VARIANCE REQUEST
Iowa Department of Natural Resources

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| 1. | Date: | December 24, 2012 | 14. | Decision: |
| 2. | Reviewer/Engr.: | (Emy) Wenxin Liu | | Date: |
| 3. | Date Received: | December 5, 2012 | | |
| 4. | Facility Name: | City of Le Mars Wastewater Treatment | | |
| 5. | Facility Number: | 6-75-40-0-01 | | |
| 6. | County Number: | 17 | 15. | Appealed: |
| 7. | Program Area: | CP (Wastewater) | | Date: |
| 8. | Facility Type: | C09 (Sludge Handling) | | |
| 9. | Subject Area: | 320 (Sludge Lagoon) | | |
| 10. | Rule Reference: | 567-64.2 (9) a | | |
| 11. | Design Std. Ref.: | 17.3.5.3 | | |
| 12. | Consulting Engr.: | Bolton & Menk, Inc. Consultants | | |
| 13. | Variance Rule: | 567-64.2(9)c | | |

16. Description of Variance Request:

The City of Le Mars proposed to IDNR a wastewater facility plan for construction of an industrial wastewater treatment facility for treating the projected significant increases in waste loads from two significant industrial users: Wells Enterprises and Dean Foods. Wells Enterprises is currently constructing a major expansion to its ice cream production plant. The proposed treatment process is an activated sludge process with aeration basins and clarifiers. Waste sludge will be gravity thickened, stored in earthen biosolids storage (holding) lagoons and land applied to agricultural land located adjacent to the industrial wastewater treatment facility site.

The City of Le Mars requests a variance from the Iowa Wastewater Facility Design Standards 17.3.5.3. IA 17.3.5.3 describes sludge holding lagoon shall be designed for mixing by satisfactory aeration equipment. To meet minimum mixing requirements, an aeration rate of 20 cfm per 1000 $ft^3$ lagoon volume shall be provided with the largest blower out of service. If mechanical aerators are utilized, a minimum of 1.0 horsepower per 1000 $ft^3$ shall be provided. Use of mechanical equipment is discouraged when freezing temperatures are normally expected.

The City of Le Mars requests a variance from the Iowa Wastewater Facility Design Standards 17.3.5.3 requirements for "mixing and air requirements" for sludge holding lagoons. The proposed design does not include a permanently installed mixing system or aeration of the biosolids storage lagoon as required by the Design Standards.

17. Applicant's/Consulting Engineer's Justification:

Consulting Engineers for the City of Le Mars listed unique circumstances of the project as bellow:

1. Proven Performance of the Existing Biosolids Storage Lagoon

The existing Le Mars biosolids storage lagoon was constructed under an IDNR construction permit and does not have mechanical mixing and aeration. The lagoons are designed for use of portable mixing equipment at the time of lagoon cleaning operations. There have been no odor issues associated with the lack of aeration. Therefore, it is anticipated that the proposed

lagoon will provide similar, acceptable performance as the existing similar biosolids storage lagoon.

There are other industrial wastewater treatment facilities in Iowa that do not have aeration in biosolids storage tanks or mixing and aeration in biosolids storage lagoons, including City of Lenox/Michael Foods Industrial Wastewater Treatment Facility, City of Postville/Agri Star Industrial Wastewater Treatment Facility, Tyson Fresh Meats Storm Lake Treatment Facility, Tyson Fresh Meats Columbus Junction Treatment Facility and Tyson Fresh Meats Perry Treatment Facility.

2. Facility Location

The proposed facility is located adjacent to the existing City of Le Mars biosolids storage lagoons. The area is low population density and adjacent to livestock production facilities. There is a relatively low risk of a significant increase in odors at this facility location due to the remote location and proximity to odor emitting land use activities.

3. Mitigation of Potential Odor Issues

In the event that there are significant objectionable odor emissions attributed to lack of biosolids storage lagoon mixing and aeration, the City of Le Mars will construct treatment facility modifications or modify the treatment process operations to reduce the odor emissions.

18. Department's Justification:

***This Variance is recommended to be denied.***

Sludge storage facilities shall be provided at all mechanical treatment plants. Sludge storage lagoons will be permitted only upon proof that the character of the ***digested*** sludge and the design mode of operation are such that offensive odors will not result (10-State Standards 89.21, 2004). In Iowa Wastewater Design Standards, sludge holding may be provided either (1) as storage where the sludge has been ***stabilized*** through the treatment process itself or (2) in addition to the storage provided in the digester (IA 17.3.4). To justify for a sludge storage lagoon, the sludge shall be well stabilized prior to discharging to the lagoon.

IDNR approved a variance request on November 28, 2012 for the same project which is designed without providing a standalone sludge stabilization unit process. The justifications for approval are based on two main reasons. First, the content of the sludge is industrial only sludge which is not subject to pathogen limits in municipal biosolids land application rules in 40 CFR Part 503 and IAC 567-67. Second, the characteristics of raw wastewater to the industrial wastewater plant is represented mostly by milk solids and sugar products and that should be more readily biodegradable so that the proposed extended aeration activated sludge process with 20 days of SRT should be able to produce fairly stabilized waste sludge. Thus, the variance was approved based on a contingency that if putrescible conditions occur due to not providing a sludge stabilization unit process, the City of Le Mars will construct treatment modifications to provide a complete sludge stabilization and reduce odor emissions. Details can be seen from November 28, 2012 IDNR variance approval for the City of Le Mars Wastewater Improvements.

