

December 23, 2004

Docket Office
Docket H054A
Room N-2625
Occupational Safety and Health Administration
United States Department of Labor
200 Constitution Avenue, NW
Washington, DC 20210

Re: Comments by the Portland Cement Association on the proposed rulemaking on occupational exposure to hexavalent chromium (Docket H054A)

Dear Sir/Madame:

The Portland Cement Association (PCA) welcomes the opportunity to provide comments on the proposed rulemaking on hexavalent chromium published in the *Federal Register* on October 4, 2004 (69 Fed. Reg. 59306). PCA is a trade association representing cement companies in the United States and Canada. PCA's U.S. membership consists of 45 companies operating 106 plants in 35 states and distribution centers in all 50 states servicing nearly every Congressional district. PCA members account for more than 95 percent of cement-making capacity in the United States and 100 percent in Canada.

Portland cement is the powder which acts as the glue or bonding agent that, when mixed with water, sand, gravel and other materials, forms concrete. Cement is produced from various naturally abundant raw materials, including limestone, shale, clay and silica sand. Portland cement is an essential construction material and a basic component of our nation's infrastructure. It is utilized in numerous markets, including the construction of highways, streets, bridges, airports, mass transit systems, commercial and residential buildings, dams, and water resource systems and facilities. The low cost and universal availability of portland cement ensure that concrete remains one of the world's most essential and widely used construction materials.

Because it is made of mined products, some portland cement might contain naturally occurring trace levels of chromium; therefore, the cement industry has an interest in the proposed rulemaking. The following comments separately address the proposals for the construction standard and the general industry standard. In the broadest terms, the position of the U.S. cement industry on the rulemaking are:

- OSHA's position that portland cement should be excluded from the construction industry standard is justifiable and correct and should be retained in the final rule.

- The general industry standard should specifically exclude portland cement as well as portland cement manufacturing.

- The final preamble should not draw undue attention to cement relative to other materials with higher hexavalent chromium content.

CONSTRUCTION STANDARD

OSHA's Position that Portland Cement Should be Excluded from the Construction Industry Standard is Justifiable and Correct and Should be Retained in the Final Rule

The proposed rulemaking includes a specific exemption for portland cement (60 Fed. Reg. 59472). PCA fully endorses this position and provides justification for the exclusion based on the following facts:

The level of hexavalent chromium contained in portland cement are very low.

The minute quantities of hexavalent chromium in portland cement and concrete poses no inhalation risk to construction workers.

There is no need for the rule to address dermal exposure risks.

The Level of Hexavalent Chromium Contained in Portland Cement are Very Low

The concentrations of hexavalent chromium, already very low in cement, are reduced by an order of magnitude in concrete, to which workers may have dermal exposure. Attachment A of these comments contains a table titled "Chrome (VI) Content of Cement from Various Countries" that is taken from a 1999 study conducted in Germany. The rough translation of the title of this report is "The Implications of Chromate in Cement and Cement-containing Preparations." This study concludes that the water soluble hexavalent chromium content in portland cement manufactured in the United States and Canada ranges from zero to seven parts per million. Another study cited in the German table puts U.S. cement concentrations at zero to 5.2 ppm. This number has declined in recent years as fewer cement plants utilize refractory materials and grinding balls containing chromium in the production process.

Almost all cement is ultimately used as an ingredient in concrete; this statement is particularly true in construction applications. Cement is mixed with sand, gravel or other aggregates, and water to make concrete. Since cement comprises roughly ten percent of the mass of concrete, any trace level of hexavalent chromium that might be found in the cement are diluted by a further order of magnitude in the concrete.

Construction Workers are Not Exposed to Inhalation Risk from Hexavalent Chromium in Portland Cement

The primary purpose of the rule making is to address airborne exposure to hexavalent chromium in an occupational setting. As the preamble correctly indicates; inhalation of hexavalent chromium derived from cement is not a concern for construction workers. As explained above, the level of hexavalent chromium found in U.S.-made cement are very low, and even lower in concrete in construction applications. In addition, most construction work is done outside, where there is ample ventilation and minimal exposure potential.

Finally, the concrete in construction is typically wet during most or all of the potential exposure period. On large jobs, it is brought in by ready-mix concrete trucks and poured wet from the truck. Sometimes it is quickly mixed on site, but most of the worker exposure would still be to the wet product. When the material is wet, it produces no dust. With no opportunity for the particles to become airborne, there is little or no inhalation risk.

The Rule Should not Address Dermal Exposure Risks

PCA fully supports OSHA's position that the rule making should focus on inhalation exposure to hexavalent chromium and should not address dermal exposures. The rule is driven by a need to minimize the potential for lung cancer. The following text provides justification for the decision to exclude portland cement from the construction standard. The reasons for this exclusion, explained in greater detail above and below, are:

The level of hexavalent chromium in cement are very low.

Few workers are susceptible to allergic contact dermatitis.

The personal protective equipment already required by existing regulations and strongly recommended by PCA is effective in preventing allergic contact dermatitis.

There is no evidence that dermal exposure to hexavalent chromium contained in cement poses a significant risk to human health.

The cost of controls to prevent dermal exposure for all construction workers to portland cement would greatly outweigh the potential benefits of those controls.

Few Workers are Susceptible to Allergic Contact Dermatitis

In discussing allergic contact dermatitis (ACD), it is important to understand that it is indeed caused by an allergy to hexavalent chromium that—like other allergies—only affects a subset of the population. Only those workers afflicted with this allergy are susceptible to ACD, while a larger number might be susceptible to cement burns caused by the alkalinity of wet cement and concrete products. The Norwegian National Institute of Occupational Health reports an epidemiological study concluding that only 0.5 to 1.7 percent of the general population is potentially susceptible to ACD. Furthermore, most (54 percent) of this small group had no adverse reaction to exposure to water-soluble hexavalent chromium of concentrations as high as 15,000 ppm or 1.5 percent hexavalent chromium. As indicated below, this is three to four orders of magnitude greater than the levels of water-soluble hexavalent chromium typically found in cement, which is typically less than 5 ppm or one-half of one thousandth of a percent. It is important to measure hexavalent chromium as water-soluble, as it is the water-soluble hexavalent chromium which may cause adverse reactions.

