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November 5, 2015

The Honorable David Michaels, Ph.D., M.P.H.
Assistant Secretary of Labor for Occupational Safety and Health
Department of Labor
Occupational Safety and Health Administration
200 Constitution Avenue, NW
Washington, DC 20210

Re: Docket No. OSHA-H005C-2006-0870 [Occupational Exposure to Beryllium and Beryllium Compounds]

Dear Dr. Michaels,

Public Citizen, a consumer advocacy organization with more than 400,000 members and supporters nationwide, submits these comments on the Occupational Safety and Health Administration's (OSHA's) proposed rule, "Occupational Exposure to Beryllium and Beryllium Compounds", issued August 7, 2015.[1]

In brief, Public Citizen notes that a lower eight-hour time-weighted average permissible exposure limit (PEL) of 0.1 micrograms per cubic meter of air ($\mu g/m^3$) and short-term exposure limit (STEL) of 1.0 $\mu g/m^3$ are more protective against beryllium sensitization (BeS) and chronic beryllium disease (CBD), as well as feasible. We further urge OSHA to apply this PEL and STEL, in addition to all ancillary provisions in the proposed rule, to the thousands of construction and shipyard workers exposed to levels of airborne beryllium that OSHA acknowledges can lead to lung cancer and CBD. Finally, given the American Conference of Governmental Industrial Hygienists' (ACGIH's) updated, evidence-based recommended Threshold Limit Value (TLV®) of 0.05 $\mu g/m^3$, we implore OSHA to commission or conduct a feasibility study, investigating the feasibility of compliance with a PEL of 0.05 $\mu g/m^3$, immediately after the current proposed rule is finalized.

Part I: Background

Beryllium's properties and toxicity

Beryllium is a light but strong metal present in many different materials used in the aerospace, defense, telecommunications, automotive, electronic, and medical specialty industries.[2] OSHA

[1] 80 FR 47565. Docket No. OSHA-H005C-2006-0870. Proposed Rule; request for comments. Occupational Exposure to Beryllium and Beryllium Compounds. August 7, 2015. https://s3.amazonaws.com/public-inspection.federalregister.gov/2015-17596.pdf. Accessed October 5, 2015. **[Hereafter referred to as "OSHA Proposed Rule"]**

[2] OSHA Proposed Rule, at 58-62.

estimates that around 35,000 workers in many different industries, including foundries, machining, and welding,[3] in addition to up to 23,000 abrasive blasters in the construction industry (40 percent of all exposed workers),[4] are exposed to beryllium.

Beryllium is toxic at extremely low levels and exposure can result in BeS, an immune response that eventually can lead to an autoimmune granulomatous lung disease known as CBD.[5] BeS is a necessary prerequisite to the development of CBD,[6] with OSHA's proposed rule citing studies showing that 31-49 percent of all sensitized workers were diagnosed with CBD after clinical evaluations.[7] Beryllium also is a recognized carcinogen[8] that can cause lung cancer.[9]

OSHA's inaction on beryllium

In 1999, the Department of Energy updated its action level for beryllium that would trigger protective measures. The action level was changed from an eight-hour time-weighted average airborne beryllium concentration of 2.0 $\mu g/m^3$ to a concentration of 0.2 $\mu g/m^3$, after it recognized that such a reduction would "significantly decrease the number of workers exposed and the level of exposure to beryllium, and therefore, is expected to decrease disease."[10] In 2001, Public Citizen and the Paper, Allied-Industrial, Chemical & Energy Workers International Union (PACE)[11] petitioned OSHA to lower the beryllium PEL from 2.0 $\mu g/m^3$ to 0.2 $\mu g/m^3$, either through an emergency temporary standard or, alternatively, through a rulemaking process for a comprehensive beryllium rule.[12] OSHA denied the request for an emergency temporary standard and failed even to respond to the petition's other request to initiate the rulemaking process for a beryllium standard.[13]

