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November 14, 2011

U.S. Environmental Protection Agency
Mailcode: 28221T
Attn: Docket ID No. EPA-HQ-RCRA-2011-0392
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Re: Hazardous and Solid Waste Management System: Identification and Listing of Special Wastes; Disposal of Coal Combustion Residuals from Electric Utilities: Notice of Data Availability and Request for Comment: 76 *Federal Register* 63252-63257 (October 12, 2011)

To Whom It May Concern:

The Associated General Contractors of America (AGC) provides the following comments on the additional information and data the U.S. Environmental Protection Agency (EPA) has posted to the docket at EPA-HQ-RCRA-2011-0392 in conjunction with the proposed rule: Hazardous and Solid Waste Management System; Identification and Listing of Special Wastes; Disposal of Coal Combustion Residuals from Electric Utilities; Proposed Rule; 75 *Federal Register* 35128-35264 (June 21, 2010) - EPA-HQ-RCRA-2009-0640. EPA has asked for public comment on whether, if at all, this additional information should affect the agency's decisions as it develops a final rule on the future management and disposal of coal combustion residuals (CCR).

AGC previously submitted comments dated November 19, 2010, on the agency's proposed hazardous or special waste designation options, which AGC incorporates herein by reference (EPA-HQ-RCRA-2009-0640-8787).

Because EPA has just released hundreds of pages of pertinent information related to the reuse of CCRs in construction applications and because the public has not had continuous access to the information in the docket during the comment period (many of the studies/materials are not accessible electronically and must be viewed by visiting the EPA docket reading room), AGC adds to the record its request for more time to respond to EPA's Oct. 12 notice of data availability (NODA). Much of the new information, data and reports are exceptionally long and complex; AGC's did not have sufficient time to adequately screen, review and assess all of the materials and would have greatly benefitted from an extended period for public comment.

AGC is aware that EPA denied all requests to extend the comment period. However, Given that there is not a statutory or judicial deadline for issuing the final CCR rule, AGC finds that there is no reasonable justification for providing the public with only 30 days to review, analyze and prepare comments on an array of new information that will be critical to EPA's final decision in this highly complex rulemaking.

AGC of America is the largest and most diverse trade association in the construction industry. The association represents more than 33,000 companies in 96 chapters throughout the United States. AGC members include more than 7,500 of America's leading general construction contractors, 12,500 specialty contractors, and 13,000 material suppliers and service providers to the construction industry.

AGC members are engaged in the construction of commercial buildings, factories and other industrial facilities, warehouses, highways, bridges, airports, waterworks facilities, waste treatment facilities, dams, water conservation projects, defense facilities, and multi-family housing projects, and in-site preparation and utilities installation for housing development.

As indicated in its November 2010 comment letter, AGC opposes EPA's proposed regulation of CCRs as hazardous waste under the Resource Conservation and Recovery Act (RCRA) Subtitle C. The construction industry puts to good use large amounts of coal combustion residuals, including about 18 million tons of fly ash a year (EPA-HQ-RCRA-2011-0392-0022). AGC has commented that EPA's proposal that considers re-categorizing fly ash as a "hazardous" waste has put beneficial reuse activities in jeopardy—creating uncertainty and potential new liability for contractors who have previously used fly ash and significantly increasing material costs.

1. Summary of AGC's Position and Recommendations

EPA states in the NODA that it is soliciting comments only on "the validity and propriety of the use of all new information, data, and potential analyses" specifically identified in the text of the NODA or in the docket for the NODA. This includes information related to the beneficial use of CCR, which is of particular interest to AGC because CCRs are beneficially used in many types of construction applications, ranging from concrete and asphalt to carpet and wallboard. Accordingly, AGC pulled from the docket and reviewed *first and foremost* the information related to beneficial use and now provides EPA with the following comment on whether this information should be considered in the development of the final rule.

As stated in its November 2010 comment letter, AGC supports a regulatory approach that would provide the construction and development industries with greater certainty that EPA will continue to support and allow for the beneficial use of CCRs in construction. As such, AGC welcomes this opportunity for a cursory review of the information in the docket related to beneficial use. Consideration of this information is an essential step towards safeguarding, improving and expanding beneficial use opportunities. Insofar as EPA continues to investigate circumstances in which CCRs have been—or may be—successfully reused in commercial applications, AGC strongly encourages EPA to afford the regulated community with sufficient notice and opportunity to provide comments and recommendations. In addition, if the agency moves ahead with providing the regulated community with a list of "approved" beneficial uses of CCRs (as suggested by EPA in its proposed rule), AGC strongly urges EPA to be certain that any list that EPA puts forth is entirely consistent with whatever final rule the agency ultimately promulgates on the future management and disposal of CCRs. *See* AGC Comment Letter to EPA, dated November 2010.) These steps are key to allow for and encourage continued innovation and progress towards finding additional ways to successfully incorporate CCRs into new applications.

