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Coal Mine Health Inspection Procedures

CHAPTER 1 - RESPIRABLE DUST

COAL MINE HEALTH INSPECTION PROCEDURES HANDBOOK

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Chapter 1

RESPIRABLE DUST

I. Purpose

The purpose of this chapter is to establish procedures and guidelines for conducting respirable coal mine dust sampling inspections, evaluating sampling results, establishing and removing sampling entities, establishing reduced dust standards due to quartz, and monitoring the operators' respirable dust control and sampling programs. This document supersedes the previously issued Chapter 1.

II. Authority

Section 103(a) of the Federal Mine Safety and Health Act of 1977 (Mine Act) requires authorized representatives of the Secretary to make frequent inspections for the purpose of "determining whether there is compliance with the mandatory health or safety standards...." Parts 70, 71, and 90, Title 30 of the Code of Federal Regulations, require mine operators to maintain dust concentrations at or below the applicable standards in the mine atmosphere where miners work or travel. Sections 72.620 and 72.630 require mine operators to use effective drill dust controls; and Section 75.362(a)(2) requires mine operators to conduct on-shift examinations to ensure compliance with the dust control parameters stipulated in the approved mine ventilation plan. Under the Mine Act, MSHA has responsibility for determining whether an operator is complying with these standards.

III. Application of Respirable Dust Standards on Mechanized Mining Units (MMUs)

For designated occupations (DOs) and Other Designated Occupations (ODOs), the 2.0 mg/m^3 (1.5 mg/m^3 beginning August 1, 2016) dust standard or a reduced standard due to the presence of quartz applies. Intake air within 200 feet outby the working faces shall be maintained to 1.0 mg/m^3 (0.5 mg/m^3 beginning August 1, 2016).

A reduced respirable dust standard associated with an MMU identification number should be continued on a MMU if the continuous mining machine or other equipment is replaced. Reduced respirable dust standards based on quartz may only be eliminated based on:

1. MSHA respirable dust samples indicating quartz levels have been reduced to 100$\mu g/m^3$ or less.

2. The MMU is permanently removed from the mine (abandoned) and no MMU is placed in producing status to replace the abandoned MMU or maintain the

number of active MMUs.

If an MMU identification number is changed due to replaced equipment, the applicable reduced standard shall be input into the computer record and continued for the new MMU since production is still occurring in the coal mining environment where excessive quartz was previously measured.

IV. Sampling Inspections

Respirable dust sampling inspections must be conducted in accordance with the following objectives.

The objective of sampling inspections is to determine:

- The dust levels to which miners are exposed in the work environment.
- Whether the operator is complying with the on-shift examination provisions of §75.362(a)(2).
- Whether the operator is complying with the dust control provisions of the approved mine ventilation plan for the underground mine, and any respirable dust control plan at a surface mine or for a Part 90 miner.
- Whether the dust control measures stipulated in the approved mine ventilation plan or in the respirable dust control plan maintain dust levels at or below the applicable standard.
- If the dust control measures actually in use differ from those stipulated in the approved plan.
- If conditions and activities within the work environment on the day of sampling are representative of those experienced by miners during non-sampling periods.
- If miners are being exposed to excessive levels of respirable crystalline silicon dioxide (quartz).
- If other work areas, occupations, or work positions need to be added by the District Manager and monitored by the operator.
- Whether the operator is complying with the drill dust control standards (§72.620 and §72.630).

A. Sampling of Entities

1. Mechanized Mining Units (MMUs)

A full-shift sample must be collected from the environment of at least five (5) occupations, if available, on each MMU. These must include the designated occupation (DO), other designated occupation (ODO) specified on MSHA form MSN078 located in the Uniform Mine File, and any haulage occupations on the MMU that have not been established as other designated occupation(s). Additional ODOs may be specified by the District Manager for each MMU.

Inspectors should also sample any occupations on the working section that are not sampled by the operator if pumps are available in sufficient quantity.

Sampling devices must be worn or carried directly to the MMU to be sampled and from the MMU sampled and must be operated portal to portal. The sampling devices must remain with the occupation -- DO or ODO -- being sampled rather than with the individual miner, even when miners change positions or alternate duties during the shift. The sampling devices must be operational during the entire shift.

If a piece of equipment is idled or changing places during the sampling shift and the continuous mining machine operator assigned other duties, the sampling device should stay with the continuous mining machine operator.

Examples:

- If a shuttle car operator is directed to help build a ventilation control while the continuous mining machine is changing places, the sampling device must stay with the shuttle car operator.

- If a continuous mining machine operator is relieved for lunch, the sampling device must be given to the person assuming control of the continuous mining machine because that person has assumed the role of the DO.

A full-shift intake air dust sample must also be collected for each MMU. Since these are intake air samples, the sampling device must remain in the intake airway within 200 feet of the working face(s). The 1.0 mg/m^3 (0.5 mg/m^3 beginning August 1, 2016) dust standard will apply to these samples. If any entity on the MMU has a reduced standard that is less than the intake air standard then the reduced standard will apply.

2. **Designated Areas (DAs)**

A full-shift sample must be collected from each DA. The sampling device must remain at the designated area specified in the operator's approved ventilation plan, in accordance with 70.2 and 75.371(t), or as stipulated in the petition for modification (two-entry mining systems) allowing the use of belt air.

The 2.0 mg/m^3 (1.5 mg/m^3 beginning August 1, 2016) dust standard applies to Designated Areas. However, Designated Areas in the air course where belt air is approved as intake air shall have the same 1.0 mg/m^3 standard (0.5 mg/m^3 beginning August 1, 2016) as intake air.

3. **Part 90 Miners**

A full-shift sample must be collected from the environment of each Part 90 miner, except during the 20-day "grace" period following the operator's receipt of notification that a miner has elected to exercise the Part 90 option. The sampling device must remain in the environment of the Part 90 work position being sampled by placing the sampler either (a) on the Part 90 miner; or (b) on the equipment that the Part 90 miner operates within 36 inches inby of the normal working position; or (c) at another location that represents the maximum concentration of dust to which the Part 90 miner is exposed.

4. **Designated Work Positions (DWPs)**

A full-shift sample must be collected from the working environment of each DWP. Generally, the sampling device must remain in the environment of the work position (occupation) being sampled rather than with the individual miner, even when miners change positions or alternate duties during the shift. However, if the DWP involves the performance of multiple tasks during the shift (e.g., operating a highwall drill, dozer, and truck for part of the shift), none of which are assumed by another miner, the sampler must remain with the miner.

For DWPs, the 2.0 mg/m^3 (1.5 mg/m^3 beginning August 1, 2016) dust standard or a reduced standard due to the presence of quartz applies.

5. **Non-designated Occupations, Areas and Work Positions**

A full-shift sample must be collected from the environment of at least three occupations (if available) other than DWPs, (non-DWP or NDWP), or if available, from other active work positions that are currently in "D" status ("quarterly sampling not required") and where the potential for high levels of coal mine respirable or quartz dust may exist (specifically, Occ. 307 - blaster/shooter/shotfirer; Occ. 368 - bulldozer operator, Occ. 382 - high lift operator/front end loader; Occ. 383 - highwall drill helper; and Occ. 386 - refuse

truck driver/backfill truck driver), at each surface coal mine, surface coal facility, and surface area of an underground coal mine.

The sampling device must remain with the occupation, or with the individual miner as described under DWP, or at the location in the non-designated area (NDA) selected by the inspector.

6. **Contract Worker Sampling**

During MSHA inspections, inspectors shall collect respirable coal mine dust samples of contract workers potentially exposed to coal mine dust while on mine property. Due to the erratic nature of contract work at mine sites, inspectors should determine if an operator uses contractors at various times and maintains information on the contractor's presence on the mine site so that sampling can be conducted when the contractor's employees are on the same site. Although respirable dust samples must be collected over the contractor's full shift, there is no requirement that production be at a minimum level for the sample to be valid. Some contract work is of long duration, such as shaft sinking or contract mine maintenance. These activities shall be sampled by MSHA personnel to establish sampling entities, evaluate quartz levels and determine compliance with the applicable standards. Appropriate dust control plans or amendments to current plans shall be required where necessary to maintain respirable dust levels at or below the applicable standard. Contractors performing work on coal mine property must comply with the MSHA standards and regulations under Title 30 of the Code of Federal Regulations. This includes required training, maintaining the environment at or below the applicable dust standard, and sampling for compliance/non-compliance, complying with dust control plans and reporting occupational injuries/illnesses.

B. Frequency of Sampling

MSHA recommends that the District Manager request in writing that the operator furnish (in accordance with 30 CFR 70.201(f), 71.201(e) or 90.201(g) as applicable) the respirable dust sampling schedule. This information shall be submitted at least 48 hours prior to the operator beginning sampling for each entity and will be useful to inspector(s) while scheduling their surveys.

If an inspector arrives at a mine to find the operator is conducting sampling, the inspector should request the operator suspend sampling for the shift that MSHA has scheduled sampling. If the operator refuses, the inspector should document this in accordance with the General Inspection Procedures Handbook and should sample entities where there is no conflict and return at a later date to complete the remainder of the sampling, or cancel the dust survey and proceed with other inspection activities. If the survey is cancelled, the appropriate amount of time should be entered on the inspector's timesheet under the "D" task code.

1. **Underground Mines**

All entity types must be sampled as stipulated below.

a. MMUs - Each MMU that is in producing status during the time the inspection is open or each MMU that is in producing status for 50% or more of the sampling period must be sampled quarterly as part of a complete regular inspection. Sampling must be in accordance with section IV, A.1. of this Chapter 1. If sampling is conducted during an event other than the regular inspection and is to be credited toward a regular inspection, this must be documented in the remarks section of both events. In addition, MSHA Inspectors must sample approximately 25 percent of MMUs during off-shift (i.e., other than day shift) or weekends at mines that produce material during off-shifts or weekends.

b. All outby DAs must be sampled once each year.

c. All intake air, including Belt Air DAs.

d. Part 90 miners.

e. NDEs (NDAs) that can be sampled concurrently with outby DAs (includes active DAs in "D" status or "sampling not required") must be sampled once each year.

2. **Surface Coal Mines, Surface Coal Facilities, and Surface Areas of Underground Coal Mines – Normal Sampling**

Surface mines, surface facilities, and surface areas of underground mines in producing status must be sampled as part of a regular inspection. If the inspector finds equipment inactive during an inspection shift, the inspector must document that sampling was attempted but did not occur. A second attempt shall be made at a later date, which must also be documented. If the second attempt fails, the inspector is not required to make additional attempts. However, each DWP must be sampled a minimum of once per year if the DWP is in producing status at any time during the year.

Inspectors must sample approximately 25 percent of surface mines, surface facilities, and surface areas of underground mines during off-shifts or weekends if production or normal work activity occurs during off-shift or weekends.

NOTE: Sampling at surface mines should be conducted during dry periods to accurately determine the dust concentrations to which miners are normally exposed. If any significant rainfall occurs during

any sampling inspection, the sample(s) must be voided by the inspector.

The following entity types will be sampled each regular inspection.

a. DWPs (includes DWPs in "D" status or "sampling not required").

b. Part 90 Miners.

c. NDEs (NDWPs). However, this does apply to NDEs at surface facilities.