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[3] Occupational Safety and Health Administration. Safety and Health Topics: Beryllium. https://www.osha.gov/SLTC/beryllium/index.html. Accessed October 29, 2015.
[4] Occupational Safety and Health Administration Advisory Committee on Construction Safety and Health. Transcript of December 6, 2013 Meeting, at 90. https://www.osha.gov/doc/accsh/transcripts/20131206_accsh_transcripts.pdf. Accessed October 18, 2015.
[5] Occupational Safety and Health Administration. Fact Sheet: Health Effects of Exposure to Beryllium. https://www.osha.gov/Publications/OSHA3822.pdf. Accessed October 29, 2015.
[6] OSHA Proposed Rule, at 93.
[7] OSHA Proposed Rule, at 106.
[8] World Health Organization. International Agency for Research on Cancer. List of Classifications, Volumes 1-114. http://monographs.iarc.fr/ENG/Classification/latest_classif.php. Beryllium is classified as a Group 1 carcinogen, which means that "sufficient evidence of carcinogenicity in humans" exists. World Health Organization. International Agency for Research on Cancer. Preamble to the IARC monographs: Scientific review and evaluation. http://monographs.iarc.fr/ENG/Preamble/currentb6evalrationale0706.php. Both links accessed October 29, 2015.
[9] National Toxicology Program. Report on Carcinogens, Thirteenth Edition. Beryllium and Beryllium Compounds CAS No. 7440-41-7 (Beryllium). http://ntp.niehs.nih.gov/ntp/roc/content/profiles/beryllium.pdf. Accessed October 29, 2015.
[10] 64 FR 68854. Docket No. EH–RM–98–BRYLM. Chronic Beryllium Disease Prevention Program. December 8, 1999. http://www.gpo.gov/fdsys/pkg/FR-1999-12-08/pdf/99-31181.pdf. Accessed October 29, 2015.
[11] PACE has since merged with the United Steelworkers. See e.g. United Steelworkers. Our History. http://www.usw.org/union/history. Accessed November 3, 2015.
[12] Public Citizen. Petition to OSHA to lower occupational exposure to beryllium. September 1, 2001. http://www.citizen.org/Page.aspx?pid=2042. Accessed October 5, 2015.
[13] Public Citizen. Comments concerning OSHA's failure to set adequate standards for occupational exposure to beryllium. February 24, 2003. http://citizen.org/Page.aspx?pid=2039. Accessed October 29, 2015.

In lieu of a formal rulemaking process, OSHA instead issued, in 2002, a Request for Information soliciting comments on various aspects of occupational beryllium exposure.[14] OSHA eventually initiated a rulemaking process, but it is unconscionable that it has taken 14 years since our petition for OSHA to issue a proposed rule.

Part II: Lowest airborne concentrations at which BeS and CBD are seen

Long-term, daily exposures

The 2001 petition noted that even a PEL of 0.2 μg/m^3 could prove too high should additional scientific evidence emerge of beryllium's harms below this level. Because of OSHA's inexcusable delay in proposing the rule, there is, by now, sufficient evidence showing that OSHA's proposed PEL of 0.2 μg/m^3 (and even its alternative proposed PEL of 0.1 μg/m^3) still would leave workers exposed to unsafe levels of beryllium. OSHA concedes this point in its proposed rule, concluding that "significant risks of sensitization and CBD remain" at both its proposed PEL of 0.2 μg/m^3 and its alternative proposal of 0.1 μg/m^3.[15] We agree, as this danger has been borne out in numerous studies.

Even before our petition, a 1997 study of two beryllium-copper alloy manufacturing factories found a significant difference in positive beryllium lymphocyte proliferation test (BeLPT; the standard screening test for BeS) results between workers exposed to average airborne beryllium concentrations up to 0.06 μg/m^3 and those exposed to concentrations of less than 0.01 μg/m^3.[16] The authors concluded that "[t]he present results suggest that T cells of workers continuously exposed to beryllium of more than 0.01 μg/m^3 may be activated, and the cell-mediated immune response of workers may be promoted."

