



NATIONAL STONE, SAND
& GRAVEL ASSOCIATION

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Re: RIN 1219–AB36
Docket No. MSHA–2023–0001

On July 13, 2023, The Mine Safety and Health Administration (MSHA) published a proposed rule, “Lowering Miners’ Exposure to Respirable Crystalline Silica and Improving Respiratory Protection.” The National Stone, Sand and Gravel Association (NSSGA) and our member companies have carefully reviewed and analyzed the proposed standard. We respectfully submit the following comments, which include issues, recommendations, and most importantly, rationale backed by research and data.

NSSGA represents the nation’s crushed stone, sand and gravel (aggregates) companies, industrial sand companies and the manufacturing and services providers who support the industry. NSSGA has over 450 member companies and represents over 9,000 operations with over 100,000 employees. Furthermore, according to MSHA data, in 2022 there were roughly 12,500 mines in the US and over 75% are aggregate or industrial sand facilities, meaning aggregates make up three quarters of MSHA’s entire portfolio.

Many NSSGA companies have significant experience managing occupational exposures to silica, including relevant experience in industrial hygiene sampling, medical surveillance, training, the use of respiratory protection and other issues relevant to the MSHA Silica Standard. NSSGA staff and member company health and safety personnel have worked with MSHA and NIOSH Mining for decades on projects to advance practical solutions to reduce silica exposures, e.g., helmet-CAM and EVADE technology, clothes cleaning booths, and enclosed cab filtration and pressurization, just to name a few. NSSGA has been a member of the NIOSH Mine Safety and Health Research Advisory Committee (MSHRAC) through member company and association staff for over a decade. NSSGA industrial sand company personnel co-authored the NIOSH and IMA-NA “Dust Control Handbook for Industrial Minerals and Processing.”¹ NSSGA member companies have made their dust sampling and medical

¹ NIOSH [2019]. Dust control handbook for industrial minerals mining and processing. Second edition. By Cecala AB, O’Brien AD, Schall J, Colinet JF, Franta RJ, Schultz MJ, Haas EJ, Robinson J, Patts J, Holen BM, Stein R, Weber J, Strebel M, Wilson L, and Ellis M. Pittsburgh PA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 2019–124, RI 9701.
<https://doi.org/10.26616/NIOSH PUB2019124>



surveillance data available to researchers to further the science on silica health effects, which has led to the publication of several important data-supported articles². The industrial sand members of the NSSGA, through their prior organization, the National Industrial Sand Association, published a comprehensive occupational health program for silica in 1977, updated in 2010³, which included a medical surveillance program, and NSSGA has had an occupational health program document for its members for over 10 years. We have included these resources— and others referenced throughout our comments— as part of our submission for the record for MSHA’s review and request the agency considers them during creation of the final rule.

Due to the number of aggregate and industrial sand facilities in the US and their tens of thousands of workers who will be affected by this rule, the significant percentage of MSHA’s total portfolio comprised of aggregate and industrial sand facilities, and extensive industry experience with controlling silica exposures and conducting medical surveillance programs, we ask that the consideration given to our comments is commensurate with these facts.

I. SUMMARY OF NSSGA RESPONSE TO THE PROPOSED SILICA RULE

First and foremost, NSSGA does not oppose MSHA’s proposed reduction of the permissible exposure limit (PEL). We support the issuance of the rule and have long stated that while we believe the current PEL is protective of workers when strictly complied with, we will not challenge the decrease of the current PEL from 100 µg/m³ to 50 µg/m³. Our comments will focus on the ancillary provisions of the proposed rule, primarily sampling and medical surveillance. We believe there are simpler, science-based, and industrial hygiene-backed sampling and medical surveillance practices that are equally protective of worker health and direct finite resources (e.g., lab analysis capacity, B Readers, the time and focus of operator personnel, costs, etc.) where they are most needed.

NSSGA’s position and recommendations are simple: MSHA’s proposed rule is overly prescriptive, does not apply sampling practices in a manner that prioritizes risk, is not based on industrial hygiene best practices, and directs finite resources where they are not necessary to the detriment of the whole industry. We strongly recommend MSHA adopt a standard like OSHA’s silica standard for MNM. OSHA’s standard includes a performance-based option for exposure assessment, a less prescriptive scheduled monitoring option, and bases medical surveillance on workers’ actual exposures, or lack thereof. These key provisions (in addition to other OSHA provisions discussed below) offer increased flexibility for operators and protect workers’ health. Furthermore, they will not vastly overburden accredited labs, medical facilities, or B Readers, and will not drive small operations out of business.

Our key issues and recommendations are outlined in this summary section. Following, we respond to many of MSHA’s 43 questions posed in the preamble and provide supporting data and analysis.

1. *Include an applicability threshold.*

MSHA should adopt a provision similar to OSHA’s general industry standard, which states that the standard does not apply when an employer has data demonstrating employee exposures will remain below the action level under any foreseeable circumstances. MSHA did not include a provision similar to this in its proposed silica standard. Some MNM operations will never expose workers to potentially harmful levels of respirable crystalline silica, for example those whose geology contains no silica or dredge operations where material is wet throughout the entire process.

² See, e.g., Vacek, PM et al. Exposure-response Relationships for Silicosis and its Progression in Industrial Sand Workers. *Scand J Work Environ Health*. 2019; 45(3):280–288. doi:10.5271/sjweh.3786

³ Occupational Health Program for Exposure to Crystalline Silica in the Industrial Sand Industry. Second Edition, 2010 National Industrial Sand Association

MSHA's silica standard should not apply to such operations. The application of the silica standard to operations at which employee exposures will remain below the Action Level (AL) under any foreseeable circumstances does not advance miner health, but rather diverts time, attention, and resources away from other health and safety matters (e.g., training, fatality prevention); furthermore, samples from these operations and inclusion of workers in medical surveillance will cause unnecessary backlogs and delay results for operations where silica exposures do exist.

2. *Keep the PEL at 50 $\mu\text{g}/\text{m}^3$ and action level of 25 $\mu\text{g}/\text{m}^3$.*

We do not oppose the proposed PEL of 50 $\mu\text{g}/\text{m}^3$ or the action level of 25 $\mu\text{g}/\text{m}^3$. However, we do have concerns with current sampling practices and labs' ability to measure low concentrations of silica consistently and accurately at 25 $\mu\text{g}/\text{m}^3$. Additionally, we do not believe that a systematic review of the literature concerning silica health effects supports the conclusion that a material risk of adverse health effects exists at exposures below 50 $\mu\text{g}/\text{m}^3$.

3. *Add a performance-based sampling option; use OSHA's scheduled monitoring (with a caveat); add a Table 1.*

MSHA should adopt OSHA's exposure assessment options: the performance-based exposure assessment option and the scheduled monitoring option. Additionally, MSHA should adopt a Table 1, similar to the Table 1 in OSHA's construction standard (discussed in detail below). MSHA should adopt the OSHA provision which requires sampling after changes that may affect exposures. MSHA should adopt these provisions in lieu of the periodic sampling and qualitative assessment provisions in its proposed rule. The introduction of four new categories of sampling is confusing and unnecessary. Many operators and workers are already familiar with the OSHA silica standard through vertical integration (i.e., asphalt, ready mixed concrete, or construction as part of their business) or having aggregate sales yards. Adopting the OSHA standard would protect worker health and simplify work for many employees who often go back and forth between OSHA and MSHA regulated sites. It would also simplify sampling and medical surveillance requirements for these employees. Additionally, under the current proposal, if a worker is sampled repeatedly and each time levels are between 25 and 50 $\mu\text{g}/\text{m}^3$, then, even though exposures are controlled below the PEL, that individual will continually have to be sampled (wear a sampling pump) once every three months for their entire tenure at that job (compared to every 6 months with OSHA). This is not necessary to protect workers' health and is an inconvenience for the worker. It is financially unnecessary for the operator and harmful to the greater sampling system and labs, which will experience a surge and face difficulties servicing the industry and getting samples results back to those who need them most.

4. *Make medical surveillance risk based.*

MSHA should adopt a provision like the OSHA medical surveillance provision, which requires employers to offer medical surveillance to workers occupationally exposed to respirable crystalline silica at or above the action level for 30 or more days a year. We believe that medical surveillance should be offered to workers who exceed a threshold level of silica exposure, rather than it being offered to every miner.

5. *Initial medical exams cannot be completed within 30 days of hire.*

Based on conversations with member companies who currently have medical surveillance programs, operators cannot realistically get medical exams performed and results back within 30 days. Even now, before the influx from thousands of MNM mines implementing medical surveillance programs, operators cannot get a worker's exam scheduled, completed, and results returned in 30 days. The 30-day requirement in the proposal is not necessary to protect worker health given the exposures that exist in MNM, and an initial medical exam taken after 30 days provides an adequate baseline for future comparisons for the same reason. Furthermore, many

operators have probationary periods and MSHA should take this industry norm into consideration relating to the medical surveillance date.

6. *Operators should have flexibility on how to run medical surveillance programs.*

The NSSGA agrees with MSHA concerning the components of the proposed medical surveillance. However, the proposed rule is too prescriptive regarding medical conduct of surveillance, should clarify operators may do more extensive testing, clarify operators can make medical surveillance mandatory, and should allow operators to get limited and pertinent test results. The MSHA proposed rule should not interfere with medical surveillance programs that are more comprehensive than the MSHA proposal in terms of the testing provided and frequency. The MSHA rule should not prohibit mine operators from making participation in medical surveillance a mandatory condition of employment, if the mine operator believes it is warranted. It should not prohibit operators from requiring workers to execute a medical release authorizing the medical surveillance provider to provide the operator with only those records pertaining to the potential health effects of exposure to RCS, including but not limited to, chest x-ray and PFT results. Any time limits applicable to the provision of medical surveillance results to the worker should allow the operator to obtain consensus readings of chest x-rays. Finally, all workers should be on the same rotation (e.g., every 3 years) to minimize logistical challenges like scheduling van services and when miners will be out of work, and MSHA does not further need to provide detail regarding timing, as it does in the proposed rule (every 5 years means a period between 3.5 years and 4.5 years after that last period). Finally, operators must receive results of medical exams pertaining to silica health effects, including the results of the ILO reading of the chest x-ray and the pulmonary function testing results. Without this information, operators cannot make informed decisions on worker placement, jobs, and the efficacy of control measures, which are essential to protect worker health.

7. *Allow for employee rotation.*

MSHA should allow employee rotation as an administrative control as OSHA does in its silica standard. We fully support the implementation of the hierarchy of controls where feasible engineering controls are primary and administrative controls supplementary. Worker rotation is a NIOSH-recommended and industrial hygiene-supported best practice administrative control. Worker rotation is a proven and effective administrative control that protects workers from overexposure to silica. It is an allowed control in OSHA's silica standard and used in other standards such as MSHA's occupational noise exposure standard. The elimination of employee rotation to limit the number of workers exposed to silica flies in the face of MSHA's assumptions stated throughout the preamble that all workers are exposed to some levels of silica. Eliminating worker rotation to limit the number of workers exposed also contradicts the existence of a PEL and its calculation as a time weighted average. A PEL allows for a level of exposure to a substance at issue (in this case, respirable crystalline silica) that MSHA considers to be protective. When a PEL is complied with, and a worker's exposure stays under that permitted level of exposure, then they are deemed by MSHA to be protected. If there was no threshold, then there would be no PEL, or the PEL would be zero— but this is not the case. MSHA has proposed a PEL of 50 µg/m³ that it deems protective of worker health and worker rotation is a proven tool operators must be able to use to achieve exposure levels under the PEL after feasible engineering controls have been applied. Further on this topic, we are submitting as part of our comments articles that support the well-established

existence of a threshold for silicosis and lung cancer^{4 5 6 7 8 9}. Furthermore, worker rotation is sometimes the only feasible control to limit employee overexposure, for instance, when performing periodic or non-routine tasks that involve a potential for exposure, but are not performed often enough or in environments (e.g., confined spaces) that do not allow for engineering controls. Other benefits can also be realized such as ergonomics (i.e., reducing repetitive use injuries) and mental health gained from increasing job engagement.

8. *Temporary respirator use should be explicitly allowed for compliance.*

We agree with MSHA that respirators should not be relied upon as a primary method for controlling exposure to respirable crystalline silica. However, as MSHA notes, there are times where engineering and administrative controls are not feasible and PPE (i.e., respirators) is the only way to keep an employee from being overexposed – for example, during some non-routine maintenance activities, periodic maintenance tasks, or for tasks of limited duration that involve potential elevated exposures for time periods of short term or less than shift lengths. In these *limited and temporary* circumstances, respirators should explicitly be allowed for compliance. In addition to maintenance activities, which often by their nature cannot be controlled through engineering and are temporary, there are other short-term tasks for which respirators should be permitted for compliance, e.g., short-term seasonal bagging operations, which only occur a couple of weeks or a month in a year. To keep operators from simply relying on respirators to achieve compliance, MSHA should require operators to outline within their respiratory protection plan (i.e., proposed section §60.14) their process for determining when respirators will be used.

