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OF NATURAL RESOURCES

MEMORANDUM

DATE: APR 1 5 2016

TO: Leanne Tippett Mosby, Director Division of Environmental Quality

FROM: John Madras, Director W Water Protection Program

SUBJECT: Chemical Additives Fact Sheet

This memo is for your approval of the attached fact sheet "Chemical Additive Usage at Wastewater Treatment Facilities." This fact sheet was created to guide permittees that are considering the use of chemical additives in their wastewater treatment process. The key message of the fact sheet is that it is incumbent on the permittee to determine if the chemical addition is effective and whether the addition is expected to affect effluent quality. If it will affect effluent quality permittees are asked to contact the department to work through their permitting options. Staff do not review chemical additives or pilot their application.

While the primary audience of the fact sheet is permittees, it does explain that if an inspector is concerned about a particular chemical addition and its effect on effluent quality he may request that the operating permit be reopened for cause so that proper conditions can be added to the permit to address the concern.

If you have any questions regarding the fact sheet, please contact me at 573-751-7298.

I concur with the recommendation

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Leanne Tippett Mosby, Director Division of Environmental Quality

I do not concur with the recommendation:

April 15,2016

Date

Leanne Tippett Mosby, Director Division of Environmental Quality Date

LTM:jm



Missouri Department of Natural Resources

CHEMICAL ADDITIVE USAGE AT WASTEWATER TREATMENT FACILITIES – 2016

Water Protection Program Fact Sheet		04/2016
Division of Environmental Quality Director:	Leanne Tippett Mosby	PUBxxxx

This factsheet is intended to guide wastewater treatment permittees who are considering the application of chemical additives to improve their current operations. The use of chemical additives at wastewater treatment plants is common and can serve a number of purposes. The addition of acids and bases such as hydrochloric acid and sodium hydroxide are commonly used to adjust pH. Chlorine gas and sodium hypochlorite are often used to kill pathogens and disinfect wastewater and sodium sulfite or sodium bisulfite are often used in tandem to dechlorinate these effluents. There is a variety of compounds that serve as coagulants, flocculants, and filter aids such as aluminum sulfate, ferric chloride, and polymer based compounds. Quite a few facilities use herbicides to control algae or other nuisance aquatic plants. Some operations can be improved with the use of enzymes and surfactants that stimulate bacterial action by cleaving fat, oil and grease, and sugar and starch molecules into basic components so that they can be destroyed by bacterial action. And some wastewater treatment systems require the addition of alkalinity and carbon sources such as methanol to function properly.

Operating permits do not prohibit the use of chemical additives unless their use is expected to result in a change or impact to effluent quality. The department does not review or approve the usage of specific additives or applications. Existing permits (Standard Conditions Part I, Section B) require permitees to "give notice to the Department as soon as reasonably possible of any planned physical alterations or additions to the permitted facility." In general this refers to how these alterations or additions may affect their discharge. When considering the addition of a new additive the permittee must determine if it will adversely affect the quality of their effluent or change the characteristics of their biosolids. In many cases chemical additives are expected to improve effluent quality and therefore do not require a modification to the operating permit. An example might be the addition of a flocculent to a final clarifier to improve settling performance without negatively affecting effluent quality.

Permittes must be careful to consider the unintended consequences of chemical addition and they need to question whether the chemical may cause toxicity to aquatic organisms or affect narrative water quality criteria such as causing scums, color or turbidity, or odors. Operating permits include conditions that prohibit permittees from causing these conditions. It may be difficult to know if a particular additive has the potential to cause toxicity, and product vendors can sometimes help with this determination. To determine toxicity, the department relies on Whole Effluent Toxicity (WET) testing. WET testing methods can be found in 40 CFR 136.3

and the U.S. Environmental Protection Agency has published a guidance on WET testing at <u>https://www.epa.gov/sites/production/files/2016-02/documents/method-guidance-</u>recommendations-wet-testing_2000.pdf. Many operating permits include requirements to conduct WET testing, and sampling should be done during periods in which chemical additives are being used so that their contribution to toxicity is considered.

In the event that a permittee expects that a chemical addition will result in an adverse impact to their effluent, they will need to contact the department to have their operating permit modified and the activity may have to undergo Antidegradation review. An example of this would be the installation of a chlorination / dechlorination system for disinfection because the addition of these chemicals is expected to affect the quality of the discharge. For this reason the installation of a chlorination system requires a modification to their operating permit. And because this project would involve the installation of equipment that is subject to design standards a construction permit would also be required.

For cases in which an operating permit modification is needed permittees must specify the conditions that require chemical addition, explain the dosages, and describe how this is expected to affect effluent quality. It is incumbent on the permittee to evaluate the effectiveness of chemical addition and make sure that they are adhering to their permit conditions. If the department suspects that a particular chemical additive may be affecting effluent quality, the department may reopen the operating permit and include conditions to address the concern.

Nothing in this document may be used to implement any enforcement action or levy any penalty unless promulgated by rule under chapter 536 or authorized by statute.

For more information Missouri Department of Natural Resources Water Protection Program P.O. Box 176 Jefferson City, MO 65102-0176 800-361-4827 or 573-751-1300 http://www.dnr.mo.gov/env/wpp