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30 CFR Parts 70, 71, 72, et al.
Lowering Miners' Exposure to Respirable Coal Mine Dust, Including Continuous Personal Dust Monitors; Proposed Rule

DEPARTMENT OF LABOR

Mine Safety and Health Administration

30 CFR Parts 70, 71, 72, 75, and 90

RIN 1219–AB64

Lowering Miners' Exposure to Respirable Coal Mine Dust, Including Continuous Personal Dust Monitors

AGENCY: Mine Safety and Health Administration, Labor.

ACTION: Proposed rule.

SUMMARY: The Mine Safety and Health Administration (MSHA) proposes to lower miners' exposure to respirable coal mine dust by revising the Agency's existing standards on miners' occupational exposure to respirable coal mine dust. The major provisions of the proposal would lower the existing exposure limit; provide for full-shift sampling; redefine the term "normal production shift;" and add reexamination and decertification requirements for persons certified to sample, and maintain and calibrate sampling devices. In addition, the proposed rule would provide for single shift compliance sampling under the mine operator and MSHA's inspector sampling programs, and would establish sampling requirements for use of the Continuous Personal Dust Monitor (CPDM) and expanded requirements for medical surveillance.

The proposed rule would significantly improve health protections for this Nation's coal miners by reducing their occupational exposure to respirable coal mine dust and lowering the risk that they will suffer material impairment of health or functional capacity over their working lives.

DATES: All comments must be received by midnight Eastern Standard Time on February 28, 2011.

ADDRESSES: Comments must be clearly identified with "RIN 1219–AB64" and may be sent by any of the following methods:

(1) *Federal e-Rulemaking Portal: http://www.regulations.gov.* Follow the instructions for submitting comments.

(2) *Electronic mail: zzMSHA-comments@dol.gov.* Include "RIN 1219–AB64" in the subject line of the message.

(3) *Facsimile:* 202–693–9441. Include "RIN 1219–AB64" in the subject line of the message.

(4) *Regular Mail:* MSHA, Office of Standards, Regulations, and Variances, 1100 Wilson Boulevard, Room 2350, Arlington, Virginia 22209–3939.

(5) *Hand Delivery or Courier:* MSHA, Office of Standards, Regulations, and Variances, 1100 Wilson Boulevard, Room 2350, Arlington, Virginia. Sign in at the receptionist's desk on the 21st floor.

Information Collection Requirements: Comments concerning the information collection requirements of this proposed rule must be clearly identified with "RIN 1219–AB64" and sent to both the Office of Management and Budget (OMB) and MSHA. Comments to OMB may be sent by mail addressed to the Office of Information and Regulatory Affairs, Office of Management and Budget, New Executive Office Building, 725 17th Street, NW., Washington, DC 20503, Attn: Desk Officer for MSHA. Comments to MSHA may be transmitted either electronically to *zzMSHA-Comments@dol.gov,* by facsimile to (202) 693–9441, or by regular mail, hand delivery, or courier to MSHA, Office of Standards, Regulations, and Variances, 1100 Wilson Blvd., Room 2350, Arlington, Virginia 22209–3939.

FOR FURTHER INFORMATION CONTACT: Patricia W. Silvey, Director, Office of Standards, Regulations, and Variances, MSHA, 1100 Wilson Boulevard, Room 2350, Arlington, Virginia 22209–3939. Ms. Silvey can be reached at *Silvey.Patricia@dol.gov* (Internet E-mail), (202) 693–9440 (voice), or (202) 693–9441 (facsimile).

SUPPLEMENTARY INFORMATION:

Availability of Information

MSHA will post all comments on the Internet without change, including any personal information provided. Comments can be accessed electronically at *http://www.msha.gov/regsinfo.htm.* Comments may also be reviewed at the Office of Standards, Regulations, and Variances, 1100 Wilson Boulevard, Room 2350, Arlington, Virginia. Sign in at the receptionist's desk on the 21st floor.

MSHA maintains a list that enables subscribers to receive e-mail notification when rulemaking documents are published in the **Federal Register**. To subscribe, go to *http://www.msha.gov/subscriptions/subscribe.aspx.*

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I. Introduction

This proposed rule promotes the Secretary of Labor's vision of "Good Jobs For Everyone." It also supports the Department of Labor's (DOL's) goal of securing safe and healthy workplaces, particularly for vulnerable workers in high-risk industries, such as mining, by reducing workplace deaths and improving the health of coal miners.

This proposed rule is an important element in MSHA's Comprehensive Initiative to "End Black Lung—Act Now!" MSHA launched this important initiative in December 2009 and it includes four components: rulemaking, enhanced enforcement, collaborative outreach, and education and training. The initiative will reduce, and ultimately eliminate, disabling occupational lung disease in coal mines.

This proposal provides the public with the opportunity to comment on the

Agency's comprehensive and integrated regulatory approach to reduce and eliminate continued risks to miners from exposure to respirable coal mine dust. Throughout the preamble, the terms "respirable coal mine dust," "coal mine dust," and "respirable dust" are used interchangeably. This proposal combines the following rulemaking actions: (1) "Occupational Exposure to Coal Mine Dust (Lowering Exposure);" (2) "Verification of Underground Coal Mine Operators' Dust Control Plans and Compliance Sampling for Respirable Dust" (Plan Verification) (65 FR 42122, July 7, 2000, and 68 FR 10784, March 6, 2003); (3) "Determination of Concentration of Respirable Coal Mine Dust" (Single Sample) (65 FR 42068, July 7, 2000, and 68 FR 10940 March 6, 2003); and (4) "Respirable Coal Mine Dust: Continuous Personal Dust Monitor (CPDM)" (74 FR 52708, October 14, 2009). MSHA is withdrawing Plan Verification and Single Sample as separate rulemaking actions.

Exposure to respirable coal mine dust can cause lung diseases including coal workers' pneumoconiosis (CWP), emphysema, silicosis, and chronic bronchitis, known collectively as "black lung." These diseases are debilitating, incurable, and can result in disability, and premature death. While considerable progress has been made in reducing the respirable coal mine dust levels, miners continue to develop black lung. Based on recent data from the National Institute for Occupational Safety and Health (NIOSH), the prevalence rate of black lung is increasing in our nation's coal miners; even younger miners are showing evidence of advanced and seriously debilitating lung disease. Black lung is a preventable disease.

Several provisions in the proposed rule, including lowering the respirable dust standard, basing noncompliance determinations on single shift sampling, sampling of extended work shifts to account for occupational exposures greater than 8 hours per shift, and changing the definition of normal production shift, would singularly lower coal miners' exposure to respirable dust. For example, MSHA's quantitative risk assessment (QRA) estimates the reduction in health risks when two provisions of the proposed rule are implemented—the proposed respirable dust limit and single shift sampling. The QRA shows that these two proposed provisions would significantly reduce the risks of CWP, severe emphysema, and death from non-malignant respiratory disease (NMRD). For instance, at underground mines, the QRA projects over a 45-year occupational lifetime from 1–105 fewer cases of pneumoconiosis per thousand exposed truck drivers, and 50 fewer cases of severe emphysema and 15 fewer deaths due to NMRD per thousand exposed cutting machine operators (see the QRA discussion in Section V of this preamble).

The other provisions in the proposed rule would further reduce health risks to miners. Cumulatively, the proposed provisions would reduce the continued risks that coal miners face from exposure to respirable coal mine dust and would further protect them from the debilitating effects of occupational respiratory disease.

II. Background Information

A. Interim Mandatory Standards Under the Mine Act

Section 202 of the Federal Mine Safety and Health Act of 1977 (Mine Act) established interim mandatory standards for respirable dust that remain in effect until superseded by improved permanent mandatory standards promulgated by the Secretary under Section 101. Section 202(b)(2) required each underground coal mine operator to *continuously* maintain the *average concentration* of respirable dust in the mine atmosphere during each shift to which each miner in the active workings is exposed at or below 2.0 milligrams of respirable dust per cubic meter of air (*i.e.,* 2.0 mg/m^3) (emphasis added). Section 205 required that when coal mine dust contains more than five percent quartz (*i.e.,* silica), the respirable coal mine dust standard must be reduced according to a formula prescribed by NIOSH.

B. MSHA's Existing Respirable Dust Standards

MSHA's existing respirable dust standards, promulgated on April 8, 1980, implemented Section 202(b) of the Mine Act (45 FR 23990, April 8, 1980). The standards require coal mine operators to continuously maintain the average concentration of respirable dust to which each miner is exposed during each shift at or below 2.0 milligrams per cubic meter of air (2.0 mg/m^3) (30 CFR 70.100 (underground coal mines), 71.100 (surface coal mines and surface areas of underground coal mines)). Miners who have evidence of pneumoconiosis and are employed at underground coal mines or surface work areas of underground coal mines have the option to work in areas where average respirable dust concentrations do not exceed 1.0 mg/m^3 of air (30 CFR § 90.100, "part 90 miners"). There is no separate standard for respirable silica; rather, where the total respirable coal mine dust contains more than five percent quartz, the respirable coal mine dust standard is computed by dividing the percentage of quartz into the number ten (30 CFR §§ 70.101 (underground coal mines), 71.101 (surface coal mines and surface areas of underground coal mines), and 90.101 (part 90 miners)).

The term "average concentration" in MSHA's existing standards tracks the language of the Mine Act and is defined in § 202(f) of the Mine Act as follows:

> [T]he term "average concentration" means a determination which accurately represents the atmospheric conditions with regard to respirable dust to which each miner in the active workings of a mine is exposed (1) as measured, during the 18 month period following December 30, 1969, over a number of continuous production shifts to be determined by the Secretary [of Labor; Originally, the Secretary of the Interior] and the Secretary of Health and Human Services [originally, the Secretary of Health, Education, and Welfare (HEW)], and (2) as measured thereafter, over a single shift only, unless the Secretary [of Labor] and the Secretary of Health and Human Services find, in accordance with the provisions of section 811 of this title, that such single shift measurement will not, after applying valid statistical techniques to such measurement, accurately represent such atmospheric conditions during such shift (30 U.S.C. § 842(f)).

Section 202(f) of the Mine Act is taken essentially verbatim from § 202(f) of the Federal Coal Mine Health and Safety Act of 1969 (Coal Act). In 1972, acting pursuant to the Coal Act, the Secretaries of the Interior and HEW made the joint finding referred to in § 202(f), concluding that "single shift measurement of respirable dust will not, after applying valid statistical techniques to such measurement, accurately represent the atmospheric conditions to which the miner is continuously exposed" (Notice of Finding That a Single Shift Measurement of Respirable Dust Will Not Accurately Represent Atmospheric Conditions During Such Shift, 37 FR 3833 (February 23, 1972) (1972 Joint Finding)). Under § 301(b)(1) and (c)(2) of the Mine Act, all standards, decisions, determinations, and regulations issued under the Coal Act remain in effect under the Mine Act until modified or set aside.

Under MSHA's existing standards, mine operators are required to collect bimonthly respirable dust samples and submit them to MSHA for analysis to determine compliance with applicable respirable dust standards (compliance samples). If compliance samples do not meet the requirements of the applicable dust standard, MSHA issues a citation

for a violation of the standard and the operator is required to take corrective action to lower the respirable dust concentration to meet the standard. Further, the operator must collect additional respirable dust samples during the time established in the citation for abatement of the hazard or violation (abatement sampling).

Underground coal mine operators collect and submit two types of samples during bimonthly sampling periods: (1) "designated occupation" (DO) samples taken for the occupations exposed to the greatest concentrations of respirable dust in each mechanized mining unit (DOs are specified in § 70.207); and (2) "designated area" (DA) samples collected at locations appropriate to best measure concentrations of respirable dust associated with dust generation sources in the active working of the mine (§ 70.208). The operator's approved ventilation system and methane and dust control plan, required in existing 30 CFR part 75, must show the specific locations in the mine designated for taking the DA samples. In addition, mine operators take respirable dust samples for part 90 miners (§§ 90.207 and 90.208).

Similarly, for surface work areas of underground mines and for surface mines, mine operators are required to collect bimonthly samples from "designated work positions" (DWPs), which are designated by the District Manager (§ 71.208).

Compliance determinations are based on the average concentration of respirable dust measured by five valid respirable dust samples taken by the operator during five consecutive normal production shifts or five normal production shifts worked on consecutive days (multiple-shift samples). Compliance determinations are also based on the average of multiple measurements taken by the MSHA inspector over a single shift (multiple, single-shift samples) or on the average of multiple measurements obtained for the same occupation on successive days (multiple-shift samples).

In 1991, MSHA began a spot inspection program (SIP). Under the SIP, if the average of multiple occupation measurements taken by the MSHA inspector on an MMU during any one-day inspection (multiple, single-shift samples) did not exceed the applicable respirable dust standard, the MSHA inspector would review the result of each individual full-shift sample (single, full-shift sample). If any single, full-shift sample exceeded the applicable standard by an amount specified by MSHA, a citation would be issued for noncompliance, requiring the mine operator to take immediate corrective action to lower the average dust concentration in the mine atmosphere in order to protect miners. In November 1991, MSHA extended the single, full-shift sampling method to all mining types, not just MMUs.

In *Keystone Coal,* 16 FMSHRC 6 (Jan. 4, 1994), the Federal Mine Safety and Health Review Commission (Commission) vacated three citations that were based on single, full-shift samples taken by MSHA inspectors under the SIP. MSHA contended that the 1972 Joint Finding did not preclude the SIP because the Joint Finding pertained to operator sampling, while the SIP involved MSHA sampling only. The Commission rejected that argument and concluded that MSHA policy could only be altered if the requirements of the Mine Act and the Administrative Procedure Act (5 U.S.C. 551 *et seq.*) were met. (*i.e.,* notice and comment rulemaking procedures). As a result of the decision, MSHA terminated the SIP.

In *Secretary of Labor* v. *Excel Mining LLC,* 334 F.3d 1 (D.C. Cir. 2003), the Secretary interpreted § 202(f) of the Mine Act and the 1972 Joint Finding to bar MSHA's use of a single, full-shift sample to calculate average dust concentration for enforcement purposes because, after applying valid statistical techniques, those samples would not accurately represent the atmospheric conditions to which the miner is continuously exposed. However, the Secretary further took the position that the statute and Joint Finding did not bar the Agency from making compliance determinations based on an average of multiple samples taken over a single shift ("multiple, single-shift samples"). The Court found the Secretary's interpretation was reasonable.

C. 1995 NIOSH Criteria Document and 1996 Dust Advisory Committee Report

On November 7, 1995, NIOSH submitted to the Secretary a criteria document recommending reduced standards for respirable coal mine dust and silica exposure. On April 25, 1996, MSHA published a **Federal Register** notice stating that it had decided to respond to the NIOSH criteria document by developing a proposed rule "derived from the recommendations" in the NIOSH Criteria Document (61 FR 18308, April 25, 1996). The NIOSH Criteria Document can be accessed electronically at *http://www.cdc.gov/niosh/95-106.html.* MSHA further stated that, although it would begin "the background work necessary to develop such a rule," it would defer development of the rule until it received a report from the Secretary of Labor's Advisory Committee on the Elimination of Pneumoconiosis Among Coal Mine Workers (Dust Advisory Committee), which the Secretary had established on January 31, 1995, and to which MSHA had referred the NIOSH criteria document.

On November 14, 1996, the Dust Advisory Committee submitted its report to the Secretary. The Dust Advisory Committee Report can be accessed electronically at *http://www.msha.gov/S&HINFO/BlackLung/1996Dust%20AdvisoryReport.pdf.* The report contained 20 wide-ranging principal recommendations, subdivided into approximately 100 action items, aimed at eliminating coal miners' pneumoconiosis and silicosis (62 FR 3717, January 24, 1997). The report recommended that MSHA consider lowering the level of allowable exposure to coal mine dust, with any reduction accompanied by a phase-in period to allow allocation of sufficient resources to the compliance effort.

D. 2000 and 2003 Plan Verification Proposed Rules

On July 7, 2000, MSHA published the Plan Verification proposed rule. The proposal would require underground mine operators to have a verified mine ventilation plan, with MSHA collecting samples to verify the adequacy of dust control parameters specified in the ventilation plan to maintain respirable dust standards ("verification sampling").

In response to comments urging MSHA to withdraw the proposal, MSHA published a new proposed rule on March 6, 2003, (68 FR 10784), which would require mine operators to have a "verified" mine ventilation plan and conduct verification sampling on each mechanized mining unit (MMU). Under the proposal, mine operators would demonstrate the adequacy of dust control parameters specified in the ventilation plan to maintain the concentration of respirable coal mine dust and quartz dust at or below applicable dust standards. In addition, the mine operators' existing bimonthly respirable dust sampling program for each MMU and DA would be eliminated and MSHA would assume responsibility for compliance and abatement sampling in underground coal mines.

The 2003 proposal would also provide for the use of CPDMs once the CPDM was verified as reliable under mining conditions and commercially available.

Public hearings were held in May 2003. The closing date for the comment period for the Plan Verification proposed rule was extended indefinitely to obtain information concerning

CPDMs being tested by NIOSH (68 FR 39881, July 3, 2003).

The following provisions from the 2003 Plan Verification proposal have been revised and integrated into this proposed rule: (1) Use of the CPDM in monitoring respirable dust exposures; (2) recording the amount of material produced by each MMU during each production shift and retaining the record; (3) sampling for respirable dust during the entire time that a miner works to account for shifts longer than 8 hours (hr); (4) requiring that dust control parameters in the mine's ventilation plan be revised when respirable dust overexposures are indicated; and (5) including threshold values that would be used to determine violations based on single sample measurements. With issuance of this proposed rule, MSHA is no longer accepting comments on the 2003 Plan Verification proposed rule. Comments on provisions of the 2003 Plan Verification proposal that are integrated in this proposal are addressed in the section-by-section analysis of this preamble.

E. 2000 Single Sample Proposed Rule

On July 7, 2000, MSHA and NIOSH jointly published a proposed rule on Determination of Concentration of Respirable Coal Mine Dust (Single Sample) (65 FR 42068). The proposal would have rescinded the 1972 Joint Notice and established that a single, full-shift measurement of respirable coal mine dust may be used to determine the average concentration on a shift if that measurement accurately represents atmospheric conditions to which a miner is exposed during such shift.

MSHA proposed the 2000 Single Sample rule following *National Mining Association (NMA) et al.* v. *Secretary of Labor, et al.,* 153 F.3d 1264 (11th Cir. 1998). In this case, the Court of Appeals for the 11th Circuit (Court) reviewed the 1998 Final Joint Notice of Finding issued by MSHA and NIOSH. The 1998 Final Joint Finding, issued on February 3, 1998, concluded that the 1972 Joint Finding was incorrect and stated that the average respirable dust concentration to which a miner is exposed can be accurately measured over a single shift (63 FR 5664). The Court vacated the 1998 Joint Finding and found that MSHA was required by section 101(a)(6)(A) of the Mine Act to demonstrate that the single full-shift measurement adequately assures that no miner will suffer a material impairment of health, on the basis of the best available evidence; uses the latest available scientific data in the field; is technologically and economically feasible; and is based on experience gained under the Mine Act and other health and safety laws (153 F.3d 1268–1269).

On March 6, 2003, MSHA and NIOSH reopened the rulemaking record to allow further comment on the 1998 Final Finding and to solicit comment on new data and information added to the record (68 FR 10940). In May 2003, public hearings on the 2000 single sample proposal were held jointly with the 2003 plan verification proposal. The comment period for the single sample proposal was extended indefinitely in order to obtain information on CPDMs being tested by NIOSH (68 FR 47886, August 12, 2003). The single sample proposal is a part of this proposed rule.

F. Continuous Personal Dust Monitors (CPDM)

On April 6, 2010, 75 FR 17512, MSHA and NIOSH published a final rule revising approval requirements under 30 CFR part 74 for the existing coal mine dust personal samplers. It also establishes new approval requirements for the new CPDM.

The CPDM is new technology that provides a direct measurement of respirable dust in the miner's work atmosphere on a real-time basis. In September 2006, NIOSH published the results of a collaborative study designed to verify the performance of the pre-commercial CPDM in laboratory and underground coal mine environments. According to the NIOSH Report of Investigations 9669, "Laboratory and Field Performance of a Continuously Measuring Personal Respirable Dust Monitor," (Volkwein, JC et al., 2006), the CPDM is accurate, precise, and durable under harsh mining conditions in providing continuous exposure information previously not available to coal miners and coal mine operators.

On October 14, 2009, MSHA published a Request for Information (RFI) on potential applications of CPDM technology to monitor and control miners' exposure to respirable coal mine dust during a working shift (74 FR 52708). The comment period closed on December 14, 2009.

III. Section-by-Section Discussion

Discussion of Alternatives

The proposed rule presents a comprehensive integrated approach for lowering miners' exposure to respirable coal mine dust. The proposal combines the following regulatory actions: Lowering miners' coal mine dust exposure; single shift sampling to determine noncompliance; plan verification (normal production shift and full shift sampling); and the use of the CPDM. In developing the proposed rule, MSHA considered a number of alternatives, ranging from addressing each rulemaking separately to combining a number of them. For example, MSHA considered lowering the exposure limit separately; and lowering the exposure limit in conjunction with single shift sampling. MSHA also considered implementation of CPDMs as a separate, later rulemaking. However, the Secretary of Labor considers ending black lung disease as one of the Department's highest regulatory priorities and strongly believes that the proposed integrated regulatory approach represents the most effective strategy for reducing miners' exposure to respirable dust. The proposed integrated approach would allow miners and operators to review and respond to the most effective provisions for addressing black lung at one time. The proposal allows both the mining community and MSHA to address improvements to end black lung comprehensively. Improvements include: regulations, enforcement procedures, compliance tools, and information technology systems and support related to coal mine dust sampling.

MSHA also considered various alternatives to key provisions in the proposal. For example, MSHA considered:

- Other limits for the respirable dust standard;
- The occupations, miners, and areas that operators should sample and sampling frequency. MSHA considered options that would sample more miners more frequently, but rejected these due to estimated projected benefits;
- Shorter and longer implementation dates for the proposed exposure limits and proposed use of CPDMs;
- Alternatives to calculating sampling of extended work shifts;
- Different production levels associated with the proposed definition of "normal production shift"; and
- Whether taking single shift samples to determine noncompliance with the proposed exposure limit should apply only to MSHA inspector samples, or to both operator and MSHA samples.

The Agency believes that the integrated approach in the proposed rule would achieve an effective and balanced regulatory program consistent with MSHA's Comprehensive Black Lung Initiative to lower coal miners' exposure to respirable coal mine dust and end lung disease. The Agency believes that a more compartmentalized approach would lessen the impact of the benefits to be achieved by this

important initiative and would not adequately reduce the risk of serious lung disease from coal mine dust exposure. The Agency solicits comment on which provisions in the proposal would be more effective if implemented. Commenters are requested to submit other alternatives, including detailed rationale and supporting documentation.

30 CFR Part 70

A. Section 70.2 Definitions

Approved Sampling Device

This new definition, *approved sampling device,* would mean a sampling device approved by the Secretary and the Secretary of Health and Human Services under 30 CFR part 74 (Coal Mine Dust Sampling Devices). The proposed definition would clarify that whenever a sampling device is used by operators to comply with the requirements of part 70, the device must be approved for use in coal mines under part 74.

Coal Mine Dust Personal Sampler Unit (CMDPSU)

This new definition, *coal mine dust personal sampler unit (CMDPSU),* would mean a personal sampling device that is approved under 30 CFR part 74, subpart B. The definition is necessary to distinguish between the two types of coal mine dust monitoring technology approved under part 74 and to clarify the applicability of the proposed rule to each approved sampling device. The existing gravimetric sampling device used by operators would be considered a CMDPSU under this proposed definition.

Continuous Personal Dust Monitor (CPDM)

This new definition, *continuous personal dust monitor (CPDM),* would mean a personal sampling device approved under part 74, subpart C. The definition is necessary to distinguish between the two types of coal mine dust monitoring technology approved under part 74 and to clarify the applicability of proposed rule provisions to each approved sampling device.

Designated Area (DA)

The proposal would retain the existing requirement that a DA is an area of the mine identified by the operator in the mine ventilation plan, and approved by the District Manager. It would make a non-substantive change to the existing definition to clarify that the DA would be identified by a four-digit identification number assigned by MSHA. The proposal would be consistent with the existing practice of identifying DAs and would incorporate language from existing § 70.208(e).

Equivalent Concentration

This new definition, *equivalent concentration,* would mean the concentration of respirable coal mine dust expressed in milligrams per cubic meter of air (mg/m^3), determined by dividing the weight of dust in milligrams collected on the filter of an approved sampling device by the volume of air in cubic meters passing through the collection filter (sampling time in minutes times the sampling airflow rate in cubic meters per minute), and then converting this concentration to an equivalent 8-hour exposure as measured by the Mining Research Establishment (MRE) instrument. When the approved sampling device is:

(1) The CMDPSU, the equivalent concentration is determined by first multiplying the concentration of respirable coal mine dust by the MRE conversion factor prescribed by the Secretary and then normalizing this quantity to an 8-hour exposure measurement by multiplying the MRE-equivalent concentration by the factor *t/480,* where *t* is the sampling time in minutes if longer than 8 hours.

(2) The CPDM, the device shall be programmed to directly report the end-of-shift equivalent concentration as an MRE 8-hour equivalent concentration.

(3) Either the CMDPSU or CPDM and the sampled work shift is less than 8 hours, the value of *t* used for normalizing the MRE-equivalent concentration to an 8-hour exposure measurement shall be 480 minutes.

This proposed definition is derived from existing § 70.206 which provides a formula to convert measured concentrations of respirable dust to an equivalent concentration as measured with an MRE instrument. MSHA has approved two sampling devices under 30 CFR part 74 for measuring the concentration of respirable coal mine dust—the CMDPSU and the CPDM. Under the proposed definition, dust concentration measurements from a CMDPSU would continue to be converted to MRE equivalent concentrations. Dust concentration measurements from a CPDM would be converted to CMDPSU equivalent concentrations because NIOSH researchers have determined that measurements of respirable dust concentrations using the CMDPSU and the CPDM are comparable (Page, S., *et al.,* 2008).

The proposed definition would address work shifts in coal mines, which frequently exceed 8 hours. A miner working for 10 hours at an average concentration of 2.0 mg/m^3 would be exposed to more respirable coal mine dust than a miner working for 8 hours at the same average concentration. To provide effective protection to miners working longer than 8 hours, the proposal would require that dust concentration measurements for these shifts be converted to an 8-hour equivalent concentration as measured by the MRE instrument. The proposal is consistent with generally accepted industrial hygiene practices that adjust worker exposures to account for all time worked, recognizing that an extended work shift results in a shorter time to recover before the next exposure.

Under the proposed rule, converting a respirable dust concentration measured by an approved sampling device to an equivalent concentration would be accomplished as follows:

First, for all sampled shifts, the measured concentration would be multiplied by a constant factor prescribed specifically for the approved sampling device by the Secretary to convert the concentration to an MRE-equivalent concentration (conversion factor). Since 1980, measurements of respirable coal mine dust using the approved cyclone-based gravimetric devices (*i.e.,* the CMDPSU) operating at a flow rate of 2.0 liters per minute (*i.e.,* 0.002 m^3/min) were multiplied by the conversion factor of 1.38 prescribed for that device. Under the proposal, MSHA would continue to apply the conversion factor of 1.38 for the CMDPSU. Application of this factor would compensate for the difference in dust collection characteristics and make the measurements equivalent to those of an MRE instrument. As explained in the preamble discussion related to § 70.201, the MRE conversion factor for the CPDM is 1.05.

Second, if the sampled shift is longer than 8 hours, the MRE equivalent concentration would be multiplied by t/480, where "t" is the sampling time for the longer sampled shift (> 480) in minutes, to make it equivalent in dosage to the concentration as measured by an MRE instrument on an 8-hour work shift. The formula for an equivalent concentration is:

$$\text{Equivalent concentration } \left(mg/m^3\right) = 1.38 \times \left(\frac{\text{accumulated dust } (mg)}{t \times \text{airflow rate}}\right) \times \frac{t}{480}$$

where airflow rate = 0.002 m³/min. The product of "t" and the airflow rate is the total volume of air from which dust is accumulated on the filter.

For example, a DO sample is collected with a CMDPSU over a 9-hour (540 min) shift and the amount of dust accumulated during the shift is 1.5 mg. The MRE equivalent concentration would be 1.92 mg/m³ [1.38 MRE conversion factor × 1.5 mg/(540 min × 0.002 m³/min)]. Under the proposed definition, this quantity would be multiplied by 540/480, yielding an equivalent concentration of 2.16 mg/m³. This adjustment allows MSHA to compare the full-shift measurement to the applicable respirable dust standard.

Since the existing standard was based on the assumption that exposure occurs over an 8-hour shift, the 8-hour exposure corresponds to a daily accumulated amount of respirable coal mine dust of 16 mg-hr/m³ (8 hours × 2.0 mg/m³) as measured by the MRE instrument. The proposed definition of equivalent concentration would continue this same 16 mg-hr/m³ daily limit, regardless of the length of the working shift being sampled. In the previous example of the 9-hour shift with a dust accumulation of 1.5 mg, the amount of dust accumulated during the sampled working shift is the same whether over 8 hours at an average of 2.16 mg/m³ or over 9 hours at an average of 1.92 mg/m³. In either case, the MRE equivalent exposure measurement for the sampled shift is 17.3 mg-hr/m³, which exceeds the 2.0 mg/m³ standard for an 8-hour shift (*i.e.,* 16 mg-hr/m³).

Using an approved gravimetric sampler, the standard for respirable quartz dust (*i.e.,* 0.1 mg/m³) will be exceeded when the total amount of quartz dust on a filter during the work shift exceeds 0.07 mg, regardless of the shift's length. For example, if 0.08 mg of quartz dust were accumulated over the course of a 12-hour shift, the equivalent concentration of respirable quartz dust would be calculated as:

$$1.38 \times \frac{0.08mg}{720 \text{ min} \times 0.002m^3/\text{min}} \times \frac{720 \text{ min}}{480 \text{ min}} = 0.115mg/m^3$$

This is the same value as would be obtained if 0.08 mg of quartz dust were accumulated on an 8-hour shift.

$$1.38 \times \frac{0.08mg}{480 \text{ min} \times 0.002m^3/\text{min}} = 0.115mg/m^3$$

For the CPDM, MSHA believes the manufacturer can make modifications to the CPDM firmware so that the device will automatically report the concentration measurements as MRE equivalent concentrations. After the certified person programs the CPDM for the length of the full shift of the occupation, work position, or DA being sampled, the CPDM would be capable of providing the 8-hour equivalent concentration. The CPDM's end-of-shift readout would provide the equivalent concentration.

The proposed definition of *equivalent concentration* is necessary to protect miners who work nontraditional or extended shifts from unnecessary health risks.

Mechanized Mining Unit (MMU)

The proposed definition of *mechanized mining unit (MMU)* would incorporate existing requirements in § 70.207(f)(1) and (f)(2) and make revisions. Like the existing standard, MSHA would assign each MMU a four-digit identification number which remains with the MMU. When two sets of mining equipment are used in a series of working places within the same working section and only one production crew is employed, the two sets of equipment will be identified as a single MMU.

The proposal would revise the definition to require that each set of mining equipment be identified as a separate MMU if two sets of mining equipment are used in a series of working places in the same working section and two production crews are employed. This would be a change from the existing standard which requires that the MMUs must be "simultaneously engaged in the production of material" within the same working section in order to be identified as separate MMUs. MSHA believes the change is necessary because miners can be exposed to respirable dust and quartz when there is no simultaneous production of material. The proposal would protect the health of miners on the working section.

The proposal would also make a conforming change in a reference since existing § 70.207(e) would be redesignated as proposed § 70.207(b).

Normal Production Shift

The proposed definition of *normal production shift* would revise the existing definition to mean (1) a production shift during which the amount of material produced by an MMU is at least equal to the average production recorded for the most recent 30 production shifts or (2) if fewer than 30 shifts of production data are available, a production shift during which the amount of material produced by an MMU is at least equal to the average production recorded by the operator for all of the MMU's production shifts.

In its 1995 Criteria Document, NIOSH recommended that, consistent with standard industrial hygiene practice (which requires exposure measurements be collected during typical work shifts), for a production shift to be considered a "normal production shift," it must produce at least 80% of the average production over the last 30 production shifts. NIOSH stated that the definition of a normal production shift should be similar to or more stringent than that

used when seeking approval of the dust control plan. NIOSH further stated that a production-level threshold should ensure that exposure conditions are comparable between sampled and unsampled shifts.

The Dust Advisory Committee recommended that respirable dust samples be taken when production is sufficiently close to normal production, which it stated should be defined as 90% of the average production of the last 30 production shifts.

MSHA believes that when an MMU has operated for at least 30 production shifts, a normal production shift should represent at least the average production of those shifts. MSHA's existing practice is to use 30 production shifts as a benchmark for establishing an MMU's typical output. MSHA believes that 30 production shifts provide sufficient historical data to give a reliable representation of an MMU's typical production. MSHA also believes that using a production level equal to at least the average production of the most recent 30 production shifts as the production level for sampling would ensure that samples are representative of the dust levels to which miners are actually exposed. The proposal would assure that production during sampling is representative of normal mining conditions.

Under the proposal, when an MMU has operated for fewer than 30 production shifts, the average production of all production shifts would be considered to determine a "normal production shift." MSHA believes it is essential to use records from all of an MMU's production shifts when it has operated for fewer than 30 shifts because this would result in a more reliable determination of the shift's production and a miner's exposure.

Under existing practice, if an operator encounters unique mining conditions, such as when the coal seam narrows due to a rock intrusion running through the coal bed, MSHA allows the operator to submit any relevant information to the District Manager so that average production levels for sampling can be adjusted. Under the proposal, MSHA would continue this practice.

The level of coal production has a significant impact on dust generation. As production increases, the amount of respirable coal mine dust generated also increases. Under the existing definition of "normal production shift," MSHA intended to accommodate fluctuations in mining cycles; however, MSHA believes that the existing definition of at least 50% of average production for the last 5 valid samples results in sampling during shifts that are not representative of typical conditions. If an operator's bimonthly dust samples are taken when production is substantially below average production, the sample results will underestimate miners' typical dust exposure. The 1992 Coal Mine Respirable Dust Task Group (U.S. Department of Labor, MSHA, 1992) acknowledged that the procedure for defining a normal production shift for sampling purposes was inadequate and that the sampling program was susceptible to intentionally reduced production during sampling periods.

MSHA believes that the proposed definition of "normal production shift" would significantly improve miners' health by requiring operators' samples to be collected during shifts that are more representative of typical conditions at the mine. The Agency solicits comment on the approach taken in the proposed rule. Please be specific in your comments and include the rationale for suggested alternatives.

Other Designated Occupation (ODO)

The proposal would add a new definition for *other designated occupation (ODO).* Under the proposal, the ODO would be defined as another occupation on a mechanized mining unit that is designated by the District Manager for sampling. Each ODO would be identified by a four-digit identification number assigned by MSHA.

MSHA designates high risk occupations to be sampled by operators. These "designated occupations" (DOs) are those based on Agency data and experience that are exposed to the highest respirable dust concentrations in the MMU. However, MSHA's sampling data reveal that limiting sampling to the DO may not adequately protect other miners in the MMU. For this reason, MSHA identifies additional underground occupations, other than the DOs, that also present a risk for excessive dust exposure. Under MSHA's existing practice, these other occupations are identified as "non-designated occupations," but would be referred to as ODOs under the proposal. MSHA would continue its existing practice of using historical sampling data on the MMU, as well as evaluating the mining system, in order to identify ODOs.

Quartz

The proposal would revise the existing definition of *quartz* to mean crystalline silicon dioxide (SiO_2) as measured by:

(1) MSHA Analytical Method P–7: Infrared Determination of Quartz in Respirable Coal Mine Dust; or

(2) Any method approved by MSHA as providing a measurement of quartz equivalent to that obtained by MSHA Analytical Method P–7.

The proposed definition would provide notice to interested parties of the analytical procedure that MSHA uses to measure quartz in coal mine dust. It would also provide notice to certified laboratories that may want to perform quartz analyses using the same procedure.

The definition of "quartz" would be expanded to provide MSHA the flexibility to accommodate new, improved technology for analyzing quartz once it is demonstrated to provide quartz measurements that are equivalent to the existing analytical method.

Representative Samples

The proposal would add a new definition for *representative samples.* Representative samples would be defined as respirable dust samples that reflect typical dust concentration levels and normal mining activity in the active workings during which the amount of material produced is equivalent to a normal production shift. The term "normal production shift" is discussed elsewhere in the preamble related to proposed § 70.2.

MSHA intends that, under the proposal, samples would be representative if taken when miners are in positions and physical locations performing tasks that they usually perform on non-sampling days. To be considered representative samples, operators should also sample when mining activities, such as production methods, reflect usual operations on non-sampling days (*e.g.,* when approved cut sequences are followed, and the sequence of mining includes the turning of multiple crosscuts).

The proposed definition would ensure that operators conduct dust sampling when working conditions are representative of working conditions during periods of non-sampling; this would avoid introducing bias into sampling. To provide optimum protection for miners' health, sampling must accurately represent miners' dust exposures. This would allow operators and MSHA to effectively evaluate the performance of dust controls and the adequacy and effectiveness of operators' approved plans.

Weekly Accumulated Exposure (WAE)

The proposal would add a new definition, weekly accumulated

exposure (WAE), which would apply when operators use a CPDM. Under the proposal, *weekly accumulated exposure (WAE)* would be defined as the total exposure to respirable coal mine dust, expressed in milligram-hour (mg-hr) per cubic meter of air (mg-hr/m^3), accumulated by an occupation during a work week (Sunday thru Saturday). The proposed definition includes the calculation for determining the WAE.

The WAE would be calculated by first multiplying each daily end-of-shift equivalent concentration, expressed as mg/m^3 as reported by the CPDM (*i.e.,* the average exposure over the shift), by 8 hours to obtain the total daily exposure (concentration × hours = exposure, expressed as mg-hr/m^3). The daily end-of-shift equivalent concentration would be the respirable dust concentration for the sampled entity expressed as an 8-hour equivalent, even when the shift length exceeds 8 hours (see proposed definition of equivalent concentration). Since the daily end-of-shift equivalent concentration is an 8-hour equivalent, it would be multiplied by 8 hours to obtain the total daily exposure, regardless of actual shift length.

The second step in calculating the WAE would be to total the daily exposures of the occupation sampled for the work week. The result would be the accumulated exposure for the work week. For example: Miner "A" works Sunday–Thursday, 10 hours each day. Assuming the applicable standard is 1.5 mg/m^3, the following data are obtained:

Day	Shift length (hrs)	End-of-shift equivalent concentration reported	Daily accumulated exposure
Sun	10	1.5 mg/m^3	12 mg-hr/m^3 (1.5 mg/m^3 × 8 hrs).
Mon	10	1.5 mg/m^3	12 mg-hr/m^3.
Tue	10	1.5 mg/m^3	12 mg-hr/m^3.
Wed	10	1.5 mg/m^3	12 mg-hr/m^3.
Thur	10	1.5 mg/m^3	12 mg-hr/m^3.
WAE			= 60 mg-hr/m^3.

MSHA believes that determining the WAE for an occupation in the manner proposed would cause mine operators to closely monitor the daily accumulated exposure of each occupation sampled during the week. If the accumulated exposure approaches the weekly permissible accumulated exposure (WPAE), defined below, when additional shifts remain to be worked, it would indicate that the average equivalent concentration is getting close to exceeding the applicable standard. The operator may then need to take action to avoid overexposing the miners assigned to that occupation.

Weekly Permissible Accumulated Exposure (WPAE)

The proposal would add a new definition, *weekly permissible accumulated exposure (WPAE),* which would apply when operators use a CPDM. WPAE would be defined as the maximum amount of accumulated exposure to respirable coal mine dust, expressed in mg-hr per cubic meter of air (mg-hr/m^3), permitted for an occupation during a 40-hr work week (Sunday thru Saturday). The WPAE would be determined by multiplying the applicable respirable dust standard by 40 hours. For example, if the applicable standard were 1.5 mg/m^3, the WPAE would be 60 mg-hr/m^3 (40 hours × 1.5 mg/m^3).

MSHA believes that the proposed WPAE definition would enable mine operators to effectively compare a miner's weekly accumulated exposure (WAE), defined previously, with the WPAE to evaluate compliance with the applicable standard at the completion of the work week.

B. Section 70.100 Respirable Dust Standards

The proposed rule would, over a phase-in period, lower the concentration limit for respirable coal mine dust in coal mines.

Proposed paragraph (a)(1) would retain the existing requirement that mine operators continuously maintain the average concentration of respirable dust in the mine atmosphere during each shift to which each miner in the active workings of each mine is exposed at or below 2.0 mg/m^3 of respirable dust.

Proposed paragraphs (a)(2) through (a)(4) are new and would require mine operators to lower dust levels, over a 24-month phase-in period, from the existing level of 2.0 mg/m^3 of air to 1.0 mg/m^3. MSHA and mine operator data indicate that, under the existing sampling program, the majority of miners' exposures are at or below the limits in the proposed rule. These data reflect sampling and measurement requirements under MSHA's existing standard. MSHA anticipates that the cumulative effects of the major changes in the proposal, *i.e.,* lowering the respirable dust standard, single shift sampling, full shift sampling, and the definition of "normal production shift", would result in higher exposures than those under the existing program. MSHA anticipates that most mines would have to implement additional controls and work practices to reduce dust levels to those expected under the proposal (see Section VIII, Feasibility, in the preamble). In a small number of cases, MSHA expects that operators may have to initially: (1) Limit production; (2) reconfigure major ventilation sources, *e.g.,* install a new shaft; or (3) install major ventilation controls. MSHA anticipates that, over time, these operators would be able to meet the proposed exposure limits. MSHA believes that with the proposed phase-in of exposure limits, all coal mines, regardless of their size and type of mining system, would have sufficient time to either upgrade existing controls or to install additional measures to meet the proposed requirements.

MSHA is proposing a 24-month phase-in period to allow the mining community the opportunity to identify, develop and implement feasible engineering controls; train miners and mine management in new technology and control measures; and to improve their overall dust control program. The phase-in period is consistent with the Dust Advisory Committee's recommendation. MSHA believes that the phase-in period would provide an appropriate amount of time for mine operators to feasibly come into compliance with the new proposed limit. MSHA specifically requests comment on the phase-in period. Please be specific in your comments and include the rationale for suggested alternatives.

MSHA is proposing a 1.0 mg/m^3 standard as a time-weighted average for an 8-hour shift based on the best available evidence that shows this level would significantly reduce miners' risks of material impairment of health or

functional capacity. Section 101(a)(1) of the Mine Act requires that the Secretary take certain action when a recommendation to issue a rule, accompanied by a Criteria Document, is received from NIOSH. The Secretary must refer the recommendation to an advisory committee, or publish the recommendation as a proposed rule, or publish in the **Federal Register** the determination and reasons not to do so.

In 1995, NIOSH published and submitted to MSHA a Criteria Document on *Occupational Exposure to Respirable Coal Mine Dust.* Consistent with the Mine Act, the Secretary referred the NIOSH Criteria Document to an advisory committee (Dust Advisory Committee). This proposal is consistent with recommendations of the NIOSH Criteria Document and the Dust Advisory Committee.

In its Criteria Document, NIOSH recommended respirable dust exposures be limited to 1 mg/m^3 as a time-weighted average (TWA) concentration for up to 10 hours per day during a 40-hour work week as measured according to existing MSHA methods. This recommended exposure level (REL) was based on exposure-response studies of U.S. coal miners participating in the National Study of Coal Workers' Pneumoconiosis (NSCWP) and sampling data collected by the Bureau of Mines from 1969–1971 and MSHA from 1985–88. NIOSH used an average concentration of 0.5 mg/m^3 of respirable dust in its disease risk estimates because, at that time, it constituted the lower range of the exposure data. NIOSH determined that extrapolations beyond the range of the existing exposure data would have carried considerable uncertainty. NIOSH found that, at a mean concentration of 0.5 mg/m^3, the excess risk of morbidity from progressive massive fibrosis at age 65 exceeded 1/1,000 for all durations of exposure and coal ranks evaluated, including 15 years of exposure to medium/low-rank coal, believed to be least toxic. NIOSH expected that long-term average dust concentrations would be below 0.5 mg/m^3 if miners' daily exposures were kept below the REL of 1 mg/m^3 (NIOSH 1995).

MSHA's QRA used respirable dust exposure data collected from 2004 through 2008 and published quantitative studies on coal workers' morbidity from black lung (Attfield and Seixas, 1995) and mortality from nonmalignant respiratory diseases (Attfield and Kuempel (2008)) and severe emphysema (Kuempel *et al.,* 2009(a)) to estimate excess disease risks in U.S. miners. The QRA estimated disease risks after 45 years of full-shift occupational exposure at observed exposure levels under the existing standard. The QRA results indicate that, in every exposure category, exposure under the existing standards places miners at a significant risk of material impairment of health. In addition, MSHA found that average dust concentrations exceed the proposed exposure limit of 1.0 mg/m^3 at a number of work locations in every occupational category. The percentage of work locations that would exceed the proposed exposure limit of 1.0 mg/m^3 ranges from less than 1 percent for a few surface occupations to more than 70 percent for miners working on the longwall tailgate. The percentages are generally greater for underground occupations than for surface occupations. A statistically significant percentage of surface work locations (generally cleaning plant operations and surface drilling) have average dust concentrations exceeding the proposed exposure limit. For part 90 miners, the average dust concentration exceeds 0.5 mg/m^3 at more than 20 percent of the work locations (see Section V of this preamble for a more detailed discussion of the QRA).

In 1996, the Dust Advisory Committee also recognized that overexposure to respirable coal mine dust remained a problem and recommended unanimously that MSHA consider lowering the allowable level of exposure to coal mine dust. The Committee reviewed MSHA monitoring data and scientific studies provided by NIOSH, including its 1995 Criteria Document. The Committee concluded that "there is substantial evidence that either a significant number of miners are currently being exposed to coal mine dust at levels well in excess of 2.0 mg/m^3 or that the current exposure limit for coal mine dust is insufficiently protective."

NIOSH also recommended that for single, full-shift samples used to determine noncompliance, MSHA should make no upward adjustment to account for measurement uncertainty. The Dust Advisory Committee made the same recommendation, but it was not supported by all of the Committee members. The proposed rule does not adopt this recommendation; a more detailed discussion on adjusting the exposure limit to account for measurement uncertainty is included in the section-by-section analysis for proposed § 70.207 and in Appendix A of the preamble.

While the proposed 1.0 mg/m^3 standard would significantly reduce the risk of impairment, disease, and premature death, MSHA's QRA reveals some remaining risk at the proposed limit. However, MSHA believes that other provisions of the proposal (*e.g.,* changes in the definition of normal production shift, and sampling for a full shift) would reduce this risk. The impact of these other provisions was not considered in the QRA.

Proposed §§ 70.100(b)(2), 75.350(b)(3)(i)(B) and 90.100(b) would revise the existing requirements that operators must maintain the concentration of respirable dust at or below 1.0 mg/m^3, to 0.5 mg/m^3 of air, for intake air courses, belt air courses, and for part 90 miners to conform to the proposed lower limit. MSHA is proposing a phase-in period of six months for operators to meet this lower level. MSHA has included these conforming changes in the proposal in recognition of the Agency's longstanding regulatory history and policy with respect to areas of the mine and part 90 miners where dust presents additional health risks. MSHA is proposing a six-month phase-in because, based on Agency data for these areas of the mine and part 90 miners, MSHA believes this phase-in period would provide an appropriate amount of time for mine operators to feasibly come into compliance with the new proposed limits. MSHA solicits comment on the proposed phase-in periods for lowering the respirable dust limits from 1.0 mg/m^3 to 0.5 mg/m^3 for intake air courses, belt air courses, and part 90 miners. Please include a detailed rationale with any comment or recommendation that is submitted.

As presented in the Preliminary Regulatory Economic Analysis (PREA) and summarized later in this preamble, MSHA has determined that this proposed standard is feasible, both technologically and economically. Dust exposures at most mine operations average less than 1.0 mg/m^3 under existing MSHA and operator sampling and measurement programs. MSHA anticipates that proposed changes to the existing program initially would cause an increase in operations where dust concentrations would exceed the proposed exposure limits. As discussed in the PREA, however, there are various engineering control methods and work practices that operators can use to meet the proposed standards. Since most methods of reducing exposure to respirable dust already exist and have been demonstrated to be both technologically and economically feasible and effective, MSHA believes that the two year phase-in period is sufficient time for mine operators to reduce respirable dust exposures to an acceptable level.

C. Section 70.101 Respirable Dust Standard When Quartz Is Present

The proposed rule would revise the standard for respirable dust when quartz is present in coal mines. Overexposure to respirable coal mine dust containing quartz has been associated with some miners developing silicosis and black lung, irreversible but preventable lung diseases, which ultimately may be fatal.

Proposed paragraph (a) is new and would establish a separate standard for respirable quartz. It would require operators to continuously maintain the average concentration of respirable quartz dust at or below 0.1 mg/m³ (100 μg/m³) during each shift.

The existing standard limits miners' exposure to respirable quartz by reducing the applicable respirable dust standard (or limit) based on a formula that was prescribed by the Department of Health, Education and Welfare (now DHHS). The formula, which applies when the respirable coal mine dust contains more than 5.0 percent quartz, is 10 divided by the concentration of quartz, expressed as a percentage. The formula results in a continuous reduction in the respirable dust standard as the quartz content in respirable dust in the mine atmosphere increases over 5 percent (*i.e.,* the higher the percentage of quartz, the lower the respirable dust standard). Application of the formula was designed to limit a miner's exposure to respirable quartz to 0.1 mg/m³ (100 μg mg/m³), based on a 2.0 mg/m³ respirable dust standard.

One commenter on the CPDM RFI stated that controlling respirable dust containing silica to the current 2.0 mg/m³ standard does not provide adequate protection for miners because of the greater lung toxicity of crystalline silica. MSHA is not establishing a new quartz limit in this rulemaking. MSHA will separately address a respirable crystalline silica standard for mining. (See the April 26, 2010 Regulatory Agenda entry at *http://www.msha.gov/regsinfo.htm.*

Proposed paragraph (b) would retain the existing requirement to limit a miner's exposure to respirable quartz by establishing a reduced respirable dust standard. To be consistent with paragraph (a), paragraph (b) would apply when the concentration of respirable quartz dust exceeds 100 μg/mg³. Under the existing standard, if analysis of an MSHA inspector respirable dust sample contains more than 5 percent quartz, then a reduced respirable dust standard is calculated and the operator is notified of the reduced standard. Under the proposal, the formula could not be used to establish a dust standard greater than the dust standard under proposed § 70.100(a).

A commenter on the CPDM RFI recommended gravimetric sampling for longer time periods or over multiple shifts to assure an adequate amount of total dust content is achieved to analyze for quartz. MSHA believes, that with the current analytical procedure (NIOSH Method P–7, infrared analysis), it is not necessary to sample for longer than an 8-hour shift. The limit of quantification of Method P–7 is 25 μg, which is the lowest amount of quartz that can be identified and quantitatively measured with accuracy and precision. If this mass is accumulated on a filter during an 8-hour shift with the sampler operating at 2.0 liters per minute, the concentration of quartz [1]

$$\frac{\text{Weight gain}}{(\text{Flowrate})(\text{Time})(.001)} = \frac{25\ \mu g}{(2.0\ \text{liter/min})\ (480\ \text{minutes})(.001\ \text{liter/m}^3)} \times 1.38 = 36\ \mu g/m^3$$

(approximately 36 μg/m³) would be well below the standard of 100 μg/m³. If there is too little quartz to analyze, exposure is well below the standard.

D. Section 70.201 Sampling; General and Technical Requirements

The proposed rule would revise the operator sampling requirements in existing § 70.201 and would phase-in the use of CPDMs to take respirable dust samples of the Designated Occupation (DO) and Other Designated Occupations (ODO), a new term defined in proposed § 70.2. MSHA is also proposing that operators take samples, with either a CMDPSU or CPDM, of DAs that are not associated with an MMU.

Under the existing standard, coal mine operators and MSHA use approved CMDPSUs to determine the concentration of respirable dust in the coal mine atmosphere. The CMDPSU samples the mine atmosphere by drawing mine air through a filter cassette that collects respirable coal mine dust. At the end of a full shift or 8 hours, whichever time is less, the cassette is sent to MSHA for processing. Each cassette is weighed under controlled conditions to determine the average concentration of respirable coal mine dust to which the affected miners were exposed. The existing process results in a delay between the time a sample is taken and when results are available to mine operators, miners, and MSHA.

The CPDM is a respirable dust sampler and gravimetric analysis device incorporated into the miner's cap lamp battery case as a single package located on the belt. The new cap lamp battery case contains all the components, including two separate batteries, to enable the dust monitor and cap lamp to operate independently. Air from a miner's work environment enters the sampling device through an inlet located adjacent to the lens of the cap light on the miner's hard hat and flows via a flexible tube that runs parallel to the lamp cord to the belt-mounted device. The air stream is first coursed through a Higgins-Dewell (HD) cyclone at a flow rate of 2.2 L/min to separate the non-respirable dust, so that only airborne particles that could penetrate to the lung will be analyzed by the device. From there, the air stream flows through: (1) A heater to remove excess moisture; (2) a 14-mm diameter glass fiber filter where the particles are collected; (3) a flow rate sensor; and (4) a computer-controlled pump.

The CPDM is designed to operate continuously for up to 12 hours. The display on the device continuously shows: (1) The respirable dust concentration calculated at distinct 30-minute intervals; (2) the average respirable dust exposure from the beginning of the shift; and (3) the percent of exposure limit. Through the display, both the miners wearing the device and the mine operator are aware of respirable dust exposures. This information can be used to validate whether dust control parameters are working as intended to assure that miners are not exposed to excessive concentrations of respirable coal mine dust.

The CPDM is capable of being used in a shift mode, in which the device is programmed by certified persons to operate for specific shift lengths (*e.g.,* 8, 10, 12 hours) to monitor a Designated Occupation or other sampling entity's exposure, or in an engineering mode for

[1] See equation above.

shorter-term evaluations. If the device is operated in an engineering mode, the certified person would operate it for short periods of time within the shift to record respirable dust levels during specific mining activities or at specific dust-generation sources in the mine. The display has various screens that show the: (1) Time of day; (2) elapsed time since beginning of the shift; (3) total amount of respirable dust accumulated on the filter since the start of sampling, which is stored in an internal memory for analysis; (4) dust concentrations; (5) operational parameters including flow rate, filter pressure, temperature, etc.; and (6) a bar graph of the average respirable dust concentration during the entire sampling period. On the bar graph, each bar represents the average concentration value for each previous 30-minute interval, with a new bar added to the graph every 30 minutes. This, along with other information, is stored in the CPDM and can be accessed and downloaded with a personal computer at the end of the shift for analysis and recordkeeping.

MSHA and NIOSH published the part 74 final rule on April 6, 2010 (75 FR 17512) that revised the approval requirements for the CMDPSU and established new approval requirements for the CPDM. The new CPDM approval requirements establish a science-based, feasible baseline for the performance of the new CPDM technology based on published NIOSH research (Volkwein, JC, *et al.,* 2006, and Volkwein, JC *et al.,* 2004). The final rule reflects current evaluation methods for assessment of direct-reading monitors. These methods have been summarized and issued as general guidelines by NIOSH in "Components for the Evaluation of Direct-Reading Monitors for Gases and Vapors," (Kennedy, ER, *et al.,* 1995). The requirements also reflect the state-of-the-art technology of the CPDM prototype.

NIOSH requires all applicants for CPDM sampling device approvals to use the NIOSH testing procedure "Continuous Personal Dust Monitor Accuracy Testing" to evaluate the accuracy, reliability, precision, and bias of a CPDM. The procedure is available at the NIOSH Web site: *http://www.cdc.gov/niosh/mining*. The procedure requires that testing be performed under diverse environmental conditions and that test results be submitted, in writing, to NIOSH. The protocol assures that all CPDMs are evaluated consistently. As stated in the preamble to the part 74 final rule, NIOSH will provide assistance to applicants, as necessary, to make the arrangement of such testing feasible.

NIOSH researchers (Page, S *et al.* 2008) determined that measurements of respirable dust concentrations using the CPDM and CMDPSU are comparable. The MRE was used as the basis for the existing coal mine respirable dust standards and had been designed specifically to match the United Kingdom British Medical Research Council (BMRC) criterion. The CMDPSU is used with a 1.38 multiplier to convert readings to the BMRC criterion.

In order to compare CPDM measurements with those of the CMDPSU, NIOSH conducted field research. Researchers used a stratified random sampling design that incorporated a proportionate allocation strategy to select a sample of MMUs representative of all U.S. underground coal mines. A sample of 180 MMUs was chosen, representing approximately 20% of the MMUs in production at the time the sample was selected (September 2004). Dust concentrations were monitored concurrently by both CMDPSUs and CPDMs for a full shift. A total of 129 valid CPDM/CMDPSU dust sample sets were obtained. A weighted linear regression analysis of this database shows that, in comparison with the CMDPSU, the CPDM requires a mass equivalency conversion multiplier of 1.05 [95% Confidence Interval (1.03 to 1.08)] to produce a concentration that is an MRE equivalent concentration similar to the CMDPSU. This research shows that the two types of sampling units are very comparable due to this linear relationship.

The Dust Advisory Committee unanimously recommended that CPDM technology, when verified, be broadly used along with other sampling methods for evaluation of dust control at all MMUs and other high risk locations. The Committee further recommended that once verified as reliable, MSHA should use CPDM data for assessing operator compliance in controlling miner exposures and should consider use of CPDM data in compliance determinations.

MSHA published a request for information on October 14, 2009 (74 FR 52708) on the use of the CPDM as a sampling device to measure a miner's exposure to respirable coal mine dust. All commenters generally agreed that the required use of a CPDM would enhance the protection of miners' health.

Under the proposed rule, § 70.201(a) would require the operator to use the CMDPSU to take respirable dust samples of the DO in each MMU until replaced by the CPDM. On [date 12 months after the effective date of the final rule], operators must replace the CMDPSU with the CPDM to sample the DO in each MMU, unless notified by the Secretary. The operator would be allowed, however, to start using the CPDM anytime during the 12-month phase-in period.

Proposed paragraph (b), which is new, would require that DAs associated with an MMU be sampled with an approved CMDPSU until replaced by a CPDM. Under the existing standard, DAs associated with an MMU are sampled with an approved CMDPSU. Proposed paragraph (b) would also require that on [date 18 months after effective date of the final rule], DAs associated with an MMU would be redesignated as ODOs. The proposal would require existing DAs associated with an MMU to be designated as ODOs because the CPDM would be used to measure respirable dust exposure of occupations on an MMU rather than areas associated with an MMU. The proposal would help assure that the sample reflects an accurate measurement of the occupation monitored.

To provide comparable protection for ODOs as for DOs, proposed paragraph (c) would require that the CPDM be used to sample ODOs after a proposed phase-in period of 18 months, unless notified by the Secretary.

The proposed rule would require, over an 18-month period, a phase-in of the use of CPDMs so that manufacturers have enough time to produce the necessary quantity of units and that MSHA and operators have enough time to train necessary personnel in the use and care of the device. The Agency recognizes that availability of the device may present logistical and other issues at the time the final rule becomes effective. The Agency intends to address the issue of availability in two ways. First, the proposal would require the use of the CPDM to sample (1) the DO in each MMU, and (2) each ODO, within a 12-month and 18-month period, respectively, unless notified by the Secretary. If MSHA determines that there will be logistical and feasibility issues surrounding the availability of CPDMs by the time the final rule becomes effective, the Agency will, through publication in the **Federal Register**, notify the public of the Agency's plans including any other action as necessary. Second, assuming no logistical or feasibility issues concerning the availability of CPDMs, and depending upon manufacturer projections, if CPDMs are not available in sufficient quantities, MSHA will accept, as good faith evidence of compliance with the final rule, a valid,

bona fide, written purchase order with a firm delivery date for the CPDMs.

For CPDM implementation, MSHA considered requiring: All coal mines to begin using them on the effective date of the final rule; different phase-in periods at underground coal mines based on the type of mining operations and mining heights (*e.g.,* longwall; continuous miner operations subject to reduced standards due to quartz and with mining heights that exceed 40 inches; or mining operations with mining heights that are 40 inches or less); and different phase-in periods for specific geographic regions (represented by Coal Mine Safety and Health Districts) where MSHA is aware of higher quartz concentrations in coal mine dust, higher respirable coal mine dust levels, and higher prevalence of CWP among working underground coal miners. After reviewing the options, MSHA believes that it would not be practical or feasible to adopt implementation dates based on the methods of mining or mine locations, or to require use of CPDMs in all mines on the effective date of the final rule. Instead, the proposed rule would require operators to begin using CPDMS to sample certain underground occupations after a 12- or 18-month phase-in period. The Agency requests comments on the proposed phase-in of the use of CPDMs, including the time period, and the Agency's intent with respect to availability of CPDMs. Please be specific in your comments and include the rationale for suggested alternatives.

The proposed rule would move existing § 70.201(d), which requires that operators, during the time for abatement of a dust citation, take corrective action to lower dust concentrations and then take additional dust samples. These requirements would be moved to proposed §§ 70.207 and 70.209, which address sampling when using a CMDPSU.

Proposed paragraph (d) would permit the operator to continue to use approved CMDPSUs or CPDMs to sample respirable coal mine dust in each DA that is not associated with an MMU (*i.e.,* an outby DA). MSHA is allowing operators to continue to use the CMDPSU because these samples are area samples and CPDMs are designed for a person to wear. MSHA does not believe that requiring the CPDM to be used to sample DAs is the best use of the device. The Agency believes that the CMDPSU and reports of sample results will provide the information needed to evaluate the dust controls used in the DA and to ensure miners working in these areas are protected.

Proposed paragraph (e), redesignated from existing paragraph (b), would retain the requirement that sampling devices be worn or carried directly to and from the MMU or DA to be sampled, and be operated portal to portal. It would also revise the existing standard and require that sampling devices remain with the occupation or DA being sampled and must be operational during the entire shift, even when the shift exceeds 8 hours (extended shift). This would include the time spent in the MMU or DA and while traveling to and from the MMU or DA being sampled. Under existing § 70.201(b), sampling devices must operate only up to 8 hours. Under the 2003 plan verification proposal, sampling devices collecting MMU verification samples and quarterly samples would have to be operational only during the period spent in the MMU. Proposed § 70.201(e) would account for all the time that a miner works and is exposed to respirable coal dust.

Some commenters in response to the 2003 proposed rule stated that all sampling, whether for compliance or verification purposes, should be conducted full-shift and portal-to-portal in order to obtain an accurate measurement of the concentration of respirable dust to which a miner is exposed. These commenters believed that a full-shift would have to account for the entire time a miner is underground to get a miner's true exposure. One commenter explained that many miners ride mantrips onto the section, some for as long as an hour, during which time the miners are exposed to dust. The commenter further stated that the exposure obtained during a miner's transportation to the section should be accounted for.

The proposed change related to extended work shifts is consistent with the Dust Advisory Committee report. Although not unanimous, the Committee recommended that exposure limits should be adjusted for extended work shifts. In support of this recommendation, the Committee reviewed exposure data and stated that the data showed that work in excess of 8 hours per day is now common in the mining industry. The Committee further stated that the data were consistent with miners' reports to the Committee. In its discussion on extended shifts, the Committee addressed increased health risks to miners and stated that exposures longer than 8 hours per day result in greater respirable dust deposition, with a shorter period of dust clearance from the lungs prior to the next exposure.

As further support for the proposal, the Coal Mine Respirable Dust Task Group concluded that current regulations limiting the duration of sampling to 8 hours do not provide for adequate assessment of respirable dust exposure during nontraditional shifts of more than 8 hours. (U.S. Department of Labor, MSHA, 1992). Also, MSHA conducted a survey in August 2002 that found 48 percent of producing MMUs operated at least a 9-hour shift.

Working extended shifts increases exposure, resulting in increased health risks to miners, both in terms of incidence and severity. The proposal with respect to extended shifts is consistent with generally accepted industrial hygiene principles today, which take into consideration all of the time a worker is exposed to an airborne contaminant, even if it exceeds 8 hours a day.