Proper Use of Personal Protective Equipment will Adequately Prevent ACD

Regardless of whether hexavalent chromium is present in cement and the individual is susceptible to allergic contact dermatitis, those working with cement-based products are advised to wear personal protective equipment such as gloves, boots and other articles necessary to protect them from the alkaline nature of the materials. This same personal protective equipment provides protection from ACD to the few individuals who may be susceptible. PCA and the associations representing cement-based products—along with their member companies—stress the importance of wearing personal protective equipment when working with cement and concrete.

“Working Safely with Concrete” is a PCA publication that explains recommended techniques for avoiding dermal contact with concrete and other cement products as a means of avoiding adverse reactions to alkalinity and the abrasive nature of some of the constituents in concrete, such as sand or rock fines. These same procedures would also prevent ACD among those few individuals that may be susceptible.

Moreover, the current OSHA construction industry standard already contains adequate requirements for personal protective equipment. The relevant text of that standard reads: “The employer is responsible for requiring the wearing of appropriate personal protective equipment in all operations where there is an exposure to hazardous conditions or where this part indicates the need for using such equipment to reduce the hazard to the employees” (29 CFR 1926.28(a)). If properly adhered to, these personal protective equipment provisions are adequate to protect against dermal exposure to cement, mitigating the potential for alkalinity and/or ACD concerns.

There is a specific statement contained in the preamble that is misleading and needs to be clarified in the final rule. In the discussion of personal protective equipment at 69 Fed. Reg. 59455, the Agency characterizes portland cement as a hexavalent chromium compound analogous to chromic acid. This characterization is incorrect. Unlike chromic acid, hexavalent chromium is present in portland cement as a trace contaminant that is typically far below 20 ppm, as acknowledged by OSHA eight pages earlier in the preamble (69 Fed. Reg. 59447).

There Is No Evidence That Dermal Exposure to the Hexavalent Chromium Contained in Cement Poses a Significant Risk

The preceding text explains why dermal contact with the trace levels of hexavalent chromium

found in some cement does not pose a significant risk. This conclusion is supported by OSHA's findings, as described below.

In the preamble on page 69 Fed. Reg. 59308, OSHA explains a preliminary determination that "suitable data are not available for making quantitative risk estimates for the non-cancer adverse health effects associated with exposure to chromium VI," including allergic contact dermatitis. The agency then asks the public whether there are suitable data for a quantitative estimation of risk of non-cancer adverse effect that OSHA should include in its final quantitative risk assessment. The following paragraphs address this request.

PCA concurs with the Agency's appraisal that suitable data are not available for making quantitative risk estimates with respect to potential adverse health effects associated with dermal exposure to wet cement. There is a marked lack of epidemiological data assessment regarding allergic dermatitis in workers who are exposed to wet cement in the United States. This is also true on a global basis. A review by the Norwegian National Institute of Occupational Health of 130 papers related to construction workers and exposures to chromates cement concluded that "There is relatively sparse epidemiological documentation of dose-responder relationships related to Cr(VI) content in cement and the risk of allergic dermatitis" (Kjuus, H. et al., Epidemiological assessment of the occurrence of allergic dermatitis in workers in the construction industry related to the content of Cr(VI) in cement, NIOH Oslo, Norway, 2003, page 41).

The range of values assigned to estimates of the incidence of dermatitis among cement workers developed through the Agency's analysis and by referenced sources also reflect this uncertainty in making a quantitative estimate of risk for allergic dermatitis (69 Fed. Reg. 59429 and 59437). These estimates are based on an extrapolation of Bureau of Labor Statistics data in which the reported incidence of skin disease is multiplied by a factor of ten to 50 to take into account unreported incidents. In addition, assumptions as to the proportion of skin disease related to various causes are inappropriately applied to unrelated classifications of workers. These unqualified extrapolations and misapplied assumptions lead to misleading interpretations about the prevalence of ACD among cement workers, like resulting in an overestimation of the prevalence of these cases.

In its discussion of risk assessment as it relates to significance of risk the Agency indicates that it has elected to assess the non-cancer risk qualitatively. While we agree that there is insufficient data available for quantitative risk assessment, we believe that the Agency has overstated portland cement associated risks in the "Summary and Explanation of the Standards," as explained above. Moreover, the entire basis for establishing significant risk hinges upon lung cancer concerns; this approach should not be expanded to address dermatological issues since the means of exposure are entirely different. Once again, however, even overstating the risks associated with cement and making assumptions regarding the application of inhalation risk analysis to dermatological risks, the Agency still concluded correctly that the potential risk presented by hexavalent chromium in cement did not meet the standard for significant risk set forth by the U.S. Supreme Court in the *Industrial Union Department, AFL-CIO v. American Petroleum Institute* decision.

In seeking data to inform the decision as to whether to address ACD concerns in the current rulemaking, OSHA refers to a study conducted by Ruttenberg and Associates on behalf of the Center to Protect Workers' Rights. While OSHA was correct in not being swayed by the conclusions reached in this study, we must point out that the Ruttenberg analysis is highly flawed on a number of levels. A review of several of the references cited in Ruttenberg revealed that the information or conclusion was absent in the cited source. Such errors cast doubt on the credibility and utility of Ruttenberg.

Moreover, the Ruttenberg study makes assumptions regarding the incidence of contact dermatitis that can be ascribed to allergic contact dermatitis associated with exposure to hexavalent chromium. In some cases, Ruttenberg assumes that all dermatitis cases are ACD, resulting in broadly exaggerated

incidence rates. A more in-depth analysis of the Ruttenberg study conducted by an independent expert is attached as Attachment B.

The Ruttenberg study also exaggerates the costs associated with incidences of allergic contact dermatitis from cement exposure, both the health-care costs of treating incidents of ACD and the costs of controlling exposure to ACD. These issues are addressed more fully in the economic feasibility section below, but are touched on here. The health-care costs of the disease highlighted by the Ruttenberg report is calculated on the basis of worst possible costs in example dermatitis cases rather than the NIOSH average costs that OSHA selectively used in the preamble on page 59429. This exaggerated the national annual disease cost by a factor of 20 for a total potential range of \$135-697 million.