AGC is encouraged that the NODA includes information on and experiences by state departments of transportations (DOTs) that have reused CCRs in construction. AGC strongly urges EPA to consider these materials in the development of its final rule. It appears that EPA recognizes the expertise of these groups, is amenable to working with them on beneficial use and that the agency ultimately would prefer "an approach that would allow beneficial uses to continue, under state controls, EPA guidance, and current industrial standards and practices (75 FR 35162)." AGC continues to support this approach.

In reviewing the information in the NODA regarding alleged and proven damage cases, AGC finds it particularly significant to note that none of the alleged and proven damage cases include instances of beneficial use during construction applications. Two alleged damage cases are linked to "structural fill," but an examination of the report makes it clear that these instances are akin to large scale disposal, not beneficial use. As stated in its November 2010 comment letter, AGC is not aware of any damages or injuries that have resulted from beneficial use in construction. To date, EPA has produced no evidence of damages from the beneficial uses of CCRs. Therefore, AGC stands firm that EPA must ensure that both the encapsulated and the unencapsulated uses of CCRs in construction will continue to be encouraged without risk that a present day use will give rise to unexpected future exposure to regulatory re-characterization as a subtitle C waste.

2. EPA Should Consider Information on Beneficial Use When Developing a Rule That Will Likely Impact That Use

The studies and/or reports that EPA included in the NODA for public review demonstrate the environmental benefits of reusing CCRs in construction applications. Specifically, the studies reflect favorably on the use of fly ash in concrete, bricks and pavements—from both an environmental and human health perspective. AGC finds that the studies and reports serve to broaden the knowledge and acceptance of the beneficial use of CCRs in construction applications, overall and must be considered by EPA in deciding if/how it should regulate CCRs.

Where the EPA-collected studies called for leachate testing, the final reports show understandably variable results for each element that, with minor exceptions, were within accepted limits. (Whereas fly ash can be generally classified or characterized, individual sources of fly ash and other variables will introduce differences.) As noted in Section II of the NODA, EPA will review all of the data to ensure their quality before using them in the rulemaking. AGC maintains that—in general—more data are better, provided the data were obtained using valid procedures and the data are appropriately used in the context of decision-making.

The NODA demonstrates that the study of beneficial use is a long-standing and still growing research field; the authors of the material provided therein often recommend the development of new protocols or methodologies to study the environmental or health impacts of beneficial use or to demonstrate the physical properties of building materials containing CCRs. AGC strongly urges EPA to encourage additional study in this area. The information collected by EPA for the purposes of this NODA should be very informative in providing a gap analysis for areas in need of further study. For instance, AGC's initial review of the reports seems to indicate that temperature, the affect of pH on leaching and long-term leaching are all potential areas that merit further study. In addition, information on the use of fly ash in grouts, mortars and soil stabilization as well as the use of flue-gas desulfurization (FGD) in wallboard may warrant additional study, based on the limited materials provided in the docket for public review.

AGC requests that EPA consider information related to beneficial use of CCRs in construction in the development of its final rule. AGC also requests that EPA continue to explore and encourage further study into the beneficial uses of CCRs and continue to make available to the public for review and comment any information relevant to future agency decisions on beneficial use, such as the development of a list of "approved" beneficial uses of CCRs.

In support of AGC's comments above, below are quotes and/or summaries of the conclusions presented in the beneficial use studies/reports that EPA included in the NODA and that AGC reviewed.[1]

EPA-HQ-RCRA-2011-0392-0019: Leachability of Trace Metal Elements from Fly Ashes, and from Concrete Incorporating Fly Ashes
"Regardless of the type and percentage of the fly ash used, w/cm of the concrete, and curing condition, none of the trace metals in the leachates from the fly ash concrete samples exceed the regulated concentration limits by the United States Environmental Protection Agency and the Transportation of Dangerous Goods Act regulations of Canada. The concrete incorporating the fly ashes is, therefore, considered environmentally stable."

EPA-HQ-RCRA-2011-0392-0029: A Life Cycle Comparison of Disposal and Beneficial Use of Coal Combustion Products in Florida: Part 1: Methodology and Inventory of Material, Energy and Emissions
"Beneficial use of CCPs [coal combustion products] is shown here to yield reductions in raw material requirements and various emissions to all environmental compartments, with potential tangible savings to human health and the environment."

"This life cycle inventory illustrates potential environmental benefit associated with diverting at least 50% of CCPs from disposal to beneficial uses in concrete, structural fill, soil amendment, road construction, blasting grit, roofing granules, and wallboard. … All emissions would be expected to continue to decrease with increasing percentages of CCPs used in such construction and engineering applications as considered here. However, the environmental benefits from these uses may decrease if contaminants contained in the CCPs are released to the environment in which they are used or if the distance by which the CCPs must be transported to their beneficial use location increases."