9. *Both 95 and 99 series respirators should be allowed.*

Regarding non-powered air purifying respirators, MSHA’s proposed standard only allows for the use of 100 series respirators; however, for non-powered air purifying respirators, 95 and 99 series respirators are protective of worker health and should be allowed. NIOSH recognizes that 95 series respirators are protective of worker health in its 2020 A Guide for Respirators Used for Dust in Construction stating, “the most commonly purchased filter types are N95s”¹⁰ and the NIOSH process for approving respirators explicitly permits NIOSH to approve 95 series filters for air-purifying respirators.

⁴Morfeld, Peter et al. “Threshold value estimation for respirable quartz dust exposure and silicosis incidence among workers in the German porcelain industry.” *Journal of occupational and environmental medicine* vol. 56,2 (2014): 123-5. doi:10.1097/JOM.0000000000000092

⁵ Vacek PM, Verma DK, Graham WG, et al Mortality in Vermont granite workers and its association with silica exposure *Occupational and Environmental Medicine* 2011;68:312-318.

⁶Mundt, Kenneth A et al. “Respirable crystalline silica exposure-response evaluation of silicosis morbidity and lung cancer mortality in the German porcelain industry cohort.” *Journal of occupational and environmental medicine* vol. 53,3 (2011): 282-9. doi:10.1097/JOM.0b013e31820c2bff

⁷ Comments of the National Stone, Sand & Gravel Association: Notice of Proposed Rulemaking for Respirable Crystalline Silica 78 FR 56274-56504 (Sept. 12, 2013); 78 FR 65242-65244 (Oct. 31, 2013); 79 FR 4641-4642 (Jan. 29, 2014).

⁸ Mundt, Kenneth A, and Paolo Boffetta. “Extended follow-up of lung cancer and non-malignant respiratory disease mortality among California diatomaceous earth workers.” *Occupational and environmental medicine* vol. 73,1 (2016): 71-2. doi:10.1136/oemed-2015-103235

⁹ Comments of the American Chemistry Council Crystalline Silica Panel: Occupational Exposure to Crystalline Silica; Notice of Proposed Rulemaking, 78 Fed. Reg. 56274 (September 12, 2013); 78 Fed. Reg. 65242 (October 31, 2013); 79 Fed. Reg. 4641 (January 29, 2014). Please see sections II A and B, materials cited within, and exhibits referenced.

¹⁰ Echt, Alan et al. “A Guide to Respirators Used for Dust in Construction.” NIOSH Science Blog. (August 17, 2020). <https://blogs.cdc.gov/niosh-science-blog/2020/08/17/respirators-construction/>

10. *The effective date should be extended for M/NM.*

MSHA should make the effective date of a final rule for MNM operations 24 months after publication in the Federal Register, which would provide time for MNM operations to come into compliance with the new provisions. The implementation period of 120 days is insufficient for all operators to comply. Even with the additional 180 days until sampling is proposed to go into effect, this is insufficient especially for MNM operators new to sampling and medical surveillance. It also does not consider the demand and backlog for industrial hygienists, labs, medical facilities, and B Readers. Furthermore, it does not consider time for operators to plan, purchase, and implement engineering controls or that there could be a surge in demand for various components that puts additional demand on an already strained supply chain. According to MSHA's Mine Data Retrieval System (MDRS), in 2022, there were roughly 12,500 mines in the US and over 300,000 miners. Of those mines, over 11,600 (93%) were MNM, accounting for almost 250,000 workers. Over 80% of aggregate companies have fewer than 25 employees and will likely rely on their insurance companies or industrial hygiene consultants for sampling, and scheduling will be based on priorities outside the control of the mine operator. Currently, most MNM facilities do not conduct medical surveillance, many are unfamiliar with sampling, and numerous operators will have to implement new engineering controls. In contrast, coal operations are already familiar with sampling and medical surveillance and have engineering controls in place, making compliance simpler and faster. Finally, there is a more urgent need in the coal industry to quickly implement the rule. There is no silicosis crisis in MNM^{11 12 13 14} and providing 24 months for compliance will not negatively affect miners' health, but it is essential for compliance.

11. *Operations found knowingly or intentionally violating the silica standard should face severe penalties.*

Based on the testimony of numerous organizations representing coal miners and coal miners themselves, there is concern that coal operators knowingly cheat on sampling, retaliate due to participation in medical surveillance programs, and engage in other deceitful behavior. There is no evidence this occurs in the MNM industry. However, *all* miners throughout the entire mining community deserve healthy workplaces; therefore, we recommend MSHA include severe penalties for operators who are found willfully and intentionally violating the silica standard.

12. *MSHA's economic burden analysis is far lower than reality.*

MSHA's reported economic analysis, which states the rule will not impose a significant economic impact, is incorrect. Furthermore, the cost estimate of \$1,220 per \$1 million in revenue for small operators is a vast understatement of costs to these companies. Based on data from member companies and industrial hygienist consultants, we calculate the annual burden will be far greater than MSHA estimates. The economic burden imposed on mine operators by the proposed rule is exacerbated by requirements that do not further miner health and safety. For example, requiring sampling every 3 months forever for exposures between 25 µg/m³ and 50 µg/m³, requiring that medical surveillance be offered to miners with less than 30 days a year of exposure to

¹¹ E.g., Center for Disease Control. (February 13, 2015). Silicosis Mortality Trends and New Exposures to Respirable Crystalline Silica — United States, 2001–2010. *Morbidity and Mortality Weekly Report*. <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6405a1.htm>

¹² Reilly MJ, Timmer SJ, Rosenman KD. The Burden of Silicosis in Michigan: 1988-2016. *Ann Am Thorac Soc*. 2018 Dec;15(12):1404-1410. doi: 10.1513/AnnalsATS.201802-117OC. PMID: 30188758; PMCID: PMC6787555.

¹³ Michigan State University Department of Medicine. (July 6, 2022). 2020 Annual Report Tracking Silicosis & Other Work-Related Lung Diseases in Michigan. https://oem.msu.edu/images/annual_reports/2020/SilicosisAndOLDS.pdf

¹⁴ Comments of the National Stone, Sand & Gravel Association: Notice of Proposed Rulemaking for Respirable Crystalline Silica 78 FR 56274-56504 (Sept. 12, 2013); 78 FR 65242-65244 (Oct. 31, 2013); 79 FR 4641-4642 (Jan. 29, 2014).

RCS above the action level, requiring baseline sampling even for facilities that have had exposure monitoring for decades, and more. Under the proposed standard, companies will incur millions of dollars in costs that do not benefit miners' health and safety.

13. Contractors and unique circumstances in M/NM need to be considered.

MSHA's proposed standard does not discuss contractors, take into consideration challenges faced by the numerous MNM operations that have employees going back and forth between OSHA and MSHA regulated sites, nor does it address unique challenges that portable operations would face. As we proposed above and will outline in detail in the following section, MSHA should adopt a silica standard similar to OSHA's because it will iron out the numerous issues for contractors, facilities with employees under both MSHA and OSHA, and portable operations.

II. ISSUES

Technological Feasibility of the Proposed Rule

4. MSHA has preliminarily determined that it is technologically feasible for mine operators to conduct air sampling and analysis and to achieve the proposed PEL using commercially available samplers. MSHA has also determined that these technologically feasible samplers are widely available, and a number of commercial laboratories provide the service of analyzing dust containing respirable crystalline silica. In addition, MSHA has determined that technologically feasible engineering controls are readily available, can control crystalline silica-containing dust particles at the source, provide reliable and consistent protection to all miners who would otherwise be exposed to respirable dust, and can be monitored. MSHA has also determined that administrative controls, used to supplement engineering controls, can further reduce and maintain exposures at or below the proposed PEL. Moreover, MSHA has preliminarily determined the proposed respiratory protection practices for respirator use are technologically feasible for mine operators to implement.

Response:

We do not fully agree with MSHA's assertion that the proposed rule is technologically feasible for laboratories to conduct baseline sampling analyses. While MSHA's preamble offers numbers on capacity of three labs, it does not consider increased demand from other industries. In 2020, OSHA issued a new National Emphasis Program (NEP) on Respirable Crystalline Silica, which has increased demand for sample analysis and just this year in 2023, there has been a spotlight on the manufactured stone countertop industry for instances of acute silicosis. California is currently pursuing an Emergency Temporary Standard (ETS) which will increase demand for analysis that MSHA has not considered.

Additionally, MSHA asserts that, "laboratories could acquire additional instrumentation, train additional analysts, or add a second or third operating shift." While a logical assumption, we do not believe it is practical in the nation's new workforce culture. The nation is experiencing a cultural shift in the workforce that shows no signs of reversing. More workers value the ability to work from home, which lab technicians cannot do, and this could hamper labs' ability to hire and train analysts or add more shifts, as MSHA hopes. Last, as MSHA asserts, labs may invest in new equipment due to the increased demand, but ordering, manufacturing and installing equipment takes time, which indicates the need for increased time for MNM companies to come into compliance.

Preliminary Regulatory Impact Analysis and Regulatory Alternatives

6. MSHA developed estimated costs of compliance with the proposed rule and estimated monetized benefits associated with averted cases of respirable crystalline silica-related diseases. MSHA requests comments on the methodologies, baseline, assumptions, and estimates presented in the Preliminary Regulatory Impact Analysis.

Response:

The NSSGA has reviewed MSHA's cost estimates (below) with member companies. MSHA's estimates of exposure control costs in particular are vastly inaccurate. Significantly, **one member company's 2023 budget for exposure controls is approximately equal to the MSHA annual estimate for all of MNM.** Based on communications with 13 member companies, costs for exposure controls will vary widely, but on average are \$920,000 annually, with a median of \$225,000. Furthermore, for exposure monitoring, based on data from more than 20 companies, costs would total roughly \$7.5 million dollars for just these companies. These data represent small, medium and large producers. These numbers for exposure monitoring and controls are in stark comparison to MSHA's estimates, below.

MSHA "estimates that the MNM sector will incur \$52.7 million (91 percent), and the coal sector will incur \$4.9 million (9 percent) in annualized compliance costs (see Table IX-2)". For the MNM industry, these costs are broken down as follows:

- Exposure monitoring - \$28.65 million
- Exposure controls - \$4.89 million
- Respiratory protection - \$0.97 million
- Medical surveillance - \$17.37 million

When we break down costs to per-sample rates based on data from our members, these varied from \$139 per sample to \$1,800 per sample, with a median of roughly \$650. The two most important determining factors were (1) whether sampling was conducted in-house or by a third-party consultant and (2) the number of employees. In-house sampling is far less expensive than using a third party. For example, two companies provided internal versus external costs, which for company one, were \$30,580 (in-house) compared to \$47,500 (third party) and, for company two, \$1.32 million (in-house) compared to \$3.3 million (third party). The second factor is the number of employees. Based on conversations with member companies and industrial hygienists who are consultants for the industry, companies can take advantage of volume discount rates when they send more samples to labs. Additionally, the cost of an industrial hygienist consultant largely goes to each trip they make. Whether they sample one miner or eight at a site does not change the cost much – just the cost of lab analysis. According to one firm, their average cost for two days of sampling was \$10,000 and more if they fly. This does not change based on the size of the mine because they are always there for a full shift. One company noted that sampling cost would be \$3,247 for three miners to be sampled, compared to \$2,866 for a single miner. Therefore, small sites will spend disproportionately more on sampling compared to large operators and should have additional time and opportunity to learn in-house sampling. Please see question 10 for more information on NSSGA's Noise and Dust Workshops. We also recommend MSHA prioritize funding (e.g., to state grantees) on conducting training on how to do sampling for small operators.

With over 11,000 MNM mines in the country, and 20 estimating over \$200,000 (median of producer data) of compliance costs for exposure monitoring, MSHA should consider this rule a serious economic burden. Using our lowest per-sample cost provided by a member company (\$139 per sample) as a best-case-scenario estimate for 250,000 MNM miners, that equals over \$34 million annually. Using the median of \$650 results in over \$162 million. Sampling is vitally important; however, MSHA must

consider opportunities that are just as protective of worker health and cost-effective – like Table 1 – to address this burden.

Last, while some companies will have minimal engineering controls to implement, most will have to install significant engineering controls. As compliance levels get stricter (e.g., halving the PEL and introducing an even lower action level) more sophisticated and expensive controls are required. Operators that currently comply with a PEL of 100 $\mu\text{g}/\text{m}^3$ will have to significantly update their controls to comply with a PEL of 50 $\mu\text{g}/\text{m}^3$ and do even more to reduce exposures below the AL. MSHA vastly underestimates the cost that companies will incur for engineering controls which range from simple fixes to companies budgeting millions of dollars annually (already) for engineering controls.