The cost of dermatitis control was calculated by Ruttenberg in the report to be \$1.5 million per year. In this calculation, Ruttenberg failed to multiply the daily costs by work days in the year, understating the cost of disease control by a factor of 250. The disease cost and control costs noted by OSHA in the preamble at 69 Fed. Reg. 59437 indicate a possible correction of this error, since the cost associated with controlling ACD with current controls is in the \$80-300 million range. However, the references to the flawed Ruttenberg calculations should be removed from the preamble to the final rule. Finally, it is unclear from the preamble whether OSHA still relies on Ruttenberg's figures on the number of cases of dermatitis among cement workers annually. If this is the case, then the preamble to the final rule should also be corrected to point out that the Ruttenberg study overstated the ACD incidence rate among cement workers.

The Cost of Adding Additional Controls to Protect all Construction Workers from Dermal Exposure to Portland Cement would Outweigh the Benefits of those Controls

The preamble to the proposed rule includes a preliminary economic analysis of the proposed standard in which OSHA presents a profile of the affected worker population. In that profile are estimates of the number of affected workers by application group and job category and the distribution of exposures by job category. OSHA then requests additional data that will enable the Agency to refine its profile of the worker population exposed to hexavalent chromium. As noted above, the cement and concrete industries endorse and support the use of personal protective equipment for workers to protect them from the alkaline and abrasive nature of cement and concrete. Such equipment includes eye protection, gloves and boots. The PCA brochure, "Working Safely with Concrete" outlines the recommended practices. By employing these measures, workers are likewise protected from exposure to hexavalent chromium and possible ACD.

The comments submitted by the National Ready Mix Concrete Association estimate the true economic costs of inclusion of portland cement in the construction standard at greater than \$135 million per year, for the ready-mix concrete industry alone. PCA endorses the findings and statements contained therein. OSHA was correct in the determination that the problem of ACD among cement workers was not sufficient to warrant the cost of implementing controls. As the above text points out, however, the prevalence of ACD is lower and the control costs higher than OSHA assumed in making this calculation. Therefore, an even stronger case can be made for excluding portland cement from the construction standard.

Conclusions

PCA supports OSHA's proposed position of excluding portland cement from the construction standard and not addressing dermal exposure in this rulemaking. The rule is and should be directed at potential inhalation risks. This approach allows consistent application of a Permissible Exposure Limit to all settings. The PEL would not be applicable to dermal contact.

Inhalation of hexavalent chromium from cement in construction settings is not a concern. The extremely low traces of the metal found in cement and concrete products, the outdoor setting, and the wet nature of the product work together to prevent inhalation of levels of hexavalent chromium that pose any health concern.

The justifications for excluding dermal exposure to portland cement from the rule are many. Again, the low concentrations of hexavalent chromium in cement and concrete strongly support the exclusion, as does the relatively small population of workers susceptible to ACD and the fact that proper use of personal protective equipment provides adequate preventive measures. It is for these reasons that OSHA has not found evidence to support inclusion of portland cement in the construction standard.

GENERAL INDUSTRY STANDARD

The Generally Industry Standard Should Specifically Exclude Portland Cement

OSHA stipulated in the preamble to the proposal that the rule for general industry includes portland cement. OSHA acknowledges, however, "that the exposure profile indicates that no workers are exposed to chromium VI at level over the proposed action level." Given the low level of airborne exposure among cement workers in general industry, OSHA then asks whether the final rule should exclude exposure to hexavalent chromium from portland cement from the scope of the general industry standard. There are several precedents for excluding a specific product from an OSHA rulemaking. Agriculture, pesticide, and wood-treatment applications are exempted from the arsenic rule. Construction-related industries are specifically carved out of the cadmium standard, and instructional and public-safety activities are excluded from the diving rulemaking.

The following section provides data on the lack of significant inhalation risk and supports PCA's position that cements should be excluded from the general industry standard. Specifically, we address the following points:

- Cement manufacturing facilities will not be covered in the OSHA hexavalent chromium rule

- OSHA's data indicates only a few cases of inhalation exposure and only at levels far below the proposed PEL

- The significant risk threshold is inappropriately applied to cement workers

- Cement worker experience no elevated levels of lung cancer

Cement Manufacturing Facilities will not be Covered in the OSHA Hexavalent Chromium Rule

In 1979, OSHA signed a memorandum of understanding (MOU) with the Mining Safety and Health Administration (MSHA) to clearly delineate which industries would be covered by each agency. Since most cement manufacturing facilities contain on-site quarrying operations, the agencies agreed that these facilities would be regulated by MSHA, rather than OSHA. This MOU can be found at the following link:

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=MOU&p_id=222

Paragraph 6.a. of Section B clearly states that "MSHA jurisdiction includes... cement plants." Removal of the cement-plant data from OSHA's exposure profile leaves only two data points from the precast concrete industry showing exposure to hexavalent chromium, and those exposures are at one fourth of the proposed PEL. This is not an adequate database upon which to justify inclusion of portland cement in the general industry standard.

There are specific clarifications that should be made to the final-rule preamble to reflect the fact that cement plants are not subject to OSHA regulation. Section IX of the preamble, starting on page 59393, contains a summary of the preliminary economic analysis. In this portion of the proposal, OSHA presents information in a number of tables that include portland cement manufacturing facilities as entities affected by the proposed standard. Tables IX-1-4, 6-8, and 13 should be adjusted to remove these facilities and their employees from the figures contained therein.

OSHA's Data Indicates Only a Few Cases of Inhalation Exposure and Only at Levels far Below the

Proposed PEL

The first question that must be asked is which workers will be protected by the general industry standard. Cement leaves the plant of origin in air-tight containers and most is sent to ready-mix concrete batch plants, where it is blended with aggregate and eventually water to make concrete. Since cement constitutes roughly ten percent of concrete's mass, this blending results in a further dilution—by an order of magnitude—of the trace levels of hexavalent chromium that might be present in the cement. Most of this concrete is then used in construction applications.

The primary industries in which workers might be exposed to cement dust in a non-construction application are cement manufacturing itself and precast concrete manufacturing. The preamble includes references to NIOSH analyses of the workers in these industries that found no exceedences of a hypothetical PEL of $1.0 \mu\text{g}/\text{m}^3$ (the proposed PEL), and none at $0.5 \mu\text{g}/\text{m}^3$ (the proposed action level). These analyses found five air samples that would exceed a hypothetical PEL of $0.25 \mu\text{g}/\text{m}^3$, which is one fourth of the proposed PEL. Three of these samples were taken at cement manufacturing facilities and two at precast concrete facilities. So few data points indicating such low exposure do not provide adequate justification for inclusion of portland cement in the general industry standard, particularly when only two of those data points are taken from an industry to which this rule is applicable, as explained below.