Under the proposal, the sampling device must remain with the occupation or DA being sampled during the entire shift to ensure that respirable dust concentration levels are continuously being monitored. If a miner in an occupation being sampled changes from one occupation to another during the production shift, the sampling device must remain with the occupation designated for sampling. For example, if using a CPDM to sample a DO (continuous mining machine operator) on a continuous mining section and the duties of the machine operator are divided equally between Miner 1 and Miner 2, the dust sampler must be worn for half the shift by Miner 1 and the other half by Miner 2, while each is operating the continuous mining machine. Similarly, under the proposal, a dust sampler must remain at the DA during the entire shift. Once sampling results are available, mine operators and MSHA would analyze the data to determine if adjustments need to be made (*e.g.* re-designating DOs or modifying dust control parameters).

Proposed paragraph (e)(1) is new and would address work shifts longer than 12 hours. It would require that when using a CMPDSU and the work shift to be sampled is longer than 12 hours, the operator would have to switch-out the unit's sampling pump prior to the 13th hour of operation. MSHA notes that the manufacturer of the CMDPSU states in its instructional manual that the typical battery-pack service life varies from a minimum of 8 hours to a maximum of 11.5 hours. However, MSHA is aware that the testing parameters are more rigorous than the actual conditions in the mine. The pumps are tested in extreme levels of coal dust which cause large amounts of dust to accumulate on

the filter. This leads to high back pressure, requiring the pump to work harder, and resulting in a shorter battery life. With the use of proper dust controls, the pump will not have to work as hard, thereby prolonging the battery life. To address shifts greater than 12 hours, the Agency is proposing to require that the unit be switched-out prior to the 13th hour to prevent disruption in operation and to provide continued protection for miners.

Paragraph (e)(2) is new and would add a similar requirement to address work shifts longer than 12 hours for operators who use CPDMs. It would require that the operator switch-out the CPDM with a fully charged device prior to the 13th hour of operation, if the work shift to be sampled is longer than 12 hours. NIOSH's Report of Investigations, 9669, Laboratory and Field Performance of a Continuously Measuring Personal Respirable Dust Monitor suggests that 12 hours of battery power be provided to the CPDM. Consistent with NIOSH's report, the Agency is proposing to require that the CPDM be switched-out prior to the 13th hour to prevent disruption in operation and to provide continued protection for miners. The Agency requests comments on an appropriate time that operators should switch out the CMDPSU's sampling pump or the CPDM when working longer than 12 hours. Please be specific in your comments and include rationale for your suggestions.

Proposed paragraphs (f)(1) through (f)(4), are derived from the 2003 plan verification proposal and, if using a CMDPSU, would require: the mine operator to use one control filter for each shift of sampling; each control filter to have the same pre-weight date (noted on the dust data card) as the filters used for sampling; each control filter to remain plugged at all times; each control filter to be exposed to the same time, temperature, and handling conditions as the filter used for sampling, and that each control filter be kept together with the exposed samples after sampling.

Consistent with accepted industrial hygiene principles and practice, proposed paragraph (f) would require the operator to use control filters when sampling. A control filter is an unexposed filter of the same design as the filter used for sampling and is pre- and post-weighed on the same day as the filter used for sampling. MSHA first began using control filters in its enforcement program in May 1998 and continues this practice today. The Agency's intent is to improve measurement accuracy by eliminating the effect of differences in pre- and post-exposure laboratory conditions, or changes introduced during storage and handling of the filter cassettes. Under the proposed rule, MSHA would extend the program in effect since July 2007, which allows operators to use control filters in the optional quartz sampling program, to the entire sampling program. The control filter would be used for all operator sampling to adjust the resulting weight gain obtained on each exposed filter by subtracting any change in the weight of the control filter from the change in weight of each exposed filter. This is especially important since the filter cassettes to be used by operators would be pre-weighed by the manufacturer and post-weighed by MSHA. To ensure the precision and accuracy of the pre-weight of filters currently used by MSHA, and proposed to be used by operators, MSHA audits the daily production of filter cassettes. The program conforms to ANSI/ASQ Z1.4–2008, "Sampling Procedures and Tables for Inspection by Attributes", which defines the criteria currently used to monitor the quality of the operator bimonthly sampling program.

Since the control filter would be used to adjust the resulting weight gain obtained on each exposed filter cassette, the control filter must have the same pre-weight date as the filter cassette to be used for sampling on the same shift. The pre-weight date is noted on the dust data card. To prevent exposure to the mine environment, the plugs attached to the inlet and outlet side of the cassette must not be removed. Also, it is important that the control filter be exposed to the same time, temperature, and handling conditions as the ones that are used for sampling, *i.e.,* carry the control filter in a shirt or coverall pocket while underground. While the control filter can be carried by any miner assigned to the MMU being sampled, it would be preferable if that miner performed the job of the DO. Finally, the control filter cassette must be kept together with the exposed samples after sampling and should be treated in the same manner as the exposed filters prior to being transmitted to MSHA. Failure to follow these proposed instructions would be cause for voiding the sampling results.

Proposed paragraph (g) is new and would require the operator to make a record showing the length of each production shift for each MMU, to retain the records for at least six months and make them available for inspection by authorized representatives of the Secretary and the miners' representative or submitted to the District Manager when requested in writing. Under the proposed rule, mine operators would need to know the length of the production shift to determine the equivalent concentration of respirable dust in the mine atmosphere. MSHA would use these records to verify that operators are accurately recording the actual production shift lengths so that miners are not being overexposed.

Proposed paragraph (h), redesignated from paragraph (c), would be revised to require that, upon request from the District Manager, the operator would submit the date and time any respirable dust sampling would begin and submit that information to the District Manager at least 48 hours prior to scheduled sampling. MSHA has included the proposed 48-hour notification requirement in the proposal to provide the Agency the opportunity to observe and monitor operator sampling to ensure that both operating conditions and sampling requirements are met.

Proposed paragraph (i) is new and would require, for purposes of establishing a normal production shift as defined under proposed § 70.2, the operator to record the amount of material produced (run-of-mine, *i.e.,* coal and rock) by each MMU during each shift used to establish the average production for the most recent 30 production shifts or for all the production shifts if fewer than 30 shifts of production data are available. The operator would also be required to retain production records for at least six months and make the records available for inspection by authorized representatives of the Secretary and the miners' representative.

The Dust Advisory Committee recommended that MSHA should require the mine operator to maintain the appropriate records. MSHA currently relies on information provided by the operator to determine at what production level the mine ventilation plan should be evaluated. No production records are required for each MMU. Although operators must submit production data on a quarterly basis, the data are compiled for the entire mine. In addition, quarterly reports provide information on the amount of clean coal produced, which is much lower than the tonnage of total material produced, and is not useful for establishing what constitutes a "normal production shift" for each MMU for sampling purposes. Under the proposed rule, MSHA would use the record under proposed paragraph (i) to establish a normal production level to evaluate.

Proposed paragraph (j) is new and would require mine operators using CPDMs to provide training to all miners expected to wear one. This would

include miners who perform the duties of the DO or ODO, occupations determined by results of respirable dust samples to have the greatest respirable dust concentration. Mine operators may also choose to use the CPDM to address outby DA sampling.

Proposed paragraph (j) would require that a miner receive initial training prior to being required to wear a CPDM, and receive retraining every 12 months. Based on MSHA's experience, training would be most effective when provided close to the time when the miner is expected to wear the CPDM. Proposed paragraphs (j)(1) through (j)(5) would require that the miner be instructed on: The basic features of the CPDM and its capabilities; how to set-up the CPDM for compliance sampling; the various types of numerical displays on the CPDM readout and how to access that information; how to start and stop a short-term sample run during compliance sampling; and the importance of continuously monitoring dust concentrations and properly wearing the CPDM.

The CPDM is an important new technology that continuously measures miners' exposure to respirable coal mine dust, in real time. The proposed training requirements would assure that miners who must wear the CPDM understand not only how the device works, but also the data displayed on the CPDM, which continuously displays the concentration of respirable dust in their work environment. The miner can use the displayed information to inform a responsible mine official of excessive dust levels and any concerns of being overexposed to respirable dust. MSHA believes it is vital that miners be properly trained on the operation of CPDMs to assure the integrity and credibility of the sampling process. For the sampling program to be effective, miners must understand the proper use of the CPDM, and its operation and information displayed. Well informed miners are more likely to make the most of the capabilities of the new CPDM technology.

Some commenters on the 2009 CPDM RFI supported CPDM training that would be separate from part 48 training. Other commenters maintained that CPDM training should occur before initial usage and be included thereafter with part 48 refresher training. MSHA considered whether training on the operation and use of the CPDM could be adequately covered under part 48 training, considering the other subjects that part 48 is required to address. MSHA believes that it is impracticable to include the proposed comprehensive training on CPDMs within the prescribed time limits under part 48. Under the proposal, the time for CPDM training would be required to be in addition to that required under part 48. However, operators may choose to provide CPDM training separately from training under 40 CFR part 48, or may provide CPDM training on days that part 48 training is held as long as additional time is designated to assure that training on the CPDM required under the proposed rule is sufficient.

Some commenters suggested that MSHA provide hands-on training to small groups in 8-hour sessions to all underground miners. It is the responsibility of mine operators to provide required training. MSHA would encourage operators to develop training materials using available instructional materials (*e.g.,* videos) or operating manuals from the manufacturers.

Proposed paragraph (k) is new and would require mine operators to maintain a record of training at the mine site for two years following completion of training. MSHA believes it is important to retain these records to verify that the required training has been provided. Proposed paragraph (k) would also permit a mine operator to maintain the record at another location as long as the record could be immediately accessed electronically from the mine site. Finally, proposed paragraph (k) would require that upon request by an authorized representative of the Secretary, Secretary of HHS, or miners' representative, the mine operator must promptly provide access to any such training record.

E. Section 70.202 Certified Person; Sampling and § 70.203 Certified Person; Maintenance and Calibration

Proposed §§ 70.202 and 70.203 would revise requirements for certified persons who perform dust sampling and who maintain and calibrate sampling equipment. The proposal would add a new requirement for decertification of certified persons who do not properly perform their duties or who fail to pass the MSHA examination required to maintain certification.

Proposed §§ 70.202(b) and 70.203(b) would retain the existing requirement that candidates for certification pass an MSHA examination to demonstrate competency in respirable dust sampling procedures or in maintenance and calibration procedures, as appropriate. To ensure consistent administration of the certification process, however, the proposal would add a new requirement that candidates complete an MSHA course of instruction prior to certification. The existing requirement that candidates pass an MSHA examination would not be changed and the examination would be given at the end of the course. MSHA believes the proposed new requirement that candidates complete an MSHA course would permit instructors to personally engage and converse with candidates to ensure that they have a comprehensive understanding of sampling or maintenance and calibration procedures. MSHA also believes that the proposed course requirement would strengthen the overall certification process. The proposed requirement is consistent with the recommendation of the 1992 Coal Mine Respirable Dust Task Group.

Several commenters on the CPDM RFI recommended that the certification requirements for both sampling and maintenance and calibration procedures be revised to account for technological differences between CMDPSUs and CPDMs. Though not explicitly reflected in the language of this proposed section, the mandatory course of instruction and competency examination that a person would be required to pass prior to becoming certified for sampling with or maintaining and calibrating a CPDM would be tailored to apply to the device. MSHA recognizes that, due to the technological differences between the instruments, a person's competency to sample with or maintain and calibrate a CPDM can only be demonstrated by standards that are specific to the device. Thus, a person who is certified to sample with or maintain and calibrate a CMDPSU would not be certified to sample with or maintain and calibrate a CPDM until completing the CPDM course of instruction and passing the examination demonstrating proficiency in CPDM sampling or maintenance and calibration procedures.

Proposed § 70.202(b) would clarify the Agency's existing practice that only persons who are specifically certified in dust sampling procedures be permitted to collect respirable dust samples and handle approved sampling devices when being used in sampling. This requirement would ensure that only trained persons, whose familiarity with proper sampling procedures has been evaluated, are allowed to collect dust samples. Dust samples must be collected effectively, and in accordance with proper procedures, to assure quality and validity of the sample. Accuracy and quality of dust sample results can be significantly affected by the procedures used during the collection process. MSHA believes that only persons certified in dust sampling procedures should be allowed to perform this important responsibility.

Proposed § 70.203(b) would clarify the Agency's existing practice that only persons who are certified in maintenance and calibration procedures be permitted to perform maintenance and calibration work on approved sampling devices. The proposal is consistent with a comment received on the CPDM RFI that only persons specifically trained in maintenance procedures should be permitted to perform maintenance on CPDMs. However, like the existing policy, the proposal would allow persons who are only certified in sampling procedures to perform maintenance of an approved device's sampling head assembly. MSHA's experience is that maintenance of the head assembly does not require a person to open, handle, disassemble, or reassemble the sampling device's internal components. Additionally, maintenance of a sampling device's head assembly would not affect the electrical components or other intrinsic safety features that must be maintained for the device to retain its approval. For these reasons, MSHA believes that sampling device head assemblies can continue to be maintained by persons who only hold a sampling certification without compromising the device's ability to perform as approved under part 74.

Proposed §§ 70.202(c) and 70.203(c) are new and would require persons certified in dust sampling procedures or maintenance and calibration procedures to pass the MSHA examination demonstrating competency in sampling procedures or maintenance and calibration procedures every three years. MSHA believes that it is absolutely critical that persons who are designated to perform dust sampling and maintenance and calibration of dust sampling equipment maintain the necessary competency to do so. Therefore, the new proposed requirement would ensure that once persons are certified, they take the necessary action to maintain their knowledge, skills, and abilities. Existing standards do not require certified persons to be re-examined at regular intervals to maintain a valid certification. MSHA believes that certifying persons for life can result in diminished aptitude or proficiency in skills in an area where regular changes in technology, procedures, and types of equipment and materials can reasonably be expected to affect a person's competence to perform required tasks. During Section 202 spot inspections conducted in 2009, MSHA personnel routinely observed certified persons using improper procedures for dust collection and handling of sampling devices, and for maintaining and calibrating approved sampling devices. Further inquiry of these certified persons revealed that a number of them were no longer familiar with basic procedures. MSHA believes that it is fundamental that the components of the dust sampling program be performed effectively to assure the integrity of the program, and periodic re-examination to maintain certification would advance this end.

The Dust Advisory Committee recommended unanimously that MSHA require annual update training for persons certified for dust sampling. The recommendation explained that annual refresher training would keep persons up to date with sampling methods and regulations, and maintain their expertise. MSHA agrees with the Dust Advisory Committee to the extent that it recommended a requirement that certified persons should be required to periodically demonstrate or reaffirm their competency in sampling procedures. MSHA believes that the proposed requirement would ensure that certified persons do not allow their knowledge, skills and abilities to lapse.

Before deciding to propose the requirement that certified persons be recertified through examination every three years, MSHA considered alternatives, such as yearly and biennial recertification. However, the Agency believes that recertification every three years would ensure that certified persons remain proficient in proper procedures and reduce the administrative burden that would be placed on operators and certified persons by a more frequent recertification requirement. Requiring persons to be reexamined at regular intervals as a condition of maintaining a valid certification would ensure certified persons have a minimum threshold of proficiency at all times, as familiarity with proper procedures is integral to protecting the health of miners. It is important to note that the proposal would not require certified persons to take the MSHA course of instruction every three years as a condition of re-certification. While MSHA believes that it is essential for persons who are seeking initial certification to complete classroom training prior to taking the competency examination and becoming certified, MSHA does not believe that the same requirement is necessary for persons seeking recertification. Persons seeking recertification will have had the benefit of actual, hands-on experience in either sampling or maintenance and calibration procedures, and MSHA believes that their competency would be adequately evaluated by whether they pass or fail the examination. For this reason, proposed §§ 70.202(c) and 70.203(c) would not require persons seeking recertification to retake the course of instruction prior to taking the competency examination every three years. MSHA solicits comment on the proposal that reexamination occur at three-year intervals, including the rationale for any suggestions.

Proposed §§ 70.202(d) and 70.203(d) would provide that MSHA may revoke a person's certification for failing to pass the MSHA examination or failing to properly carry out required sampling procedures or maintenance and calibration procedures, as appropriate. The proposal is consistent with the Dust Advisory Committee's unanimous recommendation that MSHA consider a retraining and/or decertification requirement if certified persons do not perform their duties properly. MSHA believes that the Agency's ability to revoke certifications is critical to preserving the integrity, reliability, and accuracy of the dust program, as well as maintaining miners' confidence and support in the program. MSHA's current certification procedures and procedures regarding appeals of revocation are addressed in Program Policy Letter (PPL) No. P09–V–08 (August 12, 2009).

Proposed §§ 70.202 and 70.203 would delete existing §§ 70.202(c) and 70.203(c), which permit MSHA to temporarily certify a person to collect respirable dust samples or to maintain and calibrate approved sampling devices if the person has received specific instruction from an authorized representative of the Secretary. The existing temporary certification provisions would be deleted because the process has been unused. It has been MSHA's experience that people seek permanent certification instead of temporary certification. In fact, since the provision permitting temporary certification was implemented, nobody has been temporarily certified.

F. Section 70.204 Approved Sampling Devices; Maintenance and Calibration

The proposed rule would revise existing § 70.204 to conform to the Agency's existing policy for the CMDPSU.

Proposed § 70.204(a) would retain the existing requirement that sampling devices be maintained as approved under 30 CFR part 74 and calibrated in accordance with MSHA Informational Report IR 1240 (1996). Proposed § 70.204(a) would address the use of the CPDM and require that operators who use this device maintain it in

accordance with the manufacturer's recommendations. The CPDM is a new sampling device and this new proposed requirement would ensure that the CPDM would perform as designed.

To assure proper operation of the sampling device and integrity of the samples, proposed § 70.204(a) would also clarify that pump unit maintenance on approved samplers could only be done by persons certified in maintenance and calibration. Under the proposal, persons certified only in sampling could not perform maintenance or calibration work on pump units of approved sampling devices. MSHA's experience is that maintenance and calibration of the pump unit requires a person to open, handle, disassemble, or reassemble the sampling device's internal components. Additionally, maintenance of the pump unit could affect the electrical components or other intrinsic safety features that must be maintained for the device to retain its approval. MSHA believes that only persons trained and certified in maintenance and calibration procedures are competent and knowledgeable enough to properly perform pump unit maintenance. This requirement would assure that the device's ability to perform as approved under part 74 is not compromised.

Proposed § 70.204(b) would retain the existing § 70.204(b) requirement that sampling devices be calibrated at a flowrate of 2.0 liters of air per minute, or at a different flowrate prescribed by the Secretary or Secretary of HHS. The proposal revises the existing requirement to allow calibration of sampling devices at a different flowrate, if recommended by the manufacturer. Proposed § 70.204(b) also would retain the existing requirement that calibration be done before the samplers are put into service, but would delete the existing requirement that they must be calibrated at intervals 200 hours or less after being placed into service. Instead, the proposed rule would require sampling devices to be calibrated at time intervals prescribed by the Secretary or Secretary of HHS or recommended by the manufacturer. These changes would permit the introduction of new sampling technologies that may have different calibration requirements. It would also allow the Secretary to establish a different calibration requirement or calibration schedule when necessary to address problems associated with a particular sampling unit.

Existing § 70.204(c), which addresses calibration marks on the flowmeter, would be deleted because it no longer applies to approved sampling devices. The CMDPSU has a constant-flow design with a digital flow indicator and no longer uses a rotometer to indicate the flowrate. Also, the CPDM has no external flowrate indicator; instead, it is monitored by its own internal microprocessor.

Proposed § 70.204(c) is derived from existing § 70.204(d) and existing MSHA policy and would address testing and examination requirements when using a CMDPSU to conduct sampling. The proposed rule would require that the CMDPSU be examined and tested by a person certified in sampling or in maintenance and calibration within 3 hours before the start of the shift on which it will be used to assure that it is clean and in proper working condition. The existing standard requires that this examination and testing occur "immediately" before the sampling shift, and the proposal clarifies immediately to reflect MSHA's policy on its interpretation of "immediately." MSHA believes that clarifying a 3-hour timeframe provides operators transparency regarding their responsibilities for testing and examining sampling devices, flexibility, and assurance that the sampling devices work effectively during the next shift.

MSHA proposes to redesignate existing § 70.204(d)(1) through (d)(5) as § 70.204(c)(1) through (c)(5). In addition, the order of the paragraphs would be changed to reflect the order in which the examination and testing requirements must be performed. MSHA also proposes to add clarifying changes, which would incorporate existing MSHA policy, to describe more completely the procedures to be used for the required examinations and testing. The proposed changes include: (c)(1) Examining the interior of the connector barrel, vortex finder, cyclone body and grit pot; (c)(2) examining for scratch marks on the inner surface of the cyclone where the air flow is directed by the vortex finder into the cyclone body; (c)(3) examining the external hose connecting the pump unit to the sampling head assembly; (c)(4) examining the clamping and positioning of CMDPSU components to assure they are airtight; and (c)(5) assuring that a fully assembled and examined sampling head assembly is attached to the pump inlet with the pump unit running when the battery voltage is tested. MSHA experience indicates these proposed clarifications are necessary to assist operators in correctly performing the required examinations and testing to assure the accuracy of respirable dust samples and that devices operate as approved.

Proposed § 70.204(d) is new and would require that when CPDMS are used, a person certified in sampling or in maintenance and calibration follow the examination, testing, and set-up procedures contained in the approved CPDM Performance Plan (proposed § 70.206). This proposed requirement would ensure that CPDM procedures have been approved by the District Manager and that the device operates properly.

No changes are being proposed to § 70.204(e).

G. Section 70.205 Approved Sampling Devices; Operation; Air Flowrate

Proposed § 70.205, which addresses the operation and air flowrate of approved sampling devices, would revise the existing standard to include the use of CPDMs and to conform to Agency policy.

Proposed § 70.205(a) would retain the existing requirement that approved sampling devices be operated at the flowrate of 2.0 liters of air per minute or at a different flowrate prescribed by the Secretary or Secretary of HHS. It would revise the existing requirement to allow the operator to use a different flowrate recommended by the manufacturer. MSHA believes that this proposed revision would ensure that approved sampling devices would perform properly and as designed.

For clarity and simplification, MSHA is proposing non-substantive changes to existing § 70.205(b) and (c), which would be redesignated as paragraphs (b)(1) and (b)(2). Proposed § 70.205(b) would clarify that it would apply to operators when using a CMDPSU and would retain the requirement that a person certified in sampling must examine each approved sampling device at least twice during each sampling shift to assure it is placed in the proper location, operating properly, and at the proper flowrate.

Proposed paragraph (b)(1) would retain the existing requirement that the first examination must be made during the second hour after sampling devices are put into operation. It would also include the provision in existing § 70.205(d) to clarify that the examination is not required if the sampling device is being operated in a breast or chamber of an anthracite coal mine where the full box mining method is used.

Proposed § 70.205(b)(2) would retain the requirement in existing § 70.205(c) that the second examination be made during the last hour that sampling devices are operated and, if a proper flowrate was not maintained, the dust data card transmitted to MSHA must

include a notation to that effect. This proposal would include a new requirement that the certified person must place the notation regarding the improper flowrate on the back side of the dust data card. MSHA experience indicates that operators do not always put the notation on the card in a conspicuous location, which increases the likelihood that this important information can be overlooked. The proposed revision is consistent with existing Agency policy.

Proposed paragraph (b)(2) would also require that other events occurring during the collection of respirable dust samples that may affect the validity of the sample, such as dropping the sampling head assembly on the mine floor or into water, must be noted on the back-side of the dust data card. This proposed requirement would provide an opportunity for the operator to inform MSHA of conditions that may affect the sample's validity.

A commenter to the 2003 proposed rule stated that the requirement that certified persons make second hour and last hour examinations of sampling devices is obsolete and should be changed. MSHA believes that the proposed examinations of each CMDPSU are crucial to assure that the sampling device is operating properly, in the proper location, and at the proper flowrate. Also, any corrective actions taken as a result of the examinations would increase sampling accuracy.

A commenter to the 2009 CPDM RFI stated that the examinations required under existing § 70.205 would not be compatible with the CPDM because (1) Checks do not necessarily need to be done within 3 hours prior to sampling since the CPDM can be programmed ahead of the shift; (2) the flow rate exam during the second and last hour are unnecessary because the flow rate is not displayed on the CPDM; and (3) sensors record and log failures in the CPDM data files. The Agency agrees and proposes a new requirement for the CPDM. Proposed § 70.205(c) would require that the certified person examine the CPDM during the shift as specified in the approved CPDM Performance Plan to ensure that the CPDM is operating properly at the proper flowrate. The CPDM Performance Plan requirements are in proposed § 70.206, discussed below.

H. Section 70.206 CPDM Performance Plan

Proposed § 70.206 is new and would require operators who use CPDMs to develop and submit for approval a CPDM Performance Plan (Plan) prior to using the devices. The proposal specifies the information that would be required in the Plan and would establish Plan approval procedures.

Proposed § 70.206(a) would require that operators have an approved Plan to ensure that no miner working on an MMU is exposed to respirable dust concentrations in excess of the applicable standard. The proposal would require operators to develop a proposed Plan and submit it to the District Manager for approval. Under the proposal, operators could not implement a Plan until it has been approved by the District Manager.

The proposed requirement for a Plan is based on MSHA's longstanding regulatory history of requiring approved plans to address safety and health conditions that are unique to a mine. Plans are an essential component of an effective safety and health program and allow operators the needed flexibility to address unique conditions at their mine. The proposal would ensure that distinct mine procedures, mining cycles, conditions, and experiences can be addressed on a mine-by-mine basis. The CPDM Performance Plan would be a separate plan and not part of an operator's ventilation or methane and dust control plan.

Proposed § 70.206(a)(1), like the existing ventilation plan requirements, would require operators to notify the representative of miners at least 5 days prior to submitting a proposed CPDM Performance Plan, or any proposed revision to the Plan, to the District Manager for approval. At the time of this notification, the proposal would also require operators to provide a copy of the Plan to the representative of miners, if the miners' representative so requests. Consistent with the Mine Act and MSHA's existing standards, MSHA believes that input from miners on proposed Plan provisions is important, as they are generally in the best position to determine the effect of the provisions, if implemented. Additionally, the Agency believes that more effective Plans can be developed when mine operators and representatives of miners have meaningful involvement in the process. The proposal would allow the miners' representative sufficient time to become familiar with proposed Plan provisions and, when necessary, to discuss and resolve any issues with the operator. The proposed requirement that miners' representatives be provided with a copy of the proposed Plan upon request is consistent with existing ventilation plan requirements and would allow miners' representatives to meaningfully participate in the Plan approval process.

Proposed § 70.206(a)(2) would require the operator to make available for inspection by the miners' representative a copy of the proposed Plan and any proposed revisions which have been submitted for approval to the District Manager. This proposed provision would ensure that once the operator has submitted the proposed Plan or revision to the District Manager for approval, the miners' representative would also have the opportunity to inspect the documents. This proposal is consistent with requirements for approval of the ventilation plan and would facilitate miners' representatives' ongoing involvement in the Plan approval process.

Proposed § 70.206(a)(3) would require a copy of the proposed Plan and any proposed revision that has been submitted for approval to be posted on the mine bulletin board at the time of submittal. The proposed Plan or revision would be required to remain posted on the bulletin board until approved, withdrawn, or denied. The proposed posting requirement is consistent with existing ventilation plan requirements and would ensure that each miner is aware of the provisions in the proposed Plan, or any revisions to the Plan. It would provide these miners with the opportunity to review and consider the proposed Plan or revision, and offer comments, recommendations or concerns during the approval process. This proposed provision is consistent with the statutory and existing regulatory framework that provides for miners to have a meaningful role in matters affecting their safety and health, such as the CPDM Performance Plan.

Proposed § 70.206(a)(4) would address procedures for miners' representatives to provide comments on the Plan to the District Manager. It would permit the representative of miners, following receipt of a proposed Plan or proposed revision, to submit timely, written comments to the District Manager for consideration during the review process. The proposal would also require the District Manager to provide a copy of the representative of miners' comments to the operator upon the operator's request. Consistent with existing ventilation plan requirements, the proposal would require miners' representatives to submit their comments in a "timely" manner in order to be considered by the District Manager. Accordingly, while miners' representatives would be permitted a reasonable period within which to review the operator's submittal and forward their comments to the District Manager, the proposal would not allow

them an indefinite or unreasonable period within which to do so. Like the existing standards and consistent with the statutory framework, the proposal would provide miners' representatives a reasonable amount of time in which to review a proposed CPDM Plan or revision, and submit their comments to the District Manager to facilitate development of an appropriate Plan. Although the proposal does not define timely, under the proposal, MSHA would balance the need for timely review, evaluation and approval of a Plan, with all parties' need for meaningful participation in the approval process.

The proposed requirement that District Managers provide operators, upon request, with a copy of comments submitted by the miners' representative would ensure that operators are aware of miners' and their representatives' position with respect to a proposed Plan or revision. MSHA believes that the proposed procedures for approval of a Plan, including input by miners and their representatives and information to the mine operator, would provide a reasonable approach to information sharing between operators and representatives of miners.

Proposed § 70.206(b) would include the information that would be required in CPDM Performance Plans and the names or titles of the responsible mine officials who would be designated by the operator to perform the tasks required by this proposed provision. The proposal would ensure that each Plan contains sufficient information necessary for: the operator to have an effective Plan; MSHA to approve the Plan; and for MSHA to verify the responsible mine officials designated by the operators to properly implement the provisions of the Plan in this section. The proposed requirement that operators identify the mine official who would be responsible for each required task would permit the mine official to be designated by title or name, so long as MSHA and miners are able to readily discern who that official is. For example, if the operator designates the "safety supervisor" as the official responsible for electronically transmitting certified sampling data files to MSHA at the end of each week, the proposed Plan would be considered acceptable by MSHA if the operator employed only one individual with the title of "safety supervisor." Conversely, if the operator designates the "section foreman" as the person responsible for taking on-shift action to ensure that sampled occupations will remain in compliance at the end of the shift, but has more than one section foreman, the designation would not be acceptable. The operator would have to include the titles or names of the designated mine official responsible for performing the tasks required by each of the eight proposed provisions, as well as any other tasks, if required by the District Manager.

Proposed § 70.206(b)(1) would require the Plan to include the occupations designated by MSHA in each MMU that would be sampled using a CPDM, along with a 9-digit identification number in the following sequence: (i) The first four digits would identify the MMU being sampled; (ii) the next three digits would identify the sampled occupation; (iii) the eighth digit would identify the particular shift being sampled (*e.g.,* 1st, 2nd or 3rd); and (iv) the final digit would identify the particular work crew that the wearer of the sampling device is assigned to at mines employing multiple crews to work the same shift on different days during the same calendar week (*e.g.,* 1st crew, 2nd crew, etc.). The proposed unique 9-digit identifying number would ensure that sampling results are properly attributed to the occupation and crew from which they were taken. MSHA has included this requirement in the proposal because it is critical that the Agency be able to correlate each sample result to the occupation and crew from which it was obtained. This information would allow the Agency to determine whether the weekly permissible accumulated exposure has been met. The distinction between crews is essential where operators employ several crews, each of which works the same shift but on different days of the week. It is vital for MSHA, operators and miners to know exposures of the sampled designated occupations so that timely corrective action can be taken, as necessary.

Proposed § 70.206(b)(2) would require the Plan to include pre-operational examinations, testing and set-up procedures to verify the operational readiness of the CPDM before each sampling shift. These proposed tasks would have to be performed by a person certified in sampling procedures. This proposed provision is consistent with a comment received on the CPDM RFI that favored operators being held responsible for ensuring the operational readiness of their CPDMs. The proposal would require the operator to establish examination, testing, and set-up procedures that would assure that the device is ready to be used and will function properly during the shift. Pre-operational exams, testing and set-up procedures are critical to the proper use of the CPDM, as they would ensure that the approved device is working correctly and that results from the device are reliable. These procedures should be based upon the manufacturer's recommendations, as appropriate. Set-up procedures should include programming the CPDM with the shift length and the applicable dust standard for that MMU. Additionally, set-up procedures should include placing a filter in the device. The pre-operational examination should ensure that the CPDM is ready to be used for the shift. The designated mine official should also calculate the weekly permissible accumulated exposure. MSHA solicits comment on this proposed provision and requests that a detailed rationale accompany any comment or recommendation that is submitted.

Proposed § 70.206(b)(3) would require the Plan to include procedures that address downloading end-of-shift sampling information; and validation, certification and posting of reported results. The responsible mine official designated to perform these tasks would be required to be certified in sampling procedures. The proposal would require that the Plan specify how the operator would ensure that all of the recorded CPDM data would be downloaded at the end of each shift. Because the operator would be required to post specific end-of-shift information on the mine bulletin board, the downloaded data should include: the location within the mine from which the sample was taken; the respirable dust concentration; the occupation code, where applicable; the shift length; and any information related to a voided sample. With respect to the proposed requirements that the designated mine official validate and certify the reported results, the Plan should specify the means by which the official would determine that the reported results appear reasonable and accurate in light of considerations such as shift length, the location from which the sample was taken, the sampled occupation, etc. The proposal would require that the Plan include posting procedures and information describing how the official would ensure the posting of the reported results. MSHA solicits comment on this proposed Plan provision, and requests that a detailed rationale accompany any comment or recommendation that is submitted.

Proposed § 70.206(b)(4) would require the Plan to include procedures for weekly electronic transmittals of certified sampling data files to MSHA including the responsible mine official designated to perform the weekly electronic data transmittals. If operators choose to use other services, such as a contractor, to transmit weekly data to

MSHA, the Plan would have to include that information to ensure the integrity of data. Additionally, the Plan should specify how the operator would ensure that weekly data would be electronically transmitted to MSHA. MSHA solicits comment on this proposed Plan provision, and requests that a detailed rationale accompany any comment or recommendation that is submitted.

Proposed § 70.206(b)(5) would require the routine daily and other required scheduled maintenance procedures to be included in the Plan. With regard to the routine daily maintenance procedures, the Plan should include the steps the mine official would take to prepare the units for daily usage, which may include cleaning the CPDM's inlet tubing and cyclone in order to keep it free of dust and dirt (*e.g.,* by spraying with compressed air), changing the filters, and recharging the batteries. Proper daily maintenance of the CPDM, such as cleaning the inlet tubing and cyclone, ensures that the device is ready for the sampling shift and that it provides consistent operation. Routine daily maintenance procedures should be based on the manufacturer's recommendations. With regard to "other required scheduled maintenance," the Plan would include scheduled monthly and annual maintenance, as well as any other task that requires the CPDM case or unit connections to be broken. These tasks, which require exposing the internal components of or disassembling the unit, have the potential to compromise the intrinsic safety features of the CPDM. MSHA solicits comment on this proposed Plan provision, and requests that a detailed rationale accompany any comment or recommendation that is submitted.

One commenter to MSHA's CPDM RFI recommended that MSHA assume responsibility for all non-routine maintenance of operators' CPDM units, while operators assume responsibility for routine maintenance of the units. Proposed § 70.206(b)(5), however, would require operators to include all CPDM maintenance procedures, whether routine or other than routine. The Agency believes that operators are in the best position to maintain equipment, tools and instruments that they use to comply with the Mine Act and related standards. Under the existing dust standards, operators are responsible for ensuring that their CMDPSUs are properly maintained, and MSHA believes continued application of this practice is sound.

Proposed § 70.206(b)(6) would require the Plan to specify procedures or methods for verifying the calibration of each CPDM. The Plan should specify how frequently the CPDM would be calibrated in order to ensure the validity of each device's measurements and the continued reliability of the information reported by the instrument. In determining calibration frequency, the operator should follow the manufacturer's recommendations; however, the District Manager may require more frequent calibrations should circumstances warrant, such as, prolonged exposure to extreme temperatures, repeated sampling results that are unable to be validated, intense vibration or shock, or improper handling by someone not certified in maintenance and calibration procedures. MSHA solicits comment on this proposed provision, and requests that a detailed rationale accompany any comment or recommendation that is submitted.

One commenter to the CPDM RFI recommended that MSHA assume responsibility for calibrating and maintaining each mine operator's CPDM units. The proposal does not reflect this suggestion. As discussed previously, MSHA believes that each operator is in the best position to ensure that its tools, equipment, dust sampling devices, etc., are in proper working order. Under MSHA's existing standards, operators are responsible for ensuring regular calibration of their CMDPSUs, and maintenance of the units as necessary. MSHA believes that operators should have the same responsibility with respect to CPDM calibration and maintenance.

Proposed § 70.206(b)(7) would require the Plan to specify the frequency with which the dust concentration is to be monitored by the designated mine official during the shift. The Plan should specify reasonable monitoring intervals based on considerations such as the occupation being monitored, geologic conditions, the location in the mine from which the sample is being taken, production levels, past exposure levels, and similarity to current conditions, and mine experience. MSHA solicits comment on this proposed provision, and requests that a detailed rationale accompany any comment or recommendation that is submitted.

Proposed § 70.206(b)(8) would require the Plan to include the types of actions permitted to be taken by the responsible mine official during the shift to ensure that the environment of the occupation being sampled remains in compliance at the end of the shift. Specific actions to be taken would depend upon the particular circumstances in the mine. For example, the Plan could contain actions such as checking the approved dust plan parameters, determining whether the water sprays are functioning properly and, if so, whether the water pressure is appropriate; examining the number of scrubber sprays; examining the amount of air delivered to the section; or inspecting the length of bits. Permitted actions should ensure that environmental and engineering controls that have already been installed are functioning so as to provide optimum protection. MSHA solicits comment on this proposed provision, and requests that a detailed rationale accompany any comment or recommendation that is submitted.

Proposed § 70.206(b)(9) would require the Plan to include any other information required by the District Manager. Consistent with MSHA's other existing standards that require plans, the proposal would provide District Managers the authority to require added plan content in order to accommodate special circumstances. For example, a District Manager may require added Plan content to address repeated overexposures to respirable dust, CPDM units that are not properly cleaned under an operator's existing Plan procedures, or CPDMs that have repeatedly reported errors. MSHA believes that plans must be tailored to fit each mine's needs, and the flexibility provided in this proposed provision would ensure that variations between mines are accounted for in a mine's approved Plan. MSHA solicits comment on this proposed provision, and requests that a detailed rationale accompany any comment or recommendation that is submitted.

Proposed § 70.206(c)(1) would require the approved CPDM Performance Plan and any revisions to be provided upon request to the representative of miners by the operator following notification of approval. The proposal would ensure that miners' representatives are aware and knowledgeable of any approved Plan or Plan revision. MSHA believes that providing the representative of miners with a copy of the approved Plan and revisions facilitates the information exchange that the Agency believes furthers the health protections of miners. This proposed provision is consistent with other MSHA plan requirements.

Proposed § 70.206(c)(2) would require the approved Plan and any revisions to be made available for inspection by the representative of miners. The proposal would ensure that the representative of miners could examine or look over the approved Plan or revisions so that miners and their representatives fully understand the provisions in the Plan and how the Plan affects them. The

proposed provision is consistent with other MSHA plan requirements.

Proposed § 70.206(c)(3) would require the approved Plan and any revisions to be posted on the mine bulletin board within 1 working day following notification of approval, and to remain posted for the period that the Plan is in effect. The proposal would help to assure that miners and their representatives are aware of the provisions of the approved Plan in a timely manner. The proposed provision is consistent with other MSHA plan requirements.

Proposed § 70.206(d) would allow the District Manager to require an operator to revise an approved Plan if the District Manager determines that the plan is inadequate to protect miners from exposures to excessive concentrations of respirable coal mine dust. MSHA believes that District Managers must have the authority to require Plan revisions when it is determined that the minimum Plan provisions would not reliably and consistently protect miners from excessive dust. All mines, whether surface or underground, present a dynamic work environment. MSHA's experience has demonstrated that such working environments often require Plan revisions to account for conditions or circumstances that might not have been present at the time the Plan was approved. Similarly, even absent changing mine conditions, implementation of an approved plan might reveal that variables assumed during the Plan approval process, perform differently during actual mining activities, resulting in inadequate protection of miners. For this reason, MSHA believes it is critical that District Managers have the ability to require Plan revisions. It is the Agency's intent that, prior to requiring an operator to revise an approved Plan, the District Manager would consider relevant inspection information, including any dust citations that have been issued and corrective action taken to lower respirable dust concentrations. However, under the proposal, District Managers would not be required to wait until a miner has been exposed to excessive dust prior to determining that a Plan is inadequate and a revision warranted, provided there is a reasonable basis to make such determination. For example, a District Manager may require plan revisions to address CPDM units that are not properly cleaned under an operator's existing Plan procedures, or CPDMs that have repeatedly reported errors. Failure to include the required revisions into a Plan would provide just cause for MSHA to revoke the existing Plan. MSHA believes that such instances of refusal to incorporate required revisions into a Plan will rarely, if ever, occur. Consistent with MSHA's other standards that require approved mine plans, operating without an approved Plan would be a violation of MSHA standards. MSHA solicits comment on this proposed provision, and requests that a detailed rationale accompany any comment or recommendation that is submitted.

I. Section 70.207 Sampling of Mechanized Mining Units; Requirements When Using a CMDPSU

Proposed § 70.207 would revise the existing bimonthly sampling requirements when using CMDPSUs on MMUs. The proposal would change the title to distinguish this section from proposed § 70.208 which would apply to operators who use CPDMs.

Proposed § 70.207(a) would replace the existing term "respirable dust samples" with the new term "representative samples." The term representative samples is discussed elsewhere in this preamble in proposed § 70.2 related to definitions. The proposed change to include representative samples would offer greater protection for miners since it would assure that samples taken by the operator would reflect typical dust concentrations and conditions at the mine during normal mining activity.

As in existing § 70.207(a), the proposed rule would require that DOs be sampled on "consecutive normal production shifts or normal production shifts each of which is worked on consecutive days." Proposed § 70.2 would, however, revise the definition for "normal production shift," discussed elsewhere in the preamble. Under the proposal, bimonthly sampling periods would remain the same as in the existing standard.

Proposed § 70.207(b), redesignated from existing § 70.207(e), would substantively remain unchanged. Proposed (b)(1) through (b)(10), which identify the DOs that will require sampling and the location of sampling, would remain the same.

Proposed § 70.207(c), (c)(1), and (c)(2) would apply when the respirable dust standard has been changed due to the presence of quartz under proposed § 70.101.

Proposed § 70.207(c) is new and would require that when the applicable dust standard is changed in accordance with proposed § 70.101 (Respirable dust standard when quartz is present), the new applicable standard would be effective on the first production shift following the operator's receipt of notification of the change from MSHA. The proposal would protect miners by ensuring prompt implementation of the reduced standard when high concentrations of quartz are present. For example, during the day shift on Monday, the operator receives notification from MSHA that the respirable dust standard for the DO, the cutting machine operator, will be reduced in accordance with proposed § 70.101 due to a high quartz measurement. Proposed paragraph (c) would require the reduced standard to become effective on the next production shift, which could be the evening shift on Monday or the midnight shift on Tuesday morning or the day shift on Tuesday. The proposed provision is consistent with Agency policy and would provide increased health protection for miners.

Proposed § 70.207(c)(1) is derived from existing § 70.207(b). Under the proposal, if all samples from the most recent bimonthly sampling period do not exceed the new applicable standard, the operator would begin sampling in the affected MMU on the first production shift during the next bimonthly period following notification from MSHA of the change in the applicable standard. Proposed paragraph (c)(1) is consistent with existing § 70.207(b) and Agency policy.

Proposed § 70.207(c)(2) is new and would require that if any sample from the most recent bimonthly sampling period exceeds the new applicable standard (reduced due to the presence of quartz), the operator must make necessary adjustments to the dust control parameters in the mine ventilation plan within three days, and then collect samples from the affected MMU on consecutive normal production shifts until five valid representative samples are collected. The samples collected would then be treated as normal bimonthly samples. MSHA believes that operators should take prompt actions to reduce the dust levels when the new applicable standard is exceeded and that three days is a reasonable amount of time to do so. The additional samples would allow operators to make a timely determination whether the dust controls are working effectively. Proposed § 70.207(c)(2) would assure that miners who need to be on a reduced standard are adequately protected.

Proposed § 70.207(d) would revise existing § 70.207(d) by deleting the existing provision requiring that any sample greater than 2.5 mg/m^3 be used when normal production is not achieved. In its place, the proposal would require that, if any sample

exceeds the applicable standard by 0.1 mg/m^3, regardless of production, the sample would be used to determine the average concentration for that MMU. Voiding samples that indicate miners were exposed to a concentration of respirable dust in excess of the applicable standard does not provide miners the intended health protection. For example, an MMU is on a reduced standard of 0.5 mg/m^3 due to the presence of quartz. A sample taken on the MMU when a normal production shift was not achieved shows the respirable dust concentration is 2.3 mg/m^3. Under the existing standard, that sample would not be used to determine the average concentration for the MMU. However, MSHA believes that any sample that exceeds the applicable standard while production is less than normal should be used to determine the respirable dust concentration of the MMU since operating at a higher production would likely increase miners' respirable dust exposure.

Proposed § 70.207(e) is new and would require that if an operator uses a CMDPSU, no valid single-shift sample equivalent concentration measurement shall meet or exceed the Excessive Concentration Value (ECV) that corresponds to the applicable standard. The ECVs are listed in Table 70–1. A full discussion of the use of single, full-shift measurements is addressed elsewhere in this preamble under proposed § 72.800. The ECVs were calculated to ensure that, if an ECV is met or exceeded, MSHA can determine noncompliance with the applicable dust standard with at least 95-percent confidence.

The NIOSH Criteria Document recommended that MSHA should make no upward adjustment in exposure limits to account for measurement uncertainty for single, full-shift samples used to determine noncompliance. The Dust Advisory Committee made the same recommendation; however, it was not unanimous. One commenter on the CPDM RFI stated that MSHA should issue a citation when any full-shift sample exceeds the exposure limit by > 0.1 mg/m^3. The commenter also stated that the Agency should not apply the 95% confidence level adjustment since it gives benefit of the doubt to the operator at the expense of miners' health. In developing the proposal, MSHA considered an alternative that would have established noncompliance whenever any single-shift measurement exceeded the applicable dust standard by any amount. However, the Secretary must show, to a certain level of confidence, that there has been an overexposure before issuing a citation. The proposed rule is consistent with generally accepted industrial hygiene principles for health standards that include an error factor in determining noncompliance to account for measurement uncertainty. The proposal, however, would require that the operator take corrective action when the standard is exceeded by any amount. In this situation, the proposed rule would require that the operator: (1) Make respiratory equipment available to affected miners; (2) take corrective action to lower the dust level so that it does not reach the ECV level; and (3) record the corrective actions. This proposed requirement is generally consistent with NIOSH's recommendation and commenters' suggestion that the Agency make no upward adjustment to the standard, in that it would require the operator to take actions or receive a citation for not doing so.

Each proposed ECV was calculated to ensure that citations would be issued only when a single sample measurement demonstrates, with at least 95-percent confidence, that the applicable dust standard has been exceeded. MSHA believes that the proposed ECVs provide a sufficient degree of confidence in establishing noncompliance and basing noncompliance determinations on the proposed ECVs would provide miners increased health protection. A more detailed discussion on the derivation of the ECV values is included in Appendix A of the preamble.

The proposed rule would redesignate existing § 70.207(c) as § 70.207(f). Proposed § 70.207(f) would continue to require that upon issuance of a citation for a violation of the applicable standard involving a DO on an MMU, bimonthly sampling, and requirements when the respirable dust standard is changed due to quartz, would not apply to that MMU until the violation is abated. The proposal would replace (1) "§ 70.100(a) (Respirable dust standards) or § 70.101 (Respirable dust standard when quartz is present)" with "the applicable standard" to be consistent with other proposed part 70, 71, and 90 provisions; and (2) "that unit" with "that MMU" for clarification. The proposal would also make two nonsubstantive, conforming changes to replace references to paragraphs that have been redesignated. It would replace "(b)" with "(c)(2)," and "§ 70.201(d)" with "paragraph (g)."

The proposed rule would revise and redesignate existing § 70.201(d) as proposed § 70.207(g). It would require the operator to take actions, listed in paragraphs (g)(1) through (g)(3), during the time for abatement fixed in a citation for violation of the applicable standard. Proposed (g)(1) would require the operator to make approved respirators available to affected miners in accordance with proposed § 72.700. Proposed (g)(2) would require the operator to submit to the District Manager for approval proposed corrective actions to lower the concentration of respirable dust to within the applicable standard. Proposed (g)(3) would require that, upon approval by the District Manager, the operator implement the proposed corrective actions and then sample the affected occupation in the MMU on each normal production shift until five valid representative samples are taken. Proposed paragraph (g)(1) is consistent with existing § 70.300. Proposed paragraphs (g)(2) and (g)(3) are derived from existing § 70.201 and are consistent with generally accepted occupational industrial hygiene principles. MSHA believes that if a citation is issued for a violation of the applicable standard, the operator must take action to protect miners, including making respiratory protection available, evaluating dust control measures, and implementing new measures, as necessary, to reduce miners' risks of dust exposure. Proposed paragraph (g) would assure that effective proposed corrective actions are reviewed by the District Manager and implemented by the operator in a timely manner.

Proposed § 70.207(h) is new and would establish that a citation for violation of the applicable standard will be terminated by MSHA when: (1) The equivalent concentration of each of the five valid operator abatement samples is at or below the applicable standard; (2) the operator submits revised dust control parameters as part of the mine ventilation plan applicable to the MMU; and (3) the District Manager approves the revised dust control parameters. The proposal also requires that the revised dust control parameters must reflect the control measures used to abate the violation. MSHA believes that when there is a violation of the applicable standard, the proposed provision would assure that the revised dust control parameters are appropriate and demonstrate that they effectively reduce concentrations of respirable dust on the MMU.

Proposed § 70.207(i) is new and would require that when the equivalent concentration of one or more valid samples collected by the operator under this section exceeds the applicable standard but is less than the ECV in Table 70–1, the operator must: (1) Make approved respirators available to affected miners in accordance with proposed § 72.700; (2) take corrective

action to lower the respirable dust concentration to or below the applicable standard; and (3) record the corrective actions taken in the same manner as the records for hazardous conditions required by existing § 75.363. MSHA believes these proposed requirements are necessary to prevent miners' overexposure to respirable dust and would provide improved protection for miners. Proposed paragraph (i)(1) is consistent with existing § 70.300. MSHA believes that operators must take action to lower respirable dust concentrations to or below the applicable standard as would be required by proposed paragraph (i)(2) to assure that concentrations do not reach ECV levels, or a state of noncompliance. MSHA believes that the record required to be made under proposed (i)(3) would allow the Agency and mine operators to review the corrective actions taken and assist in determining whether the dust control parameters in the approved ventilation plan are adequate.

J. Section 70.208 Sampling of Mechanized Mining Units; Requirements When Using a CPDM

Proposed § 70.208 is new and would provide requirements on operator sampling of mechanized mining units when using a CPDM. It addresses: Occupations that must be sampled; frequency of sampling; actions to be taken when any end-of-shift concentration exceeds the applicable standard; actions to be taken when overexposures occur; and interim use of supplementary controls when all feasible engineering or environmental controls have been used.

Proposed § 70.208(a)(1) would require mine operators who use CPDMs to sample the DO in each MMU during each production shift, seven days per week (Sunday through Saturday), 52 weeks per year. The proposal would maintain MSHA's longstanding practice to require operators to sample the DO on each MMU because the DO is the occupation having the highest risk of dust exposure based on past MSHA sampling. The Agency considered, but rejected, retaining the operator's existing bimonthly sampling program, because MSHA believes that sampling DOs on every production shift, 7 days per week, 52 weeks per year is the most effective method of sampling to reduce miners' exposure to respirable coal mine dust. Both operators and miners would continually be aware of the dust conditions in the working environment and the effectiveness of dust controls. The proposal is consistent with comments on MSHA's RFI on CPDMs. Commenters supported CPDM sampling on DOs during all scheduled production shifts during the week. One commenter stated that the real-time sampling aspects of the CPDM provide the opportunity for more frequent sampling than is currently done.

Proposed paragraph (a)(2) would require mine operators using CPDMs to sample ODOs specified in paragraphs (b)(1) through (b)(10) of this section in each MMU during each production shift for 14 consecutive days during each quarterly period. The proposal would establish the quarterly periods as: (1) January 1–March 31; (2) April 1–June 30; (3) July 1–September 30; and (4) October 1–December 31. ODOs to be sampled would be identified by the MSHA District Manager (DM), specified in the mine ventilation plan, and addressed in the CPDM Performance Plan. ODOs identified by the DM would be based on MSHA's historical sampling data on the MMU; sampling of ODOs, such as shuttle car operators on MMUs using blowing face ventilation, would be required because MSHA's data show that sampling only the DOs does not always adequately protect other miners in the MMU. In addition, sampling on each production shift for 14 consecutive days during the specified quarter would provide samples that are representative of typical normal mining activities during the production shifts. MSHA believes that under normal mining conditions, the MMU should be able to complete multiple mining cycles in 14 days. Sampling during the 14-day period would provide results of respirable dust concentrations in the ODO's work environment and allow MSHA to evaluate the effectiveness of the dust controls being used.

The Agency solicits comment on which occupations should be sampled and the frequency that sampling should occur. Please be specific in your comments and include a detailed rationale.

Some commenters on the CPDM RFI stated that MSHA should be responsible for the purchase of all CPDMs and all sampling for purposes of determining compliance with respirable dust standards. The Dust Advisory Committee recommended that MSHA should take full responsibility for compliance sampling at the number and frequency levels required of both operators and MSHA to ensure reliability of the program. The Committee also stated that MSHA should explore possible means to secure adequate funding for this effort without adversely impacting the remainder of the Agency's resources and responsibilities. To achieve this end, the Committee recommended that resource constraints should be overcome by mine operator funding for the incremental compliance sampling, including implementation of an operator fee program. The proposed rule does not include these suggestions and recommendations. Under existing standards and consistent with the Mine Act, mine operators are responsible for providing safe and healthful mines. Toward that end, they are responsible for ensuring that hazards from respirable coal mine dust are minimized or eliminated from the miners' work environment. Operators are responsible for compliance sampling, including purchase of approved sampling devices. MSHA believes that this is a reasonable statutory requirement and sound regulatory principle that must be maintained. Consistent with the existing operator sampling program, MSHA believes that operators have primary responsibility and are in the best position to provide miners with safe and healthy working conditions. Part of that responsibility includes sampling the working environment to assure that miners do not suffer material impairment of health or functional capacity from exposure to respirable dust.

Proposed § 70.208(b) would require that the CPDM must be worn by the miner assigned to perform the duties of the DO or ODO specified in paragraphs (b)(1) through (b)(10) for each type of MMU or specified by the DM for each type of MMU. The proposal would ensure accurate sampling by requiring the CPDM to remain on the miner performing the duties of the DO or ODO. If that miner's duties change during the shift, the CPDM must remain with the miner performing the duties of the DO or the ODO.

Proposed paragraphs (b)(1) through (b)(10) would identify the DOs that would be sampled under paragraph (a)(1) and the ODOs specified by the DM that would be sampled under (a)(2) for each specified MMU.

Paragraph (b)(1) would provide that on a conventional section using a cutting machine, the DO on the MMU would be the cutting machine operator.

Paragraph (b)(2) would provide that on a conventional section shooting off the solid, the DO on the MMU would be the loading machine operator.

Paragraph (b)(3) would provide that on a continuous mining section other than auger-type, the DO on the MMU would be the continuous mining machine operator or mobile bridge operator when using continuous haulage. The ODOs for this type of MMU would be the roof bolter operator who works nearest the working face on

the return air side of the continuous mining machine and the shuttle car operators on MMUs using blowing face ventilation. The DO would be sampled under paragraph (a)(1) and the ODOs would be sampled under paragraph (a)(2).

Paragraph (b)(4) would provide that on a continuous mining section using auger-type machines, the DO on the MMU would be the jacksetter working nearest the working face on the return air side of the continuous mining machine.

Paragraph (b)(5) would provide that on a scoop section using a cutting machine, the DO on the MMU would be the cutting machine operator.

Paragraph (b)(6) would provide that on a scoop section, shooting off the solid, the DO on the MMU would be the coal drill operator.

Paragraph (b)(7) would provide that on a longwall section, the DO on the MMU would be the longwall operator working on the tailgate side of the longwall mining machine sampled under paragraph (a)(1). The ODOs of the jack setters working nearest to the return side of the longwall working face, and the mechanics working on the longwall working face would be sampled under paragraph (a)(2).

Paragraph (b)(8) would provide that on a loading section with a cutting machine, the DO on the MMU would be the cutting machine operator.

Paragraph (b)(9) would provide that on a hand loading section shooting off the solid, the DO on the MMU would be the hand loader exposed to the greatest dust concentration.

Paragraph (b)(10) would provide that on an anthracite mine section, the DO on the MMU would be the hand loader exposed to the greatest dust concentration.

The Agency requests comments on the proposed locations for the use of CPDMs. Please be specific in your comments and include rationale for suggested alternatives.

Proposed § 70.208(c) is new and would require that when the respirable dust standard is changed in accordance with § 70.101 (Respirable dust standard when quartz is present), the new applicable standard would be effective on the first production shift following the operator's receipt of notification of such change from MSHA. The proposed provision is consistent with Agency policy and identical to proposed § 70.207(c). The rationale for proposed § 70.208(c) is the same as that for proposed § 70.207(c), discussed elsewhere in the preamble.

Proposed § 70.208(d) would require that no valid end-of-shift equivalent concentration meet or exceed the ECV that corresponds to the applicable standard. The ECVs are listed in Table 70–2. As discussed elsewhere in the preamble related to proposed § 70.207(e), each ECV is calculated to ensure that citations are issued only when a single sample measurement demonstrates, with at least 95-percent confidence, that the applicable dust standard has been exceeded. The rationale for proposed § 70.208(d) is the same as that for proposed § 70.207(e), which is discussed elsewhere in the preamble.

Proposed § 70.208(e) would require that no weekly accumulated exposure (WAE) shall exceed the weekly permissible accumulated exposure (WPAE). The proposed terms "weekly accumulated exposure" and "weekly permissible accumulated exposure" are new and discussed elsewhere in the preamble under the § 70.2 definitions. For example, suppose a CPDM reported an equivalent concentration of 1.46 mg/m^3 for a miner who worked nine hours on Monday in the DO. Under the proposed definition of WAE, this quantity would be multiplied by 8 hours, yielding an accumulated exposure on Monday of 1.46 mg/m^3 × 8 hours or 11.68 mg-hr/m^3. If the particular miner worked the rest of the week, including Saturday, the exposure accumulated during each of the other five shifts would be determined in the same manner. If the daily exposures accumulated by the DO for the week were recorded as follows: Monday—11.68 mg-hr/m^3; Tuesday—12.51 mg-hr/m^3; Wednesday—10.75 mg-hr/m^3; Thursday—9.68 mg-hr/m^3; Friday—12.00 mg-hr/m^3; Saturday—10.75 mg-hr/m^3, adding together the daily accumulated exposures yields a WAE of 67.37 mg-hr/m^3.

To continue, if the applicable standard in the MMU is 1.5 mg/m^3, this quantity would be multiplied by 40 hours, yielding a WPAE of 60 mg-hr/m^3 for the DO. Since the WAE for the DO is 67.37 mg-hr/m^3, it would exceed the WPAE of 60 mg-hr/m^3.

Proposed paragraph (e) would assure that miner's respirable dust exposure for the work week would be limited to a calculated weekly permissible accumulated exposure for an equivalent 40-hour work week. This proposed paragraph is consistent with the NIOSH Criteria Document which recommended that respirable coal mine dust be limited to 1 mg/m^3 as a TWA concentration for up to 10 hr/day during a 40-hour work week.

Proposed § 70.208(f)(1) through (f)(5) would require the operator to take actions when any valid end-of-shift equivalent concentration meets or exceeds the ECV that corresponds to the applicable standard in Table 70–2, or a weekly accumulated exposure (WAE) exceeds the weekly permissible accumulated exposure (WPAE). The action would include making respirators available to affected miners, implementing corrective actions, submitting corrective measures to the DM for approval, recording the reported excessive dust conditions, and reviewing the adequacy of the approved CPDM Performance Plan. The proposal would ensure that operators take prompt actions to protect miners, evaluate their dust control measures, and implement new measures, as necessary, to reduce miners' excessive respirable dust exposure.

Paragraph (f)(1) would require the operator to make approved respirators available to the affected miners in accordance with proposed § 72.700. The proposal is consistent with existing § 70.300 which requires the operator to make respiratory equipment available to all persons exposed to excessive concentrations of respirable dust.

Paragraph (f)(2) would require the operator to implement corrective actions to assure compliance with the applicable standard on the next and subsequent production shifts. Corrective actions would include, for example, engineering or environmental controls that control the level of respirable dust by (1) reducing dust generation at the source with the dust controls on the machine; (2) suppressing dust with water sprays, wetting agents, foams or water infusion; (3) using ventilation to dilute dust; (4) capturing dust with machine-mounted dust collectors; or (5) diverting dust being generated by the mining process with shearer clearer or passive barriers. MSHA believes that the proposal would protect miners' health because the operator would be required to review the dust control parameters, determine what factors may have contributed to the overexposures, and immediately take corrective actions starting on the next production shift. Commenters on the RFI on CPDMs supported taking corrective actions to correct overexposures when operators are using a CPDM.

Paragraph (f)(3) would require the operator to submit the corrective actions implemented to lower the concentration of respirable dust to within the applicable standard as a proposed change to the approved ventilation plan to the District Manager for approval within 3 days of determining that the applicable standard was exceeded. The District Manager would address the operator's submission through the

approval process associated with the mine ventilation plan under existing § 75.370. The District Manager's review would assure that control measures in the plan would maintain respirable dust concentrations at or below the applicable standard so that concentrations would not approach the citable ECV levels. It would also assure improved protection for miners.

Paragraph (f)(4) would require the operator to review the adequacy of the approved CPDM Performance Plan. If any CPDM Performance Plan revisions are needed, it would require the operator to submit proposed revisions to the District Manager for approval within 7 calendar days following posting of the applicable end-of-shift equivalent concentration or the weekly accumulated exposure on the mine bulletin board. MSHA believes that if an end-of-shift respirable dust concentration meets or exceeds an applicable ECV in Table 70–2, or a weekly accumulated exposure exceeds the weekly permissible accumulated exposure, the operator should be required to review the CPDM Performance Plan to determine whether revisions are necessary to prevent miners from being overexposed in the future. In addition, MSHA believes a 7-calendar day period is a reasonable amount of time for the operator to review and submit CPDM plan revisions for approval.

Paragraph (f)(5) would require the operator to record the reported excessive dust condition as part of and in the same manner as the records for hazardous conditions required by existing § 75.363. The proposal would require the record to include the following information: (i) Date of sampling; (ii) length of the sampled shift; (iii) location within the mine and the occupation where the sample was collected; (iv) the end-of-shift equivalent concentration, or weekly accumulated exposure and weekly permissible accumulated exposure; and (v) corrective action taken to reduce the concentration of respirable coal mine dust to or below the applicable standard. The record would provide necessary and useful information for operators, miners, and MSHA to be able to evaluate dust exposures, controls, and conditions in order to determine when and where corrective actions are necessary, and whether such conditions are recurring. In addition, this information would be critical to MSHA when requiring necessary changes to the operator's approved ventilation plan to ensure that suitable controls are in place to protect miners on each shift. Some commenters on the RFI on CPDMs supported recording of sampling results and corrective actions taken.

Proposed § 70.208(g) would require the operator to take actions, listed in paragraphs (g)(1) through (g)(4), before production begins on the next shift when a valid end-of-shift equivalent concentration exceeds the applicable standard but is less than the ECV that corresponds to the applicable standard in Table 70–2. Proposed § 70.208(g)(1) and (g)(2) are identical to proposed § 70.208(f)(1) and (f)(2) and would require the operator to make respirators available to affected miners and implement corrective actions.

Proposed § 70.208(g)(3), like proposed § 70.208(f)(5), would require the operator to record the reported excessive dust condition as part of and in the same manner as the records for hazardous conditions required by existing § 75.363. Proposed paragraphs (g)(3)(i) through (g)(3)(iii), and (g)(3)(v), which specify information to include in the record, are identical to proposed paragraphs (f)(5)(i) through (f)(5)(iii), and (f)(5)(v). Proposed paragraph (g)(3)(iv) requires the record to include end-of-shift concentrations because paragraph (g) addresses only end-of-shift concentration measurements.