These exposure control costs clearly demonstrate the need for additional compliance time, as many companies will implement significant engineering controls that take months, and sometime years, to complete from planning to final installation.

7. MSHA considered two regulatory alternatives in developing the proposed rule discussed in Section IX. Summary of Preliminary Regulatory Impact Analysis and Regulatory Alternatives. In the regulatory alternatives presented, MSHA discussed alternatives to the proposed PEL, action level, sampling requirements, and semi-annual evaluations. MSHA requests comments on these and other regulatory alternatives and information on any other alternatives that the Agency should consider.

Response:

A regulatory alternative MSHA did not consider, and should adopt, is an approach like OSHA's silica standard. There are many reasons, shared throughout these comments, that MSHA should adopt a standard like OSHA's. In this section, we will address worker overlap between OSHA and MSHA regulated sites and cost of compliance.

First, aggregates are the base of the construction materials industry, which also includes asphalt and ready mixed concrete, both of which are regulated under OSHA. Because aggregates are a key component of these construction materials, it is common for pits, quarries, asphalt plants, and concrete plants to be co-located. Based on data from 14 companies on the number of employees who go back and forth between MSHA and OSHA-regulated sites regularly we found the average percentage of employees is 20%, with a median of 8%. The companies in this dataset range from very large to very small. Small and medium size companies (with asphalt and/or concrete businesses) had the greater percentage of their employees going back and forth between OSHA and MSHA regulated sites. Based on this information, if even just 5-15% of the nation's MNM miners go back and forth between OSHA and MSHA regulated work, that is 12,500-37,500 workers.

Having workers go back and forth under different regulatory structures for exposure monitoring and medical surveillance is confusing, unclear which agency would have jurisdiction when, and pulls attention from protection to paperwork. For example: how would an operator comply for an employee in the northeastern US, new to the mining industry, who works in a quarry during the summer, then moves to equipment maintenance in the winter? If that employee's sample comes back between 25-50 $\mu\text{g}/\text{m}^3$ in October, how could periodic sampling occur in the next three months when that quarry is shut down for winter and the employee is working in an OSHA-regulated role? What pathway should be followed regarding medical surveillance – OSHA's or MSHA's? Countless examples like this exist for mobile operators, contractors, and producer companies of all sizes.

Second, MSHA ignored an obvious alternative when it did not consider a regulation like OSHA's. The OSHA rule has been in place for years – workers and employers are familiar with it, it was litigated and upheld in court, and allocates resources where they are needed most. The OSHA silica standard is risk-based in its sampling and medical surveillance requirements, which directs time, energy and cost where

workers are at greatest risk of being exposed to respirable crystalline silica. The performance-based option takes into account historical data from longstanding sampling programs that have characterized exposures— if MSHA adopts this approach, it will decrease unnecessary sampling and free up resources (including health and safety professionals’ time) to focus on other issues. The OSHA standard also includes a Table 1 that identifies specific jobs and tasks with auditable controls that operators must follow. **A Table 1 does not give operators a ‘free pass’ on sampling;** rather, engineering controls in the table must be followed – for example, having proper door seals and filtration on enclosed cabs – and can be inspected by MSHA to ensure compliance. A Table 1 approach is also backed by data that demonstrates when control measures are complied with, workers are not exposed above the action level (please see Appendix for data in support of a Table 1).

For medical surveillance, the current MSHA proposal has essentially all miners included in a medical surveillance program regardless of their risk. MSHA should follow OSHA’s standard, which offers medical surveillance to workers who are exposed at or above the action level for thirty or more days a year. It is not necessary to test a worker for silicosis who has no significant RCS exposure – for example, at a dredge operation where the material is wet the entire time, or a quarry where the geology contains no silica. Operators already have difficulties getting chest x-rays and there is a shortage of B Readers, which cannot be remedied quickly. Having only workers exposed above a threshold is protective of worker health, decreases load on the medical and B Reader system (enabling them to address at-risk workers) and decreases economic burden to operators.

Initial Regulatory Flexibility Analysis

8. MSHA examined the impact of the proposed rule on small mines in accordance with the Regulatory Flexibility Act. MSHA estimated that small-entity controllers would be expected to incur, on average, additional regulatory costs equaling approximately 0.122 percent of their revenues (or \$1,220 for every \$1 million in revenues). MSHA is interested in how the proposed rule would affect small mines, including their ability to comply with the proposed requirements.

Response:

Please see response to question 6.

Scope and Effective Date

9. MSHA is proposing a unified regulatory and enforcement framework for controlling miners’ exposures to respirable crystalline silica for the mining industry. MSHA requests comments on this unified regulatory and enforcement framework. MSHA requests the views and recommendations of stakeholders regarding the scope of proposed part 60, which would include all surface and underground MNM and coal mines. MSHA requests comments on whether separate standards should be developed for the MNM mining industry and the coal mining industry.

Response:

We will discuss two issues related to scope: the creation of separate standards for MNM and coal and applicability.

Create Separate Standards for MNM and Coal

First, we support the development of separate standards for MNM and coal. We support different sampling and medical surveillance requirements and different effective dates; keeping the same PEL and action level is appropriate. There is longstanding precedent for separate standards for the MNM and

coal industries. Perhaps the clearest example is their distinction in Title 30 of the CFR (Code of Federal Regulations), where Subchapter K is dedicated to Metal and Nonmetal Mine Safety and Health and Subchapter O is dedicated to Coal Mine Safety and Health. This separation supports sound regulations that are unique to each industry and address their significant differences. Where regulations overlap the two industries (e.g., Part 47, Hazard Communication (HazCom) or Part 62, Occupational Noise Exposure), the issues or hazards are similar and/or similarly controlled. Regarding silica, the aggregate and coal industries are distinct in their current dust/silica regulations, operations, worker overlap with OSHA, medical surveillance, and severity of exposures to respirable crystalline silica, all of which support separate rules.

Different Current Regulations

MSHA's current MNM regulations governing silica are found in § 56.5001 and 57.5001, § 56.5002 and 57.5002, and § 56.5005 and 57.5005, which, respectively, outline permissible exposure limits, exposure monitoring requirements, and controls. Current exposure monitoring requirements for MNM are that mine operators must conduct respirable dust surveys as frequently as necessary to determine the adequacy of control measures. This is in stark contrast to the proposed exposure monitoring requirements that lay out four new sampling categories, baseline sampling regardless of historical data, continuous quarterly sampling if samples come back between the action level and PEL (25 - 50 µg/m³) even if exposures are characterized, and vague qualitative testing requirements every six months. By comparison, the coal industry is already familiar with quarterly sampling and equipped to continue doing so. Current coal regulations under §§ 70.208, 70.209, 71.206, and 90.207 require coal mine operators to "sample for respirable dust on a quarterly basis for specified occupations and work areas ... typically in locations where respirable dust is generated." The coal industry is also already familiar with medical surveillance, which coal operators are required to offer miners, but will be new to many MNM operators.

Different Operations

Aggregate operations would rarely be able to use a "representative fraction" for sampling because miners rarely perform the same job, on the same shift, in the same working conditions. Additionally, most operations are large surface operations, many of which quarry geologic deposits of limestone with little to no silica content. We also have unique operations such as dredging, where the material stays wet from extraction to sale, and mobile operations that face unique challenges that MSHA does not seem to have considered. Some of these challenges will be discussed in further detail later.

MNM Needs Consistency with the OSHA Silica Standard

Many workers in the MNM industry work jobs that fall under both OSHA and MSHA. For example, many aggregate companies are vertically integrated, meaning they have an aggregates business and other business lines along the construction supply chain (e.g., construction, precast concrete, asphalt paving, ready mixed concrete, etc.). Workers will often go back and forth between MSHA and OSHA-regulated worksites (please see question 7 for additional information and data). This is also a challenge for contractors who work on both OSHA and MSHA sites and mobile operators who fall under both agencies at varying times. Having two vastly different silica standards will cause confusion for employees and operators alike and make compliance more difficult. This challenge does not exist for coal operators as their employees do not go back and forth like those in MNM.

There is No Silicosis Crisis in MNM

While it has been noted by activists and researchers that cases of silicosis are being seen more frequently in younger Appalachian coal miners¹⁵, this is not the case in MNM. In fact, based ILO classification of

¹⁵ E.g., Cohen, Robert A et al. "Pathology and Mineralogy Demonstrate Respirable Crystalline Silica Is a Major Cause of Severe Pneumoconiosis in U.S. Coal Miners." *Annals of the American Thoracic Society* vol. 19,9 (2022): 1469-1478. doi:10.1513/AnnalsATS.202109-1064OC

chest x-rays provided by member companies, of 5,690 miners, 99.9% had readings of 0/-, 0/0, or 0/1. Only 5 (0.0009%) had a 1/1 or greater reading. Over 1,000 of these workers have been with their respective companies for more than 10 years, which is important due to the latency of silicosis. While even one case of silicosis is too many, these data do not demonstrate there is a crisis in MNM.

The data discussed in the previous paragraph is consistent with the decline in silicosis cases that has been a trend in the US for decades. For example, the CDC's Morbidity and Mortality Weekly Report in 2015, stated: "[t]he number of deaths from silicosis declined from 1,065 in 1968 to 165 in 2004," and that "[a] statistically significant decline in silicosis death rates was observed during 2001–2010". In Michigan, which requires the reporting of silicosis cases and has a state surveillance program, the number of silicosis cases "decreased from 620 during 1988–1997, to 292 during 1998–2007, to 136 during 2008–2016. The cumulative incidence rate of silicosis decreased from 3.7 to 1.4 to 0.7 cases per 100,000 men 40 years of age and older in Michigan over the same three periods." We provided additional data concerning the decline in the incidence of silicosis in supplemental materials. The Appalachian coal problem is an unfortunate outlier.

Applicability

Second, the goal of the silica standard is to protect miners from overexposure to respirable crystalline silica to prevent silicosis, which we strongly support. There are finite key resources available to the whole mining industry relevant to the proposed rule, including sampling equipment, industrial hygienists and consultants, accredited labs, and NIOSH-certified B Readers. Operators also have finite resources, including time and attention that should be directed where it is most needed. These finite resources must be available to protect miners who are at risk of being exposed to respirable crystalline silica rather than being misallocated on those where there is no risk of exposure above the action level. We propose MSHA incorporate language similar to OSHA's silica standard for general industry which states that the standard does not apply when an employer has data demonstrating employee exposures will remain below the action level under any foreseeable circumstances.

10. MSHA is proposing that the final rule would be effective 120 days after its publication in the Federal Register. This period is intended to provide mine operators time to evaluate existing engineering and administrative controls, update their respiratory protection programs, and prepare to comply with other provisions of the rule including recordkeeping requirements. Please provide your views on the proposed effective date.

Response:

NSSGA proposes that the obligations under the final MSHA silica standard commence on a date that is 24 months after the publication of the final rule for MNM. We ask MSHA to extend the proposed deadline for MNM to account for the initial shortage of personnel, equipment, lab capacity, installation of engineering controls, and logistical challenges for operators new to sampling and medical surveillance. As discussed previously, there is no crisis in MNM (see question 9) and an additional 24 months will not result in workers' health being put at risk. Where there are isolated problems, MSHA can address these through existing enforcement and temporary use of PPE.

Based on data from MSHA's Preliminary Regulatory Impact Analysis there are over 10,000 MNM mines with less than twenty miners. This is a significant portion of the industry that will need time and support to come into compliance. Operators will need time to start sampling programs, acquire equipment that will be in high demand, coordinate with van services or local hospitals for medical surveillance, and train individuals how to properly conduct sampling if they choose to do so in-house. There are few opportunities for companies to get workers effectively trained to conduct sampling. For two years, NSSGA has held Noise and Dust Workshops, which we partner with MSHA on, to train workers how to conduct hands-on sampling. The course is three days long and there are only 15 participants per class

to keep training effective by ensuring each participant gets the hands-on experience conducting sampling during the field day. We will have held three classes in 2022 and by the end of 2023 – we are planning for three classes in 2024 and 2025. But this will not meet training demands and additional time will be necessary.

The installation of engineering controls – which MSHA requires as the primary means of controlling RCS exposures – will also take time, where there are necessary upgrades or installations. The sampling requirements of the proposed MSHA silica standard may result in a surge in demand for engineering controls, as many small mines may not already sample and therefore may not be aware of the need for controls. One year is not enough time to install engineering controls. Implementing controls involves conducting sufficient dust monitoring to properly characterize the dust and the locations/jobs affected; determining which jobs present or may present overexposures; conducting detective work to determine the sources of dust; designing an engineered dust control system; building it; commissioning it; and optimizing its performance. As NSSGA members have learned from bringing into compliance facilities that they have acquired, this can be a major operation involving multiple outside industrial hygiene, engineering, architectural, and construction firms, and can easily take multiple years – especially since the work has to be retrofitted onto currently-operating processes. Even two years can be a tight timeframe to do all this work in some complex circumstances. As a result, MSHA should give operators at least two years to come into compliance.

