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Subject Request for Alternate Site Specific Grout Mixture

Project Name Tyco Fire Products LP (Tyco), Marinette, Wisconsin

Attention Sara Krueger/Wisconsin Department of Natural Resources (WDNR)

From Jacobs Engineering Group Inc. (Jacobs)

Date May 26, 2023

Copies to Angela Carey, WDNR
Ryan Suennen, Tyco Fire Products
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On behalf of Tyco, Jacobs has prepared this memorandum requesting WDNR approval of an alternative site specific grout mixture for the Tyco property located at the One Stanton Street in Marinette, Wisconsin (site).

Background

In the late 1990s, Tyco requested a variance from the NR 141 well sealing and abandonment requirements. The variance was requested because a well seal constructed of bentonite chips or a bentonite slurry may not hydrate or degrade due to the elevated saline concentration in the groundwater observed in portions of the site. WDNR approved the site specific sand-cement grout mixture and the mixture has been used at that site since that approval.

The original approved mix design, without bentonite, is as follows:

1 bag (94 pounds) Type II Portland cement, 4.5 gallons water, and 2 cubic feet of fine grained sand. Up to 1 pint of super plasticizer may be used per bag of cement to aid in installation (by increasing the fluidity of the grout for pumping into the borehole).

Proposed Replacement

During recent well abandonment and installation planning, the Type II Portland cement component of the mix design was not available from regional suppliers and had to be procured and shipped in from other alternative suppliers. As part of U.S. sustainability efforts, Type I and II Portland cement are being phased out and will either no longer be produced or will have limited availability. The Type I and II Portland cement are being replaced with Portland-limestone cement (PLC) Type IL. Other Portland cement types (such as Type V with high sulfate resistance) are specialized and not always easily accessible for purchase commercially in small quantities.

PLC Type IL is a blended cement manufactured with a limestone content between 5% and 15% and is governed by ASTM Standard C 595 Standard Specification for Blended Hydraulic Cements. Most Type IL cements result in an approximate 10 percent reduction in carbon production versus the standard Type I¹.

Due to the future availability concerns and Type II Portland cement not being readily available, Tyco is requesting an alternate mix design be allowed, where the PLC Type IL serve as direct substitute at the same dose in the mix design as the Type II Portland cement. The alternate mix design, without bentonite, would be as follows:

1 bag (94 pounds) PLC Type IL, 4.5 gallons water, and 2 cubic feet of fine grained sand. Up to 1 pint of super plasticizer may be used per bag of cement to aid in installation (by increasing the fluidity of the grout for pumping into the borehole).

The information presented herein is serving as the written request to WDNR for approval to use the alternative site specific grout mixture with PLC Type IL substitute. Please contact Denice Nelson at 651.280.7259 if you have any question or require additional information.

¹ https://www.euclidchemical.com/fileshare/Literature/Technical_Bulletins/AD-08-What_Is_PLC_or_Type_IL.pdf