EPA-HQ-RCRA-2011-0392-0030: A Life Cycle Comparison of Disposal and Beneficial Use of Coal Combustion Products in Florida: Part 2: Impact Assessment of Disposal and Beneficial Use Options
"Beneficial use of coal combustion products (CCPs) in industrial or construction operations has the potential to minimize environmental and human health impacts that would otherwise be associated with disposal of CCPs in the life cycle of coal used for electricity generation."

"In each impact category, beneficial use of fly ash, bottom ash, and FGD material resulted in a reduced impact compared to disposal of these materials."

EPA-HQ-RCRA-2011-0392-0031: A Probabilistic Source Assessment Framework for Leaching from Secondary Materials in Highway Applications
"This paper is based on the hypothesis that use of secondary materials may be advantageous and more common if a methodology was available to characterize the environmental impact for decision makers. Thus, a new framework is proposed which provides the much needed tool for the decision maker to evaluate possible designs with secondary materials and also compare the risks with risks from use of

[1] The information on the studies/reports is presented by individual EPA docket numbers followed by document name. Unless otherwise indicated, all findings presented in Section II of this comment letter are actual quotes from the document. (If AGC summarized the findings, it will not be set off in quotation marks.) Lastly, if information related to beneficial use in construction applications was included in the NODA or the docket for the NODA yet is not presented in Section II of this comment letter as reviewed by AGC, that exclusion was unintentional.

traditional materials. With more rigorous description of the input parameters, the framework is a new approach (instead of best case or worst case designs) for prediction of the ‘‘correct’’ range of release concentrations along with their frequency of occurrence as demonstrated in the arsenic example. A major strength of the framework is that it provides guidance on how to incorporate different levels of ignorance and knowledge in contaminant release estimates. The probabilistic approaches that have almost become standard in other components of risk assessment can now be used for source term estimates as explained in this paper."

EPA-HQ-RCRA-2011-0392-0033: Classification of Pulverized Coal Ash: Part II. Leaching Properties of Concrete with Pulverized Coal Fly Ash as Partial Cement Replacement [Netherlands]
"The release of trace contaminants from concrete containing coal fly ash is increased relative to regular concrete. With the exception of Mo, which may become critical under certain conditions, the release from concrete containing coal fly ash as a cement replacement or as a filler is generally well within the specifications of the Building Materials Decree. This implies that replacing a fraction of the cement by coal fly ash is not only beneficial from a technical point of view but is also an environmentally acceptable means of utilizing this power generation by-product."

This research was completed under contract with the Netherlands Agency for Energy and Environment and the report concludes with a caution: "Major changes in ash properties require a new verification of release controlling parameters." Also note that the methodologies and "legal" limits referenced in the report are as defined in Dutch law.

EPA-HQ-RCRA-2011-0392-0034: Comparative Leaching of Midwestern Fly Ash and Cements
"When RCRA and drinking water standards are compared with actual and calculated maximum leachate concentrations of elements, the following can be seen: The maximum leachable amounts of RCRA elements generally do not exceed RCRA limits, with the exception of barium. All of the leachate concentrations are below the RCRA limits and many are below primary drinking water limits."

"The data presented here demonstrate clearly that large differences can exist in concentrations of trace elements from different leaching protocols."

In its conclusion, the report cautioned that whereas fly ash may leach more than cement, it is still generally within allowable limits and it would be meaningless to draw any conclusions without consideration of mobility. The report also recommends more study of long-term leaching.

EPA-HQ-RCRA-2011-0392-0038: Environmental Monitoring of Full-Scale Coal Combustion Product (CCP) Pavements during Accelerated Loading
"Laboratory tests indicated that the leaching of inorganic elements from Portland cement concrete pavement containing fly ash was similar to values observed for Portland cement concrete without fly ash. … Since concrete pavement is exposed to rainfall events instead of landfill leachate, leaching tests conducted with DI [deionized] water as the leaching fluid better represent the field environment. None of the leachate concentrations exceeded the National Primary Drinking Water Regulations (NPDWR) limits and Ohio EPA's non-toxic criteria (DSW 0100.007, 1994). In addition, Hg levels in all leachate samples were below the limit of detection."

"Results obtained so far show higher release rates of the monitoring elements were observed from the 50% fly ash concrete pavement, while there are no significant differences between plain concrete and 30% fly ash concrete. … Although low levels of inorganic elements are released from the pavement, the

surface runoff concentrations generally did not exceed either the NPDWR limits or the Ohio EPA non-toxic criteria, suggesting that the use of these materials in roadway construction is environmentally benign."

EPA-HQ-RCRA-2011-0392-0039: Environmental Properties of Fly Ash Bricks
In summation, this paper concludes that fly ash bricks ("compacted from a Class C fly ash resulting from burning a Powder River Basin Coal")—

3. Do not emit mercury in the air,
4. Emit radon at approximately 50% of the level of concrete,
5. Leach negligible levels of pollutants when exposed to rain and
6. Are non-hazardous for handling and placing in landfills.

