F. Other Information

Please provide any other data or information that may be useful to MSHA in evaluating miners' exposure to harmful diesel exhaust emissions, including the effectiveness of existing control mechanisms for reducing harmful diesel emissions and limiting miners' exposures to harmful diesel exhaust emissions.

General comments on other information:

a) One commenter described ventilation as an important control. This commenter described the use of calibrated air monitoring devices and engineering techniques to select and develop ventilation flow patterns to remove the largest amount of air pollutants, and stated that sufficient ventilation would also benefit employee productivity and morale. This commenter noted the importance of including wording in the regulation that allows for improvements to be made without having to endure the entire process for a formal rule change. The commenter stated that this could be accomplished through a general duty clause and enforced through worksite inspections, with employers having a total understanding of their responsibilities.

b) A second commenter described a mine that manages the number of diesel-powered plant into ventilation splits by diesel-tag-boards. The regular review of tag board allocation and their placement is required to ensure compliance as the mine develops; this ensures optimum placement and setting of diesel-tag boards to improve DPM dilution efficiency. Further controls are applied through integrated planning detailing vehicle allocations in the panels, and job setup with consideration of vehicle exhaust to reduce exposure.

c) This second commenter described diesel exhaust fluid addition, in which a urea solution is added to the raw exhaust. This allows an over stoichiometric fuel mixture to be used, which results in a cleaner burn, but increases nitrogen oxides formation. The urea solution converts the nitrogen oxides to nitrogen and water.

d) This second commenter also described fitting underground equipment with over speed protection to prevent over revving, with testing every 28 days to ensure the maximum allowable revs are within OEM specifications. This commenter noted that these machines do not have a protection device for limiting idling which creates an opportunity for improvement through culture and compliance.

e) A third commenter described extensive use of electric-powered machinery in a MNM mine. Electrical-powered equipment is used to mine ore at faces, transport it over miles via conveyors, hoist the ore up central shafts to the surface, and ventilate the mine, which is gassy. Use of diesel-powered equipment depends on several factors, including the tasks, engine efficiency, and horsepower needs.

Diesel equipment is used primarily to transport personnel and material from the bottom of the shafts to the mine's working faces and in support operations. This commenter also offered a critique of the Diesel Exhaust in Miners Study (DEMS). [Comment].

f) A fourth commenter discussed improvements in controls since 2001. This commenter stated that exhaust filters and alternative fuels such as biofuels were only emerging technologies in 2001, and it took several years for all stakeholders to gain experience, through trial and error, until parties gained confidence in their use. This commenter noted that based MSHA inspection data from 2006 to 2015, the average DPM exposures of MNM underground miners have decreased by 57 percent.

g) A fifth commenter stated that MSHA should update Table 57.5067-1 to require that the most up-to-date Tier 4 engines be used in underground MNM mines because it is outdated, and it is now feasible for the MNM mining industry to comply with Tier 4 engine DPM standards. This commenter noted that, since the 2001 rulemaking, significant advances have been made in diesel engine and exhaust after-treatment technologies. [Comment].

h) This fifth commenter noted that MSHA's RFI indicates that 66 percent of diesel engines operating in underground coal mines are classified as light-duty equipment, but that, under 72.502, MSHA only requires light-duty equipment engines to meet one of the following outdated requirements: 5.0 gr/hr of DPM; DPM requirements equivalent to the EPA non-road Tier 2 standards; or EPA's 1986 DPM standards for highway vehicles. This commenter noted that current diesel engine technology can reduce DPM emissions well beyond what these standards require, and that all other non-road diesel engines produced today and installed in new equipment are required to meet EPA Tier 4 standards. This commenter stated that Tier 4 DPM standards are approximately 90 percent cleaner than those for Tier 2 engines, and that many of MSHA's approved engines under Part 7 have DPM emissions greater than a Tier 2 standard. This commenter noted that, if MSHA fails to revise Table 72.502-1, mine operators have no incentives to introduce the most modern diesel engines and after-treatment technologies that are available for their light-duty equipment fleet.

i) A sixth commenter submitted several published resources to the docket, including a book reference for Internal Combustion Engine Fundamentals (1988), a reference for the North American Mine Ventilation Symposium (2012), and an article on test procedures and quality standards (such as the Swiss SRN 277 205 standard) for vehicle exhaust particle filters (2009). [Calizaya 2012], [Heywood 1988], [Mayer 2009].