Proposed paragraph (g)(4), like proposed paragraph (f)(4), would require the operator to review the adequacy of the approved CPDM Performance Plan. It would also require the operator to submit to the District Manager for approval any plan revisions to their CPDM Performance Plan within 7 calendar days following posting of the end-of-shift equivalent concentration on the mine bulletin board. The rationale for this proposed provision is the same as for proposed paragraph (f)(4).

Proposed paragraph (h) would provide that for the 24-month period following the effective date of the final rule, if an operator is unable to maintain compliance with the applicable standard for an MMU and the operator determines that all feasible engineering or environmental controls are being used on the MMU, the operator may request through the District Manager that the Administrator for Coal Mine Safety and Health approve, for a period not to exceed 6 months, the use of supplementary controls, including worker rotation, in conjunction with monitoring miners' exposures with CPDMs to reduce affected miners' dust exposure. When making such request, the operator would have to provide a report that: (1) Evaluates the specific situation in the MMU; (2) outlines all controls that will be used during this time period to prevent miners from being exposed to concentrations exceeding the applicable standard; (3) addresses the actions that will be taken to reduce miners' exposures through the use of engineering and environmental controls; and (4) establishes the time line for the implementation of the engineering and environmental controls. MSHA believes that the report submitted by the operator should be made by a knowledgeable mine employee such as an industrial hygienist, safety and health engineer, or other person with experience in respirable dust control. The District Manager would address the request through the approval process associated with the mine ventilation plan.

Engineering controls, also known as environmental controls, are the most protective means of controlling dust generation at the source. To control respirable dust, MSHA requires engineering or environmental controls as the primary means of controlling respirable dust. This is consistent with the Mine Act and generally accepted industrial hygiene principles. Used in the mining environment, engineering controls work to reduce dust generation at the source, or suppress, dilute, divert, or capture the generated dust. Unlike administrative controls, well-designed engineering controls or environmental controls provide consistent and reliable protection to all workers because the controls are not dependent on individual human performance, supervision, or intervention to function as intended. However, the proposal would allow limited short-term use of measures to supplement engineering or environmental controls to accommodate operators that may have difficulty meeting the applicable standards by the compliance dates that would be established by the final rule.

Any approved use of supplementary controls would only be in effect for a period not to exceed 6 months. MSHA believes that a 6-month period is a reasonable time within which supplementary controls may be used. If approved, supplementary controls would be permitted until other feasible engineering or environmental controls are implemented or MSHA determines that the supplementary controls are no longer necessary. In addition, if an operator cannot meet the applicable standard after the 6-month period, the operator may make another request to use supplementary controls; however, the use of supplementary controls would not be permitted beyond the 24 months following the effective date of the final rule. MSHA believes that the 24-month period allows operators sufficient time to implement engineering or environmental controls

to control respirable dust in the active workings of the mine atmosphere. MSHA specifically requests comments on the Agency's proposed approach to the use of supplementary controls, including any suggested alternatives, with supporting rationale.

K. Section 70.209 Sampling of Designated Areas

Proposed § 70.209 is derived from existing § 70.208 and would address sampling of designated areas (DAs). It would revise existing § 70.208 when operators use a CMDPSU and add new requirements when operators use a CPDM.

Proposed § 70.209 would apply initially to all DAs, but according to § 70.201(b), after [date 18 months after the effective date of the final rule] or upon implementation of the use of CPDMs, DAs associated with an MMU would be redesignated as ODOs and would no longer be subject to the proposed sampling provisions of this section. However, proposed § 70.209 would continue to apply to outby areas identified as DAs by the operator under proposed § 75.371(t).

Proposed § 70.209(a) would revise existing § 70.208(a) and require operators, who are using CMDPSUs or CPDMs, to sample each DA for five consecutive shifts every calendar quarter. The quarterly periods would be: (1) January 1–March 31; (2) April 1–June 30; (3) July 1–September 30; and (4) October 1–December 31.

Under the existing standard, operators are required to take one sample during the sampling period, with the potential under existing § 70.208(c) that five additional samples must be collected to make a compliance determination. Proposed § 70.209 would revise the existing standard to require the operator to take five DA samples on consecutive production shifts during the sampling period. One commenter on the CPDM RFI recommended less frequent CPDM sampling in outby areas, stating that historic sampling results indicate that exposure in outby areas is far lower than where coal is extracted. MSHA believes that, under the proposal, requiring operators to take five samples in a short period of time, such as consecutive production shifts, provides a better representation of the mining cycle and whether dust controls are effective in protecting miners who work in these areas. Since the five DA samples would provide a more accurate portrayal of mining activities and dust conditions, MSHA also believes it is reasonable to reduce the sampling period frequency from bimonthly to a quarterly basis.

Proposed § 70.209(b), (b)(1), and (b)(2) would apply when the respirable dust standard has been changed under proposed § 70.101 due to the presence of quartz.

Proposed § 70.209(b) is new and would require that when the applicable dust standard is changed in accordance with proposed § 70.101 (Respirable dust standard when quartz is present), the new applicable standard would be effective on the first production shift following the operator's receipt of notification of the change from MSHA. The proposal would provide increased health protection for miners by ensuring prompt implementation of the new applicable standard when quartz is present. The proposed provision is consistent with Agency policy and proposed § 70.207(c), which is discussed elsewhere in the preamble. The rationale for proposed § 70.209(b) is the same as that for proposed § 70.207(c), discussed elsewhere in the preamble.

Proposed § 70.209(b)(1) is derived from existing § 70.208(b). Under the proposal, if all samples from a DA taken during the most recent quarterly sampling period do not exceed the new applicable standard, the operator would begin sampling of the DA on the first production shift during the next quarterly period following notification from MSHA of the change in the applicable standard. Proposed § 70.209(b)(1) is consistent with Agency policy, existing § 70.208(b), and proposed § 70.207(c)(1), which is discussed elsewhere in the preamble.

Proposed § 70.209(b)(2) is new and would require that if any sample from the most recent quarterly sampling period exceeds the new applicable standard (reduced due to the presence of quartz), the operator must make necessary adjustments to the dust control parameters within three days, and then collect samples from the affected DA on consecutive shifts until five valid representative samples are collected. The samples would be treated as normal quarterly samples. Proposed § 70.209(b)(2) is consistent with proposed § 70.207(c)(2). The rationale for proposed § 70.209(b)(2) is the same as that for proposed § 70.207(c)(2), which is discussed elsewhere in the preamble.

Proposed § 70.209(c) is new and would require that no valid single-shift equivalent concentration shall meet or exceed the ECV that corresponds to the applicable standard. Tables 70–1 and 70–2 list ECVs for operators using CMDPSUs or CPDMs, respectively. Proposed § 70.209(c) is consistent with proposed § 70.207(e), and other proposed provisions in parts 71 and 90. The rationale for proposed § 70.209(c) is the same as that for proposed § 70.207(e), which is discussed elsewhere in the preamble.

Proposed § 70.209(d) would revise existing § 70.208(d) and would require that upon issuance of a citation for a violation of the applicable standard, paragraph (a) (quarterly sampling) and (b)(2) (sampling when a respirable dust standard is changed due to quartz) would not apply to the DA until the violation is abated in accordance with proposed paragraph (e). Except for minor and conforming changes, the proposal would be essentially the same as the existing standard.

Proposed § 70.209(e) is new and would require the operator to take actions, listed in paragraphs (e)(1) through (e)(3), during the time for abatement fixed in a citation for violation of the applicable standard. Proposed (e)(1) would require the operator to make approved respirators available to affected miners in accordance with proposed § 72.700. Proposed (e)(2) would require the operator to submit to the District Manager for approval proposed corrective actions to lower the concentration of respirable dust to within the applicable standard. Proposed (e)(3) would require that, upon approval by the District Manager, the operator implement the proposed corrective actions and then sample the affected DA on each production shift until five valid representative samples are taken. Proposed § 70.209(e) is consistent with proposed § 70.207(g). The rationale for proposed § 70.209(e) is identical to that for proposed § 70.207(g), which is discussed elsewhere in the preamble.

Proposed § 70.209(f) is new and would establish that a citation for violation of the applicable standard will be terminated by MSHA when: (1) The equivalent concentration of each of the five valid operator abatement samples is at or below the applicable standard; (2) the operator submits revised dust control parameters as part of the mine ventilation plan applicable to the DA; and (3) the District Manager approves the revised dust control parameters. The proposal also requires that the revised dust control parameters must reflect the control measures used to abate the violation. Proposed § 70.209(f) and its rationale are identical to proposed § 70.207(h), which is discussed elsewhere in the preamble.

Proposed § 70.209(g) would apply to operators who use CPDMs to sample DAs. It would require that operators take actions listed in paragraphs (g)(1)

through (g)(4), if a valid end-of-shift equivalent concentration exceeds the applicable standard but is less than the ECV that corresponds to the applicable standard in Table 70–2. Proposed § 70.209(g)(1) and (g)(2) would require the operator to make respirators available to affected miners and implement corrective actions. Proposed § 70.209(g)(3) would require the operator to record the reported excessive dust condition as part of and in the same manner as the records for hazardous conditions required by existing § 75.363. Proposed § 70.209(g)(3)(i)–(g)(3)(v) specify the information to include in the record. Proposed § 70.209(g)(4) would require the operator to review the adequacy of the approved CPDM Performance Plan. It would also require the operator to submit to the District Manager for approval any plan revisions to the CPDM Performance Plan within 7 calendar days after posting of the end-of-shift equivalent concentration on the mine bulletin board. Proposed § 70.209(g) and its rationale are identical to proposed § 70.208(g), which is discussed elsewhere in the preamble.

The proposed rule would make other minor changes to existing § 70.208. Existing § 70.208(e) would be deleted because § 75.371 addresses where DA samples are collected. The proposed rule would redesignate without change existing § 70.208(f), which addresses revocation of operators' mine ventilation plans, as proposed § 70.209(h).

L. Section 70.210 Respirable Dust Samples; Transmission by Operator

Proposed § 70.210, redesignated from existing § 70.209, would revise requirements for the operator to transmit respirable dust sampling information collected by either a CMDPSU or CPDM. It would revise paragraphs (a) and (c) and add a new paragraph (f); paragraphs (b), (d) and (e) would remain the same.

Proposed paragraph (a) would make a non-substantive change to clarify that it only applies to operators' transmission of samples collected with a CMDPSU.

Proposed paragraph (c) would retain the existing requirement that only persons certified in sampling complete the dust data card provided by the manufacturer of the filter cassette. It would be revised to require that each dust data card be signed by the certified person who actually performed the sampling shift examinations. For example, under the proposal, the certified person who performs required sampling shift examinations would be responsible for signing the dust data card and verifying the proper flow rate, or noting on the back-side of the card that the proper flowrate was not maintained. Since the certified person who conducted the examination is the most knowledgeable of the conditions surrounding the examination, MSHA would require that person to sign the dust data card.

Consistent with MSHA's existing policy, the proposal would also require that the person's signature on the data card include that person's MSHA Individual Identification Number (MIIN). Since July 1, 2008, MSHA has required that the certified person section of the dust data card include the MIIN, a unique identifier, for the certified person, instead of the social security number. To assure privacy and to comport with Federal requirements related to safeguarding personal-identifiable information, MSHA has eliminated use of social security numbers on its documents.

Proposed paragraph (f) is new and would apply when operators use CPDMs to sample. It would require that, within 12 hours after the end of the last sampling shift of the work week, a designated mine official must validate, certify, and transmit electronically to MSHA all daily sample and error data file information collected during the previous calendar week (Sunday through Saturday) and stored in the CPDM. It would also require the operator to maintain all CPDM data files transmitted to MSHA for at least 12 months.

Some commenters to the CPDM RFI stated that MSHA should be responsible for downloading all CPDM sampling data. MSHA has not included this suggestion in the proposal. Under the proposal, mine operators would download end-of-shift sampling information for weekly transmission to MSHA. Operators have the primary responsibility for providing miners with safe and healthy working conditions. Part of that responsibility includes sampling the working environment to assure that miners do not suffer material impairment of health or functional capacity from exposure to respirable dust. Data are stored in the CPDM memory for about 20 shifts. Operators, who would be in possession of CPDMs, would be in the best position to prevent data loss and to download and transmit CPDM data to MSHA in a timely manner.

Some commenters to the CPDM RFI suggested various timeframes for operators' CPDM data transmission to MSHA, ranging from every shift, to every week, to at least once a month. MSHA believes that transmitting data every shift would be burdensome on operators and the Agency, with negligible potential benefit. Similarly, MSHA believes that monthly transmission is too infrequent, given the CPDM's limited memory capacity noted in the previous discussion. The proposal reflects a balance between MSHA's need for the data and a reasonable transmission schedule and would require weekly transmission of daily sampling and error data file information from the CPDM. The Agency solicits comment on an appropriate timetable for operators' transmission of CPDM data to MSHA. Please be specific in your comments and include rationale for your suggestions.

Some commenters on the CPDM RFI recommended that the CPDM sampling data downloaded to MSHA should be incapable of alteration (*i.e.,* read-only). Proposed § 70.210(f) would require that sampling data stored in the CPDM be sent to the MSHA internet portal. To be approved under MSHA's new part 74 final rule (75 FR 17512), the CPDM must be designed to prevent intentional tampering or inadvertent altering of monitoring results. The part 74 final rule requires that the CPDM have a safeguard or indicator which either prevents altering the measuring or reporting functions of the device or indicates if these functions have been altered.

M. Section 70.211 Respirable Dust Samples; Report to Operator; Posting

Proposed § 70.211, redesignated from existing § 70.210, would address data contained in MSHA's report of respirable dust samples provided to operators. It would also address requirements for the operators' posting of sampling data. Proposed § 70.211 would include non-substantive changes in paragraphs (a)(2) through (a)(4), and add a new paragraph (c). The other provisions would remain the same.

Proposed paragraph (a)(2) would replace the language "mechanized mining unit or designated area" with "locations" to assure that all areas where samples are taken in the mine would be included (*i.e.,* DOs, ODOs, and DAs).

Proposed paragraphs (a)(3) and (a)(4) would include conforming changes by adding that the concentration of respirable dust be expressed "as an equivalent concentration." The changes are consistent with other proposed provisions that specify that the concentration of respirable coal mine dust is converted to and expressed as an 8-hour equivalent concentration.

Proposed paragraph (c) is new and would apply to operators who use a CPDM. It would require the designated

mine official to validate, certify, and post certain sampling information on the mine bulletin board. Proposed paragraph (c)(1) would require the designated mine official to post the daily end-of-shift sampling results within 1 hour after the end of the sampling shift. The daily posting must include the: Mine identification number; location in the mine from which samples were taken; respirable dust concentration expressed as an equivalent concentration for each valid sample; total amount of exposure accumulated by the sampled occupation during the shift; occupation code, where applicable; reason for voiding any sample; and shift length. This information, similar to that required under existing § 70.210, would provide miners with sampling and exposure information for the shift. Under the proposal, the District Manager could require any other information, such as the person responsible for sampling during the shift and unique mining activities (*e.g.,* retreat mining, and cutting overcast).

Proposed paragraph (c)(2) would require the designated mine official to post the weekly accumulated exposure (WAE) and the weekly permissible accumulated exposure (WPAE) for each occupation and for each crew within two hours after the end of the last sampling shift of a work week (Sunday through Saturday). If an operator employs multiple crews on a single MMU, the proposal would require that the WAE and WPAE for each crew be posted. Posting the WAE and WPAE would provide miners with the total amount of coal mine dust accumulated during the work week, as well as the maximum amount of accumulated exposure to coal mine dust permitted to be received during a normal work week. Posting these data would assure that miners are informed of their weekly exposure levels so that they can take a proactive role in their health protection.

Proposed paragraph (c)(3) would require the information to be posted for at least 15 calendar days. In response to the CPDM RFI, some commenters suggested that the information be posted for 31 days. One commenter stated that the information should be available to any interested party, should be posted for 31 days and available thereafter on request. Some commenters stated that MSHA should develop a standard format for reporting data. Since the CPDM would generate daily and weekly reports, the Agency believes that 15 days is an adequate amount of time to assure that all affected miners would be informed of their daily and weekly exposure levels. MSHA is concerned that requiring daily and weekly reports to be posted for 31 days would cause the mine bulletin board to become cluttered, making it difficult for miners to sort through the data. The Agency requests comment on an appropriate amount of time for posting and a standard format for reporting data. Please be specific in your comments and include rationale for your suggestions.

N. Section 70.212 Status Change Reports

Proposed § 70.212, redesignated from existing § 70.220, would revise paragraph (a) and add a new paragraph (c). Paragraph (b) would remain the same.

Proposed paragraph (a) would provide operators the option of reporting to MSHA changes in operational status of the mine, MMU, or DA electronically instead of in writing.

Proposed paragraph (c) is new and would require the designated mine official to report status changes that affect the operational readiness of any CPDM within 24 hours after the status change has occurred. Examples could include a malfunction or breakdown of a CPDM that is needed for sampling, or failure to have a spare CPDM available for required sampling. Since MSHA would rely on data provided by the CPDM to evaluate dust controls and to assure that miners are not exposed to excessive levels of respirable coal mine dust, the Agency would need to be informed of any circumstances that would affect the operational readiness of CPDMs.

30 CFR Part 71

A. Section 71.2 Definitions

The proposed definitions, approved sampling device, CMDPSU, CPDM, equivalent concentration, and quartz, are the same as proposed part 70 definitions discussed elsewhere in the preamble related to proposed § 70.2.

Designated Work Position (DWP)

The proposal would revise the existing definition of *designated work position (DWP)* to mean a work position at a surface area of a coal mine required to be sampled under this standard. Consistent with Agency policy, the proposed definition would require that the DWP designation consist of a four-digit surface area number assigned by MSHA identifying the specific physical portion of a surface coal mine or surface area of an underground mine that is affected, and a three-digit MSHA coal mining occupation code describing the location to which a miner is assigned in the performance of his or her regular duties.

Representative Samples

The proposal would add a new definition for *representative samples.* It would be defined as respirable dust samples that reflect typical dust concentration levels in the working environment of the DWP when the miner is performing normal duties.

MSHA would consider that "typical dust concentration levels" are present during sampling if they approximate and are characteristic of the DWP's dust concentration levels during periods of non-sampling. Under the proposed rule, samples must be taken while the DWP is engaged in normal work duties.

The proposed definition would be added to ensure that operators conduct dust sampling when working conditions accurately represent miners' dust exposures. This would allow operators and MSHA to more effectively evaluate the performance of dust controls and the adequacy and effectiveness of operators' approved plans.

Work Position

The proposal would make a non-substantive change by adding the term "three-digit" to the existing definition of *work position.* The proposal is consistent with the Agency's practice of identifying the specific position being sampled. The proposed change would ensure that MSHA can properly correlate each dust sample with the work location, position and shift from which it was obtained.

B. Section 71.100 Respirable Dust Standards

The proposed rule would, over a phase-in period, lower the concentration limit for respirable coal mine dust for surface coal mines and for surface work areas of underground coal mines.

Proposed paragraph (a) would retain the existing requirement that mine operators continuously maintain the average concentration of respirable dust in the mine atmosphere during each shift to which each miner in the active workings of each mine is exposed at or below 2.0 mg/m^3 of respirable dust.

Proposed paragraphs (b) through (d) are new and would require mine operators to lower dust levels, over a 24-month phase-in period, from the existing level of 2.0 mg/m^3 of air to 1.0 mg/m^3. MSHA solicits comment on the proposed phase-in periods and requests that a detailed rationale accompany any comment or recommendation that is submitted.

Proposed § 71.100(a) through (d) are identical to proposed § 70.100(a)(1) through (a)(4) and the rationale is

discussed elsewhere in the preamble related to proposed § 70.100(a)(1) through (a)(4).

C. Section 71.101 Respirable Dust Standard When Quartz is Present

Proposed § 71.101 would be identical to proposed § 70.101, discussed elsewhere in this preamble.

D. Section 71.201 Sampling; General and Technical Requirements

The proposed rule would revise operator sampling requirements in existing § 71.201.

Proposed paragraph (a) would make a nonsubstantive change to existing § 71.201(a) to clarify that the respirable dust samples taken in the active workings be "representative samples". The term "representative samples" is discussed elsewhere in the preamble related to definitions.

Proposed paragraph (b) would retain the existing requirement that sampling devices be worn or carried directly to and from the DWP to be sampled. It would revise the existing standard to require that sampling devices remain with the DWP and be operational during the entire shift, even when the shift exceeds 8 hours (extended shift). This would include the time spent in the DWP and while traveling to and from the DWP being sampled. Proposed § 71.201(b) is consistent with proposed § 70.201(e); however, the language in proposed § 71.201(b) would be tailored to apply to DWPs. The rationale for the proposed provision is the same as that in proposed § 70.201(e), which is discussed elsewhere in the preamble.

Proposed paragraph (b)(1) is new and would address work shifts longer than 12 hours. It would require that when using a CMPDSU and the work shift to be sampled is longer than 12 hours, the operator would have to switch-out the unit's sampling pump prior to the 13th hour of operation. Proposed § 71.201(b)(1) is the same as proposed § 70.201(e)(1).

Proposed paragraph (b)(2) is new and would add a similar requirement to address work shifts longer than 12 hours when operators use CPDMs. It would require the operator to switch-out the CPDM with a fully charged device prior to the 13th-hour of operation. Proposed paragraph (b)(2) is the same as proposed § 70.201(e)(2). The rationale for proposed § 71.201(b)(1) and (b)(2) is discussed elsewhere in the preamble related to proposed § 70.201(e)(1) and (e)(2).

Proposed paragraphs (c)(1) through (c)(4) are new and would require: The mine operator to use one control filter for each shift of sampling when a CMDPSU is used; each control filter to have the same pre-weight date (noted on the dust data card) as the filters used for sampling; each control filter to remain plugged at all times; each control filter to be exposed to the same time, temperature, and handling conditions as the filter used for sampling; and that each control filter be kept together with the exposed samples after sampling. Proposed § 71.201(c)(1) through (c)(4) are identical to proposed § 70.201(f)(1) through (f)(4) and the rationale is discussed elsewhere in the preamble related to proposed § 70.201(f).

The proposed rule would revise and move existing § 71.201(d) to proposed § 71.207(k), which would apply to operators who use a CMDPSU or a CPDM for sampling DWPs. Proposed § 71.207(k) is discussed elsewhere in the preamble.

Proposed paragraph (d) is new and would require the operator to make a record showing the length of each normal work shift for each DWP, retain the records for at least six months, and make them available for inspection by authorized representatives of the Secretary and the miners' representative. Mine operators would need to know the length of the normal work shift to determine the equivalent concentration. MSHA would use these records to verify that operators are accurately recording the normal work shift lengths so that miners are not being overexposed.

Proposed paragraph (e), redesignated from existing paragraph (c), would be revised to require that, upon request from the District Manager, the operator would submit the date and time any respirable dust sampling would begin. This information would have to be submitted to the District Manager at least 48 hours prior to scheduled sampling. The proposed 48-hour notification requirement would provide the Agency the opportunity to observe and monitor operator sampling, which would ensure that both operating conditions and sampling requirements are met.

Proposed paragraphs (f)(1) through (f)(2), redesignated from existing (e)(1) and (e)(2), retain the existing requirements.

Proposed paragraph (g) is new and would require mine operators using CPDMs to provide training to all miners expected to wear one. This would include each highwall drill operator, bulldozer operators, and other work positions determined by results of respirable dust samples to have the greatest respirable dust concentration. Proposed § 71.201(g) is the same as proposed § 70.201(j) and the rationale is discussed elsewhere in the preamble related to proposed § 70.201(j). In addition, proposed paragraphs (g)(1)–(5), which are identical to proposed § 70.201(j)(1)–(5), would establish the CPDM training that would be required. The rationale, discussed elsewhere in the preamble, is the same for both.

Proposed paragraph (h) is new and would require mine operators to maintain a record of training at the mine site for two years following completion of training. MSHA believes it is important to retain these records to verify that the required training has been provided. Proposed paragraph (h) would also permit a mine operator to maintain the record at another location as long as the record could be immediately accessed electronically from the mine site. Finally, proposed paragraph (h) would require that upon request by an authorized representative of the Secretary, Secretary of HHS, or miners' representative, the mine operator must promptly provide access to any such training record. Proposed § 71.201(h) is the same as proposed § 70.201(k) and the rationale is discussed elsewhere in the preamble related to proposed § 70.201(k).

E. Section 71.202 Certified Person; Sampling and § 71.203 Certified Person; Maintenance and Calibration

Proposed §§ 71.202 and 71.203 would be identical to proposed §§ 70.202 and 70.203, discussed elsewhere in this preamble.

F. Section 71.204 Approved Sampling Devices; Maintenance and Calibration

Proposed § 71.204 would be identical to proposed § 70.204, discussed elsewhere in this preamble.

G. Section 71.205 Approved Sampling Devices; Operation; Air Flowrate

Proposed § 71.205 would be identical to proposed § 70.205 with one exception. The last sentence of proposed §§ 70.205(b)(1) is not included in proposed § 71.205 since it applies to underground areas of anthracite coal mines. The rationale for proposed § 71.205 is the same as that for proposed § 70.205, which is discussed elsewhere in the preamble.

H. Section 71.206 CPDM Performance Plan

Proposed § 71.206 would be identical to proposed § 70.206, discussed elsewhere in this preamble, with one exception. Proposed § 71.206(b)(1) would require the Plan to include the designated work positions (DWPs) that would be sampled, and each DWP would be required to be identified by a

unique 9-digit number. Though the 9-digit identification number would be determined similarly to the identification number that would be required for each MMU occupation in underground mines, it would be modified to account for the operation of surface mines.

I. Section 71.207 Sampling of Designated Work Positions

Proposed § 71.207 is derived from existing § 71.208 and would address sampling of designated work positions (DWPs) when using a CMDPSU or CPDM.

Proposed § 71.207(a) would revise existing § 71.208(a) and require operators, who are using CMDPSUs or CPDMs, to take one sample every calendar quarter from the working environment of each DWP. The quarterly periods would be: (1) January 1–March 31; (2) April 1–June 30; (3) July 1–September 30; and (4) October 1–December 31. Like the existing rule, the proposal would require that one valid sample be taken from each DWP. It would require that each sample be a "representative sample," and would no longer include the term "respirable dust sample." The term representative sample is new and is discussed elsewhere in this preamble in proposed § 71.2 related to definitions. The proposed change to include a representative sample would offer greater protection for miners since it would provide a more accurate portrayal of miners' respirable dust exposure. The proposed rule would reduce the existing DWP sampling frequency from bimonthly to quarterly. However, as discussed below for proposed paragraph (b), the proposal would require operators to sample an increased number of DWPs, which are associated with higher dust concentrations, at a frequency to assure that all miners in those positions are protected.

Proposed § 71.207(b) is new and would require operators to collect DWP samples at designated locations to measure respirable dust generation sources in the active workings. The proposal would require that DWP samples be collected from the following positions: each highwall drill operator (MSHA occupation code 384); bulldozer operators (MSHA occupation code 368); and other work positions designated by the District Manager for sampling in accordance with proposed § 71.207(f). The proposal would require that each highwall drill operator be sampled since historical sampling data and MSHA experience indicate that these positions have the greatest potential of being overexposed to respirable quartz and respirable coal mine dust. Bulldozer operators would be DWPs since they have similar risks and need additional protection. Under circumstances specified in proposed § 71.207(c), discussed below, some bulldozer operators could be exempt from sampling requirements. Also, the District Manager could designate other work positions for sampling in accordance with proposed § 71.207(f) discussed below. MSHA believes that the proposed rule would provide improved health protection for miners in work positions that have increased risks of overexposure to respirable dust and quartz.

Proposed § 71.207(c) is new and would require operators with multiple work positions specified in paragraphs (b)(2) (bulldozer operators) and (b)(3) (other work positions) to sample the DWP exposed to the greatest respirable dust concentration in each work position performing the same activity or task at the same location and exposed to the same dust generation source. MSHA recognizes that some bulldozer operator positions, or other work positions designated by the District Manager, may have variable respirable dust exposure. In those cases, the proposal would require the operator to sample only the DWP exposed to the greatest respirable dust concentration. For example, if two bulldozer operators push overburden at the same location, the operator would sample the bulldozer operator exposed to the greatest concentration of respirable dust. MSHA believes this would assure that other miners performing similar tasks at the same location are protected from excessive dust exposure. Also, if some bulldozer operators push overburden and others perform reclamation work, the mine operator would be required to sample one bulldozer operator pushing overburden and one bulldozer operator performing reclamation work. MSHA would not accept a respirable dust sample for the designated bulldozer operator performing reclamation work as a representative sample of the working environment for all bulldozer operators.

Proposed § 71.207(c) would also require operators to provide the District Manager with a list identifying the specific bulldozer operator positions and other work positions under proposed § 71.207(b)(2) and (b)(3) that will be sampled. The proposed timeframes for submitting the lists would be: (1) Active mines—by [date 60 days after publication of final rule]; (2) New mines—30 calendar days of mine opening; or (3) Changes in operational status that increase or reduce the number of active DWPs—within 7 calendar days. The proposed rule would require the lists be submitted to the District Manager to assure that the appropriate DWPs are identified for sampling. MSHA believes that the proposal would provide operators with sufficient time to identify and submit to the Agency the lists of DWPs to be sampled.

Proposed § 71.207(d), redesignated from existing § 71.208(h), would retain the requirement that DWP samples be taken on a normal work shift and that when a normal work shift is not achieved, the dust data card transmitted to MSHA must include a notation to that effect. The proposal would include a new requirement that certified persons must place the notation on the back side of the dust data card. MSHA experience indicates that operators do not always put the notation on the card in a conspicuous location, which increases the likelihood that this important information can be overlooked. The proposed revision is consistent with proposed § 70.205(b)(2) and Agency policy.

Proposed § 71.207(d) would continue to allow MSHA to void a DWP sample if a normal work shift is not achieved. It would delete the existing requirement that any sample greater than 2.5 mg/m^3 be used when a normal work shift is not achieved. Instead, the proposal would require that, if any sample exceeds the applicable standard by at least 0.1 mg/m^3, regardless of whether or not a normal work shift was achieved, the sample would be used to determine compliance with the applicable standard. The proposed provision is similar to proposed § 70.207(d). The rationale for proposed § 71.207(d) is the same as for proposed § 70.207(d), which is discussed elsewhere in the preamble.

Proposed § 71.207(e), redesignated from existing § 71.208(g), would include a minor, nonsubstantive change.

Proposed § 71.207(f), redesignated from existing § 71.208(e), would allow the District Manager to designate additional work positions for sampling where a concentration of respirable dust exceeding 50 percent of the applicable standard has been measured by one or more MSHA samples. Example: Suppose the applicable standard is 1.5 mg/m^3 and MSHA samples taken for a work position at a surface mine show respirable dust concentrations of 0.8 and 1.0 mg/m^3. Both samples exceed 0.75 mg/m^3, which is 50% of the applicable standard. Since the sampling results are at levels of concern, it is reasonable for the District Manager to designate the position as a DWP. The

proposal would assure the work environments of miners in these positions are sampled so that operators can determine if dust controls are adequate and that miners are sufficiently protected. The proposal is consistent with existing § 71.208(e) which requires District Managers to designate for sampling each work position where the average concentration of respirable dust exceeds 1.0 mg/m^3, which is 50% of the existing standard.

Proposed § 71.207(f) would also revise existing § 71.208(e) and provide that if the respirable dust standard is reduced in accordance with proposed § 71.101 to a level below the respirable dust standard under proposed § 71.100 (reduced standard due to quartz), the District Manager may designate additional work positions for sampling where the respirable dust concentration from one or more MSHA samples exceeds the new (reduced) applicable standard. For example: If based on samples from a work position, the respirable dust standard is reduced due to quartz from 1.5 mg/m^3 to 1.2 mg/m^3 and one or more MSHA samples for the position exceed 1.2 mg/m^3, the proposal would allow the District Manager to designate the work position as a DWP. The proposal would improve miners' health and assure that operators would be required to routinely sample work positions that have increased health risks due to respirable quartz.

Proposed § 71.207(g), redesignated from existing § 71.208(f) would provide that, upon finding that the operator is able to maintain continuing compliance with the applicable standard, the District Manager may withdraw a DWP designated for sampling under proposed paragraph (f) from sampling. Under the existing standard, the District Manager must withdraw the designation of a work position for sampling when such a finding is made. In both the existing and proposed rules, the District Manager's finding is based on the results of MSHA and operator samples taken during at least a one-year period. MSHA believes that requiring the withdrawal of the work position from sampling does not protect miners who are assigned duties that have temporarily kept them from high dust exposures since assigned duties in surface work positions, including truck drivers and front end loaders, can change. Under the proposal, the District Manager would have discretion to evaluate the potential duties of the DWP, and mining conditions, to determine whether the DWP should be withdrawn from sampling requirements.

Proposed § 71.207(h), (h)(1), and (h)(2) would apply when the respirable dust standard has been changed under proposed § 71.101 due to the presence of quartz.

Proposed § 71.207(h) is new and would require that when the applicable dust standard is changed in accordance with proposed § 71.101 (Respirable dust standard when quartz is present), the new applicable standard would be effective on the first normal work shift following the operator's receipt of notification of the change from MSHA. The proposal would provide increased health protection for miners by ensuring prompt implementation of the new applicable standard when quartz is present. The proposed revision is consistent with Agency policy and proposed § 70.207(c), which is discussed elsewhere in the preamble.

Proposed § 71.207(h)(1) is derived from existing § 71.208(b). Under the proposal, if all samples for the DWP from the most recent quarterly sampling period do not exceed the new applicable standard, the operator would begin sampling of the DWP on the first normal work shift during the next quarterly period following notification from MSHA of the change in the applicable standard. Proposed § 71.207(h)(1) is also consistent with Agency policy and proposed § 70.207(c)(1), which is discussed elsewhere in the preamble.

Proposed § 71.207(h)(2) is new and would require that if any sample from the most recent quarterly sampling period exceeds the new applicable standard (reduced due to the presence of quartz), the operator must make necessary adjustments to the dust control parameters within three days, and then collect a sample from the affected DWP on a normal work shift. The sample would be treated as a normal quarterly sample. MSHA believes that operators should take prompt actions to reduce the dust levels when the new applicable standard is exceeded and that three days is a reasonable amount of time to do so. Under the proposed rule, the additional sample would allow operators to make a timely determination as to whether dust controls are working effectively. Proposed § 71.207(h)(2) would afford additional protection for miners who need to be on a reduced standard.

Proposed § 71.207(i) is new and would require that no valid single-shift equivalent concentration shall meet or exceed the ECV that corresponds to the applicable standard. Tables 71–1 and 71–2 list ECVs for operators using CMDPSUs or CPDMs, respectively. Proposed § 71.207(i) is consistent with proposed § 70.207(e), which would apply when CMDPSUs are used, and § 70.208(d), which would apply when CPDMs are used. The rationale for the proposed provision is the same as that for proposed §§ 70.207(e) and 70.208(d), which are discussed elsewhere in the preamble.

Proposed § 71.207(j), redesignated from existing § 71.208(d), would require that upon issuance of a citation for a violation of the applicable standard, paragraphs (a) (quarterly sampling) and (h)(2) (sampling when a respirable dust standard is changed due to quartz) would not apply to the DWP until the violation is abated in accordance with proposed paragraph (k). Except for minor, nonsubstantive changes, the proposal would be essentially the same as the existing standard. The proposal would also make conforming changes to replace references to paragraphs that have been redesignated.

The proposed rule would redesignate and revise existing § 71.201(d) as proposed § 71.207(k), and would require operators to take actions, listed in proposed paragraphs (k)(1) through (k)(4), during the time for abatement fixed in a citation for violation of the applicable standard.

Proposed paragraph (k)(1) would require operators to make approved respirators available to the affected miners in accordance with proposed § 72.700. The proposal is consistent with existing § 70.300, which requires operators to make respiratory equipment available to all persons exposed to respirable dust concentrations exceeding levels required to be maintained. Proposed § 71.207(k)(1) is consistent with proposed § 70.207(g)(1). The rationale for proposed § 71.207(k)(1) is the same as that for proposed § 70.207(g)(1), which is discussed elsewhere in the preamble.

Proposed paragraph (k)(2) would require operators to submit to the District Manager for approval proposed corrective actions to lower the concentration of respirable dust to within the applicable standard. Proposed paragraph (k)(3) would require that, upon approval by the District Manager, operators must implement corrective actions and then sample the affected DWP on each normal work shift until five valid representative samples are taken. Proposed paragraphs (k)(2) and (k)(3) are derived from existing § 71.201(d) and are consistent with generally accepted occupational industrial hygiene principles. MSHA believes that if a citation is issued for a violation of the applicable standard, operators must take action to protect miners, including making respiratory protection available, evaluating dust

control measures, and implementing new measures, as necessary, to reduce miners' risks of dust exposure.

Proposed paragraph (k)(4) would require operators to review the adequacy of the approved CPDM Performance Plan. If any CPDM Performance Plan revisions are needed, it would require operators to submit proposed revisions to the District Manager for approval within 7 calendar days following posting of the applicable end-of-shift equivalent concentration on the mine bulletin board. MSHA believes that when the respirable dust concentration meets or exceeds an applicable ECV, the operator should be required to review the CPDM Performance Plan to determine whether revisions are necessary to prevent miners from being overexposed in the future. In addition, MSHA believes a 7-calendar day period is a reasonable amount of time for the operator to review and submit CPDM plan revisions for approval. This proposed provision is consistent with proposed § 70.208(f)(4) which would apply when operators use a CPDM.

MSHA believes that proposed § 71.207(k)(2)–(4) would assure that effective proposed corrective actions are reviewed by the District Manager and implemented by operators in a timely manner.

Proposed § 71.207(l) is new. It would allow MSHA to terminate a violation of the applicable standard when: (1) The equivalent concentration of each of the five valid operator abatement samples is at or below the applicable standard; and (2) within 15 calendar days after receipt of MSHA's sampling results, the operator submits to the District Manager for approval a proposed dust control plan applicable to the DWP, or proposed changes to the approved dust control plan, as prescribed in proposed § 71.300. The proposal also would require that proposed plan parameters or proposed changes reflect the control measures used to abate the violation. The proposed provision is consistent with proposed §§ 70.207(h), 70.209(f), and 90.208(f). MSHA believes that 15 calendar days is a reasonable amount of time for the operator to prepare and submit a dust control plan or changes to that plan. The proposal would assure that dust control parameters in the approved dust control plan for the DWP are appropriate and demonstrate that they effectively reduce concentrations of respirable dust.

The proposed rule would redesignate existing § 71.208(c) as proposed § 71.207(m). Proposed § 71.207(m) would remain essentially the same as existing § 71.208(c), with minor changes. Like the existing standard, proposed § 71.207(m) would apply to operators who use a CMDPSU to meet DWP sampling requirements. If MSHA notifies the operator that a valid representative sample taken from a DWP exceeds the applicable standard but is less than the ECV that corresponds to the applicable standard in Table 71–1, the operator would be required, within 15 calendar days of notification, to sample the DWP until five valid representative samples are collected. The term "representative sample" is new and discussed elsewhere in the preamble related to definitions in proposed § 71.2. Also, the proposal would require that operators begin sampling on the first normal work shift following receipt of MSHA's notification and that samples be evaluated to determine compliance with the applicable standard for the sampling period.

Proposed § 71.207(n) is derived from existing § 71.208(c) and would apply to operators who use a CPDM to meet the DWP quarterly sampling requirements under proposed paragraph (a). Proposed paragraph (n)(1) is similar to proposed paragraph (m). It would require the operator to sample the DWP until five valid representative samples are collected when a valid end-of-shift equivalent concentration exceeds the applicable standard but is less than the ECV that corresponds to the applicable standard in Table 71–2. Sampling would be required to begin on the first normal work shift after the operator determines that the applicable standard is exceeded and the samples would be evaluated to determine compliance with the applicable standard for the sampling period. The rationale for sampling under proposed paragraph (n)(1) is the same as that for proposed paragraph (m).

Proposed paragraph (n)(2) is new and would require the operator to review the adequacy of the approved CPDM Performance Plan. If any CPDM Performance Plan revisions are needed, it would require the operator to submit proposed revisions to the District Manager for approval within 7 calendar days following posting of the end-of-shift equivalent concentration on the mine bulletin board. MSHA believes that if an end-of-shift respirable dust concentration meets or exceeds an applicable ECV, the operator should be required to review the CPDM Performance Plan to determine whether revisions are necessary to prevent miners from being overexposed in the future. A 7-calendar day period is a reasonable amount of time for the operator to review and submit CPDM plan revisions for approval. This proposed provision is consistent with proposed §§ 70.208(g)(4), 70.209(g)(4), and 90.209(f)(4).

J. Section 71.208 Respirable Dust Samples; Transmission by Operator

Proposed § 71.208, redesignated from existing § 71.209, would revise requirements for the operator to transmit respirable dust sampling information collected by either a CMDPSU or CPDM. It would revise paragraphs (a) and (c) and add a new paragraph (f); paragraphs (b), (d), and (e) would remain the same.

Proposed paragraph (a) would make a non-substantive change to clarify that it only applies to operators' transmission of samples collected with a CMDPSU.

Proposed paragraph (c) would retain the existing requirement that only persons certified in sampling complete the dust data card provided by the manufacturer of the filter cassette. It would be revised to require that each dust data card be signed by the certified person who actually performed the sampling shift examinations. Consistent with MSHA's existing policy, the proposal would also require that the person's signature on the data card include that person's MSHA Individual Identification Number (MIIN). Proposed § 71.208(c) is similar to proposed § 70.210(c), and the rationale is discussed elsewhere in the preamble related to proposed § 70.210(c).

Proposed paragraph (f) is new and would apply when operators use CPDMs to sample. It would require that, within 12 hours after the end of the last sampling shift for a DWP, a designated mine official must validate, certify, and transmit electronically to MSHA all sample and error data file information collected during the previous shifts and stored in the CPDM. It would also require the operator to maintain all CPDM data files transmitted to MSHA for at least 12 months. Proposed § 71.208(f) is similar to proposed § 70.210(f), and the rationale is discussed elsewhere in the preamble related to proposed § 70.210(f).

K. Section 71.209 Respirable Dust Samples; Report to Operator; Posting

Proposed § 71.209, redesignated from existing § 71.210, would address data contained in MSHA's report of respirable dust samples provided to operators. It would also address requirements for the operators' posting of sampling data. Proposed § 71.209 would include non-substantive changes in paragraphs (a)(2) through (a)(4), revise paragraph (b), and add a new

paragraph (c). Paragraph (a)(1) would remain the same.

Proposed paragraph (a)(2) would replace "designated work position" with "DWP." Proposed paragraph (a)(3) would make a conforming change by adding that the concentration of respirable dust be expressed "as an equivalent concentration." The change is consistent with other proposed provisions that specify that the concentration of respirable coal mine dust is converted to and expressed as an 8-hour equivalent concentration, even when the total time worked is greater than 8 hours.

Existing paragraph (a)(4) would be deleted because the average concentration of respirable dust would be based on a valid single-shift sample under the proposed rule.

Existing paragraph (a)(5) would be redesignated as proposed paragraph (a)(4) and would retain the existing requirement that reasons for voiding samples be posted.

Proposed paragraph (b) would be revised to require operators to post sampling data for at least 46 days on the mine bulletin board. Existing regulations under parts 70 and 71 require operators to post sampling data for 50 percent of the specified sampling period (*e.g.,* 31 days is 50 percent of the bimonthly sampling period specified in existing § 71.208(a)). Since proposed § 71.207 would require operators to take DWP samples every calendar quarter, posting the sampling data for 46 days, which is approximately 50 percent of a quarterly sampling period, would be consistent with existing posting requirements.

Proposed paragraph (c) is new and would apply to operators who use a CPDM. It would require the designated mine official to validate, certify, and post certain sampling information on the mine bulletin board. Proposed paragraph (c)(1) would require the designated mine official to post the daily end-of-shift sampling results within 1 hour after the end of the sampling shift. The daily posting must include the: mine identification number; DWP at the mine from which samples were taken; respirable dust concentration expressed as an equivalent concentration for each valid sample; reason for voiding any sample; and shift length. This information, similar to that required under existing § 71.210, would provide miners with sampling and exposure information for the shift. Under the proposal, the District Manager could require any other information, such as activities being performed (hauling rock or hauling dust), physical conditions (rainy or dry) and the location sampled on the mine site (in the pit or on the mountain top).

Proposed paragraph (c)(2) would require the information to be posted for at least 46 calendar days. Proposed paragraph (c)(2) is identical to proposed paragraph (b) of this section, and the rationale is discussed earlier in this section of the preamble. The Agency requests comment on an appropriate amount of time for posting and a standard format for reporting data. Please be specific in your comments and include the rationale for your suggestions.

L. Section 71.210—Status Change Reports

Proposed § 71.210, redesignated from existing § 71.220, would revise paragraph (a) and add a new paragraph (c). Paragraph (b) would remain the same. Proposed paragraph (a) would provide operators the option of reporting to MSHA changes in operational status of the mine or DWP electronically instead of in writing. Proposed paragraph (c) would require the designated mine official to report status changes that affect the operational readiness of any CPDM within 24 hours after the status change has occurred. Proposed § 71.210(c) is identical to proposed § 70.212(c), and the rationale is discussed elsewhere in the preamble related to proposed § 70.212(c).

M. Section 71.300 Respirable Dust Control Plan; Filing Requirements

Proposed § 71.300 would revise existing requirements for operators who must file a dust control plan when they receive a citation for a DWP sample.

Proposed § 71.300(a) would require the operator to submit a dust control plan applicable to the DWP identified in the citation and that the plan be adequate to continuously maintain respirable dust within the applicable standard at the DWP. For clarification and consistency, the proposal would replace the term "work position" in existing § 71.300(a) with the term "DWP." The proposal would also replace language in the existing standard that requires the plan to be submitted "Within 15 calendar days after the termination date of a citation for violation of § 71.100 (Respirable dust standard) or § 71.101 (Respirable dust standard when quartz is present)" with "As required by § 71.207(l)." Proposed § 71.207(l) is discussed elsewhere in the preamble. Proposed § 71.300(a) would also replace the phrase "permissible concentration at the surface work position identified in the citation" with the phrase "applicable standard at the DWP." This is a nonsubstantive change and reflects MSHA's intent under the proposed rule that dust control measures identified in the respirable dust control plan must be sufficient to maintain dust levels at or below the applicable standard so that concentrations do not get to citable ECV levels. This would assure increased protections for miners.

Proposed § 71.300(a)(1) is new and would require operators to notify the representative of miners at least 5 days prior to submitting a proposed respirable dust control plan, or proposed revisions to an existing plan, to the District Manager for approval. The proposal would also require that, if requested, operators must provide a copy to the representative of miners at the time of the 5-day notification. This provision is consistent with procedures for submitting plans in other MSHA standards. MSHA experience reveals that input from miners on proposed dust provisions is important. The proposal would allow sufficient time for the miners' representative to become familiar with the proposed plan or revisions and to discuss and resolve any issues prior to submission to the District Manager for approval.

Proposed § 71.300(a)(2) is new and would require the operator to make available for inspection by the miners' representative a copy of the proposed respirable dust control plan and any proposed revisions that have been submitted for approval to the District Manager. This would ensure that the miners' representative would have access to copies of proposed plan documents for review.

Proposed § 71.300(a)(3) is new and would require a copy of the proposed respirable dust control plan, and a copy of any proposed revision, submitted to the District Manager for approval to be posted on the mine bulletin board at the time of submittal. The proposed dust control plan or proposed revision would be required to remain posted on the bulletin board until approved, withdrawn, or denied. The proposed posting requirement would ensure that miners are made aware of the content of the proposed plan.

Proposed § 71.300(a)(4) is new and would permit the representative of miners, following receipt of a proposed dust control plan or proposed revision, to submit timely, written comments to the District Manager for consideration during the review process. To receive consideration by the District Manager, the miners' representative would have to submit comments to the District Manager in a "timely" manner. Under the proposal, MSHA would construe "timely" to mean that miners'

representatives must submit comments within a reasonable time after they receive a copy of proposed plan provisions so the District Manager would have sufficient time to consider them in the review process.

Proposed § 71.300(a)(4) would require that, when requested, the District Manager must provide operators with a copy of the miners' representatives' comments. Proposed § 71.300(a)(2) and (a)(4) would ensure that all parties to the dust control plan process are aware of each others' positions on potential issues.

Proposed § 71.300(b)(1) and (b)(2) would include nonsubstantive changes and replace "designated work position" with "DWP" for consistency with other part 71 proposed provisions. No changes are proposed for existing § 71.300(b)(3) and (b)(4).

N. Section 71.301 Respirable Dust Control Plan; Approval by District Manager and Posting

Proposed § 71.301 would continue to address the criteria MSHA would use to approve, on a mine-by-mine basis, the dust control plan. MSHA is proposing revisions to § 71.301(a)(1) and 71.301(b), and proposing to add a new § 71.301(d)(1) through 71.301(d)(3). No changes are proposed for existing § 71.301(a)(2), (c), and (e).

For consistency and clarification, proposed § 71.301(a)(1) would provide that, in approving respirable dust control plans, the District Manager would consider whether the respirable dust control measures would likely maintain "concentrations of respirable coal mine dust at or below the applicable standard." Under the existing standard, the District Manager considers whether the dust control measures would likely maintain "compliance with the respirable dust standard." The proposed language would clarify that the District Manager's review would assure that control measures in the plan would likely maintain respirable dust concentrations at or below the applicable standard so that concentrations do not get to citable ECV levels. This would assure improved protection for miners.

Proposed § 71.301(b) would revise the existing standard to permit MSHA to take respirable dust samples to determine whether control measures in the operator's plan effectively maintain "concentrations of respirable coal mine dust at or below the applicable standard." MSHA's rationale for this proposal is the same as that described above for proposed § 71.301(a)(1). The proposed language would clarify that the operator's dust control measures must control dust to levels at or below the applicable respirable dust standard, which would ensure that concentrations do not get to citable ECV levels. This would assure improved protection for miners.

Proposed § 71.301(d)(1) is new and would require that, upon request and following notification of approval, the operator must provide the approved respirable dust control plan to the miners' representative. Proposed § 71.301(d)(2) is also new and would require the operator to make available the approved respirable dust control plan for inspection by the representative of miners. The proposed provisions are consistent with procedures for plan approval in other MSHA standards. They would ensure that the miners' representative would have timely access to the approved plan or plan revisions following notification of approval. They reflect MSHA's recognition that miners and their representatives play an important role in the plan approval process and need to be kept aware of the contents of the approved plan.

Proposed § 71.301(d)(3), derived from existing § 71.301(d), is new and would require the operator to post the respirable dust control plan on the mine bulletin board within 1 working day following notification of approval, and keep it posted for the period that the plan is in effect. The proposal would assure that miners, as well as their representatives, are aware of approved respirable dust control plan provisions. The Agency believes that allowing operators one full working day to post the plan is reasonable and would provide effective protection for miners.

30 CFR Part 72

A. Section 72.100 Periodic Examinations

Proposed § 72.100 is new and would add periodic spirometry, occupational history, and symptom assessment to the chest radiographic examinations already required to be offered to underground coal miners. It would extend the opportunity for those examinations to surface miners.

Proposed paragraph (a) would require mine operators to provide periodic examinations that include chest x-rays, spirometry, symptom assessment, and occupational history at no cost to the miner. Under NIOSH's existing Coal Workers' Health Surveillance Program (42 CFR part 37), "Specifications for Medical Examinations of Underground Coal Miners," underground coal mine operators are required to provide to underground coal miners and miners at surface areas of underground coal mines the opportunity for periodic evaluation with chest x-rays. Proposed paragraph (a) would extend chest x-ray examinations to coal miners at surface mines and implement a new requirement for spirometry examinations, symptom assessment, and occupational history for all coal miners. This proposal is consistent with recommendations of the Dust Advisory Committee and the NIOSH Criteria Document. The Dust Advisory Committee unanimously recommended that spirometry and questionnaire data be collected periodically and that medical testing be extended to surface coal miners. NIOSH recommended that the Coal Workers' X-Ray Surveillance Program be extended to include spirometry examinations, respiratory symptom and occupational history questionnaires, and surface coal miners.

MSHA is proposing a requirement for a spirometry examination because it is the most practical screening tool to detect reduced lung function in miners, which is the common evidence of Chronic Obstructive Pulmonary Disease (COPD). A requirement for a spirometry examination also complements the chest x-ray program by detecting effects, other than pneumoconiosis, of dust on the lung. The chest x-ray cannot detect COPD.

Miners at surface mines would be included in medical monitoring because they are also at risk of developing pneumoconiosis and COPD as a result of exposure to respirable coal mine dust. Some occupations at surface mines (*e.g.,* drill operators, bulldozer operators, and truck drivers) experience high exposure to silica and there are many former underground miners among surface miners with chest x-ray films that show pneumoconiosis. MSHA believes that this proposed requirement would provide improved health protection for all coal miners.

MSHA's proposal to extend chest x-ray examinations and implement a new requirement for spirometry would enable early detection of pneumoconiosis and COPD, respectively, both of which are irreversible and, for miners subject to continued overexposure, progressive. In the absence of medical monitoring and early intervention, a miner may continue to be overexposed, allowing the disease to progress so that the miner may suffer material impairment of health or functional capacity. For miners at surface mines, the proposal would allow them to have knowledge of the existence of pneumoconiosis so that they could exercise their rights to transfer to a less dusty job under proposed 30 CFR part 90. For all coal

miners, the proposed requirement for spirometry examinations would allow them to have knowledge of an abnormal decline in lung function, which would enable them to be proactive in their approach to their health.

Proposed paragraph (a)(1) would require mine operators to use NIOSH-approved facilities to conduct the examinations. Initial approval of facilities and subsequent renewals of approvals will be dependent upon meeting requirements specified by NIOSH. Approved facilities would: provide standardized methods for evaluating miners' health; have the necessary equipment and expertise for conducting tests, interpreting results, informing miners, and maintaining confidentiality of miners' health records; and be in locations that are accessible to miners.

Proposed paragraph (b) would require mine operators to provide miners the opportunity to have examinations specified in paragraph (a) at least every 5 years. Both pneumoconiosis and COPD develop slowly. It is unusual, for example, for a miner to have a positive chest x-ray less than ten years from first exposure to respirable coal mine dust. If a miner has a positive chest x-ray, it is important to intervene as promptly as possible for maximum health protection. An interval of 5 years or less between each miner's serial spirometry examinations should provide reasonable opportunity to assure detection of important declines in a miner's lung function due to dust exposure.

Early symptoms of pneumoconiosis or COPD may not appear to be important to miners so they might not be likely to seek medical assistance without regulatory intervention. More pronounced symptoms occur only after diseases become more advanced. The proposed requirement for periodic examinations is necessary for early detection of disease and early intervention to prevent progression of disease.

The proposal would also require mine operators to make examinations available during a 6-month period that begins no less than 3.5 years and not more than 4.5 years from the end of the last 6-month period. For example: If an operator provided examinations to miners during a 6-month period of July 1, 2009 to December 31, 2009, the operator would be notified by NIOSH by April 1, 2013, 3 months prior to July 1, 2013, to schedule the next 6-month period within which to offer miners the examinations. This proposed schedule is designed to give mine operators and approved facilities some flexibility in scheduling examinations and is consistent with the timeframes established in NIOSH's existing program.

Proposed paragraph (c) would require mine operators to provide the examinations specified in paragraph (a) to miners, who begin work at a coal mine for the first time (*i.e.,* the miner has never worked in any coal mine), when they are initially hired. Proposed paragraph (c)(1) would require that these initial examinations be made available no later than 30 days after beginning employment. Initial examinations would be mandatory for the miner. MSHA believes that examinations provided in close proximity to when miners are first hired and first exposed to respirable coal mine dust are necessary in order to establish an accurate baseline of the miner's health. The Agency solicits comment on an appropriate time for operators to make initial examinations available to miners. Please be specific in your comments and include rationale for your suggestions.

Proposed paragraph (c)(2), like the existing standard for chest x-rays, would require follow-up examinations to be provided within 3 years of the initial examinations. A 3-year rather than a 5-year interval at the start of the miner's career could provide necessary information for evaluating the results of spirometry tests. Several researchers noted that the decline in lung function due to dust is non-linear, sometimes with much of the decline coming early in the miner's career, often in less than three years. (Attfield & Hodous, 1992; Seixas NS, *et al.,* 1993). The Agency solicits comment on an appropriate time for operators to provide follow-up examinations to miners. Please be specific in your comments and include rationale for your suggestions.

Proposed paragraph (c)(3) would require the operator to provide follow-up examinations within 2 years, if the second chest x-ray (after the initial examination) shows evidence of pneumoconiosis or if the second spirometry examination shows evidence of reduced lung function. When this chest x-ray or spirometry examination indicates the presence of disease, more frequent testing would be necessary to detect and prevent further progression. There are some individuals who adversely respond to dust exposure relatively quickly and it is important to identify those individuals early.

Proposed paragraph (d), like the existing standard for chest x-rays, would require each mine operator to develop a plan for providing the medical examinations specified in paragraph (a) and to submit the plan to NIOSH for approval. The proposed requirement for a plan is essential to assure that mine operators provide the examinations within the established timeframes and at an approved facility. The proposed requirement for medical examinations would allow for early detection and treatment and, to be effective, it should be part of a comprehensive program designed to prevent further progression of early respiratory disease. The proposed requirement for submitted plans to include a roster specifying the name and current address of each miner covered by the plan would provide NIOSH with the ability to assure adequate notification of the availability of medical examinations to covered coal miners. NIOSH has required that such rosters be provided since the early 1990s, so this requirement would not create an additional burden for mine operators.

Proposed paragraph (e), like the existing standard for chest x-rays, would require each mine operator to post the approved plan for providing periodic examinations specified in paragraph (a) on the mine bulletin board and to keep it posted at all times. Posting the approved plan on the mine bulletin board can help to improve miners' awareness of the plan, and its purpose and provisions.

B. Section 72.700 Respiratory Equipment; Respirable Dust

Proposed § 72.700 would revise and redesignate existing § 70.300 to apply to all coal mines, whether surface or underground. The proposal would also add new training and record retention requirements related to respiratory equipment.

Proposed § 72.700(a) would revise and redesignate existing § 70.300 and would require operators to make NIOSH-approved respiratory equipment available to all persons as required by parts 70, 71 and 90. The proposal would revise the existing requirement and expand it to ensure that, as required under parts 70, 71, and 90, operators make respiratory equipment available to all persons, regardless of whether the person is at a surface mine, the surface area of an underground mine, or an underground mine. The existing standard does not cover persons at surface mines and surface areas of underground mines, nor miners subject to the part 90 requirements. Respirable dust is found not only in underground mining environments, but also at surface installations. Respirators can play an important role as an interim measure to reduce miners' exposure to respirable dust for short periods of time during which engineering and

environmental controls are being implemented. This interim protection is available for underground miners. MSHA believes that the existing protections afforded to underground miners should be extended to cover persons at surface mines, surface work areas of underground mines, and miners who are subject to the part 90 requirements.

Proposed § 72.700(a) would also require operators to maintain an adequate supply of respiratory equipment in order to make respirators available as required by the section. The existing requirement under § 70.300 provides that operators must maintain a supply of respiratory equipment adequate to deal with occurrences of concentrations of respirable dust in the mine atmosphere in excess of the levels required to be maintained under part 70. The proposal would expand the existing standard's scope of coverage to include parts 71 and 90. The Agency believes that operators should maintain an adequate supply of respiratory equipment so that any person, whether at a surface mine, the surface area of an underground mine, or an underground mine, as well as miners subject to the part 90 requirements, may avail themselves of the protections provided by respirators if they choose to do so.

Proposed § 72.700(a) would retain the existing requirement under § 70.300 that requires operators to use environmental control measures as the primary means of regulating respirable dust in the active workings. Consistent with the Mine Act, the proposal would prohibit the substitution of respirators for environmental control measures. Under existing practice and policy, engineering controls are the primary method used to control exposure to respirable dust. Section 202(h) of the Mine Act expressly prohibits the use of respirators as a substitute for environmental control measures in the active workings of a mine. The proposal is also consistent with the Dust Advisory Committee members' unanimous recommendation that respiratory equipment should not be permitted to replace environmental control measures, but should continue to be provided to miners until environmental controls are implemented that are capable of maintaining respirable dust levels within the applicable standard. The importance of using environmental controls was not only recognized by the Dust Advisory Committee, but also by NIOSH. NIOSH's 1995 Criteria Document recommends that engineering controls continue to be relied on as the primary means of protecting coal miners from respirable dust. Although MSHA received comments in 2000 and 2003 that operators should be allowed to use respiratory equipment in lieu of environmental and engineering controls to achieve compliance, proposed § 72.700(a) would retain the existing requirement that environmental controls be used as the primary means of complying with applicable dust standards. MSHA experience indicates that even when respirators are made available, miners may not use them because they can be uncomfortable and impractical to wear while performing work duties. In some cases, a miner may not be able to use a respirator due to health issues. General industrial hygiene principles recognize that engineering and environmental controls provide more consistent and reliable protection.

Proposed § 72.700(b) is new and would require training to be provided to all miners to whom respiratory protection must be made available under the proposal. It would require an operator to provide training prior to the affected miner's next scheduled work shift, unless the miner received training within the previous 12 months on the types of respirators that the operator makes available. The required training would include instruction on the types of respirators made available by the operator as well as instruction in the proper fitting, care, use and limitations of the respirators. The proposed training requirements are consistent with the recommendations made in the 1995 NIOSH Dust Criteria Document.

The proposed training requirements ensure that persons are adequately informed about the respirators that are available to them. In addition, the effectiveness of a respirator depends on the respirator wearer receiving proper training on use, fit, and care. Initial training would provide miners who must have respirators made available to them with general information about each type of respirator, as well as the proper care, fit, use and limitations of the equipment. Retraining under the proposal would be required only if the miner was not trained within the previous 12 months on the specific types of respirators made available. When required, retraining would reinforce the information and concepts provided in initial training. It would also serve to remind persons of the specific technical and functional limitations of the respiratory equipment available for use at the mine. As with each of MSHA's training standards, the Agency believes that providing proper instruction to miners serves to help them internalize information necessary to achieve optimum health protection from respirators, thereby reinforcing their commitment to helping to reduce health and safety risks to which they may be exposed.

The proposed training requirements would be performance-oriented and would allow for training to be tailored to each mine's individual circumstances and needs. For example, operators could develop a training module that not only includes the training topics required by proposed § 72.700(b), but also includes additional course content. Similarly, operators could choose to emphasize certain topics more than others based on the skills and knowledge assessment of their miners.

MSHA did not include the proposed training requirements under part 48 because part 48 already requires a considerable number of health and safety topics in which miners must receive training in a specified amount of time. For this reason, the proposal would require that this training be in addition to that required under part 48. MSHA believes requiring respirator training to be provided in a time period in addition to that required under part 48 would allow miners to receive adequate instruction on use of respirators in a comprehensive and focused manner. Although the time of training must be in addition to that required under part 48, operators may integrate this training into their part 48 training schedule. MSHA specifically solicits comments on the Agency's proposed approach to respirator training, including supporting rationale for suggested alternatives.

Proposed § 72.700(c) is new and would require operators to keep a record of the training provided under this provision. It would also require operators to maintain these records for at least two years following completion of the training, and would permit operators to store training records elsewhere if the records are immediately accessible from the mine site by electronic transmission, *e.g.,* by fax or computer.

The proposed two-year retention period provides MSHA with sufficient time within which the Agency can verify that miners have received the required training, while not being unduly burdensome on operators. MSHA solicits comment on the proposed record retention period. In addition, the proposal would allow for the convenience and efficiency of storing records at a central location, and accommodates the trend towards electronic record-keeping.

Proposed § 72.700(c) would also require operators to provide training records to an authorized representative

of the Secretary of Labor, Secretary of HHS, or miners' representative upon the request of such persons. This proposed requirement would be consistent with MSHA's other training standards.