EPA-HQ-RCRA-2011-0392-0040: Evaluating the Thermal Stability of Mercury and Other Metals in Coal Combustion Residues Used in the Production of Cement Clinker, Asphalt, and Wallboard
"Research is underway by the U.S. Environmental Protection Agency (EPA) to document changes that may occur to coal combustion residues (CCRs) as a result of implementation of mercury and multipollutant control technology at coal-fired power plants. This work was cited as a priority in EPA's Mercury Roadmap (http://www.epa.gov/mercury/roadmap.htm) to evaluate the potential for any crossmedia transfers from the management of coal combustion residues resulting from more stringent air pollution control at coal fired power plants."

"This report focuses on the potential for an increase in the volatilization of mercury and other metals from the utilization of CCRs in the production of cement clinker, asphalt, and wallboard. All three of these processes require heating during the production process. The four metals evaluated in this study are mercury (Hg), arsenic (As), selenium (Se), and lead (Pb) (Table E-1). Heating temperatures of the CCRs for this study were chosen to simulate actual conditions encountered in the cement, wallboard, and asphalt industries (Table E-2)."

"The results from this laboratory study demonstrate the varying degree of volatility for mercury, arsenic, Se and Pb in CCRs depending on the process temperature being used. A high temperature process such as cement clinker production has the ability to release all four metals from fly ash when exposed to the high temperatures found in production. Laboratory simulation of the asphalt and wallboard production processes showed a significant release of mercury during heating, but the temperatures were too low to volatilize the arsenic, Se, or Pb. Whereas, the Hg loss for wallboard production suggest non-Hg metals being retained in wallboard with a potential Hg loss of 9 to 48%. However, the actual mass emission rates must be considered when determining potential concern to human health and the environment."

The study also notes: "In interpreting the results from this study, please note that the samples are not considered to be a representative sample."

EPA-HQ-RCRA-2011-0392-0042: Evaluation of Potential Human Health Inhalation Risks from Mercury in Building and Construction Materials Containing Coal Combustion Products
"Following U.S. EPA guidance, an exposure is not expected to pose a health risk if the hazard quotient is less than or equal to 1. Results of the risk assessment demonstrated that potential mercury exposures under all scenarios pose negligible risk; all calculated hazard quotients were at least two orders of magnitude below 1. This includes high-end exposure scenarios that used very conservative assumptions both with regard to modeling exposure point concentrations and with regard to exposure time, frequency, and duration estimates. Moreover, modeled mercury air concentrations for each scenario were within the

range of background concentrations of mercury in both outdoor and indoor settings. Based on these results, researchers concluded that CCPs used in concrete and wallboard are unlikely to result in mercury exposures that pose a health concern either in classroom or residential settings, and CCPs used as structural fill or disposed of in C&D landfills do not pose a mercury inhalation risk to the public."

EPA-HQ-RCRA-2011-0392-0043: Field Leaching of Bricks and Concrete Containing Coal Fly Ash [Netherlands]
In summation, the conclusion of this presentation and abstract is that coal fly ash used in bricks and concrete did not result in significant leaching of heavy metals and can meet the Dutch leaching limits (self-described as strict limits). The studies referenced in this presentation and abstract are consistent with methodologies and "legal" limits as defined in Dutch law.

EPA-HQ-RCRA-2011-0392-0045: Immobilization of Heavy Metals in the Mineral Additions Containing Concrete Composites
"The solidification of heavy metal compounds in matrices produced using mineral additions is beneficial from the natural environment point of view in several aspects. The wastes from the other areas of human activity, e.g. from power industry (fly ash of different origin), metallurgy (GGBFS) can be very effectively adapted for this purpose. The materials thus produced are not detrimental for environment and can be stored or practically implemented, e.g. in road making."

EPA-HQ-RCRA-2011-0392-0046: Improved Materials Testing: Leaching Tests on Ready-Mixed Concrete: Report to the Department of the Environment, Transport and the Regions [United Kingdom]
"Results for the analysis of total metals in the solid samples showed that the ready-mixed concretes did not contain silver, cadmium, mercury or selenium. Of the metals found, aluminium and iron were found in the greatest concentration, followed by barium and manganese. Some metals, namely arsenic, chromium, manganese, nickel and lead, were readily extracted from the solid samples when digested under concentrated acid conditions. However none of these metals were detected in the aqueous leachates, except chromium which was found at low concentrations. Aluminium, barium and iron were also readily acid extracted at the high concentrations used."

