



STATE OF IOWA

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

DEPARTMENT OF NATURAL RESOURCES
CHUCK GIPP, DIRECTOR

April 18, 2016

Wendy Erger, City Clerk
City of Norway
108 Railroad St
Norway, IA 52318

RE: Norway Wastewater Treatment Improvements
City of Norway
DNR Project No. S2015-0209
CWSRF File No. CS1920794 01

Subject: Variance Request from 567 IAC 64.2(9) and Design Standards Section
18.C.7.1.1

Dear Ms. Erger:

After careful and thorough consideration, the Department has **approved** your April 8, 2016 request for a variance from Iowa Administrative Code Subrule 64.2(9) and Chapter 18C.7.1.1 of the Iowa Wastewater Facilities Design Standards, which specifies individual cells must be separated by earthen dikes with the understanding that adequate maintenance, including repair of, or, if necessary, replacement of the baffle curtain will be provided in order to maintain the integrity of the system.

Based on the documentation presented by your Engineer, it is the determination of this Department that satisfactory justification has been presented to warrant the granting of a variance for the installation of a baffle curtain between the existing lagoon cell which would separate it into two aerated cells. The requested variance is deemed to be reasonable and necessary pursuant to the Iowa Code section 455B.181.

The facts presented for the project present unique circumstances and the variance is therefore justified to provide the narrowest exception possible to the provisions of the rule in accordance with Rule 561 IAC 10.5. Since the project planning and construction may last more than one year, the variance is considered to be of a permanent nature. The validity of this variance approval shall last for a period of one year from the date of the construction permit in accordance with Rule 561 IAC 10.5.

This decision is based on our review of justification presented to support the request. Our concurrence with the request is based on the Department's finding that the resulting project will provide substantially equivalent effectiveness as would be provided by technical compliance with the design standard on this issue.

Please feel free to contact Melissa Schlickbernd at 515-725-8424 or melissa.schlickbernd@dnr.iowa.gov if you have any further questions.

Sincerely,



Jon Tack
Water Quality Bureau Chief

cc: Lindsay Beaman, P.E., Snyder & Associates (Cedar Rapids)
DNR FO #1
DNR Sewage File 6-06-56-0-01
CWSRF File No. CS1920794 01

VARIANCE REQUEST
Iowa Department of Natural Resources

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| 1. Date: April 18, 2016 2. Reviewer/Engr.: Melissa Schlickbernd 3. Date Received: April 8, 2016 4. Facility Name: City of Norway 5. Facility Number: 6-06-56-0-01 6. County Number: 06 (Benton) 7. Program Area: CP (Wastewater) 8. Facility Type: C05 (Biological Treatment) 9. Subject Area: 318 (Curtain Wall) 10. Rule Reference: 567-64.2(9)a 11. Design Std. Ref.: 18C.7.1.1 (Lagoon Baffle Curtain) 12. Consulting Engr.: Snyder & Associates 13. Variance Rule: 567-64.2(9)c | 14a. Decision: <i>Approved</i> Date: <i>4/14/16</i> Expiration Date (if any): <i>JCH</i> 14b. 15. Appealed: Date: |
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16. Description of Variance Request:

The City of Norway is requesting a variance from the Iowa Wastewater Facilities Design Standards Chapter 18C - Iowa Design Standards for Wastewater Treatment Ponds - 18C.7.1.1 (Pond Shape - General) for the installation of a baffle curtain in an existing aerated cell in lieu of constructing an earthen dike.

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

Decreased Storage Volume: If an earthen dike were to be constructed in the existing aerated lagoon cell per DNR standards it would reduce storage capacity of each lagoon cell by 265,000 gallons thereby inhibiting treatment and requiring a variance.

Cost Savings: Currently the City does not have an earthen dike that separates the two aerated cells and is currently utilizing two baffle curtain walls to separate the lagoon into two aerated cells and a quiescent cell. Most likely clay and backfill material for the dike will have to be imported to the site which would be costly.

Constructability: Building a new earthen dike would require the lagoons to be emptied for a substantial time period during construction and force the City to haul its wastewater to another City's treatment plant.

Existing Site Limitations: To construct an earthen dike the City would have to purchase additional land to accommodate the two large aerated lagoons plus the required ammonia and E. coli upgrades.

Historical Use: The City has been using the existing baffle curtains since the early 1990's when the lagoons were converted into aerated lagoons.

Maintenance: The new proposed diffusers can be installed and removed from a boat. Each diffuser is attached to a flexible air hose that is fixed at the edge of the lagoon and dropped into place. This will eliminate the need to isolate a lagoon cell in order to do any maintenance on the air diffusers.

18. Department's Justification:

Recommend variance approval with the understanding that adequate maintenance, including repair of, or, if necessary, replacement of the baffle curtain will be provided in order to maintain the integrity of the system.