C. Section 72.701 Respiratory Equipment; Gas, Dusts, Fumes, or Mists

Proposed § 72.701, redesignated from existing § 70.305, would expand the scope of the existing standard to all coal mines, whether underground or surface. The existing standard applies to underground coal mines and does not cover miners who work at surface mines or surface areas of underground coal mines. Gases, dusts, fumes and mists that may be detrimental to miners' health can be found at surface facilities as well as in underground mining environments. Respirators can play an important role in reducing miners' exposure to these gases, dusts, fumes and mists, and MSHA believes that the protections currently afforded to underground miners should extend to miners who work at surface facilities.

D. Section 72.800 Single, Full-shift Measurement of Respirable Coal Mine Dust

Proposed § 72.800 is new and would allow the use of either single, full-shift samples collected by either the Agency or operator to determine noncompliance with the respirable coal mine dust standards. MSHA believes that the proposed use of single, full-shift samples collected by the Agency or operator to determine noncompliance would eliminate an important source of sampling bias due to averaging [for a detailed description of this issue, see Appendix A of the 2000 single sample proposed rule (65 FR 42108, July 7, 2000).] Available at *http://www.msha.gov/regsinfo.htm.*

Under MSHA's existing standards and procedures, measurements made at the dustiest occupational locations or during the dustiest shifts sampled can be diluted by averaging them with measurements made under less dusty conditions. This practice has frequently resulted in MSHA not being able to require operators to take corrective actions to protect miners from the hazard of excessive respirable dust exposure. The existing regulatory framework based on averaging does not provide miners with an adequate level of protection from overexposure to respirable coal mine dust.

As was noted in the background section, in 1972, acting pursuant to the Coal Act, the Secretaries of the Interior and HEW made the joint finding in § 202(f), concluding that "single shift measurement of respirable dust will not, after applying valid statistical techniques to such measurement, accurately represent the atmospheric conditions to which the miner is continuously exposed" (Notice of Finding That a Single Shift Measurement of Respirable Dust Will Not Accurately Represent Atmospheric Conditions During Such Shift, 37 FR 3833 (February 23, 1972) (1972 Joint Finding)).

The proposed single sample provision is based on MSHA's experience, review of section 202(f) of the Mine Act, significant improvements in sampling technology, updated data, and comments and testimony on previous notices and proposals addressing the accuracy of single, full-shift sample measurements. This proposed rule would rescind the 1972 Joint Finding.

The proposed rule would allow the Agency to base determinations of noncompliance on single full-shift samples collected by the Agency or operator. The proposal is consistent with recommendations contained in both the 1995 NIOSH Criteria Document and the 1996 Dust Advisory Committee report. In the Criteria Document, NIOSH recommended the use of single, full-shift samples to compare worker exposures with its recommended exposure limit (REL) and concluded that this action is consistent with Section 202(f) of the Act. The Dust Advisory Committee recommended that MSHA change its compliance sampling program to allow the use of single full-shift samples for determining compliance; seven of nine Committee members affirmed this recommendation.

Sampling and analytical technology have progressed since the time the 1972 Joint Finding was issued. In 1995, NIOSH published an accuracy criterion that could be used to evaluate sampling and analytical methods for airborne contaminants (Kennedy *et al.* 1995). The accuracy criterion is that sampling and analytical methods need to produce results that fall within 25% of the true value 95 times out of 100. Various factors were included in the determination, such as the analytical recovery from the sampler, sampler capacity, storage stability of samples, and the effect of environmental factors on sampling results. NIOSH also included evaluation criteria for the experiments and details for the calculation of bias, precision, and accuracy. In 1996, the Secretary and Secretary of HHS proposed to apply this accuracy criterion (61 FR 10012) to determine whether a single, full-shift measurement of respirable coal mine dust would "accurately represent" the full-shift atmospheric dust concentration at the sampling location. They proposed this because the term "accurately represent," as used in section 202(f) of the Mine Act (30 U.S.C. 842(f)) in connection with a single shift measurement was not defined. Application of the NIOSH Accuracy Criterion to respirable coal dust sampling would require that measurements come within 25 percent of the corresponding true dust concentration at least 95 percent of the time.

The NIOSH Accuracy Criterion, widely recognized and accepted, has been the standard used by occupational health professionals to validate sampling and analytical methods for over 15 years. It is important that sampling and analytical methods generate reliable measurements of exposure for contaminants at or near the standard. Development of methods that meet the NIOSH Accuracy Criterion is critically important in order to produce reliable sampling and analytical methods.

OSHA frequently uses a similar accuracy criterion when issuing new or revised single substance standards. For example, OSHA's benzene standard provides: "[m]onitoring shall be accurate, to a confidence level of 95 percent, to within plus or minus 25 percent for airborne concentrations of benzene" (29 CFR 1910.1028(e)(6)). Similar wording can be found in the OSHA sampling and analytical methods for arsenic (29 CFR 1910.1018(e)(6)), lead (29 CFR 1910.1025(d)(9)), 1,2-dibromo-3-chloropropane (29 CFR 1910.1044(f)(6)), ethylene oxide (29 CFR 1910.1047(d)(6)), and formaldehyde (29 CFR 1910.1048(d)(5)).

For purposes of section 202(f) of the Mine Act (30 U.S.C. 842(f)), MSHA would consider a single, full-shift measurement to "accurately represent" atmospheric conditions at the sampling location, if the sampling and analytical method used meets the NIOSH Accuracy Criterion. Because MSHA would restrict the measurement objective to an individual shift and sampling location, the Agency has determined that environmental variability beyond what occurs at the sampling location on a single shift is not relevant to assessing measurement accuracy.

As previously noted in this preamble, the Secretary and the Secretary of HHS jointly published a **Federal Register** notice in July 2000 proposing (1) to rescind the 1972 Joint Notice of Finding and (2) a new mandatory standard stating a single, full-shift respirable dust measurement would accurately represent atmospheric conditions to

which a miner is exposed during such shift. In March 2003, the rulemaking record was reopened and the comment period was extended, and in August 2003, the comment period was extended indefinitely. Since the 2000 single sample proposal has been integrated into this proposed rule, the rulemaking records of the 2000 and 2003 single sample notices are incorporated into the rulemaking record for this proposal. The following discussion addresses comments made to 2000 and 2003 single sample notices.

Some commenters suggested that the dust concentration that should be measured is dust concentration averaged over a period greater than a single shift because Congress intended that the measurement objective be a long-term average. Specifically, some of these commenters stated that because coal dust exposure is related to chronic health effects, the exposure limit should be applied to dust concentrations averaged over a miner's lifetime. These commenters identified the measurement objective as being the dust concentration averaged over a long, but unspecified, term and stated that a single, full-shift measurement cannot accurately estimate this long-term average.

However, Section 202(b) of the Mine Act (30 U.S.C. 842(b)), explicitly requires that the average dust concentration be continuously maintained at or below the applicable standard during each shift. In *Consolidation Coal Company* v. *Secretary of Labor* 8 FMSHRC 890 (1986), aff'd 824 F.2d 1071 (DC Cir. 1987), the Federal Mine Safety and Health Review Commission found that each episode of a miner's overexposure to respirable dust significantly and substantially contributes to the health hazard of contracting chronic bronchitis or coal workers' pneumoconiosis, diseases of a fairly serious nature. Exposures during a single shift play a critical role in protecting miners' health, not just long term average exposures.

Commenters also stated that dust concentrations can vary during a shift due to changing conditions such as the height and slope of the seam. Also, dust concentrations are not uniform and may vary due to unpredictable, infrequent events, such as a "face blowout" (a violent expulsion of coal together with large quantities of coal dust or methane gas) or high winds at a surface mine. Commenters submitted evidence that dust concentrations can vary significantly near the mining face, and that these variations may extend into areas where miners are located. As a result, according to these commenters, the average dust concentration over a full shift is not identical at every point within a miner's work area.

MSHA recognizes that dust concentrations in the mine environment can vary from location to location, even within a small area near a miner. As mentioned earlier, the Mine Act does not specify the area that the measurement is supposed to represent; the sampler unit may be placed in any location reasonably calculated to determine excessive exposure to respirable dust. Commenters presented no evidence to demonstrate that short-term high exposures can overload a dust sampling filter or cause the sampling device to malfunction. The approved samplers are designed to measure the atmospheric conditions at a specific sampling location over a full shift.

Some commenters suggested that local factors such as dusty clothing could cause concentrations in the immediate vicinity of the sampler unit to be unrepresentative of a larger area. Commenters presented no evidence to demonstrate that dusty clothing can have a significant impact on sampling results obtained over a full shift. Moreover, respirable coal mine dust represents a hazard to the miner regardless of the source.

Several commenters suggested that the measurement objective should be a miner's "true exposure" or what the miner actually inhales. MSHA does not intend to use a single, full-shift measurement to estimate any miner's "true exposure," because no sampling device can exactly duplicate the particle inhalation and deposition characteristics of a miner at any work rate (these characteristics change with work rate), or at the various work rates occurring over the course of a shift. Limiting the respirable dust concentration at every location miners work or travel would ensure reduced exposures that would result in reduced health risks.

Some commenters suggested that MSHA continue to average at least five separate measurements prior to making a noncompliance determination. They stated that abandoning this practice would reduce the accuracy of noncompliance determinations. Several of these commenters maintained that the average of dust measurements obtained at the same occupational location on different shifts more accurately represents dust exposure to a miner than a single, full-shift measurement. They stated that not averaging measurements would reduce accuracy to unacceptable levels. Other commenters agreed with MSHA and NIOSH that the averaging of multiple samples can dilute and mask specific instances of overexposure. Some of these commenters stated that averaging not only distorts the estimate of dust concentration applicable to individual shifts, but also biases the estimate of exposure levels over a longer term. In addition, some commenters objected to MSHA's current policy of issuing citations only when the average of five dust samples exceeds the applicable dust standard. They noted that the averaging methodology used during MSHA sampling creates the potential to underestimate the exposure at one occupation, such as the DO, by diluting its measurement with the exposure measurements of other occupations, such as the non-designated occupations.

Consistent with NIOSH and the Dust Advisory Committee, MSHA believes that averaging multiple measurements can mask individual overexposures by diluting a high measurement at one location, or on one shift, with a lower concentration taken at another location, or on another shift. The Agency's existing regulatory framework of averaging measurements does not ensure that the concentration of respirable dust is maintained at or below the applicable standard during each shift, which is inconsistent with the statutory requirement that operators continuously maintain the average respirable dust exposure of each individual miner on each shift at or below the applicable respirable dust standard.

Some commenters stated that the NIOSH Accuracy Criterion did not conform to international standards adopted by the European Committee for Standardization (CEN) (European Standard No. EN 482, 1994). The current edition of this standard was updated in 2006. The NIOSH Accuracy Criterion not only conforms to the CEN criterion but is, in fact, more stringent than the CEN criterion. The CEN criterion requires that 95 percent of the measurements fall within ±30 percent of the true concentration, compared to ±25 percent under the NIOSH criterion. Also, EN 482 (2006) imposes no control over inaccuracy in the measurement of sampling and analytical accuracy itself. Any sampling and analytical method that meets the NIOSH Accuracy Criterion will also meet or exceed the CEN criterion in European Standard No. EN 482 (2006).

Some commenters suggested that method accuracy should be determined under actual mining conditions rather than in a laboratory or in a controlled environment. Although the NIOSH Accuracy Criterion does not require field testing, it recognizes that field

testing "does provide further test of the method." To avoid confusing real differences in dust concentration with measurement errors when testing is done in the field, "precautions may have to be taken to ensure that all samplers are exposed to the same concentrations" (Kennedy *et al.* 1995). Similarly, the CEN criterion for method accuracy specifies that testing of a procedure shall be carried out under laboratory conditions (European Standard No. EN 482, 2006).

One commenter opposed the application of the NIOSH Accuracy Criterion since the commenter believed it ignores environmental variability. MSHA proposes to restrict the measurement objective to an individual shift and sampling location. Therefore, environmental variability beyond what occurs at the sampling location on a single shift would not be relevant to assessing measurement accuracy.

MSHA has concluded that sufficient data exist for determining the uncertainty associated with a single, full-shift measurement; rigorous requirements are in place, as specified by existing standards, to ensure the validity of a respirable coal mine dust sample; and valid statistical techniques were used to determine that MSHA's improved dust sampling and analytical method meets the NIOSH Accuracy Criterion. In accordance with section 202(f) (30 U.S.C. 842(f)) and section 101 (30 U.S.C. 811) of the Mine Act, MSHA proposes to rescind the 1972 joint notice of finding.

30 CFR Part 75

A. Section 75.325 Air Quantity

The proposed rule would revise existing § 75.325(a)(2) by adding a new requirement that when the operator measures the quantity of air reaching the working face (production area or area where coal is extracted) and a blowing face ventilation system is used, the operator must take the air measurement with any machine-mounted dust collector system turned off.

MSHA existing standards for underground coal mines require adequate quantities of air in the working face to dilute, render harmless, and carry away flammable, explosive, noxious and harmful gases, dusts, smoke, and fumes. Therefore, before mining begins in a working face, operators are required to measure the amount of air coming into that area.

To ensure that the working face is ventilated with the amount of air required by the approved ventilation plan, existing § 75.325 specifies where the air quantity measurement at the face must be taken. Under the existing standard, operators using blowing ventilation in the working face are measuring the air quantity in that area after the continuous mining machine is moved into the area and the dust collector system on the machine is turned on. MSHA believes that this practice is not providing an accurate measurement of the air coming into the working face. When the dust collector system is turned on, it acts as a vacuum, pulling air from behind the line curtain, which results in a higher air quantity reading in the working face than the actual quantity of air reaching the area. The dust collector systems are supplemental control devices used primarily to assist in filtering and directing the dust through the systems and then exhausting clean air out the back of the systems. Maintaining the required quantity of air in the working face areas ensures that the dust collector systems operate efficiently. More importantly, it is essential to protecting miners' health.

Therefore, the proposed rule would require operators who use dust collector systems in conjunction with blowing face ventilation systems to determine the air quantity with the dust collector turned off. This proposed provision would assure that the operator gets a more accurate air quantity reading and therefore would provide better protection for the miners.

B. Section 75.332 Working Sections and Working Places

Proposed § 75.332(a)(1) would revise the existing standard to require that "each MMU" on each working section be ventilated by a separate split of air directed by overcasts, undercasts, or other permanent ventilation controls. It would retain the requirement that a separate split of air must ventilate each area where mechanized mining equipment is being installed or removed.

MSHA is proposing this change to address the situation where operators operate two sets of mechanized mining equipment on a working section ventilated by a single split of intake air, and mining activities from the upwind set of equipment expose miners working downwind to respirable dust and quartz. MSHA believes that, together, proposed § 75.332 and the proposed MMU definition, discussed elsewhere in the preamble related to proposed § 70.2, would improve miners' health by reducing their exposure to respirable dust.

C. Section 75.350 Belt Air Course Ventilation

The proposed rule would redesignate existing paragraph (b)(3)(i) as paragraphs (b)(3)(i)(A) and (b)(3)(i)(B). Proposed paragraph (b)(3)(i)(A) would retain the existing requirement that operators limit the average concentration of respirable dust in the belt air course, when used as a section intake airway, to 1.0 mg/m^3.

Proposed paragraph (b)(3)(i)(B) would reduce the respirable dust standard in a belt air course, when used as a section intake airway, from 1.0 mg/m^3 to 0.5 mg/m^3 on [date 6 months after the effective date of the final rule]. The proposed lower limit of 0.5 mg/m^3 is 50% of the proposed 1.0 mg/m^3 respirable dust standard in proposed § 70.100(a)(4), and is consistent with proposed §§ 70.100(b)(2) and 90.100(b). MSHA has included this conforming change in recognition of the Agency's regulatory history and policy with respect to areas of the mine where dust presents additional health risks. MSHA solicits comment on the proposed phase-in period for lowering the respirable dust limit and requests that a detailed rationale accompany any comment or recommendation that is submitted.

MSHA believes that when belt air is used as a source of intake air, the dust concentration in the belt air must be at or below 0.5 mg/m^3 to ensure that relatively clean air is used to ventilate the face.

MSHA is proposing a conforming change to existing paragraph (b)(3)(ii) which requires that the average concentration of respirable dust in the belt entry must be at or below the lowest applicable respirable dust standard on that section when miners on a working section are on a reduced standard below 1.0 mg/m^3. Proposed paragraph (b)(3)(ii) would replace "1.0 mg/m^3" with "that specified in 75.350(b)(3)(i)." The proposed revision would recognize that the belt air respirable dust standard would change from 1.0 mg/m^3 to 0.5 mg/m^3 after a six-month phase-in period.

D. Section 75.362 On-shift Examinations

Proposed § 75.362(a)(2) would add a new requirement that the person conducting the on-shift examination must record the results and corrective actions taken to assure compliance with respirable dust control parameters in the approved mine ventilation plan. The proposal focuses attention on the need for properly functioning dust controls and would greatly improve the level of

health protection for underground coal miners. A record of the results of all dust control parameters and any corrective action taken would assist the Agency and operators in evaluating dust control parameters and assist in determining whether the parameters specified in the mine ventilation plan continue to be effective in controlling respirable dust. Proposed paragraph (a)(2) is consistent with the Dust Advisory Committee's unanimous recommendation that operators should record the results of on-shift examinations.

Proposed § 75.362(a)(2) would also add a new requirement that the on-shift examination of dust control parameters include specific measurements like roof bolter dust collector vacuum levels, scrubber air flow rate, and work practices required in the mine ventilation plan. Conducting examinations of these dust control measures and recording the results offers additional protection for miners because the information would provide early warning of deteriorating dust controls, allowing corrective action to be taken before dust controls fail to protect miners from excessive dust levels. This proposed revision would also assist operators in evaluating whether they are meeting the requirements of the approved dust control parameters in the ventilation plan so that they can effectively determine whether the parameters are sufficient to control miners' respirable dust exposure.

Proposed paragraph (a)(2) is consistent with the Dust Advisory Committee's unanimous recommendation that MSHA should examine all recorded operational data and information on miner exposure and dust control measures as part of the on-going and six-month review of the ventilation plan in order to evaluate the continued effectiveness of the plan. With the new proposed requirements, MSHA will be able to review and evaluate additional information on dust control measures as part of the Agency's review of the ventilation plan.

The proposed rule would revise § 75.362(g)(2) by renumbering and adding new paragraphs (g)(2)(i)–(ii), (3), and (4). Proposed paragraph (g)(2) would make non-substantive changes to existing paragraph (g)(2) and would retain the existing requirement that the certified person directing the on-shift examination assure compliance with the respirable dust control parameters specified in the approved mine ventilation plan. Proposed paragraph (g)(2)(i) is new and would include requirements from existing paragraph (g)(2) that the certified person must certify by initials, date, and time that the on-shift examination was conducted and would include a new requirement that the certification be placed on a board maintained at the section load-out or similar location showing that the examination was made prior to resuming production. The certification requirements would provide assurance that the examinations were made. Posting of the certification on a board at the section load-out or similar location would permit miners on the section to confirm easily that the required examination was made in a timely manner.

Proposed paragraph (g)(2)(ii) is new and would require that the certified person directing the examination verify, by initials and date, the record of the examination results no later than the end of the shift. Under new proposed paragraph (g)(3), this record of examination results would be required to be countersigned by the mine foreman or equivalent mine official by the end of the foreman's or mine official's next regularly scheduled work shift.

The proposal would require that the on-shift examination record contain (1) The results of the examination to assure compliance with the ventilation plan; (2) verification by the certified person of the record of the results of the examination; and (3) countersigning of the record by the mine foreman or equivalent mine official.

MSHA has added the proposed new requirement that the certified person directing the on-shift examination verify the examination results and that the mine foreman or equivalent mine official countersign the record to assure that a qualified official evaluates the effectiveness of the dust control parameters and that a knowledgeable supervisory official receives the necessary notification of the on-shift examination results. MSHA believes that the proposed requirement would ensure that a person with authority is informed and can implement any necessary changes to dust control parameters to maintain compliance with applicable respirable dust standards.

Proposed paragraph (g)(3) would also add a new requirement that the on-shift examination record must be made in a secure book that is not susceptible to alteration, or recorded electronically in a secure computer system that is not susceptible to alteration. MSHA believes that a record of the results of the examination of all dust control parameters and corrective actions would provide a history of the conditions documented at the mine and would alert miners and mine management to recurring problems, to conditions that need to be corrected and to those corrective actions taken. The proposal would allow records to be kept in the traditional manner in a secure book, and it would accommodate new technology by allowing the record to be kept electronically in a secure manner. Based on MSHA's longstanding history with other safety and health records, the Agency believes that records should be maintained so that they cannot be altered. In addition, electronic storage of information and accessing it through computers is increasingly a common business practice in the mining industry. The proposal would permit the use of electronically stored records provided they are secure, not susceptible to alteration, able to capture the information and signatures required, and are accessible to the representative of the coal miners and MSHA. MSHA believes that electronic records meeting these criteria are practical and as reliable as traditional records. MSHA also believes that once records are properly completed and reviewed, mine management can use them to evaluate whether dust control parameters are adequate or need appropriate adjustments; whether the same conditions or problems, if any, are recurring; and whether corrective measures are effective.

Proposed paragraph (g)(3) is consistent with the Dust Advisory Committee's unanimous recommendation that operators should conduct periodic reviews of the adequacy of the dust control parameters stipulated in the mine ventilation plan and make modifications necessary to achieve and maintain compliance with the applicable dust standard.

Proposed paragraph (g)(4) is new and would require that the records be retained at a surface location at the mine for at least 1 year and be made available for inspection by authorized representatives of the Secretary and the representatives of miners. This proposed requirement is consistent with recordkeeping provisions in other MSHA standards and would assure that examination results are maintained for a period of time to allow for MSHA's evaluation during several inspections and are accessible to the representative of the miners.

Proposed paragraph (g)(4) is consistent with the Dust Advisory Committee's unanimous recommendation that recordkeeping be required as a part of on-shift examinations under § 75.362. The Committee explained that the results of the on-shift examinations were

informative and should be recorded and shared with workers who have been properly trained concerning their interpretation and importance. Furthermore, the Committee unanimously recommended that MSHA inspections should include: A review of recorded parameter data; dust control measures observed in operation; and input from miners regarding whether the dust controls and coal production are representative of usual operations.

E. Section 75.371 Mine Ventilation Plan: Contents

Proposed § 75.371(f), (j) and (t) would revise the information that operators would be required to provide in mine ventilation plans.

Proposed paragraph (f) would add a new requirement to include the minimum quantity of air that would be delivered to the working section for each mechanized mining unit. It would also add a new requirement that the description of each different dust suppression system used on equipment on each working section be identified by make and model. The proposed rule would add new requirements in paragraphs (f)(1) through (f)(4) to include in plans the following information related to each section: (1) The number, types, location, orientation, operating pressure, and flow rate of operating water sprays; (2) the maximum distance that ventilation control devices will be installed from each working face when mining or installing roof bolts in entries and crosscuts; (3) procedures for maintaining the roof bolter dust collection system, if used, in approved condition; and (4) recommended best work practices for equipment operators to minimize dust exposure.

Proposed paragraph (j) would be revised to add a new requirement that the type and size of dust collector screens used and a description of the procedures to be followed in properly maintaining dust collectors used on equipment be included in the ventilation plan.

The proposed revisions are consistent with the 1992 Report of the Coal Mine Respirable Dust Task Group, which identified insufficient detail and specificity as a major factor that can adversely affect the quality of dust control plans. Proposed paragraphs (f)(1) through (f)(3) are also consistent with the recommendations of a recent targeted enforcement initiative conducted by MSHA's Respirable Dust Emphasis Teams, which focused on miners' exposures to respirable coal mine dust at selected underground coal mines as part of the Agency's Comprehensive Initiative to End Black Lung—Act Now! MSHA determined that due to ambiguities in ventilation plans, miners had trouble determining the types of dust controls to use and how to evaluate their effectiveness. After reviewing results from this initiative, MSHA stated that operators should include in their plans: The type of water sprays and water volume at the minimum pressure to be used; orifice size; spray pattern; location where each type of spray will be used; and minimum number of sprays that will be maintained. Recommendations also included the location of curtains where roof bolting is being performed since the distance from the face is important in the effectiveness of ventilation. Guidance was provided to mine operators on the proper maintenance of roof bolter dust collectors.

In the 2003 plan verification proposed rule, MSHA proposed revisions to § 75.371 to require operators to include any specific work practices used to minimize the dust exposure of individual miners, along with information on the location of the roof bolter during the mining cycle for each continuous miner section, and the cut sequence for each longwall mining section in the ventilation plan. Some commenters on the proposal stated that more dust control parameters and information should be contained in plans. In response to comments and consistent with the Agency's findings in its ongoing Dust Emphasis Program, the proposal would require that ventilation plans include more information and specificity on dust suppression systems used and best work practices used by equipment operators to minimize dust exposure. The additional information that MSHA proposes to include in the ventilation plan would allow both operators and MSHA to observe and measure specific dust control parameters to better evaluate the effectiveness of the dust control systems. This would result in greater protection to miners from hazards of respirable dust. In addition, if a respirable dust standard were exceeded, the operator and MSHA would be in a better position to determine why (*e.g.,* whether the plan was not followed or it was inadequate).

Another commenter on the 2003 plan verification proposal stated that operators must have flexibility to adjust ventilation and water pressure in order to meet the specific conditions of the mine.

MSHA does not intend to limit the operator's ability to make appropriate adjustments to mine ventilation and dust suppression systems for MMUs. MSHA recognizes that ventilation and dust suppression systems necessary to control respirable dust must be based on the conditions of the mine.

Proposed § 75.371(t) would include a nonsubstantive change to replace a parenthetical reference to existing § 70.208 with proposed § 70.209, because § 70.208 has been redesignated as § 70.209 in the proposed rule.

30 CFR Part 90

A. Section 90.1 Scope

Proposed § 90.1 would be revised to include surface coal miners and to make a conforming change. The proposal would extend to all coal miners who have evidence of the development of pneumoconiosis the option to work in an area of a mine where the average concentration of respirable dust in the mine atmosphere during each shift is continuously maintained at or below the applicable standard. Surface coal miners are at risk of developing pneumoconiosis as a result of exposure to respirable coal mine dust. Chest x-ray examinations enable early detection of pneumoconiosis, which is irreversible and, if exposure continues, progressive. In the absence of medical monitoring and intervention, a miner may continue to be exposed, allowing the disease to progress so that the miner may suffer material impairment of health or functional capacity.

The proposal would also make a conforming change that would revise the existing standard to require mine operators to continuously maintain the average concentration of respirable dust to which the part 90 miner would be exposed at or below "the applicable standard" as specified in proposed § 90.100. The proposed language, "the applicable standard," would replace the existing language, "1.0 milligrams per cubic meter of air." This conforming change would be necessary because the Agency is proposing to phase in a lower respirable dust standard, from 1.0 mg/m^3 to 0.5 mg/m^3, in proposed § 90.100 on [date six months after the effective date of the final rule].

B. Section 90.2 Definitions

The proposed definitions of approved sampling device, CMDPSU, CPDM, equivalent concentration, MMU, quartz, weekly accumulated exposure, and weekly permissible accumulated exposure, are the same as proposed part 70 definitions discussed elsewhere in the preamble related to proposed § 70.2.

Part 90 Miner

The proposed rule would amend the existing definition of *part 90 miner* to

state it applies to a miner employed at "a coal mine." This proposed revision would conform with proposed § 90.3, which extends part 90 protections to surface miners. Proposed § 90.3 is discussed elsewhere in the preamble.

The proposal would also make a conforming change to replace "1.0 mg/m³" with "the applicable standard." The change would reflect that the respirable dust standard would change from 1.0 mg/m³ to 0.5 mg/m³ after a six-month phase-in period. Other minor nonsubstantive changes would be made.

Representative Samples

The proposal would add a new definition for *representative samples.* It would be defined as respirable dust samples that reflect typical dust concentration levels in the working environment of the part 90 miner when the miner is performing normal work duties.

MSHA would consider that "typical dust concentration levels" are present during sampling if they approximate and are characteristic of the part 90 miner's dust concentration levels during periods of non-sampling. Under the proposed rule, samples must be taken while the part 90 miner is engaged in normal work duties, as that term is defined in existing § 90.2. Samples taken when the part 90 miner performs an atypical task, or other activity that does not mirror duties performed on a routine day-to-day basis in the part 90 miner's job classification at the mine would not be considered representative samples for the part 90 miner.

The proposed definition would be added to ensure that operators conduct dust sampling when working conditions accurately represent miners' dust exposures. This would allow operators and MSHA to more effectively evaluate the performance of dust controls and the adequacy and effectiveness of operators' approved plans.

C. Section 90.3 Part 90 Option; Notice of Eligibility; Exercise of Option

For the same reason stated in proposed § 90.1, proposed § 90.3(a) would be revised to extend to surface coal miners the option to work in an area of a mine where the average concentration of respirable dust in the mine atmosphere during each shift is continuously maintained at or below "the applicable standard" as specified in proposed § 90.100, which is discussed elsewhere in the preamble. The proposal would also include a conforming change. The proposed language, "the applicable standard," would replace the existing language, "1.0 milligrams per cubic meter of air" to reflect that the respirable dust standard would change from 1.0 mg/m³ to 0.5 mg/m³ after a six-month phase-in period.

The proposal would make conforming changes to proposed § 90.3(d) and (e) to extend the part 90 transfer option to surface coal miners.

D. Section 90.100 Respirable Dust Standard

Proposed § 90.100 would reduce the respirable dust standard from 1.0 mg/m³ to 0.5 mg/m³ for part 90 miners on [date six months after the effective date of the final rule]. The proposed lower limit of 0.5 mg/m³ is 50% of the proposed 1.0 mg/m³ respirable dust standard in proposed § 70.100(a)(4) and 71.100(d), and consistent with § 70.100(b)(2). MSHA has included this conforming change to prevent the progression of pneumoconiosis. Miners with evidence of pneumoconiosis have a higher risk of advancing to a more serious condition than do other miners if they continue to be exposed to dust (Antao, VC *et al.,* 2005; Lee, HS et al., 2001; Castranova, V and Vallyathan, V, 2000; Heppleston, AG, 1988; Ashford, JR, *et al.,* 1965). MSHA's QRA shows that, at a standard of 1.0 mg/m³, there is a residual risk to miners. Reducing the concentration limit for part 90 miners continues the Agency's regulatory program for providing necessary protection for these miners. MSHA solicits comment on the proposed phase-in period for lowering the respirable dust limit and requests that a detailed rationale accompany any comment or recommendation that is submitted.

E. Section 90.101 Respirable Dust Standard When Quartz is Present

The proposed rule would revise the respirable dust standard for part 90 miners when quartz is present in coal mines. The rationale for revising § 90.101 is identical to proposed § 70.101, discussed elsewhere in this preamble, however, the language in proposed § 90.101(b) has been tailored to apply to part 90 miners.

F. Section 90.102 Transfer; Notice

The proposed rule would revise existing § 90.102(a) to include an exception to the part 90 miner transfer requirements. Under the existing standard, an operator must transfer the miner to an existing position at the same coal mine on the same shift or shift rotation on which the miner was employed immediately before the transfer. Under the proposed rule, transfer requirements would not apply when a part 90 miner is working in an area that meets the applicable part 90 respirable dust standard, but circumstances such as reductions in workforce or changes in operational methods require a change in the miner's job or shift assignment. The proposed exception would accommodate the need for operators to reassign part 90 miners when unforeseen circumstances and unexpected mine conditions arise. MSHA believes that the proposed exception provides operators some necessary flexibility with respect to the assignment of a part 90 miner. The proposed rule would retain the provision that the operator may transfer a part 90 miner to a different coal mine, a newly-created position, or a position on a different shift or shift rotation if the miner agrees in writing to the transfer. Proposed § 90.102(a) is consistent with the Agency's policy and is identical to the 2003 proposed Plan Verification rule. The Agency received no comments specific to these provisions.

G. Section 90.103 Compensation

Proposed § 90.103(c) is new and would provide that the existing provisions in §§ 90.103(a) and (b), concerning compensation for a part 90 miner, do not apply when a part 90 miner initiates and accepts a change in work assignment for reasons of job preference. This proposed provision is consistent with MSHA's longstanding policy of not applying the part 90 miner compensation provisions under circumstances where, once a miner has been placed in a position that complies with the provisions in part 90, the part 90 miner on his own initiative applies for and accepts another job in a work area with an average respirable dust concentration at or below the applicable part 90 respirable dust standard.

The proposal is also consistent with Section 101(a)(7) of the Mine Act which provides for compensation at the same rate of pay for miners transferred as a result of exposure to respirable dust, but not as a result of a miner-initiated transfer based on job preference. As an example: A miner exercised the part 90 option when the miner's job paid $20 per hour. If the operator keeps the part 90 miner in the same work position because compliance with the applicable part 90 respirable dust standard is maintained, or if the operator transfers the miner to a new work position to achieve compliance with part 90, the miner cannot be paid less than $20 per hour—the amount paid immediately before exercising the option. However, once the operator has placed the miner in a position that complies with the provisions of part 90, if the miner prefers a different job and initiates and accepts a job change that only pays $17

per hour, the miner would receive $17 per hour in the new position.

Under the proposal, a miner-initiated job change to a position that is at or below the part 90 respirable dust standard would not constitute a waiver of part 90 rights. In the new job, the miner would retain part 90 status and all other requirements of part 90 continue in effect, including the operator's obligations to continuously maintain the part 90 respirable dust standard and to give MSHA notice whenever the miner's work assignment changes or lasts longer than one shift. Proposed § 90.103(c) is identical to the 2003 proposal on Plan Verification. The Agency did not receive any comments specific to these provisions.

The proposed rule would redesignate: existing § 90.103(c) as proposed § 90.103(d); existing § 90.103(d) as proposed § 90.103(e); existing § 90.103(e) as proposed § 90.103(f); and existing § 90.103(f) as proposed § 90.103(g.) No other changes are proposed for these provisions.

H. Section 90.104 Waiver of Rights; Re-exercise of Option

Proposed § 90.104(a)(2) and (a)(3) would revise the existing requirements to include conforming changes to part 90 on the respirable dust standard and respirable dust standard when quartz is present. Proposed paragraphs (a)(2) and (a)(3) would replace both the "1.0 milligrams per cubic meter of air" and "the respirable dust standard established by § 90.101 (Respirable dust standard when quartz is present)" with the term "applicable standard." MSHA proposed identical revisions in 2003 under the proposed rule on Plan Verification and received no comments on the proposal.

I. Section 90.201 Sampling; General and Technical Requirements

The proposed rule would revise operator sampling requirements in existing § 90.201 and would phase in the use of CPDMs to collect respirable dust samples in the working environment of each part 90 miner.

Under the proposed rule, § 90.201(a) would require the operator to use the CMDPSU to take respirable dust samples in the working environment of each part 90 miner until replaced by the CPDM. On [date 12 months after the effective date of the final rule], operators would be required to replace the CMDPSU with the CPDM to sample part 90 miners, unless notified by the Secretary. The operator would be allowed to start using the CPDM anytime during the 12-month phase-in period. Proposed § 90.201(a) is consistent with proposed § 70.201(a); however, the language in proposed § 90.201(a) would be tailored to apply to part 90 miners. The rationale for the proposed provision is the same as that in proposed § 70.201(a), which is discussed elsewhere in the preamble.

Proposed paragraph (b) would retain the existing requirement that sampling devices be worn or carried directly to and from each part 90 miner's position. It would revise the existing standard to require that a CPDM be worn at all times if it is used for sampling. It would also revise the existing standard to require that sampling devices be operated portal to portal, and be operational during the part 90 miner's entire shift, even when the shift exceeds 8 hours (extended shift). This would include the time spent performing normal work duties and while traveling to and from the assigned work location. Proposed § 90.201(b) is consistent with proposed § 70.201(e); however, the language in proposed § 90.201(b) would be tailored to apply to part 90 miners. The rationale for the proposed provision is the same as that in proposed § 70.201(e), which is discussed elsewhere in the preamble.

Proposed paragraph (b)(1) is new and would address work shifts longer than 12 hours. It would require that when using a CMPDSU and the work shift to be sampled is longer than 12 hours, the operator would have to switch-out the unit's sampling pump prior to the 13th hour of operation. Proposed § 90.201(b)(1) is the same as proposed § 70.201(e)(1). Proposed paragraph (b)(2) is new and would add a similar requirement to address work shifts longer than 12 hours when operators use CPDMs. It would require the operator to switch-out the CPDM with a fully charged device prior to the 13th-hour of operation. Proposed paragraph (b)(2) is the same as proposed § 70.201(e)(2). The rationale for proposed § 90.201(b)(1) and (b)(2) is discussed elsewhere in the preamble related to proposed § 70.201(e)(1) and (e)(2).

Proposed paragraphs (c)(1) through (c)(3), redesignated from existing (f)(1) through (f)(3) retain the existing requirements.

Proposed paragraphs (d)(1) through (d)(4) are new and would require: the mine operator to use one control filter for each shift of sampling when a CMDPSU is used; each control filter to have the same pre-weight date (noted on the dust data card) as the filters used for sampling; each control filter to remain plugged at all times; each control filter to be exposed to the same time, temperature, and handling conditions as the filter used for sampling, and that each control filter be kept together with the exposed samples after sampling. Proposed § 90.201(d)(1) through (d)(4) are identical to proposed § 70.201(f)(1) through (f)(4) and the rationale is discussed elsewhere in the preamble related to proposed § 70.201(f).

Proposed paragraph (e) would make a minor revision to the existing standard to clarify that it would apply when a CMDPSU is used to take respirable dust samples.

The proposed rule would revise and move existing § 90.201(d) to proposed § 90.208(e), which would apply to operators who use a CMDPSU for sampling the work environment of part 90 miners. Proposed § 90.208(e) is discussed elsewhere in the preamble.

Proposed paragraph (f) is new and would require the operator to make a record showing the length of each shift for each part 90 miner, retain the records for at least six months, and make them available for inspection by authorized representatives of the Secretary or submitted to the District Manager when requested in writing. Operators would need to know the length of the work shift to determine the equivalent concentration. MSHA would use these records to verify that operators are accurately recording the normal work shift lengths so that miners are not being overexposed.

Proposed paragraph (g), redesignated from existing paragraph (c), would be revised to require that, upon request from the District Manager, the operator would submit the date and time any respirable dust sampling would begin. This information would have to be submitted to the District Manager at least 48 hours prior to scheduled sampling. The proposed 48-hour notification requirement would provide the Agency the opportunity to observe and monitor operator sampling which would ensure that both operating conditions and sampling requirements are met.

Proposed paragraph (h) is new and would require mine operators using CPDMs to provide training to all part 90 miners. Proposed § 90.201(h) is the same as proposed § 70.201(j) and the rationale is discussed elsewhere in the preamble related to proposed § 70.201(j). In addition, proposed (h)(1)–(5), which are identical to proposed § 70.201(j)(1)–(5), would establish the CPDM training that would be required. The rationale, discussed elsewhere in the preamble, is the same for both.

Proposed paragraph (i) is new and would require mine operators to maintain a record of training at the mine site for two years following completion of training. MSHA believes it is important to retain these records to

verify that the required training has been provided. Proposed paragraph (i) would also permit a mine operator to maintain the record at another location as long as the record could be immediately accessed electronically from the mine site. Finally, proposed paragraph (i) would require that upon request by an authorized representative of the Secretary or Secretary of HHS, the mine operator would be required to promptly provide access to any such training record. Proposed § 90.201(i) is the same as proposed § 70.201(k), except tailored for part 90 miners, and the rationale is discussed elsewhere in the preamble related to proposed § 70.201(k).

J. Section 90.202 Certified Person; Sampling and § 90.203 Certified Person; Maintenance and Calibration

Proposed §§ 90.202 and 90.203 would be identical to proposed §§ 70.202 and 70.203, discussed elsewhere in this preamble.

K. Section 90.204 Approved Sampling Devices; Maintenance and Calibration

Proposed § 90.204 would be identical to proposed § 70.204, discussed elsewhere in this preamble.

L. Section 90.205 Approved Sampling Devices; Operation; Air Flowrate

Proposed § 90.205 would be identical to proposed § 70.205, discussed elsewhere in this preamble.

M. Section 90.206 CPDM Performance Plan

Proposed § 90.206 would be identical to proposed § 70.206, discussed elsewhere in this preamble, with a few exceptions. Proposed § 90.206(c)(1) would require the CPDM Performance Plan to include the specific part 90 miner who will be sampled, identified by the unique 8-digit MSHA Individual Identification Number (MIIN) obtained from the Agency.

Also, unlike §§ 70.206(a)(1)–(a)(2) and (a)(4) and 71.206(a)(1)–(a)(2) and (a)(4), proposed § 90.206(a) would not include requirements that miners' representatives be notified of proposed Plans or plan revisions for any part 90 miner, be given copies of plans or plan revisions for affected part 90 miners, or be allowed to submit comments on such plans or revisions to the District Manager. Similarly, proposed § 90.206 does not include requirements in proposed §§ 70.206(a)(3) and (c)(3), and 71.206(a)(3) and (c)(3), that would require proposed and approved Plans or revisions to be posted on the mine bulletin board. Instead, proposed §§ 90.206(d) would require a copy of the approved Plan for the part 90 miner or revisions be provided to the affected part 90 miner. It would also prohibit the posting of the approved Plan or revisions on the mine bulletin board. MSHA believes that the proposed provisions and proposed prohibition against posting approved Plans or revisions on the bulletin board are consistent with existing requirements and would help to prevent the unwarranted disclosure of a part 90 miner's identity.

N. Section 90.207 Exercise of Option or Transfer Sampling

Proposed § 90.207 would remain essentially unchanged from the existing standard since only nonsubstantive changes are proposed.

The proposal would change the title to distinguish it from compliance sampling under proposed § 90.208.

The proposed language in paragraph (a)(2), "the applicable standard," would replace the existing language, "1.0 milligrams per cubic meter of air or the respirable dust standard established by § 90.101 (Respirable dust standard when quartz is present)." This proposed revision reflects that the respirable dust standard would change from 1.0 mg/m^3 to 0.5 mg/m^3 on [date 6 months after the effective date of the final rule] and that a reduced standard could apply due to the presence of quartz.

Other minor editorial changes would be made.

O. Section 90.208 Compliance Sampling; Procedures for Sampling With CMDPSUs

Proposed § 90.208 would revise the existing sampling requirements for part 90 miners. The proposal would change the title to distinguish it from proposed § 90.209, which would apply to operators who use a CPDM to sample part 90 miners.

Proposed § 90.208(a) would revise existing § 90.208 and require operators who use CMDPSUs to take five valid representative samples during each quarterly period from the environment of the part 90 miner while performing normal work duties. The quarterly periods would be: (1) January 1–March 31; (2) April 1–June 30; (3) July 1–September 30; and (4) October 1–December 31. The proposal would also require that the samples be collected on consecutive work days. The proposed rule would replace the bimonthly sampling period under the existing standard with a quarterly sampling period. Also, the proposal would increase sampling from one sample during a bimonthly period under the existing standard to five samples collected on consecutive work days during a quarterly period. Sampling part 90 miners during five consecutive work days on a quarterly basis would provide a better representation of typical dust conditions to which part 90 miners are exposed and, therefore, would provide greater protection for miners.

In addition, proposed paragraph (a) would require that the samples be "representative samples" and would no longer include the term "respirable dust samples." The term representative samples is new and is discussed elsewhere in the preamble in § 90.2 related to definitions. The proposed change to include representative samples would offer greater protection for miners.

Proposed § 90.208(b), (b)(1), and (b)(2) would apply when the respirable dust standard under § 90.101 has been changed due to the presence of quartz. Proposed § 90.208(b) is new and would require that when the applicable dust standard is changed in accordance with proposed § 90.101 (Respirable dust standard when quartz is present), the new applicable standard would be effective on the first shift on which the part 90 miner is performing normal work duties following receipt of the notification of such change from MSHA. Proposed § 90.208(b)(1) is derived from existing § 90.208(b). Under the proposal, if all samples from the most recent quarterly sampling period do not exceed the new applicable standard, the operator would begin sampling of the part 90 miner on the first shift on which the miner is performing normal work duties during the next quarterly period following notification from MSHA of the change in the applicable standard. Proposed paragraph (b)(2) is new and would require that if any sample from the most recent quarterly sampling period exceeds the new applicable standard, the operator must make necessary adjustments to the dust control parameters within three days and collect samples from the affected part 90 miner on consecutive work days until five valid representative samples are collected. The collected samples would be treated as normal quarterly samples. Proposed § 90.208(b), (b)(1), and (b)(2) are consistent with proposed § 70.207(c), (c)(1), and (c)(2). The rationale for proposed § 90.208(b), (b)(1), and (b)(2) is the same as that for § 70.207(c), (c)(1), and (c)(2), which is discussed elsewhere in the preamble.

Proposed § 90.208(c) is new and would require that no valid single-shift equivalent concentration shall meet or exceed the ECV that corresponds to the applicable standard. The ECVs are listed in Table 90–1. Proposed § 90.208(c) is

consistent with proposed § 70.207(e). A discussion on the proposed use of ECVs and rationale is addressed elsewhere in the preamble under proposed § 70.207(e).

The proposed rule would redesignate existing § 90.208(c) as proposed § 90.208(d). Proposed § 90.208(d) would require that upon issuance of a citation for a violation of the applicable standard, paragraphs (a) (quarterly sampling) and (b)(2) (sampling when a respirable dust standard is changed due to quartz) would not apply to the part 90 miner until the violation is abated in accordance with proposed paragraph (e). Proposed § 90.208(d) is consistent with proposed § 70.207(f). The rationale is the same as that for proposed § 70.207(f) discussed elsewhere in the preamble. The proposal would make conforming, nonsubstantive revisions to the existing standard. Proposed § 90.208(d) would replace "§ 90.100 (Respirable dust standard) or § 90.101 (Respirable dust standard when quartz is present)" with "the applicable standard" to be consistent with other proposed part 70, 71, and 90 provisions. The proposal would also replace "§ 90.201(d)" with "paragraph (e)" since proposed § 90.208(e) would address the operators' requirements to abate violations of the respirable dust standard for part 90 miners.

Proposed § 90.208(e), derived from existing § 90.201(d), would require the operator to take the following actions during the time for abatement fixed in a citation for violation of the applicable standard. Proposed paragraph (e)(1) would require the operator to make respirators available to the affected part 90 miner in accordance with proposed § 72.700. Proposed paragraph (e)(2) would require the operator to submit, to the District Manager for approval, proposed corrective actions to lower the concentration of respirable dust to within the applicable standard. If the corrective action involves reducing the respirable dust levels in the work environment of the part 90 miner, proposed paragraph (e)(2) would require the operator to implement the proposed corrective actions after receipt of approval by the District Manager, and then sample the affected part 90 miner until five valid representative samples are taken.

If the corrective action taken by the operator involves transferring the part 90 miner to another work position in the mine to meet the applicable standard, proposed paragraph (e)(2)(ii) would require the operator to comply with proposed § 90.102 and then sample the affected miner in accordance with proposed § 90.207(a). Proposed § 90.208(e)(1) and (e)(2)(i) are consistent with proposed §§ 70.207(g)(1)–(g)(3) and 70.209(e)(1)–(e)(3). The rationale for proposed § 90.208(e)(1) and (e)(2)(i) is identical to that in proposed § 70.207(g), which discussed elsewhere in this preamble. Proposed § 90.208(e)(2)(ii) would clarify that other part 90 requirements apply when the applicable standard for a part 90 miner is exceeded and the operator transfers a part 90 miner to meet the standard.

Proposed § 90.208(f), derived from existing § 90.300(a), is new and would establish that a citation for violation of an applicable standard will be terminated by MSHA when: (1) the equivalent concentration of each of the five valid operator abatement samples is at or below the applicable standard; and (2) the operator submits a proposed dust control plan for the part 90 miner or proposed changes to the approved dust control plan as prescribed in proposed § 90.300 to the District Manager for approval within 15 calendar days after sampling results are received from MSHA indicating the concentration has been reduced to or below the applicable standard. The proposal also requires that the revised parameters must reflect the control measures used to maintain the concentration of respirable dust to or below the applicable standard. The proposed provision is consistent with proposed §§ 70.207(h) and 71.207(l). MSHA believes that this proposal would assure that dust control parameters in the approved dust control plan for that part 90 miner are appropriate and demonstrate that they effectively reduce the miner's respirable dust exposure.

Proposed § 90.208(g) is new and would require that when the equivalent concentration of one or more valid samples collected by the operator under this section exceeds the applicable standard but is less than the ECV that corresponds to the applicable standard in Table 90–1, the operator would be required to: (1) Make approved respirators available to affected miners in accordance with proposed § 72.700; (2) take corrective action to lower the respirable dust concentration to or below the applicable standard; and (3) record the corrective actions taken in the same manner as the records for hazardous conditions required by existing § 75.363. This proposed provision and its rationale are identical to proposed § 70.207(i).

P. Section 90.209 Compliance Sampling; Procedures for Sampling With CPDMs

Proposed § 90.209 is new and would provide requirements on sampling the working environment of part 90 miners when using a CPDM. It addresses: frequency of sampling; actions to be taken when any end-of-shift concentration exceeds the applicable standard; actions to be taken when overexposures occur; and requirements when transferring a part 90 miner as part of the operator's corrective actions.

Proposed § 90.209(a) would require operators who use CPDMs to sample the working environment of the part 90 miner during each shift, 7 days per week (Sunday through Saturday), 52 weeks per year. The proposal is consistent with proposed § 70.208(a)(1). MSHA believes that continuous monitoring of part 90 miners on every shift during the year is the most effective method of reducing their exposure to respirable coal mine dust and preventing any further progression of black lung disease. Both operators and part 90 miners would be aware continually of the dust conditions in the working environment and the effectiveness of dust controls.

Proposed § 90.209(b) would require that when the applicable dust standard is changed in accordance with proposed § 90.101 (Respirable dust standard when quartz is present), the new applicable standard would become effective on the first shift that the part 90 miner is performing normal work duties following receipt of the notification of the change from MSHA. Proposed § 90.209(b) is identical to proposed § 90.208(b) and consistent with proposed §§ 70.207(c) and 70.208(c). The proposal would protect part 90 miners by ensuring prompt implementation of the reduced standard when there is high quartz exposure. The proposed provision is consistent with Agency policy and would provide increased health protection for part 90 miners.

Proposed § 90.209(c) would require that for operators who use a CPDM, no valid end-of-shift equivalent concentration shall meet or exceed the ECV that corresponds to the applicable standard. The ECVs are listed in Table 90–2. Proposed § 90.209(c) is consistent with proposed §§ 70.207(e) and 70.208(d). As discussed elsewhere in the preamble under proposed §§ 70.207(e) and 70.208(d), and in Appendix A, ECVs are calculated to ensure that citations are issued only when a single sample measurement demonstrates, with at least 95-percent confidence, that the applicable dust standard has been exceeded. The rationale for proposed § 90.209(c) is the same as that in proposed § 70.207(e), which is discussed elsewhere in the preamble.

Proposed § 90.209(d) would require that no weekly accumulated exposure (WAE) shall exceed the weekly permissible accumulated exposure (WPAE). The proposed terms "weekly accumulated exposure" and "weekly permissible accumulated exposure" are new and discussed elsewhere in the preamble under the § 90.2 definitions. For example, suppose a CPDM reported an equivalent concentration of 1.0 mg/m^3 for a part 90 miner who worked nine hours on Monday. Under the proposed definition of WAE, this quantity would be multiplied by 8 hours, yielding an accumulated exposure on Monday of 1.0 mg/m^3 × 8 hours or 8.00 mg-hr/m^3. If the part 90 miner worked the rest of the week, including Saturday, the exposure accumulated during each of the other five shifts would be determined in the same manner. If the daily exposures accumulated by the part 90 miner for the week were recorded as follows: Monday—8.00 mg-hr/m^3; Tuesday—6.32 mg-hr/m^3; Wednesday—7.84 mg-hr/m^3; Thursday—6.80 mg-hr/m^3; Friday—5.69 mg-hr/m^3; Saturday—4.16 mg-hr/m^3, adding together the daily accumulated exposures yields a WAE of 38.81 mg-hr/m^3.

To continue, if the applicable standard for the part 90 miner is 1 mg/m^3, this quantity would be multiplied by 40 hours, yielding a WPAE of 40 mg-hr/m^3 for the part 90 miner. Since the WAE for the part 90 miner is 38.81 mg-hr/m^3, it would not exceed the WPAE of 40 mg-hr/m^3.

Proposed paragraph (d) would assure that the part 90 miner's respirable dust exposure for the work week would be limited to a calculated weekly permissible accumulated exposure for an equivalent 40-hour work week. This proposed paragraph is consistent with the NIOSH Criteria Document, which recommended that respirable coal mine dust be limited to 1 mg/m^3 as a TWA concentration for up to 10 hr/day during a 40-hour work week. Proposed § 90.209(d) and its rationale are identical to proposed § 70.208(e), which is discussed elsewhere in the preamble.

Proposed § 90.209(e) would require the operator to take actions, listed in proposed paragraphs (e)(1) through (e)(6), when a valid end-of-shift equivalent concentration meets or exceeds the ECV that corresponds to the applicable standard in Table 90–2, or a weekly accumulated exposure exceeds the weekly permissible accumulated exposure. The operator would be required to take the actions before the part 90 miner's next work shift begins. Proposed § 90.209(e) is consistent with proposed § 70.208(f); however, the language in proposed § 90.209(e) is tailored to apply to part 90 miners.

Proposed paragraph (e)(1) would require operators to make approved respirators available to affected part 90 miners in accordance with proposed § 72.700. The proposal is consistent with existing § 70.300, which requires the operator to make respiratory equipment available to all persons exposed to excessive concentrations of respirable dust. The rationale for this proposed provision is the same as that for proposed §§ 70.207(i)(1) and 70.208(f)(1) discussed elsewhere in the preamble.

Proposed paragraph (e)(2) would require the operator to implement corrective actions to assure compliance with the applicable standard on the next and subsequent work shifts. Corrective actions would include, for example, engineering or environmental controls that reduce the level of respirable dust, or transferring the part 90 miner to another position at the mine that is at or below the applicable standard. MSHA believes that the proposal would improve protections for part 90 miners, since the operator would need to determine factors that may have contributed to the overexposure and take corrective actions beginning on the part 90 miner's next work shift.

Under proposed paragraph (e)(3), if the corrective actions involve implementing dust control measures to lower the miner's respirable dust to within the applicable standard, the operator must submit the corrective actions as a proposed dust control plan, or proposed changes to an approved plan, for the part 90 miner. The proposal would require that the plan or plan changes be submitted as required in proposed § 90.300 to the District Manager for approval within 3 days of determining that the applicable standard has been exceeded. The rationale for proposed § 90.209(e)(3) is the same as that in proposed § 70.208(f)(3), which is discussed elsewhere in the preamble.

Proposed paragraph (e)(4) would require the operator to review the adequacy of the approved CPDM Performance Plan in relation to the part 90 miner. It would require the operator to submit any plan revisions, if needed, to the District Manager for approval. Plan revisions would be required to be submitted within 7 calendar days after the operator provides the end-of-shift equivalent concentration to the part 90 miner. Under the proposed rule, for example, if the applicable standard is exceeded, the operator would review the adequacy of the CPDM Performance Plan for the affected part 90 miner to assure that sufficient actions are required to prevent respirable dust concentrations from exceeding citable ECV levels and expose the miner to excessive dust. The proposed provision is consistent with proposed § 70.208(f)(4). MSHA believes that requiring the operator to review the CPDM plan would assist the operator in monitoring part 90 miners' exposure to respirable coal mine dust and in verifying the adequacy of the dust control parameters. In addition, like proposed § 70.208(f)(4), MSHA believes a 7-calendar day period is a reasonable amount of time for the operator to review and submit CPDM plan revisions for approval.

Proposed paragraph (e)(5), which is identical to proposed § 70.208(f)(5), would require the operator to record the reported excessive dust condition as part of and in the same manner as the records for hazardous conditions required by existing § 75.363. The proposal would require the record to include the following information: (i) Date of sampling; (ii) length of the sampled shift; (iii) location within the mine and the occupation where the sample was collected; (iv) the end-of-shift equivalent concentration, or weekly accumulated exposure and the weekly permissible accumulated exposure; and (v) corrective action taken to reduce the concentration of respirable coal mine dust to or below the applicable standard. The rationale for proposed § 90.209(e)(5) is the same as that for proposed § 70.208(f)(5), which is discussed elsewhere in the preamble.

Proposed paragraph (e)(6) would require the operator to comply with proposed §§ 90.102(c) and 90.207(a) when an operator transfers a part 90 miner to meet the applicable standard. MSHA believes that transferring a part 90 miner is an acceptable method to meet the applicable standard and protect the miner's health as long as the operator complies with proposed § 90.102(c) notice requirements and proposed § 90.207(a) sampling requirements.

Proposed § 90.209(f) would require the operator to take actions, listed in proposed paragraphs (f)(1) through (f)(4), when any valid end-of-shift equivalent concentration exceeds the applicable standard but is less than the ECV that corresponds to the applicable standard in Table 90–2. Proposed § 90.209(f)(1) through (f)(4), like proposed § 70.208(g)(1) through (g)(4), would require the operator to make respirators available, implement corrective actions, record the reported excessive dust conditions, and review the adequacy of the CPDM Performance

Plan. MSHA believes that corrective action taken when the applicable standard is exceeded would assure that respirable dust concentrations do not get to citable ECV levels and the part 90 miner's exposure to excessive dust is minimized.

Proposed § 90.209(f)(1) and (f)(2) would require the operator to make approved respirators available to the affected part 90 miners and implement corrective actions. MSHA believes these proposed requirements are necessary to prevent miners' overexposure to respirable dust and would provide improved protection for miners. The proposed provisions are consistent with proposed § 90.209(e)(1) and (e)(2) and proposed § 70.208(g)(1) and (g)(2). The rationale for this part 90 provision is the same as that for proposed § 70.208(g)(1) and (2), which is discussed elsewhere in the preamble.

Proposed § 90.209(f)(3), like proposed § 90.209(e)(5) and proposed § 70.208(g)(3), would require the operator to record the reported excessive dust condition as part of and in the same manner as the records for hazardous conditions required by existing § 75.363. The proposal would require the record to include the following information: (i) Date of sampling; (ii) length of the sampled shift; (iii) location within the mine and the occupation where the sample was collected; (iv) the end-of-shift equivalent concentration; and (v) corrective action taken to reduce the concentration of respirable coal mine dust to or below the applicable standard. Like other similar proposed part 70 and 90 provisions, the record would provide useful information for operators, miners, and MSHA to evaluate dust exposures, whether such conditions are recurring, and the effectiveness of the dust controls being used.

Proposed paragraph (f)(4) would require the operator to review the adequacy of the approved CPDM Performance Plan applicable to part 90 miners. It would require the operator to submit any plan revisions, if needed, to the District Manager for approval. Plan revisions would be required to be submitted within 7 calendar days after the operator provides the end-of-shift equivalent concentration to the part 90 miner. This proposed provision is consistent with proposed paragraph (e)(4). The rationale for proposed § 90.209(f)(4) is the same as that for proposed § 90.209(e)(4).

Q. Section 90.210 Respirable Dust Samples; Transmission by Operator

Proposed § 90.210, redesignated from existing § 90.209, would revise requirements for the operator to transmit sampling information collected by either a CMDPSU or CPDM. It would revise paragraphs (a) and (c) and add a new paragraph (f); paragraphs (b), (d) and (e) would remain the same.

Proposed paragraph (a) would make a non-substantive change to clarify that it only applies to operators' transmission of samples collected with a CMDPSU.

Proposed paragraph (c) would retain the existing requirement that only persons certified in sampling complete the dust data card provided by the manufacturer of the filter cassette. It would be revised to require that each dust data card be signed by the certified person who actually performed the sampling shift examinations. Consistent with MSHA's existing policy, the proposal would also require that the person's signature on the data card include that person's MSHA Individual Identification Number (MIIN). Proposed § 90.210(c) is identical to proposed § 70.210(c), and the rationale is discussed elsewhere in the preamble related to proposed § 70.210(c).

Proposed paragraph (f) is new and would apply when operators use CPDMs to sample. It would require that, within 12 hours after the end of the last sampling shift of the work week, a designated mine official must validate, certify, and transmit electronically to MSHA all daily sample and error data file information collected during the previous calendar week (Sunday through Saturday) and stored in the CPDM. It would also require the operator to maintain all CPDM data files transmitted to MSHA for at least 12 months. Proposed § 90.210(f) is identical to proposed § 70.210(f), and the rationale is discussed elsewhere in the preamble related to proposed § 70.210(f).

R. Section 90.211 Respirable Dust Samples; Report to Operator

Proposed § 90.211, redesignated from existing § 90.210, would address data contained in MSHA's report of respirable dust samples provided to operators. It would also address requirements for the operators' report provided to each part 90 miner. Proposed paragraphs (a)(1), (a)(5), (a)(6), and (b) would remain the same.

Proposed paragraph (a) would include minor editorial changes. Proposed paragraph (a)(2) would replace the language "mechanized mining unit" with "locations" to assure that all areas where part 90 miners work would be included.

Proposed paragraphs (a)(3) and (a)(4) would include conforming changes by adding that the concentration of respirable dust be expressed "as an equivalent concentration." The changes are consistent with other proposed provisions that specify that the concentration of respirable coal mine dust is converted to and expressed as an 8-hour equivalent concentration.

Proposed paragraph (a)(7) would revise the existing requirement to specify that MSHA's report will contain the part 90 miner's MSHA Individual Identification Number (MIIN) instead of a social security number. To assure privacy and to comport with Federal requirements related to safeguarding personal-identifiable information, MSHA has eliminated the use of social security numbers on its documents.

Proposed paragraph (c) is new and would apply to operators who use a CPDM. It would require the designated mine official to validate, certify, and provide certain sampling information to each part 90 miner. Proposed paragraph (c)(1) would require the designated mine official to provide each part 90 miner with a report of the daily end-of-shift sampling results within 1 hour of the part 90 miner's next work shift. The daily report must include the: mine identification number; location in the mine from which samples were taken; respirable dust concentration expressed as an equivalent concentration for each valid sample; total amount of exposure accumulated by the part 90 miner; occupation code; reason for voiding any sample; the part 90 miner's MIIN; and the shift length. This information, similar to that required under existing § 90.210 would provide miners with sampling and exposure information for the shift. Under the proposal, the District Manager could require any other information, such as the duties performed during the shift (*i.e.,* shoveling the belt or building stoppings), or the special purpose for sampling (certifying the part 90 miner in a new occupation or evaluating a new work location).

Proposed paragraph (c)(2) would require the designated mine official to provide to the part 90 miner the weekly accumulated exposure (WAE) and the weekly permissible accumulated exposure (WPAE) within 1 hour after the start of the part 90 miner's next work shift of a new work week (Sunday through Saturday). Providing part 90 miners with a copy of the WAE and WPAE would inform them of the total amount of coal mine dust exposure accumulated during the work week, as

well as the maximum amount of accumulated exposure to coal mine dust permitted to be received during a normal work week. Providing these data would assure that part 90 miners are informed of their weekly exposure levels so that they can take a proactive role in their health protection.

Proposed paragraph (d) is new and would not allow the operator to post part 90 sampling data on the mine bulletin board. This proposal is consistent with existing § 90.210(b).

S. Section 90.212 Status Change Reports

Proposed § 90.212(a), redesignated from existing § 90.220, would provide operators the option of reporting to MSHA changes in the status of a part 90 miner electronically instead of in writing.

Proposed paragraph (b) is new and would require the designated mine official to report status changes that affect the operational readiness of any CPDM within 24 hours after the status change has occurred. Examples could include a malfunction or breakdown of a CPDM that is needed for sampling, or failure to have a spare CPDM available for required sampling. Since MSHA would rely on data provided by the CPDM to evaluate dust controls and to assure that miners are not exposed to excessive levels of respirable coal mine dust, the Agency would need to be informed of any circumstances that would affect the operational readiness of CPDMs.

T. Section 90.300 Respirable Dust Control Plan; Filing Requirements

Proposed § 90.300 would address requirements for filing a dust control plan for a part 90 miner. MSHA is proposing to revise § 90.300(a) and 90.300(b)(2) and (b)(3); no changes are proposed for § 90.300(b)(1) or (b)(4).