EPA-HQ-RCRA-2011-0392-0048: Lack of Complete Exposure Pathways for Metals in Natural and FGD Gypsum
"Use of wallboard made from synthetic gypsum generated via flue-gas desulfurization (FGD) by coal-fired power plants (FGD gypsum) raised questions concerning the potential for exposure to residual trace metals. Because gypsum is widely used (e.g., in wallboard), any issue with metals could have far-reaching implications. A conceptual site model evaluated potential human health exposure pathways for metals in gypsum, through consideration of data for 21 metals including samples of natural (mined) gypsum, and of FGD gypsum. Because there are no screening values for gypsum, comparisons were made to background soil concentrations and to risk-based concentrations for metals in soil termed preliminary remedial action goals (PRGs), which assume more frequent and prolonged contact with particulate soil than would be likely for gypsum, and thus provide a health protective means for evaluation of exposure. Additional screenings evaluated occupational exposure and agricultural use of gypsum. Maximum metal concentrations in natural and FGD gypsum samples were either consistent with background concentrations or much lower than PRGs for residential or agricultural soil, or workplace air, and thus exposure pathways for these media were considered incomplete. Separate analyses of mercury volatilization were conducted, and this pathway was also found to be incomplete."

EPA-HQ-RCRA-2011-0392-0049: Leachability of Selected Chemical Elements from Concrete
"Results indicate metal concentrations in leachate are all less than one-tenth RCRA regulatory limits, and any concentrations are below detection limits. Chromium TCLP cement values correlate with concrete leachate values while lead values do not. … Otherwise, it appears that metals, fluoride, and nitrate concentrations for the two aggregates and four cements tested do not present concerns in drinking water leachates from concrete."

EPA-HQ-RCRA-2011-0392-0050: Leachability of Trace Metal Elements from Fly Ashes, and from Concrete Incorporating Fly Ashes
This is a duplicate item with EPA-HQ-RCRA-2011-0392-0019.

EPA-HQ-RCRA-2011-0392-0052: Leachate and Radon Production from Fly Ash Autoclaved Cellular Concrete
"ACC [Autoclaved Cellular Concrete] appears to be an environmentally benign material based on the following:

- The concentration of heavy metals in leachates of crushed ACC were below 100 times their applicable drinking water standards, which is the regulatory hazard threshold. The possible microencapsulation in the ACC structure and the moderate to high pH of ACC leachates, contributed to the low concentration of heavy metals released to and solubilized in the aqueous extractants.
- ACC leachates did not induce a toxic response to MICROTOX organisms attributable to trace metals or other leached solutes.
- Polycyclic aromatic hydrocarbons or other hazards, high molecular weight organics derived from the ingredient flow ash were not detected in solvent extracts. This result indicates a very low mobilization potential of such organics from ACC.
- Radon exhalation from fly ash ACC was not of a magnitude to produce unacceptable buildups of the gas, even in poorly ventilated rooms."

EPA-HQ-RCRA-2011-0392-0053: Leaching Characteristics of Construction Materials and Stabilization Products Containing Waste Materials
"In this work, several construction materials prepared with an admixture of waste material and various stabilized waste products have been subjected to leaching studies in order for the leaching behavior of trace elements from these materials to be characterized. Static and dynamic leach tests have been applied, in which the specimen to be studied is fully immersed in demineralized water. Often the leaching process is governed by outward diffusion of constituents dissolved in the pore water. In some cases, dissolution from the surface of the product is most prominent, and in some materials short-term surface release has been observed. Groups of materials can be distinguished with similarities in the leaching behavior of trace elements."

"The alkalinity of the material, the open porosity of the product, and the surface-to-volume ratio prove to be important factors in controlling the release of potential hazardous elements from materials containing waste products."

EPA-HQ-RCRA-2011-0392-0055: Leaching Tests for Concrete Containing Fly Ash- Evaluation and Mechanism [Germany]
"Various tests were carried out with mortar mixtures containing fly ash. Mortar specimens using one bituminous coal fly ash and one fly ash from municipal waste incineration were prepared. The results of

the leaching tests were compared and classified. In addition, diffusion rates for certain elements were determined by use of tank tests with mortar specimens"

"The evaluation of leaching data on fly ash products is extremely difficult, owing to the large number of different leaching processes involved. The present paper aims to compare and classify results for a number of different leaching procedures."

"The 45 F Portland cement used in the tests possesses an extremely high contaminant-fixing capacity. All contaminant concentrations in the leachates from the various tests (except the maximum leachability test) are below the permissible limit prescribed by the German Drinking Water Order."

EPA-HQ-RCRA-2011-0392-0056: Mercury Emissions from Curing Concretes that Contain Fly Ash and Activated Carbon Sorbents
"Replacement of portland cement in concrete is the largest single beneficial use of fly ash, accounting for about 14 million tons of the fly ash produced in 2004. Changes in fly ash characteristics due to increased capture of mercury represent a potential threat to that market. The results presented in this report, as well as previously reported results, indicate that mercury emissions from concrete containing fly ash and powdered activated carbon are insignificant, accounting for less than 0.5 percent of the total mercury content of the concrete in all cases. These data show that higher mercury concentrations in fly ash containing PAC should not inhibit the use of the fly ash in concrete."