The Significant Risk Threshold Is Inappropriately Applied To Cement Workers

The determination by OSHA that an exposure of $0.25 \mu\text{g}/\text{m}^3$ would represent a significant risk for workers was based upon a study analyzing inhalation of aerosol mists containing chromium in industrial settings. However, in the cement manufacturing and precast concrete setting examined in the NIOSH study, exposure is to dry particles, which tend to be larger and less respirable than aerosols. Yet the analysis of the NIOSH findings used the same $0.25 \mu\text{g}/\text{m}^3$ exposure level as the significant risk threshold. The findings of a study on exposure to aerosol mists should not be applied to work environments involving exposure to dry particles. Since this misapplication is the sole basis for inclusion of portland cement in the general industry rule, the final rule should be revised to exclude portland cement.

Studies Demonstrate that Cement Workers Experience no Elevated Level of Lung Cancer

Even though cement plants will not be subject to the final OSHA rulemaking, it is important to point out that the cement industry is concerned about whether workers at their facilities are exposed to hexavalent chromium at levels which put them at risk. Attachment C contains the report of a NIOSH study on the mortality of U.S. portland cement plant workers. The study concluded that cement workers had no elevated incidence of death from lung cancer, non-malignant respiratory disease, arteriosclerotic heart disease, or from any cause. Attachment D contains a study conducted at the Department of Occupational and Environmental Medicine at University Hospital in the United Kingdom. Once again, this study, published in the British Journal of Medicine, also found no excess of respiratory cancer among cement workers. The fact that cement workers experience no increase in lung cancer risk compared to the general population further justifies exclusion of portland cement from the general industry standard.

Conclusions

Even if the sparse data and flawed assumptions leading to the NIOSH findings are accepted, that analysis supports exclusion of portland cement from the general industry standard, since it indicates that cement workers are not exposed to hexavalent chromium above the proposed action level, which is only half of the proposed PEL. Moreover, the lack of evidence linking cement workers to increased cancer rates buttresses the conclusion that the trace levels of hexavalent chromium found in some cement do not endanger workers. Specifically, these levels and the associated risks are far too low to justify inclusion of portland cement in a rule establishing a PEL of $1.0 \mu\text{g}/\text{m}^3$. The regulatory language in the final rule should specifically exempt portland cement from inclusion in the general industry standard.

The Final Preamble Text Should Not Inappropriately Focus on Cement in the General Industry Standard.

The comments above make a strong case for excluding portland cement from the general industry standard, and we strongly urge OSHA to revise the final regulatory language to promulgate such an exclusion. As noted above, many products contain trace levels of hexavalent chromium but were not singled out in the preamble. Barring a specific exclusion, however, OSHA should at the very least revise the preamble language in the final rule to avoid incorrect or inflammatory statements related to exposure to hexavalent chromium in cement.

The proposed preamble language stresses repeatedly that portland cement is “included” in the general industry standard, but the proposed standard does not *include* cement so much as it fails to *exclude* the product. A more correct statement would be that it is “not excluded” from the rule, since the regulatory language does not provide an all-inclusive list of those industries covered. Even if this failure to exclude cement carries forward to the final rule, there is no reason to call out cement as specifically included, any more than each of the potentially affected industries or products would be explicitly included.

Since the proposed construction standard does exclude portland cement, OSHA attempts to distinguish the general industry standard by highlighting portland cement in the preamble. It is PCA’s position that in doing so, OSHA goes farther than necessary and makes several statements regarding cement that are incorrect or without justification. PCA urges OSHA at the very least to revise the preamble language to more appropriately address portland cement.

As described in the first section of four comments above, OSHA was fully justified in excluding portland cement from the construction standard. The very fact that the product is deserving of an exclusion from one standard, however, does not warrant being unjustifiably highlighted in the preamble to the next standard. On the contrary, since the inhalation risk for cement workers in the general industry is below the proposed action level and a good case can be made for outright exclusion from the rule, the product should be mentioned in the preamble only in accurate and reasonable terms, if at all.

Specifically, PCA recommends removing the following references to inclusion of portland cement in the general industry standard:

References to applicability of the rule to cement manufacturing facilities.

“OSHA has proposed to include exposure to chromium VI from portland cement in the scope of the standard for general industry.” (at page 59309)

“OSHA has proposed to cover exposure to chromium VI in portland cement in general industry.” (at page 59447)

“The Agency’s preliminary exposure profile indicates that some employees in general industry are exposed to airborne chromium VI levels associated with a significant risk of lung cancer as a result of work with portland cement.” (at page 59447)

The first set of statements is addressed above. The second and third should be removed or altered to point out that portland cement was excluded from the general industry standard and that no instances have been found at which inhalation exposure exceeded the proposed action level.

While the final statement might be technically correct, in that it includes such qualifying words and terms as “preliminary,” “indicates,” “some,” and “associated with,” the benefits of making such a declaration do not warrant the potentially inflammatory message that some readers might tread into it. As explained above, the preliminary exposure profile cited is highly suspect, in that it is based upon only five air samples, and only two from an industry subject to this rulemaking. Again, as described previously, even when taken at face value, the exposure profile found no cases of inhalation risk for hexavalent chromium from portland cement above the action level. Moreover, multiple long-term studies have indicated that cement workers are not at elevated risk for lung cancer.

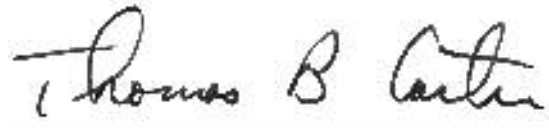
Singling out one product despite the lack of evidence of any risk above the proposed action level only invites undue criticism of the product and the industry that manufactures it. Since cement workers do not demonstrate higher incidences of lung cancer than the general population (see Attachments C and D), this statement is particularly misleading and unnecessary. PCA favors removing it altogether or replacing it and the next sentence with the following text:

The Agency's preliminary exposure profile indicates that some employees in general industry might be exposed to airborne Cr(VI) levels between 0.25 and 0.5 $\mu\text{g}/\text{m}^3$ as a result of work with portland cement. While this exposure is below the proposed action level, it does exceed the one-in-one-thousand risk level. OSHA's preliminary findings show that 1852 workers in general industry are exposed to Cr(VI) levels between 0.25 and 0.5 $\mu\text{g}/\text{m}^3$ as an 8-hour TWA....