The new standard will also significantly increase demand for NIOSH Certified B Readers, who are required to interpret chest x-rays as part of medical surveillance. There are currently only 189 NIOSH Certified B Readers in the US¹⁶ and many are full-time physicians and only part-time B Readers. Additionally, a 2020 study showed that “since the mid-1990s the number of B Readers has declined and the mean age and years certified have increased.”¹⁷ The same study showed the average passing rate for certification was just 40.4%. MSHA’s assertion that that number of B Readers will increase with demand may be sound, however the agency must take into account that it will take time for new individuals to train and pass the difficult certification.

MSHA must also account for the time it will take mine operators new to medical surveillance to understand the B Reading process, what ILO classifications are and what they mean, and to establish connections with B Readers. With only 189 B Readers in the nation, not all medical facilities or van services will have relationships with B Readers who they can send chest x-rays to. It will take those facilities time to connect with B Readers and establish processes – these inevitable delays are outside mine operators’ control.

MSHA itself will also require time to enhance its compliance assistance efforts, particularly for small mines, which may be challenging due to the agency’s current staffing shortage and difficulties hiring.

A compliance date of two years following the rule’s publication aligns with OSHA’s general industry standard, which established that the obligations commenced 2 years after the effective date of the rule. The construction standard was the same, except the obligations commenced one year after the effective

¹⁶ National Institute for Occupational Safety and Health (NIOSH). B Reader List NIOSH Certified B Readers. <https://wwwn.cdc.gov/niosh-rhd/cwhsp/ReaderList.aspx?formid=USReaders&lastname=&state=&sortkey=state&format=table&btnSubmit=Submit> Retrieved September 11, 2023.

¹⁷ Halldin, Cara N et al. “The National Institute for Occupational Safety and Health B Reader Certification Program-An Update Report (1987 to 2018) and Future Directions.” *Journal of occupational and environmental medicine* vol. 61,12 (2019): 1045-1051. doi:10.1097/JOM.0000000000001735

date of the rule, except for the obligations for the methods of sample analysis, which commenced 2 years after the effective date.

Proposed Permissible Exposure Limit

13. MSHA is proposing a PEL for respirable crystalline silica of 50 µg/m³ for a full-shift exposure, calculated as an 8-hour TWA for MNM and coal miners. MSHA has made a preliminary determination that the proposed PEL would reduce miners' risk of suffering material impairment of health or functional capacity over their working lives. MSHA seeks the views and recommendations of stakeholders on the proposed PEL.

Response:

NSSGA does not oppose the proposed PEL of 50 µg/m³ for a full-shift exposure, calculated as an 8-hour TWA for MNM.

14. MSHA is proposing a PEL of 50 ug/m³ and an action level of 25 µg/m³ for respirable crystalline silica exposure. Which proposed requirements should be triggered by exposure at, above, or below the proposed action level?

Response:

NSSGA has no objection to the MSHA proposed definition of the AL, but notes the following concerns. The proposed AL presents unresolved measurability challenges^{18 19}. This virtually guarantees that many employers will be required to conduct periodic air sampling on the basis of questionable lab results alone because any single reported result greater than 25 µg/m³ would trigger more frequent sampling. NSSGA believes that mine operators should be required to offer medical surveillance only to miners exposed to RCS at or above the AL for 30 or more days a year. NSSGA has addressed the application of the AL to sampling in its comments on sampling (please see questions 17-28).

Methods of Compliance

15. MSHA requests comments on the proposed prohibition against rotation of miners as an administrative control. Please include a discussion of the potential effectiveness of this non-exposure approach and its impact on miners at specific mines.

Response:

The prohibition against employee rotation flies in the face of long-standing, widely accepted industrial hygiene practice. Employee rotation is an established approach to protecting worker health, for example, with hearing protection, and is used in the case of potential mutagens or carcinogens, like radiation.

Under the NIOSH hierarchy of controls and, specifically, administrative controls, rotation of miners is an effective and successful tool for control of silica exposures below the PEL. According to the NIOSH Chemical Carcinogen Policy (Current Intelligence Bulletin 68, NIOSH 2017), which MSHA cites in its preamble (p. 172), "NIOSH will continue to recommend reduction of exposure to an occupational

¹⁸ Cox, Louis Anthony Tony Jr. "How accurately and consistently do laboratories measure workplace concentrations of respirable crystalline silica?." Regulatory toxicology and pharmacology : RTP vol. 81 (2016): 268-274. doi:10.1016/j.yrtph.2016.09.008

¹⁹ The Comments of the American Chemistry Council – Crystalline Silica Panel dated February 11, 2014, OSHA Docket 2010-0034. Attachments 10, 11, 12, and 14.

carcinogen according to the hierarchy of controls through elimination or substitution and implementation of engineering controls, if practical, and the use of administrative controls before use of personal protective equipment (PPE).” The NIOSH Hierarchy of Controls defines “job rotation” as an acceptable means of administrative controls. It should also be noted that when MSHA cited the NIOSH Chemical Carcinogen Policy document (p. 172) the final portion of the sentence was selectively eliminated: “and the use of administrative controls.” This selective use of language changes the context of NIOSH’s recommendation to falsely support MSHA’s recommendation. MSHA’s statement to prohibit miner rotation based on “NIOSH’s recommendation’s” is in error and miner rotation should remain a viable option to control silica exposures.

If, as MSHA believes, risk of silicosis is correlated with cumulative exposures, it does not matter whether one employee works an exposed job position eight hours in one day or two hours a day for four days. If, as a fair reading of the epidemiology suggests, risk of silicosis (or any other silica-related health effect) is subject to a threshold below which exposures are without appreciable risk, then rotation to maintain exposures at low levels could only be protective. In other words, regardless of how silica-related illnesses are caused, rotation helps protect against them (again, assuming a threshold).

The prohibition against miner rotation on the basis that it potentially exposes more miners to “carcinogens” is misplaced; the best evidence is that there is a threshold associated with silica as a carcinogen, and a substantial body of evidence suggests that the presence of the disease silicosis is a prerequisite to an increased cancer risk (and there is still a dispute about the risks associated with silica as a carcinogen). Because miner rotation works to minimize the average and cumulative exposure of miners to silica, rotation should be permitted as a control.

Furthermore, MSHA ignores the fact that most people are routinely exposed to carcinogens in their daily lives (e.g., sunlight). However, not all people develop skin cancer, because there is a threshold.

In addition to miner rotation being a well-established and protective industrial hygiene practice, it is an essential control when others are infeasible. For example, the implementation of engineering controls such as spray bars in cold weather climates is not always possible in winter when water freezes, and it is not always technically feasible for portable operations to install enclosures or ventilation systems. MSHA’s feasibility study fails to recognize these barriers to compliance.

Last, it will be incredibly challenging for MSHA inspectors to enforce a prohibition against miner rotation because there are many reasons a miner may move from one job to another. For example, due to other exposures such as noise or due to daily job duties.

NSSGA urges MSHA to delete the prohibition.

If MSHA retains the prohibition, it should at a minimum confirm that it would not prohibit:

- Operations that involve employee rotation because rotation is performed for purposes other than “to achieve compliance with the PEL”; or
- Rotating employees to maintain their exposures below the *action level*, rather than the PEL.

Failure by MSHA to include the first bulleted exception above would get the agency into the business of micro-managing operations without any clearly identified benefit to workers.

Proposed Exposure Monitoring

17. MSHA requests comments and information from stakeholders concerning the proposed approaches to monitoring exposures, and other approaches to accurately monitor miner exposure to respirable crystalline silica in MNM and coal mines.

Response:

The MSHA proposal as written is unnecessarily complicated, too prescriptive, is not risk based, and results in over and under sampling, i.e., it is not as protective of miners as the NSSGA proposal. Because it results in over sampling, it will lead to unnecessary sampling, which will burden companies with unnecessary costs and divert valuable resources including time away from other health and safety risks.

The NSSGA urges MSHA to adopt the existing OSHA exposure assessment provisions for MNM, with minor modifications, and include a Table 1. The inclusion of a Table 1 is not “original”, it is what the Department of Labor has already enacted through a rigorous rule making process and has been demonstrated to work in the field. We have discussed with dozens of members who are regulated by both MSHA and OSHA who agree that the rule works in practice. As noted throughout the materials MSHA released in support of its proposed rule, MSHA explicitly stated – repeatedly – that it relied heavily on the work done by OSHA on the OSHA silica rule making, which resulted in a final rule in 2016. MSHA has been clear on its expected reliance on OSHA’s work on the silica rule for at least a decade, e.g., the U.S. Department of Labor, Semiannual Agenda of Regulations, Nov. 26, 2013, pp. 48-49, states, in part, “MSHA intends to use OSHA's work on the health effects and risk assessment, adapting it as necessary for the mining industry.” The adoption of OSHA’s exposure assessment provisions aligns with the work MSHA relies on throughout the preamble and rule.

OSHA’s exposure assessment requirement provides two options: (1) performance and (2) scheduled monitoring. Mine operators have the option to select an exposure assessment option, and it should be clear that mine operators can change the exposure assessment option. For example, in the example outlining the results of 11 periodic samples below, the mine operator collected sufficient data under scheduled monitoring to accurately characterize exposures to respirable crystalline silica, which would allow the mine operator to stop or reduce sampling under the performance option. This allows for flexibility, incorporates data from companies who have had sampling programs in place for years, and is more protective of workers as it characterizes exposures.

The MSHA proposal may also lead to ongoing unnecessary sampling. Consider a baseline sample of 34 $\mu\text{g}/\text{m}^3$ - periodic sampling is initiated. Three months later, sampling comes back at 26 $\mu\text{g}/\text{m}^3$ and periodic sampling continues. Here are the sampling results for three years:

Baseline	34 $\mu\text{g}/\text{m}^3$
Periodic 1	26 $\mu\text{g}/\text{m}^3$
Periodic 2	27 $\mu\text{g}/\text{m}^3$
Periodic 3	40 $\mu\text{g}/\text{m}^3$
Periodic 4	42 $\mu\text{g}/\text{m}^3$
Periodic 5	26 $\mu\text{g}/\text{m}^3$
Periodic 6	45 $\mu\text{g}/\text{m}^3$
Periodic 7	35 $\mu\text{g}/\text{m}^3$
Periodic 8	35 $\mu\text{g}/\text{m}^3$
Periodic 9	40 $\mu\text{g}/\text{m}^3$
Periodic 10	29 $\mu\text{g}/\text{m}^3$
Periodic 11	30 $\mu\text{g}/\text{m}^3$

Twelve consecutive samples have come back below the PEL and data shows that the exposures are controlled. Why should sampling continue (assuming there are no significant changes in operations)? Continuing sampling is not additionally protective of worker health, but rather diverts time, energy and resources away from where they are most needed.

Following OSHA allows operators the flexibility to follow either a performance-based program or a scheduled program. These options are both protective of miners and direct limited sampling resources to those with a greater likelihood of being exposed to RCS above the PEL. It is also easier for operators to administer, because it is less unnecessarily complicated, allows those with successful well-established programs to maintain course, and helps keep focus on protecting miner health.

We recommend a minor modification to the OSHA exposure assessment provisions only under the scheduled monitoring option. While OSHA allows for discontinuation of exposure monitoring (for initial sampling) if one sample is under the action level. This may not be protective of miners and sampling should take place until the mine operator is confident that results are below the action level.

The MSHA proposal assumes that two sample “compliance” with the AL will benefit employees by lowering overall exposures. However, even assuming that lab-reported sample results perfectly represent actual exposures (which even the most charitable view of the sampling and analytical error for respirable crystalline silica shows to be unrealistic), one or even two results below the proposed AL do not necessarily equate to overall lower exposures and it is likely that such two-sample sub-AL results will occur merely by chance. That is particularly true for underlying exposure distributions that are highly variable and include actual exposures above the PEL and/or AL.

Two-sample compliance with the AL may discourage additional sampling by employers, possibly for years as employers would be obligated to sample only when they became aware of significant workplace changes that could increase exposures. However, infrequent or no sampling on the basis of two-sample AL compliance reduces the chance of discovering potentially greater exposures— including exposures above the PEL.

In the following hypothetical sequence of possible air sample results (expressed as $\mu\text{g}/\text{m}^3$; values assumed to perfectly represent actual exposures), collected in the given order for a similarly exposed group of employees, there is a better than four-in-ten chance that any two samples would fall below the proposed 25 $\mu\text{g}/\text{m}^3$ Action Level: 12, 8, 93, 45, 48, 102, 22, 18, 40, 26, 75, 47, 24, 16. The arithmetic and geometric means (42 and 32, respectively) are both below the proposed 50 $\mu\text{g}/\text{m}^3$ PEL. The first two sample results are below the proposed 25 $\mu\text{g}/\text{m}^3$ Action Level—providing justification in the MSHA proposal to stop sampling. (Two other sub-AL sample pairs in this group would provide a similar opportunity to stop sampling). Yet, three samples are above the proposed 50 $\mu\text{g}/\text{m}^3$ PEL and one sample is above the current 100 $\mu\text{g}/\text{m}^3$ PEL; in fact, the underlying lognormal distribution predicts that about one in four sampled exposures would exceed the proposed PEL.