Proposed § 90.300(a) would require that the operator submit a written respirable dust control plan to the District Manager for a part 90 miner identified in a citation and that the plan be adequate to continuously maintain respirable dust within the applicable standard for the part 90 miner. The proposed change "applicable standard" would replace "permissible concentration" in existing § 90.300(a). MSHA's rationale for proposing this change is the same as for proposed § 71.300(a), *i.e.,* to reflect the Agency's intent that the dust control plan must be sufficient to maintain dust levels at or below the applicable standard to ensure that respirable dust concentrations do not get to ECV levels. This would assure improved protection for miners.

The proposed rule would delete language in existing § 90.300(a) that requires submission of a respirable dust control plan for the part 90 miner within 15 calendar days after termination of a citation for violation of § 90.100 or § 90.101. Instead proposed § 90.300(a) would require the plan to be submitted "As required by § 90.208(f) and § 90.209(e)(3)." Both referenced sections, § 90.208(f) and § 90.209(e)(3), are discussed elsewhere in the preamble and specify the timeframes for operators to submit a respirable dust control plan, or proposed changes to an approved plan, when a CMDPSU or a CPDM is used.

Proposed § 90.300(b) would address the information that must be included in the dust control plan for a part 90 miner and would remain essentially unchanged from the existing requirements. Proposed § 90.300(b)(2) would revise the existing standard to require the dust control plan to include the name and MSHA Individual Identification Number (MIIN) of the part 90 miner instead of the part 90 miner's social security number as required by the existing standard. To assure privacy and to comport with Federal requirements related to safeguarding personal identifiable information, MSHA has eliminated the use of social security numbers on it documents. This requirement is consistent with MSHA's Program Policy Letter No. P08–III–1 (April 21, 2008). Proposed § 90.300(b)(3) would require the dust control plan include a detailed description of the specific respirable dust control measures used to continuously maintain concentrations of respirable coal mine dust at or below the applicable standard. The proposal would revise the existing standard, which requires a detailed description of control measures used to "abate violations" of the respirable dust standard. The proposed revision would clarify that the dust control measures must be sufficient to continuously maintain dust levels at or below the applicable standard and not overexpose part 90 miners. The proposal would improve the health protections of part 90 miners.

U. Section 90.301 Respirable Dust Control Plan; Approval by District Manager; Copy to Part 90 Miner

Proposed § 90.301 would address the criteria MSHA would use to approve the dust control plan, as well as require operators' compliance with plan provisions. Proposed § 90.301(a)(1) and (b) would be identical to proposed § 70.301, discussed elsewhere in this preamble. MSHA is not proposing revisions to paragraphs (a)(2), and (c) through (e).

IV. Health Effects

A. Introduction

This section summarizes the health effects from occupational exposure to respirable coal mine dust. MSHA discussed health effects in its Notice of Proposed Rulemaking (NPRM) on Plan Verification, which was published on March 6, 2003 (68 FR 10784). The literature referenced in that document pre-dated 1999. This section discusses the more recent literature dating from 1997 to mid-2009 with occasional references to earlier papers.

Pulmonary disease in miners chronically exposed to coal mine dust consists of interstitial and obstructive diseases. Miners develop Coal Workers' Pneumoconiosis (CWP) or chronic obstructive pulmonary disease (COPD). There are no specific treatments to cure pneumoconiosis or COPD. These chronic effects may progress even after miners are no longer exposed to coal dust resulting in increased disability and death. Other complications may follow, such as pulmonary and cardiac failure, that result in total disability and premature death.

Reduction of coal mine dust exposure is the only effective way to prevent either CWP or COPD. Screening and surveillance programs detect trends and clusters of disease occurrences and allow secondary preventive intervention to slow the rate of progression in individual miners. Data from screening and surveillance programs provide estimates of the prevalence of occupational respiratory disease among working coal miners.

At the existing standard of 2.0 mg/m^3, cases of CWP and COPD continue to occur. In recent years, the prevalence of CWP has increased among experienced miners, and in some cases, CWP has progressed rapidly to PMF. The persistence of disease requires that additional action be taken to reduce coal mine dust exposures. The proposed requirements would result in a further reduction in occupational pulmonary disease, disability, and premature mortality in coal miners.

B. Hazard Identification

1. Agent: Coal Mine Dust

Coal may be classified on the basis of its type, grade, and rank. The type of coal is based on the plant material (*e.g.,* lignin, cellulose) from which it originated. The grade of coal refers to its chemical purity. Although coal is largely carbon, it may also contain other elements such as hydrogen, oxygen,

nitrogen, and sulfur. Coal rank reflects the stage the coal has reached on the coalification path (*i.e.*, the processes involved in the historical transformation of plants to form peat, lignite, sub-bituminous coal, bituminous coal, and anthracite). High rank "hard" coal refers to coal with a higher carbon content (*e.g.*, 90–95%) than "soft" coal (*e.g.*, 65–75%). In addition to hardness, coal rank refers to its fixed carbon content, down to 65%, and then by its heating value and amount of volatile matter. The most commonly described coal ranks include lignite (low rank), bituminous coal (medium rank), and anthracite (high rank) (68 FR 10784). The inorganic components of coal include phyllosilicates, quartz, carbonates, and sulfates. Coal deposits also contain metals, mostly iron and aluminum and trace amounts of arsenic, nickel, zinc, cadmium, cobalt, mercury, beryllium, and copper (Huang *et al.*, 2005). The relative toxicity of coal increases with its rank.

2. Physical State: Respirable Coal Mine Dust

Dusts are solid particles suspended in the air. Coal dust may be freshly generated or may be re-suspended from surfaces on which it is deposited in mines. Dust particles have an irregular shape and a wide range of sizes. Coal mine dust may be inhaled by miners, and some of the smaller respirable particles are deposited, some are cleared, and the remainder is retained in their lungs where it can initiate or advance the disease process.

Coal mine dust particles are insoluble in water which is important biologically and physiologically. Soluble dusts can be absorbed into the blood stream but insoluble dusts may remain in the lungs for prolonged periods of time resulting in a variety of cellular responses that could lead to pulmonary disease (68 FR 10784).

3. Biological Action: Respirable Coal Mine Dust

Coal mine dust has a particle size distribution that typically ranges between 1 and 100 micrometers (μm) in diameter (note: 1 μm = [1/1,000,000] meter). The size of the coal particles determines how deeply into the respiratory tract they penetrate (ACGIH, 1999; AIHA, 1997). Dusts that are small enough to penetrate to the alveolar region are called respirable dusts. They range in size up to 10 or even 20 μm in diameter but most respirable particles (68 FR 10784) are approximately 1–2 μm in diameter.

Because dust in this size range is responsible for disease, it is the fraction that is measured in the mine environment. The particles collected with an approved sampling device in accordance with 30 CFR part 74 (Coal Mine Dust Sampling Devices) approximate that portion of the dust which may be deposited in the lungs (68 FR 10784, 75 FR 17512).

Respirable dust particles are deposited but, as part of the lung's defense mechanism, most particles are cleared. Within the upper airways, hair-like projections called cilia line the airways and are covered by a thin layer of mucus. Cilia create waves to carry particles toward the throat where they are swallowed, coughed up and spat out, or sneezed out. This mechanism removes particles quickly, within hours or days. In the deepest region of the lower airways, the alveolar region, particles are cleared by pulmonary macrophages. These cells engulf and carry particles to the ciliated airways or may remove them by way of the blood or lymphatic system or by storing them in the spaces between cells. This process, unlike the movement of the cilia, is much slower and can take months or years. Thus, some particles may remain in the alveolar region for a very long time and some are retained permanently. Either alveolar clearance or ciliated clearance can be altered by disease progression. It is the retention of coal mine dust in the alveolar region that is the starting point for the coal macule (a combination of coal dust and macrophages) and CWP (Kuempel *et al.* 2001a, 2001b; Hatch and Gross, 1964; Oberdorster, 1995).

4. Mechanism of Action: Respirable Coal Mine Dust

The literature includes various mechanisms of damage, inflammation, and lung scarring that explain the development and progression of pulmonary disease induced by the inhalation and retention of coal mine dust. These include direct cell destruction (*i.e.*, cytotoxicity), activation of oxidant production by alveolar macrophages, and stimulation of inflammatory and fibrogenic factors (Attfield *et al.*, 2007).

a. Cytotoxicity

Coal mine dust exposure can cause direct cell membrane damage, as indicated by hemolysis of red blood cells, lactate dehydrogenase released from alveolar macrophages, and lipid peroxidation. Researchers concluded that some coal dust-related toxicity could be related to trace metal contaminants in the coal dust. For example, water leachate of Pennsylvania coal is reportedly more potent in inhibiting in vitro mammalian cell growth than Utah coal leachate. This potency difference is, in part, related to the nickel content of these coal samples. There are other studies that support bioavailable iron (BAI) as another pathway through which oxidative injury is initiated in lung tissue. Huang *et al.* (2005) found that iron present in coal can become bioavailable by pyrite oxidation, which produces ferrous sulfate and sulfuric acid. In different deposits of coal, calcite content could neutralize the available acid and inhibit iron's bioavailability. This could partially explain the different toxicity of coals seen not only in the United States, but also in Europe and Asia (Huang *et al.*, 2005; Zhang and Huang, 2005; Zhang *et al.*, 2002; McCunney *et al.*, 2009).

Cell destruction is also related, in part, to the generation of free radicals. Free radicals are highly reactive molecules or sub-atomic particles that are created, for example, by crushing coal or other rocks (Cohen *et al.*, 2008). Anthracite coal generates more free radicals than bituminous coal when fractured. This difference in potency is reflected in the higher prevalence of CWP among anthracite miners (Attfield *et al.*, 2007).

Oxidative free radicals contribute to the development and progression of pulmonary disease by at least three mechanisms. First, oxidants react with a variety of pulmonary proteins. Second, these oxidized proteins contribute to the inactivation of naturally occurring chemicals such as α_1-antitrypsin, which is important in the development of emphysema. Third, oxidants promote inflammation and may be important in the development of asthma (Luppi and Hiemstra, 2007; De Andrade *et al.*, 2005).

b. Activation of Reactive Oxidant Species

Coal dust increases the production of reactive oxygen and nitrogen species in the alveolar macrophages of miners exposed to coal dust. Coal miners with CWP show evidence of such species but this activity does not occur in asymptomatic coal miners. The magnitude of reactive species was directly related to the severity of CWP (Attfield *et al.*, 2007).

c. Stimulation of Inflammatory and Fibrogenic Factors

Coal miners with CWP suffered inflammatory injury to their lungs but similar effects were not found in asymptomatic coal miners. Cohen *et al.* (2006) found that pyrite (FeS_2), a common iron compound found in some

coal dust, can generate reactive oxygen species. This may be one way that the inflammation associated with CWP development begins. Such an effect was found in coal miners with simple CWP but not in a control group (Altin *et al.* 2004). Higher rank coals also have a higher electrostatic charge when broken during mining. This higher charge on the coal particles leads to an increased degree of agglomeration of submicron coal dust particles. These particles enhance respiratory deposition and toxicity due to their higher lung deposition efficiencies than uncharged particles. These characteristics may contribute to the increased incidence of CWP observed in high-rank coal regions (Page and Organiscak 2000).

Coal dust toxicity may be increased by modern mining practices that shear the coal, creating more freshly broken coal dust. A greater number of free radicals is contained on the exposed surface of freshly created dust (Cohen *et al.* 2008). Coal dust exposure has also been associated with elevated production of fibrogenic (*i.e.*, scar-producing) factors. Evidence indicates that production of these fibrogenic factors is directly related to disease severity.

C. Health Effects

Epidemiological studies have consistently demonstrated the serious health effects of exposure to high levels of respirable coal mine dust (*i.e.*, above 2.0 mg/m3) over a working lifetime. Table V–1 lists epidemiological studies published since 1997. The results of these studies will be discussed on the basis of the type of observed health effect. These studies show that the lung is the major target organ in which toxic effects occur from inhalation of respirable coal mine dust. Numerous studies of miners have been conducted in the U.S., as well as in a number of other coal-producing countries (*e.g.*, England, France, Poland, Germany, Turkey, South Africa, China, and Taiwan). Recent U.S. studies were conducted using data from the National Study of Coal Workers' Pneumoconiosis (NSCWP) surveys, and have provided extensive data on miners' health. The results of these studies demonstrate that miners are at increased risk of multiple, concurrent respiratory ailments, including asthma, COPD, and CWP.

TABLE V–1—RESPIRABLE COAL MINE DUST EPIDEMIOLOGICAL STUDIES, REPORTED EFFECTS FROM 1997 TO PRESENT

Study	Population studied	Exposure measure	Reported effects								
			LLF	RS	CB	A	COPD	E	CWP	PMF	NMRD
Althouse et al., 1998*	U.S.	Tenure	.....	.....	.....	.....	.....	.....	√	√	.....
Altin et al., 2004	Turkey	Tenure	.....	√	.....	.....	.....	.....	√	.....	.....
Antao et al., 2005*	U.S.	N/A	.....	.....	.....	.....	.....	.....	√	√	.....
Antao et al., 2006	U.S.	Tenure & Job	√	√	√	.....	.....	.....	√	√	.....
Attfield et al., 2004	U.S.	N/A	.....	.....	.....	.....	.....	.....	√	.....	.....
Attfield et al., 2007+	Various	N/A	√	.....	√	.....	√	√	√	√	.....
Attfield and Petsonk, 2007*.	U.S.	Tenure	.....	.....	.....	.....	.....	.....	√	√	.....
Attfield and Kuempel, 2008*.	U.S.	Region & CDE	.....	.....	√	.....	.....	√	√	√	√
Attfield et al., 2009*	U.S.	# Miners/Region & Tenure.	.....	.....	.....	.....	.....	.....	√	.....	.....
Beeckman et al., 2001*	U.S.	N/A	√	√	√	√	√	√	.....	.....	.....
Bourgkard et al., 1998	France	CDE	√	√	√	.....	.....	.....	√	.....	.....
Coggon and Newman-Taylor, 1998+.	Review	.....	√	√	√	.....	√	√	√	.....	.....
Cohen et al., 2008+	U.S.	N/A	√	.....	√	.....	√	√	√	√	.....
Cowie et al., 1999	Britain	CDE	√	√	√	.....	.....	.....	.....	.....	.....
Green et al., 1998a*	U.S.	Tenure	.....	.....	.....	.....	.....	√	√	√	.....
Green et al., 1998b*	U.S.	Tenure	.....	.....	.....	.....	.....	√	√	√	.....
Henneberger and Attfield, 1997*.	U.S.	CDE	√	√	√	.....	.....	.....	.....	.....	.....
Hurley et al., 2002	Britain	CDE (N/A)	.....	√	√	.....	.....	.....	√	√	.....
Kuempel et al., 1997*	U.S.	RDC & CDE & Tenure.	√	.....	.....	.....	√	√	√	√	.....
Kuempel et al., 2009a*	U.S.	CDE	√	.....	.....	.....	.....	√	.....	.....	.....
Kuempel et al., 2009b*	U.S.	CDE & Tenure	.....	.....	.....	.....	.....	√	√	√	.....
Lin et al., 2001	Taiwan	Tenure	√	√	√	.....	√	.....	√	.....	.....
Love et al., 1997	Britain	RDC	√	.....	√	√	.....	.....	√	.....	.....
MacCalman and Miller, 2009.	Britain	Tenure	.....	.....	√	.....	√	√	√	√	√
Meijers et al., 1997	Dutch	Tenure	√	√	.....	.....	√	.....	√	√	√
Miller et al., 1997	Britain	CDE	.....	.....	√	.....	.....	.....	√	√	.....
Miller et al., 2007	Britain	CDE	.....	.....	√	.....	√	√	√	√	√
Naidoo et al., 2004	S. Africa	CDE	√	√	√	.....	.....	.....	√	.....	.....
Naidoo et al., 2005	S. Africa	CDE	√								
Naidoo et al., 2006	S. Africa	CDE	√	√	√	.....	.....	.....	.....	.....	.....
Page and Organiscak, 2000.	U.S.	N/A	.....	.....	.....	.....	.....	.....	√	√	.....
Peng et al., 2005 [abstract].	China	RDC	√	.....	.....	.....	.....	.....	.....	.....	.....
Pon et al., 2003*	U.S.	Tenure	.....	.....	.....	.....	.....	.....	√	√	.....
Ross and Murray, 2004+.	Various	N/A	√	√	√	.....	.....	√	√	.....	.....
Scarsbrick and Quinlan, 2002.	Britain	N/A	.....	.....	.....	.....	.....	.....	√	.....	.....

TABLE V–1—RESPIRABLE COAL MINE DUST EPIDEMIOLOGICAL STUDIES, REPORTED EFFECTS FROM 1997 TO PRESENT—Continued

Study	Population studied	Exposure measure	Reported effects								
			LLF	RS	CB	A	COPD	E	CWP	PMF	NMRD
Smith and Leggat, 2006.	Australia	N/A	.....	.....	.....	.....	.....	.....	√	.....	.....
Soutar et al., 2004+	Britain	RDC & CDE	√	.....	.....	.....	.....	.....	√	√	.....
Wang et al., 1997	China	Tenure	√	.....	.....	.....	.....	√	.....	.....	.....
Wang et al., 2005	China	T & RDC	√	.....	.....	.....	.....	.....	.....	.....	.....
Wang et al., 2007	China	RDC	√	√	√	.....	.....	.....	.....	.....	.....
Wang ML et al., 1999	U.S.	Tenure	√	.....	.....	.....	.....	.....	.....	.....	.....
Wang X et al., 1999	China	Tenure	√	√	√	.....	.....	√	√	.....	.....
Yeoh and Yang, 2002	Taiwan	Tenure	√	.....	.....	.....	√	.....	.....	√	.....

*Studies of U.S. Miners Participating in the National Study of Coal Workers' Pneumoconiosis (NSCWP) or Nationwide Coal Workers Autopsy Study (NCWAS).
+Review.
A: Asthma. N/A: Not Applicable.
CB: Chronic Bronchitis. NMRD: Non-Malignant Respiratory Disease.
CDE: Cumulative Dust Exposure. PMF: Progressive massive fibrosis.
COPD: Chronic obstructive pulmonary disease. RDC: Respirable Dust Concentrations.
CWP: Coal workers' pneumoconiosis. RS: Respiratory symptoms, such as cough or phlegm.
E: Emphysema. T&RDC: Total and Respirable Dust Concentrations.

1. Estimates of Morbidity and Mortality

a. Morbidity (Prevalence of Disease)

Routine screening leading to timely intervention affords the opportunity to prevent further development or progression of occupational pulmonary disease among miners still exposed to coal dust. Surveillance programs exist in both the United States and Great Britain. These data show that coal dust-related diseases among miners still exist at unacceptable levels. These data sources and studies are described below.

(1) Data Sources: American Pneumoconiosis Surveillance

There are three surveillance programs in the United States that track the prevalence of coal–related disease. These are—

- The Coal Workers' X-ray Surveillance Program (CWXSP),
- The Miners' Choice Program (MCP), and
- The Enhanced Coal Workers' Health Surveillance Program (ECWHSP).

The CWXSP is an occupational health program established by the Coal Mine Health and Safety Act of 1969 (Coal Act) and administered by the National Institute for Occupational Safety and Health (NIOSH) pursuant to 42 CFR part 37. The program screens underground coal miners for pneumoconiosis. Since implementation of the Coal Act in 1970, coal mine operators have been required to pay for chest radiographs of all underground coal miners at the time of hire and again 3 years later. Coal mine operators are also required to provide miners with the opportunity for additional x-rays at a NIOSH-approved facility every 5 years at no cost to the miners for the remainder of their mining careers (Attfield and Petsonk, 2007).

The initial medical survey under this program was conducted between 1969 and 1971. It included posterior-anterior and lateral chest x-rays and a questionnaire that collected information on symptoms, demographics, smoking and work history, work tenure, and specific jobs in the mine. The chest films were read by physicians certified by NIOSH as proficient in use of the International Labour Office (ILO) classification system for radiographs of the pneumoconioses. Each film was read by at least two readers who used a consensus approach to reach a final determination for each film. The CWXSP defines CWP as small opacity profusion category of at least 1/0 or large opacities (i.e., larger than one centimeter in diameter). Miners with evidence of CWP are offered the option to work in an area of the mine with a respirable coal mine dust level of 1 mg/m^3 or less and have personal dust exposures monitored at frequent intervals (NIOSH, 2008).

In 1996, the Secretary of Labor's *Advisory Committee on the Elimination of Pneumoconiosis Among Coal Workers* (Advisory Committee) recommended that monitoring for pneumoconiosis be expanded to include surface coal miners and independent contractors. The Advisory Committee also recommended incentives to increase underground coal miners' participation. In response to the Advisory Committee recommendation, MSHA and NIOSH implemented the Miners' Choice Health Screening Program (MCP) in October 1999 in an attempt to reach not only surface miners but also additional underground miners. Through the MCP, MSHA paid for the miners' x-rays that were taken at any certified medical facility. MSHA communicated the results of the testing to the individual miners. The MCP and the CWXSP identified cases of CWP and PMF.

The MCP x-rays were processed using the same procedures and criteria used in the CWXSP in accordance with the requirements of 42 CFR part 37. The participants were miners from 586 surface coal mines and 444 underground coal mines and included eight active surface coal mining communities in Pennsylvania, Kentucky, and West Virginia, as well as Poteau, Oklahoma, and Gillette, Wyoming. A ninth group included underground miners in Kentucky. The process was designed to encourage miners' participation by providing for a greater degree of anonymity than may be available under the CWXSP. The program ended in October 2002 and more than 19,500 active coal miners from 20 states voluntarily participated (Pon *et al.,* 2003; 68 FR 10784).

NIOSH in cooperation with MSHA initiated the ECWHSP in March 2006 to increase participation by providing additional respiratory health evaluations to coal miners using a mobile medical examination unit to bring the medical exams to the miners in the field. NIOSH and MSHA hoped that this program would provide early detection of dust-related pulmonary disease and target additional areas for prevention. Standardized questionnaires, pulmonary function testing, and chest x-rays are administered following the protocol of

the CWXSP (Antao *et al.,* 2006; Attfield and Petsonk, 2007).

The National Center for Health Statistics (NCHS) collects population data on the prevalence of asthma and COPD (including chronic bronchitis) in the National Health Interview Survey (NHIS). Another survey used to assess the health status of the population is the National Health and Nutrition Examination Survey (NHANES). Findings from these surveys are used to determine the prevalence of major diseases, including pneumoconiosis, and their risk factors in the general population (NIOSH, 2008). Approximately 30% of American miners have participated in these surveys, resulting in a large database.

(2) Data Sources: British Pneumoconiosis Surveillance

British health surveillance started in the 1950s with the Pneumoconiosis Field Research (PFR) program. In addition, radiographic assessment was conducted by the Periodic X-ray (PXR) Scheme of the British National Coal Board, and medical investigations were conducted by the Pneumoconiosis Research Unit (PRU) of the Medical Research Council.

The United Kingdom National Joint Pneumoconiosis Committee recommended to the National Coal Board that it establish the Pneumoconiosis Field Research (PFR) program in the early 1950s. This recommendation was based on research indicating that over 36,000 coal miners were disabled by pneumoconiosis between the years 1931 and 1949. The purpose of the PFR program was to conduct field research to determine the kinds and quantities of dust that cause pneumoconiosis and to establish health-based exposure levels to reduce the development of disease in miners. In addition, the PXR Scheme of the British National Coal Board took x-rays and the Pneumoconiosis Research Unit (PRU) of the Medical Research Council conducted medical investigations. There have been at least 10 rounds of health surveys conducted under the PFR program between 1959 and 2000. Voluntary health surveys were conducted every five years and included chest radiographs, pulmonary function tests, and questionnaires on respiratory symptoms and smoking habits. Initially, response rates were generally above 90%.

Concurrent with the health surveys, a separate industrial hygiene (IH) assessment was conducted as part of the PFR program that quantified typical concentrations of respirable dust and quartz for a variety of occupations within the mines. These exposure measurements were linked to data from payroll systems on the times worked by each miner in the same occupations. This IH assessment work produced individual and period-specific estimates of exposure to respirable dust and quartz. The number of mines included in the surveys has fluctuated from 24 representative British collieries (coal mines) in the early 1950s to between 10 and 15 collieries in more recent years. Since the PXR does not follow a defined cohort of miners, results may not be representative of the mining population in Britain (MacCalman and Miller, 2009; Attfield and Kuempel, 2003; Scarisbrick and Quinlan, 2002). In cohort studies subjects are selected based on their exposure status, in this case, coal dust. The complete cohort should be followed over time to track disease development.

(3) Estimates of Prevalence in Active American Coal Miners

Studies conducted by NIOSH and MSHA estimated the prevalence of pneumoconiosis in current coal miners using data collected between October 1, 1995, and September 30, 2002, from the CWXSP and MCP surveillance programs (Pon *et al.,* 2003; Antao *et al.,* 2005; Cohen *et al.,* 2008). A total of 35,983 readable chest films from 31,179 contract and non-contract miners at 1,439 mines in 23 states were evaluated. The prevalence of CWP in this population was 2.8% (n = 862 cases), and the prevalence of PMF was 0.2% (n = 62 cases).

The prevalence of CWP among non-contract employees at surface mines, non-contract employees at underground mines, and contract miners was 1.9%, 3.2%, and 3.0%, respectively. The prevalence of CWP and PMF in underground non-contract miners from 16 states ranged from 0.0% to 9.6%, and 0.0% to 0.6%, respectively. Miners that worked at larger mines (greater than 50 employees) had a lower prevalence of pneumoconiosis than those from smaller mines (2.0% versus 5.6% for CWP, and 0.1% versus 0.5% for PMF, respectively).

As expected, the prevalence of CWP and PMF increased with age and the length of time worked in coal mining. Information about the length of time worked in coal mining was available for 28,253 miners (18,388 underground miners and 9,793 surface miners).

In a broader examination of the data, NIOSH reported the number of cases of CWP category 1/0+ for five year intervals from 1970 through 2004 (NIOSH, 2008). The range of cases (and their percentages) were 11,847 cases in 1970 (11.2% of all miners examined). This number dropped to 601 cases (3.6%) in the 2000 to 2004 time period. The estimate for the 2 years of 2005 and 2006 is 270 cases (3.3%). The prevalence rate increases as tenure in mining increases, from 0.7% for miners with 0 to 4 years in mining to 9.9% for miners with 30 or more years in mining.

NIOSH researchers further examined these data to determine if disease progression could be determined in the 783 underground coal miners who had at least two radiographs available for review (Antao *et al.,* 2005). NIOSH determined that 277 (35.4%) of these miners presented evidence of rapidly progressive CWP and 41 (14.8%) of these miners presented evidence of PMF. Eight cases showed progression of one subcategory over 5 years, 156 cases had progression equivalent to two or three subcategories over a 5-year period, and 72 cases had progression the equivalent of more than three subcategories over a 5-year period.

Rounded opacities were the primary shape/size in 73% of the rapidly progressive cases compared to 50% in the non-rapidly progressive cases. Overall, the miners with rapidly progressive CWP were somewhat younger (mean age 48) than the remaining miners evaluated (mean age 51), but were similar in mean work tenure (27 to 28 years). Miners with rapidly progressive cases were more likely to have worked in smaller mines than in larger mines. These miners also reported longer mean tenure in jobs involving work at the face of the mine (19 years), compared to miners without rapid progression (17 years). These particular cases occurred in miners from eastern Kentucky and western Virginia (Antao *et al.,* 2005).

Clusters of newly identified cases of advanced pneumoconiosis were surveyed in 2006 by ECWSHP teams that visited two counties in Virginia (Antao *et al.,* 2006) and in eastern Kentucky and southwestern Virginia (Attfield and Petsonk, 2007). In March and May 2006, 328 underground coal miners employed in Lee and Wise counties in Virginia were examined, representing 31% of the estimated 1,055 underground miners in those counties. The mean age of examined miners was 47 years, and their mean tenure working in underground coal mines was 23 years. A total of 216 (66%) had worked at the coal face for more than 20 years; and 30 (9%) had radiographic evidence of pneumoconiosis (i.e., category 1/0 or higher profusion of small opacities). Of these, 11 miners had advanced cases, including five with large opacities consistent with PMF and six with coalescence of small opacities on a

background profusion of category 2. Among the 11 miners with advanced cases, the mean age was 51 years (range: 39–62 years), the mean tenure in underground coal mines was 31 years (range: 17–43 years), and the mean number of years working at the coal face was 29 years (range: 17–33 years). All 11 advanced cases met the radiographic criteria for rapidly progressive CWP. All reported at least one respiratory symptom (i.e., productive cough, wheeze, or shortness of breath), the most common being shortness of breath (dyspnea). Four of the nine who underwent lung function testing had abnormal results (Antao *et al.,* 2006).

In a separate ECWSHP survey in 2006, pneumoconiosis rates were determined for 26 sites in seven counties in eastern Kentucky and southwestern Virginia. A total of 975 (20%) of the 4,897 active underground miners in the counties participated; 37 (4%) of those tested had advanced pneumoconiosis. Many of these miners had worked underground for many years without medical follow-up. Medical records indicated that all 37 miners with advanced disease had worked underground for at least 10 years without a chest x-ray; 22 (59%) had worked for at least 20 years and two others had worked for more than 30 years (Attfield and Petsonk, 2007).

(4) Estimates of Prevalence in Active British Coal Miners

Published PXR results include data for miners and, where appropriate, separate reports for contractors. A summary of the prevalence of pneumoconiosis in a given time frame illustrates the decrease in the size of the British coal mining industry over the last 40 years. Pneumoconiosis prevalence decreased from 12% (56,000 cases) in the years 1959 through 1963, to 0.2% (13 cases, all category 1) in the years 1994 through 1997. The prevalence in the years 1998 through 2000, however, rose to 0.8% (35 cases) and included nine cases of category 2 CWP or greater. The incidence of new cases diagnosed on second examination among those miners x-rayed on two occasions in the ninth round of the PXR was 1.4 per 1,000 (all category 1). In the years 1998 through 2000, it rose to 6.9 per 1,000 (a total of 32 cases, 23 category 1 and nine category 2 CWP or greater). A similar increasing trend in CWP prevalence is apparent in British miners as in U.S. miners. At the beginning of the British tracking scheme (1959 through 1963), CWP prevalence was 12%; it had dropped to 0.2% in 1997. But surveillance from 1998 to 2000 shows an increase to 0.8%. The authors speculated that reasons behind the increase may include longer working hours, the increased average age of miners, and changes in mining practices (Scarisbrick and Quinlan, 2002).

b. Mortality (Disease That Results in Death)

The mortality experience of U.S. and British coal miners has been studied by using either autopsy studies or death certificate data. These data sources and studies are described below.

(1) Data Sources: American Miners

Two autopsy study populations have been used by researchers studying the effects of coal mine dust exposure on mining populations. The first was a study group that consists of 616 underground coal miners autopsied at the Beckley Southern Appalachian Regional Hospital, Beckley, West Virginia from 1957 through 1973. All cases had at least one year of underground bituminous coal mining experience in various mines within a 100 mile radius of Beckley. The following information was collected at time of death: Age at death, smoking history, underground coal mining tenure, and cause of death. A control autopsy group was comprised of 106 non-miners: 56 cases from the same hospital who died during the same period as the coal miners and a series of Medical Examiner autopsies of 50 men at the University of Vermont from 1972 through 1978. All autopsy and demographic data were collected and processed in a similar manner. At autopsy, whole left lungs were removed, inflated, and preserved and tissue blocks were taken for histologic examination from representative areas of the right and left lungs (Vallyathan *et al.,* 1997; Kuempel *et al.,* 2009a and b).

The second autopsy group is the U.S. nationwide autopsy program (National Study of Coal Workers' Pneumoconiosis) for underground coal miners. This program was initiated in 1969 as part of the Coal Act and implemented in 1972 under section 411(c) (Black Lung benefit claims). Research has been published on approximately 6,580 autopsy cases from 27 states through 1996. For each case, information was obtained by means of a questionnaire completed by the next of kin on age, years of underground mining tenure, primary job within the mine, smoking history, and state where the questionnaire was completed. A pathology report and a minimum of three blocks and slides of lung tissues were submitted. The population autopsied represented approximately 12% of all deceased miners (Green *et al.,* 1998b).

(2) Data Sources: British Miners

Study of mortality within the PFR cohort began in 1970 and has compared the mortality experience of the first survey dating from the 1950s with that expected on the basis of general population rates (Miller *et al.,* 1997 and 2007; MacCalman and Miller, 2009). There were a series of six PFR surveys beginning in 1954 and ending in 1978. In the first survey, 24 collieries were included in the study. In the remaining rounds of the survey, 10 collieries were studied. Surveys were used in the first round to estimate exposure; whereas in subsequent rounds actual dust measurements were provided (Miller *et al.,* 2007). The mortality experience of 18,000 of the initial 31,000 men in the first round was followed over time. Most of the deep mines in Britain closed around 1980. The cohort's vital status is still being tracked; though exposure estimates are the same as those reported in Miller *et al.* (1997). Mortality of the mining population is compared to that of a reference population, controlled for region, age, and year-specific rates. The number of observed deaths in the cohort is compared to that in the comparison population and a standard mortality ratio (SMR) is calculated. If the ratio is over 100, than the death experience of the cohort is elevated above that of the comparison group. If the ratio is less than 100, then there were fewer deaths from a specific cause in the cohort than in the comparison population. Statistical techniques are applied to determine if the specific-cause of death SMRs are statistically significant, usually at a 95% confidence level.

(3) Estimates of Mortality in American Coal Miners

Green *et al.* (1998b) researched the prevalence of the various pathological types of CWP that occurred in deceased miners by evaluating lung specimens collected as part of the NCWAS during 1972 to 1996. The researchers examined lung specimens from 4,115 randomly selected cases from 27 states. In this autopsy survey, the authors determined that the overall frequencies of CWP lesions were:

- 77% macules;
- 39% nodules (macules develop into nodules);
- 23% silicosis;
- 8% progressive massive fibrosis (PMF); and
- 80% emphysema.

The prevalence of all types of lesions has declined over the years. At the beginning of the autopsy survey in the

1970s, miners had died who worked in the industry in the 1940s. Their prevalence of nodular CWP at death was 53%. Autopsies of miners who had begun working in the industry since 1970 (under the existing 2 mg/m^3 standard) had a 17% prevalence of nodular CWP at death. The results of this autopsy study indicate that as dust exposure was reduced in U.S. mines the prevalence of CWP also was reduced. Attfield *et al.* (2004) examined mortality from pneumoconiosis using National Center of Health Statistics data from 1968 through 2000. They found that overall age-adjusted death rates for CWP dropped 36% from the 1968–1981 time period to the 1982–2000 time period.

From 1990 to 1999, a large majority of CWP deaths were associated with employment in the coal mining industry, for which proportionate CWP mortality was more than 50 times higher than that of all occupations combined. A review of death certificates for the years 1968 through 2005 shows that CWP mortality has been declining rapidly in the anthracite coal region of Pennsylvania, reflecting the reduction in coal mining in this region over the last 30 years. In the much larger bituminous coal mining regions, deaths from CWP have declined over time but may be increasing among younger miners (Attfield *et al.,* 2009). Nationally, CWP deaths among U.S. residents age 15 and over continue to decline, from well over 2,500 deaths annually in the early 1980s to well below 1,000 in the early 2000s. CWP deaths accounted for over one-third of pneumoconiosis deaths during the 10-year period from 1995 to 2004; and seven counties (two in Virginia, one in Pennsylvania, one in Kentucky, and three in West Virginia) had age-adjusted CWP death rates that exceeded the national rate by more than 100-fold (NIOSH, 2008).

In order to determine mortality rates for a cohort of 9,078 working coal miners who participated in the initial round of the CWXSP surveillance survey from 1969 to 1971, NIOSH researchers conducted a study that reviewed the 23-year mortality experience of the cohort and analyzed the mortality data through 1993. The final analysis included the mortality experience of 8,899 miners (Attfield and Keumpel, 2008). The vital status of these miners was determined using various sources. Death certificates were obtained from the appropriate State Department of Vital Statistics to collect cause of death information, including underlying and contributing causes of death. Exposure data from the CWXSP were cross-referenced on the decedents. Cumulative dust exposure estimates were determined based on tenure in mining and estimates of dust concentrations for given occupations.

This group of miners experienced increased mortality from nonmalignant respiratory diseases (NMRD), pneumoconiosis, and other respiratory diseases. Mortality was significantly associated with coal rank in decreasing order of anthracite, east Appalachia, west Appalachia, and the West. A significant trend in NMRD mortality was seen with increasing severity of pneumoconiosis after controlling for age, coal rank region, and smoking. Coal dust exposure was also significantly related to NMRD mortality independent of pneumoconiosis. There was also a statistically significant trend in mortality from NMRD with increasing dust exposure and with increasing radiographic category of simple or complicated CWP. It is important to note that miners with minimal CWP had significantly elevated levels of NMRD mortality despite the fact that their mean cumulative dust exposure was less than would be expected after a 40-year working life at the existing limit of 2 mg/m^3. Smoking had a significant impact on the mortality experience of these miners. However, it did not appear to be a confounding factor in the current findings for NMRD mortality because the prevalence of smoking did not vary systematically with mortality among miners across the pneumoconiosis or cumulative dust exposure groups (Attfield and Keumpel, 2008).

A large proportion of miners in every coal mining state die due to CWP. NIOSH (2008) reported the proportionate mortality ratio (PMR), adjusted for age, sex, and race, for the years 1990 to 1999 for specific coal mining occupations. The PMR is the observed number of deaths divided by the expected number of deaths. A PMR greater than 1.0 indicates more deaths associated with CWP in a specific coal mining occupation than expected. Over all, the age-adjusted PMR for the coal mining industry due to CWP is estimated to be 53.2. For individual occupations the estimates were as follows:

Occupation	PMR
Mining machine operators	51.7
Supervisors in extractive occupations	14.4
Mining engineers	6.0
Mining occupations not elsewhere classified	4.5
Miscellaneous material moving equipment operators	2.3
Locomotive operating occupations	2.0

These data indicate that coal miners in production jobs have higher proportionate mortality from CWP (NIOSH, 2008).

(4) Estimates of Mortality in British Coal Miners

Data show that mortality risks due to NMRD (including COPD, chronic bronchitis, and emphysema) and severe pneumoconiosis have increased over time. Analyses have also shown exposure-response relationships for risks of various respiratory causes of death with increasing exposure to dust, but little evidence of increased cancer risks from dust or quartz exposures (MacCalman and Miller, 2009). Miller *et al.* (1997) reported that between the second phase of the PFR (November 1957 to June 1963) through December 1992 the number of deaths in the British cohort of 23,789 men was 7,002 (29.4%). Of theses deaths, 1,272 (18.2%) were from respiratory disease: 436 (6.2%) from chronic bronchitis, 56 (4.4%) from other bronchitis, 203 (16%) from pneumoconiosis (including seven silico-tuberculosis deaths), and 584 (8.3%) from other respiratory causes.

Miller *et al.* (2007) updated this analysis by including 14 more years of follow-up and covering mortality through 2006. The number of deaths in the British cohort of 17,820 men was 10,698 (60.0%) from all causes. Deaths from respiratory diseases were 1,966 (11.0%) from NMRD, 849 (4.8%) from COPD, 500 (2.8%) from chronic bronchitis, 70 (0.4%) from emphysema, and 288 (1.6%) from all pneumoconioses (including 222 (1.2%) from CWP and 10 (0.1%) from silicosis). Significantly elevated cause-specific mortality was determined for NMRD, COPD, chronic bronchitis, and emphysema when the cohort mortality was compared to that of an external reference group. There was not a pneumoconiosis-specific mortality in the comparison group. There was less than expected mortality from tuberculosis (TB), all cancer, lung cancer, and cardiovascular disease, including acute pulmonary heart disease. Miller *et al.* (2007) observed elevated, but not statistically significant, mortality for all causes and ischemic heart disease. Miners also had significantly elevated deaths from stomach cancer with 323 deaths (1.8%).

2. Chronic Obstructive Pulmonary Disease (COPD)

a. Pulmonary Function

The feature common to obstructive pulmonary diseases is obstructed ventilation. This physiological defect is

measured with a spirometer. The specific parameter is the Forced Expiratory Volume in one second (FEV_1). This is a measure of the amount of air a person can forcibly exhale in one second. If it is less than a predicted value by 80% or by 65%, it indicates impairment or serious impairment. The FEV_1 varies with a person's age, height, gender, and ethnicity. Formulas based on surveys of normal healthy adults provide formulas for predicting a "normal" value. It is a simple and inexpensive test to perform and was used in many surveys and studies, as discussed below.

Peng *et al.* (2005) and Wang ML *et al.* (2005) compared pulmonary function in young miners exposed to coal dust with younger students at a mining technical school over a 3-year period. On average, respirable dust concentrations exceeded MSHA's exposure limit for respirable coal mine dust of 2 mg/m^3. The FEV_1 of the miners showed a significant clinical, though non-linear, decline compared to the controls. Smoking aggravated the effect of dust exposure.

Chinese coal miners with clinically important depressed FEV_1 were compared to other miners with stable pulmonary function (controls). (Wang ML *et al.,* 1999) Miners with impaired function (cases) were more likely to work as a roof bolter, on a longwall section, and at the face. They were also more likely to have been exposed to explosive blasting and to water stored for dust control. Miners in the control group were more likely to have reported using respiratory protection than cases. On longwall sections, nearly twice as many of the controls used respiratory protection than had the miners with decreased FEV_1.

Naidoo *et al.,* (2005) compared lung function of former and current coal miners in South Africa. Cumulative coal dust exposure estimates were derived from historical data maintained by coal companies. The FEV_1 of current miners declined by 1.1 ml/mg-year/m^3 and for former miners, at 2.2 ml/mg-year/m^3. This study found that 2.7% of current miners and 5.7% of former miners had FEV_1 levels less than 65% predicted (the conventional threshold level for determining significant impairment). Ex-miners had a lower average percent predicted pulmonary function than current miners for each cumulative exposure category. Past history of TB contributed to 21% and 14% declines in percent predicted FEV_1 and FVC, respectively. This study confirmed that cross sectional studies of working miners can underestimate the prevalence of disease because of a healthy worker or survivor effect. This implies that estimates of the effects of dust on pulmonary function based on surveys limited to active miners are likely underestimates of the true effect. Miners with greater loss of pulmonary function tend to drop out of the mining workforce.

The study of British miners by Cowie *et al.* (2006) was prompted by the need to study clinically important deficits in pulmonary function in relation to dust exposure in a population of miners that was sufficiently large and representative and whose prior dust exposure was well characterized. This need arose following the recognition that exposure to coal mine dust could impair pulmonary function independently of pneumoconiosis. The aim was to support setting dust standards to prevent functional disability among British miners. This investigation was based on data from more than 7000 miners who participated in the fifth round of the PFR in the late 1970s. In practical terms, the aim of this analysis was to evaluate the association between cumulative dust exposure and functional disability (*i.e.,* breathlessness).

The investigators first evaluated the relationship between FEV_1 and breathlessness and then between FEV_1 and cumulative exposure to dust among relevant other factors (age, height, and smoking). The decline in FEV_1 due to dust was estimated to be between 0.5 and 0.6 ml per gram-hour/m^3. (This finding is not directly applicable to miners in the U.S. because of differences in dust sampling methods.) An exposure-response relationship between dust exposure and reduced pulmonary function was determined.

Wang *et al.* (1997) compared pulmonary function in underground coal miners with that of factory workers in Chongqing, China. They took chest x-rays, performed pulmonary function tests (FEV_1, FVC, and DL_{CO}), and assessed their smoking habits. DL_{CO} (diffusion of carbon monoxide) is an indicator of gas exchange in the lung. Exposure was measured by the miners' occupational histories. The results of the study indicated that pulmonary function was associated with job tenure (and, indirectly, because of exposure to dust) and independently of simple CWP. Pulmonary function was further decreased when simple CWP was present. This study did not provide exposure measurements and there was no consideration of exposure-response relationships.

Bourgkard *et al.* (1998) studied French coal miners with CWP (Categories 0/1 and 1/0) who were employed in underground and surface mines over a 4-year period. They examined the prognostic role of cumulative dust exposure, smoking, respiratory symptoms, lung CT scans, and pulmonary function indices progression to simple CWP category 1/1 or higher. At the first medical examination, miners with wheezing and lower ratio of FEV_1/FVC were more likely to progress to category 1/1 or higher. Thus, this study suggested that such pulmonary function changes for miners with Category 0/1 or 1/0 may indicate an increased risk of progressing to a higher category of simple CWP and therefore should be monitored closely.

Collectively, these studies from the United States, Great Britain, France, China, and South Africa show that cumulative exposure to respirable dust results in loss of pulmonary function. These studies illustrate an exposure-response relationship between coal dust and loss of pulmonary function that is non-linear, with a higher rate of decline early in the miner's exposure. Investigations by Naidoo et al. (2005) also suggest that cross-sectional studies of working miners may underestimate the effects of dust on pulmonary function because they are studies of "healthy workers." This obstructive impairment is likely associated with COPD, such as chronic bronchitis or emphysema (Cohen *et al.,* 2008) and may be an indicator of risk of developing CWP. Minimal recovery of pulmonary function is possible if exposure is reduced. Effects are independent of CWP and of smoking. Miners with CWP typically have worse pulmonary function than miners without CWP and the combined effects of smoking and exposure to dust appear to be additive (Cohen *et al.,* 2008).

b. Chronic Bronchitis

Chronic bronchitis develops slowly, by small increments, and, by definition, "exists" when it reaches a certain stage. It is defined as the presence of a productive cough for most days of a week, at least three months of a year for at least two consecutive years. Emphysema is destruction of lung architecture in the alveolar region resulting in airways obstruction and impaired gas exchange. Asthma is a reactive condition of the airways that is triggered by any of several allergens or other factors. Asthma, chronic bronchitis, and emphysema, have been studied in mining populations (Henneberger and Attfield, 1997; Naidoo *et al.,* 2006; Wang *et al.,* 1997 and 2007; Coggon and Taylor, 1998; Beeckman *et al.,* 2001; Ross and Murray, 2004; Kuempel *et al.,* 2009a and b; Boschetto *et al.,* 2006; Green *et al.,* 1998b). As

indicated by these studies, the exposure of miners to respirable coal mine dust places them at increased risk of developing obstructive pulmonary diseases. Furthermore, these diseases may occur in miners with or without CWP or PMF and independent of smoking history.

COPD is characterized by airflow limitations (usually as reduced FEV_1) that are not fully reversible. This limitation in airflow is both progressive and associated with abnormal inflammatory response of lung tissue to noxious agents, such as coal dust. As in simple CWP or PMF, a miner with COPD may have a variety of respiratory symptoms (*e.g.,* shortness of breath, cough, sputum or phlegm production, and wheezing) and may be at increased risk of acquiring infections (Boschetto *et al.,* 2006). COPD is associated with increased premature mortality (Hansen *et al.,* 1999; Meijers *et al.,* 1997), especially in association with pneumoconiosis (Attfield and Keumpel, 2008). The occurrence of chronic bronchitis and of decreased FEV_1 is closely related, but one does not always occur with the other. A miner with bronchitis, especially in early stages, will not necessarily have reduced FEV_1 and a miner with reduced FEV_1 may have any of several conditions (*e.g.,* asthma, emphysema, or an infection), bronchitis among them. There have been many studies evaluating this relationship.

Henneberger and Attfield (1997) evaluated data from pulmonary function tests and standardized health questionnaires of 1,866 male miners who were either in the first round of NSCWP testing in 1969–1971 or the second round in 1972–1975. These miners were followed-up in the fourth round (1985–88). A common finding in their study was an increase in respiratory symptoms, such as chronic bronchitis, shortness of breath, and wheezing. These symptoms were associated with cumulative dust exposure.

An international team of researchers studied respirable coal dust exposure and respiratory symptoms in former and current South African coal miners (Naidoo *et al.* 2006). Ex-miners had significantly more respiratory symptoms—cough and phlegm production, wheezing, breathlessness when dressing—than current miners. The authors attributed this difference to the "healthy worker effect" as noted by Naidoo (above). Smoking and past tuberculosis history were associated with wheezing and breathlessness when walking or dressing.

Wang *et al.* (2007) investigated the relationship between early rapid decline in FEV_1 and symptoms of bronchitis among newly hired Chinese miners exposed to high levels of respirable dust (average 8.9 mg/m^3). In a three year study, symptoms of bronchitis were elevated after 11 months. After 24 months, the miners who developed symptoms of bronchitis and who smoked had lost significantly more FEV_1 (235 ml v 96 ml) than miners without symptoms and who did not smoke. In both groups, loss of pulmonary function was early and rapid with some recovery after two years.

In a review of chronic obstructive pulmonary disease occurring in coal miners, Coggon and Newman-Taylor (1998) and Newman-Taylor and Coggon (1999) summarized the evidence that the best estimate of the average loss of FEV_1 in miners exposed to coal mine dust is 0.76 ml/gram-hour/m^3. (This rate is not applicable to miners in the U.S. because of differences in measuring dust concentration.) This loss is independent of the development of chronic bronchitis, and is in addition to the effect of smoking. The British PFR studies indicate an increase in the prevalence of severe loss of pulmonary function and mortality from COPD in miners heavily exposed to coal dust. Miller *et al.* (1997) reported 20% increased risk of chronic bronchitis in the British mining cohort, compared to the disease occurrence in the general population.

Using PFR data, Hurley *et al.* (2002) calculated estimates of dust-related disease in British coal miners at exposure levels common in the late 1980s, and related the impairment of pulmonary function and the development of chronic bronchitis in these coal miners to their cumulative dust exposure. Estimates of disease were calculated based on the results of a random sample of 895 miners who worked at 10 mines. Their average dust exposure was 200 gram-hour/m^3 and their average age was 49. The authors estimated that by the age of 58, 5.8% of these men would report breathlessness for every 100 gram-hour/m^3 dust exposure. The authors also estimated the prevalence of chronic bronchitis at age 58 would be 4.0% per 100 gram-hour/m^3 of dust exposure. These miners averaged over 35 years of tenure in mining and a cumulative dust exposure of 132 gram-hour/m^3 respirable dust exposure.

Beeckman *et al.* (2001) studied U.S. coal miners who had participated in the NSCWP surveys after 1976. The purpose of this study was to determine the long-term health effects associated with rapid decline in FEV_1. They selected cases with accelerated loss in FEV_1 and compared them to miners matched on age, height, smoking habits and initial FEV_1. (Accelerated decline was > 60 ml per year compared to the matched referent miner.) These miners presented multiple adverse respiratory symptoms related to their dust exposure. Surveys were completed by the miners or, if the miner had died, by his or her next of kin. The survey collected information on occupational, health, and smoking history. The follow-up period for this cohort of miners was between 10 and 18 years. Researchers found that accelerated loss of pulmonary function was associated with dust exposure. There were no significant differences between the two mining groups in relation to age, height, weight, or pack-years of smoking.

Compared to miners who did not have accelerated decline in FEV_1, smoking and nonsmoking miners who experienced accelerated declines in FEV_1 subsequently developed more frequent respiratory symptoms of cough, phlegm production, grades II and III dyspnea, and wheezing. They also reported more frequent chest illnesses (chronic bronchitis and self-reported asthma and emphysema). A larger proportion of this group of miners left mining before retirement due to their chest illnesses. They were twice as likely to die due to cardiovascular or nonmalignant respiratory disease and three times as likely to die due to COPD as were their colleagues with more stable pulmonary function. Beeckman et al. concluded that rapid decline in FEV_1 among miners was associated with increased morbidity and mortality and could be used to facilitate early intervention to preserve pulmonary function.

c. Emphysema

Emphysema is the destruction of the normal structure of the lung and results in impaired gas exchange and airways obstruction. There are three main morphological types of pulmonary emphysema: centriacinar, panacinar, and paraseptal. Centriacinar (centrilobular) emphysema occurs when focal dilations occur around respiratory bronchioles. These dilations occur throughout the upper parts of the lung among normal lung tissue. The other main form of emphysema is panacinar (panlobular) where tissue loss and damage occurs in the terminal bronchioles and is more likely to affect the lower half of the lungs. Another form of emphysema that is less common is paraseptal (scar) emphysema where bullae occur on the lung edges. If these

bullae rupture, a pneumothorax (collapsed lung) could result. These types (and sub-types) can only be identified at autopsy. In the living miner, one cannot easily identify these types and the diagnosis is made on clinical findings, one of which is reduced FEV_1.

Autopsy studies have determined that centriacinar emphysema in coal miners is associated with the amount of dust retained in lung tissue at the time of death (lung burden), with measured dust exposures, associated with CWP, and with years worked underground.

The objective of a study by Kuempel *et al.* (2009a) was to determine whether lifetime exposure to cumulative respirable coal mine dust resulted in clinically important emphysema. This group reviewed the medical records and questionnaire responses of 616 coal miners and 106 non-miners autopsied during 1957 to 1978. Clinically relevant emphysema was defined at two levels, FEV_1 less than 80% and FEV_1 less than 65% of predicted normal values. The cohort average cumulative coal dust exposure was 87 mg-year/m^3 and the cohort average cigarette smoking was 42 pack-years. Study results indicate that the odds ratio of developing emphysema associated with FEV_1 less than 80% was 2.30 (95% CL: 1.46–3.64) at the cohort average cumulative coal dust exposure of 87 mg/m^3·yr and 1.95 (1.39–2.79) at the cohort average smoking level. For emphysema associated with FEV_1 less than 65% of predicted, the respective odds ratios were 2.39 (1.51–3.83) for dust exposure and 1.52 (1.10–2.13) for smoking. The odds ratios for developing clinically-relevant emphysema (*i.e.,* associated with FEV_1 less than 80% or less than 65%) for cumulative coal dust exposure (2.30 or 2.39, respectively) were elevated, though not significantly different than the odds ratios for cigarette smoking (1.95 or 1.52, respectively) at the cohort mean values. Never-smoking coal miners had a significant risk of developing clinically-relevant severe emphysema. Thus exposure to coal mine dust and smoking were each predictors of clinically relevant emphysema. Effects appear to be additive.

Green *et al.* (1998a) and Kuempel *et al.* (2009b) further analyzed the autopsy data from 722 coal miners and non-miners in the U.S. described above. Green *et al.* studied the different types of emphysema and various factors, such as lung dust burden, associated with its occurrence; while Kuempel *et al.* determined the independent effects of smoking and dust exposure on the different grades of emphysema. Green *et al.* found that the severity of emphysema was associated with time worked in mining, level of pneumoconiosis, and the lung burden of coal dust. Centriacinar emphysema (including focal emphysema) was the predominant form associated with coal mine dust exposure but that almost all forms of emphysema were associated with coal mining. Senile emphysema was more commonly found in the non-miner controls. As expected, smoking was also associated with all types of emphysema in this study population. Kuempel *et al.* found that emphysema severity was significantly elevated in coal miners compared with non-miners regardless of smoking history. Cumulative exposure to respirable coal mine dust or coal dust lung burden significantly predicted emphysema severity in models that controlled for smoking, age at death, and race. Both Green *et al.* (1998a) and Kuempel *et al.* (2009b) determined that smoking and coal dust exposure had an additive effect on the occurrence of emphysema in this cohort.

3. Coal Workers Pneumoconiosis (CWP)

a. Simple Coal Workers' Pneumoconiosis (Simple CWP)

In a study of miners who participated in round six (1990–1995) of the CWXSP, Althouse *et al.* (1998) found an average prevalence rate of 2.2% for simple CWP category 1 among the 8,210 miners who reported beginning work in underground coal mines in 1973 or later. Miners who reported other prior dusty work were excluded from the analysis. The Althouse *et al.* (1998) study did not include estimates of exposure concentration, but the prevalence rates were shown to increase with tenure in mining (up to 22 years).

Wang *et al.* (1999b) studied a mining population in China (described above). On average, miners with CWP worked over 22 years underground while those without CWP worked 15 years underground. Miners with CWP had significant reductions in pulmonary function parameters, and diffusing capacity for carbon monoxide after adjustment of smoking and working underground. Miners with CWP had significantly more respiratory symptoms, including emphysema, than miners without CWP after adjustment for age, smoking, and years working underground. Simple CWP was found to be an independent contributor to pulmonary function and to increased risk of respiratory symptoms. Reduction of FVC and diffusing capacity are thought to reflect CWP-related interstitial fibrosis. Miners that developed chronic bronchitis and emphysema had reductions in FEV_1 and FEV_1/FVC. These pulmonary effects were associated with years of coal mine dust exposure.

Bourgkard et al. (1998), described above, conducted a study of French underground coal miners between 1990 and 1994. Miners in the case group had significantly higher mean profusion scores (micronodules, nodules, and other lung abnormalities) as determined by CT scans. They also had significantly more wheezing and dyspnea than either of the control groups. Miners with CWP also had significantly lower pulmonary function test results including FEV_1/FVC, MMEF (maximal mid-expiratory flow), and FEF 25% (maximal forced expiratory flow at 25% of vital capacity). This study found a significant association between cumulative dust exposure and worsening chest x-ray (*i.e.,* increase in reader-designated category signifying progression of simple CWP). In addition, they found that miners with pneumoconiosis, wheezing, decreased pulmonary function, and high cumulative dust exposure at the first medical examination were those most likely to show worsening on their chest x-rays four years later.

Love *et al.* (1997) reported on occupational exposures and the health of British opencast (*i.e.,* surface or strip) coal miners. They studied a group of approximately 1,200 miners who were employed at sites in England, Scotland, and Wales. The mean age of the men was 41 years; many had worked in the mining industry since the 1970s. To determine dust exposure levels, full-shift personal samples were collected. Most were respirable dust samples which were collected using Casella cyclones according to the procedures described by the British Health and Safety Executive. Thus, exposure determinations would be comparable to exposure determinations obtained in U.S. surface coal mines since both measure respirable dust according to the British Medical Research Council criteria. These investigators found a doubling in the relative risk of developing profusion of simple CWP category 0/1 for every 10 years of work in the dustiest jobs in surface mines. These coal dust exposures were under 1 mg/m^3.

Naidoo *et al.* (2004) in the initial analysis of the data collected on South African coal miners (see above) reported a significant trend in the development of pneumoconiosis in current miners as cumulative dust exposures increased from low (0.62–20.10 milligram-year per cubic meter of air (mg-yr/m^3)) through medium (20.11–72.77 mg-yr/m^3) to high

(72.78 to 258.70 mg-yr/m^3) levels. Miners diagnosed with an average CWP profusion of greater than 1/0 had significantly more cumulative dust exposure of 115 mg.years/m^3 as compared to miners without CWP who had dust exposure of 57.72 mg-yr/m^3. The authors reported that miners with CWP profusion of greater than 1/0 also had lower mean percent predicted pulmonary function.

Lin *et al.* (2001) studied 227 former and current miners who showed evidence of CWP on x-ray. These miners were evaluated at two medical clinics in Taiwan from June 1998 to February 2000 for the effect of CWP on respiratory function. Each subject received a medical examination and included a self-administered questionnaire to collect demographic, occupational, and health history. Subjects were classified according to their CWP radiological category (0–3) and the presence (52.9%) or absence (47.1%) of airway obstruction, defined as having a normal FVC and FEV_1. These two groups were similar in regard to age, body size, and cumulative exposure to coal dust and smoking. There was significant progression of functional pulmonary impairment in men with category 2 or 3 CWP, in both the obstructed as well as unobstructed group.

Smith and Leggat (2006) studied pneumoconiosis mortality in Australian coal miners by examining 24 years of national mortality data (1979–2002). These researchers found that 6% of these cases died due to CWP. The prevalence was about 0.5 CWP deaths/million population in 1979–1981. Prevalence increased during the period 1988–1990 to about 0.7 CWP deaths/million population. It declined to about 0.4 CWP deaths/million during the 1994–1996 time period. It remained at this level through 2002.

b. Rapidly Progressive CWP and Progressive Massive Fibrosis (PMF)

PMF is associated with decreased pulmonary function and increased premature mortality. It is also associated with increases in respiratory symptoms such as chest tightness, cough, and shortness of breath. Miners with PMF also are at increased risk of acquiring infections and pulmonary tuberculosis. Finally, miners with PMF are at an increased risk of right-side heart failure (*i.e., cor pulmonale*) (68 FR 10784).

Researchers determined that cases of rapidly progressive CWP are sentinel health events. These cases indicate inadequate prevention measures in specific regions. As reported above, Antao *et al.* (2005) identified a total of 886 cases of CWP among 29,521 miners examined from 1996 to 2002 in the CWXSP. CWP progression was evaluated in 783 of these miners; 277 (35.4%) were cases of rapidly progressive CWP, including 41 with PMF. The miners with rapidly progressive CWP were younger than miners without rapid progression, worked in smaller mines, and reported longer mean tenure in jobs involving work at the face of the mine. Many of these cases of rapidly progressive CWP developed in miners from eastern Kentucky and western Virginia.

In a review, Soutar et al. 2004, reported on exposure-response relationships that have been derived using the PFR data for category 2 CWP, PMF, chronic bronchitis (breathlessness), clinically important deficits of pulmonary function (FEV_1), and category II silicosis. Risks for CWP and PMF are based on over 50,000 observations collected over 25 years. Pulmonary function results are based on a study of 7,000 miners. A threefold increase in the odds of a clinically-important deficit in pulmonary function was associated, on average, with a 0.993 liter FEV_1 deficit from predicted at the same average exposure level. Reductions in dust levels to protect against pneumoconiosis would protect similarly exposed miners from this significant pulmonary functional deficit.

Yeoh and Yang (2002) studied PMF in current and ex-coal miners from October 1998 to February 2000 who were medically examined at clinics in Taiwan. Miners were between 45 and 76 years of age and had between 2 and 42 years dust exposure in coal mines. A non-mining control population of healthy male Taiwanese over the age of 40 was selected. Data from 86 miners with PMF and the controls were included in the final analysis. These miners had worked as rock drillers (n = 65), face workers (n = 17), and general laborers (n = 4). Average duration of work underground was 28.6 years. Miners were shorter, weighed less, but smoked more than the controls. These miners had significantly reduced pulmonary function as compared to healthy controls. Miners were diagnosed as having either PMF Category A (n = 45), PMF Category B (n = 32), or PMF Category C (n = 9). Pulmonary function testing indicated that 51 of these miners presented with an obstructive pulmonary disorder, while 17 presented with a restrictive disorder, 11 had a mixed functional abnormality, and 7 had normal lung function. Smoking and nonsmoking miners had comparable reductions in FEV_1 and FVC measurements. Smokers also showed a higher degree of airway obstruction. Similar restrictive, obstructive, or mixed patterns of respiratory impairments have been observed in American coal miners (Cohen *et al.* 2008).

Kuempel *et al.* (1997) estimated excess (exposure-attributable) prevalence of simple CWP and PMF (*i.e.,* number of cases of disease present in a population at a specified time, divided by the number of persons in the population at that specified time). PMF excess risk point estimates ranged from 1/1,000 to 167/1,000 among miners exposed at the existing MSHA standard for respirable coal mine dust. These estimates were based upon dust exposure that occurred over a miner's working lifetime (*e.g.,* 8 hours per day, 5 days a week, 50 weeks per year, over a period of 45 years). Actual occupational lifetime exposure may be more, due to extended work shifts and work weeks. The point estimates of PMF presented by Kuempel et al. (1997) were related to coal rank, where higher estimates (*e.g.,* 167/1,000) were obtained for high-rank coal (anthracite coal) and somewhat lower estimates were obtained for medium/low rank bituminous coal (*e.g.,* 21/1,000). Within each coal rank, the estimates of simple CWP cases were at least twice as high as those for PMF (*e.g.,* 167/1,000 PMF vs. 380/1,000 simple CWP).

In summary, studies confirm that the risk of PMF increases with increasing category of simple CWP. The risk of PMF increases with increasing cumulative exposure, regardless of the initial category of simple CWP. This indicates that reducing dust exposures is a more effective means of reducing the risk of PMF than reliance on detection of simple CWP.

D. Conclusion

The premature morbidity and mortality related to pulmonary disease in coal miners affect not only the miners and their families, but also the companies they work for and the communities they live in. The serious nature of one of these diseases, pneumoconiosis, was stated in the Coal Act as part of the justification for lowering the coal dust standard to 2 mg/m^3.

