peak particle velocity of Paragraph (d)(2)(i) of this section, at a 95-percent confidence level.

(4) *Blasting-level chart.* (i) An operator may use the ground-vibration limits in Figure 1 to determine the maximum allowable ground vibration.

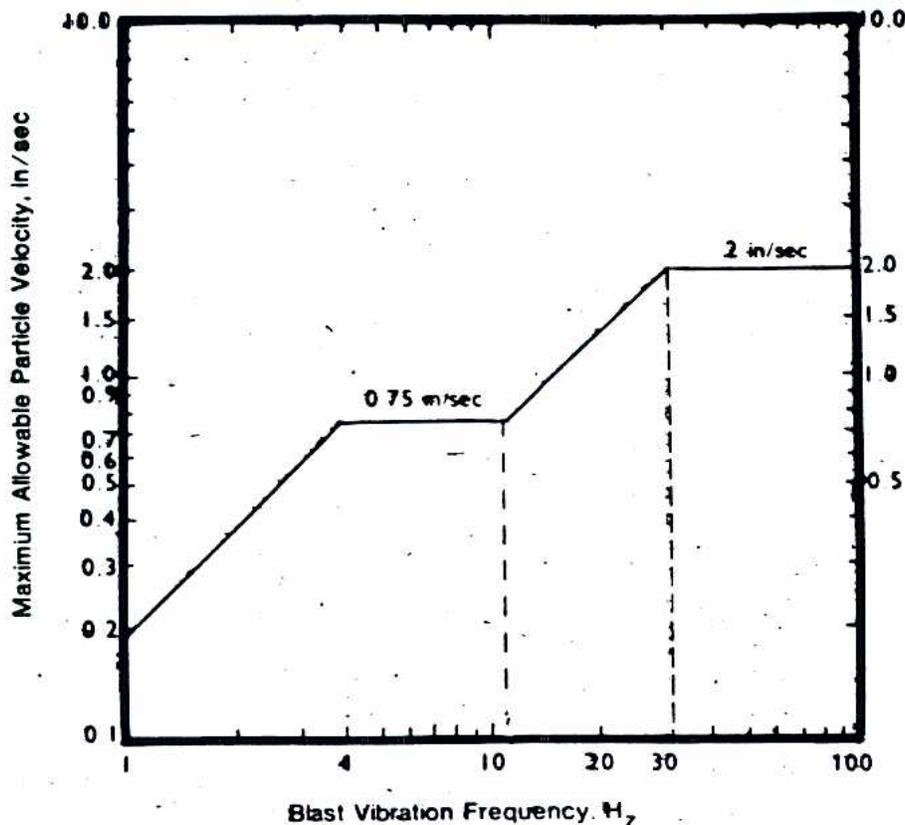


Figure 1 Alternative blasting level criteria

(Source: Modified from figure B-1, Bureau of Mines R18507)

(ii) If the Figure 1 limits are used, a seismographic record including both particle velocity and vibration-frequency levels shall be provided for each blast. The method for the analysis

of the predominant frequency contained in the blasting records shall be approved by the regulatory authority before application of this alternative blasting criterion.

(5) The maximum allowable ground vibration shall be reduced by the regulatory authority beyond the limits otherwise provided by this section, if determined necessary to provide damage protection.

(6) The regulatory authority may require an operator to conduct seismic monitoring of any or all blasts or may specify the location at which the measurements are taken and the degree of detail necessary in the measurement.

(e) The maximum airblast and ground-vibration standards of paragraphs (b) and (d) of this section shall not apply at the following locations:

(1) At structures owned by the permittee and not leased to another person.

(2) At structures owned by the permittee and leased to another person, if a written waiver by the lessee is submitted to the regulatory authority before blasting.

11. Section 816.68 is revised to read as follows:

§ 816.68 Use of explosives: Records of blasting operations.

The operator shall retain a record of all blasts for at least 3 years. Upon request, copies of these records shall be made available to the regulatory authority and to the public for inspection. Such records shall contain the following data:

(a) Name of the operator conducting the blast.