OSHA’s performance-based option allows operators to create, or in many cases continue, exposure monitoring programs that characterize silica exposures without following an overly prescriptive set of requirements. Programs are created with monitoring that is often more extensive than that proposed by MSHA (i.e., exposures are characterized with more than two samples below the action level). MSHA should follow OSHA’s standard in providing these two options. The scheduled option is also recommended because its sampling frequency changes based on risk. For example, samples above the PEL trigger sampling again within three months compared to samples between the action level and PEL, which trigger sampling within six months.

Baseline Data Does Not Have to be New Data

Dozens of NSSGA member companies have had successful sampling programs in place for decades. Under the proposed rule, even companies with baseline data going back to the 1970's (which exists for numerous companies) would have to conduct new baseline sampling. This is unnecessary, expensive, does not further worker health, and takes away time and resources from other health and safety matters. Furthermore, not being able to use existing data effectively penalizes companies that have had ongoing industrial hygiene programs. We strongly urge MSHA to accept existing baselines, which aligns with the OSHA "performance option" in 1910.1053(d)(2).

Following OSHA Simplifies Compliance for Dual-Regulated Companies

As noted previously (please see question 9) many aggregate companies have OSHA and MSHA regulated facilities. Operator experience with the OSHA rule will create a smooth process rather than excessive, unnecessary paperwork and uncertainty around what regulations to follow when workers are under both. An MSHA regulation that conforms to the existing OSHA regulation eases management burdens, and facilitates the movement of employees within the co-located sites, all while protecting worker health.

Requirements for Representative Sampling Should Change

The proposed requirement to assess exposures for each job title on each work shift should be restricted to those cases in which a significant difference exists between the environment and/or work tasks performed on the different shifts, so that there is a reasonable basis to expect different exposures. For example, if an equipment operator performs exactly the same job tasks using the same equipment and in the same place on one shift compared to another operator on a different shift (and if the processes and work environment do not change across the shifts) there should be no reason that the respective exposure distributions would be any different. The requirement is an unnecessary and costly burden on the operator that will not improve worker health. In addition, documented IH practice is to establish Similar Exposure Groups (SEGs) that combine job positions or tasks that are similar in exposure risk to streamline and manage exposure monitoring. MSHA should consider adding language for SEGs in consideration of representative sampling.

MSHA Should Adopt a Table 1

Table 1 is a significant component of OSHA's exposure monitoring provisions. We urge MSHA to adopt a similar table in their proposed rule.

For full discussion on this and a proposed Table 1 adapted for MSHA, please see question 43.

18. MSHA proposes to require mine operators to collect a respirable crystalline silica sample for a miner's regular full shift during typical mining activities. Many potential sources of respirable crystalline silica are present only when the mine is operating under typical conditions. MSHA requests comments on this requirement and whether to specify environmental conditions under which samples should be taken to ensure that samples accurately reflect actual levels of respirable crystalline silica exposure. In MSHA's experience, for example, environmental conditions such as precipitation (e.g., rain or snow) or wind could affect the actual levels of respirable crystalline silica exposure at miners' normal or regular workplaces throughout their typical workday.

Response:

MSHA should not specify environmental conditions because MSHA cannot know what "typical mining activities" look like for over 12,000 mines nor can they define or enforce such a provision. Typical conditions for surface mining operations across the country include everything that one would confront over the course of a year including hot, cold, rain, snow, wind, no wind, wind from every direction, wind at 1 mph versus 25 mph, high humidity, low humidity, and so on and so forth. Operators know

their own sites best and what typical mining conditions and environmental conditions are like. Operators *want* to sample at the right times so they *know* their exposures so they can be controlled. Adding such requirements would be nearly impossible for some sites if they had to do periodic sampling during the winter – for example, how could operators in the northeast conduct periodic sampling (if required as it could be under the current proposal) in December if MSHA prohibited sampling when it is raining, snowing, etc.? Adding such a provision would not only be highly impractical, it would cross MSHA into micromanaging and would also be near impossible to enforce. How would MSHA define this? For example, if rain is ‘typical’ in an area like the Pacific Northwest, but MSHA were to require less than half the shift be dry, how would an operator account for rain off-and-on throughout the day? A plant manager’s time is far more valuable than tracking how many minutes it rained during a shift. We strongly urge MSHA not to include such a provision.

19. MSHA recognizes that some mining facilities operate seasonally or intermittently and that cumulative exposures for miners at these facilities may be lower than that of miners working at year-round operations. MSHA requests comments on the exposure monitoring approach under proposed § 60.12, including the frequency of exposure monitoring necessary to safeguard the health of miners at seasonal or intermittent operations.

Response:

To address seasonal and intermittently operational sites, MSHA should adopt a standard like OSHA’s. In discussions with member companies who run seasonal or intermittent sites, many of their employees move to OSHA regulated facilities like maintenance shops when pits or quarries close (e.g., for the winter). If MSHA were to adopt OSHA’s standard, this would eliminate concerns for intermittent sites because worker protections would be the same throughout the year.

Sampling at intermittent and seasonal sites also supports the adoption of a Table 1 approach. Intermittent operations do not have as much time to conduct sampling as year-round operations; however, they do have many of the same jobs and tasks like working in enclosed cabs. Table 1 would provide intermittent operators with specific engineering and administrative controls to follow, that are proven to be protective of workers. This would reduce challenges caused by only operating for part of the year because operators could implement auditable controls listed in Table 1, which control for silica exposure under the action level. For those jobs and tasks not listed in Table 1 that exist at intermittent sites, a performance-based option would allow operators to sample during routine operations and enough times to characterize exposures.

20. MSHA is proposing that each mine operator perform baseline sampling within 180 days after the rule becomes effective to assess the respirable crystalline silica exposure of each miner who is or may reasonably be expected to be exposed to respirable crystalline silica. MSHA requests comments on this proposed baseline sampling requirement.

Response:

Please see response in question 17.

As stated in the preamble, MSHA requires “each miner who is or may reasonably be expected to be exposed to respirable crystalline silica at any level” to undergo baseline sampling. This does not consider exposure monitoring and historical data that many companies already have. As written, most miners would require baseline sampling – as of 2022 there were over 300,000 miners in the US. There are only 23 AIHA accredited labs in the US, limited certified industrial hygienists many companies would need to hire, and limited supplies (e.g., filters, pumps, etc.) that will be in high demand.

MSHA should accept existing sampling data from companies with established sampling programs and not require these companies to conduct “baseline” sampling as MSHA has proposed. There is no miner health benefit gained by requiring mine operators that have been sampling for years and in many cases decades, and that have already characterized exposures, to under a new MSHA rule conduct “baseline” samples for exposures that are already characterized. Furthermore, companies that will need to establish exposure monitoring programs will need more than 180 days after the effective date of the rule. MSHA should provide 24 months for compliance following publication in the federal register. Please see response to question 10.

21. MSHA is proposing a requirement that mine operators qualitatively evaluate every 6 months any changes in production, processes, engineering controls, personnel, administrative controls, or other factors, beginning 18 months after the effective date. MSHA requests comments on the timing of the proposed semi-annual evaluation requirements, and in particular, whether miners would possibly be exposed unnecessarily to respirable crystalline silica levels above the PEL due to the gap between the effective date and the proposed requirements.

Response:

The straightforward way to address what MSHA seems to be concerned with is to adopt the OSHA provision referenced throughout these comments and eliminate the 6-month qualitative evaluation provision in the proposed rule. OSHA requires operators to reassess exposures whenever a change in the production, process, control equipment, personnel, or work practices may reasonably be expected to result in new or additional exposures at or above the action level, or when the employer has any reason to believe that new or additional exposures at or above the action level have occurred. The OSHA provision applies whether these changes occur weekly, monthly, yearly or never; if there are changes, sample. There will be no “gap”, which MSHA claims to be concerned with. The MSHA proposed qualitative evaluation proposal is a largely meaningless paperwork exercise that will result in more meaningless activity, wasted litigation over citations for paperwork, and other activities that have nothing to do with worker health and safety.

Requiring a qualitative evaluation every 6 months is too prescriptive, results in unnecessary paperwork and does not fit with the reality of operation. Operations may change more or less frequently. Some sites may not undergo changes that will reasonably be expected to affect exposures for years. Conversely, process changes could occur more often than every six months that may reasonably be expected to affect exposures. For example, an operator may decide to upgrade six screens in their plant, but due to budgetary, production, or time constraints, they can’t replace them all at once, which results in installation of two new screens every two months. Under MSHA’s proposal, the first two sets of screen changes would not result in reassessment. MSHA’s proposal will result in both over and under assessment. MSHA should adopt a requirement similar to OSHA.

22. MSHA has determined that most occupations related to extraction and processing would meet the “reasonably be expected” threshold for baseline sampling. MSHA recognizes that some miners may work in areas or perform tasks where exposure is not reasonably expected, if at all. MSHA solicits comments on the assumption that most miners are exposed to at least some level of respirable crystalline silica, and on the proposed requirement.

Response:

“At least some level...” should not be the basis upon which baseline sampling is predicated – “at least some level...” is not a defined term of any meaning in the context of a standard and as a term has no connection with any potential adverse health effect. It is so broad that it encompasses the entire population, since *everyone* is reasonably expected to be exposed to at least some levels of RCS by virtue

of living on earth, the crust of which is 12% crystalline silica in the form of quartz. In fact, it is well established that RCS is in the ambient air independent of any industrial activities.

First, MSHA should have an applicability threshold for operations where exposures will remain below 25 µg/m³. OSHA's general industry silica standard includes such a provision where the standard does not apply where an employer has data demonstrating employee exposures will remain below the action level under any foreseeable circumstances. MSHA should adopt a similar provision. Some MNM operations will never expose workers to respirable crystalline silica, for example those where the geology of their deposit contains no silica, or dredge operations where material is wet throughout the entire process from extraction to sale meaning silica cannot become airborne. MSHA's silica standard should not apply to such operations where silica exposures do not exist as sampling does not advance miner health, but rather diverts time, attention, and resources away from other health and safety matters (e.g., noise, housekeeping).

Second, for tasks and jobs that fall under a Table 1, baseline sampling is unnecessary. There is already data demonstrating that when an operator complies with Table 1 (i.e., follows the engineering and administrative controls required for a particular job or task), then that worker will not be exposed above the action level.

Sampling should not occur at "at least some level," and NSSGA strongly encourages MSHA to remove this language, and direct sampling efforts to where they are most needed – where there is a chance of silica exposure above the action level.

23. MSHA is proposing that mine operators would not be required to conduct periodic sampling if the baseline sampling result, together with another sampling result or objective data, as defined in proposed § 60.2, confirms miners' exposures are below the proposed action level. MSHA seeks comments on this proposal.

Response:

This proposal does not follow industrial hygiene best practices and does not provide reliable data on what worker exposures are. Please see question 17, "*Monitoring Should Characterize Exposures.*"

24. MSHA is proposing that mine operators conduct periodic sampling within 3 months where the most recent sampling indicates miner exposures are at or above the proposed action level but at or below the proposed PEL and continue to sample within 3 months of the previous sampling until two consecutive samplings indicate that miner exposures are below the action level. MSHA solicits comments on the proposed frequency for periodic sampling, including whether the consecutive samples should be at least 7 days apart.

Response:

This proposal will keep operators sampling forever should their monitoring results continually be between the action level and the PEL even though it has been demonstrated their exposures are controlled below the PEL. Please see question 17, "*Monitoring Should Characterize Exposures.*"

MSHA should adopt a performance-based option like OSHA's silica standard. For a "scheduled monitoring option" MSHA should conform with OSHA so that where exposures are at or above the action level but at or below the PEL, the employer shall repeat such monitoring within six months of the most recent monitoring. Monitoring should be repeated within 3 months when results indicate an employee is exposed above the PEL. This timeline is consistent with AIHA guidance.

25. MSHA is proposing that mine operators may discontinue periodic sampling when two consecutive samples indicate that miner exposures are below the proposed action level. MSHA requests comments on this proposal.

Response:

Please see response to question 24.

MSHA should adopt OSHA's performance-based option and its scheduled-monitoring option. However, under the scheduled-monitoring option, for miner exposures below the proposed action level, MSHA should set out in the proposed rule that operators may discontinue sampling when they are confident that exposures are below the action level. This follows IH best practice because not every job or task has significantly variable exposures. For example, a plant operator in a booth on top of a tower and a plant operator on the ground going in and out of the booth will have different variations in exposure. The operator in the booth will experience very little variation and the operator on the ground far more – the latter will need more samples so the operator can be confident of exposures relative to the AL.