The extent of knowledge on how coal dust causes adverse pulmonary effects has evolved greatly in the 31 years since the Coal Act was signed into law. Though exposures have been reduced, this review of the literature indicates that miners are still suffering unacceptable levels of disease. Under the existing standards, miners are still at increased risk of developing adverse effects such as pulmonary function

deficits, obstructive and restrictive diseases including chronic bronchitis, COPD, emphysema, and simple CWP and PMF from a working lifetime exposure to respirable coal mine dust.

The knowledge and methods for preventing these occupationally-related diseases is known. The proposed rule would lower the concentration limit and include other important provisions necessary to reduce miners' exposure. Medical monitoring methods, such as pulmonary function testing, can be used to detect reductions in pulmonary function over time before CWP develops. Such affected miners can be protected from further deterioration by common industrial hygiene practices such as engineering controls and respiratory protection.

V. Quantitative Risk Assessment

Below is a summary of the quantitative risk assessment (QRA) prepared for this rulemaking. The QRA has been peer reviewed by independent scientific experts at NIOSH and OSHA. The full text of the QRA and the peer reviewers' reports can be accessed electronically at *http://www.msha.gov/regs/QRA/CoalDust2010.pdf.*

The QRA addresses three questions related to MSHA's proposed respirable coal mine dust rule: (1) Whether potential health effects associated with existing exposure conditions constitute material impairments to a miner's health or functional capacity; (2) whether existing exposure conditions and compliance approaches place miners at a significant risk of incurring any of these material impairments; and (3) whether the proposed rule has the potential to substantially reduce those risks.

After summarizing respirable coal mine dust (RCMD) measurements for miners in various occupational categories, Part 1 of the QRA shows that exposures at existing levels are associated with coal workers pneumoconiosis (CWP), chronic obstructive pulmonary disease (COPD) including severe emphysema, and death due to non-malignant respiratory disease (NMRD). All of these outcomes constitute material impairments to a miner's health or functional capacity.

Part 2 of the QRA analyzes and quantifies the excess risk of miners' incurring CWP or COPD, or dying due to NMRD, after 45 years of full-shift occupational exposure at levels currently observed in various exposure categories. Miners having different occupations and working at different locations face significantly different levels of RCMD exposure. In every exposure category, including clusters of occupational environments showing the lowest average dust concentrations, current exposure conditions place miners at a significant risk of incurring each of the material impairments considered.

Part 3 of the QRA projects the risk of material impairments after the proposed exposure limit is applied to each shift. Although significant risks would remain in every exposure category, the proposed rule would substantially reduce the risks of CWP, severe emphysema, and NMRD mortality attributable to RCMD exposures. The proposed rule is projected to have a greater impact on risk for underground miners than for surface miners. Surveillance and exposure data have been collected on U.S. underground coal miners for over 40 years; there are few comparable studies on surface coal miners. The QRA shows that surface work locations exceed the proposed exposure limit on relatively few individual shifts and that the proposed rule is projected to have relatively little impact for surface workers who are exposed to average concentrations below 0.5 mg/m^3. However, the data also show that certain surface occupations are exposed to concentrations of respirable dust exceeding the proposed exposure limit.

Table 28 of the QRA contains the projected reduction in these risks for each occupational category. For progressive massive fibrosis (PMF, the most severe stage of CWP considered), projected improvements for underground workers at age 73 range from a reduction of 4 excess cases per thousand loading machine operators to a reduction of 75 excess cases per thousand cutting machine operators. For severe emphysema at age 73, the range of projected improvements for underground workers runs from a reduction of 3 cases per thousand white loading machine operators to a reduction of 50 cases per thousand non-white cutting machine operators. Again for underground workers, the range of projected improvements in the risk of death due to NMRD by age 85 is projected to run from 1 excess case per thousand loading machine operators to 15 excess cases per thousand cutting machine operators. For surface workers, reductions are projected of up to 3 excess cases of PMF per thousand cleaning plant operators and utility men, 8 excess cases of severe emphysema per thousand non-white cleaning plant operators and utility men, and 3 excess cases of NMRD mortality by age 85 per thousand laborers.

The proposed rule would adjust dust concentration limits downward to compensate for exposure hours in excess of 8 hours per shift, change the definition of normal production shift, and require the use of CPDMs. These proposed provisions would further reduce remaining risk for such miners and result in improvements that would be greater than those shown in Table 28. For a complete discussion of the benefits of the proposed rule, see Chapter III of the PREA.

VI. Derivation and Distribution Table

Derivation Table

The following derivation table lists: (1) Each section number of the proposed rule and (2) the section number of the existing standard from which it is derived.

DERIVATION TABLE

Proposed section	Existing section
70	70
70.1	70.1
70.2	70.2, 70.206, 70.207(f), new
70.100	70.100
70.100(a)	70.100(a), new
70.100(b)	70.100(b), new
70.101	70.101
70.101(a)	70.101, new
70.101(b)	70.101, new
70.201	70.201
70.201(a)	70.201(a), new
70.201(b)	new
70.201(c)	new
70.201(d)	new
70.201(e)	70.201(b), new
70.201(e)(1)	new
70.201(e)(2)	new
70.201(f)	new
70.201(g)	new
70.201(h)	70.201(c), new
70.201(i)	new
70.201(j)	new
70.201(k)	new
70.202	70.202
70.202(a)	70.202(a)
70.202(b)	70.202(b), new
70.202(c)	new
70.202(d)	new
70.203	70.203
70.203(a)	70.203(a)
70.203(b)	70.203(b), new
70.203(c)	new
70.203(d)	new
70.204	70.204
70.204(a)	70.204(a), new
70.204(b)	70.204(b), new
70.204(c)	70.204(d), new
70.204(c)(1)	70.204(d)(2), new
70.204(c)(2)	70.204(d)(3), new
70.204(c)(3)	70.204(d)(4), new
70.204(c)(4)	70.204(d)(5), new
70.204(c)(5)	70.204(d)(1), new
70.204(d)	new
70.204(e)	70.204(e)
70.205	70.205
70.205(a)	70.205(a), new

DERIVATION TABLE—Continued

Proposed section	Existing section
70.205(b)	70.205(b)
70.205(b)(1)	70.205(b), 70.205(d)
70.205(b)(2)	70.205(c), new
70.205(c)	new
70.206	new
70.207	70.207, new
70.207(a)	70.207(a), new
70.207(b)	70.207(e)
70.207(b)(1)	70.207(e)(1)
70.207(b)(2)	70.207(e)(2)
70.207(b)(3)	70.207(e)(3)
70.207(b)(4)	70.207(e)(4)
70.207(b)(5)	70.207(e)(5)
70.207(b)(6)	70.207(e)(6)
70.207(b)(7)	70.207(e)(7)
70.207(b)(8)	70.207(e)(8)
70.207(b)(9)	70.207(e)(9)
70.207(b)(10)	70.207(e)(10)
70.207(c)	new
70.207(c)(1)	70.207(b), new
70.207(c)(2)	new
70.207(d)	70.207(d), new
70.207(e)	new
70.207(f)	70.207(c)
70.207(g)	70.201(d), new
70.207(g)(1)	70.300, new
70.207(g)(2)	new
70.207(g)(3)	70.201(d), new
70.207(h)	new
70.207(i)	new
70.207(i)(1)	new (70.300)
70.207(i)(2)	new
70.207(i)(3)	new
70.208	new
70.208(a)	70.207(a), new
70.208(a)(1)	70.207(a), new
70.208(a)(2)	70.207(a), new
70.208(b)	70.207(e), new
70.208(b)(1)	70.207(e)(1), new
70.208(b)(2)	70.207(e)(2), new
70.208(b)(3)	70.207(e)(3), new
70.208(b)(4)	70.207(e)(4), new
70.208(b)(5)	70.207(e)(5), new
70.208(b)(6)	70.207(e)(6), new
70.208(b)(7)	70.207(e)(7), new
70.208(b)(8)	70.207(e)(8), new
70.208(b)(9)	70.207(e)(9), new
70.208(b)(10)	70.207(e)(10), new
70.208(c)	new
70.208(d)	new
70.208(e)	new
70.208(f)	70.201(d), new
70.208(f)(1)	70.300, new
70.208(f)(2)	70.201(d), new
70.208(f)(3)	new
70.208(f)(4)	new
70.208(f)(5)	new
70.208(g)	new
70.208(g)(1)	new (70.300)
70.208(g)(2)	new
70.208(g)(3)	new
70.208(g)(4)	new
70.208(h)	new
70.209	70.208, new
70.209(a)	70.208(a), new
70.209(b)	new
70.209(b)(1)	70.208(b), new
70.209(b)(2)	new
70.209(c)	new
70.209(d)	70.208(d)
70.209(e)	70.201(d),new
70.209(e)(1)	70.300, new

DERIVATION TABLE—Continued

Proposed section	Existing section
70.209(e)(2)	new
70.209(e)(3)	70.201(d),new
70.209(f)	new
70.209(g)	new
70.209(g)(1)	70.300, new
70.209(g)(2)	new
70.209(g)(3)	new
70.209(g)(4)	new
70.209(h)	70.208(f)
70.210	70.209
70.210(a)	70.209(a)
70.210(b)	70.209(b)
70.210(c)	70.209(c), new
70.210(d)	70.209(d)
70.210(e)	70.209(e)
70.210(f)	new
70.211	70.210
70.211(a)	70.210(a)
70.211(a)(1)	70.210(a)(1)
70.211(a)(2)	70.210(a)(2), new
70.211(a)(3)	70.210(a)(3), new
70.211(a)(4)	70.210(a)(4), new
70.211(a)(5)	70.210(a)(5)
70.211(a)(6)	70.210(a)(6)
70.211(b)	70.210(b)
70.211(c)	new
70.211(c)(1)	new
70.211(c)(1)(i)	new (70.210(a)(1))
70.211(c)(1)(ii)	new (70.210(a)(2))
70.211(c)(1)(iii)	new (70.210(a)(3))
70.211(c)(1)(iv)	new
70.211(c)(1)(v)	new (70.210(a)(5))
70.211(c)(1)(vi)	new (70.210(a)(6))
70.211(c)(1)(vii)	new
70.211(c)(1)(viii)	new
70.211(c)(2)	new
70.211(c)(3)	70.210(b), new
70.212	70.220
70.212(a)	70.220(a), new
70.212(b)	70.220(b)
70.212(c)	new
71	71
71.1	71.1
71.2	71.2, 71.206, new
71.100	71.100
71.100(a)	71.100
71.100(b)	new
71.100(c)	new
71.100(d)	new
71.101	71.101
71.101(a)	71.101, new
71.101(b)	71.101, new
71.201	71.201
71.201(a)	71.201(a), new
71.201(b)	71.201(b), new
71.201(b)(1)	new
71.201(b)(2)	new
71.201(c)	new
71.201(d)	new
71.201(e)	71.201(c), new
71.201(f)	71.201(e)
71.201(g)	new
71.201(h)	new
71.202	71.202
71.202(a)	71.202(a)
71.202(b)	71.202(b), new
71.202(c)	new
71.202(d)	new
71.203	71.203
71.203(a)	71.203(a)
71.203(b)	71.203(b), new
71.203(c)	new

DERIVATION TABLE—Continued

Proposed section	Existing section
71.203(d)	new
71.204	71.204
71.204(a)	71.204(a), new
71.204(b)	71.204(b), new
71.204(c)	71.204(d), new
71.204(c)(1)	71.204(d)(2), new
71.204(c)(2)	71.204(d)(3), new
71.204(c)(3)	71.204(d)(4), new
71.204(c)(4)	71.204(d)(5), new
71.204(c)(5)	71.204(d)(1), new
71.204(d)	new
71.204(e)	71.204(e)
71.205	71.205
71.205(a)	71.205(a), new
71.205(b)	71.205(b), new
71.205(b)(1)	71.205(b)
71.205(b)(2)	71.205(c)
71.205(c)	new
71.206	new
71.207	71.208, new
71.207(a)	71.208(a), new
71.207(b)	new
71.207(c)	new
71.207(d)	71.208(h), new
71.207(e)	71.208(g)
71.207(f)	71.208(e), new
71.207(g)	71.208(f), new
71.207(h)	new
71.207(h)(1)	71.208(b), new
71.207(h)(2)	new
71.207(i)	new
71.207(j)	71.208(d)
71.207(k)	71.201(d), new
71.207(k)(1)	new (70.300)
71.207(k)(2)	new
71.207(k)(3)	71.201(d), new
71.207(l)	71.300, new
71.207(m)	71.208(c), new
71.207(n)	71.208(c), new
71.207(n)(1)	71.208(c), new
71.207(n)(2)	new
71.208	71.209
71.208(a)	71.209(a)
71.208(b)	71.209(b)
71.208(c)	71.209(c), new
71.208(d)	71.209(d)
71.208(e)	71.209(e)
71.208(f)	new
71.209	71.210
71.209(a)	71.210(a)
71.209(a)(1)	71.210(a)(1)
71.209(a)(2)	71.210(a)(2)
71.209(a)(3)	71.210(a)(3), new
71.209(a)(4)	71.210(a)(5)
71.209(b)	71.210(b), new
71.209(c)	new
71.209(c)(1)(i)	new (71.210(a)(1))
71.209(c)(1)(ii)	new (71.210(a)(2))
71.209(c)(1)(iii)	new (71.210(a)(3))
71.209(c)(1)(iv)	new (71.210(a)(5))
71.209(c)(1)(v)	new
71.209(c)(1)(vi)	new
71.209(c)(2)	new (71.210(b))
71.210	71.220
71.210(a)	71.220(a), new
71.210(b)	71.220(b)
71.210(c)	new
71.300	71.300
71.300(a)	71.300(a), new
71.300(a)(1)	new
71.300(a)(2)	new
71.300(a)(3)	new

DERIVATION TABLE—Continued

Proposed section	Existing section
71.300(a)(4)	new
71.300(b)	71.300(b)
71.301	71.301
71.301(a)	71.301(a)
71.301(a)(1)	71.301(a)(1), new
71.301(a)(2)	71.301(a)(2)
71.301(b)	71.301(b), new
71.301(c)	71.301(c)
71.301(d)	new
71.301(d)(1)	new
71.301(d)(2)	new
71.301(d)(3)	71.301(d), new
71.301(e)	71.301(e)
72.100	new
72.700	new (70.300)
72.700(a)	new (70.300)
72.700(b)	new
72.700(c)	new
72.701	new (70.305)
72.800	new
75.325(a)(2)	75.325(a)(2), new
75.332(a)(1)	75.332(a)(1), new
75.350(b)(3)(i)	75.350(b)(3)(i)
75.350(b)(3)(i)(A)	75.350(b)(3)(i)
75.350(b)(3)(i)(B)	75.350(b)(3)(i), new
75.350(b)(3)(ii)	75.350(b)(3)(ii), new
75.362(a)(2)	75.362(a)(2), new
75.362(g)(2)	75.362(g)(2), new
75.362(g)(2)(i)	75.362(g)(2), new
75.362(g)(2)(ii)	new
75.362(g)(3)	new
75.362(g)(4)	new
75.371(f)	75.371(f), new
75.371(f)(1)	new
75.371(f)(2)	new
75.371(f)(3)	new
75.371(f)(4)	new
75.371(j)	75.371(j), new
75.371(t)	75.371(t)
90	90
90.1	90.1, new
90.2	90.2, 90.206, new
90.3	90.3
90.3(a)	90.3(a), new
90.3(b)	90.3(b)
90.3(c)	90.3(c)
90.3(d)	90.3(d), new
90.3(e)	90.3(e), new
90.3(f)	90.3(f)
90.100	90.100
90.100(a)	90.100
90.100(b)	new
90.101	90.101
90.101(a)	90.101, new
90.101(b)	90.101, new
90.102	90.102
90.102(a)	90.102(a), new
90.102(b)	90.102(b)
90.102(c)	90.102(c)
90.103	90.103
90.103(a)	90.103(a)
90.103(b)	90.103(b)
90.103(c)	new
90.103(d)	90.103(c)
90.103(e)	90.103(d)
90.103(f)	90.103(e)
90.103(g)	90.103(f)
90.104	90.104
90.104(a)	90.104(a)
90.104(a)(1)	90.104(a)(1)
90.104(a)(2)	90.104(a)(2), new
90.104(a)(3)	90.104(a)(3), new

DERIVATION TABLE—Continued

Proposed section	Existing section
90.104(b)	90.104(b)
90.104(c)	90.104(c)
90.201	90.201, new
90.201(a)	90.201(a), new
90.201(b)	90.201(b), new
90.201(b)(1)	new
90.201(b)(2)	new
90.201(c)	90.201(f)
90.201(c)(1)	90.201(f)(1)
90.201(c)(2)	90.201(f)(2)
90.201(c)(3)	90.201(f)(3)
90.201(d)	new
90.201(e)	90.201(e)
90.201(f)	new
90.201(g)	90.201(c), new
90.201(h)	new
90.201(i)	new
90.202	90.202
90.202(a)	90.202(a)
90.202(b)	90.202(b), new
90.202(c)	new
90.202 (d)	new
90.203	90.203
90.203(a)	90.203(a)
90.203(b)	90.203(b), new
90.203(c)	new
90.203(d)	new
90.204	90.204
90.204(a)	90.204(a), new
90.204(b)	90.204(b), new
90.204(c)	90.204(d), new
90.204(c)(1)	90.204(d)(2), new
90.204(c)(2)	90.204(d)(3), new
90.204(c)(3)	90.204(d)(4), new
90.204(c)(4)	90.204(d)(5), new
90.204(c)(5)	90.204(d)(1), new
90.204(d)	new
90.204(e)	90.204(e)
90.205	90.205
90.205(a)	90.205(a), new
90.205(b)	90.205(b)
90.205(b)(1)	90.205(b), 90.205(d)
90.205(b)(2)	90.205(c), new
90.205(c)	new
90.206	new
90.207	90.207, new
90.207(a)	90.207(a)
90.207(a)(1)	90.207(a)(1)
90.207(a)(2)	90.207(a)(2), new
90.207(a)(3)	90.207(a)(3)
90.208	90.208, new
90.208(a)	90.208(a), new
90.208(b)	new
90.208(b)(1)	90.208(b), new
90.208(b)(2)	new
90.208(c)	new
90.208(d)	90.208(c)
90.208(e)	90.201(d), new
90.208(e)(1)	new (70.300)
90.208(e)(2)	new
90.208(e)(2)(i)	90.201(d), new
90.208(e)(2)(ii)	new
90.208(f)	new
90.208(g)	new
90.208(g)(1)	new (70.300)
90.208(g)(2)	new
90.208(g)(3)	new
90.209	new
90.209(a)	new
90.209(b)	new
90.209(c)	new
90.209(d)	new

DERIVATION TABLE—Continued

Proposed section	Existing section
90.209(e)	90.201(d), new
90.209(e)(1)	new (70.300)
90.209(e)(2)	90.201(d), new
90.209(e)(3)	90.300(a), new
90.209(e)(4)	new
90.209(e)(5)	new
90.209(e)(6)	new
90.209(f)	new
90.210	90.209
90.210(a)	90.209(a)
90.210(b)	90.209(b)
90.210(c)	90.209(c), new
90.210(d)	90.209(d)
90.210(e)	90.209(e)
90.210(f)	new
90.211	90.210
90.211(a)	90.210(a)
90.211(a)(1)	90.210(a)(1)
90.211(a)(2)	90.210(a)(2), new
90.211(a)(3)	90.210(a)(3), new
90.211(a)(4)	90.210(a)(4), new
90.211(a)(5)	90.210(a)(5)
90.211(a)(6)	90.210(a)(6)
90.211(a)(7)	90.210(a)(7), new
90.211(b)	90.210(b)
90.211(c)	new
90.211(c)(1)	new
90.211(c(1)(i))	90.210(a)(1)
90.211(c)(1)(ii)	90.210(a)(2), new
90.211(c)(1)(iii)	90.210(a)(3), new
90.211(c)(1)(iv)	new
90.211(c)(1)(v)	90.210(a)(5)
90.211(c)(1)(vi)	90.210(a)(6)
90.211(c)(1)(vii)	90.210(a)(7), new
90.211(c)(1)(viii)	new
90.211(c)(1)(ix)	new
90.211(c)(2)	new
90.211(d)	90.210(b), new
90.212	90.220
90.212(a)	90.220 new
90.212(b)	new
90.300	90.300
90.300(a)	90.300(a), new
90.300(b)	90.300(b)
90.300(b)(1)	90.300(b)(1)
90.300(b)(2)	90.300(b)(2), new
90.300(b)(3)	90.300(b)(3), new
90.300(b)(4)	90.300(b)(4)
90.301	90.301
90.301(a)	90.301(a)
90.301(a)(1)	90.301(a)(1), new
90.301(a)(2)	90.301(a)(2)
90.301(b)	90.301(b), new
90.301(c)	90.301(c)
90.301(d)	90.301(d)
90.301(e)	90.301(e)

Distribution Table

The following distribution table lists each section number of the existing standard and status of that section number in the proposed rule.

DISTRIBUTION TABLE

Existing section	Proposed section
70.1	70.1
70.2	70.2 (revised)
70.100	70.100

DISTRIBUTION TABLE

Existing section	Proposed section
70.100(a)	70.100(a)(1)–(a)(4) (revised)
70.100(b)	70.100(b)(1)–(b)(2) (revised)
70.101	70.101(a)–(b) (revised)
70.201	70.201 (revised)
70.201(a)	70.201(a) (revised)
70.201(b)	70.201(e) (revised)
70.201(c)	70.201(h) (revised)
70.201(d)	70.207(g) (revised), 70.208(f) (revised)
70.202	70.202
70.202(a)	70.202(a)
70.202(b)	70.202(b) (revised)
70.202(c)	Removed
70.203	70.203
70.203(a)	70.203(a)
70.203(b)	70.203(b) (revised)
70.203(c)	Removed
70.204	70.204
70.204(a)	70.204(a) (revised)
70.204(b)	70.204(b) (revised)
70.204(c)	Removed
70.204(d)	70.204(c) (revised)
70.204(d)(1)	70.204(c)(5) (revised)
70.204(d)(2)	70.204(c)(1) (revised)
70.204(d)(3)	70.204(c)(2) (revised)
70.204(d)(4)	70.204(c)(3) (revised
70.204(d)(5)	70.204(c)(4) (revised)
70.204(e)	70.204(e)
70.205	70.205
70.205(a)	70.205(a) (revised)
70.205(b)	70.205(b), (b)(1) (revised)
70.205(c)	70.205(b)(2) (revised)
70.205(d)	70.205(b)(1)
70.206	70.2 (revised)
70.207	70.207 (revised)
70.207(a)	70.207(a) (revised)
70.207(b)	70.207(c)(1) (revised)
70.207(c)	70.207(f) (revised)
70.207(d)	70.207(d) (revised)
70.207(e)	70.207(b) (revised)
70.207(e)(1)	70.207(b)(1)
70.207(e)(2)	70.207(b)(2)
70.207(e)(3)	70.207(b)(3)
70.207(e)(4)	70.207(b)(4)
70.207(e)(5)	70.207(b)(5)
70.207(e)(6)	70.207(b)(6)
70.207(e)(7)	70.207(b)(7)
70.207(e)(8)	70.207(b)(8)
70.207(e)(9)	70.207(b)(9)
70.207(e)(10)	70.207(b)(10)
70.207(f)	70.2 (revised) (Mechanized mining unit)
70.208	70.209 (revised)
70.208(a)	70.209(a) (revised)
70.208(b)	70.209(b)(1) (revised)
70.208(c)	70.209(b)(2) (revised)
70.208(d)	70.209(d) (revised)
70.208(e)	70.2 (revised) (Designated area)
70.208(f)	70.209(h)
70.209	70.210
70.209(a)	70.210(a)
70.209(b)	70.210(b)
70.209(c)	70.210(c) (revised)
70.209(d)	70.210(d)
70.209(e)	70.210(e)
70.210	70.211

DISTRIBUTION TABLE

Existing section	Proposed section
70.210(a)	70.211(a) (revised)
70.210(a)(1)	70.211(a)(1)
70.210(a)(2)	70.211(a)(2) (revised)
70.210(a)(3)	70.211(a)(3) (revised)
70.210(a)(4)	70.211(a)(4) (revised)
70.210(a)(5)	70.211(a)(5)
70.210(a)(6)	70.211(a)(6)
70.210(b)	70.211(b)
70.220	70.212
70.220(a)	70.212(a) (revised)
70.220(b)	70.212(b)
70.300	72.700 (revised)
70.305	72.701
71.1	71.1
71.2	71.2 (revised)
71.100	71.100
71.101	71.101 (revised)
71.201	71.201 (revised)
71.201(a)	71.201(a) (revised)
71.201(b)	71.201(b) (revised)
71.201(c)	71.201(e) (revised)
71.201(d)	71.201(k) (revised)
71.201(e)	71.201(f) (revised)
71.202	71.202
71.202(a)	71.201(a)
71.202(b)	71.202(b) (revised)
71.202(c)	Removed
71.203	71.203
71.203(a)	71.203(a)
71.203(b)	71.203(b) (revised)
71.203(c)	Removed
71.204	71.204
71.204(a)	71.204(a) (revised)
71.204(b)	71.204(b) (revised)
71.204(c)	Removed
71.204(d)	71.204(c) (revised)
71.204(d)(1)	71.204(c)(5) (revised)
71.204(d)(2)	71.204(c)(1) (revised)
71.204(d)(3)	71.204(c)(2) (revised)
71.204(d)(4)	71.204(c)(3) (revised)
71.204(d)(5)	71.204(c)(4) (revised)
71.204(e)	71.204(e)
71.205	71.205
71.205(a)	71.205(a) (revised)
71.205(b)	71.205(b), 71.205(b)(1) (revised)
71.205(c)	71.205(b)(2) (revised)
71.206	71.2 (revised)
71.208	71.207 (revised)
71.208(a)	71.207(a) (revised)
71.208(b)	71.207(h)(1)
71.208(c)	71.207(m)
71.208(d)	71.207(j)
71.208(e)	71.207(f) (revised)
71.208(f)	71.207(g) (revised)
71.208(g)	71.207(e)
71.208(h)	71.207(d)
71.209	71.208
71.209(a)	71.208(a)
71.209(b)	71.208(b)
71.209(c)	71.208(c) (revised)
71.209(d)	71.208(d)
71.209(e)	71.208(e)
71.210	71.209
71.210(a)	71.209(a) (revised)
71.210(a)(1)	71.209(a)(1)
71.210(a)(2)	71.209(a)(2)
71.210(a)(3)	71.209(a)(3) (revised)
71.210(a)(4)	Removed
71.210(a)(5)	71.209(a)(4)
71.210(b)	71.209(b) (revised)

DISTRIBUTION TABLE

Existing section	Proposed section
71.220	71.210
71.220(a)	71.210(a) (revised)
71.220(b)	71.210(b)
71.300	71.300
71.300(a)	71.300(a) (revised)
71.300(b)	71.300(b)
71.301	71.301
71.301(a)	71.301(a)
71.301(a)(1)	71.301(a)(1) (revised)
71.301(a)(2)	71.301(a)(2)
71.301(b)	71.301(b) (revised)
71.301(c)	71.301(c)
71.301(d)	71.301(d) (revised)
71.301(e)	71.301(e)
75.325(a)(2)	75.325(a)(2) (revised)
75.332(a)(1)	75.332(a)(1) (revised)
75.350(b)(3)(i)	75.350(b)(3)(i) (revised)
75.350(b)(3)(ii)	75.350(b)(3)(ii) (revised)
75.362(a)(2)	75.362(a)(2) (revised)
75.362(g)(2)	75.362(g)(2) (revised)
75.371(f)	75.371(f) (revised)
75.371(j)	75.371(j) (revised)
75.371(t)	75.371(t) (revised)
90.1	90.1 (revised)
90.2	90.2 (revised)
90.3	90.3
90.3(a)	90.3(a) (revised)
90.3(b)	90.3(b)
90.3(c)	90.3(c)
90.3(d)	90.3(d) (revised)
90.3(e)	90.3(e) (revised)
90.3(f)	90.3(f)
90.100	90.100 (revised)
90.101	90.101 (revised)
90.102(a)	90.102(a) (revised)
90.102(b)	90.102(b)
90.102(c)	90.102(c)
90.103(a)	90.103(a)
90.103(b)	90.103(b)
90.103(c)	90.103(d)
90.103(d)	90.103(e)
90.103(e)	90.103(f)
90.103(f)	90.103(g)
90.104	90.104
90.104(a)	90.104(a)
90.104(a)(1)	90.104(a)(1)
90.104(a)(2)	90.104(a)(2) (revised)
90.104(a)(3)	90.104(a)(3) (revised)
90.104(b)	90.104(b)
90.104(c)	90.104(c)
90.201	90.201 (revised)
90.201(a)	90.201(a) (revised)
90.201(b)	90.201(b) (revised)
90.201(c)	90.201(g) (revised)
90.201(d)	90.208(e) (revised), 90.209(e) (revised)
90.201(e)	90.201(e)
90.201(f)	90.201(c)
90.201(f)(1)	90.201(c)(1)
90.201(f)(2)	90.201(c)(2)
90.201(f)(3)	90.201(c)(3)
90.202	90.202
90.202(a)	90.202(a)
90.202(b)	90.202(b) (revised)
90.202(c)	Removed
90.203	90.203
90.203(a)	90.203(a)
90.203(b)	90.203(b) (revised)
90.203(c)	Removed
90.204	90.204

DISTRIBUTION TABLE

Existing section	Proposed section
90.204(a)	90.204(a) (revised)
90.204(b)	90.204(b) (revised)
90.204(c)	Removed
90.204(d)	90.204(c) (revised)
90.204(d)(1)	90.204(c)(5) (revised)
90.204(d)(2)	90.204(c)(1) (revised)
90.204(d)(3)	90.204(c)(2) (revised)
90.204(d)(4)	90.204(c)(3) (revised)
90.204(d)(5)	90.204(c)(4) (revised)
90.204(e)	90.204(e)
90.205	90.205
90.205(a)	90.205(a) (revised)
90.205(b)	90.205(b), (b)(1) (revised)
90.205(c)	90.205(b)(2) (revised)
90.205(d)	90.205(b)(1)
90.206	90.2 (revised)
90.207	90.207 (revised)
90.207(a)	90.207(a)
90.207(a)(1)	90.207(a)(1)
90.207(a)(2)	90.207(a)(2) (revised)
90.207(a)(3)	90.207(a)(3)
90.208	90.208 (revised)
90.208(a)	90.208(a) (revised)
90.208(b)	90.208(b)(1) (revised)
90.208(c)	90.208(d) (revised)
90.209	90.210
90.209(a)	90.210(a)
90.209(b)	90.210(b)
90.209(c)	90.210(c) (revised)
90.209(d)	90.210(d)
90.209(e)	90.210(e)
90.210	90.211
90.210(a)	90.211(a) (revised)
90.210(a)(1)	90.211(a)(1)
90.210(a)(2)	90.211(a)(2) (revised)
90.210(a)(3)	90.211(a)(3) (revised)
90.210(a)(4)	90.211(a)(4) (revised)
90.210(a)(5)	90.211(a)(5)
90.210(a)(6)	90.211(a)(6)
90.210(a)(7)	90.211(a)(7) (revised)
90.210(b)	90.211(b)
90.220	90.212, 90.212(a) (revised)
90.300	90.300
90.300(a)	90.300(a) (revised)
90.300(b)	90.300(b)
90.300(b)(1)	90.300(b)(1)
90.300(b)(2)	90.300(b)(2) (revised)
90.300(b)(3)	90.300(b)(3) (revised)
90.300(b)(4)	90.300(b)(4)
90.301	90.301
90.301(a)	90.301(a)
90.301(a)(1)	90.301(a)(1) (revised)
90.301(a)(2)	90.301(a)(2)
90.301(b)	90.301(b) (revised)
90.301(c)	90.301(c)
90.301(d)	90.301(d)
90.301(e)	90.301(e)

VII. Executive Order 12866

Executive Order (E.O.) 12866 requires that regulatory agencies assess both the costs and benefits of regulations. To comply with E.O. 12866, MSHA has prepared a Preliminary Regulatory Economic Analysis (PREA) for this proposed rule. The PREA contains supporting data and explanation for the summary materials presented in this preamble, including the covered mining industry, costs and benefits, feasibility, small business impacts, and paperwork. The PREA can be accessed electronically at *http://www.msha.gov/rea.htm.* A copy of the PREA can be obtained from MSHA's Office of Standards, Regulations and Variances at the address in the **ADDRESSES** section of this preamble. MSHA requests comments on all estimates of costs and benefits presented in this preamble and in the PREA, and on the data and assumptions the Agency used to develop estimates.

Under E.O. 12866, a significant regulatory action is one meeting any of a number of specified conditions, including the following: Having an annual effect on the economy of $100 million or more, creating a serious inconsistency or interfering with an action of another agency, materially altering the budgetary impact of entitlements or the rights of entitlement recipients, or raising novel legal or policy issues. Based on the PREA, MSHA has determined that this proposed rule would not have an annual effect of $100 million or more in terms of compliance costs to the economy and therefore it is not an economically significant regulatory cost action pursuant to section 3(f) of Executive Order 12866. However, benefit effects of the proposed rule are likely to exceed $100 million and would be economically significant in terms of benefits.

A. Population at Risk

The proposed rule would apply to all underground and surface coal mines in the United States. For 12 months ending January 2010, there was an average of 424 active underground coal mines employing approximately 40,300 miners (excluding office workers) and 1,123 active surface coal mines employing approximately 32,300 miners (excluding office workers).

B. Benefits

This section includes a summary of the health risks under the existing standard; estimated health risks under the proposed rule; and the estimated benefits resulting from proposed changes. The primary benefit of the proposed rule is the reduction of occupational lung disease among coal miners by improving the existing program to control respirable coal mine dust and quartz, and reducing miners' exposure to these hazards.

Three documents that examined the program to control respirable coal mine dust in U.S. mines were MSHA's Respirable Dust Task Group Report, the National Institute for Occupational Safety and Health's (NIOSH) Criteria Document on Occupational Exposure to Respirable Coal Mine Dust, and the Report of the Secretary of Labor's Advisory Committee on the Elimination of Pneumoconiosis Among Coal Mine Workers. While recognizing that significant progress had been made to reduce respirable coal mine dust levels in coal mines, these documents concluded that there are existing practices in the dust program that should be changed to provide miners with increased health protection. This proposed rule would address many of the recommendations made in those documents. The primary benefit of the proposed rule is the reduction of occupational lung disease (*e.g.,* coal workers' pneumoconiosis (CWP), progressive massive fibrosis (PMF), silicosis, and chronic obstructive pulmonary disease (COPD)) among coal miners. This reduction results from improving the existing program to control respirable coal mine dust and quartz, and reducing miners' exposure to these hazards. These adverse health effects are considered collectively to be non-malignant (non-cancerous) respiratory diseases (NMRD).

MSHA based its estimate of benefits on the 2010 Quantitative Risk Assessment (QRA) developed specifically to support this proposed rule. The 2010 QRA focuses on the effects of the proposed lowering of the standard to 1.0 mg/m^3 for most miners (0.5 mg/m^3 for part 90 miners) and the proposed use of single shift samples to determine noncompliance.

To estimate the benefits of the proposed rule, the QRA compared the risks for two hypothetical cohorts of miners with the same occupation/coal rank distribution. The cohort designed to characterize risks to current workforce was assigned 45-year lifetime exposures based on current monitoring data. The comparison cohort was assigned 45-year lifetime exposures designed to represent risks associated with two provisions of the proposed rule (*i.e.,* lowering the limit from 2.0 mg/m^3 to 1.0 mg/m^3 and basing determinations of noncompliance on single samples rather than the average of 5 samples). Since the two cohorts being compared are independent, it is important to note two important caveats: (1) No benefits were projected for slowing or stopping the progression of disease among the population that has experienced current (or historical) exposures during their working lifetime; and (2) due to the latency between exposure and disease, especially for such endpoints as severe emphysema, a

large portion of the benefits estimated by this analysis would not be expected to accrue for many years into the future.

Based upon this analysis, MSHA estimates that over a 45-year working lifetime, two provisions of the proposed rule (*i.e.,* lowering the limit from 2.0 mg/m^3 to 1.0 mg/m^3 and basing determinations of noncompliance on single samples rather than the average of 5 samples) would result in the prevention of the adverse health effects shown in Table VII–1.

TABLE VII–1—ESTIMATED NUMBER OF ADVERSE HEALTH EFFECTS PREVENTED OVER 45 YEARS FROM TWO PROVISIONS OF THE PROPOSED RULE

[Lowering the limit from 2.0 mg/m^3 to 1.0 mg/m^3 and basing determinations of noncompliance on single samples]

	CWP 1+	CWP 2+	PMF	Severe emphysema	Deaths from NMRD
Number of Cases Prevented Over a 45-Year Work Life	1,301	985	641	556	106

MSHA projects that there would be additional reductions in cases of CWP, PMF, severe emphysema, and NMRD resulting from other proposed changes. If the proposed requirement for full-shift sampling and the proposed definition of normal production shift had been in effect in 2009, the amount of dust on the samples would have been higher because of the longer time and the higher levels of production. Lowering exposures from these higher levels to the levels being proposed would result in additional benefits beyond those associated with the actual recorded sampling results. MSHA used additional data from the feasibility assessment to extrapolate the further impact of these two provisions.

TABLE VII–2—ESTIMATED NUMBER OF ADVERSE HEALTH EFFECTS PREVENTED FROM FOUR PROVISIONS OF THE PROPOSED RULE

[Lowering the limit from 2.0 mg/m^3 to 1.0 mg/m^3, two changes to the sampling strategy and the revised definition of normal production shift]

	CWP 1+	CWP 2+	PMF	Severe emphysema	Deaths from NMRD
Number of Cases Prevented Over a 45-Year Work Life	1,606	1,216	791	687	131

MSHA did not quantify the benefits associated with several provisions of the proposed rule (*e.g.,* sampling the designated occupations (DOs) and Part 90 miners on every production shift using the CPDM, periodic examinations, expanding the Part 90 option to surface miners). MSHA also projects that there would be reductions in cases of other adverse health effects that result from exposure to respirable coal mine dust, such as silicosis and chronic bronchitis, which the Agency has not quantified.

More detailed information about how MSHA estimated benefits is available in the Preliminary Regulatory Economic Analysis (PREA) supporting this proposed rule. Both the PREA and the 2010 QRA are available on MSHA's Web site, at *http://www.msha.gov/rea.htm and http://www.msha.gov/regs/QRA/CoalDust2010.pdf,* respectively.

To estimate the monetary values of the reductions in cases of CWP 1+, CWP 2+, PMF, severe emphysema and deaths from NMRD, MSHA performed an analysis of the imputed value of illnesses and fatalities avoided based on a willingness-to-pay approach. This approach relies on the theory of compensating wage differentials (*i.e.,* the wage premium paid to workers to accept the risk associated with various jobs) in the labor market. A number of studies have shown a correlation between higher job risk and higher wages, suggesting that employees demand monetary compensation in return for incurring a greater risk of illness or fatality.

Viscusi & Aldy (2003) conducted an analysis of studies that use a willingness-to-pay methodology to estimate the imputed value of life-saving programs (*i.e.,* meta-analysis) and found that each fatality avoided was valued at approximately $7 million and each lost work-day injury was approximately $50,000 in 2000 dollars. Using the GDP Deflator (U.S. Bureau of Economic Analysis, 2010), this yields an estimate of $8.7 million for each fatality avoided and $62,000 for each injury avoided in 2009 dollars. MSHA is using the $8.7 million estimate for the value of a death prevented and $62,000 for each case of CWP 1+ or CWP 2+ prevented. This value of a statistical life (VSL) estimate is within the range of the substantial majority of such estimates in the literature ($1 million to $10 million per statistical life), as discussed in OMB Circular A–4 (OMB, 2003).

Given the disabling consequences of PMF and severe emphysema, MSHA does not believe that limiting the value to the estimate for lost workday injuries is appropriate. Instead, MSHA based the value of a case of PMF and severe emphysema prevented on the work of Magat, Viscusi & Huber (1996), which estimated the value of a non-fatal cancer avoided. The Occupational Safety and Health Administration (OSHA) used this approach in the Final Economic Analysis (FEA) supporting its hexavalent chromium final rule, and Environmental Protection Agency (EPA) used this approach in its Stage 2 Disinfectants and Disinfection Byproducts water rule (EPA, 2003). Although PMF and severe emphysema are not non-fatal cancers, MSHA believes that they have a similar impact on the quality of life and would thus result in similar valuations. Based on Magat, Viscusi & Huber (1996), EPA valued the prevention of a case of non-fatal cancer at 58.3 percent of the value of a fatal cancer avoided. MSHA estimates the value of a case of PMF or severe emphysema prevented to be $5.1 million ($5.1 million = 58.3 percent of $8.7 million).

Although MSHA is using the willingness-to-pay approach as the basis for monetizing the expected benefits of the proposed rule, the Agency does so with several reservations, given the methodological difficulties involved in estimating the compensating wage differentials (see Hintermann, Alberini and Markandya, 2008). Furthermore, these estimates pooled across different industries may not capture the unique

circumstances faced by coal miners. For example, some have suggested that VSL models be disaggregated to account for different levels of risk, as might occur in coal mining (see Sunstein, 2004). In addition, coal miners may have few options of alternative employers and in some cases only one employer (near-monopsony or monopsony) that may depress wages below those in a more competitive labor market.

MSHA developed the estimates in Table VII–3 by multiplying the number of adverse health effects in Tables VII–1 and VII–2 by the monetized value of each adverse health effect.

TABLE VII–3—ESTIMATED VALUE OF ADVERSE HEALTH EFFECTS PREVENTED OVER A 45-YEARS[1] WORK LIFETIME

[Millions of 2009 dollars]

	CWP 1+	CWP 2+	PMF	Severe emphysema	Deaths from NMRD	Total
Benefits Based Upon Table VII–1 (i.e., Based on 2010 QRA)						
Underground and Part 90 Miners	66	51	2,815	2,198	653	5,783
Surface Miners	14	10	454	638	270	1,386
Total	80	61	3,269	2,836	923	7,169
Benefits Based Upon Table VII–2 (i.e. Includes Additional Provisions Extrapolated From 2010 QRA Results)						
Underground and Part 90 Miners	82	63	3,467	2,707	804	7,123
Surface Miners	18	12	567	797	337	1,731
Total	100	75	4,034	3,504	1,141	8,854

[1]Estimate is for *a cohort of workers who begin working in mines after the proposed changes are in place.*

The monetized benefits in Table VII–3 cover a 45-year period. When estimating the annual benefits, it is necessary to take the timing into account of when the health benefits accrue. However, it is quite difficult to gauge the timing of reductions in chronic diseases that may not develop until years after initial exposure and whose progression may not be instantly stopped even if exposure were completely eliminated. MSHA did not have the data necessary to project the timing of CWP and related diseases. Furthermore, MSHA does not have data on the historical exposures of the current workforce of coal miners; they have already been exposed to various levels of respirable coal mine dust and some lung damage has invariably already been done. In the absence of this data and the information on the latency and cessation lags, MSHA estimated the monetized benefits under two alternative assumptions to illustrate some of the uncertainty in its estimates.

- First, MSHA made the assumption that benefits begin immediately and that annual benefits equal lifetime benefits divided by 45 years. This assumption is equivalent to assuming that the benefits begin to accrue in the first year after the provisions are put into effect, which MSHA admits is highly unrealistic.
- Second, MSHA assumed that no benefits would occur for the first 10 years and that the annualized benefit for each of the next 35 years would be equal to the projected benefits divided by 35 years.

The impact of each of these assumptions is calculated using a 7 percent discount rate, consistent with OMB's Circular A–4.

TABLE VII–4—ANNUALIZED BENEFITS

[Millions of 2009 dollars]

Distribution assumptions	7% Discount rate, 45 years	
	2 provisions	4 provisions
Immediate, evenly distributed		
Underground/ Part 90	$128.5	$158.3
Surface	30.8	38.5
Total	159.3	196.8
10-year latency, evenly distributed		
Underground/ Part 90	79.9	98.5
Surface	19.2	24.0
Total	99.1	122.4

The analysis numbers presented in Table VII–4 might be viewed as incomplete estimates because they do not include the potential impacts of other provisions of the proposed rule. In addition, MSHA's estimates are based on a series of simplifying assumptions. The impact of these assumptions on the total benefits depends on the degree of the mismatch between the assumption and reality. Unfortunately, MSHA does not have the data to quantify this uncertainty. However, the impact of assumptions about the timing of the benefits probably has the most significant impact on the estimated monetized benefits.

C. Compliance Costs

This section presents MSHA's estimates of costs that would be incurred by underground and surface coal operators to comply with the proposed coal mine dust rule. These costs are based on the assessment of MSHA staff of the most likely actions that would be necessary to comply with the proposed rule. MSHA acknowledges that in rare instances, after taking these projected actions, some mine operators may need to take additional measures to comply. In order to illustrate the full range of possible compliance costs, this section also includes a discussion of three potential situations where some operators could incur additional costs. All three of the following situations are in underground coal mines: (1) Longwall mines that have two entries; (2) mines that have multiple MMUs on a single split of air; and (3) mines operating under reduced respirable coal dust standards below 1.0 mg/m^3 due to the presence of quartz.

MSHA presents two values for the engineering and work practice estimates and the total cost estimates for underground coal mines. The lower value represents MSHA's most likely estimate. The higher value includes additional costs for those rare instances where some operators after taking these actions may encounter implementation issues as they attempt to comply with the proposed requirements and need to take additional measures to comply with the proposed standard.

MSHA estimates that the first year cost of the proposed rule would be approximately $72.4 to $93.2 million

and the annualized cost of the proposed rule would be approximately $40.4 to $44.5 million.

The estimated first year costs of the proposed rule for underground coal mine operators would be approximately $63.6 to $84.4 million. Costs associated with the proposed requirement to use CPDMs ($51.5 million) and upgrading and maintaining existing engineering controls and work practices ($12.6 to $33.4 million) represent the most significant first year costs for underground coal operators.

The first year costs of the proposed rule for surface coal mine operators would be approximately $8.8 million. The proposed expansion of the part 90 transfer option to surface miners represents the most significant first year cost for surface operators.

MSHA estimates that at a 7% discount rate, the annualized costs of the proposed rule for underground coal mine operators would be approximately $35.6 to 39.7 million. Costs associated with the proposed requirement to use CPDMs ($24.8 million) and upgrading and maintaining existing engineering controls and work practices ($5.1 to 9.1 million) represent the most significant annualized costs for underground coal operators.

MSHA estimates that at a 7% discount rate, the annualized costs of the proposed rule for surface coal operators would be approximately $4.8 million. Costs associated with the proposed expansion of the part 90 transfer option to surface miners ($1.9 million) represent 40 percent of the total annualized costs for surface operators.

D. Net Benefits

This section presents a summary of estimated benefits and costs of the proposed rule for informational purposes only. Under the Mine Act, MSHA is not required to use estimated net benefits as the basis for its decision. MSHA's estimates suggest, however, that net benefits are positive, with (1) economically significant estimated annualized benefits ranging from $99 to $197 million and (2) estimated annualized costs ranging from $40 to $44 million. The estimates of costs and benefits are only roughly comparable due to both limitations in the data and different underlying assumptions.

The annualized dollar value of the benefits MSHA estimated range from (1) a low of $99 million per year for only two provisions of the proposed rule and an assumption of a 10 year latency period at a discount rate of 7% to (2) a high of $197 million per year for four of the provisions of the proposed rule and an assumption of no latency. These estimates are both incomplete and highly uncertain because they do not include the potential impacts of other provisions of the proposed rule and because MSHA does not have the data necessary to either (a) calculate benefits to those with historical exposures and pre-existing conditions or (b) estimate how long into the future it will be until the benefits of this proposal might begin to accrue. With respect to the latter, the comparison of benefits streams from assuming no latency to assuming a ten year latency highlights the degree of uncertainty. While an estimate of no latency is unrealistic, so are the implicit assumptions that there would be no benefits from the provisions that were not included in the analysis and no benefits would accrue to those with significant historical exposures. Thus, these estimates encompass a significant amount of uncertainty. MSHA requests comments on methods to both improve the comprehensiveness of the benefits estimates and better characterize timing of the stream of benefits.

TABLE VII–5—ANNUALIZED BENEFITS 7% DISCOUNT RATE

[Millions of 2009 dollars]

Distribution assumptions	2 provisions	4 provisions
Immediate, evenly distributed		
Underground/ Part 90	$128.5	$158.3
Surface	30.8	38.5
Total	159.3	196.8
10-year latency, evenly distributed		
Underground/ Part 90	79.9	98.5
Surface	19.2	24.0
Total	99.1	122.4

The annualized costs MSHA estimated range from $40.4 to $44.5 million. The lower value represents MSHA's most likely estimate. The higher value includes additional costs for those rare instances where some operators of underground mines may encounter implementation issues as they attempt to comply with the proposed requirements and may need to take additional measures to comply with the proposed standard. MSHA requests comments on the cost estimates and solicits information on data sources to better characterize the cost range.

TABLE VII–6—ANNUALIZED COSTS OF PROPOSED RULE 7% DISCOUNT RATE

[Millions of 2009 dollars]

	1–19	20–500	501 +	Totals
Most Likely Estimated Costs				
Underground Operators	$1.6	$29.6	$35.6	
Surface Operators	1.1	3.3	0.4	4.8
Total	2.7	32.9	4.8	40.4
Most Likely Estimated Costs plus Additional Costs for Rare Situations				
Underground Operators	1.6	32.5	5.6	39.7
Surface Operators	1.1	3.3	0.4	4.8
Total	2.7	35.8	6.0	44.5

The range of benefits and costs estimated by MSHA do not correspond to the same assumptions: The benefit range corresponds to assumptions about latency periods while the cost range corresponds to assumptions about whether some mines may incur additional costs. Thus, the probability that the benefits will be at the high end of the benefit distribution is entirely independent of the probability that the costs will be at the high end of the cost distribution. A comparison of benefits and costs, therefore, encompasses a broad range of independent assumptions.

VIII. Feasibility

Although MSHA has concluded that the requirements of the proposed rule would be both technologically and

economically feasible, MSHA has included a phase-in period for two of the major provisions to facilitate implementation of the proposal. The Agency's actions are discussed in more detail below.

A. Technological Feasibility

Based on both Agency and mine operator data, MSHA believes that this proposed rule is technologically feasible. Data show that not only are mine operators keeping miners' exposures at or below the levels required under the existing standards, but dust exposures at most operations average less than 1.0 mg/m3. Based on these data, the majority of miners' exposures are at or below the limits in the proposed rule. MSHA understands that these data reflect measurements under the existing sampling program and that requirements under the proposed rule (*e.g.,* use of single full-shift samples to determine noncompliance, change in the definition of normal production shift) would result in higher measured exposures compared to the existing sampling program. However, existing engineering controls including ventilation, sprays, and environmentally controlled cabs along with changes in work practices can be used to further reduce dust levels.

To facilitate operator implementation of the requirements in the proposed rule related to the lower exposure limits, MSHA has included a 24-month phase-in period to allow mine operators time to come into compliance. During this phase-in period, MSHA will work with the mining industry to help them identify, develop, and implement feasible engineering controls, and train miners and supervisors in new technology.

The proposal would require implementation of new and improved dust monitoring technology, the CPDM. The proposal would require the operator to use the CPDM to sample certain underground occupations and part 90 miners. To facilitate implementation of use of CPDMs, MSHA has proposed a 12- and 18-month phase-in period, unless otherwise notified by the Secretary. MSHA believes that the proposed phase-in periods would allow manufacturers enough time to produce the necessary quantity of CPDMs and MSHA and operators enough time to train necessary personnel in the use and care of the device. The Agency recognizes that availability of the device may present logistical and other issues at the time the final rule becomes effective. The Agency intends to address the issue of availability in two ways. First, the proposal would require the use of the CPDM to sample (1) the Designated Occupation in each MMU and Part 90 miners, and (2) each Other Designated Occupation, within a 12-month and 18-month period, respectively, unless notified by the Secretary. If, during the phase-in periods, MSHA determines that there will be logistical and feasibility issues surrounding the availability of CPDMs by the time the final rule becomes effective, the Agency will, through publication in the **Federal Register**, notify the public of the Agency's plans. Second, assuming no logistical or feasibility issues concerning the availability of CPDMs, and depending on manufacturer projections, if CPDMs are not available in sufficient quantities, MSHA will accept, as good faith evidence of compliance with the final rule, a valid, bona fide, written purchase order with a firm delivery date for the CPDMs.

The Agency has specifically included in the preamble discussion a request for comment on the proposed phase-in periods of the two proposed provisions: (1) Lowering the respirable dust limits; and (2) requiring use of CPDMs. Specifically, on phase-in periods related to CPDMs, the Agency requests that comments address the time period and the Agency's intent with respect to availability of CPDMs. The Agency asks that commenters be specific in their comments, and include rationale for suggested alternatives.

B. Economic Feasibility

MSHA has traditionally used a revenue screening test—whether the annualized compliance costs of a regulation are less than 1 percent of revenues, or are negative (*i.e.,* provide net cost savings)—to establish presumptively that compliance with the regulation is economically feasible for the mining industry. Based upon this test, MSHA has concluded that the requirements of the proposed rule are economically feasible. The annualized compliance costs of the proposed rule to underground coal mine operators are $35.6 to 39.7 million, which are approximately 0.2 percent of total annual revenue of $17 billion ($39.7 million/$17 billion) for all underground coal mines. The annualized compliance cost of the proposed rule to surface coal mine operators is $4.8 million, which is approximately 0.03 percent of total annual revenue of $16.6 billion ($5.3 million/$16.6 billion) for all surface coal mines. Since the estimated compliance costs for both underground and surface coal mines are below one percent of their estimated annual revenue, MSHA concludes that compliance with the provisions of the proposed rule would be economically feasible for the coal industry.

IX. Regulatory Flexibility Act and Small Business Regulatory Enforcement Fairness Act

Pursuant to the Regulatory Flexibility Act (RFA) of 1980, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA), MSHA has analyzed the compliance cost impact of the proposed rule on small entities. Based on that analysis, MSHA has determined and certifies that the proposed rule would not have a significant economic impact on a substantial number of small entities in terms of compliance costs. Therefore, the Agency is not required to develop an initial regulatory flexibility analysis.

The factual basis for this certification is presented in full in Chapter V of the PREA and in summary form below.

A. Definition of a Small Mine

Under the RFA, in analyzing the impact of a rule on small entities, MSHA must use the Small Business Administration's (SBA's) definition for a small entity, or after consultation with the SBA Office of Advocacy, establish an alternative definition for the mining industry by publishing that definition in the **Federal Register** for notice and comment. MSHA has not established an alternative definition, and is required to use SBA's definition. The SBA defines a small entity in the mining industry as an establishment with 500 or fewer employees.

MSHA has also examined the impact of the proposed rule on mines with fewer than 20 employees, which MSHA and the mining community have traditionally referred to as "small mines." These small mines differ from larger mines not only in the number of employees, but also in economies of scale in material produced, in the type and amount of production equipment, and in supply inventory. Therefore, their costs of complying with MSHA's rules and the impact of the agency's rules on them will also tend to be different. This analysis complies with the requirements of the RFA for an analysis of the impact on "small entities" while continuing MSHA's traditional definition of "small mines."

B. Factual Basis for Certification

MSHA's analysis of the economic impact on "small entities" begins with a "screening" analysis. The screening compares their estimated costs of the proposed rule for small entities to the estimated revenues. When estimated costs are less than one percent of

estimated revenues (for the size categories considered), MSHA believes it is generally appropriate to conclude that there is no significant economic impact on a substantial number of small entities. If estimated costs are equal to or exceed one percent of revenues, further analysis may be warranted.

Revenue for underground and surface coal mines is derived from data on coal prices and tonnage. The 2008 price of coal was $51.35 per short ton for underground coal and $22.35 per short ton for surface coal.[2]

Total underground coal production in 2009 was approximately 5 million short tons for mines with 1–19 employees. Multiplying tons by the 2008 price per ton, 2009 underground coal revenue was $259 million for mines with 1–19 employees. Total underground coal production in 2009 was approximately 242 million short tons for mines with 1–500 employees. Multiplying tons by the 2008 price per ton, 2009 underground coal revenue was $12.4 billion for mines with 1–500 employees. Total underground coal production in 2009 was approximately 332 million tons. Multiplying tons by the 2008 price per short ton, total estimated revenue in 2009 for underground coal production was $17.0 billion.

The estimated annualized cost of the proposed rule for underground coal mines with 1–19 employees is approximately $1.6 million, or approximately $20,000 per mine. This is equal to approximately 0.63 percent of annual revenues. MSHA estimates that some mines might experience costs somewhat higher than the average per mine in their size category while others might experience lower costs.

When applying SBA's definition of a small mine, the estimated annualized cost of the proposed rule for underground coal mines with 1–500 employees is approximately $34.1 million, or approximately $82,800 per mine. This is equal to approximately 0.28 percent of annual revenue.

Based on this analysis, MSHA has determined that the proposed rule will not have a significant economic impact in terms of compliance costs on a substantial number of small underground coal mines.

Total surface coal production in 2009 was approximately 19.7 million short tons for mines with 1–19 employees. Multiplying tons by the 2008 price per ton, 2009 surface coal revenue was $441 million for mines with 1–19 employees. Total surface coal production in 2009 was approximately 495 million short tons for mines with 1–500 employees. Multiplying tons by the 2008 price per ton, 2009 surface coal revenue was $11.1 billion for mines with 1–500 employees. Total surface coal production in 2009 was approximately 743 million short tons. Multiplying tons by the 2008 price per ton, total estimated revenue in 2009 for surface coal production was $16.6 billion.

The estimated annualized cost of the proposed rule for surface coal mines with 1–19 employees is approximately $1.1 million, or approximately $1,800 per mine. This is equal to approximately 0.25 percent of annual revenues. MSHA estimates that some mines might experience costs somewhat higher than the average per mine in their size category while others might experience lower costs.

When applying SBA's definition of a small mine, the estimated annualized cost of the proposed rule for surface coal mines with 1–500 employees is approximately $4.4 million, or approximately $4,000 per mine. This is equal to approximately 0.04 percent of annual revenue.

Based on this analysis, MSHA has determined that the proposed rule will not have a significant economic impact in terms of compliance costs on a substantial number of small surface coal mines. Since the annualized costs of the proposed rule are less than one percent of annual revenue for both small underground and surface coal mines, as defined by SBA, MSHA has certified that the proposed rule would not have a significant impact on a substantial number of small mining entities, as defined by SBA. However, MSHA has provided, in the PREA accompanying this rule, a complete analysis of the cost impact on this category of mines.

X. Paperwork Reduction Act of 1995

A. Summary

This proposed rule contains changes that would affect the burden in existing paperwork packages with OMB Control Numbers 1219–0011, 1219–0048, and 1219–0088. The proposed rule also contains new burden for collection requirements that are listed in Table X–1. This proposed rule would result in 120,864 burden hours and related costs of approximately $10.2 million in the first year the rule is in effect. In the second year the rule is in effect, the proposed rule would result in 156,103 burden hours and related costs of approximately $13.4 million. In the third year the rule is in effect, the proposed rule would result in 162,267 burden hours and related costs of approximately $14 million.

TABLE X–1—NEW BURDEN FOR INFORMATION COLLECTION REQUIREMENTS IN THE PROPOSED RULE

30 CFR Part	Proposed sections
Part 70	70.201(g), (i), (k).
	70.206(a), (a)(1), (a)(3), (c), (c)(1), (c)(3), (d).
	70.207(c)(2), (g)(2), (h), (i)(3).
	70.208(f)(3), (f)(4), (f)(5), (g)(3), (g)(4), (h).
	70.209(b)(2), (e)(2), (f), (g)(3), (g)(4).
	70.210(c), (f).
	70.211(b), (c).
	70.212(c).
Part 71	71.201(d), (h).
	71.206(a), (a)(1), (a)(3), (c)(1), (c)(3), (d).
	71.207(c), (k)(2), (k)(4), (l), (n)(2).
	71.208(c), (f).
	71.209(b), (c).
	71.210(c).
	71.300(a), (a)(1), (a)(3).
	71.301(d)(1), (d)(3).
Part 72	72.100(d), (e).
	72.700(c).
Part 75	75.362(a)(2), (g)(2)(ii), (g)(3), (g)(4).
Part 90	90.201(f), (i).
	90.206(a), (b), (d), (e).
	90.208(e)(2), (f), (g)(3).
	90.209(e)(3), (e)(4), (e)(5), (f)(3), (f)(4).
	90.210(c), (f).
	90.211(b), (c).
	90.212(b).
	90.300(a).
	90.301(d).

For a detailed summary of the burden hours and related costs by provision, see the Preliminary Regulatory Economic Analysis (PREA) accompanying this proposed rule. The PREA is posted on MSHA's Web site at *http://www.msha.gov/rea.HTM.* A paper copy of the PREA can be obtained from MSHA's Office of Standards, Regulations, and Variances at the address provided in the **ADDRESSES** section of this preamble.

B. Procedural Details

The information collection package for this proposed rule has been submitted to OMB for review under 44 U.S.C. § 3504, paragraph (h) of the Paperwork Reduction Act of 1995, as amended. A copy of the information collection package can be obtained from the Department of Labor by electronic mail request to Michel Smyth or by phone request to (202) 693–4129.

MSHA requests comments to:

- Evaluate whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including

[2] U.S. DOE, EIA, "Annual Coal Report 2009," Table 28, October 2009.

whether the information will have practical utility;

- Evaluate the accuracy of the Agency's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used;
- Enhance the quality, utility, and clarity of the information to be collected; and
- Minimize the burden of the collection of information on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, *e.g.,* permitting electronic submission of responses.

Comments on the information collection requirements should be sent to both OMB and MSHA. Addresses for both offices can be found in the **ADDRESSES** section of this preamble. The regulated community is not required to respond to any collection of information unless it displays a current, valid, OMB control number. MSHA displays the OMB control numbers for the information collection requirements in its regulations in 30 CFR part 3.

XI. Other Regulatory Considerations

A. National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq.*), requires each Federal agency to consider the environmental effects of final actions and to prepare an Environmental Impact Statement on major actions significantly affecting the quality of the environment. MSHA has reviewed the proposed standard in accordance with NEPA requirements, the regulation of the Council on Environmental Quality (40 CFR part 1500), and the Department of Labor's NEPA procedures (29 CFR part 11). As a result of this review, MSHA has preliminarily determined that this proposed rule will have no significant environmental impact.

B. The Unfunded Mandates Reform Act of 1995

MSHA has reviewed the proposed rule under the Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1501 *et seq.*). MSHA has determined that this proposed rule does not include any federal mandate that may result in increased expenditures by State, local, or tribal governments; nor will it increase private sector expenditures by more than $100 million in any one year or significantly or uniquely affect small governments. Accordingly, the Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1501 *et seq.*) requires no further Agency action or analysis.

C. The Treasury and General Government Appropriations Act of 1999: Assessment of Federal Regulations and Policies on Families

Section 654 of the Treasury and General Government Appropriations Act of 1999 (5 U.S.C. 601) requires agencies to assess the impact of Agency action on family well-being. MSHA has determined that the proposed rule will have no effect on family stability or safety, marital commitment, parental rights and authority, or income or poverty of families and children. The proposed rule impacts the coal mine industry. Accordingly, MSHA certifies that the proposed rule will not impact family well-being.

D. Executive Order 12630: Government Actions and Interference With Constitutionally Protected Property Rights

This proposed rule does not implement a policy with takings implications. Accordingly, under E.O. 12630, no further Agency action or analysis is required.

E. Executive Order 12988: Civil Justice Reform

The proposed rule was written to provide a clear legal standard for affected conduct and was carefully reviewed to eliminate drafting errors and ambiguities, so as to minimize litigation and undue burden on the Federal court system. Accordingly, the proposed rule will meet the applicable standards provided in § 3 of E.O. 12988, Civil Justice Reform.

F. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

The proposed rule will have no adverse impact on children. Accordingly, under E.O. 13045, no further Agency action or analysis is required.