In a 2001 case control study of 20 workers with BeS and/or CBD at a beryllium machining plant, eight (40 percent) of the workers (including 7 with CBD) had average exposures to airborne beryllium concentrations of less than 0.2 μg/m^3, with two of the workers with CBD having worked as machinists for three months or less.[17] No cases of BeS or CBD were observed at exposures below 0.02 μg/m^3. Another 2001 study found that two of 20 short-term workers exposed to average airborne beryllium concentrations of less than 0.2 μg/m^3 had BeS, with one of the two sensitized workers exposed to an average concentration of just 0.05 μg/m^3.[18] A 2008 study identified two aluminum smelter workers with CBD following exposures to average airborne beryllium concentrations of 0.04 and 0.16 μg/m^3.[19]

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[14] 67 FR 70707. Docket No. H005C. Occupational Exposure to Beryllium; Request for Information. November 26, 2002. https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=FEDERAL_REGISTER&p_id=17469. Accessed October 30, 2015.

[15] OSHA Proposed Rule, at 732.

[16] Yoshida T, Shima S, Nagaoka K, et al. A study on the beryllium lymphocyte transformation test and the beryllium levels in working environment. *Ind Health*. 1997;35(3):374-379.

[17] Kelleher PC, Martyny JW, Mroz MM, et al. Beryllium particulate exposure and disease relations in a beryllium machining plant. *J Occup Environ Med*. 2001;43(3):238-249.

[18] Henneberger PK, Cumro D, Deubner DD, Kent MS, McCawley M, Kreiss K. Beryllium sensitization and disease among long-term and short-term workers in a beryllium ceramics plant. *Int Arch Occup Environ Health*. 2001;74(3):167-176.

[19] Taiwo OA, Slade MD, Cantley LF, et al. Beryllium sensitization in aluminum smelter workers. *J Occup Environ Med*. 2008;50(2):157-162.

In 2009, the ACGIH revised its prior beryllium TLV® from 2.0 to 0.05 μg/m^3 based on a review of studies quantifying the relationship between beryllium exposure levels and the occurrence of BeS and CBD.[20] The ACGIH reviewers concluded that a "TLV-[time-weighted average] of 0.05 μg/m^3 is expected to be protective of the beryllium-sensitive population because available data indicate very low or no incidences of BeS or disease at this level."

Finally, a 2012 National Institute for Occupational Safety and Health (NIOSH) analysis found that 3 percent of workers at a beryllium manufacturing facility exposed to an average airborne beryllium concentration of <0.1 μg/m^3, and 11 percent of workers exposed to a range of 0.1-0.6 μg/m^3, had been sensitized to beryllium.[21] The lowest average airborne beryllium concentration at which sensitization was seen was 0.09 μg/m^3. When analyzing only the estimated respirable concentration of beryllium, they found that 6 percent of workers had been sensitized after average exposures to <0.06 μg/m^3 and 8 percent after exposures to 0.06-0.42 μg/m^3, with 0.04 μg/m^3 representing the lowest average respirable exposure at which BeS was observed.

The available evidence therefore indicates that BeS and CBD occur after even brief exposures to average beryllium concentrations well below OSHA's proposed PEL of 0.2 μg/m^3, and that even a PEL of 0.1 μg/m^3 may not adequately protect workers from these dangers. Both NIOSH[22] and the National Research Council[23] have concluded that there is not enough evidence to determine a safe concentration of airborne beryllium below which BeS and CBD do not occur. Nevertheless, OSHA can at least minimize the risks to workers by lowering the PEL to 0.1 μg/m^3.

Short-term exposures

The existing studies investigating the association between airborne beryllium concentrations and BeS and CBD have analyzed long-term (days or longer) average concentrations. However, OSHA noted in its proposed rule that "relatively brief, short-term beryllium exposures may be sufficient to trigger the immune hypersensitivity reaction [responsible for BeS]"[24] and that "higher-level exposures or short-term peak exposures such as those encountered in machining jobs may be highly relevant to risk of sensitization."[25] The impossibility of continuously monitoring individuals' beryllium exposure levels and sensitization status precludes definitive conclusions on the precise duration (whether 15 minutes or shorter) over which beryllium sensitization can occur.[26] Nevertheless, OSHA concluded, correctly, that "a STEL in