28. MSHA is proposing the use of representative sampling. Where several miners perform the same task on the same shift and in the same work area, the mine operator may sample a representative fraction of miners to meet the proposed exposure monitoring requirements. MSHA seeks comments on the use of representative sampling.

Response:

The proposed requirement to assess exposures for each job title on each work shift should be restricted to those cases in which a significant difference exists between the environment and/or work tasks performed on the different shifts, so that there is a reasonable basis to expect different exposures. For example, if an equipment operator performs the same job tasks using the same equipment in the same place on one shift compared with another operator on a different shift (and if the processes and work environment do not change across the shifts) there should be no reason that the respective exposure distributions would be any different. The requirement is an unnecessary and a costly burden on the operator that will not improve worker health. In addition, documented IH practice is to establish Similar Exposure Groups (SEGs) that combine job positions or tasks that are similar in exposure risk in order to streamline and manage exposure monitoring. MSHA should consider adding language for SEGs in consideration of representative sampling.

Proposed Medical Surveillance for Metal and Nonmetal Miners

32. MSHA's proposal would require MNM mine operators to provide each miner new to the mining industry with an initial medical examination and a follow-up examination no later than 3 years after the initial examination, at no cost to the miner. It would also require MNM mine operators to provide examinations for all miners at least every 5 years, which would be voluntary for miners. Is there an alternative strategy or schedule, such as voluntary initial or follow-up examinations, tying the medical surveillance requirement to miners reasonably expected to be exposed to any level of silica or to the action level that would be more appropriate for new MNM miners?

Response:

First, while medical surveillance will be a new requirement for the MNM industry, we are supportive of it. However, we do not agree with aspects of MSHA's proposal, most significantly that all miners are provided medical surveillance regardless of their exposure to RCS. We will cover the following items: (1) medical surveillance should be tied to exposure, (2) all workers should be on the same schedule, (3) employers should be allowed to have mandatory or more stringent requirements, (4) participation should be voluntary.

Medical surveillance should be tied to exposure.

We fully support medical surveillance for workers who are at some potential risk due to silica exposure – this is not all workers. Those who have no material silica exposure should not be included in medical surveillance. We recommend MSHA align with OSHA’s standard where workers occupationally exposed to RCS 30 or more days a year at or above the action level are offered medical surveillance. This is better aligned with protecting miners, avoids unnecessary costs, and aligns the use of scarce resources with the real need. Based on discussions with numerous members who currently have medical surveillance programs, they already experience delays getting workers chest x-rays due to workforce shortages, long wait times for B Readers to return results and challenges scheduling van services out months in advance. There are currently only 189 NIOSH Certified B Readers in the US²⁰ and many of these individuals are full time physicians who conduct B reading services outside their full-time practices. As of 2022 data, there are almost 250,000 MNM miners in the US. While some MNM companies do conduct medical surveillance, many (especially many small mines, which make up more than half of MSHA’s portfolio) do not. This will place an incredible burden on an already backed up system with many unnecessary exams of those who are not exposed to silica. The greatest threat of this is taking away those resources from workers who need exams and results most.

All workers should be on the same schedule.

MSHA’s proposal has workers new to the industry on a three-year rotation and current industry workers on a five-year rotation. This adds an unnecessary logistical burden on operators having to coordinate services on different rotations. Operators already face challenges getting van services on-site, which many rural operators compete for. Having different classifications of employees on different schedules is not necessary and harms the whole system. MSHA should have all workers on the same schedule. We request that MSHA follows OSHA’s standard and have operators make medical examinations available at least every three years.

Employers should be allowed to have mandatory or more stringent requirements.

Some operators have medical surveillance programs that include additional tests beyond what MSHA is recommending. We request that MSHA clarify that operators are allowed to do this so long as they meet MSHA’s minimum requirements. Some operators make participation in medical surveillance a mandatory condition of employment. We request that MSHA clarify that operators are allowed to do this if the mine operator believes it is warranted.

Participation should be voluntary.

MSHA should clarify that while operators are required to offer workers the option of participating in medical surveillance, that workers can decline if they wish (which follows other surveillance programs like benzene and hearing), unless employers require it as a condition of employment.

MSHA should state that the results of pulmonary function test administered as part of medical surveillance should be interpreted pursuant to the most recent guidelines adopted by the American Thoracic Society. The reference to a standard provides a basis for the interpretation of pulmonary function testing results (analogous to the reference to the ILO classification system for chest x-rays)

²⁰ National Institute for Occupational Safety and Health (NIOSH). B Reader List NIOSH Certified B Readers. <https://wwwn.cdc.gov/niosh-rhd/cwhsp/ReaderList.aspx?formid=USReaders&lastname=&state=&sortkey=state&format=table&btnSubmit=Submit> Retrieved September 11, 2023.

and provides a transparent and medically agreed upon standard for classifying results as “normal” or otherwise.²¹”

Mine operators need more than 30 days to get results back.

Based on data from member companies, from the time of exam to getting results back (including a B-read of the chest x-ray), operators ranged from a few days to three months, with an average of 45 days—and this does not include scheduling time, which was highly variable. Furthermore, with only 189 NIOSH certified B Readers in the US, the influx of miners entering medical surveillance programs will delay turnaround time more, making it even more challenging for mine operators to get results back within 30 days of hire. Finally, the 30-day time limit proposed by MSHA may negatively impact the ability of miner operators to get consensus readings of chest x-rays. It is a good practice given the variability of chest x-ray readings from B Reader to B Reader to send some chest x-rays (pursuant to whatever protocol is adopted as part of the medical surveillance program) for additional B Reads to obtain a “consensus” reading. A consensus reading may require 3 total B Reads of a miner’s chest x-ray to reach a consensus reading. Obviously, obtaining additional readings takes time, and the 30-day time limit proposed by MSHA will work to limit or eliminate this important process.²²

33. MSHA’s proposed medical surveillance requirements for MNM miners do not include some requirements that are in MSHA’s existing medical surveillance requirements for coal mine operators in 30 CFR 72.100. For example, § 72.100 requires coal mine operators to use NIOSH-approved facilities for medical examinations. Should MNM operators be required to use NIOSH-approved facilities for medical examinations? Coal mine operators also are required to submit for approval to NIOSH a plan for providing miners with the examinations specified. This is because NIOSH administers medical surveillance for coal miners with requirements for coal operators, but not MNM operators, in NIOSH standards (42 CFR part 37). Should the plan requirements be extended to MNM operators?

Response:

MNM should not be required to use NIOSH-approved facilities for medical examinations or submit a plan to NIOSH on how operators will provide miners with medical exams. It makes sense for coal operators to work through NIOSH because the agency is intertwined with their medical surveillance already. MNM operators who have medical surveillance programs already struggle to schedule exams and get results back – this will be more difficult when the MSHA standard comes out and would be almost impossible if the 250,000 MNM miners all had to use these same NIOSH-approved facilities. According to NIOSH there are only 161 approved health facilities in the US and none in many states, including the entire west coast (see map below from cdc.gov)²³.

²¹ Graham, Brian L et al. “Standardization of Spirometry 2019 Update. An Official American Thoracic Society and European Respiratory Society Technical Statement.” American journal of respiratory and critical care medicine vol. 200,8 (2019): e70-e88. doi:10.1164/rccm.201908-1590ST

²² Occupational Health Program for Exposure to Crystalline Silica in the Industrial Sand Industry. Second Edition, 2010 National Industrial Sand Association

²³ NIOSH. (June, 2023). NIOSH-Approved Health Facility Search & Map. <https://wwwn.cdc.gov/niosh-rhd/cwhsp/FacilityMap.aspx>

Map of NIOSH-approved Health Facilities in US (retrieved 8/31/23)



It also does not make sense for MNM operators to submit a plan to NIOSH. There are less than 1,000 coal mines in the US (who have already submitted plans to NIOSH) but over 11,500 MNM mines (where there is currently no requirement to do medical surveillance). NIOSH is already understaffed and will not have the capacity to accept, review and approve an additional 10,500 plans in a reasonable amount of time. This would also detract time from NIOSH's important core mission of furthering research that advances the safety and health of workers.

35. MSHA's proposed medical surveillance requirements would require that the MNM mine operator provide a mandatory follow-up examination to the miner no later than 3 years after the miner's initial medical examination. If a miner's 3-year follow-up examination shows evidence of a respirable crystalline silica-related disease or decreased lung function, the operator would be required to provide the miner with another mandatory follow-up examination with a specialist within 2 years. For examinations that show evidence of disease or decreased lung function, MSHA seeks comment on how, and to whom, test results should be communicated.

Response:

The results of all medical examinations, including but not limited to those with a specialist, should go to the worker and pertinent information should go to the MNM operator. Operators need the results of medical surveillance pertaining to occupational diseases that they are obligated to prevent in their workforce. Without knowing the test results that indicate if a worker shows signs of disease or not, that operator cannot adequately manage and protect workers.

At a minimum, MSHA should ensure that mine operators receive ILO classifications of readings that are 1/1 or greater or if a PLHCP recommends a follow-up examination with a specialist as soon as possible. Companies that currently have medical surveillance programs are allowed to get results the day the B Reader is finished, and this should continue in order to protect workers. Getting results as soon as possible allows mine operators to immediately take action to protect workers' health. When a 1/1 reading or recommendation from a PLHCP comes back, an operator can take critical actions, such as moving the employee to the lowest exposure job on site, increasing respiratory protection, beginning the consensus reading process, and having a discussion with the employee. Any delay in operators getting results back could result in avoidable exposures to individuals with respiratory disease.

To help protect workers' rights, MSHA may consider including language that any worker moved to a new position or job function as a result of medical examination results may not be paid less than in their current position nor otherwise retaliated against.

Finally, the follow up to a specialist because of a "decrease" in pulmonary function is too broad/not qualified because a decrease in pulmonary function will most likely be the result of smoking (silicosis is only caused by silica, a decrease in pulmonary function can be caused by many things, the most prevalent cause being smoking). The interpretation of a serial pulmonary function test should be done pursuant to a transparent and medically supported standard. The statement of the American College of Occupational and Environmental Medicine "Evaluating Pulmonary Function Change Over Time" is set forth as Appendix H to the NIOSH Occupational Health Program²⁴, which has been provided to MSHA as part of these comments. The MSHA rule should reference a standard.

Proposed Respiratory Protection Standard

37. MSHA requests comments concerning the temporary, non-routine use of respirators and whether there are other instances or occupations in which the Agency should allow the use of respirators as a supplemental control. Please discuss any impacts on particular mines and mining conditions and the cost of air-purifying respirators, if applicable. MSHA also solicits comments on the proposed requirement that affected miners wear respiratory protection to maintain protection during temporary and non-routine use of respirators.

Response:

We agree with MSHA that respirators should not be relied upon as a primary method for controlling exposure to respirable crystalline silica. However, as MSHA notes, there are times where engineering and administrative controls are not feasible and PPE (i.e., respirators) is the only way to keep an employee from being overexposed – like during some non-routine maintenance activities, periodic maintenance tasks, or for tasks of limited duration that involve potential elevated exposures for time periods of short term or less than shift lengths. For example, respiratory protection with a high assigned protection factor (APF) is necessary to ensure miners are protected when entering a baghouse dust collector for the purpose of changing or replacing bags as there are no engineering controls to control levels under the PEL. In addition to maintenance activities, there are other short-term tasks for which respirators should be permitted for compliance, e.g., short-term seasonal bagging operations, which only occur a couple of weeks or a month in a year. In these *limited and temporary* circumstances, respirators should *explicitly* be allowed for compliance. MSHA's proposed rule contradicts itself in numerous places in the preamble and is confusing, saying, for example, "Under the proposal, respiratory protection equipment could be used in specific and limited situations, as discussed in § 60.14 – Respiratory Protection, but the use of respiratory protection equipment would not be acceptable as a method of compliance." This language calls into question whether respiratory protection would or would not be acceptable. It should be clearly stated that when respirators are used properly for tasks that are temporary or for specific maintenance activities, that over standard exposures will not result in a citation for being in excess of the PEL. MSHA should clarify their language and specify that respiratory protection equipment *is* acceptable for compliance only when the hierarchy of controls is followed.

To keep operators from simply relying on respirators to achieve compliance, MSHA should require operators to outline within their respiratory protection plan (i.e., proposed section §60.14) their process for determining when respirators will be used.

²⁴ Occupational Health Program for Exposure to Crystalline Silica in the Industrial Sand Industry. Second Edition, 2010, National Industrial Sand Association.

