

DATE: December 08, 2016

FILE REF: **DRAFT**

TO: NR 538 Technical Advisory Committee

FROM: Philip Fauble, Beneficial Use Coordinator
Waste & Materials Management Program

SUBJECT: Draft Responses to Second Request for Proposed Revisions to ch. NR 538 Wis. Adm. Code

During the second meeting of the NR 538 Technical Advisory Committee (TAC) for rule revisions on June 1, 2016, the Department solicited comments from the committee members for suggested revisions to the tables in Appendix I, and sections NR 538.06 to NR 538.08 of the existing administrative code requirements. Below is a summary of the comments submitted and the Department's draft responses.

At our September 13, 2016 meeting, the Department discussed some of these draft responses with the TAC members to determine if we can come to a consensus on our approach. Our intent is to develop a series of memos documenting comments from the TAC members and responses where we could achieve consensus and to note areas where disagreements remained.

Clean Wisconsin's Comments on Revisions to s. NR 538, September 14, 2016

Comment: The characterization tests for at least coal ash and FGD gypsum should include aluminum.

Response: Clean Wisconsin presented a good deal of information to justify the addition of aluminum to the testing parameters required for coal ash and FGD byproducts. Rather than comment on each point raised, DNR will lay out our rationale for not including aluminum as a required parameter under Appendix I of s. NR 538:

- Aluminum was evaluated by the U.S. EPA in their evaluation of coal combustion residuals (EPA 530-R-14-001) and it was not considered a constituent of potential concern (COPC) with respect to either ground or surface water impacts.
- The U.S. EPA modeled potential releases from unlined CCR landfills in their 2010 report "*Human and Ecological Risk Assessment of Coal Combustion Wastes*" and found that several compounds including arsenic, boron and molybdenum may be released at levels posing unacceptable risks to downgradient receptors, but aluminum was not listed as one of those compounds.
- Aluminum is listed by the U.S. EPA as a nuisance chemical subject to secondary drinking water standards. These standards were established only as guidelines for aesthetic considerations and are not enforced by the U.S. EPA.
- Aluminum is not included in the list of required testing parameters nor is there a standard established for a maximum aluminum concentration for FGD gypsum in the NRCS Conservation Practice Code 333 for the use of FGD gypsum as an agricultural soil additive.
- Aluminum is not listed as an element required for baseline or detection monitoring for groundwater or leachate quality at coal ash landfills under s. NR 507.30 Wis. Adm. Code.
- The ionic form of aluminum (Al^{3+}) is only the dominant species at solutions with a pH below 4. Above neutral pH, the predominant dissolved form is actually an aluminum hydroxide ($Al(OH)_4$)

in the form of a small crystalline clay known as gibbsite (Hem, 1992, USGS Paper #2254). Gibbsite particles are very stable and insoluble in water, but small enough (near 0.10 microns) to pass through most filter media. Since none of the byproducts listed in this rule have a characteristic pH below 4 (most tend to be somewhat alkaline), aluminum will be found not in its ionic state, but travelling as colloidal clay particles. The behavior of aluminum makes it difficult to predict its solubility in any groundwater and injects a good deal of uncertainty in any water analysis. This is especially true of materials that already possess aluminum in the form of small clay particles such as coal ash or foundry sand.

- In summary, DNR does not find evidence, either in previous studies or based on its geochemical behavior, that aluminum should be included as a required sampling parameter in the byproducts covered by this proposed rule revision.

Comment: Please confirm that the following allowances and exceptions for Existing Category 1 byproducts will NOT apply to the proposed Category 1 byproducts.

Response: Clean Wisconsin then provided a list of allowances and exemptions that pertained to the existing Category 1 byproduct materials, which will not be listed here. These exemptions are in portions of the Code that have not yet been revised or discussed, but DNR can confirm that those exemptions applied to the existing Category 1 byproduct material will be deleted or revised since there will no longer be a category that represents an “unrestricted use”.

Wisconsin Cast Metals Association’s Review of Direct Contact Standard Values, November 1, 2016

Comment: The Wisconsin Cast Metals Association (WCMA) submitted comments directly related to the proposed direct contact standards contained in the revised NR 538.22 Wis. Adm. Code, Appendix I Tables. As part of their submittal, WCMA attached a copy of a report prepared by the TRC Environmental Corporation (TRC) also dated November 1, 2016 prepared on behalf of the WCMA. The TRC report raised several concerns regarding the Wisconsin Department of Health Services (DHS) assessment methodology for direct contact exposure, mostly contending that use of an occupational exposure assumption is unrealistic for the proposed uses and overly conservative. WCMA echoed the concerns raised by TRC, fearing it would restrict potential reuse options for foundry byproducts.