C. Monitoring of Operator-Collected Abatement Samples

Inspection personnel will monitor at least one of the required 5 abatement samples for each citation issued for excessive dust. When monitoring operator abatement sampling, the inspector must measure the parameters specified in the approved ventilation plan, including any parameters included as corrective action(s) in the proposed plan revisions, and record the findings in his or her notes. This monitoring must cover a representative portion of the sampling shift and include the mid-shift check in accordance with 70.205(c)

The following information must be documented in the inspector's notes while conducting the monitoring of an operator-collected abatement sample:

- All data from the Dust Data card for the sample being monitored.
- Citation number that the sample is being credited toward.
- Note if a Certified Person performed the checks on the appropriate device as required by the 30 Code of Federal Regulations.
- Note corrective actions in place and compare to recorded corrective actions.

The District must assemble a package that includes: a copy of the completed MSHA Form 2000-86 and a legible copy of the inspector's notes. Twenty percent of monitoring packages must be provided to the Chief, Division of Health within 15 days after the end of the calendar quarter in which all data is available. This package should be submitted electronically as directed by the Chief of Health.

D. Pre-Inspection Reviews (can be performed prior to the day of sampling)

1. MSHA Records:
   - Listing of entities on a reduced standard
   - Previous ventilation plan citations
   - Previous respirable dust citations

2. Dust control portion of an operator's approved ventilation plan and any dust control plans for Part 90 miners or surface DWPs.

3. Uniform Mine File Notebook.

E. Sampling Inspection Procedures

The following procedures must be followed during respirable dust sampling inspections:

1. Prior to the mine visit, check the battery voltage (minimum of 4.8 volts) and flowrate (2.0 liters per minute) of the Zefon Escort ELF® sampling pump under load. The test results must be documented in the inspector's notes or in a notebook maintained in the field office.

2. Use properly maintained and calibrated sampling devices [i.e., in accordance with MSHA Informational Report (IR) 1240 (1996) at intervals not to exceed 200 hours of use] that have been cleaned and examined prior to use, and assembled correctly. The samplers must be secured in accordance with established procedures to minimize tampering.

3. Use only filter cassettes that are pre-weighed to the nearest 0.001 mg. The dust data card accompanying the filter cassette will be "blue". Inspectors must place the Field Office Number in the lower, right-hand portion of the data card.

4. Secure one control filter cassette for each respirable dust sampling inspection and note the cassette number in the inspector's notes. The control filter will be used to adjust the resulting weight gain obtained on each exposed filter capsule. That is, any change in weight of the control filter capsule must be subtracted from the change in weight of the exposed filter capsule. Therefore, the control filter cassette must have the same pre-weight date (noted on the front of the dust data card) as all the other cassettes to be used for sampling on the same inspection.

    a. Mark the dust data card with a large capital "C" for 'CONTROL' in the middle of the card and enter a "9" in the 'Type of Sample' box. Also complete Items 2 (Mine ID), 6 (Date Sampled), and 13 (Certified Person) and place the Field Office number in the lower, right-hand portion of the data card.

    b. The control filter should remain capped at all times during the inspection shift. Carry the control filter cassette in a shirt or coverall pocket during the sampling inspection; keep the control filter cassette together with the exposed cassettes after sampling; and treat the control filter cassette the same as the exposed cassettes after returning to the office or laboratory.

NOTE**:** If the above procedures are not followed, the sampling results cannot be used for enforcement purposes. However, if all sample results are less than the applicable standard but the control filter was not handled as specified in paragraph b., then the survey may be considered complete.

5. While at the mine, the inspector must:
   a. Review operator records of:
      i. production shift length
      ii. daily production (i.e., run-of-mine material)
      iii. on-shift dust control parameter checks
      iv. corrective actions (any operator sample that meets or exceeds the ECV requires the operator to take immediate corrective action and make a record in accordance with 30 CFR §§ 70.208(e)(3), 70.209(c)(3), 71.206(h)(3), or 90.207(c)(3).

6. Discuss with mine management and representatives of the miners the purpose of the inspection activity, stressing the need to have dust controls in place and functioning properly on every production shift, examinations performed in accordance with Section 75.362(a)(2), and to have dust samples that reflect dust concentrations in the work environment to which miners are typically exposed. During this time, the inspector must confer with miners and mine management to discuss the results of any previous MSHA dust inspections and, if currently on a reduced standard, explain its significance. The inspector must also determine the length of the shift and solicit cooperation from the miner to wear the sampling device. The shift length must be noted in the comments section of the MSHA Form 2000-86 that is to be completed during the inspection. Explain to mine management that MSHA is conducting the survey as an evaluation of the minimum dust control parameters in the ventilation plan and request that the operator keep values at levels not to exceed 120% of the values in the plan. If miners refuse to wear the sampling device, this should be documented in the inspector's notes and the device should be placed inby the miner's work position within 36 inches of his or her breathing zone and in a location that represents his or her greatest potential for exposure.

   a. In addition, the inspector must take the following actions:

      1) Explain to a miner that when a DO, ODO, or DWP is being sampled, the sampling device generally must remain in the environment of the DO, ODO, or DWP that is being sampled rather than with any individual miner, even when a miner changes positions or alternates duties during the shift. However, if, for example, the DWP involves one miner performing different tasks during the shift (operating a highwall drill, dozer, and truck for part of the shift), and none of the tasks are assumed by another miner, the miner performing all the different tasks must wear the sampler the entire shift. If a Part 90 miner is being sampled, the inspector should refer

to 90.201(c) for guidance in determining where to place the sampling device.

2) Make certain that when attaching the sampling head assembly to the miner's clothing, the inlet of the cyclone is facing away from the body of the worker. Instruct the miner not to cover the sampling head (cyclone inlet) with anything, such as a coat or other garment. Care must be exercised to prevent the sampling unit from presenting a safety hazard. Attach the unit so that the sample tubing will not catch on equipment or other objects.

3) Emphasize the need for the miners whose occupations or positions will be sampled to continue to work in a routine manner and to report any unusual occurrences during the sampling period that may affect the validity of the sample.

4) Inform the miners of when and where the sampling device will be removed.

5) Distribute health hazard information cards or other educational material. Talk to miners about black lung and silicosis, and the importance of complying with approved dust control parameters on every production shift and approved respirable dust control plans, if any, for DWPs and part 90 miners. Encourage miners to participate in "Medical Surveillance" (periodic examinations consisting of chest x-rays, spirometry, symptom assessment, and occupational history) and discuss the operator's responsibilities under this program. Also, share with the mine operator information on dust controls and provide whatever assistance is requested to enable the mine operator to maintain compliance with applicable standards on a continuous basis.

   a) Determine if the following items are posted on the mine bulletin board:
      i. Latest results of operator sampling (excluding Part 90);
      ii. Underground- quarterly sampling/dust data cards
      iii. Surface - quarterly sampling

   b) Current ventilation plan and/or respirable dust control plan; and

   c) The NIOSH-approved medical examinations plan or NIOSH notice for medical examinations for underground and surface mines.

6) Record in the inspector's notes the cassette number, the time the sampling device was started, and location of the sampler by sample type and occupation code for each sample collected.

7. Check the pump flowrate when first turned "ON" and before turning it "OFF" at the end of the shift. On-shift checks of the sampling devices must be made as frequently as necessary (no less than at the beginning of the shift, during the second hour of operation, and the middle and end of the shift) to ensure that:

   a. The pump is operating properly and at the correct flowrate;

   b. The pump has remained in the same environment as recorded earlier;

   c. The pump has not been tampered with;

   d. The sample tubing is not being pinched and connections are not leaking; and

   e. The sampling head (cyclone inlet) is not covered by anything such as a coat or other garment.

   If the pump is not operating properly when first turned "ON" (after allowing the pump to reach the set point value), adjust it using the flowrate control (↑ and ↓) switch buttons. If the proper flowrate was not maintained during the final check, the sample should be voided by entering the code "MFP" in the "Void Code" box located in the lower right-hand portion of the dust data card. Improper flowrate is indicated if the actual flowrate displayed in the readout window is either less than 1.9 LPM or greater than 2.1 LPM or if the Flow Fault LED is "ON." The inspector's notes must show the MSHA pump property number, the time of the examination, and whether the flowrate readout is within the acceptable range or the Flow Fault LED is "ON."

8. Accompany the miners to the work area and remain on the section or with the Part 90 miner to:

   a. Ensure that the sampling devices are located in the correct environments.

   b. Observe working conditions and activities, and to document any changes that occur during the sampling shift which may affect the level of respirable dust to which miners are exposed.

   c. Observe miners during the shift to verify the job classifications previously recorded.

   d. Determine from discussions with a representative number of miners whether working conditions and activities during sampling by either MSHA or the operator are representative of non-sampling periods, and document any relevant findings in the inspector’s notes. Since any shift

may exhibit wide variations in working conditions and activities, it should be determined if these variations are "typical" conditions.

Authorized Representatives (MSHA inspectors) must remain in the area where sampling (plan evaluation, routine respirable dust, quartz evaluation, citation/order abatement, monitoring inspection) is being conducted to ensure that the samples are representative of the normal mining activities. The inspector must observe sufficient sampling activity to ensure that the sampling devices are maintained in the environment being sampled, the pump flowrate is maintained, sampling devices are not abused, normal mining activities are taking place, a determination of production level is made, and dust control practices and work activities are properly documented. The inspector must not perform inspection activities that will require being away from an MMU (section dumping point and inby) more than 15 minutes during the sampling shift. This requirement, however, does not prevent the inspector from performing other work on the MMU that is being sampled. In addition, an inspector trainee under the direction of an inspector may assist in the collection of respirable dust samples if the trainee has the MSHA certification to collect respirable dust samples. The inspector and the trainee must remain on the specific MMU where sampling is being conducted. A trainee may not be left on an MMU while the inspector performs work on a different MMU. This includes “super-section” MMUs directly adjacent to the MMU that is being sampled, outby areas of the mine, or another mine. The inspector has the ultimate control over how the trainee will participate in the sampling activities; however, the inspector must sign the dust data cards as the certified person, perform the checks of the sampling devices during the shift, fill out the data cards, etc. Generally, the inspector will accompany the miners out of the mine.

9. When sampling DWPs and outby DAs, an inspector generally should not remain with the entity for the entire sampling shift. Instead, the inspector should spend sufficient time to either properly place the sampling device in the environment to be monitored or verify its location, record its location in the inspector’s notes, and make the on-shift pump checks. Additionally, the inspector should observe and record the operating conditions and work activities in the area, the dust controls in use with a general description and whether they are adequate, and potential sources of dust generation. The inspector must remain at the mine site while sampling is being conducted.

If the work position to be sampled involves the highwall drill operator, the inspector must first determine if the mine operator is in compliance with the drill dust control standard (§72.620).

a. Generally, the inspector should not continue sampling when visible dust is present, unless the drill is equipped with a properly maintained pressurized environmental cab and the only person potentially exposed to the drill dust

is inside the cab. The environment inside the cab shall be sampled to determine if the pressurized cab is equipped with an effective air filtration system that is being properly maintained.

b. In cases where dust controls appear to be effective, samples should be collected from work positions where miners are exposed to drill dust to determine if the operator is complying with the respirable coal mine dust standard.

c. Procedures for Assessing Compliance with Section 72.620 concerning Drill dust control at surface coal mines and surface areas of underground coal mines. Section 72.620 provides that drill holes shall be collared and drilled wet or that other effective dust control measures shall be used when drilling non-water-soluble material. This standard requires operators to provide effective drill dust control, regardless of exposure. Consequently, mine operators will be cited when a dust control is missing, not maintained, defective, or ineffective, generally based on a visual inspection.

d. How the surface drill dust control standard is to be enforced:

MSHA enforces the drill dust control standards as explained in the agreement reached between the American Mining Congress and the Secretary of Labor on May 26, 1995, as set out in paragraphs 1 through 5 below. In response to inquiries by MSHA inspectors, paragraph 1 below also discusses the phrase "collaring a hole." The following will guide enforcement personnel in determining the appropriate action to take in specific situations with regard to enforcement of §72.620.