In summary, PCA supports OSHA's proposal for excluding portland cement from the construction standard. We strongly recommend that the Agency extend this exclusion to the final general industry standard as well. Barring exclusion of portland cement from the general industry standard, however, we urge OSHA to revise the final preamble to remove the incorrect and inflammatory statements cited above.

Thank you for the opportunity to comment on the proposed rulemaking. Please contact me at tcarter@cement.org or 202-408-9494 if you have any questions related to PCA's comments.

Regards,



Thomas B. Carter
Director
Environment, Health and Safety

ATTACHMENT A
Chrome(VI)ContentofCementfromVariousCountries

Country	Total Chromium (ppm)	Chrome(VI) Water-Soluble	Number of Samples Analyzed	Reference
Australia	65-235	1-18.5	24	2.
Australia	49-112	0.2-8.1	8	12.
Denmark	35-60	1-5	5	3.
East Germany	not reported	0.4-24	14	9.
Germany	not reported	2-35	139	6.
Germany	20-100	1-30	300	8.
Germany	not reported	2-27	56	10.
England	57-80	3-4	3	3.
Finland	48-80	5-17	4	3.
France	57-102	1-9	15	3.
Poland	0-135	1-30	not reported	11.
Norway	42-173	6-40	3	3.
Sweden	38-173	2-15	8	3.
Sweden	not reported	0-20	8	14.
Switzerland	not reported	4-25	19	13.
Singapore	not reported	3.6-17.7	6	5.
Spain	20-110	0.9-7.8	20	4.
USA	5-124	0-5.2	42	7.
USA&Canada	28-60	0-7	100	1.,15.

Table obtained from Research Institute of Cement Industry in Düsseldorf, Germany. "Die Bedeutung des Chromates in Zementen und zementhaltigen Zubereitungen" 1999

1. Delles, Kanare, Padiyara, Broton; Portland Cement Association (1992) An Analysis of Selected Trace Metals in Cement and Kiln Dusts
2. Ellis, Freeman; Australian Cement and Concrete Association (1986) Dermatitis due to chromate in cement
3. Fregert, Grubberger; Berufsdermatosen 20 (1972) 5, S. 238-248 Chemical Properties of Cement
4. Frias, Rojas; Cement and Concrete Research 25 (1995) 2, S. 433-439 Determination and Quantification of total chromium and water soluble chromium contents in commercial cements
5. Goh, Kwok; Dermatosen 35 (1987) 3, S. 109 Chromat-Gehalt asiatischer Zemente
6. Kersting, Adelman, Breuer; Staub-Reinhalung der Luft 54 (1994), S. 409-413 Bestimmung des Chrom-VI-Gehaltes in Zementen
7. Perone, Moffitt, Possick, Key, Danzinger, Gellin; Am. Ind. Hyg. Ass. J. (1974) 5, S. 301-306 The Chromium, Cobalt, Nickel Contents of American Cement and their relationship to cement dermatitis
8. Pisters; Zement Kalk Gips 19 (1966) 10, S. 467-472 Chromim Zement und Chromatekzem
9. Reifenstein, Patzold; Z. gesamte Hygiene 26 (1980) 9, S. 625-628 Zur Eliminierung von Chromat im Zement
10. Ruhl, Kluger; Handbuch der Bau-Chemikalien (1994) Kapitel IV-3: Zement
11. *Szczerba, Foszcz; Cement-Wapno-Gips (1988) 12, S. 268-270 Hexavalent Chromium compounds in Portland cement*
12. Tandon, Arts; Contact Dermatitis 28 (1993), S. 201-205 Chromium, Nickel and Cobalt Contents of Some Australian Cements
13. Verein Schweizerischer Zement-, Kalk- und Gips-Fabrikanten, Chromat-Kommission, Schlußbericht (1986) Untersuchungen 1984/85 zu den Möglichkeiten einer Eliminierung oder Reduktion von Chromat in den Schweizerischen Portlandzementwerken
14. Wahlberg, Lindstedt, Einarsson; Berufsdermatosen 25 (1977) 6, S. 220-228 Chromium, Cobalt and Nickel in Swedish Cement, Detergents, Mould and Cutting Oils
15. Denton, Keenan, Birmingham; Jof Invest. Dermatog. 23 (1954), S. 189-192 The Chromium Content

ofCementanditsSignificanceinCementDermatitis

ATTACHMENT B

Review of Discussion of Cement-Related Dermatitis As Presented in the Ruttenberg Report 1

This report provides a summary of our review of the Ruttenberg Report, which was prepared for The Center to Protect Workers' Rights (CPWR) and is entitled "The Economics of Intervention: Protecting Workers Who Come in Contact with Wet Portland Cement," to identify errors and misstatements related to cement-related dermatitis. Our comments are provided in the order in which they arise within the document. This review is limited to scientific issues included in the presentation of dermatitis in the Ruttenberg Report.

Summary

The Ruttenberg Report's discussion of cement-related contact dermatitis contains many errors, some of which are quite fundamental and question the scientific integrity of the Report itself. In numerous instances, the numbers used to substantiate facts are incorrect. In other instances, assumptions that serve as the bases for conclusions are simply wrong. While wet cement contains hexavalent chromium, and this form of chromium is a known skin sensitizer, the numbers of affected workers are substantially fewer than the Ruttenberg Report states. A 2001 National Institute for Occupational Safety and Health (NIOSH) report, referenced in the Ruttenberg Report, provides a general understanding of the extent to which dermatitis is an occupational concern, noting that it is one of the more highly reported health concerns for all workers. While it is generally agreed that under-reporting of occupational dermatitis occurs, the Ruttenberg Report errs in concluding that incidence rates of cement-related occupational dermatitis are quantitatively similar to incidence rates as measured by patch-testing of chromium-sensitive individuals from the general population and, in some instances, from workers seen at clinics for dermatitis. The studies the Ruttenberg Report references provide varying results that suggest the incidence of chromium-sensitivity in patients diagnosed with allergic contact dermatitis ranges from 2.6% to 8%. The Ruttenberg Report, however, concludes that a greater percentage of all workers will develop allergic contact dermatitis. In fact, because those with allergic contact dermatitis are a subset of the total workforce, the percentage of workers in the entire workforce with allergic contact dermatitis is considerably lower than the 2.6% to 8% range noted above. As the Occupational Safety and Health Administration (OSHA) states in its proposed rule,² the incidence of dermatitis among concrete workers is between 0.2% and 1%, and the annual occurrence of dermatitis is exhibited in 418 to 2,089 cases of dermatitis annually. OSHA believes this estimate represents an overestimate for cases of dermatitis.