G. Executive Order 13132: Federalism

The proposed rule does not have "federalism implications" because it will not "have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government." Accordingly, under E.O. 13132, no further Agency action or analysis is required.

H. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

The proposed rule does not have "tribal implications" because it will not "have substantial direct effects on one or more Indian tribes, on the relationship between the Federal government and Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes." Accordingly, under E.O. 13175, no further Agency action or analysis is required.

I. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

Executive Order 13211 requires agencies to publish a statement of energy effects when a rule has a significant energy action that adversely affects energy supply, distribution or use. The proposed rule has been reviewed for its impact on the supply, distribution, and use of energy because it applies to the coal mining industry. Insofar as the proposed rule would result in annualized compliance costs of $35.6 to 39.7 million for the underground coal industry relative to annual revenues of $17 billion in 2009 and annualized compliance costs of $4.8 million for surface coal industry relative to annual revenue of $16.6 billion in 2009, it is not a "significant energy action" because it is not "likely to have a significant adverse effect on the supply, distribution, or use of energy * * * (including a shortfall in supply, price increases, and increased use of foreign supplies)." Accordingly, Executive Order 13211 requires no further Agency action or analysis.

J. Executive Order 13272: Proper Consideration of Small Entities in Agency Rulemaking

MSHA has thoroughly reviewed the proposed rule to assess and take appropriate account of its potential impact on small businesses, small governmental jurisdictions, and small organizations. MSHA has determined and certified that the proposed rule will not have a significant economic impact on a substantial number of small entities.

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XIII. Appendix A—Excessive Concentration Values

The Excessive Concentration Value (ECV) tables ensure that noncompliance is cited only when there is a 95-percent level of confidence that the applicable respirable dust standard has actually been exceeded. A single-shift measurement of respirable coal mine dust that does not exceed the applicable ECV value does not necessarily imply probable compliance with the applicable dust standard (S), let alone compliance at a 95-percent confidence level. For example, using a CMDPSU, a single-shift measurement of 2.14 mg/m^3 would not, according to Table 70–1, indicate noncompliance with sufficient confidence to warrant a citation if the applicable standard S = 2.0 mg/m^3. This does not imply that the mine atmosphere was in compliance on the shift and at the location sampled. On the contrary, unless contradictory evidence was available, this measurement would indicate that the MMU was probably *out* of compliance. However, because there is a small chance that the measurement exceeded the respirable dust standard only because of measurement error, a citation would not be issued. Additional measurements would be necessary to verify the adequacy of control measures. Similarly, a single-shift measurement of 1.92 mg/m^3 would not warrant issuance of a citation; but, because of possible measurement error, neither would it warrant concluding that the mine atmosphere sampled was in compliance.

Furthermore, even if a single-shift measurement were to demonstrate, at a high confidence level, that the mine atmosphere was in compliance at the sampling location on a given shift, additional measurements would be required to demonstrate compliance on each shift. For example, if S = 2.0 mg/m^3, then a valid measurement of 1.65 mg/m^3 would demonstrate compliance on the particular shift and at the particular location sampled. It would not, however, demonstrate compliance on other shifts or at other locations.

I. Derivation of Tables 70–1, 71–1, and 90–1

To understand how the ECVs are derived and justified, one must distinguish between variability due to measurement error and variability due to actual differences in dust concentration. Variability observed among individual measurements obtained at different locations (or at different times) combines both: Dust concentration measurements vary partly because of measurement error and partly because of differences in the dust concentration being measured. The distinction between measurement error and variation in the true dust concentration can more easily be explained by first defining some notational abbreviations.

Dust samples are collected in the same MMU or other mine area on a particular shift. Since it is necessary to distinguish between different samples in the same MMU, let X_i represent the 8-hour MRE dust concentration measurement obtained from the i^{th} sample. The quantity being measured is the true, single-shift average dust concentration at the i^{th} sampling location and is denoted by μ_i. Because of potential measurement errors, μ_i can never be known with complete certainty. A "sample," "measurement," or "observation" always refers to an instance of X_i rather than μ_i.

The overall measurement error associated with an individual measurement is the difference between the measurement (X_i) and the quantity being measured (μ_i). Therefore, this error can be represented as

$\varepsilon_i = X_i - \mu_i$.

Equivalently, any measurement can be regarded as the true concentration in the atmosphere sampled, with a measurement error added on:

$X_i = \mu_i + \varepsilon_i$

For two different measurements (X_1 and X_2), it follows that X_1 may differ from X_2 not only because of the combined effects of ε_1 and ε_2, but also because μ_1 differs from μ_2.

The probability distribution of X_i around μ_i depends only on the probability distribution of ε_i and should not be confused with the statistical distribution of μ_i, which arises from spatial and/or temporal variability in dust concentration. This variability [*i.e.,* among μ_i for different values of *I*] is not associated with inadequacies of the measurement system, but real variation in exposures due to the fact that contaminant generation rates vary in time and contaminants are heterogeneously distributed in workplace air.

Since noncompliance determinations are made relative to individual sampling locations on individual shifts, derivation of the tables require no assumptions or inferences about the spatial or temporal pattern of atmospheric dust concentrations—*i.e.,* the statistical distribution of μ_i. MSHA is not evaluating dust concentrations averaged across the various sampling locations. Therefore, the degree and pattern of variability observed among different measurements obtained during MSHA sampling are not used in establishing any ECV. Instead, the ECV for each applicable dust standard (S) is based entirely on the distribution of measurement errors (ε_i) expected for the maximum dust concentration in compliance with that standard—*i.e.,* a concentration equal to S itself.

If control filters are used to eliminate potential biases, then each ε_i arises from a combination of four weighing errors (pre- and post-exposure for both the control and exposed filter capsule) and a continuous summation of instantaneous measurement errors accumulated over the course of an eight-hour sample. Since the eight-hour period can be subdivided into an arbitrarily large number of sub-intervals, and some fraction of ε_i is associated with each sub-interval, ε_i can be represented as comprising the sum of an arbitrarily large number of sub-interval

errors. By the Central Limit Theorem, such a summation tends to be normally distributed, regardless of the distribution of sub-interval errors. This does not depend on the distribution of μ_i, which is generally represented as being lognormal.

Any systematic error or bias in the weighing process attributable to the laboratory is mathematically canceled out by subtraction. Any bias that may be associated with day-to-day changes in laboratory conditions or introduced during storage and handling of the filter capsules is also mathematically canceled out. Elimination of the sources of systematic errors identified above, together with the fact that the concentration of respirable dust is defined by section 202(e) of the Mine Act to mean the average concentration of respirable dust measured by an approved sampler unit, indicates that the measurements are unbiased. This means that ε_i is equally likely to be positive or negative and, on average, equal to zero.

Therefore, each ε_i is assumed to be normally distributed, with a mean value of zero and a degree of variability represented by its standard deviation: $ó_i = i_i \times CV_{total}$.

Since $X_i = \mu_i + \varepsilon_i$, it follows that for a given value of μ_i, X_i is normally distributed with expected value equal to μ_i and standard deviation equal to σ_i. CV_{total}, is the coefficient of variation in measurements corresponding to a given value of μ_i. CV_{total} relates entirely to variability due to measurement errors and not at all to variability in actual dust concentrations.

The proposed procedure for citing noncompliance based on Tables 70–1, 71–1, and 90–1 consists of formally testing a presumption of compliance at every location sampled. Compliance with the applicable dust standard at the i^{th} sampling location is expressed by the relation $\mu_i \leq S$. Max$\{\mu_i\}$ denotes the maximum dust concentration, among all of the sampling locations within an MMU. Therefore, if Max$\{\mu_i\} \leq S$, none of the sampling devices in the MMU were exposed to excessive dust concentration. Since the burden of proof is on MSHA to demonstrate noncompliance, the hypothesis being tested (called the *null hypothesis,* or H_0,) is that the concentration at every location sampled is *in* compliance with the applicable dust standard. It follows that for an MMU, the null hypothesis (H_0) is that max$\{\mu_i\} \leq S$. In other areas, where only one, full-shift measurement is made, the null hypothesis is simply that $\mu_i \leq S$.

The test consists of evaluating the likelihood of measurements under the assumption that H_0 is true. Since $X_i = \mu_i + \varepsilon_i$, X_i (or max$\{X_i\}$ in the case of an MMU) can exceed S even under that assumption. However, based on the normal distribution of measurement errors, it is possible to calculate the probability that a measurement error would be large enough to account for the measurement's exceeding the standard. The greater the amount by which X_i exceeds S, the less likely it is that this would be due to measurement error alone. If, under H_0, this probability is less than five percent, then H_0 can be rejected at a 95-percent confidence level and a citation is warranted. For an MMU, rejecting H_0 (and therefore issuing a citation) is equivalent to determining that $\mu_i > S$ for at least one value of *I.*

Each ECV listed was calculated to ensure that citations will be issued at a confidence level of at least 95 percent. As described in MSHA's February 1994 notice, Coal Mine Respirable Dust Standard Noncompliance Determinations (59 FR 8356, February 18, 1994) and explained further by Kogut (Kogut, J, 1994) the tabled ECV corresponding to each S was calculated on the assumption that, at each sampling location:

$$CV_{total} \quad £ \quad CV_{CTV} = \sqrt{\left(\frac{0.14\ mg/m^3}{\mu_i\ mg/m^3} \times 100\%\right)^2 + (5\%)^2 + (5\%)^2}$$

The July 2000 MSHA and NIOSH proposed joint finding, "Determination of Concentration of Respirable Coal Mine Dust" (65 FR 42068, July 7, 2000), determined that for valid measurements made with an approved sampler unit, CV_{total} is in fact less than CV_{ECV} at all dust concentrations (μ_i).

The situation in which measurement error is most likely to cause an erroneous noncompliance determination is the hypothetical case of $\mu_i = S$ for either a single-shift sample measurement or for all of the measurements made in the same MMU. In that borderline situation—*i.e.,* the worst case consistent with H_0—the standard deviation is identical for all measurement errors. Therefore, the value of σ used in constructing the ECV tables is the product of S and CV_{ECV} evaluated for a dust concentration equal to S:

$$\dot{o} = S \cdot \sqrt{\left(\frac{0.14}{S}\right)^2 + (.05)^2 + (.05)^2}$$

Assuming a normal distribution of measurement errors as explained above, it follows that the probability a single measurement would equal or exceed the critical value

$c = S + 1.64 \cdot \sigma$

is five percent under H_0 when $CV_{total} = CV_{ECV}$. The tabled ECV corresponding to S is derived by raising the critical value c up to the next exact multiple of 0.01 mg/m^3.

For example, at a dust concentration (μ_i) just meeting the applicable dust standard of S = 2 mg/m^3, CV_{ECV} is 9.95 percent. Therefore, the calculated value of c is 2.326 and the ECV is 2.33 mg/m^3. Any valid single-shift measurement at or above this ECV is unlikely to be this large simply because of measurement error. Therefore, any such measurement should result in a noncompliance citation.

The probability that a measurement exceeds the ECV is even smaller if $\mu_i < S$ for any *I.* Furthermore, to the extent that CV_{total} is actually less than CV_{ECV}, σ is actually less than $S \cdot CV_{ECV}$. This results in a lower probability that the critical value would be exceeded under the null hypothesis. Consequently, if any single-shift measurement equals or exceeds c, then H_0 can be rejected at confidence level of at least 95-percent. Since rejection of H_0 implies that $\mu_i > S$ for at least one value of *I,* this should result in a noncompliance citation.

It should be noted that when each of several measurements is separately compared to the ECV table, the probability that at least one ε_i will be large enough to force $X_i \geq$ ECV when $\mu_i \leq S$ is greater than the probability when only a single comparison is made. For example (still assuming S = 2 mg/m^3), if CV_{total} is actually 6.6%, then the standard deviation of ε_i is 6.6% of 2.0 mg/m^3, or 0.132 mg/m^3, when $\mu_i = S$. Using properties of the normal

distribution, the probability that any single measurement would exceed the ECV in this borderline situation is calculated to be 0.0062. However, the probability that at least one of five such measurements results in a citation is $1-(0.9938)^5 = 3.1$ percent. Therefore, the confidence level at which a citation can be issued, based on the maximum of five measurements made in the same MMU on a given shift, is 97%.

The constant 1.64 used in calculating the ECV is a 1-tailed 95-percent confidence coefficient and is derived from the standard normal probability distribution. Since the purpose of the ECV tables is to provide criteria for determining that the true dust concentration strictly exceeds the applicable dust standard and such a determination can occur only when a single-shift measurement is sufficiently high, there is exactly zero probability of erroneously citing noncompliance when a measurement falls below the lower confidence limit. Consequently, the total probability of erroneously citing noncompliance equals the probability that a standard normal random variable exceeds 1.64, which is 5 percent.

II. Derivation of Tables 70–2, 71–2, and 90–2

The same statistical theory underlying the derivation of the ECVs in Tables 70–1, 71–1, and 90–1 applies in constructing the values listed in Tables 70–2, 71–2, and 90–2. This discussion explains the derivation of the listed ECVs in Tables 70–2, 71–2, and 90–2.

The initial step in the derivation process involves addressing uncertainty due to potential measurement errors. Such errors reflect the imprecision inherent in any measurement system and cause individual concentration measurements to deviate above or below the true concentration value in the mine atmosphere sampled by a random but statistically quantifiable amount. Measurement imprecision is quantified by the total coefficient of variation for overall measurement error, or CV_{total}, also sometimes called relative standard deviation (RSD). CV_{total} is defined as the ratio of the standard deviation of measurement errors to the true value of whatever quantity is being measured. It is normally expressed either as a fraction (*e.g.,* 0.1) or as a percent (*e.g.,* 10.5 percent) of the true value. MSHA will address uncertainty due to measurement error by applying a margin of error before issuing a citation for exceeding the applicable standard. This margin of error is designed to ensure that a violation of the applicable standard is cited only when a single, full-shift 8-hour MRE equivalent concentration measurement demonstrates noncompliance with at least 95-percent confidence. To achieve this 95-percent confidence level, the applicable margin of error must be constructed by applying an error factor appropriate for the measurement being considered. The *error factor* is calculated as:

$EF = 1 + (1.645 \times CV_{total})$

CV_{total} corresponding to the CPDM has been estimated as 7.8 percent based on in-mine studies and is documented by Volkwein et al. (2006). It relates entirely to variability due to measurement errors and not at all to variability in actual dust concentrations. Therefore, when $CV_{total} = 7.8$ percent, the calculated value of EF is 1.128. If, for example, the sampled occupation is on a 1.5-mg/m^3 standard, the operator would be in violation of the applicable standard if a single, full-shift 8-hour MRE equivalent concentration measurement times the EF exceeds 1.692 mg/m^3 [1.5×1.128]. The ECV corresponding to each applicable standard is derived by simply raising the calculated ECV to the next exact multiple of 0.01 mg/m^3. Therefore, the ECV corresponding to the applicable standard of 1.5 mg/m^3 is 1.70 mg/m^3. Since it is unlikely that any valid end-of shift 8-hour MRE equivalent concentration is this large simply because of measurement error, such a measurement would result in a citation for violation of the applicable standard. The same procedures were followed in calculating ECVs corresponding to other applicable standards.

List of Subjects

30 CFR Part 70

Coal, Mine safety and health, Reporting and recordkeeping requirements, Respirable dust, Underground coal mines.

30 CFR Part 71

Coal, Mine safety and health, Reporting and recordkeeping requirements, Surface coal mines, Underground coal mines.

30 CFR Part 72

Coal, Health standards, Mine safety and health, Training, Underground mines.

30 CFR Part 75

Coal, Mine safety and health, Reporting and recordkeeping requirements, Underground coal mines, Ventilation.

30 CFR Part 90

Coal, Mine safety and health.

Dated: October 1, 2010.

Joseph A. Main,

Assistant Secretary of Labor for Mine Safety and Health.

For the reasons discussed in the preamble, the Mine Safety and Health Administration is proposing to amend 30 CFR parts 70, 71, 72, 75 and 90 as follows:

PART 70—MANDATORY HEALTH STANDARDS FOR UNDERGROUND COAL MINES

1. The authority citation for part 70 is revised to read as follows:

Authority: 30 U.S.C. 811, 813(h), and 957.

2. Section 70.1 is revised to read as follows:

§ 70.1 Scope.

This part 70 sets forth mandatory health standards for each underground coal mine subject to the Federal Mine Safety and Health Act of 1977, as amended.

3. Amend § 70.2 by:

a. Removing the alphabetical paragraph designations and arranging existing definitions in alphabetical order;

b. Adding definitions for "Approved sampling device," "Coal mine dust personal sampler unit *(CMDPSU*)," "Continuous personal dust monitor *(CPDM*)," "Equivalent concentration," "Other designated occupation (ODO)," "Representative samples," "Weekly accumulated exposure (WAE)," and "Weekly permissible accumulated exposure (WPAE);" and

c. Revising definitions for "Act," "Designated area *(DA*)," "Mechanized mining unit (MMU)," "Normal production shift," and "Quartz."

The additions and revisions are revised to read as follows:

§ 70.2 Definitions.

Act. The Federal Mine Safety and Health Act of 1977, Public Law 91–173, as amended by Public Law 95–164 and Public Law 109–236.

* * * * *

Approved sampling device. A sampling device approved by the Secretary and Secretary of Health and Human Services (HHS) under part 74 of this title.

* * * * *

Coal mine dust personal sampler unit (CMDPSU). A personal sampling device approved under part 74, subpart B, of this title.

Continuous personal dust monitor (CPDM). A personal sampling device approved under part 74, subpart C of this title.

Designated area (DA). An area of a mine identified by the operator in the mine ventilation plan, approved by the District Manager, and identified by a four-digit identification number assigned by MSHA.

* * * * *

Equivalent concentration. The concentration of respirable coal mine dust expressed in milligrams per cubic meter of air (mg/m^3), determined by dividing the weight of dust in milligrams collected on the filter of an approved sampling device by the volume of air in cubic meters passing through the collection filter (sampling time in minutes times the sampling airflow rate in cubic meters per minute), and then converting this concentration to an equivalent 8-hour exposure as measured by the Mining Research Establishment (MRE) instrument. When the approved sampling device is:

(1) The CMDPSU, the equivalent concentration is determined by first multiplying the concentration of respirable coal mine dust by the MRE conversion factor prescribed by the Secretary and then normalizing this quantity to an 8-hour exposure measurement by multiplying the MRE-equivalent concentration by the factor *t/480,* where *t* is the sampling time in minutes if longer than 8 hours.

(2) The CPDM, the device shall be programmed to directly report the end-of-shift equivalent concentration as an MRE 8-hour equivalent concentration.

(3) Either the CMDPSU or CPDM and the sampled work shift is less than 8 hours, the value of *t* used for normalizing the MRE-equivalent concentration to an 8-hour exposure measurement shall be 480 minutes.

Mechanized mining unit (MMU). A unit of mining equipment including hand loading equipment used for the production of material; or a specialized unit which uses mining equipment other than specified in § 70.207(b). Each MMU is assigned a four-digit identification number by MSHA, which is retained by the MMU. However, when:

(1) Two sets of mining equipment are used in a series of working places within the same working section and only one production crew is employed, the two sets of equipment are identified as a single MMU.

(2) Two or more sets of mining equipment are used in a series of working places within the same working section and two or more production crews are employed, each set of mining equipment shall be identified as a separate MMU.

* * * * *

Normal production shift. A production shift during which the amount of material produced by an MMU is at least equal to the average production recorded by the operator for the most recent 30 production shifts or for all production shifts if fewer than 30 shifts of production data are available.

Other designated occupation (ODO). Other occupation on a mechanized mining unit that is designated for sampling in addition to the Designated Occupation. Each ODO will be identified by a four-digit identification number assigned by MSHA.

* * * * *

Quartz. Crystalline silicon dioxide (SiO_2) as measured by:

(1) MSHA Analytical Method P–7: Infrared Determination of Quartz in Respirable Coal Mine Dust; or

(2) Any method approved by MSHA as providing a measurement of quartz equivalent to that obtained by MSHA Analytical Method P–7.

* * * * *

Representative samples. Respirable dust samples that reflect typical dust concentration levels and normal mining activity in the active workings during which the amount of material produced is equivalent to a normal production shift.

* * * * *

Weekly accumulated exposure (WAE). The total amount of exposure to respirable coal mine dust, expressed in mg-hr/m^3, accumulated by an occupation during a work week (Sunday thru Saturday), determined by multiplying the daily individual end-of-shift equivalent concentration measurements by 8 hours, which yields the total amount of exposure accumulated over the course of the particular shift sampled, and then adding together all of the daily accumulated exposures.

Weekly permissible accumulated exposure (WPAE). The maximum amount of accumulated exposure to respirable coal mine dust, expressed in mg-hr/m^3, permitted to be received by an occupation during a 40-hour work week (Sunday thru Saturday), determined by multiplying the applicable standard by 40 hours.

4. Subpart B is revised to read as follows:

Subpart B—Dust Standards

Sec.

§ 70.100 Respirable dust standards.

(a) Each operator shall continuously maintain the average concentration of respirable dust in the mine atmosphere during each shift to which each miner in the active workings of each mine is exposed, as measured with an approved sampling device and in terms of an equivalent concentration, at or below:

(1) 2.0 milligrams of respirable dust per cubic meter of air (mg/m^3).

(2) 1.7 mg/m^3 as of [date 6 months after the effective date of the final rule].

(3) 1.5 mg/m^3 as of [date 12 months after the effective date of the final rule].

(4) 1.0 mg/m^3 as of [date 24 months after the effective date of the final rule].

(b) Each operator shall continuously maintain the average concentration of respirable dust within 200 feet outby the working faces of each section in the intake airways as measured with an approved sampling device and in terms of an equivalent concentration at or below:

(1) 1.0 mg/m^3.

(2) 0.5 mg/m^3 as of [date 6 months after the effective date of the final rule].

§ 70.101 Respirable dust standard when quartz is present.

(a) Each operator shall continuously maintain the average concentration of respirable quartz dust in the mine atmosphere during each shift to which each miner in the active workings of each mine is exposed at or below 0.1 mg/m^3 (100 micrograms per cubic meter or μg/m^3) as measured with an approved sampling device and in terms of an equivalent concentration.

(b) When the concentration of respirable quartz dust exceeds 100 μg/m^3, the operator shall continuously maintain the average concentration of respirable dust in the mine atmosphere during each shift to which each miner in the active workings is exposed as measured with an approved sampling device and in terms of an equivalent concentration at or below the applicable dust standard. The applicable dust standard is computed by dividing the percent of quartz into the number 10. The application of this formula shall not result in an applicable dust standard that exceeds the standard established by § 70.100(a).

Example: Assume the sampled MMU or DA is on a 1.0-mg/m^3 dust standard. Suppose a valid respirable dust sample with an equivalent concentration of 1.0 mg/m^3 contains 12.3% of quartz dust, which corresponds to a quartz concentration of 123 μg/m^3. Therefore, the average concentration of respirable dust in the mine atmosphere associated with that MMU or DA shall be maintained on each shift at or below 0.8 mg/m^3 (10/12.3% = 0.8 mg/m^3).

5. Subpart C is revised to read as follows:

Subpart C–Sampling Procedures

Sec.

§ 70.201 Sampling; general and technical requirements.

(a) Approved coal mine dust personal sampler units (CMDPSU) shall be used to take samples of the concentration of respirable coal mine dust for the designated occupation (DO) in each MMU as required by this part until replaced by continuous personal dust monitors (CPDM). After [date 12 months after the effective date of the final rule], only approved CPDMs shall be used to sample DOs in each MMU unless notified by the Secretary.

(b) Approved CMDPSUs shall be used to take samples of the concentration of respirable coal mine dust in each designated area (DA) associated with an MMU as required by this part until replaced by CPDMs. After [date 18 months after the effective date of the final rule] or upon implementation of the use of CPDMs, DAs associated with an MMU will be redesignated as Other Designated Occupations (ODO).

(c) After [date 18 months after the effective date of the final rule], only approved CPDMs shall be used to take samples of the concentration of respirable coal mine dust for each ODO as required by this part unless notified by the Secretary.

(d) Approved CMDPSUs or CPDMs shall be used to take samples of the concentration of respirable coal mine dust in each DA that is not associated with an MMU as required by this part.

(e) Sampling devices shall be worn or carried directly to and from the MMU or DA to be sampled and shall be operated portal-to-portal. Sampling devices shall remain with the occupation or DA being sampled and shall be operational during the entire shift, which includes the total time spent in the MMU or DA and while travelling to and from the mining section or area being sampled. If the work shift to be sampled is longer than 12 hours and the sampling device is:

(1) A CMDPSU, the operator shall switch-out the unit's sampling pump prior to the 13th-hour of operation.

(2) A CPDM, the operator shall switch-out the CPDM with a fully charged device prior to the 13th-hour of operation.

(f) If using a CMDPSU, one control filter shall be used for each shift of sampling. Each control filter shall:

(1) Have the same pre-weight date (noted on the dust data card) as the filters used for sampling;

(2) Remain plugged at all times;

(3) Be exposed to the same time, temperature, and handling conditions as the filters used for sampling;

(4) Be kept with the exposed samples after sampling.

(g) Records showing the length of each production shift for each MMU shall be made and retained for at least six months and shall be made available for inspection by authorized representatives of the Secretary and the representative of miners, and submitted to the District Manager when requested in writing.

(h) Upon request from the District Manager, the operator shall submit the date and time any respirable dust sampling required by this part will begin. This information shall be submitted at least 48 hours prior to scheduled sampling.

(i) To establish a normal production shift, the operator shall record the amount of run-of-mine material produced by each MMU during each shift to determine the average production for the most recent 30 production shifts or for all production shifts if fewer than 30 shifts of production data are available. Production records shall be retained for at least six months and shall be made available for inspection by authorized representatives of the Secretary and the representative of miners.

(j) Operators using CPDMs shall provide training to all miners expected to wear a CPDM. The training shall be completed prior to a miner being required to wear a CPDM and then every 12 months thereafter. The training shall include:

(1) Explaining the basic features and capabilities of the CPDM;

(2) How to set-up the CPDM for compliance sampling.

(3) A discussion of the various types of information displayed by the CPDM and how to access that information;

(4) How to start and stop a short-term sample run during compliance sampling; and

(5) The importance of continuously monitoring dust concentrations and properly wearing the CPDM.

(k) An operator shall keep a record of the CPDM training at the mine site for two years after completion of the training. An operator may keep the record elsewhere if the record is immediately accessible from the mine site by electronic transmission. Upon request from an authorized representative of the Secretary, Secretary of HHS, or representative of miners, the operator shall promptly provide access to any such training records.

§ 70.202 Certified person; sampling.

(a) The respirable dust sampling required by this part shall be performed by a certified person.

(b) To be certified, a person shall complete the applicable MSHA course of instruction and pass the MSHA examination demonstrating competency in sampling procedures. Persons not certified in sampling, and those certified only in maintenance and calibration procedures in accordance with § 70.203(b), are not permitted to collect respirable dust samples required by this part or handle approved sampling devices when being used in sampling.

(c) To maintain certification, a person must pass the MSHA examination demonstrating competency in sampling procedures every three years.

(d) MSHA may revoke a person's certification for failing to pass the MSHA examination or to properly carry out the required sampling procedures.

§ 70.203 Certified person; maintenance and calibration.

(a) Approved sampling devices shall be maintained and calibrated by a certified person.

(b) To be certified, a person shall complete the applicable MSHA course of instruction and pass the MSHA examination demonstrating competency in maintenance and calibration procedures for approved sampling devices. If using a CMDPSU, necessary maintenance of the sampling head assembly can be performed by persons certified in sampling or in maintenance and calibration.

(c) To maintain certification, a person must pass the MSHA examination demonstrating competency in maintenance and calibration procedures every three years.

(d) MSHA may revoke a person's certification for failing to pass the MSHA examination or to properly carry out the required maintenance and calibration procedures.

§ 70.204 Approved sampling devices; maintenance and calibration.

(a) Approved sampling devices shall be maintained as approved under part 74 of this title and calibrated in accordance with MSHA Informational Report IR 1240 (1996) "Calibration and Maintenance Procedures for Coal Mine Respirable Dust Samplers" or in accordance with the manufacturer's recommendations if using a CPDM. Only persons certified in maintenance and calibration can perform maintenance work on the pump unit of approved sampling devices.

(b) Sampling devices shall be calibrated at the flowrate of 2.0 liters of air per minute (L/min), or at a different flowrate recommended by the manufacturer or prescribed by the Secretary or Secretary of HHS for the particular device, before they are put into service and, thereafter, at time intervals recommended by the manufacturer or prescribed by the Secretary or Secretary of HHS.

(c) If using a CMDPSU, sampling devices shall be examined and tested by a person certified in sampling or in maintenance and calibration within 3 hours before the start of the shift on which the approved sampling devices will be used to collect respirable dust samples. This is to assure that the sampling devices are clean and in proper working condition. This examination and testing shall include the following:

(1) Examination of all components of the cyclone assembly to assure that they are clean and free of dust and dirt. This includes examining the interior of the connector barrel (located between the cassette assembly and vortex finder), vortex finder, cyclone body and grit pot;

(2) Examination of the inner surface of the cyclone body to assure that it is free of scoring or scratch marks on the inner surface of the cyclone where the air flow is directed by the vortex finder into the cyclone body;

(3) Examination of the external hose connecting the pump unit to the sampling head assembly to assure that it is clean and free of leaks; and

(4) Examination of the clamping and positioning of the cyclone body, vortex finder and cassette to assure that they are rigid, in alignment, firmly in contact and airtight.

(5) Testing the voltage of each battery while under actual load to assure the battery is fully charged. This requires that a fully assembled and examined sampling head assembly be attached to the pump inlet with the pump unit running when the voltage check is made. The voltage for nickel cadmium cell batteries shall not be lower than the product of the number of cells in the battery multiplied by 1.25. The voltage for other than nickel cadmium cell batteries shall not be lower than the product of the number of cells in the battery multiplied by the manufacturer's nominal voltage per cell value.

(d) If using a CPDM, the certified person in sampling or in maintenance and calibration shall follow the examination, testing and set-up procedures contained in the approved CPDM Performance Plan.

(e) MSHA Informational Report IR 1240 (1996) referenced in paragraph (a) of this section is incorporated-by-reference. This incorporation-by-reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be inspected or obtained at MSHA, Coal Mine Safety and Health, 1100 Wilson Blvd., Room 2424, Arlington, Virginia 22209–3939 and at each MSHA Coal Mine Safety and Health district office. Copies may be inspected at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

§ 70.205 Approved sampling devices; operation; air flowrate.

(a) Approved sampling devices shall be operated at the flowrate of 2.0 L/min, or at a different flowrate recommended by the manufacturer or prescribed by the Secretary or Secretary of HHS.

(b) If using a CMDPSU, each approved sampling device shall be examined each shift by a person certified in sampling during:

(1) The second hour after being put into operation to assure it is in the proper location, operating properly and at the proper flowrate. If the proper flowrate is not maintained, necessary adjustments shall be made by the certified person. This examination is not required if the sampling device is being operated in a breast or chamber of an anthracite coal mine where the full box mining method is used.

(2) The last hour of operation to assure that the sampling device is operating properly and at the proper flowrate. If the proper flowrate is not maintained, the respirable dust sample shall be transmitted to MSHA with a notation by the certified person on the back side of the dust data card stating that the proper flowrate was not maintained. Other events occurring during the collection of respirable dust samples that may affect the validity of the sample, such as dropping of the sampling head assembly onto the mine floor, shall be noted on the back side of the dust data card.

(c) If using a CPDM, the certified person shall examine the sampling device during the shift in accordance with the procedures contained in the approved CPDM Performance Plan.

§ 70.206 CPDM Performance Plan.

(a) If using a CPDM, the operator shall have an approved CPDM Performance Plan to ensure that no miner working on an MMU shall be exposed to concentrations of respirable coal mine dust in excess of the applicable standard. The operator shall develop a proposed CPDM Performance Plan and submit it to the District Manager. The proposed CPDM Performance Plan shall not be implemented until approved by the District Manager.

(1) The mine operator shall notify the representative of miners at least 5 days prior to submission of a proposed CPDM Performance Plan and any proposed revision to a CPDM Performance Plan. If requested, the mine operator shall provide a copy to the representative of miners at the time of notification;

(2) A copy of the proposed CPDM Performance Plan, and a copy of any proposed revision, submitted for approval shall be made available for inspection by the representative of miners; and

(3) A copy of the proposed CPDM Performance Plan, and a copy of any proposed revision, submitted for approval shall be posted on the mine bulletin board at the time of submittal. The proposed plan or proposed revision shall remain posted until it is approved, withdrawn, or denied.

(4) Following receipt of the proposed plan or proposed revision, the representative of miners may submit timely comments to the District Manager, in writing, for consideration during the review process. A copy of these comments shall also be provided to the operator by the District Manager upon request.

(b) The approved CPDM Performance Plan shall include the names or titles of the responsible mine officials who are designated by the operator and the following information:

(1) The occupations in each MMU that will be sampled using a CPDM. Each sampled occupation shall be assigned a 9-digit identification number as follows:

(i) The first four digits identify the MMU being sampled;

(ii) The next three digits identify the sampled occupation;

(iii) The eighth digit identifies the particular shift being sampled (*e.g.*, 1st, 2nd or 3rd); and

(iv) The final digit identifies the particular work crew that the wearer of the sampling device is assigned to at mines employing multiple crews to work the same shift on different days during the same calendar week (*e.g.*, 1st crew, 2nd crew, etc.).

(2) The pre-operational examinations, testing and set-up procedures to verify the operational readiness of the sampling device before each sampling shift;

(3) Procedures that address downloading of end-of-shift sampling information, and validation, certification and posting of reported results;

(4) Procedures for weekly transmittals of certified sampling data files electronically to MSHA;

(5) The routine daily and other required scheduled maintenance procedures;

(6) Procedures or methods for verifying the calibration of each CPDM; and

(7) The frequency with which dust concentrations being reported by the CPDM shall be monitored by the designated mine official during the shift;

(8) The types of actions permitted to be taken during the shift to ensure the environment of the occupation being sampled remains in compliance at the end of the shift.

(9) Any other information required by the District Manager.

(c) The approved CPDM Performance Plan and any revisions shall be:

(1) Provided upon request to the representative of miners by the operator following notification of approval;

(2) Made available for inspection by the representative of miners; and

(3) Posted on the mine bulletin board within 1 working day following notification of approval, and shall remain posted for the period that the plan is in effect.

(d) The District Manager may require an approved CPDM Performance Plan to be revised if the District Manager determines that the plan is inadequate to protect miners from exposure to concentrations of respirable dust in excess of the applicable standard.

§ 70.207 Sampling of mechanized mining units; requirements when using a CMDPSU.

(a) Each operator shall take five valid representative samples from the designated occupation (DO) in each MMU during each bimonthly period. DO samples shall be collected on consecutive normal production shifts or normal production shifts each of which is worked on consecutive days. The bimonthly periods are:

January 1–February 28 (29)
March 1–April 30
May 1–June 30
July 1–August 31
September 1–October 31
November 1–December 31.

(b) Unless otherwise directed by the District Manager, the DO samples shall be taken by placing the approved sampling device as specified in paragraphs (b)(1) through (b)(10) of this section.

(1) *Conventional section using cutting machine.* On the cutting machine operator or on the cutting machine within 36 inches inby the normal working position;

(2) *Conventional section shooting off the solid.* On the loading machine operator or on the loading machine within 36 inches inby the normal working position;

(3) *Continuous mining section other than auger-type.* On the continuous mining machine operator or on the continuous mining machine within 36 inches inby the normal working position;

(4) *Continuous mining machine; auger-type.* On the jacksetter who works nearest the working face on the return air side of the continuous mining machine or at a location that represents the maximum concentration of dust to which the miner is exposed;

(5) *Scoop section using cutting machine.* On the cutting machine operator or on the cutting machine within 36 inches inby the normal working position;

(6) *Scoop section, shooting off the solid.* On the coal drill operator or on the coal drill within 36 inches inby the normal working position;

(7) *Longwall section.* On the miner who works nearest the return air side of the longwall working face or along the working face on the return side within 48 inches of the corner;

(8) *Hand loading section with a cutting machine.* On the cutting machine operator or on the cutting machine within 36 inches inby the normal working position;

(9) *Hand loading section shooting off the solid.* On the hand loader exposed to the greatest dust concentration or at a location that represents the maximum concentration of dust to which the miner is exposed;

(10) *Anthracite mine sections.* On the hand loader exposed to the greatest dust concentration or at a location that represents the maximum concentration of dust to which the miner is exposed.

(c) When the respirable dust standard is changed in accordance with § 70.101, the new applicable standard shall become effective on the first production shift following receipt of the notification of such change from MSHA.

(1) If all samples from the most recent bimonthly sampling period do not exceed the new applicable standard, respirable dust sampling of the MMU shall begin on the first production shift during the next bimonthly period following receipt of such change from MSHA.

(2) If any sample from the most recent bimonthly sampling period exceeds the new applicable standard, the operator shall make necessary adjustments to the dust control parameters in the mine ventilation plan within three days and then collect samples from the affected MMU on consecutive normal production shifts until five valid representative samples are collected. The samples collected will be treated as normal bimonthly samples under this part.

(d) If a normal production shift is not achieved, the DO sample for that shift may be voided by MSHA. However, any sample, regardless of production, that exceeds the applicable standard by at least 0.1 mg/m^3 shall be used to determine the average concentration for that MMU.

(e) No valid single-shift equivalent concentration shall meet or exceed the excessive concentration value (ECV) that corresponds to the applicable standard in Table 70–1.

(f) Upon issuance of a citation for a violation of the applicable standard involving a DO in an MMU, paragraphs (a) and (c)(2) of this section shall not apply to that MMU until the violation is abated in accordance with paragraph (g) of this section.

(g) During the time for abatement fixed in a citation for violation of the applicable standard, the operator shall take the following actions:

(1) Make approved respiratory equipment available to affected miners in accordance with § 72.700 of this chapter;

(2) Submit to the District Manager for approval proposed corrective actions to lower the concentration of respirable dust to within the applicable standard; and

(3) Upon approval by the District Manager, implement the proposed corrective actions and then sample the environment of the affected occupation in the MMU in the citation on each normal production shift until five valid representative samples are taken.

(h) A citation for violation of the applicable standard shall be terminated

by MSHA when the equivalent concentration of each of the five valid operator abatement samples is at or below the applicable standard, the operator has submitted to the District Manager revised dust control parameters as part of the mine ventilation plan applicable to the MMU in the citation, and such changes have been approved by the District Manager. The revised parameters shall reflect the control measures used to abate the violation.

(i) When the equivalent concentration of one or more valid samples collected by the operator under this section exceeds the applicable standard but is less than the applicable ECV in Table 70–1, the operator shall:

(1) Make approved respiratory equipment available to affected miners in accordance with § 72.700 of this chapter;

(2) Take corrective action to lower the concentration of respirable dust to or below the applicable standard.

(3) Record the corrective actions taken in the same manner as the records for hazardous conditions required by § 75.363 of this chapter.

TABLE 70–1—EXCESSIVE CONCENTRATION VALUES (ECV) BASED ON SINGLE-SHIFT CMDPSU EQUIVALENT CONCENTRATION MEASUREMENTS

Applicable standard (mg/m^3)	ECV (mg/m^3)
2.0	2.33
1.9	2.22
1.8	2.12
1.7	2.01
1.6	1.90
1.5	1.79
1.4	1.69
1.3	1.59
1.2	1.47
1.1	1.37
1.0	1.26
0.9	1.16
0.8	1.05
0.7	0.95
0.6	0.85
0.5	0.74
0.4	0.65
0.3	0.54
0.2	0.44

§ 70.208 Sampling of mechanized mining units; requirements when using a CPDM.

(a) Each operator shall sample:

(1) The designated occupation (DO) in each MMU during each production shift, seven days per week (Sunday through Saturday), 52 weeks per year; and

(2) The Other Designated Occupations (ODO) specified in paragraphs (b)(1) through (b)(10) of this section in each MMU during each production shift for 14 consecutive days during each quarterly period. The quarterly periods are:

January 1–March 31
April 1–June 30
July 1–September 30
October 1–December 31.

(b) Unless otherwise directed by the District Manager, the CPDM shall be worn by the miner assigned to perform the duties of the DO and ODOs specified in paragraphs (b)(1) through (b)(10) or by the District Manager for each type of MMU.

(1) *Conventional section using cutting machine.* DO—The cutting machine operator;

(2) *Conventional section shooting off the solid.* DO—The loading machine operator;

(3) *Continuous mining section other than auger-type.* DO—The continuous mining machine operator or mobile bridge operator when using continuous haulage; ODOs—The roof bolter operator who works nearest the working face on the return air side of the continuous mining machine; and the shuttle car operators on MMUs using blowing face ventilation;

(4) *Continuous mining section using auger-type machine.* DO—The jacksetter who works nearest the working face on the return air side of the continuous mining machine;

(5) *Scoop section using cutting machine.* DO—The cutting machine operator;

(6) *Scoop section, shooting off the solid.* DO—The coal drill operator;

(7) *Longwall section.* DO—The longwall operator working on the tailgate side of the longwall mining machine; ODOs—The jacksetter who works nearest the return air side of the longwall working face; and on the mechanic;

(8) *Hand loading section with a cutting machine.* DO—The cutting machine operator;

(9) *Hand loading section shooting off the solid.* DO—The hand loader exposed to the greatest dust concentration; and

(10) *Anthracite mine sections.* DO—The hand loader exposed to the greatest dust concentration.

(c) When the respirable dust standard is changed in accordance with § 70.101, the new applicable standard shall become effective on the first production shift following receipt of notification of such change from MSHA.

(d) No valid end-of-shift equivalent concentration shall meet or exceed the excessive concentration value (ECV) that corresponds to the applicable standard in Table 70–2.

(e) No weekly accumulated exposure shall exceed the weekly permissible accumulated exposure.

(f) When a valid end-of-shift equivalent concentration meets or exceeds the applicable ECV in Table 70–2, or a weekly accumulated exposure exceeds the weekly permissible accumulated exposure, the operator shall take the following actions before production begins on the next shift:

(1) Make approved respiratory equipment available to affected miners in accordance with § 72.700 of this chapter;

(2) Implement corrective actions to assure compliance with the applicable standard on the next and other subsequent production shifts;

(3) Submit to the District Manager for approval, within 3 days of determining that the applicable standard was exceeded, the corrective actions implemented to lower the concentration of respirable dust to within the applicable standard as a proposed change to the approved ventilation plan;

(4) Review the adequacy of the approved CPDM Performance Plan. Within 7 calendar days following posting of the end-of-shift equivalent concentration or weekly accumulated exposure on the mine bulletin board, the operator shall submit any plan revisions to the District Manager for approval; and

(5) Record the reported excessive dust condition as part of and in the same manner as the records for hazardous conditions required by § 75.363 of this chapter. The record shall include:

(i) Dates of sampling;

(ii) Lengths of sampled shifts;

(iii) Locations within the mine and the occupation where samples were collected;

(iv) The end-of-shift equivalent concentration or weekly accumulated exposure and weekly permissible accumulated exposure; and

(v) Corrective actions taken to reduce the concentration of respirable coal mine dust to or below the applicable standard.

(g) When a valid end-of-shift equivalent concentration exceeds the applicable standard but is less than the applicable ECV in Table 70–2, the operator shall take the following actions:

(1) Make approved respiratory equipment available to affected miners in accordance with § 72.700 of this chapter;

(2) Implement corrective actions to assure compliance with the applicable standard on the next and subsequent production shifts;

(3) Record the reported excessive dust condition as part of and in the same manner as the records for hazardous conditions required by § 75.363 of this chapter. The record shall include:

(i) Date of sampling;

(ii) Length of the sampled shift;

(iii) Location within the mine and the occupation where the sample was collected;

(iv) The end-of-shift equivalent concentration; and

(v) Corrective action taken to reduce the concentration of respirable coal mine dust to or below the applicable standard; and

(4) Review the adequacy of the approved CPDM Performance Plan. The operator shall submit to the District Manager for approval any plan revisions within 7 calendar days following posting of the end-of-shift equivalent concentration on the mine bulletin board.

TABLE 70–2—EXCESSIVE CONCENTRATION VALUES (ECV) BASED ON SINGLE-SHIFT CPDM EQUIVALENT CONCENTRATION MEASUREMENTS

Applicable Standard (mg/m^3)	ECV (mg/m^3)
2.0	2.26
1.9	2.15
1.8	2.04
1.7	1.92
1.6	1.81
1.5	1.70
1.4	1.59
1.3	1.47
1.2	1.36
1.1	1.25
1.0	1.13
0.9	1.02
0.8	0.91
0.7	0.80
0.6	0.68
0.5	0.57
0.4	0.46
0.3	0.34
0.2	0.23

(h) During the period of [effective date of rule] through [effective date plus 24 months], if an operator is unable to maintain compliance with the applicable standard for an MMU and has determined that all feasible engineering or environmental controls are being used on the MMU, the operator may request through the District Manager that the Administrator for Coal Mine Safety and Health approve the use of supplementary controls for a period not to exceed 6 months, including worker rotation, in conjunction with monitoring miners' exposures with CPDMs to reduce affected miners' dust exposures. The operator shall provide a report that evaluates the specific situation in the MMU, outlines all controls that will be used during this time period to prevent miners from being exposed to concentrations exceeding the applicable standard, addresses the actions that will be taken to reduce miners' exposures through the use of engineering and environmental controls, and establishes the time line for the implementation of the engineering and environmental controls. The District Manager will address this request through the approval process associated with the mine ventilation plan.

§ 70.209 Sampling of designated areas.

(a) The operator shall sample each DA for five consecutive production shifts every calendar quarter using a CMDPSU or CPDM. The quarterly periods are:

January 1–March 31
April 1–June 30
July 1–September 30
October 1–December 31

(b) When the respirable dust standard is changed in accordance with § 70.101, the new applicable standard shall become effective on the first production shift following receipt of the notification of such change from MSHA.

(1) If all samples from the most recent quarterly sampling period do not exceed the new applicable standard, respirable dust sampling of the DA shall begin on the first production shift during the next quarterly period following receipt of such change from MSHA.

(2) If any sample from the most recent quarterly sampling period exceeds the new applicable standard, the operator shall make necessary adjustments to the dust control parameters in the mine ventilation plan within three days and then collect samples from the affected DA on consecutive shifts until five valid representative samples are collected. The samples collected will be treated as normal quarterly samples under this part.

(c) If using a CMDPSU, no valid single-shift sample equivalent concentration shall meet or exceed the ECV that corresponds to the applicable standard in Table 70–1; or if using a CPDM, no valid end-of-shift equivalent concentration shall meet or exceed the applicable ECV in Table 70–2.

(d) Upon issuance of a citation for a violation of the applicable standard, paragraphs (a) and (b)(2) of this section shall not apply to that DA until the violation is abated in accordance with paragraph (e) of this section.

(e) During the time for abatement fixed in a citation for violation of the applicable standard, the operator shall take the following actions:

(1) Make approved respiratory equipment available to affected miners in accordance with § 72.700 of this chapter;

(2) Submit to the District Manager for approval proposed corrective actions to lower the concentration of respirable dust to within the applicable standard; and

(3) Upon approval by the District Manager, implement the proposed corrective actions and then sample the affected DA on each production shift until five valid representative samples are taken.

(f) A citation for violation of the applicable standard shall be terminated by MSHA when the equivalent concentration of each of the five valid operator abatement samples is at or below the applicable standard, the operator has submitted to the District Manager revised dust control parameters as part of the mine ventilation plan applicable to the DA in the citation, and such changes have been approved by the District Manager. The revised parameters shall reflect the control measures used to abate the violation.

(g) If an operator uses a CPDM to meet the requirements in paragraph (a) of this section and a valid end-of-shift equivalent concentration exceeds the applicable standard but is less than the applicable ECV in Table 70–2, the operator shall take the following actions:

(1) Make approved respiratory equipment available to affected miners in accordance with § 72.700 of this chapter;

(2) Implement corrective actions to assure compliance with the applicable standard on the next and other subsequent production shifts; and

(3) Record the reported excessive dust condition as part of and in the same manner as the records for hazardous conditions required by § 75.363 of this chapter. The record shall include:

(i) Date of sampling;

(ii) Length of the sampled shift;

(iii) Location within the mine and the occupation where the sample was collected;

(iv) The end-of-shift equivalent concentration; and

(v) Corrective action implemented to reduce the concentration of respirable coal mine dust to or below the applicable standard; and

(4) Review the adequacy of the approved CPDM Performance Plan. The operator shall submit to the District Manager for approval any plan revisions within 7 calendar days following posting of the end-of-shift equivalent

concentration on the mine bulletin board.

(h) MSHA approval of the operator's ventilation system and methane and dust control plan may be revoked based on samples taken by MSHA or in accordance with this part 70.

§ 70.210 Respirable dust samples; transmission by operator.

(a) If using a CMDPSU, the operator shall transmit within 24 hours after the end of the sampling shift all samples collected to fulfill the requirements of this part in containers provided by the manufacturer of the filter cassette to: Respirable Dust Processing Laboratory, Pittsburgh Safety and Health Technology Center, Cochrans Mill Road, Building 38, P.O. Box 18179, Pittsburgh, Pennsylvania 15236–0179, or to any other address designated by the District Manager.

(b) The operator shall not open or tamper with the seal of any filter cassette or alter the weight of any filter cassette before or after it is used to fulfill the requirements of this part.

(c) A person certified in sampling shall properly complete the dust data card that is provided by the manufacturer for each filter cassette. The card shall have an identification number identical to that on the cassette used to take the sample and be submitted to MSHA with the sample. Each card shall be signed by the certified person who actually performed the required examinations during the sampling shift and shall include that person's MSHA Individual Identification Number (MIIN). Respirable dust samples with data cards not properly completed shall be voided by MSHA.

(d) All respirable dust samples collected by the operator shall be considered taken to fulfill the sampling requirements of part 70, 71 or 90 of this title, unless the sample has been identified in writing by the operator to the District Manager, prior to the intended sampling shift, as a sample to be used for purposes other than required by part 70, 71 or 90 of this title.

(e) Respirable dust samples received by MSHA in excess of those required by this part shall be considered invalid samples.

(f) If using a CPDM, the designated mine official shall validate, certify and transmit electronically to MSHA within 12 hours after the end of the last sampling shift of the work week all daily sample and error data file information collected during the previous calendar week (Sunday through Saturday) and stored in the CPDM. All CPDM data files transmitted to MSHA shall be maintained by the operator for at least 12 months.

§ 70.211 Respirable dust samples; report to operator; posting.

(a) MSHA shall provide the operator a report with the following data on respirable dust samples submitted in accordance with this part:

(1) The mine identification number;

(2) The locations within the mine from which the samples were taken;

(3) The concentration of respirable dust, expressed as an equivalent concentration in milligrams per cubic meter of air, for each valid sample;

(4) The average concentration of respirable dust, expressed as an equivalent concentration in milligrams per cubic meter of air, for all valid samples;

(5) The occupation code, where applicable;

(6) The reason for voiding any sample.

(b) Upon receipt, the operator shall post this data for at least 31 days on the mine bulletin board.

(c) If using a CPDM, the designated mine official shall validate, certify and post on the mine bulletin board:

(1) Within 1 hour after the end of the sampling shift, the daily end-of-shift sampling results for each monitored occupation and DA, if applicable. The daily posting shall include:

(i) The mine identification number;

(ii) The locations within the mine from which the samples were taken;

(iii) The concentration of respirable dust, expressed as an equivalent concentration in milligrams per cubic meter of air, for each valid sample;

(iv) The total amount of exposure accumulated by the sampled occupation during the shift;

(v) The occupation code, where applicable;

(vi) The reason for voiding any sample;

(vii) The shift length; and

(viii) Any other information required by the District Manager.

(2) Within 2 hours after the end of the last sampling shift of the work week (Sunday through Saturday), the weekly accumulated exposure (WAE) and the weekly permissible accumulated exposure (WPAE) for each occupation sampled in an MMU. If the mine employs multiple crews at an MMU to work the same shift but on different days during the same calendar week, the operator shall post the WAE and WPAE for each crew that was assigned to the occupation being monitored.

(3) This information shall be posted for at least 15 calendar days.

§ 70.212 Status change reports.

(a) If there is a change in operational status that affects the respirable dust sampling requirements of this part, the operator shall report the change in operational status of the mine, mechanized mining unit, or designated area to the MSHA District Office or to any other MSHA office designated by the District Manager. Status changes shall be reported in writing or electronically within 3 working days after the status change has occurred.

(b) Each specific operational status is defined as follows:

(1) Underground mine:

(i) *Producing*—has at least one MMU unit producing material.

(ii) *Nonproducing*—no material is being produced.

(iii) *Abandoned*—the work of all miners has been terminated and production activity has ceased.

(2) MMU:

(i) *Producing*—producing material from a working section.

(ii) *Nonproducing*—temporarily ceased production of material.

(iii) *Abandoned*—permanently ceased production of material.

(3) DA:

(i) *Producing*—activity is occurring.

(ii) *Nonproducing*—activity has ceased.

(iii) *Abandoned*—the dust generating source has been withdrawn and activity has ceased.

(c) Status changes affecting the operational readiness of any CPDM shall be reported by the designated mine official to the MSHA District Office or to any other MSHA office designated by the District Manager within 24 hours after the status change has occurred. Status changes shall be reported in writing or electronically.

§§ 70.300 and 70.305 [Redesignated as §§ 72.700 and 72.701]

6. Sections 70.300 and 70.305 are redesignated as §§ 72.700 and 72.701 respectively.

Subpart D—[Reserved]

7. Subpart D heading removed and subpart reserved.

PART 71—MANDATORY HEALTH STANDARDS FOR SURFACE COAL MINES AND SURFACE WORK AREAS OF UNDERGROUND COAL MINES

8. The authority citation for part 71 is revised to read as follows:

Authority: 30 U.S.C. 811, 813(h), and 957.

9. Section 71.1 is revised to read as follows:

§ 71.1 Scope.

This part 71 sets forth mandatory health standards for each surface coal mine and for the surface work areas of each underground coal mine subject to the Federal Mine Safety and Health Act of 1977, as amended.

9. Section 71.2 is amended by:

a. Removing the alphabetical paragraph designations and arranging existing definitions in alphabetical order;

b. Adding definitions for "Approved sampling device," "Coal mine dust personal sampler unit *(CMDPSU),*" "Continuous personal dust monitor *(CPDM),*" "Equivalent concentration," and "Representative samples;"

c. Revising definitions for "Act," "Designated work position (DWP)," "Quartz," and "Work position."

The additions and revisions are revised to read as follows:

§ 71.2 Definitions.

Act. The Federal Mine Safety and Health Act of 1977, Public Law 91–173, as amended by Public Law 95–164 and Public Law 109–236.

* * * * *

Approved sampling device. A sampling device approved by the Secretary and Secretary of Health and Human Services (HHS) under part 74 of this title.

* * * * *

Coal mine dust personal sampler unit (CMDPSU). A personal sampling device approved under part 74, subpart B, of this title.

* * * * *

Continuous personal dust monitor (CPDM). A personal sampling device approved under part 74, subpart C, of this title.

Designated work position (DWP). A work position at a surface area of a coal mine required to be sampled by this part. The DWP designation consists of a four-digit surface area number assigned by MSHA identifying the specific physical portion of a surface coal mine or surface area of an underground mine that is affected, and a three-digit MSHA coal mining occupation code describing the location to which a miner is assigned in the performance of his or her regular duties.

* * * * *

Equivalent concentration. The concentration of respirable coal mine dust expressed in milligrams per cubic meter of air (mg/m^3), determined by dividing the weight of dust in milligrams collected on the filter of an approved sampling device by the volume of air in cubic meters passing through the collection filter (sampling time in minutes times the sampling airflow rate in cubic meters per minute), and then converting this concentration to an equivalent 8-hour exposure as measured by the Mining Research Establishment (MRE) instrument. When the approved sampling device is:

(1) The CMDPSU, the equivalent concentration is determined by first multiplying the concentration of respirable coal mine dust by the MRE conversion factor prescribed by the Secretary and then normalizing this quantity to an 8-hour exposure measurement by multiplying the MRE-equivalent concentration by the factor $t/480$, where t is the sampling time in minutes if longer than 8 hours.

(2) The CPDM, the device shall be programmed to directly report the end-of-shift equivalent concentration as an MRE 8-hour equivalent concentration.

(3) Either the CMDPSU or CPDM and the sampled work shift is less than 8 hours, the value of t used for normalizing the MRE-equivalent concentration to an 8-hour exposure measurement shall be 480 minutes.

* * * * *

Quartz. Crystalline silicon dioxide (SiO_2) as measured by:

(1) MSHA Analytical Method P–7: Infrared Determination of Quartz in Respirable Coal Mine Dust; or

(2) Any method approved by MSHA as providing a measurement of quartz equivalent to that obtained by MSHA Analytical Method P–7.

Representative samples. Respirable dust samples that reflect typical dust concentration levels in the working environment of the DWP when performing normal duties.

* * * * *

Work position. An occupation identified by an MSHA three-digit code number describing a location to which a miner is assigned in the performance of his or her normal duties.

10. Subpart B is revised to read as follows:

Subpart B—Dust Standards

Sec.

§ 71.100 Respirable dust standard.

Each operator shall continuously maintain the average concentration of respirable dust in the mine atmosphere during each shift to which each miner in the active workings of each mine is exposed, as measured with an approved sampling device and in terms of an equivalent concentration, at or below:

(a) 2.0 milligrams of respirable dust per cubic meter of air (mg/m^3).

(b) 1.7 mg/m^3 as of [date 6 months after the effective date of the final rule].

(c) 1.5 mg/m^3 as of [date 12 months after the effective date of the final rule].

(d) 1.0 mg/m^3 as of [date 24 months after the effective date of the final rule].

§ 71.101 Respirable dust standard when quartz is present.

(a) Each operator shall continuously maintain the average concentration of respirable quartz dust in the mine atmosphere during each shift to which each miner in the active workings of each mine is exposed at or below 0.1 mg/m^3 (100 micrograms per cubic meter or $\mu g/m^3$) as measured with an approved sampling device and in terms of an equivalent concentration.

(b) When the concentration of respirable quartz dust exceeds 100 $\mu g/m^3$, the operator shall continuously maintain the average concentration of respirable dust in the mine atmosphere during each shift to which each miner in the active workings is exposed as measured with an approved sampling device and in terms of an equivalent concentration at or below the applicable standard. The applicable standard is computed by dividing the percent of quartz into the number 10. The application of this formula shall not result in the applicable standard that exceeds the standard established by § 71.100(a) of this section.

Example: Assume the sampled DWP is on a 2.0-mg/m^3 dust standard. Suppose a valid representative dust sample with an equivalent concentration of 1.0 mg/m^3contains 16.7% of quartz dust, which corresponds to a quartz concentration of 167 $\mu g/m^3$. Therefore, the average concentration of respirable dust in the mine atmosphere associated with that DWP shall be maintained on each shift at or below 0.6 mg/m^3 (10/16.7% = 0.6 mg/m^3).

11. Subpart C is revised to read as follows:

Subpart C—Sampling Procedures

Sec.

§ 71.201 Sampling; general and technical requirements.

(a) Each operator shall take representative samples of the concentration of respirable dust in the active workings of the mine as required by this part with an approved sampling device.

(b) Sampling devices shall be worn or carried directly to and from the DWP to be sampled. Sampling devices shall remain with the DWP and shall be operational during the entire shift, which includes the total time spent in the DWP and while travelling to and from the DWP being sampled. If the work shift to be sampled is longer than 12 hours and the sampling device is:

(1) A CMDPSU, the operator shall switch-out the unit's sampling pump prior to the 13th-hour of operation.

(2) A CPDM, the operator shall switch-out the CPDM with a fully charged device prior to the 13th-hour of operation.

(c) If using a CMDPSU, one control filter shall be used for each shift of sampling. Each control filter shall:

(1) Have the same pre-weight date (noted on the dust data card) as the ones used for sampling;

(2) Remain plugged at all times;

(3) Be exposed to the same time, temperature, and handling conditions as the ones used for sampling; and

(4) Be kept with the exposed samples after sampling.

(d) Records showing the length of each normal work shift for each DWP shall be made and retained at least six months and shall be made available for inspection by authorized representatives of the Secretary and the representative of miners or submitted to the District Manager when requested in writing.

(e) Upon request from the District Manager, the operator shall submit the date and time any respirable dust sampling required by this part will begin. This information shall be submitted at least 48 hours prior to scheduled sampling.

(f) Upon written request by the operator, the District Manager may waive the rain restriction for a normal work shift as defined in § 71.2 for a period not to exceed two months, if the District Manager determines that:

(1) The operator will not have reasonable opportunity to complete the respirable dust sampling required by this part without the waiver because of the frequency of rain; and

(2) The operator did not have reasonable opportunity to complete the respirable dust sampling required by this part prior to requesting the waiver.

(g) Operators using CPDMs shall provide training to all miners expected to wear the CPDM. The training shall be completed prior to a miner being required to wear the CPDM and then every 12 months thereafter. The training shall include:

(1) Explaining the basic features and capabilities of the CPDM;

(2) How to set-up the CPDM for compliance sampling;

(3) A discussion of the various types of information displayed by the CPDM and how to access that information;

(4) How to start and stop a short-term sample run during compliance sampling; and

(5) The importance of continuously monitoring dust concentrations and properly wearing the CPDM.

(h) An operator shall keep a record of the CPDM training at the mine site for two years after completion of the training. An operator may keep the record elsewhere if the record is immediately accessible from the mine site by electronic transmission. Upon request from an authorized representative of the Secretary, Secretary of HHS, or representative of miners, the operator shall promptly provide access to any such training records.

§ 71.202 Certified person; sampling.

(a) The respirable dust sampling required by this part shall be performed by a certified person.

(b) To be certified, a person shall complete the applicable MSHA course of instruction and pass the MSHA examination demonstrating competency in sampling procedures. Persons not certified in sampling, and those certified only in maintenance and calibration procedures in accordance with § 71.203(b), are not permitted to collect respirable dust samples required by this part or handle approved sampling devices when being used in sampling.

(c) To maintain certification, a person must pass the MSHA examination demonstrating competency in sampling procedures every three years.

(d) MSHA may revoke a person's certification for failing to pass the MSHA examination or to properly carry out the required sampling procedures.

§ 71.203 Certified person; maintenance and calibration.

(a) Approved sampling devices shall be maintained and calibrated by a certified person.

(b) To be certified, a person shall complete the applicable MSHA course of instruction and pass the MSHA examination demonstrating competency in maintenance and calibration procedures for approved sampling devices. If using a CMDPSU, necessary maintenance of the sampling head assembly can be performed by persons certified in sampling or maintenance and calibration.

(c) To maintain certification, a person must pass the MSHA examination demonstrating competency in maintenance and calibration procedures every three years.

(d) MSHA may revoke a person's certification for failing to pass the MSHA examination or to properly carry out the required maintenance and calibration procedures.

§ 71.204 Approved sampling devices; maintenance and calibration.

(a) Approved sampling devices shall be maintained as approved under part 74 of this chapter and calibrated in accordance with MSHA Informational Report IR 1240 (1996) "Calibration and Maintenance Procedures for Coal Mine Respirable Dust Samplers" or in accordance with the manufacturer's recommendations if using a CPDM. Only persons certified in maintenance and calibration can perform maintenance work on the pump unit of approved sampling devices.

(b) Approved sampling devices shall be calibrated at the flowrate of 2.0 liters of air per minute (L/min), or at a different flowrate recommended by the manufacturer or prescribed by the Secretary or Secretary of HHS for the particular device, before they are put into service and, thereafter, at time intervals recommended by the manufacturer or prescribed by the Secretary or Secretary of HHS.

(c) If using a CMDPSU, sampling devices shall be examined and tested by a person certified in sampling or in maintenance and calibration within 3 hours before the start of the shift on which the approved sampling devices will be used to collect respirable dust samples. This is to assure that the sampling devices are clean and in proper working condition. This examination and testing shall include the following:

(1) Examination of all components of the cyclone assembly to assure that they are clean and free of dust and dirt. This includes examining the interior of the connector barrel (located between the cassette assembly and vortex finder), vortex finder, cyclone body and grit pot;

(2) Examination of the inner surface of the cyclone body to assure that it is free of scoring or scratch marks on the inner surface of the cyclone where the air flow is directed by the vortex finder into the cyclone body;

(3) Examination of the external hose connecting the pump unit to the

sampling head assembly to assure that it is clean and free of leaks; and

(4) Examination of the clamping and positioning of the cyclone body, vortex finder and cassette to assure that they are rigid, in alignment, firmly in contact and airtight.