1) The operator is in compliance if the drill holes are collared and drilled wet or other effective dust control measures are used. According to the *Dictionary of Mining, Mineral, and Related Terms*, published by the former U.S. Bureau of Mines in 1968, "collaring a hole" means "the formation of the front end of a drill hole, or the collar, which is the preliminary step in drilling to cause the drill bit to engage in the rock." Thus, collaring is the preliminary step in drilling when the drill bit initiates the drill hole, and collaring of the hole is complete once the drill bit has entered the earth. The depth of the hole once collaring is complete would be the length of the actual bit, which is approximately 12 inches. The duration of collaring should never exceed one minute. Therefore, the dust generated when starting to drill does not constitute a violation of §72.620, until after collaring has been completed.

2) The operator is not in compliance if drill dust controls are not installed.

3) The operator is not in compliance if drill dust controls are installed but are not operating.

4) The operator is not in compliance if a drill dust control is installed and operating but: (a) the control is operating improperly; (b) the control has not been maintained properly; (c) the control is not an effective control for the condition or location in which it is operating (e.g., bailing air volume exceeds the dust collector volume); (d) a necessary dust control component is missing, broken, or malfunctioning; or (e) the skirt is not close enough to the ground to confine dust at the hole.

5) If an operator's drill dust controls are properly installed and maintained, and appear to be operating properly after inspection of all components of the dust control system but there is still visible dust, no citation will be issued at that time. Instead, the MSHA inspector will take the following actions:

   a) The MSHA inspector will request assistance from persons with technical expertise, either in the MSHA District Office or from MSHA's Pittsburgh Safety and Health Technology Center (PSHTC), in evaluating the specific drill and its operation at the mine. If MSHA's district personnel with technical expertise or the Pittsburgh Technical Center personnel determine that the drill dust controls are operating improperly, or that the controls have not been maintained properly, MSHA will issue a citation for violation of the drill dust control standards.

   b) However, if the evaluation by MSHA's district or Pittsburgh Technical Center personnel identifies a manufacturing or design defect or flaw in the drill dust control mechanism or device or reveals that the drill dust control device is being used in a manner that exceeds or is inconsistent with its design capacity, MSHA will inform the operator of its findings and give the operator a reasonable time to correct the situation. If the operator does not correct the situation within that time, a citation will be issued.

   c) Finally, if the evaluation by MSHA's technical personnel does not identify any manufacturing or design defects or flaws or any use of the drill dust control mechanism or device in a manner or capacity for which it was not designed, MSHA will not issue a citation.

e. In addition, as explained in the preamble to the final rule, in cases where it is not obvious that a dust control is effective, MSHA has the option to collect dust samples from areas where miners are exposed to drill dust to evaluate the effectiveness of dust controls. If samples exceed the

applicable dust standards, MSHA will issue a citation for exceeding the respirable dust standard. If the samples do not indicate an overexposure, no citation for exceeding the exposure limit would be issued.

Because of the need to control drill dust at the source, effective drill dust controls do not include administrative controls, which control exposure by limiting the amount of time a miner is in a contaminated atmosphere, or providing personal protective equipment.

f. Environmental Cab:

To be classified as an environmental cab, the cab's interior must be always pressurized (positive pressure relative to the outside) with filtered air under all conditions of heating, ventilation, and air condition to prevent drill dust from entering the cab. That is, all outside intake air used to pressurize the operator cab must pass through a filtering system that captures particulate matter. If pressurized, the direction of air movement should always flow from the cab toward the outside, which can be checked under normal operating conditions with doors and windows in the closed position.

To determine if the pressurized cab is equipped with an effective air filtration system that is being properly maintained, the inspector must sample the environment of the highwall drill operator in accordance with established procedures during each 6-month respirable dust sampling inspection at the mine. This is necessary for two reasons as follows.

1) The filters typically used for filtering the outside intake air are not marked to enable the inspector to identify the type of media employed, its classification (e.g., designed to remove vapor, particulate, or vapor and particulate), or its efficiency rating.

2) Even if the filter is clearly marked, neither the filter's performance as installed nor its current condition can be adequately evaluated through visual inspection. Even if the inspector observes dust inside the cab, this by itself is insufficient to conclude that the cab is equipped with an ineffective filtration system, because the dust could be due to inadequate housekeeping.

Since the objective is to assess the adequacy of the cab's filtration system, the sampling device must remain inside the cab during the entire sampling shift. If, based on an MSHA sample, overexposure is found, the operator will be cited under either Section 71.100 or Section 71.101. Any respirable dust control plan submitted following termination of the citation shall specify the dust control measures used to abate the violation. If the operator elects to use a more efficient particulate air filter to achieve

compliance, the plan shall describe the type of filter to be used and how it will be maintained to assure that respirable dust levels continuously comply with the applicable standard inside the cab. Additionally, consideration should be given to including in the plan, provisions requiring the cab's interior to be periodically cleaned to maintain it relatively dust-free.

All inspector highwall drill samples having sufficient weight gain are also analyzed for quartz content. If those results indicate that the standard should be reduced further, the enclosed cab should be re-evaluated to assess the effectiveness of the control under the lower standard.

10. If an inspector observes another entity being sampled by the mine operator, the following steps must be taken:

    a. Record the location and general condition of the sampling device, the time the sampler was observed operating, and the cassette number if a gravimetric sampler is used or the CPDM Serial Number in the inspector's notes;
    b. Check whether the pump is operating as specified in the 30 Code of Federal Regulations and, if not, record the company's pump identification number;
    c. Document any abnormal conditions that exist in the sampling area and note worker activities;
    d. Determine who is responsible for making the required pump checks and make an attempt to determine whether such checks were actually performed as required for the type of sampling device in use;
    e. Do not discuss observations with the mine operator while on site; and
    f. Inform the responsible field office supervisor so that appropriate follow-up enforcement action can be taken if the sample in question is transmitted to MSHA as a valid sample. This may involve meeting with the operator to discuss findings, initiating a special investigation, or conducting a monitoring and/or sampling inspection, etc.

11. Intake air samples, including approved belt air used for intake, taken at DA locations by inspectors or mine operators must be coded as "Type 3" samples on the dust data card, and the entity block (Block 10) should be identified using the "801-0 through 899-9" numbering series in the following manner:

    a. The first digit will always be "8." This indicates the sampling entity is located in intake air and is recognized by the computer for the purpose of applying the 1.0 mg/m^3 (0.5 mg/m^3 beginning August 1, 2016) intake air standard.
    b. The next two digits, in this case "01," indicate that this intake air "DA" is associated with MMU 001-0.

c. The fourth digit, in this case "0," indicates that this is the first intake air DA associated with a particular MMU, and is useful, especially, in identifying MMUs with multiple intake air "DAs." However, when the DA sampling entity has been established as a result of a petition for modification, the fourth digit will be a "9".

d. Intake air samples taken by inspectors from areas that are not a DA must be coded as "Type 7" (in Block 9) on the dust data card, and the entity number of the associated MMU (i.e., 001-0 thru 099-0) will be entered in Block 10.

12. The District Manager must be able to reliably ascertain whether the approved ventilation plan's minimum control parameters (e.g., air quantity, number of sprays, water pressure, etc.) allow for effective and consistent control of respirable dust and methane. Data based on samples collected when control parameters significantly exceeded the ventilation plan minimums (and/or when production is significantly below normal levels) cannot reasonably or reliably serve as the basis for justifying the continued approval of a ventilation plan.

Since the primary sampling objective is to assess the effectiveness of the control parameters in the approved ventilation plan, when an operator is operating with any parameters that exceed 120% of the quantities/volumes specified in the approved ventilation plan, the inspector should inform the operator that he/she may adjust the parameters to levels that do not exceed 120% of the specified quantities/volumes. If a plan specifies a range of values as a control parameter, the lowest value in the range is the quantity/volume to which the 120% factor will be applied. The inspector should inform the operator that, if such adjustments are not made, the District Manager may determine that the minimum plan parameters do not reliably assure protection for all miners over all shifts, even if the MSHA sampling results do not exceed the applicable dust standard.

If the operator adjusts the control parameters as informed by the MSHA inspector, and MSHA samples indicate compliance with the applicable respirable dust standard, the District Manager will consider this data as evidence that the approved ventilation plan's minimum control parameters allow for the effective and consistent control of respirable dust and methane. If an MSHA sample indicates noncompliance with the applicable respirable dust standard because the sample meets or exceeds the ECV, a plan revision is required before termination of a citation for noncompliance. If there are single occupation samples that exceed the applicable dust standard but not the ECV, the operator and MSHA should consider this data to evaluate the need for additional action to control respirable dust and methane.

If an MSHA sample indicates noncompliance with the applicable respirable dust standard, the modified plan should include parameters that correct the cause of the

overexposure. Additional controls, such as those listed in section IV H. of this Chapter, and modification or elimination of deep-cut systems, may also be required to help ensure miners are protected against respirable dust overexposures.

If the plan being evaluated stipulates the use of blowing or exhausting face ventilation in any entry at any time, each type of face ventilation should be evaluated separately or the use of all blowing face ventilation must be evaluated to retain the option in the approved plan. For MMUs that specify in the plan specific entries that will use blowing face ventilation and specific entries that will use exhausting face ventilation, this combination of face ventilation must occur during the sampling shift so that the MSHA sampling reflects these conditions.

It is important that the inspector's notes and MSHA Form 2000-86 accurately reflect the dust controls being used and the actual quantities measured. This will serve as supporting documentation when plan changes are required or enforcement actions are taken.

13. At least twice during the sampling shift, the inspector must verify that all dust control parameters stipulated in the approved ventilation plan are in place and functioning properly and make other necessary measurements as detailed below. These checks must be initiated at least at the beginning of the shift and between the 4th and 5th hour of operation. When checking air quantities and velocities, the inspector must take measurements in as many working places as practical and immediately prior to the operation of the mining machine in that place, recording the results on MSHA Form 2000-86.

    If the plan requires the use of a machine-mounted dust collector, air measurements at the face must be taken with the scrubber off. The inspector should follow the procedure instructions included in this section when performing the required visual checks and measurements to verify that the scrubber is being maintained and is operating properly.

    a. Maintenance of Dust Controls on Roof Bolters and Machine-Mounted Dust Collectors on Continuous Mining Machines

       Engineering or environmental controls are the primary means of maintaining compliance with the respirable coal mine dust standards. Inspection personnel are required to examine the respirable dust control parameters as part of a regular health and safety inspection (E01). These controls are also checked during technical sampling and non-sampling inspections. This section outlines the areas that should be examined to properly inspect these controls. It is imperative that these controls be properly installed and maintained. Dust controls on roof bolters and

machine-mounted dust collectors on continuous mining machines are two primary engineering controls utilized by mine operators to reduce respirable coal mine dust in the active workings of the mine environment. Roof bolting machines normally use either dry dust collectors or wet drilling methods. Both methods have been shown to be effective in controlling the dust generated from drilling holes for roof bolts.