It is critical to note that the Ruttenberg Report mentions the difference between simple dermatitis and allergic contact dermatitis. In many instances, however, the data or studies the Ruttenberg Report relies upon do not distinguish between irritant dermatitis and allergic contact dermatitis. In other instances, the Ruttenberg Report itself mixes incidence and prevalence rates of irritant contact dermatitis from some studies with incidence and prevalence rates of allergic contact dermatitis in other studies. The impact of failing to make the distinction is large and impacts each of the Ruttenberg Report's efforts to determine the numbers of workers affected. We believe it is appropriate to distinguish between irritant contact dermatitis and allergic contact dermatitis, however, it is not possible to untangle the Ruttenberg Report's use of statistics that mix the two forms of dermatitis. Therefore, when we make specific comments in this analysis that refer to the irritant or allergic forms of contact dermatitis, or dermatitis generally, we are referring to the form or category of dermatitis (irritant, allergic, dermatitis generally) the Ruttenberg Report is discussing.

The Ruttenberg Report makes a series of errors that shows a lack of precision and attention to detail necessary to support conclusions of the sort the Report makes. These errors, as well as blatant copying of material from the

Internet without providing proper reference or quotation marks to indicate material from another source, suggest that the integrity of the Report is disputable.

Specific Errors and Misstatements

Page 1, paragraph 1 : The Ruttenberg Report addresses the number of construction workers in the United States (7,000,000) and suggests 1,300,000 American workers may be exposed regularly to wet cement, adding that the number may be as high as 1.8 million (according to calculations in the Report itself). The Report specifically states “5 to 15 percent of construction workers--most of them masons--develop dermatitis during their work lives.” The Ruttenberg Report employs this figure to suggest “350,000 to 1,050,000” (*i.e.*, 5% to 15% of 7,000,000) current construction workers will develop some type of occupational dermatitis. Assuming 1,300,000 workers may be exposed regularly to wet cement leads to the erroneous conclusion that 27% (350,000/1,300,000) to 81% (1,050,000/1,300,000) of American workers exposed to wet cement will develop dermatitis.

The reference that is the basis for the 5% to 15% assumption, however, actually states: “ *Depending on the country* , 5 to 15% of construction workers--most of them masons--acquire dermatosis during their work lives” (emphasis added). The Report inappropriately applies the reference’s percent range, which is based on figures from within and outside the United States, to the U.S. workforce. The percent of construction workers in the United States developing dermatitis will be on the lower end of the suggested 5% to 15% range stated due to better work practices and the routine use of personal protective equipment (PPE) in the United States. The wording of the Ruttenberg Report erroneously allows the reader to assume the range is applicable to the United States. If instead a more appropriate estimate of incidence of dermatitis among concrete workers is applied, such as 0.2% to 1%, the result is that there are 418 to 2,089 cases of dermatitis occurring annually for American workers estimated to be exposed regularly to wet cement.³

The Ruttenberg Report states that the number of American workers regularly exposed to wet cement may be as high as 1.8 million. Tables 1 and 2 of the Ruttenberg Report suggest this number is close to 1,722,517 workers. On page 7 of the Ruttenberg Report, the Report states the number of workers working with cement is 1.7 million. While the difference between 1.8 million and 1.722 million is not dramatic, the lack of precision and discrepancies within the Report are noteworthy and suggest a lack of attention to detail in drafting the Report and developing conclusions.

Page 2, footnote 10 : The Ruttenberg Report states, “Others sensitizing agents include various epoxy adhesives and sealants, in addition to additives in rubber gloves and various chemicals present in the admixtures used with cement and plaster.” It would be more appropriate to reference <http://www.haz-map.com/allergic.htm>, which lists over 300 chemicals that cause occupational allergic contact dermatitis. This broader list provides a more accurate depiction of the sources of sensitizing agents. *See also* http://www.ccohs.ca/oshanswers/diseases/allergic_derm.html, which lists various occupations and allergens that can cause allergic contact dermatitis. These lists make it more clear than the Ruttenberg Report that there are hundreds of potentially allergic contact dermatitis-inducing substances to which workers are exposed and hexavalent chromium is but one.

Page 3 : The Ruttenberg Report states, “Approximately 25 percent of occupational dermatitis is allergic” and it references a web page that is no longer available. While this value may be within the correct range in describing the percentage of occupational dermatitis that is allergy-based, it would be appropriate to provide additional references, including <http://www.aafp.org/afp/20020915/1025.html> (2002), which in Table 4 states that allergic contact dermatitis is responsible for 10% to 20% of contact dermatitis cases in the workplace (assumed to be from all sources). A 1997 reference, http://www.ccohs.ca/oshanswers/diseases/allergic_derm.html, states, “Among all cases of occupational dermatitis, allergic contact dermatitis accounts for about thirty percent” (again, assumed to be from

all sources). The value chosen in the Ruttenberg Report is further indication of the lack of precision within the Report and the lack of care taken in assembling and drafting information pertinent to developing the Report's conclusions.

The Ruttenberg Report further states, "In cement work, as much as 62 percent of cement-related dermatitis becomes allergic contact dermatitis." There is no reference for this statement, although the next footnoted reference is a web page that is not available. No sources were identified that support this statement.