(b) Location, date, and time of the blast.

(c) Name, signature, and certification number of the blaster conducting the blast.

(d) Identification, direction, and distance, in feet, from the nearest blast hole to the nearest dwelling, public building, school, church, community or institutional building outside the permit area, except those described in § 816.67(e).

(e) Whether conditions, including those which may cause possible adverse blasting effects.

(f) Type of material blasted.

(g) Sketches of the blast pattern including number of holes, burden, spacing, decks, and delay pattern.

(h) Diameter and depth of holes.

(i) Types of explosives used.

(j) Total weight of explosives used per hole.

(k) The maximum weight of explosives detonated in an 8-millisecond period.

(l) Initiation system.

(m) Type and length of stemming.

(n) Mats or other protections used.

(o) Seismographic and airblast records, if required, which shall include—

(1) Type of instrument, sensitivity, and calibration signal or certification of annual calibration;

(2) Exact location of instrument and the date, time, and distance from the blast;

(3) Name of the person and firm taking the reading;

(4) Name of the person and firm analyzing the seismographic record; and

(5) The vibration and/or airblast level recorded.

(p) Reasons and conditions for each unscheduled blast.

PART 817—PERMANENT PROGRAM PERFORMANCE STANDARDS—UNDERGROUND MINING ACTIVITIES

§ 817.11 [Amended]

12. Section 817.11 is amended by removing paragraph (f) and redesignating paragraph (g) as paragraph (f).

13. Section 817.61 is amended by revising paragraphs (a) and (b) and adding paragraph (d) to read as follows:

§ 817.61 Use of explosives: General requirements.

(a) Sections 817.61—817.68 apply to surface blasting activities incident to underground coal mining, including, but not limited to, initial rounds of slopes and shafts.

(b) Each operator shall comply with all applicable State and Federal laws and regulations in the use of explosives.

(d) *Blast design.* (1) An anticipated blast design shall be submitted if blasting operations will be conducted within—

(i) 1,000 feet of any building used as a dwelling, public building, school, church or community or institutional building; or

(ii) 500 feet of active or abandoned underground mines.

(2) The blast design may be presented as part of a permit application or at a time, before the blast, approved by the regulatory authority.

(3) The blast design shall contain sketches of the drill patterns, delay periods, and decking and shall indicate the type and amount of explosives to be used, critical dimensions, and the location and general description of structures to be protected, as well as a discussion of design factors to be used, which protect the public and meet the applicable airblast, flyrock, and ground-vibration standards in § 817.67.

(4) The blast design shall be prepared and signed by a certified blaster.

(5) The regulatory authority may require changes to the design submitted.

14. Section 817.62 is revised to read as follows:

§ 817.62 Use of explosives: Preblasting survey.

(a) At least 30 days before initiation of blasting, the operator shall notify, in writing, all residents or owners of dwellings or other structures located within $\frac{1}{2}$ mile of the permit area how to request a preblasting survey.

(b) A resident or owner of a dwelling or structure within $\frac{1}{2}$ mile of any part of the permit area may request a preblasting survey. This request shall be made, in writing, directly to the operator or to the regulatory authority, who shall promptly notify the operator. The operator shall promptly conduct a preblasting survey of the dwelling or structure and promptly prepare a written report of the survey. An updated survey of any additions, modifications, or renovations shall be performed by the operator if requested by the resident or owner.

(c) The operator shall determine the condition of the dwelling or structure and shall document any preblasting damage and other physical factors that could reasonably be affected by the blasting. Structures such as pipelines, cables, transmission lines, and cisterns, wells, and other water systems warrant special attention; however, the assessment of these structures may be limited to surface conditions and other readily available data.

(d) The written report of the survey shall be signed by the person who conducted the survey. Copies of the report shall be promptly provided to the regulatory authority and to the person requesting the survey. If the person requesting the survey disagrees with the contents and/or recommendations contained therein, he or she may submit to both the operator and the regulatory authority a detailed description of the specific areas of disagreement.