EPA-HQ-RCRA-2011-0392-0057: Mercury Emissions from Curing Concretes that Contain Fly Ash and Activated Carbon Sorbents
"Leaching results are presented graphically in Figure 6. Mercury concentrations in the leachates from crushed fly ash concretes averaged less than 5 ng/L. As a point of comparison, the U.S. EPA drinking water standard for mercury is 2,000 ng/L, more than 400 times higher than the concentrations found in the crushed concrete leachate samples. Mercury concentrations in leachate from fly ash concretes were less than levels observed for leachate from ordinary portland cement concrete in both the TCLP and SPLP tests. Researchers hypothesize that this may be due to the greater amount of carbon and lower permeability of the fly ash concretes. Based on the leach testing results, at least 99.98% of the mercury was retained in the fly ash concretes."

EPA-HQ-RCRA-2011-0392-0058: Memo from Gradient to CalStar: Metals Exposure Evaluation - Newly Manufactured CalStar Coal Fly Ash (CFA) Bricks
"…Results were evaluated to determine the leaching potential of CFA trace metals from fly ash bricks, and surface wipe sample results were evaluated to assess the potential for dermal and oral ingestion exposures (*via* hand-to-mouth contact) to CFA trace metals from direct skin contact with exterior bricks. Based on Gradient's evaluation of the sampling results, the presence of CFA metals in newly manufactured CalStar bricks is not expected to result in any exposures of health concern *via* dermal contact with brick surfaces or *via* leaching."

EPA-HQ-RCRA-2011-0392-0059: Prediction of the Long-Term Release of Hazardous Substances from Cement-Based Materials to Water [Sweden]
"Conclusions

- The leaching behavior depends to a large extent on the binding characteristics of the substance.
- The diffusion models can be used as a basis to predict the leaching for some metals.
- The concrete type does not change the leaching behavior significantly.

- Much more research is needed on the understanding and quantification of the binding of substances in cement-based materials."

"This work was supported by MISTRA, the Swedish Foundation for Strategic Environmental Research, as part of the research program Sustainable Building."

EPA-HQ-RCRA-2011-0392-0061: Pulverised Fuel Ash and Furnace Bottom Ash [Northern Ireland]
"PFA and FBA currently have end markets that will be further stimulated if their classification as a waste is removed. Producers must ensure that products from PFA and FBA meet the appropriate standards identified in this report. With the appropriate use of good practice guidance, if the chemical composition does not significantly exceed the parameters used in the risk assessment and listed in Appendix F, the risk of harm to human health and the environment from the use of products from PFA and FBA is low."

EPA-HQ-RCRA-2011-0392-0063: Review of Handling and Use of FGD Material
"FGD technology is well established and can be used to achieve the SO2 emission reductions required in the CSI. Additionally, much work has been and continues to be done on the utilization of FGD materials. The use of FGD gypsum in place of natural gypsum in wallboard manufacture, cement production, and other existing products has been demonstrated and commercialized. This has been accomplished because most of the technical challenges of producing commercially viable FGD gypsum have been solved, and the operating changes required to use these materials in commercial applications are becoming relatively well established. An area that remains a significant challenge in increasing the utilization of FGD gypsum is structuring successful relationships between producers and consumers. Other FGD materials are still in the process of being investigated for use in various applications, and technical challenges may require further investigation and demonstration in order to lead to commercialization. The issue of mercury associated with FGD material and its potential release to the environment is part of investigations funded by EPA, DOE, and industry; results of these studies may impact management of FGD material in the future."

EPA-HQ-RCRA-2011-0392-0064: Risk Evaluation of Leachable Mercury from Concrete Products Made with Fly Ash
"The study demonstrated that, even in cases where mercury in the raw fly ash exceeds the SWMP limit, no detectable mercury is leachable from the final concrete products containing such fly ash. In addition, since no mercury was detected in leachates, no threshold of fly ash content (up to 90 percent cement replacement) appears to exist where leachable mercury exceeds the applicable risk-based limits. As such, mercury in AES Hawaii fly ash used as an admixture in concrete products does not pose an unacceptable risk to human health or the environment. The Hawaii Department of Health therefore proposed an increased mercury limit for such fly ash from 0.00025 mg/L to 0.0055 mg/L."

EPA-HQ-RCRA-2011-0392-0123: Comparative Leaching of Midwestern Fly Ash and Cements
This is a duplicate item with EPA-HQ-RCRA-2011-0392-0034.

EPA-HQ-RCRA-2011-0392-0127: The Long-Term Assessment of a Cement Stabilised/Solidified Contaminated Made Ground for Use As a Road Construction Material [United Kingdom]
"This study investigated the physical and chemical properties of two aged cement stabilised / solidified materials, one produced from a contaminated made ground, the other from a pulverised fuel ash (PFA). … Comparison of the leachate data with UK environmental quality standards and published dilution factors, showed that both stabilised / solidified materials posed no potential threat to a water resource. Unconfined compressive strength testing of test cubes and core samples showed that contamination

present within the materials controlled the early strength of the treated materials. A cement stabilised / solidified made ground material was crushed and subjected to five aggregate tests. The material was found to meet the UK Highways Agency physical specifications for earthwork Class 1 and 6 materials, aggregate in a cement bound material and Type 1 sub-base road construction materials. This study has demonstrated that aged S/S materials can meet existing UK environmental and construction specifications."