[20] American Conference of Governmental Industrial Hygienists. *Beryllium and Compounds* 11 (2009).
[21] Schuler CR, Virji MA, Deubner DC, et al. Sensitization and chronic beryllium disease at a primary manufacturing facility, part 3: exposure-response among short-term workers. *Scand J Work Environ Health*. 2012;38(3):270-281.
[22] National Institute for Occupational Safety and Health. Comments of the National Institute for Occupational Safety and Health on the Department of Energy Request for Information on Chronic Beryllium Disease Prevention Program. Docket No. HS-RM-10-CBDPP. February 22, 2011. http://energy.gov/sites/prod/files/2015/04/f21/23_Paul%20A.%20Schulte_10%20CFR%20850%20Request%20for%20Information_Docket%20Number_HS_RM_10_CBDPP.pdf. Accessed October 30, 2015.
[23] National Research Council. Managing health effects of beryllium exposure. The National Academies Press;2008. http://www.nap.edu/catalog/12464/managing-health-effects-of-beryllium-exposure. Accessed October 16, 2015.
[24] OSHA Proposed Rule, at 93.
[25] OSHA Proposed Rule, at 276.
[26] OSHA Proposed Rule, at 276.

combination with a…PEL adds further protection from risk of harm than that afforded by the… PEL alone."[27]

Part III: Feasibility of a PEL lower than 0.2 μg/m^3 and a STEL lower than 2.0 μg/m^3

Lower PEL

In its proposed rule, OSHA conceded that "significant risks of sensitization and CBD remain" at both its proposed PEL of 0.2 μg/m^3 and its alternative proposal of 0.1 μg/m^3.[28] However, OSHA claimed that a PEL of 0.2 μg/m^3 was the lowest exposure limit that would be "feasible for most operations most of the time,"[29] basing this conclusion on an analysis of sampled airborne beryllium concentrations in nine different industries.[30]

OSHA nevertheless conceded that a PEL of 0.1 μg/m^3 would "almost certainly be feasible" for some industries, such as beryllium alloy production, and "appears feasible" for others, such as the precision turned products industry.[31] This conclusion was based, in part, on data indicating that airborne beryllium concentrations in some of these industries were already below this level.[32]

The sole reason OSHA listed for not requiring a PEL of 0.1 μg/m^3 was that, for industries with the highest measured airborne beryllium concentrations, "the exposure monitoring data necessary to more fully evaluate the effectiveness of exposure controls adopted after 2000 are not currently available to OSHA, which makes it difficult to determine the feasibility of achieving exposure levels at or below 0.1 μg/m^3."[33]

The claimed lack of evidence by which to judge the feasibility of a PEL of 0.1 μg/m^3 for certain industries should not preclude the institution of such a PEL. OSHA's conclusion that a PEL of 0.2 μg/m^3 would be feasible for "most operations most of the time" necessarily means that some operations in certain industries will continue to exceed this proposed PEL even with maximal engineering and work practice controls. In its proposed rule, OSHA describes how it would address such workplaces: "Where engineering and work practice controls are insufficient to reduce exposures to or below the TWA PEL and STEL, employers would still be required to implement them to reduce exposure as much as possible, and to supplement them with a respiratory protection program".[34]

This same enforcement paradigm could and should be instituted for workplaces unable to achieve a PEL of 0.1 μg/m^3 with the maximum possible engineering and work practice controls, within those industries for which OSHA has not yet been able to determine the feasibility of meeting the PEL solely through such controls.

[27] OSHA Proposed Rule, at 735.
[28] OSHA Proposed Rule, at 732.
[29] OSHA Proposed Rule, at 401.
[30] OSHA Proposed Rule, Section IX. Summary of the Preliminary Economic Analysis and Initial Regulatory Flexibility Analysis, beginning at 397.
[31] OSHA Proposed Rule, at 402.
[32] OSHA Proposed Rule, at 400.
[33] OSHA Proposed Rule, at 402.
[34] OSHA Proposed Rule, at 16.