(e) Any surveys requested more than 10 days before the planned initiation of blasting shall be completed by the operator before the initiation of blasting.

15. Section 817.64 is revised to read as follows:

§ 817.64 Use of explosives: General performance standards.

(a) The operator shall notify, in writing, residents within $\frac{1}{2}$ mile of the blasting site and local governments of the proposed times and locations of blasting operations. Such notice of times that blasting is to be conducted may be

announced weekly, but in no case less than 24 hours before blasting will occur.

(b) **Unscheduled blasts** may be conducted only where public or operator health and safety so requires and for emergency blasting actions. When an operator conducts an unscheduled surface blast incidental to underground coal mining operations, the operator, using audible signals, shall notify residents within 1/2 mile of the blasting site and document the reason in accordance with § 817.68(p).

(c) All blasting shall be conducted between sunrise and sunset unless nighttime blasting is approved by the regulatory authority based upon a showing by the operator that the public will be protected from adverse noise and other impacts. The regulatory authority may specify more restrictive time periods for blasting.

§ 817.65 [Removed]

16. Section 817.65 is removed.

17. Section 817.66 is added to read as follows:

§ 817.66 Use of explosives: Blasting signs, warnings, and access control.

(a) **Blasting signs.** Blasting signs shall meet the specifications of § 817.11. The operator shall—

(1) Conspicuously place signs reading "Blasting Area" along the edge of any blasting area that comes within 100 feet of any public-road right-of-way, and at the point where any other road provides access to the blasting area; and

(2) At all entrances to the permit area from public roads or highways, place conspicuous signs which state "Warning! Explosives in Use," which clearly list and describe the meaning of the audible blast warning and all-clear signals that are in use, and which explain the marking of blasting areas and charged holes awaiting firing within the permit area.

(b) **Warnings.** Warning and all-clear signals of different character or pattern that are audible within a range of 1/2 mile from the point of the blast shall be given. Each person within the permit area and each person who resides or regularly works within 1/2 mile of the permit area shall be notified of the meaning of the signals in the blasting notification required in § 817.64(a).

(c) **Access control.** Access within the blasting areas shall be controlled to prevent presence of livestock or unauthorized persons during blasting and until an authorized representative of the operator has reasonably determined that—

(1) No unusual hazards, such as imminent slides or undetonated charges, exist; and

(2) Access to and travel within the blasting area can be safely resumed.

18. Section 817.67 is revised to read as follows:

§ 817.67 Use of explosives: Control of adverse effects.

(a) **General requirements.** Blasting shall be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availability of surface or ground water outside the permit area.

(b) **Airblast.**—(1) **Limits.** (i) Airblast shall not exceed the maximum limits listed below at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area, except as provided in Paragraph (e) of this section.

Lower frequency limit of measuring system, in Hz (±3 dB)	Maximum level, in dB
0.1 Hz or lower—flat response ¹	134 peak.
2 Hz or lower—flat response.....	133 peak.
6 Hz or lower—flat response.....	129 peak.
C-weighted—slow response ¹	105 peak dBC.

¹Only when approved by the regulatory authority.

(ii) If necessary to prevent damage, the regulatory authority may specify lower maximum allowable airblast levels than those of Paragraph (b)(1)(i) of this section for use in the vicinity of a specific blasting operation.

(2) **Monitoring.** (i) The operator shall conduct periodic monitoring to ensure compliance with the airblast standards. The regulatory authority may require airblast measurement of any or all blasts and may specify the locations at which such measurements are taken.

(ii) The measuring systems used shall have an upper-end flat-frequency response of at least 200 Hz.

(c) **Flyrock.** Flyrock travelling in the air or along the ground shall not be cast from the blasting site—

(1) More than one-half the distance to the nearest dwelling or other occupied structure;

(2) Beyond the area of control required under § 817.68(c); or

(3) Beyond the permit boundary.