(5) Testing the voltage of each battery while under actual load to assure the battery is fully charged. This requires that a fully assembled and examined sampling head assembly be attached to the pump inlet with the pump unit running when the voltage check is made. The voltage for nickel cadmium cell batteries shall not be lower than the product of the number of cells in the battery multiplied by 1.25. The voltage for other than nickel cadmium cell batteries shall not be lower than the product of the number of cells in the battery multiplied by the manufacturer's nominal voltage per cell value.

(d) If using a CPDM, the certified person in sampling or in maintenance and calibration shall follow the examination, testing and set-up procedures contained in the approved CPDM Performance Plan.

(e) MSHA Informational Report IR 1240 (1996) referenced in paragraph (a) of this section is incorporated-by-reference. This incorporation-by-reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be inspected or obtained at MSHA, Coal Mine Safety and Health, 1100 Wilson Blvd., Room 2424, Arlington, Virginia 22209–3939 and at each MSHA Coal Mine Safety and Health district office. Copies may be inspected at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

§ 71.205 Approved sampling devices; operation; air flowrate.

(a) Approved sampling devices shall be operated at the flowrate of 2.0 L/min, or at a different flowrate recommended by the manufacturer or prescribed by the Secretary or Secretary of HHS.

(b) If using a CMDPSU, each sampling device shall be examined each shift by a person certified in sampling during:

(1) The second hour after being put into operation to assure it is in the proper location, operating properly and at the proper flowrate. If the proper flowrate is not maintained, necessary adjustments shall be made by the certified person.

(2) The last hour of operation to assure that it is operating properly and at the proper flowrate. If the proper flowrate is not maintained, the respirable dust sample shall be transmitted to MSHA with a notation by the certified person on the back-side of the dust data card stating that the proper flowrate was not maintained. Other events occurring during the collection of respirable dust samples that may affect the validity of the sample, such as dropping of the sampling head assembly onto the mine floor, shall be noted on the back-side of the dust data card.

(c) If using a CPDM, the certified person shall examine the sampling device during the shift in accordance with the procedures contained in the approved CPDM Performance Plan.

§ 71.206 CPDM Performance Plan.

(a) If using a CPDM, the operator shall have an approved CPDM Performance Plan to ensure that the regular duties of the DWP shall not expose miners to concentrations of respirable coal mine dust in excess of the applicable standard. The operator shall develop a proposed CPDM Performance Plan and submit it to the District Manager. The proposed CPDM Performance Plan shall not be implemented until approved by the District Manager.

(1) The mine operator shall notify the representative of miners at least 5 days prior to submission of a proposed CPDM Performance Plan and any proposed revision to a CPDM Performance Plan. If requested, the mine operator shall provide a copy to the representative of miners at the time of notification;

(2) A copy of the proposed CPDM Performance Plan, and a copy of any proposed revision, submitted for approval shall be made available for inspection by the representative of miners; and

(3) A copy of the proposed CPDM Performance Plan and a copy of any proposed revision submitted for approval shall be posted on the mine bulletin board at the time of submittal. The proposed plan or proposed revision shall remain posted until it is approved, withdrawn, or denied.

(4) Following receipt of the proposed plan or proposed revision, the representative of miners may submit timely comments to the District Manager, in writing, for consideration during the review process. A copy of these comments shall also be provided to the operator by the District Manager upon request.

(b) The approved CPDM Performance Plan shall include the names or titles of the responsible mine officials designated by the operator and the following information:

(1) The DWPs that will be sampled using a CPDM. Each DWP shall be assigned a 9-digit identification number as follows:

(i) The first four digits identify the surface work area of the mine;

(ii) The next three digits identify the sampled work position or occupation;

(iii) The eighth digit identifies the particular shift being sampled (*e.g.,* 1st, 2nd or 3rd); and

(iv) The final digit identifies the particular miner assigned to that DWP if the mine employs other miners that perform similar duties in the rest of the mine.

(2) The pre-operational examinations, testing and set-up procedures to verify the operational readiness of the sampling device before each sampling shift;

(3) Procedures that address downloading of end-of-shift sampling information, and validation, certification and posting of reported results;

(4) Procedures for weekly transmittals of certified sampling data files electronically to MSHA;

(5) The routine daily and other required scheduled maintenance procedures;

(6) Procedures or methods for verifying the calibration of each CPDM; and

(7) The frequency with which dust concentrations being reported by the CPDM shall be monitored by the designated mine official during the shift;

(8) The types of actions permitted to be taken during the shift to ensure the environment of the occupation being sampled remains in compliance at the end of the shift.

(9) Any other information required by the District Manager.

(c) The approved CPDM Performance Plan and any revisions shall be:

(1) Provided upon request to the representative of miners by the operator following notification of approval;

(2) Made available for inspection by the representative of miners; and

(3) Posted on the mine bulletin board within 1 working day following notification of approval, and shall remain posted for the period that the plan is in effect.

(d) The District Manager may require an approved CPDM Performance Plan to be revised if the District Manager determines that the plan is inadequate to protect miners from exposure to concentrations of respirable dust in excess of the applicable standard.

§ 71.207 Sampling of designated work positions.

(a) Each operator shall take one valid representative sample from each DWP every calendar quarter. The quarterly periods are:

January 1–March 31
April 1–June 30
July 1–September 30
October 1–December 31

(b) Designated work position samples shall be collected at locations to measure respirable dust generation sources in the active workings. The work positions at each mine where DWP samples shall be collected include:

(1) Each highwall drill operator (MSHA occupation code 384);

(2) Bulldozer operators (MSHA occupation code 368); and

(3) Other work positions designated by the District Manager for sampling in accordance with § 71.207(f).

(c) Operators with multiple work positions specified in paragraph (b)(2) and (b)(3) of this section shall sample the DWP exposed to the greatest respirable dust concentration in each work position performing the same activity or task at the same location at the mine and exposed to the same dust generation source. Each operator shall provide the District Manager with a list identifying the specific work positions where DWP samples will be collected for:

(1) Active mines—by [date 60 days after date of publication of final rule];

(2) New mines—Within 30 calendar days of mine opening; or

(3) Change in operational status that increases or reduces the number of active DWPs—within 7 calendar days of the change in status.

(d) Each DWP sample shall be taken on a normal work shift. If a normal work shift is not achieved, the respirable dust sample shall be transmitted to MSHA with a notation by the certified person on the back-side of the dust data card stating that the sample was not taken on a normal work shift. When a normal work shift is not achieved, the sample for that shift may be voided by MSHA. However, any sample, regardless of whether a normal work shift was achieved, that exceeds the applicable standard by at least 0.1 mg/m^3 shall be used to determine compliance with this part.

(e) Unless otherwise directed by the District Manager, DWP samples shall be taken by placing the sampling device as follows:

(1) *Equipment operator:* On the equipment operator or on the equipment within 36 inches of the operator's normal working position;

(2) *Non-equipment operators:* On the miner assigned to the DWP or at a location that represents the maximum concentration of dust to which the miner is exposed.

(f) The District Manager may designate for sampling under this section additional work positions at a surface coal mine and at a surface work area of an underground coal mine where a concentration of respirable dust exceeding 50 percent of the applicable standard has been measured by one or more MSHA samples. Where the applicable standard established in accordance with § 71.101 is below the respirable dust standard under § 71.100, the District Manager may designate for sampling additional work positions where a concentration of respirable dust exceeding the applicable standard has been measured by one or more MSHA samples.

(g) The District Manager may withdraw from sampling any DWP designated for sampling under paragraph (f) of this section upon finding that the operator is able to maintain continuing compliance with the applicable standard. This finding shall be based on the results of MSHA and operator samples taken during at least a one-year period.

(h) When the respirable dust standard is changed in accordance with § 71.101, the new applicable standard shall become effective on the first normal work shift following receipt of the notification of such change from MSHA.

(1) If all samples from the most recent quarterly sampling period do not exceed the new applicable standard, respirable dust sampling of the DWP shall begin on the first normal work shift during the next quarterly period following receipt of such change from MSHA.

(2) If any sample from the most recent quarterly sampling period exceeds the new applicable standard, the operator shall make necessary adjustments to the dust control parameters within three days and then collect a sample from the affected DWP on a normal work shift. The sample collected will be treated as a normal quarterly sample under this part.

(i) If using a CMDPSU, no valid single-shift concentration shall meet or exceed the excessive concentration value (ECV) that corresponds to the applicable standard in Table 71–1; or, if using a CPDM, no valid end-of-shift equivalent concentration shall meet or exceed the applicable ECV in Table 71–2.

TABLE 71–1—EXCESSIVE CONCENTRATION VALUES (ECV) BASED ON SINGLE-SHIFT CMDPSU EQUIVALENT CONCENTRATION MEASUREMENTS

Applicable standard (mg/m^3)	ECV (mg/m^3)
2.0	2.33
1.9	2.22
1.8	2.12
1.7	2.01
1.6	1.90
1.5	1.79
1.4	1.69
1.3	1.59
1.2	1.47
1.1	1.37
1.0	1.26
0.9	1.16
0.8	1.05
0.7	0.95
0.6	0.85
0.5	0.74
0.4	0.65
0.3	0.54
0.2	0.44

TABLE 71–2—EXCESSIVE CONCENTRATION VALUES (ECV) BASED ON SINGLE-SHIFT CPDM EQUIVALENT CONCENTRATION MEASUREMENTS

Applicable standard (mg/m^3)	ECV (mg/m^3)
2.0	2.26
1.9	2.15
1.8	2.04
1.7	1.92
1.6	1.81
1.5	1.70
1.4	1.59
1.3	1.47
1.2	1.36
1.1	1.25
1.0	1.13
0.9	1.02
0.8	0.91
0.7	0.80
0.6	0.68
0.5	0.57
0.4	0.46
0.3	0.34
0.2	0.23

(j) Upon issuance of a citation for a violation of the applicable standard, paragraphs (a) and (h)(2) of this section shall not apply to that DWP until the violation is abated in accordance with paragraph (k) of this section.

(k) During the time for abatement fixed in a citation for violation of the applicable standard, the operator shall take the following actions:

(1) Make approved respiratory equipment available to affected miners in accordance with § 72.700 of this chapter;

(2) Submit to the District Manager for approval proposed corrective actions to

lower the concentration of respirable dust to within the applicable standard; and

(3) Upon approval by the District Manager, implement the proposed corrective actions and then sample the affected DWP on each normal work shift until five valid representative samples are taken.

(4) If using a CPDM to meet the requirements of paragraph (a) of this section, review the adequacy of the approved CPDM Performance Plan. The operator shall submit any plan revisions to the District Manager for approval within 7 calendar days following posting of the end-of-shift equivalent concentration on the mine bulletin board.

(l) A citation for violation of the applicable standard shall be terminated by MSHA when the equivalent concentration of each of the five valid operator abatement samples is at or below the applicable standard and, within 15 calendar days after receipt of sampling results from MSHA, the operator has submitted to the District Manager for approval a proposed dust control plan applicable to the DWP in the citation or notice or proposed changes to the approved dust control plan as prescribed in § 71.300. The proposed plan parameters or proposed changes shall reflect the control measures used to abate the violation.

(m) Upon notification from MSHA that any valid representative sample taken with a CMDPSU from a DWP to meet the requirements of paragraph (a) of this section exceeds the applicable standard but is below the applicable ECV in Table 71–1, the operator shall, within 15 calendar days of notification, sample that DWP each normal work shift until five valid representative samples are taken. The operator shall begin sampling on the first normal work shift following receipt of notification. These samples will be evaluated to determine compliance with the applicable standard for this sampling period.

(n) If using a CPDM to meet the requirements in paragraph (a) of this section and a valid end-of-shift equivalent concentration exceeds the applicable standard but is less than the applicable ECV in Table 71–2, the operator shall:

(1) On the first normal work shift after determining that the applicable standard was exceeded, sample that DWP each normal work shift until five valid representative samples are taken. These samples will be evaluated to determine compliance with the applicable standard for this sampling period; and

(2) Review the adequacy of the approved CPDM Performance Plan. The operator shall submit any plan revisions to the District Manager for approval within 7 calendar days following posting of the end-of-shift equivalent concentration on the mine bulletin board.

§ 71.208 Respirable dust samples; transmission by operator.

(a) If using a CMDPSU, the operator shall transmit within 24 hours after the end of the sampling shift all samples collected to fulfill the requirements of this part in containers provided by the manufacturer of the filter cassette to: Respirable Dust Processing Laboratory, Pittsburgh Safety and Health Technology Center, Cochrans Mill Road, Building 38, P.O. Box 18179, Pittsburgh, Pennsylvania 15236–0179, or to any other address designated by the District Manager.

(b) The operator shall not open or tamper with the seal of any filter cassette or alter the weight of any filter cassette before or after it is used to fulfill the requirements of this part.

(c) A person certified in sampling shall properly complete the dust data card that is provided by the manufacturer for each filter cassette. The card shall have an identification number identical to that on the cassette used to take the sample and be submitted to MSHA with the sample. Each card shall be signed by the certified person who actually performed the required two examinations during the sampling shift and shall include that person's MSHA Individual Identification Number (MIIN). Respirable dust samples with data cards not properly completed shall be voided by MSHA.

(d) All respirable dust samples collected by the operator shall be considered taken to fulfill the sampling requirements of part 70, 71 or 90 of this title, unless the sample has been identified in writing by the operator to the District Manager, prior to the intended sampling shift, as a sample to be used for purposes other than required by part 70, 71 or 90 of this title.

(e) Respirable dust samples received by MSHA in excess of those required by this part shall be considered invalid samples.

(f) If using a CPDM, the designated mine official shall validate, certify and transmit electronically to MSHA within 12 hours after the end of the last sampling shift for a DWP all sample and error data file information collected during the previous shifts and stored in the CPDM. All CPDM data files transmitted to MSHA shall be maintained by the operator for at least 12 months.

§ 71.209 Respirable dust samples; report to operator; posting.

(a) MSHA shall provide the operator a report with the following data on respirable dust samples submitted in accordance with this part:

(1) The mine identification number;

(2) The DWP at the mine from which the samples were taken;

(3) The concentration of respirable dust, expressed as an equivalent concentration in milligrams per cubic meter of air, for each valid sample; and

(4) The reason for voiding any sample.

(b) Upon receipt, the operator shall post this data for at least 46 days on the mine bulletin board.

(c) If using a CPDM, the designated mine official shall validate, certify and post on the mine bulletin board:

(1) Within 1 hour after the end of the sampling shift, the daily end-of-shift sampling results for each DWP. The daily posting shall include:

(i) The mine identification number;

(ii) The DWP at the mine from which the samples were taken;

(iii) The concentration of respirable dust, expressed as an equivalent concentration in milligrams per cubic meter of air, for each valid sample;

(iv) The reason for voiding any sample;

(v) The shift length; and

(vi) Any other information required by the District Manager.

(2) This information shall be posted at least 46 calendar days.

§ 71.210 Status change reports.

(a) If there is a change in operational status that affects the respirable dust sampling requirements of this part, the operator shall report the change in operational status of the mine or DWP to the MSHA District Office or to any other MSHA office designated by the District Manager. Status changes shall be reported in writing or electronically within 3 working days after the status change has occurred.

(b) Each specific operational status is defined as follows:

(1) Underground mine:

(i) Producing—has at least one mechanized mining unit producing material.

(ii) Nonproducing—no material is being produced.

(iii) Abandoned—the work of all miners has been terminated and production activity has ceased.

(2) Surface mine:

(i) Producing—normal activity is occurring and coal is being produced or processed or other material or equipment is being handled or moved.

(ii) Nonproducing—normal activity is not occurring and coal is not being produced or processed, and other material or equipment is not being handled or moved.

(iii) Abandoned—the work of all miners has been terminated and all activity has ceased.

(3) DWP:

(i) Producing—normal activity is occurring.

(ii) Nonproducing—normal activity is not occurring.

(iii) Abandoned—the dust generating source has been withdrawn and activity has ceased.

(c) Status changes affecting the operational readiness of any CPDM shall be reported by the designated mine official to the MSHA District Office or to any other MSHA office designated by the District Manager within 24 hours after the status change has occurred. Status changes shall be reported in writing or electronically.

12. Subpart D is revised to read as follows:

Subpart D–Respirable Dust Control Plans

Sec.

§ 71.300 Respirable dust control plan; filing requirements.

(a) As required by § 71.207(l), the operator shall submit to the District Manager for approval a written respirable dust control plan applicable to the DWP identified in the citation. The respirable dust control plan and revisions thereof shall be suitable to the conditions and the mining system of the coal mine and shall be adequate to continuously maintain respirable dust within the applicable standard at the DWP.

(1) The mine operator shall notify the representative of miners at least 5 days prior to submission of a respirable dust control plan and any revision to a dust control plan. If requested, the mine operator shall provide a copy to the representative of miners at the time of notification;

(2) A copy of the proposed respirable dust control plan, and a copy of any proposed revision, submitted for approval shall be made available for inspection by the representative of miners; and

(3) A copy of the proposed respirable dust control plan, and a copy of any proposed revision, submitted for approval shall be posted on the mine bulletin board at the time of submittal. The proposed plan or proposed revision shall remain posted until it is approved, withdrawn, or denied.

(4) Following receipt of the proposed plan or proposed revision, the representative of miners may submit timely comments to the District Manager, in writing, for consideration during the review process. Upon request, a copy of these comments shall be provided to the operator by the District Manager.

(b) Each respirable dust control plan shall include at least the following:

(1) The mine identification number and DWP number assigned by MSHA, the operator's name, mine name, mine address, and mine telephone number and the name, address, and telephone number of the principal officer in charge of health and safety at the mine;

(2) The specific DWP at the mine to which the plan applies;

(3) A detailed description of the specific respirable dust control measures used to abate the violation of the respirable dust standard; and

(4) A detailed description of how each of the respirable dust control measures described in response to paragraph (b)(3) of this section will continue to be used by the operator, including at least the specific time, place and manner the control measures will be used.

§ 71.301 Respirable dust control plan; approval by District Manager and posting.

(a) The District Manager will approve respirable dust control plans on a mine-by-mine basis. When approving respirable dust control plans, the District Manager shall consider whether:

(1) The respirable dust control measures would be likely to maintain concentrations of respirable coal mine dust at or below the applicable standard; and

(2) The operator's compliance with all provisions of the respirable dust control plan could be objectively ascertained by MSHA.

(b) MSHA may take respirable dust samples to determine whether the respirable dust control measures in the operator's plan effectively maintain concentrations of respirable coal mine dust at or below the applicable standard.

(c) The operator shall comply with all provisions of each respirable dust control plan upon notice from MSHA that the respirable dust control plan is approved.

(d) The approved respirable dust control plan and any revisions shall be:

(1) Provided upon request to the representative of miners by the operator following notification of approval;

(2) Made available for inspection by the representative of miners; and

(3) Posted on the mine bulletin board within 1 working day following notification of approval, and shall remain posted for the period that the plan is in effect.

(e) The operator may review respirable dust control plans and submit proposed revisions to such plans to the District Manager for approval.

PART 72—[AMENDED]

13. The authority citation for part 72 is revised to read as follows:

Authority: 30 U.S.C. 811, 813(h), and 957.

14. Subpart B is added to part 72 to read as follows:

Subpart B–Medical Surveillance

§ 72.100 Periodic examinations.

(a) Each operator of a coal mine shall provide to each miner periodic examinations including chest x-rays, spirometry, symptom assessment, and occupational history at a frequency specified in this section and at no cost to the miner.

(1) Each operator shall use facilities approved by the National Institute for Occupational Safety and Health (NIOSH) to provide examinations specified in paragraph (a) of this section.

(b) *Voluntary examinations.* Each operator shall provide the opportunity to have the examinations specified in § 72.100(a) at least every 5 years to all miners employed at a coal mine. The examinations shall be available during a 6-month period that begins no less than 3.5 years and not more than 4.5 years from the end of the last 6-month period.

(c) *Mandatory examinations.* For each miner who begins work at a coal mine for the first time, the operator shall provide examinations specified in § 72.100(a) as follows:

(1) An initial examination no later than 30 days after beginning employment;

(2) A follow-up examination no later than 3 years after the initial examination in paragraph (c)(1) of this section; and

(3) A follow-up examination no later than 2 years after the examinations in paragraph (c)(2) of this section if the chest x-ray shows evidence of pneumoconiosis or the spirometry examination indicates evidence of decreased lung function. For this purpose, evidential criteria will be defined by NIOSH.

(d) Each mine operator shall develop and submit for approval to NIOSH a plan for providing miners with the examinations specified in § 72.100(a)

and a roster specifying the name and current address of each miner covered by the plan.

(e) Each mine operator shall post on the mine bulletin board at all times the approved plan for providing the examinations specified in § 72.100(a).

15. Add § 72.700 to subpart E of part 72 to read as follows:

§ 72.700 Respiratory equipment; respirable dust.

(a) Respiratory equipment approved by NIOSH under 42 CFR part 84 shall be made available to all persons as required under parts 70, 71, and 90 of this chapter. Use of respirators shall not be substituted for environmental control measures in the active workings. Each operator shall maintain an adequate supply of respiratory equipment.

(b) When required to make respirators available, the operator shall provide training prior to the miner's next scheduled work shift, unless the miner received training within the previous 12 months on the types of respirators made available. The training shall include: the care, fit, use, and limitations of each type of respirator.

(c) An operator shall keep a record of the training at the mine site for two years after completion of the training. An operator may keep the record elsewhere if the record is immediately accessible from the mine site by electronic transmission. Upon request from an authorized representative of the Secretary, Secretary of HHS, or representative of miners, the operator shall promptly provide access to any such training records.

16. Add § 72.701 to subpart E of part 72 to read as follows:

§ 72.701 Respiratory equipment; gas, dusts, fumes, or mists.

Respiratory equipment approved by NIOSH under 42 CFR part 84 shall be provided to persons exposed for short periods to inhalation hazards from gas, dusts, fumes, or mists. When the exposure is for prolonged periods, other measures to protect such persons or to reduce the hazard shall be taken.

17. Add § 72.800 to subpart E of part 72 to read as follows:

§ 72.800 Single, full-shift measurement of respirable coal mine dust.

The Secretary may use a single, full-shift measurement of respirable coal mine dust to determine average concentration on a shift if that measurement accurately represents atmospheric conditions to which a miner is exposed during such shift.

PART 75—MANDATORY SAFETY STANDARDS—UNDERGROUND COAL MINES

18. The authority citation for part 75 is revised to read as follows:

Authority: 30 U.S.C. 811, 813(h), and 957.

19. Amend § 75.325 by revising paragraph (a)(2) to read as follows:

§ 75.325 Air quantity.

(a) * * *

(2) The quantity of air reaching the working face shall be determined at or near the face end of the line curtain, ventilation tubing, or other ventilation control device. If the curtain, tubing, or device extends beyond the last row of permanent roof supports, the quantity of air reaching the working face shall be determined behind the line curtain or in the ventilation tubing at or near the last row of permanent supports. When machine mounted dust collectors are used in conjunction with blowing face ventilation systems, the quantity of air reaching the working face shall be determined with the dust collector turned off.

* * * * *

20. Amend § 75.332 by revising paragraph (a)(1) to read as follows:

§ 75.332 Working sections and working places.

(a)(1) Each MMU on each working section and each area where mechanized mining equipment is being installed or removed, shall be ventilated by a separate split of intake air directed by overcasts, undercasts or other permanent ventilation controls.

* * * * *

21. Amend § 75.350 by revising paragraph (b)(3)(i) and (ii) to read as follows:

§ 75.350 Belt air course ventilation.

* * * * *

(b) * * *

(3)(i) The average concentration of respirable dust in the belt air course, when used as a section intake air course, shall be maintained at or below:

(A) 1.0 mg/m^3

(B) 0.5 mg/m^3 as of [date 6 months after the effective date of the final rule].

(ii) Where miners on the working section are on a reduced standard below that specified in § 75.350(b)(3)(i), the average concentration of respirable dust in the belt entry must be at or below the lowest applicable standard on that section.

* * * * *

22. Amend § 75.362 by revising paragraphs (a)(2) and (g)(2) and adding paragraphs (g)(3) and (g)(4) to read as follows:

§ 75.362 On-shift examinations.

(a) * * *

(2) A person designated by the operator shall conduct an examination and record the results and the corrective actions taken to assure compliance with the respirable dust control parameters specified in the approved mine ventilation plan. In those instances when a shift change is accomplished without an interruption in production on a section, the examination shall be made anytime within 1 hour of the shift change. In those instances when there is an interruption in production during the shift change, the examination shall be made before production begins on a section. Deficiencies in dust controls shall be corrected before production begins or resumes. The examination shall include: air quantities and velocities; water pressures and flow rates; excessive leakage in the water delivery system; water spray numbers and orientations; section ventilation and control device placement and any other dust suppression measures; specific measurements like roof bolter dust collector vacuum levels and scrubber air flow rate; and work practices required by the ventilation plan. Measurements of the air velocity and quantity, water pressure and flow rates are not required if continuous monitoring of these controls is used and indicates that the dust controls are functioning properly.

* * * * *

(g)(2) The certified person directing the on-shift examination to assure compliance with the respirable dust control parameters specified in the approved mine ventilation plan shall:

(i) Certify by initials, date, and time on a board maintained at the section load-out or similar location showing that the examination was made prior to resuming production; and

(ii) Verify, by initials and date, the record of the results of the examination required under paragraph (a)(2) of this section to assure compliance with the respirable dust control parameters specified in the mine ventilation plan. The verification shall be made no later than the end of the shift for which the examination was made.

(3) The mine foreman or equivalent mine official shall countersign each examination record required under paragraph (a)(2) of this section after it is verified by the certified person under paragraph (g)(2)(ii) of this section, and no later than the end of the mine foreman's or equivalent mine official's next regularly scheduled working shift. The record shall be made in a secure book that is not susceptible to alteration or electronically in a computer system

so as to be secure and not susceptible to alteration.

(4) Records shall be retained at a surface location at the mine for at least 1 year and shall be made available for inspection by authorized representatives of the Secretary and the representative of miners.

23. Amend § 75.371 by revising paragraphs (f), (j) and (t) to read as follows:

§ 75.371 Mine ventilation plan; contents.

* * * * *

(f) Section and face ventilation systems used and the minimum quantity of air that will be delivered to the working section for each mechanized mining unit, including drawings illustrating how each system is used, and a description of each different dust suppression system used on equipment, identified by make and model, on each working section, including:

(1) The number, types, location, orientation, operating pressure, and flow rate of operating water sprays;

(2) The maximum distance that ventilation control devices will be installed from each working face when mining or installing roof bolts in entries and crosscuts;

(3) Procedures for maintaining the roof bolter dust collection system in approved condition; and

(4) Recommended best work practices for equipment operators to minimize dust exposure.

* * * * *

(j) The operating volume of machine mounted dust collectors or diffuser fans, if used (see § 75.325(a)(3)), including the type and size of dust collector screen used, and a description of the procedures to maintain dust collectors used on equipment.

* * * * *

(t) The locations where samples for "designated areas" will be collected, including the specific location of each sampling device, and the respirable dust control measures used at the dust generating sources for these locations (see § 70.209 of this chapter).

* * * * *

PART 90—MANDATORY HEALTH STANDARDS FOR COAL MINERS WHO HAVE EVIDENCE OF THE DEVELOPMENT OF PNEUMOCONIOSIS

24. The authority citation for part 90 is revised to read as follows:

Authority: 30 U.S.C. 811, 813(h) and 957.

25. Section 90.1 is revised to read as follows:

§ 90.1 Scope.

This part 90 establishes the option of miners who are employed at coal mines and who have evidence of the development of pneumoconiosis to work in an area of a mine where the average concentration of respirable dust in the mine atmosphere during each shift is continuously maintained at or below the applicable standard as specified in § 90.100. The rule sets forth procedures for miners to exercise this option, and establishes the right of miners to retain their regular rate of pay and receive wage increases. The rule also sets forth the operator's obligations, including respirable dust sampling for part 90 miners. This part 90 is promulgated pursuant to section 101 of the Act and supersedes section 203(b) of the Federal Mine Safety and Health Act of 1977, as amended.

26. Amend § 90.2 by:

a. Adding definitions for "Approved sampling device," "Coal mine dust personal sampler unit *(CMDPSU),*" "Continuous personal dust monitor (CPDM)," "Equivalent concentration," "Representative samples," "Weekly accumulated exposure (WAE)," and "Weekly permissible accumulated exposure (WPAE);" and

b. Revising definitions for "Act," "Mechanized mining unit (MMU)," and "Part 90 Miner."

The additions and revisions are revised to read as follows:

§ 90.2 Definitions.

Act. The Federal Mine Safety and Health Act of 1977, Public Law 91–173, as amended by Public Law 95–164 and Public Law 109–236.

* * * * *

Approved sampling device. A sampling device approved by the Secretary and Secretary for Health and Human Services (HHS) under part 74 of this title.

* * * * *

Coal mine dust personal sampler unit (CMDPSU). A personal sampling device approved under part 74, subpart B, of this title.

* * * * *

Continuous personal dust monitor (CPDM). A personal sampling device approved under part 74, subpart C, of this title.

* * * * *

Equivalent concentration. The concentration of respirable coal mine dust expressed in milligrams per cubic meter of air (mg/m^3), determined by dividing the weight of dust in milligrams collected on the filter of an approved sampling device by the volume of air in cubic meters passing through the collection filter (sampling time in minutes times the sampling airflow rate in cubic meters per minute), and then converting this concentration to an equivalent 8-hour exposure as measured by the Mining Research Establishment (MRE) instrument. When the approved sampling device is:

(1) The CMDPSU, the equivalent concentration is determined by first multiplying the concentration of respirable coal mine dust by the MRE conversion factor prescribed by the Secretary and then normalizing this quantity to an 8-hour exposure measurement by multiplying the MRE-equivalent concentration by the factor $t/480$, where t is the sampling time in minutes if longer than 8 hours.

(2) The CPDM, the device shall be programmed to directly report the end-of-shift equivalent concentration as an MRE 8-hour equivalent concentration.

(3) Either the CMDPSU or CPDM and the sampled work shift is less than 8 hours, the value of t used for normalizing the MRE-equivalent concentration to an 8-hour exposure measurement shall be 480 minutes.

Mechanized mining unit (MMU). A unit of mining equipment including hand loading equipment used for the production of material; or a specialized unit which uses mining equipment other than specified in § 70.207(b) of this chapter. Each MMU is assigned a four-digit identification number by MSHA, which is retained by the MMU. However, when:

(1) Two sets of mining equipment are used in a series of working places within the same working section and only one production crew is employed, the two sets of equipment are identified as a single MMU.

(2) Two or more sets of mining equipment are used in a series of working places within the same working section and two or more production crews are employed, each set of mining equipment shall be identified as a separate MMU.

* * * * *

Part 90 miner. A miner employed at a coal mine who has exercised the option under the old section 203(b) program, or under § 90.3 of this part to work in an area of a mine where the average concentration of respirable dust in the mine atmosphere during each shift to which that miner is exposed is continuously maintained at or below the applicable standard, and who has not waived these rights.

Quartz. Crystalline silicon dioxide (SiO_2) as measured by:

(1) MSHA Analytical Method P–7: Infrared Determination of Quartz in Respirable Coal Mine Dust; or

(2) Any method approved by MSHA as providing a measurement of quartz equivalent to that obtained by MSHA Analytical Method P–7.

Representative samples. Respirable dust samples that reflect typical dust concentration levels in the working environment of the part 90 miner when performing normal work duties.

* * * * *

Weekly accumulated exposure (WAE). The total amount of exposure to respirable coal mine dust, expressed in mg-hr/m^3, accumulated by a part 90 miner when performing normal work duties during a work week (Sunday through Saturday), determined by multiplying the daily individual end-of-shift equivalent concentration measurements by 8 hours, which yields the total amount of exposure accumulated over the course of the particular shift sampled, and then adding together all of the daily accumulated exposures.

Weekly permissible accumulated exposure (WPAE). The maximum amount of accumulated exposure to respirable coal mine dust, expressed in mg-hr/m^3, permitted to be received by a part 90 miner when performing normal work duties during a 40-hour work week (Sunday through Saturday), determined by multiplying the applicable standard by 40 hours.

27. Section 90.3 is revised to read as follows:

§ 90.3 Part 90 option; notice of eligibility; exercise of option.

(a) Any miner employed at a coal mine who, in the judgment of the Secretary of HHS, has evidence of the development of pneumoconiosis based on a chest X-ray, read and classified in the manner prescribed by the Secretary of HHS, or based on other medical examinations shall be afforded the option to work in an area of a mine where the average concentration of respirable dust in the mine atmosphere during each shift to which that miner is exposed is continuously maintained at or below the applicable standard. Each of these miners shall be notified in writing of eligibility to exercise the option.

(b) Any miner who is a section 203(b) miner on January 31, 1981, shall be a part 90 miner on February 1, 1981, entitled to full rights under this part to retention of pay rate, future actual wage increases, and future work assignment, shift and respirable dust protection.

(c) Any part 90 miner who is transferred to a position at the same or another coal mine shall remain a part 90 miner entitled to full rights under this part at the new work assignment.

(d) The option to work in a low dust area of the mine may be exercised for the first time by any miner employed at a coal mine who was eligible for the option under the old section 203(b) program, or is eligible for the option under this part by signing and dating the Exercise of Option Form and mailing the form to the Chief, Division of Health, Coal Mine Safety and Health, MSHA, 1100 Wilson Boulevard, Arlington, Virginia 22209.

(e) The option to work in a low dust area of the mine may be re-exercised by any miner employed at a coal mine who exercised the option under the old section 203(b) program, or exercised the option under this part by sending a written request to the Chief, Division of Health, Coal Mine Safety and Health, MSHA, 1100 Wilson Boulevard, Arlington, Virginia 22209. The request should include the name and address of the mine and operator where the miner is employed.

(f) No operator shall require from a miner a copy of the medical information received from the Secretary or Secretary of HHS.

28. Subpart B is revised to read as follows:

Subpart B—Dust Standards, Rights of Part 90 Miners

Sec.

§ 90.100 Respirable dust standard.

After the 20th calendar day following receipt of notification from MSHA that a part 90 miner is employed at the mine, the operator shall continuously maintain the average concentration of respirable dust in the mine atmosphere during each shift to which the part 90 miner in the active workings of the mine is exposed, as measured with an approved sampling device and in terms of an equivalent concentration, at or below:

(a) 1.0 milligrams of respirable dust per cubic meter of air (mg/m^3).

(b) 0.5 mg/m^3 as of [date 6 months after the effective date of the final rule].

§ 90.101 Respirable dust standard when quartz is present.

(a) Each operator shall continuously maintain the average concentration of respirable quartz dust in the mine atmosphere during each shift to which a part 90 miner in the active workings of each mine is exposed at or below 0.1 mg/m^3 (100 micrograms per cubic meter or μg/m^3) as measured with an approved sampling device and in terms of an equivalent concentration.

(b) When the mine atmosphere of the active workings where the part 90 miner performs his or her normal work duties exceeds 100 μg/m^3 of respirable quartz dust, the operator shall continuously maintain the average concentration of respirable dust in the mine atmosphere during each shift to which a part 90 miner is exposed as measured with an approved sampling device and in terms of an equivalent concentration at or below the applicable standard. The applicable standard is computed by dividing the percent of quartz into the number 10. The application of this formula shall not result in an applicable standard that exceeds the standards specified in 90.100.

Example: Assume the part 90 miner is on a 0.5-mg/m^3 dust standard. Suppose a valid respirable dust sample with an equivalent concentration of 0.5 mg/m^3 contains 25.6% of quartz dust, which corresponds to a quartz concentration of 128 μg/m^3. Therefore, the average concentration of respirable dust in the mine atmosphere associated with that part 90 miner shall be maintained on each shift at or below 0.4 mg/m^3 (10/25.6% = 0.4 mg/m^3).

§ 90.102 Transfer; notice.

(a) Whenever a part 90 miner is transferred in order to meet the applicable standard, the operator shall transfer the miner to an existing position at the same coal mine on the same shift or shift rotation on which the miner was employed immediately before the transfer. The operator may transfer a part 90 miner to a different coal mine, a newly-created position or a position on a different shift or shift rotation if the miner agrees in writing to the transfer. The requirements of this paragraph do not apply when the respirable dust concentration in a part 90 miner's work position complies with the applicable standard but circumstances, such as reductions in workforce or changes in operational status, require a change in the miner's job or shift assignment.

(b) On or before the 20th calendar day following receipt of notification from MSHA that a part 90 miner is employed at the mine, the operator shall give the District Manager written notice of the occupation and, if applicable, the MMU unit to which the part 90 miner shall be assigned on the 21st calendar day following receipt of the notification from MSHA.

(c) After the 20th calendar day following receipt of notification from MSHA that a part 90 miner is employed at the mine, the operator shall give the

District Manager written notice before any transfer of a part 90 miner. This notice shall include the scheduled date of the transfer.

§ 90.103 Compensation.

(a) The operator shall compensate each part 90 miner at not less than the regular rate of pay received by that miner immediately before exercising the option under § 90.3.

(b) Whenever a part 90 miner is transferred, the operator shall compensate the miner at not less than the regular rate of pay received by that miner immediately before the transfer.

(c) Once a miner has been placed in a position in compliance with the provisions of part 90, paragraphs (a) and (b) of this section do not apply when the part 90 miner initiates and accepts a change in work assignment for reasons of job preference.

(d) The operator shall compensate each miner who is a section 203(b) miner on January 31, 1981, at not less than the regular rate of pay that the miner is required to receive under section 203(b) of the Act immediately before the effective date of this part.

(e) In addition to the compensation required to be paid under paragraphs (a), (b) and (d) of this section, the operator shall pay each part 90 miner the actual wage increases that accrue to the classification to which the miner is assigned.

(f) If a miner is temporarily employed in an occupation other than his or her regular work classification for two months or more before exercising the option under § 90.3, the miner's regular rate of pay for purposes of paragraph (a) and (b) of this section is the higher of the temporary or regular rates of pay. If the temporary assignment is for less than two months, the operator may pay the part 90 miner at his or her regular work classification rate regardless of the temporary wage rate.

(g) If a part 90 miner is transferred, and the Secretary subsequently notifies the miner that notice of the miner's eligibility to exercise the part 90 option was incorrect, the operator shall retain the affected miner in the current position to which the miner is assigned and continue to pay the affected miner the applicable rate of pay provided in paragraphs (a), (b), (d) and (e) of this section, until:

(1) The affected miner and operator agree in writing to a position with pay at not less than the regular rate of pay for that occupation; or

(2) A position is available at the same coal mine in both the same occupation and on the same shift on which the miner was employed immediately before exercising the option under § 90.3 or under the old section 203(b) program.

(i) When such a position is available, the operator shall offer the available position in writing to the affected miner with pay at not less than the regular rate of pay for that occupation.

(ii) If the affected miner accepts the available position in writing, the operator shall implement the miner's reassignment upon notice of the miner's acceptance. If the miner does not accept the available position in writing, the miner may be reassigned and protections under part 90 shall not apply. Failure by the miner to act on the written offer of the available position within 15 days after notice of the offer is received from the operator shall operate as an election not to accept the available position.

§ 90.104 Waiver of rights; re-exercise of option.

(a) A part 90 miner may waive his or her rights and be removed from MSHA's active list of miners who have rights under part 90 by:

(1) Giving written notification to the Chief, Division of Health, Coal Mine Safety and Health, MSHA, that the miner waives all rights under this part;

(2) Applying for and accepting a position in an area of a mine which the miner knows has an average respirable dust concentration exceeding the applicable standard; or

(3) Refusing to accept another position offered by the operator at the same coal mine that meets the requirements of §§ 90.100, 90.101 and 90.102(a) after dust sampling shows that the present position exceeds the applicable standard.

(b) If rights under part 90 are waived, the miner gives up all rights under part 90 until the miner re-exercises the option in accordance with § 90.3(e) (Part 90 option; notice of eligibility; exercise of option).

(c) If rights under part 90 are waived, the miner may re-exercise the option under this part in accordance with § 90.3(e) (Part 90 option; notice of eligibility; exercise of option) at any time.

29. Subpart C is revised to read as follows:

Subpart C—Sampling Procedures

Sec.

§ 90.201 Sampling; general and technical requirements.

(a) CMDPSUs shall be used to take samples of the concentration of respirable coal mine dust in the working environment of each part 90 miner as required by this part until replaced by CPDMs. After [date 12 months after the effective date of the final rule], only approved CPDMs shall be used to sample part 90 miners unless notified by the Secretary.

(b) If using CMDPSUs, the sampling device shall be worn or carried to and from each part 90 miner. If using CPDMs, the sampling device shall be worn by the part 90 miner at all times. Approved sampling devices shall be operated portal to portal and shall be operational during the part 90 miner's entire shift, which includes the time spent performing normal work duties and while travelling to and from the assigned work location. If the work shift to be sampled is longer than 12 hours and the sampling device is:

(1) A CMDPSU, the operator shall switch-out the unit's sampling pump prior to the 13th-hour of operation.

(2) A CPDM, the operator shall switch-out the CPDM with a fully charged device prior to the 13th-hour of operation.

(c) Unless otherwise directed by the District Manager, the respirable dust samples required under this part using a CMDPSU shall be taken by placing the sampling device as follows:

(1) On the part 90 miner;

(2) On the piece of equipment which the part 90 miner operates within 36 inches of the normal working position; or

(3) At a location that represents the maximum concentration of dust to which the part 90 miner is exposed.

(d) If using a CMDPSU, one control filter shall be used for each shift of sampling. Each control filter shall:

(1) Have the same pre-weight date (noted on the dust data card) as the filter used for sampling;

(2) Remain plugged at all times;

(3) Be exposed to the same time, temperature, and handling conditions as the filter used for sampling; and

(4) Be kept with the exposed samples after sampling.

(e) The respirable dust samples required by this part and taken with a CMDPSU shall be collected while the part 90 miner is performing normal work duties.

(f) Records showing the length of each shift for each part 90 miner shall be made and retained for at least six months, and shall be made available for inspection by authorized representatives of the Secretary and submitted to the District Manager when requested in writing.

(g) Upon request from the District Manager, the operator shall submit the date and time any respirable dust sampling required by this part will begin. This information shall be submitted at least 48 hours prior to scheduled sampling.

(h) Operators using CPDMs shall provide training to all part 90 miners. The training shall be completed prior to a part 90 miner being required to wear the CPDM and then every 12 months thereafter. The training shall include:

(1) Explaining the basic features and capabilities of the CPDM;

(2) How to set-up the CPDM for compliance sampling;

(3) A discussion of the various types of information displayed by the CPDM and how to access that information;

(4) How to start and stop a short-term sample run during compliance sampling; and

(5) The importance of continuously monitoring dust concentrations and properly wearing the CPDM.

(i) An operator shall keep a record of the CPDM training at the mine site for two years after completion of the training. An operator may keep the record elsewhere if the record is immediately accessible from the mine site by electronic transmission. Upon request from an authorized representative of the Secretary or Secretary of HHS, the operator shall promptly provide access to any such training records.

§ 90.202 Certified person; sampling.

(a) The respirable dust sampling required by this part shall be performed by a certified person.

(b) To be certified, a person shall complete the applicable MSHA course of instruction and pass the MSHA examination demonstrating competency in sampling procedures. Persons not certified in sampling and those certified only in maintenance and calibration procedures in accordance with § 90.203(b) are not permitted to collect respirable dust samples required by this part or handle approved sampling devices when being used in sampling.

(c) To maintain certification, a person must pass the MSHA examination demonstrating competency in sampling procedures every three years.

(d) MSHA may revoke a person's certification for failing to pass the MSHA examination or to properly carry out the required sampling procedures.

§ 90.203 Certified person; maintenance and calibration.

(a) Approved sampling devices shall be maintained and calibrated by a certified person.

(b) To be certified, a person shall complete the applicable MSHA course of instruction and pass the MSHA examination demonstrating competency in maintenance and calibration procedures for approved sampling devices. If using a CMDPSU, necessary maintenance of the sampling head assembly can be performed by persons certified in sampling or in maintenance and calibration.

(c) To maintain certification, a person must pass the MSHA examination demonstrating competency in maintenance and calibration procedures every three years.

(d) MSHA may revoke a person's certification for failing to pass the MSHA examination or to properly carry out the required maintenance and calibration procedures.

§ 90.204 Approved sampling devices; maintenance and calibration.

(a) Approved sampling devices shall be maintained as approved under part 74 of this title and calibrated in accordance with MSHA Informational Report IR 1240 (1996) "Calibration and Maintenance Procedures for Coal Mine Respirable Dust Samplers" or in accordance with the manufacturer's recommendations if using a CPDM. Only persons certified in maintenance and calibration can perform maintenance on the pump unit of approved sampling devices.

(b) Approved sampling devices shall be calibrated at the flowrate of 2.0 liters of air per minute (L/min), or at a different flowrate recommended by the manufacturer or prescribed by the Secretary or Secretary of HHS for the particular device, before they are put into service and, thereafter, at time intervals recommended by the manufacturer or prescribed by the Secretary or Secretary of HHS.

(c) If using a CMDPSU, sampling devices shall be examined and tested by a person certified in sampling or in maintenance and calibration within 3 hours before the start of the shift on which the approved sampling devices will be used to collect respirable dust samples. This is to assure that the sampling devices are clean and in proper working condition. This examination and testing shall include the following:

(1) Examination of all components of the cyclone assembly to assure that they are clean and free of dust and dirt. This includes examining the interior of the connector barrel (located between the cassette assembly and vortex finder), vortex finder, cyclone body and grit pot;

(2) Examination of the inner surface of the cyclone body to assure that it is free of scoring or scratch marks on the inner surface of the cyclone where the air flow is directed by the vortex finder into the cyclone body;

(3) Examination of the external hose connecting the pump unit to the sampling head assembly to assure that it is clean and free of leaks; and

(4) Examination of the clamping and positioning of the cyclone body, vortex finder and cassette to assure that they are rigid, in alignment, firmly in contact and airtight.

(5) Testing the voltage of each battery while under actual load to assure the battery is fully charged. This requires that a fully assembled and examined sampling head assembly be attached to the pump inlet with the pump unit running when the voltage check is made. The voltage for nickel cadmium cell batteries shall not be lower than the product of the number of cells in the battery multiplied by 1.25. The voltage for other than nickel cadmium cell batteries shall not be lower than the product of the number of cells in the battery multiplied by the manufacturer's nominal voltage per cell value.

(d) If using a CPDM, the certified person in sampling or in maintenance and calibration shall follow the examination, testing and set-up procedures contained in the approved CPDM Performance Plan.

(e) MSHA Informational Report IR 1240 (1996) referenced in paragraph (a) of this section is incorporated-by-reference. This incorporation-by-reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be inspected or obtained at MSHA, Coal Mine Safety and Health, 1100 Wilson Blvd., Room 2424, Arlington, Virginia 22209–3939 and at each MSHA Coal Mine Safety and Health district office. Copies may be inspected at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/*

federal_register/code_of_federal_regulations/ibr_locations.html.

§ 90.205 Approved sampling devices; operation; air flowrate.

(a) Approved sampling devices shall be operated at the flowrate of 2.0 L/min, or at a different flowrate recommended by the manufacturer or prescribed by the Secretary or Secretary of HHS.

(b) Except as provided in paragraph (c) of this section, each approved sampling device shall be examined each shift by a person certified in sampling during:

(1) The second hour after being put into operation to assure it is in the proper location, operating properly and at the proper flowrate. If the proper flowrate is not maintained, necessary adjustments shall be made by the certified person. This examination is not required if the sampling device is being operated in a breast or chamber of an anthracite coal mine where the full box mining method is used.

(2) The last hour of operation to assure that the sampling device is operating properly and at the proper flowrate. If the proper flowrate is not maintained, the respirable dust sample shall be transmitted to MSHA with a notation by the certified person on the back-side of the dust data card stating that the proper flowrate was not maintained. Other events occurring during the collection of respirable dust samples that may affect the validity of the sample, such as dropping of the sampling head assembly onto the mine floor, shall be noted on the back-side of the dust data card.

(c) If using a CPDM, the certified person shall examine the sampling device during the shift in accordance with the procedures contained in the approved CPDM Performance Plan to assure sampling devices are operating properly.

§ 90.206 CPDM Performance Plan.

(a) If using a CPDM, the operator shall have a CPDM Performance Plan approved by the District Manager to ensure that no part 90 miner is exposed to concentrations of respirable coal mine dust in excess of the applicable standard when performing normal work duties. An operator shall not implement a proposed CPDM Performance Plan until approved by the District Manager.

(b) The proposed CPDM Performance Plan and any proposed revision to the plan shall be submitted in writing to the District Manager, and shall be reviewed and approved in accordance with §§ 90.300 and 90.301 of this chapter.

(c) The approved CPDM Performance Plan shall include the names or titles of the responsible mine officials designated by the operator and the following information:

(1) The specific part 90 miner who will be sampled, identified by the miner's unique 8-digit MSHA Individual Identification Number (MIIN).

(2) The pre-operational examinations, testing and set-up procedures to verify the operational readiness of the sampling device before each sampling shift;

(3) Procedures that address downloading of end-of-shift sampling information, and validation and certification of reported results;

(4) Procedures for weekly transmittals of certified sampling data files electronically to MSHA;

(5) The routine daily and other required scheduled maintenance procedures;

(6) Procedures or methods for verifying the calibration of each CPDM; and

(7) The frequency with which dust concentrations being reported by the CPDM shall be monitored by the designated mine official during the shift;

(8) The types of actions permitted to be taken during the shift to ensure the environment of the occupation being sampled remains in compliance at the end of the shift.

(9) Any other information required by the District Manager.

(d) A copy of the approved CPDM Performance Plan and any revisions pertaining to a part 90 miner shall be provided to the affected part 90 miner. The operator shall not post a copy of the plan or any revisions on the mine bulletin board.

(e) The District Manager may require an approved CPDM Performance Plan to be revised if the District Manager determines that the plan is inadequate to protect the part 90 miner from exposure to concentrations of respirable dust in excess of the applicable standard.

§ 90.207 Exercise of option or transfer sampling.

(a) The operator shall take five valid respirable dust samples for each part 90 miner within 15 calendar days after:

(1) The 20-day period specified for each part 90 miner in § 90.100;

(2) Receipt of notification from MSHA that any respirable dust sample taken in accordance with § 90.208 exceeds the applicable standard.

(3) Implementing any transfer after the 20th calendar day following receipt of notification from MSHA that a part 90 miner is employed at the mine.

§ 90.208 Compliance sampling; procedures for sampling with CMDPSUs.

(a) Each operator shall take five valid representative samples every calendar quarter from the environment of the part 90 miner while performing normal work duties. Part 90 miner samples shall be collected on consecutive work days. The quarterly periods are:

January 1–March 31
April 1–June 30
July 1–September 30
October 1–December 31

(b) When the respirable dust standard is changed in accordance with § 90.101, the new applicable standard shall become effective on the first shift on which the part 90 miner is performing normal work duties following receipt of notification of such change from MSHA.

(1) If all samples from the most recent quarterly sampling period do not exceed the new applicable standard, respirable dust sampling of the part 90 miner shall begin on the first shift on which the miner is performing normal work duties during the next quarterly period following notification of such change.

(2) If any sample from the most recent quarterly sampling period exceeds the new applicable standard, the operator shall make necessary adjustments to the dust control parameters within three days and then collect samples from the affected part 90 miner on consecutive work days until five valid representative samples are collected. The samples collected will be treated as normal quarterly samples under this part.

(c) No valid single-shift equivalent concentration shall meet or exceed the excessive concentration value (ECV) that corresponds to the applicable standard in Table 90–1.

(d) Upon issuance of a citation for a violation of the applicable standard, paragraphs (a) and (b)(2) of this section shall not apply to that part 90 miner until the violation is abated in accordance with paragraph (e) of this section.

(e) During the time for abatement fixed in a citation for violation of the applicable standard, the operator shall take the following actions:

(1) Make approved respiratory equipment available to the affected part 90 miner in accordance with § 72.700 of this chapter;

(2) Submit to the District Manager for approval proposed corrective actions to lower the concentration of respirable dust to within the applicable standard. If the corrective action involves:

(i) Reducing the respirable dust levels in the work environment of the part 90

miner identified in the citation, the operator shall implement the proposed corrective actions following receipt of approval by the District Manager and then sample the affected miner until five valid representative samples are taken.

(ii) Transferring the part 90 miner to another work position at the mine to meet the applicable standard, the operator shall comply with § 90.102 and then sample the affected miner in accordance with § 90.207(a).

(f) A citation for violation of the applicable standard shall be terminated by MSHA when the equivalent concentration of each of the five valid operator abatement samples is at or below the applicable standard and, within 15 calendar days after receipt of sampling results from MSHA indicating the concentration has been reduced to or below the applicable standard, the operator has submitted to the District Manager for approval a proposed dust control plan for that part 90 miner or proposed changes to the approved dust control plan as prescribed in § 90.300. The revised parameters shall reflect the control measures used to maintain the concentration of respirable dust to or below the applicable standard.

(g) When the equivalent concentration of one or more valid samples collected by the operator under this section exceeds the applicable standard but is less than the applicable ECV in Table 90–1, the operator shall:

(1) Make approved respiratory equipment available to the affected part 90 miner in accordance with § 72.700 of this chapter;

(2) Take corrective action to lower the concentration of respirable dust to or below the applicable standard.

(3) Record the corrective actions taken in the same manner as the records for hazardous conditions required by § 75.363 of this chapter.

TABLE 90–1—EXCESSIVE CONCENTRATION VALUES (ECV) BASED ON SINGLE-SHIFT CMDPSU EQUIVALENT CONCENTRATION MEASUREMENTS

Applicable standard (mg/m^3)	ECV (mg/m^3)
1.0	1.26
0.9	1.16
0.8	1.05
0.7	0.95
0.6	0.85
0.5	0.74
0.4	0.65
0.3	0.54
0.2	0.44

§ 90.209 Compliance sampling; procedures for sampling with CPDMs.

(a) Each operator shall sample the working environment of the part 90 miner during each shift, seven days per week (Sunday through Saturday), if applicable, 52 weeks per year.

(b) When the respirable dust standard is changed in accordance with § 90.101, the new applicable standard shall become effective on the first shift on which the part 90 miner is performing normal work duties following receipt of notification of such change from MSHA.

(c) No valid end-of-shift equivalent concentration shall meet or exceed the excessive concentration value (ECV) that corresponds to the applicable standard in Table 90–2.

(d) No weekly accumulated exposure shall exceed the weekly permissible accumulated exposure.

(e) When a valid end-of-shift equivalent concentration meets or exceeds the applicable ECV or a weekly accumulated exposure exceeds the weekly permissible accumulated exposure, the operator shall take the following actions before the part 90 miner's next work shift:

(1) Make approved respiratory equipment available to affected part 90 miners in accordance with § 72.700 of this chapter;

(2) Implement corrective actions to assure compliance with the applicable standard on the next and other subsequent work shifts;

(3) If the corrective actions implemented to lower the concentration of respirable dust to within the applicable standard involve implementation of dust control measures, the operator shall submit to the District Manager for approval, within 3 days of determining that the applicable standard has been exceeded, the corrective actions as a proposed dust control plan for the part 90 miner or proposed changes to the approved part 90 dust control plan as prescribed in § 90.300;

(4) Review the adequacy of the approved CPDM Performance Plan applicable to the part 90 miner. The operator shall submit any plan revisions to the District Manager for approval within 7 calendar days after the operator provides the end-of-shift equivalent concentration or the weekly accumulated exposure to the affected part 90 miner; and

(5) Record the reported excessive dust condition as part of and in the same manner as the records for hazardous conditions required by § 75.363 of this chapter. The record shall include:

(i) Dates of sampling;

(ii) Lengths of sampled shifts;

(iii) Locations within the mine and the occupation where samples were collected;

(iv) The end-of-shift equivalent concentration or weekly accumulated exposure and the weekly permissible accumulated exposure; and

(v) Corrective actions taken to reduce the concentration of respirable coal mine dust to or below the applicable standard.

(6) If the corrective action involves transferring the part 90 miner to another position at the mine to meet the applicable standard, the operator shall comply with § 90.102(c) and then sample the affected miner in accordance with § 90.207(a).

(f) When any valid end-of-shift equivalent concentration exceeds the applicable standard but is less than the applicable ECV in Table 90–2, the operator shall take the following actions:

(1) Make approved respiratory equipment available to affected part 90 miners in accordance with § 72.700 of this chapter;

(2) Implement corrective actions to assure compliance with the applicable standard on the next and other subsequent work shifts; and

(3) Record the reported excessive dust condition as part of and in the same manner as the records for hazardous conditions required by § 75.363 of this chapter. The record shall include:

(i) Date of sampling;

(ii) Length of the sampled shift;

(iii) Location within the mine and the occupation where the sample was collected;

(iv) The end-of-shift equivalent concentration; and

(v) Corrective action taken to reduce the concentration of respirable coal mine dust to or below the applicable standard; and

(4) Review the adequacy of the approved CPDM Performance Plan applicable to part 90 miners. The operator shall submit any plan revisions to the District Manager for approval within 7 calendar days after the operator provides the end-of-shift equivalent concentration to the affected part 90 miner.

TABLE 90–2—EXCESSIVE CONCENTRATION VALUES (ECV) BASED ON SINGLE–SHIFT CPDM EQUIVALENT CONCENTRATION MEASUREMENTS

Applicable standard (mg/m^3)	ECV (mg/m^3)
1.0	1.13
0.9	1.02
0.8	0.91

TABLE 90–2—EXCESSIVE CONCENTRATION VALUES (ECV) BASED ON SINGLE–SHIFT CPDM EQUIVALENT CONCENTRATION MEASUREMENTS—Continued

Applicable standard (mg/m^3)	ECV (mg/m^3)
0.7	0.80
0.6	0.68
0.5	0.57
0.4	0.46
0.3	0.34
0.2	0.23

§ 90.210 Respirable dust samples; transmission by operator.

(a) If using a CMDPSU, the operator shall transmit within 24 hours after the end of the sampling shift all samples collected to fulfill the requirements of this part in containers provided by the manufacturer of the filter cassette to: Respirable Dust Processing Laboratory, Pittsburgh Safety and Health Technology Center, Cochrans Mill Road, Building 38, P.O. Box 18179, Pittsburgh, Pennsylvania 15236–0179, or to any other address designated by the District Manager.

(b) The operator shall not open or tamper with the seal of any filter cassette or alter the weight of any filter cassette before or after it is used to fulfill the requirements of this part.

(c) A person certified in sampling shall properly complete the dust data card that is provided by the manufacturer for each filter cassette. The card shall have an identification number identical to that on the cassette used to take the sample and be submitted to MSHA with the sample. Each card shall be signed by the certified person who actually performed the required examinations during the sampling shift and shall include that person's MSHA Individual Identification Number (MIIN). Respirable dust samples with data cards not properly completed shall be voided by MSHA.

(d) All respirable dust samples collected by the operator shall be considered taken to fulfill the sampling requirements of part 70, 71 or 90 of this title, unless the sample has been identified in writing by the operator to the District Manager, prior to the intended sampling shift, as a sample to be used for purposes other than required by part 70, 71 or 90 of this title.

(e) Respirable dust samples received by MSHA in excess of those required by this part shall be considered invalid samples.

(f) If using a CPDM, the designated mine official shall validate, certify and transmit electronically to MSHA within 12 hours after the end of the last sampling shift of the work week all daily sample and error data file information collected during the previous calendar week (Sunday through Saturday) and stored in the CPDM. All CPDM data files transmitted to MSHA shall be maintained by the operator for at least 12 months.

§ 90.211 Respirable dust samples; report to operator.

(a) MSHA shall provide the operator a report with the following data on respirable dust samples submitted in accordance with this part:

(1) The mine identification number;

(2) The locations within the mine from which the samples were taken;

(3) The concentration of respirable dust, expressed as an equivalent concentration in milligrams per cubic meter of air, for each valid sample;

(4) The average concentration of respirable dust, expressed as an equivalent concentration in milligrams per cubic meter of air, for all valid samples;

(5) The occupation code;

(6) The reason for voiding any sample; and

(7) The part 90 miner's MSHA Individual Identification Number (MIIN).

(b) Upon receipt, the operator shall provide a copy of this report to the part 90 miner. The operator shall not post the original or a copy of this report on the mine bulletin board.

(c) If using a CPDM, the designated mine official shall validate, certify and provide to each part 90 miner:

(1) Within the first hour of the part 90 miner's next work shift, the daily end-of-shift sampling results applicable to that part 90 miner. The daily report shall include:

(i) The mine identification number;

(ii) The location within the mine from which the samples were taken;

(iii) The concentration of respirable dust, expressed as an equivalent concentration in milligrams per cubic meter of air, for each valid sample;

(iv) The total amount of exposure accumulated by the part 90 miner;

(v) The occupation code;

(vi) The reason for voiding any sample;

(vii) The part 90 miner's MSHA Individual Identification Number (MIIN).

(viii) The shift length; and

(ix) Any other information required by the District Manager.

(2) Within 1 hour after the start of the part 90 miner's next work shift of a new work week (Sunday through Saturday), the weekly accumulated exposure and the weekly permissible accumulated exposure applicable to that part 90 miner.

(d) The operator shall not post data on respirable dust samples for part 90 miners on the mine bulletin board.

§ 90.212 Status change reports.

(a) If there is a change in the status of a part 90 miner (such as entering a terminated, injured or ill status, or returning to work), the operator shall report the change in the status of the part 90 miner to the MSHA District Office or to any other MSHA office designated by the District Manager. Status changes shall be reported in writing or by electronic means within 3 working days after the status change has occurred.

(b) Status changes affecting the operational readiness of any CPDM shall be reported by the designated mine official to the MSHA District Office or to any other MSHA office designated by the District Manager within 24 hours after the status change has occurred. Status changes shall be reported in writing or electronically.

30. Subpart D is revised to read as follows:

Subpart D—Respirable Dust Control Plans

Sec.

§ 90.300 Respirable dust control plan; filing requirements.

(a) As required by § 90.208(f) and § 90.209(e)(3), the operator shall submit to the District Manager for approval a written respirable dust control plan for the part 90 miner in the position identified in the citation. The respirable dust control plan and revisions thereof shall be suitable to the conditions and the mining system of the coal mine and shall be adequate to continuously maintain respirable dust within the applicable standard for that part 90 miner.

(b) Each respirable dust control plan shall include at least the following:

(1) The mine identification number assigned by MSHA, the operator's name, mine name, mine address, and mine telephone number and the name, address and telephone number of the principal officer in charge of health and safety at the mine;

(2) The name and MSHA Individual Identification Number of the part 90 miner and the position at the mine to which the plan applies;

(3) A detailed description of the specific respirable dust control measures used to continuously maintain concentrations of respirable coal mine dust at or below the applicable standard; and

(4) A detailed description of how each of the respirable dust control measures described in response to paragraph (b)(3) of this section will continue to be used by the operator, including at least the specific time, place and manner the control measures will be used.

§ 90.301 Respirable dust control plan; approval by District Manager; copy to part 90 miner.

(a) The District Manager will approve respirable dust control plans on a mine-by-mine basis. When approving respirable dust control plans, the District Manager shall consider whether:

(1) The respirable dust control measures would be likely to maintain concentrations of respirable coal mine dust at or below the applicable standard; and

(2) The operator's compliance with all provisions of the respirable dust control plan could be objectively ascertained by MSHA.

(b) MSHA may take respirable dust samples to determine whether the respirable dust control measures in the operator's plan effectively maintain concentrations of respirable coal mine dust at or below the applicable standard.

(c) The operator shall comply with all provisions of each respirable dust control plan upon notice from MSHA that the respirable dust control plan is approved.

(d) The operator shall provide a copy of the current respirable dust control plan required under this part to the part 90 miner. The operator shall not post the original or a copy of the plan on the mine bulletin board.

(e) The operator may review respirable dust control plans and submit proposed revisions to such plans to the District Manager for approval.

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