j) A seventh commenter stated that MSHA research regarding health effects of diesel exhaust did not include research that is relevant to underground coal

miners, that existing fleets provide superb protection for underground coal miners, and that new regulations simply are neither necessary nor feasible. This commenter noted the enormous amount of ventilated air used in coal mines, which dilutes and sweeps diesel exhaust away from underground coal miners nearby diesel-powered engines. This commenter stated that the carbon content of diesel exhaust cannot be accurately measured in underground coal mines because coal itself is virtually pure carbon.

k) This seventh commenter noted that MSHA has received other pleas urging the revision of the current diesel rules, and stated the intent to file a Freedom of Information Act (FOIA) request with the agency to obtain these and other relevant communications and records. This commenter also noted that NIOSH is at work on a diesel exhaust risk assessment (DERA), and the expectation that the DERA team will fully adhere to and abide by landmark public rulings on what dates and how often the DERA may be subject to public review and comment.

l) This seventh commenter also submitted a statement noting that: the coal mining industry is under severe financial stress, MSHA must consider economic feasibility, MSHA must consider the latest scientific evidence, and referencing a critique of the health effects literature by consulting toxicologist Roger O. McClellan.

m) Two commenters submitted a copy of a June 2012 letter to Joseph Main (Assistant Secretary of Labor for MSHA) recommending that MSHA take action in response to the National Cancer Institute 2012 publication of epidemiologic studies assessing mortality risk for diesel-exposed underground miners, and 2012 IARC classification of diesel exhaust as carcinogenic. This letter recommended that MSHA prepare and disseminate a simple annual report describing inspector sampling results for total carbon (TC) and elemental carbon (EC) at underground mines, and the current control measures used in the work area where the samples were collected. The letter stated that this information would help the public assess whether mine operators have implemented all feasible controls and remind the public that the concentration of DPM permitted by MSHA's health standard is not a safe exposure level, but was based on feasibility at the time the rules were published. The letter also recommended that MSHA conduct exposure monitoring at surface mining operations and prepare an annual report summarizing DPM exposure findings for the surface miners not covered by MSHA's DPM regulation. This letter stated that without opportunity for comment, MSHA dropped several requirements of those standards for underground MNM mines that would protected these miners, and that the two recommendations made above will help assemble the evidence for what additional regulation of this hazard is warranted and feasible to protect miners in this sector, including surface miners and contractors servicing surface mines. This letter is also discussed under section C. [2012 letter].

F2. Diesel Emissions Partnership

Four commenters discussed a proposed a diesel emissions partnership, and three described the MNM industry diesel emissions task force. Two submitted comments on the proposed charter for the partnership:

a) One commenter noted that there can be major differences between mines, even among those mining the same commodity. There can be major differences in access, vault height, availability of ventilation, risks from other airborne materials, and size of equipment that is used in the mine. This commenter stated that these differences mean that MSHA must proceed thoughtfully in considering new DPM standards for metal/non-metal underground mines, and must take into account the experience of operator and labor stakeholders, and that the planned partnership is the best way to achieve this level of communication.

b) A second commenter stated that his organization is pleased to engage in a partnership process on DPM, and described other collaborative efforts with NIOSH, and with MSHA through an Alliance program on education and training. This commenter noted decreases in DPM achieved in his industry due to technology, ventilation, and age and maintenance of equipment.

c) A third commenter stated that these questions are not only extraordinarily technical, but also may be best addressed by working with the manufacturers of diesel engines and suppliers of mining equipment. This commenter noted that there have been substantial improvements in diesel engine technology and exhaust after-treatment systems over the past quarter century, which largely were driven by the Environmental Protection Agency's (EPA) diesel engine standards. Engine and equipment manufacturers would be much more familiar with those changes than mine operators. This commenter proposed that MSHA and NIOSH work with the mining industry (both metal/nonmetal and coal), diesel engine manufacturers, diesel mining equipment manufacturers, and representatives of organized labor to form a Diesel Exhaust Health Effects Partnership to address these complex issues and reach consensus on the path forward. This commenter described the Diesel Emissions Task Force, which was formed approximately one year ago. The commenter explained that this group is made up of operators of underground mines producing trona, calcium carbonate, industrial sand, and wollastonite, some of whom volunteered to participate as study mines in the Diesel Exhaust in Miners Study (DEMS) conducted by the National Institute for Occupational Safety and Health (NIOSH) and the National Cancer Institute (NCI). This commenter stated that these technical questions may be best addressed by working with the manufacturers of diesel engines and suppliers of mining equipment, and requested that MSHA and NIOSH form a Diesel Exhaust Health Effects Partnership with the mining industry, including both coal and metal/nonmetal mines, diesel engine manufacturers, and representatives of organized labor. This commenter noted that some of the