1) Dry dust collection systems on roof bolters have numerous components that are critical to the effective operation of the system. These systems must be examined as a part of each respirable dust survey inspection. Inspection for proper maintenance of the dry dust collector should include an examination of the seals around the dust box, the mechanism used to keep the door of the dust box secure, the hoses from the drill pod to the dust box, the hoses and clamps from the dust box to the vacuum pump, and the hoses from the pump to the mufflers to ensure that there are no holes or leaks. If these components are not maintained, a violation of §72.630(b) should be cited.

   The muffler is an excellent barometer for indicating whether the operator is maintaining the dry dust collector properly. Visual observations can be made on the clean side of the dry dust collector to determine if the filter has been damaged or bypassed. If dust is present on the inside of the muffler exhaust, the filter associated with the dry dust collector has been bypassed. When this occurs, the system should be thoroughly cleaned from the exhaust back to the filter. If dust is not present on the inside of the muffler exhaust, the system should still be checked. The filter should be checked for holes and removed to check the seal between the filter and the exhaust. If the filter has holes or the seal is missing or damaged, the dry dust collector is not being maintained in permissible and operating condition. A violation of §72.630(b) exists if these conditions are observed. If dust is found on the clean side of the exhaust, a bag sample should be collected and sent to the respirable dust lab in Pittsburgh, PA for analysis of quartz.

   The vacuum pressure of the dry dust collection system should also be checked. Pressure readings at the drill pod can be taken and these readings compared to the manufacturer's specifications.

   Emptying the roof bolting machine dry dust collector box is important in limiting miners' exposures to drill dust. This dust may routinely contain high quartz content. Mishandling of the dust can contaminate the section ventilating air, thereby increasing miners' potential exposure to excessive quartz levels. In order to address this problem, the method utilized to empty the dust box and the location where this process takes place should be addressed in the approved ventilation

plan. If the section or roof bolter is on a reduced standard, incorporating such procedures in the approved plan is even more important. If these procedures are contained in the approved plan and the operator does not follow these procedures, a violation of §75.370(a)(1) should be cited.

Some roof bolters are equipped with an automatic dump box. These units have been found to have improperly fitting filters which sustain damage when the door closes. The damage allows the dust to bypass the filter and be introduced into the working environment. Deficiencies such as damaged filters, torn hoses, or degraded seals are all examples of failure to maintain the equipment as approved and constitute a violation of §72.630(b).

Wet drilling methods have fewer working components and therefore require less maintenance. However, it is still imperative that the wet drilling system be properly installed and maintained. The water delivery system should be checked to ensure that no leaks are present that would prohibit sufficient water from reaching the drill steel. If multiple pieces of drill steel are utilized, this could be a problem area for the bolter operator since water loss can occur at the connection. Proper water pressure and volume, as well as the ability to control these variables, are critical when utilizing wet drilling methods. Observation of dust, while drilling with a wet drilling system, may indicate an insufficient dust control system and may be a violation of §72.630(a).

The type of drill bit used affects the dust generation and capture efficiency of drill dust control systems. Research by the former United States Bureau of Mines has shown that drill bits that have openings on the bit at or near the cutting surface generate less dust when compared to bits that capture dust at the end of the drill steel. The research also indicated that these bits have a better capture efficiency. Accordingly, the MSHA inspector should encourage mine operators to use the most effective respirable dust control methods, procedures, and components for drilling in rock that are available.

2) Continuous mining machines equipped with machine-mounted dust collectors are common in underground coal mines. As auxiliary controls, flooded bed scrubbers on continuous mining machines have allowed the mine operator to take cuts in excess of 20 feet. The scrubber has also allowed the operator to operate the continuous mining machine with line curtain or tubing distances up to 40 feet from the deepest point of penetration without decreasing the level of protection afforded miners from respirable dust. As with any

respirable dust control measure, the scrubber must be properly installed and maintained. If operators are using scrubbers for these curtain setbacks, maintenance requirements must be incorporated in the approved mine ventilation plan.

Inspectors should perform the following visual checks on the scrubber system to verify that the scrubber is being maintained. The inspector should check that the inlets, exhaust and ductwork of the scrubber are free from obstructions. The operator should be routinely flushing or washing the inside of the ductwork in its entirety to remove any materials that have been deposited in the duct, as well as clearing the inlets and exhaust. Obstructions in the system will not allow the proper air quantity or velocity to be maintained. The operator should also be cleaning the scrubber screen on a regular basis. The inspector should check the screen to ensure that the water spray hits the entire screen and not just the center of the screen. If the screen is not completely covered by the water spray, dust may pass through the screen and become entrained in the section air flow. Surveys have shown that without proper cleaning of the ductwork, scrubber screen, inlets, and exhaust, the efficiency of the scrubber is greatly reduced. The flooded bed scrubber is also equipped with a demister which should be checked by inspection personnel. A common demister problem is a sump clogged by material that will not pass through the system. A thorough cleaning of the sump should correct this problem. The operator's routine maintenance of the scrubber system is critical for the proper and effective operation of the scrubber. Scrubber maintenance requirements must be incorporated in the ventilation plan. If the operator is not performing the maintenance as specified in the plan, a violation of §75.370(a)(1) must be cited.

Inspectors should take measurements of engineering parameters to determine if the operator is maintaining the scrubber system properly. If the operating capacity stated in the approved ventilation plan is not indicative of actual conditions, or if respirable dust samples indicate that this quantity is not sufficient, appropriate enforcement action shall be taken and plan revisions may be necessary. (Examples: require the operator to take periodic pitot tube readings on the scrubber, increase the air required to be maintained behind the line curtain or tubing, require more frequent cleaning of the filter and ductwork.)

3) Providing and maintaining adequate ventilation for roof bolters and continuous mining machines continues to be an integral part of any effective respirable dust control strategy to limit miners' exposure to respirable coal mine dust. During the inspection of respirable dust controls for roof bolters and continuous mining machines, inspection

personnel should take sufficient air readings to verify that the operator is maintaining adequate ventilation as stipulated in the approved mine ventilation plan. If the approved quantity of air or mean entry air velocity, if required, is not maintained, a violation of §75.370(a)(1) should be cited for a failure to follow the approved ventilation plan. In addition, §75.362(a)(2) requires that deficiencies in dust controls shall be corrected before production begins or resumes on a section. When deficiencies discovered during an on-shift have not been corrected and production is underway, §75.362(a)(2) should be cited. Section 75.362(a)(2) should also be cited when the on-shift examiner conducts an inadequate examination of respirable dust control parameters specified in the regulation or additional controls in the approved mine ventilation plan.

4) In addition, inspection personnel must conduct a full pitot tube traverse on each scrubber during each respirable dust survey. This traverse data must be attached or otherwise included with the MSHA Form 2000-86 and in the inspector's notes. This information must be used by the inspector to determine if the plan scrubber quantity is correct. The inspector can also use this data to determine a centerline correlation (if a centerline hole is provided) which can be used during non-measurement inspections of the scrubber system to determine if the scrubber is being maintained and the ventilating air current is suitable for this system of mining. A duct set-up for a centerline hole will always have an odd number of holes.

   Full pitot tube traverse must consist of collecting approximately 16 data points (not less than 14) from holes in the scrubber duct that must be less than 6 inches from the sides and between each hole. For example: for a scrubber duct measuring 20″ × 20″, a minimum of 4 holes must be present spaced equally across the duct. A minimum of 4 readings at each hole must be taken that are equally spaced in the 20-inch depth. This will result in 16 velocity pressure (VP) readings. The 16 VP readings must be converted to velocity (V) readings and then the 16 V readings averaged. This average is the velocity of the air in the scrubber. A chart of conversions from VP to V is on page 1-25 to aid in this work. The average velocity is then multiplied by the area of the duct (20″ × 20″ = 400 square inches/144″ = 2.78 square feet in this example) to obtain the volume of air in CFM for the scrubber. This number should be recorded on the MSHA Form 2000-86. The reference used to obtain the traverse information is the ACGIH "Industrial Ventilation: A Manual of Recommended Practice" 22nd Edition.

<u>Centerline correlation values</u> are obtained by the following method:

Average Velocity (from full traverse) divided by centerline velocity = correlation factor.
Centerline velocity x correlation factor x area = scrubber cfm

The results of the complete on-shift checks of plan parameters may be recorded on a single MSHA Form 2000-86 if all readings can be accommodated and the data from each check is clearly labeled as being the first or second check. Inspection personnel can continue to record each check on separate 2000-86 Forms if preferred or if necessary to accommodate the information. Record other dust controls or work practices (i.e., higher air quantities, greater number of water sprays, frequency of scrubber screen cleaning, wetting roadways or shields, bolting procedures, etc.) that are in use but not included in the approved plan in the comment section of MSHA Form 2000-86.

When calculating the 30-shift average, the inspector should verify the operators' record of production for the past 30 shifts. This should be included in the inspector's notes. Each MSHA Form 2000-86 will be reviewed and signed by the inspector's supervisor indicating that the data is complete and accurate.

Velocity Pressure Conversion											
VP	V	VP	V	VP	V	VP	V	VP	V	VP	V
0.01	401	0.51	2860	1.01	4025	1.51	4921	2.01	5678	2.60	6458
0.02	566	0.52	2888	1.02	4045	1.52	4938	2.02	5692	2.70	6581
0.03	694	0.53	2916	1.03	4065	1.53	4954	2.03	5706	2.80	6702
0.04	801	0.54	2943	1.04	4084	1.54	4970	2.04	5720	2.90	6820
0.05	896	0.55	2970	1.05	4104	1.55	4986	2.05	5734	3.00	6937
0.06	981	0.56	2997	1.06	4123	1.56	5002	2.06	5748	3.10	7052
0.07	1060	0.57	3024	1.07	4143	1.57	5018	2.07	5762	3.20	7164
0.08	1133	0.58	3050	1.08	4162	1.58	5034	2.08	5776	3.30	7275
0.09	1202	0.59	3076	1.09	4181	1.59	5050	2.09	5790	3.40	7385
0.10	**1266**	**0.60**	**3102**	**1.10**	**4200**	**1.60**	**5066**	**2.10**	**5804**	**3.50**	**7493**
0.11	1328	0.61	3128	1.11	4220	1.61	5082	2.11	5818	3.60	7599
0.12	1387	0.62	3154	1.12	4238	1.62	5098	2.12	5831	3.70	7704
0.13	1444	0.63	3179	1.13	4257	1.63	5113	2.13	5845	3.80	7807
0.14	1499	0.64	3204	1.14	4276	1.64	5129	2.14	5859	3.90	7909
0.15	1551	0.65	3229	1.15	4295	1.65	5145	2.15	5872	4.00	8010
0.16	1602	0.66	3254	1.16	4314	1.66	5160	2.16	5886	4.10	8110
0.17	1651	0.67	3278	1.17	4332	1.67	5176	2.17	5900	4.20	8208
0.18	1699	0.68	3303	1.18	4351	1.68	5191	2.18	5913	4.30	8305
0.19	1746	0.69	3327	1.19	4369	1.69	5207	2.19	5927	4.40	8401
0.20	**1791**	**0.70**	**3351**	**1.20**	**4387**	**1.70**	**5222**	**2.20**	**5940**	**4.50**	**8496**
0.21	1835	0.71	3375	1.21	4406	1.71	5237	2.21	5954	4.60	8590
0.22	1879	0.72	3398	1.22	4424	1.72	5253	2.22	5967	4.70	8683
0.23	1921	0.73	3422	1.23	4442	1.73	5268	2.23	5981	4.80	8775
0.24	1962	0.74	3445	1.24	4460	1.74	5283	2.24	5994	4.90	8865
0.25	2003	0.75	3468	1.25	4478	1.75	5298	2.25	6007	5.00	8955
0.26	2042	0.76	3491	1.26	4496	1.76	5313	2.26	6021	5.50	9393
0.27	2081	0.77	3514	1.27	4513	1.77	5328	2.27	6034	6.00	9810
0.28	2119	0.78	3537	1.28	4531	1.78	5343	2.28	6047	6.50	10211
0.29	2157	0.79	3560	1.29	4549	1.79	5358	2.29	6061	7.00	10596
0.30	**2194**	**0.80**	**3582**	**1.30**	**4566**	**1.80**	**5373**	**2.30**	**6074**	**7.50**	**10968**
0.31	2230	0.81	3605	1.31	4584	1.81	5388	2.31	6087	8.00	11328
0.32	2266	0.82	3627	1.32	4601	1.82	5403	2.32	6100	8.50	11676
0.33	2301	0.83	3649	1.33	4619	1.83	5418	2.33	6113	9.00	12015
0.34	2335	0.84	3671	1.34	4636	1.84	5433	2.34	6126	9.50	12344
0.35	2369	0.85	3692	1.35	4653	1.85	5447	2.35	6140	10.00	12665
0.36	2403	0.86	3714	1.36	4671	1.86	5462	2.36	6153	10.50	12978
0.37	2436	0.87	3736	1.37	4688	1.87	5477	2.37	6166	11.00	13283
0.38	2469	0.88	3757	1.38	4705	1.88	5491	2.38	6179	11.50	13582
0.39	2501	0.89	3778	1.39	4722	1.89	5506	2.39	6192	12.00	13874
0.40	**2533**	**0.90**	**3799**	**1.40**	**4739**	**1.90**	**5521**	**2.40**	**6205**	**12.50**	**14160**
0.41	2564	0.91	3821	1.41	4756	1.91	5535	2.41	6217	13.00	14440
0.42	2596	0.92	3841	1.42	4773	1.92	5549	2.42	6230	13.50	14715