(d) **Ground vibration.**—(1) **General.** In all blasting operations, except as otherwise authorized in paragraph (e) of this section, the maximum ground vibration shall not exceed the values approved by the regulatory authority. The maximum ground vibration for protected structures listed in paragraph (d)(2)(i) of this section shall be established in accordance with either the maximum peak-particle-velocity limits of paragraph (d)(2), the scaled-distance equation of paragraph (d)(3), the blasting-level chart of paragraph

(d)(4) of this section, or by the regulatory authority under paragraph (d)(5) of this section. All structures in the vicinity of the blasting area, not listed in paragraph (d)(2)(i) of this section, such as water towers, pipelines and other utilities, tunnels, dams, impoundments, and underground mines shall be protected from damage by establishment of a maximum allowable limit on the ground vibration, submitted by the operator and approved by the regulatory authority before the initiation of blasting.

(2) **Maximum peak-particle velocity.**

(i) The maximum ground vibration shall not exceed the following limits at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area:

Distance (D), from the blasting site, in feet	Maximum allowable peak particle velocity (V _{max}) for ground vibration, in inches/second ¹	Scaled-distance factor to be applied without seismic monitoring ²
0 to 300.....	1.25	50
301 to 5,000.....	1.00	55
5,001 and beyond.....	0.75	65

¹Ground vibration shall be measured as the particle velocity. Particle velocity shall be recorded in three mutually perpendicular directions. The maximum allowable peak particle velocity shall apply to each of the three measurements.

²Applicable to the scaled-distance equation of Paragraph (d)(3)(i) of this section.

(ii) A seismographic record shall be provided for each blast.

(3) **Scaled-distance equation.** (i) An operator may use the scaled-distance equation, $W = (D/D_s)^2$, to determine the allowable charge weight of explosives to be detonated in any 8-millisecond period, without seismic monitoring; where W = the maximum weight of explosives, in pounds; D = the distance, in feet, from the blasting site to the nearest protected structure; and D_s = the scaled-distance factor, which may initially be approved by the regulatory authority using the values for scaled-distance factor listed in Paragraph (d)(2)(i) of this section.

(ii) The development of a modified scaled-distance factor may be authorized by the regulatory authority on receipt of a written request by the operator, supported by seismographic records of blasting at the minesite. The modified scaled-distance factor shall be determined such that the particle velocity of the predicted ground vibration will not exceed the prescribed maximum allowable peak particle

velocity of paragraph (d)(2)(i) of this section, at a 95-percent confidence level.

(4) *Blasting-level chart.* (i) An

operator may use the ground-vibration limits in Figure 1 to determine the maximum allowable ground vibration.