Response: Before we address specific issues and concerns raised by the TRC report, we would like to reiterate that our goal with this rule revisions is to try to simplify the process (for both the applicant and the DNR) while preserving existing beneficial uses and protecting the environment consistent with our statutory requirements. To accomplish this, the DNR specifically evaluated and opted not to follow a “case-specific” approach to regulating beneficial use of industrial byproducts. While this results in a rule that appears to favor a “one size fits all” strategy, our experience with the results of our rule implementation since 1997 compared with the experiences of neighboring States, seems to confirm that, while not perfect, a more self-implementing approach does encourage more beneficial use. The disadvantage of this self-implementing approach is that the standards are, by necessity, fairly conservative. This is necessary since we are not going to evaluate and approve each and every byproduct and reuse individually, which would be cost and time prohibitive for both the generator and the DNR. Instead, we are relying on the same basic successful system developed in the original rules that allows us maximum flexibility and minimal direct oversight, with the trade-off that certain safety factors have to be built in to compensate for uncertainties.

An example of this approach is the response to TRC's suggestion that use of a Hazard Quotient (HQ) of 1.0 instead of the HQ of 0.2 proposed for use by DNR would be more appropriate given the potential risk for exposure presented by several of the reuse options. The goal of the original NR 538 standards were to maintain a hazard risk quotient of no more than 1.0 and that standard remains unchanged with the current proposed standards. Since calculating a risk for each individual byproduct line and potential use (case specific approach) was deemed too time consuming and expensive, a safety factor of 5 was introduced thereby dropping the HQ to 0.2. In this way, the standards could account for up to 5 different contaminants without exceeding the hazard quotient of 1.0, which is the exact same approach being taken in the proposed new standards for direct contact. TRC also suggested using a recreational user scenario as an alternate approach but, unfortunately, those standard calculators are also almost entirely case specific. They cannot account for a wide variety of byproduct types and uses in a mostly self-regulating approach to beneficial use.

TRC also mentions that using an industrial exposure scenario (8 hours/day, 250 days per year) is excessive for the potential uses cited in ch. NR 538.10 Wis. Adm. Code. Exploring this aspect of the standards calculations further may be warranted. Uses such as winter road abrasive would be confined to winter months and unbonded surface courses for trails and roadways would have limited exposure potential in winter months. DNR will work with DHS to incorporate adjustments to the potential exposure calculations based on these factors.

Internal DNR Comments and Review

Comment: The case of a foundry operation that has had a history of difficulties running accurate water leach tests for iron on their foundry sand byproduct was mentioned in response to the proposal for iron being required for foundry sand characterization. DNR confirmed that laboratories contracted to the foundry were having difficulty analyzing foundry sand samples for iron using ASTM D3987 due to the presence of fine clay particles that interfered with the analyses resulting in erroneously elevated iron levels. This resulted in the foundry sand byproduct bouncing back and forth from Category 2 to Category 4 even without any changes to the foundry process. It was also noted that iron is listed as a Public Welfare standard under s. NR 140 Wis. Adm. Code, not a Public Health standard.

Response: Given these facts and difficulties, iron will no longer be included in the parameter list for foundry sand water leach testing.

Comment: A review of the EPA report EPA-530-R-14-003 "*Risk Assessment of Spent Foundry Sands In Soil-Related Applications*", manganese was not listed as a groundwater constituent of concern (COC). As with iron, manganese is listed as a groundwater Public Welfare parameter under s. NR 140 Wis. Adm. Code and not a Public Health parameter.

Response: After further consideration of this information, manganese will also no longer be included in the list for foundry sand leach testing.

Comment: It was noted that, while foundry and steel slag may contain elevated levels of manganese, it is bound up in a glassy matrix and not readily available for leaching. In this way it very closely mirrors the performance of iron in slag byproducts. A review of characterization data from the DNR files confirms that manganese has historically not leached out of foundry slags in amounts above the s. NR 140 preventative action groundwater standards.

Response: Based on historic data and the performance of manganese in slags, manganese will no longer be required in analysis for foundry slag.

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