0.43	2626	0.93	3862	1.43	4789	1.93	5564	2.43	6243	14.00	14985
0.44	2657	0.94	3883	1.44	4806	1.94	5578	2.44	6256	14.50	15251
0.45	2687	0.95	3904	1.45	4823	1.95	5593	2.45	6269	15.00	15511
0.46	2716	0.96	3924	1.46	4839	1.96	5607	2.46	6282	15.50	15768
0.47	2746	0.97	3944	1.47	4856	1.97	5621	2.47	6294	16.00	16020
0.48	2775	0.98	3965	1.48	4872	1.98	5636	2.48	6307	16.50	16268
0.49	2804	0.99	3985	1.49	4889	1.99	5650	2.49	6320	17.00	16513
0.50	**2832**	**1.00**	**4005**	**1.50**	**4905**	**2.00**	**5664**	**2.50**	**6332**	**17.50**	**16754**
V = 4005 X √VP				**V = Velocity in fpm**				**VP = Velocity Pressure "WG**			

The inspector must determine if the operator has performed an on-shift examination of the respirable dust control parameters as required under 30 CFR §75.362 On-shift Examinations.

Section 75.362(a)(2) requires a person designated by the operator to 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 after 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:

a) Air quantities and velocities
b) Water pressures and flowrates
c) Excessive leakage in the water delivery system
d) Water spray numbers and orientation
e) Section ventilation and control device placement
f) Roof bolter dust collector vacuum levels
g) Scrubber air flowrate
h) Work practices required by the ventilation plan
i) Any other dust suppression measures

Measurements of the air velocity and quantity, water pressure and flowrates are not required if continuous monitoring of these controls is used and indicates that the dust controls are functioning properly.

Section 75.362(g)(2) requires that a 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 §75.362(a)(2) to assure compliance with the respirable dust control plan 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.

Section 75.362(g)(3) requires that the mine foreman or equivalent mine official countersign each examination record required under §75.362(a)(2) after it is verified by the certified person under §75.362(g)(2)(ii), 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.

Section 75.362(g)(4) requires that the record 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 the miners.

When an inspector is conducting a health-related inspection activity (collecting respirable coal mine dust samples, monitoring the mine operator's sampling program, or conducting a respirable dust technical investigation) he/she shall complete in its entirety, MSHA Form 2000-86. A separate MSHA Form 2000-86 shall be completed for each producing MMU and shift that the inspector visits. A copy of the completed MSHA Form 2000-86 shall be filed with the appropriate inspection or investigation report as currently required. During these inspections or investigations, inspectors must evaluate and record the respirable dust controls in use. This includes their placement, condition, and ability to actually control the dust levels.

All primary section dust generating sources, such as continuous and longwall mining machines, roof and rib bolters, coal drills, cutting machines, rock dust equipment, and the section loading point must be inspected for compliance with the respirable dust control parameters specified in the plan. The inspection shall include an examination of airflow quantities and velocities, water pressures and flowrates, water spray size and orientation, section ventilation and dust control device placement, and any other dust controls specified in the mine ventilation

plan. This may include, but is not limited to, work practices, physical conditions, and enclosures.

The actual airflow delivered by scrubbers is critical to the performance of dust control and ventilation systems. Coal mine inspectors shall measure the airflow of scrubbers and dust collectors during respirable dust inspections and investigations. Mine ventilation plans that include air-directing spray systems, such as shearer clearer and fan sprays, usually specify spray angles. CMS&H does not expect inspectors to measure precise spray angles during each respirable dust inspection or investigation. However, inspectors shall determine that sprays are oriented as stipulated in the approved ventilation plan. A sketch of the water spray system should be provided in the space available on the MSHA Form 2000-86 or attached as a supplemental page. The inspector shall also determine the water pressure and flow used on the dust control system. These may be measured indirectly by the mine operator based on a relationship or remote sensor. The inspector shall determine, during the inspection, if such indirect method is accurate and take appropriate enforcement action if such method is inadequate.

All respirable dust controls required to be examined by 75.362(a)(2) must be included in the on-shift examination and must be part of the record and certification. If an inspector determines that the mine operator is not maintaining compliance at all times, the inspector shall take appropriate enforcement action.

When an inspector determines that the mine operator has failed to conduct the required on-shift examination of the dust control parameters, or has failed to complete the examination prior to beginning or resuming production, the inspector shall issue a citation for violation of 75.362(a)(2). If the examination was completed but the person directing the on-shift examination (certified mine official) does not certify by date, time, and initials that the examination was conducted, the inspector shall issue a citation for violation of 75.362(g)(2).

If the inspector determines that the mine operator failed to correct any identified deficiencies found during the required examination prior to beginning or resuming production, the inspector shall issue a citation or order for violation of §75.362(a)(2). The inspector shall include the appropriate provision of the mine ventilation plan that was not being complied within the narrative of the violation. In addition to the on-shift requirements required by this standard, many ventilation plans contain more frequent examination requirements for the dust controls at various times during the mining cycle. The mine operators must continue to comply with the provisions as outlined in the mine ventilation plan.
If the inspector determines that the mine operator failed to maintain compliance with the requirements of the approved mine ventilation plan, the inspector shall issue a citation or order for violation of §75.370(a)(1). The inspector shall include in the violation narrative the appropriate parameter(s) of the approved mine ventilation plan that were not being complied with.

14. If a mine operator is found to be in violation of the approved ventilation plan, the operator must be cited and required to take immediate corrective action while the MSHA sampling is taking place. If this occurs, the inspector will document in his/her notes the specific action taken and when it was taken during the sampling shift.

    a. Consideration should be given to a finding of S&S when an operator is found to be in violation of the approved ventilation plan. In determining whether the violation should be designated as S&S, the inspector must take into consideration all facts surrounding the violation and make a judgment based on his/her past experience of whether the operator's failure to comply could result in overexposure. One key factor to be considered is the extent of the deviation from the plan and its potential impact on the dust exposure. For instance, if the plan calls for 30 operating sprays and 3 were found defective but were separated by other functional sprays, the violation may not be S&S because its impact on the miner's dust exposure may be minimal. On the other hand, if the 3 sprays that were not operating were in the same location, such as in the throat of the continuous miner, the impact on the dust suppression could be more severe and may justify a finding of S&S.

    b. When deciding on the degree of negligence, consideration should be given to a high negligence finding if the mine operator was in a position to be aware of the conditions based on the results of the on-shift examination of the dust control parameters and there were no mitigating circumstances. Because of the on-shift requirement, the mine operator is expected to be fully familiar with the provisions of the approved ventilation plan.

       Furthermore, if there are unique aggravating circumstances associated with the violation, such as repeated violations of the same standard, serious consideration should be given to recommending the violation for special assessment.

15. Full-shift samples must be taken portal to portal. (NOTE: A 15-minute window is provided in both the inspector and operator sampling programs to cover unanticipated delays when exiting the mine.) Sampling devices shall remain operational during the entire shift which includes travel time in and out of the mine. If the work shift is longer than 12 hours and the sampling device is:

    a. a CMDPSU, the inspector should be prepared to switch-out the unit's sampling pump prior to the 13th hour of operation.
    b. a CPDM, the inspector should be prepared to switch-out the CPDM with a fully charged device prior to the 13th hour.

16. At the conclusion of the sampling shift, record the time, examine the condition of the sampling devices for any evidence of mishandling, and note any findings in the inspector's notes. Also, when sampling MMUs, estimate the amount of total material in tons that was mined during the time the sampling device(s) was located on the section based on the number of feet advanced, number of passes, or number of cars loaded. Tonnage for sampling purposes includes all mined material, which may be rock or coal or both. Compare this information with the operator's records of production. Record the operator production data and the estimate based on your observations on the MSHA Form 2000-86. Record the production on the dust data card that is the higher of the inspector's estimate or the number recorded by the operator for the sampled shift.

17. MSHA samples collected for an MMU will be valid if production is at least 80% of the average of the previous 30 production shifts. MSHA samples must be voided with the production (PRO) void code on the dust data card by the inspector if the production is less than the 80% level prior to the samples being submitted to the Pittsburgh laboratory.

    If, however, the production during MMU sampling is less than 80% of the average of the 30 previous production shifts and the sample results indicate one or more samples having a concentration that exceeds the applicable standard by any amount, all samples from this survey will be modified by the district to remove the production void code. These samples may be voided for other reasons at the inspector's discretion. Removing the void code from these samples will permit the district to count this survey toward their sampling completion rates.

F. Post-Inspection Reviews

1. Complete the dust data card for each exposed filter cassette and review the information for clarity, legibility, and accuracy. Refer to paragraph E.4.a. for completing the dust data card for a control filter cassette.

    a. Cassette Number: This number is supplied by the manufacturer and must correspond to the number on the filter cassette bearing the identical serial number.

    b. Mine ID Number: The seven-digit number assigned by MSHA.

    c. Contractor Code: No entry required.

    d. Mine Name: Name of the mine being inspected.

    e. Company Name: Name of the company that operates the mine.

f. Date Sampled: The date the sample was taken. When entering the date, be sure to enter a zero before single-digit months or days so that each box contains a digit (Example: [02 28 93]).

g. Sampling Start Time: The hour on a 24-hour clock that the sampling unit is started (if start time is 7:15, 7:30, or 7:45 a.m., record 07).

h. Sampling Time: The actual elapsed time in minutes between when the pump was started and when the pump was turned "OFF". The total time cannot be more than the full shift plus 15 minutes or the sample must be voided (a 15-minute window is provided to cover unanticipated delays when exiting the mine). Also, the time cannot be less than 360 minutes, unless that is the normal length of the full shift or the Administrator for CMS&H has granted written permission to run less than 360 minutes. If the actual time is less than the normal full-shift time, note on the dust data card the length of the normal full shift.