EPA-HQ-RCRA-2011-0392-0128: Utilization of North Dakota Lignite Combustion By-Products in Road Building Applications
This report mainly focused on the suitability of North Dakota lignite combustion by-products in road building applications, except for a section of the report related to a leachate test.

"The characterization phase of this investigation included chemical, environmental, mineralogical, and physical components. The laboratory results from this study indicate that the North Dakota lignite by-products evaluated are environmentally benign and show excellent potential for utilization in a variety of applications. Results of the comprehensive environmental characterization showed all leachate concentrations of Resource Conservation and Recovery Act (RCRA) elements below RCRA limits and most leachate concentrations below primary drinking water limits. These results indicated that these materials are environmentally suitable for utilization and environmentally friendly, and it is recommended that the North Dakota State Health Department (NDSHD) consider development of preapproved use for the recycling of lignite combustion by-products."

3. EPA Should Consider Information on the Use of Fly Ash by the State Departments of Transportation

AGC is pleased that EPA included in the docket for the NODA several comments and a report on the specifications for beneficial use currently in use by state departments of transportation (DOTs). As AGC stated in its prior comments, DOTs have an enormous wealth of knowledge regarding fly ash use in highway and transportation construction. AGC again encourages EPA to carefully review the comments it receives from state DOTs and associated organizations such as the American Association of State Highway and Transportation Officials (AASHTO). AGC finds that the beneficial use studies/reports included in the NODA, and reviewed by AGC, provide an abundance of pertinent findings and important information on the accepted uses of CCRs in highway applications. This information must be considered by EPA in deciding if/how it should regulate CCRs.

Below are some highlighted findings on the accepted uses of CCRs in highway applications.

EPA-HQ-RCRA-2011-0392-0036: Engineering and Environmental Specifications of State Agencies for Utilization and Disposal of Coal Combustion Products: Volume 1 – DOT Specifications
"The objective of this report is to present a state-by-state comparison of U.S. Department of Transportation (DOT) specifications governing the use of coal combustion products. Because of a lack of resources, namely, time and funding, most transportation and materials engineers cannot fully research all of the current technologies of coal ash utilization. This compilation allows these professionals to become familiar with other department practices and to identify areas where specifications need to be developed within their own transportation offices."

"Fly ash use as a partial cement replacement in concrete was the most frequently indicated application."

"In addition to concrete, numerous states have used fly ash as a mineral filler in asphaltic concrete and soil stabilization, with many more states beginning to use fly ash in flowable mortar applications."

"Several states made references to not allowing the blending of two or more sources of fly ash and to only allowing the use of ash that had been evaluated by Cement and Concrete Reference Laboratories (CCRL)."

"All states had in place specifications pertaining to coal combustion products and their applications. The single most noted application is the partial replacement of cement in concrete. For this reason, the most commonly referenced specifications were ASTM C618 or AASHTO M295. Both are designed as methods of verifying if an ash can be used as a partial cement replacement in concrete. It was common practice for transportation departments to often change their specification from the indicated ASTM C618 and AASHTO M295 to reflect regional practices."

"The most significant changes in DOT specifications from 1992 were the additions of specifications for CLSM, GGBF slag, and blended cements. During the earlier comparison study, most states were aware of CLSM applications, but few had in-place specifications for its uses. The specified use of blended cements is an indication of the increased use of fly ash within the cement industry, as is also the case for GGBF slag. Some states have already adopted, or are currently in the process of doing so, updated specifications for utilizing coal combustion products. Differences between DOT specifications still varied greatly between states, even neighboring ones. A transition in material specifications to performance specifications will gradually blur the lines between state specifications."

4. EPA Should Take into Account the Lack of Damage Cases Related to the Beneficial Use of CCRs in Construction

In reviewing the docket for the NODA, AGC looked closely for documents on alleged or proven damage cases associated with fly ash disposal and management. AGC identified one report, which is summarized below, that mentions two alleged damage cases involving "beneficial use." A closer examination of the report, however, revealed that neither of these cases, in fact, involved the beneficial use of fly ash material. Rather, they appear to be instances of the same large scale disposal as the other alleged damage cases included in the report—which all focus largely on impoundments and landfills.

Particularly striking to note is that: "Most damage case facilities were opened before current state and federal non-hazardous landfill regulations were promulgated. Specifically, two-thirds of the sites with known operational dates were opened prior to promulgation of RCRA in 1976, and all with known operational dates opened before 1990." (EPA-HQ-RCRA-2011-0392-0007) This would suggest that current practices at the state level have alleviated many of the instances of proven damage cases.

Also worthy of note is that all of the proven damage cases have either been resolved and cleaned-up or are in the process of remediation.

AGC maintains that sufficient information and analysis are needed before the damage cases are used in a regulatory context. More site-specific information is required to place each site in the proper context in

terms of disposal practices at the site and current status of the site. This information is critical to assure that the assessments do not rely solely on old or incomplete data.