The proposed baffle curtain is replacement of the existing baffle curtains that had a variance approved on March 17, 1992. The proposed improvements are adding additional treatment after the baffled aeration cells to further reduce ammonia effluent limits and e.coli effluent limits.

The existing treatment plant is in the floodplain so any additional land purchase adjacent to the property

would require substantial cost increase for additional dirtwork to raise any new earthen dikes.

Given the area available at the existing treatment plant site is limited with the existing aerated cell and the constructed wetlands, the argument that constructing an earthen dike in the existing cell will reduce the available detention time is valid. An earthen dike meeting the applicable design standards placed within the existing cell without purchasing additional property and enlarging the lagoon system would reduce the total volume thereby requiring a variance from the Design Standard 18C.6.1.1 in lieu of this variance.

It is also assuring that the proposed aeration equipment is retrievable without dewatering the lagoon cell and that the City has operated with the existing baffle curtains for the last 20 plus years. The proposed treatment after the aerated lagoon cells would all have reliability built-in with multiple basins and a portion of the existing wetlands area is being kept as is so it would be available for temporary storage of wastewater, if ever needed.

19. Precedents Used:

City of New London - Approved 6/21/13

City of Princeton - Approved 5/8/08

City of Woodward - Approved 2/7/03

City of Cambridge - Approved 5/10/01

20. Staff Reviewer: *Melvin Schluck*

Date: *4-18-16* *LWB 4/18/16*

21. Supervisor: *Jatya Chatterjee*

Date: *4/18/16*

22. Authorized by: *Jm @ 4/18*

Date: *4/19/16*



TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

LARRY J. WILSON, DIRECTOR

March 17, 1992

Mr. Michael W. Hart, P.E.
Hart Engineering
823 Rider Street
Iowa City, IA 52246

SUBJECT: Variance Request
Curtain Wall Separation of Aeration Cells
Norway, Iowa

Dear Mr. Hart:

The Iowa Department of Natural Resources in accordance with subrule 567--64.2(9)c of the Iowa Administrative Code has approved your request for a variance from Iowa Wastewater Facilities Design Standard 18C.7.1.1 which requires that individual aerated lagoon cells must be separated by earthen dikes. The approval of this variance will permit separation of the two aeration cells by use of a floating baffle curtain wall in lieu of an earthen dike.

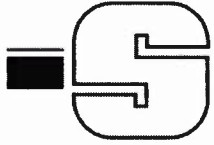
The engineering justification submitted demonstrates that this variance will result in substantially equivalent effectiveness while significantly reducing costs.

Sincerely,

DARRELL MCALLISTER
BUREAU CHIEF
SURFACE AND GROUNDWATER PROTECTION BUREAU

bkp/S&GW077P01.01

cc: City of Norway
Field Office 1



Memorandum

To: Melissa Schlickbernd, P.E. Iowa Department of Natural Resources **Date:** March 31, 2016

From: Lindsay Beaman, P.E. Snyder and Associates, Inc

CC: City of Norway

RE: Variance Request – Use of Baffle Curtain Walls in lieu of an Earthen Dike to Separate Lagoon Cells

Per 561 Iowa Administrative Code (IAC) Chapter 10, the City of Norway is requesting a variance to the Iowa Department of Natural Resources (IDNR) Wastewater Facilities Design Standards for the Norway Wastewater Treatment Plant Improvements project and issuance of the related Facility Plan Approval.

The following information has been provided per the IDNR's Variance Request Guidance document:

1. Name, address and telephone of entity requesting the variance:
 - a. City of Norway
108 Railroad St.
Norway, IA 52318
319-227-7351
2. Description and citation of specific rule from which a variance is requested:
 - a. A variance is requested for the methods and details of construction as cited in Chapter 18C, Section 18C.7.1.1 of the IDNR Wastewater Facilities Design Standards.
3. Specific variance requested, scope, and operative period which the variance will extend:
 - a. The variance requested is to install a baffle curtain wall to separate the lagoon cell into two aerated cells. This baffle curtain will be used in lieu of constructing an earthen dike structure.
 - b. Scope of the variance relates to separation of aerated lagoon cells with no way to bypass either cell.
 - c. The variance will extend from start up of the plant through the design life of the treatment plant (20 years).
4. Relevant facts justifying the variance:
Background: The City currently operates a continuous discharge aerated lagoon that has floating baffles to serve as cell divisions. The proposed treatment improvements for the

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approved design flows and loading include keeping the lagoon cells and adding processes to help the plant meet the future effluent limits.