It is likely that data eventually will emerge demonstrating that a PEL of 0.1 μg/m^3 is as feasible as a PEL of 0.2 μg/m^3 "for most operations most of the time." Should this happen, it is highly doubtful that OSHA would reopen the rulemaking process to revise the PEL downward. Even if it were to do so, given how long it took to issue the current proposed rule, a rulemaking process would not be completed for many years. OSHA should not allow workers in all industries to continue to be exposed to a higher PEL of 0.2 μg/m^3 while it waits for such data on a few industries.

In sum, OSHA acknowledges that, as is the case with any chemical PEL, not *every* work process within each covered industry will be able to achieve average airborne beryllium concentrations of less than 0.2 μg/m^3. This, rightly, did not prevent OSHA from proposing such a PEL. Nor should it prevent the agency from further lowering the PEL to a more protective 0.1 μg/m^3.

Lower STEL

OSHA proposes a STEL of 2.0 μg/m^3, which would prohibit exposures to airborne beryllium concentrations above this level for more than 15 minutes at a time.[35] OSHA claimed that it was "more difficult based on the currently available evidence to determine whether the alternative STEL of 1.0 μg/m^3 would also be feasible in most operations based on lack of detail in the activities of the workers presented in the data".[36] However, this seems to be refuted by OSHA's analysis of its own inspection data.

OSHA completed a Preliminary Economic Analysis and Initial Regulatory Flexibility Analysis in anticipation of the issuance of its proposed beryllium rule.[37] Part of this report involved an analysis of all short-term airborne beryllium samples taken by its inspectors since 1978.[38] OSHA found that 75 percent of the 623 samples fell below a concentration of 1.0 μg/m^3, with the median beryllium concentration ranging from 0.07 to 0.7 μg/m^3 across the seven industries for which short-term sampling data were available. Furthermore, over the past several decades, there has been a steady increase in the proportion of short-term airborne beryllium samples falling below a concentration of 1.0 μg/m^3, from 51 percent (1980-1989) to 80 percent (1990-1999) and, finally, 94 percent from 2000-2008. Therefore, judging from OSHA's own inspection data, a STEL of 1.0 μg/m^3 seems to be readily feasible for all industries. And, judging from the median beryllium concentrations by industry, every industry would even be able to comply with a STEL of 0.7 μg/m^3 most of the time.

OSHA notes in its proposed rule that "for a small number of tasks, short-term exposures may exceed the proposed STEL, even after feasible control measures to reduce…exposure to below the proposed PEL have been implemented, and [OSHA] therefore assumes that the use of respiratory protection will continue to be required for some short-term tasks".[39] We agree and urge the agency to thereby implement a STEL of 1.0 μg/m^3 and require the tiny minority of

[35] OSHA Proposed Rule, at 397.
[36] OSHA Proposed Rule, at 402-403.
[37] Occupational Safety and Health Administration. Preliminary Economic Analysis and Initial Regulatory Flexibility Analysis: Supporting document for the Notice of Proposed Rulemaking for Occupational Exposure to Beryllium. http://www.regulations.gov/#!documentDetail;D=OSHA-H005C-2006-0870-0426. Accessed November 3, 2015.
[38] *Ibid*, at PDF pages 602-605.
[39] OSHA Proposed Rule, at 402.

workplaces unable to achieve short-term airborne beryllium concentrations below this STEL with maximal engineering controls to protect workers with respirators and the other ancillary provisions provided for in the proposed rule.

Part IV: Scope of the proposed rule

General industry exemptions

OSHA irresponsibly exempts from its proposed rule those operations in general industry that: a) deal with beryllium-containing products but do not process them in a way that results in the release of "more than very small quantities" of beryllium, or b) involve materials containing trace amounts of beryllium (less than 0.1 percent beryllium by weight).[40]

The first exemption fails to account for dermal exposures. OSHA acknowledges in its proposed rule, "Once absorbed through the skin, beryllium can induce a sensitization response that is a necessary first step toward CBD" and that there is evidence that this risk is not limited to soluble forms of beryllium that are more easily absorbed through the skin.[41] Exempting industries that require workers to handle beryllium-containing products would potentially allow these workers to be sensitized to beryllium through dermal contact, even in the absence of airborne beryllium. OSHA's proposal to require the use of personal protective clothing only "where employees' skin or clothing become visibly contaminated with beryllium," without defining criteria for "visible contamination,"[42] further increases the risk of exposing these workers to toxic levels of beryllium.