Page 4 : The Ruttenberg Report states that " Allergic Contact Dermatitis is an acquired sensitivity developed when an individual is exposed to a causative agent, in this case, wet Portland cement." This statement should be corrected to state " Allergic Contact Dermatitis is an acquired sensitivity developed when a susceptible individual is exposed to a causative agent, in this case, chromates (hexavalent chromium) within Portland cement." In "Chromium Allergy in the Construction Industry--An Epidemiological Review," the authors conclude there is documentation to support a relationship between hexavalent chromium in wet cement and allergic dermatitis in construction workers, and not just wet Portland cement and allergic dermatitis. *See* http://www.wbcd.ch/web/projects/cement/tf3/NIOH-study_chromium_allergic_dermatitis.pdf at 42. This error suggests wet Portland cement is the irritant when in fact it is chromium in cement that may be a potential irritant for some workers.

The Ruttenberg Report states also, "The development of occupational hand eczema is affected by many factors, such as the concentration of the allergen, duration of exposure, work processes, and the need for improved hand washing." Hand eczema is also referred to as hand dermatitis, and results from a "combination of causes, including genetic makeup (constitutional factors), injury (contact with irritants) and allergy." *See* <http://dermnetnz.org/dermatitis/hand-dermatitis.html>. If the Report insists on referring to "hand eczema" rather than the more precise allergic contact dermatitis, it would be appropriate to include other factors that lead to hand dermatitis, such as contact with irritants. In addition, it is inaccurate to state that the development of eczema is affected by the "need for improved" hand washing. Instead it is more accurate to state that the development of hand eczema is affected by hand washing, such that improved hand washing may reduce the likelihood of developing occupational hand eczema. Each of these points further demonstrates the lack of precision within the Ruttenberg Report and the lack of care taken in assembling and drafting information critical to developing conclusions.

The Ruttenberg Report also incorrectly states that "(eczematous contact) dermatitis usually occurs 5 to 7 days and occasionally as long as 20 days, after initial contact, at the site of contact." The time until a person exhibits dermatitis will depend on the individual's sensitivity, as well as the exposure concentrations; for low concentrations of the allergen or low degree of sensitivity, the allergic contact dermatitis may develop after several weeks of exposure. The "time until reaction" will be a function of the individual's threshold of sensitization, which may be reached within the stated timeframe, but may also be several years out. Thus, it is the dose and duration of exposure that is critically important, not merely the length of time from initial contact.

The Ruttenberg Report states, "One study showed that 75 percent of patients with occupational contact dermatitis developed chronic skin disease."⁴ This statement is presented out of context and is thus misleading. The referenced source refers only generally to the specific study, and no citation is provided for this statement. It is not clear based on the reference whether the referenced study distinguishes between cement-related contact dermatitis and other occupationally derived dermatitis. The paragraph of text in the Ruttenberg Report is explicitly discussing cement-related dermatitis, leading one to conclude that the cited source found that 75% of cement-related dermatitis patients developed chronic skin disease. The referenced does not support this statement.

Pages5and6 :TheRuttenbergReportdevelopsfigureforarangeofestimatedcasesofcement-relateddermatitis occurringinayear,andthenumberofconstructionworkersatriskofallergicdermatitis.TheReportappearsto suggesttherangeisbasedinpartonaseriesofstudies,foreachofwhichtheReportprovidesaone-to three-sentencesummary.Thefollowingcommentsaddressetheindividualsummariesofthestudiesreferenced.

1. TheReportcitesaNIOSH2001documentthatprovidesatablelistingthenumberofcasesandtheratesfor dermatitisin1996.InTable38,beginningatpage86,the“concreteworkconstructionworkers” categoryisranked22ndforrateofdermatitisbyindustrycategory.Thiscategoryof“cement workers”ranks26thfornumberofcasesofdermatitisreportedbyindustrycategory,with45cases reported.TheinformationinthisReportmaybeoflimitedvalue,becausework-relateddermatitis isunder-reported. See <http://www.cdc.gov/niosh/pdfs/2001-120.pdf>at99.

2. TheRuttenbergReportreferencesaSingapore-basedstudy(Wong *et al.*).Theresultsofthisstudyare reportedinawaythatwillleadtoerroneousconclusions.Thisstudylookedatallpatients diagnosedtohaveoccupationalallergiccontactdermatitisandpositivereactionstochromateatthe NationalSkinCentreinSingaporebetween1990and1995.Thisincludedconstructionand non-constructionworkers.Eighthundredfifty(850)workersreportedlywereseen.Sixhundred thirty-three(633)hadoccupationalcontactdermatitisandwerepatchtested.Twohundred fifty-seven(257)ofthese633workershadallergiccontactdermatitis.Eighty-seven(87)ofthese 257hadpositivereactiontochromateonpatchtesting.AccordingtotheReport,53workerswere allergictochromatefromcement(thisis61%ofthe87,and6%ofthe850workersseen).The RuttenbergReportstatesthat“75percent(633)hadcontactdermatitisand40percent(257)ofthem hadallergiccontactdermatitis.”TheRuttenbergReportmuddlesthefactsofthestudy.While75% ofthestudyparticipantsexhibitedcontactdermatitis,therelevanceofthisfactisoverstated becauseonly53workerswithallergiccontactdermatitis(6%ofthe850patients)wereallergicto chromatefromcement.

Significantly,whiletheWong *et al.* studynotes thatcementremains themostcommonsourceof chromateallergyintheworkers,thearticleconcludes thatchromatehasprogressivelybecomea lesscommonoccupationalallergenattheNationalSkinCentre,becauseofaprogressivedecline inthenumberofcasesofallergiccontactdermatitisfromcement.Thestudystates thatchromate allergyfromcementisdecliningfromaninitialvalueof92%in1983,andthatsourcesotherthan cementareleadingtodemonstratedincreases.Thestudydoesnotsuggestwhatexposurelevels were,nordoesitdiscusstheuseofPPE.

3. TheRuttenbergReportreferencesBureauofLaborStatistics(BLS)data,statingthat1995BLSdata showanincreasingnumberofskindisorders.AccordingtotheRuttenbergReport,1993BLSnumbers showthatskindisorderswereatanincidence rateof4.9per10,000workers.TheRuttenberg Reportalsoreports that “[t]herewereatotalof372,000occupationalillnessesrecordedbyBLSfor 1999ofwhich44,600(12percent)wereskin diseases/disorders,anincidenceof4.9casesper 10,000workers.”TheRuttenbergReportprovidesnoconclusionsfromthesefigures.Thefigures mayormaynotrelatetocement.Itisunclearwhatoneistoconcludefromthesefiguresregarding cementandallergiccontactdermatitis.TheRuttenbergReportitselfnotesseveral limitationswith theBLSdata,includingthattheincidentreports“donotprovideinformationontheetiologyofskin diseases.”RuttenbergReportatnote29.Itisundisputed thatskindiseasesanddisordersare noteworthy. Since1972,skindiseasesanddisordershavebeenamongthemostcommon occupationalillnessesreported. See <http://www.cdc.gov/niosh/pdfs/2001-120.pdf>at99.