a. Decreased Storage Volume

- i. The existing earthen lagoon cell has a total capacity of 5.2 million gallons. The proposed upgrades to the lagoon cell include dividing the lagoon into two aerated cells using a floating baffle curtain wall. Each aerated cell would have a capacity of 2.6 million gallons. Using the design flow of 132,000 gpd that was calculated following 18C4.1.2.a each cell will have a detention time of 19.6 days. The required detention time per cell to achieve compliance with NPDES permit limits for BOD is 18.7 days.
- ii. If an earthen dike were to be constructed per DNR standard 18C.7.1.1 with a top width of 8 feet, 2 feet of freeboard and having side slopes of 3:1 it would reduce the storage capacity of each lagoon cell by 265,000 gallons. This reduction of storage capacity would restrict the design storage retention by 2 days thereby inhibiting treatment.

b. Cost Savings

- i. Currently the City does not have an earthen dike that separates the two aerated cells and is currently just using baffle curtain walls to separate the lagoon into two aerated cells and a quiescent cell. It would be more cost efficient to just replace the baffle curtains than it would be to build new earthen dikes while the plant is still operational. Clay and backfill material for the dike will likely have to be imported to the site which would be costly.

c. Constructability

- i. Building a new earthen dike would require the lagoons to be emptied for a substantial time period so that the dike could be integrated within the existing lagoon. This would force the City to haul its wastewater to another treatment plant because it would not have the ability to conduct primary treatment. This would affect the plants ability to meet the permitted effluent limits while construction is taking place. Hauling the City's wastewater would not be reasonable to do because of the costs to haul the waste offsite, there is no way to account for peak flows and the uncertainty of any nearby plants being willing to take it.

d. Existing Site Limitations

- i. Per DNR design standards 18C.6.1 the first two cells shall be of equal size and no one cell shall provide more than 50% of the total required volume. If a second earthen lagoon cell were to be constructed to match this requirement it would require the City to purchase more land either to the south or to the west of the treatment site. The existing site is large enough space to accommodate two large aerated lagoons but it would not have enough for the necessary upgrades so that plant can meet the new permit limits.
- ii. Two equal sized lagoons cells could be built within the existing site if the existing aerated lagoon cell is expanded. This would require the north earthen dike to be moved north and a new earthen dike to be constructed down the center of the lagoon. This however would force the treatment plant to

completely shut down for an extended amount of time to allow the plant to complete drain. This would force the City to have its wastewater hauled to another treatment plant assuming they could find one nearby to accept the waste.

e. Historical Use

- i. The City has been using the baffle curtain walls since the early 1990's when the lagoons were converted into aerated lagoons.

f. Maintenance

- i. The proposed diffusers can be installed and removed from a boat. Each diffuser is attached to a flexible air hose that is fixed at the edge of the lagoons and is dropped into place. This will eliminate the need to isolate a lagoon cell in order to do any maintenance on the air diffusers.

5. Contact history with the Department

- a. There has been correspondence with the IDNR regarding this variance. This variance was originally brought to our attention during facility plan review. During this time Melissa Schlickbernd brought to our attention that per the DNR design standards Chapter 18C an earthen dike is required to separate two lagoon cells. It was recommended that since the existing lagoon has operating with just a baffle curtain wall separating the lagoon cells a variance request could be submitted to keep it that way.

6. Known Department's treatment of similar cases:

- a. We have not discussed if the DNR has accepted a variance request for this type of scenario however this is how the existing treatment facility was allowed to be constructed and has operated this way since early 1990's.

7. Name, address, and telephone number of any public agency or political subdivision(s) that might be affected by granting the variance:

- a. None

8. Name, address, and telephone number of any person or entity that might be affected by granting the variance:

- a. None

9. Identity of those having knowledge of relevant facts concerning the variance:


- a. Lindsay Beaman, P.E., Snyder & Associates, Inc
- b. Nick Eisenbacher, E.I., Snyder & Associates, Inc
- c. Melissa Schlickbernd, PE, Iowa Department of Natural Resources
- d. Wendy Erger, City Clerk, City of Norway

10. Signed Release:

I attest to the accuracy of the facts provided in the petition and the reasons as listed to justify issuance of the variance request.

Wendy Ziger
City of Norway

I attest to the accuracy of the facts provided in the petition and the reasons as listed to justify issuance of the variance request.

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|  | <p>I hereby certify that this Engineering Document was prepared by me or under my direct personal supervision and that I am a duly Licensed Professional Engineer under the Laws of the State of Iowa.</p> <p><u>Lindsay Beaman 4-1-16</u> Lindsay R. Beaman P.E. Date</p> <p>License Number 19971</p> <p>My License Renewal Date is December 31, 2017</p> <p>Pages or sheets covered by this seal: <u>All</u></p> |
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Please feel free to contact me at (319) 362-9394 with any questions pertaining to this variance request.

Sincerely,

SNYDER & ASSOCIATES, INC

Lindsay Beaman

Lindsay Beaman, P.E.
Project Manager

CC: City of Norway