The second exemption is equally perplexing, as OSHA describes in its proposal studies unequivocally demonstrating that BeS and CBD occur in multiple industries utilizing products containing trace amounts of beryllium.[43] OSHA's question to prospective commenters: "Is it appropriate to include an exemption for operations where beryllium exists only as a trace contaminant, *but some workers can nevertheless be significantly exposed?*"[44] [emphasis added] answers itself. Such an inappropriate exemption would needlessly condemn workers in such industries to the risks of beryllium toxicity.

Construction and shipyard workers

During the May 7-8, 2014, meeting of the Advisory Committee on Construction Safety and Health (ACCSH), OSHA proposed four possible options for construction employers regarding its pending proposed beryllium rule:[45]

- Option 1: Alter the PEL and introduce, for the first time, a STEL, but add no other protective provisions to the new standard.

[40] OSHA Proposed Rule, at 711-712. For the first exemption category, OSHA cites criteria in its Hazard Communication Standard (29 CFR 1910.1200(c)), yet this standard does not define what constitute "more than very small quantities".
[41] OSHA Proposed Rule, at 782-783.
[42] OSHA Proposed Rule, at 782.
[43] OSHA Proposed Rule, at 713. Also, see Taiwo et al. study of aluminum smelter workers (footnote 19).
[44] OSHA Proposed Rule, at 713.
[45] Occupational Safety and Health Administration. OSHA Request for an ACCSH Committee Recommendation – Options for the Construction Industry in the Proposed Rulemaking for Beryllium.

- Option 2: Alter the PEL, introduce a STEL, and include a medical surveillance requirement for BeS and CBD.
- Option 3: Alter the PEL, introduce a STEL, and include "various ancillary provisions typical of OSHA 6(b) health standards such as exposure monitoring, regulated areas, medical surveillance, and methods of compliance." This option would harmonize the new standard for construction workers with the standard eventually adopted for general industry.
- Option 4: No change.

The ACCSH members voted for Option 3,[46] which would have applied all provisions of the eventual proposed rule to construction workers. However, OSHA has opted to ignore the advice of its own advisory committee experts and has not extended *any* of the proposed changes to the beryllium rule to construction workers (Option 4).

This decision also contradicts the reasoning of OSHA's own officials in their presentation to the December 6, 2013, meeting of the committee. At the meeting, OSHA officials observed that most exposures in the construction industry occur during abrasive blasting operations and estimated that 23,000 workers (40 percent of all beryllium-exposed workers) are performing open-air blasting.[47] The officials provided data that 70 percent of inspected abrasive blasting worksites had detectable airborne beryllium concentrations, with a mean level of 3.7 $\mu g/m^3$ and a median of 0.6 $\mu g/m^3$. Fully 35 percent of abrasive blasting worksites were above the current PEL of 2.0 $\mu g/m^3$.

Some in the coal slag industry claim that airborne beryllium exposures are not a major concern to abrasive blasting workers because beryllium is largely present only at trace levels (<0.1 percent by weight) in coal slag.[48] What they fail to mention is that the abrasive blasting process can concentrate beryllium in the air, in the form of dust, to levels that pose a risk to workers. OSHA noted this in its presentation to the ACCSH: "Even though beryllium is just a minor contaminant

[46] Occupational Safety and Health Administration. Advisory Committee on Construction Safety and Health. Minutes of May 7-8, 2014, Meeting. https://www.osha.gov/doc/accsh/meetingminutes/may2014.html. Accessed October 28, 2015.

[47] Occupational Safety and Health Administration Advisory Committee on Construction Safety and Health. Transcript of December 6, 2013, Meeting, at 86-94 https://www.osha.gov/doc/accsh/transcripts/20131206_accsh_transcripts.pdf. Accessed October 18, 2015.