4. The Ruttenberg Report references a 1982 Nethercott, *et al.* article. This Nethercott, *et al.* review of literature found an incidence of 7.9% for sensitization to potassium dichromate in the 200 patients tested. The Ruttenberg Report misreads the table providing incidence rates. In the 200 patients tested by Nethercott, *et al.*, an incidence of 8.0% was obtained. The 7.9% incidence rate relates to the incidence of positive reactions reported elsewhere, where 17,021 patients had been patch tested. While the stated values of 7.9% and 8.0% are relatively minor differences, the lack of precision in the Ruttenberg Report is disturbing. It indicates the authors misread the table in the study referenced. In combination with the other errors in the Report, it calls into question the validity of the Ruttenberg Report itself.

There is no indication in the Nethercott, *et al.* study that the 200 patients in the study were cement workers. Instead, it appears the patients were selected for having been patients with eczematous dermatitis at the Contact Dermatitis Clinic of St. Michael's Hospital, in Toronto, Canada, between 1977 and 1979. The Nethercott, *et al.* report states generally that "[m]en more commonly develop chrome sensitivity which tends to be occupationally related, whereas women become sensitive to nickel, usually without occupational association. . . ." This statement, however, is related to a discussion of metal sensitivity correlating with sex (Nethercott, *et al.* (1982) at 393). Moreover, there is no indication that cement work is the occupation the authors have in mind. Indeed, the word "cement" is never mentioned in the study.

5. The Ruttenberg Report states, "In a study of 850 workers at a clinic in Singapore, between January 1990 and December 1995, 75 percent (633) had contact dermatitis and 40 percent (257) of them had allergic contact dermatitis." The reference provided is to Wong *et al.* (1998). The information provided, both in the citation and in the factual presentation, suggests that Ruttenberg is repeating on page 6 the information of the Wong *et al.* study noted on page 5, and discussed above in this analysis under #2. By re-stating the same facts, the Ruttenberg Report is attempting to support its conclusions with information it has already presented and on which it has already relied.

6. The Ruttenberg Report also lists an Australian study that patch-tested 117 cement workers and found the prevalence of irritant contact dermatitis was 4.2%, and the prevalence of allergic contact dermatitis was 2.6%. Of all the studies the Ruttenberg Report references, this is the only study that focused on cement workers (as well as tire manufacturing workers). The Australian study, conducted in 1978, found the occupational health conditions in the cement factories less than ideal and concluded that this fact was a confounding factor and contributed to the "high" prevalence rate. This suggests the occupational health conditions were well below levels that U.S. workers encounter. One of the two cement factories studied had an overall dermatitis rate of 23% and was being closed by the company. It is also noteworthy that the study was in cement factories, and it is unclear whether the study was looking at exposure to wet cement.

Page 7 : The Ruttenberg Report states the following: "If 62 percent of those with contact dermatitis develop allergic dermatitis (Australian study), . . ." Of the two reportedly "Australian" studies referenced in footnotes to this Report, neither states nor suggests such a figure for the development of allergic dermatitis after having been diagnosed with contact dermatitis. As noted above regarding the lack of a reference for the statement in the Ruttenberg Report about the "percent of cement-related dermatitis becomes allergic contact dermatitis," there is no cited support for this statement. No sources were identified that support this statement.

Page 7 : The Ruttenberg Report states, "A 2001 NIOSH report found that median days away from work was 33

percent higher for concrete work (4 days) than for all private industry (3 days).” This statement is misleading. The same source also provides information indicating that concrete construction work has the same number of median days away from work (4) for dermatitis as do 13 other industry categories, and a smaller number of median days away from work (4) for dermatitis than do 22 other industry categories. Left alone, the Ruttenberg Report’s statement suggests concrete work is the leading category for days away from work, when in fact concrete work’s proper ranking is in the middle.

Page 9 : The Ruttenberg Report states, “After five years, half the Australian patients still had contact dermatitis. Six to 22 months after the five years, 25 percent of patients were well again and 50 percent had improved, but 25 percent were the same or worse.” The Report states it is referring to the Australian patients from the Halbert, *etal* study that is discussed directly prior to this statement. The quote is directly from http://www.emedicine.com/PED/topic2569.htm#section~author_information, however, which involves a discussion of deterrence and prevention in the context of follow-up in an article on contact dermatitis, authored by a physician at the University of Washington School of Medicine. The information referenced in the Ruttenberg Report is not from the Halbert, *etal* study.

Page 9, footnote 46 : The Ruttenberg Report states that “BLS estimates that occupational skin disease is ten to fifty times more prevalent than what [is] reported.” The footnote provided references earlier discussion at footnote 25 and <http://www.proteque.com/documents/report.htm>, neither of which provide support for this range of under-reporting. In fact, it is related to discussion associated with footnote 29. The link at that footnote, <http://www.cdc.gov/niosh/ocderm1.html>, provides the information stated in the Report, verbatim without providing applicable quotation marks, however, the statement “it has been estimated that the number of actual occupational skin diseases may be on the order of 10-50 times higher than reported by the BLS” does not reference who or what authority has estimated the number of actual occupational skin diseases.

- 1 RuthRuttenberg&Associates,Inc.,“TheEconomicsofIntervention:ProtectingWorkersWhoComein
ContactwithWetPortlandCement,”preparedforTheCentertoProtectWorkers’Rights(updatedAugust2002).
- 2 69Fed.Reg.59306,59429(Oct.4,2004).
- 3 69Fed.Reg.at59429(referencingaRuttenbergandAssociatesestimate).
- 4 RuttenbergReportat4, *citing*NationalInstituteforOccupationalSafetyandHealth,NationalOccupational
ResearchAgenda(NORA),“AllergicandIrritantDermatitis,”(Feb.15,2001),availableat
<http://www.cdc.gov/niosh/nrderm.html>.