If an inspector is delayed in exiting the mine by more than the 15-minute window, he may turn the pumps off at the end of the scheduled shift. If the inspector remains in the mine to sample miners who work a longer shift than the remainder of the crew, the inspector may turn the pumps off for miners who have exited the mine at the end of their shift.

NOTE: The actual elapsed time can be a full shift plus 15 minutes for the sample to be considered valid.

i. Tons This Shift - Tons of material produced. This item is required for samples taken on MMUs only. Tonnage less than five digits must be preceded by zeroes (Example: one thousand two hundred thirty would be [0 1 2 3 0]).

If a situation should arise during which no material was mined but other ongoing activities resulted in dust exposures, the actual production must be reported as [0 0 0 0 1] since the computer will not accept zero production for an MMU.

j. Average Tons – 30 shifts - The average of the most recent 30 production shifts immediately preceding the sampling shift.

k. Type of Sample - The number identifying the type of sample collected.

Designated Occupation (DO)	1
Non-designated Occupation (NDO)	2
Other Designated Occ. (ODO)	2
Designated Area (DA)	3

Designated Work Position (DWP)	4
Part 90 Miner	5
Non-designated Area (NDA)	6
Intake Air	7
Non-designated Work Position (NDWP)	8
Control Filter	9

Sample codes “1” through “5” and “9” will be used by coal operators and MSHA inspectors. Codes “6” through “8” will be used only by MSHA inspectors.

l. MMU/DA/ODO/SA): These four blocks are for the number assigned by MSHA to identify the MMU, DA, ODO, surface area (SA), or Part 90 miner. Part 90 miners working underground, but not working on an MMU, are coded 850-0. When a Part 90 miner is working on an MMU, the MMU identification number is used (Example: 001-0). Part 90 miners working in surface occupations are coded 950-0.

m. Occupation Code: Enter the appropriate three-digit occupation code. This block is not filled out when DAs are sampled.

n. Part 90 Miner Sampled: Complete only if the miner sampled is one who has exercised the option to work in a less dusty area of the mine (a "Part 90 miner"). The Part 90 miner's MIIN, one digit in each box.

o. Certified Person - Enter the certification number of the inspector taking the sample by entering the inspector AR/RE number followed by zeroes. (Ex. AR # 20743 certification numbers for dust data card would be: [2][0][7] [4][3] [0][0][0][0]).

p. Record the district field office code number in the lower right-hand portion of the dust data card. A stamp with this number is preferred.

q. All MSHA samples shall be considered valid by the inspector, except the following:

BRK - Broken (actual physical damage)

CON - Contaminated (abnormal particle size or foreign material)

IVR - Inspector void - rain (rain caused environmental changes that are not normal)

MFP - Malfunctioning pump (pump would not operate or maintain proper flowrate)

PRO - Production less than 80% of the last 30-shift average

TME - Invalid Time (less than 360 minutes or greater than full shift plus 15 minutes)

IWS - Invalid Work Shift - activity is not representative of normal operation.

NOTE: If an inspector recommends that a sample be voided, the appropriate void code shall be entered in the "Void Code" box located in the lower right-hand portion of the dust data card.

r. Review the dust data card information for clarity, legibility and accuracy, and then reattach the control filter cassette and each exposed filter cassette to the data card via the hole in the card.

2. Package all cassettes from each sampling inspection along with the control filter cassette and properly completed dust data cards in one mailing container. If more than one container is required, securely tape both containers together and mail to the following address:

Respirable Dust Processing Laboratory
PSHTC
P.O. Box 18179
Pittsburgh, PA 15236-0179
Cochrans Mill Road, Bldg 38 (FOR OVERNIGHT MAIL)

Multiple surveys may be packaged in the same mailing container if each survey is placed in a sealed plastic bag and the multiple bags are then placed in the mailing container.

NOTE: <u>Never split cassettes from the same inspection and mail separately.</u>

3. Complete all applicable sections of MSHA Form 2000-86 and send it to the appropriate office to be included in the inspection report.

G. Evaluation of Sampling Results

1. The Secretary will use a single, full-shift measurement of respirable coal mine dust to determine the average concentration on a shift to which a miner is exposed during the shift. Noncompliance with the applicable respirable dust standard or the applicable respirable dust standard when quartz is present is demonstrated when a single, full-shift measurement taken by MSHA meets or exceeds the

"Excessive Concentration Value" (ECV) established in Table 1-1, that corresponds to the applicable standard and the particular sampling device used. However, if multiple samples indicate overexposure, MSHA will evaluate what the source of the dust exposure was. For example: if the dust is all coming from the operation of the continuous mining machine, then 1 citation would be issued listing all the overexposures in the body of the citation. If an overexposure is found on a shuttle car operator and a roof bolter operator and the MMU is using split ventilation so that these two occupations are operating in different splits on intake air, then 2 citations would be issued requiring corrective actions that would reduce the exposure in the two different areas of the MMU.

2. If the sampled entity is on a reduced standard, the inspector must delay any enforcement action until the results of quartz analysis is received. If the percentage of quartz found in a sample that meets or exceeds the ECV in Table 1-1 would not cause the dust standard to change, the operator must be cited for a violation of the dust standard. If the percentage of quartz found in the sample would cause the dust standard and the corresponding ECV to change so that the average concentration would no longer indicate noncompliance, no citation will be issued.

3. Dust citations and orders will generally be designated as "significant and substantial" (S&S). The use of respirators cannot be substituted for engineering controls to control the level of dust in the mine atmosphere. However, the proper use of personal protective equipment (PPE), should be taken into account, as well as any other evidence that miners were not exposed to an excessive concentration of respirable dust when determining whether the violation is S&S. The inspector must evaluate the circumstances, for example, the effectiveness of the PPE (refer to section G.9 of this Chapter). This evaluation will include consideration of whether the PPE has been properly selected, used, and maintained to ensure that an adequate degree of protection is afforded to the miner.

   In addition, a high degree of negligence should be considered. "Reckless disregard" should be considered if the operator was in a position to be aware of the condition that contributed to the high dust levels in the environment and there were no mitigating circumstances, or if there are unique aggravating circumstances associated with the violation, such as repeated past violations of the same standard at the mine. Otherwise, the negligence would be less than high. When high negligence is assigned, such violations will be reviewed for special assessment.

   In setting time for abatement of a violation for excessive dust (only), the inspector or supervisor should allow a total of 21 calendar days for the operator to implement corrective action(s) and submit the required abatement samples. The mine operator should implement corrective actions immediately, after the issuance of the citation, so as to have sufficient time to collect the required 5 valid

representative respirable dust samples and submit those samples to MSHA. The first of the 5 samples must be collected within 8 calendar days after the citation issue date. The primary consideration in setting a reasonable abatement time shall be the health and safety of the miners. Abatement times shall not be established for the convenience of the operator or inspector and must be set based on an appeal to the FMSHRC. In the event that the abatement time must be extended, written justification establishing the specific reason(s) for extension must be documented on the extension (MSHA Form 7000-3a Continuation) and maintained in the district health files. The written justification shall be provided to Headquarters Staff upon request of the Chief, Division of Health.

Examples: The MMU under citation has been idle for 19 of the 21 days provided for abatement. An additional 5 days will be necessary for the operator to collect and submit the required respirable dust samples to determine if implemented dust control measures will achieve compliance. (Acceptable reason to extend abatement time.)

<u>Additional time is needed for the mine operator to achieve compliance.</u> (Unacceptable reason to extend abatement time.)

4. If an NDE is cited, MSHA Form 2000-142 must be completed. The violation information must be promptly entered in the computer before it will accept operator abatement dust samples from the NDE. For example, if the scoop operator (Occ. 054) on MMU 001-0 was cited, the operator must be instructed to sample a non-designated entity ("Type 2" sample) identified as 001-1, Occ. 054. The effective date of this action (Item 4 on Form 2000-142) must be the actual date the citation was issued (Item 1 on MSHA Form 7000-3).

5. The District Manager may require the operator to submit the date on which abatement sampling will begin so that an inspector can monitor the action(s) taken to correct the condition causing the violation. Note the requirement in Section IV.C. that MSHA monitor operator compliance sampling.

The information gathered during this on-site visit will enable the inspector to better evaluate whether the operator has recorded meaningful corrective action as required by the 30 CFR and is in compliance with the actions recorded. When onsite, the inspector must also determine if the operator has made available approved PPE and whether this equipment, if utilized, is being worn properly and by whom. If approved PPE is not made available, the inspector will issue a citation for a violation of the appropriate standard in part 70, 71, or 90.

a. If the condition that caused the violation has been corrected through the application of additional controls not included in the approved ventilation plan or recorded as corrective action(s), the mine operator must be instructed to update the ventilation plan or respirable dust control plan, as

applicable, and incorporate the parameters that were observed and documented by the inspector while the samples were collected.

b. However, if the operator fails to correct the condition within the period of time set forth in the citation, the inspector must review the circumstances surrounding the operator's failure to abate and determine whether an extension is justified. Refer to Chapter 7 of the *Coal Mine Health Inspection Procedures Handbook* for specific guidelines. If an extension of time is not justified, the inspector must issue a withdrawal order under Section 104(b). The inspector must document the following in the narrative portion of the order:

1) the action or inaction of the mine operator that made it necessary to issue the order; and

2) the area(s) of the mine affected by the violation.

6. Once an order is issued, MSHA must be reasonably assured that the mine operator is able to achieve and maintain dust levels at or below the applicable respirable dust standard before the order is terminated. Therefore, the inspector must take the following action.

a. Determine, based on the history of this and similar entities, whether the corrective actions proposed by the operator, in writing, may reasonably be expected to achieve compliance.

b. Ensure that the mine operator implements the corrective actions.

c. Modify the order to allow production in the affected area so that respirable dust samples can be collected to determine if the violation has been abated. The inspector must outline the corrective action that has been taken in the narrative portion of the modification to the order.

d. MSHA-collected samples must be transmitted via overnight mail or equivalent, to the Pittsburgh laboratory the next MSHA business day. Operator-collected samples must be transmitted electronically or via U.S. Postal Service, or equivalent, to the Pittsburgh laboratory.

e. Determine compliance/noncompliance according to Section IV.G. of this chapter.

f. Record on MSHA Form 2000-86 the dust controls that are actually used by the mine operator.

g. Once the condition that caused the violation has been corrected and compliance is achieved, the mine operator must submit a revised

ventilation plan for the entity in question. The revised ventilation plan must be approved by the District Manager prior to the inspector terminating the order. The revised plan must include all corrective actions taken and recorded with all parameters that were observed and documented by the inspector while the samples were collected.

h. If compliance is not achieved, the inspector will modify the order to its original state until the operator determines what other or additional measures need to be taken that could reasonably be expected to achieve compliance. Follow the steps for abatement outlined in the 30 Code of Federal Regulations.