information MSHA requested in the RFI could contain confidential business information. This commenter stated that the Task Force believes the RFI has truly set the stage for the Partnership to engage with a large audience of expert private sector stakeholders and MSHA and NIOSH experts in an informal iterative process likely to result in a work-product that will provide the basis for any additional regulation (if any) of the exposure of underground MNM miners to diesel exhaust. This commenter stated the expectation that: (a) the [MSHA and NIOSH] would draft a protocol or charter for the Partnership, which would then be available for review and comment by private sector partners before being finalized; and (b) especially from MSHA's point of view, it would be expected the Partnership would be able to develop regulatory recommendations, if any, for consideration by MSHA in around two years from its first meeting next month. That time-line would not affect the life of the Partnership, as the Partnership will likely continue to work on useful research about diesel exhaust health effects.

d) A fourth commenter described the mission of the MNM industry Diesel Emissions Task Force, to function as a forum for mine operators to learn as much as possible about the health effects of diesel exhaust, especially its carcinogenic potential, to protect members' employees in their occupational settings.

e) A fifth commenter, representing underground coal mines, strongly supports the partnership, and plans to actively participate. This commenter also noted that they plan to collaborate with the MNM Diesel Task Force, for example by offering mine tours and educating the task force about the underground coal mining industry.

f) Two commenters submitted joint comments on the proposed charter for the partnership. They proposed adding language stating that:
    - The partnership is neither constituted to carry out negotiated rulemaking nor to function as a federal advisory committee;
    - The partnership would address issues relating to economic and technological feasibility;
    - Consensus would be desirable, but not necessary;
    - Consideration should be given to establishing working groups to address specific issues such as health effects, and technological issues such as engines, after-treatment, ventilation, maintenance, and training.

F3. Low Sulfur Fuels, Additives

Two commenters discussed low sulfur fuels and fuel additives. One comment regarding biodiesel fuel is also included here (most comments regarding use of biodiesel are summarized under question 27, comment code E1):

a) One commenter stated that use of low sulfur fuels is already in place, and that the use of low sulfur fuels coupled with fuel additives will impact exhaust quality. This commenter also stated that sulfur content should be tested periodically for consistency and accuracy, and that, because distributors receive their fuel from different sources and the quality or composition may fluctuate, regulated testing of diesel fuel is important.

b) A second commenter, at a non-U.S. mine, described use of Ultra Low Sulfur Diesel (ULSD) which contains no more than 7 parts per million of sulfur, suitable for use with after treatment devices. This commenter stated that regular fuel, lubricant, air, and coolant audits are conducted to ensure the quality of the fuel and the fuel handling systems. Fuel delivered to the operation is filtered between the delivery truck and bulk storage and filtered again when taken from that tank to vehicle top up tanks. Maintenance programs ensure the filter systems are clean and functioning correctly. This commenter also explained that engine oil is low SAPS (sulfated ash, phosphorous and sulfur) oil which is specifically designed to be used in modern turbo engines, particularly those fitted with diesel particulate filters.

c) A third commenter discussed biodiesel. This commenter cited studies showing that biodiesel requires less energy to produce, is much less toxic to humans and can reduce our dependence on foreign fuel supply, create domestic manufacturing jobs and reduce CO_2 emissions into our atmosphere. This commenter stated that biodiesel contains 11% oxygen which allows the fuel to burn more completely leaving less toxic gases in the air. This commenter noted that biodiesel, like regular diesel fuel, must be stored in a clean, dry, dark environment and should not be exposed to temperature extremes. Over time, biodiesel will degrade certain types of natural rubber compounds and elastomers, so fuel pump seals and other storage or distribution equipment might leak if they contain these compounds. [Comment]

d) A fourth commenter submitted a published study reviewing combustion products of renewable fuels. [Westphal 2013].