According to wastewater design standards, when sludge holding lagoons are justified, they

must be designed in accordance with design standards in IA 17.3.5 which requires mixing and air requirements to be met. To meet minimum mixing requirements, an aeration rate of 20 cfm per 1000 $ft^3$ lagoon volume shall be provided with the largest blower out of service.

IDNR has previously approved variance requests for sludge storage lagoons that do not provide the degree of aeration and mixing as required by IA 17.3.5.3. List of variance approved facilities includes City of Ames in 1987 for anaerobically digested sludge, City of Sully in 1996 for Biolac Sludge, City of Maquoketa in 1995 and City of Riverside in 2006 for SBR sludge digested in ISAM anaerobic tank, City of Le Mars (municipal wastewater plant) in 2003 for anaerobically digested sludge, and City of Walford in 2003 for aerobically digested sludge. Another recent approval by the department (February 3, 2012) was for another Biolac system in City of Hospers that stored Biolac waste sludge in an aerated lagoon converted sludge lagoon which provides 2,017 cfm air for 133,700 $ft^3$ waste sludge as design.

Among all the above approved facilities, all have provided stabilized sludge through sludge digestion unit process before discharging to sludge lagoon, except for Biolac systems that provide an earthern basin activated sludge process with SRT up to 70 days. Long SRT in Biolac system becomes one of the fundamental reasons for allowing waste sludge discharging to sludge holding facility which is still equipped with some mixing mechanisms (EPA Technology Assessment with Publication No. 430/99-90-013). The SRT for both Sully and Hopsers reaches about 60 days. Sludge lagoons at Hospers and Sully are also provided with some degrees of mixing that are not up to the design standards requirement, which are also the reason for variance requests for the projects.

The Le Mars wastewater facility is designed as an extended aeration process to provide 20 days of SRT. The extended aeration process as proposed will possibly be operated at endogenous decay stage on microorganism growth curve in activated sludge process so that the sludge solids would be relatively more stabilized as compared to the other activated sludge processes with shorter SRT. However, there is no literature reporting that the sludge from a typical extended aeration process is fully stabilized. We found that by providing a sludge storage lagoon with no mixing and aeration is hard to justify for those waste sludge that stabilization status is undetermined.

Iowa Wastewater Design Standards 17.5.2 states sludge lagoon shall not be substituted for sludge digestion. So, sludge lagoon shall not be approved for use as a sludge digester. Sludge lagoon can only be used as sludge holding lagoon, if it is justified by IA 17.3.5, or as a sludge supernatant separation device as indicated by 17.5.2 and 17.3.5.6. In this project, due to the uncertainty in terms of sludge stabilization due to lacking sludge digestion defined as a process, we feel sludge storage lagoon, if proposed as a single unit to accept waste sludge that only undergoes gravity thickening, shall be designed to fully comply with IA 17.3.5.3 for providing 20 cfm/1000 $ft^3$ with the largest blower out of service to prevent odor risks rising from anaerobic stabilization happening in the sludge lagoon.

19. Precedents Used:
None

20. Staff Reviewer: Eng Wen Li — Date: December 24, 2012

21. Supervisor: Shelli Stapp for Satya Kommepalli — Date: 12-27-12

22. Authorized by: Shelli Stapp — Date: 12-27-12

Fields of Opportunities

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
CHUCK GIPP, DIRECTOR

December 27, 2012

Mr. Scott P. Langel
City Administrator
City of Le Mars
40 Central Ave. SE
P.O. Box 1130
Le Mars, Iowa 51031-1130

RE: City of Le Mars Wastewater Improvements
DNR Project No. S2010-0309

Subject: Variance Request from 567 IAC 64.2(9) and Design Standards Section 17.3.5.3

Dear Mr. Langel:

After careful and thorough consideration, the Department has ***disapproved*** your December 5, 2012 request for a variance from Iowa Administrative Code Subrule 64.2 (9) and Chapter 17.3.5.3 of the Iowa Wastewater Facilities Design Standards, which requires mixing and air requirements shall be in accordance with 17.3.4.3. 17.3.4.3 requires sludge holding tanks shall be designed to meet minimum mixing requirements at an aeration rate of 20 cfm per 1,000 $ft^3$ of tank volume with the largest blower out of service.

Pursuant to Iowa Code Section 455B.181, and 561 Iowa Administrative Code (IAC) 7.4(1), as adopted by reference by 567 IAC Chapter 7, a written notice of appeal to the Environmental Protection Commission may be filed within 30 days of receipt of this letter. The notice of appeal is required to be filed with the Director of the Department, and must identify the specific portion or portions of the variance denial that are being appealed and include a short and plain statement of the reasons for appeal. A contested case hearing will then be commenced pursuant to Iowa Code Chapter 17A, 561 IAC Chapter 7, and 567 IAC Chapter 7.

Please feel free to call Emy Liu at 515-2818509 or email at emy.liu@dnr.iowa.gov if you have any further questions.

Sincerely,

Shelli Grapp

Shelli Grapp
Water Quality Bureau Chief

Cc: Bolton & Menk, Ames, Attn:Greg Sindt

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DNR FO #3
DNR Sewage File 6-75-40-0-01
DNR Legal Services