H. Evaluation of an Acceptable Respiratory Protection Program

1. Section 72.710 provides that approved respirators shall be selected, fitted, used and maintained in accordance with the provisions of ANSI Z-88.2-1969,"Practices for Respiratory Protection. "Paragraph 1.3 of Z-88.2-1969 provides that the provisions of Z-88.2 are mandatory in nature where the word "shall" is used and advisory where the word "should" is used.

This section is provided to guide the inspector through the review of an operator's respirator program and to assess whether miners are protected from exposure to respirable coal mine dust. While all of the listed elements are necessary to have an acceptable program, each incidence must be reviewed in relation to the specific citation or exposure situation to determine whether miners were protected from dust levels that exceeded the applicable standard. As stated in Section 202(h) of the Mine Act, respirators cannot be used as a substitute for engineering controls to control the level of dust in the mine atmosphere. However, the inspector may consider respirator use when making a determination as to whether a violation of the applicable respirable dust standard is S&S.

The items listed below comprise the minimum requirements necessary to determine that a personal respiratory program is acceptable:

a. Written procedures detailing the selection and use of available respirators which include an evaluation of:

1. the nature of the hazard;
2. the limitations of the respiratory protective device;
3. the job duties potentially requiring the use of respirators;
4. where the personal protection is needed; and
5. who is responsible for each respirator program area (training, fit-test, maintenance, selection, etc.).

b. Provisions for training of all persons associated with the use and/or selection of personal respiratory protection which include:

1. Explanation of the type of hazard, i.e., is the hazard quick-acting or does it require a long duration exposure;

2. The limitation of each available personal respiratory protective device;

3. Explanation of when the respirator is to be used;

4. Hands-on experience of putting the respirator on, exercising while wearing the respirator, and testing for proper face piece-to-face seal; and

5. The cleaning, disinfecting, and maintenance procedures used and how to determine that the respirator being provided is clean and functioning properly.

c. Provisions for a face piece fit-test for each miner prior to being expected to utilize each such respirator. The test should be conducted on each miner required to wear a personal respiratory protective device at least every 12 months. The test shall be conducted by subjecting each miner, while wearing the appropriate respirator, to a test atmosphere as specified by a scientifically acceptable test method. Note however, that a fit-test is not necessary for the use of some respirators such as an Airstream helmet.

Examples of two widely accepted test methods are:

1. Qualitative Fit Test - the fit is acceptable if the miner, while wearing a respirator fitted with high-efficiency particulate filters, is subjected to a test atmosphere of irritant smoke from a stannic chloride smoke tube and does not cough.

2. Quantitative Fit Test - the fit is acceptable if the miner, while wearing a fitted respirator which has been outfitted with a sample port, is subjected to a test atmosphere (usually mineral oil mist) and the concentration of test atmosphere inside the respirator is negligible.

The miner must perform exercises while wearing the respirator in the test atmosphere to determine if the respirator is properly fitted. Exercises should simulate at least the work of lifting, bending over, talking, movement of the head in all directions and exhibiting various facial expressions.

d. Provisions require miners who wear a respirator to maintain the face piece-to-face seal at all times by maintaining the facial surfaces free of hair or eliminating other interferences at the face-to-respirator contact points and in areas that may cause interference with the respirator valves or flow characteristics.

e. A program for the maintenance and care of all respirators which includes:

1. Provisions for the inspection of each respirator for defects conducted prior to and after each use;

2. Provisions for cleaning and disinfecting each respirator after each use and at periodic intervals if not used for an extended period of time (30 days);

3. Provisions for storage of respirators in a convenient, clean and sanitary location; and

4. Provisions for a person to perform the maintenance and cleaning of respirators and who is trained for such duty and is knowledgeable in the respirator manufacturer recommendations for the use, care and maintenance of each model of respirator provided by the mine operator.

f. Records of actions taken in relation to the respirator program including at least:

1. Records of fit-test which identify:

a. the exact model and size respirator;

b. date of testing;

c. the fit-test method; and

d. whether the miner passed or failed the test.

2. Records of training provided which include at least:

a. identification of miners;

b. date of training; and

c. topics covered.

g. A statement of use which includes:

1. A requirement that an assigned respirator will be worn by miners at all times while in the normal work area such as the face area of an MMU; and

2. A requirement that management personnel will make frequent checks of the work area to ensure that miners, mandated by the mine operator to wear respirators, are wearing such respirators.

I. Evaluation of Ventilation Plan and Respirable Dust Control Plan

1. MSHA personnel shall determine whether the operator's ventilation plan or respirable dust control plan, as applicable, provides sufficient controls to reliably and consistently protect each miner from exposure to concentrations of respirable coal mine dust that exceed the applicable standard. MSHA may determine that a plan is inadequate, even if the operator has not been cited for an excessive concentration of respirable dust when there is a reasonable basis to conclude that, if the mine operated in accordance with the minimum plan parameters, one or more miners would be exposed to concentrations of respirable dust exceeding the applicable standard. If a review of the operator's ventilation plan results in a determination by MSHA that it is inadequate to control dust, the District Manager will send written notification to the operator that changes are needed in the plan. The notice will identify the reasons(s) why such changes are needed, afford the operator an opportunity to meet with District personnel to discuss any proposed changes, and set a reasonable time for the operator to submit revised plan provisions to the District.

   If the operator fails to respond within the time provided, or if the District and operator discuss the plan but cannot resolve the differences and the operator does not submit a revised plan, the District Manager will send a second written notification to the operator. This notification shall (1) inform the operator that the District continues to be unable to approve the plan with the existing provisions, (2) specify a time by which suitable plan provisions must be submitted by the operator to the District, and (3) make it clear that, if suitable provisions are not submitted, approval of the plan in its present form will be revoked and the operator will be without the required approved plan. Operating after the revocation date is a violation of the standard requiring the approved plan.

2. When MSHA-collected respirable dust samples that are determined to have greater than 100 micrograms per cubic meter of air (100 $\mu g/m^3$) of quartz present, the following actions should be considered in securing a revised ventilation plan or respirable dust control plan:

a. Mining Machine with Scrubber:

1) Use of at least a 30-mesh screen.
2) Adjust the ventilating air quantity to no more than 1000 CFM greater than the scrubber quantity in the working place when using blowing ventilation.
3) Remove the "Deep-Cut" provisions. Permit tubing/curtain set-back incrementally so that MSHA can sample to determine that miners are not exposed to quartz levels greater than 100 $\mu g/m^3$. MSHA samples must reflect normal mining activity and include those activities that would result in the greatest dust levels such as advancing to the deepest point of penetration in the plan, turning crosscuts, mining on side of section opposite the return and cutting top or bottom.
4) Clean scrubber duct each day or shift.
5) Clean scrubber screens each cut as a minimum.
6) Add additional checks of scrubber air quantity and condition of screen and ductwork.
7) Increase CFM at the end of the line curtain if using blowing ventilation. Increase Mean Entry Air Velocity (MEAV) requirement if using exhaust.

b. Roof Bolting Machine:

1) Specify type of bits to be used in the plan.
2) Reduce the amount of time that roof bolting can be done downwind of continuous miner in the plan.
3) Increase the ventilating air quantity specified in the plan when the roof bolter is being operated.
4) Reduce curtain setback distance specified in the plan when the roof bolter is being operated.

c. Other Areas/Occupations:

1) Review ventilation plan or respirable dust control plan to determine if additional controls will reduce quartz levels. Identified improvements will be specified in the plan.

J. Additional Sampling Requested of the Operator §70.208(a)

If information indicates that a mine operator has not followed the approved ventilation plan for an MMU, §70.208(a)(1) provides that the District Manager may require the operator to submit 15 additional samples for the DO. Additional sampling may be

required when there are deviations from the specified dust control measures such as:

- curtain not hung
- 50% or less of water sprays working
- water pressure 50% or less of plan requirements
- less specific plan parameter quantities but multiple deviations of reduced plan parameters.

The additional sampling under §70.208(a)(1) is intended to ensure that miners are provided protection from overexposure to respirable coal mine dust.

K. Additional CPDM Checks Requested of the Operator, §§70.205, 71,205, 90.205

Routine monitoring of dust concentrations during the sampling shift is important. It ensures that MSHA, mine operators, and miners know the dust concentrations where samples were taken so that timely corrective action can be taken. Sections 70.205(c), 71.205(c), and 90.205(c) require that when a CPDM is in use, the person certified in sampling must monitor the dust concentration being reported by the device at mid-shift or more frequently as specified in the operator's approved mine ventilation plan or respirable dust control plan. More frequent monitoring should never be accepted as a stand-alone corrective action for overexposure. Specifying the monitoring frequency as part of the approved ventilation plan or respirable dust control plan will allow the District Manager to assess the need, if any, for more frequent monitoring of dust concentrations on a mine-by-mine basis.

L. Compliance Assistance

Following the procedures outlined in section G. when sampling additional shifts, the inspector must offer compliance assistance to mine operators and miners as part of an overall enforcement strategy to achieve a healthier work environment for all miners on all shifts. The type and level of compliance assistance to be offered will depend on the frequency and the gravity of overexposures measured, the mine's compliance history, the specific help requests by either the operator or miner(s), and the willingness of individual operators and miners to work with MSHA to resolve identified overexposures and achieve and maintain compliance on a continuous basis. Examples of the types of compliance assistance to be made available include:

1. Assisting in determining the cause(s) of identified overexposure(s) and in sharing information on available dust controls and "best practices" to implement what are designed to protect miners on all production shifts. This is the standard practice whenever an inspector returns to the mine to conduct additional sampling.

2. Offering educational and training expertise and aids aimed at: improving and reinforcing operator and miner awareness of the health hazards associated with exposure to excessive concentrations of respirable coal mine dust including and quartz the "best practices" available to address those hazards on a continuous

basis, and the importance to implement and maintain these practices on each shift to make the work place healthier. In certain circumstances, it may be necessary to provide "one-on-one" training to help operators and miners better understand their individual responsibilities in achieving and promoting a healthier workplace.

3. Encouraging the operator or miner(s) to seek the assistance of MSHA's Technical Support Division to achieve a workplace that is free of excessive dust when efforts by the inspector and operator fail to correct the cause of overexposures. This assistance can be in the form of a consultation visit involving the sharing of technical knowledge or an in-mine visit if necessary due to the complexity of the particular circumstances. The latter will enable MSHA personnel to identify the various dust-generating sources in the workplace that may be causing miners to be overexposed, quantify the amount of respirable dust generated by each source, identify potential solutions, and, if requested, assist the operator in evaluating the effectiveness of efforts to achieve and maintain compliance on a continuous basis.

M. Selecting Designated Occupations (DOs)

The DO is specified in Section §70.208(b).

N. Establishing Designated Areas (DAs), Other Designated Occupations (ODOs), or Designated Work Positions (DWPs)

In some instances after completion of a sampling inspection, it may be necessary to establish additional DAs, ODOs, or DWPs for operator sampling in order to ensure the health of miners working in the affected area, occupation, or position. The following procedure must be used to ensure that the work occupation, area or position is properly designated.

1. After each respirable dust sampling inspection, the results must be reviewed to determine if additional sampling entities should be established.

   a. When a sample of an entity that is collected by the inspector **exceeds 50% of the applicable standard** and the entity is not protected by dust control measures that are in place at another similar entity, the District Manager should consider establishing a DA, ODO or DWP.

   b. When an MMU uses belt air to ventilate the face areas, a DA shall be established in accordance with §75.350(b)(3)(i-iii), unless already required by a petition for modification. The intake air coursed through a belt conveyor haulage way shall be sampled at a location as stipulated in the petition for modification allowing the use of belt air or as stipulated in §75.350(b)(3)(i-iii). The DA sampling locations shall be maintained continuously during the sampling shift within the stated area.

