From:	David Beattie
To:	Knutson, Jason R - DNR; Stocks, Adrian G - DNR; DeVenecia, Eric R - DNR
Cc:	Sager, John E - DNR; Tom Holstrom
Subject:	7/18/2018 Request for Change to Sampling Frequency at Temporary Treatment System
Date:	Wednesday, July 18, 2018 2:20:05 PM
Attachments:	Husky Energy - Temporary treatment system SAP - 07182018 (final).pdf

Jason/Adrian/Eric:

The Superior Refinery would like to request reduced sampling frequency for our temporary granular activated carbon (GAC)/ion exchange (IX) water treatment system for PFAS compounds. Coverage for operation and discharge of treated water for the temporary water treatment system was allowed under WPDES General Permit for Petroleum Contaminated Water (No. WI-0046531-06-0) on June 4, 2018. It was amended July 2, 2018 for the installation of a parallel GAC/Ion Exchange treatment system.

Per the permit approval dated June 4, 2018, sampling for PFAS compounds was required every other day. On June 14, 2018, in response to a request from the Superior Refinery, the WDNR approved a reduced sampling plan of Monday, Wednesday and Friday.

With the redundancy of a second, operational water treatment system (operational as of July 6, 2018) and a better understanding gained through operating a system for approximately seven weeks, we request the following approval from the Department:

The refinery is requesting a revised water treatment system sampling frequency for PFAS compounds to two times per week, every Monday and Wednesday, starting the week of July 16th.

With continued operating experience with the water treatment system, and decreasing influent total PFAS concentrations, we believe this is an appropriate frequency. Attached is a revised Sampling and Analysis Plan showing the proposed PFAS sampling schedule [*Husky Energy - Temporary treatment system SAP - 07182018 (final)*].

Additional information/clarification:

Clarification of calculation method for breakthrough percentage.

With decreasing influent total PFAS concentrations, we are seeing variations in the calculated breakthrough percentages for PFOS and PFOA in the lead vessel. For example, when the water treatment system influent PFOS or PFOA concentration decreases between two sampling events, the concentration in between the lead/lag GAC vessels does not typically exhibit the same amount of mass reduction. This is primarily due to the movement of the PFAS mass transfer zone within the lead GAC vessel itself; it can take several days/sampling events to notice concentration reductions in between the lead/lag GAC vessels when the influent concentration decreases, and concentration reductions in between the lead/lag GAC vessels may not be observed.

Because a calculation method is not specifically stated in the permit coverage determination letters, we have been using the influent concentration from the day of the sampling event to calculate breakthrough percentage between the lead/lag GAC vessels for each train of the temporary treatment system. To calculate breakthrough percentages moving forward we will be using an average influent concentration from the last three sampling events as follows:

> Breakthrough = (between lead/lag vessel concentration) / (last three sample average temporary water treatment system influent concentration)

This will help dampen variations in the calculated breakthrough percentages and provide a more

accurate description of the status of the carbon in the lead vessels and prevent premature change-out of GAC in a lead vessel.

Modification of requirement for replacement of GAC (originally summarized for the Department in e-mail on 7/3/2018).

Based on telephone conversations between Mark Darby and Jason Knutson, on July 3, 2018, in reference to condition number 3 in the Approval of Plans and Specifications for additions to temporary treatment system for water containing firefighting materials- WI-0003085-08-0, dated July 2, 2018, additional wording was added (in red):

> *3. The concentrations of PFOS and PFOA will be monitored and used to determine when the GAC will be replaced. A 50% breakthrough of the influent concentration of PFOS or PFOA in the lead vessel will indicate that the GAC needs to be changed or as approved by the Department following sampling data evaluation, overall system performance and influent concentrations of PFOS and PFOA.*

Granular activated carbon in the lead vessel of system #1 was recently replaced, before the breakthrough percentage exceeded 50%. However as total PFAS influent concentrations to the system continue to decrease, we would like the flexibility to make a case-by-case determination as to when carbon should be changed, depending on additional operations information. This information includes performance of the lag GAC vessels as well as the ion exchange vessels in terms of PFAS removal.

As always, please let me know if you have any questions. We would like to follow the revised sampling plan immediately, meaning we would not be sampling this Friday, 7/20/2018.

Thanks,

Dave

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