EPA-HQ-RCRA-2011-0392-0005: Out of Control: Mounting Damages from Coal Ash Waste Sites
This report initially indicates that it includes "high hazard ash ponds," and then goes on to state that two alleged damage cases relate to beneficial use—structural fill practices at Rocky Acres in Illinois and Swift Creek in North Dakota. However, it is evident from the report that these instances are not typical of beneficial use construction applications and are more aptly considered "landfilling"—as described by EPA in its proposed rulemaking

> EPA has identified a few problems involving large-scale fill operations—most involved the placement of fly ash and bottom ash in sand and gravel quarries and one involved the beneficial use of 1.5 million yards of fly ash to contour a golf course. Because of these cases, EPA is proposing not to accept large-scale placement of CCRs (which it likens to disposal) as an approved beneficial use. However, EPA recognizes that these uses are not typical of the construction industry's beneficial use of CCRs. (75 FR 35164) (AGC Comment Letter, November 2010)

Later, the report no longer describes the Rocky Acres site as beneficial use and instead refers to it as a disposal site in which allegedly 380,000 tons of CCRs were placed in a ravine. According to the report, the owner had stated their intention to build a structure on top of the CCR-filled ravine, which is why the owner had declared that the site was utilizing a beneficial use practice. Also according to the report, "State sent notice that the site was an illegal open dump in 2006; in 2007, Bunge Corp. agreed to monitor groundwater and submitted groundwater work plan."

According to the report, the second alleged damage case involves placing of coal ash directly into a wetland and ground water in/or around Swift Creek for approximately a 10-year period. Again, the owner had allegedly declared the site to be utilizing a beneficial use practice. In this case, the report indicates "State issued Notice of Violation in 2002 and Compliance Order in 2006 (assessing $4,000 penalty); corrective action system installed in 2008 to intercept groundwater."

EPA-HQ-RCRA-2011-0392-0007: Evaluation of Coal Combustion Product Damage Cases: Volume 1: Data Summary and Conclusions and **EPA-HQ-RCRA-2011-0392-0008: Evaluation of Coal Combustion Product Damage Cases: Volume 2: Case Summaries**
"This report provides a detailed technical evaluation for 63 of the CCP damage cases categorized as proven or potential."

"Review of available and assembled information on the 63 CCP damage cases indicates that they are largely older, unlined facilities. The constituents identified most often were sulfate and boron, and impacts were generally contained on site. Remediation is completed or ongoing at facilities where it was determined to be necessary." And "Most new CCP disposal facilities built in the last 15 years are constructed with liners and monitor groundwater."

"Most damage case facilities were opened before current state and federal non-hazardous landfill regulations were promulgated. Specifically, two-thirds of the sites with known operational dates were opened prior to promulgation of RCRA in 1976, and all with known operational dates opened before 1990."

"Review of available and assembled information on the 63 CCP damage cases reported in the 2007 USEPA Damage Case Assessment shows that groundwater impacts were mostly observed in on-site monitoring wells, and few cases had documented impacts to drinking water wells. When exceedances were observed, sulfate and boron, which do not have MCLs, were the most common constituents with exceedances, although exceedances of MCLs were observed at many sites—mostly in on-site monitoring wells. Remediation is completed or ongoing at most of the facilities, significantly lowering the probability that off-site water supplies will be impacted."

"These cases are not representative of the designs used at new CCP landfill and impoundment units, nearly all of which are constructed using liners, and often leachate collection systems. The damage case facilities, all constructed prior to 1990, are mostly unlined and rarely have leachate collection systems. As such, these facilities reflect past practices, many predating current state and federal non-hazardous waste disposal regulations. While the damage cases are relevant to evaluating the potential from older units still in operation today, they provide limited insight relevant to new units or for comparing the technical performance of common designs in use today."

5. Closing

AGC urges EPA to consider the additional information it received on the beneficial use of CCRs in its development of a final rule. It is also crucial that EPA encourage continued research in this important focus area. The studies and other information contained in the NODA demonstrate the environmental benefits of reusing CCRs in construction applications and underscore the need for additional research and analysis. When developing its final rule, and weighing the potential impacts of its regulatory options on the beneficial use of these materials, EPA also should take into consideration the real environmental benefits of reusing these materials and the lack of damage cases associated with the beneficial use of CCRs in construction.

Additionally, EPA should continue to work closely with stakeholders throughout the rulemaking process—especially state DOTs and other members of the regulated community—and provide all interested parties with ample time to adequately review and assess materials that will inform any new rule. State DOTs serve as one of the largest markets for incorporating fly ash into construction materials. It is essential that EPA consider the information contained in the NODA on the adoption of beneficial use practices by these state agencies.

Finally, AGC regrets not having more time to review the information presented in the NODA and requests that EPA provides longer comment periods in the future.

Sincerely,

Melinda Tomaino

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