2. When a new DA, ODO or DWP is to be established, the District Manager or his/her authorized representative must notify the mine operator in writing and identify the following:

   a. the cassette number and sample concentration and, if applicable, the quartz percentage of the cassette(s) used to establish the entity as a DA, ODO, or DWP;

   b. the code the mine operator must use to identify the sample type for sampling purposes (Item 9 on dust data card) which shall be “Type 2” for ODO, “Type 3" for DA and “Type 4" for DWP samples;

   c. the codes the mine operator must use to correctly identify the MMU/DA/SA/ODO entity in question (Item 10 on dust data card) as listed below or as designated by the district:

ODO Codes (Sample Type #2)

00x-1 –- 00x-9 Face Haulage and Labor/Other
900-0 -- 999-0 Roof Bolter Operators (Regulation)
900-1 -- 900-9 Roof Bolter Operators (DM Established)

DA Codes (Sample Type #3)

100-0 -- 199-0 Track Haulage
200-0 -- 299-0 Belt Area
300-0 -- 399-0 Trackless Haulage
400-0 -- 499-0 Shops
500-0 -- 599-0 Section Dumping Points
600-0 -- 699-0 Rotary Dumps and Crushers
700-0 -- 799-0 Miscellaneous
800-0 -- 899-0 Intake Air

DWP Codes (Sample Type #4)

001-0 -- 099-0 Surface Mines
900-0 -- 999-0 Surface Area UG Mines

d. the occupation code the mine operator must use to identify the DWP (Item 11 on dust data card);

e. the date that quarterly sampling must begin for the newly established entity. Newly established entities typically have an effective date of the first day of the next quarter.

f. the need for the mine operator to submit a short addendum to the approved ventilation plan or dust control plan that shows the location of the new DA, ODO, or DWP to be sampled quarterly, the position of the sampling unit, and the type of dust controls that are to be maintained.

3. Enter the required information in the computer using MSHA Form 2000-142. The entity should be placed in producing status effective on the first day of the next quarterly sampling period. If the newly established entity is an intake air DA on a 1.0 mg/m^3 (.5 mg/m^3 beginning August 1, 2016) dust standard, Item 7B on MSHA Form 2000-142 shall be marked "Yes."

Example:

A sample is taken on the highwall drill helper occupation operating under a reduced dust standard due to quartz and the sample exceeds the reduced standard. The highwall drill operator is a DWP (i.e., 001-0 384) and his or her duties require that the drill rig be operated from within the cab of the machine. Therefore, the operator is not exposed to the respirable coal mine dust including quartz. However, the highwall drill helper occupation is exposed to the dust and should be established as a DWP (i.e., 002-0 383).

4. When establishing a new DWP, the DWP ,must be established with the appropriate DWP number, identification of the occupation code and completion of the location description. The location description shall establish the type of work that the occupation must be performing while monitoring the DWP.

Example:

A bulldozer operator (occupation code 368) is determined to be exposed to 1.705 mg/m^3 of respirable dust and has a quartz level of 10.0% while performing the task of pushing rock at a surface mine. The DWP must have a reduced standard of 1.0 mg/m^3 and would be established as:

DWP:	001-0
Occupation Code:	368 - Bulldozer
Location:	S/N 123456 coal stockpile

The DWP must be tied to a specific piece of mining equipment via the serial number or company number. The conditions that resulted in the need to establish the DWP must be the primary determinate of the location where to monitor the potential exposure.

Example of multiple pieces of equipment:

A haul truck driver is exposed to 1.607 mg/m^3 respirable dust while hauling coal from the pit to the preparation plant in truck # 555. There are 4 additional haul trucks that haul coal from the pit to the preparation plant. The other truck drivers are not exposed to dust concentrations exceeding 50% of the applicable standard. The DWP should be established as:

DWP:	001-0
Occupation code:	376
Location:	Truck driver hauling pit to plant Co. truck #555

If truck #555 is removed from the mine property, the DWP will be changed to another truck of a similar kind or abandoned at the District Manager's discretion.

O. Removing or Withdrawing DAs, ODOs, or DWPs from Sampling Status

At times it may become necessary, on a mine-by-mine basis, to withdraw a designation from an underground work area or occupation or surface work position that had been previously established by the District Manager. To ensure that the proper work areas, occupations, or work positions are removed from quarterly sampling and that miners are not being overexposed, use the following procedures:

1. Withdrawal/Removal of an outby DA:

   a. area has been abandoned or sealed
   b. the dust generation source that caused the establishment of the DA has been removed and will not be replaced (i.e. mining has been completed and conveyor belt removed).
   c. active outby DAs must not be considered for withdrawal from sampling status.

2. Withdrawal or removal of a DWP:

   Only DWPs designated by the District Manager for sampling under §71.206(c)(3)

may be considered for withdrawal.

a. based on the results of MSHA and operator valid respirable dust samples taken in the 12 months immediately preceding the request, for the entity in question, showing that all samples are below the applicable standard
b. work area or position has been removed from the mine property and will not be replaced (abandoned)

3. Factors District Managers should consider in withdrawal or removal of an ODO (beginning February 1, 2016) includes:

a. only ODOs designated by the District Manager under §70.208(a)(2) may be considered for withdrawal
b. based on the results of MSHA and operator valid respirable dust samples taken in the 12 months immediately preceding the request, for the entity in question, showing that all samples are below 50% of the applicable standard
c. work area or position has been removed from the mine and will not be replaced (abandoned)

4. When a designation has been withdrawn or removed from sampling, complete MMU/DA/DWP/ODO form (MSHA Form 2000-142), and enter the required information in the computer. This is to update the sampling status of the entity and prevent the computer from generating erroneous "Failure–to-Sample" advisories for the entity in question. Therefore, if the DA, DWP or ODO is no longer required to be sampled due to sampling results, the entity shall be placed in "D" status (Sampling not required) by checking Item 6D on the form. If the DA, DWP or ODO is no longer required to be sampled due to abandonment, the entity shall be placed in a "C" status (abandoned) by checking Item 6C on the form.

5. All entities in "D" status will continue to be sampled by inspectors during regular quarterly/semi-annual inspections.

P. Establishing a Reduced Respirable Dust Standard

In some cases, it may be necessary to establish a reduced standard for an entity when a respirable dust sample contains more than 100 µg/m³ quartz. The following procedures apply.

1. The following inspector samples must be analyzed for quartz:

a. those with at least 200 µg weight gain collected from the environment of a DO, DA,ODO, DWP, NDE, or Part 90 miner; and

b. those with at least 100 µg weight gain collected from these occupations, positions, and Part 90 miners

MSHA will use a single, full-shift measurement of respirable coal mine dust to determine the respirable dust concentration to which a miner is exposed.

Each operator shall continuously maintain the average concentration of respirable dust when quartz is present 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/m³ (100 µg/m³) as measured with an approved sampling device.

When the concentration of respirable quartz dust in an MSHA single sample exceeds 100 µg/m^3, MSHA will reduce the applicable respirable dust standard according to the formula of 10 divided by the percent quartz. This calculation must never result in setting a standard greater than the standard set by §§ 70.100, 71.100 or 90.100, whichever applies. Only MSHA samples will be used in determining quartz levels.

Example: Assume the sampled DWP, NDE, DA, or ODO is on a 1.5 mg/m³ dust standard due to a quartz analysis of 7%. Suppose a valid representative dust sample with a concentration of 1.09 mg/m³ contains 16.7% quartz dust, which corresponds to a quartz concentration of 182 µg/m³. Using the formula, the average concentration of respirable dust in the mine atmosphere associated with that entity shall be maintained on each shift at or below 0.9 mg/m³. (7% + 16.7% ÷ 2 = 11.85% truncated to 11.8%)(10/11.8 = .84 round up to 0.9 mg/m³)

2. When MSHA collects respirable dust samples from DOs, DAs, ODOs, DWPs, Part 90 miners, and NDEs that are already on a reduced dust standard, the applicable standard must be adjusted in the following manner:

   a. Each sample must be analyzed. If the sample contains more than100 µg/m³ quartz, the sample must be used to determine the new applicable standard by averaging the results of the current sample with the previous sample to establish the new reduced standard.

   b. If the sample being analyzed contains 100 µg/m³ or less quartz, the applicable standard for the entity must be reset to the standard in §§ 70.100, 71.100 or 90.100, whichever applies, prior to any reductions.

3. When a mine operator or miners' representative requests a quartz reevaluation based on but not limited to justification listed in paragraph P.5. (below) and MSHA elects to conduct such reevaluation, the inspector must first determine if the applicable dust standard has been exceeded in accordance with Section IV.G.

of this chapter before submitting the sample for quartz analysis. If the entity is in citation processing, the violation must be abated before the entity can be sampled by MSHA. When sampling for quartz purposes, the inspector should collect samples not only from the occupation(s) originally requested but from other occupations that normally would be sampled during a respirable dust spot inspection.

4. When an MMU moves to a new location, the reduced standard and any citations issued for exceeding the reduced standard move with the entity. The following examples address some situations that may occur as sampling results are received and entities move to new locations.

   a. An MMU operating in location 1 under a reduced standard and moves to location 2 (for example, 3000 feet away). The reduced standard remains in effect on that MMU in location 2. If subsequent sampling by the operator indicates a violation of the reduced standard at location 2, the inspector issues a citation. However, when sampling by MSHA indicates a violation, the inspector shall refer to paragraph G.2. of this chapter.

   b. An MMU is operating in location 1 under a reduced standard and a citation is in effect. Mining is completed in location 1 and the MMU moves to location 2 (for example, 3000 feet away). The citation remains in effect until the violation is abated.

5. Reevaluation of an entity's airborne quartz levels may become necessary because of the following.

   a. **Changing conditions** - such as cutting more or less roof or bottom, variation in the coal seam parting, etc. - have resulted in increased or decreased quartz content.
   b. **Improved dust controls** - mine operator requests MSHA to resample because of improved mining methods, ventilation controls, or engineering controls.

6. During the reevaluation, the inspector should look for possible sources that may be the cause of the excessive quartz and include this in the inspection notes along with other information on the types of controls in use and mining conditions being encountered. This can be used to compare operating conditions observed in subsequent surveys.

Q. Excessive Concentration Values Table 1-1

Table 1-1 EXCESSIVE CONCENTRATION VALUES (ECV) BASED ON SINGLE, FULL-SHIFT CMDPSU/CPDM CONCENTRATION MEASUREMENTS

Applicable Standard (mg/m^3)	ECV (mg/m^3)	
	CMDPSU	CPDM
2.0	2.33	2.26
1.9	2.22	2.15
1.8	2.12	2.04
1.7	2.01	1.92
1.6	1.90	1.81
1.5	1.79	1.70
1.4	1.69	1.58
1.3	1.59	1.47
1.2	1.47	1.36
1.1	1.37	1.25
1.0	1.26	1.13
0.9	1.16	1.02
0.8	1.05	0.91
0.7	0.95	0.79
0.6	0.85	0.68
0.5	0.74	0.57
0.4	0.65	0.46
0.3	0.54	0.34
0.2	0.44	0.23

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