Lastly regarding respiratory protection, for non-powered air purifying respirators, operators should be allowed to use 95 and 99 series because they are protective of workers' health, as supported by NIOSH. NIOSH recommends "respirators with N95 or better filters for airborne exposure to crystalline silica at concentrations less than or equal to 0.5mg/m³" (NIOSH, 2008).²⁵ OSHA's decision logic flowchart used to determine the correct respirator selection also explicitly lists "any NIOSH 42 CFR 84 filter" for particles under 2um, which, for non-powered air purifying particulate respirators, are 95, 99 and 100 series.²⁶

Recordkeeping Requirements

40. MSHA is proposing to require recordkeeping for records of evaluations, records of samplings, records of corrective actions, and written determination records received from a PLHCP. The proposed rule's recordkeeping requirements are discussed in the Section-by-Section Analysis section of this Preamble. MSHA seeks comment on the utility of these recordkeeping requirements as well as the costs of making and maintaining these records.

Response:

NSSGA requests MSHA make the recordkeeping requirement more flexible. For example, MSHA can require operators to simply 'notify' workers, but the agency should not specify how. Mine operators know what communication tools work best at their operations. NSSGA supports the creation and retention of records in conjunction with exposure monitoring and medical surveillance. However, MSHA's requirement that operators post results for 31 days on a bulletin board is too prescriptive and may cause issue for operators who do not have bulletin boards. While this was common practice for many years in the industry, as technology advances, it is not long true at all operations. Additionally, portable operations do not have stationary locations and therefore have no bulletin boards or other common posting location. MSHA should eliminate the requirement for posting records. Last, technology is growing throughout the industry and adding flexibility will help future-proof the regulation.

Last, MSHA should not cite operators for overexposures noted on posted results. Overexposures require an operator to implement controls to eliminate the overexposure; these corrective actions and steps taken by the operator to protect workers during that time should be MSHA's primary concern. If anything, MSHA should offer compliance assistance, not a citation for complying with the regulation so long as an operator is working to control the overexposure. Similarly, we do not support MSHA requiring operators to submit to the agency overexposures noted during internal sampling, as was mentioned during the final public hearing on the rule.

Training Requirements

41. MSHA requests the views and recommendations of stakeholders regarding whether training requirements for miners should be included in proposed part 60.

²⁵ NIOSH Policy Statement. (July 2008). Respiratory Protection Recommendations for Airborne Exposures to Crystalline Silica. *DHHS (NIOSH) Publication No. 2008-140*. <https://www.cdc.gov/niosh/docs/2008-140/pdfs/2008-140.pdf>

²⁶ OSHA. Respiratory Change Schedules Decision Logic Flowcharts. <https://www.osha.gov/etools/respiratory-protection/change-schedules/decision-logic/flowchart>

Response:

We support the inclusion of training requirements under the proposed part 60 that are not overly prescriptive. Training requirements are included under the OSHA rule and operators already follow many training provisions, which make it practical for operators to add silica training.

43. MSHA is not proposing to adopt a similar approach as the OSHA Table 1 for the construction industry, where MSHA would prescribe specific exposure control methods for task-based work practices when working with materials containing respirable crystalline silica. See 29 CFR 1926.1153(c)(1). MSHA requests comments on specific tasks and exposure control methods appropriate for a Table 1-approach for the mining industry that also would adequately protect miners from risk of exposure to respirable crystalline silica. Please provide specific rationale and supporting information, including data on how such an approach would be implemented.

Response:

NSSGA strongly urges MSHA to adopt a Table 1 approach. Below, we have provided a sample Table 1 adapted from OSHA's Table 1 for the mining industry. Data in support of the Table 1 is included in the appendix.

We recognize that MSHA may not agree in full with all the equipment, tasks, and jobs proposed in this table. If such disagreements exist, we strongly urge MSHA to not wholly reject the Table 1 approach, but rather exclude certain items. Of all the tasks included, we believe jobs where workers will be in enclosed cabs, booths, and buildings at a minimum can be an area of consensus.

The Table 1 is protective of workers and does not give operators an "out" when a worker performs a task on the table. In contrast, the operator must ensure all engineering and work practice control methods (in column 3) are done in order to comply with the table and not engage in exposure monitoring. The Table 1 approach works because sampling has been done that demonstrates these controls work and keep workers below the action level.

Under a Table 1 approach, inspection focus also shifts to be more protective of workers. Rather than focusing mainly on sampling records and paperwork (i.e., did the operator get two samples in a row under the action level?), inspectors will focus on ensuring engineering and administrative controls are followed in the field, which is more protective of worker health.

Simplification of controls is another benefit of a Table 1 approach. When operators previously unfamiliar with exposure monitoring must comply with the new rule, it will be far better for worker health when those operators can apply the required Table 1 controls and focus their sampling attentions where they are most needed – where exposures may exist.

Proposed Table 1 for MSHA – Adapted from OSHA

Equipment / Tasks				Potentially Exposed Positions / SEGs	Engineering and Work Practice Control Methods
(Description of operation type and tasks performed)				(Job position titles that may perform the identified task and, which may be considered to be in the same SEG* or sub-SEG*, depending upon the site and specific operations)	(Control methods to be applied to the task and equipment. All control measures listed must be implemented.)
1	QUARRY AND PIT OPERATIONS	(i)	Use of mobile equipment to mine quarry and move material: - Excavating - Loading - Hauling material - Hauling overburden	<ul style="list-style-type: none"> ▪ Haul Truck Driver ▪ Pit Loader Operator ▪ Stripping Crew ▪ Water Truck Driver ▪ Excavator / 'Shovel' Operator ▪ Dragline Operator 	Mobile Equipment with Environmentally Controlled Cabs: - Air-filtration system (use of positive pressure for sand operations or similar high silica content) - HEPA filters on AC/heater - Cab windows and doors remain up and closed tight - Door gaskets and other joints, etc., sealed - Routine cleaning inside cab to remove dust debris (e.g., shift end or mid-shift)
		(ii)	Drilling - Drilling prior to blasting	<ul style="list-style-type: none"> ▪ Driller Operator (enclosed cab) 	- Positive-pressure air-filtration systems in cab - HEPA filters on AC/heater in cab - Cab windows and doors remain up and closed tight - Routine cleaning inside cab to remove dust debris (e.g., shift end or mid-shift) - Door gaskets and other joints, etc., sealed - While drilling operations are ongoing remain in the enclosed cab (driller helper)
		(iii)		<ul style="list-style-type: none"> ▪ Driller Helper 	When employees outside of the cab are engaged in the task, apply water and/or dust suppressants to minimize dust emissions OR use drill-stem collar or shroud as dust-collection at point of drilling with automatic collector on dump discharge if dry drilling.

2	PLANT OPERATIONS	(i)	<p>Routine plant operations (crushers, screening towers, conveyors):</p> <ul style="list-style-type: none"> - Control of plant operations / fixed plant / customer truck loading 	<ul style="list-style-type: none"> ▪ Plant/Crusher Operator 	<p>Environmentally Controlled Control Booths:</p> <ul style="list-style-type: none"> - Air-filtration system (use of positive pressure for sand operations or similar high silica content) - HEPA filters on AC/heater - Windows and doors remain up and closed tight - Door gaskets and other joints, etc., sealed - Routine cleaning inside booth to remove dust debris (e.g., shift end or mid-shift)
		(ii)	<p>Routine rounds within plant operations (crushers, screening towers, conveyors, active stockpiles):</p> <ul style="list-style-type: none"> - Outside of control booths/room - Natural ventilation (e.g., outdoors, not in tunnels or enclosed plants, etc.) 	<ul style="list-style-type: none"> ▪ Plant/Crusher Operator ▪ Conveyor/Crusher Attendant ▪ Groundsman ▪ Laborer/Helper ▪ Oiler/Grease-Lube Man ▪ QC Technician ▪ Maintenance / Mechanic ▪ Tunnel Man 	<p>Feasible Engineering Dust Controls:</p> <ul style="list-style-type: none"> - High pressure-low volume dust suppression while plant is operating - Enclosed conveyors and shrouded transfer points - General ventilation system with bag house and cyclone dust collectors - Enclosed lab room with separate ventilation to exterior of lab to control dust - Wetting material down at points of origin before removing
		(iii)	<p>General clean-up, housekeeping and light maintenance within the plant (crushers, screening towers, conveyors, active stockpiles):</p> <ul style="list-style-type: none"> - Outside of control booths/room - Natural ventilation (e.g., outdoors, not in tunnels or enclosed plants, etc.) 	<ul style="list-style-type: none"> ▪ Plant/Crusher Operator ▪ Conveyor/Crusher Attendant ▪ Groundsman ▪ Laborer/Helper ▪ Oiler/Grease-Lube Man ▪ Tunnel Man 	<p>Feasible Engineering Dust Controls:</p> <ul style="list-style-type: none"> - High pressure-low volume dust suppression while plant is operating - Enclosed conveyors and shrouded transfer points - General ventilation system with bag house and cyclone dust collectors - Wetting material down at points of origin before removing - Ban all dry sweeping or compressed air dust clean-up - Wet sweeping or HEPA-filtered vacuuming removal practices utilized

	PLANT OPERATIONS (CONT)	(iv)	<p>General clean-up within the plant using loaders and/or small enclosed support equipment</p> <p>- Removal of material and debris (e.g. skid steer)</p>	<ul style="list-style-type: none"> ▪ Loader Operator ▪ Tunnel Man 	<p>Mobile Equipment with Environmentally Controlled Cabs:</p> <ul style="list-style-type: none"> - Air-filtration system (use of positive pressure for sand operations or similar high silica content) - HEPA filters on AC/heater - Cab windows and doors remain up and closed tight - Door gaskets and other joints, etc., sealed - Routine cleaning inside cab to remove dust debris (e.g., shift end or mid-shift) <p>*Non-routine or periodic housekeeping tasks may require consideration to task-specific respiratory protection*</p>
		(v)	<p>Maintenance throughout the plant</p> <p>- Particularly within confined or enclosed spaces</p>	<ul style="list-style-type: none"> ▪ Maintenance/Mechanic ▪ Groundsman ▪ Laborer/Helper ▪ Oiler/Grease-Lube Man ▪ Tunnel Man 	<p>Feasible Engineering Dust Controls:</p> <ul style="list-style-type: none"> - Use of additional ventilation (e.g., portable ventilation systems) - Wetting material down at points of origin before removing <p>*Non-routine or periodic maintenance tasks may require consideration to task-specific respiratory protection*</p>
3	TRANSPORT AND PRODUCT LOADING OPERATIONS	(i)	Binsetter / Customer Truck Loading	<ul style="list-style-type: none"> ▪ Binsetter ▪ Plant Operator 	<p>Environmentally Controlled Control Booths:</p> <ul style="list-style-type: none"> - Positive-pressure air-filtration systems - HEPA filters on AC/heater - Windows and doors remain up and closed tight - Routine cleaning inside booth to remove dust debris (e.g., shift end or mid-shift) - Door gaskets and other joints, etc., sealed

	TRANSPORT AND PRODUCT LOADING OPERATIONS (CONT)	(ii)	<p>Cleaning Containers:</p> <ul style="list-style-type: none"> - Rail-Car Shaking - Barge Clean-out - Silos / Bins Clean-out 	<ul style="list-style-type: none"> ▪ Rail-Car Shaker Operator ▪ Rail-Car Dropper ▪ Barge Laborer / Helper 	<p>Mobile Equipment with Environmentally Controlled Cabs (e.g. skid steer) or Booths:</p> <ul style="list-style-type: none"> - Air-filtration system (use of positive pressure for sand operations or similar high silica content) - HEPA filters on AC/heater - Cab windows and doors remain up and closed tight - Routine cleaning inside cab/booth to remove dust debris (e.g., shift end or mid-shift) - Door gaskets and other joints, etc., sealed
		(iii)	<p>Use of mobile equipment to load material:</p> <ul style="list-style-type: none"> - Loading 	<ul style="list-style-type: none"> ▪ Loader Operator 	<p>Mobile Equipment with Environmentally Controlled Cabs:</p> <ul style="list-style-type: none"> - Air-filtration system (use of positive pressure for sand operations or similar high silica content) - HEPA filters on AC/heater - Cab windows and doors remain up and closed tight - Routine cleaning inside cab to remove dust debris (e.g., shift end or mid-shift) - Door gaskets and other joints, etc., sealed

III. SUGGESTED LANGUAGE ADAPTED FROM OSHA FOR MNM

This final section outlines suggested language for some sections, adapted directly from OSHA, where we believe MSHA should align with its sister agency. It is organized by relevant section in the MSHA proposed rule (as applicable) and OSHA references are provided (as applicable).

Scope and Application; Effective Date

60.1(a) Suggested language: “This section does not apply where the operator has objective data demonstrating that miner exposure to respirable crystalline silica will remain below 25 micrograms per cubic meter of air (25 µg/m³) as an 8-hour time-weighted average (TWA) under any foreseeable conditions.” [OSHA 1910.1053(a)(2)]

60.1(b) “This section is effective 24 months after [publication date in the Federal Register] for MNM mines.”

Methods of compliance

(a) The mine operator shall install, use, and maintain feasible engineering controls, supplemented by administrative controls when necessary, to keep each miner's exposure at or below the PEL, except as specified in § 60.14.