[48] HARSCO presentation to the White House's Office of Information and Regulatory Affairs. September 30, 2014. http://www.reginfo.gov/public/do/eoDownloadDocument?pubId=&eodoc=true&documentID=649. The company went so far as to imply that OSHA's position was that the form of beryllium [beryllium silicate] the company utilized did not lead to CBD. See Slide 9, which stated that "Even OSHA's [actually the interagency Small Business Advocacy Review Panel's] analysis states: 'It has been suggested that CBD is the result of occupational exposure to beryllium oxide and other water-insoluble berylliums rather than exposure to water-soluble beryllium or beryllium ores,'" while omitting the very next sentence in the cited document responding to this suggestion: "However, there are inadequate data, at this time, on employees selectively exposed to specific beryllium compounds to eliminate a potential CBD concern for any particular form of this metal" (Small Business Administration. Report of the Small Business Advocacy Review Panel on the OSHA Draft Proposed Standard for Occupational Exposure to Beryllium. January 15, 2008. Page 4. https://www.sba.gov/sites/default/files/files/Report_review_panel_exposure_to_beryllium_01_15_2008.pdf). OSHA agreed with this conclusion in its proposed rule: "Based on a review of scientific studies, OSHA has preliminarily determined that the toxicological effects of beryllium exposure on the human body are similar regardless of the form of beryllium" (OSHA Proposed Rule, at 707). All links accessed October 29, 2015.

in these slags, because the blasting is so dusty, it can get to levels that are above the current PEL."[49] This assertion is borne out by OSHA's inspection data above.

Despite its own alarming data, OSHA elected not to extend the protections of the proposed beryllium rule to construction and shipyard workers, basing its decision on the fact that existing construction (29 CFR 1926.57) and maritime (29 CFR 1915.34(c)) standards already require the use of respirators by abrasive blasting workers under certain conditions.[50] However, abrasive blasters in general industry are similarly currently protected by a respirator requirement when any airborne toxic chemical concentrations exceed the exposure limits in 29 CFR 1910.1000,[51] yet this did not prevent OSHA from including these workers within the scope of its proposed rule.[52]

Furthermore, OSHA's justification for excluding construction and shipyard workers does not explain why the proposed rule's other, non-respirator-related provisions (the PEL and the remaining ancillary provisions) were similarly not applied to these workers. Excluding them from the proposed rule would condemn thousands to continued exposure to levels of beryllium that will inevitably result in CBD and lung cancer in many.

Part V: Conclusion: More protective beryllium rule required

In conclusion, Public Citizen strongly urges OSHA to implement the following measures:

1. Finalize the more protective alternative proposed PEL of 0.1 $\mu g/m^3$ and STEL of 1.0 $\mu g/m^3$.

2. Extend the final, updated beryllium rule — the new PEL of 0.1 $\mu g/m^3$, the new STEL of 1.0 $\mu g/m^3$, and all protective ancillary provisions — to construction and shipyard workers.

3. Commission or conduct a feasibility study, investigating the feasibility of compliance — by most workplaces most of the time — with a PEL of 0.05 $\mu g/m^3$, consistent with ACGIH's current, evidence-based recommendation. The study should include an an ongoing exposure assessment of workplace beryllium concentrations and the possibility of adopting and implementing nationwide the best practices of worksites that already have average airborne beryllium concentrations at or below 0.05 $\mu g/m^3$. In order to avoid any further delays in the rulemaking process, this feasibility study should be conducted immediately *after* the current proposed rule is finalized.

After so many years of dangerous foot-dragging by OSHA, it is time that workers exposed to beryllium on a daily basis get the protections they need and deserve. We urge OSHA to finalize a much safer beryllium standard without delay, with exposure limits that will protect all workers from the devastating effects of beryllium exposure.

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[49] Occupational Safety and Health Administration Advisory Committee on Construction Safety and Health. Transcript of December 6, 2013 Meeting, at 88-89. https://www.osha.gov/doc/accsh/transcripts/20131206_accsh_transcripts.pdf. Accessed October 18, 2015.
[50] OSHA Proposed Rule, at 709.
[51] 29 CFR 1910.94(a)(5)(ii)(c).
[52] OSHA Proposed Rule, at 411.

Thank you for taking our comments into consideration,

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