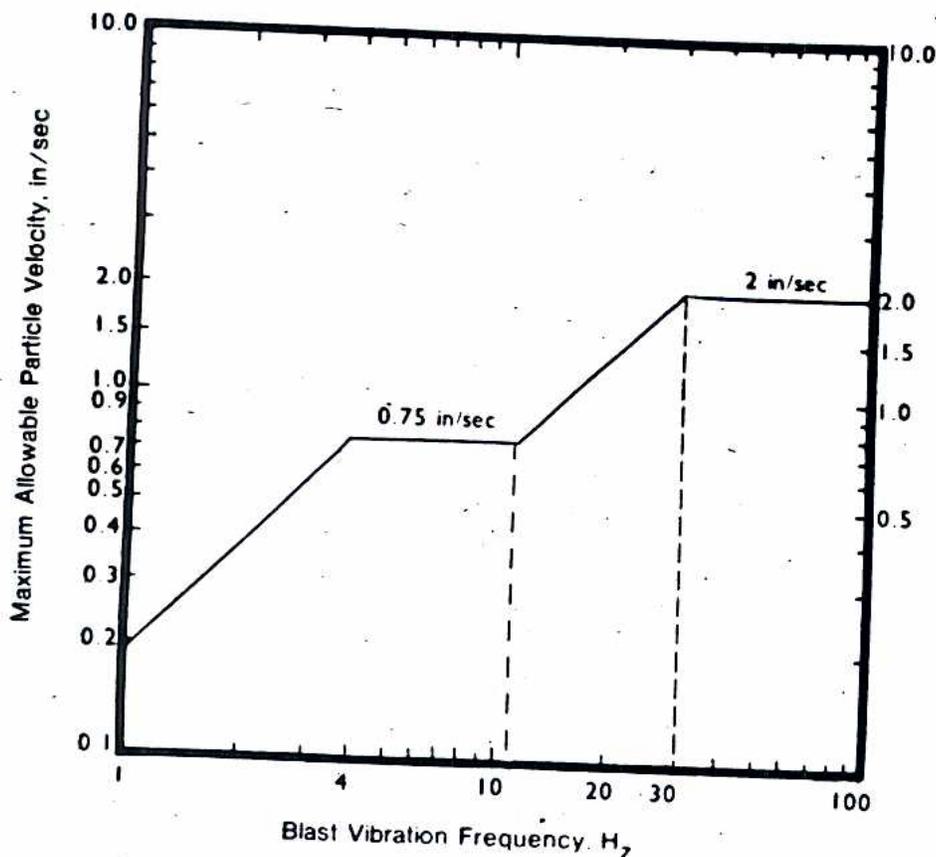


Figure 1 Alternative blasting level criteria

(Source: Modified from figure B-1, Bureau of Mines RI8507)

(ii) If the Figure 1 limits are used, a seismographic record including both particle velocity and vibration-frequency levels shall be provided for each blast. The method for the analysis of the predominant frequency contained in the blasting records shall be approved by the regulatory authority before application of this alternative blasting criterion.

(5) The maximum allowable ground vibration shall be reduced by the regulatory authority beyond the limits otherwise provided by this section, if determined necessary to provide damage protection.

(6) The regulatory authority may require an operator to conduct seismic monitoring of any or all blasts and may

specify the location at which the measurements are taken and the degree of detail necessary in the measurement.

(e) The maximum airblast and ground-vibration standards of paragraphs (b) and (d) of this section shall not apply at the following locations:

(1) At structures owned by the permittee and not leased to another person.

(2) At structures owned by the permittee and leased to another person, if a written waiver by the lessee is submitted to the regulatory authority before blasting.

19. Section 817.68 is revised to read as follows:

§ 817.68 Use of explosives: Records of blasting operations.

The operator shall retain a record of all blasts for at least 3 years. Upon request, copies of these records shall be made available to the regulatory authority and to the public for inspection. Such records shall contain the following data:

(a) Name of the operator conducting the blast.

(b) Location, date, and time of the blast.

(c) Name, signature, and certification number of the blaster conducting the blast.

(d) Identification, direction, and distance, in feet, from the nearest blast hole to the nearest dwelling, public building, school, church, community or institutional building outside the permit area, except those described in § 817.67 (e).

(e) Weather conditions, including those which may cause possible adverse blasting effects.

(f) Type of material blasted.

(g) Sketches of the blast pattern including number of holes, burden, spacing, decks, and delay pattern.

(h) Diameter and depth of holes.

(i) Types of explosives used.

(j) Total weight of explosives used per hole.

(k) The maximum weight of explosives detonated in an 8-millisecond period.

(l) Initiation system.

(m) Type and length of stemming.

(n) Mats or other protections used.

(o) Seismographic and airblast records, if required, which shall include—

(1) Type of instrument, sensitivity, and calibration signal or certification of annual calibration;

(2) Exact location of instrument and the date, time, and distance from the blast;

(3) Name of the person and firm taking the reading;

(4) Name of the person and firm analyzing the seismographic record; and

(5) The vibration and/or airblast level recorded.

(p) Reasons and conditions for each unscheduled blast.

Authority: Pub. L. 95-87, 30 U.S.C. 1201 *et seq.*

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