~~(b) Rotation of miners shall not be considered an acceptable administrative control used for compliance with this part~~

Exposure monitoring; Table 1

§ 60.12(a) **Specified exposure control methods.** [OSHA 1926.1153(c)]

§ 60.12(a)(1) “For each miner engaged in a task identified on Table 1, the mine operator shall fully and properly implement the engineering controls, work practices, and respiratory protection specified for the task on Table 1, unless the mine operator assesses and limits the exposure of the miner to respirable crystalline silica in accordance with paragraph (b) of this section.”

Table 1 - Specified Exposure Control Methods When Working with Materials Containing Crystalline

Silica (Please see question 43 and attachment submitted with comments for Table 1.)

§ 60.12(a)(2) When implementing the control measures specified in Table 1, each mine operator shall:

§ 60.12(a)(2)(i) For tasks performed indoors or in enclosed areas, provide a means of exhaust as needed to minimize the accumulation of visible airborne dust;

§ 60.12(a)(2)(ii) For tasks performed using wet methods, apply water at flow rates sufficient to minimize release of visible dust;

§ 60.12(a)(2)(iii) For measures implemented that include an enclosed cab or booth, ensure that the enclosed cab or booth:

§ 60.12(a)(2)(iii)(A) Is maintained as free as practicable from settled dust;

§ 60.12(a)(2)(iii)(B) Has door seals and closing mechanisms that work properly;

§ 60.12(a)(2)(iii)(C) Has gaskets and seals that are in good condition and working properly;

§ 60.12(a)(2)(iii)(D) Is under positive pressure maintained through continuous delivery of fresh

§ 60.12(a)(2)(iii)(E) Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0 µm range (*e.g.*, MERV-16 or better); and

§ 60.12(a)(2)(iii)(F) Has heating and cooling capabilities.

§ 60.12(b) **Exposure assessment** [OSHA 1910.1053(d)]

§ 60.12(b)(1) “**General.** The mine operator shall assess the exposure of each miner who is or may reasonably be expected to be exposed to respirable crystalline silica at or above the action level in accordance with either the performance option in paragraph (b)(2) or the scheduled monitoring option in paragraph (b)(3) of this section.”

§ 60.12(b)(2) “**Performance option.** The mine operator shall assess the 8-hour TWA exposure for each miner on the basis of any combination of air monitoring data or objective data sufficient to accurately characterize miner exposures to respirable crystalline silica.”

§ 60.12(b)(3) “**Scheduled monitoring option.**”

§ 60.12(b)(3)(i) “The mine operator shall perform initial monitoring to assess the 8-hour TWA exposure for each miner on the basis of one or more personal breathing zone air samples that reflect the exposures of miners on each shift, for each job classification, in each work area. Where several employees perform the same tasks on the same shift and in the same work area, or when a substantial difference does not exist between the environment and/or work tasks performed on different shifts and it is reasonable to expect similar exposures, the mine operator may sample a representative fraction of these miners in order to meet this requirement. In representative sampling, the operator shall sample the miner(s) who are expected to have the highest exposure to respirable crystalline silica.”

§ 60.12(b)(3)(ii) “Where the most recent exposure monitoring indicates that miner exposures are below the action level, sampling should take place until the mine operator is confident that results are below the action level for those miners whose exposures are represented by such monitoring.

§ 60.12(b)(3)(iii) “Where the most recent exposure monitoring indicates that miner exposures are at or above the action level but at or below the PEL, the operator shall repeat such monitoring within six months of the most recent monitoring.”

§ 60.12(b)(3)(iv) “Where the most recent exposure monitoring indicates that miner exposures are above the PEL, the operator shall repeat such monitoring within three months of the most recent monitoring.”

§ 60.12(c) “**Reassessment of exposures.** The operator shall reassess exposures whenever a change in the production, process, control equipment, personnel, or work practices may reasonably be expected to result in new or additional exposures at or above the action level, or when the operator has any reason to believe that new or additional exposures at or above the action level have occurred.”

Respiratory protection

§ 60.14(a) “**Temporary non-routine use of respirators.** The mine operator shall use respiratory protection as a temporary measure in accordance with paragraph (c) of this section. Miners must use respirators when working in concentrations of respirable crystalline silica above the PEL while:”

§ 60.14(a)(1) “Engineering control measures are being developed and implemented; or”

§ 60.14(a)(2) “During limited and temporary tasks, such as certain maintenance and repair tasks, for which engineering and work practice controls are not feasible; or,”

§ 60.14(a)(3) “It is necessary by the nature of work involved.”

§ 60.14(c) “**Respiratory protection requirements**” (1) Affected miners shall be provided with a NIOSH- approved atmosphere-supplying respirator or NIOSH-approved air-purifying respirator equipped with the following:”

§ 60.14(c)(1)(i) Particulate protection classified as 95, 99 or 100 series under 42 CFR part 84; or

§ 60.14(c)(1)(ii) Particulate protection classified as High Efficiency “HE” under 42 CFR part 84.

Medical surveillance for metal and nonmetal miners

§ 60.15(a) **General.** [OSHA 1910.1053(i)]

§ 60.15(a)(1) The mine operator shall make medical surveillance available at no cost to the miner, and at a reasonable time and place, for each miner who will be occupationally exposed to respirable crystalline silica at or above the action level for 30 or more days per year.

§ 60.15(a)(2) The mine operator shall ensure that all medical examinations and procedures required by this section are performed by a PLHCP as defined in paragraph () of this section.

§ 60.15(b) **Initial examination.** The mine operator shall make available an initial (baseline) medical examination as soon as practical, but in no case more than 90 days after the miner becomes employed as a non-probationary miner after initial assignment, unless the miner has received a medical examination that meets the requirements of this section within the last three years. The examination shall consist of:

§ 60.15(b)(1) A medical and work history, with emphasis on: Past, present, and anticipated exposure to respirable crystalline silica, dust, and other agents affecting the respiratory system; any history of respiratory system dysfunction, including signs and symptoms of respiratory disease (e.g., shortness of breath, cough, wheezing); history of tuberculosis; and smoking status and history;

§ 60.15(b)(2) A physical examination with special emphasis on the respiratory system;

§ 60.15(b)(3) A chest X-ray (a single posteroanterior radiographic projection or radiograph of the chest at full inspiration recorded on either film (no less than 14 x 17 inches and no more than 16 x 17 inches) or digital radiography systems), interpreted and classified according to the International Labour Office (ILO) International Classification of Radiographs of Pneumoconioses by a NIOSH-certified B Reader;

§ 60.15(b)(4) A pulmonary function test to include forced vital capacity (FVC) and forced expiratory volume in one second (FEV₁) and FEV₁/FVC ratio, administered by a spirometry technician with a current certificate from a NIOSH-approved spirometry course, interpreted according to the most recent American Thoracic Society guidelines for the interpretation of spirometry;

§ 60.15(b)(5) Testing for latent tuberculosis infection.

§ 60.15(c) **Periodic examinations.** The mine operator shall make available medical examinations that include the procedures described in paragraph (b) of this section (except paragraph (b)(5)) at least every three years, or more frequently if recommended by the PLHCP.

IV. CONCLUSION

In conclusion, we do not oppose MSHA's lowering of the PEL or general requirements for mine operators to conduct exposure monitoring and offer medical surveillance. We do oppose the prescriptive nature of how MSHA would require mine operators to carry out these provisions. MSHA's proposed rule is overly prescriptive, does not apply sampling practices in a manner that prioritizes risk, is not based on industrial hygiene best practices, and directs finite resources where they are not necessary. We strongly recommend MSHA adopt a standard like OSHA's silica standard, including a Table 1, for the reasons we have laid out in these comments.

We appreciate MSHA's continued partnership and critical mission of protecting our nation's miners.

Thank you for your consideration and please do not hesitate to reach out with any questions.

Respectfully,

A handwritten signature in black ink, appearing to read 'M. Johnson', with a long horizontal flourish extending to the right.

Michael W. Johnson
President & CEO
National Stone, Sand & Gravel Association

V. APPENDIX

In support of a Table 1, the following data are submitted and show average exposure of employees in various jobs where engineering controls (required under a Table 1) have been implemented. These data are from 2018-2022, show exposures for over 800 employees, and that exposures remain under the proposed AL in all but one case, and under the proposed PEL in all cases.

Figure 1. Respirable Crystalline Silica Data (2018-2022)

SEG	Job Title	Count of Emp ID	Avg. Exposure in Ug/M3	Median Exposure in Ug/M3 (copy)	Std. dev. of Exposure in Ug/M3	Percentile (95) of Exposure in Ug/M3
Booth	BATCH OPERATOR	1.0	4.19	4.19		4.19
	PLANT OPER. IN BOOTH	57.0	6.46	4.31	9.08	14.61
	PUGMILL OPERATOR	1.0	0.00	0.00		0.00
	SHIP/BARGE LOADER OPER	1.0	4.31	4.31		4.31
	WASHPLANT OPERATOR	1.0	4.58	4.58		4.58
	Total	61.0	3.91	4.31	8.82	14.25
Crusher	CRUSHER OPERATOR	15.0	9.13	4.26	10.16	32.04
	Total	15.0	9.13	4.26	10.16	32.04
Drill	DRILL OPERATOR	3.0	9.33	4.97	7.84	17.04
	Total	3.0	9.33	4.97	7.84	17.04
Misc	MULTIPLE JOBS	9.0	4.67	4.66	1.52	7.06
	UNCLASSIFIED	1.0	5.65	5.65		5.65
	Total	10.0	5.16	4.71	1.47	7.05
Mobile Cab	CRANE/DAGLINE OPR	2.0	4.64	4.64	0.99	5.27
	DOZER OPERATOR	8.0	4.14	3.63	1.49	6.58
	EXCAVATOR OPERATOR	14.0	6.22	4.42	6.58	14.55
	GRADER OPERATOR	6.0	3.41	4.25	1.82	4.71
	HAUL TRUCK DRIVER	158.0	4.65	4.24	2.36	8.83
	LOADER OPERATOR	211.0	4.26	4.14	1.63	6.27
	ROCKBREAKER OPER	7.0	4.78	4.48	3.72	10.06
	SHOVEL OPERATOR	2.0	4.11	4.11	0.11	4.18
	SWEEPER OPERATOR	2.0	3.37	3.37	0.73	3.83
	TRUCK DRIVER-OTHER	1.0	4.75	4.75		4.75
	UTILITY OPERATOR	2.0	4.44	4.44	0.14	4.53
	WATER TRUCK DRIVER	24.0	6.21	4.42	5.47	14.46
	Total	437.0	4.58	4.21	2.59	7.71
Nonbooth	BELT REPAIRER	2.0	7.25	7.25	4.07	9.84
	CONVEYOR ATTENDANT	4.0	23.60	23.00	19.10	42.50
	FOREMAN/FORM.ASSIT	21.0	6.42	4.71	8.07	10.63
	HELPER/LABORER-GEN	74.0	8.26	5.54	7.65	21.08
	LEADMAN	22.0	4.96	4.43	1.45	7.82
	OILER/GREASER	5.0	7.73	4.41	5.11	13.99
	PLANT OPER NONBOOTH	4.0	5.09	4.28	1.97	7.47
	REPAIRMAN/FITTER	24.0	7.15	4.58	5.92	17.84
	YARDMAN	1.0	27.33	27.33		27.33
	Total	157.0	10.87	4.77	7.72	24.23
Office	OFFICE PERSONNEL	6.0	5.95	5.79	1.80	8.06
	SCALE CLERK	9.0	4.45	4.57	0.93	5.81
	SUPERINTENDENT	4.0	4.32	4.21	0.49	4.90
	Total	19.0	4.91	4.57	1.37	7.46
Other	DREDGE ENGR/OPR	4.0	4.90	4.43	1.16	6.30
	HELPER/LABORER-CON	2.0	5.44	5.44	2.09	6.76
	STACKER OPERATOR	2.0	4.00	4.00	0.13	4.08
	Unknown	2.0	5.04	5.04	1.58	6.05
	Total	10.0	4.84	4.19	1.21	6.77
QC	QC TECH/MATLS INSP	30.0	7.72	5.33	5.98	22.08
	Total	30.0	7.72	5.33	5.98	22.08
Rail Yard	CAR DROPPER/CLEANR	3.0	4.26	4.31	0.11	4.34
	LOCOMOTIV OPERATOR	2.0	4.18	4.18	0.28	4.36
	Total	5.0	4.22	4.31	0.17	4.37
Shop	ELECTRICIAN/HELPER	6.0	5.12	4.13	2.30	8.58
	MECHANIC/MACHINIST	47.0	11.43	4.23	47.43	10.63
	WELDER/WELDER ASST	2.0	3.87	3.87	0.24	4.02
	Total	55.0	6.81	4.22	43.84	10.10
Grand Total		802.0	6.32	4.31	12.55	13.14